Generalizations of the Tests by Kruskal-Wallis, Friedman and van der Waerden for Split-plot Designs

Appendix C 2
Tables and Graphs of the Power
in relation to n_i (5,10,..,50)

All tables and graphs refer to α=0.05. Reported are the proportions of rejections of the corresponding null hypothesis.

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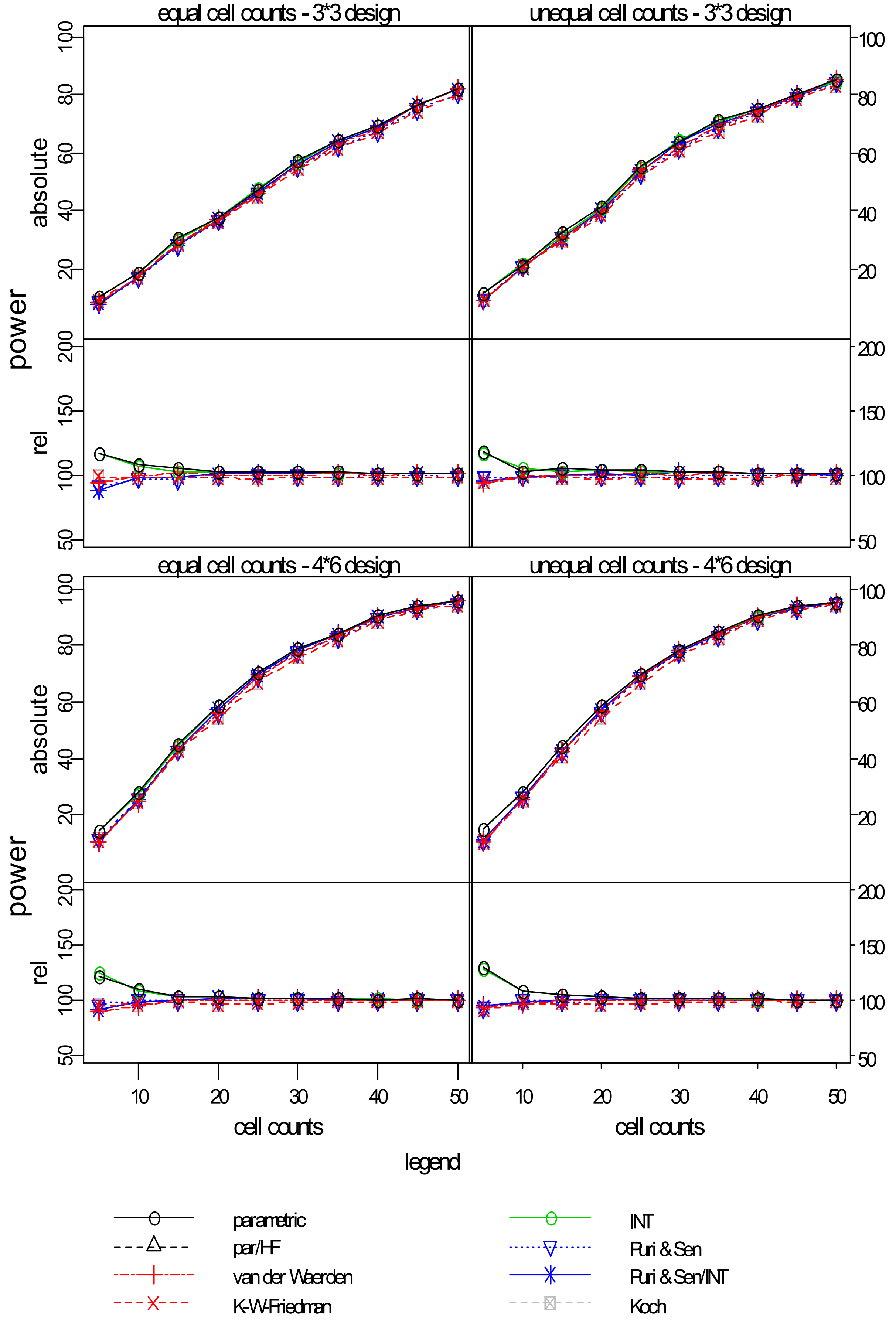
2. 1. Main effect A (effects a_i=0.4*s)

2. 1. 1. equal correlations on B (r=0.3)

2. 1. 1. 1 normal distribution - equal variances

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	10.55	18.85	30.45	37.50	57.60	69.25	82.40	11.40	21.25	32.35	41.25	63.80	75.30	85.15
parametric HF-adj														
van der Waerden	8.50	17.35	29.10	36.85	55.80	68.40	81.90	9.10	20.60	30.45	39.60	62.15	74.75	85.40
KW/F	8.95	17.05	28.55	36.10	54.45	67.00	80.45	9.15	20.80	29.90	38.55	60.65	73.05	83.15
INT	10.55	18.65	29.75	37.75	56.85	69.30	82.20	11.35	22.00	31.60	41.05	64.10	75.10	84.90
Puri & Sen	8.25	17.00	28.00	36.55	55.55	67.60	80.50	9.50	20.60	30.70	39.10	61.30	74.00	84.45
Puri & Sen + INT	7.95	17.10	28.40	37.05	56.30	68.85	81.95	9.25	20.50	30.40	40.25	63.55	74.85	84.70
Koch	8.95	17.05	28.55	36.10	54.45	67.00	80.45	9.15	20.80	29.90	38.55	60.65	73.05	83.15
	large design (4*6)													
parametric	14.20	28.15	44.70	58.80	78.90	90.30	95.70	14.80	28.10	44.50	58.40	78.50	90.35	95.20
parametric HF-adj														
van der Waerden	10.55	24.45	42.70	56.05	77.20	90.10	95.45	10.65	25.35	42.20	56.40	77.95	89.65	94.90
KW/F	11.05	24.75	42.50	54.35	75.85	88.30	94.35	10.45	25.35	41.10	54.30	76.50	89.05	94.15
INT	14.45	27.60	44.30	58.85	78.85	90.35	95.80	14.70	28.25	44.25	58.50	78.40	90.10	95.15
Puri & Sen	11.15	25.75	42.80	56.05	77.40	89.35	94.80	10.70	26.00	42.05	56.15	77.50	89.05	94.75
Puri & Sen + INT	10.65	25.30	42.75	57.45	78.40	90.05	95.55	10.85	25.90	42.60	57.05	77.75	89.80	95.05
Koch	11.05	24.75	42.50	54.35	75.85	88.30	94.35	10.45	25.35	41.10	54.30	76.50	89.05	94.15


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
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rel
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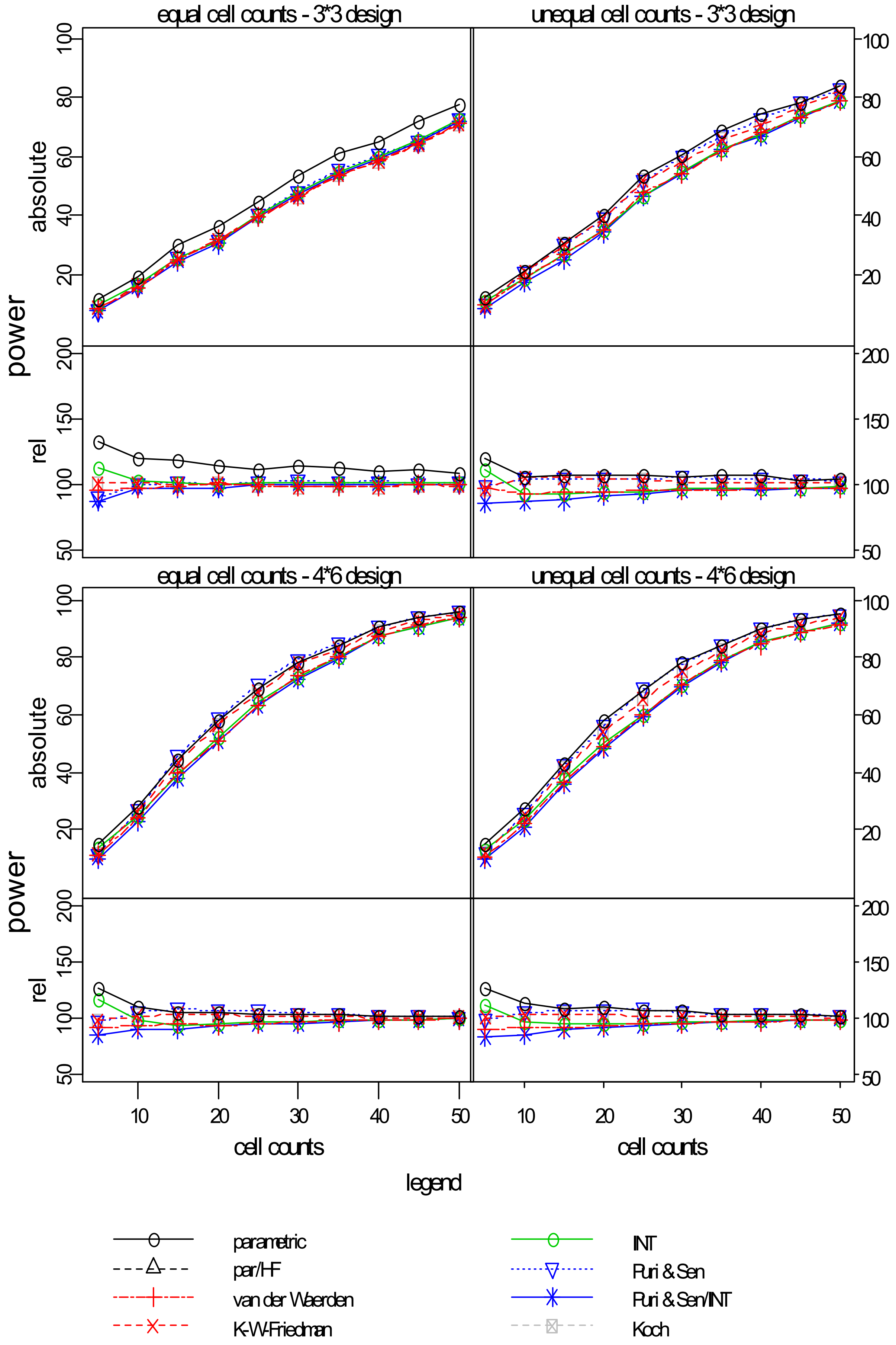
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

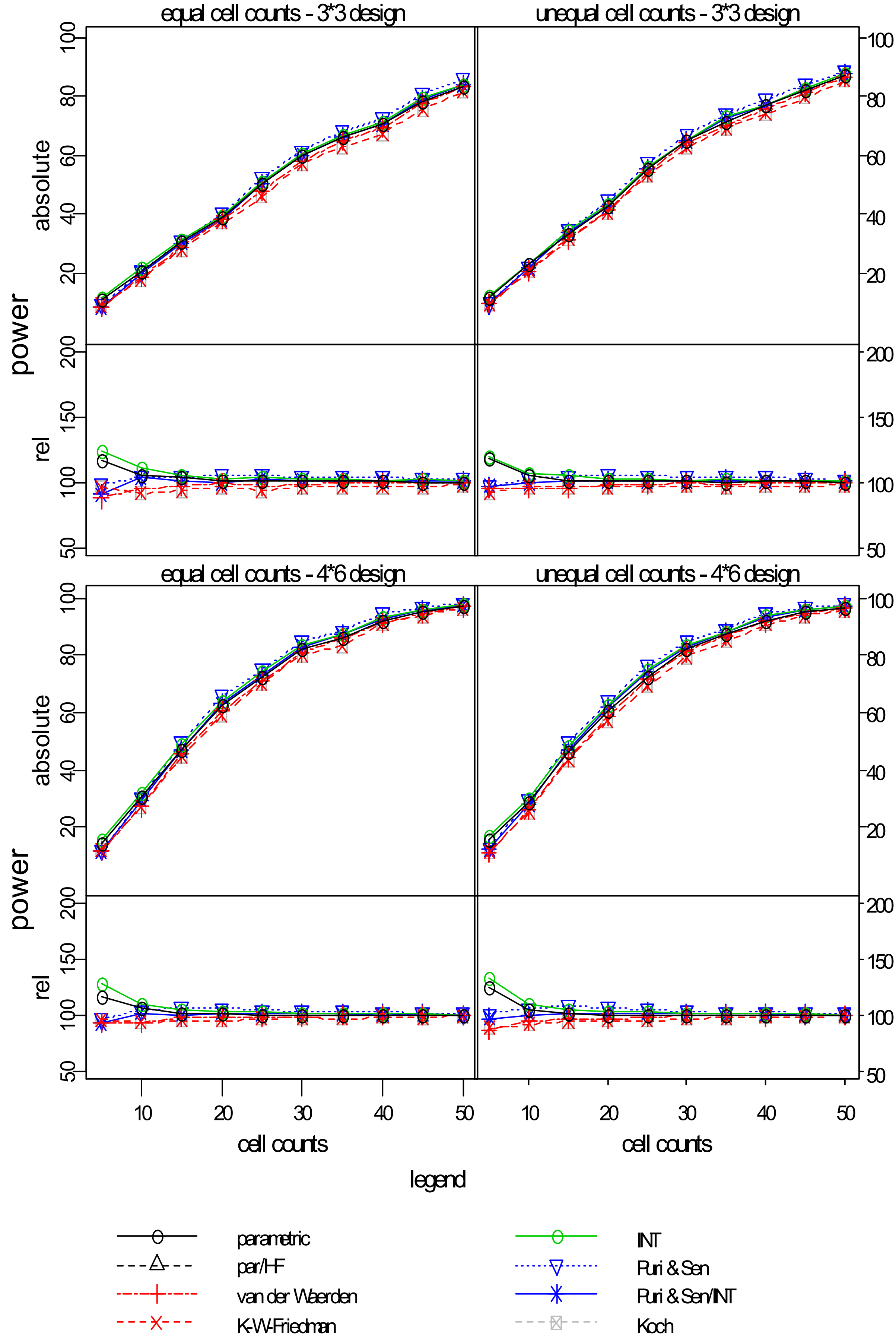
2. 1. 1. 2 normal distribution - unequal variances (on A)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	11.40	19.35	29.95	36.10	53.80	65.00	77.45	12.50	22.30	31.15	40.00	58.55	70.65	81.15
parametric HF-adj														
van der Waerden	8.30	15.65	25.00	32.00	46.70	58.45	71.60	9.50	18.65	26.30	34.15	50.65	62.70	75.05
KW/F	8.70	16.20	25.35	31.50	46.05	58.15	70.95	9.25	19.70	28.70	36.50	52.70	65.20	76.85
INT	9.75	16.45	25.60	31.35	47.65	60.00	72.45	11.90	19.50	26.00	34.65	50.70	62.80	75.65
Puri & Sen	7.75	16.00	25.70	31.40	48.30	60.55	72.50	9.70	19.90	28.65	36.20	53.95	66.35	77.80
Puri & Sen + INT	7.55	15.65	24.65	30.40	47.20	59.45	72.15	9.05	18.10	24.95	33.85	50.10	62.70	75.25
Koch	8.70	16.20	25.35	31.50	46.05	58.15	70.95	9.25	19.70	28.70	36.50	52.70	65.20	76.85
	large design (4*6)													
parametric	14.95	28.20	44.25	57.70	78.45	90.60	95.60	17.30	30.20	44.60	57.75	79.60	90.30	95.95
parametric HF-adj														
van der Waerden	10.85	23.90	39.60	51.10	73.90	87.10	93.80	12.50	26.25	40.20	52.00	75.15	87.10	94.10
KW/F	11.50	26.10	43.20	56.55	77.55	89.15	94.90	13.00	27.90	43.80	56.00	77.70	89.50	95.55
INT	13.65	24.95	39.05	52.10	72.95	87.55	93.90	15.25	26.15	40.95	53.40	74.95	87.75	94.40
Puri & Sen	11.45	26.80	45.55	58.70	79.25	90.85	95.65	12.65	27.65	45.65	58.05	79.40	91.20	96.10
Puri & Sen + INT	10.00	22.90	37.75	50.85	72.15	87.20	93.80	11.70	23.85	38.95	52.55	74.30	87.30	94.20
Koch	11.50	26.10	43.20	56.55	77.55	89.15	94.90	13.00	27.90	43.80	56.00	77.70	89.50	95.55


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

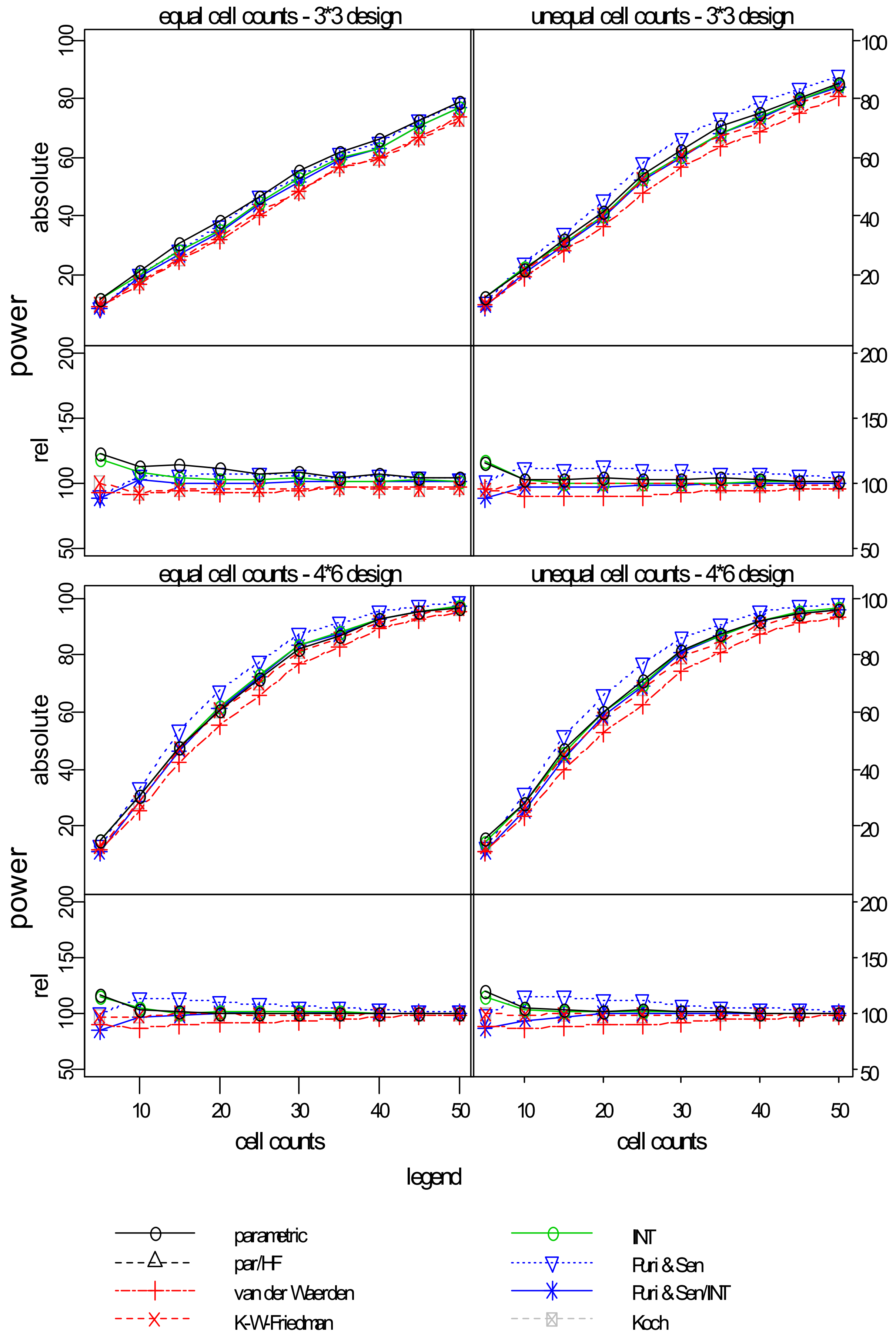
2. 1. 1. 3 normal distribution - unequal variances (on B)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	11.00	20.70	30.75	39.00	59.90	70.65	83.45	10.90	21.60	32.50	42.05	62.35	73.95	85.65
parametric HF-adj														
van der Waerden	8.20	18.55	28.70	38.40	58.15	69.70	83.25	8.55	19.70	30.40	41.60	60.70	73.25	85.20
KW/F	9.05	17.90	27.95	37.30	57.15	67.35	81.65	8.35	20.30	30.25	40.25	59.95	71.80	84.25
INT	11.55	21.60	31.20	39.30	60.65	71.15	84.30	11.40	22.25	33.45	42.65	63.45	74.70	86.85
Puri & Sen	9.20	20.40	31.00	40.50	61.65	72.70	85.85	9.00	22.45	32.80	43.25	64.45	76.60	87.75
Puri & Sen + INT	8.50	20.20	30.25	38.35	60.05	70.80	84.15	8.55	20.70	31.75	41.90	63.10	74.25	86.65
Koch	9.05	17.90	27.95	37.30	57.15	67.35	81.65	8.35	20.30	30.25	40.25	59.95	71.80	84.25
	large design (4*6)													
parametric	14.55	30.55	47.00	62.85	81.85	92.05	96.85	15.85	30.00	46.05	60.90	82.45	92.55	96.90
parametric HF-adj														
van der Waerden	11.65	27.10	45.55	60.55	80.75	91.35	96.75	12.00	27.30	44.10	59.50	81.75	92.25	96.80
KW/F	11.95	27.05	44.60	59.05	80.15	91.05	96.20	12.05	27.40	42.60	57.85	80.65	91.50	96.40
INT	15.90	31.85	49.00	64.15	83.70	92.95	97.40	16.55	31.35	48.65	63.00	83.65	93.50	97.30
Puri & Sen	11.95	30.10	49.75	65.70	84.70	94.40	98.05	13.00	31.25	49.45	63.90	85.15	94.45	97.80
Puri & Sen + INT	11.55	29.55	46.90	63.10	83.00	92.70	97.30	12.30	29.15	46.75	62.05	83.15	93.45	97.25
Koch	11.95	27.05	44.60	59.05	80.15	91.05	96.20	12.05	27.40	42.60	57.85	80.65	91.50	96.40


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

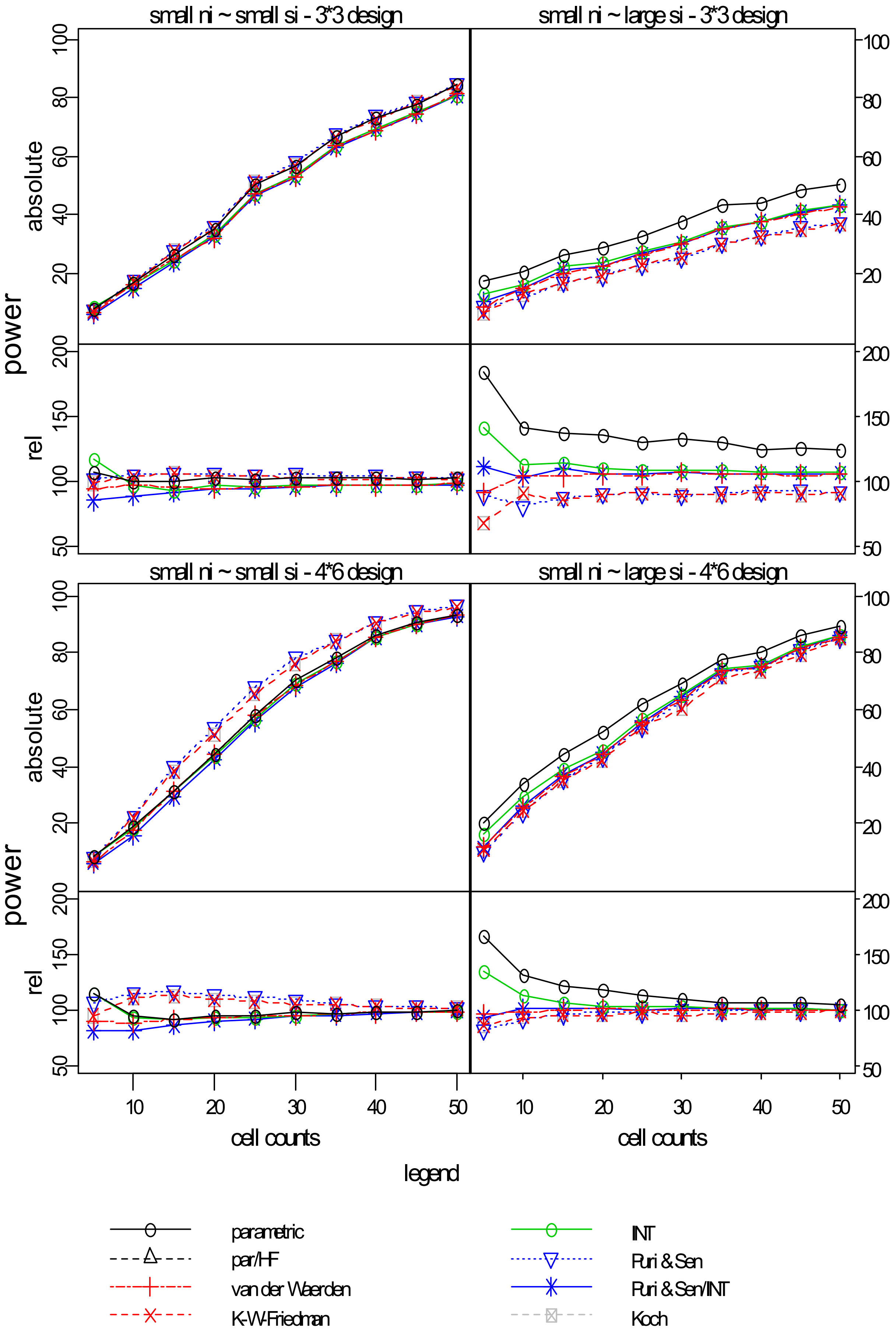
2. 1. 1. 4 normal distribution - unequal variances (on A and B)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	11.80	21.10	30.60	38.15	55.60	66.10	79.25	13.30	23.50	32.45	41.90	59.15	70.40	83.20
parametric HF-adj														
van der Waerden	8.95	17.00	25.20	32.15	48.25	59.80	74.00	10.30	19.30	26.10	36.55	52.15	63.25	77.25
KW/F	9.65	17.15	25.40	33.10	48.40	59.50	72.95	10.05	20.95	28.90	38.40	54.90	65.95	78.30
INT	11.40	20.15	27.90	35.25	52.75	63.20	77.20	12.95	21.85	29.05	39.50	57.50	68.35	81.75
Puri & Sen	8.75	19.80	28.10	36.80	53.70	65.25	78.45	10.25	22.30	31.85	42.80	61.10	71.70	83.65
Puri & Sen + INT	8.55	19.05	26.70	34.40	51.80	62.80	76.95	9.70	20.10	27.85	38.85	56.65	67.85	81.60
Koch	9.65	17.15	25.40	33.10	48.40	59.50	72.95	10.05	20.95	28.90	38.40	54.90	65.95	78.30
	large design (4*6)													
parametric	15.05	30.45	47.75	60.65	82.30	92.20	96.45	17.70	31.30	46.90	61.85	82.95	92.70	97.00
parametric HF-adj														
van der Waerden	11.60	25.30	42.40	55.45	76.95	89.00	95.00	12.90	26.60	42.30	55.45	77.60	90.40	95.30
KW/F	12.60	28.45	47.15	60.55	80.95	91.50	95.95	13.75	28.65	45.50	59.50	81.10	91.65	96.50
INT	14.90	30.85	47.50	61.95	83.70	92.80	97.15	17.10	31.50	47.80	61.80	84.10	93.35	97.50
Puri & Sen	12.95	33.45	53.40	67.45	87.15	95.15	98.25	14.15	34.05	52.90	67.55	87.70	95.75	98.15
Puri & Sen + INT	11.00	28.55	46.40	61.00	83.15	92.55	97.10	12.35	29.20	45.65	60.55	83.70	93.10	97.35
Koch	12.60	28.45	47.15	60.55	80.95	91.50	95.95	13.75	28.65	45.50	59.50	81.10	91.65	96.50


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
100
80
60
40
20
200
150
100
50
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

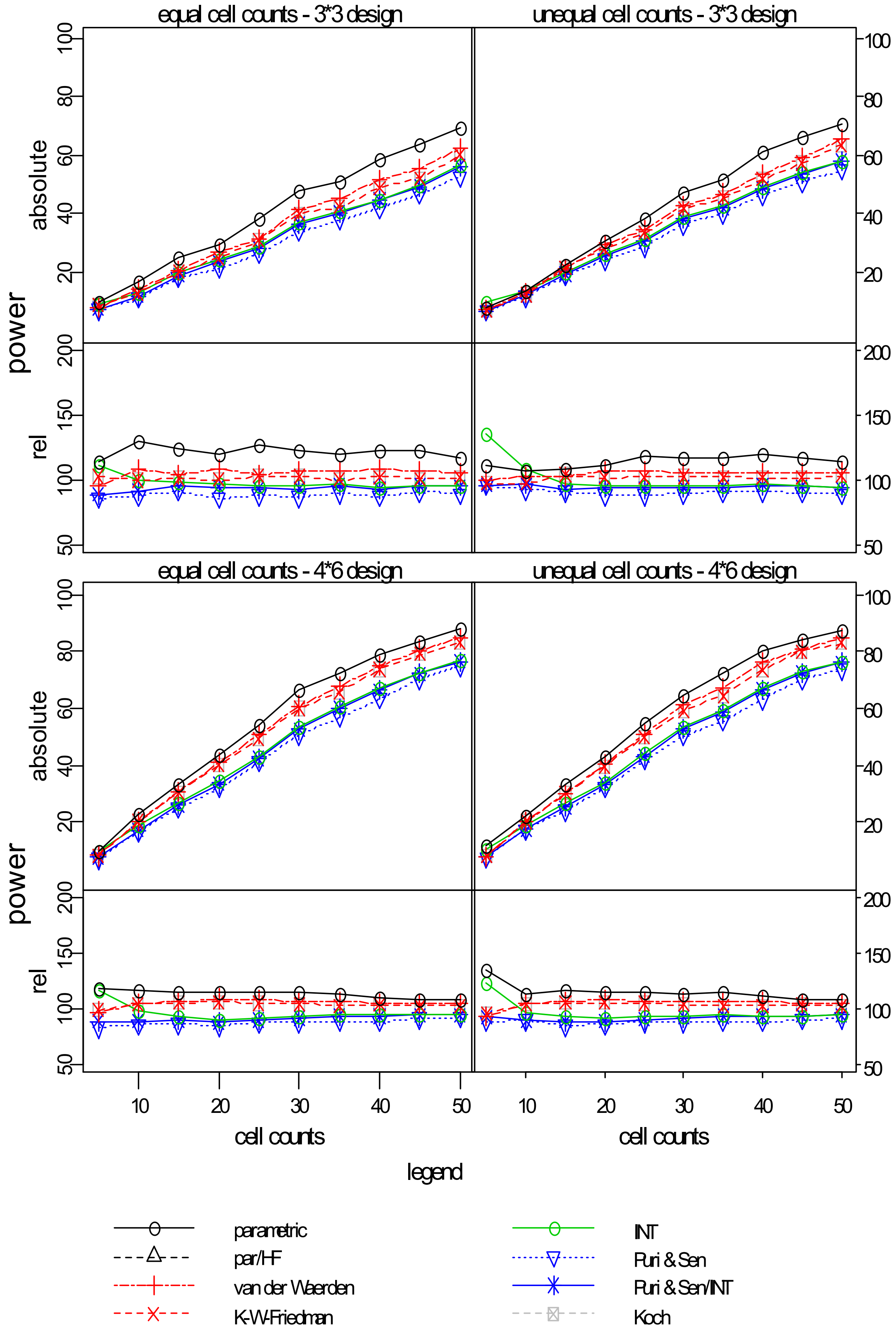
2. 1. 1. 5 normal distribution - unequal variances (on A) - pairing

	small n_i ~ small s_i							small n_i ~ large s_i						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	7.65	16.40	26.15	34.95	56.85	73.00	84.65	17.15	20.35	26.55	29.10	37.65	44.15	50.45
parametric HF-adj														
van der Waerden	6.75	15.80	24.80	32.15	52.85	68.70	81.30	8.45	15.05	20.05	22.40	30.20	37.40	42.80
KW/F	7.00	17.00	27.55	35.45	56.70	72.70	83.95	6.30	12.95	16.65	19.15	25.35	32.50	36.90
INT	8.30	15.90	24.25	33.10	53.35	69.65	81.05	13.20	16.20	22.15	23.45	30.60	38.00	43.50
Puri & Sen	7.25	17.20	27.45	36.20	58.10	74.15	84.70	8.30	11.60	17.00	19.30	25.20	32.80	37.35
Puri & Sen + INT	6.05	14.60	23.60	32.30	52.70	69.15	80.90	10.30	14.80	21.20	22.65	30.25	37.70	43.25
Koch	7.00	17.00	27.55	35.45	56.70	72.70	83.95	6.30	12.95	16.65	19.15	25.35	32.50	36.90
	large design (4*6)													
parametric	8.50	18.65	31.10	44.45	70.15	86.20	93.45	20.35	33.90	44.60	51.85	69.35	79.85	89.40
parametric HF-adj														
van der Waerden	6.65	17.45	31.05	44.20	68.30	85.45	93.05	11.85	25.45	36.70	44.45	62.90	75.00	85.60
KW/F	7.05	21.95	38.15	51.35	75.95	90.45	95.85	10.60	24.30	35.15	42.15	60.10	73.65	84.80
INT	8.50	18.25	31.25	43.80	68.75	85.40	93.10	16.55	29.10	39.35	45.70	64.85	75.45	86.10
Puri & Sen	7.90	22.60	39.70	53.55	78.40	90.60	96.40	10.05	23.90	35.45	43.40	62.80	75.00	85.25
Puri & Sen + INT	6.05	15.95	29.35	42.45	68.00	85.15	92.80	11.45	26.25	37.35	44.55	64.30	75.15	85.80
Koch	7.05	21.95	38.15	51.35	75.95	90.45	95.85	10.60	24.30	35.15	42.15	60.10	73.65	84.80


small ni ~ small si - 3*3 design
small ni ~ large si - 3*3 design
small ni ~ small si - 4*6 design
small ni ~ large si - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

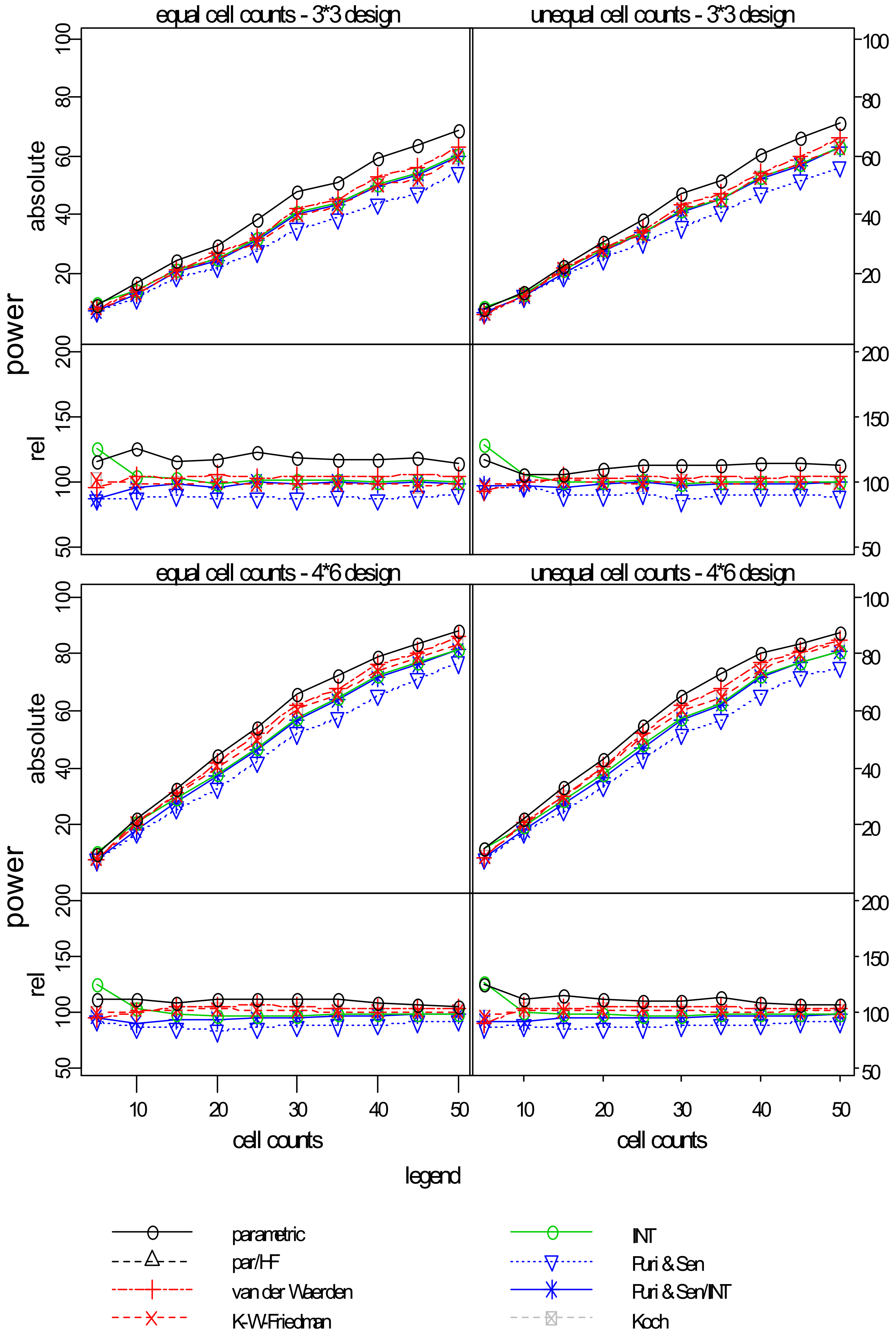
2. 1. 1. 6 exponential distribution

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	9.50	16.60	24.75	29.55	47.70	58.85	69.20	7.85	13.40	22.25	30.60	47.45	61.05	70.90
parametric HF-adj														
van der Waerden	7.95	13.95	20.70	26.80	41.60	51.80	62.55	7.00	12.90	21.10	29.45	42.60	53.75	65.55
KW/F	8.55	12.80	20.10	24.85	40.00	49.05	60.15	6.85	12.20	21.50	28.05	41.75	51.75	63.65
INT	9.20	12.85	19.65	24.20	37.15	44.90	56.70	9.60	13.55	20.10	26.50	38.90	49.20	58.25
Puri & Sen	7.15	11.25	18.20	21.25	33.95	41.90	52.75	6.75	11.60	18.85	24.30	36.20	46.50	55.15
Puri & Sen + INT	7.40	11.75	18.85	23.40	36.35	44.65	56.20	6.75	12.10	19.20	25.75	38.25	48.80	58.00
Koch	8.55	12.80	20.10	24.85	40.00	49.05	60.15	6.85	12.20	21.50	28.05	41.75	51.75	63.65
	large design (4*6)													
parametric	9.95	22.55	33.05	43.40	66.20	78.75	87.85	11.45	21.95	32.95	42.95	64.75	80.00	87.55
parametric HF-adj														
van der Waerden	8.20	20.30	30.75	41.25	60.90	75.00	84.50	7.95	20.20	30.15	40.55	61.00	76.10	84.50
KW/F	8.30	20.25	30.35	40.15	59.90	73.65	83.30	8.10	20.20	30.05	39.45	59.00	73.50	82.85
INT	9.80	19.10	26.95	34.30	53.25	67.00	76.65	10.50	18.85	26.75	34.20	53.45	67.00	76.30
Puri & Sen	7.00	16.70	24.90	32.10	50.65	63.35	74.65	7.55	17.40	24.10	32.15	50.25	63.15	73.45
Puri & Sen + INT	7.50	17.25	25.80	33.35	52.45	66.35	76.45	7.90	17.30	25.25	33.30	52.55	66.50	76.00
Koch	8.30	20.25	30.35	40.15	59.90	73.65	83.30	8.10	20.20	30.05	39.45	59.00	73.50	82.85


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

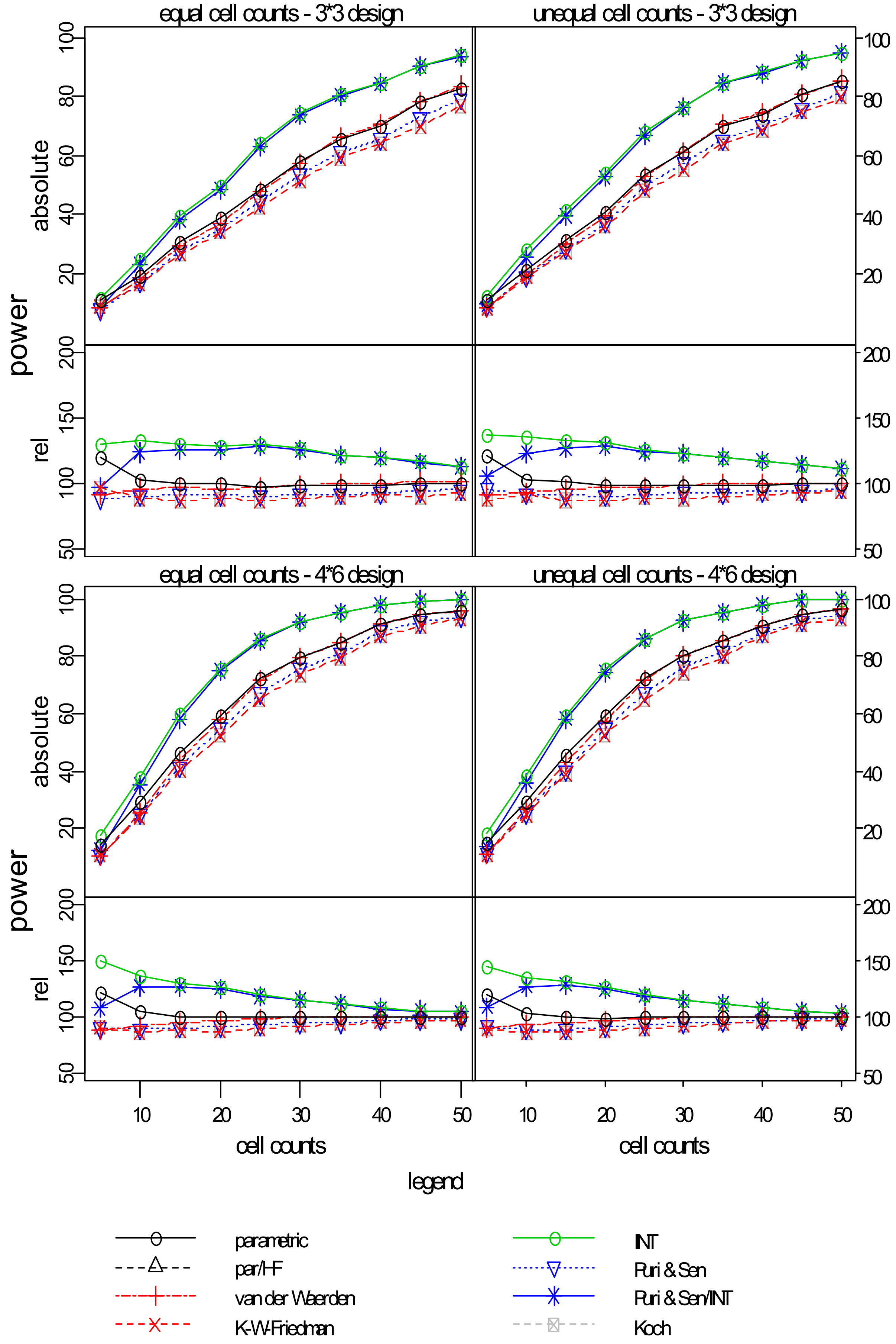
2. 1. 1. 7 exponential distribution - discrete values

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	9.20	16.65	24.20	29.50	47.55	59.15	68.75	7.75	13.25	22.25	30.65	47.20	60.60	71.45
parametric HF-adj														
van der Waerden	7.65	13.90	21.30	26.80	41.85	52.90	62.95	6.15	12.45	21.85	28.80	43.15	54.30	66.05
KW/F	8.10	13.15	20.55	25.15	39.80	50.15	59.85	6.40	12.45	21.35	27.95	42.05	52.65	63.10
INT	10.00	13.85	21.40	25.00	40.60	50.35	60.45	8.50	13.20	21.25	27.85	41.35	53.10	63.40
Puri & Sen	6.90	11.60	18.70	22.00	35.15	43.80	54.60	6.20	12.15	18.95	25.00	35.75	47.50	56.35
Puri & Sen + INT	6.95	12.65	20.40	24.30	40.00	49.90	59.95	6.45	12.20	20.10	27.40	40.70	52.45	63.15
Koch	8.10	13.15	20.55	25.15	39.80	50.15	59.85	6.40	12.45	21.35	27.95	42.05	52.65	63.10
	large design (4*6)													
parametric	9.50	22.30	32.40	44.10	66.00	79.05	88.00	11.55	22.10	33.40	43.10	64.85	80.25	87.50
parametric HF-adj														
van der Waerden	8.15	20.20	31.10	41.50	61.90	76.15	85.90	8.35	20.65	30.25	40.50	61.90	76.80	84.80
KW/F	8.40	20.55	30.40	40.55	60.30	74.00	83.60	8.90	20.30	29.75	39.45	60.10	74.00	83.30
INT	10.65	20.90	29.05	38.05	57.40	72.00	81.70	11.75	19.85	28.95	38.00	57.60	72.45	81.05
Puri & Sen	7.85	17.25	25.60	32.90	52.00	65.40	76.75	8.00	17.50	25.05	33.40	51.90	65.50	75.10
Puri & Sen + INT	8.15	18.20	27.75	37.10	56.55	71.50	81.25	8.55	18.15	27.65	36.65	56.65	71.85	80.55
Koch	8.40	20.55	30.40	40.55	60.30	74.00	83.60	8.90	20.30	29.75	39.45	60.10	74.00	83.30


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

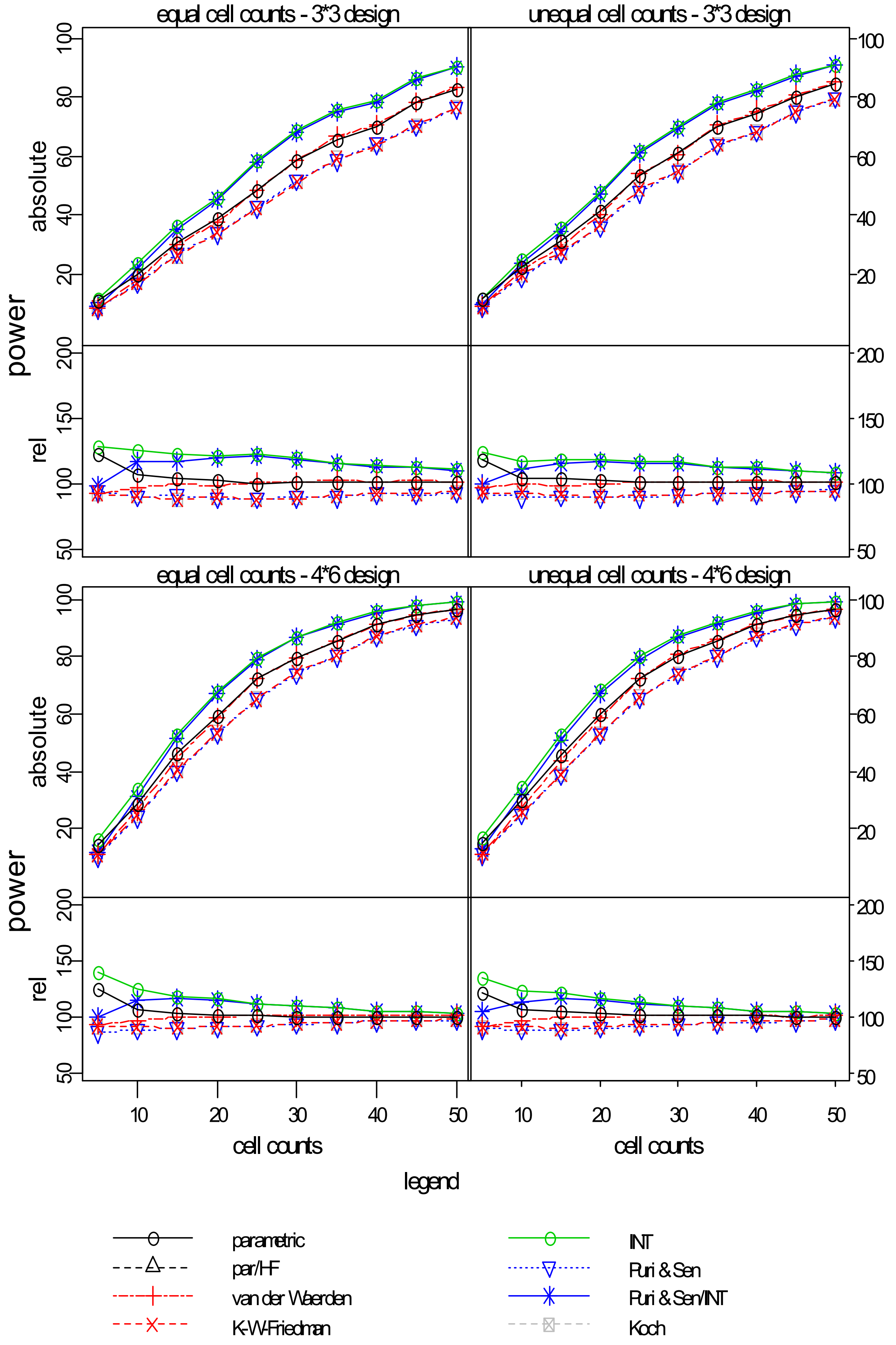
2. 1. 1. 8 uniform distribution

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	10.70	19.15	30.55	38.85	57.95	69.80	82.85	11.10	21.15	31.50	40.60	61.50	74.05	85.10
parametric HF-adj														
van der Waerden	8.15	18.00	29.50	36.95	57.60	70.50	83.75	8.25	19.15	29.75	39.75	61.35	74.50	85.65
KW/F	8.60	16.55	26.35	33.95	51.60	64.30	76.90	7.95	18.85	27.20	36.00	55.00	68.65	79.85
INT	11.60	24.80	39.55	49.55	74.35	84.80	94.00	12.45	27.95	41.30	53.90	76.65	88.25	95.15
Puri & Sen	7.85	16.85	27.65	35.30	53.50	65.65	79.10	8.70	19.00	28.45	37.30	57.60	70.40	81.75
Puri & Sen + INT	8.60	23.10	38.25	48.65	73.85	84.55	93.70	9.55	25.45	39.65	52.70	76.30	88.10	95.00
Koch	8.60	16.55	26.35	33.95	51.60	64.30	76.90	7.95	18.85	27.20	36.00	55.00	68.65	79.85
	large design (4*6)													
parametric	14.25	29.25	46.00	59.55	79.65	91.05	95.85	14.95	29.50	45.45	59.15	80.40	90.65	96.45
parametric HF-adj														
van der Waerden	10.45	25.60	43.50	57.75	79.55	91.10	95.95	11.25	26.70	43.25	57.65	80.30	90.80	96.50
KW/F	10.70	24.00	40.40	52.40	73.55	86.80	93.15	11.05	24.70	38.80	52.70	74.30	87.30	93.10
INT	17.70	37.95	59.85	75.80	92.10	97.80	99.75	17.95	38.45	59.55	75.75	92.40	98.00	99.85
Puri & Sen	10.60	24.90	41.45	54.90	75.65	88.45	93.85	11.50	25.25	40.20	54.85	76.55	88.15	94.55
Puri & Sen + INT	12.70	35.40	58.20	74.90	91.95	97.75	99.70	13.55	36.10	58.15	74.50	92.20	97.90	99.80
Koch	10.70	24.00	40.40	52.40	73.55	86.80	93.15	11.05	24.70	38.80	52.70	74.30	87.30	93.10


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

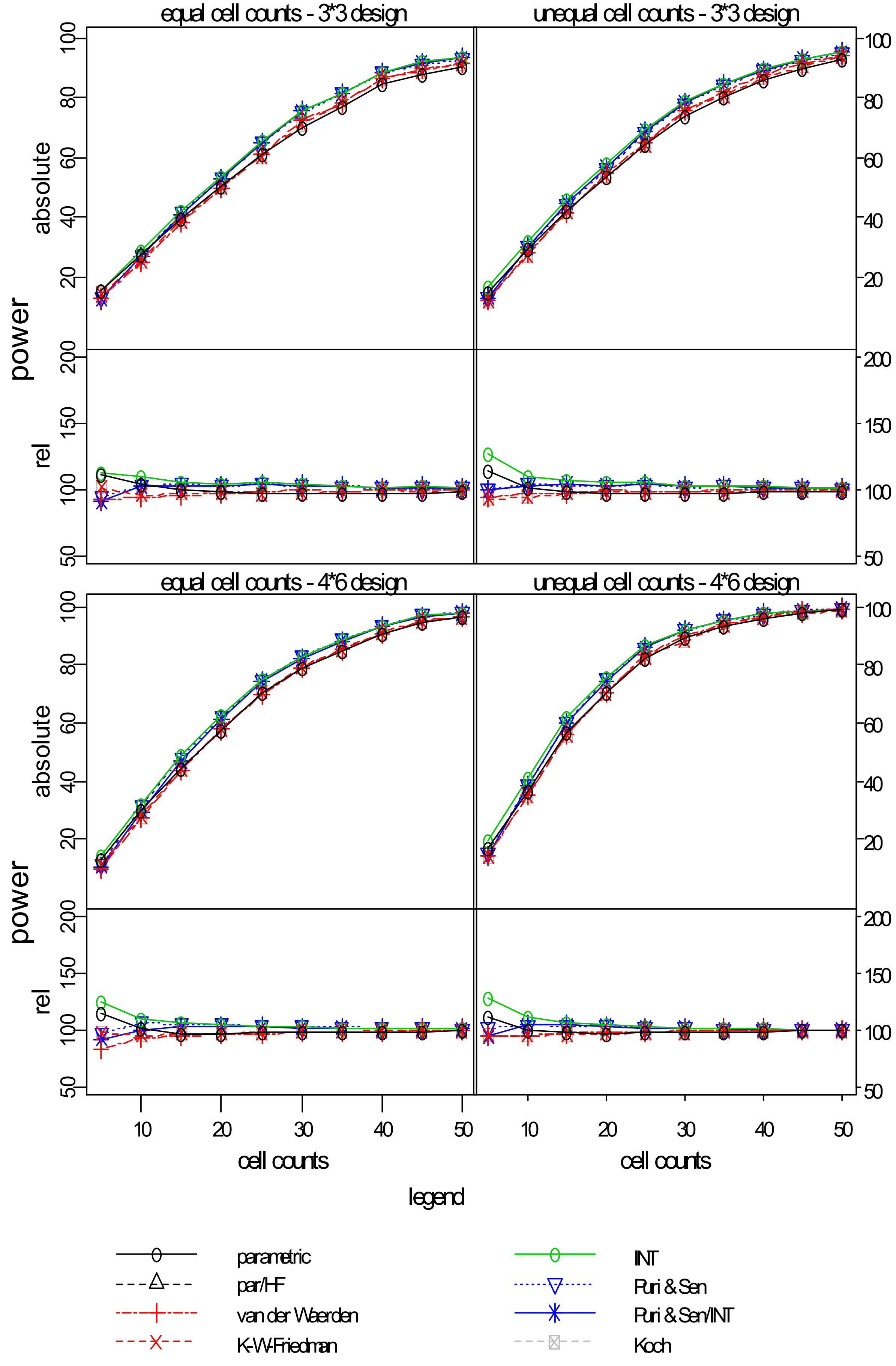
2. 1. 1. 9 uniform distribution - discrete values

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	11.10	20.00	30.95	39.10	58.60	70.10	82.90	11.30	22.15	31.35	41.35	61.20	74.60	84.50
parametric HF-adj														
van der Waerden	8.35	18.15	29.80	37.40	58.45	70.75	83.25	9.20	21.00	29.35	40.45	60.80	75.50	85.65
KW/F	8.40	16.90	26.20	34.10	51.20	64.05	76.70	8.85	19.65	27.50	36.55	54.90	68.20	79.50
INT	11.65	23.65	36.40	46.10	68.65	78.90	90.60	11.85	24.80	35.70	48.05	70.05	82.70	91.20
Puri & Sen	8.50	16.90	27.05	33.75	51.75	64.25	76.45	8.85	19.00	27.00	36.20	54.80	68.40	79.80
Puri & Sen + INT	8.95	21.80	34.95	45.35	68.20	78.50	90.35	9.45	23.45	34.45	47.25	69.45	82.45	91.10
Koch	8.40	16.90	26.20	34.10	51.20	64.05	76.70	8.85	19.65	27.50	36.55	54.90	68.20	79.50
	large design (4*6)													
parametric	14.65	28.75	46.20	59.50	79.55	91.10	96.35	15.05	30.05	45.70	60.00	80.30	91.45	96.40
parametric HF-adj														
van der Waerden	10.95	26.40	44.35	58.55	79.80	91.50	96.55	11.25	27.30	43.85	58.55	80.55	91.45	96.60
KW/F	10.80	24.80	40.40	53.45	74.75	87.10	93.50	11.20	25.60	39.00	53.35	74.15	87.40	93.55
INT	16.50	33.75	52.85	68.05	86.85	95.55	98.75	16.65	34.45	53.00	68.25	87.25	95.45	98.90
Puri & Sen	10.20	24.10	40.05	53.10	73.95	87.00	93.25	11.05	25.05	38.80	53.00	73.75	86.75	93.80
Puri & Sen + INT	11.80	31.00	51.70	67.10	86.60	95.35	98.75	12.85	32.00	51.05	67.10	86.95	95.20	98.90
Koch	10.80	24.80	40.40	53.45	74.75	87.10	93.50	11.20	25.60	39.00	53.35	74.15	87.40	93.55


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

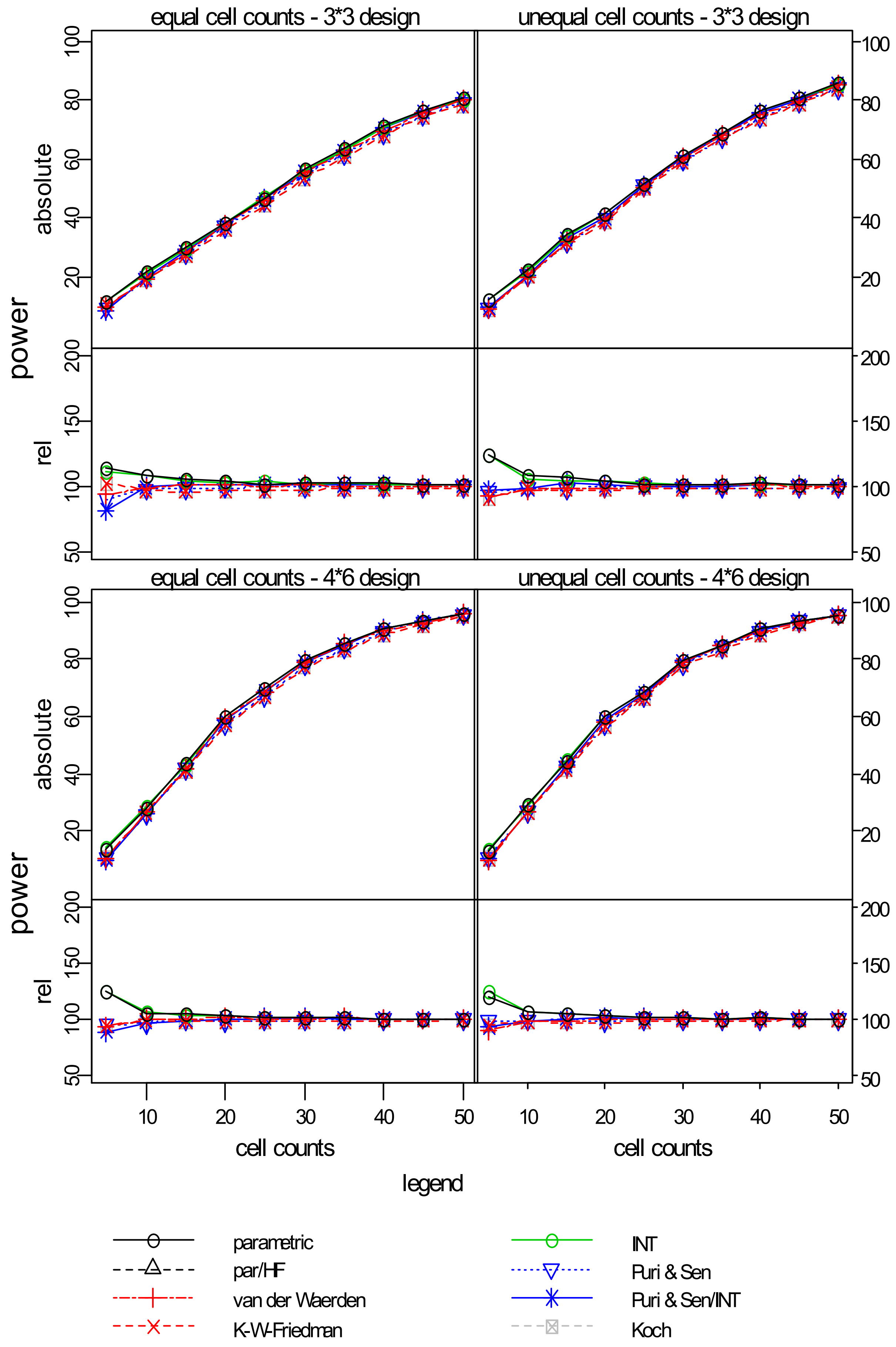
2. 1. 1. 10 lognormal distribution - equal variances

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	15.40	27.55	39.70	50.10	70.40	84.85	90.40	15.00	29.50	42.15	53.60	74.05	86.05	93.15
parametric HF-adj														
van der Waerden	12.80	24.80	38.20	49.95	72.50	86.50	91.95	12.50	28.10	41.60	54.70	75.90	88.00	94.50
KW/F	14.10	25.40	38.85	50.20	71.35	86.50	91.50	12.30	27.40	42.00	53.85	75.60	86.80	94.05
INT	15.65	29.05	42.10	53.60	76.15	88.45	93.55	16.85	31.80	45.75	57.90	78.85	89.70	95.55
Puri & Sen	13.00	27.15	41.45	52.90	75.10	88.45	93.20	13.20	30.15	44.20	56.30	78.15	89.20	95.20
Puri & Sen + INT	12.60	27.00	40.80	52.70	75.55	88.35	93.50	13.15	29.85	44.90	56.85	78.45	89.35	95.45
Koch	14.10	25.40	38.85	50.20	71.35	86.50	91.50	12.30	27.40	42.00	53.85	75.60	86.80	94.05
	large design (4*6)													
parametric	13.20	29.65	44.25	57.65	78.80	90.40	96.20	16.80	36.75	56.50	70.15	89.10	95.85	98.70
parametric HF-adj														
van der Waerden	9.55	27.45	43.50	57.70	79.00	90.85	96.60	14.45	35.05	56.35	70.45	89.80	96.65	99.05
KW/F	11.20	27.95	44.10	57.55	79.25	91.10	96.25	14.40	35.20	55.75	70.25	88.15	96.25	98.55
INT	14.30	32.15	48.55	62.45	82.55	93.25	97.85	19.40	41.00	61.85	75.45	92.10	97.60	99.35
Puri & Sen	11.15	31.35	47.95	62.15	82.85	93.45	97.75	15.40	38.35	60.15	75.25	91.80	97.30	99.25
Puri & Sen + INT	10.60	29.40	46.80	61.30	82.10	93.00	97.75	14.30	38.35	60.20	74.35	91.95	97.45	99.35
Koch	11.20	27.95	44.10	57.55	79.25	91.10	96.25	14.40	35.20	55.75	70.25	88.15	96.25	98.55


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

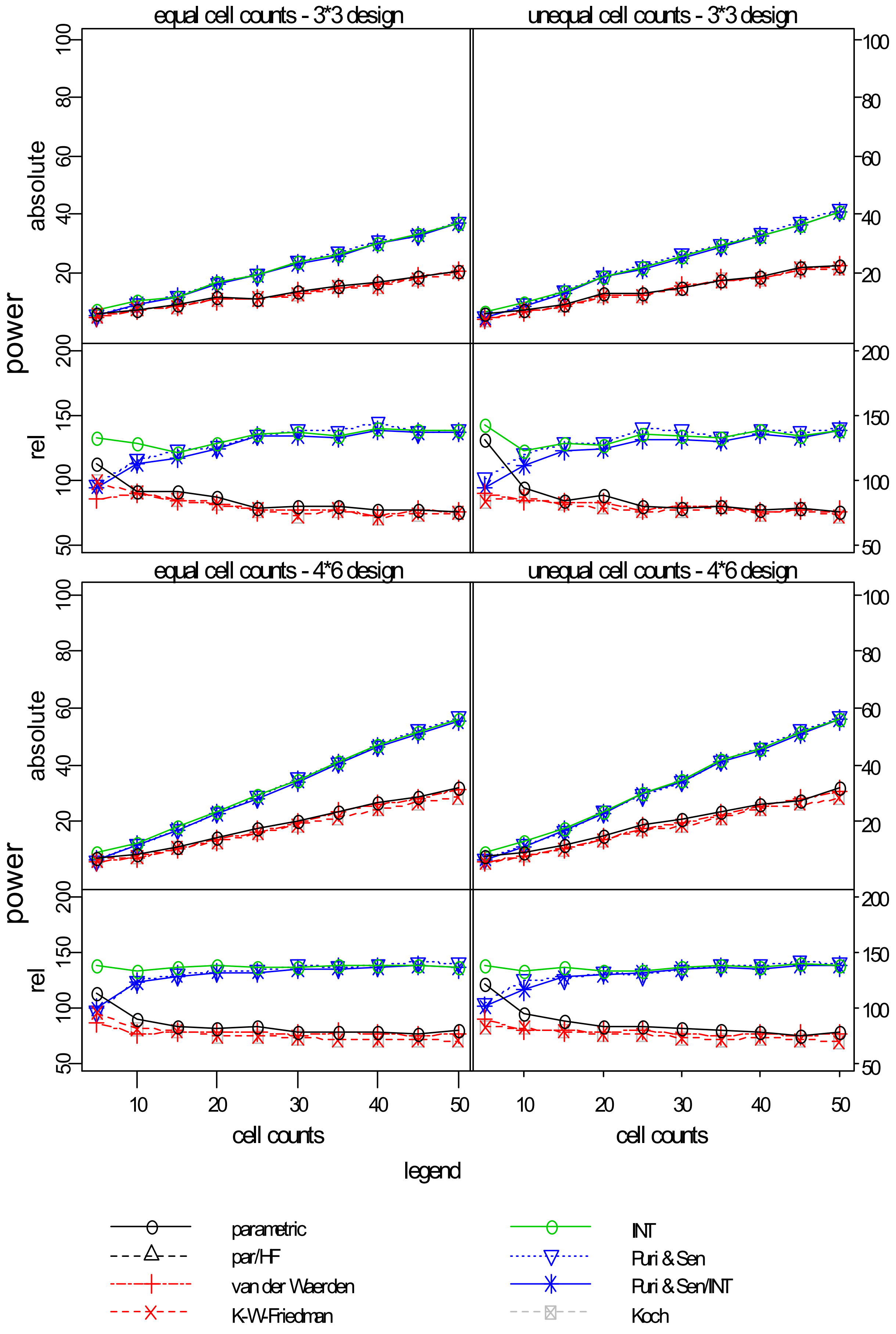
2. 1. 1. 11 normal distribution - equal variances - contaminated I

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	11.85	21.50	29.80	38.60	56.65	71.25	80.85	12.00	22.60	34.30	41.30	61.25	76.75	85.70
parametric HF-adj														
van der Waerden	9.85	19.55	28.45	37.70	55.45	69.55	80.00	8.90	20.05	31.75	39.30	60.50	75.45	85.10
KW/F	10.65	19.10	27.05	36.00	53.55	68.25	78.30	8.80	20.55	31.45	38.60	59.15	73.55	84.15
INT	11.65	21.35	29.55	38.35	56.05	70.70	80.50	12.00	22.05	33.80	41.35	61.25	76.25	85.50
Puri & Sen	9.35	19.35	27.75	36.90	54.60	68.70	79.40	9.20	20.50	31.60	39.55	59.45	74.15	84.00
Puri & Sen + INT	8.50	19.70	28.65	37.50	55.50	70.45	80.40	9.40	20.45	32.95	40.15	60.30	76.00	85.35
Koch	10.65	19.10	27.05	36.00	53.55	68.25	78.30	8.80	20.55	31.45	38.60	59.15	73.55	84.15
	large design (4*6)													
parametric	14.00	28.20	43.75	59.90	79.50	90.40	95.90	13.20	29.00	44.60	59.90	79.75	90.30	95.25
parametric HF-adj														
van der Waerden	10.50	26.70	41.80	59.20	78.65	89.85	95.60	9.90	26.75	42.05	58.10	78.75	89.55	95.30
KW/F	10.60	26.65	41.10	56.85	77.15	88.60	95.05	10.45	26.55	41.65	56.35	77.60	88.40	94.95
INT	14.15	28.50	43.25	59.75	79.80	90.35	95.80	13.70	28.75	44.80	60.05	79.65	90.45	95.25
Puri & Sen	10.70	25.80	41.65	57.25	77.65	89.55	95.45	10.80	26.75	42.60	56.95	77.90	89.40	95.25
Puri & Sen + INT	10.05	26.05	41.45	58.40	79.10	90.25	95.65	10.25	26.65	42.95	58.90	79.05	90.00	95.15
Koch	10.60	26.65	41.10	56.85	77.15	88.60	95.05	10.45	26.55	41.65	56.35	77.60	88.40	94.95


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

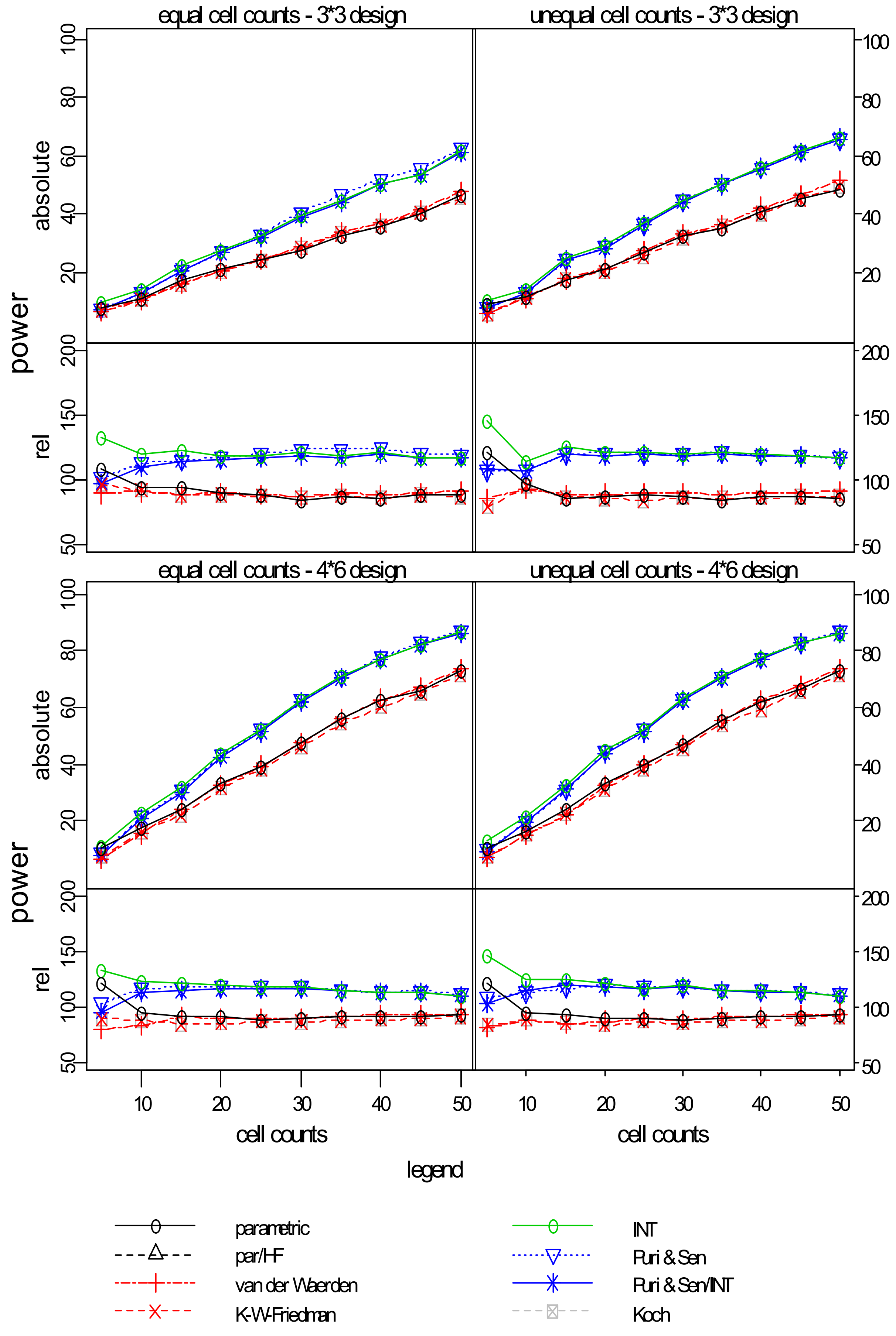
2. 1. 1. 12 normal distribution - equal variances - contaminated II

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	5.95	7.35	8.95	11.40	13.80	16.60	20.45	6.10	7.35	8.80	13.10	14.90	18.45	22.35
parametric HF-adj														
van der Waerden	4.50	7.20	8.25	10.70	13.20	15.75	20.40	4.15	6.60	8.70	12.35	15.20	17.90	22.50
KW/F	5.20	7.25	8.30	10.75	12.45	15.35	20.05	3.90	6.80	8.55	11.70	14.65	17.70	21.25
INT	7.00	10.25	11.90	16.90	23.70	30.15	37.15	6.65	9.55	13.40	18.85	25.45	32.90	41.00
Puri & Sen	5.10	9.25	12.00	16.45	23.80	31.00	37.40	4.70	9.35	13.45	19.05	26.35	33.10	41.40
Puri & Sen + INT	5.00	9.05	11.45	16.20	23.10	29.80	36.80	4.40	8.65	12.85	18.40	25.10	32.40	40.65
Koch	5.20	7.25	8.30	10.75	12.45	15.35	20.05	3.90	6.80	8.55	11.70	14.65	17.70	21.25
	large design (4*6)													
parametric	7.35	8.50	10.95	14.10	20.10	26.60	32.25	7.95	9.15	11.55	14.75	20.60	26.15	31.85
parametric HF-adj														
van der Waerden	5.65	7.25	10.40	13.40	19.25	25.75	31.30	5.85	7.75	10.40	14.00	19.35	25.35	30.90
KW/F	6.20	7.65	10.50	12.95	18.65	24.20	28.70	5.40	7.90	10.35	13.55	18.55	24.45	28.25
INT	8.95	12.45	18.00	23.70	34.85	46.75	55.80	9.00	12.75	17.80	23.50	34.60	45.60	56.20
Puri & Sen	6.25	11.65	17.10	22.95	35.05	46.70	56.90	6.80	12.05	16.50	23.30	34.05	46.00	57.00
Puri & Sen + INT	6.45	11.50	17.05	22.75	34.20	46.30	55.20	6.60	11.15	16.75	22.85	34.20	45.15	55.75
Koch	6.20	7.65	10.50	12.95	18.65	24.20	28.70	5.40	7.90	10.35	13.55	18.55	24.45	28.25


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
100
80
60
40
20
200
150
100
50
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 1. 1. 13 normal distribution - equal variances - contaminated III

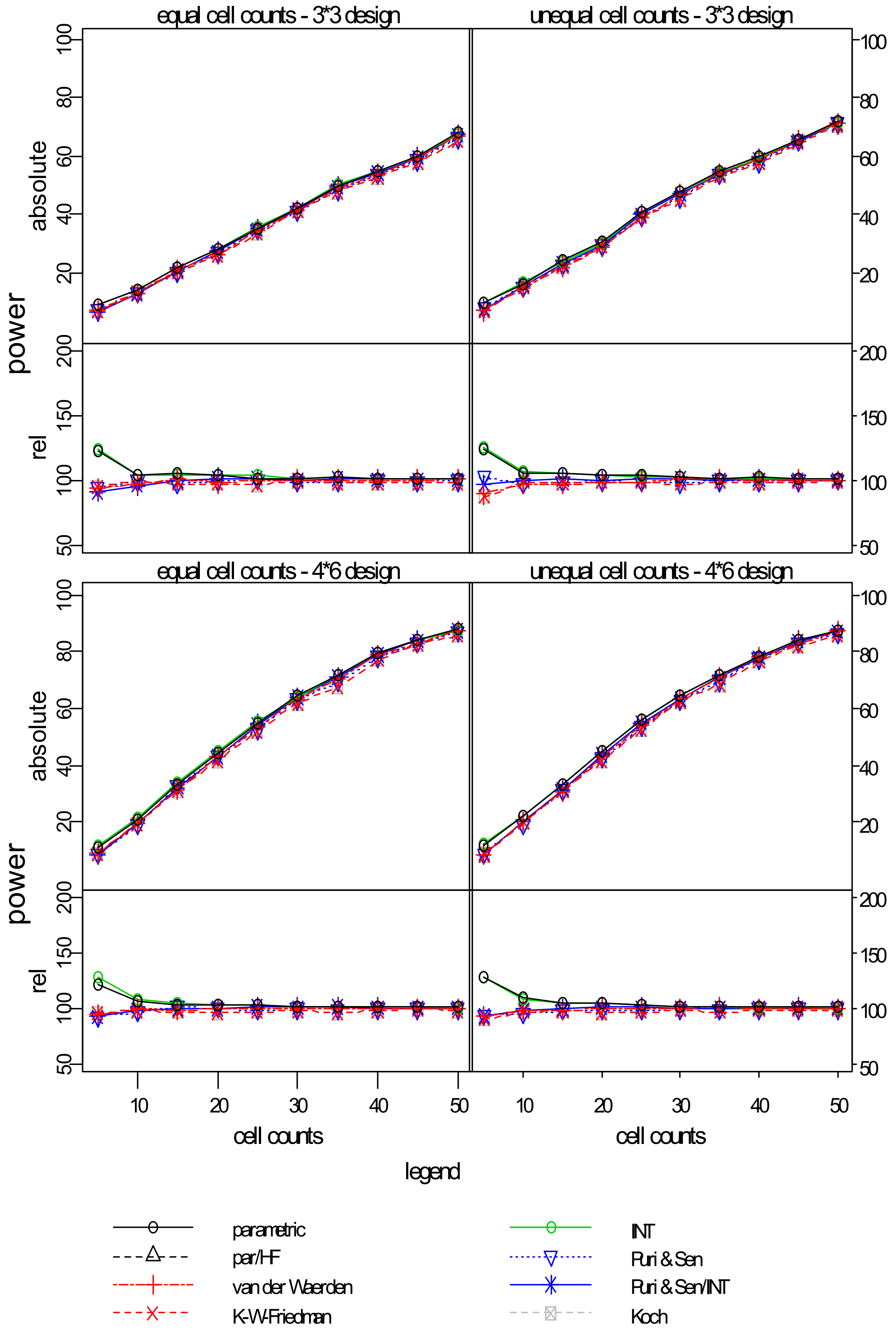
	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	7.85	11.00	17.05	20.85	27.70	35.90	46.40	8.80	11.70	17.10	21.05	32.30	40.65	48.50
parametric HF-adj														
van der Waerden	6.45	10.55	15.90	20.80	28.70	36.95	47.85	6.20	11.20	17.70	21.40	33.25	42.40	51.45
KW/F	7.00	10.70	16.00	20.40	28.45	35.90	45.45	5.75	11.50	17.45	20.40	31.95	40.25	49.30
INT	9.55	13.95	22.20	27.35	39.75	50.55	61.65	10.55	13.90	25.15	29.30	44.65	56.20	66.20
Puri & Sen	7.30	13.15	20.80	27.00	40.60	52.10	62.50	7.75	13.05	24.15	29.00	44.70	55.70	65.65
Puri & Sen + INT	7.05	12.75	20.70	26.60	39.15	50.15	61.15	7.90	13.00	24.05	28.45	44.30	55.75	65.95
Koch	7.00	10.70	16.00	20.40	28.45	35.90	45.45	5.75	11.50	17.45	20.40	31.95	40.25	49.30
	large design (4*6)													
parametric	10.20	17.45	24.00	33.50	47.70	62.60	72.85	10.70	16.40	24.25	33.05	47.10	61.75	72.95
parametric HF-adj														
van der Waerden	6.65	15.35	24.05	32.70	47.60	62.85	73.45	7.25	15.30	22.25	32.35	47.10	62.25	73.30
KW/F	7.45	16.15	22.05	31.35	46.05	60.10	71.40	7.40	15.30	22.45	31.05	45.40	59.35	71.10
INT	11.15	22.85	31.80	43.80	62.80	77.20	86.35	12.95	21.65	32.65	44.90	63.20	77.45	86.10
Puri & Sen	8.65	21.50	30.80	43.20	62.70	77.35	87.10	9.60	19.50	30.70	44.55	62.65	77.25	86.80
Puri & Sen + INT	7.95	20.95	30.00	42.55	62.05	76.80	86.20	9.10	19.80	31.25	43.90	62.55	76.80	85.95
Koch	7.45	16.15	22.05	31.35	46.05	60.10	71.40	7.40	15.30	22.45	31.05	45.40	59.35	71.10


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 1. 2. unequal correlations on B (r = 0.7, 0.5, 0.4, 0.2, 0.1)

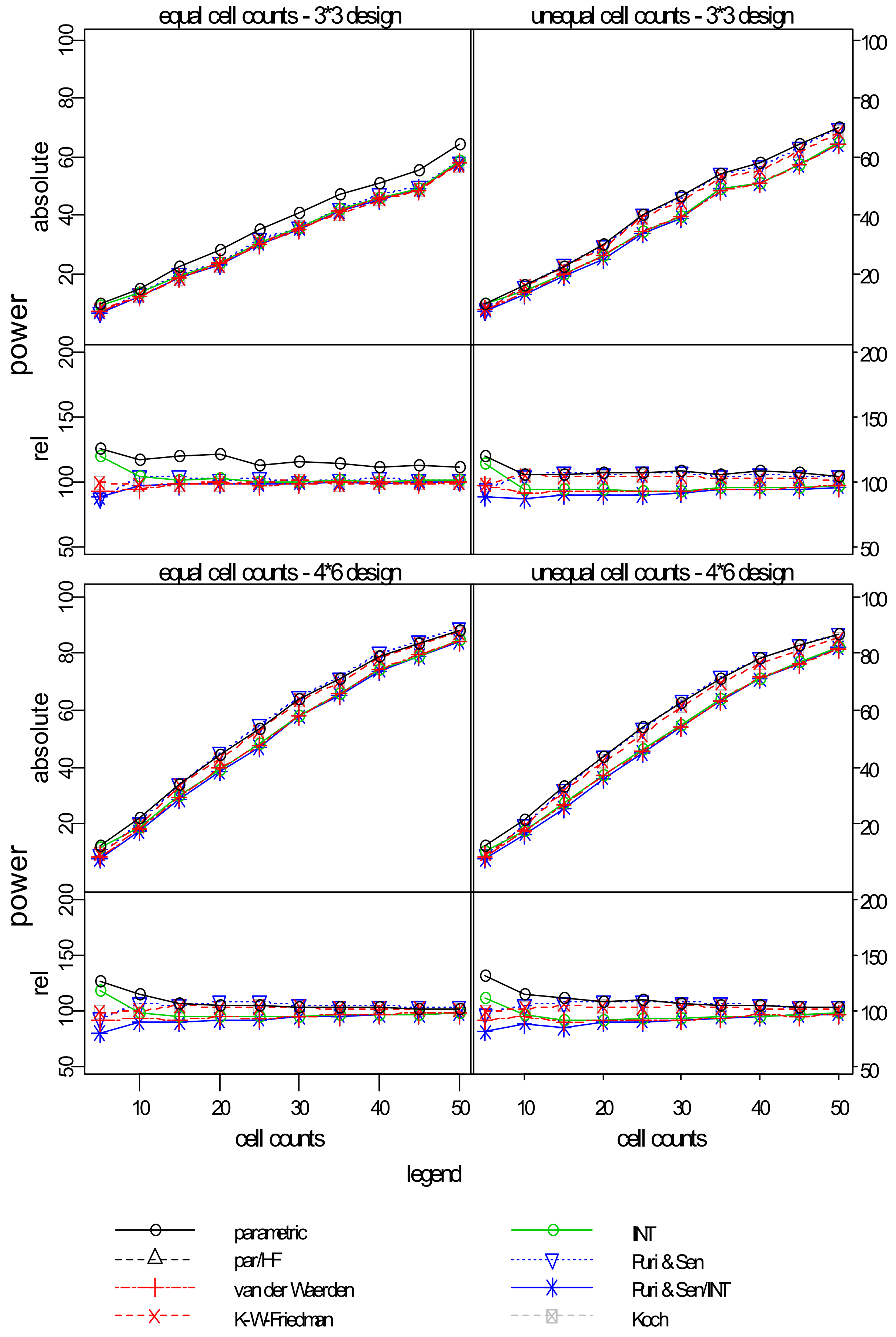
2. 1. 2. 1 normal distribution - equal variances

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	9.05	13.95	22.05	28.05	42.25	54.65	68.00	9.30	16.20	23.30	29.95	47.25	58.25	71.75
parametric HF-adj														
van der Waerden	6.95	13.00	21.15	26.30	41.75	53.85	67.25	6.90	13.90	21.70	29.30	46.00	57.75	71.35
KW/F	7.05	13.30	20.20	26.15	41.20	52.90	65.25	6.45	14.30	20.95	29.05	43.75	56.70	69.15
INT	9.20	14.00	21.80	28.10	42.20	54.90	67.75	9.75	16.60	22.60	30.35	46.50	58.05	71.60
Puri & Sen	7.00	13.30	20.20	26.75	41.15	53.85	66.35	7.40	14.75	21.05	29.90	45.20	57.35	70.45
Puri & Sen + INT	6.75	12.85	20.75	27.40	41.55	54.25	67.45	6.85	14.85	21.50	29.55	46.20	57.70	71.25
Koch	7.05	13.30	20.20	26.15	41.20	52.90	65.25	6.45	14.30	20.95	29.05	43.75	56.70	69.15
	large design (4*6)													
parametric	11.30	21.00	33.45	44.45	64.30	79.50	87.75	12.80	21.80	32.45	44.90	64.60	79.55	88.00
parametric HF-adj														
van der Waerden	8.85	19.70	31.55	43.00	63.45	78.55	87.40	9.30	20.05	31.10	43.05	63.90	78.65	87.25
KW/F	8.95	19.30	31.30	41.60	61.75	77.05	85.45	9.10	20.10	30.75	41.15	62.25	77.15	85.90
INT	11.90	21.40	33.70	44.70	64.10	79.20	87.55	12.70	22.10	32.95	44.90	64.55	79.75	88.00
Puri & Sen	8.65	19.20	32.80	43.20	63.15	78.15	86.75	9.20	20.05	30.80	42.75	63.30	78.70	86.85
Puri & Sen + INT	8.65	19.40	32.05	43.00	63.80	78.85	87.30	9.30	19.90	31.40	43.20	63.90	79.20	87.85
Koch	8.95	19.30	31.30	41.60	61.75	77.05	85.45	9.10	20.10	30.75	41.15	62.25	77.15	85.90


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

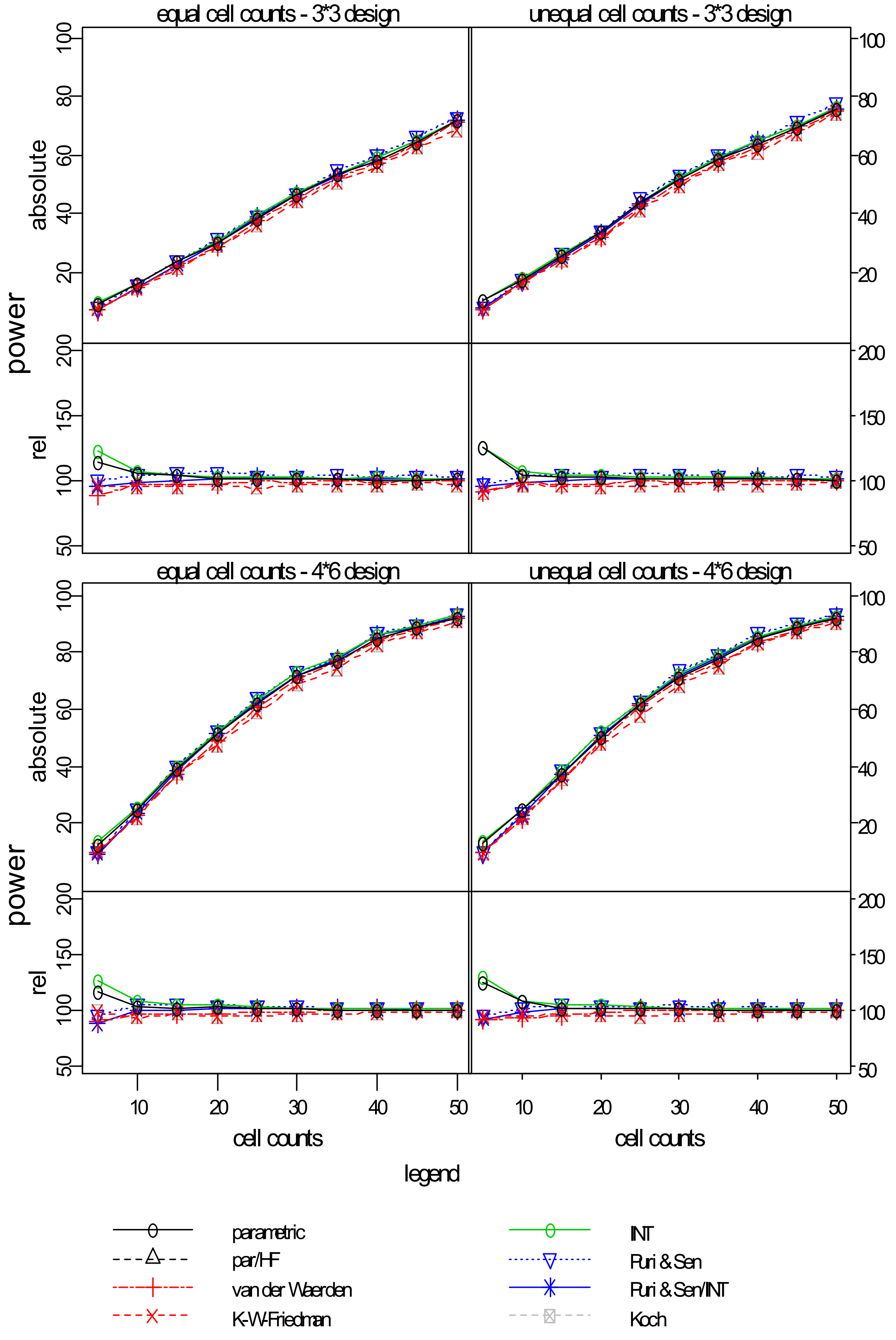
2. 1. 2. 2 normal distribution - unequal variances (on A)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	9.45	14.90	22.65	28.40	41.00	51.00	64.45	10.55	17.75	23.55	31.20	45.40	56.10	69.35
parametric HF-adj														
van der Waerden	7.05	12.00	18.55	23.45	35.20	45.95	58.15	7.25	14.65	20.10	26.65	38.70	48.45	61.55
KW/F	7.50	12.40	18.65	23.00	35.90	45.40	57.25	7.20	15.50	22.60	27.65	41.05	52.00	63.00
INT	9.10	13.30	19.20	23.90	35.70	45.80	58.35	9.95	15.45	20.15	26.40	39.10	48.15	61.50
Puri & Sen	6.60	13.25	19.70	23.75	35.85	47.10	58.45	7.80	15.60	21.85	28.25	42.15	52.45	64.05
Puri & Sen + INT	6.65	12.40	18.50	22.95	35.25	45.45	57.90	7.45	14.40	19.25	25.60	38.35	47.95	61.30
Koch	7.50	12.40	18.65	23.00	35.90	45.40	57.25	7.20	15.50	22.60	27.65	41.05	52.00	63.00
	large design (4*6)													
parametric	12.25	22.30	34.05	44.10	63.55	79.10	87.95	14.40	23.35	33.85	45.95	64.85	79.60	88.30
parametric HF-adj														
van der Waerden	8.75	18.20	29.30	39.65	58.30	74.10	83.95	10.85	20.70	30.70	41.35	59.10	75.05	84.80
KW/F	9.50	19.45	33.30	42.85	63.40	78.20	87.05	11.30	21.85	33.80	44.25	63.65	77.85	86.80
INT	11.45	19.00	30.25	39.30	58.30	74.15	84.45	13.10	21.00	30.45	41.35	59.05	75.15	84.70
Puri & Sen	8.95	20.60	33.75	45.25	64.65	79.95	89.00	10.60	21.90	34.00	45.40	65.45	80.70	88.40
Puri & Sen + INT	7.70	17.35	28.65	38.25	57.85	73.75	84.10	9.45	18.95	28.85	39.90	58.35	74.60	84.30
Koch	9.50	19.45	33.30	42.85	63.40	78.20	87.05	11.30	21.85	33.80	44.25	63.65	77.85	86.80


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

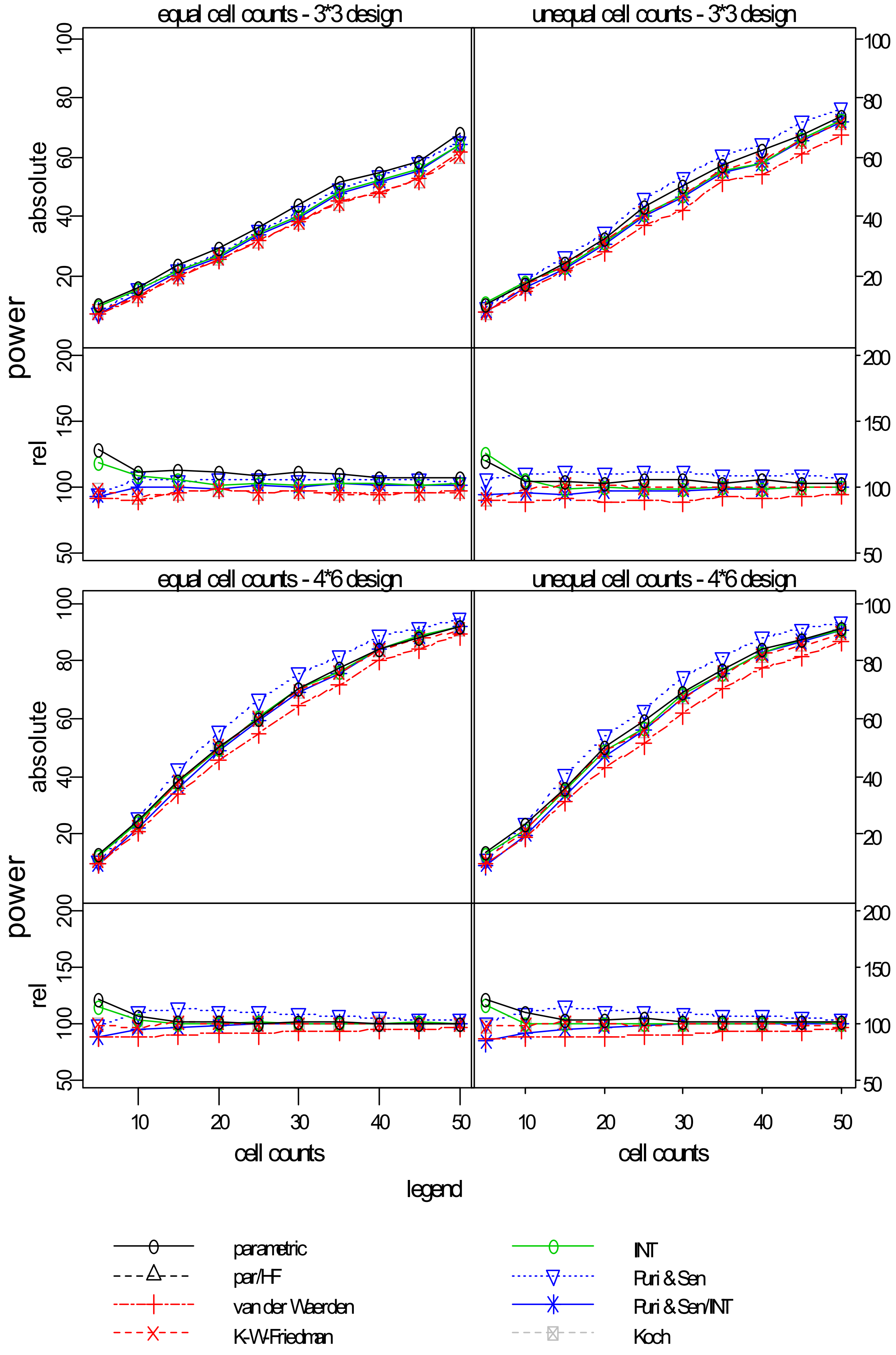
2. 1. 2. 3 normal distribution - unequal variances (on B)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	8.90	16.10	23.40	30.00	46.30	58.10	72.20	9.55	16.85	24.35	33.25	50.05	61.05	75.45
parametric HF-adj														
van der Waerden	6.90	14.70	21.85	28.85	45.20	57.25	71.30	6.85	15.80	23.10	32.45	48.90	60.20	74.75
KW/F	7.50	14.40	21.45	28.90	44.15	56.25	68.65	6.75	15.60	23.45	31.15	47.65	59.90	72.70
INT	9.65	16.20	23.45	30.65	47.20	59.55	72.30	10.00	17.85	24.65	33.60	50.60	62.30	76.70
Puri & Sen	7.80	15.80	23.80	31.55	46.90	59.90	73.00	7.50	17.10	24.40	33.65	51.90	63.70	77.05
Puri & Sen + INT	7.45	14.95	22.50	29.95	46.50	59.10	72.15	7.40	16.50	23.55	32.70	49.95	61.95	76.55
Koch	7.50	14.40	21.45	28.90	44.15	56.25	68.65	6.75	15.60	23.45	31.15	47.65	59.90	72.70
	large design (4*6)													
parametric	12.40	24.45	38.85	51.45	71.55	84.90	91.95	13.35	24.10	37.00	51.15	71.00	84.85	92.30
parametric HF-adj														
van der Waerden	9.55	22.70	37.20	48.55	70.25	84.15	91.70	10.05	22.60	35.50	48.80	70.00	84.80	91.95
KW/F	10.40	22.00	37.30	47.50	68.55	82.65	90.80	10.00	22.80	35.00	48.25	68.15	82.90	90.85
INT	13.40	25.25	40.05	52.35	72.65	86.05	92.90	13.85	25.45	38.50	51.85	72.25	86.25	93.20
Puri & Sen	10.10	24.75	40.15	52.30	73.20	86.70	93.45	10.35	24.90	38.25	51.85	73.00	86.85	93.80
Puri & Sen + INT	9.30	23.60	38.45	51.20	71.85	85.85	92.55	10.40	23.40	36.75	50.65	71.75	86.10	92.85
Koch	10.40	22.00	37.30	47.50	68.55	82.65	90.80	10.00	22.80	35.00	48.25	68.15	82.90	90.85


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

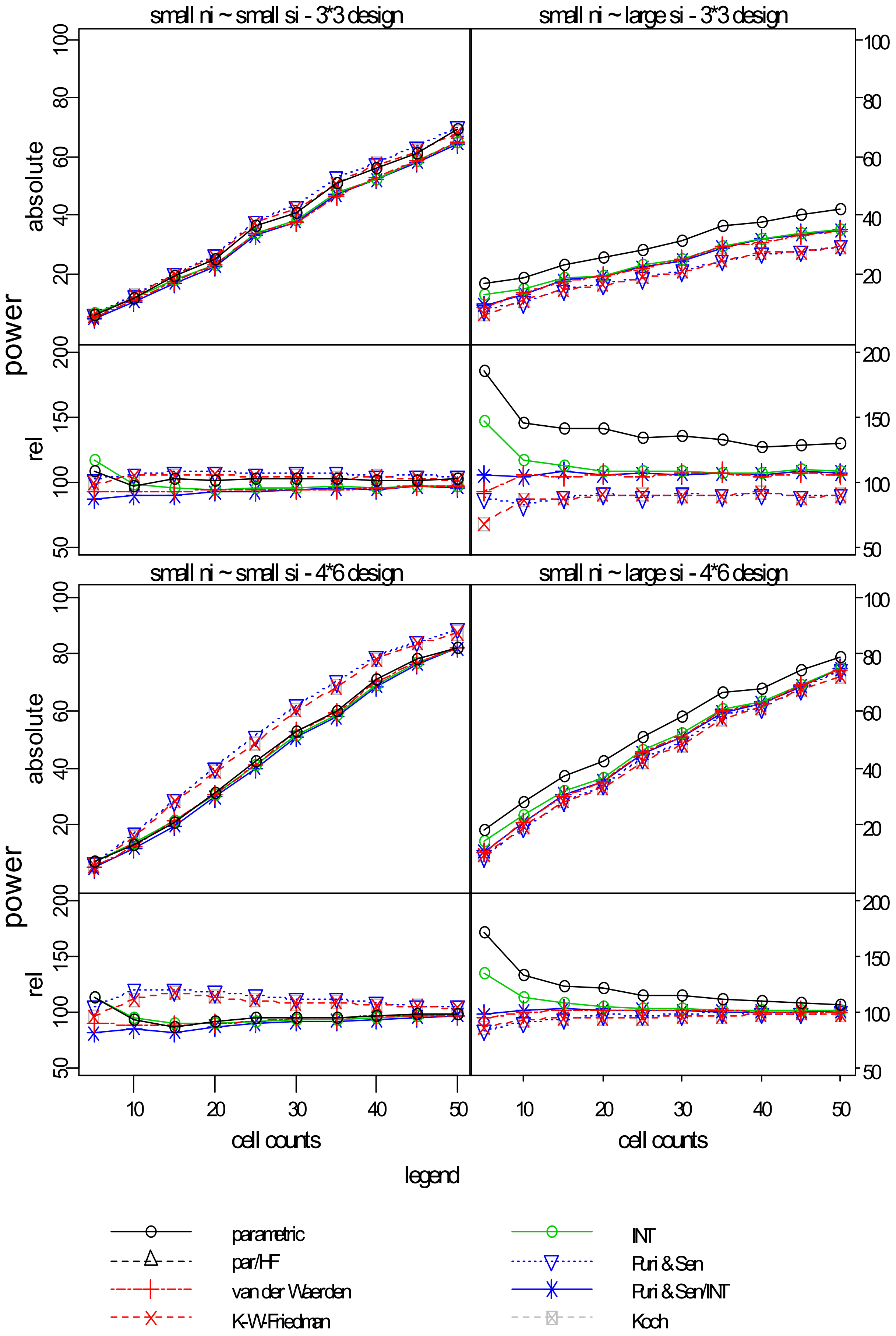
2. 1. 2. 4 normal distribution - unequal variances (on A and B)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	10.35	16.05	23.50	29.50	43.85	54.65	67.95	11.00	18.50	24.80	33.10	47.75	58.60	72.55
parametric HF-adj														
van der Waerden	7.35	13.00	19.85	25.90	38.15	48.10	61.75	8.25	15.20	21.50	28.65	41.15	51.05	64.55
KW/F	7.80	13.35	19.85	25.85	38.25	48.70	60.50	8.00	16.65	23.05	29.95	43.00	53.35	65.95
INT	9.50	15.65	21.90	26.65	40.25	52.35	64.65	11.05	16.80	22.90	30.30	44.45	54.80	69.60
Puri & Sen	7.60	15.50	21.60	27.80	41.55	53.45	65.20	8.75	17.75	24.30	32.60	48.05	58.70	72.50
Puri & Sen + INT	7.45	14.30	20.90	25.95	39.60	51.75	64.35	7.85	15.70	21.85	29.35	43.70	54.40	69.25
Koch	7.80	13.35	19.85	25.85	38.25	48.70	60.50	8.00	16.65	23.05	29.95	43.00	53.35	65.95
	large design (4*6)													
parametric	13.15	25.00	38.20	50.40	70.50	83.85	91.65	15.50	26.10	38.05	50.70	71.75	85.65	92.45
parametric HF-adj														
van der Waerden	9.65	20.60	33.75	45.55	64.70	80.05	88.95	10.75	22.65	33.70	46.00	67.25	80.95	89.85
KW/F	10.75	22.55	37.95	50.15	69.50	83.75	90.80	11.45	23.80	37.25	49.85	70.15	84.00	91.25
INT	12.50	24.10	37.65	49.75	70.10	84.30	92.05	14.35	25.35	38.00	50.05	71.90	85.50	92.70
Puri & Sen	10.65	25.70	42.50	55.30	75.75	88.65	94.75	11.05	25.85	41.20	54.75	76.10	88.80	95.15
Puri & Sen + INT	9.60	22.25	36.10	48.90	69.35	84.00	91.90	10.45	23.00	36.40	49.30	71.00	85.25	92.40
Koch	10.75	22.55	37.95	50.15	69.50	83.75	90.80	11.45	23.80	37.25	49.85	70.15	84.00	91.25


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
150
200
10
30
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

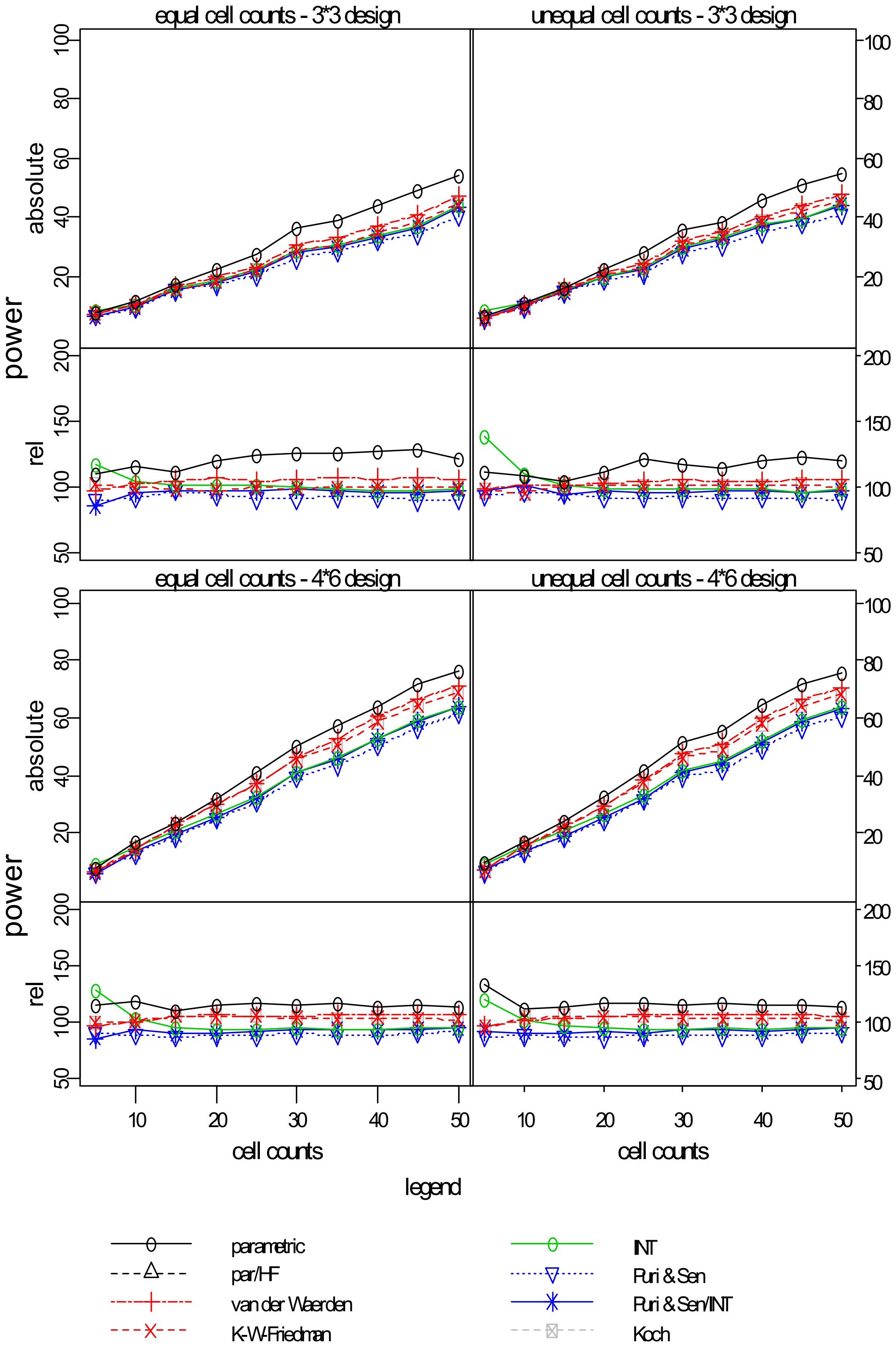
2. 1. 2. 5 normal distribution - unequal variances (on A) - pairing

	small n_i ~ small s_i							small n_i ~ large s_i						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	6.10	11.60	19.25	24.70	41.15	55.90	69.45	16.40	18.45	23.35	25.45	31.30	37.75	42.40
parametric HF-adj														
van der Waerden	5.20	11.10	17.45	22.90	37.95	53.05	64.80	8.20	13.40	17.25	19.20	24.75	30.85	34.50
KW/F	5.55	12.55	19.65	25.90	42.10	57.60	68.50	6.05	10.95	14.50	16.30	20.65	27.45	29.35
INT	6.55	11.80	17.80	23.05	38.55	52.50	65.20	13.05	14.75	18.75	19.55	24.95	31.85	35.25
Puri & Sen	5.75	12.65	20.20	26.35	43.15	57.75	70.05	7.80	10.40	14.60	16.45	21.10	27.00	29.60
Puri & Sen + INT	4.90	10.65	16.80	22.60	37.90	52.15	64.70	9.30	13.15	17.90	19.00	24.50	31.65	35.00
Koch	5.55	12.55	19.65	25.90	42.10	57.60	68.50	6.05	10.95	14.50	16.30	20.65	27.45	29.35
	large design (4*6)													
parametric	6.85	13.20	20.60	31.40	52.75	70.80	82.40	18.40	27.95	37.05	42.05	57.95	68.05	79.15
parametric HF-adj														
van der Waerden	5.50	12.40	21.20	30.70	52.85	70.55	82.00	10.20	20.70	30.25	35.05	50.80	62.50	74.20
KW/F	5.85	15.65	28.20	38.70	60.15	77.95	87.35	9.25	19.50	28.30	33.00	48.25	61.00	72.20
INT	6.85	13.45	21.35	30.50	51.55	69.25	82.30	14.55	23.65	32.20	36.30	51.80	63.30	74.95
Puri & Sen	6.35	16.95	28.60	40.20	62.15	79.20	88.70	9.00	19.00	28.10	34.10	48.95	61.25	74.20
Puri & Sen + INT	4.95	12.05	19.65	29.65	50.70	68.50	81.85	10.50	21.05	30.70	35.20	50.85	62.60	74.65
Koch	5.85	15.65	28.20	38.70	60.15	77.95	87.35	9.25	19.50	28.30	33.00	48.25	61.00	72.20


small ni ~ small si - 3*3 design
small ni ~ large si - 3*3 design
small ni ~ small si - 4*6 design
small ni ~ large si - 4*6 design
power
absolute
rel
100
80
60
40
20
200
150
100
50
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

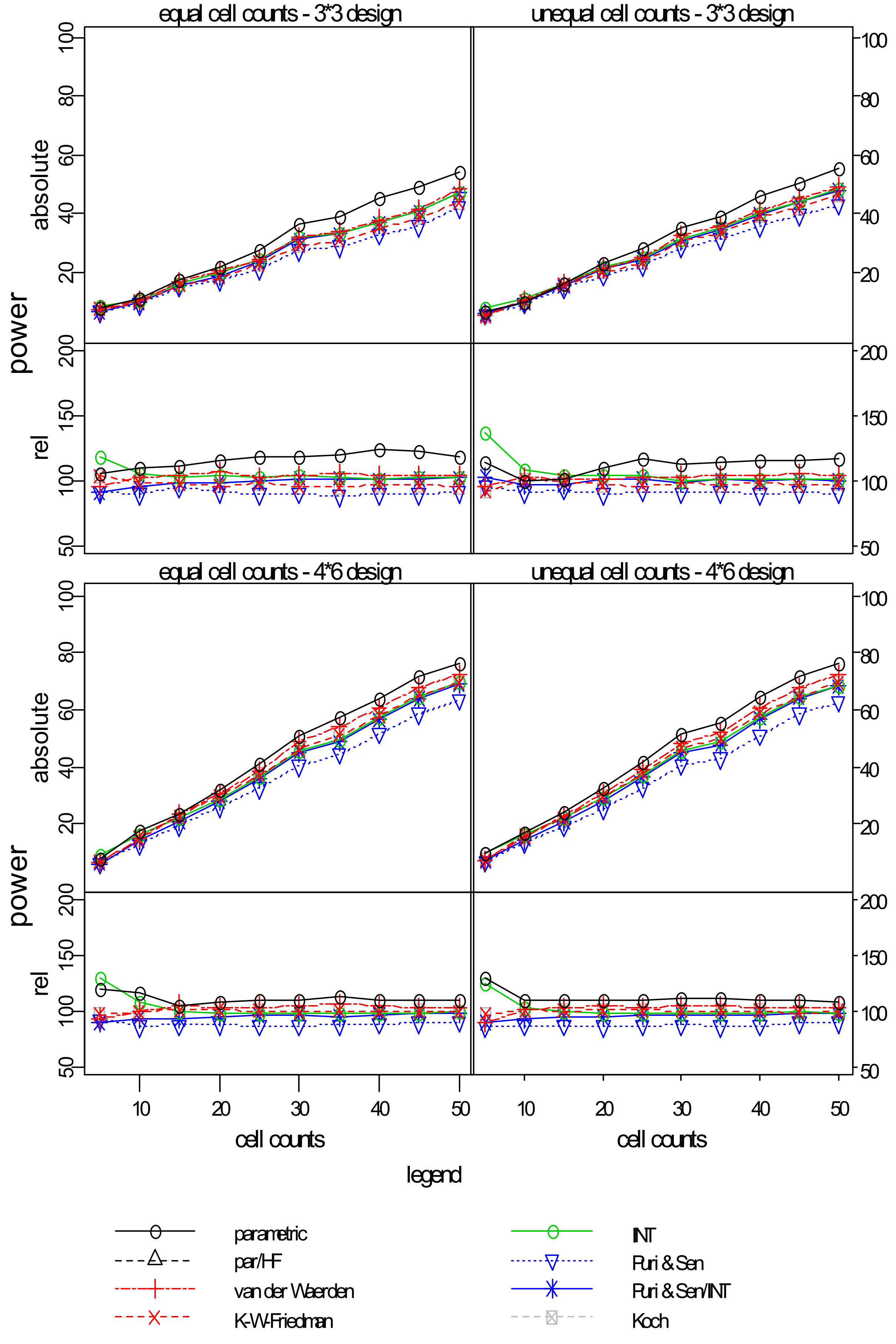
2. 1. 2. 6 exponential distribution

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	8.05	11.80	17.45	22.40	36.50	44.30	54.40	6.80	10.75	15.95	22.70	35.50	45.95	54.95
parametric HF-adj														
van der Waerden	7.15	10.45	16.50	20.05	30.50	36.95	47.10	6.05	10.10	15.70	21.15	31.95	40.00	47.85
KW/F	7.50	10.10	15.50	18.10	28.50	35.00	44.45	5.95	9.50	15.60	20.70	30.65	38.70	45.65
INT	8.60	10.65	16.00	18.90	28.90	33.90	44.30	8.50	11.00	15.55	20.15	29.95	37.85	44.80
Puri & Sen	6.65	9.35	15.30	17.40	26.20	32.05	40.45	5.75	9.55	14.75	18.75	28.20	35.15	41.15
Puri & Sen + INT	6.30	9.70	15.35	18.05	28.35	33.40	43.65	6.00	10.05	14.55	19.75	29.30	37.15	44.25
Koch	7.50	10.10	15.50	18.10	28.50	35.00	44.45	5.95	9.50	15.60	20.70	30.65	38.70	45.65
	large design (4*6)													
parametric	8.05	17.10	23.75	32.25	50.45	63.85	76.00	9.90	17.00	24.10	32.40	51.35	64.20	75.75
parametric HF-adj														
van der Waerden	6.75	14.50	22.70	29.90	46.35	60.50	71.20	7.25	15.45	21.95	29.55	47.60	59.80	70.30
KW/F	6.90	14.65	22.85	29.70	45.55	58.60	68.90	7.15	15.85	22.35	29.20	46.05	58.00	68.20
INT	8.90	14.95	20.65	26.45	41.35	52.95	64.05	8.95	15.50	20.55	26.50	41.75	52.05	63.60
Puri & Sen	6.25	12.80	18.85	24.90	39.25	50.40	61.50	6.50	13.50	18.60	24.25	39.70	49.20	60.35
Puri & Sen + INT	5.95	13.55	19.40	25.60	40.80	52.50	63.55	6.90	13.90	19.15	25.50	41.35	51.20	63.10
Koch	6.90	14.65	22.85	29.70	45.55	58.60	68.90	7.15	15.85	22.35	29.20	46.05	58.00	68.20


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
100
80
60
40
20
200
150
100
50
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

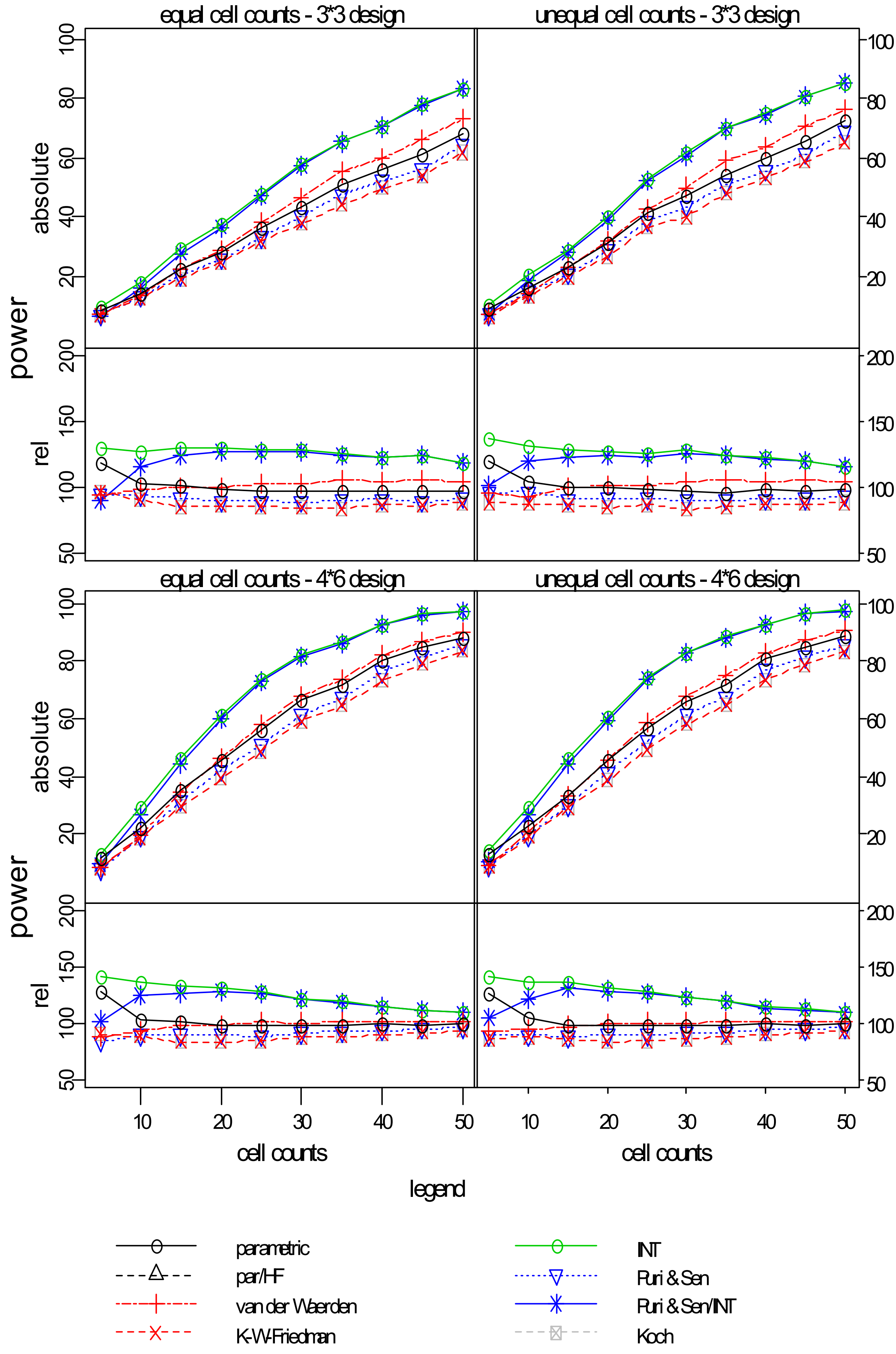
2. 1. 2. 7 exponential distribution - discrete values

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	7.50	11.10	17.50	22.00	36.40	45.15	54.30	6.40	10.00	15.85	23.00	35.25	46.05	55.65
parametric HF-adj														
van der Waerden	6.85	10.35	16.40	20.30	32.00	38.00	48.20	5.40	10.30	15.90	21.30	32.30	41.10	49.30
KW/F	7.40	9.90	15.50	18.25	29.00	35.40	43.95	5.15	10.15	15.70	20.20	30.90	39.05	46.50
INT	8.40	10.65	16.10	19.75	31.95	37.20	47.50	7.70	10.95	16.25	21.90	31.35	40.15	48.30
Puri & Sen	6.50	9.00	15.00	17.30	27.55	32.75	41.95	5.40	9.15	14.60	18.80	28.30	35.75	43.00
Puri & Sen + INT	6.45	9.55	15.50	18.75	31.10	36.75	47.10	5.80	9.75	15.20	21.10	30.95	39.55	47.80
Koch	7.40	9.90	15.50	18.25	29.00	35.40	43.95	5.15	10.15	15.70	20.20	30.90	39.05	46.50
	large design (4*6)													
parametric	8.15	17.55	23.50	31.95	50.90	63.65	76.30	10.00	17.20	24.20	32.40	51.70	64.60	76.00
parametric HF-adj														
van der Waerden	6.40	14.90	23.65	30.45	48.60	60.60	72.00	7.00	15.75	22.70	30.60	48.45	60.90	72.50
KW/F	6.60	14.95	22.70	29.90	46.10	57.95	69.55	7.50	15.70	21.95	29.60	46.40	58.85	69.60
INT	8.85	16.25	22.20	28.95	45.55	57.35	69.50	9.70	16.05	22.00	29.00	45.60	57.40	68.60
Puri & Sen	6.30	13.00	19.60	25.90	40.40	51.70	63.30	6.65	13.60	19.15	25.30	40.55	50.95	62.80
Puri & Sen + INT	6.10	14.10	20.85	28.05	45.05	56.60	69.05	6.95	14.55	20.85	27.85	44.85	56.85	68.30
Koch	6.60	14.95	22.70	29.90	46.10	57.95	69.55	7.50	15.70	21.95	29.60	46.40	58.85	69.60


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

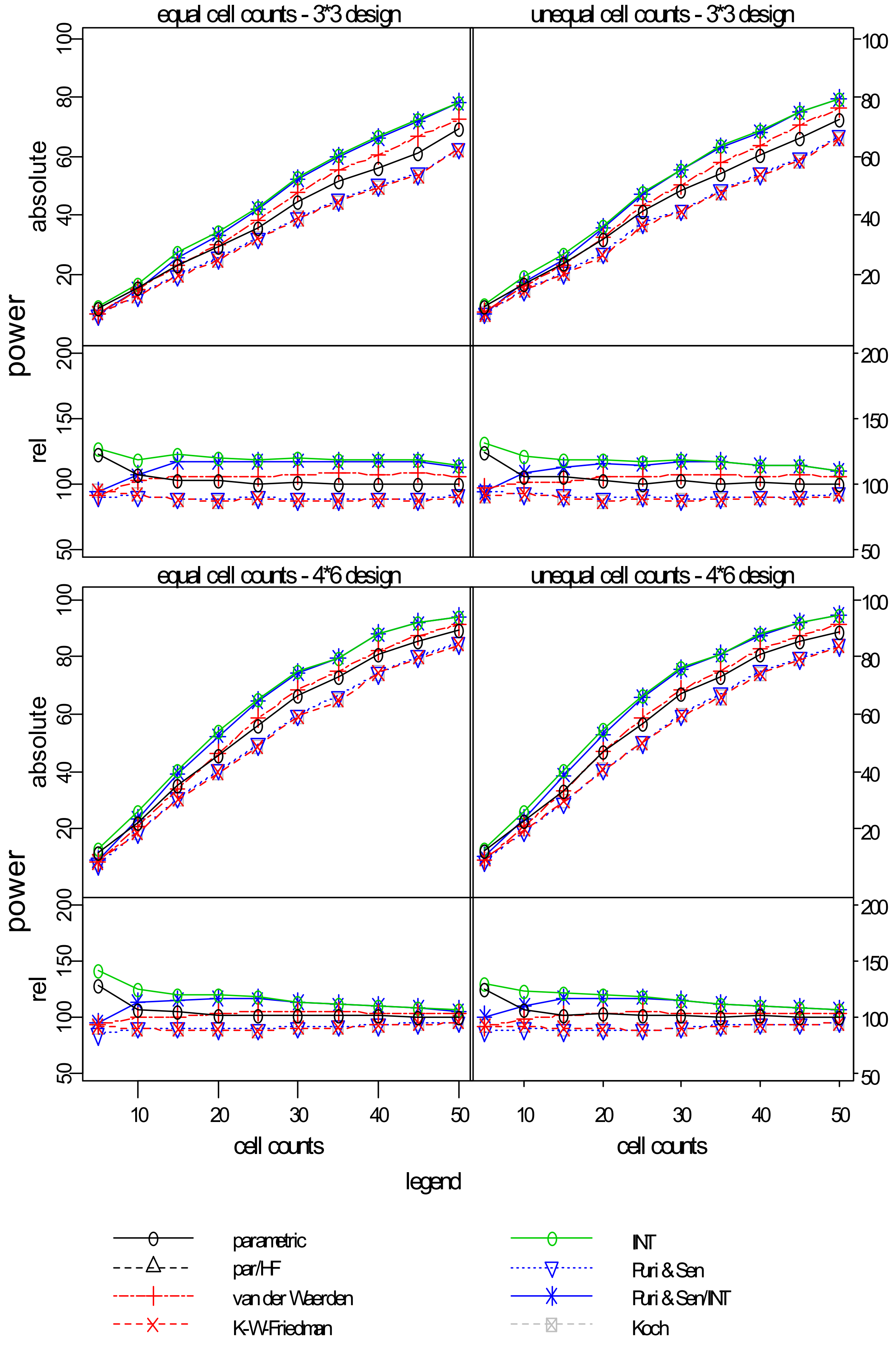
2. 1. 2. 8 uniform distribution

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	8.65	14.35	22.50	28.35	43.70	56.35	68.40	8.80	16.05	22.75	31.45	47.00	59.95	72.70
parametric HF-adj														
van der Waerden	6.95	13.80	22.40	28.90	46.30	59.75	73.30	7.05	14.35	22.80	31.85	50.05	63.50	76.70
KW/F	7.10	12.70	19.05	24.75	38.00	49.95	61.80	6.50	13.50	19.65	26.75	40.15	53.45	65.10
INT	9.50	17.75	29.20	37.60	58.05	70.85	83.50	10.10	20.25	29.10	40.20	61.70	74.90	85.55
Puri & Sen	6.95	13.15	20.40	25.70	40.15	52.30	64.50	7.00	14.85	20.65	28.90	43.50	55.70	68.65
Puri & Sen + INT	6.60	16.25	27.65	36.65	57.40	70.45	83.40	7.40	18.40	28.00	39.15	60.85	74.40	85.45
Koch	7.10	12.70	19.05	24.75	38.00	49.95	61.80	6.50	13.50	19.65	26.75	40.15	53.45	65.10
	large design (4*6)													
parametric	11.90	21.90	35.30	45.75	66.20	80.40	88.20	12.75	22.55	33.00	45.35	66.05	80.75	88.65
parametric HF-adj														
van der Waerden	8.30	19.80	34.35	46.10	67.55	82.35	90.10	9.35	20.65	32.95	45.85	67.65	82.50	90.60
KW/F	8.45	18.75	29.40	39.25	59.00	73.25	83.55	8.75	19.10	29.10	38.70	58.25	73.50	83.20
INT	13.15	29.05	46.35	61.40	81.90	92.55	97.15	14.20	29.35	45.95	60.80	83.00	92.70	97.40
Puri & Sen	7.80	19.05	31.50	42.10	61.35	76.10	85.45	9.00	19.30	29.80	41.40	61.30	76.75	85.30
Puri & Sen + INT	9.55	26.45	44.45	60.00	81.50	92.35	97.10	10.60	26.40	44.45	59.50	82.65	92.45	97.35
Koch	8.45	18.75	29.40	39.25	59.00	73.25	83.55	8.75	19.10	29.10	38.70	58.25	73.50	83.20


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

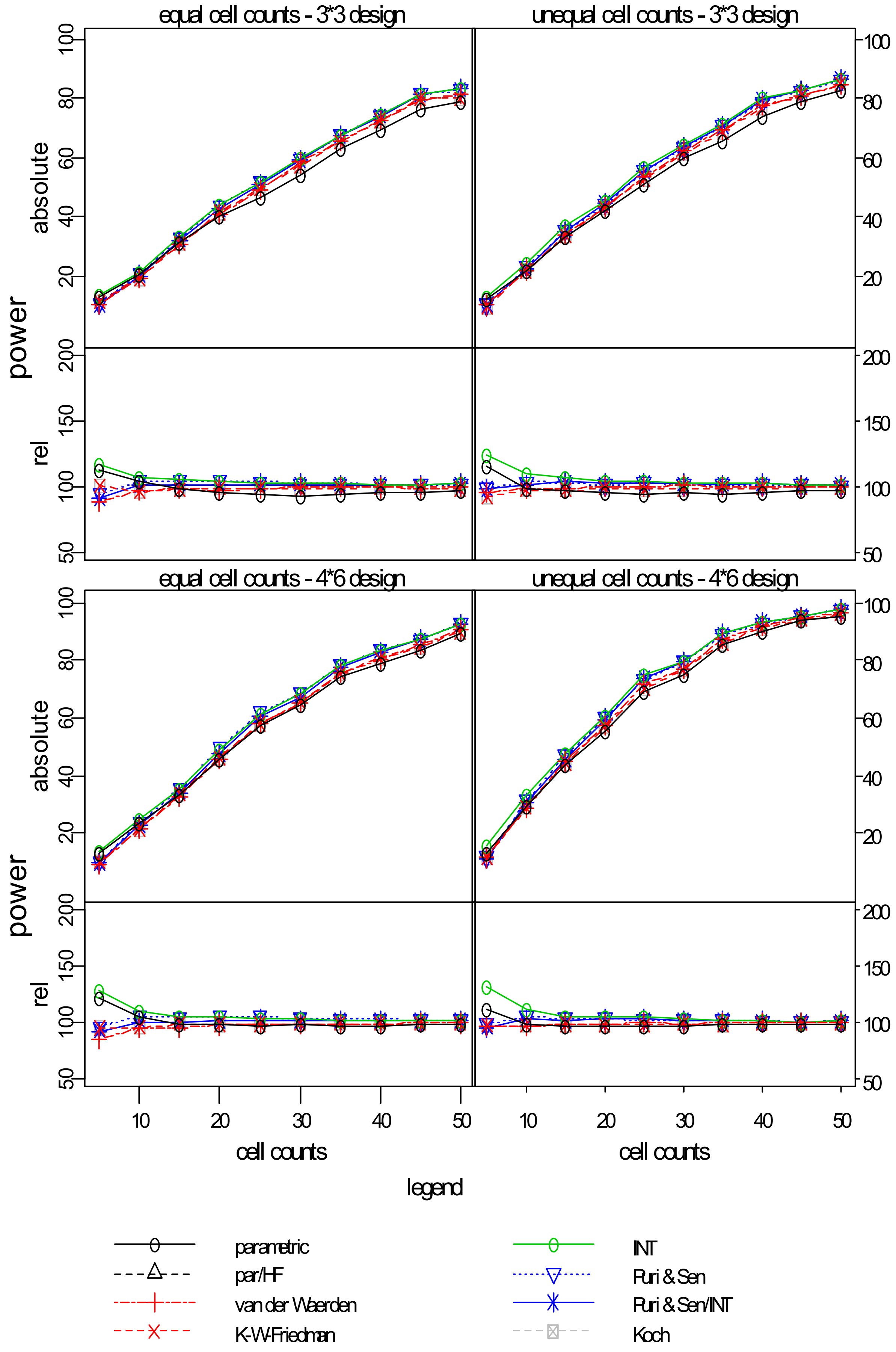
2. 1. 2. 9 uniform distribution - discrete values

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	8.60	15.15	22.75	29.45	44.80	56.35	69.20	8.95	16.70	23.50	31.70	48.30	60.60	72.60
parametric HF-adj														
van der Waerden	6.40	14.55	23.25	30.20	47.75	60.45	72.95	6.95	16.00	22.80	32.55	50.45	63.50	76.30
KW/F	6.65	12.95	19.45	24.70	38.90	49.60	62.30	6.55	14.60	20.05	26.50	41.25	53.65	66.10
INT	8.85	16.80	27.20	34.20	53.10	66.65	78.60	9.40	19.10	26.60	36.45	55.80	68.65	79.75
Puri & Sen	6.30	12.80	19.65	25.45	39.25	50.30	62.70	6.75	14.60	20.40	27.30	41.60	54.15	67.10
Puri & Sen + INT	6.60	15.00	25.80	33.35	52.30	66.20	78.10	6.75	17.25	25.20	35.60	55.30	68.40	79.50
Koch	6.65	12.95	19.45	24.70	38.90	49.60	62.30	6.55	14.60	20.05	26.50	41.25	53.65	66.10
	large design (4*6)													
parametric	11.80	22.25	35.50	45.85	66.50	80.65	89.15	12.65	22.65	33.40	46.70	66.90	80.70	88.80
parametric HF-adj														
van der Waerden	8.65	20.90	34.10	46.30	68.35	82.25	90.90	9.30	21.00	33.55	46.75	68.20	82.60	90.95
KW/F	8.50	18.65	30.25	39.80	59.20	74.30	84.35	9.35	19.70	29.60	40.60	59.40	74.20	83.65
INT	13.05	26.05	40.60	53.95	74.80	88.10	93.75	13.30	26.30	40.10	54.45	75.95	87.85	94.55
Puri & Sen	7.85	18.90	30.80	40.50	59.70	74.15	84.55	8.90	19.20	29.05	40.50	59.70	75.10	84.10
Puri & Sen + INT	8.85	23.60	39.25	52.35	74.15	87.75	93.50	10.25	23.55	38.55	53.00	75.40	87.55	94.40
Koch	8.50	18.65	30.25	39.80	59.20	74.30	84.35	9.35	19.70	29.60	40.60	59.40	74.20	83.65


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

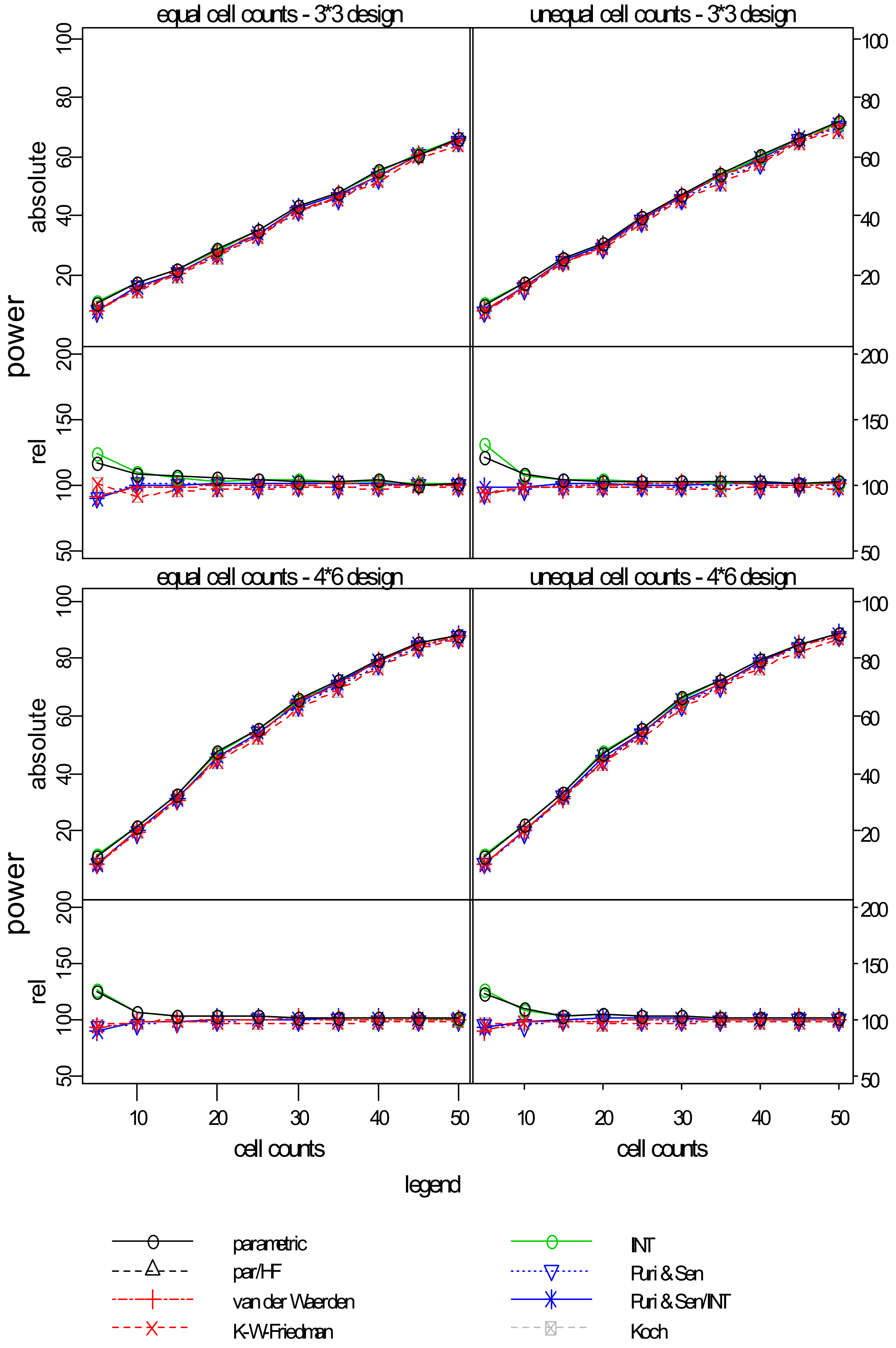
2. 1. 2. 10 lognormal distribution - equal variances

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	12.90	20.70	31.20	40.20	54.20	69.65	78.80	12.10	22.05	33.40	42.10	59.65	74.10	82.80
parametric HF-adj														
van der Waerden	10.10	19.35	30.90	41.05	58.40	72.60	81.40	10.05	22.10	33.65	43.60	62.70	78.00	85.00
KW/F	11.50	19.15	30.90	41.45	57.10	72.60	80.20	9.70	21.80	33.40	43.30	61.30	76.90	84.80
INT	13.40	21.35	33.45	43.80	59.85	74.30	83.35	13.05	24.65	36.75	45.55	64.30	80.00	86.90
Puri & Sen	10.75	20.75	32.90	43.80	59.45	74.30	83.05	10.30	23.15	35.35	44.20	62.95	78.70	86.05
Puri & Sen + INT	10.35	20.20	32.10	42.70	59.30	74.05	83.15	10.30	22.70	35.40	44.65	63.55	79.60	86.80
Koch	11.50	19.15	30.90	41.45	57.10	72.60	80.20	9.70	21.80	33.40	43.30	61.30	76.90	84.80
	large design (4*6)													
parametric	12.80	23.40	33.15	45.90	64.65	78.60	89.00	13.15	29.50	43.70	55.70	74.65	89.95	95.40
parametric HF-adj														
van der Waerden	9.00	21.45	32.45	45.70	65.30	80.35	90.30	11.45	28.90	44.65	57.10	76.75	91.80	96.55
KW/F	10.00	21.45	33.45	46.00	65.35	80.70	89.95	11.45	29.10	44.35	56.75	76.75	91.05	96.00
INT	13.45	24.60	35.40	48.85	68.15	83.30	92.55	15.60	33.30	47.65	60.80	79.70	93.25	97.50
Puri & Sen	10.10	23.55	35.35	49.40	68.55	83.70	92.60	11.60	31.45	46.80	59.80	79.45	92.80	97.50
Puri & Sen + INT	9.70	22.50	34.05	47.40	67.30	83.00	92.35	11.30	30.75	45.65	59.60	79.20	93.15	97.50
Koch	10.00	21.45	33.45	46.00	65.35	80.70	89.95	11.45	29.10	44.35	56.75	76.75	91.05	96.00


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

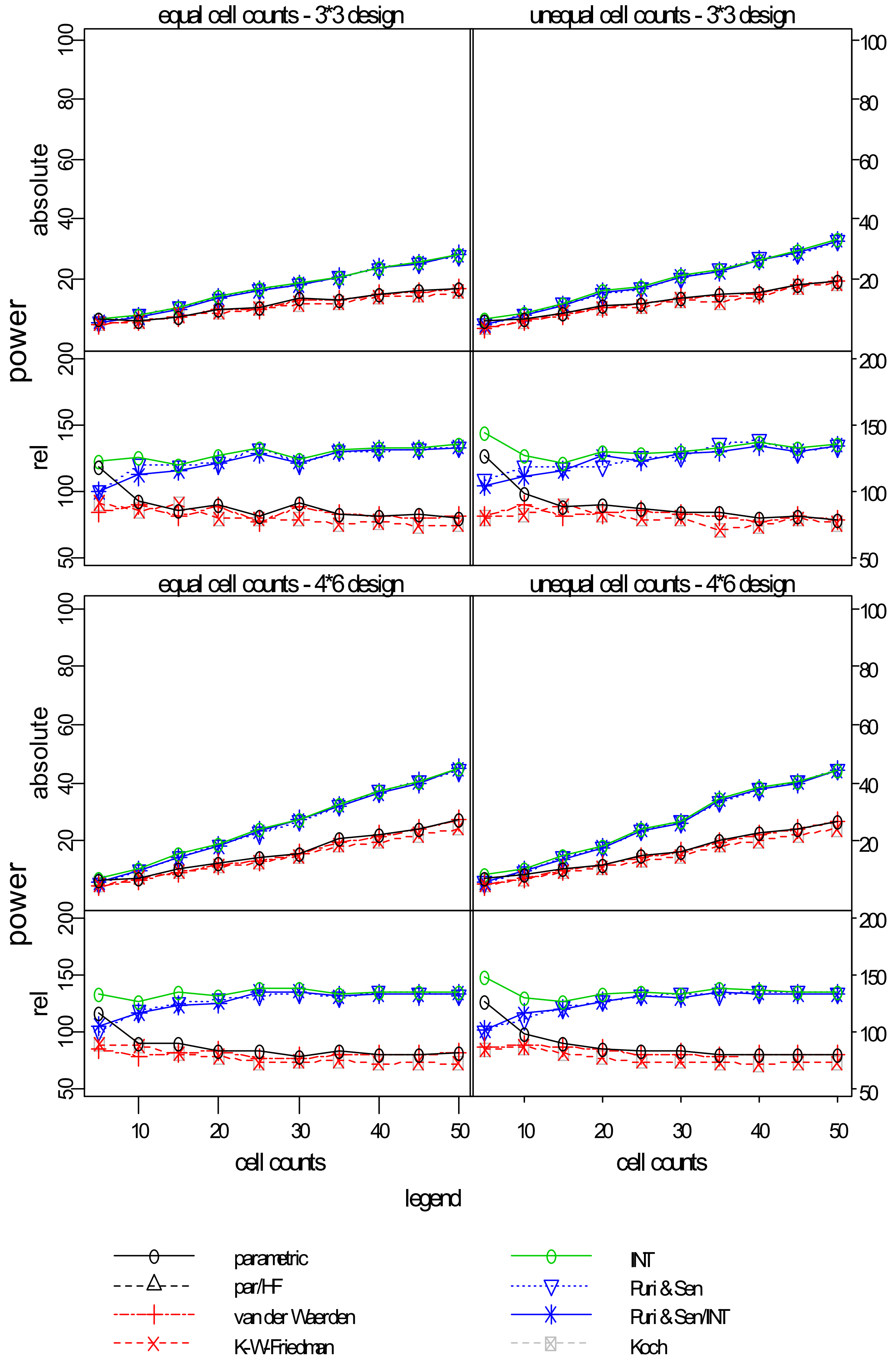
2. 1. 2. 11 normal distribution - equal variances - contaminated I

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	10.15	17.20	22.10	28.55	43.15	55.20	66.30	9.75	17.20	25.60	30.45	47.35	60.60	71.90
parametric HF-adj														
van der Waerden	7.90	15.55	20.30	27.25	41.90	53.35	65.75	7.60	15.75	24.10	29.30	46.65	58.85	71.00
KW/F	8.75	14.55	19.90	26.25	41.20	51.80	64.05	7.45	15.60	24.30	28.95	45.05	57.60	68.85
INT	10.80	17.45	21.80	27.95	43.60	54.55	66.55	10.50	17.10	25.60	30.70	47.35	59.90	71.55
Puri & Sen	7.85	16.15	20.80	26.95	41.75	52.85	65.25	7.55	15.40	24.45	29.15	45.75	57.80	70.30
Puri & Sen + INT	7.80	15.85	20.70	27.30	42.75	53.70	66.15	7.85	15.75	24.80	29.75	46.30	59.45	71.20
Koch	8.75	14.55	19.90	26.25	41.20	51.80	64.05	7.45	15.60	24.30	28.95	45.05	57.60	68.85
	large design (4*6)													
parametric	11.40	21.65	32.60	47.25	65.55	79.75	88.05	11.20	22.45	33.15	47.05	66.25	79.25	88.55
parametric HF-adj														
van der Waerden	8.50	19.85	30.75	45.45	64.85	78.80	87.45	8.25	20.30	31.60	44.35	64.65	78.15	87.45
KW/F	8.70	19.90	31.45	44.20	62.60	76.70	86.40	8.70	20.05	31.65	43.40	62.65	76.75	86.75
INT	11.60	21.75	32.75	47.15	65.45	79.50	87.90	11.55	22.35	33.25	47.55	66.00	79.20	88.70
Puri & Sen	8.60	19.45	31.00	45.15	63.80	77.80	87.15	8.65	19.55	32.10	44.60	63.60	78.40	87.65
Puri & Sen + INT	8.25	20.05	31.20	45.85	64.50	79.00	87.75	8.50	20.10	32.10	45.85	65.25	78.85	88.30
Koch	8.70	19.90	31.45	44.20	62.60	76.70	86.40	8.70	20.05	31.65	43.40	62.65	76.75	86.75


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

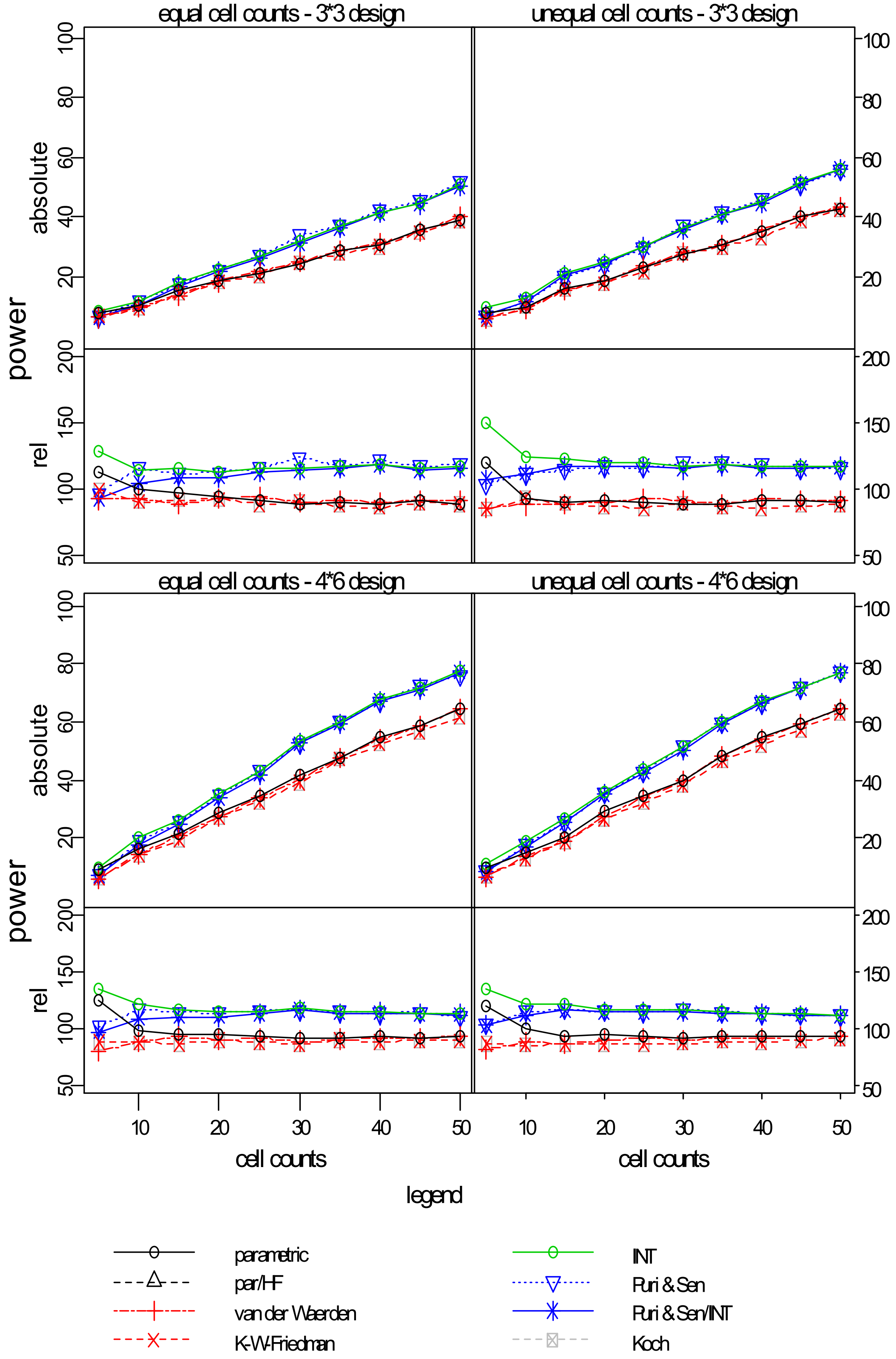
2. 1. 2. 12 normal distribution - equal variances - contaminated II

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	6.55	5.95	7.35	9.85	13.50	14.75	16.60	5.60	6.70	8.55	11.00	13.60	15.30	19.20
parametric HF-adj														
van der Waerden	4.65	5.80	6.95	9.70	12.95	14.55	16.90	3.55	6.15	7.95	10.30	13.35	14.80	19.05
KW/F	5.05	5.50	7.75	8.75	11.60	13.90	15.55	3.50	5.60	8.70	10.20	12.90	14.25	18.45
INT	6.80	8.10	10.35	13.90	18.35	24.00	28.25	6.30	8.60	11.75	16.10	20.95	26.40	33.10
Puri & Sen	5.55	7.70	10.25	13.30	17.85	23.50	27.80	4.75	8.05	11.45	14.65	20.30	26.70	32.70
Puri & Sen + INT	5.50	7.20	9.95	13.40	17.95	23.70	27.85	4.55	7.55	11.20	15.60	20.65	26.05	32.80
Koch	5.05	5.50	7.75	8.75	11.60	13.90	15.55	3.50	5.60	8.70	10.20	12.90	14.25	18.45
	large design (4*6)													
parametric	6.35	7.45	10.30	12.15	15.85	21.85	27.15	7.20	8.20	10.55	11.80	16.55	22.65	26.65
parametric HF-adj														
van der Waerden	4.65	6.50	9.40	12.05	15.50	21.80	27.05	4.95	7.30	10.10	11.80	16.20	22.25	26.60
KW/F	4.85	7.25	9.20	11.35	14.80	19.80	24.20	4.80	7.20	9.45	10.80	14.80	20.10	24.15
INT	7.25	10.50	15.50	18.95	27.60	37.00	45.00	8.40	10.75	14.75	18.50	26.70	38.25	44.60
Puri & Sen	5.50	9.80	14.35	18.65	26.85	37.00	44.25	5.75	9.25	14.15	17.70	26.60	37.75	44.60
Puri & Sen + INT	5.75	9.65	14.05	18.15	27.10	36.40	44.65	5.80	9.65	13.95	17.65	26.05	37.60	44.05
Koch	4.85	7.25	9.20	11.35	14.80	19.80	24.20	4.80	7.20	9.45	10.80	14.80	20.10	24.15


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 1. 2. 13 normal distribution - equal variances - contaminated III

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	7.65	10.15	15.20	18.75	24.35	30.95	38.75	8.00	9.70	15.75	18.70	27.65	35.20	42.90
parametric HF-adj														
van der Waerden	6.25	9.45	13.80	18.30	24.75	31.30	39.95	5.75	9.25	15.45	18.50	28.20	35.70	43.55
KW/F	6.75	9.20	14.35	18.25	24.75	30.05	38.70	5.65	9.80	15.50	17.80	27.70	33.15	42.50
INT	8.75	11.60	18.15	22.25	31.70	41.65	51.00	10.00	13.10	21.35	24.75	36.20	45.15	56.25
Puri & Sen	6.55	11.80	17.35	22.15	33.85	42.45	51.90	6.95	11.70	19.90	24.10	37.25	46.10	55.60
Puri & Sen + INT	6.30	10.60	17.00	21.55	31.10	41.30	50.45	7.20	11.75	20.45	24.10	35.70	44.65	56.15
Koch	6.75	9.20	14.35	18.25	24.75	30.05	38.70	5.65	9.80	15.50	17.80	27.70	33.15	42.50
	large design (4*6)													
parametric	8.90	16.20	21.20	28.85	41.65	54.65	64.45	9.70	15.20	20.35	29.00	39.90	54.60	64.65
parametric HF-adj														
van der Waerden	5.70	14.45	20.75	27.55	40.30	54.20	64.55	6.60	13.50	18.90	27.50	39.45	53.85	64.50
KW/F	6.30	14.35	19.15	27.30	39.05	52.25	61.55	7.00	13.05	18.85	26.45	38.30	51.85	63.20
INT	9.60	19.95	25.75	34.95	53.60	67.60	77.30	10.85	18.65	26.50	35.85	51.40	66.85	77.20
Puri & Sen	7.25	19.10	25.35	34.60	52.45	66.90	75.95	8.40	17.70	25.45	35.35	51.30	66.45	77.15
Puri & Sen + INT	6.95	17.75	24.45	33.60	52.70	67.30	77.15	8.30	17.15	25.30	35.10	50.30	66.50	76.95
Koch	6.30	14.35	19.15	27.30	39.05	52.25	61.55	7.00	13.05	18.85	26.45	38.30	51.85	63.20

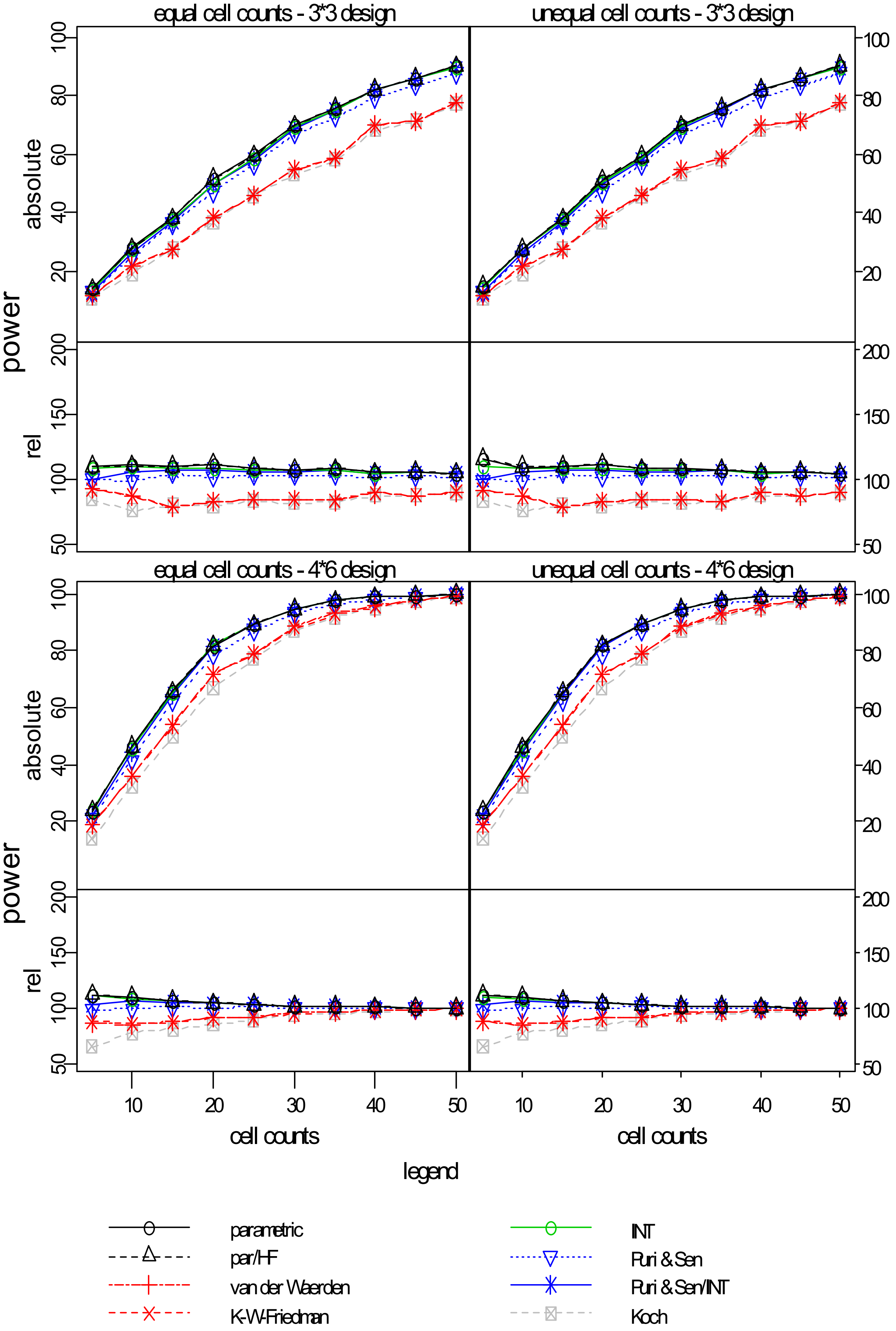

equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 2. Main effect B (effects b_i=0.3*s)

2. 2. 1. equal correlations on B (r=0.3)

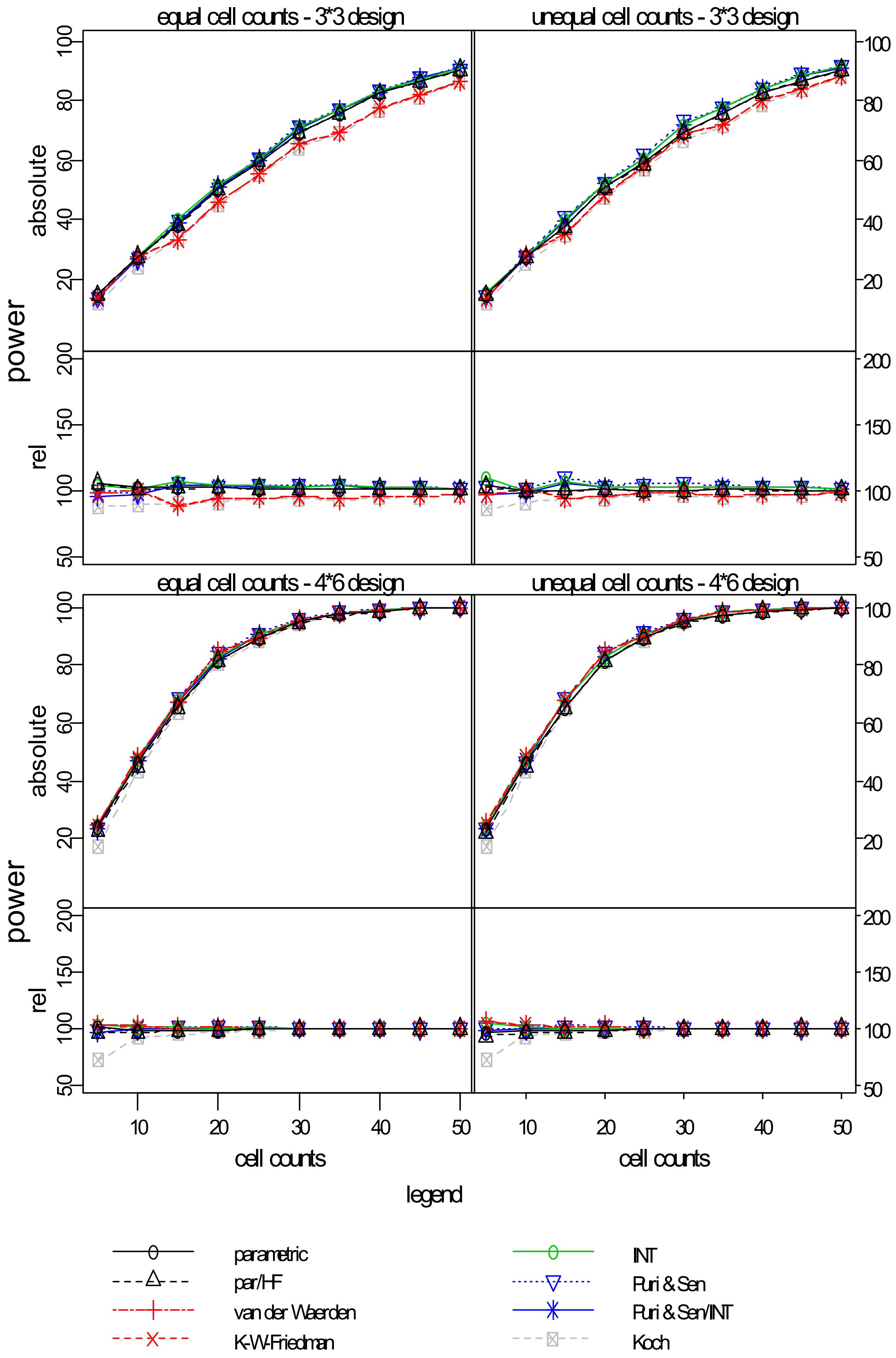
2. 2. 1. 1 normal distribution - equal variances

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	14.10	27.90	38.05	51.40	69.95	82.30	90.25	15.05	27.45	38.20	51.00	70.10	82.30	90.30
parametric HF-adj	14.00	27.80	38.15	51.70	69.95	82.30	90.25	15.35	27.60	38.30	51.25	70.00	82.20	90.25
van der Waerden	11.80	21.85	27.35	38.45	54.90	69.80	77.95	11.80	21.85	27.35	38.45	54.90	69.80	77.95
KW/F	11.80	21.85	27.35	38.45	54.90	69.80	77.95	11.80	21.85	27.35	38.45	54.90	69.80	77.95
INT	13.75	27.50	37.60	49.90	69.30	82.00	89.85	14.65	27.20	37.90	50.10	69.25	82.05	89.80
Puri & Sen	12.75	24.85	36.25	47.10	67.00	79.55	87.90	12.75	24.85	36.25	47.10	67.00	79.55	87.90
Puri & Sen + INT	12.80	26.50	37.05	49.55	68.95	81.90	89.75	12.80	26.50	37.05	49.55	68.95	81.90	89.75
Koch	10.80	19.05	27.65	36.90	53.20	68.40	77.35	10.80	19.05	27.65	36.90	53.20	68.40	77.35
	large design (4*6)													
parametric	23.70	46.15	65.60	81.65	94.55	98.75	99.90	23.05	46.10	65.90	81.80	94.55	98.75	99.90
parametric HF-adj	23.95	46.20	65.50	81.85	94.50	98.75	99.90	23.15	46.05	65.60	81.65	94.55	98.70	99.90
van der Waerden	18.65	35.80	54.00	71.35	88.85	95.45	98.85	18.65	35.80	54.00	71.35	88.85	95.45	98.85
KW/F	18.75	36.10	53.45	71.60	88.15	95.30	98.85	18.75	36.10	53.45	71.60	88.15	95.30	98.85
INT	23.80	45.40	65.15	81.95	94.50	98.90	99.90	22.95	45.35	65.15	81.95	94.45	98.85	99.90
Puri & Sen	21.05	41.50	62.20	78.50	93.05	97.70	99.85	21.05	41.50	62.20	78.50	93.05	97.70	99.85
Puri & Sen + INT	21.95	44.30	64.75	81.65	94.35	98.85	99.90	21.95	44.30	64.75	81.65	94.35	98.85	99.90
Koch	13.95	32.55	49.80	66.95	87.30	94.85	98.75	13.95	32.55	49.80	66.95	87.30	94.85	98.75


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

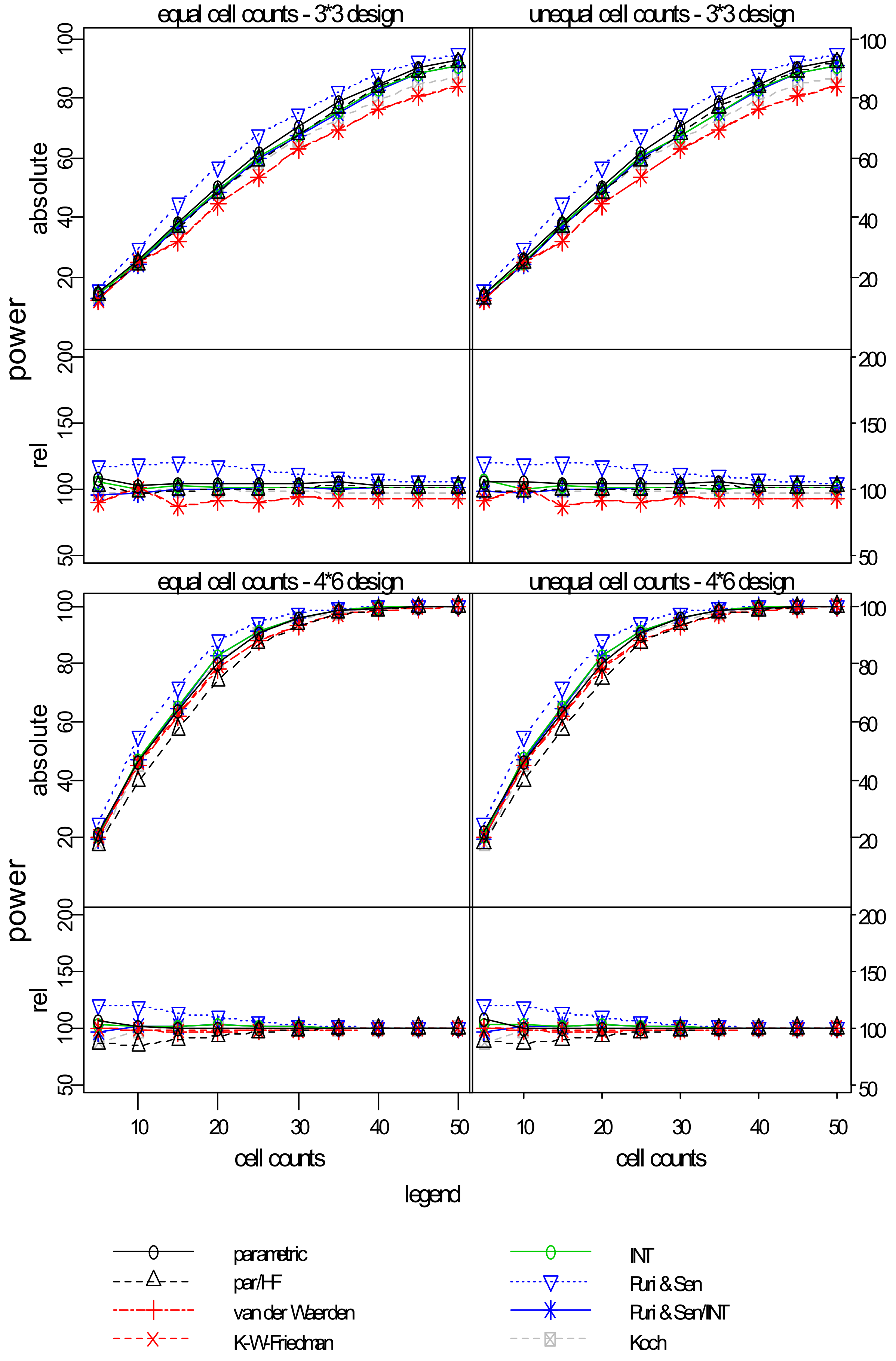
2. 2. 1. 2 normal distribution - unequal variances (on A)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	14.65	27.80	38.55	50.60	69.70	82.80	90.35	14.50	27.80	37.60	51.05	69.20	82.85	90.40
parametric HF-adj	14.65	27.55	38.00	50.40	69.60	82.60	90.45	14.40	27.35	37.55	50.90	69.20	82.65	90.40
van der Waerden	13.60	27.40	33.20	46.15	65.75	78.05	86.70	13.55	27.85	35.25	48.25	68.60	80.10	88.30
KW/F	13.60	27.40	33.20	46.15	65.75	78.05	86.70	13.55	27.85	35.25	48.25	68.60	80.10	88.30
INT	14.55	27.75	39.95	51.50	71.25	83.15	91.05	15.30	27.75	40.00	52.25	71.85	84.20	91.50
Puri & Sen	13.90	26.80	39.60	50.60	71.75	83.45	90.80	14.50	27.95	41.00	52.35	73.25	84.25	91.60
Puri & Sen + INT	13.30	26.60	39.00	51.30	70.90	83.00	91.05	13.55	27.35	39.50	52.15	71.85	84.10	91.30
Koch	12.15	24.30	33.75	44.90	64.40	76.95	86.75	12.05	25.25	35.15	47.35	66.75	78.85	88.00
	large design (4*6)													
parametric	24.05	46.15	65.65	81.55	95.00	98.55	99.85	23.20	46.00	65.40	81.50	94.85	98.60	99.80
parametric HF-adj	22.90	45.00	65.10	81.50	94.65	98.55	99.85	22.05	45.05	65.00	81.15	94.75	98.50	99.80
van der Waerden	24.75	48.00	67.25	84.40	95.40	98.80	99.80	25.20	48.35	67.80	84.80	95.50	98.90	99.85
KW/F	24.55	47.70	66.95	84.10	95.45	98.90	99.80	24.80	48.35	67.75	84.60	95.60	98.95	99.85
INT	24.80	47.45	67.60	83.00	95.40	98.85	99.95	24.95	47.65	67.55	82.95	95.35	98.85	99.90
Puri & Sen	23.70	46.25	68.35	84.15	95.70	99.00	100.0	23.90	46.30	68.70	84.30	95.90	99.10	100.0
Puri & Sen + INT	23.15	46.85	67.15	82.40	95.35	98.85	99.95	23.35	46.90	67.45	82.85	95.35	98.85	99.90
Koch	17.20	43.15	63.90	80.65	94.50	98.65	99.75	17.40	43.25	64.60	81.30	94.90	98.75	99.75


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

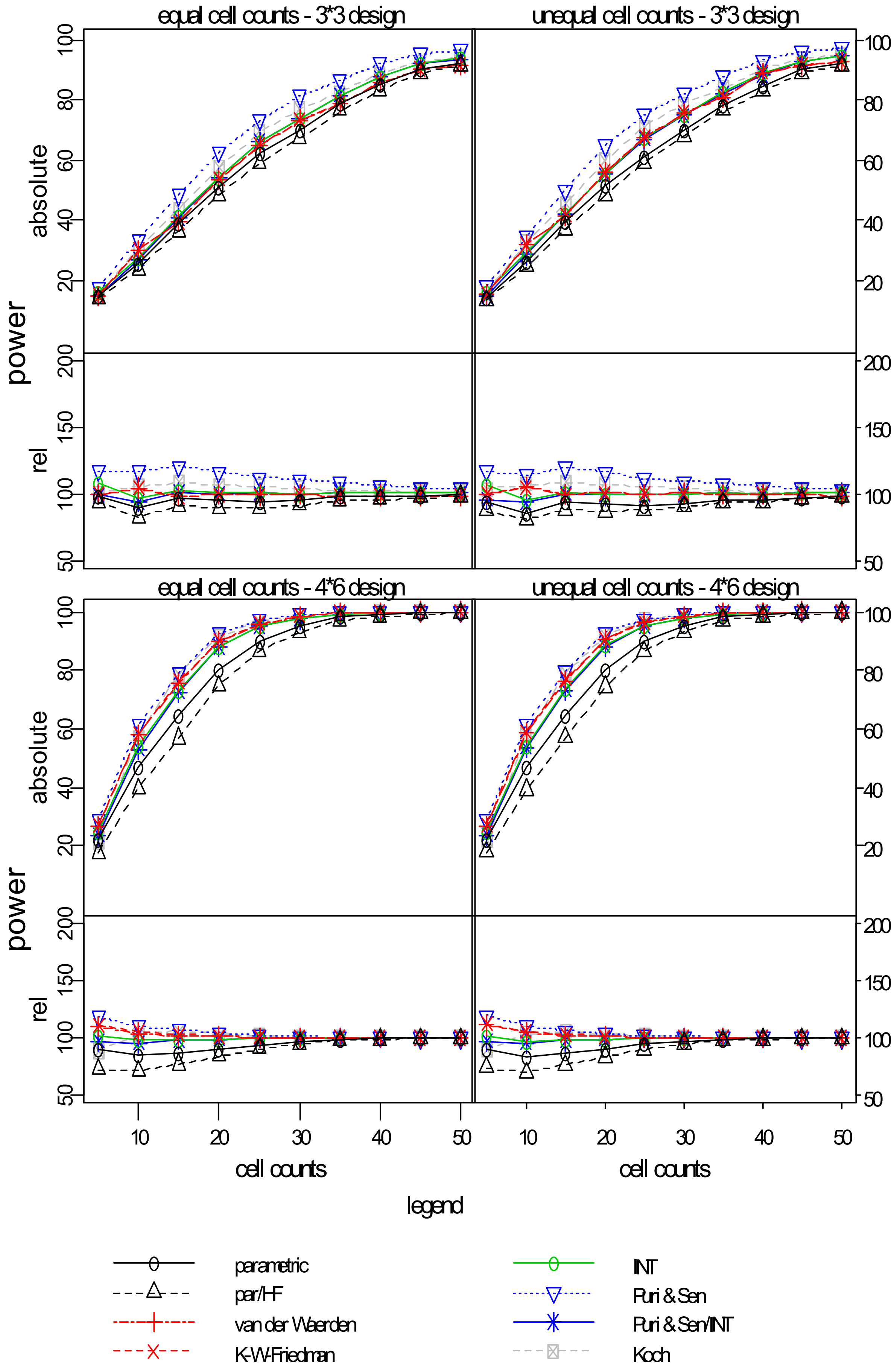
2. 2. 1. 3 normal distribution - unequal variances (on B)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	14.60	25.80	38.60	50.35	70.45	84.95	92.80	13.95	26.45	38.55	50.45	70.50	84.90	92.80
parametric HF-adj	13.80	24.45	36.65	48.35	68.05	83.80	91.95	13.05	24.60	37.05	48.45	68.15	83.90	92.10
van der Waerden	12.10	25.25	32.20	44.40	63.30	76.65	84.30	12.10	25.25	32.20	44.40	63.30	76.65	84.30
KW/F	12.10	25.25	32.20	44.40	63.30	76.65	84.30	12.10	25.25	32.20	44.40	63.30	76.65	84.30
INT	14.20	25.20	38.00	48.85	68.05	83.25	91.40	14.10	25.00	37.90	48.85	67.80	83.15	91.40
Puri & Sen	15.85	29.65	44.50	57.15	75.00	88.35	94.85	15.85	29.65	44.50	57.15	75.00	88.35	94.85
Puri & Sen + INT	12.95	24.35	36.95	48.55	67.85	83.10	91.35	12.95	24.35	36.95	48.55	67.85	83.10	91.35
Koch	13.00	24.75	36.80	48.30	66.00	79.90	87.55	13.00	24.75	36.80	48.30	66.00	79.90	87.55
	large design (4*6)													
parametric	21.80	46.55	63.65	79.85	95.65	99.10	99.70	22.15	46.35	63.50	79.95	95.60	99.10	99.70
parametric HF-adj	17.75	39.30	57.40	74.45	93.45	98.40	99.65	18.05	39.55	57.25	74.50	93.45	98.40	99.65
van der Waerden	20.45	45.05	61.95	78.30	93.40	98.65	99.75	20.45	45.05	61.95	78.30	93.40	98.65	99.75
KW/F	20.40	45.70	62.65	78.90	93.40	98.65	99.75	20.40	45.70	62.65	78.90	93.40	98.65	99.75
INT	21.15	47.20	65.10	83.05	95.95	99.40	99.85	21.15	47.60	65.25	82.95	95.85	99.40	99.85
Puri & Sen	24.65	54.90	72.10	88.10	97.40	99.75	99.90	24.65	54.90	72.10	88.10	97.40	99.75	99.90
Puri & Sen + INT	19.75	46.95	64.80	82.55	95.85	99.35	99.80	19.75	46.95	64.80	82.55	95.85	99.35	99.80
Koch	17.80	45.25	64.35	80.65	95.15	99.00	99.90	17.80	45.25	64.35	80.65	95.15	99.00	99.90


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

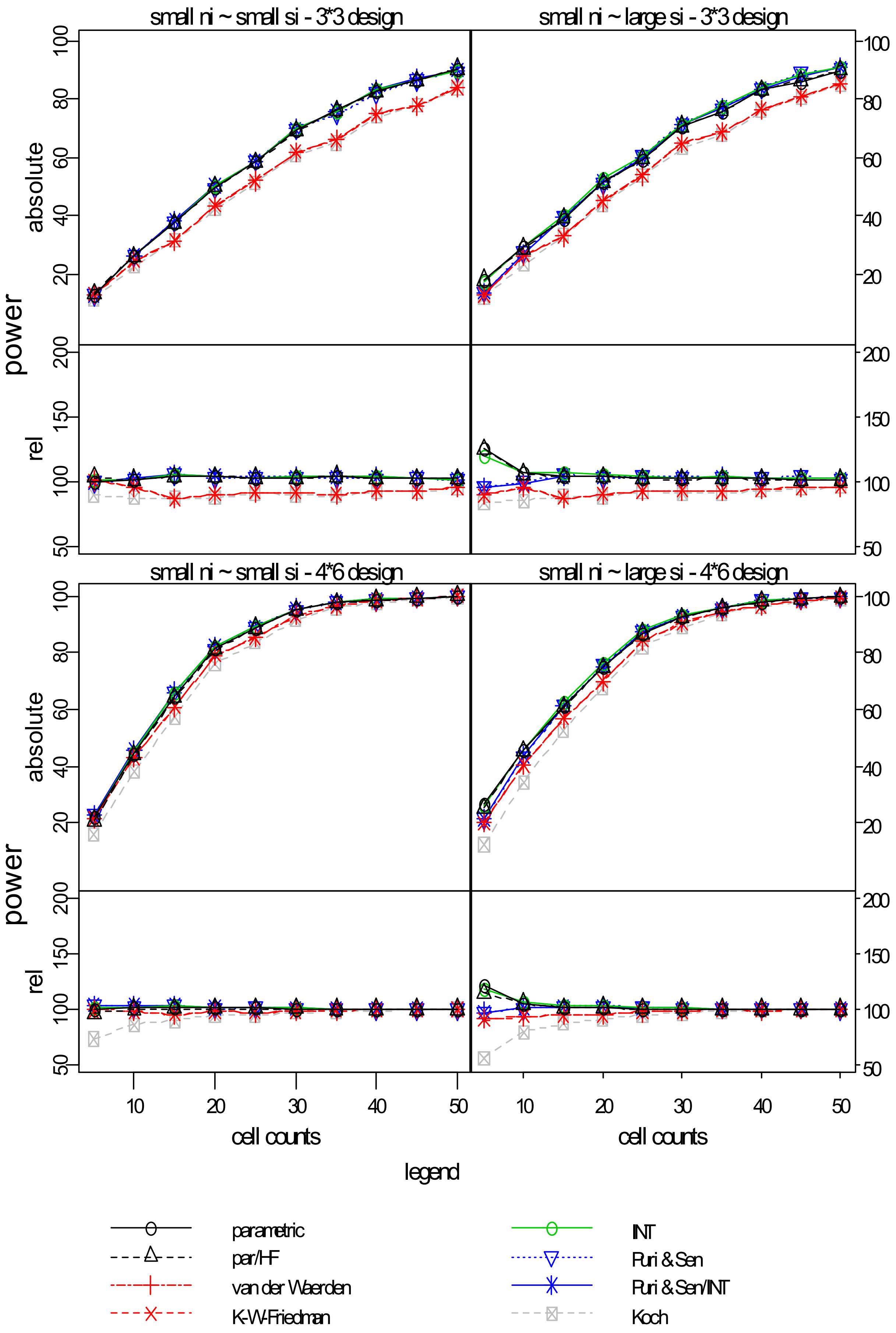
2. 2. 1. 4 normal distribution - unequal variances (on A and B)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	14.65	25.60	38.90	51.20	70.25	85.15	92.65	14.40	25.95	39.30	51.40	70.20	84.85	92.45
parametric HF-adj	13.90	23.85	36.60	48.20	67.55	83.60	91.70	13.45	24.60	37.00	48.50	68.20	83.05	91.60
van der Waerden	14.85	30.10	39.35	53.70	73.60	86.15	91.75	15.45	31.90	41.70	56.15	76.00	89.25	92.95
KW/F	14.85	30.10	39.35	53.70	73.60	86.15	91.75	15.45	31.90	41.70	56.15	76.00	89.25	92.95
INT	16.10	27.80	41.40	54.40	73.95	88.05	94.00	16.35	29.20	42.25	55.65	75.45	88.90	95.10
Puri & Sen	17.45	33.60	48.50	62.70	81.45	92.55	96.80	18.10	34.70	50.10	64.90	82.50	93.35	97.30
Puri & Sen + INT	14.80	27.00	40.70	53.95	73.75	87.80	93.95	14.75	28.50	41.95	55.30	75.05	88.60	95.05
Koch	14.95	30.40	43.75	57.50	77.15	89.05	94.30	15.95	32.60	45.45	59.95	78.75	90.65	94.90
	large design (4*6)													
parametric	21.95	46.80	64.70	80.05	95.20	99.10	99.80	21.85	47.10	64.60	80.25	95.30	99.10	99.80
parametric HF-adj	17.60	39.65	56.85	74.60	93.00	98.45	99.60	17.90	39.15	56.90	74.40	93.00	98.55	99.70
van der Waerden	26.75	57.75	75.45	89.90	98.45	99.75	100.0	26.85	58.40	76.40	90.40	98.40	99.75	100.0
KW/F	26.95	58.25	76.20	90.00	98.45	99.75	100.0	27.15	59.15	76.95	90.60	98.45	99.75	100.0
INT	24.80	54.25	72.95	88.00	97.55	99.80	99.95	24.65	54.35	73.50	88.45	97.70	99.80	99.95
Puri & Sen	28.70	61.25	79.10	92.80	98.95	99.95	100.0	28.85	61.65	79.40	92.95	98.95	99.95	100.0
Puri & Sen + INT	23.60	52.95	72.55	87.95	97.45	99.80	99.95	23.55	53.55	73.10	88.05	97.70	99.80	99.95
Koch	21.45	57.05	78.60	91.20	98.65	99.85	100.0	21.80	58.00	79.05	92.00	98.75	99.80	100.0


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
150
200
10
20
30
40
50
cell counts
legend
parametric
par/H-F
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

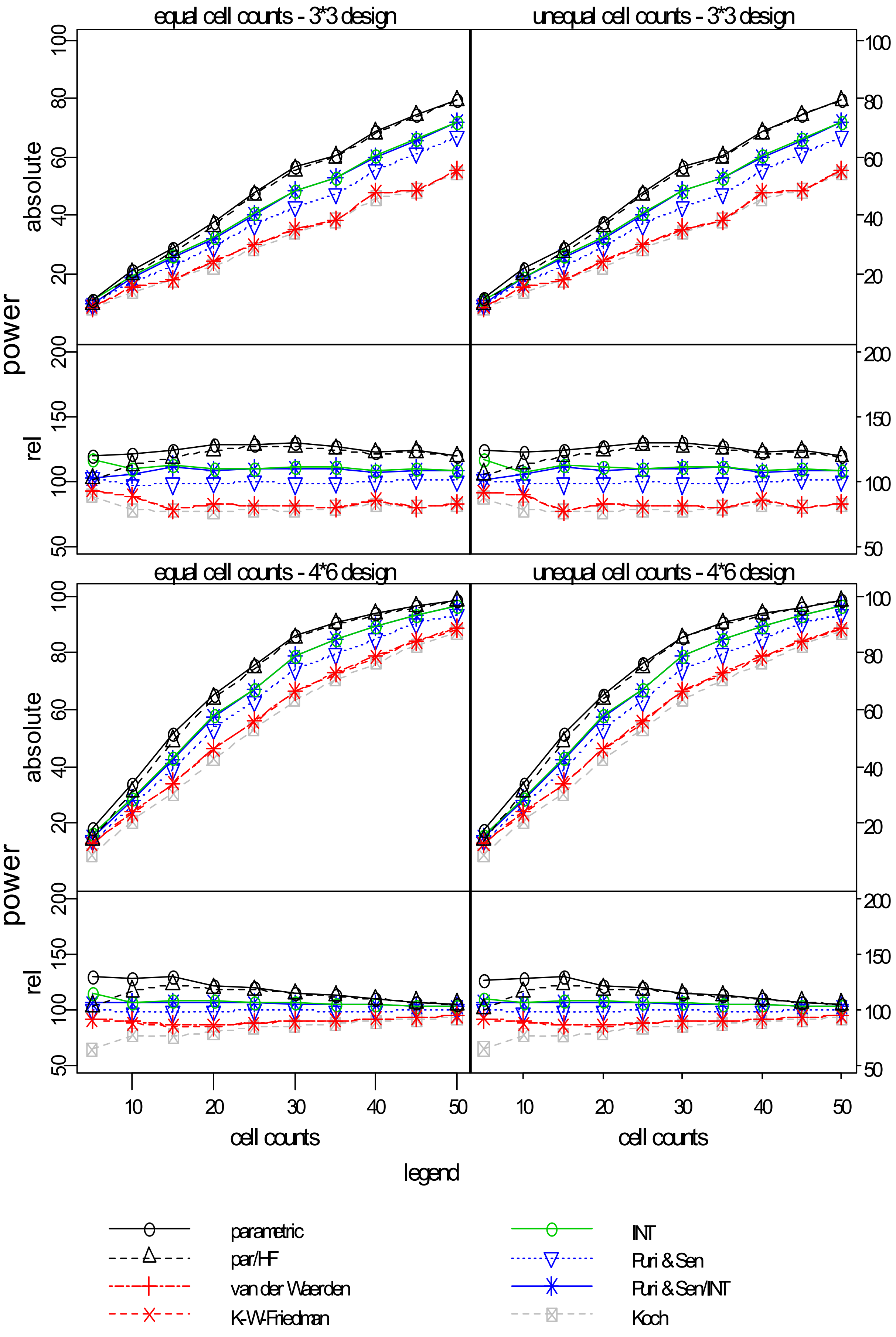
2. 2. 1. 5 normal distribution - unequal variances (on A) - pairing

	small n_i ~ small s_i							small n_i ~ large s_i						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	12.95	26.20	37.65	50.00	69.25	82.55	90.45	18.10	29.30	39.20	51.60	70.95	83.35	90.05
parametric HF-adj	13.40	26.15	37.60	50.00	69.15	82.40	90.45	18.00	28.95	39.25	51.55	70.75	83.20	90.05
van der Waerden	13.05	24.65	31.40	43.55	62.05	74.95	84.15	12.85	26.35	32.95	45.00	64.80	76.65	85.45
KW/F	13.05	24.65	31.40	43.55	62.05	74.95	84.15	12.85	26.35	32.95	45.00	64.80	76.65	85.45
INT	13.15	26.25	38.00	50.35	69.95	83.20	90.10	17.30	29.30	40.35	52.65	71.70	84.20	91.05
Puri & Sen	12.90	26.10	38.05	49.50	69.85	82.05	89.55	13.80	27.45	40.00	51.00	71.75	83.80	90.30
Puri & Sen + INT	12.90	26.40	38.30	50.45	69.95	83.30	90.10	13.65	26.90	39.30	51.65	71.35	83.60	90.85
Koch	11.65	22.50	31.60	42.20	60.65	74.10	83.65	12.10	23.30	33.45	44.00	63.35	75.95	85.05
	large design (4*6)													
parametric	21.95	44.50	64.40	81.30	94.90	98.55	99.90	26.75	45.65	61.35	75.10	92.60	97.95	99.45
parametric HF-adj	20.95	43.95	64.10	81.05	94.80	98.55	99.90	25.20	45.50	60.90	74.85	92.40	97.95	99.45
van der Waerden	21.65	43.00	60.85	78.90	92.95	98.05	99.75	20.10	40.35	56.95	69.85	90.30	96.70	99.20
KW/F	21.45	43.00	60.80	78.95	92.70	98.05	99.75	20.05	40.45	56.85	69.90	90.05	96.35	99.10
INT	22.15	45.00	65.75	81.95	95.15	98.70	99.90	25.95	45.90	62.40	76.00	92.90	98.05	99.60
Puri & Sen	22.65	44.50	66.00	81.20	94.85	98.40	99.95	21.55	43.10	61.55	75.65	92.50	98.20	99.40
Puri & Sen + INT	22.55	45.60	66.10	82.05	95.40	98.70	99.85	21.50	43.65	61.00	75.15	92.75	98.05	99.60
Koch	16.00	37.90	57.35	75.90	91.40	97.50	99.65	12.45	34.45	52.45	67.45	88.70	96.20	98.95


small ni ~ small si - 3*3 design
small ni ~ large si - 3*3 design
small ni ~ small si - 4*6 design
small ni ~ large si - 4*6 design
power
absolute
rel
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

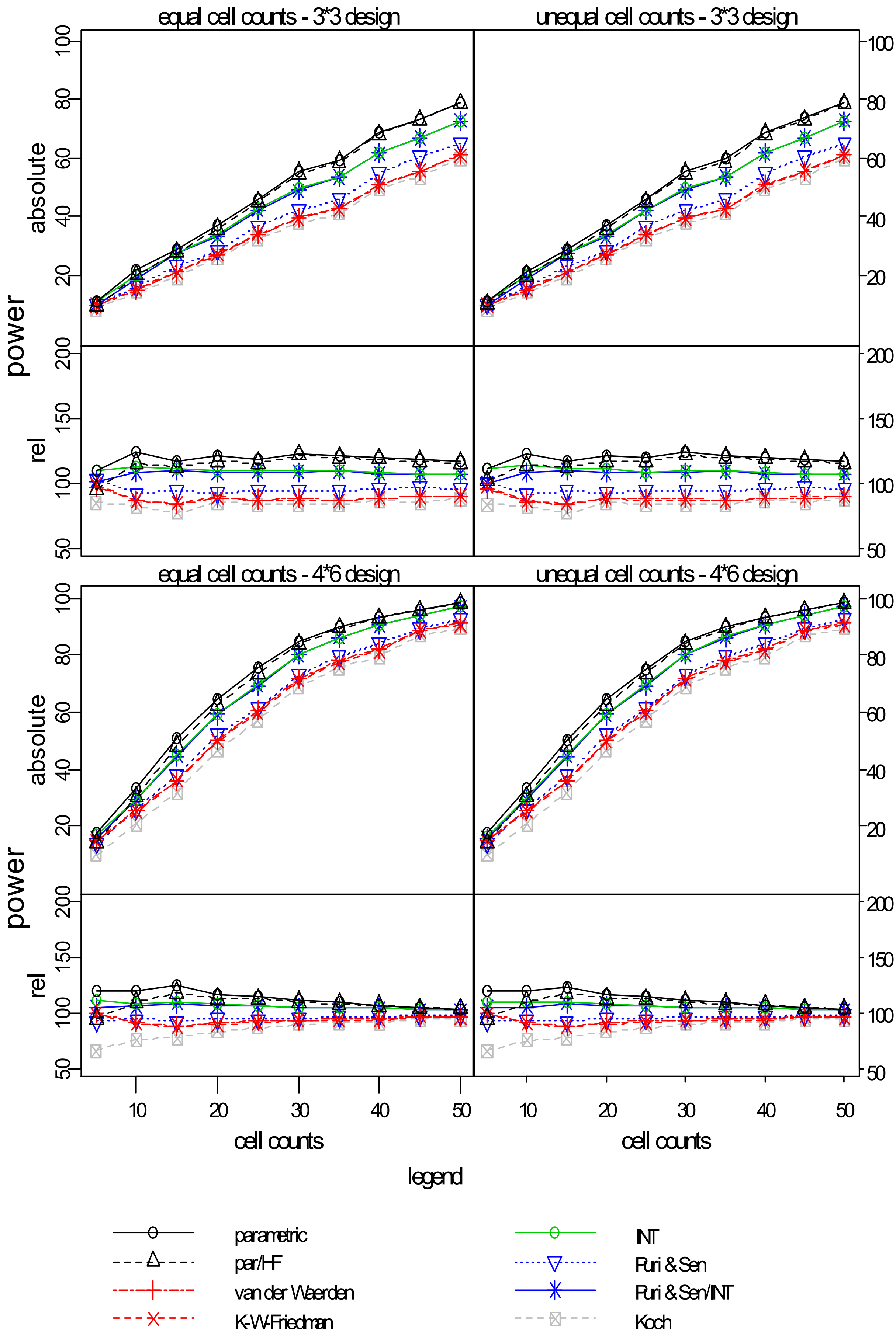
2. 2. 1. 6 exponential distribution

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	11.05	21.40	28.75	37.60	56.70	68.85	79.60	11.50	21.50	28.80	37.55	56.65	68.95	79.70
parametric HF-adj	9.35	19.90	27.40	36.50	55.55	68.15	79.45	9.85	19.85	27.60	36.30	55.60	68.25	79.35
van der Waerden	8.55	15.60	17.95	24.25	35.45	48.00	55.40	8.55	15.60	17.95	24.25	35.45	48.00	55.40
KW/F	8.55	15.60	17.95	24.25	35.45	48.00	55.40	8.55	15.60	17.95	24.25	35.45	48.00	55.40
INT	10.75	19.30	25.95	32.50	48.55	60.35	72.25	10.90	18.85	26.15	32.55	48.55	60.35	72.25
Puri & Sen	9.45	17.15	22.65	29.15	43.00	55.70	67.10	9.45	17.15	22.65	29.15	43.00	55.70	67.10
Puri & Sen + INT	9.45	18.50	25.80	31.90	48.30	60.00	72.25	9.45	18.50	25.80	31.90	48.30	60.00	72.25
Koch	8.15	13.70	17.80	22.45	33.95	45.95	54.75	8.15	13.70	17.80	22.45	33.95	45.95	54.75
	large design (4*6)													
parametric	18.20	34.00	51.35	65.15	85.75	93.85	98.25	17.60	34.05	51.20	65.00	85.65	93.85	98.20
parametric HF-adj	14.50	31.10	48.85	63.85	85.10	93.40	98.20	14.00	31.00	48.80	63.75	85.15	93.45	98.20
van der Waerden	12.80	23.80	34.15	46.20	66.50	78.70	88.45	12.80	23.80	34.15	46.20	66.50	78.70	88.45
KW/F	12.80	23.45	34.00	46.00	66.50	78.50	88.20	12.80	23.45	34.00	46.00	66.50	78.50	88.20
INT	16.15	28.60	43.25	58.15	78.90	89.20	96.25	15.35	28.55	42.85	58.05	78.80	89.10	96.20
Puri & Sen	14.00	26.05	38.95	53.20	74.10	84.50	93.40	14.00	26.05	38.95	53.20	74.10	84.50	93.40
Puri & Sen + INT	14.95	28.30	42.50	57.40	78.55	89.15	96.20	14.95	28.30	42.50	57.40	78.55	89.15	96.20
Koch	9.05	20.60	30.45	42.65	63.50	76.55	87.30	9.05	20.60	30.45	42.65	63.50	76.55	87.30


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

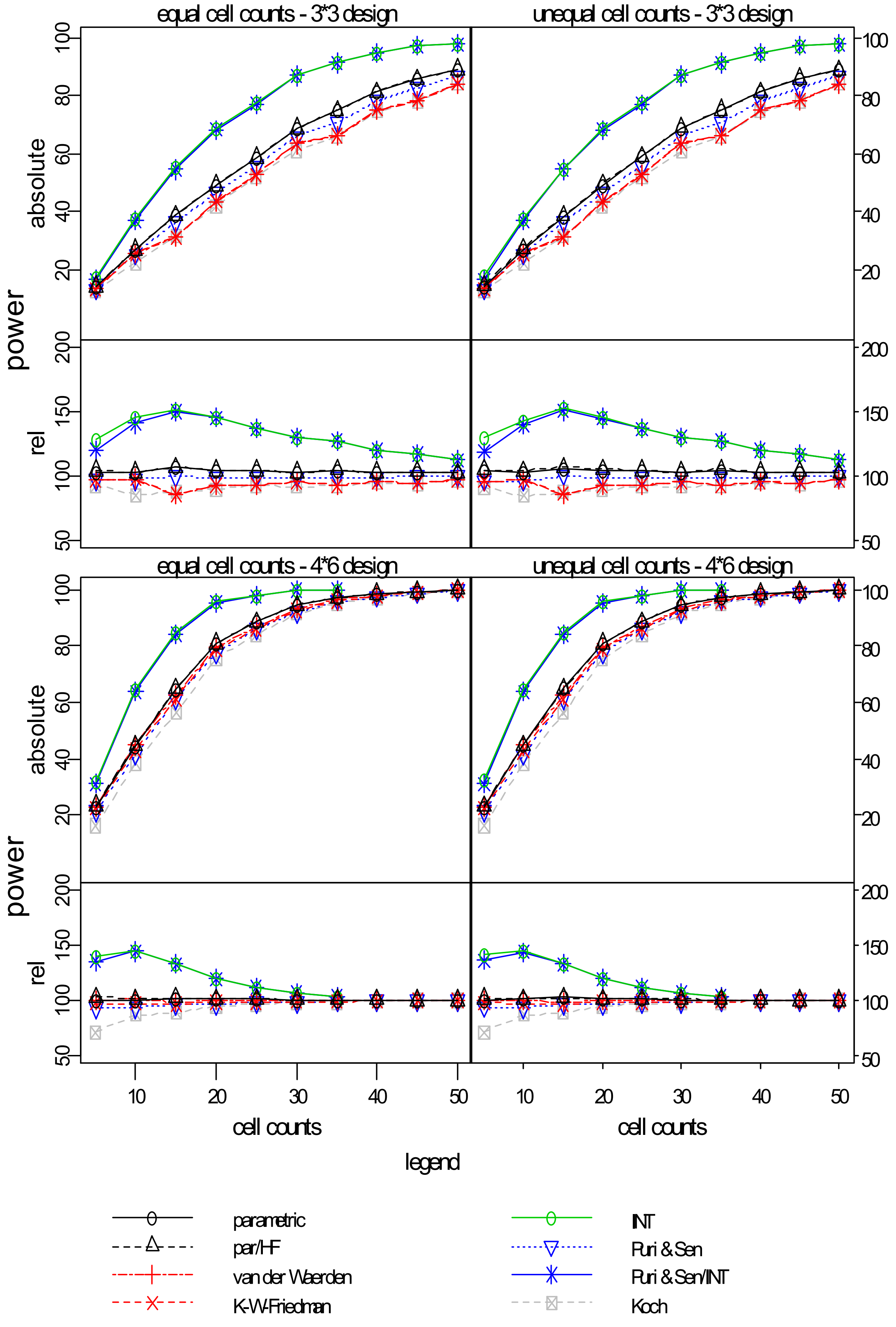
2. 2. 1. 7 exponential distribution - discrete values

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	10.75	21.60	29.05	37.25	55.50	68.55	79.20	11.05	21.30	28.85	37.20	55.80	68.60	79.30
parametric HF-adj	9.30	20.15	27.75	35.80	55.00	68.10	78.70	10.15	19.85	27.70	35.60	54.90	68.15	78.70
van der Waerden	9.50	15.05	20.85	27.15	39.65	50.80	61.10	9.50	15.05	20.85	27.15	39.65	50.80	61.10
KW/F	9.65	15.15	20.95	27.25	39.30	50.70	61.10	9.65	15.15	20.95	27.25	39.30	50.70	61.10
INT	10.70	19.65	27.60	33.80	49.60	61.80	72.90	11.10	19.95	27.60	33.85	49.60	61.80	72.95
Puri & Sen	10.00	16.05	23.20	28.35	42.25	54.90	65.10	10.00	16.05	23.20	28.35	42.25	54.90	65.10
Puri & Sen + INT	9.95	18.85	27.25	33.05	49.05	61.60	72.75	9.95	18.85	27.25	33.05	49.05	61.60	72.75
Koch	8.30	14.35	19.10	26.20	37.80	49.70	59.70	8.30	14.35	19.10	26.20	37.80	49.70	59.70
	large design (4*6)													
parametric	17.90	33.05	50.65	64.30	84.80	93.00	98.15	17.80	33.25	50.10	64.35	84.60	93.05	98.15
parametric HF-adj	14.20	30.25	48.25	62.65	83.85	92.85	98.05	14.15	30.25	48.25	62.65	83.75	92.85	98.05
van der Waerden	14.95	25.20	36.05	50.35	71.55	81.90	91.15	14.95	25.20	36.05	50.35	71.55	81.90	91.15
KW/F	14.85	24.90	36.05	49.80	71.20	81.20	90.55	14.85	24.90	36.05	49.80	71.20	81.20	90.55
INT	16.75	29.60	44.90	59.50	80.25	90.35	96.80	16.35	30.15	45.00	59.40	80.20	90.25	96.75
Puri & Sen	13.80	25.85	37.75	52.25	72.95	84.25	92.80	13.80	25.85	37.75	52.25	72.95	84.25	92.80
Puri & Sen + INT	15.65	29.05	44.40	59.00	79.90	90.35	96.80	15.65	29.05	44.40	59.00	79.90	90.35	96.80
Koch	9.90	20.85	31.80	46.35	69.05	79.35	89.55	9.90	20.85	31.80	46.35	69.05	79.35	89.55


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
150
200
10
30
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

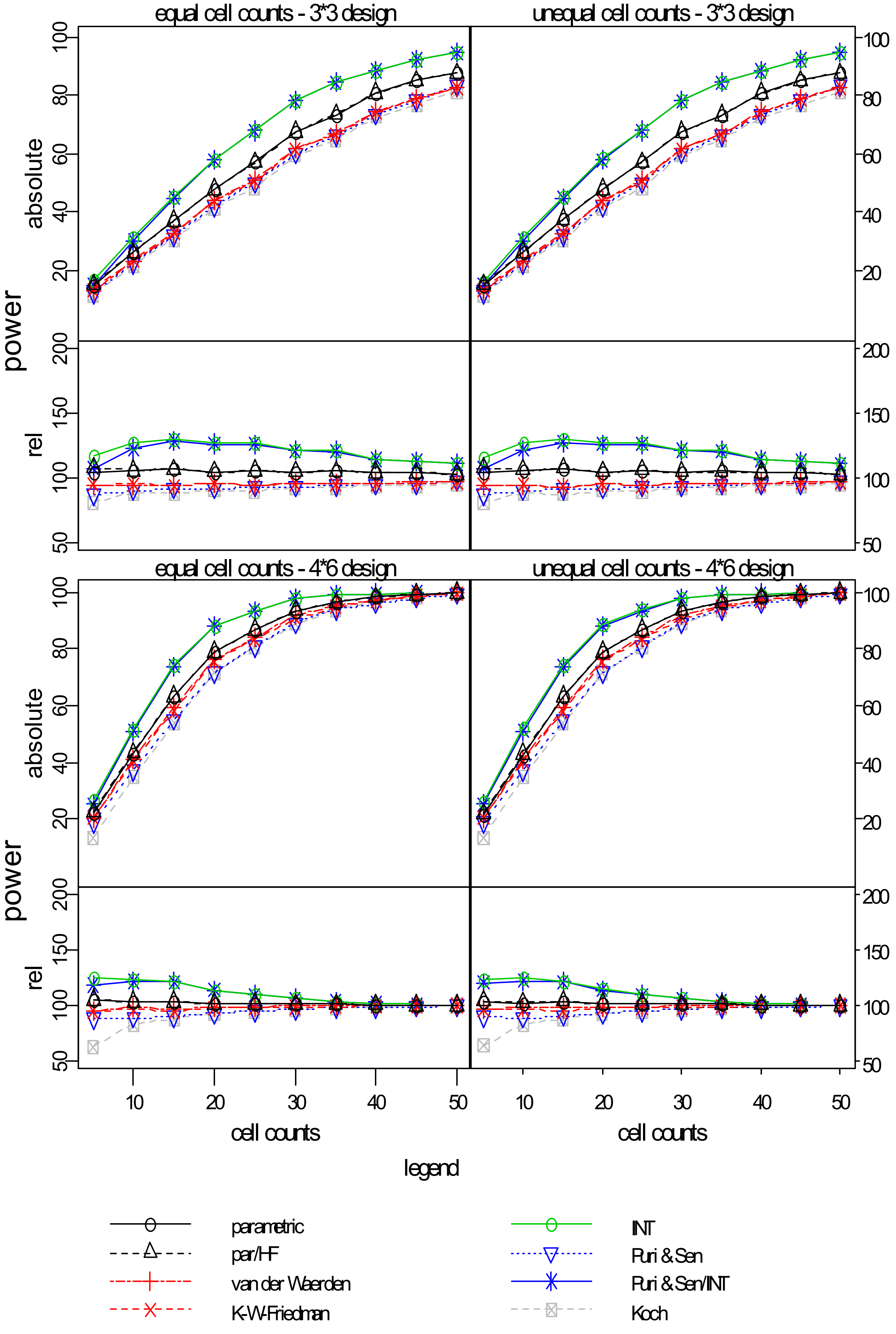
2. 2. 1. 8 uniform distribution

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	14.05	26.70	38.90	49.20	68.95	81.35	89.20	14.45	27.05	38.40	49.25	69.05	81.30	89.20
parametric HF-adj	14.35	26.95	38.70	49.25	68.80	81.40	89.20	14.55	27.35	38.55	49.50	69.05	81.35	89.10
van der Waerden	13.30	25.55	31.15	43.65	63.45	75.50	84.40	13.30	25.55	31.15	43.65	63.45	75.50	84.40
KW/F	13.30	25.55	31.15	43.65	63.45	75.50	84.40	13.30	25.55	31.15	43.65	63.45	75.50	84.40
INT	17.55	38.00	55.20	68.85	87.10	94.80	98.00	18.05	37.50	55.10	68.70	87.25	94.75	97.90
Puri & Sen	13.30	25.35	36.30	46.60	66.05	78.30	87.00	13.30	25.35	36.30	46.60	66.05	78.30	87.00
Puri & Sen + INT	16.50	36.80	54.55	68.35	87.00	94.80	97.90	16.50	36.80	54.55	68.35	87.00	94.80	97.90
Koch	12.65	22.30	31.75	42.00	61.15	74.65	84.30	12.65	22.30	31.75	42.00	61.15	74.65	84.30
	large design (4*6)													
parametric	23.00	44.50	64.80	80.85	94.20	98.35	99.95	22.90	44.70	64.85	80.65	94.20	98.40	99.95
parametric HF-adj	23.55	44.75	64.70	80.85	94.20	98.40	99.95	23.15	44.85	64.80	80.85	94.25	98.40	99.95
van der Waerden	22.85	44.65	62.40	79.65	93.15	97.70	99.80	22.85	44.65	62.40	79.65	93.15	97.70	99.80
KW/F	22.25	43.05	61.15	78.60	92.45	97.45	99.70	22.25	43.05	61.15	78.60	92.45	97.45	99.70
INT	32.15	64.25	84.55	95.60	99.65	99.95	99.95	32.35	64.35	84.40	95.45	99.65	99.95	99.95
Puri & Sen	21.35	41.30	61.15	77.30	91.75	97.30	99.65	21.35	41.30	61.15	77.30	91.75	97.30	99.65
Puri & Sen + INT	31.05	63.70	84.00	95.25	99.65	99.95	99.95	31.05	63.70	84.00	95.25	99.65	99.95	99.95
Koch	16.30	38.50	56.35	75.50	91.30	97.05	99.60	16.30	38.50	56.35	75.50	91.30	97.05	99.60


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
150
200
10
30
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

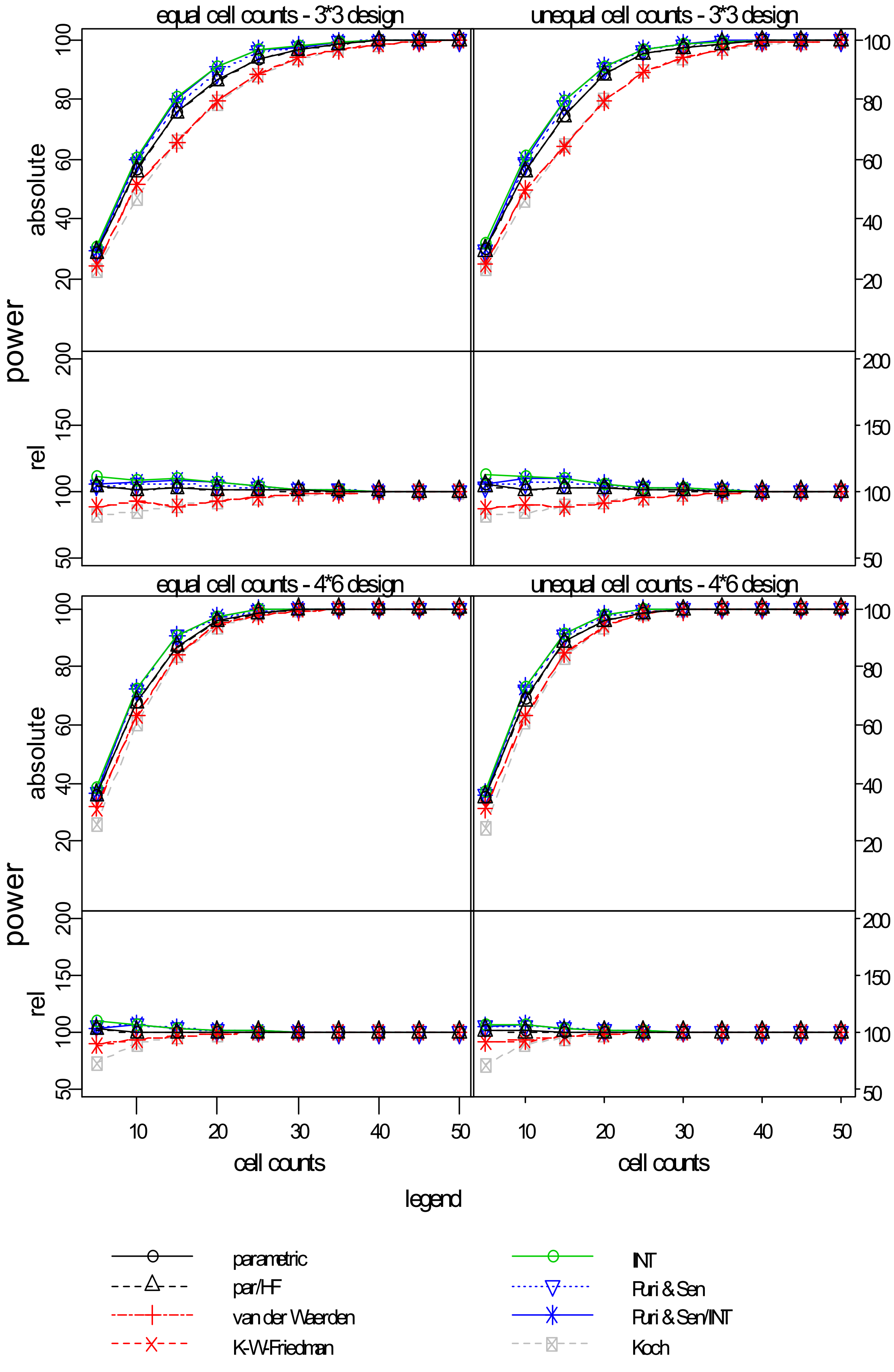
2. 2. 1. 9 uniform distribution - discrete values

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	14.70	26.05	37.05	47.95	67.70	80.95	87.90	14.70	26.05	37.70	48.00	67.50	80.90	87.80
parametric HF-adj	15.15	26.10	37.15	47.90	67.65	81.00	87.85	15.15	26.25	37.80	47.95	67.60	80.95	87.85
van der Waerden	13.15	23.25	32.60	43.80	61.70	74.60	82.95	13.15	23.25	32.60	43.80	61.70	74.60	82.95
KW/F	13.25	23.40	32.70	43.80	61.65	74.20	82.85	13.25	23.40	32.70	43.80	61.65	74.20	82.85
INT	16.50	31.20	45.35	58.10	78.25	88.65	94.85	16.25	31.25	45.50	58.35	78.30	88.70	94.85
Puri & Sen	12.20	22.25	31.95	42.00	60.20	73.60	83.30	12.20	22.25	31.95	42.00	60.20	73.60	83.30
Puri & Sen + INT	15.05	30.10	44.75	57.80	78.20	88.60	94.75	15.05	30.10	44.75	57.80	78.20	88.60	94.75
Koch	11.30	21.75	30.75	41.45	59.45	72.85	81.45	11.30	21.75	30.75	41.45	59.45	72.85	81.45
	large design (4*6)													
parametric	22.40	43.05	63.40	78.90	93.35	98.15	99.85	21.70	42.65	63.10	78.85	93.40	98.10	99.85
parametric HF-adj	22.50	43.50	63.30	78.95	93.40	98.10	99.85	21.90	43.05	63.35	78.95	93.40	98.10	99.85
van der Waerden	20.30	41.00	59.45	76.35	91.80	97.30	99.65	20.30	41.00	59.45	76.35	91.80	97.30	99.65
KW/F	20.30	40.40	57.95	75.50	90.80	96.95	99.55	20.30	40.40	57.95	75.50	90.80	96.95	99.55
INT	26.70	51.70	73.95	88.15	97.70	99.35	99.95	26.00	51.90	74.30	88.40	97.75	99.35	99.95
Puri & Sen	18.85	37.20	55.00	71.65	89.00	96.00	99.15	18.85	37.20	55.00	71.65	89.00	96.00	99.15
Puri & Sen + INT	25.30	51.00	73.70	88.10	97.70	99.35	99.95	25.30	51.00	73.70	88.10	97.70	99.35	99.95
Koch	13.45	34.70	53.55	71.70	88.75	96.50	99.50	13.45	34.70	53.55	71.70	88.75	96.50	99.50


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
150
200
10
30
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

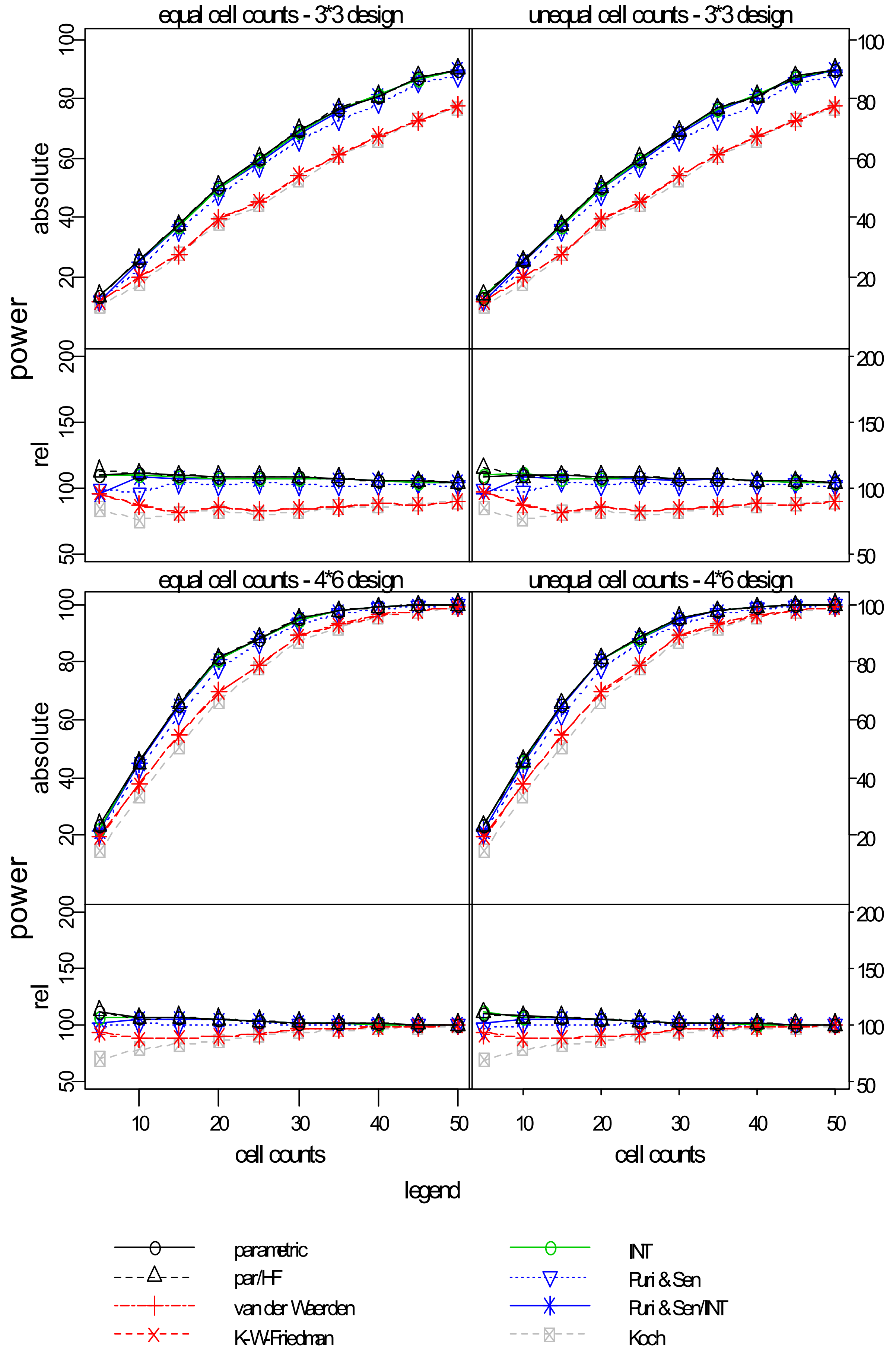
2. 2. 1. 10 lognormal distribution - equal variances

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	28.90	56.70	75.85	86.35	96.75	99.75	100.0	29.80	56.05	74.70	88.45	97.55	99.90	100.0
parametric HF-adj	28.80	56.30	75.70	86.20	96.70	99.75	100.0	29.60	55.90	74.35	88.40	97.35	99.85	100.0
van der Waerden	24.55	51.60	65.80	79.50	94.10	98.60	99.85	24.80	49.75	64.25	79.40	94.55	99.15	99.85
KW/F	24.55	51.60	65.80	79.50	94.10	98.60	99.85	24.80	49.75	64.25	79.40	94.55	99.15	99.85
INT	30.95	60.55	80.75	91.00	97.80	99.90	100.0	31.90	61.35	79.85	91.30	98.90	100.0	100.0
Puri & Sen	29.05	59.00	78.20	88.90	97.75	99.80	100.0	29.35	58.65	78.05	90.30	98.50	99.95	100.0
Puri & Sen + INT	29.20	59.70	80.20	90.85	97.75	99.90	100.0	29.80	60.15	79.70	91.05	98.90	100.0	100.0
Koch	22.85	47.20	66.00	79.00	93.85	98.60	99.80	23.30	46.40	64.80	79.80	94.30	98.80	99.85
	large design (4*6)													
parametric	36.15	67.65	86.90	95.50	99.80	99.95	100.0	35.25	68.80	88.45	95.90	99.55	100.0	100.0
parametric HF-adj	35.90	67.75	86.90	95.40	99.80	99.95	100.0	35.20	68.25	88.45	95.80	99.55	100.0	100.0
van der Waerden	31.75	63.50	83.85	94.35	99.30	99.95	100.0	31.60	63.20	84.80	93.65	99.40	99.95	100.0
KW/F	31.00	63.10	84.25	94.15	99.35	99.95	100.0	31.45	62.75	84.55	93.90	99.45	99.95	100.0
INT	38.60	72.50	90.50	97.30	99.80	100.0	100.0	37.00	72.95	91.20	97.60	99.70	100.0	100.0
Puri & Sen	36.90	71.90	90.55	96.65	99.80	100.0	100.0	36.10	71.95	90.50	97.20	99.75	100.0	100.0
Puri & Sen + INT	36.50	72.15	90.45	97.05	99.80	100.0	100.0	36.15	72.85	91.10	97.50	99.70	100.0	100.0
Koch	25.60	60.55	83.55	93.70	99.20	100.0	100.0	24.50	61.30	83.45	93.55	99.50	99.95	100.0


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

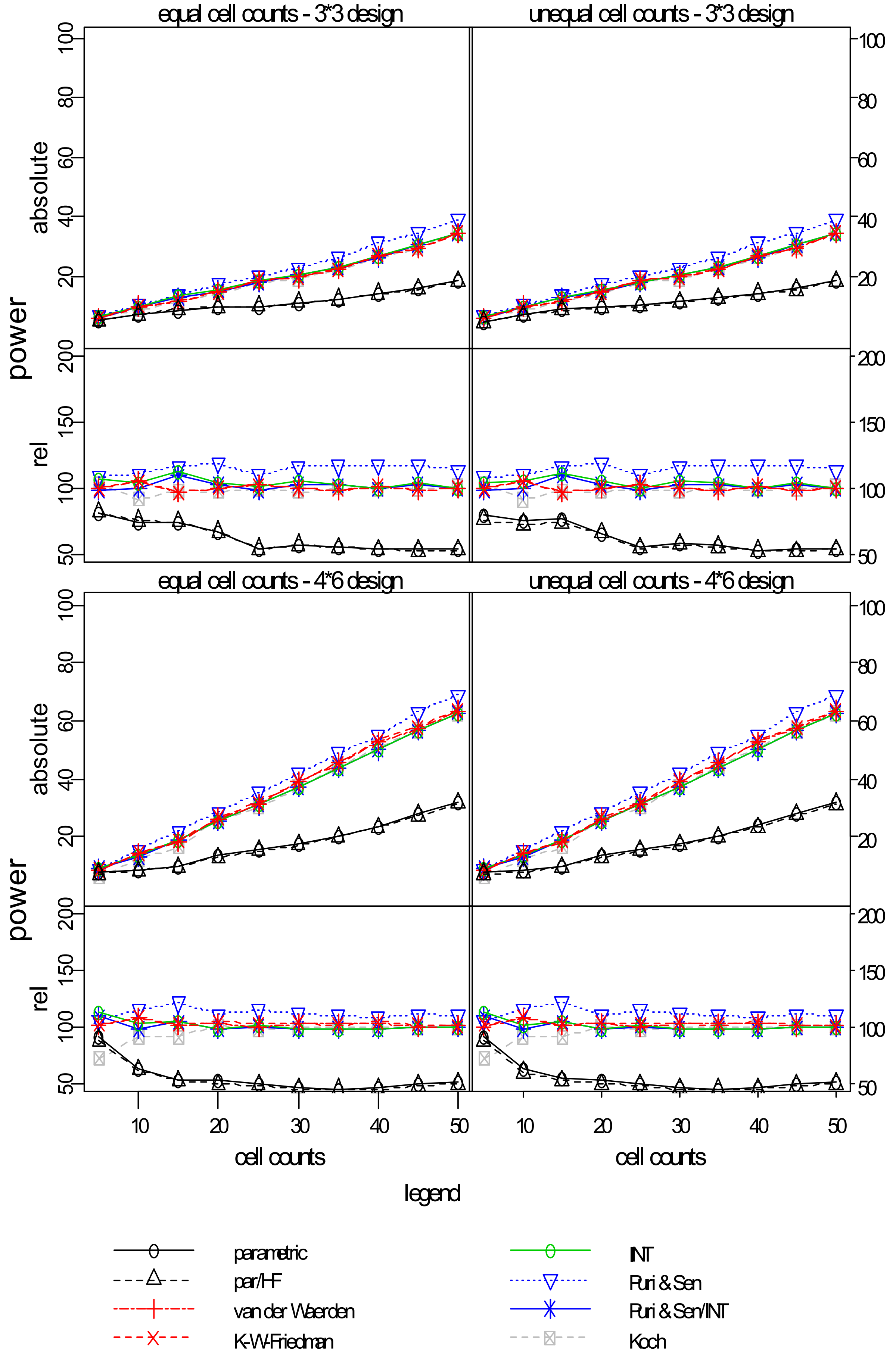
2. 2. 1. 11 normal distribution - equal variances - contaminated I

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	13.30	25.85	37.50	50.55	69.45	81.05	89.95	13.15	25.40	37.40	50.40	69.10	80.90	89.90
parametric HF-adj	13.65	25.85	37.55	50.60	69.45	81.00	90.05	13.90	25.25	37.45	50.55	69.15	81.05	90.00
van der Waerden	11.65	20.20	27.75	39.40	54.35	67.55	77.45	11.65	20.20	27.75	39.40	54.35	67.55	77.45
KW/F	11.65	20.20	27.75	39.40	54.35	67.55	77.45	11.65	20.20	27.75	39.40	54.35	67.55	77.45
INT	13.25	25.55	37.05	49.65	68.80	81.30	89.90	13.35	25.85	36.75	49.55	68.85	81.30	89.95
Puri & Sen	12.00	22.50	35.70	47.35	66.05	78.50	87.65	12.00	22.50	35.70	47.35	66.05	78.50	87.65
Puri & Sen + INT	11.60	25.15	36.80	49.50	68.35	81.35	89.95	11.60	25.15	36.80	49.50	68.35	81.35	89.95
Koch	10.20	17.65	27.80	38.20	52.55	66.05	76.95	10.20	17.65	27.80	38.20	52.55	66.05	76.95
	large design (4*6)													
parametric	23.30	45.35	65.35	81.40	95.05	98.95	99.70	23.20	46.20	65.30	81.05	95.10	98.95	99.70
parametric HF-adj	23.45	45.10	65.50	81.35	95.05	98.95	99.70	23.35	45.70	65.45	81.10	95.10	98.95	99.70
van der Waerden	19.55	37.65	54.70	69.50	89.20	96.25	98.90	19.55	37.65	54.70	69.50	89.20	96.25	98.90
KW/F	19.20	37.55	54.60	69.35	89.10	96.05	98.95	19.20	37.55	54.60	69.35	89.10	96.05	98.95
INT	22.20	45.55	65.05	81.00	94.75	98.85	99.65	23.40	45.75	65.20	80.75	94.85	98.80	99.70
Puri & Sen	20.40	43.00	61.50	77.70	93.30	98.45	99.60	20.40	43.00	61.50	77.70	93.30	98.45	99.60
Puri & Sen + INT	21.35	44.85	64.55	80.60	94.70	98.85	99.65	21.35	44.85	64.55	80.60	94.70	98.85	99.65
Koch	14.60	33.65	50.75	66.15	87.25	95.50	98.45	14.60	33.65	50.75	66.15	87.25	95.50	98.45


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 2. 1. 12 normal distribution - equal variances - contaminated II

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	5.00	7.10	8.75	9.80	11.15	14.25	18.60	4.90	7.15	9.05	9.70	11.45	14.25	18.65
parametric HF-adj	5.05	7.20	8.80	9.85	11.20	14.35	18.35	4.70	6.95	8.70	9.70	11.30	14.15	18.50
van der Waerden	6.15	10.00	11.40	14.70	19.60	27.10	34.60	6.15	10.00	11.40	14.70	19.60	27.10	34.60
KW/F	6.15	10.00	11.40	14.70	19.60	27.10	34.60	6.15	10.00	11.40	14.70	19.60	27.10	34.60
INT	6.65	9.85	13.25	15.30	20.65	26.75	34.50	6.40	10.00	13.15	15.50	20.60	26.85	34.55
Puri & Sen	6.70	10.50	13.75	17.50	22.85	31.30	39.20	6.70	10.50	13.75	17.50	22.85	31.30	39.20
Puri & Sen + INT	6.05	9.45	12.90	15.10	20.30	26.55	34.45	6.05	9.45	12.90	15.10	20.30	26.55	34.45
Koch	6.40	8.70	11.55	14.35	19.15	26.45	34.90	6.40	8.70	11.55	14.35	19.15	26.45	34.90
	large design (4*6)													
parametric	7.55	8.50	9.70	13.60	17.55	23.70	32.20	7.65	8.35	9.90	13.55	17.55	23.85	32.15
parametric HF-adj	7.35	8.30	9.55	12.75	17.25	23.35	31.55	7.30	7.95	9.55	12.80	17.20	23.15	31.45
van der Waerden	8.40	14.30	18.40	26.35	39.05	52.70	63.50	8.40	14.30	18.40	26.35	39.05	52.70	63.50
KW/F	8.50	14.40	18.40	26.70	39.10	53.15	63.55	8.50	14.40	18.40	26.70	39.10	53.15	63.55
INT	9.45	13.60	18.85	25.15	37.15	49.95	62.85	9.45	13.55	18.85	25.30	37.25	50.20	62.80
Puri & Sen	8.80	15.35	21.90	28.40	42.00	55.05	68.85	8.80	15.35	21.90	28.40	42.00	55.05	68.85
Puri & Sen + INT	9.10	13.05	18.85	25.15	37.00	49.90	62.75	9.10	13.05	18.85	25.15	37.00	49.90	62.75
Koch	6.00	12.15	16.45	25.85	37.40	51.10	62.55	6.00	12.15	16.45	25.85	37.40	51.10	62.55


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
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80
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200
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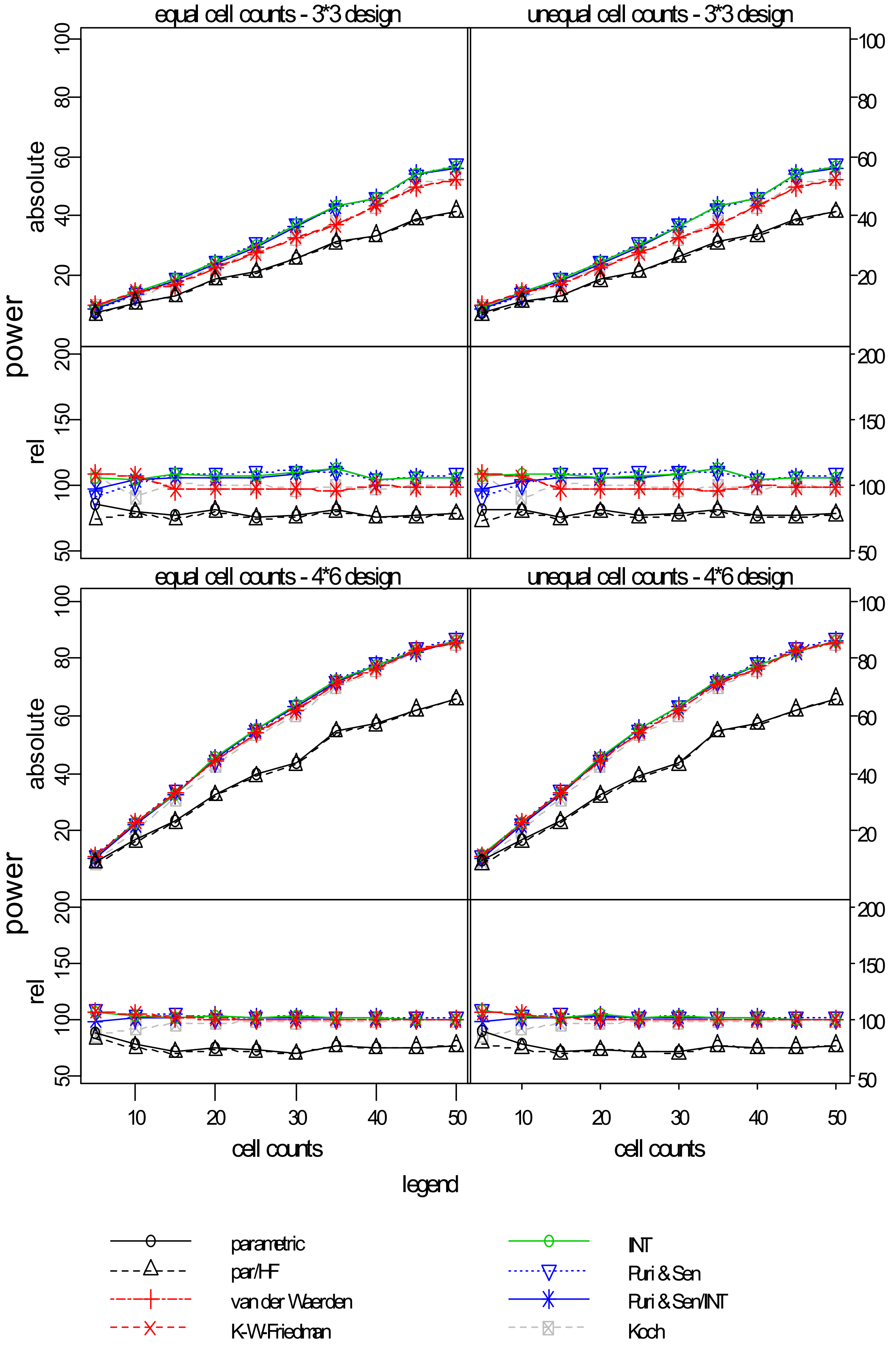
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 2. 1. 13 normal distribution - equal variances - contaminated III

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	7.45	10.60	13.15	18.55	25.90	33.50	41.75	7.15	10.90	13.00	18.35	26.30	33.70	41.50
parametric HF-adj	6.50	10.45	12.60	18.20	25.50	33.30	41.60	6.40	10.55	12.75	18.00	25.90	33.35	41.30
van der Waerden	9.50	14.20	16.50	22.20	32.80	43.70	52.40	9.50	14.20	16.50	22.20	32.80	43.70	52.40
KW/F	9.50	14.20	16.50	22.20	32.80	43.70	52.40	9.50	14.20	16.50	22.20	32.80	43.70	52.40
INT	9.30	13.85	18.45	24.30	36.80	45.85	56.55	9.35	14.35	18.50	24.15	36.55	46.00	56.60
Puri & Sen	8.00	13.40	18.65	24.60	37.25	45.85	57.70	8.00	13.40	18.65	24.60	37.25	45.85	57.70
Puri & Sen + INT	8.50	13.75	18.20	23.90	36.60	45.75	56.25	8.50	13.75	18.20	23.90	36.60	45.75	56.25
Koch	9.35	12.00	17.40	22.85	32.50	42.95	52.80	9.35	12.00	17.40	22.85	32.50	42.95	52.80
	large design (4*6)													
parametric	9.25	17.00	23.45	32.70	43.70	57.50	65.90	9.50	16.95	23.65	32.40	43.85	57.25	65.85
parametric HF-adj	8.80	16.40	22.95	32.15	43.00	56.85	65.65	8.40	16.15	22.75	31.90	42.80	56.90	65.75
van der Waerden	11.30	22.70	33.00	44.20	62.10	76.35	85.50	11.30	22.70	33.00	44.20	62.10	76.35	85.50
KW/F	11.30	22.95	33.35	44.55	61.70	76.40	85.45	11.30	22.95	33.35	44.55	61.70	76.40	85.45
INT	11.25	22.65	32.90	45.65	63.60	77.75	85.80	11.45	22.65	33.30	45.75	63.50	77.70	85.80
Puri & Sen	11.50	22.50	34.20	44.30	63.30	78.25	86.90	11.50	22.50	34.20	44.30	63.30	78.25	86.90
Puri & Sen + INT	10.40	22.00	32.90	45.20	63.00	77.70	85.85	10.40	22.00	32.90	45.20	63.00	77.70	85.85
Koch	9.10	20.05	31.25	42.65	60.25	75.80	85.35	9.10	20.05	31.25	42.65	60.25	75.80	85.35


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
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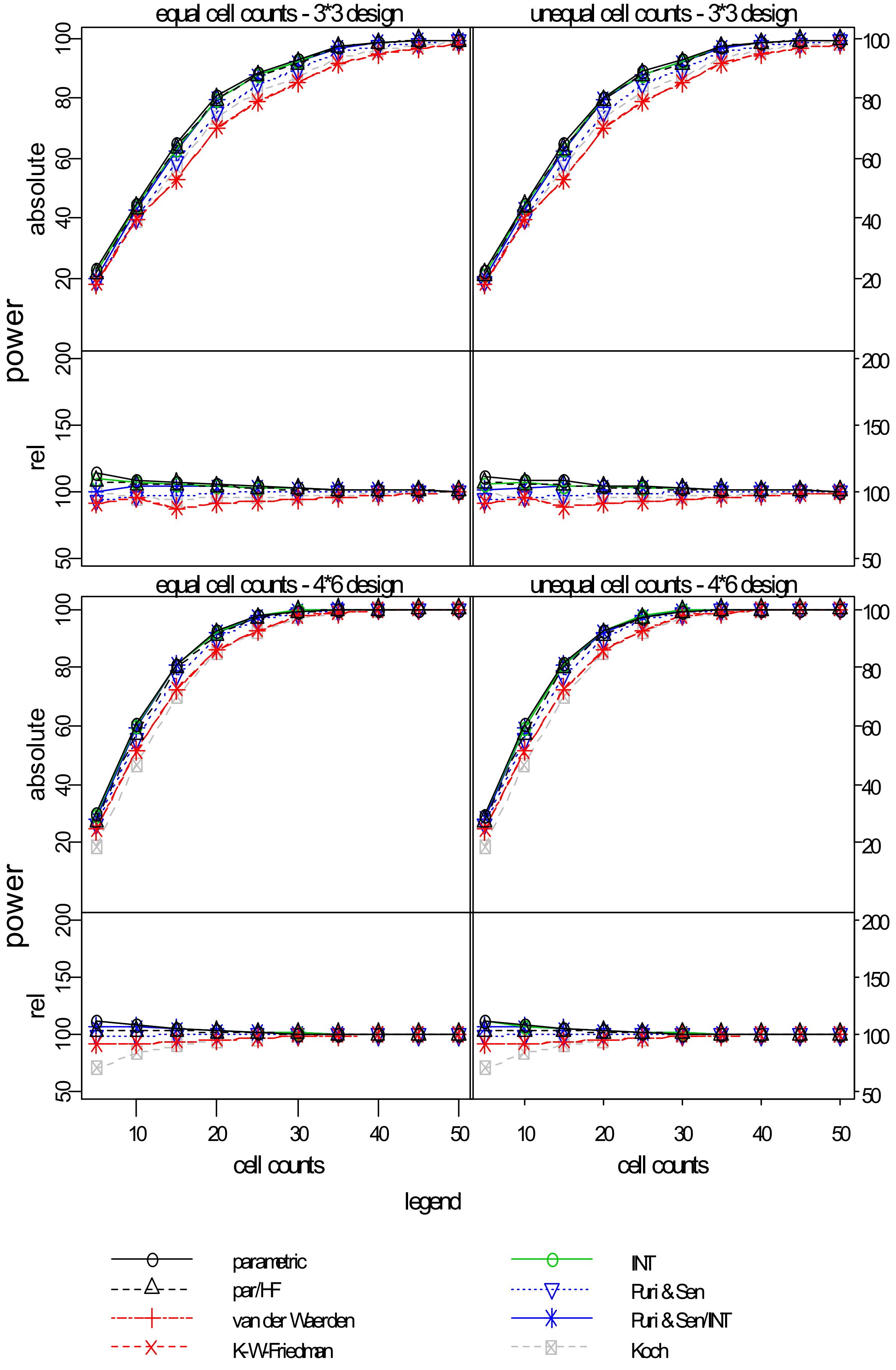
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 2. 2. unequal correlations on B (r = 0.7, 0.5, 0.4, 0.2, 0.1)

2. 2. 2. 1 normal distribution - equal variances

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	22.85	44.75	64.75	81.00	92.85	98.75	99.55	22.20	44.95	64.85	80.60	92.75	98.75	99.55
parametric HF-adj	21.65	43.50	63.60	79.70	91.80	98.60	99.50	21.25	44.00	63.20	79.40	91.90	98.60	99.55
van der Waerden	18.25	39.70	52.85	70.30	85.45	95.00	98.25	18.25	39.70	52.85	70.30	85.45	95.00	98.25
KW/F	18.25	39.70	52.85	70.30	85.45	95.00	98.25	18.25	39.70	52.85	70.30	85.45	95.00	98.25
INT	21.95	44.15	63.40	79.90	92.25	98.90	99.55	21.05	44.35	62.95	80.20	92.25	98.85	99.55
Puri & Sen	18.70	39.95	58.75	75.30	89.55	97.45	99.35	18.70	39.95	58.75	75.30	89.55	97.45	99.35
Puri & Sen + INT	20.05	42.95	62.65	79.70	92.10	98.80	99.55	20.05	42.95	62.65	79.70	92.10	98.80	99.55
Koch	19.95	39.40	56.75	73.70	87.40	95.90	98.50	19.95	39.40	56.75	73.70	87.40	95.90	98.50
	large design (4*6)													
parametric	29.65	60.35	81.10	92.40	99.35	99.80	100.0	29.50	60.60	81.45	92.35	99.30	99.80	100.0
parametric HF-adj	27.25	57.50	79.75	91.30	99.15	99.80	100.0	27.55	57.10	79.85	91.35	99.05	99.80	100.0
van der Waerden	24.45	51.45	72.60	85.75	97.60	99.65	99.90	24.45	51.45	72.60	85.75	97.60	99.65	99.90
KW/F	24.35	51.40	72.60	85.85	97.60	99.65	99.90	24.35	51.40	72.60	85.85	97.60	99.65	99.90
INT	29.55	60.05	81.00	92.15	99.40	99.80	10.00	29.50	59.50	81.05	92.30	99.40	99.85	100.0
Puri & Sen	26.25	55.30	76.95	89.90	98.40	99.75	99.95	26.25	55.30	76.95	89.90	98.40	99.75	99.95
Puri & Sen + INT	28.20	59.10	80.75	92.05	99.40	99.85	100.0	28.20	59.10	80.75	92.05	99.40	99.85	100.0
Koch	18.70	46.80	70.00	85.15	97.25	99.65	99.95	18.70	46.80	70.00	85.15	97.25	99.65	99.95


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
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150
200
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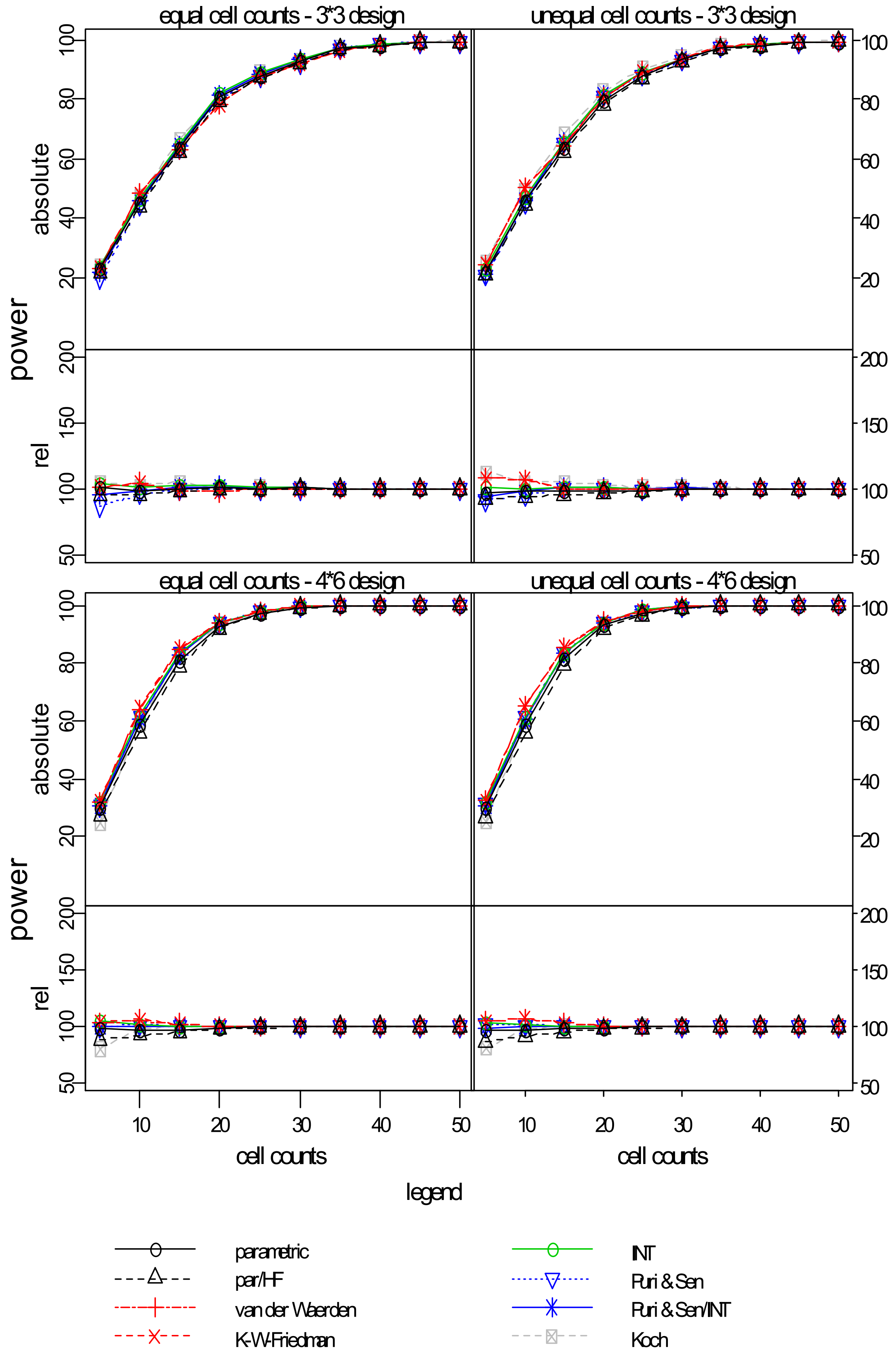
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 2. 2. 2 normal distribution - unequal variances (on A)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	23.20	45.45	63.90	80.70	93.30	98.30	99.50	21.80	46.00	63.95	79.35	93.45	98.25	99.60
parametric HF-adj	21.60	43.95	62.30	79.50	92.55	98.20	99.50	20.95	44.35	62.30	78.55	92.65	98.20	99.55
van der Waerden	23.10	48.35	63.05	78.30	92.35	98.25	99.55	24.45	50.35	64.65	80.80	93.40	98.50	99.65
KW/F	23.10	48.35	63.05	78.30	92.35	98.25	99.55	24.45	50.35	64.65	80.80	93.40	98.50	99.65
INT	23.55	46.40	65.10	82.10	93.40	98.70	99.55	22.95	46.95	65.70	81.70	93.90	98.70	99.60
Puri & Sen	19.75	44.30	63.55	80.45	92.40	98.55	99.40	20.60	44.75	65.35	81.20	93.20	98.65	99.65
Puri & Sen + INT	21.75	45.65	64.55	81.65	93.45	98.60	99.55	21.30	46.15	65.65	81.80	93.95	98.70	99.60
Koch	23.85	47.20	66.80	80.30	93.15	98.55	99.75	25.35	49.45	68.40	82.95	94.60	98.55	99.75
	large design (4*6)													
parametric	30.20	58.90	80.80	92.65	99.30	99.90	100.0	29.90	58.60	81.15	92.85	99.20	99.90	100.0
parametric HF-adj	27.25	55.95	78.85	91.75	99.00	99.90	100.0	26.75	55.60	79.15	91.90	98.85	99.90	100.0
van der Waerden	31.95	64.10	84.95	94.00	99.65	99.95	100.0	32.40	64.90	85.45	94.25	99.65	99.95	100.0
KW/F	31.90	64.50	85.05	94.00	99.75	99.95	100.0	32.40	65.20	85.35	94.25	99.80	99.95	100.0
INT	32.15	61.65	83.20	93.70	99.50	99.90	100.0	32.15	61.50	83.15	93.85	99.50	99.95	100.0
Puri & Sen	30.65	61.15	83.20	93.70	99.40	99.95	100.0	31.35	61.40	83.60	94.00	99.35	99.95	100.0
Puri & Sen + INT	30.60	60.35	82.95	93.55	99.50	99.90	100.0	30.50	60.55	83.20	93.85	99.45	99.95	100.0
Koch	24.70	59.35	82.80	93.15	99.40	99.90	100.0	24.95	59.65	83.10	93.35	99.50	99.90	100.0


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
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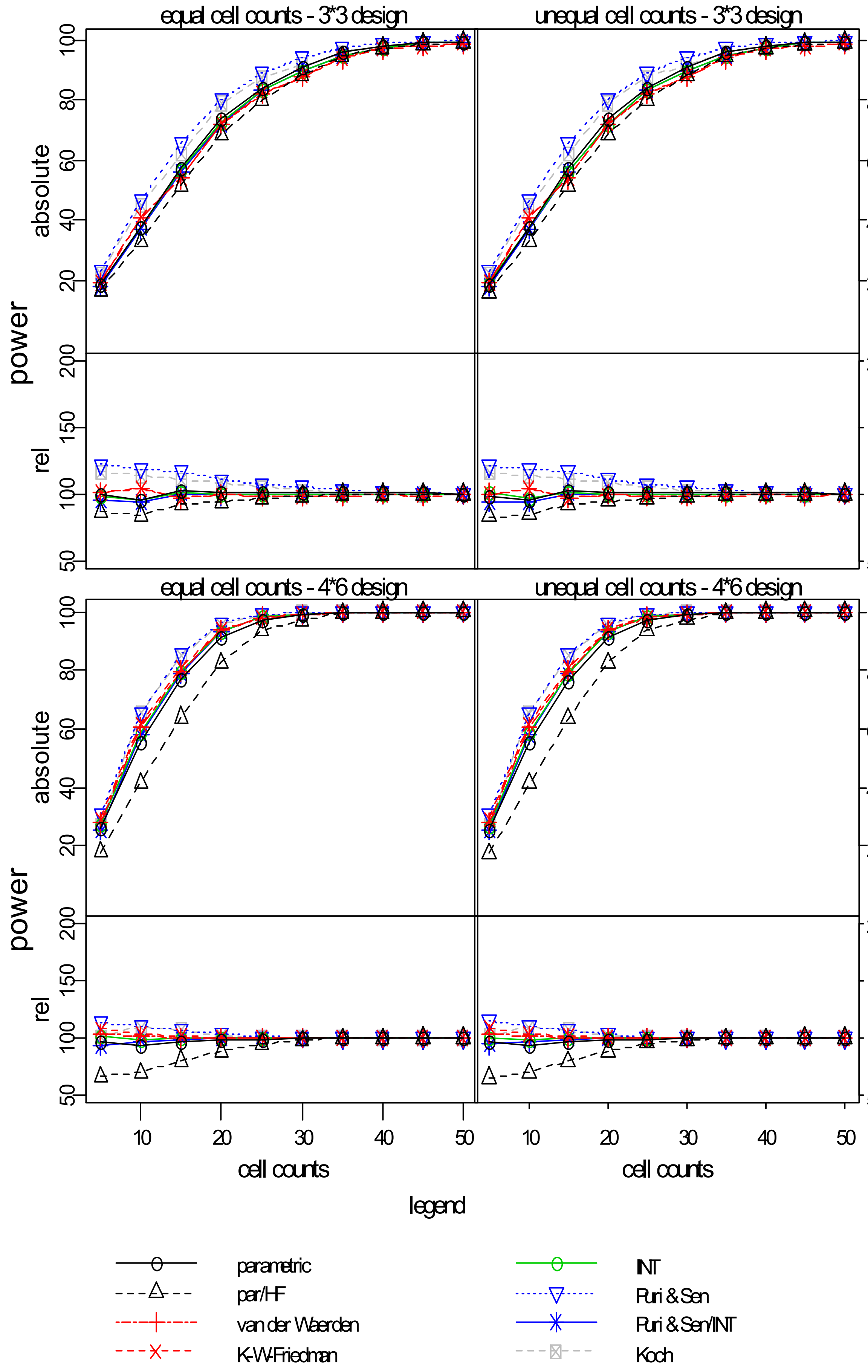
60
80
100
50
150
200
10
30
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 2. 2. 3 normal distribution - unequal variances (on B)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	18.85	37.95	57.60	73.85	91.35	98.35	99.60	18.70	37.75	57.60	73.65	91.30	98.35	99.60
parametric HF-adj	16.45	33.15	51.85	68.60	88.25	97.45	99.45	15.90	33.35	51.80	68.70	88.35	97.55	99.45
van der Waerden	19.20	41.10	53.95	72.25	88.05	97.15	98.90	19.20	41.10	53.95	72.25	88.05	97.15	98.90
KW/F	19.20	41.10	53.95	72.25	88.05	97.15	98.90	19.20	41.10	53.95	72.25	88.05	97.15	98.90
INT	18.70	37.80	56.50	72.40	89.95	97.60	99.60	19.45	38.00	56.30	72.30	89.95	97.40	99.60
Puri & Sen	23.15	46.80	65.65	80.40	94.50	99.15	99.75	23.15	46.80	65.65	80.40	94.50	99.15	99.75
Puri & Sen + INT	18.00	37.15	56.20	72.00	90.00	97.35	99.60	18.00	37.15	56.20	72.00	90.00	97.35	99.60
Koch	22.15	44.75	62.00	79.05	92.00	98.35	99.50	22.15	44.75	62.00	79.05	92.00	98.35	99.50
	large design (4*6)													
parametric	25.90	55.40	76.65	91.30	99.10	99.95	100.0	25.70	55.40	76.30	91.25	99.15	99.95	100.0
parametric HF-adj	17.85	41.45	63.80	82.65	97.25	99.65	100.0	17.45	41.35	63.50	82.55	97.30	99.65	100.0
van der Waerden	27.70	60.75	79.75	93.55	99.25	99.95	100.0	27.70	60.75	79.75	93.55	99.25	99.95	100.0
KW/F	29.20	61.65	80.85	94.10	99.35	99.95	100.0	29.20	61.65	80.85	94.10	99.35	99.95	100.0
INT	27.30	58.65	79.20	93.30	99.15	99.95	100.0	26.60	58.55	79.10	93.30	99.15	99.95	100.0
Puri & Sen	30.75	65.35	85.20	96.15	99.50	100.0	100.0	30.75	65.35	85.20	96.15	99.50	100.0	100.0
Puri & Sen + INT	25.25	57.85	78.70	93.05	99.15	99.95	100.0	25.25	57.85	78.70	93.05	99.15	99.95	100.0
Koch	27.25	65.30	84.95	95.70	99.65	99.95	100.0	27.25	65.30	84.95	95.70	99.65	99.95	100.0


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
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150
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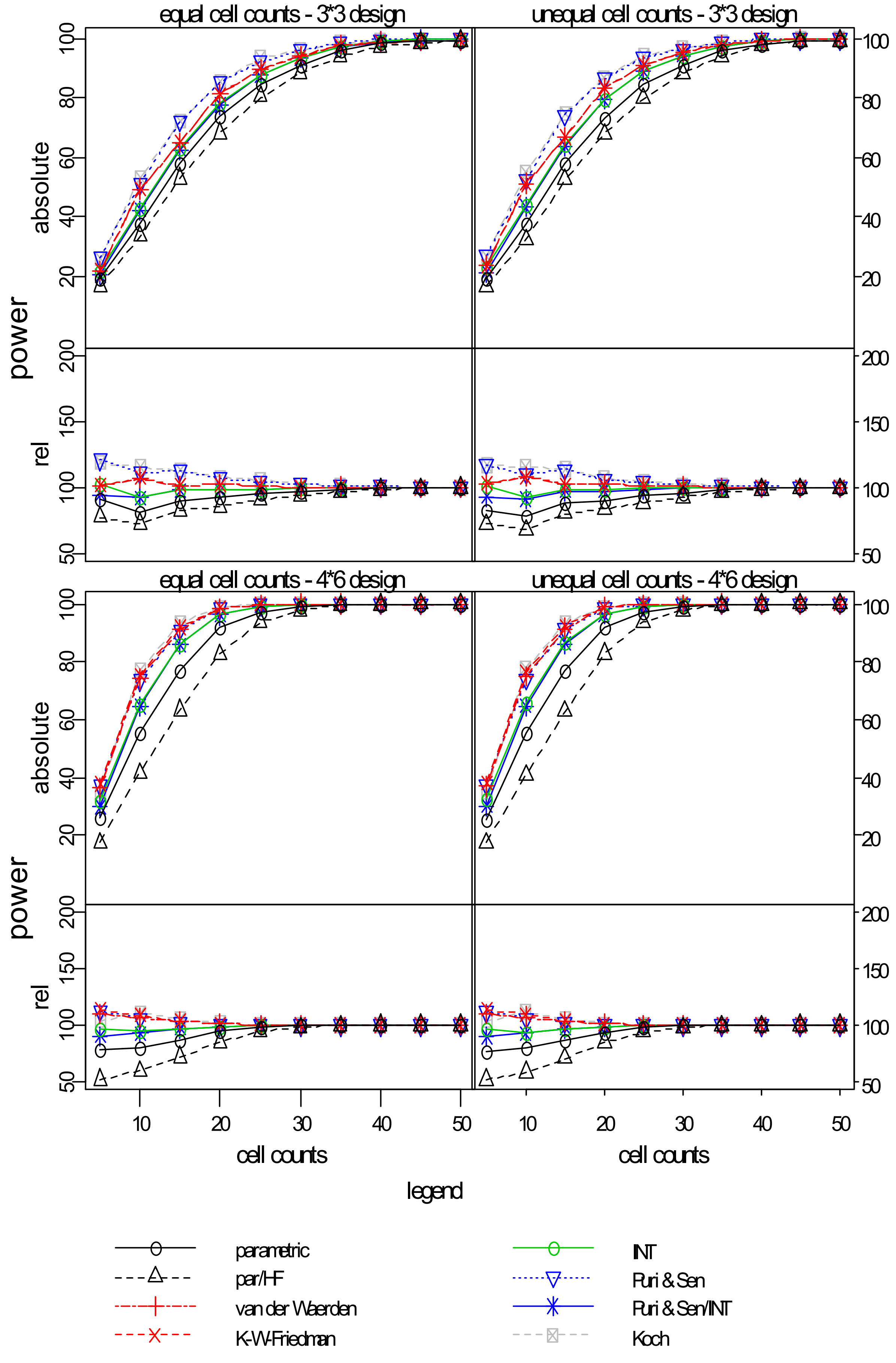
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 2. 2. 4 normal distribution - unequal variances (on A and B)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	19.55	37.45	57.90	73.70	91.05	98.45	99.55	19.05	37.55	58.15	73.50	91.00	98.35	99.60
parametric HF-adj	16.75	33.45	52.95	68.30	88.60	97.50	99.30	16.60	32.35	52.50	68.10	88.30	97.80	99.35
van der Waerden	21.95	49.40	65.10	81.25	94.20	99.00	99.55	23.60	51.35	66.90	83.60	95.55	99.30	99.85
KW/F	21.95	49.40	65.10	81.25	94.20	99.00	99.55	23.60	51.35	66.90	83.60	95.55	99.30	99.85
INT	22.10	42.70	63.40	78.10	93.90	99.10	99.85	23.10	44.25	64.35	79.90	94.35	99.10	99.90
Puri & Sen	26.10	51.00	72.15	85.30	96.30	99.80	99.95	26.85	52.45	74.25	86.50	96.60	99.85	100.0
Puri & Sen + INT	20.40	42.35	62.70	77.80	93.60	99.00	99.80	21.35	43.45	63.75	79.50	94.35	99.10	99.90
Koch	25.70	53.05	72.30	85.65	96.15	99.65	99.85	26.75	54.95	74.70	87.15	96.95	99.60	99.95
	large design (4*6)													
parametric	26.10	55.45	77.10	91.65	99.10	100.0	100.0	25.70	55.60	77.15	91.60	99.05	100.0	100.0
parametric HF-adj	17.30	41.50	63.35	82.60	97.60	99.80	100.0	17.50	40.75	62.85	82.70	97.65	99.75	100.0
van der Waerden	36.25	74.00	91.15	98.40	99.95	100.0	100.0	36.85	75.05	91.50	98.75	99.90	100.0	100.0
KW/F	37.75	75.40	91.80	98.60	99.90	100.0	100.0	38.25	76.45	92.30	98.75	99.95	100.0	100.0
INT	32.10	65.40	85.95	96.20	99.65	100.0	100.0	32.30	65.75	86.35	96.40	99.65	100.0	100.0
Puri & Sen	37.10	73.50	90.70	98.25	99.75	100.0	100.0	37.40	73.95	91.05	98.25	99.75	100.0	100.0
Puri & Sen + INT	29.95	64.55	85.90	96.10	99.65	100.0	100.0	30.15	64.75	86.25	96.20	99.65	100.0	100.0
Koch	34.40	77.20	93.10	98.85	99.95	100.0	100.0	34.85	77.85	93.15	98.80	99.90	100.0	100.0


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
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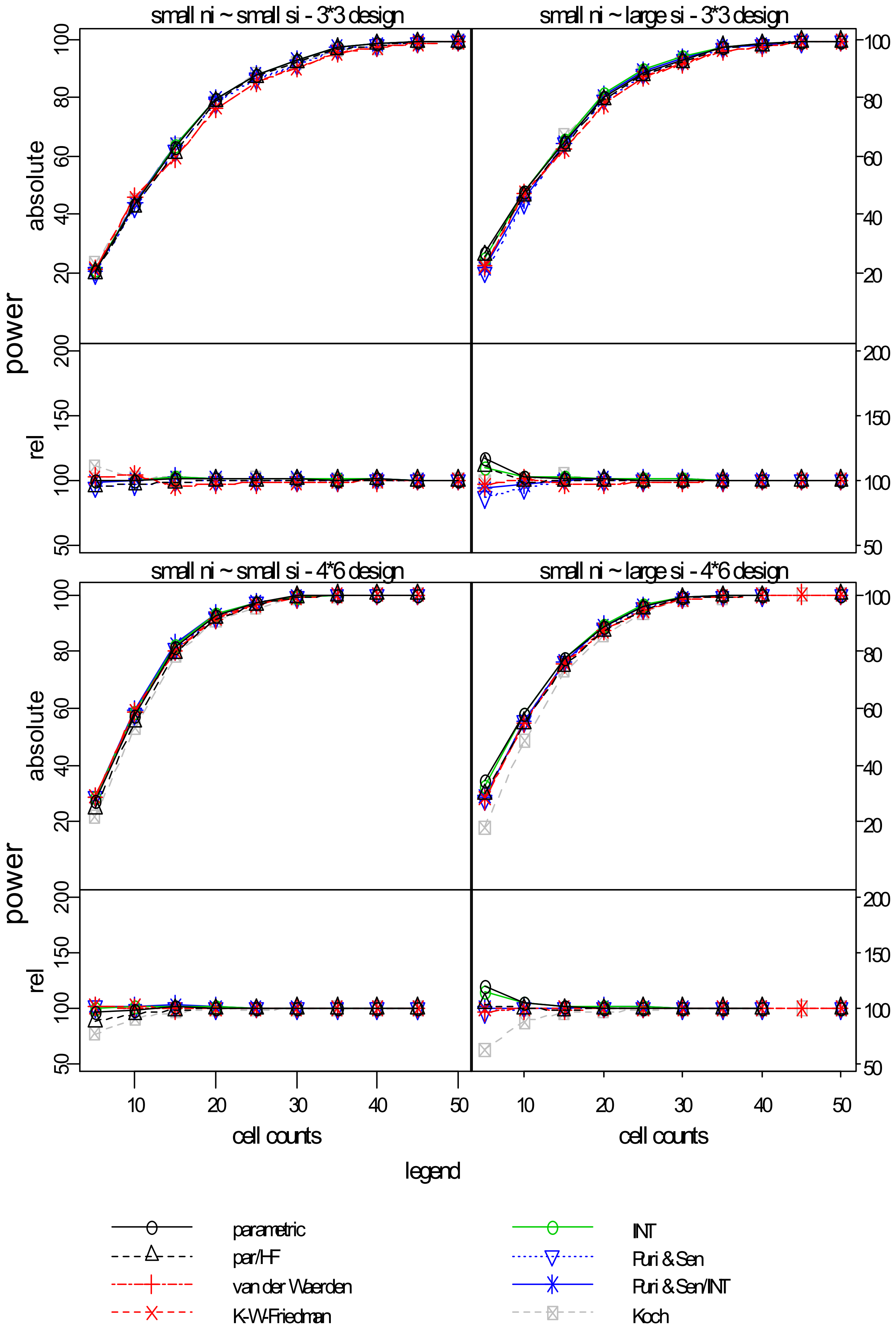
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 2. 2. 5 normal distribution - unequal variances (on A) - pairing

	small n_i ~ small s_i							small n_i ~ large s_i						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	20.70	43.55	63.00	79.70	92.95	98.60	99.45	27.05	47.70	64.95	80.55	93.25	98.45	99.55
parametric HF-adj	19.85	42.65	61.40	78.70	92.25	98.40	99.40	25.80	46.30	63.75	79.55	92.40	98.20	99.45
van der Waerden	21.35	45.70	59.60	76.70	90.30	97.20	99.25	22.25	47.20	62.35	77.80	91.90	97.55	99.40
KW/F	21.35	45.70	59.60	76.70	90.30	97.20	99.25	22.25	47.20	62.35	77.80	91.90	97.55	99.40
INT	20.95	43.55	63.65	79.85	93.10	98.55	99.50	25.25	48.00	65.65	81.25	94.00	98.55	99.65
Puri & Sen	19.85	42.45	61.75	78.20	91.35	98.00	99.45	20.05	44.05	64.30	79.30	92.90	98.50	99.65
Puri & Sen + INT	20.60	43.95	63.90	79.85	93.25	98.55	99.50	21.65	45.40	64.55	80.80	93.85	98.40	99.60
Koch	23.10	44.70	63.75	78.75	91.85	97.35	99.40	22.75	46.55	66.95	80.10	93.45	97.80	99.50
	large design (4*6)													
parametric	27.45	57.55	81.50	92.55	99.40	99.90	100.0	34.30	57.90	77.65	88.50	98.85	99.50	99.95
parametric HF-adj	24.95	54.95	79.50	91.50	99.15	99.90	100.0	29.90	54.75	74.95	87.40	98.70	99.45	99.95
van der Waerden	28.60	58.50	79.90	91.35	98.75	99.85	100.0	27.75	54.75	75.35	87.55	98.15	99.65	99.90
KW/F	28.75	59.10	80.05	91.55	98.80	99.80	100.0	28.50	55.05	76.00	87.25	98.10	99.70	99.90
INT	28.35	58.80	82.20	92.90	99.30	99.90	100.0	32.90	57.95	77.55	89.35	99.05	99.65	99.95
Puri & Sen	28.75	57.85	80.75	91.80	98.95	99.95	100.0	27.80	55.40	76.45	88.35	98.60	99.65	99.95
Puri & Sen + INT	28.90	59.20	82.60	93.05	99.25	99.90	100.0	28.75	55.60	76.30	89.00	98.95	99.65	99.95
Koch	21.85	53.00	78.25	91.20	98.70	99.80	100.0	18.05	48.30	73.25	85.60	98.05	99.75	99.95


small ni ~ small si - 3*3 design
small ni ~ large si - 3*3 design
small ni ~ small si - 4*6 design
small ni ~ large si - 4*6 design
power
absolute
rel
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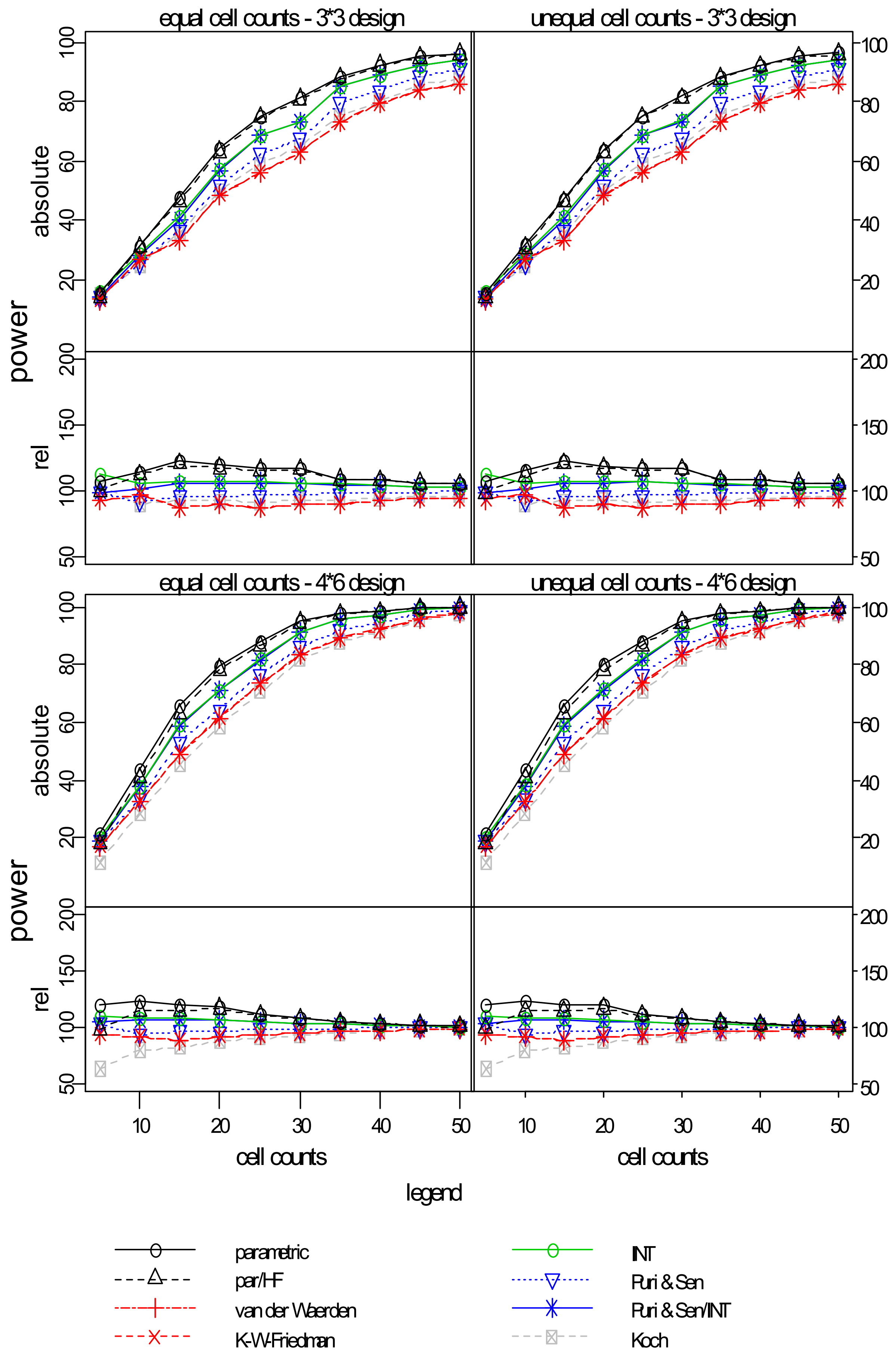
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 2. 2. 6 exponential distribution

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	15.30	31.60	47.60	64.30	81.80	92.60	96.45	15.20	32.10	47.45	63.90	81.95	92.60	96.55
parametric HF-adj	14.15	31.15	46.50	63.20	81.05	92.35	96.35	13.90	30.85	46.40	63.00	81.20	92.30	96.35
van der Waerden	13.25	26.90	33.55	48.75	62.85	79.60	86.25	13.25	26.90	33.55	48.75	62.85	79.60	86.25
KW/F	13.25	26.90	33.55	48.75	62.85	79.60	86.25	13.25	26.90	33.55	48.75	62.85	79.60	86.25
INT	16.15	29.10	41.50	57.60	73.55	89.20	94.25	16.05	29.05	41.35	57.40	73.65	89.25	94.25
Puri & Sen	14.05	25.45	36.85	51.50	67.40	83.80	91.40	14.05	25.45	36.85	51.50	67.40	83.80	91.40
Puri & Sen + INT	14.05	28.10	40.50	57.05	73.45	89.25	94.25	14.05	28.10	40.50	57.05	73.45	89.25	94.25
Koch	14.80	24.75	35.65	49.90	65.15	80.60	87.90	14.80	24.75	35.65	49.90	65.15	80.60	87.90
	large design (4*6)													
parametric	21.75	43.70	65.65	79.80	95.15	98.40	99.70	21.70	43.65	65.70	79.90	95.10	98.40	99.70
parametric HF-adj	17.95	40.75	62.95	78.30	94.55	98.15	99.65	18.00	40.65	62.95	78.30	94.55	98.15	99.65
van der Waerden	16.90	32.70	48.75	61.55	83.55	92.20	97.90	16.90	32.70	48.75	61.55	83.55	92.20	97.90
KW/F	17.10	32.60	48.95	61.75	83.50	91.90	98.05	17.10	32.60	48.95	61.75	83.50	91.90	98.05
INT	20.10	38.05	59.45	71.20	90.95	97.10	99.45	20.00	38.20	59.55	71.45	91.00	97.20	99.45
Puri & Sen	18.80	33.30	53.10	64.30	86.30	94.60	98.75	18.80	33.30	53.10	64.30	86.30	94.60	98.75
Puri & Sen + INT	18.95	37.55	58.75	70.95	90.90	97.10	99.45	18.95	37.55	58.75	70.95	90.90	97.10	99.45
Koch	11.55	28.35	45.25	58.70	81.75	91.35	97.65	11.55	28.35	45.25	58.70	81.75	91.35	97.65


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
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80
100
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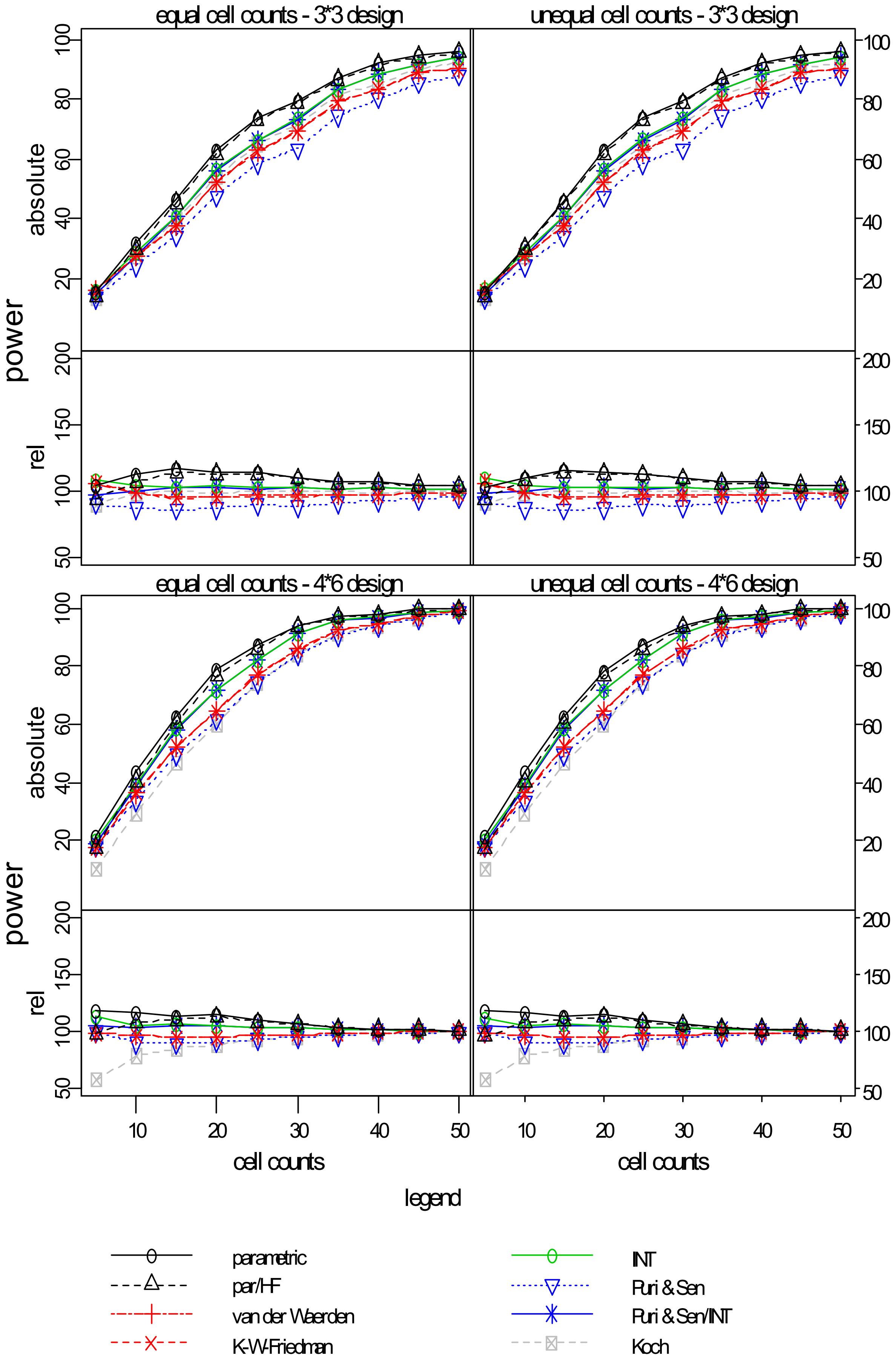
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 2. 2. 7 exponential distribution - discrete values

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	15.65	31.65	46.35	62.85	79.55	92.25	96.00	15.30	30.85	46.05	62.80	79.55	92.30	96.10
parametric HF-adj	14.10	29.95	45.50	61.70	78.90	91.80	95.85	13.95	30.15	45.20	61.75	78.90	91.85	95.95
van der Waerden	15.75	27.55	37.95	52.35	69.50	83.70	90.55	15.75	27.55	37.95	52.35	69.50	83.70	90.55
KW/F	15.95	27.60	37.60	52.00	69.35	83.60	90.25	15.95	27.60	37.60	52.00	69.35	83.60	90.25
INT	16.25	29.05	41.15	56.80	73.90	88.80	94.10	16.40	29.00	41.00	56.55	74.00	88.75	94.05
Puri & Sen	13.55	24.30	34.30	47.55	63.55	80.35	88.05	13.55	24.30	34.30	47.55	63.55	80.35	88.05
Puri & Sen + INT	14.60	27.80	40.90	56.20	73.60	88.85	94.10	14.60	27.80	40.90	56.20	73.60	88.85	94.10
Koch	13.45	27.35	39.60	53.95	71.85	85.60	92.15	13.45	27.35	39.60	53.95	71.85	85.60	92.15
	large design (4*6)													
parametric	21.30	43.50	62.60	78.55	94.05	97.75	99.60	21.40	43.50	62.65	78.45	94.00	97.80	99.60
parametric HF-adj	17.55	40.35	60.55	76.50	93.60	97.55	99.60	17.20	40.30	60.50	76.70	93.40	97.55	99.60
van der Waerden	17.65	36.20	52.05	64.50	85.85	94.40	98.90	17.65	36.20	52.05	64.50	85.85	94.40	98.90
KW/F	17.60	36.10	52.10	64.35	85.65	94.40	98.85	17.60	36.10	52.10	64.35	85.65	94.40	98.85
INT	20.25	39.05	58.70	71.55	91.25	96.75	99.25	20.05	39.05	58.80	71.60	91.25	96.80	99.25
Puri & Sen	17.85	33.65	49.40	61.55	83.90	93.50	98.25	17.85	33.65	49.40	61.55	83.90	93.50	98.25
Puri & Sen + INT	18.90	38.60	58.00	71.75	91.15	96.65	99.25	18.90	38.60	58.00	71.75	91.15	96.65	99.25
Koch	10.25	29.35	46.50	59.95	83.95	93.70	98.70	10.25	29.35	46.50	59.95	83.95	93.70	98.70


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
power
absolute
rel
20
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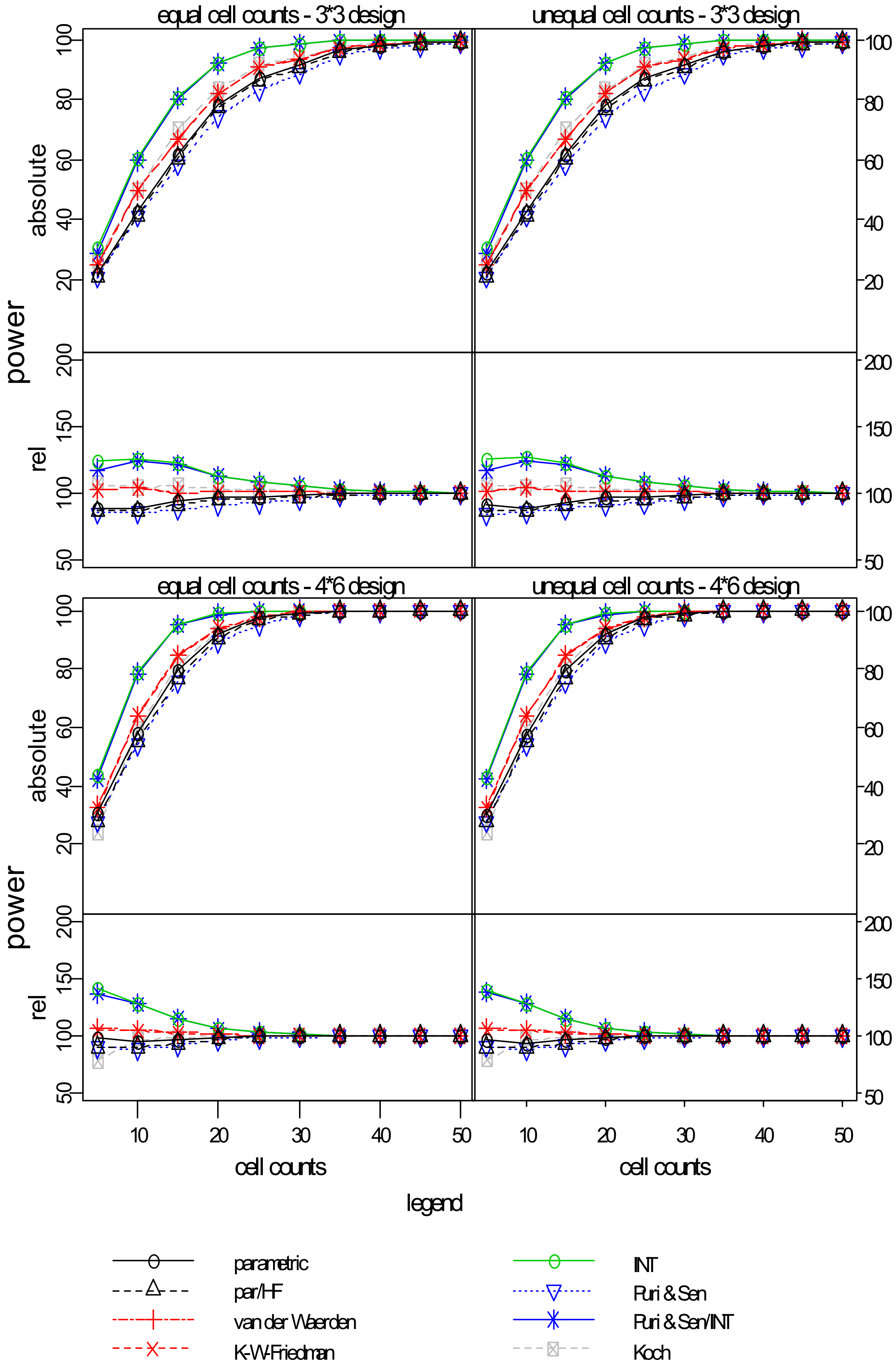
80
100
50
100
150
200
10
20
30
40
50
cell counts
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

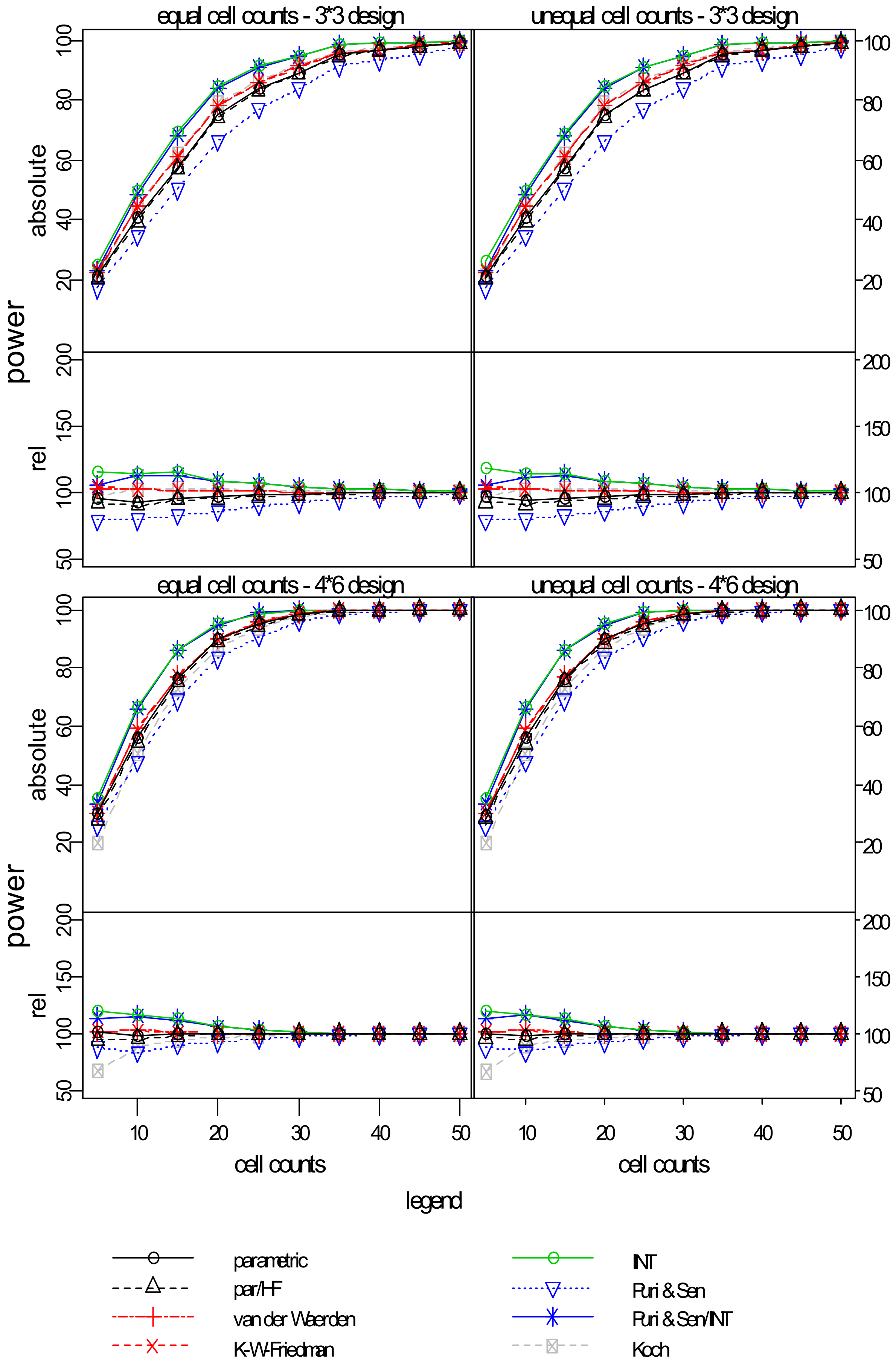
2. 2. 2. 8 uniform distribution

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	21.70	42.60	62.15	78.50	91.65	98.25	99.45	22.50	42.50	61.80	78.65	91.50	98.25	99.50
parametric HF-adj	21.10	41.60	60.65	77.45	90.70	98.05	99.40	21.30	41.60	60.60	76.95	90.75	98.05	99.40
van der Waerden	24.90	49.80	66.65	82.20	93.80	98.60	99.65	24.90	49.80	66.65	82.20	93.80	98.60	99.65
KW/F	24.90	49.80	66.65	82.20	93.80	98.60	99.65	24.90	49.80	66.65	82.20	93.80	98.60	99.65
INT	30.40	60.40	81.15	92.10	98.90	99.90	100.0	30.75	60.70	81.20	92.10	98.85	99.95	100.0
Puri & Sen	20.70	41.10	58.10	74.45	88.70	97.35	99.20	20.70	41.10	58.10	74.45	88.70	97.35	99.20
Puri & Sen + INT	28.70	59.65	80.60	92.10	98.85	99.90	100.0	28.70	59.65	80.60	92.10	98.85	99.90	100.0
Koch	26.15	50.05	70.15	83.50	94.30	98.95	99.75	26.15	50.05	70.15	83.50	94.30	98.95	99.75
	large design (4*6)													
parametric	30.35	57.85	79.60	91.60	98.75	99.80	100.0	29.80	57.50	79.50	91.65	98.75	99.80	100.0
parametric HF-adj	27.75	55.25	76.90	90.50	98.60	99.75	99.95	27.60	55.25	77.05	90.50	98.55	99.75	99.95
van der Waerden	32.85	63.95	84.45	93.85	99.40	100.0	100.0	32.85	63.95	84.45	93.85	99.40	100.0	100.0
KW/F	32.15	64.15	84.30	93.90	99.40	99.95	100.0	32.15	64.15	84.30	93.90	99.40	99.95	100.0
INT	43.65	78.80	95.05	98.90	100.0	100.0	100.0	43.05	78.75	95.00	98.85	100.0	100.0	100.0
Puri & Sen	27.70	54.10	75.50	89.15	98.15	99.65	99.95	27.70	54.10	75.50	89.15	98.15	99.65	99.95
Puri & Sen + INT	42.25	78.45	95.05	98.65	100.0	100.0	100.0	42.25	78.45	95.05	98.65	100.0	100.0	100.0
Koch	24.10	59.50	81.20	92.40	99.10	99.95	100.0	24.10	59.50	81.20	92.40	99.10	99.95	100.0


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 2. 2. 9 uniform distribution - discrete values

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	21.00	40.60	57.40	75.30	89.45	97.05	99.25	21.20	40.85	57.55	75.35	89.40	97.05	99.30
parametric HF-adj	20.25	39.45	57.05	74.30	88.95	96.85	99.25	20.40	39.75	56.90	74.35	88.90	96.80	99.25
van der Waerden	22.55	44.65	61.05	78.15	91.50	96.80	99.10	22.55	44.65	61.05	78.15	91.50	96.80	99.10
KW/F	22.70	44.60	61.10	78.15	91.40	96.80	99.05	22.70	44.60	61.10	78.15	91.40	96.80	99.05
INT	25.25	49.90	69.50	84.50	94.90	99.10	99.80	26.00	49.80	69.10	84.50	94.80	99.05	99.80
Puri & Sen	17.35	34.70	50.25	66.60	84.25	93.65	98.05	17.35	34.70	50.25	66.60	84.25	93.65	98.05
Puri & Sen + INT	23.00	48.80	68.35	84.20	94.75	99.05	99.70	23.00	48.80	68.35	84.20	94.75	99.05	99.70
Koch	21.30	44.65	61.90	79.25	92.25	97.20	99.30	21.30	44.65	61.90	79.25	92.25	97.20	99.30
	large design (4*6)													
parametric	29.80	56.20	76.55	89.60	98.40	99.55	99.90	29.55	55.80	76.50	89.60	98.45	99.55	99.90
parametric HF-adj	27.80	54.50	75.15	88.80	98.30	99.45	99.90	28.30	54.20	75.25	88.60	98.30	99.45	99.90
van der Waerden	30.05	59.00	77.15	89.70	98.75	99.65	100.0	30.05	59.00	77.15	89.70	98.75	99.65	100.0
KW/F	30.05	58.55	76.90	89.45	98.60	99.65	99.95	30.05	58.55	76.90	89.45	98.60	99.65	99.95
INT	35.40	66.75	86.00	94.80	99.70	99.95	100.0	35.15	66.65	86.15	94.80	99.75	99.95	100.0
Puri & Sen	25.85	48.00	69.05	83.40	96.05	99.30	99.85	25.85	48.00	69.05	83.40	96.05	99.30	99.85
Puri & Sen + INT	33.55	66.00	85.90	94.60	99.75	99.95	100.0	33.55	66.00	85.90	94.60	99.75	99.95	100.0
Koch	19.70	50.75	72.65	86.55	98.00	99.65	100.0	19.70	50.75	72.65	86.55	98.00	99.65	100.0


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
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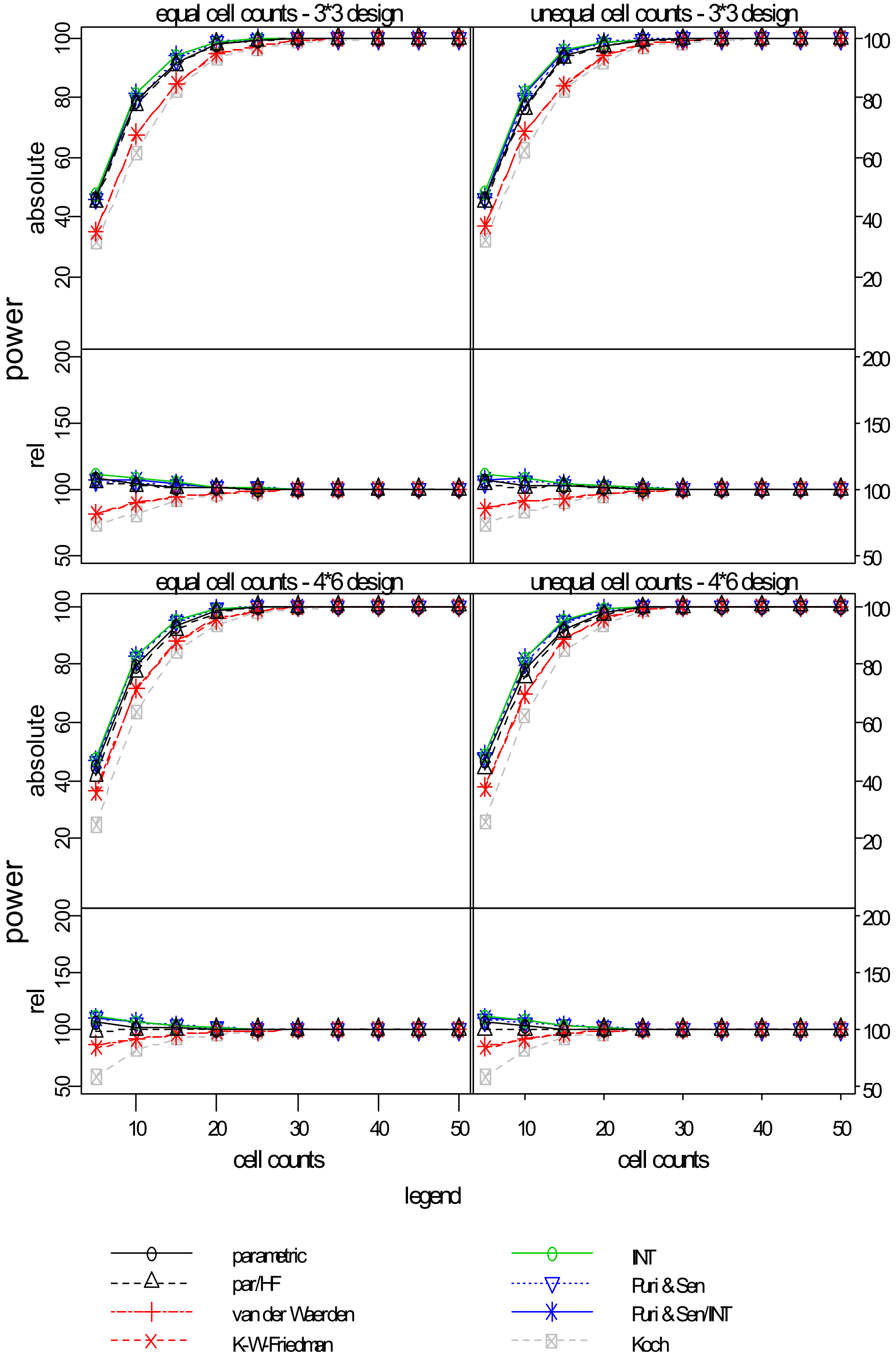
60
80
100
50
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 2. 2. 10 lognormal distribution - equal variances

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	46.65	79.05	91.65	98.15	99.80	100.0	100	46.65	77.25	94.00	97.70	99.70	100.0	100.0
parametric HF-adj	45.10	77.75	91.20	98.10	99.75	100.0	100	45.15	76.55	93.50	97.55	99.65	100.0	100.0
van der Waerden	35.05	67.85	85.00	94.75	99.45	100.0	100	37.10	68.65	84.35	94.10	99.15	99.90	100.0
KW/F	35.05	67.85	85.00	94.75	99.45	100.0	100	37.10	68.65	84.35	94.10	99.15	99.90	100.0
INT	47.90	81.75	94.50	98.90	99.95	100.0	100	48.50	82.00	95.95	98.85	100.0	100.0	100.0
Puri & Sen	46.05	79.10	93.00	98.75	99.85	100.0	100	46.10	79.45	94.95	98.50	100.0	100.0	100.0
Puri & Sen + INT	46.05	81.25	94.20	98.90	99.95	100.0	100	46.70	81.50	95.85	98.90	100.0	100.0	100.0
Koch	31.60	61.65	82.65	93.35	99.00	99.95	100	32.30	62.50	82.70	92.30	98.70	99.85	100.0
	large design (4*6)													
parametric	44.85	79.20	93.15	98.10	99.75	99.95	100	47.15	77.95	92.05	97.45	99.70	100.0	100.0
parametric HF-adj	41.80	77.25	92.05	97.85	99.65	99.95	100	43.90	75.70	91.00	97.00	99.70	100.0	99.95
van der Waerden	36.45	71.60	87.75	95.50	99.45	100.0	100	37.80	69.45	88.40	95.80	99.75	99.95	99.95
KW/F	35.50	71.05	87.45	95.35	99.40	99.95	100	37.05	69.00	88.35	95.70	99.70	99.90	99.95
INT	47.55	83.00	95.05	98.90	99.95	100.0	100	49.10	82.15	95.05	98.80	99.95	100.0	100.0
Puri & Sen	46.50	82.05	94.55	99.05	99.90	100.0	100	47.75	80.45	94.50	98.45	99.95	100.0	100.0
Puri & Sen + INT	46.65	82.90	94.95	98.90	99.95	100.0	100	48.75	81.85	94.75	98.75	99.95	100.0	100.0
Koch	24.80	63.50	84.50	93.45	99.15	99.95	100	25.80	62.20	84.85	93.70	99.65	99.95	99.95


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
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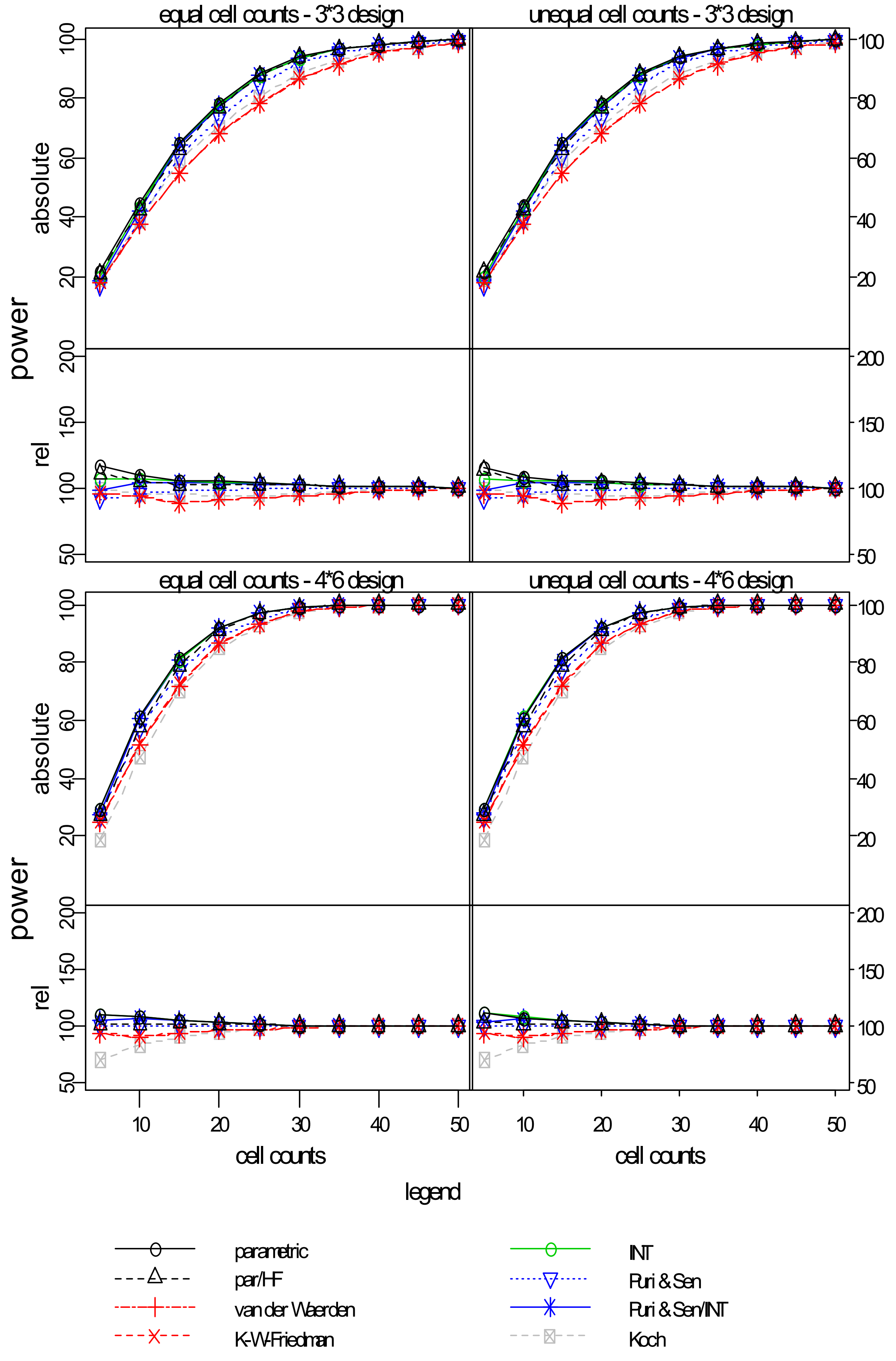
40
60
80
100
50
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

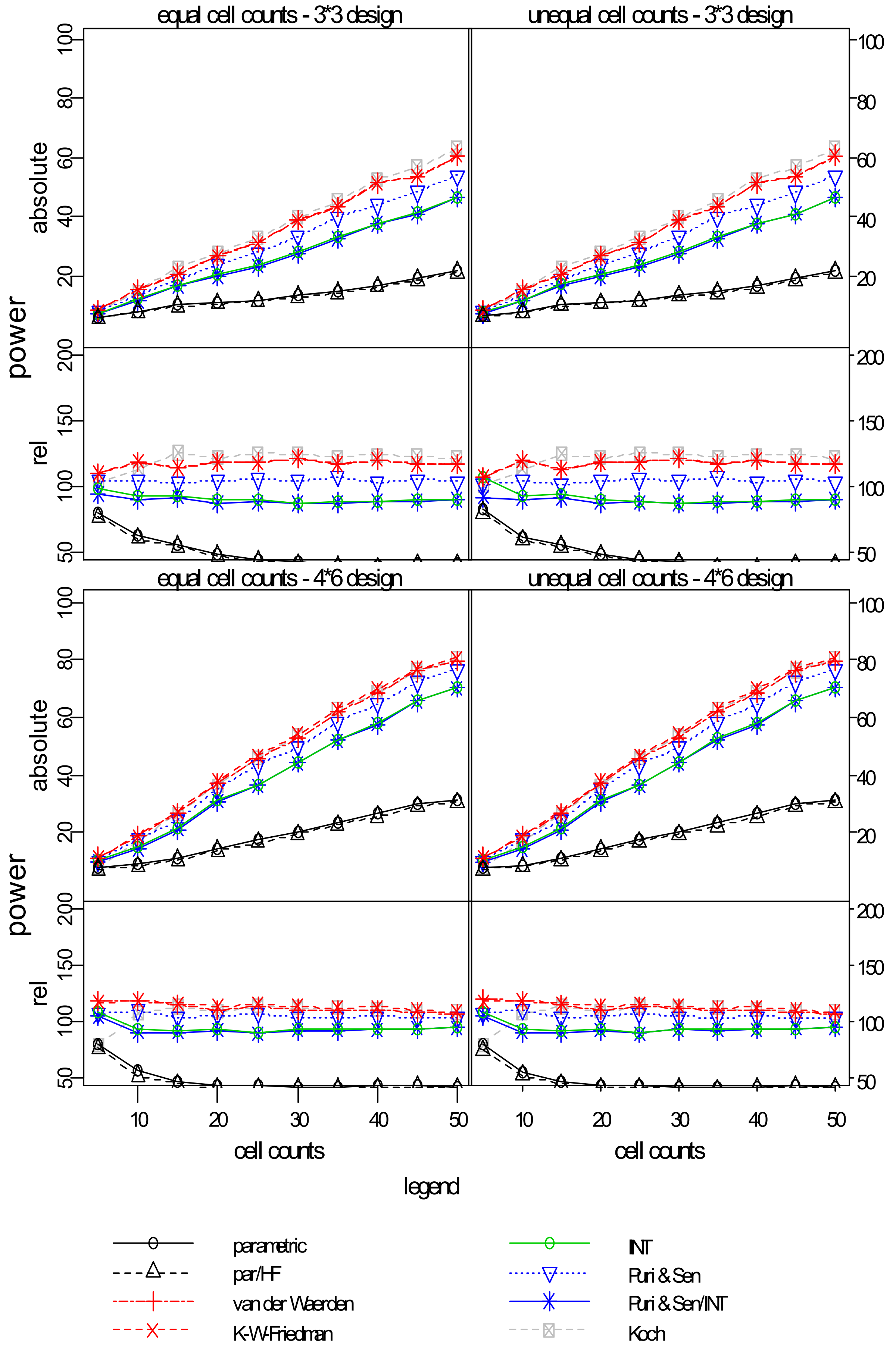
2. 2. 2. 11 normal distribution - equal variances - contaminated I

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	22.05	44.70	65.00	78.45	94.45	98.40	99.95	21.95	44.00	65.00	78.40	94.50	98.45	99.95
parametric HF-adj	20.90	42.65	63.10	77.00	93.90	98.15	99.85	21.40	42.65	62.80	77.10	93.90	98.30	99.90
van der Waerden	18.15	38.00	54.65	68.20	86.85	95.40	98.80	18.15	38.00	54.65	68.20	86.85	95.40	98.80
KW/F	18.15	38.00	54.65	68.20	86.85	95.40	98.80	18.15	38.00	54.65	68.20	86.85	95.40	98.80
INT	20.20	43.20	65.20	77.80	93.90	98.20	99.90	20.10	43.00	65.00	78.00	94.00	98.40	99.90
Puri & Sen	17.30	39.10	60.55	73.55	92.10	97.15	99.55	17.30	39.10	60.55	73.55	92.10	97.15	99.55
Puri & Sen + INT	18.60	42.20	64.65	77.40	93.90	98.30	99.90	18.60	42.20	64.65	77.40	93.90	98.30	99.90
Koch	18.75	38.75	59.10	70.50	88.40	95.90	99.20	18.75	38.75	59.10	70.50	88.40	95.90	99.20
	large design (4*6)													
parametric	29.20	60.95	81.55	91.95	99.25	99.95	100.0	29.50	60.90	81.35	92.00	99.30	99.95	100.0
parametric HF-adj	27.00	57.55	79.00	90.90	98.95	99.90	100.0	27.25	57.80	78.90	91.05	98.95	99.90	100.0
van der Waerden	24.90	51.40	71.85	86.45	97.65	99.60	99.95	24.90	51.40	71.85	86.45	97.65	99.60	99.95
KW/F	24.95	51.80	72.40	86.50	97.85	99.70	99.95	24.95	51.80	72.40	86.50	97.85	99.70	99.95
INT	29.30	61.00	81.05	92.10	99.20	99.95	100.0	29.45	61.25	81.20	91.90	99.20	99.95	100.0
Puri & Sen	26.45	56.90	77.10	88.85	98.65	99.90	99.95	26.45	56.90	77.10	88.85	98.65	99.90	99.95
Puri & Sen + INT	27.65	60.35	80.70	91.85	99.20	99.95	100.0	27.65	60.35	80.70	91.85	99.20	99.95	100.0
Koch	18.60	47.20	70.05	84.95	97.35	99.65	99.95	18.60	47.20	70.05	84.95	97.35	99.65	99.95


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

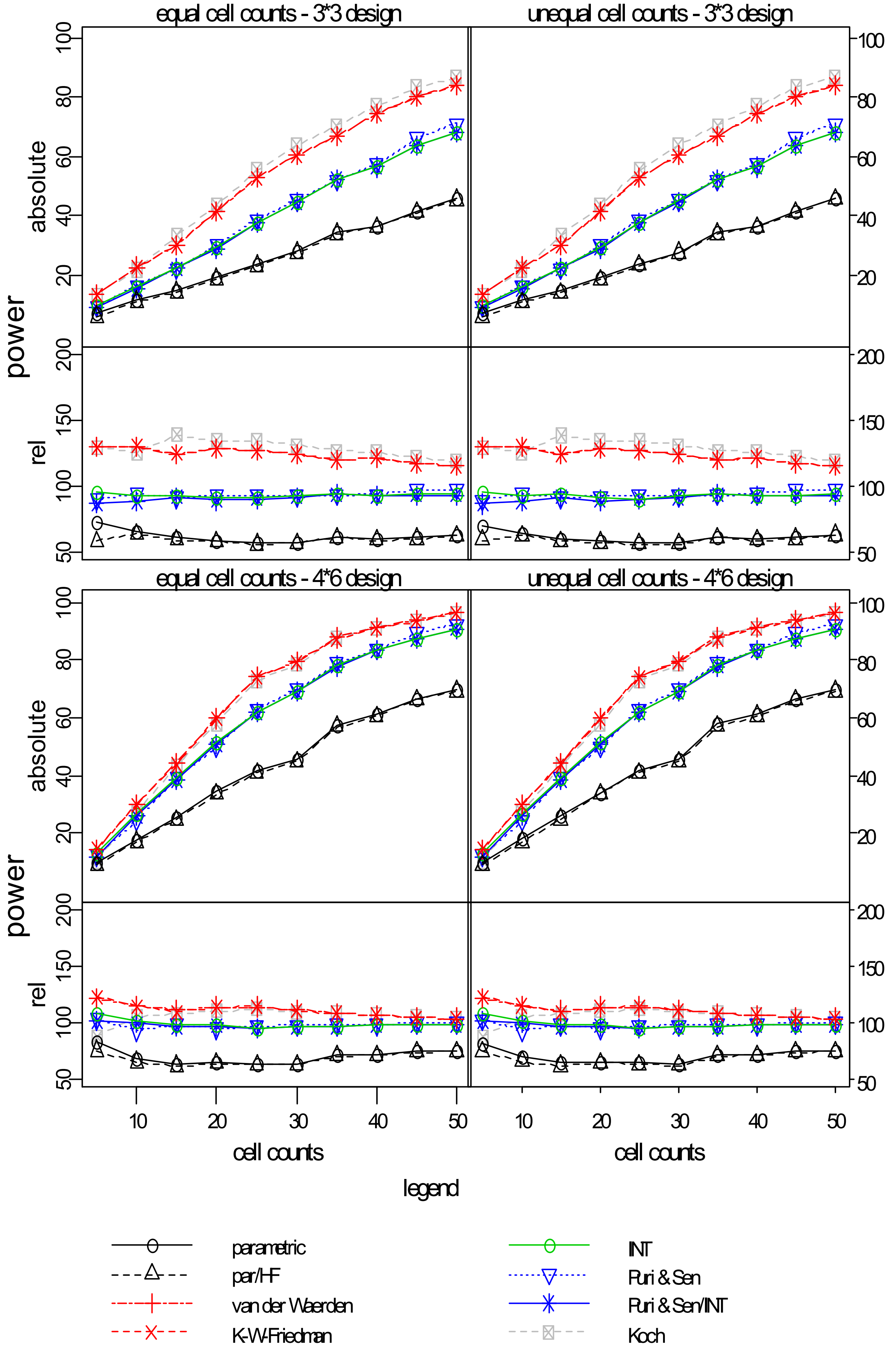
2. 2. 2. 12 normal distribution - equal variances - contaminated II

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	5.90	7.95	10.20	11.00	13.55	16.85	21.75	6.30	7.80	10.20	11.05	13.60	16.65	21.60
parametric HF-adj	5.70	7.75	9.85	10.65	13.05	16.30	21.25	6.10	7.55	9.95	10.75	13.15	16.25	21.10
van der Waerden	8.15	15.25	20.80	26.75	38.85	51.40	60.85	8.15	15.25	20.80	26.75	38.85	51.40	60.85
KW/F	8.15	15.25	20.80	26.75	38.85	51.40	60.85	8.15	15.25	20.80	26.75	38.85	51.40	60.85
INT	7.35	11.95	16.85	20.25	27.90	37.80	46.90	8.10	11.80	17.40	20.30	27.90	37.85	46.85
Puri & Sen	7.75	13.35	18.65	23.65	33.35	43.95	53.90	7.75	13.35	18.65	23.65	33.35	43.95	53.90
Puri & Sen + INT	7.00	11.55	16.70	19.80	27.80	37.65	46.70	7.00	11.55	16.70	19.80	27.80	37.65	46.70
Koch	7.65	14.50	22.90	27.55	39.80	52.80	63.35	7.65	14.50	22.90	27.55	39.80	52.80	63.35
	large design (4*6)													
parametric	7.60	9.00	10.80	14.65	20.25	26.50	31.45	7.55	8.80	10.85	14.45	20.10	26.40	31.40
parametric HF-adj	7.25	8.25	10.40	13.65	19.40	25.60	30.55	7.10	8.35	10.35	13.65	19.35	25.50	30.45
van der Waerden	11.35	18.80	26.85	36.85	52.75	68.25	79.55	11.35	18.80	26.85	36.85	52.75	68.25	79.55
KW/F	11.15	18.80	27.05	37.75	54.25	70.00	80.50	11.15	18.80	27.05	37.75	54.25	70.00	80.50
INT	10.40	14.75	21.45	31.05	44.20	57.75	70.40	10.20	14.70	21.45	31.00	44.10	57.70	70.60
Puri & Sen	10.20	17.50	24.25	35.20	49.60	64.80	76.60	10.20	17.50	24.25	35.20	49.60	64.80	76.60
Puri & Sen + INT	10.00	14.35	21.15	30.75	44.05	57.65	70.20	10.00	14.35	21.15	30.75	44.05	57.65	70.20
Koch	7.55	17.00	26.40	36.30	53.55	68.60	80.30	7.55	17.00	26.40	36.30	53.55	68.60	80.30


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 2. 2. 13 normal distribution - equal variances - contaminated III

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	7.45	11.45	14.70	19.00	27.95	36.30	45.85	7.20	11.30	14.50	18.95	27.70	36.35	46.00
parametric HF-adj	5.95	11.15	14.25	18.70	27.60	36.15	45.50	6.05	10.85	13.95	18.45	27.45	36.15	45.65
van der Waerden	13.25	22.70	30.05	41.55	60.50	74.60	84.25	13.25	22.70	30.05	41.55	60.50	74.60	84.25
KW/F	13.25	22.70	30.05	41.55	60.50	74.60	84.25	13.25	22.70	30.05	41.55	60.50	74.60	84.25
INT	9.70	16.20	22.45	29.35	44.95	56.90	68.45	9.80	16.30	22.65	29.55	45.20	56.75	68.45
Puri & Sen	9.15	16.40	22.00	29.90	45.20	57.40	71.15	9.15	16.40	22.00	29.90	45.20	57.40	71.15
Puri & Sen + INT	8.85	15.40	22.15	28.90	44.60	56.45	68.00	8.85	15.40	22.15	28.90	44.60	56.45	68.00
Koch	13.25	21.85	33.45	43.60	63.85	77.15	86.80	13.25	21.85	33.45	43.60	63.85	77.15	86.80
	large design (4*6)													
parametric	9.95	17.85	25.50	34.25	45.45	61.25	69.95	9.65	18.10	25.75	34.15	45.60	61.30	69.90
parametric HF-adj	8.90	16.90	24.60	33.55	44.80	60.50	69.15	8.85	17.05	24.75	33.70	44.65	60.70	69.05
van der Waerden	14.40	29.90	44.20	59.65	79.35	91.30	96.25	14.40	29.90	44.20	59.65	79.35	91.30	96.25
KW/F	14.55	29.85	43.70	59.40	79.20	91.00	96.20	14.55	29.85	43.70	59.40	79.20	91.00	96.20
INT	12.80	26.55	38.90	51.20	69.10	83.45	90.85	12.85	26.45	39.10	51.25	69.00	83.45	90.80
Puri & Sen	12.20	24.30	39.30	49.75	69.90	83.70	92.30	12.20	24.30	39.30	49.75	69.90	83.70	92.30
Puri & Sen + INT	12.05	25.90	38.45	50.70	68.85	83.30	90.85	12.05	25.90	38.45	50.70	68.85	83.30	90.85
Koch	10.40	27.35	43.00	57.75	78.25	90.90	95.95	10.40	27.35	43.00	57.75	78.25	90.90	95.95

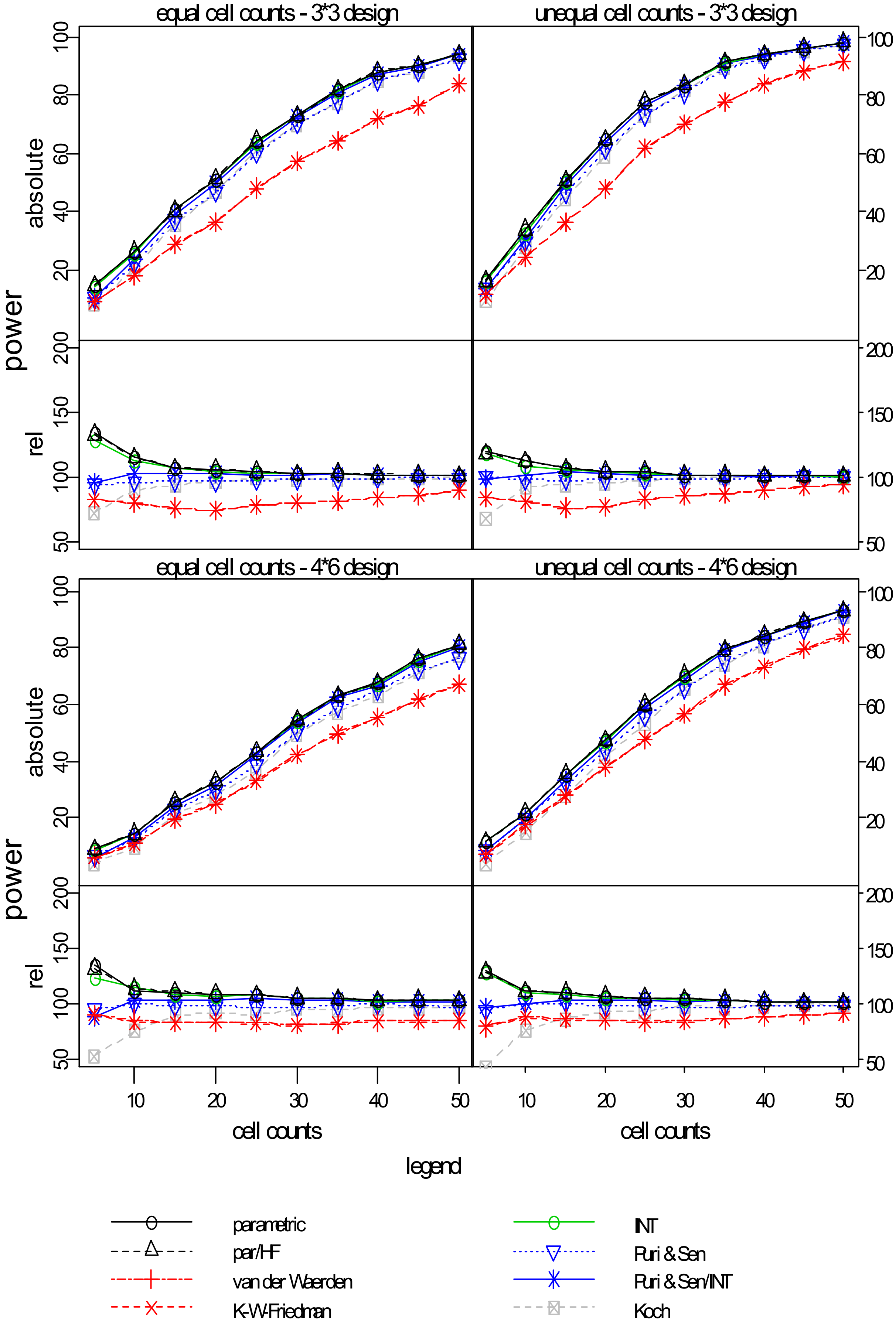

equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
150
200
10
30
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 3. Interaction effect AB (effects ab_i=0.25*s)

2. 3. 1. equal correlations on B (r=0.3)

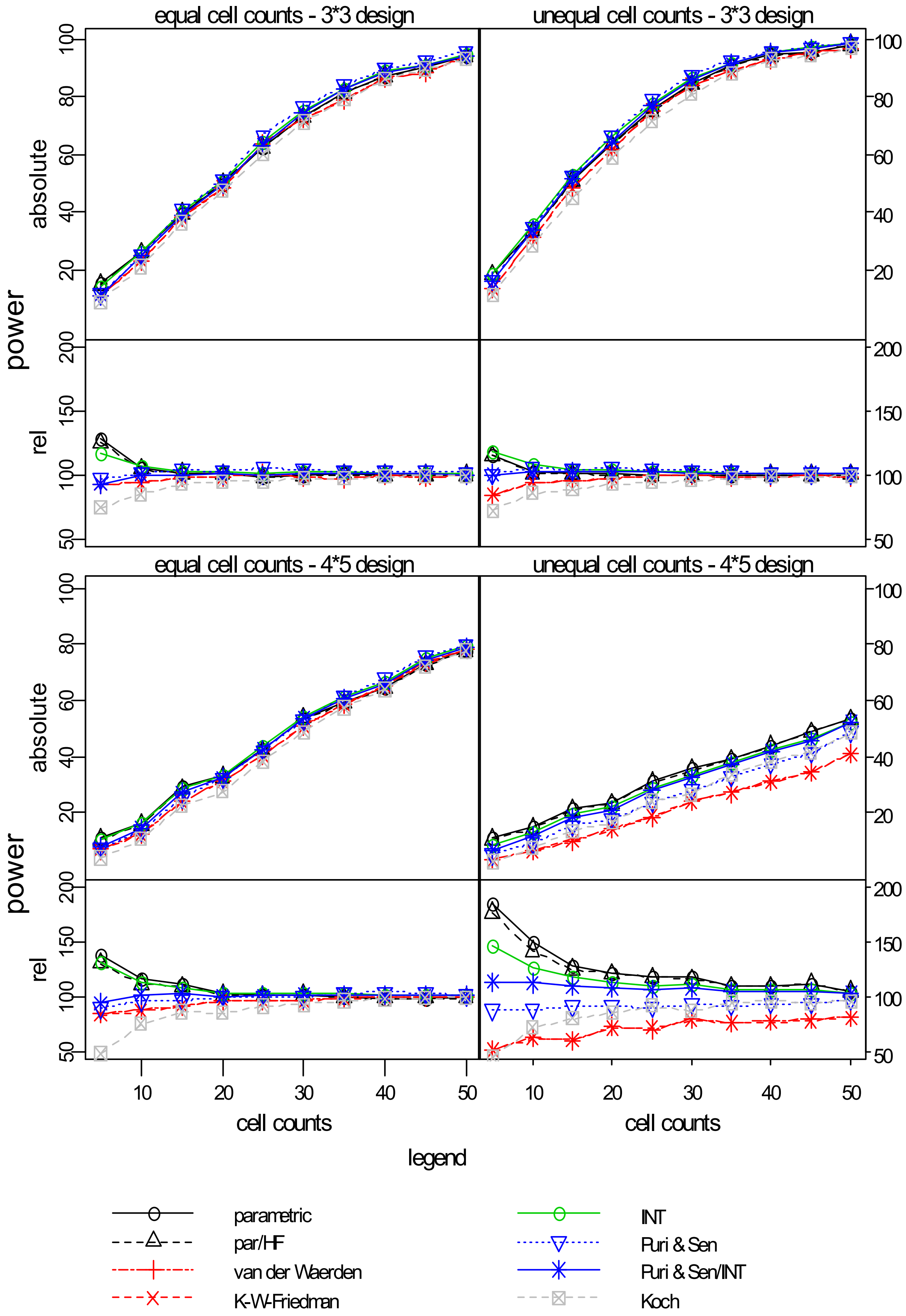
2. 3. 1. 1 normal distribution - equal variances

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	14.65	26.25	40.60	51.30	73.00	87.95	94.20	15.95	33.00	51.00	64.75	84.65	94.65	98.55
parametric HF-adj	14.55	26.20	40.40	51.45	72.90	88.30	94.20	16.85	33.15	51.20	65.15	84.70	94.65	98.55
van der Waerden	9.05	18.25	28.95	36.20	57.25	72.20	83.85	11.10	24.30	37.70	47.90	71.85	84.30	92.05
KW/F	9.05	18.25	28.95	36.20	57.25	72.20	83.85	11.10	24.30	37.70	47.90	71.85	84.30	92.05
INT	14.05	25.55	40.70	50.75	73.10	87.90	94.10	16.00	32.50	50.50	64.55	84.35	94.75	98.45
Puri & Sen	10.30	21.90	36.75	46.80	70.25	85.30	92.35	13.30	29.45	46.00	59.65	82.60	92.95	97.75
Puri & Sen + INT	10.55	23.40	39.25	50.00	72.60	87.55	94.05	13.55	30.10	49.10	63.45	83.90	94.65	98.45
Koch	7.90	20.35	35.65	46.80	70.15	85.30	93.15	9.25	26.20	45.20	59.75	83.75	93.30	98.10
	large design (4*6)													
parametric	9.20	14.20	25.60	32.85	54.55	67.65	81.05	6.10	10.25	15.10	19.30	32.05	42.10	51.90
parametric HF-adj	8.95	14.45	25.95	32.85	54.35	67.50	81.10	6.05	10.30	14.90	19.20	31.90	42.15	52.00
van der Waerden	6.15	10.95	19.40	25.05	42.25	55.15	67.10	3.20	6.65	10.80	14.00	23.55	31.45	40.30
KW/F	6.15	10.60	19.40	25.25	41.85	55.15	66.90	3.05	6.80	11.20	13.60	22.90	31.35	40.15
INT	8.40	14.65	25.45	32.40	54.30	67.05	80.80	5.75	10.40	15.35	19.35	31.30	41.90	52.20
Puri & Sen	6.45	12.70	22.80	29.50	50.30	65.05	76.20	4.25	8.30	13.45	16.70	27.75	38.50	49.90
Puri & Sen + INT	5.95	13.20	24.10	31.10	53.35	66.75	80.45	4.05	9.15	14.15	18.50	30.65	41.15	51.75
Koch	3.60	9.60	21.10	27.80	49.35	63.20	77.20	2.35	6.55	11.90	15.35	25.95	37.75	49.40


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

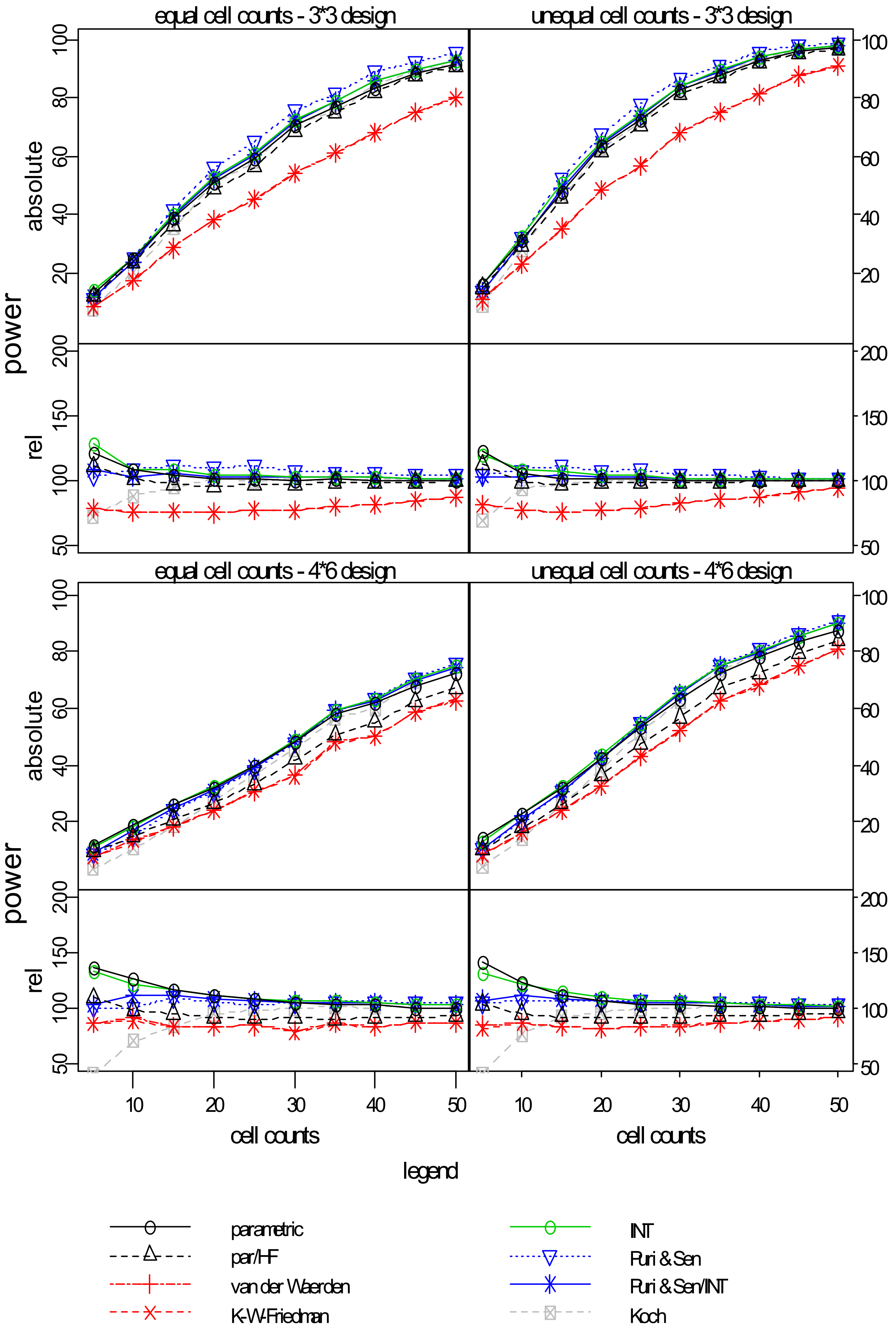
2. 3. 1. 2 normal distribution - unequal variances (on A)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	15.20	26.20	39.80	50.05	73.40	87.45	94.00	18.50	34.10	51.00	63.85	84.50	94.60	98.25
parametric HF-adj	14.85	25.95	39.65	50.15	73.05	87.35	94.00	18.40	33.50	51.00	63.60	84.35	94.40	98.25
van der Waerden	11.05	23.30	38.35	48.65	72.40	86.90	94.10	13.50	31.30	48.30	61.75	84.25	93.15	97.00
KW/F	11.05	23.30	38.35	48.65	72.40	86.90	94.10	13.50	31.30	48.30	61.75	84.25	93.15	97.00
INT	13.95	26.50	40.20	51.10	75.20	88.95	94.65	18.90	35.80	52.85	66.15	86.50	95.30	98.60
Puri & Sen	11.50	25.20	40.85	51.10	76.50	89.70	95.95	16.15	34.90	52.60	66.70	87.70	95.55	98.90
Puri & Sen + INT	11.05	24.85	38.95	49.95	74.35	88.70	94.30	16.10	33.80	51.80	64.70	85.95	95.25	98.50
Koch	8.85	21.10	36.35	47.30	71.35	86.25	93.25	11.55	28.50	44.90	59.20	81.20	92.95	97.05
	large design (4*6)													
parametric	11.20	16.40	29.10	33.25	53.75	64.45	77.45	10.85	15.30	21.40	23.50	35.70	43.80	53.25
parametric HF-adj	10.55	15.75	28.60	32.75	53.75	64.30	77.35	10.40	14.50	20.90	23.30	35.15	43.70	53.15
van der Waerden	6.85	12.50	24.10	31.00	50.70	65.10	78.15	3.05	6.45	10.00	14.25	24.15	31.20	41.25
KW/F	6.75	12.25	24.05	31.20	50.55	64.95	77.95	3.05	6.35	10.20	13.80	23.80	30.80	40.90
INT	10.65	16.00	28.35	33.05	54.00	66.20	79.30	8.60	12.95	19.75	21.95	33.55	42.25	52.40
Puri & Sen	7.25	13.60	25.15	32.35	52.75	67.85	79.30	5.20	9.05	15.35	17.80	28.30	37.45	48.85
Puri & Sen + INT	7.65	14.40	27.05	32.40	53.65	65.75	78.85	6.70	11.50	18.35	20.90	32.60	41.75	52.10
Koch	3.90	10.65	22.65	27.55	48.80	63.90	77.50	2.65	7.40	13.50	16.50	26.40	38.25	48.35


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*5 design
unequal cell counts - 4*5 design
power
absolute
rel
0
20
40
60
80
100
50
150
200
10
30
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

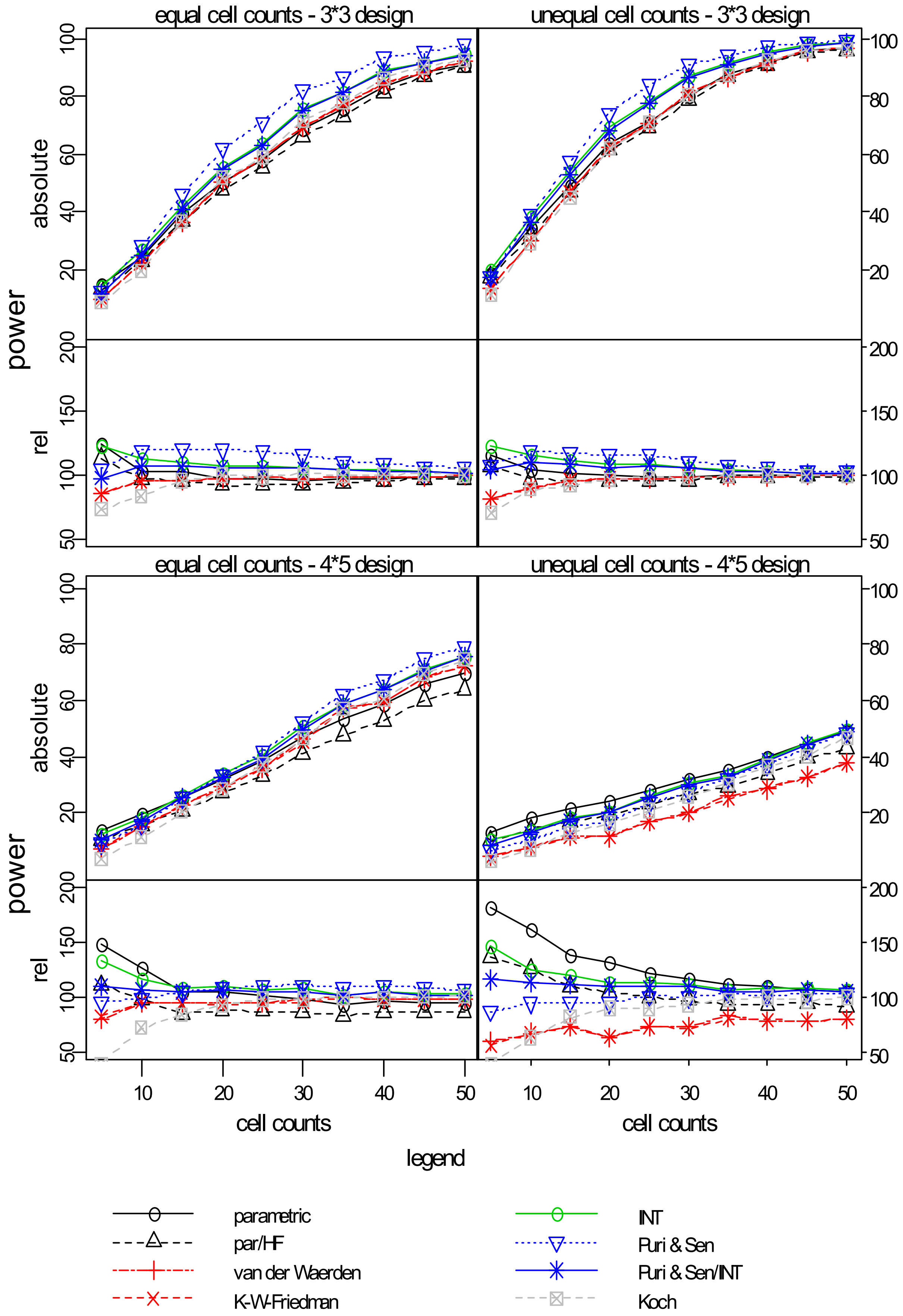
2. 3. 1. 3 normal distribution - unequal variances (on B)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	13.15	25.00	38.80	51.35	70.80	83.75	91.80	16.50	33.40	49.35	64.10	82.35	92.65	97.15
parametric HF-adj	12.10	23.40	36.45	48.80	68.75	82.10	91.15	14.60	31.40	46.75	61.10	81.15	91.80	96.85
van der Waerden	8.50	17.55	28.50	38.10	54.20	68.15	80.05	10.50	22.95	35.75	49.55	68.45	79.65	90.60
KW/F	8.50	17.55	28.50	38.10	54.20	68.15	80.05	10.50	22.95	35.75	49.55	68.45	79.65	90.60
INT	14.05	25.15	40.45	53.20	72.85	86.05	93.30	17.30	33.90	50.60	65.50	84.30	94.15	97.75
Puri & Sen	11.25	25.00	41.85	56.25	75.90	89.05	95.65	13.50	33.75	51.75	68.00	86.85	95.65	98.70
Puri & Sen + INT	11.80	23.80	39.45	52.40	72.15	85.75	93.05	13.40	31.75	49.25	64.35	83.85	94.00	97.65
Koch	7.85	20.30	35.45	51.25	71.40	84.75	91.90	9.60	27.80	45.55	62.80	83.10	93.45	97.40
	large design (4*6)													
parametric	11.70	18.90	25.75	31.95	48.30	61.65	72.40	9.15	13.10	16.35	19.05	28.50	37.00	48.35
parametric HF-adj	9.40	14.80	20.95	26.40	41.90	55.05	67.30	6.80	10.05	13.05	15.15	23.45	31.15	42.45
van der Waerden	7.50	13.65	18.50	24.10	36.45	50.00	62.75	4.35	8.35	11.70	12.85	20.10	28.95	37.05
KW/F	7.40	13.25	18.40	24.15	35.85	50.05	62.90	4.50	8.05	11.70	13.05	19.65	28.60	37.20
INT	11.40	18.25	25.75	32.35	49.05	63.05	74.85	8.95	12.70	16.35	18.15	29.55	38.70	48.90
Puri & Sen	8.65	15.00	24.20	30.30	47.80	63.40	75.85	5.30	9.55	14.20	15.85	27.55	37.50	48.70
Puri & Sen + INT	8.85	16.65	24.55	31.20	48.50	62.70	74.45	6.45	11.55	15.80	17.25	28.60	38.00	48.60
Koch	3.50	10.60	18.45	27.35	45.50	59.90	74.60	2.45	6.60	11.30	14.10	26.15	36.00	47.10


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

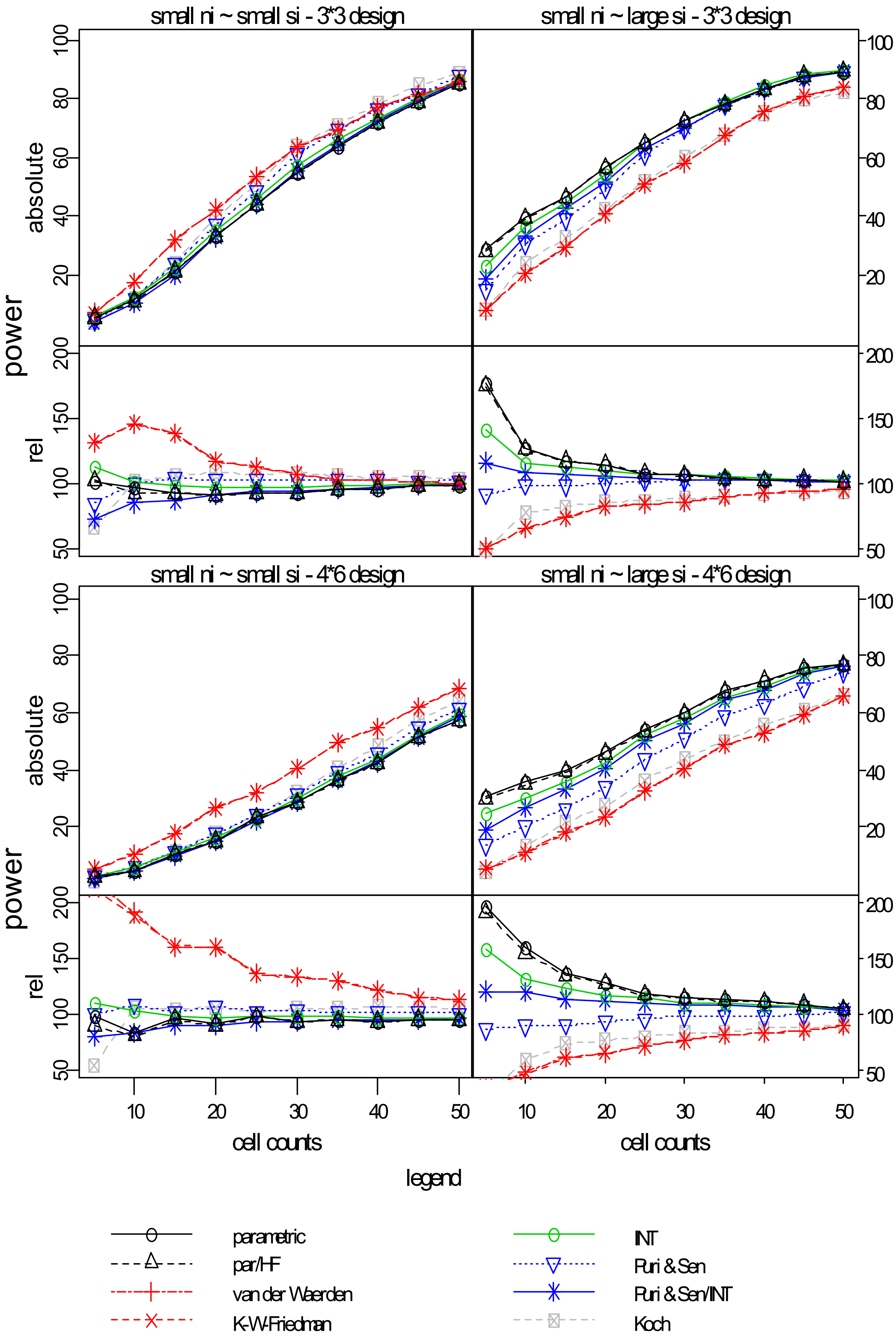
2. 3. 1. 4 normal distribution - unequal variances (on A and B)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	14.55	24.15	39.35	50.55	68.70	83.30	91.10	18.90	34.30	49.40	63.55	80.60	92.00	96.90
parametric HF-adj	13.20	22.75	36.85	47.55	66.45	81.50	90.25	17.30	32.10	46.90	61.45	78.65	91.00	96.15
van der Waerden	10.00	22.45	36.60	50.50	69.50	84.45	92.65	13.25	29.75	47.10	62.45	81.40	91.55	96.75
KW/F	10.00	22.45	36.60	50.50	69.50	84.45	92.65	13.25	29.75	47.10	62.45	81.40	91.55	96.75
INT	14.40	26.65	42.30	55.30	75.80	89.00	94.70	19.85	38.30	54.45	69.40	87.25	95.45	98.65
Puri & Sen	12.30	28.15	46.20	62.00	82.30	93.45	97.95	17.55	39.25	57.65	74.35	91.20	97.55	99.40
Puri & Sen + INT	11.45	25.20	41.05	54.60	75.25	88.75	94.45	17.05	36.25	53.00	68.05	86.70	95.00	98.60
Koch	8.55	19.75	36.80	51.75	71.85	86.35	92.85	11.45	29.40	45.15	62.00	80.45	92.45	96.60
	large design (4*6)													
parametric	13.85	19.85	25.35	32.25	46.65	58.50	69.85	13.25	18.25	21.55	23.85	32.05	39.80	48.80
parametric HF-adj	10.35	15.40	20.55	27.00	40.85	52.80	63.90	10.05	14.15	17.10	19.15	26.60	33.95	42.95
van der Waerden	7.45	14.85	22.95	29.10	46.15	59.30	72.55	4.40	7.60	11.50	11.45	19.95	28.35	37.65
KW/F	7.70	14.85	22.80	28.90	45.25	59.45	72.35	4.15	7.55	11.40	11.60	19.75	29.00	37.80
INT	12.45	18.15	26.15	33.65	50.85	64.10	75.80	10.75	14.00	18.55	20.50	30.65	39.30	49.55
Puri & Sen	8.95	15.45	25.25	33.35	52.40	67.35	78.85	6.40	10.65	14.85	17.20	27.25	36.90	48.55
Puri & Sen + INT	10.25	16.70	25.25	32.75	49.75	63.60	75.45	8.50	12.80	17.40	20.00	29.95	38.55	49.15
Koch	3.70	11.30	20.40	28.60	46.50	60.60	74.55	2.90	7.15	12.75	16.35	25.50	36.45	46.75


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*5 design
unequal cell counts - 4*5 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

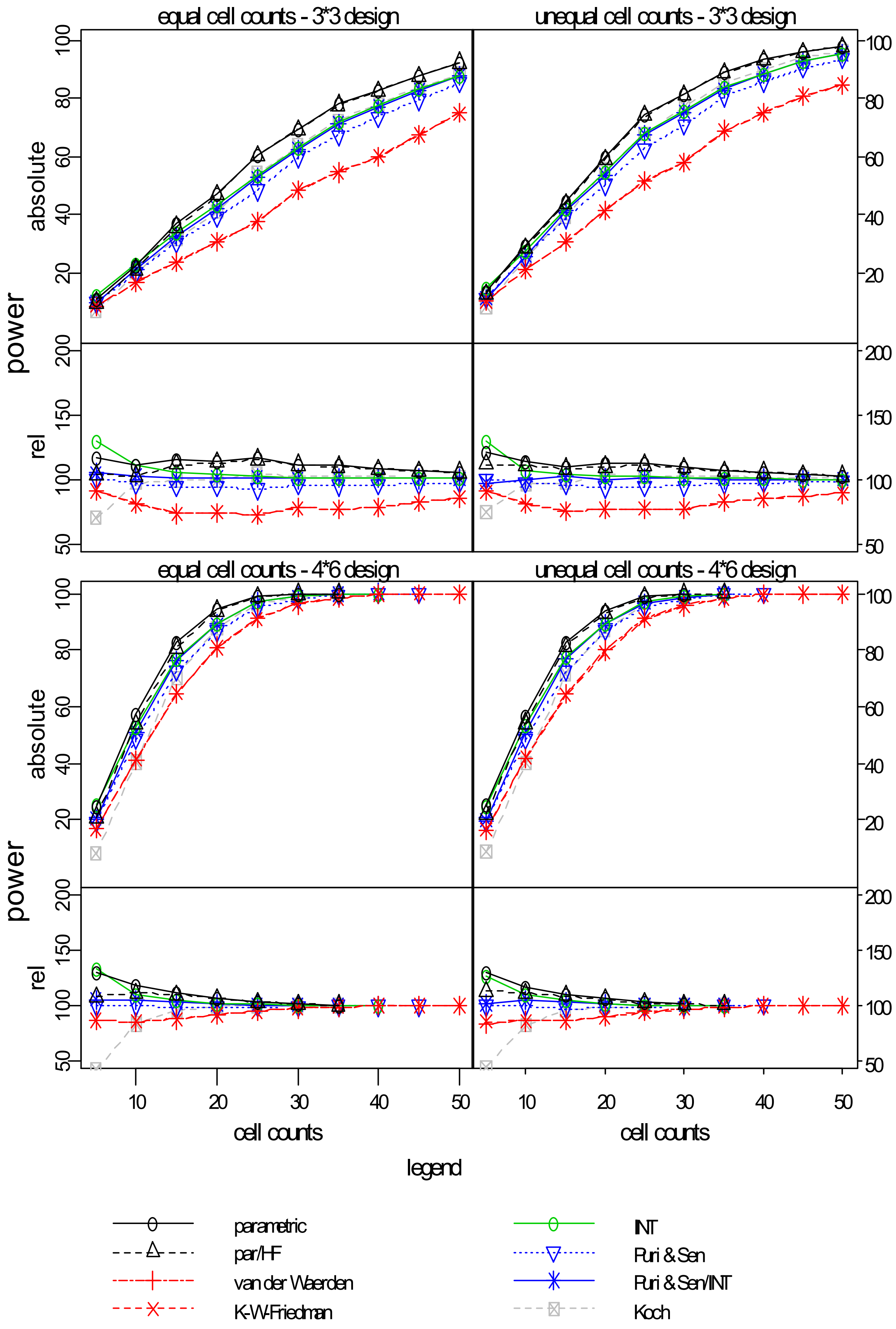
2. 3. 1. 5 normal distribution - unequal variances (on A) - pairing

	small n_i ~ small s_i							small n_i ~ large s_i						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	5.30	11.70	21.35	33.20	54.80	71.90	85.15	28.50	39.50	46.55	56.65	72.55	83.20	89.40
parametric HF-adj	5.35	11.05	21.20	33.05	54.70	71.90	85.20	28.05	39.15	46.40	56.60	72.35	83.10	89.40
van der Waerden	6.90	17.55	31.65	42.45	63.45	76.80	86.30	8.10	20.40	29.30	40.65	58.25	75.65	84.00
KW/F	6.90	17.55	31.65	42.45	63.45	76.80	86.30	8.10	20.40	29.30	40.65	58.25	75.65	84.00
INT	5.90	12.20	22.40	34.95	57.20	73.50	86.45	22.80	36.10	44.60	54.45	72.45	84.50	89.85
Puri & Sen	4.45	12.05	23.80	37.35	61.05	76.60	88.00	14.75	30.65	39.00	49.35	69.85	83.75	89.60
Puri & Sen + INT	3.80	10.20	19.85	32.95	55.60	72.40	86.00	18.65	33.50	42.60	51.95	70.35	83.20	89.25
Koch	3.45	12.15	24.25	39.35	63.85	78.35	88.95	7.95	24.10	32.55	42.35	60.10	75.20	82.45
	large design (4*6)													
parametric	2.45	4.60	10.65	15.30	28.45	42.05	57.55	30.65	35.85	39.80	45.95	59.90	71.25	76.65
parametric HF-adj	2.25	4.45	10.60	15.00	28.50	42.05	57.50	29.90	34.80	39.40	45.65	59.70	71.05	76.55
van der Waerden	5.40	10.50	17.65	26.60	40.60	54.45	68.25	5.25	10.95	18.00	23.25	40.30	52.95	65.55
KW/F	5.25	10.35	17.80	26.60	40.60	54.60	68.15	5.50	10.55	17.80	23.45	40.10	52.80	65.75
INT	2.75	5.65	10.80	16.00	29.75	43.80	59.05	24.70	29.65	36.00	42.05	57.70	69.10	76.80
Puri & Sen	2.50	6.00	11.30	17.70	31.35	45.60	61.30	13.55	20.10	26.45	33.75	51.05	62.90	74.10
Puri & Sen + INT	2.00	4.60	10.05	15.05	28.50	42.70	58.50	18.90	26.75	33.15	40.35	56.25	67.70	75.90
Koch	1.35	5.80	11.55	17.65	32.15	48.30	63.80	4.35	13.25	21.65	27.50	43.75	55.95	66.35


small ni ~ small si - 3*3 design
small ni ~ large si - 3*3 design
small ni ~ small si - 4*6 design
small ni ~ large si - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

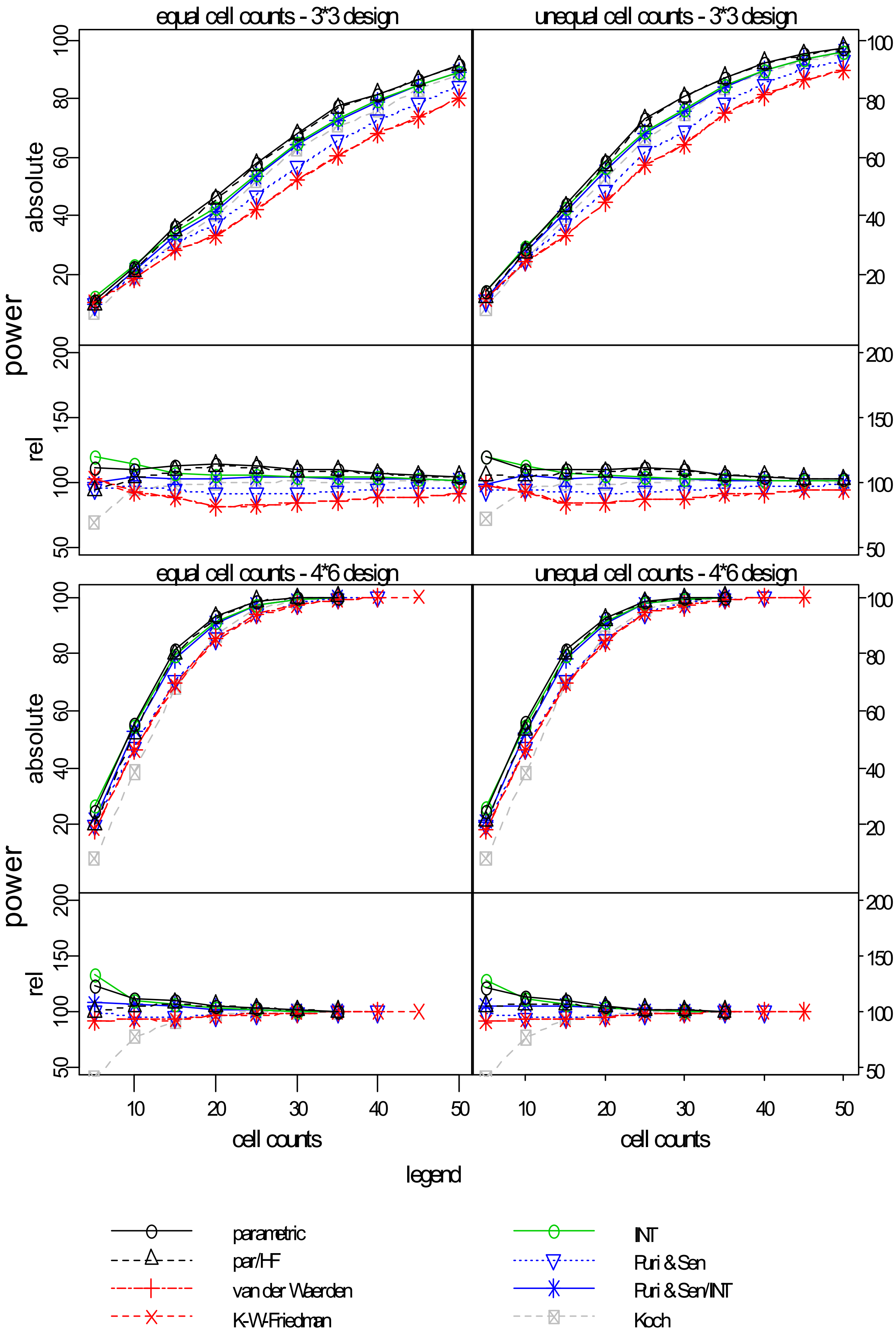
2. 3. 1. 6 exponential distribution

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	11.15	22.65	36.95	47.35	69.70	82.90	92.60	13.80	29.50	44.65	60.20	81.70	93.35	97.85
parametric HF-adj	9.80	21.10	35.90	46.80	69.40	82.70	92.50	12.70	28.65	43.85	59.10	81.35	93.20	97.85
van der Waerden	8.65	16.55	23.55	30.80	48.45	60.05	75.00	10.30	21.00	30.80	41.30	58.00	75.00	84.85
KW/F	8.65	16.55	23.55	30.80	48.45	60.05	75.00	10.30	21.00	30.80	41.30	58.00	75.00	84.85
INT	12.25	22.90	33.65	43.10	63.10	77.80	88.20	14.70	27.65	42.40	54.95	75.65	88.85	95.55
Puri & Sen	9.55	19.75	30.40	39.20	59.75	73.70	85.45	11.40	25.30	38.90	50.30	70.95	85.90	93.80
Puri & Sen + INT	9.95	21.15	32.40	42.10	62.60	77.35	88.05	11.05	25.75	41.30	53.85	75.35	88.60	95.55
Koch	6.65	19.95	32.00	41.15	63.80	78.20	88.80	8.50	25.00	39.45	55.55	77.05	89.90	96.15
	large design (4*6)													
parametric	25.05	57.30	82.55	94.20	99.85	100.0	100.0	25.25	56.85	82.45	93.55	99.65	100.0	100.0
parametric HF-adj	20.80	53.95	80.95	93.85	99.75	100.0	100.0	21.85	54.10	81.30	92.90	99.65	100.0	100.0
van der Waerden	16.75	41.05	64.75	81.10	96.10	99.75	99.85	16.25	41.75	64.55	79.85	95.50	99.50	99.85
KW/F	16.70	41.35	64.80	80.80	96.10	99.65	99.85	16.55	41.85	64.10	79.00	95.40	99.50	99.85
INT	25.70	53.05	77.05	89.30	98.90	99.95	100.0	24.50	53.15	77.85	89.30	98.70	100.0	100.0
Puri & Sen	19.25	48.30	72.45	86.70	97.95	99.90	100.0	19.25	48.50	72.40	86.95	97.80	99.80	100.0
Puri & Sen + INT	20.35	51.10	76.05	89.05	98.75	99.95	100.0	19.65	51.00	76.70	89.00	98.55	100.0	100.0
Koch	8.15	40.35	70.25	87.80	98.50	100.0	100.0	8.65	40.05	71.70	86.90	98.60	100.0	100.0


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
150
200
10
30
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

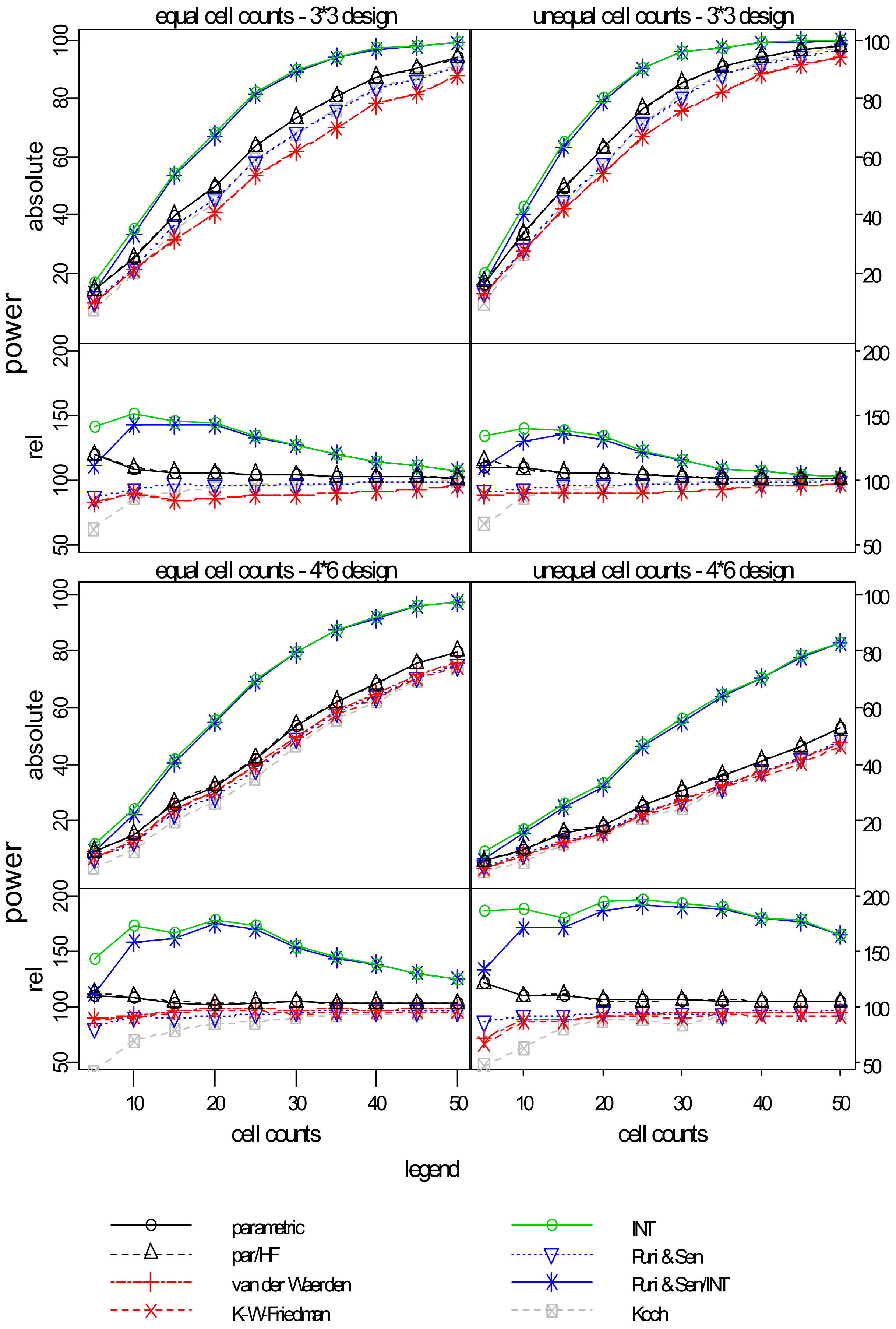
2. 3. 1. 7 exponential distribution - discrete values

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	11.20	22.25	36.60	46.40	68.30	81.60	91.65	13.95	28.85	44.20	58.60	81.10	92.60	97.60
parametric HF-adj	9.40	20.85	35.25	45.55	67.80	81.50	91.65	12.30	27.50	43.05	57.55	80.70	92.50	97.65
van der Waerden	10.35	18.75	28.40	33.05	52.45	67.95	80.35	11.40	24.40	33.50	44.80	64.60	81.25	89.80
KW/F	10.35	18.55	28.45	33.00	52.50	67.95	80.20	11.55	24.45	33.45	44.75	64.45	81.15	89.65
INT	12.05	22.90	34.70	42.90	65.20	79.35	89.50	14.00	29.50	42.70	56.50	76.35	90.00	96.45
Puri & Sen	9.55	19.60	30.45	37.05	57.00	72.55	84.50	10.95	24.80	37.15	48.70	69.10	85.15	93.30
Puri & Sen + INT	10.00	21.15	33.05	41.70	64.60	78.95	89.25	11.50	27.65	41.20	55.20	75.95	89.70	96.45
Koch	6.95	19.20	31.25	40.30	62.90	76.15	88.60	8.45	25.10	39.65	52.70	74.80	89.05	95.80
	large design (4*6)													
parametric	24.65	55.70	81.55	93.30	99.70	100.0	100.0	24.55	56.20	81.55	92.80	99.45	100.0	100.0
parametric HF-adj	20.10	52.00	79.90	92.80	99.50	100.0	100.0	21.15	53.05	79.75	91.90	99.35	100.0	100.0
van der Waerden	18.45	46.30	69.40	85.30	97.10	99.90	100.0	18.35	46.55	69.80	84.40	96.80	99.80	100.0
KW/F	18.40	46.05	68.65	84.90	96.90	99.90	100.0	18.15	45.95	69.20	83.95	96.50	99.80	100.0
INT	26.85	54.80	79.35	90.95	98.95	100.0	100.0	25.90	55.00	79.60	91.35	99.00	100.0	100.0
Puri & Sen	20.00	47.35	70.60	85.40	97.45	99.95	100.0	19.70	46.80	70.55	85.10	97.45	99.85	100.0
Puri & Sen + INT	21.65	53.00	78.25	90.50	98.95	100.0	100.0	21.15	52.20	78.35	90.85	98.90	100.0	100.0
Koch	8.10	38.40	67.95	86.55	98.25	100.0	100.0	8.15	38.05	70.00	85.85	98.10	100.0	100.0


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

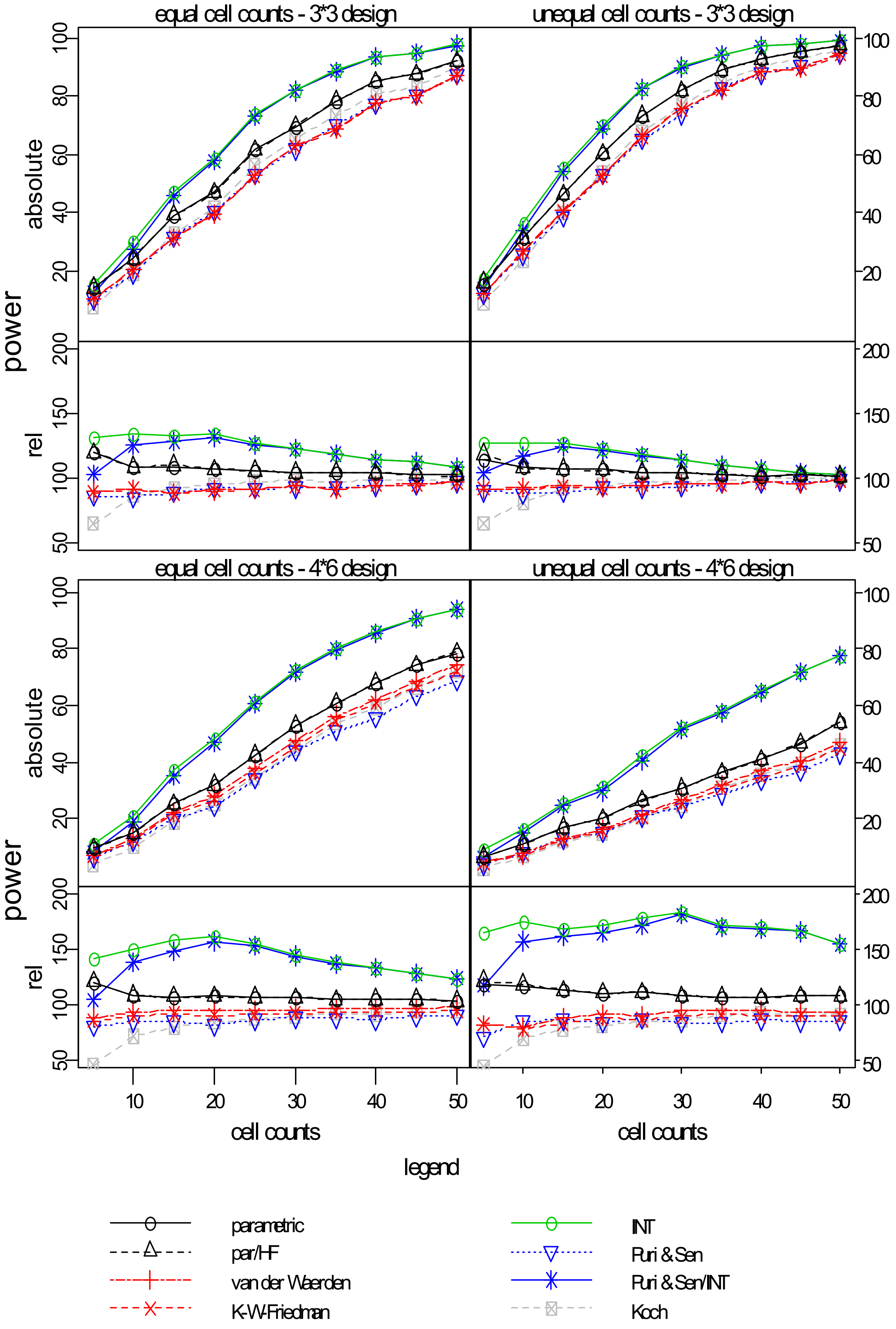
2. 3. 1. 8 uniform distribution

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	14.30	25.25	39.70	49.75	73.15	87.35	94.00	16.25	33.60	49.25	63.00	85.45	94.50	98.25
parametric HF-adj	14.25	25.40	39.60	49.60	73.35	87.40	93.95	16.95	33.35	49.45	63.00	85.50	94.45	98.25
van der Waerden	9.95	21.00	31.60	40.55	62.05	78.10	87.90	13.15	27.60	42.10	54.10	76.05	88.45	94.10
KW/F	9.95	21.00	31.60	40.55	62.05	78.10	87.90	13.15	27.60	42.10	54.10	76.05	88.45	94.10
INT	16.85	35.15	54.50	68.05	89.60	97.15	99.20	19.90	42.75	64.75	80.10	96.15	99.20	99.95
Puri & Sen	10.35	21.55	36.65	45.40	68.40	83.65	91.25	13.55	28.45	44.75	57.55	80.55	91.80	96.95
Puri & Sen + INT	13.25	33.20	53.70	67.25	89.30	97.10	99.15	16.15	40.05	63.35	78.80	96.05	99.20	99.95
Koch	7.40	20.00	34.35	44.15	67.75	84.20	91.95	9.75	26.60	43.45	56.85	81.80	92.45	97.35
	large design (4*6)													
parametric	9.00	15.15	26.20	32.10	53.75	68.25	79.70	5.80	10.05	15.75	18.30	30.65	41.25	52.45
parametric HF-adj	9.20	15.20	26.45	32.30	53.95	68.25	79.75	5.80	10.00	16.00	18.15	30.70	41.00	52.50
van der Waerden	7.30	12.80	24.40	30.85	49.50	64.45	75.50	3.45	8.15	12.65	15.85	27.25	37.05	47.45
KW/F	7.20	12.60	23.80	30.15	48.50	63.35	74.05	3.20	7.95	12.50	15.60	26.05	36.05	46.05
INT	11.60	24.15	41.90	55.65	79.80	91.60	97.25	8.95	17.25	25.95	33.40	55.80	70.55	82.90
Puri & Sen	6.60	12.70	22.80	28.60	49.15	63.80	74.80	4.15	8.45	13.30	16.40	27.15	37.70	48.50
Puri & Sen + INT	9.10	22.10	40.55	54.70	79.20	91.40	97.10	6.40	15.65	24.70	32.05	54.65	70.35	82.60
Koch	3.35	9.70	19.90	26.75	46.55	62.15	74.85	2.25	5.75	11.80	15.15	24.30	37.20	47.50


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

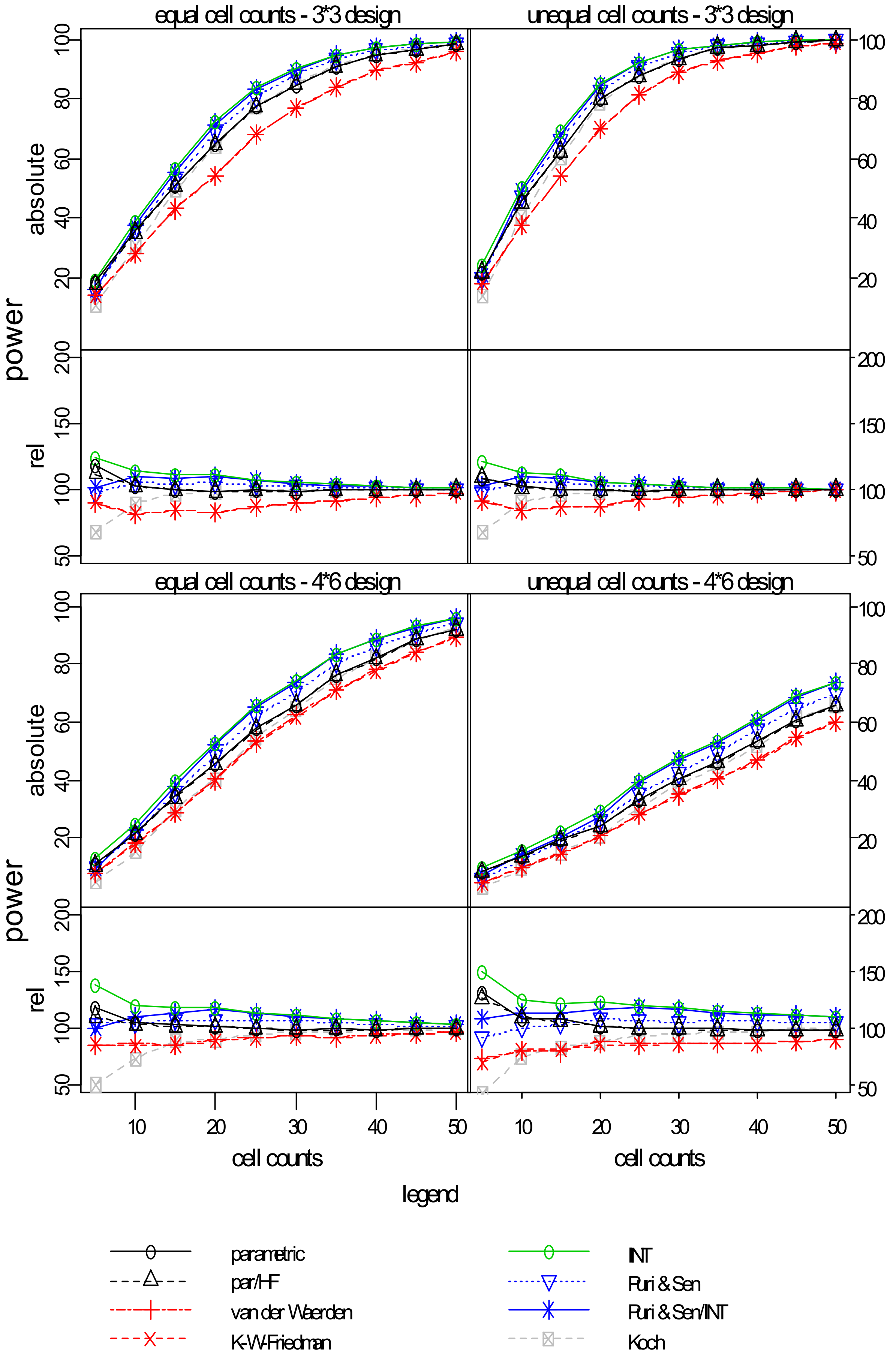
2. 3. 1. 9 uniform distribution - discrete values

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	14.30	24.20	38.80	47.10	69.55	85.35	92.30	15.40	31.30	46.55	60.50	81.95	92.75	97.70
parametric HF-adj	14.30	24.05	39.15	46.90	69.80	85.25	92.25	16.05	31.10	46.50	60.40	82.05	92.75	97.70
van der Waerden	10.65	20.35	31.35	39.80	63.25	77.85	87.40	12.35	26.95	40.70	53.10	75.70	88.40	94.60
KW/F	10.60	20.35	31.35	39.70	62.85	77.85	87.35	12.40	26.55	40.50	52.75	75.70	88.30	94.50
INT	15.65	29.80	47.00	58.80	82.45	93.60	97.80	17.15	36.60	55.20	70.05	90.50	97.35	99.30
Puri & Sen	10.25	18.85	31.70	40.45	61.80	77.50	87.55	12.15	25.45	38.75	53.05	73.75	87.90	94.50
Puri & Sen + INT	12.30	27.80	45.70	57.80	81.90	93.55	97.75	14.00	33.75	54.10	68.95	90.10	97.35	99.25
Koch	7.70	19.15	32.80	41.45	65.45	81.00	90.20	8.80	23.45	39.90	53.90	77.10	90.70	96.20
	large design (4*6)													
parametric	9.55	14.95	25.20	32.15	52.85	67.60	78.50	6.40	11.00	17.20	19.95	30.85	40.95	53.90
parametric HF-adj	9.55	15.05	25.25	32.00	52.75	67.75	78.60	6.60	11.20	17.10	20.00	30.60	40.85	53.95
van der Waerden	7.05	13.05	22.20	28.10	47.65	62.15	74.05	4.45	7.55	13.30	16.45	26.90	36.85	46.85
KW/F	6.80	12.50	21.55	26.95	45.85	60.75	71.85	4.50	7.35	12.60	15.95	25.40	34.70	44.85
INT	11.25	20.85	37.10	48.10	72.10	85.95	93.85	8.95	16.55	25.45	31.00	52.15	65.20	77.65
Puri & Sen	6.40	11.80	19.95	24.20	43.80	55.50	68.55	3.85	8.05	13.10	15.20	23.80	33.30	42.95
Puri & Sen + INT	8.30	19.20	35.00	46.80	71.65	85.55	93.75	6.35	14.85	24.60	29.70	51.45	64.60	77.45
Koch	3.60	9.95	18.80	25.15	44.50	59.20	72.05	2.40	6.60	11.90	14.80	24.55	35.70	45.75


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
150
200
10
30
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

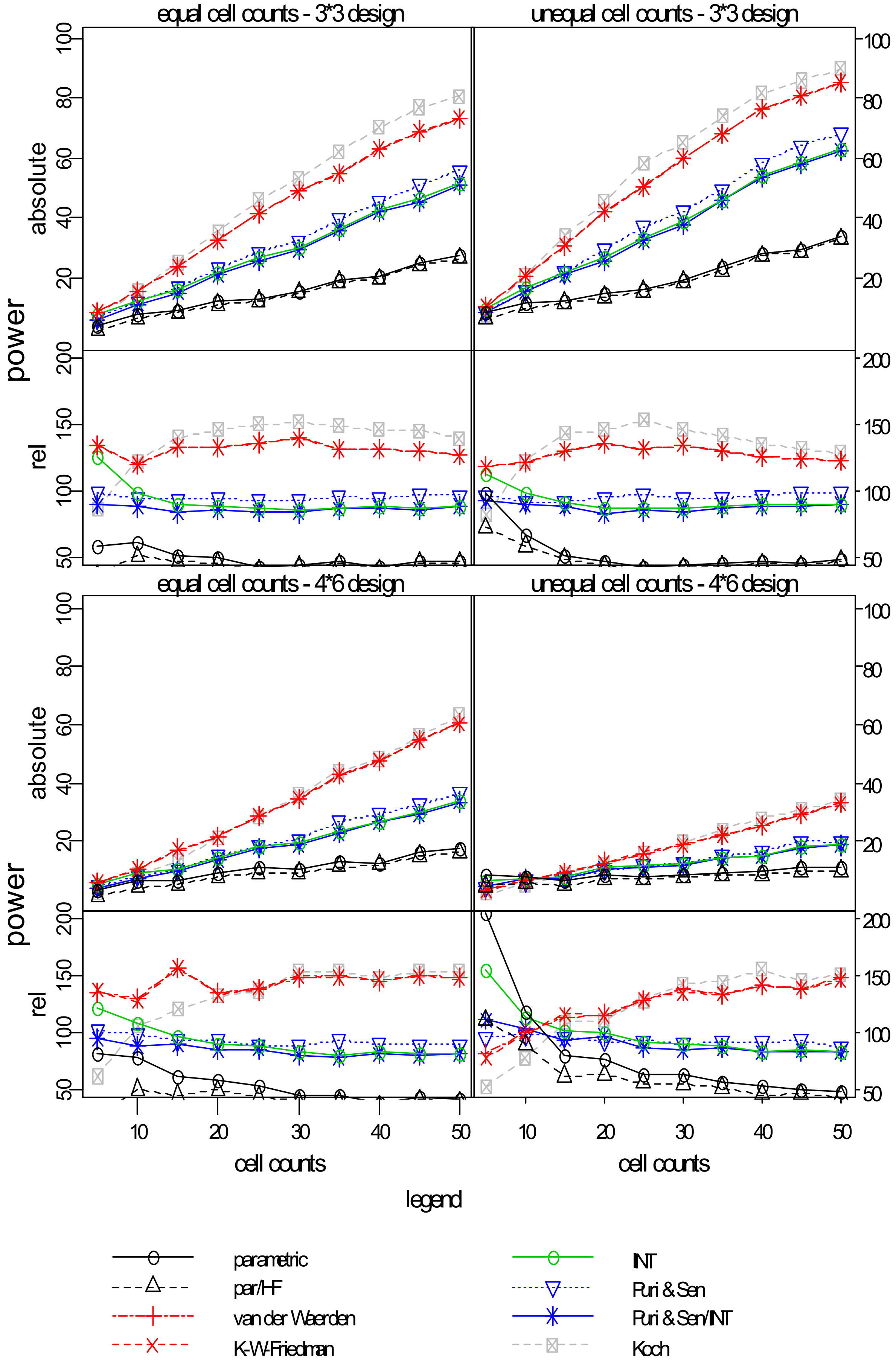
2. 3. 1. 10 lognormal distribution - equal variances

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	18.65	35.50	51.10	64.75	84.95	94.95	98.65	21.85	46.15	62.65	80.45	93.70	98.10	99.75
parametric HF-adj	17.60	35.20	50.85	64.60	85.00	94.90	98.65	21.90	45.20	62.65	80.45	93.80	98.05	99.75
van der Waerden	14.15	28.05	43.10	54.30	77.15	90.10	96.15	18.25	37.65	54.40	70.35	88.90	95.80	98.90
KW/F	14.15	28.05	43.10	54.30	77.15	90.10	96.15	18.25	37.65	54.40	70.35	88.90	95.80	98.90
INT	19.55	39.25	56.65	72.90	90.25	97.60	99.40	24.30	50.70	69.60	85.45	96.95	99.15	99.90
Puri & Sen	15.20	36.25	53.15	68.75	88.30	96.80	99.00	19.70	47.45	66.30	82.95	95.70	99.00	99.95
Puri & Sen + INT	16.00	37.60	55.50	71.65	89.75	97.60	99.40	20.75	49.10	68.10	84.90	96.90	99.05	99.90
Koch	10.55	30.75	49.40	64.25	85.50	95.20	98.75	13.60	40.75	60.35	79.00	93.90	98.35	99.70
	large design (4*6)													
parametric	11.10	21.80	34.50	45.80	65.80	81.95	91.95	8.70	13.55	19.55	24.25	40.65	53.45	65.50
parametric HF-adj	10.40	21.30	34.05	45.30	65.85	81.70	91.95	8.35	13.65	19.10	24.15	40.55	53.25	65.50
van der Waerden	8.00	18.00	28.55	40.10	62.35	78.25	89.35	4.80	9.95	14.35	20.80	34.90	47.05	60.25
KW/F	8.10	17.45	28.50	39.80	61.75	77.45	89.10	4.60	10.10	14.75	20.35	34.75	46.55	59.70
INT	13.05	24.80	39.60	53.05	74.05	88.65	95.95	9.90	15.55	21.95	29.25	47.75	61.05	73.80
Puri & Sen	9.85	21.75	35.90	48.15	70.50	86.25	94.25	6.10	12.55	18.75	25.90	42.35	57.40	70.00
Puri & Sen + INT	9.45	22.65	37.90	51.95	73.50	88.30	95.80	7.20	14.05	20.50	27.65	47.00	60.35	73.50
Koch	4.75	15.10	29.80	40.25	64.45	82.05	92.55	2.80	9.35	15.00	20.80	38.30	51.75	65.85


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

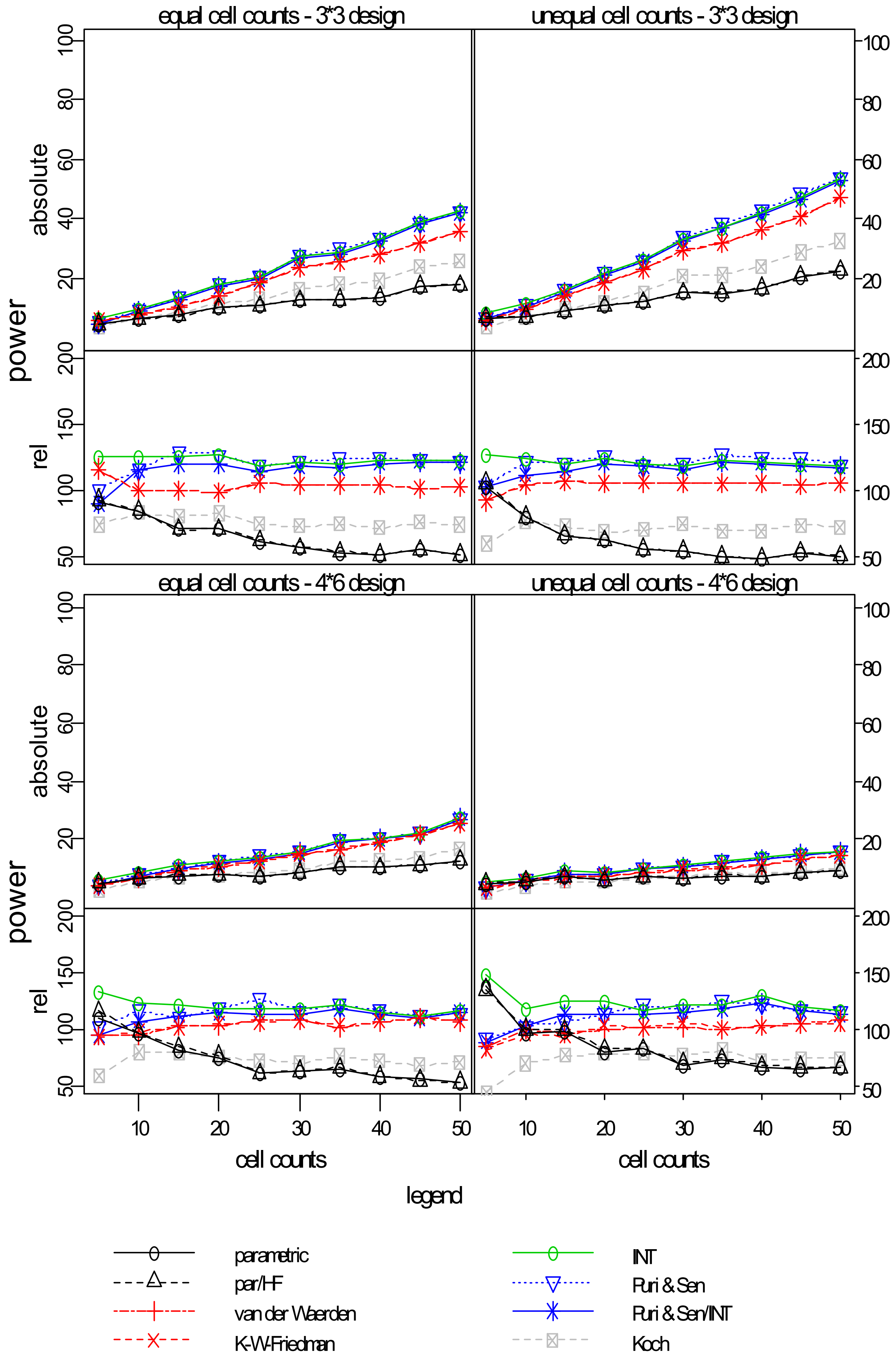
2. 3. 1. 11 normal distribution - equal variances - contaminated I

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	3.75	7.80	9.10	12.20	15.45	20.55	27.30	8.75	11.30	12.20	14.70	19.55	28.10	33.75
parametric HF-adj	2.35	6.40	8.30	11.15	15.05	19.75	26.55	6.40	10.00	11.60	13.60	18.80	27.25	33.15
van der Waerden	8.65	15.15	23.75	32.45	48.95	63.15	73.40	10.45	20.65	30.95	42.25	60.15	76.35	85.35
KW/F	8.65	15.15	23.75	32.45	48.95	63.15	73.40	10.45	20.65	30.95	42.25	60.15	76.35	85.35
INT	8.10	12.45	16.10	21.60	29.85	42.50	51.45	10.00	16.65	21.75	26.95	38.65	54.25	62.80
Puri & Sen	6.40	11.95	16.70	23.05	32.40	45.30	55.85	8.55	15.60	21.60	29.50	42.05	58.40	68.30
Puri & Sen + INT	5.80	11.10	14.90	20.90	29.30	42.15	51.20	8.20	15.30	20.90	25.70	37.85	53.65	62.65
Koch	5.60	15.50	25.00	35.70	53.30	70.35	80.80	7.25	20.85	34.00	45.40	65.10	81.85	90.00
	large design (4*6)													
parametric	3.50	6.50	6.75	9.35	10.65	12.55	17.40	8.65	7.75	6.30	8.35	8.75	9.65	10.95
parametric HF-adj	1.25	4.15	4.95	8.00	9.25	11.95	16.05	4.70	5.90	4.85	6.90	7.65	8.20	9.90
van der Waerden	5.80	10.65	17.25	21.70	34.65	47.45	60.70	3.45	6.60	8.90	12.70	19.00	25.55	33.20
KW/F	5.90	10.45	17.20	21.35	34.80	47.75	60.35	3.30	6.50	9.10	12.60	18.60	25.55	32.70
INT	5.25	8.95	10.70	14.55	19.45	27.00	33.90	6.55	7.45	7.95	10.95	12.45	15.05	18.90
Puri & Sen	4.40	8.05	10.20	14.95	20.55	29.45	36.70	4.05	6.45	7.55	10.10	12.55	16.40	19.65
Puri & Sen + INT	4.05	7.25	9.80	13.65	18.80	26.55	33.55	4.70	6.85	7.40	10.65	11.70	14.85	18.60
Koch	2.65	8.65	13.25	21.20	35.80	48.15	63.20	2.20	5.15	8.55	12.20	19.70	27.90	33.95


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

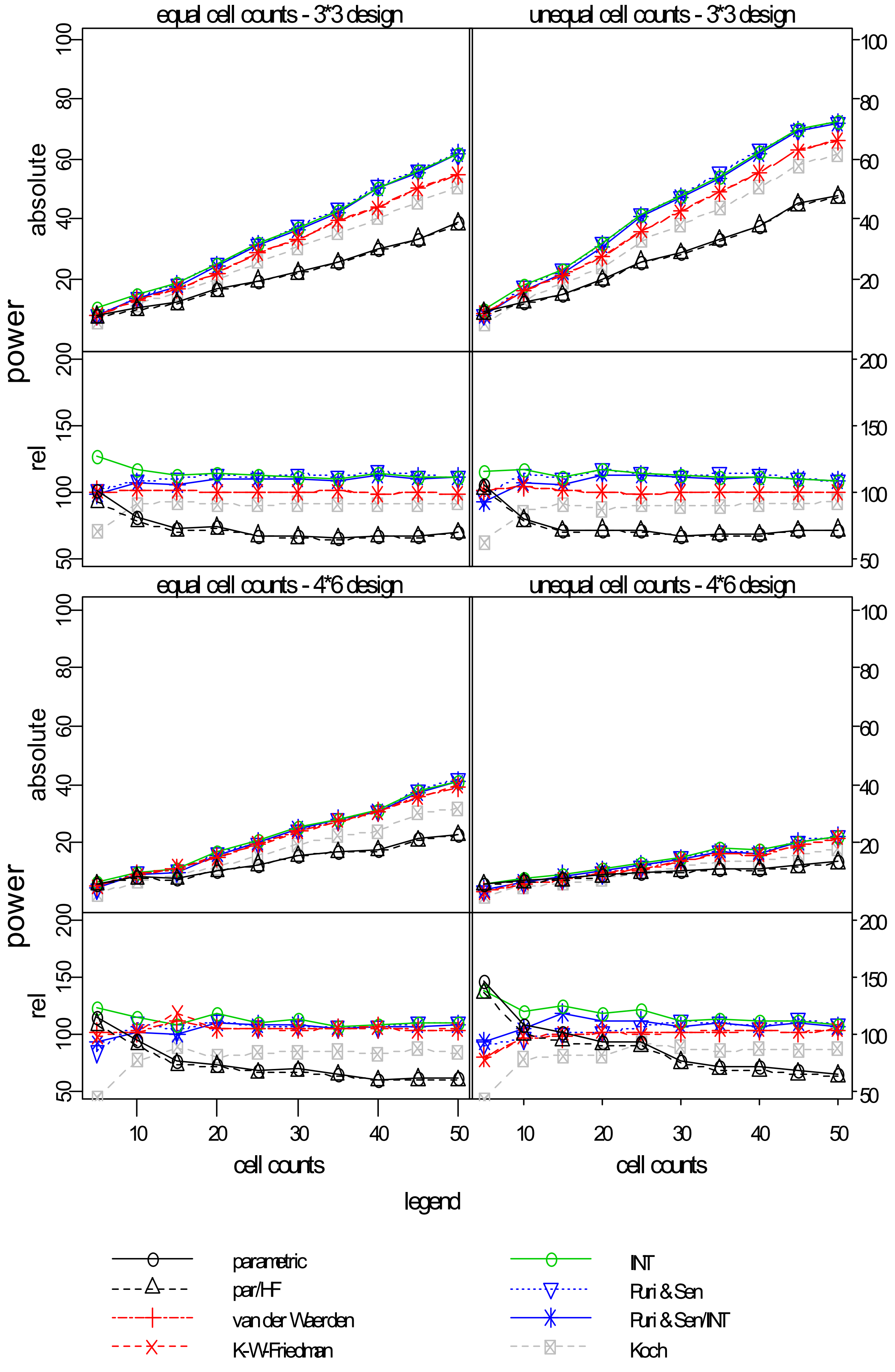
2. 3. 1. 12 normal distribution - equal variances - contaminated II

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	4.65	6.70	7.50	10.25	12.70	13.65	17.90	6.65	7.30	8.95	10.85	15.15	16.65	22.70
parametric HF-adj	4.75	6.70	7.45	10.20	12.80	13.75	17.90	6.90	7.30	8.95	10.85	15.25	16.80	22.80
van der Waerden	5.95	7.95	10.60	14.20	23.60	27.95	35.85	6.00	9.50	14.45	18.35	29.55	36.50	47.50
KW/F	5.95	7.95	10.60	14.20	23.60	27.95	35.85	6.00	9.50	14.45	18.35	29.55	36.50	47.50
INT	6.40	9.90	13.25	18.20	27.30	33.05	42.55	8.25	11.35	16.30	21.50	33.10	42.10	53.45
Puri & Sen	5.15	9.15	13.65	18.15	27.35	33.35	42.45	6.75	11.00	16.35	21.80	33.80	43.05	53.85
Puri & Sen + INT	4.60	9.10	12.65	17.20	26.60	32.30	42.05	6.70	10.15	15.50	20.90	32.55	41.55	53.05
Koch	3.80	6.60	8.45	11.85	16.45	19.25	25.85	3.90	7.00	9.85	11.95	20.90	24.10	32.55
	large design (4*6)													
parametric	4.60	6.55	7.25	7.85	8.55	10.20	12.55	4.80	5.50	7.00	5.60	6.35	7.25	9.00
parametric HF-adj	4.85	6.55	7.55	7.95	8.60	10.25	12.65	4.70	5.65	7.10	5.75	6.45	7.30	9.05
van der Waerden	3.95	6.45	9.25	10.70	14.70	18.75	25.30	2.95	5.65	6.85	6.95	9.30	11.15	14.55
KW/F	3.90	6.65	9.05	10.90	14.50	18.75	25.25	2.85	5.45	6.70	7.20	9.75	11.00	14.20
INT	5.60	8.30	10.80	12.25	15.95	20.15	27.45	5.15	6.65	8.90	8.70	11.15	13.95	15.80
Puri & Sen	4.25	7.85	9.80	12.20	15.65	20.50	26.85	3.20	5.80	7.60	7.85	10.70	13.20	15.70
Puri & Sen + INT	3.95	7.20	10.00	11.85	15.30	19.90	27.00	3.10	5.80	8.10	7.90	10.60	13.30	15.35
Koch	2.50	5.40	7.10	7.85	9.45	12.60	16.70	1.55	3.95	5.50	5.45	7.05	7.80	10.05


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 3. 1. 13 normal distribution - equal variances - contaminated III

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	8.05	10.25	12.05	16.40	22.35	29.85	38.65	8.85	12.05	14.90	19.75	28.65	37.90	47.85
parametric HF-adj	7.35	9.75	11.75	16.00	21.95	29.70	38.40	8.55	11.90	14.60	19.55	28.35	37.65	47.40
van der Waerden	8.00	12.70	16.95	21.90	33.30	43.75	54.85	8.45	15.80	21.15	27.55	42.65	55.55	66.30
KW/F	8.00	12.70	16.95	21.90	33.30	43.75	54.85	8.45	15.80	21.15	27.55	42.65	55.55	66.30
INT	10.15	14.70	18.75	24.90	37.25	50.45	61.85	9.65	17.75	23.20	32.05	48.05	62.35	72.35
Puri & Sen	8.05	13.65	18.30	24.95	37.90	51.20	61.55	8.10	17.20	22.90	32.15	47.55	63.40	72.40
Puri & Sen + INT	7.85	13.40	17.65	24.10	36.45	50.10	61.60	7.75	16.10	22.00	31.00	47.40	61.90	72.05
Koch	5.60	11.35	15.40	20.00	30.45	40.45	51.00	5.20	12.90	18.85	23.90	38.25	50.60	61.65
	large design (4*6)													
parametric	5.85	8.30	7.75	10.65	15.95	17.45	23.05	5.95	6.85	7.55	8.90	10.30	11.20	13.50
parametric HF-adj	5.55	7.95	7.40	10.40	15.35	17.25	22.50	5.55	6.30	7.00	8.60	10.10	10.65	13.20
van der Waerden	5.20	8.90	11.25	15.20	23.80	30.60	39.00	3.25	6.15	7.25	9.70	13.70	15.95	21.35
KW/F	5.00	9.00	11.95	15.05	23.55	30.40	39.50	3.15	6.20	7.45	9.65	13.75	16.00	21.65
INT	6.30	10.05	10.90	16.95	25.65	31.40	41.35	5.65	7.55	9.30	11.20	14.95	17.30	22.45
Puri & Sen	4.35	9.70	10.40	16.15	24.40	30.75	41.55	3.70	6.10	7.50	9.65	14.95	16.40	22.45
Puri & Sen + INT	4.75	8.90	10.10	15.80	24.75	30.65	40.80	3.80	6.60	8.75	10.55	14.40	16.55	22.00
Koch	2.30	6.80	9.00	11.60	19.30	24.00	31.75	1.75	4.95	6.05	7.75	11.95	13.50	18.05


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
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40
60
80
100
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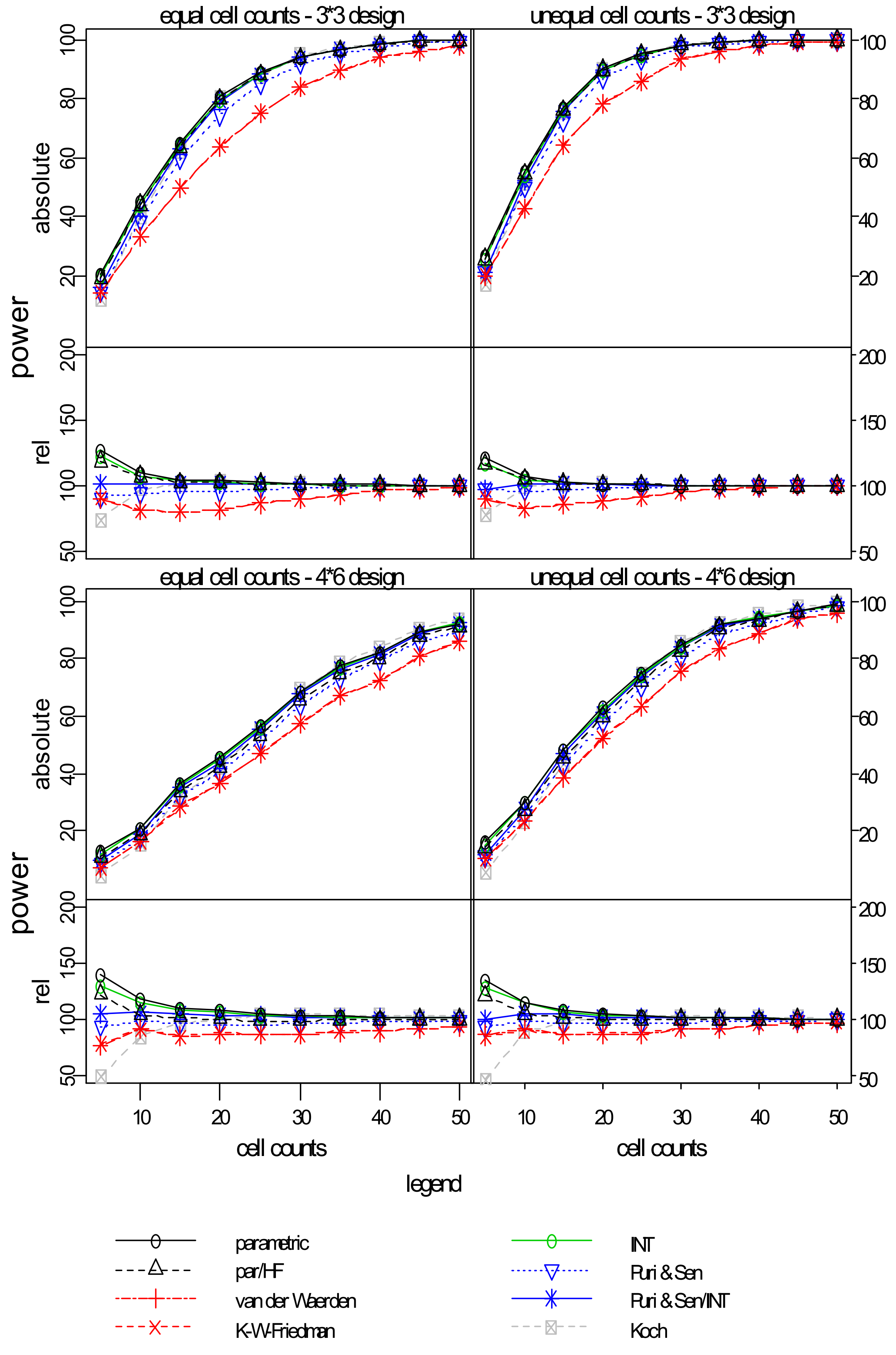
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 3. 2. unequal correlations on B (r = 0.7, 0.5, 0.4, 0.2, 0.1)

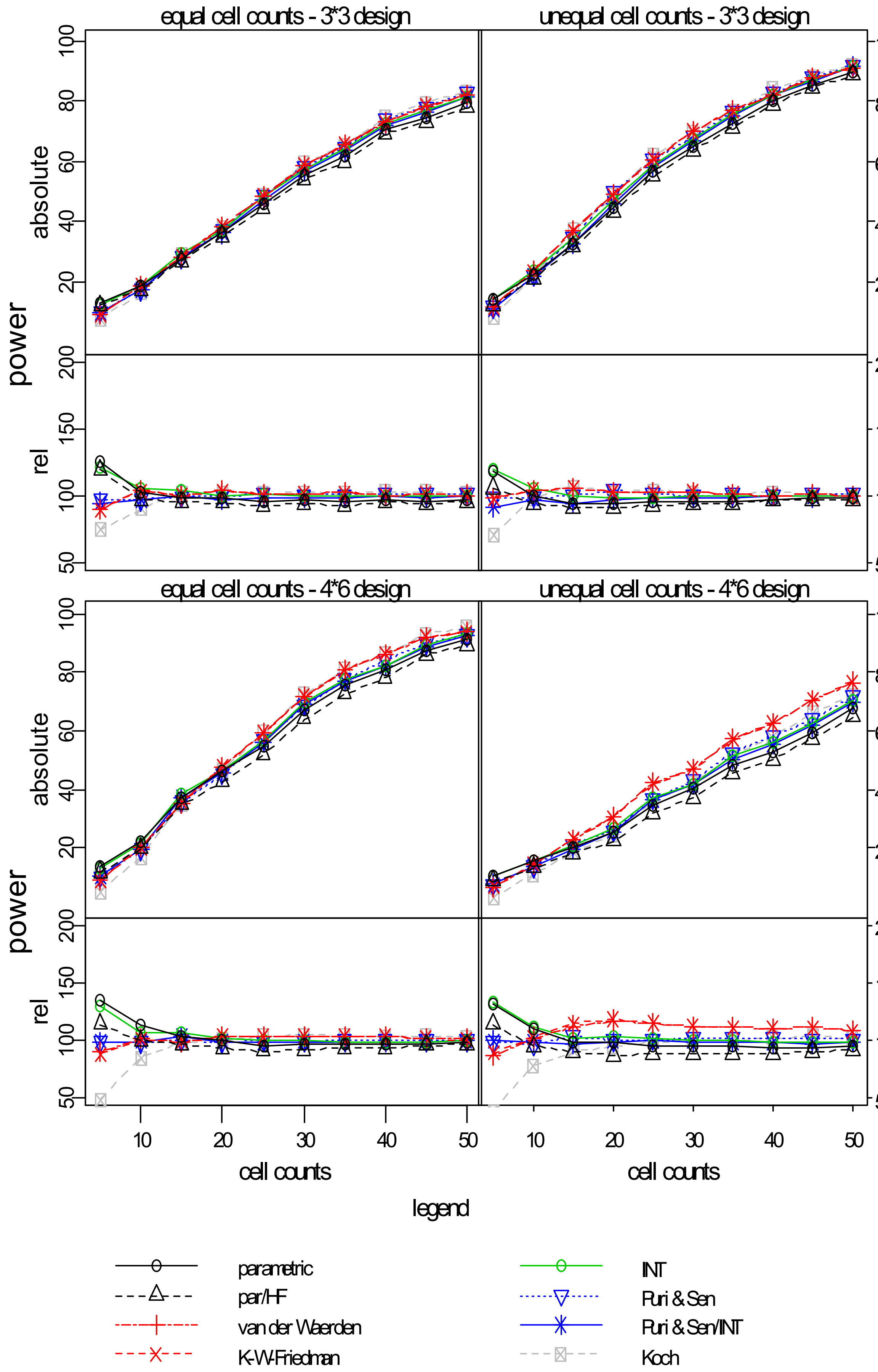
2. 3. 2. 1 normal distribution - equal variances

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	20.30	45.35	65.05	81.15	94.45	98.80	99.75	26.95	55.65	77.20	90.55	98.40	99.85	100.0
parametric HF-adj	19.00	44.10	63.65	79.90	94.10	98.60	99.75	25.65	54.65	76.05	89.80	98.35	99.80	100.0
van der Waerden	14.45	33.30	49.90	64.00	84.00	94.55	98.00	19.85	42.85	64.20	78.25	93.35	97.90	99.50
KW/F	14.45	33.30	49.90	64.00	84.00	94.55	98.00	19.85	42.85	64.20	78.25	93.35	97.90	99.50
INT	19.80	44.05	64.55	79.85	94.40	98.55	99.70	25.75	54.20	76.55	90.00	98.40	99.80	100.0
Puri & Sen	14.55	38.70	59.50	74.50	91.95	97.35	99.50	21.55	49.95	72.35	87.25	97.70	99.35	100.0
Puri & Sen + INT	16.30	41.90	63.10	79.30	94.10	98.50	99.70	21.45	52.30	75.75	89.75	98.35	99.75	100.0
Koch	11.80	40.15	62.45	80.55	95.15	98.95	99.65	17.05	51.60	75.75	90.25	98.45	99.80	100.0
	large design (4*6)													
parametric	12.75	21.10	36.40	45.45	68.70	82.05	92.15	16.00	30.00	48.50	63.20	84.75	94.05	98.70
parametric HF-adj	11.15	18.65	34.00	42.40	65.70	80.25	91.10	14.35	27.35	45.20	59.80	82.80	93.05	98.45
van der Waerden	7.00	16.35	28.40	36.70	57.30	72.10	85.75	10.20	23.65	38.65	52.25	75.40	88.60	95.85
KW/F	7.15	16.35	28.15	36.95	57.45	72.35	85.70	10.05	23.30	38.75	52.55	75.80	88.85	95.90
INT	11.90	20.70	36.15	44.70	68.35	81.85	92.35	15.25	29.75	47.90	62.20	84.20	94.20	98.65
Puri & Sen	8.55	17.65	31.85	40.10	63.60	79.30	89.25	11.05	25.50	42.90	57.60	80.40	92.10	98.05
Puri & Sen + INT	9.60	19.05	35.10	43.70	67.60	81.65	92.25	11.90	27.35	46.75	60.95	83.75	93.90	98.65
Koch	4.45	15.15	31.95	42.30	69.10	83.90	93.70	5.50	23.00	43.55	60.70	85.30	95.40	99.00


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 3. 2. 2 normal distribution - unequal variances (on A)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	12.85	18.35	27.75	36.65	55.75	70.80	79.35	13.95	22.25	32.55	44.65	65.30	80.25	89.80
parametric HF-adj	12.15	17.25	26.90	35.10	54.20	69.20	78.00	12.40	21.15	31.55	43.25	63.55	79.20	88.80
van der Waerden	9.10	18.55	28.30	38.40	58.75	73.00	82.10	11.50	23.45	36.75	48.90	70.05	82.40	91.10
KW/F	9.10	18.55	28.30	38.40	58.75	73.00	82.10	11.50	23.45	36.75	48.90	70.05	82.40	91.10
INT	12.35	18.75	29.40	36.90	57.70	72.60	81.55	14.05	23.60	34.55	46.95	67.40	82.45	91.55
Puri & Sen	9.85	17.30	28.05	37.20	58.25	73.85	82.65	11.50	22.10	34.65	49.65	68.35	82.70	92.00
Puri & Sen + INT	9.65	17.30	28.35	36.10	57.00	72.15	81.25	10.75	21.80	32.85	46.05	66.85	82.20	91.45
Koch	7.60	16.15	28.90	37.85	59.25	74.70	83.20	8.30	21.95	37.00	48.70	69.65	84.05	92.05
	large design (4*6)													
parametric	13.85	22.40	37.25	46.05	67.20	80.85	91.05	10.15	15.45	20.10	25.60	40.30	52.75	67.55
parametric HF-adj	11.70	19.80	34.80	42.60	64.05	78.25	89.25	8.80	13.30	18.25	22.40	36.85	50.00	64.75
van der Waerden	9.20	20.20	35.05	47.45	71.40	86.05	93.60	6.75	14.40	22.95	30.35	46.60	62.75	76.50
KW/F	9.05	20.00	35.30	47.65	71.75	86.35	93.55	6.85	14.45	23.35	30.55	47.10	62.60	76.65
INT	13.30	21.20	38.45	46.40	69.45	82.40	92.90	10.25	15.60	20.80	26.50	41.80	55.90	70.30
Puri & Sen	10.10	19.55	35.85	45.20	68.50	84.10	92.50	7.60	13.50	21.20	25.85	42.90	57.95	71.55
Puri & Sen + INT	10.15	19.70	37.20	45.40	68.85	82.10	92.50	7.70	13.95	19.65	25.50	41.45	55.40	69.85
Koch	4.95	16.85	35.05	46.30	72.60	86.20	95.30	2.95	10.95	18.50	24.45	42.15	57.90	72.25


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
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60
80
100
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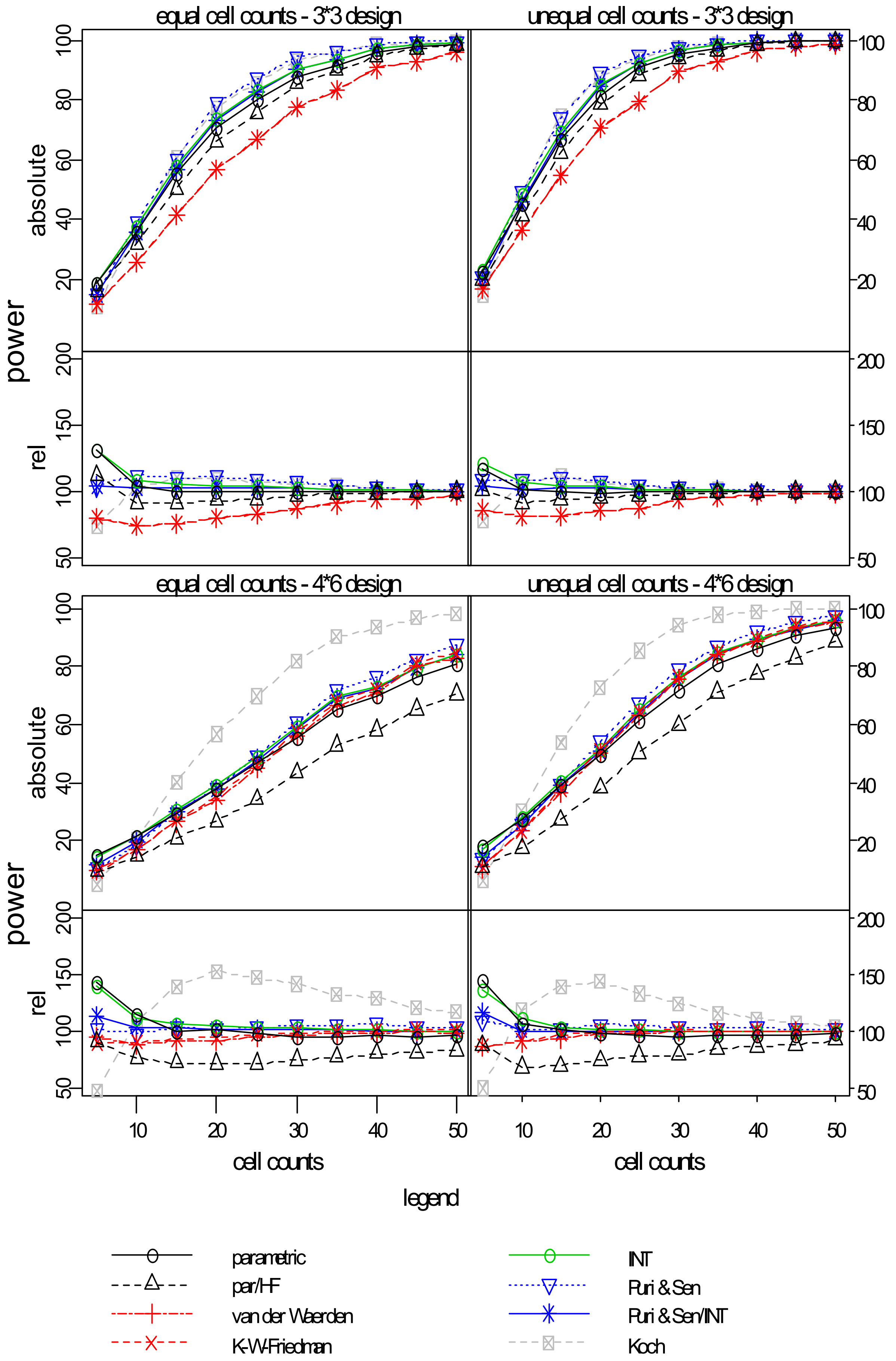
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 3. 2. 3 normal distribution - unequal variances (on B)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	18.70	35.95	55.20	70.75	88.05	96.35	98.80	22.45	45.55	67.15	81.75	95.40	99.30	99.85
parametric HF-adj	16.10	31.75	50.30	66.15	85.60	94.90	98.55	19.45	41.25	62.65	78.65	93.85	98.85	99.85
van der Waerden	11.50	25.70	41.60	56.90	77.55	90.80	96.05	16.50	36.65	54.75	70.85	89.55	96.50	98.90
KW/F	11.50	25.70	41.60	56.90	77.55	90.80	96.05	16.50	36.65	54.75	70.85	89.55	96.50	98.90
INT	18.75	37.80	57.90	74.00	90.70	97.35	99.25	23.20	48.20	69.75	85.40	96.60	99.65	99.95
Puri & Sen	14.90	38.85	60.35	79.20	94.70	98.85	99.80	20.70	49.00	73.90	89.05	97.85	99.90	100.0
Puri & Sen + INT	14.85	35.50	56.65	73.00	90.40	97.20	99.20	20.00	46.00	68.40	84.90	96.55	99.65	99.95
Koch	10.55	35.65	60.55	77.55	93.45	98.70	99.65	14.85	48.55	74.90	87.60	97.70	99.65	99.95
	large design (4*6)													
parametric	14.95	21.65	29.00	37.65	55.35	70.00	80.60	17.95	27.15	39.15	49.70	71.80	85.85	93.40
parametric HF-adj	9.40	14.55	20.85	26.60	43.55	58.15	70.30	10.95	17.40	27.05	38.00	59.85	77.45	88.40
van der Waerden	9.80	16.65	26.40	34.10	56.05	70.70	82.95	10.80	23.15	36.25	50.05	75.25	88.30	95.40
KW/F	9.35	17.10	26.90	35.10	57.30	72.00	84.55	10.80	23.35	37.65	51.15	76.40	89.20	95.95
INT	14.50	21.20	30.80	38.80	59.50	72.85	84.30	17.05	28.25	40.25	51.65	76.00	89.55	95.85
Puri & Sen	10.55	18.45	29.65	37.75	60.90	76.35	87.30	13.60	25.75	39.55	53.95	78.65	91.80	97.45
Puri & Sen + INT	11.80	19.65	29.70	37.75	58.55	72.25	83.75	14.40	25.60	38.80	50.60	75.40	89.25	95.70
Koch	4.90	20.45	40.20	56.65	81.80	93.30	98.10	6.25	30.10	54.00	72.90	94.30	98.95	100.0


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
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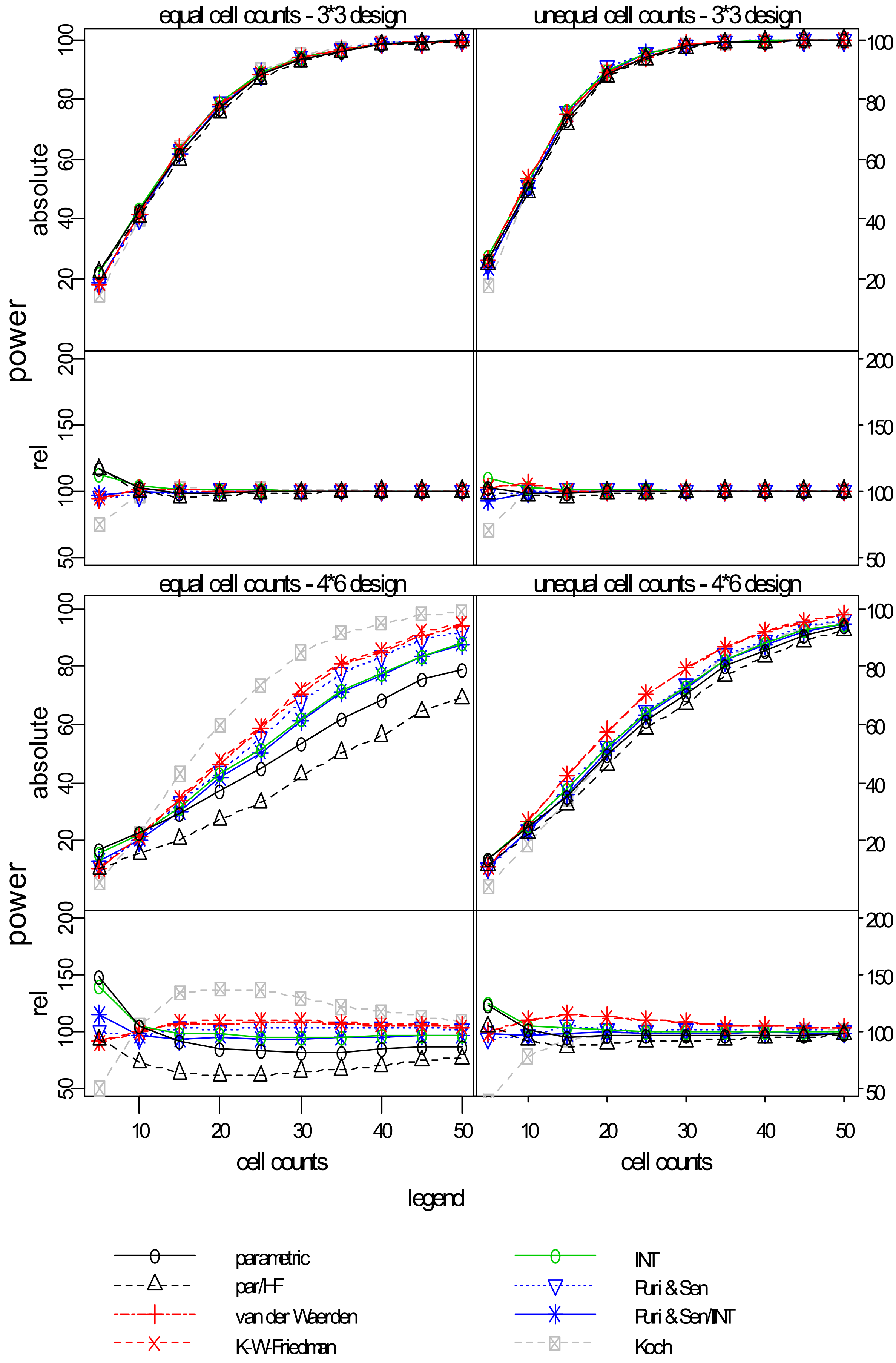
40
60
80
100
50
150
200
10
30
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

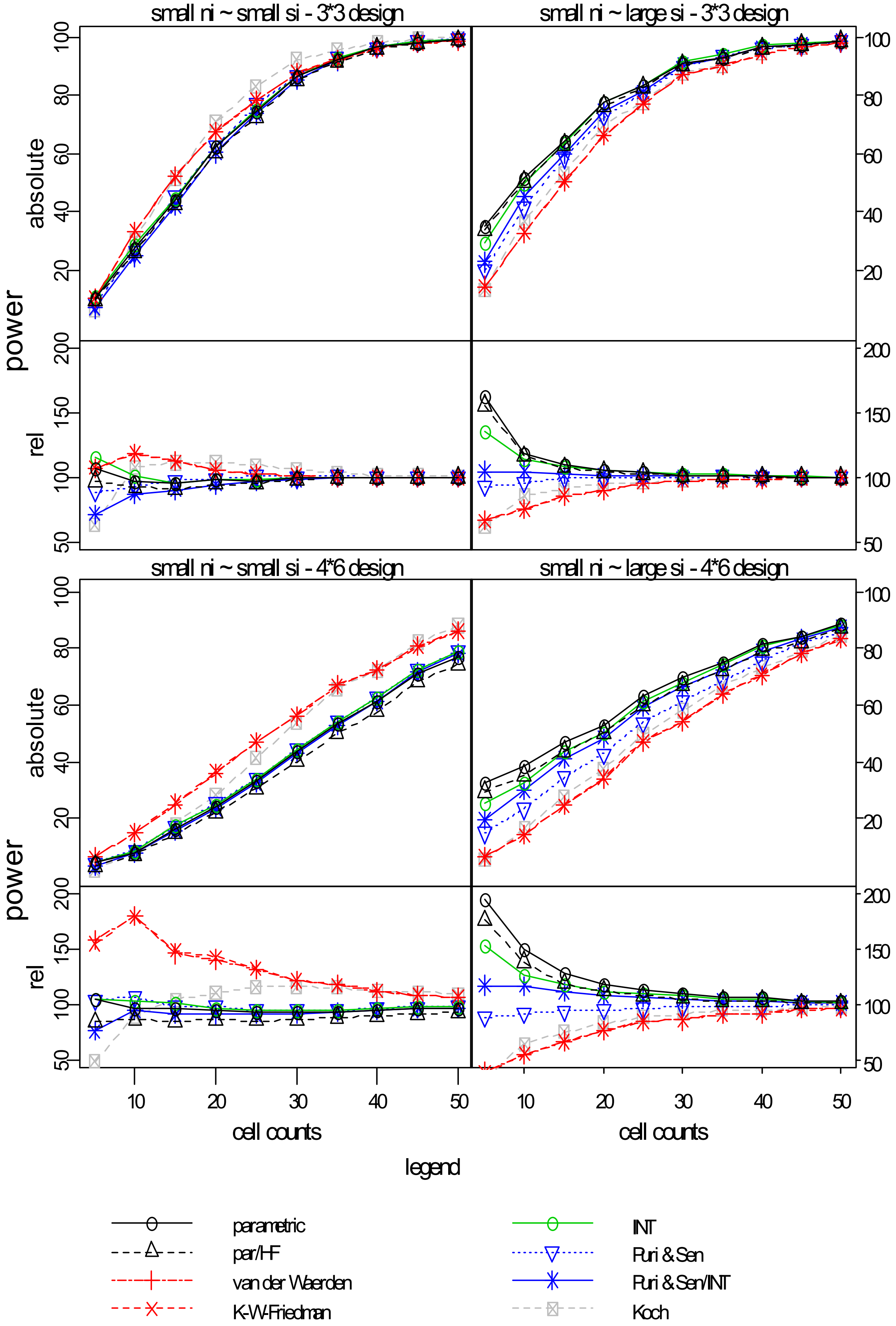
2. 3. 2. 4 normal distribution - unequal variances (on A and B)

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	22.40	42.55	61.65	76.85	93.55	98.70	99.75	26.10	50.45	73.55	88.70	97.90	99.60	100.0
parametric HF-adj	22.25	40.95	60.05	75.85	92.80	98.60	99.70	24.90	49.20	71.75	87.85	97.40	99.45	100.0
van der Waerden	18.10	41.55	63.50	78.15	94.25	98.90	99.65	26.00	53.65	75.05	89.35	98.65	99.50	100.0
KW/F	18.10	41.55	63.50	78.15	94.25	98.90	99.65	26.00	53.65	75.05	89.35	98.65	99.50	100.0
INT	21.65	43.15	63.30	78.70	94.50	98.90	99.80	27.65	52.30	76.25	90.05	98.30	99.70	100.0
Puri & Sen	18.25	40.00	63.10	79.20	94.45	99.05	99.95	24.55	51.00	76.05	90.95	98.40	99.75	100.0
Puri & Sen + INT	18.60	41.25	62.10	77.80	94.20	98.85	99.75	23.40	50.45	75.25	89.50	98.15	99.65	100.0
Koch	14.40	39.85	64.25	78.65	95.00	99.10	99.75	17.90	50.70	74.75	89.15	98.45	99.60	100.0
	large design (4*6)													
parametric	16.95	22.50	29.25	37.25	53.35	68.50	78.95	13.75	24.60	35.05	49.65	70.20	85.25	93.55
parametric HF-adj	10.60	15.55	20.45	27.10	42.60	56.15	68.90	11.75	22.40	32.15	45.90	66.95	83.20	92.55
van der Waerden	10.40	21.35	34.10	46.20	70.65	84.45	93.95	11.20	26.75	42.50	57.65	79.55	91.70	97.75
KW/F	10.25	21.25	34.85	47.75	72.20	85.45	94.55	10.90	26.75	42.65	57.25	79.10	91.80	97.60
INT	15.95	22.25	31.50	42.70	62.15	77.65	87.95	13.95	25.40	37.85	52.00	73.05	87.85	94.45
Puri & Sen	11.45	20.10	33.15	43.95	67.60	83.25	92.05	10.50	23.55	38.85	52.00	73.90	88.50	95.80
Puri & Sen + INT	13.10	20.50	29.75	41.60	61.55	77.10	87.40	11.05	23.35	36.00	51.05	72.40	87.50	94.20
Koch	5.70	22.40	43.05	59.80	84.65	94.65	98.50	4.35	18.95	34.20	49.10	73.00	88.20	95.95


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

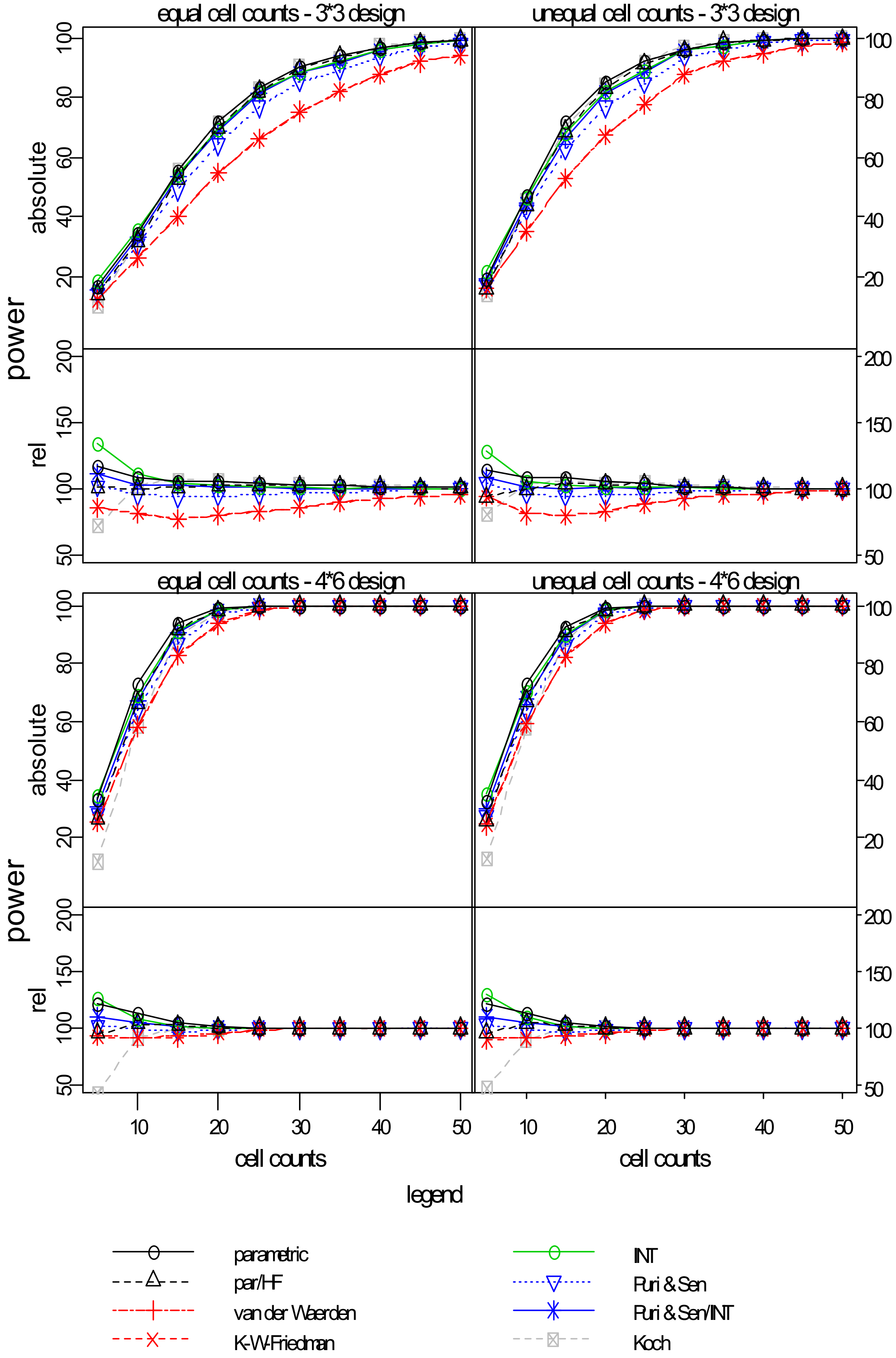
2. 3. 2. 5 normal distribution - unequal variances (on A) - pairing

	small n_i ~ small s_i							small n_i ~ large s_i						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	10.30	27.50	44.10	62.20	86.45	96.65	99.25	35.25	51.40	64.15	77.75	91.05	96.55	98.75
parametric HF-adj	9.40	26.20	42.50	60.35	85.40	96.30	99.20	33.80	50.55	63.15	76.65	90.45	96.30	98.70
van der Waerden	10.35	33.35	52.10	67.55	88.10	96.15	98.85	14.45	32.70	50.55	66.40	87.50	94.40	98.30
KW/F	10.35	33.35	52.10	67.55	88.10	96.15	98.85	14.45	32.70	50.55	66.40	87.50	94.40	98.30
INT	11.10	28.70	44.65	62.45	86.90	96.95	99.45	29.55	49.55	63.65	77.55	91.55	97.40	98.90
Puri & Sen	8.60	26.10	45.40	62.70	86.70	96.60	99.45	20.20	41.40	58.50	72.90	89.95	96.35	98.65
Puri & Sen + INT	6.90	24.70	42.00	60.30	85.60	96.65	99.30	22.75	45.35	60.05	74.65	90.55	96.60	98.75
Koch	6.15	30.45	51.70	71.00	92.35	98.25	99.85	13.45	36.95	53.50	69.85	87.95	94.55	98.20
	large design (4*6)													
parametric	4.30	8.05	16.55	24.30	43.35	61.00	77.20	32.55	38.15	46.95	52.90	69.45	81.15	88.35
parametric HF-adj	3.45	7.20	14.60	22.30	40.00	57.65	74.45	29.40	35.35	43.65	50.15	66.65	79.05	87.05
van der Waerden	6.45	15.10	25.05	36.10	56.20	72.25	86.00	6.75	14.15	24.80	34.00	54.15	70.50	83.40
KW/F	6.30	15.05	25.50	36.60	56.50	72.55	85.95	6.55	14.15	24.50	34.55	54.35	70.75	82.85
INT	4.30	8.65	17.35	24.80	44.15	62.30	78.75	25.70	32.30	43.65	50.15	67.80	80.50	88.15
Puri & Sen	4.25	8.90	16.85	25.35	44.50	62.50	79.05	14.80	23.45	34.70	42.75	61.50	75.30	85.50
Puri & Sen + INT	3.10	7.95	15.65	23.35	42.90	61.20	78.00	19.60	29.85	41.00	48.35	66.15	79.15	87.55
Koch	2.00	7.55	18.00	28.30	53.95	72.10	88.00	5.50	16.50	27.70	37.50	58.00	73.05	84.40


small ni ~ small si - 3*3 design
small ni ~ large si - 3*3 design
small ni ~ small si - 4*6 design
small ni ~ large si - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
150
200
10
30
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

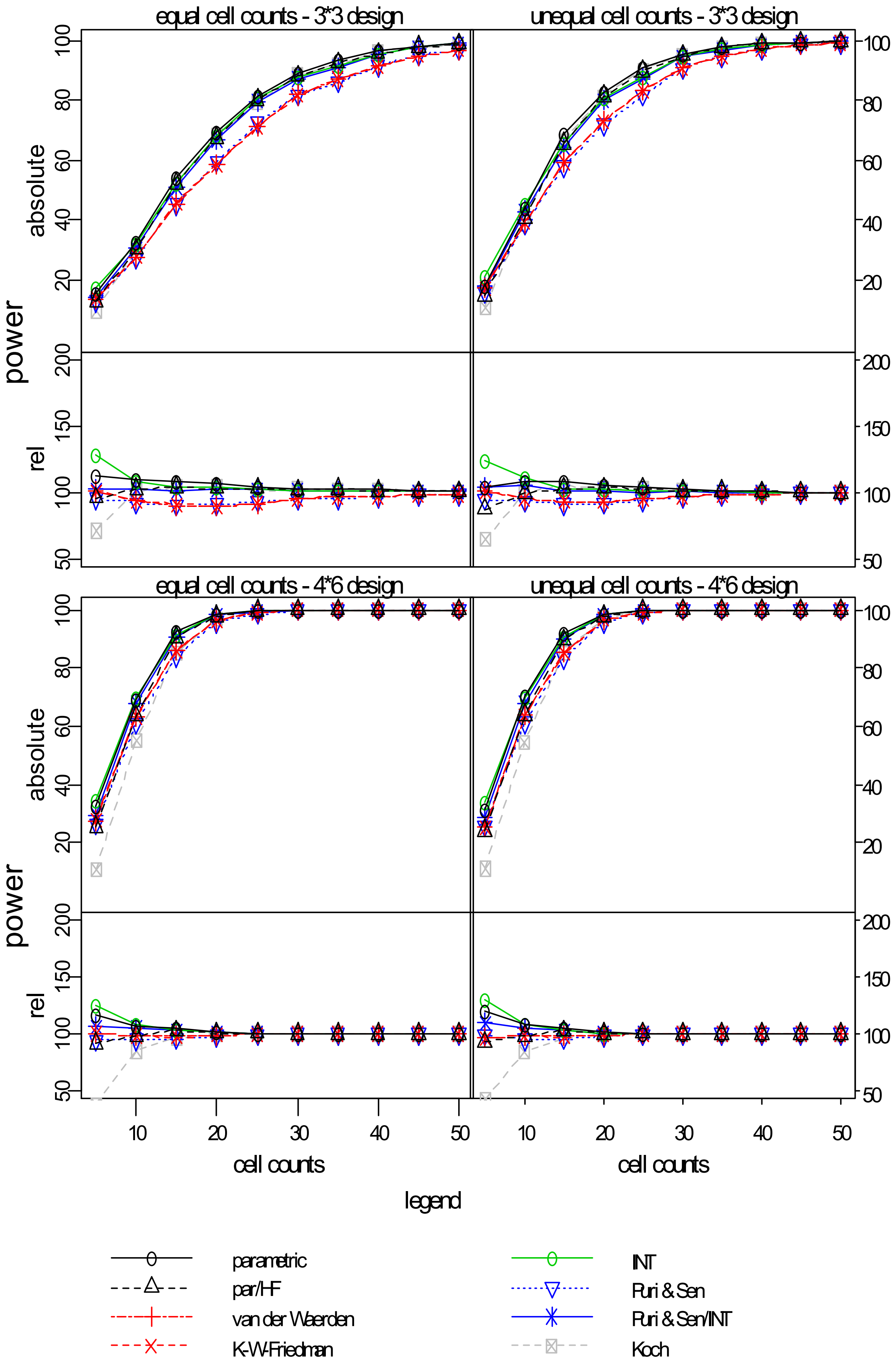
2. 3. 2. 6 exponential distribution

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	16.40	34.80	55.45	72.15	90.50	97.10	99.45	19.40	47.50	71.80	85.10	96.40	99.40	99.90
parametric HF-adj	14.10	32.15	52.90	70.05	89.75	96.65	99.30	15.90	43.65	69.00	83.60	96.10	99.25	99.85
van der Waerden	12.05	26.30	40.15	54.70	75.50	87.90	94.20	15.90	35.45	52.70	67.50	87.85	95.05	98.75
KW/F	12.05	26.30	40.15	54.70	75.50	87.90	94.20	15.90	35.45	52.70	67.50	87.85	95.05	98.75
INT	18.80	35.90	54.35	69.75	88.65	96.10	99.10	21.80	46.55	67.95	82.20	96.15	99.10	99.90
Puri & Sen	14.30	30.75	49.00	64.20	85.55	93.85	98.35	17.65	42.35	62.75	77.05	93.80	98.55	99.60
Puri & Sen + INT	15.65	33.15	53.50	68.55	88.45	95.95	99.10	18.45	44.40	66.45	81.70	96.00	99.10	99.90
Koch	10.05	32.90	55.80	71.95	90.65	97.65	99.40	13.60	45.80	70.20	84.05	97.35	99.45	99.95
	large design (4*6)													
parametric	33.30	72.65	93.55	98.80	100.0	100.0	100.0	32.80	72.65	92.75	98.70	100.0	100.0	100.0
parametric HF-adj	26.30	66.40	91.80	98.25	100.0	100.0	100.0	25.70	67.25	91.05	98.15	100.0	100.0	100.0
van der Waerden	25.60	58.30	82.80	93.50	99.80	100.0	100.0	24.45	59.25	82.20	93.75	99.65	100.0	100.0
KW/F	25.35	58.45	82.70	93.35	99.75	100.0	100.0	24.20	58.90	82.50	93.60	99.60	100.0	100.0
INT	34.65	69.00	91.15	98.30	99.85	100.0	100.0	35.05	70.55	90.05	98.30	99.95	100.0	100.0
Puri & Sen	27.95	63.80	86.90	96.75	99.80	100.0	100.0	27.80	63.70	86.05	96.95	99.95	100.0	100.0
Puri & Sen + INT	30.30	66.90	90.70	98.25	99.85	100.0	100.0	29.65	68.00	89.25	98.15	99.95	100.0	100.0
Koch	11.75	58.35	89.25	97.60	100.0	100.0	100.0	12.55	57.75	88.20	98.15	100.0	100.0	100.0


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
0
20
40
60
80
100
50
150
200
10
30
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

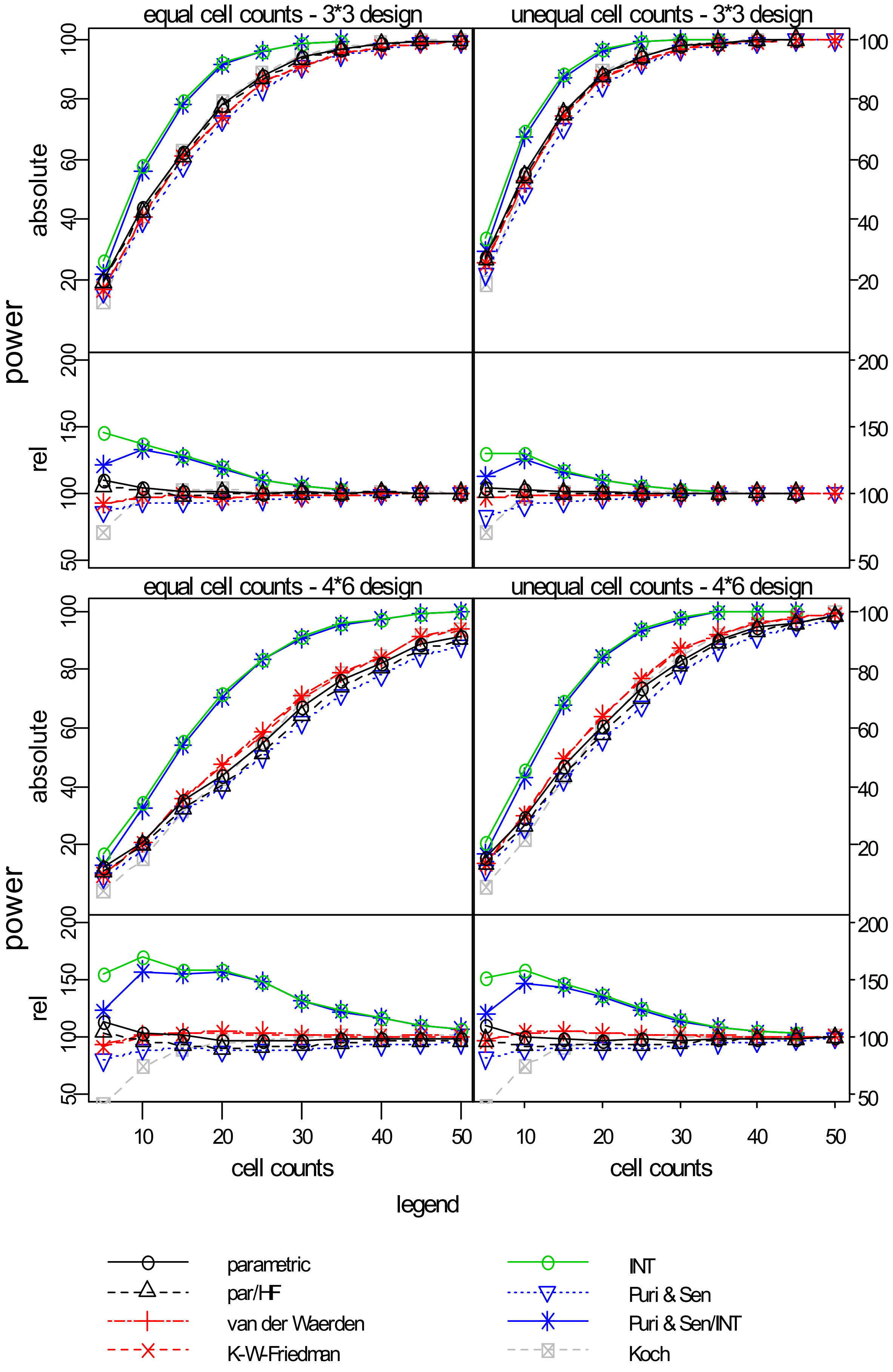
2. 3. 2. 7 exponential distribution - discrete values

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	15.35	32.65	54.35	69.55	89.00	96.60	99.25	17.70	44.25	68.65	82.85	95.70	99.30	99.80
parametric HF-adj	13.05	30.35	52.30	67.60	88.25	95.75	98.95	14.85	41.05	65.75	81.60	95.15	99.20	99.70
van der Waerden	13.65	27.75	45.50	58.90	81.90	91.75	97.05	17.20	38.95	59.45	73.30	91.10	97.20	99.45
KW/F	13.70	27.70	45.65	58.60	81.75	91.65	96.95	17.10	39.10	59.25	73.20	90.95	97.20	99.40
INT	17.40	32.20	52.55	67.90	87.60	95.60	99.05	21.05	45.60	65.80	80.70	94.75	98.80	99.80
Puri & Sen	12.90	27.20	45.35	59.40	81.90	91.55	96.95	16.00	38.40	58.05	72.05	90.85	97.15	99.30
Puri & Sen + INT	13.90	30.40	50.95	66.95	87.25	95.30	99.05	17.60	43.05	64.10	80.05	94.70	98.65	99.80
Koch	9.65	29.90	52.50	68.20	88.85	96.60	98.95	10.90	41.15	66.85	81.30	95.45	99.00	99.85
	large design (4*6)													
parametric	32.45	69.15	92.60	98.35	100.0	100.0	100.0	31.30	70.30	91.60	98.65	100.0	100.0	100.0
parametric HF-adj	25.50	63.45	90.50	97.75	100.0	100.0	100.0	24.30	63.90	89.80	97.75	100.0	100.0	100.0
van der Waerden	27.65	63.15	86.15	96.10	99.95	100.0	100.0	25.20	63.60	85.50	96.45	99.95	100.0	100.0
KW/F	27.75	63.20	85.75	96.15	99.90	100.0	100.0	25.05	63.60	85.00	96.55	99.90	100.0	100.0
INT	34.65	69.85	91.15	98.30	100.0	100.0	100.0	34.15	69.85	90.55	98.10	99.95	100.0	100.0
Puri & Sen	26.15	60.90	84.00	95.60	99.75	100.0	100.0	25.75	61.20	83.30	95.80	99.80	100.0	100.0
Puri & Sen + INT	29.40	67.85	90.50	98.15	100.0	100.0	100.0	28.60	67.70	89.75	98.05	99.95	100.0	100.0
Koch	10.50	54.80	85.20	96.60	99.95	100.0	100.0	11.05	54.60	85.05	97.05	100.0	100.0	100.0


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
150
200
10
30
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

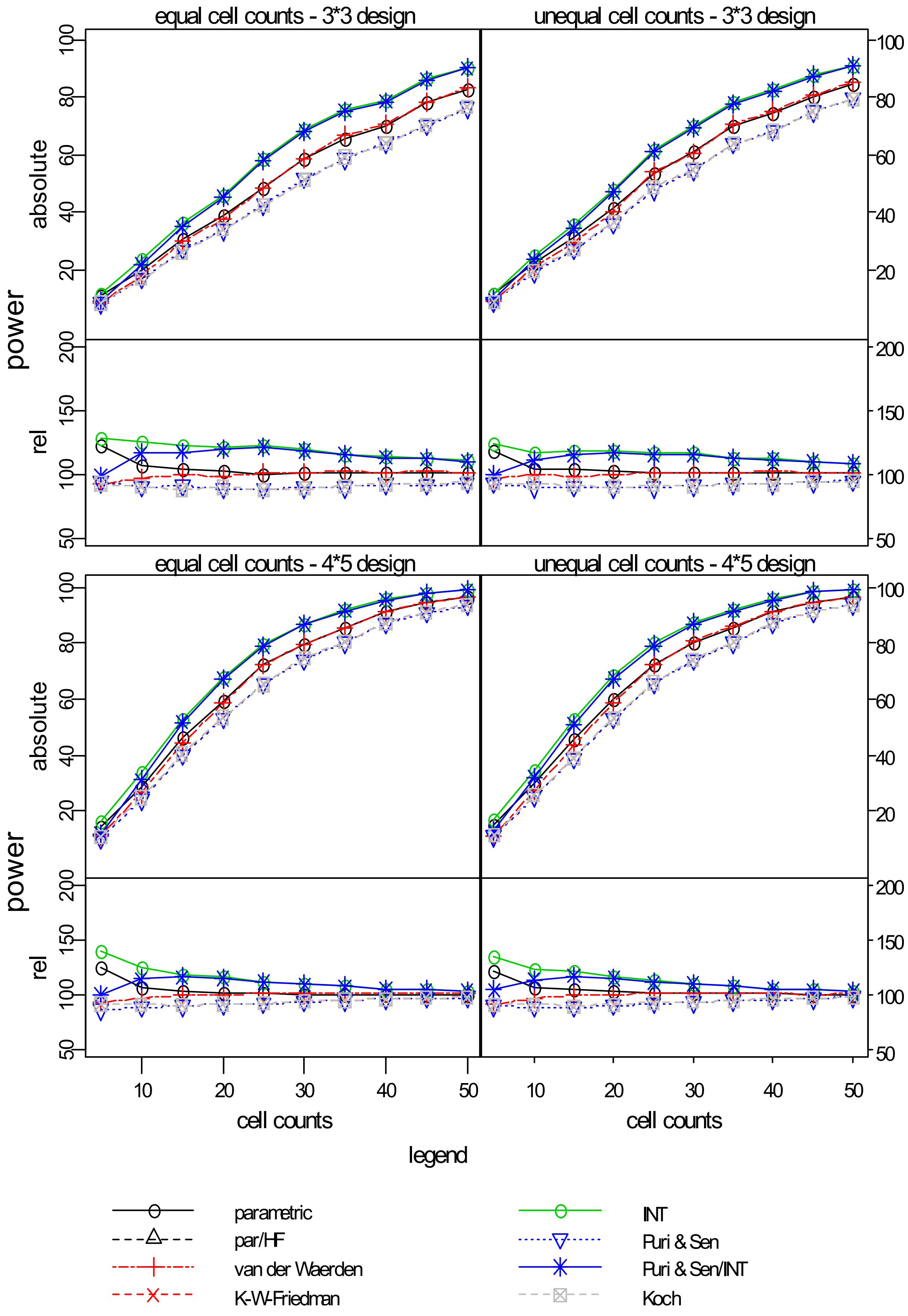
2. 3. 2. 8 uniform distribution

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	20.00	43.75	62.35	78.50	94.10	98.55	99.65	27.50	55.35	76.00	88.85	98.15	99.70	100.0
parametric HF-adj	19.15	42.55	60.80	77.50	93.45	98.50	99.55	26.70	54.40	75.25	87.85	98.10	99.60	100.0
van der Waerden	16.70	40.95	61.00	74.15	91.25	97.50	99.15	25.50	52.65	74.55	87.25	97.05	99.25	99.85
KW/F	16.70	40.95	61.00	74.15	91.25	97.50	99.15	25.50	52.65	74.55	87.25	97.05	99.25	99.85
INT	26.50	57.85	79.35	92.10	98.85	100.0	100.0	33.95	69.70	88.25	96.50	99.80	100.0	100.0
Puri & Sen	15.55	39.25	57.50	72.95	91.15	97.00	99.30	21.70	48.75	70.50	84.60	96.35	99.05	99.95
Puri & Sen + INT	21.90	56.00	78.20	91.60	98.80	100.0	100.0	29.50	67.80	87.35	96.35	99.80	100.0	100.0
Koch	12.85	41.55	63.05	79.30	95.00	98.90	99.65	18.55	52.90	75.60	89.15	98.35	99.85	100.0
	large design (4*6)													
parametric	12.15	21.15	35.35	43.50	67.35	82.20	91.00	15.45	29.00	46.75	60.75	82.90	94.15	98.50
parametric HF-adj	11.20	19.75	32.60	40.40	64.10	80.45	90.20	13.55	26.75	43.75	57.90	81.25	93.10	98.30
van der Waerden	10.00	20.80	36.05	47.35	70.80	84.20	93.60	13.40	30.00	49.45	64.15	87.10	95.65	98.90
KW/F	9.80	20.50	36.05	46.85	70.35	83.85	93.45	13.50	30.35	49.30	64.05	86.75	95.50	98.90
INT	16.65	34.85	55.25	71.60	91.15	97.35	99.80	21.15	45.80	69.10	85.00	97.40	99.70	100.0
Puri & Sen	8.60	18.20	31.50	39.60	61.85	77.95	87.85	11.40	25.75	42.20	55.95	78.75	91.05	97.35
Puri & Sen + INT	13.25	32.30	54.10	70.40	90.80	97.30	99.70	16.80	42.70	67.90	84.10	97.30	99.65	100.0
Koch	4.35	15.15	31.55	43.05	69.15	84.10	93.70	5.55	21.70	43.30	60.45	84.65	95.40	99.00


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
20
40
60
80
100
50
100
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

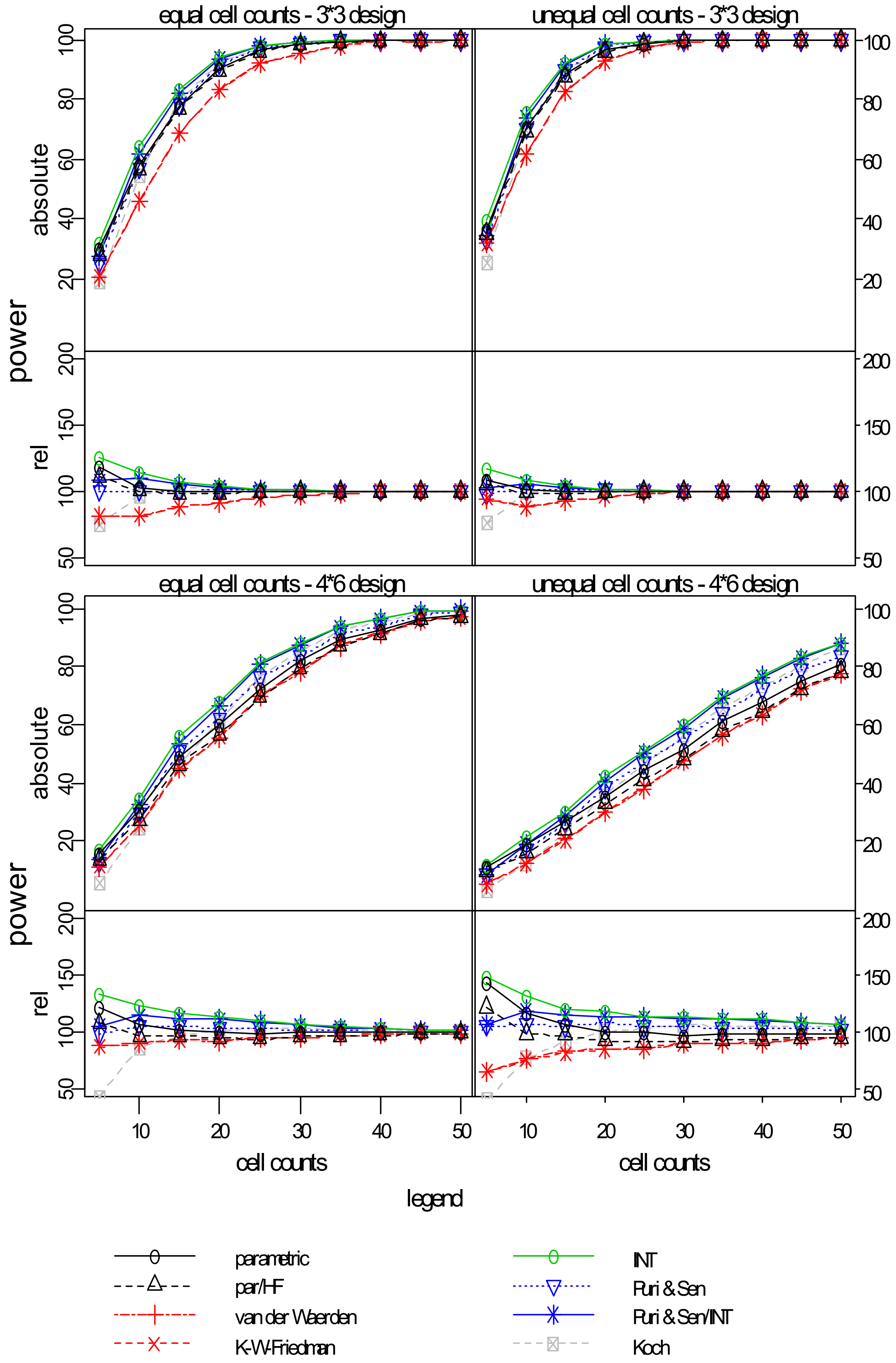
2. 3. 2. 9 uniform distribution - discrete values

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	19.70	41.50	59.55	74.85	91.60	97.30	99.45	25.80	50.85	71.05	85.05	96.60	99.20	99.95
parametric HF-adj	19.30	40.65	58.45	74.20	91.10	97.15	99.35	24.55	50.30	70.10	84.40	96.55	99.20	99.95
van der Waerden	17.35	39.15	57.85	72.00	90.80	97.05	99.15	23.45	49.40	70.25	83.25	96.15	98.90	99.85
KW/F	17.25	39.25	57.60	71.95	90.80	97.00	99.15	23.30	49.25	70.15	83.25	96.10	98.90	99.85
INT	22.40	49.40	69.85	85.15	96.70	99.25	99.95	27.85	58.20	78.70	91.65	98.85	99.85	100.0
Puri & Sen	14.50	34.10	50.60	66.75	85.00	93.05	97.90	18.80	43.65	61.95	77.10	93.00	97.55	99.55
Puri & Sen + INT	18.60	47.65	68.45	84.60	96.55	99.25	99.95	23.75	56.10	78.00	91.10	98.80	99.85	100.0
Koch	12.30	38.05	58.25	74.15	91.75	97.60	99.30	16.15	46.95	69.50	84.75	96.65	99.35	99.85
	large design (4*6)													
parametric	12.10	21.45	34.20	43.25	65.50	80.20	89.55	14.75	27.75	43.50	58.85	80.20	92.05	98.00
parametric HF-adj	10.90	19.75	32.35	41.20	63.40	78.80	88.45	12.90	26.25	40.95	56.40	78.55	90.75	97.45
van der Waerden	10.00	20.10	32.30	42.20	66.20	79.80	89.90	11.25	27.60	42.35	57.65	80.80	92.05	98.05
KW/F	9.50	19.50	31.25	41.20	65.00	78.70	89.05	11.05	26.90	41.30	56.75	80.00	91.50	97.65
INT	15.25	30.20	48.20	62.05	84.20	93.70	98.05	16.30	35.80	56.65	73.85	91.90	97.85	99.70
Puri & Sen	8.80	16.20	26.90	34.40	54.50	69.95	81.55	9.70	21.70	35.20	49.35	71.00	85.05	94.40
Puri & Sen + INT	12.30	27.95	46.75	60.80	83.80	93.60	98.05	13.20	33.80	55.75	72.95	91.55	97.70	99.70
Koch	4.30	14.60	28.35	38.50	63.80	78.65	89.05	5.00	20.05	36.90	54.65	78.45	91.35	97.85


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*5 design
unequal cell counts - 4*5 design
power
absolute
rel
20
40
60
80
100
50
150
200
10
20
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 3. 2. 10 lognormal distribution - equal variances

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	29.90	58.30	77.80	90.20	98.50	99.70	100.0	36.40	70.75	88.60	96.50	99.80	100.0	100.0
parametric HF-adj	28.15	56.80	77.10	89.70	98.45	99.70	100.0	35.30	69.20	87.60	96.30	99.75	100.0	100.0
van der Waerden	20.60	46.15	68.75	83.35	95.65	99.70	99.85	31.85	61.55	82.60	92.95	99.35	100.0	100.0
KW/F	20.60	46.15	68.75	83.35	95.65	99.70	99.85	31.85	61.55	82.60	92.95	99.35	100.0	100.0
INT	31.65	64.30	83.45	94.10	99.15	99.95	100.0	39.45	76.10	92.15	98.50	99.90	100.0	100.0
Puri & Sen	25.35	56.90	78.25	91.95	98.70	99.90	100.0	32.90	70.40	89.95	97.80	99.85	100.0	100.0
Puri & Sen + INT	27.35	62.05	82.10	93.85	99.15	99.95	100.0	34.45	74.20	91.45	98.45	99.90	100.0	100.0
Koch	18.90	54.65	79.80	92.15	98.80	99.90	100.0	25.50	69.80	90.00	97.10	99.85	100.0	100.0
	large design (4*6)													
parametric	15.55	30.35	49.00	59.75	81.85	92.70	97.90	11.30	18.85	26.45	35.50	51.40	67.65	80.65
parametric HF-adj	13.75	27.40	46.20	56.75	79.30	90.95	97.20	9.55	15.90	24.25	32.90	48.40	64.65	78.30
van der Waerden	11.30	25.50	44.75	55.30	78.50	91.40	96.90	5.15	12.25	20.70	30.05	47.35	63.00	77.80
KW/F	11.15	25.65	44.45	56.00	78.55	91.70	96.95	5.15	12.20	20.20	30.25	47.50	63.55	77.75
INT	16.90	34.65	55.75	67.70	87.95	96.60	99.35	11.60	21.30	29.75	42.05	59.95	77.15	88.15
Puri & Sen	12.55	29.75	50.75	62.25	83.70	94.10	98.75	8.30	17.20	26.15	38.50	55.70	72.25	83.60
Puri & Sen + INT	13.45	32.35	53.75	66.65	87.55	96.25	99.35	8.40	19.15	28.60	40.40	58.85	76.55	87.65
Koch	5.45	24.55	46.25	61.15	85.35	95.15	98.90	3.15	12.45	22.80	35.60	56.20	73.10	86.45


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
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150
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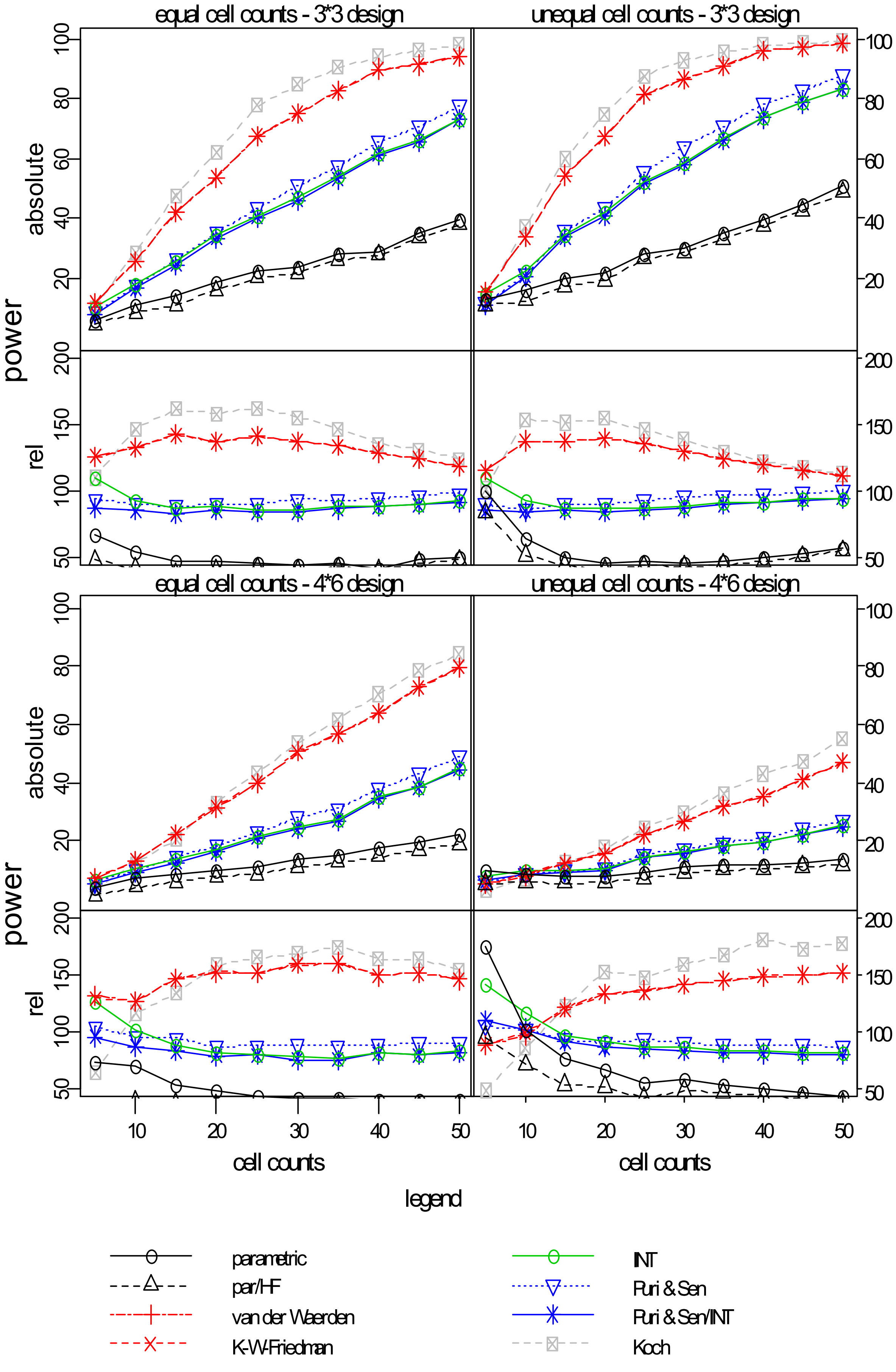
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 3. 2. 11 normal distribution - equal variances - contaminated I

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	6.15	10.70	13.85	18.40	23.95	29.00	39.55	13.05	15.75	19.85	21.75	30.05	39.60	50.90
parametric HF-adj	4.40	8.20	11.10	16.00	21.95	27.75	37.95	11.00	12.55	17.45	19.35	28.50	37.60	48.75
van der Waerden	11.60	25.85	41.95	53.80	75.20	90.10	94.25	15.15	33.65	54.50	67.50	86.60	96.00	98.70
KW/F	11.60	25.85	41.95	53.80	75.20	90.10	94.25	15.15	33.65	54.50	67.50	86.60	96.00	98.70
INT	10.10	18.20	25.60	34.60	46.95	62.00	73.30	14.50	22.55	34.70	41.90	58.80	73.85	83.55
Puri & Sen	8.60	17.60	26.20	35.20	51.25	65.95	77.70	11.80	21.05	35.85	43.70	64.15	78.30	87.80
Puri & Sen + INT	8.05	16.65	24.40	33.55	46.20	61.45	73.05	11.20	20.60	33.70	40.75	58.15	73.65	83.45
Koch	10.10	28.70	47.65	62.00	84.95	94.25	98.20	13.30	37.60	60.00	74.90	93.00	98.30	99.55
	large design (4*6)													
parametric	3.90	7.30	8.25	10.00	13.50	17.50	22.00	9.90	8.60	7.80	7.80	10.80	11.80	13.75
parametric HF-adj	1.15	4.15	5.70	7.60	11.05	14.65	18.65	5.40	6.00	5.50	6.00	9.10	10.20	11.55
van der Waerden	7.00	13.30	22.40	31.60	50.75	63.95	79.30	5.00	8.15	12.45	15.40	26.55	35.15	47.00
KW/F	6.90	13.30	22.25	31.70	50.25	64.00	79.55	5.05	8.40	12.10	15.50	26.45	35.50	47.20
INT	6.75	10.65	13.60	17.00	24.70	35.25	44.90	8.05	9.90	9.85	10.60	16.10	19.75	25.35
Puri & Sen	5.55	10.05	14.40	18.10	27.85	37.75	48.95	6.00	8.65	9.60	10.45	16.85	21.10	26.95
Puri & Sen + INT	5.10	9.15	12.70	16.35	23.95	34.75	44.50	6.25	8.65	9.30	10.00	15.50	19.25	24.95
Koch	3.40	12.25	20.40	32.95	53.45	70.35	84.05	2.75	7.20	12.45	17.70	29.85	43.05	55.05


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
absolute
rel
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100
150
200
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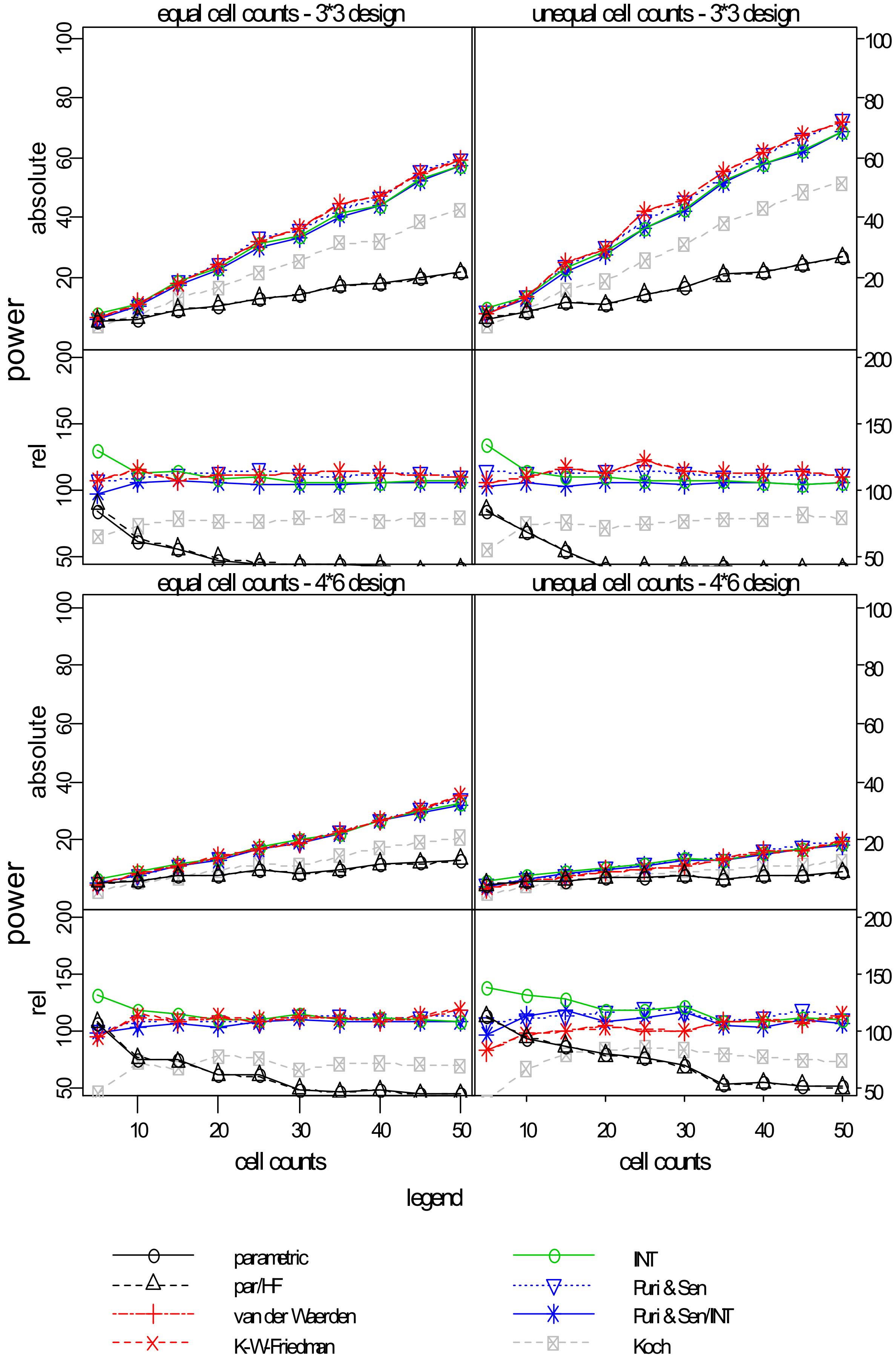
30
40
50
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 3. 2. 12 normal distribution - equal variances - contaminated II

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	5.00	6.00	9.15	10.30	14.00	17.75	21.95	6.15	8.25	11.30	10.90	16.90	21.80	26.90
parametric HF-adj	5.25	6.25	9.20	10.60	13.95	17.85	21.50	6.25	8.20	11.30	10.90	17.00	21.70	26.80
van der Waerden	6.35	11.25	17.70	24.10	36.35	47.15	59.10	7.80	13.25	24.80	29.45	46.05	61.95	71.80
KW/F	6.35	11.25	17.70	24.10	36.35	47.15	59.10	7.80	13.25	24.80	29.45	46.05	61.95	71.80
INT	7.70	11.05	18.85	23.30	34.10	44.10	57.70	9.90	13.75	23.15	28.80	42.90	58.30	69.15
Puri & Sen	6.30	10.60	18.45	24.35	35.80	46.70	59.65	8.35	13.50	23.65	29.90	45.45	61.15	72.50
Puri & Sen + INT	5.75	10.35	17.65	22.70	33.35	43.90	57.30	7.55	12.70	21.80	27.60	42.25	57.95	68.85
Koch	3.85	7.10	12.90	16.45	25.30	31.90	42.60	4.00	8.95	15.95	18.60	31.00	42.90	51.40
	large design (4*6)													
parametric	5.45	5.65	7.65	7.75	8.45	11.95	13.35	4.80	5.55	6.10	7.10	7.90	8.00	8.95
parametric HF-adj	5.50	5.70	7.50	7.85	8.50	11.70	13.25	4.75	5.65	6.15	7.00	7.80	7.90	8.80
van der Waerden	4.85	8.35	11.15	14.00	19.20	26.55	35.45	3.50	5.85	7.10	9.40	11.40	16.00	19.65
KW/F	4.80	8.50	11.30	14.35	19.65	26.85	35.70	3.55	5.80	7.10	9.20	11.45	15.95	20.05
INT	6.75	8.85	11.85	13.85	19.95	27.00	32.55	5.85	7.85	9.15	10.55	13.75	15.80	19.05
Puri & Sen	5.10	8.05	11.30	13.75	19.55	26.90	33.75	4.55	6.65	8.05	10.35	13.20	16.30	19.35
Puri & Sen + INT	5.05	7.70	10.95	13.10	19.10	26.55	32.25	4.10	6.75	8.45	9.60	13.15	15.10	18.55
Koch	2.30	5.40	6.90	9.80	11.40	17.50	20.85	1.60	4.00	5.65	7.45	9.45	11.25	12.85


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
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rel
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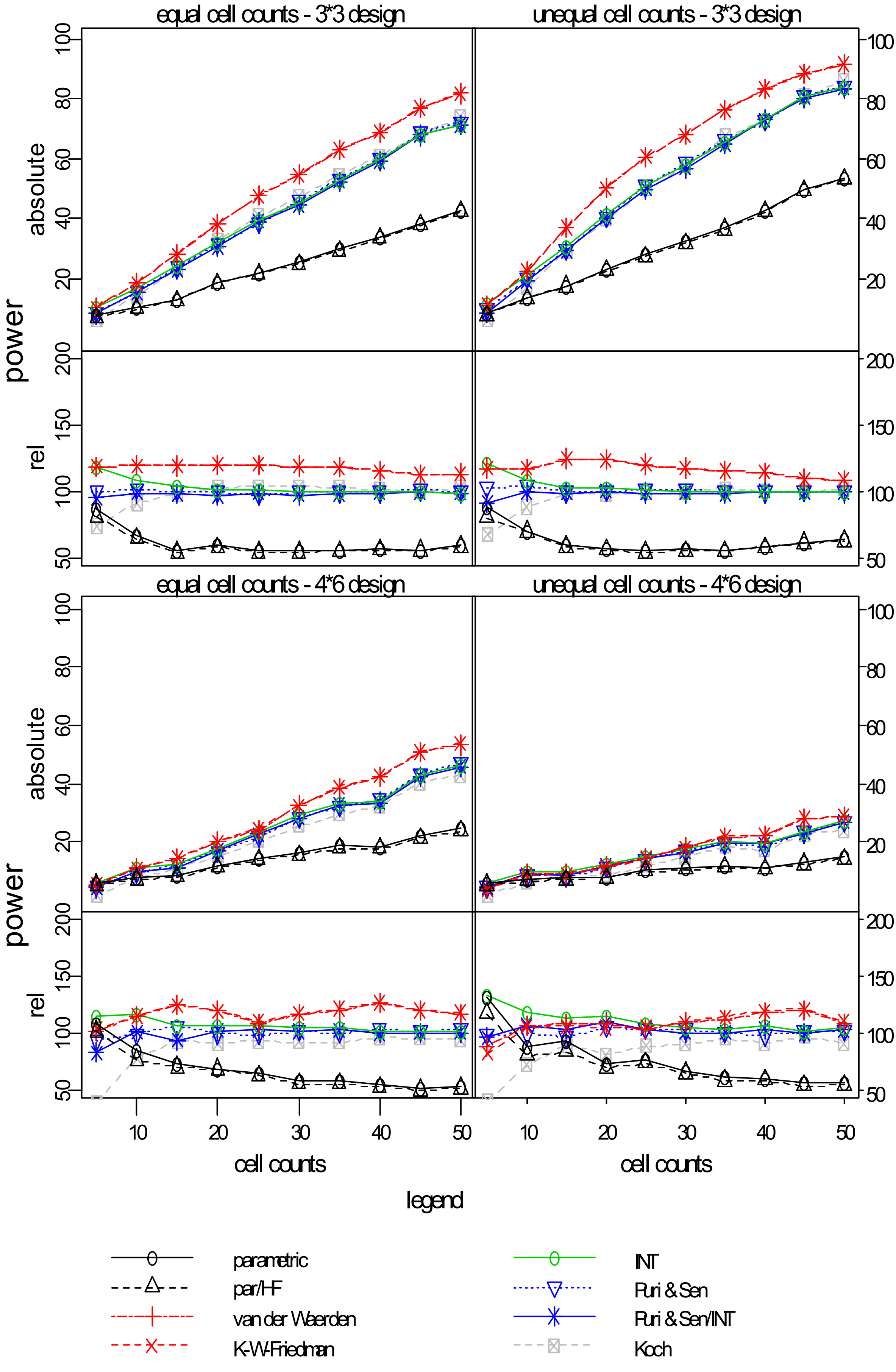
cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch

2. 3. 2. 13 normal distribution - equal variances - contaminated III

	equal cell counts							unequal cell counts						
method	5	10	15	20	30	40	50	5	10	15	20	30	40	50
	small design (3*3)													
parametric	7.50	10.30	13.10	18.90	25.40	34.10	42.75	8.25	13.55	17.65	23.30	32.50	42.60	53.60
parametric HF-adj	7.00	10.00	12.75	18.40	24.90	33.55	42.40	7.55	13.45	17.35	22.70	31.80	42.35	53.15
van der Waerden	10.20	18.50	28.05	38.05	54.60	69.05	81.90	11.05	22.60	37.00	50.20	67.95	83.40	91.70
KW/F	10.20	18.50	28.05	38.05	54.60	69.05	81.90	11.05	22.60	37.00	50.20	67.95	83.40	91.70
INT	10.10	16.85	24.40	32.10	45.55	59.85	71.60	11.40	20.90	30.55	41.40	57.90	73.25	83.85
Puri & Sen	8.60	15.70	23.60	31.55	45.95	59.75	72.35	9.70	19.95	29.50	40.55	58.55	72.75	84.45
Puri & Sen + INT	8.15	15.25	23.05	30.75	44.70	59.35	71.35	8.60	19.15	29.35	40.50	57.05	73.00	83.70
Koch	6.35	14.10	23.15	32.55	47.50	60.95	74.15	6.35	17.00	29.30	39.70	57.70	72.90	85.95
	large design (4*6)													
parametric	5.60	8.05	8.60	11.55	16.15	18.45	24.55	6.00	7.40	7.95	7.90	10.90	11.30	14.70
parametric HF-adj	5.30	7.30	8.15	11.40	15.45	17.85	23.75	5.35	6.75	7.10	7.50	10.75	11.00	14.25
van der Waerden	5.25	10.95	14.45	19.95	32.50	42.45	53.10	4.00	8.85	9.15	11.65	18.05	22.00	28.45
KW/F	5.40	10.95	14.45	19.90	32.50	42.50	53.90	3.75	8.80	9.00	11.30	17.95	22.20	28.90
INT	6.00	11.15	12.45	17.90	29.05	33.90	46.40	6.10	9.85	9.65	12.40	17.30	19.70	27.35
Puri & Sen	4.85	9.45	12.30	16.70	28.35	34.60	47.15	4.50	8.35	8.15	11.35	17.00	18.25	26.85
Puri & Sen + INT	4.30	9.65	10.90	17.00	28.20	33.50	45.70	4.40	8.95	8.75	11.75	16.55	19.30	26.95
Koch	2.00	7.40	10.80	15.20	25.55	32.40	42.95	1.85	6.05	7.55	8.75	14.90	17.05	23.85


equal cell counts - 3*3 design
unequal cell counts - 3*3 design
equal cell counts - 4*6 design
unequal cell counts - 4*6 design
power
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cell counts
legend
parametric
par/HF
van der Waerden
K-W-Friedman
INT
Puri & Sen
Puri & Sen/INT
Koch