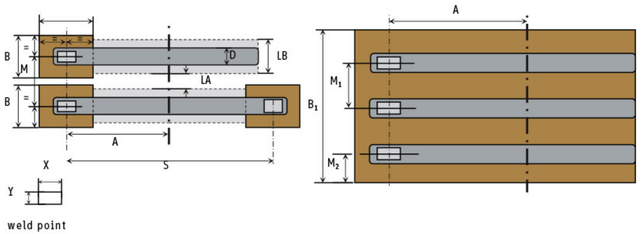
Design rules for wirelaid layouts

	wire dimensions			conductor width and distance											
wire type	diameter [µm]	wire height [µm]	wire width [µm]	LB conductor width above wire [mm]	LA conductor distance above wire [mm]	B min. welding pad width separate potential [mm]	B_1 min. welding pad width equal potential [mm]	L min. welding pad length [mm]	M min. wire distance separate potential [mm]	M1 min. wire distance equal potential [mm]	M_2 min. wire distance to cu-pad edge [mm]	X weld point length [mm]	Y weld point width [mm]	S max. weld distance [mm]	A min. distance weld to bending edge [mm]
round wire	100			0,6		1,0	1,0 * n	1,5		0,5	0,55	0,5	0,5	50	3
round wire	300			0,8	depends on	1,7	1,7 * n	2,0	depends on	0,7	0,65	0,7	0,7	50	3
flat wire		250	800	1,3	cu-thickness	2,5	2,5 * n	3,0	cu-thickness	1,2	0,9	0,8	0,55	100	3
flat wire		350	1400	1,9		3,0	3,0 * n	3,5		1,8	1,2	1,2	0,8	100	3

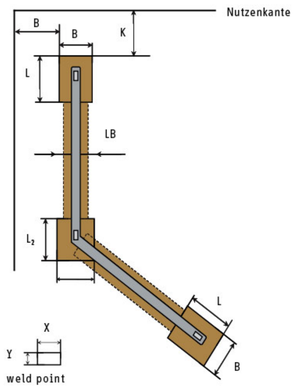
n = Number of wires

	wire dimensions			pad dimensions		conductor width and distance							
wire type	D diameter [µm]	wire height [µm]	wire width [µm]	L min. welding pad length [mm]	B min. welding pad width separate potential [mm]	LB conductor width above wire [mm]	L_2 min. welding pad length angled conductor [mm]	B_2 min. welding pad width angled conductor [mm]	a min. distance weld to pad edge [mm]	C min. wire separation distance, angled conductor [mm]	K min. distance weld pad to outline [mm]	X weld point length [mm]	Y weld point width [mm]
round wire	100			1,5	1,0	0,7	1,5	1,0	0,5	0,8	0,8	0,5	0,5
round wire	300			2,0	1,7	0,9	2,0	1,7				0,7	0,7
flat wire		250	800	3,0	2,5	1,4	5,4	2,8	0,5	0,8	0,8	0,8	0,55
flat wire		350	1400	3,5	3,0	2,0	6,3	3,6				1,2	0,8

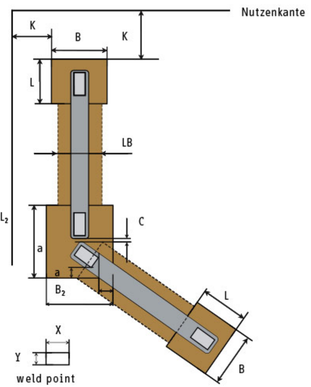
Straight conductor tracks on separate/equal potential



Angled conductor tracks with round wire



Angled conductor tracks with flat wire



General instructions for 3D-applications

The copper wire needs to be placed diagonally (90°) to the groove.

In order to achieve homogeneous bending, a suitable bending fixture is mandatory.

Bending radius ≥ 0,1 mm

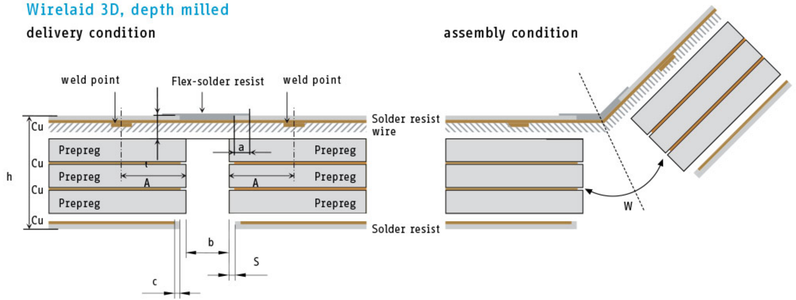
Once assembled, bent parts need to be locked in position.

3D-Design rules wirelaid PCB with Flex-Solder resist

min. distance weld to bending edge [A]	3,0 mm
solder resist covering flexible / fixed [a]	0,4 mm
width milling groove [b]	1,0 mm
solder resist-Cu-covering [c]	
solder resist-antipad milling groove [s]	
width residual bridge [t]	wire + Cu + Solder resist+ 150 µm
max. bending angle [W]	90°

Wirelaid 3D, depth milled

delivery condition **assembly condition**



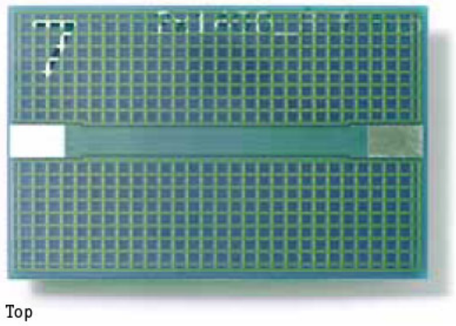
PCB buildup

Cu Top	35/70/105 µm *
Prepreg	
Cu Layer 2	35/70/105 µm
Prepreg	
Cu Layer 3	35/70/105 µm
Prepreg	
Cu Bottom	35/70/105 µm *

Standard FR4, Solder resist std., HAL blfr., Th. = 2,2 – 2,5 mm
contour: 115 x 80 mm²

* plus copper plating (ca. 25 µm)

Wires on top layer

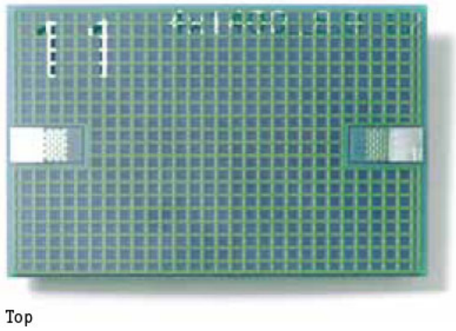


Top

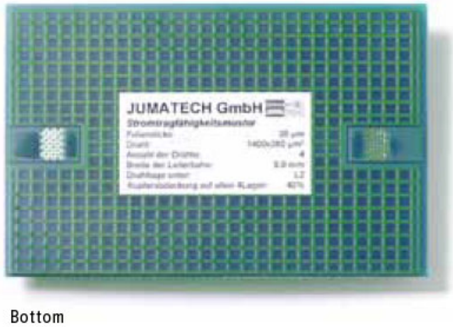
Bottom

Width conductor Track and number of wires: see tables
statistical Cu-flooding: Hatch 40 %, all layers

Wires on Layer 2



Top



Bottom

Width conductor Track and number of wires: see tables
statistical Cu-flooding: Hatch 40 %, 1 PCB 60 % each, all layers
connection to outer layers by std. Vias

Test setup

The PCBs are fixated at the long side on a temperature-controlled insulated loading gage. Soldering pads act as power supply.
Power connection: 4mm² bzw. 6mm² Cu-Litzen
Power supply: EA power supply unit, PS9080-200, 0...80V / 200A DC
IR camera: FLIR ThermaCam E320, interpretation software: Quickguide 6.0
Emissivity adjustment: chalk spray Spotcheck SKD-S2, = 0,91
Ambient temperature is at a constant approx. 22°C

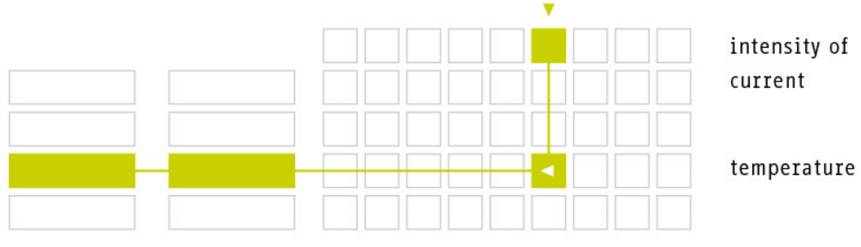
Test execution

Currents are impressed in a 5 minute interval, after which an IR image of the surface temperature was recorded. Analysis was carried out using a variety of wire numbers and dimensions, Cu base thickness and coverings. In the chart, the temperature is marked out as a function of the current.

Used wires

Wire type as specified in the chart	type	diameter in µm	width in µm	height in µm
300	round wire	300		
800	flat wire		800	250
1400	flat wire		1400	350

Functionality



determination
of conductor specifications

Wires below top layer

			2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110	112
Cu 35 µm	– 1x300	¬ 0.9	0	1	4	8	13	17	30	42	56	74	101	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x300	¬ 1.8	0	0	1	3	6	9	13	18	23	29	34	41	50	62	74	89	106	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x800	¬ 1.4	0	1	1	3	6	9	12	16	21	26	32	39	47	56	67	79	95	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x800	¬ 3.1	0	1	2	2	3	5	7	9	12	15	18	20	23	26	34	38	43	50	56	62	70	78	87	96	106	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 3x800	¬ 4.8	0	0	1	1	2	3	5	6	8	9	12	14	17	22	24	27	29	33	37	41	46	50	54	59	65	73	81	85	93	101	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 4x800	¬ 6.5	0	0	1	1	1	1	2	4	7	9	11	12	15	18	20	23	27	30	33	36	40	44	48	53	58	63	67	74	80	86	93	102	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 2.0	0	0	1	2	4	6	8	11	14	18	22	27	31	37	43	49	56	64	74	81	92	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 4.0	0	0	1	2	2	3	5	7	11	14	17	20	24	28	32	36	41	47	53	59	67	75	83	92	103	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 6.0	0	0	1	1	2	3	5	6	9	11	14	16	19	22	26	30	35	39	44	49	54	60	67	73	80	87	96	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x1400	¬ 4.3	0	0	1	1	1	2	3	4	6	8	10	11	14	17	19	22	25	28	32	36	39	44	48	53	58	63	69	75	81	89	97	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x1400	¬ 6.3	0	0	1	1	1	2	2	3	4	6	7	10	12	14	17	19	21	24	28	31	35	38	43	47	52	56	61	66	72	77	83	90	97	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x1400	¬ 8.3	0	0	0	1	1	2	3	3	4	4	6	8	10	12	15	17	19	22	25	28	32	36	41	44	49	52	57	62	68	75	79	86	92	99	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 3x1400	¬ 6.6	0	0	0	0	1	1	2	2	3	4	6	7	8	9	12	14	16	17	19	21	23	25	29	32	36	38	42	46	50	53	58	63	68	72	78	84	89	93	99	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 3x1400	¬ 8.6	0	0	0	0	0	0	1	2	3	4	6	7	10	10	12	14	15	17	19	20	22	24	27	30	35	37	40	44	48	53	56	62	66	70	75	79	84	89	95	101	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 3x1400	¬ 10.6	0	0	0	0	0	1	1	2	2	3	5	7	9	10	12	14	16	18	19	21	24	26	29	31	35	38	41	45	48	53	57	61	66	70	75	79	85	90	97	101	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 4x1400	¬ 8.9	0	0	0	0	0	0	1	1	2	3	4	5	6	8	10	11	13	15	17	19	21	23	26	28	31	33	36	39	43	46	49	53	57	60	64	69	75	80	85	89	93	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 4x1400	¬ 10.9	0	0	0	0	0	0	0	1	2	3	4	4	5	7	9	10	12	14	16	18	20	23	25	27	30	34	38	39	43	46	49	53	56	60	62	67	72	76	79	87	92	97	104	.	.	.	.	.	.	.	.	.	.	.	.	.
Cu 70 µm	– 1x300	¬ 0.9	0	1	3	7	12	16	27	38	51	68	92	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x300	¬ 1.8	0	0	1	3	6	8	12	16	21	26	31	38	46	56	67	81	97	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x800	¬ 1.4	0	1	1	3	.	8	11	14	19	23	29	35	42	50	60	71	86	106	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x800	¬ 3.1	0	1	1	2	3	5	6	8	10	12	16	19	23	26	31	35	40	45	51	57	64	72	79	87	95	105	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 3x800	¬ 4.8	0	0	0	1	2	2	2	3	5	7	9	10	13	15	18	20	23	26	29	33	37	41	45	49	54	59	63	69	75	81	88	94	102	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 4x800	¬ 6.5	0	0	0	0	0	1	2	3	4	5	7	8	10	11	14	16	18	21	23	26	29	32	35	39	43	47	50	54	58	62	67	71	78	85	90	97	101	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 2.0	0	0	1	2	3	4	6	7	9	12	15	18	22	25	29	34	39	45	51	57	64	74	82	91	96	101	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 4.0	0	1	1	1	2	3	4	7	9	11	14	16	19	22	26	30	33	38	42	47	52	58	63	70	77	84	91	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 6.0	0	0	1	1	1	2	3	4	6	7	9	10	13	15	17	20	22	25	28	31	35	39	43	48	52	57	62	68	74	79	86	93	99	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x1400	¬ 4.3	0	0	0	1	1	2	3	4	5	6	7	9	10	12	14	16	18	21	23	26	29	32	35	39	43	47	51	55	59	64	69	74	79	85	91	97	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x1400	¬ 6.3	0	1	1	1	1	1	2	3	3	4	5	7	8	9	11	12	14	16	19	21	24	27	30	33	36	39	43	46	49	53	57	62	66	70	75	80	85	89	94	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x1400	¬ 8.3	0	0	0	1	1	2	2	3	4	4	5	7	8	9	10	11	12	14	16	18	20	22	25	28	31	34	37	40	43	46	49	53	57	62	66	70	75	80	85	90	97	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 3x1400	¬ 6.6	0	1	1	1	2	2	2	3	4	4	4	6	7	9	10	11	12	14	16	18	20	22	24	26	28	30	31	35	39	42	44	50	55	57	60	63	66	69	72	76	80	86	91	96	101	107	.	.	.	.	.	.	.	.	.
	– 3x1400	¬ 8.6	0	0	0	0	0	1	1	1	2	2	2	3	5	6	7	8	9	11	12	13	15	17	19	20	22	24	26	28	31	34	37	40	43	46	49	52	55	59	64	68	72	77	80	84	90	95	99	.	.	.	.	.	.	.	.
	– 3x1400	¬ 10.6	0	0	0	0	0	0	1	1	2	2	3	4	4	5	6	8	9	10	12	13	14	16	18	20	22	24	26	28	29	30	33	35	40	44	46	48	52	56	59	63	65	68	73	77	81	85	89	94	100	.	.	.	.	.	.	.
	– 4x1400	¬ 8.9	0	0	0	0	0	0	1	1	3	3	4	4	5	6	8	10	11	12	13	14	16	17	19	21	23	24	26	29	31	33	35	37	40	42	45	48	51	54	57	60	63	68	72	75	79	82	86	90	95	102	.	.	.	.	.	.
	– 4x1400	¬ 10.9	0	0	0	0	0	0	0	0	1	1	2	3	4	4	6	7	8	10	11	13	14	16	17	19	20	22	24	25	28	30	32	35	38	40	43	45	47	50	53	56	60	63	67	70	73	76	79	85	92	.	.	.	.	.	.	.
Cu 105 µm	– 2x800	¬ 3.1	0	0	1	2	3	4	5	7	8	10	12	15	17	20	22	26	29	33	37	42	46	51	56	62	67	75	82	90	98	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 3x800	¬ 4.8	0	0	1	1	1	2	3	4	5	6	7	9	10	12	13	15	18	20	23	25	28	31	34	36	40	43	47	52	56	60	65	69	74	81	90	96	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 4x800	¬ 6.5	0	0	0	0	1	1	2	2	3	3	4	6	8	9	11	12	14	16	18	20	23	25	28	30	33	36	39	42	45	48	52	56	60	64	68	73	77	82	87	92	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 2.0	0	1	1	2	2	3	5	7	8	10	12	14	17	20	24	27	31	36	40	45	51	57	63	70	76	84	93	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 4.0	0	0	0	1	1	1	2	3	5	7	8	10	12	14	17	20	22	25	28	31	35	39	43	47	51	56	61	66	72	78	84	91	98	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 6.0	0	0	0	1	1	1	1	2	3	4	5	7	8	10	12	14	16	18	21	23	26	29	32	34	37	40	44	48	53	57	62	67	71	76	82	88	94	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x1400	¬ 4.3	0	0	1	1	1	2	2	3	4	5	6	7	8	10	11	13	15	17	19	21	24	27	29	31	34	37	40	44	47	51	55	58	62	66	71	76	81	86	92	98	105	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x1400	¬ 6.3	0	1	2	2	2	3	3	4	5	6	7	8	10	11	12	13	15	17	19	21	24	27	29	32	34	37	39	42	45	48	51	55	59	62	66	70	74	79	83	88	94	99	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x1400	¬ 8.3	0	1	1	1	1	2	2	3	4	5	5	6	7	9	10	12	13	15	16	18	19	21	24	27	30	34	37	41	44	47	51	54	57	61	64	68	71	74	78	81	85	88	91	95	98	.	.	.	.	.	.	.	.	.	.
	– 3x1400	¬ 6.6	0	1	1	1	1	2	2	2	3	4	4	5	7	8	9	10	12	13	14	16	18	20	21	23	25	27	29	32	36	38	40	42	45	48	51	54	57	60	63	67	70	73	77	81	85	89	93	.	.	.	.	.	.	.	.	.
	– 3x1400	¬ 8.6	0	0	0	0	0	0	1	1	1	2	2	3	3	4	5	6	7	8	9	10	12	13	14	16	18	20	21	23	25	26	29	31	33	35	38	40	43	45	47	50	53	56	59	62	65	69	72	76	80	84	88	92	.	.	.	.
	– 3x1400	¬ 10.6	0	0	0	0	0	1	1	2	2	3	3	4	5	6	7	8	9	11	12	13	14	16	19	22	24	27	30	32	35	35	36	36	36	39	41	44	47	49	52	55	58	61	64	67	71	74	77	81	84	88	92	96	101	.	.
	– 4x1400	¬ 8.9	0	0	0	0	1	1	2	2	3	3	4	5	5	5	8	9	10	11	12	13	14	14	15	15	15	16	16	17	17	25	33	34	36	37	40	42	44	47	49	52	55	58	61	64	66	69	72	75	78	82	85	89	94	98	.
	– 4x1400	¬ 10.9	0	0	1	1	2	2	2	2	2	2	2	2	3	4	4	5	6	7	8	9	10	11	12	14	15	16	18	19	21	22	25	27	29	30	32	35	37	39	41	44	46	49	52	54	57	60	62	65	68	71	73	76	79	81	84

¬ 覆膜后的导线线路宽

– Wires and conductor tracks above (in mm)

1 current temperature * Hatch 60%

Wires below layer 2

			2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110	112
Cu 35 µm L2	– 1x300	¬ 0.9	1	2	5	8	12	21	31	46	63	85	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x300	¬ 1.8	0	1	3	5	9	13	17	24	30	39	47	58	69	82	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x800	¬ 1.4	0	1	3	6	9	14	19	25	32	41	50	61	72	87	103	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x800	¬ 3.1	0	0	1	2	4	6	8	11	14	17	20	24	28	34	40	46	52	59	67	74	83	93	103	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 3x800	¬ 4.8	0	0	0	1	2	3	4	6	8	10	12	15	18	21	24	28	32	35	39	45	50	56	60	66	73	80	88	95	103	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 4x800	¬ 6.5	0	0	0	0	1	2	3	4	5	7	9	11	13	15	17	19	23	26	30	33	37	41	45	50	53	59	65	70	74	81	87	94	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 2.0	0	0	1	2	3	5	7	9	11	14	17	21	25	29	34	40	45	50	57	64	72	79	88	96	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 4.0	0	0	0	1	3	.	7	9	11	14	16	20	24	27	32	36	42	47	53	58	65	74	81	88	96	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 6.0	0	0	0	1	3	4	5	7	9	10	13	17	20	23	27	31	35	39	45	50	55	62	70	76	83	91	97	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x1400	¬ 4.3	0	0	0	0	1	1	2	4	5	7	8	10	12	13	16	18	22	24	27	30	34	37	43	46	50	56	61	65	71	77	83	88	96	101	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x1400	¬ 6.3	0	0	0	0	1	1	2	3	.	7	8	10	12	13	16	18	22	24	27	30	34	38	42	47	52	57	61	65	71	76	82	89	95	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x1400	¬ 8.3	0	0	0	0	0	1	2	3	4	5	7	8	10	11	14	17	20	22	24	27	29	32	35	39	44	49	55	60	65	69	75	79	85	90	98	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 3x1400	¬ 6.6	0	0	0	0	0	1	2	3	3	4	5	6	7	9	10	12	14	16	18	20	22	24	26	29	31	35	39	43	46	50	53	57	62	66	70	74	78	84	90	95	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 3x1400	¬ 8.6	0	0	0	0	0	0	1	2	3	4	5	6	7	8	10	12	14	16	18	20	22	24	26	28	30	32	35	37	40	43	46	49	53	57	60	64	68	72	75	78	85	91	96	100	.	.	.	.	.	.	.	.	.	.	.
	– 3x1400	¬ 10.6	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	11	12	14	16	18	20	21	23	25	28	31	33	37	40	44	48	52	55	60	64	68	72	76	80	85	90	95	101	107	.	.	.	.	.	.	.	.	.	.	.
	– 4x1400	¬ 8.9	0	0	0	0	0	0	1	1	2	3	4	5	6	7	8	10	12	14	17	19	21	23	25	27	30	32	35	37	40	43	46	49	53	57	60	64	68	71	76	82	89	95	103	.	.	.	.	.	.	.	.	.	.	.	.
	– 4x1400	¬ 10.9	0	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	11	13	16	18	19	22	23	24	26	28	31	33	36	40	44	46	50	52	55	58	62	66	70	74	80	87	92	96	102	105	.	.	.	.	.	.	.	.	.
	– 4x1400 *	¬ 8.9	0	0	0	0	0	0	1	1	2	3	3	4	5	6	7	8	9	11	13	16	18	19	21	22	24	27	30	32	35	37	40	43	47	49	52	56	59	62	66	70	73	79	83	88	92	95	102	.	.	.	.	.	.	.	.
Cu 70 µm L2	– 1x300	¬ 0.9	1	2	4	8	13	19	28	40	53	70	88	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x300	¬ 1.8	0	1	2	3	6	8	12	16	21	25	31	38	45	54	62	72	84	97	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x800	¬ 1.4	0	1	2	3	6	9	13	18	22	28	35	42	50	59	70	83	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x800	¬ 3.1	0	1	1	2	2	4	5	7	9	11	13	16	19	23	27	32	36	41	46	52	58	64	71	78	86	95	104	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 3x800	¬ 4.8	0	0	0	1	1	2	3	4	6	7	9	10	12	14	17	19	21	24	27	30	34	38	41	46	50	55	59	64	70	76	82	88	95	101	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 4x800	¬ 6.5	0	0	0	0	1	2	2	3	4	6	7	9	10	12	13	15	18	20	22	25	28	31	34	37	40	43	47	51	55	58	61	67	72	77	82	88	93	99	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 2.0	0	0	1	2	2	3	5	7	9	11	13	16	19	22	26	30	34	38	43	48	53	59	65	72	80	87	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 4.0	0	0	0	1	1	2	2	4	6	8	10	12	14	17	19	23	26	29	34	38	42	47	52	57	63	68	74	81	88	94	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 1x1400	¬ 6.0	0	0	0	0	1	2	2	3	4	5	8	10	12	14	16	19	22	24	28	31	35	38	42	46	51	56	61	66	72	77	83	89	95	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x1400	¬ 4.3	0	0	0	0	1	1	2	3	4	5	6	8	9	11	12	14	16	18	20	22	25	28	30	33	37	40	43	47	51	56	61	66	72	77	83	88	94	100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	– 2x1400	¬ 6.3	0	0	0	0	1	2	2	3	4	6	7	8	10	11	13	15	17	19	21	23	25	28	32	34	37	39	43	47	51	56	63	66	70	76	81	85