

**Measuring Volt (milli Volt) and under Amp load, over each item in the electric path, to determine heat sources (Watt sources/high mOhm items).**

### Board 144C, Blade fuse on wire, PSU 12,5V

(15A blade fuse)

Mosfet: 2x IRLR7843

				'Soldered to' = heats PCB			
Red wire (+)	7.1 mV	9.54 A	0.068 W				0.74 mOh
Connector	8.1 mV	9.51	0.077 W	8.1 mV	0.077 W	0.85 mOhm	0.85 mOh
PCB	2.9 mV	9.42 A	0.027 W	2.9 mV	0.027 W	0.31 mOhm	0.31 mOh
Fuse (SMD 7A)	49.6 mV	9.38 A	0.465 W				5.29 mOh
PCB	3.2 mV	9.29 A	0.030 W	3.2 mV	0.030 W	0.34 mOhm	0.34 mOh
Connector	7.5 mV	9.23	0.069 W	7.5 mV	0.069 W	0.81 mOhm	0.81 mOh
Bed + (red wire)	11.8 mV	9.20 A	0.109 W				1.28 mOh
Bed- (black wire)	12.3 mV	9.17 A	0.113 W				1.34 mOh
Connector	7.5 mV	9.13	0.068 W	7.5 mV	0.068 W	0.82 mOhm	0.82 mOh
PCB to mosfet	3.8 mV	9.06 A	0.034 W	3.8 mV	0.034 W	0.42 mOhm	0.42 mOh
Mosfet A	32.8 mV	9.04 A	0.297 W	32.8 mV	0.297 W	3.63 mOhm	3.63 mOh
Mosfet B	31.6 mV	9.03 A	0.285 W	31.6 mV	0.285 W	3.50 mOhm	3.50 mOh
PCB to -	26.3 mV	9.01 A	0.237 W	26.3 mV	0.237 W	2.92 mOhm	2.92 mOh
Connector	6.8 mV	8.95	0.061 W	6.8 mV	0.061 W	0.76 mOhm	0.76 mOh
Black wire (-)	4.7 mV	8.92 A	0.042 W				0.53 mOh
Sum:	130.5 mV			1.186 W		14.36 mOhm	

At the end of measuring, temperatures were taken

Blade fuse	52.0 C
Mosfet A	42.7 C
Mosfet B	43.9 C

### Board 144C, Blade fuse in PCB sockets, PSU 12,5V

(15A blade fuse)

Mosfet: 2x IRLR7843

				'Soldered to' = heats PCB			
Red wire (+)	4.1 mV	9.20 A	0.038 W				0.45
Connector	8.7 mV	9.16 A	0.080	8.7 mV	0.080 W	0.95 mOhm	0.95 mOh
PCB	2.2 mV	9.13 A	0.020 W	2.2 mV	0.020 W	0.24 mOhm	0.24
Fuse only	48.5 mV	9.06 A	0.439 W			mOhm	5.35
Fuse and socket	52.7 mV	9.07 A	0.478 W	52.7 mV	0.478 W	5.81 mOhm	5.81
PCB	3.9 mV	9.05 A	0.035 W	3.9 mV	0.035 W	0.43 mOhm	0.43
Connector	8.6 mV	9.03 A	0.078	8.6 mV	0.078 W	0.95 mOhm	0.95
Bed + (red wire)	10.7 mV	9.02 A	0.097 W			mOhm	1.19
Heat Bed	11.7 V	9.01 A	105.417 W				1.30 Ohm
Bed- (black wire)	8.5 mV	9.00 A	0.077 W			mOhm	0.94 mOh
Connector	10.6 mV	8.98 A	0.095	10.6 mV	0.095 W	1.18 mOhm	1.18
PCB to mosfet	4.1 mV	8.97 A	0.037 W	4.1 mV	0.037 W	0.46 mOhm	0.46
Mosfet A	31.7 mV	8.96 A	0.284 W	31.7 mV	0.284 W	3.54 mOhm	3.54
Mosfet B	33.0 mV	8.96 A	0.296 W	33.0 mV	0.296 W	3.68 mOhm	3.68
PCB to -	25.8 mV	8.95 A	0.231 W	25.8 mV	0.231 W	2.88 mOhm	2.88
Connector	10.6 mV	8.95 A	0.095	10.6 mV	0.095 W	1.18 mOhm	1.18
Black wire (-)	2.1 mV	8.94 A	0.019 W			mOhm	0.23
Sum:	191.9 mV			1.728 W		21.310 mOhm	

At the end of measuring, temperatures were taken

Blade fuse	50.2 C			
Mosfet A	48.3 C			
Mosfet B	47.4 C			
Bottom of PCB	46.8 C			
Connector	41.4 C	42.0 C	40.9 C	39.8 C

**Board 144C, Blade fuse on wire, PSU 24,5V**

(15A blade fuse)

Mosfet: 2x IRLR7843

				Soldered to/heats PCB			
Red wire (+)	3.0 mV	5.07 A	0.015 W				0.59
Connector	3.6 mV	5.05 A	0.018	3.6 mV	0.018 W	0.71 mOhm	0.71 mOh
PCB	0.9 mV	5.01 A	0.005 W	0.9 mV	0.005 W	0.18 mOhm	0.18
Fuse only	24.0 mV	4.92 A	0.118 W			mOhm	4.88
Fuse and socket	mV	A	0.000 W			mOhm	###
PCB	2.1 mV	4.95 A	0.010 W	2.1 mV	0.010 W	0.42 mOhm	0.42
Connector	4.2 mV	4.92 A	0.021	4.2 mV	0.021 W	0.85 mOhm	0.85
Bed + (red wire)	5.8 mV	4.90 A	0.028 W			mOhm	1.18
Heat Bed	24.2 V	4.84 A	116.934 W				4.99 Ohm
Bed- (black wire)	4.2 mV	4.88 A	0.020 W			mOhm	0.86 mOh
Connector	4.0 mV	4.86 A	0.019	4.0 mV	0.019 W	0.82 mOhm	0.82
PCB to mosfet	1.6 mV	4.81 A	0.008 W	1.6 mV	0.008 W	0.33 mOhm	0.33
Mosfet A	15.7 mV	4.80 A	0.075 W	15.7 mV	0.075 W	3.27 mOhm	3.27
Mosfet B	16.3 mV	4.78 A	0.078 W	16.3 mV	0.078 W	3.41 mOhm	3.41
PCB to -	14.0 mV	4.78 A	0.067 W	14.0 mV	0.067 W	2.93 mOhm	2.93
Connector	3.4 mV	4.77 A	0.016	3.4 mV	0.016 W	0.71 mOhm	0.71
Black wire (-)	1.7 mV	4.77 A	0.008 W			mOhm	0.36
Sum:				65.8 mV	0.317 W	13.649 mOhm	

At the end of measuring, temperatures were taken

Blade fuse	33.7 C	
Mosfet A	43.7 C	
Mosfet B	41.0 C	
Bottom of PCB	C	Warm, but not hot, to touch.
Bed	85.2 C	

**Board 144C, Blade fuse in PCB sockets, PSU 24,5V**

(15A blade fuse)

Mosfet: 2x IRLR7843

				Soldered to/heats PCB			
Red wire (+)	3.0 mV	4.89 A	0.015 W				0.61
Connector	4.9 mV	4.86 A	0.024	4.9 mV	0.024 W	1.01 mOhm	1.01 mOh
PCB	1.6 mV	4.84 A	0.008 W	1.6 mV	0.008 W	0.33 mOhm	0.33
Fuse only	25.4 mV	4.81 A	0.122 W			mOhm	5.28
Fuse and socket	27.1 mV	4.80 A	0.130 W			mOhm	5.65
PCB	1.4 mV	4.79 A	0.007 W	1.4 mV	0.007 W	0.29 mOhm	0.29
Connector	4.2 mV	4.77 A	0.020	4.2 mV	0.020 W	0.88 mOhm	0.88
Bed + (red wire)	4.8 mV	4.77 A	0.023 W			mOhm	1.01
Heat Bed	24.2 V	4.76 A	115.335 W				5.09 Ohm
Bed- (black wire)	4.9 mV	4.74 A	0.023 W			mOhm	1.03 mOh
Connector	5.2 mV	4.73 A	0.025	5.2 mV	0.025 W	1.10 mOhm	1.10
PCB to mosfet	2.0 mV	4.73 A	0.009 W	2.0 mV	0.009 W	0.42 mOhm	0.42
Mosfet A	16.2 mV	4.72 A	0.076 W	16.2 mV	0.076 W	3.43 mOhm	3.43
Mosfet B	16.8 mV	4.72 A	0.079 W	16.8 mV	0.079 W	3.56 mOhm	3.56
PCB to -	13.1 mV	4.71 A	0.062 W	13.1 mV	0.062 W	2.78 mOhm	2.78
Connector	5.6 mV	4.71 A	0.026	5.6 mV	0.026 W	1.19 mOhm	1.19
Black wire (-)	0.9 mV	4.71 A	0.004 W			mOhm	0.19
Sum:				71 mV	0.336 W	14.996 mOhm	

At the end of measuring, temperatures were taken

Blade fuse	39.8 C	
Mosfet A	44.0 C	
Mosfet B	42.0 C	
Bottom of PCB	43.0 C	Quite warm to the touch
Bed	90.5 C	

**Board 144C(optimized PCB), Blade fuse in PCB sockets, PSU 12,5V**

(15A blade fuse)

Mosfet: 2x IRLR7843

				Soldered to/heats PCB			
Red wire (+)	4.5 mV	10.00 A	0.045 W				0.45
Connector	9.0 mV	10.00 A	0.090	9.0 mV	0.090 W	0.90 mOhm	0.90 mOh
PCB	0.8 mV	10.00 A	0.008 W	0.8 mV	0.008 W	0.08 mOhm	0.08
Fuse only	mV	10.00 A	0.000 W			mOhm	0.00
Fuse and socket	60.0 mV	10.00 A	0.600 W			mOhm	6.00
PCB	1.0 mV	10.00 A	0.010 W	1.0 mV	0.010 W	0.10 mOhm	0.10
Connector	8.1 mV	10.00 A	0.081	8.1 mV	0.081 W	0.81 mOhm	0.81
Bed + (red wire)	mV	10.00 A	0.000 W			mOhm	0.00
Heat Bed	V	10.00 A	0.000 W				0.00 Ohm
Bed- (black wire)	mV	10.00 A	0.000 W			mOhm	0.00 mOh
Connector	8.6 mV	10.00 A	0.086	8.6 mV	0.086 W	0.86 mOhm	0.86
PCB to mosfet	4.1 mV	10.00 A	0.041 W	4.1 mV	0.041 W	0.41 mOhm	0.41
Mosfet A	36.5 mV	10.00 A	0.365 W	36.5 mV	0.365 W	3.65 mOhm	3.65
Mosfet B	35.5 mV	10.00 A	0.355 W	35.5 mV	0.355 W	3.55 mOhm	3.55
PCB to -	35.5 mV	10.00 A	0.355 W	35.5 mV	0.355 W	3.55 mOhm	3.55
Connector	6.3 mV	9.97 A	0.063	6.3 mV	0.063 W	0.63 mOhm	0.63
Black wire (-)	mV	A	0.000 W			mOhm	###
Sum:				145.4 mV	1.454 W	14.542 mOhm	

At the end of measuring, temperatures were taken

Blade fuse	39.4 C			
Mosfet A	44.6 C			
Mosfet B	45.0 C			
Connector	40.0	40.2	38.9	38.0
Buttom of PCB	37.8 C			
Bed	71.0 C			