

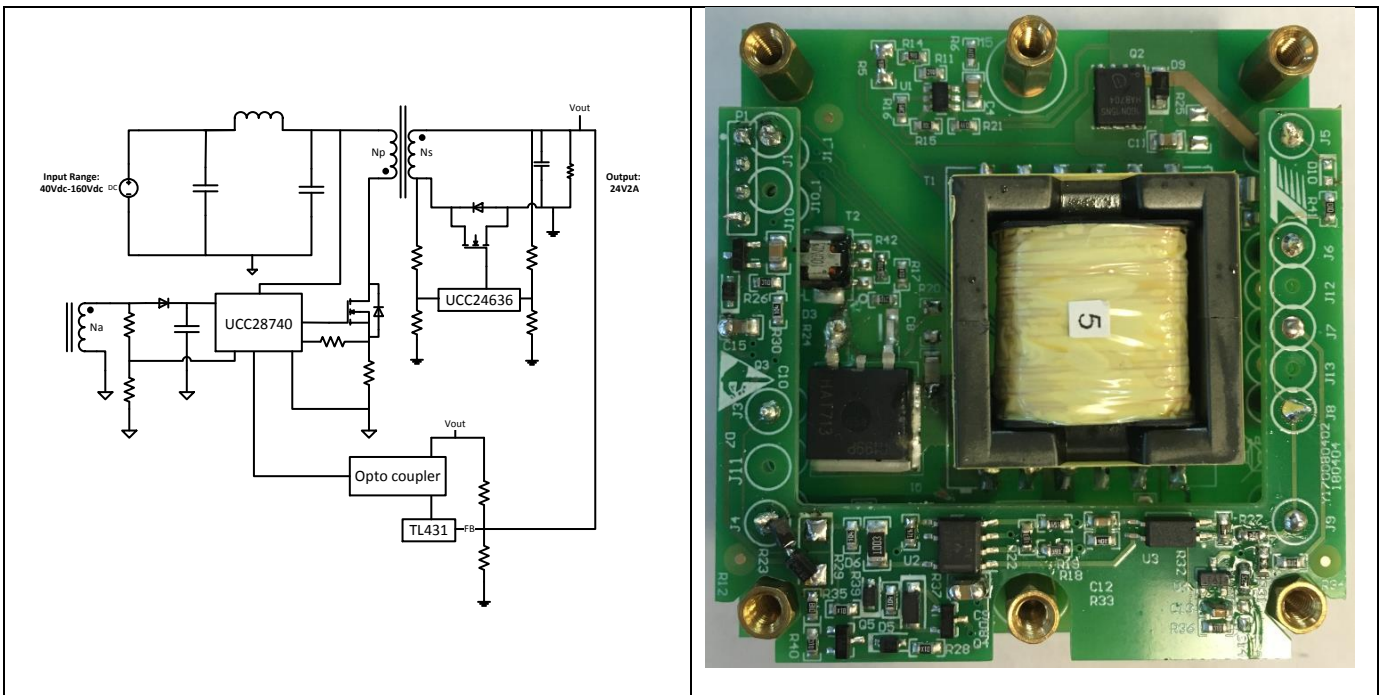
Test Report: PMP40376

40-V to 180-V DC input, 24-V 2-A output half brick power module reference design



Description

This reference design is an auxiliary power supply with 24-V, 2-A output. The line and load regulation of the power supply is designed to be within 1% using secondary side regulator UCC28740. All components are on the toplayer and the size is the industrial standard half-brick dimension.



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1 Test Prerequisites

1.1 Voltage and Current Requirements

Table 1. Voltage and Current Requirements

PARAMETER	SPECIFICATIONS
Input	DC Source: 40V DC to 180V DC
Output	24V/2A

1.2 Required Equipment

- DC Source: Chroma 62012P-600-8
- E-Load: Chroma 63103A module
- Multi-meter (voltage): Fluke 287C
- Multi-meter (current): Fluke 287C

2 Testing and Results

2.1 Efficiency Graphs

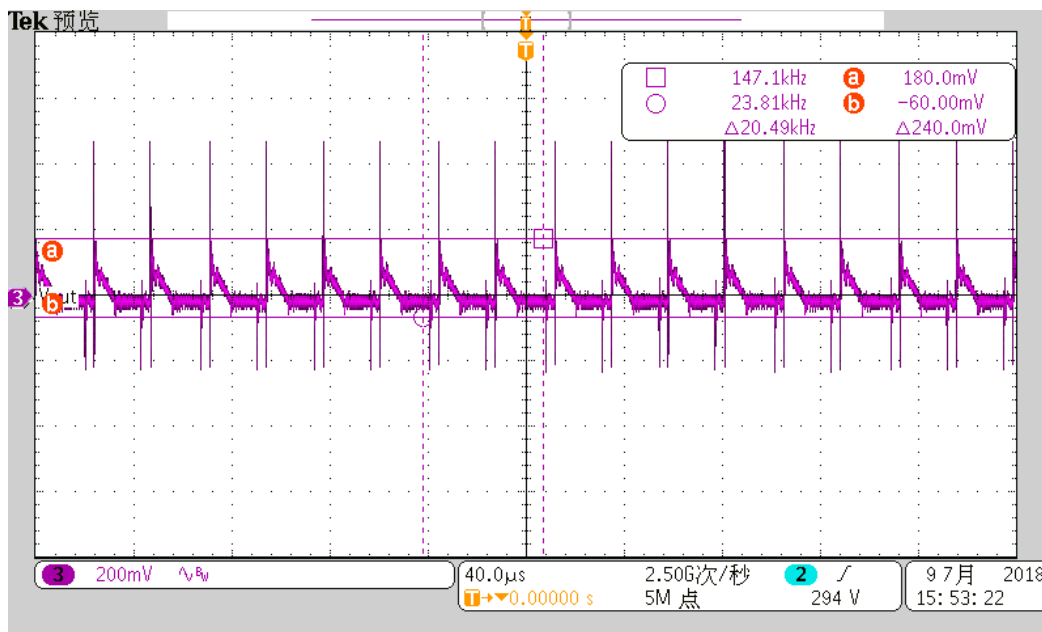
2.2 Efficiency Data*

Vin(V)	Iin(A)	Pin(W)	Vout(V)	Iout(A)	Pout(W)	Efficiency
110.08	0.0503	5.537	24.010	0.195	4.682	84.56
110.08	0.1001	11.019	24.002	0.4022	9.654	87.61
110.08	0.1467	16.149	24.002	0.6009	14.423	89.31
110.04	0.1970	21.678	23.987	0.8091	19.408	89.53
110.02	0.2403	26.438	23.986	0.9891	23.725	89.74
110.02	0.2911	32.027	23.984	1.1991	28.759	89.80
110.01	0.3421	37.634	23.987	1.4100	33.822	89.87
110.01	0.3892	42.816	23.985	1.6041	38.474	89.86
110.00	0.4391	48.301	23.980	1.8131	43.478	90.01
109.99	0.4853	53.378	23.973	2.0072	48.119	90.15

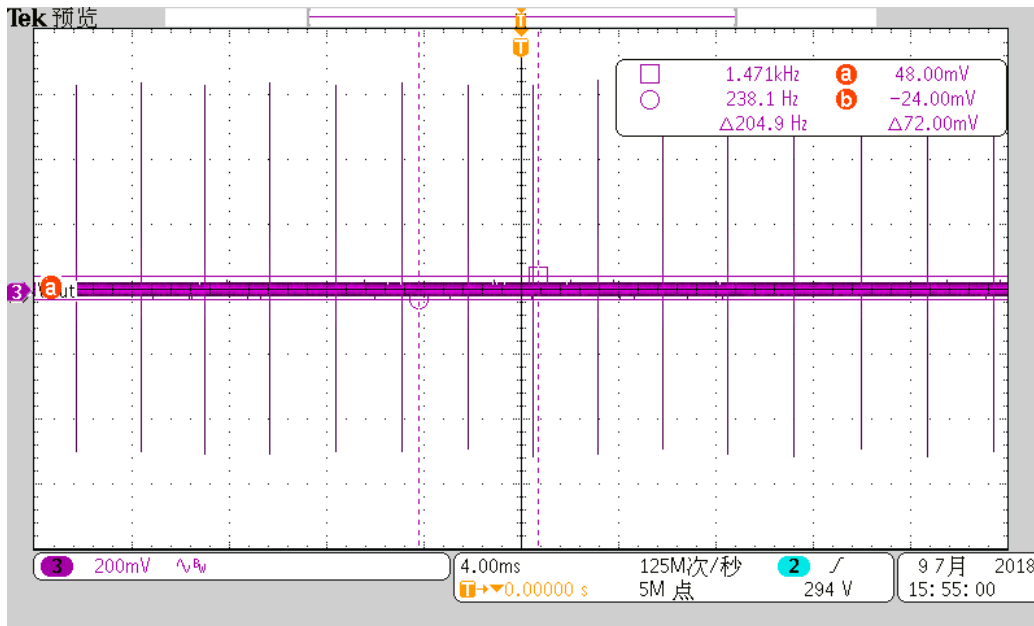
3 Waveforms

3.1 Output Voltage Ripple*

110Vin 24Vout Full Load

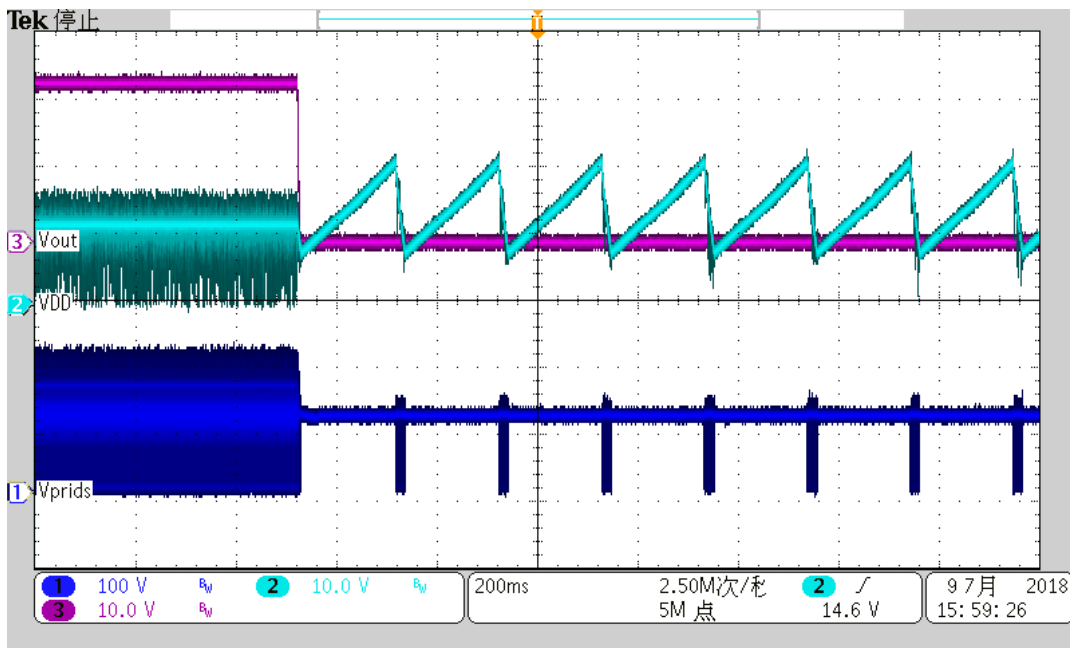


110Vin 24Vout No Load

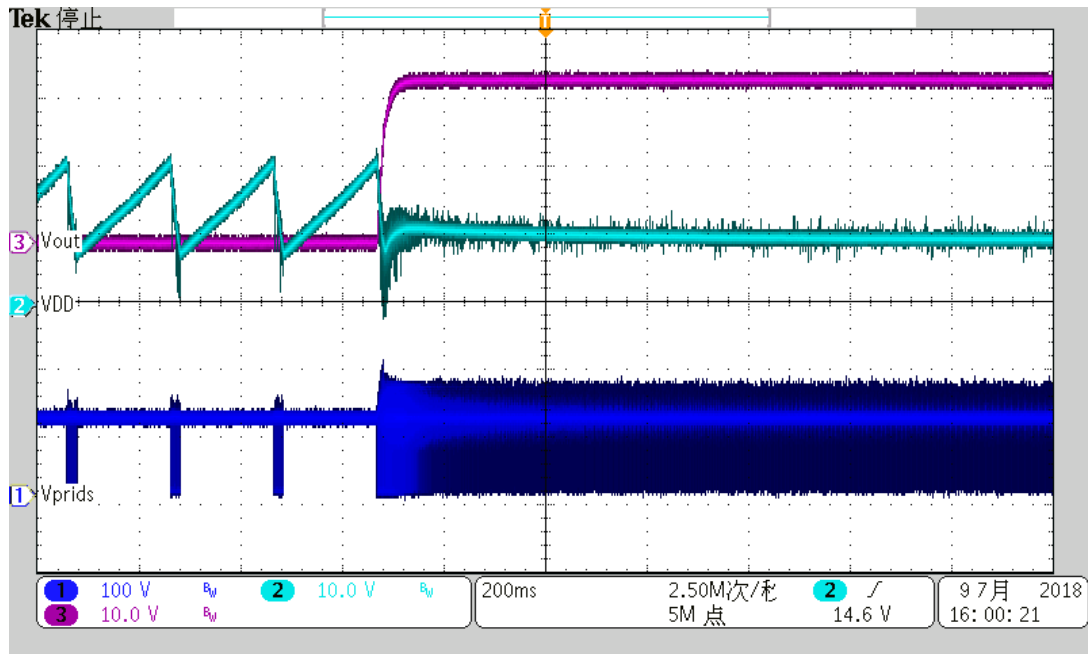


3.2 Short Circuit Recovery*

110Vin 24Vout Short Circuit Protection

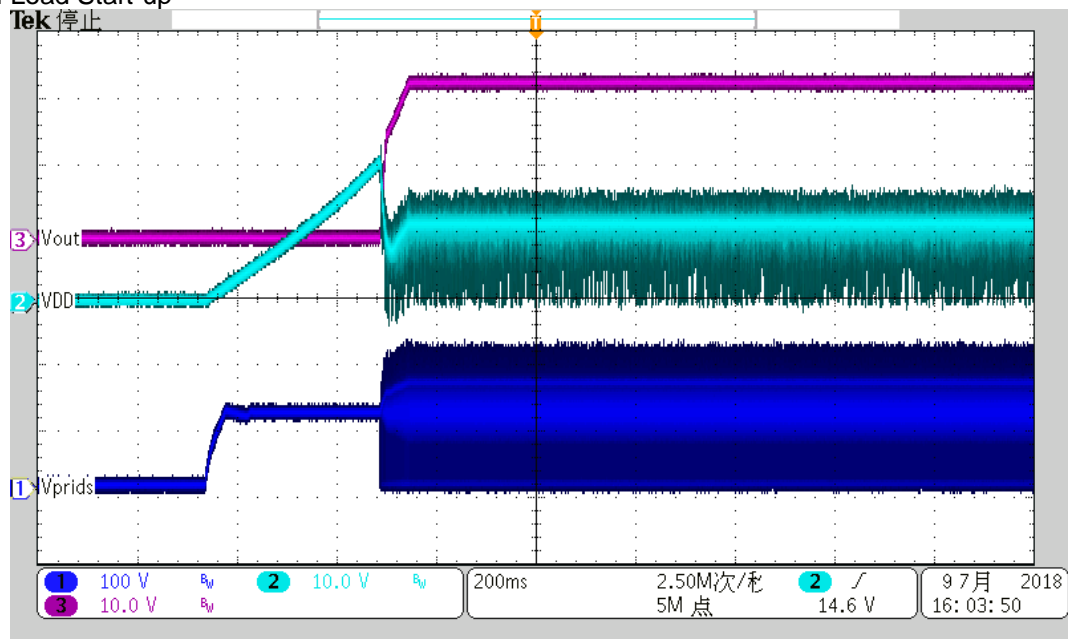


110Vin 24Vout Short Circuit Protection Recovery

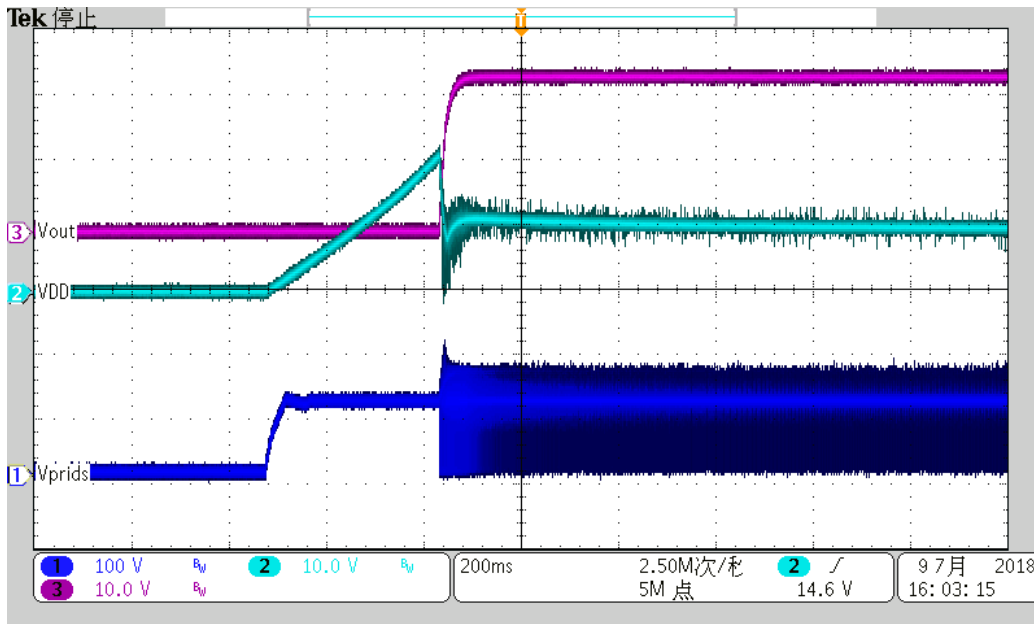


3.3 Start-up Sequence*

110Vin Full Load Start-up

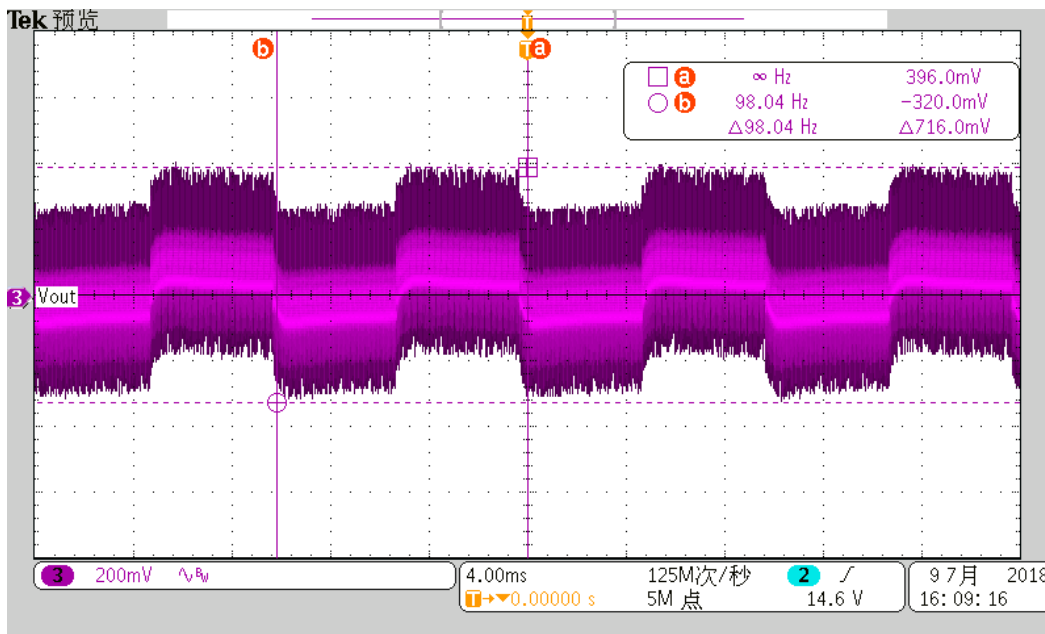


110Vin No Load Start-up



3.4 Dynamic Response

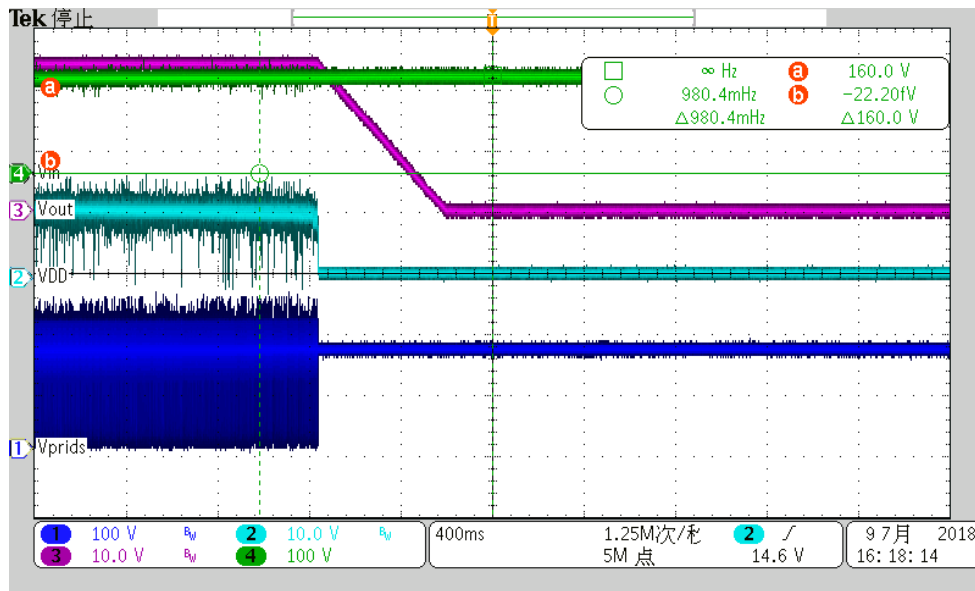
110Vin 24Vout Dynamic Response



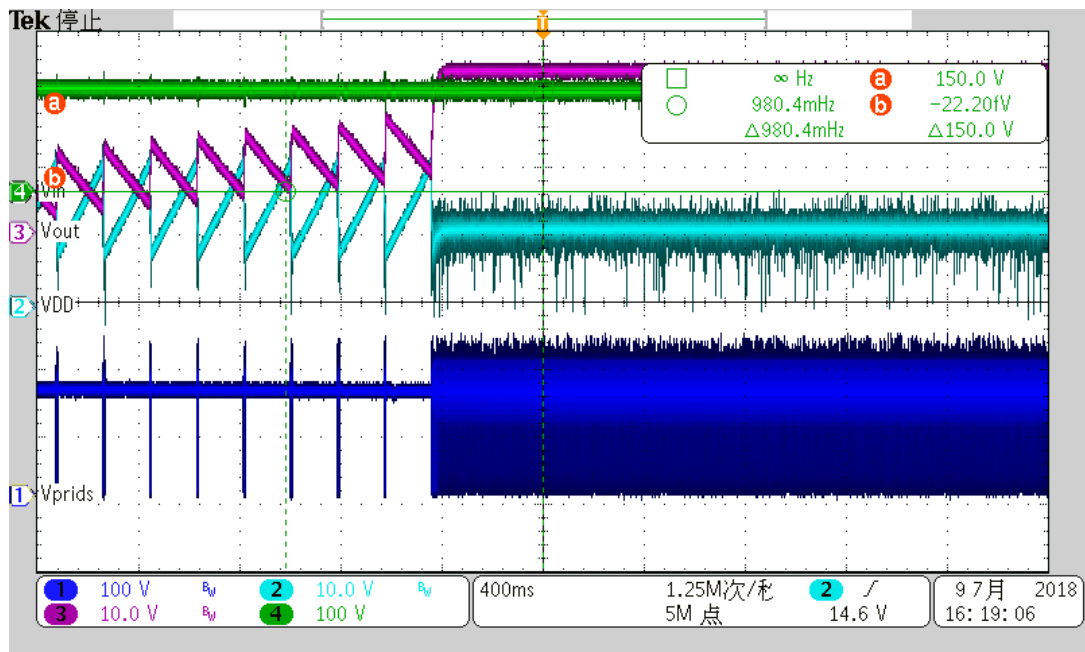
Condition: 100Hz frequency, 1A/us, 1.5A-2.0A

3.5 Line Overvoltage Protection

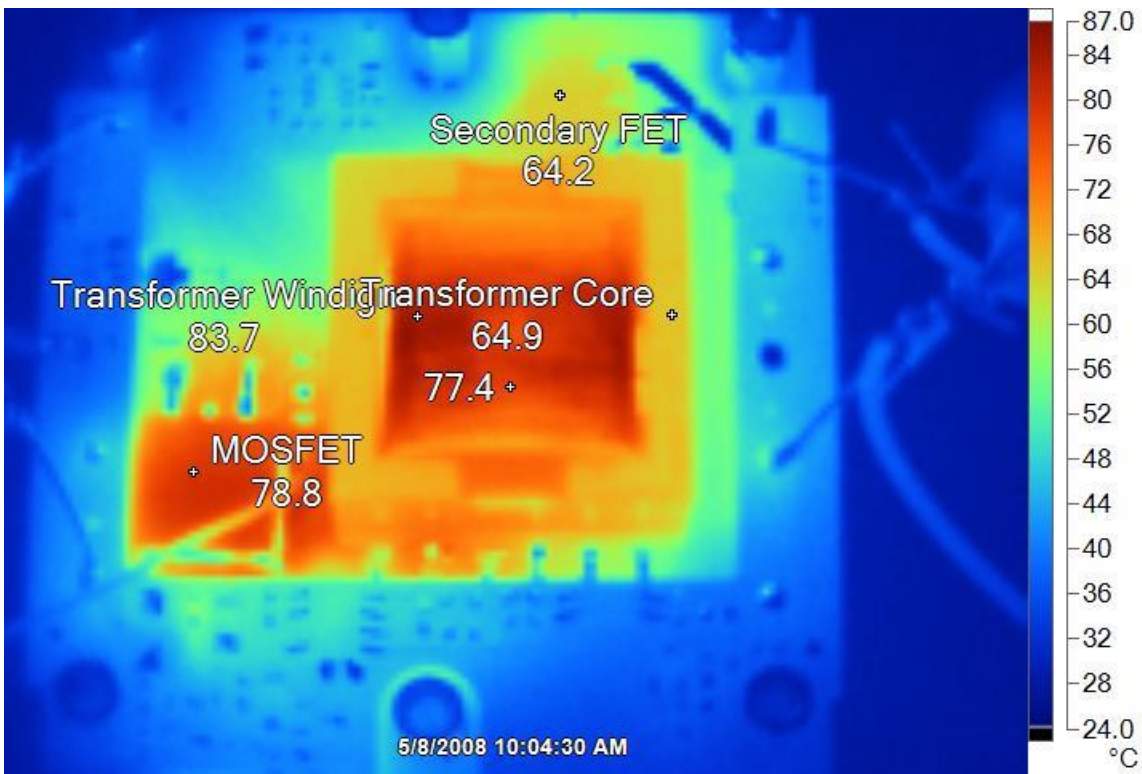
160Vin line overvoltage protection



160Vin line overvoltage protection recovery



3.6 Thermal Performance



Without heatsink, running 30mins

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