Texas Instruments

PMP4468 REVA Test Procedure

China Power Reference Design

REVA

03/27/2015

1 General

1.1 PURPOSE

Provide the detailed data for evaluating and verifying the PMP4468.

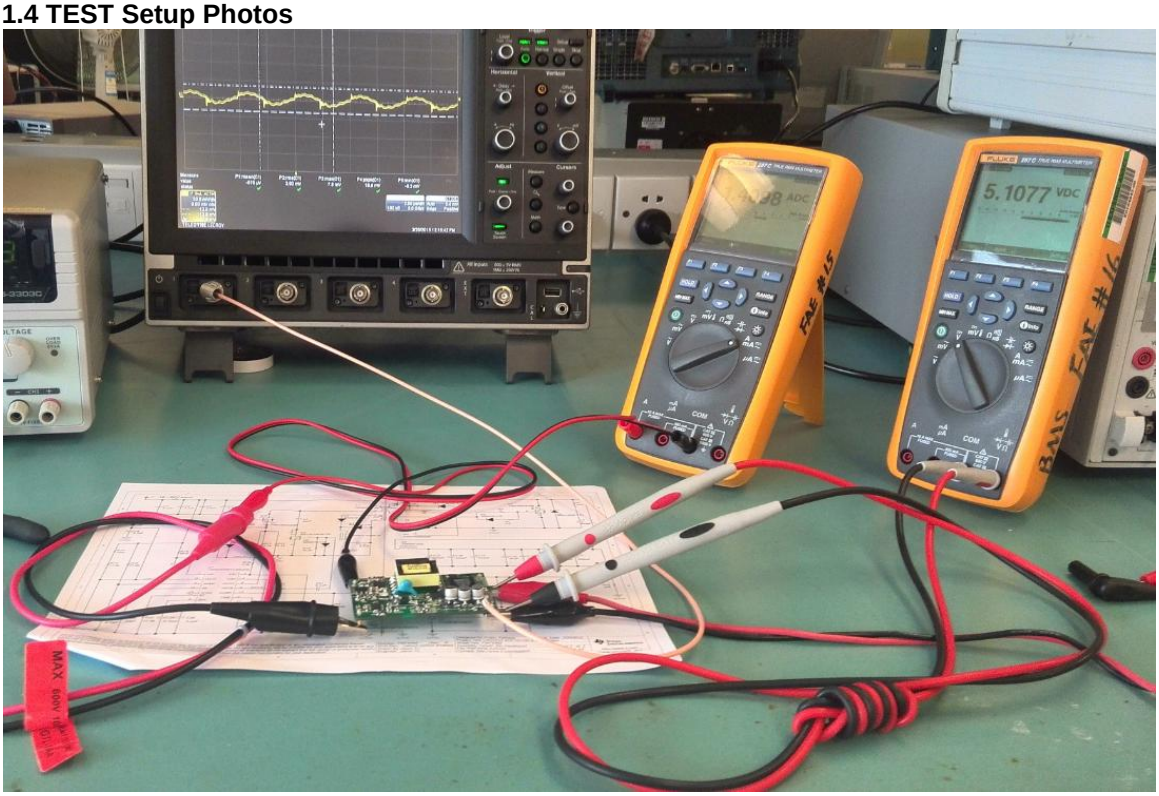
1.2 REFERENCE DOCUMENTATION

Schematic PMP4468_REVA_SCH.PDF
Assembly PMP4468_REVA_PCB.PDF
BOM

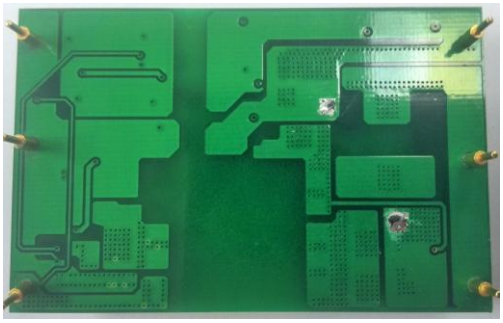
1.3 TEST EQUIPMENTS

Multi-meter: Fluke 187
DC Source: GPS-3303C
Ambient Temperature at 25DegC, convectional cooling

1.4 TEST Setup Photos



Top View



Bottom View

2 INPUT & Output CHARACTERISTICS

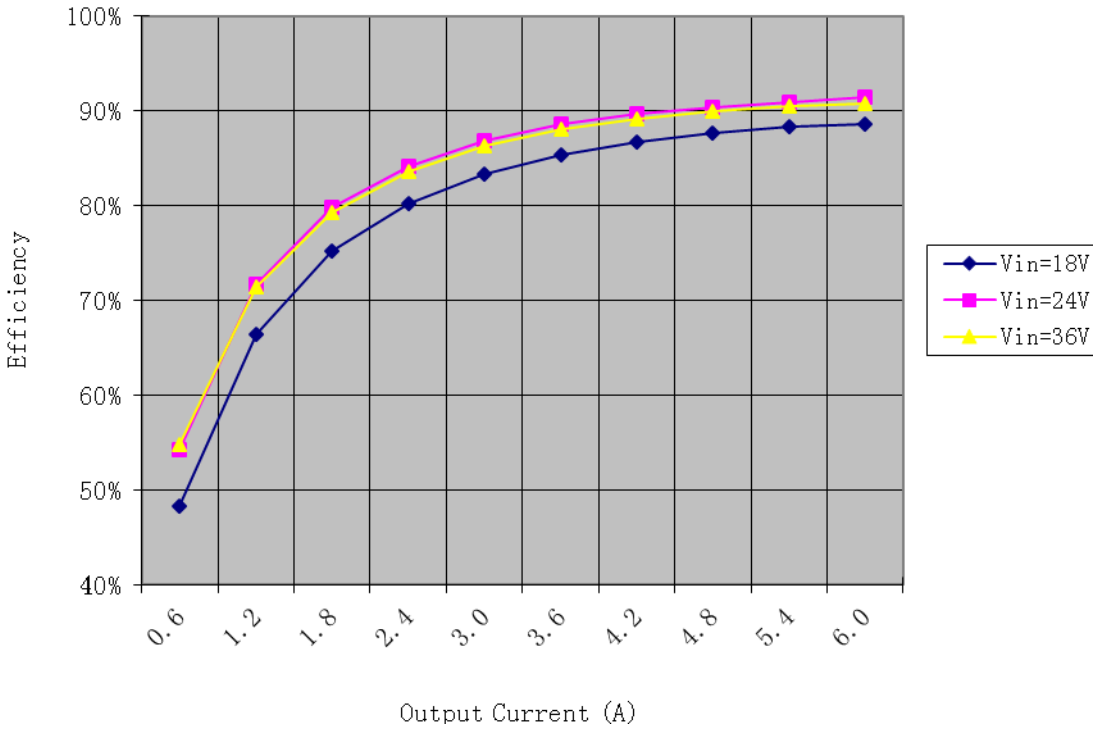
2.1: Efficiency & Regulation

Vin (V)	Iin (A)	Vout (V)	Iout (A)	Eff. (%)
18V Input				
18.549	0.1932	5.128	0.0	0.00%
18.512	0.3439	5.129	0.6	48.34%
18.474	0.5020	5.13	1.2	66.38%
18.435	0.6659	5.131	1.8	75.24%
18.394	0.8347	5.132	2.4	80.22%
18.351	1.0071	5.133	3.0	83.32%
18.310	1.1829	5.134	3.6	85.33%
18.265	1.3619	5.136	4.2	86.72%
18.220	1.5440	5.137	4.8	87.65%
18.175	1.7298	5.138	5.4	88.25%
18.128	1.9200	5.141	6.0	88.62%

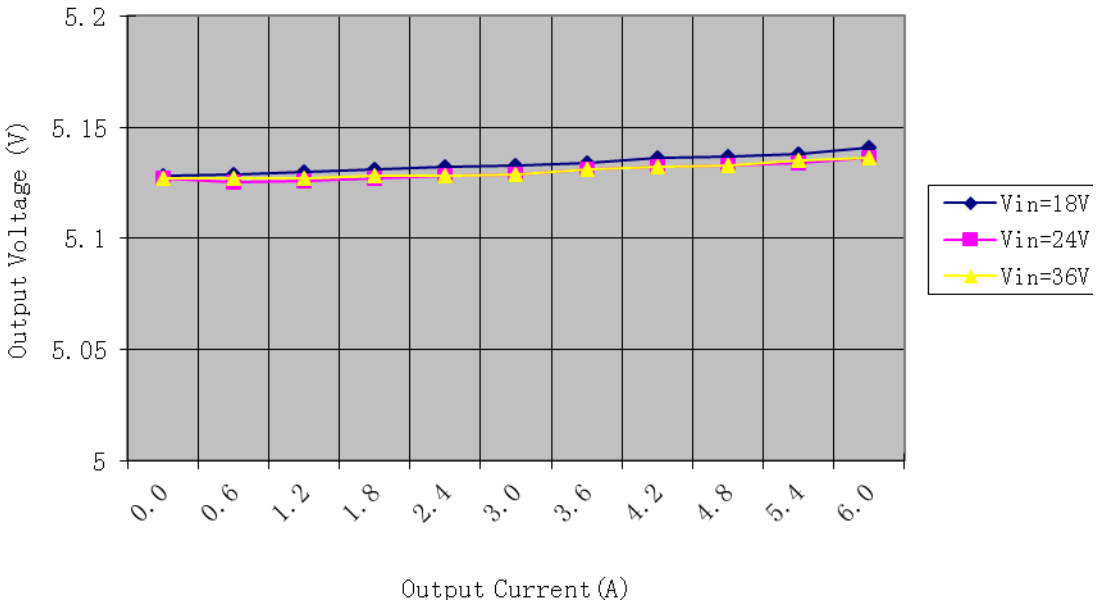
Vin (V)	Iin (A)	Vout (V)	Iout (A)	Eff. (%)
24V Input				
24.510	0.1100	5.127	0.0	0.00%
24.481	0.2316	5.125	0.6	54.23%
24.452	0.3512	5.126	1.2	71.63%
24.422	0.4738	5.127	1.8	79.76%
24.391	0.5996	5.128	2.4	84.15%
24.360	0.7277	5.129	3.0	86.80%
24.328	0.8578	5.131	3.6	88.51%
24.290	0.9897	5.132	4.2	89.66%
24.262	1.1236	5.133	4.8	90.38%
24.228	1.2594	5.134	5.4	90.86%
24.194	1.3939	5.136	6.0	91.38%

Vin (V)	Iin (A)	Vout (V)	Iout (A)	Eff. (%)
36V Input				
36.243	0.0734	5.127	0.0	0.00%
36.223	0.1549	5.127	0.6	54.83%
36.204	0.2379	5.127	1.2	71.43%
36.184	0.3219	5.128	1.8	79.25%
36.164	0.4071	5.128	2.4	83.60%
36.143	0.4935	5.129	3.0	86.27%
36.120	0.5811	5.131	3.6	88.00%
36.099	0.6699	5.132	4.2	89.13%
36.076	0.7596	5.133	4.8	89.91%
36.054	0.8503	5.135	5.4	90.45%
36.031	0.9423	5.136	6.0	90.76%

Efficiency vs Output Current

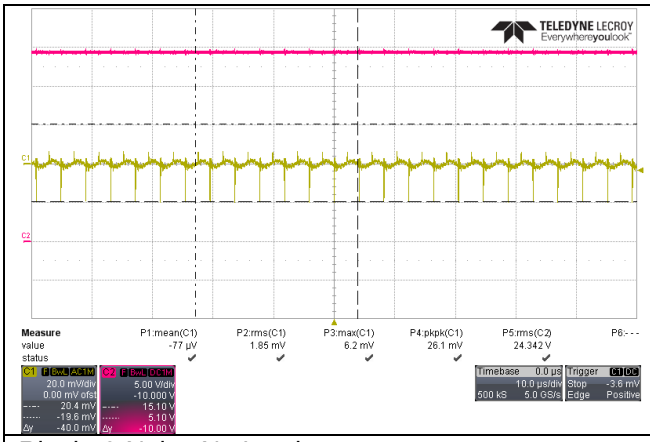
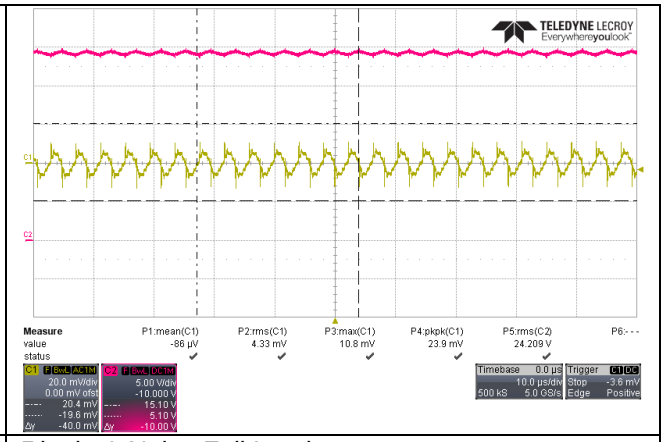
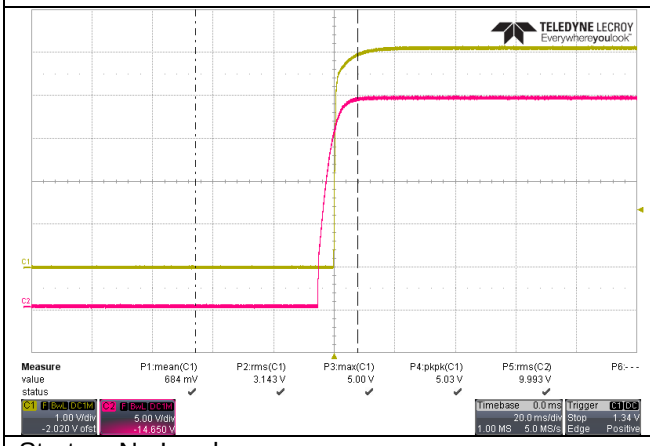
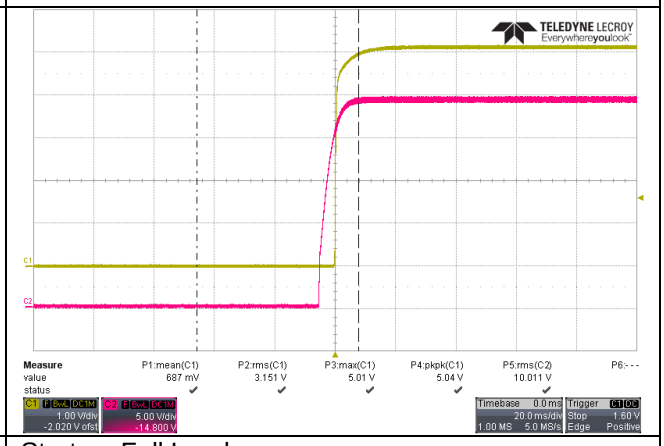


Load Regulation

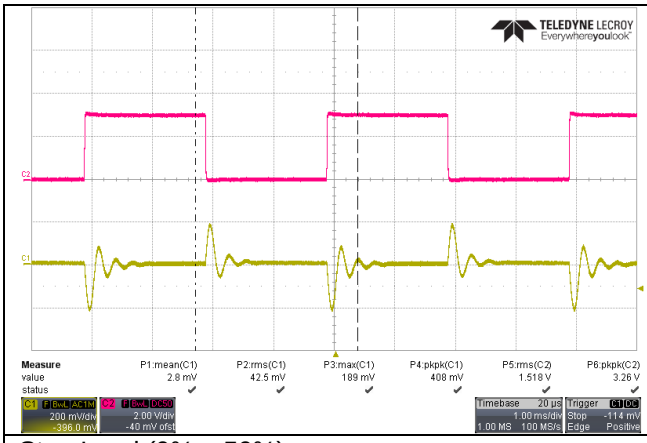


2.2: Start Up Waveforms & Output Ripple

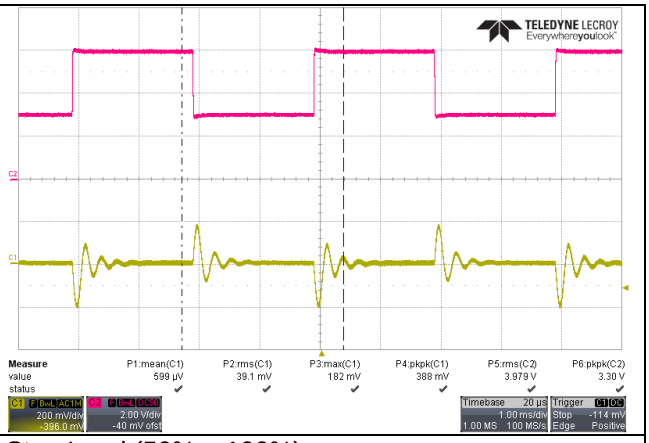
24V Input with Full Load & No Load

	
Ripple & Noise No Load CH1: Output Voltage 20mV/Div CH2: Input Voltage 5.0V/Div	Ripple & Noise Full Load CH1: Output Voltage 20mV/Div CH2: Input Voltage 5.0V/Div
	
Start up No Load CH1: Output Voltage 1.0V/Div CH2: Input Voltage 5.0V/Div	Start up Full Load CH1: Output Voltage 1.0V/Div CH2: Input Voltage 5.0V/Div

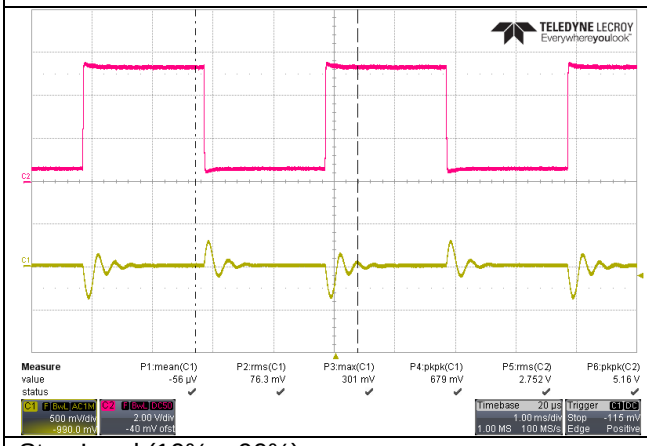
2.3: Dynamic Load Waveforms



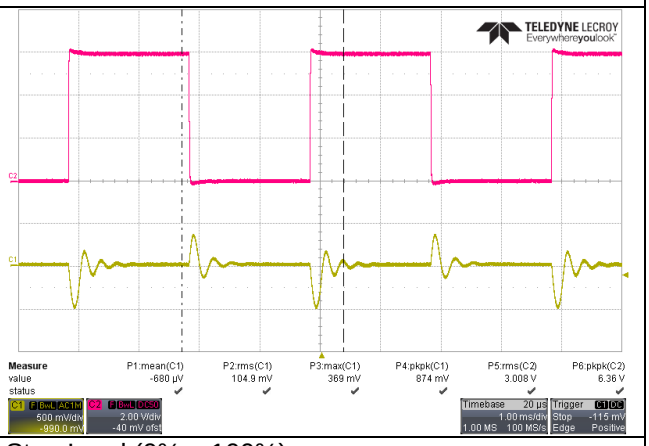
Step Load (0% – 50%)
CH1: Output Voltage 200mV/Div
CH2: Output Current 1A/V



Step Load (50% – 100%)
CH1: Output Voltage 200mV/Div
CH2: Output Current 1A/V



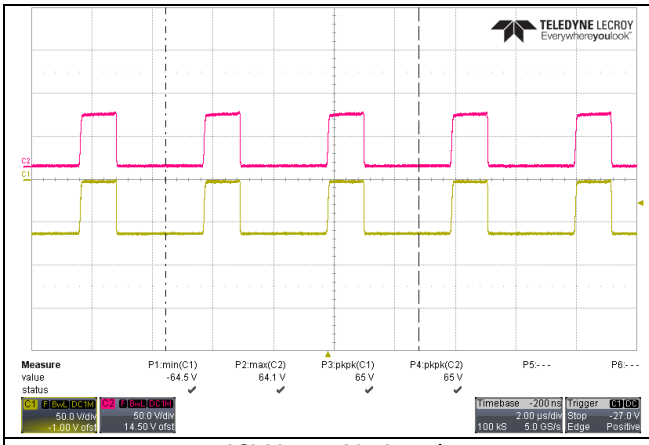
Step Load (10% – 90%)
CH1: Output Voltage 500mV/Div
CH2: Output Current 1A/V



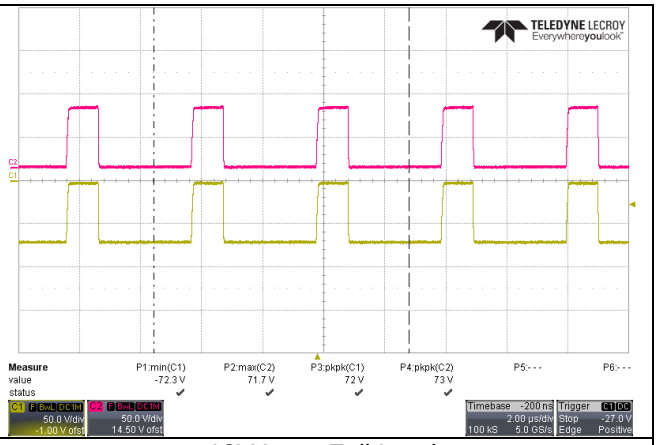
Step Load (0% – 100%)
CH1: Output Voltage 500mV/Div
CH2: Output Current 1A/V

2.4: Operating waveform (Primary MOSFET VDS)

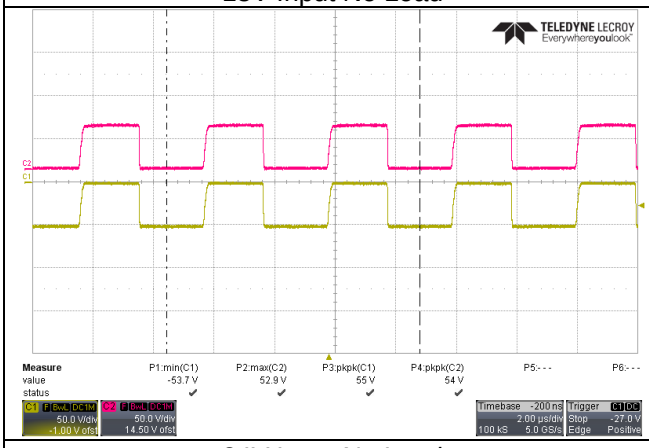
CH1: Primary Aux. MOSFET VDS 50V/Div
CH2: Primary MOSFET VDS 50V/Div



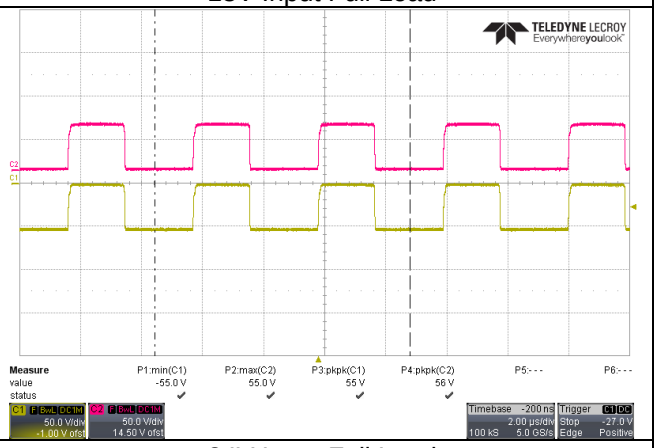
18V Input No Load



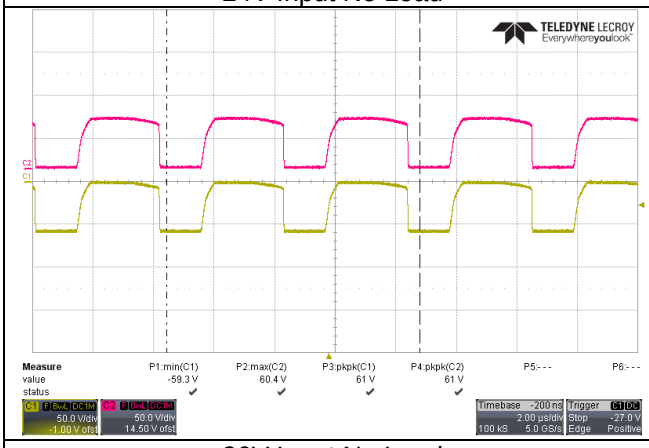
18V Input Full Load



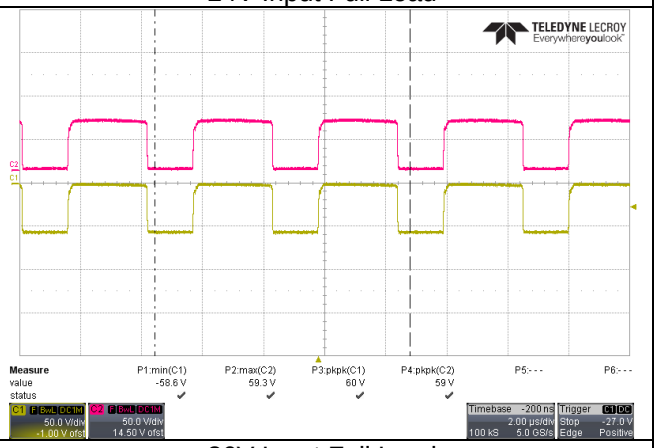
24V Input No Load



24V Input Full Load



36V Input No Load

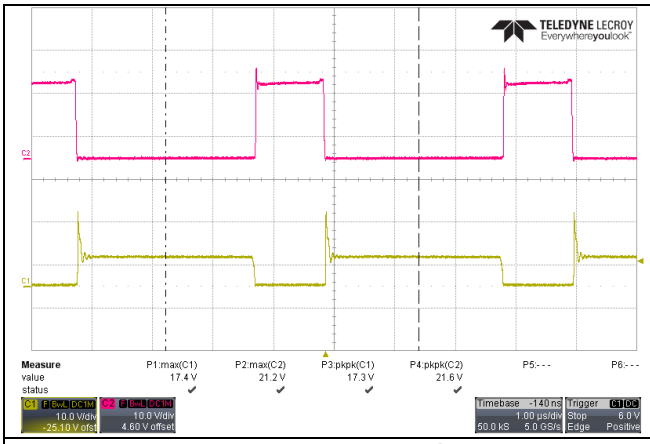


36V Input Full Load

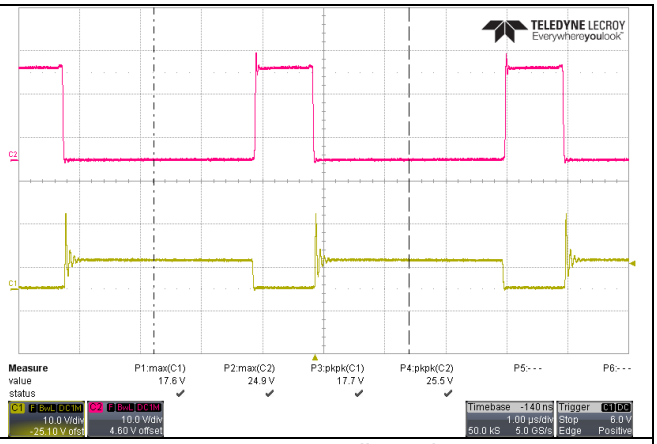
2.5: Operating waveform (Secondary MOSFET VDS)

CH1: Secondary Freewheeling MOSFET VDS 10.0V/Div (Q1)

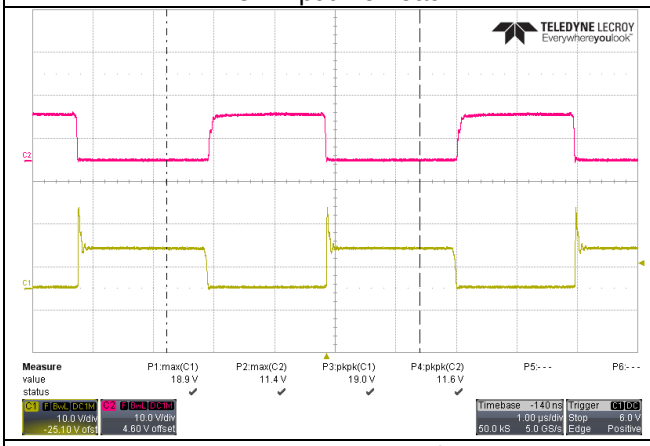
CH2: Secondary Rectifier MOSFET Driver 10.0V/Div (Q4)



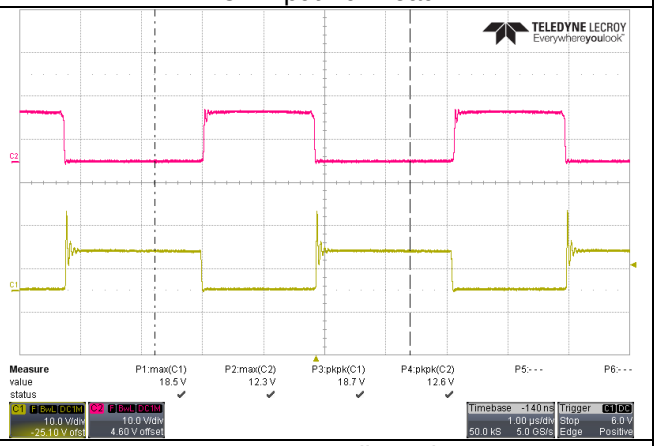
18V Input No Load



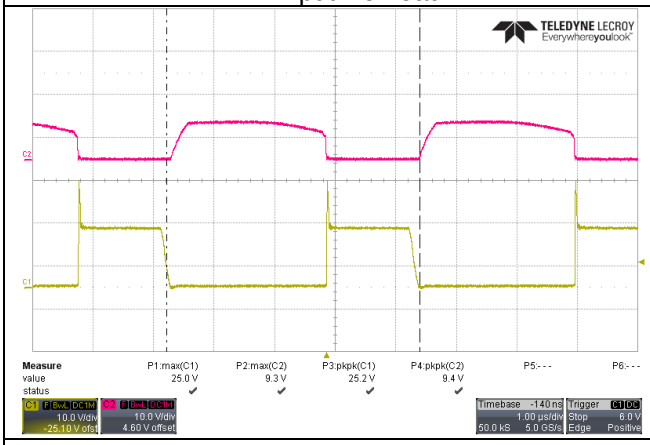
18V Input Full Load



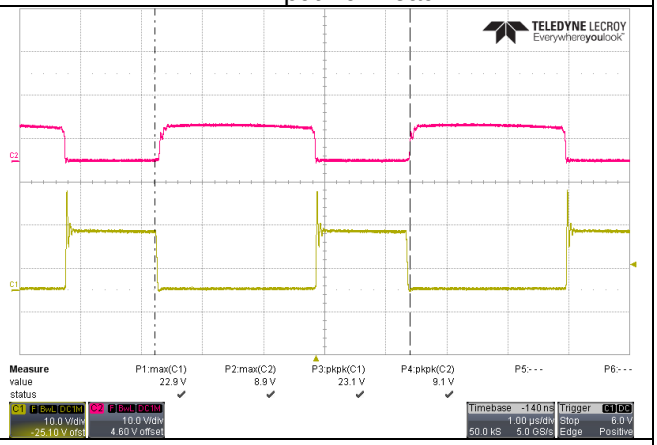
24V Input No Load



24V Input Full Load



36V Input No Load

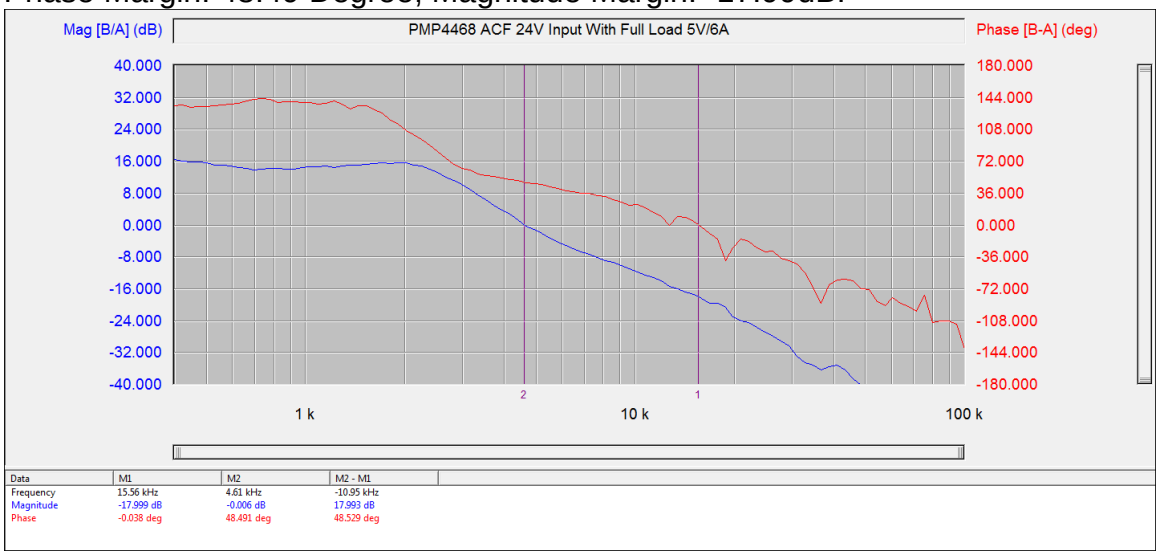


36V Input Full Load

3 Bode Plot

24V Input, Full Load (5.1V/6.0A).

Phase Margin: 48.49 Degree; Magnitude Margin: -17.99dB.



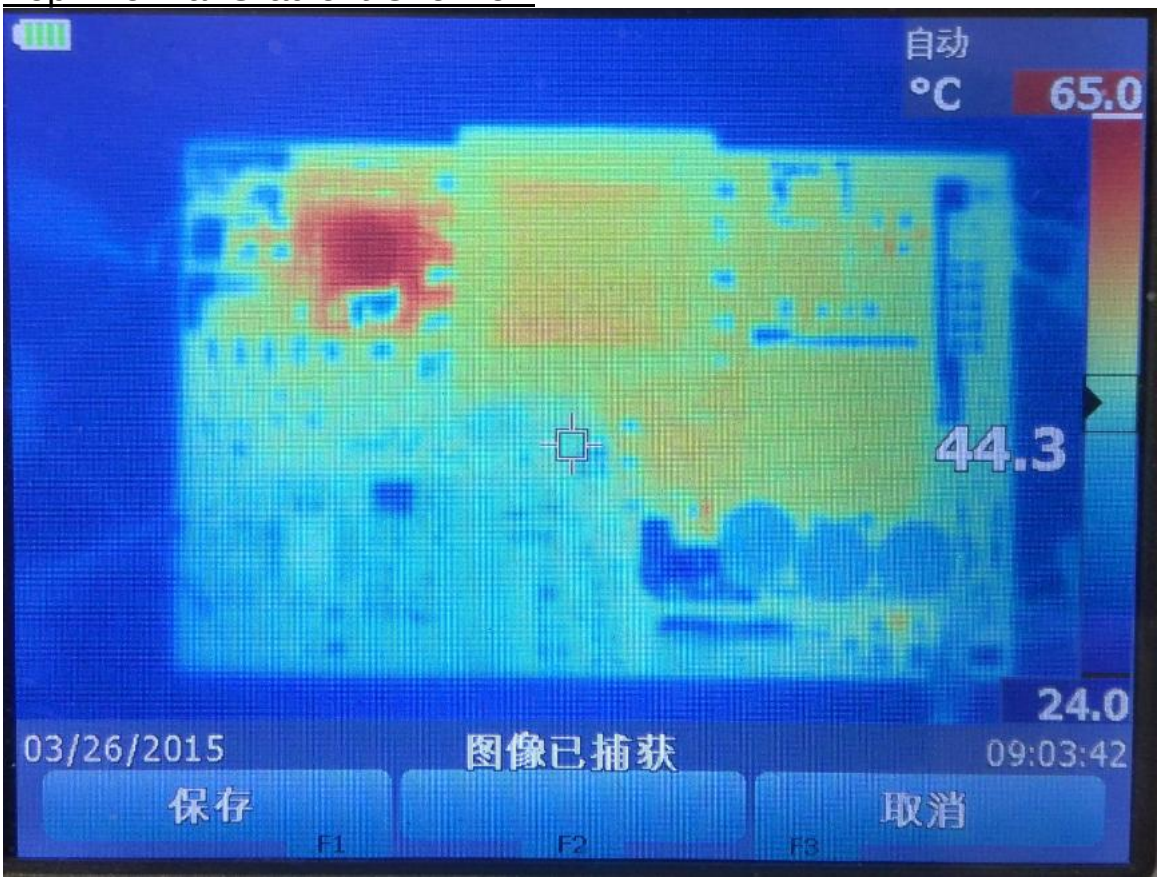
4 Thermal IR Scan

Testing condition:

Ambient temperature without Fan cooling

24V input with full load (15 minutes warm up)

Top Thermal Gradient Overview



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