



**Texas Instruments**

**PMP4481 Test Report**

**Asia Power Design Service**

## 1 General

### 1.1 PURPOSE

Provide the detailed data for evaluating and verifying the PMP4481.  
PMP4481 is a low DC input (3V–6V) and low DC output (0.9V) power design.

The output voltage can be modified by the resistor divider; the valid output voltage can be 0.9V to 3.3V (for 3.3V output voltage, the input voltage must be higher than 4V). The rated output current is 6A.

Typical application is 0.9V/6A.

### 1.2 REFERENCE DOCUMENTATION

PMP4481\_Schematic.pdf

PMP4481\_Layout.zip

PMP4481\_BOM.pdf

### 1.3 TEST EQUIPMENTS

Multi-meter: FLUKE 17B

DC Source: Chroma 62024P-100-50

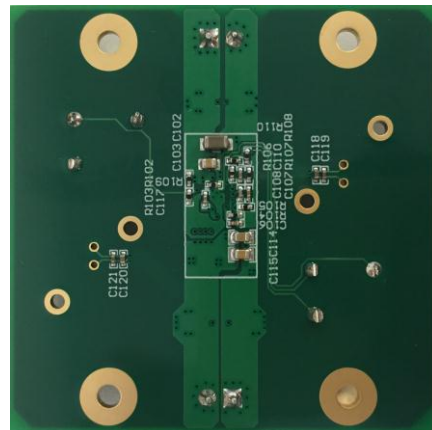
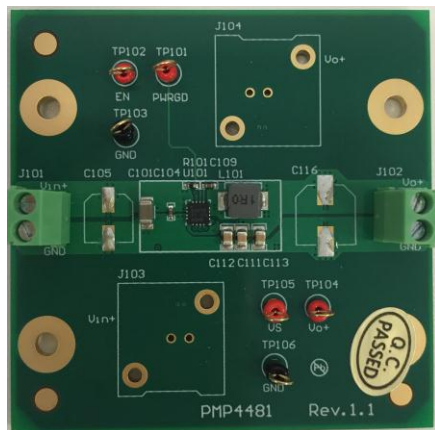
Electronic Load: Chroma 63106A/63030

Oscillation: Tektronix DPO3054

Infrared Thermometer: FLUKE Ti9

Network Analyzer: AP Model 300

### 1.4 PHOTOS



## 2 INPUT AND OUTPUT CHARACTERISTICS

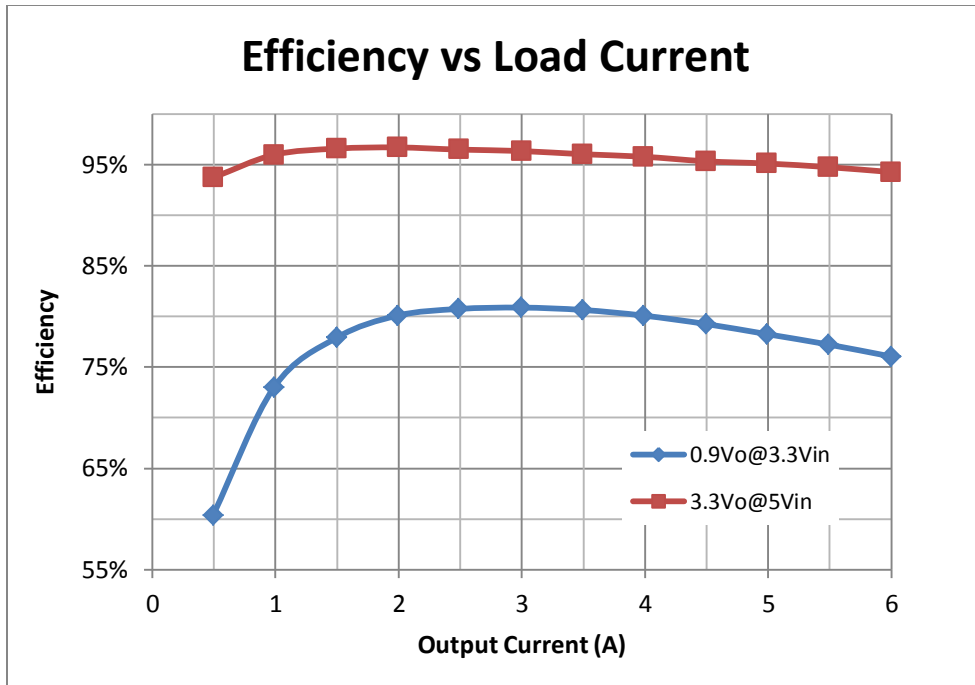
### 2.1 EFFICIENCY

## 3.3Vin & 0.9Vo

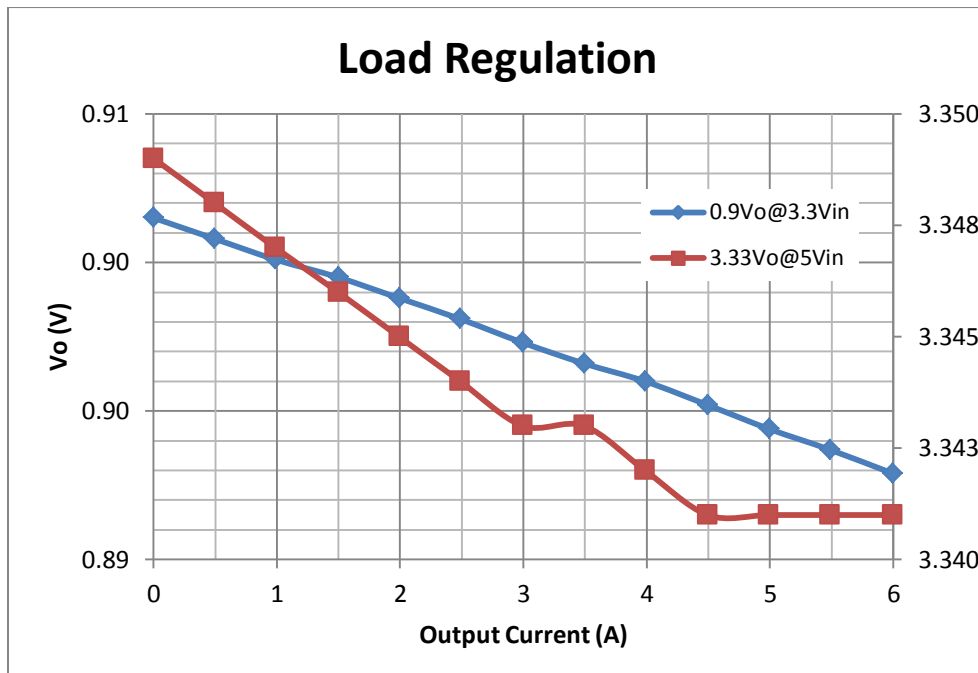
| Vin(V) | Iin(A) | Vo(V)  | Io(A)  | EFF.(%) |
|--------|--------|--------|--------|---------|
| 3.386  | 0.083  | 0.9015 | 0      | 0.00%   |
| 3.375  | 0.218  | 0.9008 | 0.4931 | 60.37%  |
| 3.363  | 0.362  | 0.9001 | 0.9872 | 72.99%  |
| 3.35   | 0.516  | 0.8995 | 1.4972 | 77.91%  |
| 3.337  | 0.67   | 0.8988 | 1.9922 | 80.09%  |
| 3.324  | 0.832  | 0.8981 | 2.4863 | 80.74%  |
| 3.31   | 1.004  | 0.8973 | 2.9953 | 80.88%  |
| 3.296  | 1.178  | 0.8966 | 3.4922 | 80.64%  |
| 3.28   | 1.36   | 0.896  | 3.9872 | 80.09%  |
| 3.264  | 1.556  | 0.8952 | 4.4963 | 79.25%  |
| 3.247  | 1.757  | 0.8944 | 4.9913 | 78.25%  |
| 3.23   | 1.965  | 0.8937 | 5.4853 | 77.24%  |
| 3.211  | 2.192  | 0.8929 | 5.9953 | 76.06%  |

## 5Vin & 3.3Vo

| Vin(V) | Iin(A) | Vo(V) | Io(A) | EFF.(%) |
|--------|--------|-------|-------|---------|
| 5.16   | 0.025  | 3.349 | 0     | 0.00%   |
| 5.13   | 0.344  | 3.348 | 0.494 | 93.72%  |
| 5.1    | 0.675  | 3.347 | 0.987 | 95.96%  |
| 5.06   | 1.025  | 3.346 | 1.497 | 96.58%  |
| 5.03   | 1.37   | 3.345 | 1.992 | 96.69%  |
| 5      | 1.724  | 3.344 | 2.487 | 96.48%  |
| 4.96   | 2.096  | 3.343 | 2.996 | 96.34%  |
| 4.93   | 2.466  | 3.343 | 3.492 | 96.02%  |
| 4.89   | 2.845  | 3.342 | 3.987 | 95.78%  |
| 4.85   | 3.249  | 3.341 | 4.496 | 95.33%  |
| 4.8    | 3.652  | 3.341 | 4.99  | 95.11%  |
| 4.76   | 4.064  | 3.341 | 5.486 | 94.75%  |
| 4.73   | 4.493  | 3.341 | 5.996 | 94.26%  |

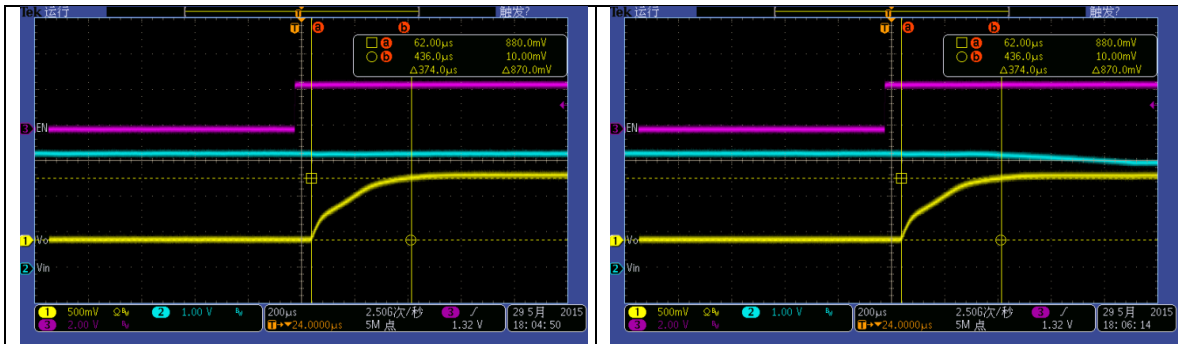


## 2.2 LOAD REGULATION



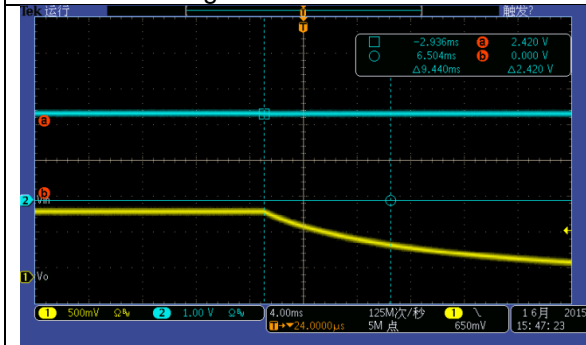
## 2.3 START UP AND SHUT DOWN

### 3.3Vin & 0.9Vo

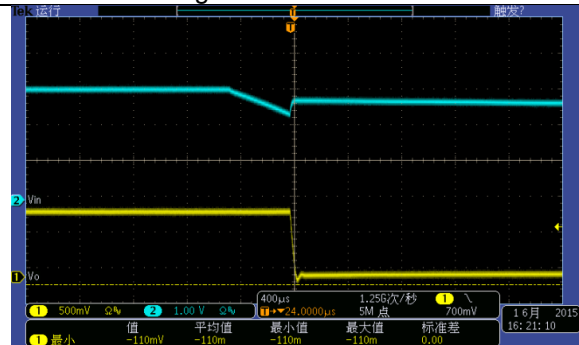


No Load  
 CH1: Output Voltage 0.5V/Div  
 CH2: Input Voltage 1V/Div  
 CH3: Enable Signal 2V/Div

Full Load  
 CH1: Output Voltage 0.5V/Div  
 CH2: Input Voltage 1V/Div  
 CH3: Enable Signal 2V/Div



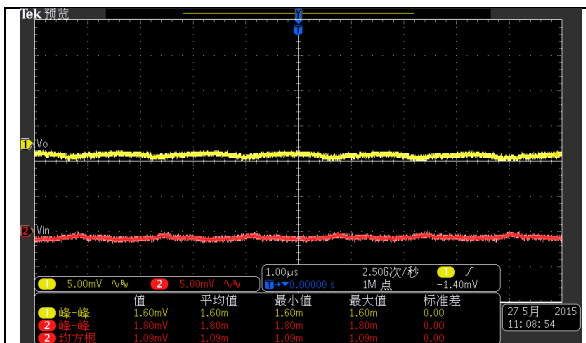
No Load  
 CH1: Output Voltage 0.5V/Div  
 CH2: Input Voltage 1V/Div



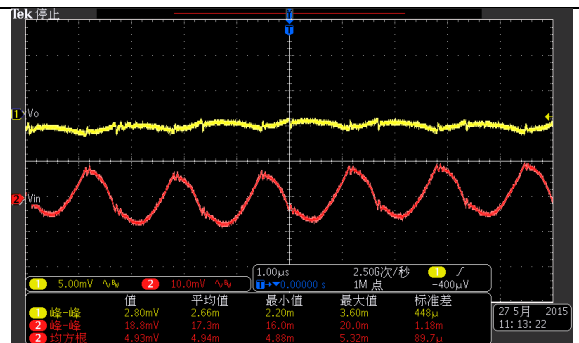
Full Load  
 CH1: Output Voltage 0.5V/Div  
 CH2: Input Voltage 1V/Div

## 2.4 OUTPUT RIPPLE & NOISE

### 3.3Vin & 0.9Vo



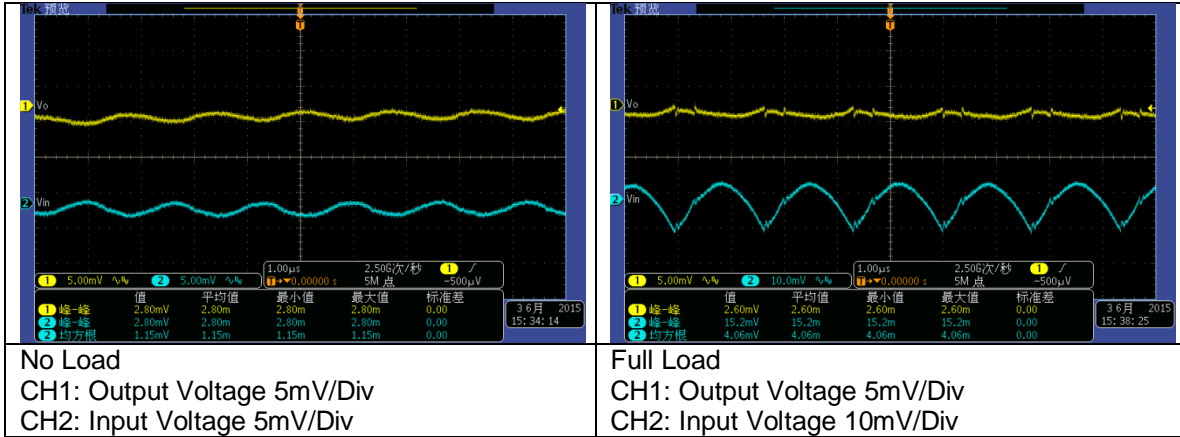
No Load  
 CH1: Output Voltage 5mV/Div  
 CH2: Input Voltage 5mV/Div



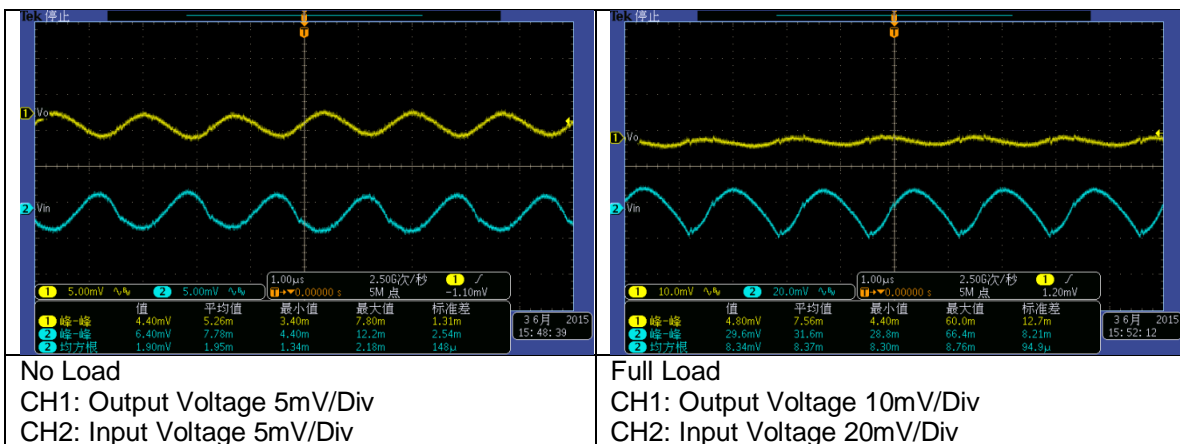
Full Load  
 CH1: Output Voltage 5mV/Div  
 CH2: Input Voltage 10mV/Div

### 3.3Vin & 2.5Vo

# PMP4481

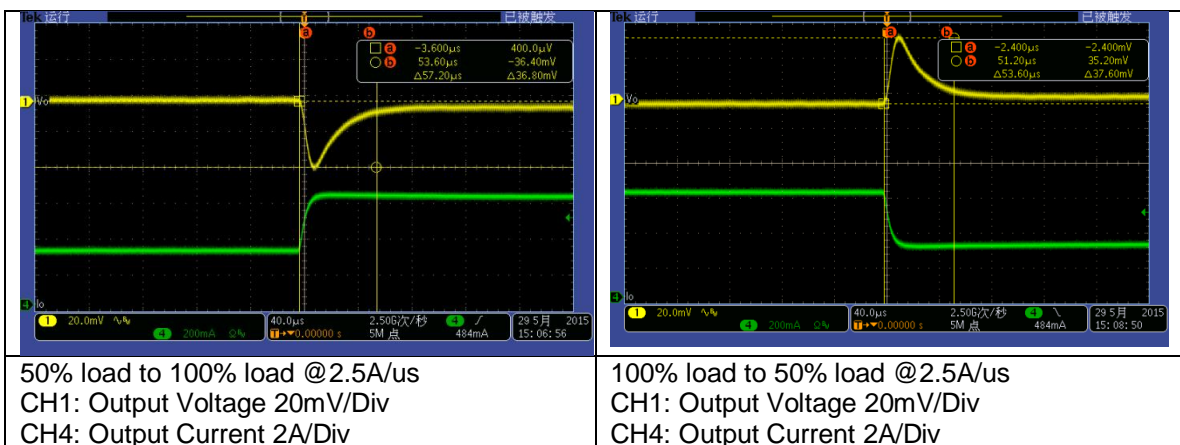


## 5Vin & 3.3Vo

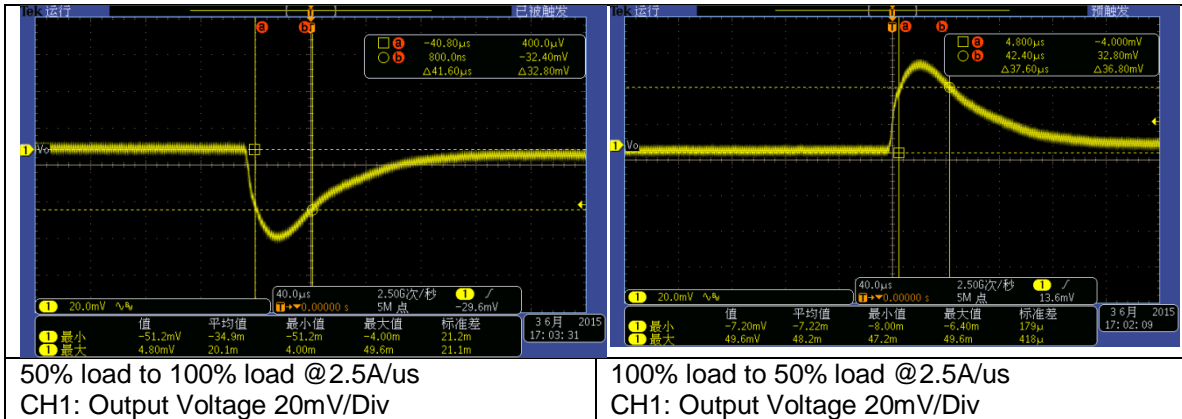


## 2.5 DYNAMIC WAVEFORMS

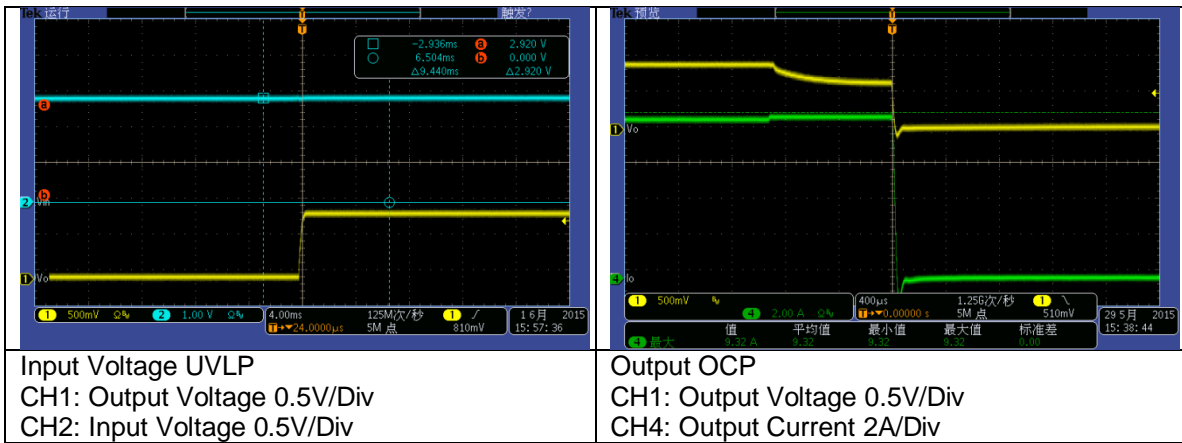
### 3.3Vin & 0.9Vo



## 5Vin & 3.3Vo

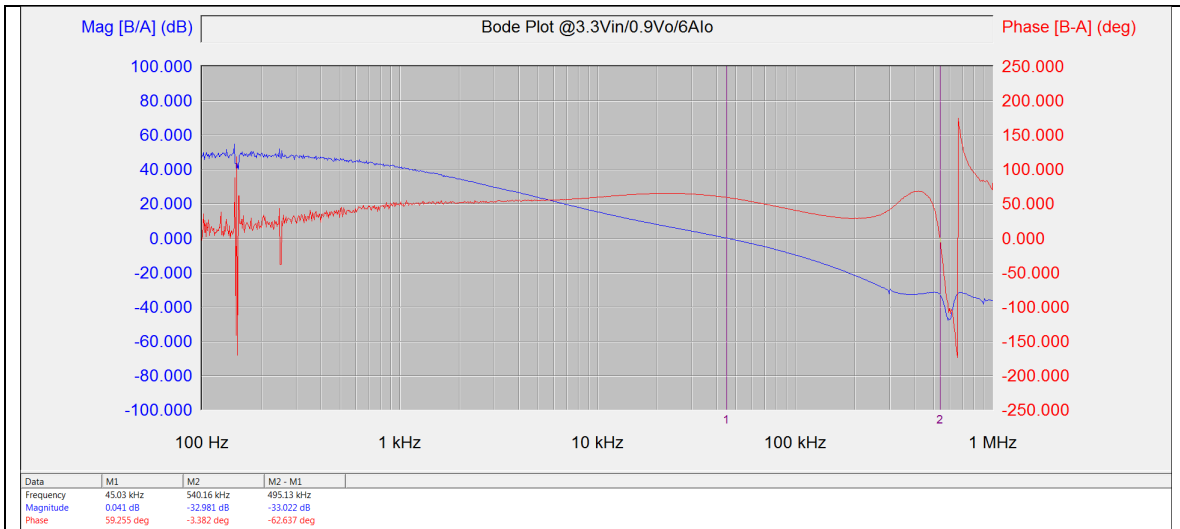


## 2.6 UVLP & OCP TESTING WAVEFORMS



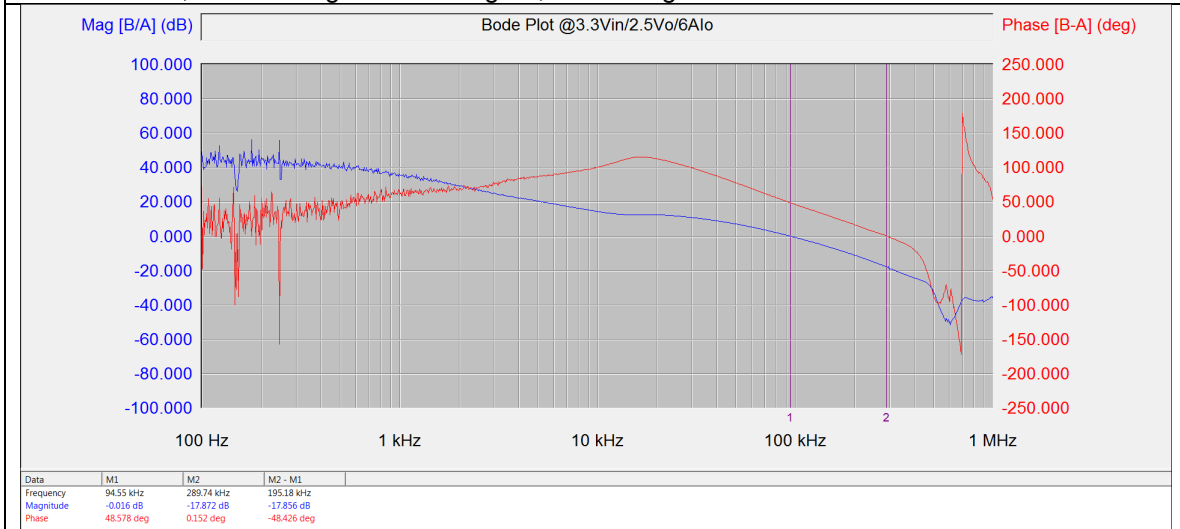
## 3 Bode Plot

# PMP4481



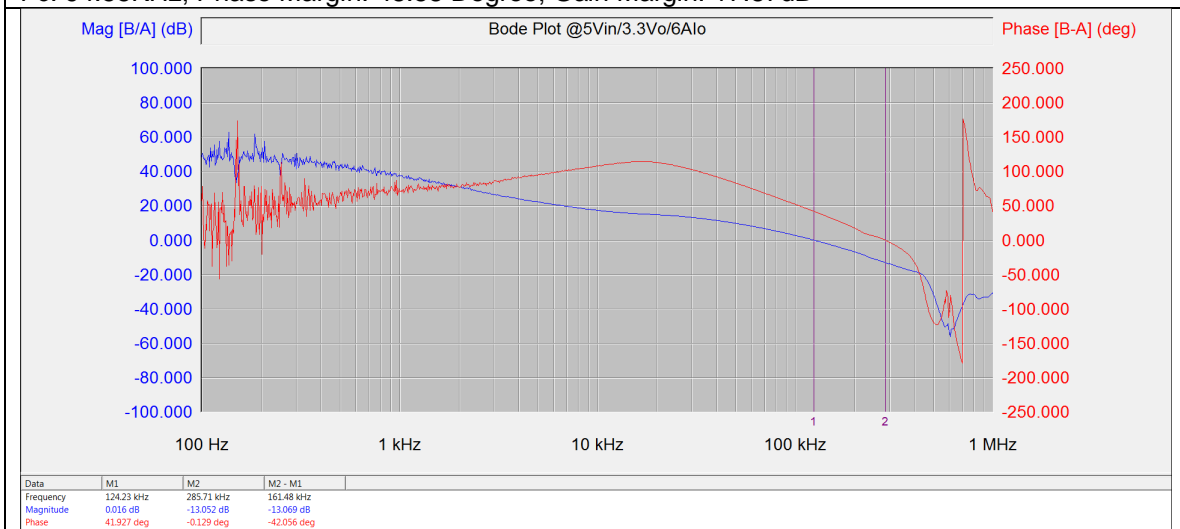
**3.3Vin & 0.9Vo/6A**

**Fc: 59.25KHz; Phase Margin: 59.26 Degree; Gain Margin: 32.98dB**



**3.3Vin & 2.5Vo/6A**

**Fc: 94.55KHz; Phase Margin: 48.58 Degree; Gain Margin: 17.87dB**

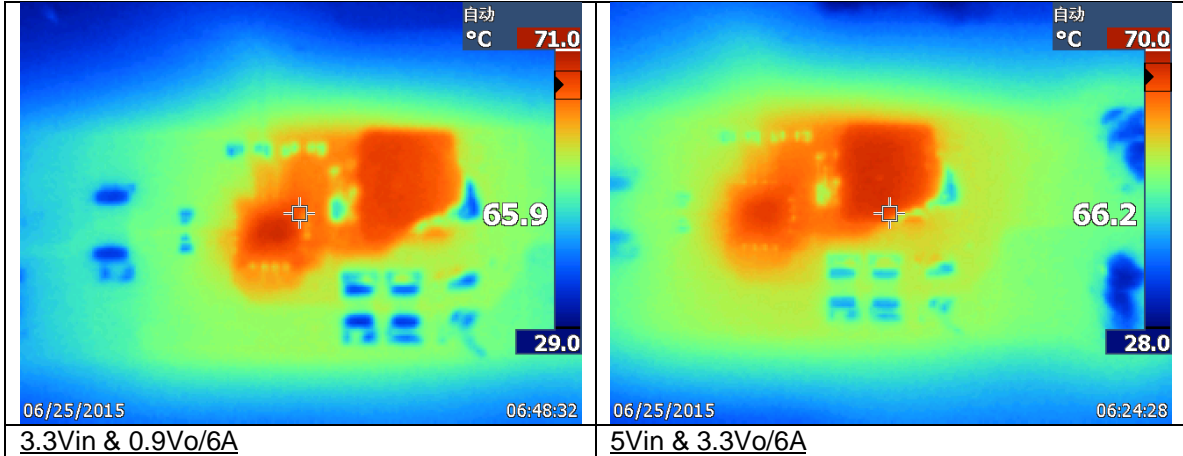




5Vin & 3.3Vo/6A

Fc: 124.23KHz; Phase Margin: 41.93 Degree; Gain Margin: 13.05dB

## 4 THERMAL



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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265  
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