



APPLICATIONS

- IP Camera
- IP Phone
- Wireless Access Point
- Video Supervisory

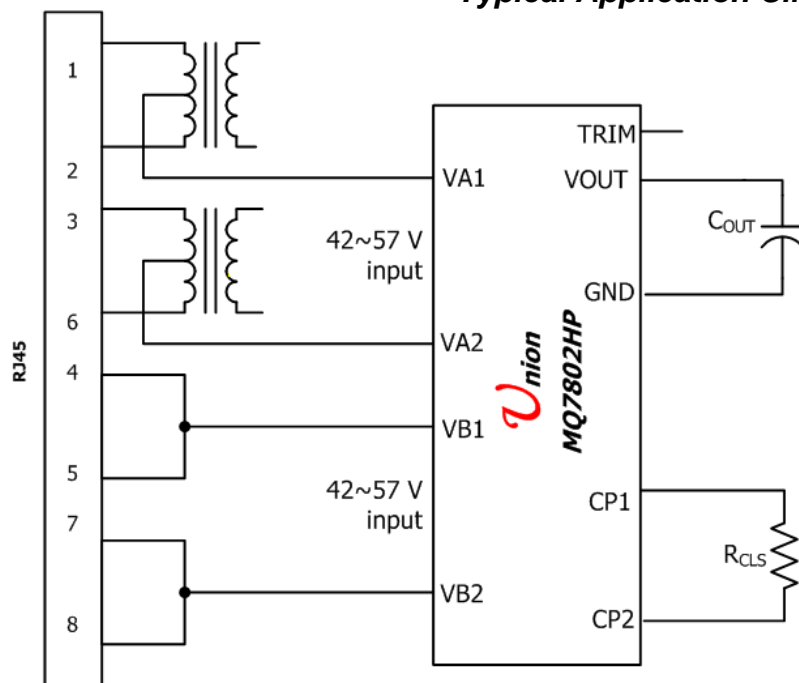
Description

The **POE MQ7802HP** series of modules are designed to extract power from a conventional twisted pair Category 5 Ethernet cable, conforming to the IEEE 802.3af/at Power-over-Ethernet (PoE) standard. IEEE 802.3af/at allows for two power options for Category 5 cables and the MQ7802HP have two pairs of power inputs pins: - VA1&2 and VB1&2 to accommodate this.

The MQ7802HP signature and control circuit provides the PoE AT compatibility signature and power classification required by the Power Sourcing Equipment (PSE) before applying up to 30W power to the port. The MQ7802HP is compatible with Class 0 to Class 4 equipment.

The high efficiency DC/DC converter operates over a wide input voltage range and provides a regulated low ripple and low noise output. The DC/DC converter also has built-in overload and short-circuit output protection.

***** **Typical Application Circuit** *****



CLASS	POWER AT PD		RESISTOR (Ω)
	MINIMUM (W)	MAXIMUM (W)	
0	0.44	12.95	1270
1	0.44	3.84	243
2	3.84	6.49	137
3	6.49	12.95	90.9
4	12.95	25.5	63.4

FEATURES

- Wide operating voltage:
 - 42V ~ 57V
- Full features 802.3af/at interface built-in
- Output Current:
 - 12V, 2.5A
 - 5V, 6A
- Output voltage ripple: 200mV_{PP}
- High Efficiency 90% (input 48V, 12V@2.5A)
- Over current /short circuit protection
- High reliability: designed to meet 5 million hour MTBF
- Minimal space on PCB:
 - 62.2 mm x 27 mm x 14.3mm or
 - 2.45 in x 1.06 in x 0.56in
- No derating to +65°C, without convection
- UL/IEC/EN60950 compliant
- RoHS Compliant available
- Operating Temperature: -40°C ~ +85°C

Performance Specifications (at Ta=+25°C)

Model	Input V _{IN} Range (V)	Output				Efficiency (%)
		I _{OUT} (A)	V _{OUT} (V)	Regulation		
				Line (%)	Load (%)	
MQ7802HPT050	42~57	6	5	0.5	0.5	87
MQ7802HPT120		2.5	12	0.5	0.5	89

Mechanical Specifications

Dimensions are in millimeters (inches)

PIN	DESCRIPTION
1	VA1
2	VA2
3	VB1
4	VB2
5	CP1
6	CP2
7/8	GND
9/10	VOUT
11	TRIM
12	NC

"-R" option for through hole

Ordering Information

MQ7802HPT120-R

Union Microsystems
Power Module P/N

Through Hole

Right Angle Option

Output Voltage Range:

050: 5 V

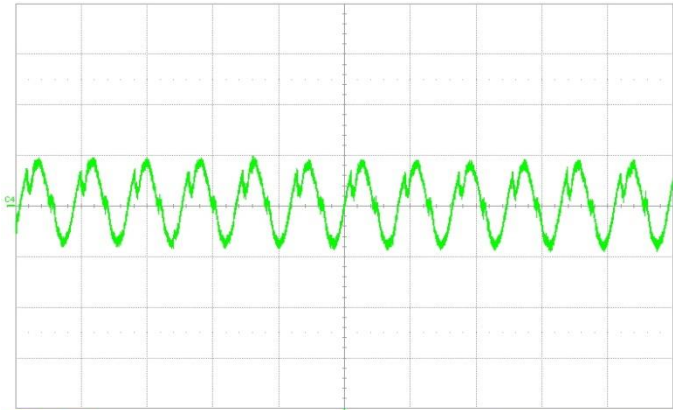
120: 12 V

For examples:

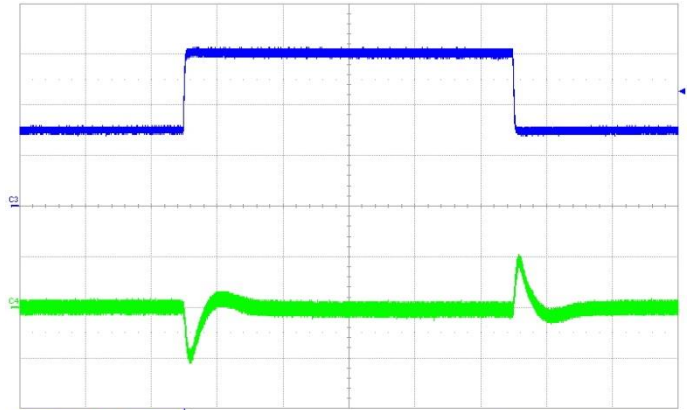
MQ7802HPT120 means MQ7802HP in SIP package, output voltage is 12V

Typical Characteristics: $V_{out}=5V$

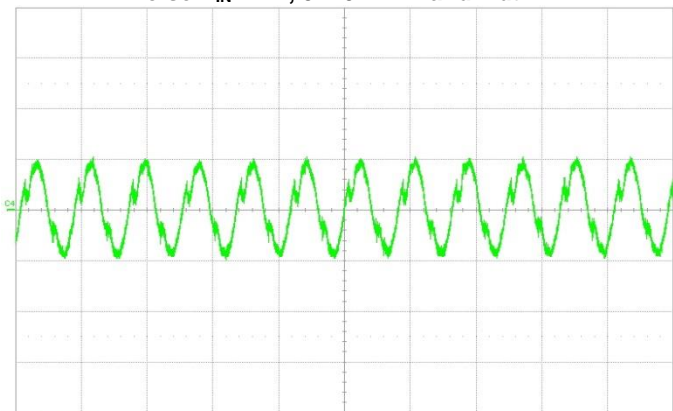
(Output Capacitor: 470uf/10V Electrolytic Capacitor*1)



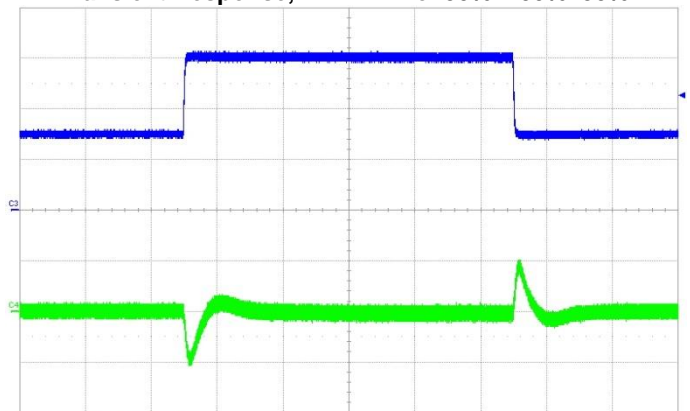
Noise $V_{IN}=42V$, 5~20MHz Bandwidth



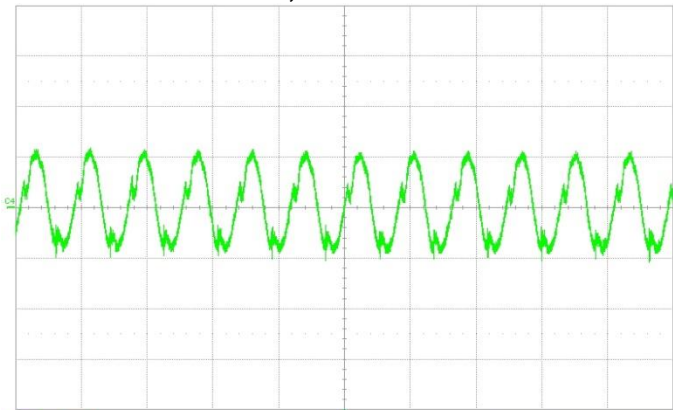
Transient Response, $V_{in}=42V$ $I_o=50\% \sim 100\% \sim 50\%$



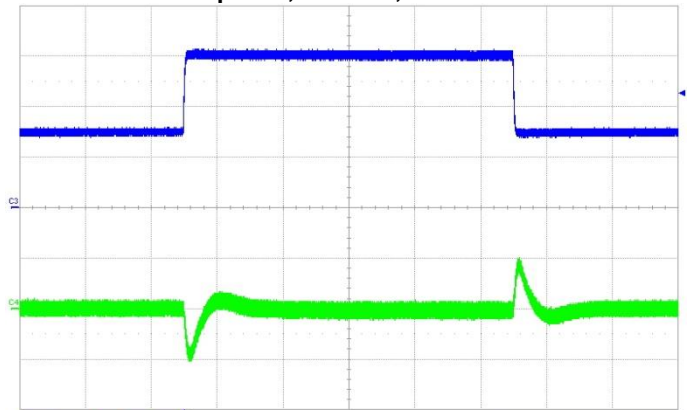
Noise $V_{IN}=48V$, 5~20MHz Bandwidth



Transient Response, $V_{in}=48V$ $I_o=50\% \sim 100\% \sim 50\%$

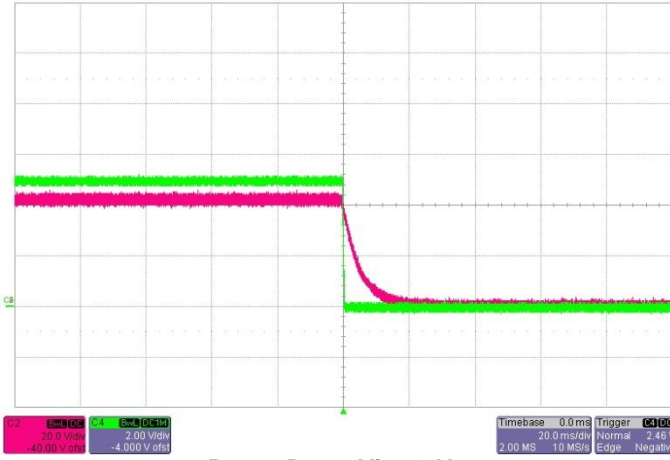


Noise $V_{IN}=57V$, 5~20MHz Bandwidth

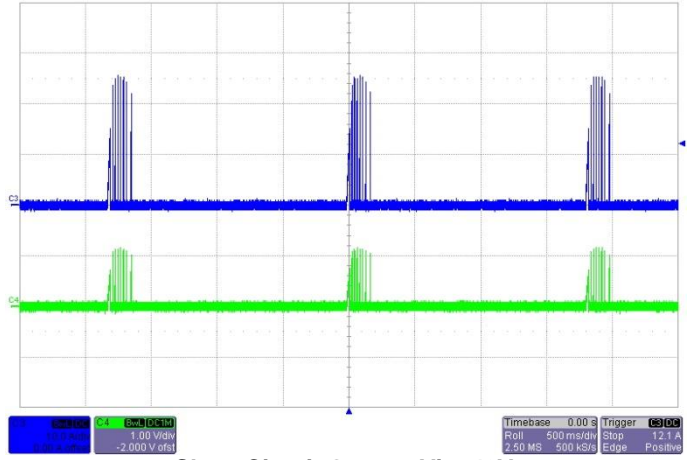


Transient Response $V_{IN}=57V$ $I_o=50\% \sim 100\% \sim 50\%$

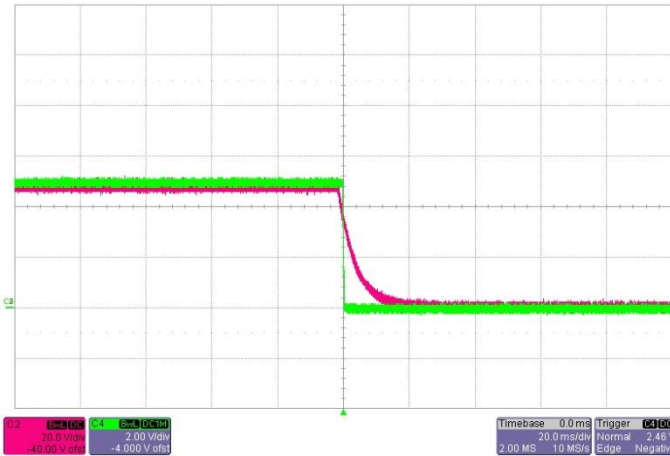
POE input power module, MQ7802HP



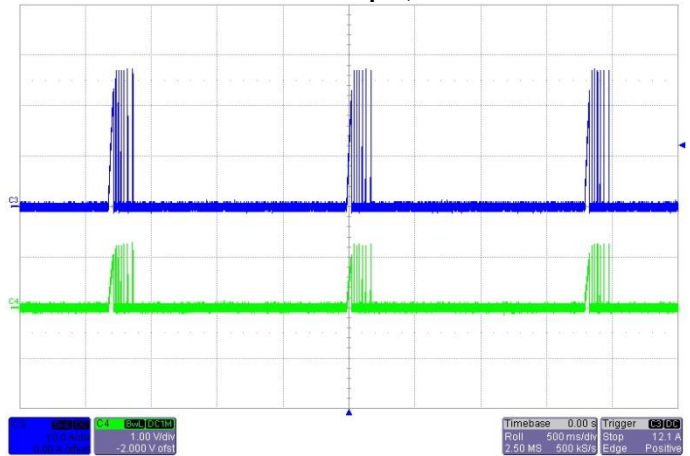
Power Down Vin=42V



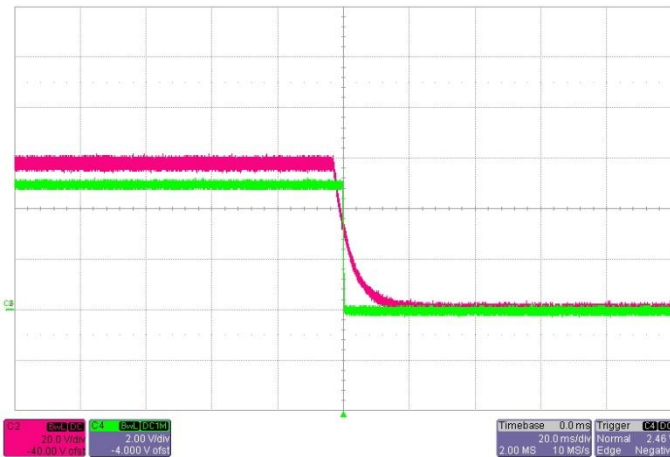
Short-Circuit Output, Vin=42V



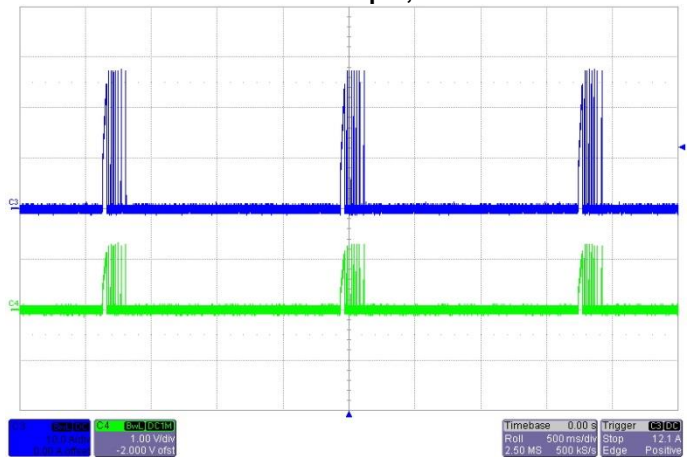
Power Down Vin=48V



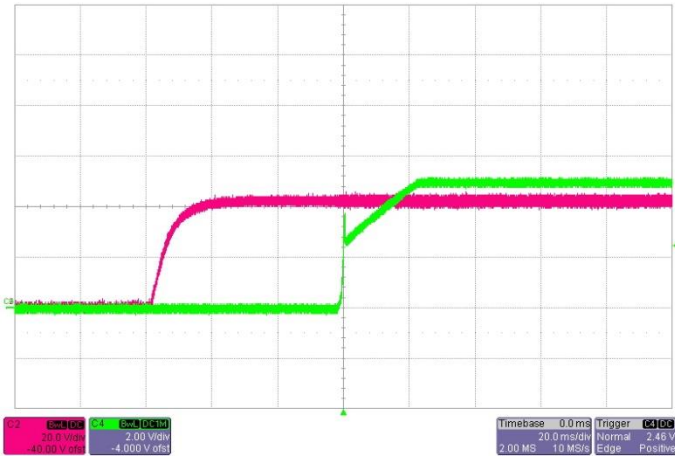
Short-Circuit Output, Vin=48V



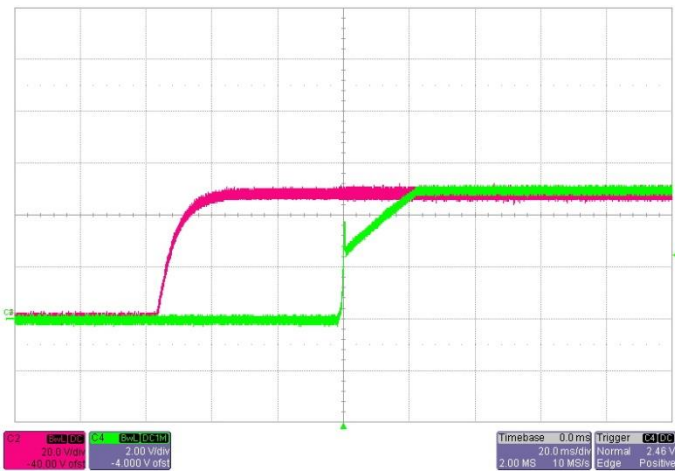
Power Down, Vin=57V



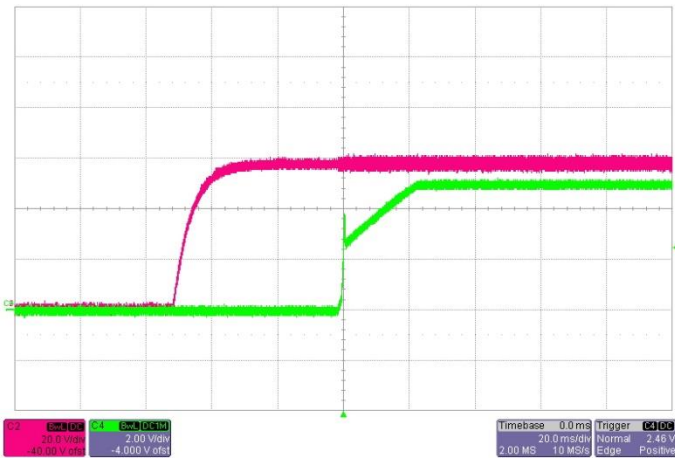
Short-Circuit Output Vin=57V



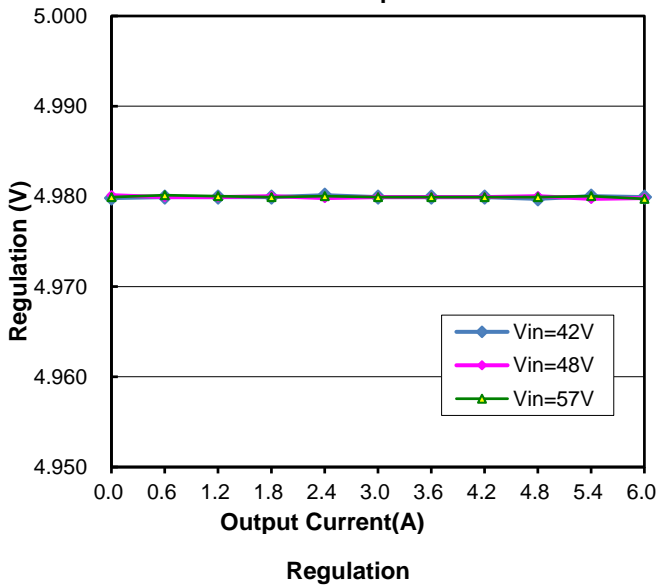
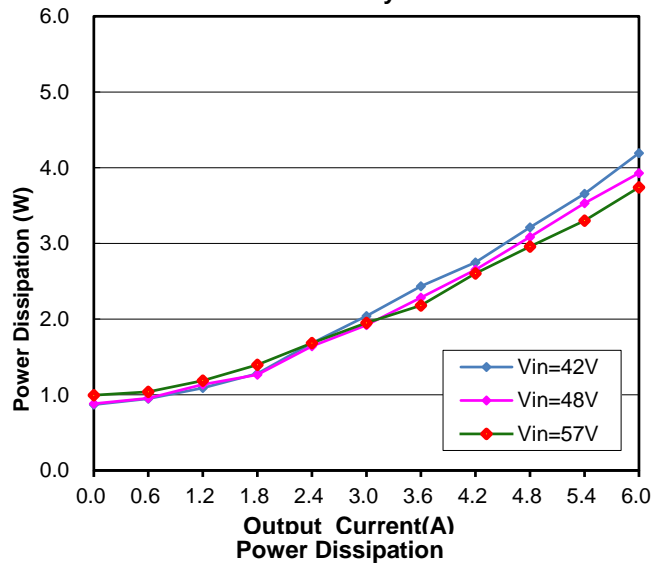
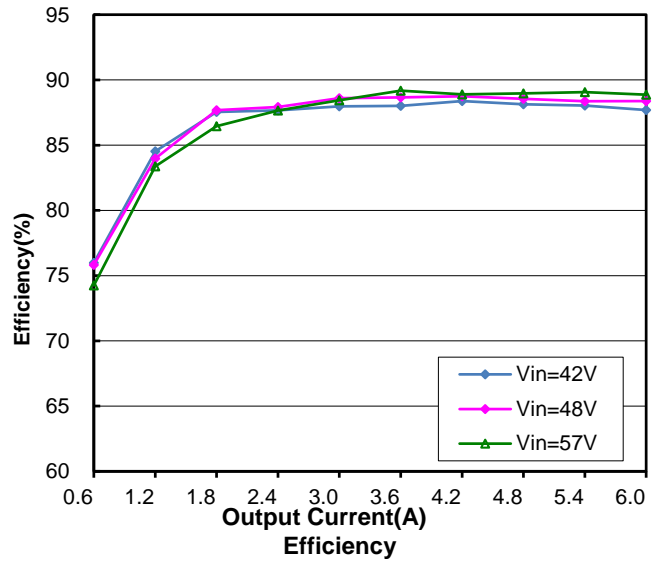
Power Up Vin=42V

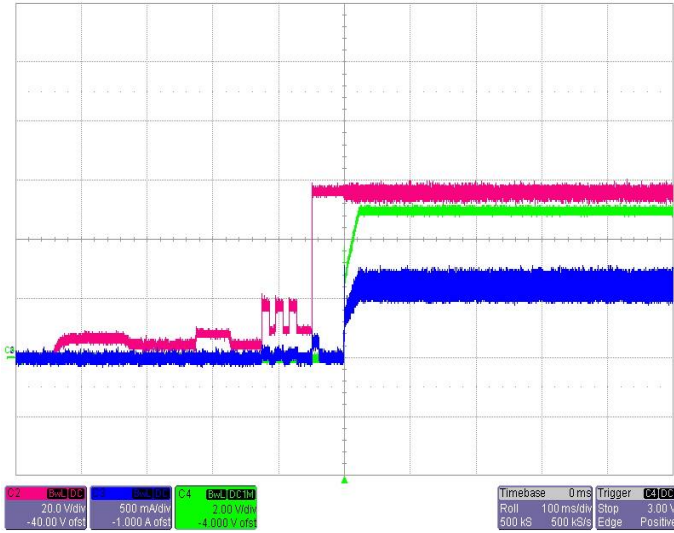


Power Up Vin=48V



Power Up, Vin=57V



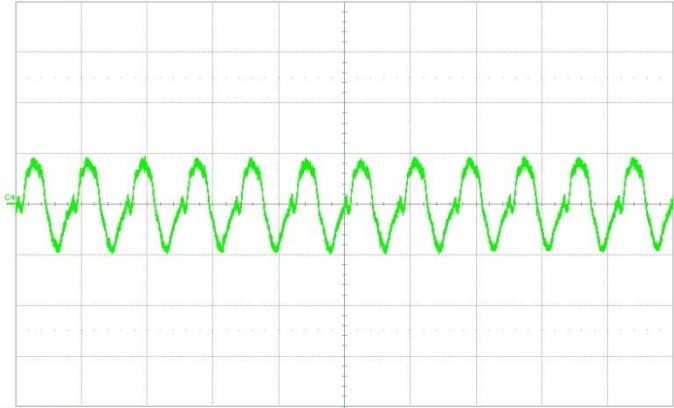


Full load start up from PSE (Model: UM-PSE70M, Union)

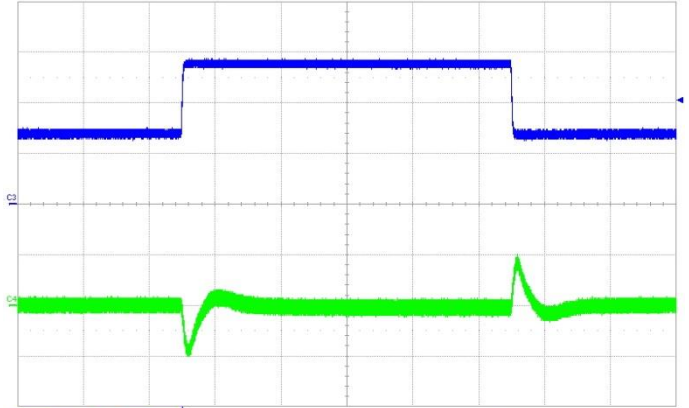
Derating
Inside Closed Box

Typical Characteristics: $V_{out}=5V5$

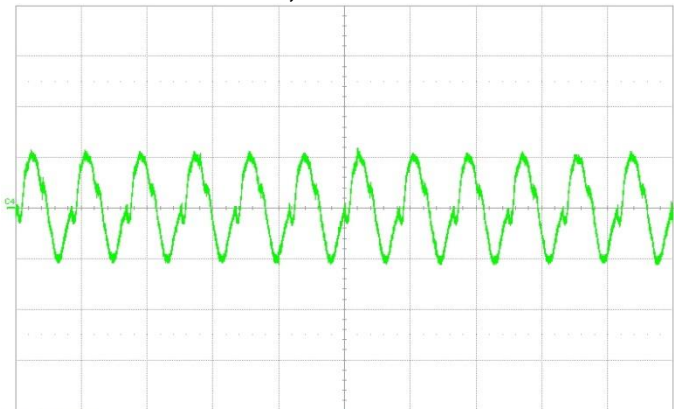
Output Capacitor: 470uf/10V Electrolytic Capacitor*1



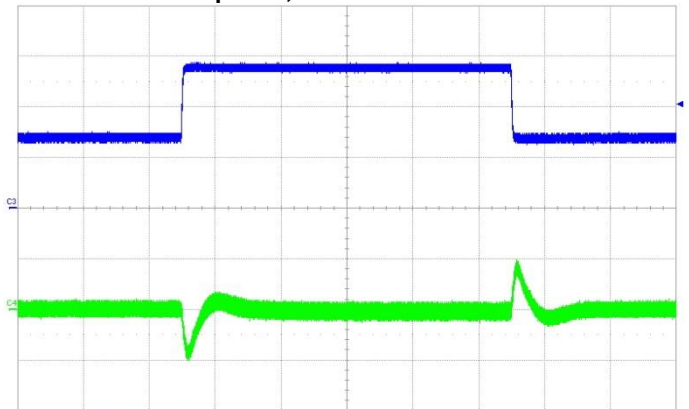
Noise $V_{IN}=42V$, 5~20MHz Bandwidth



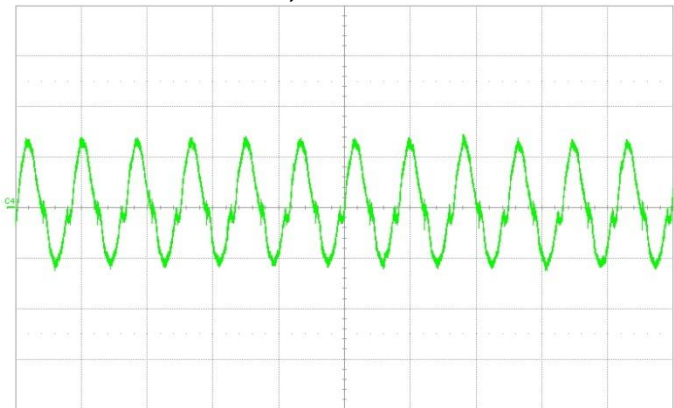
Transient Response, $V_{in}=42V$ $I_o=50\% \sim 100\% \sim 50\%$



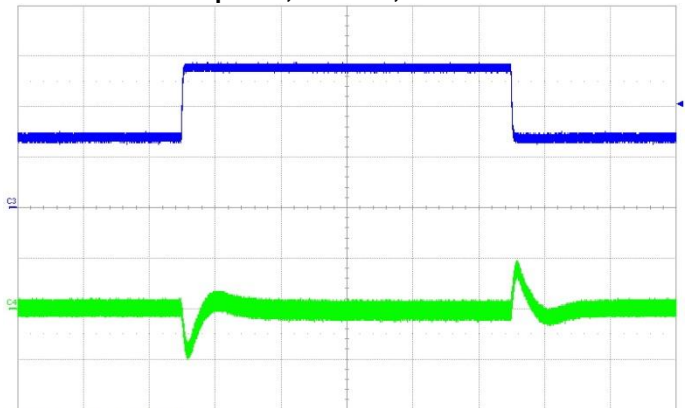
Noise $V_{IN}=48V$, 5~20MHz Bandwidth



Transient Response, $V_{in}=48V$ $I_o=50\% \sim 100\% \sim 50\%$

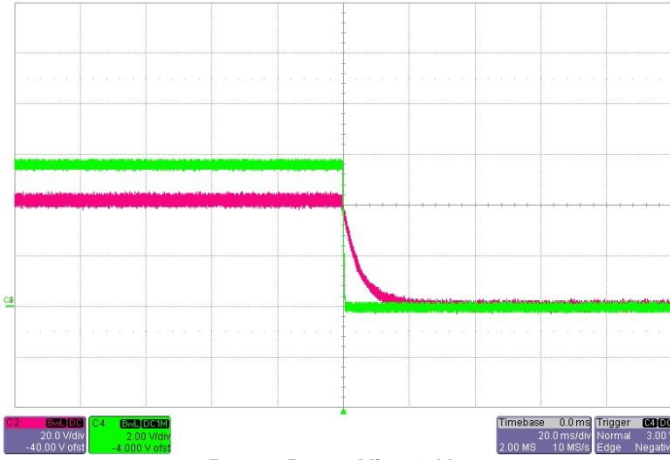


Noise $V_{IN}=57V$, 5~20MHz Bandwidth

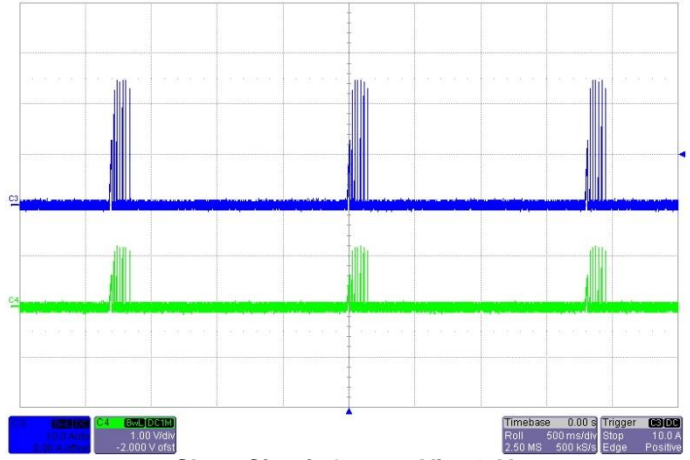


Transient Response $V_{IN}=57V$ $I_o=50\% \sim 100\% \sim 50\%$

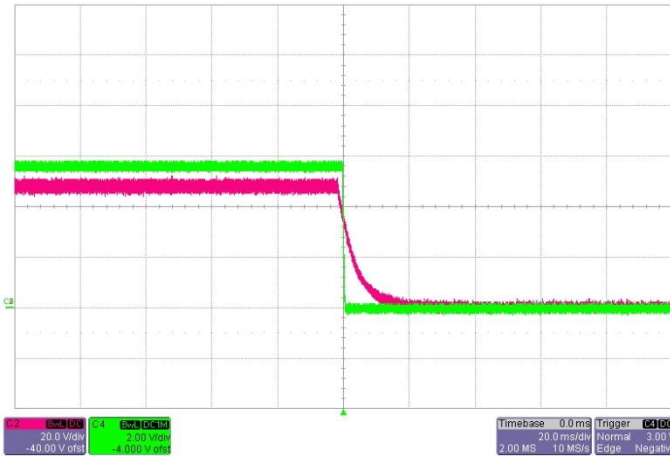
POE input power module, MQ7802HP



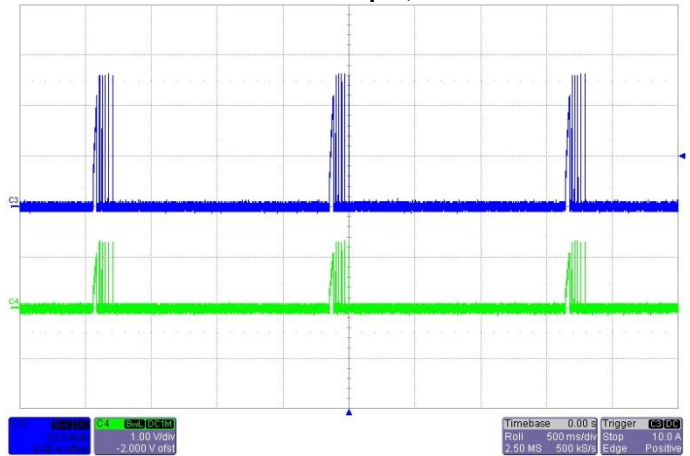
Power Down Vin=42V



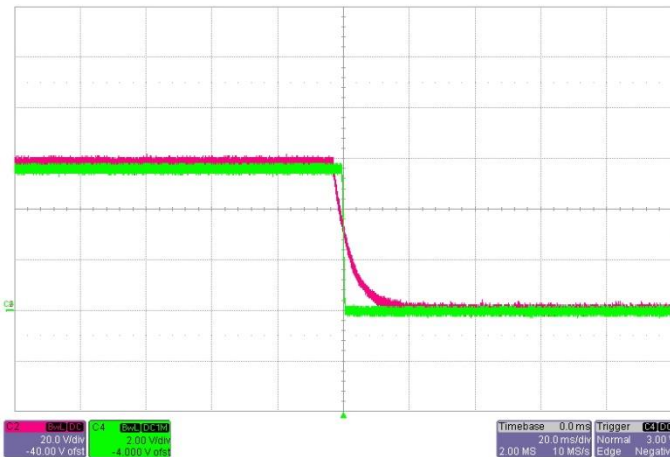
Short-Circuit Output, Vin=42V



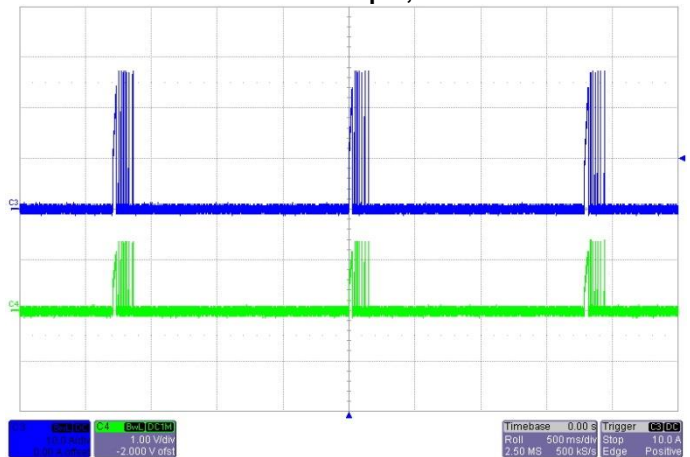
Power Down Vin=48V



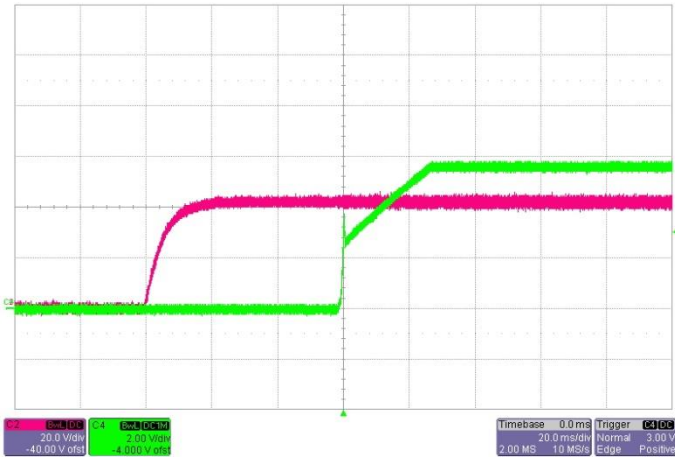
Short-Circuit Output, Vin=48V



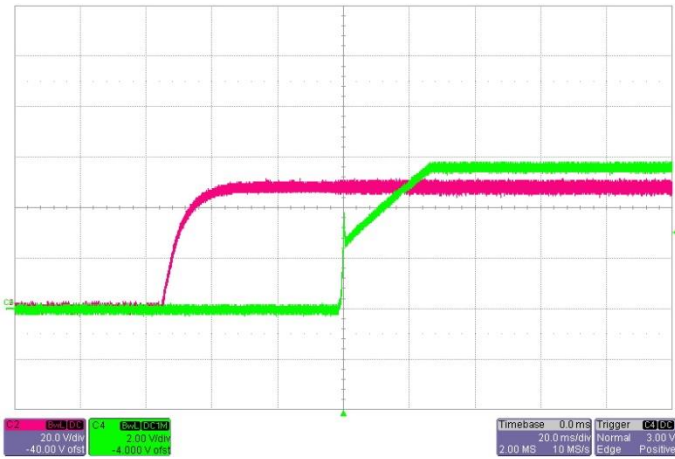
Power Down, Vin=57V



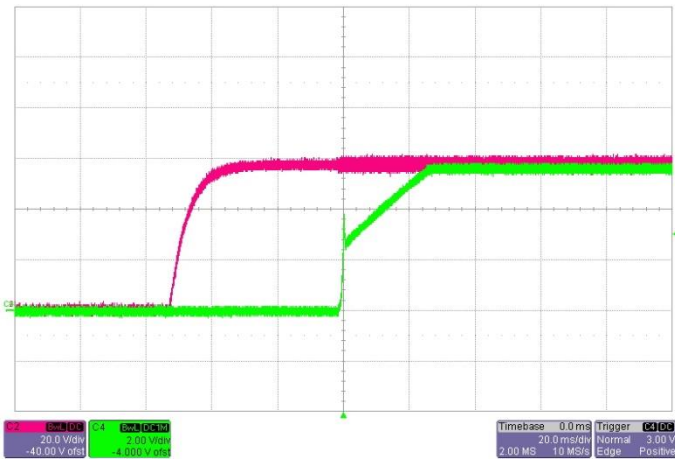
Short-Circuit Output Vin=57V



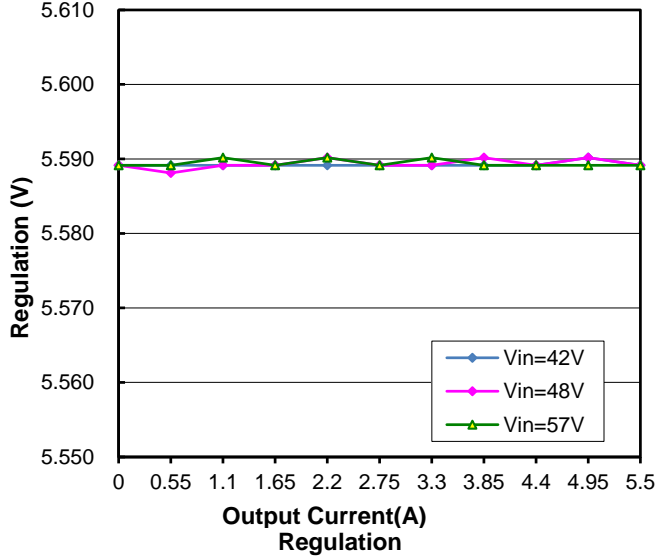
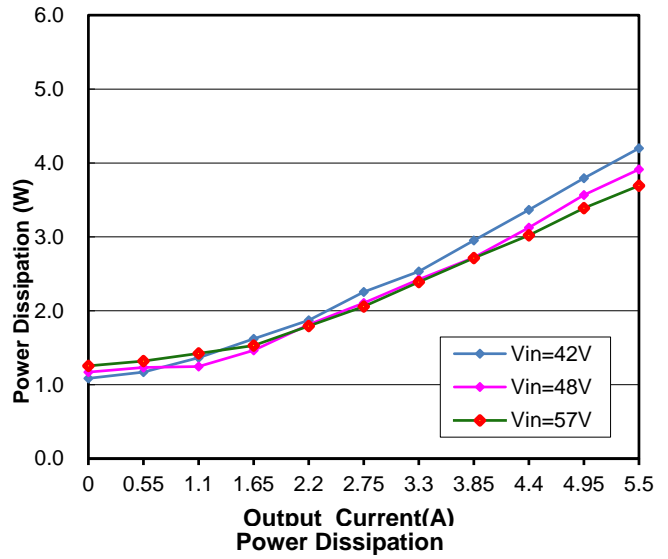
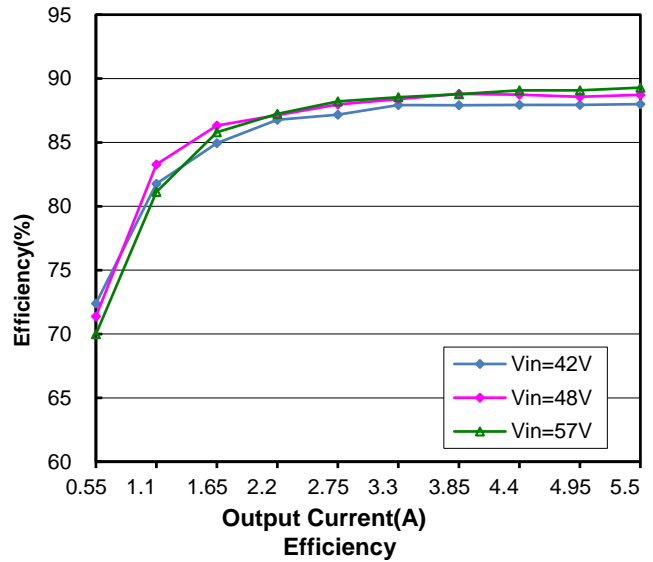
Power Up Vin=42V

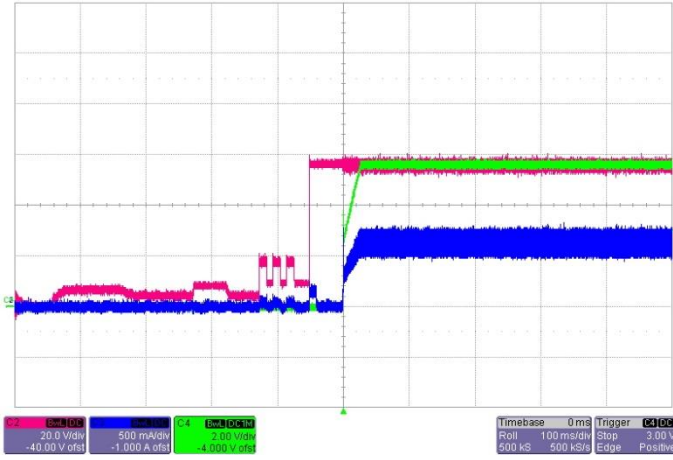


Power Up Vin=48V



Power Up, Vin=57V



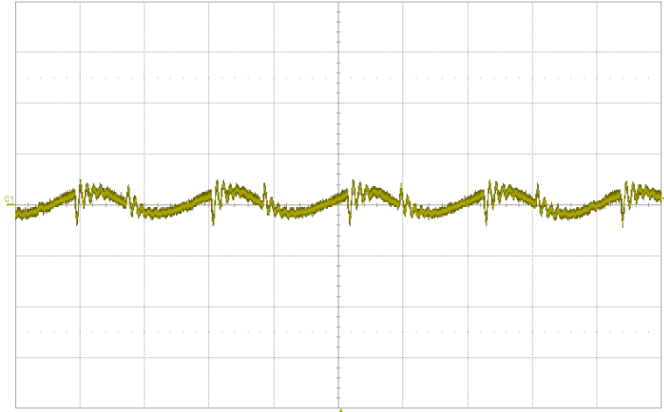


Full load start up from PSE (Model: UM-PSE70M, Union)

Derating
Inside Closed Box

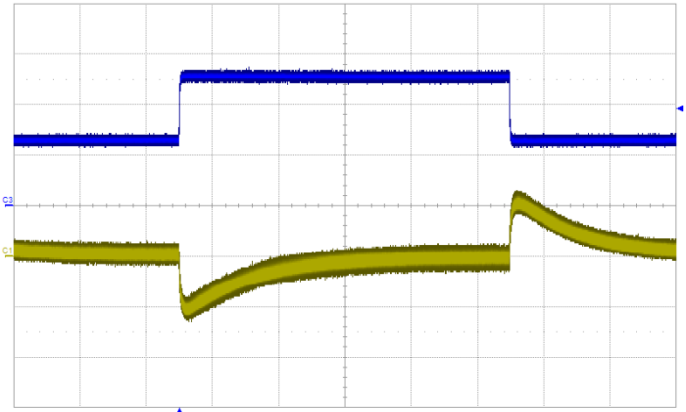
Typical Characteristics : $V_{out}=12V$

Output Capacitor: 470uF AL-cap*1



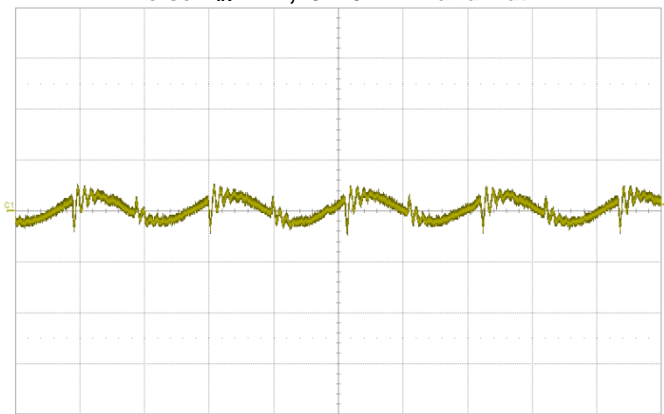
Timebase 80 ns Trigger 0100
2.00 us/div Stop 6.0 mV
100 kS 5.0 GS/s Edge Positive

Noise $V_{IN}=42V$, 5~20MHz Bandwidth



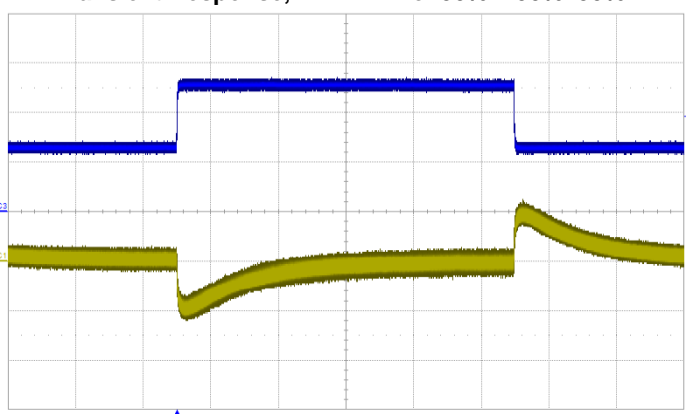
Timebase -2.50 ms Trigger 0300
1.00 ms/div Stop 1.91 A
5.00 MS 500 MS/s Edge Positive

Transient Response, $V_{in}=42V$ $I_o=50\% \sim 100\% \sim 50\%$



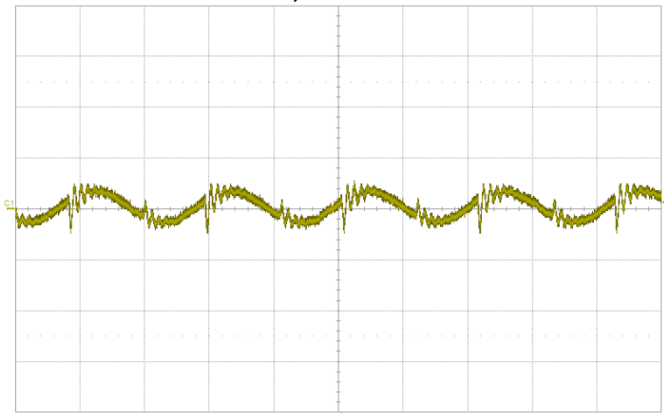
Timebase 80 ns Trigger 0100
2.00 us/div Stop 6.0 mV
100 kS 5.0 GS/s Edge Positive

Noise $V_{IN}=48V$, 5~20MHz Bandwidth



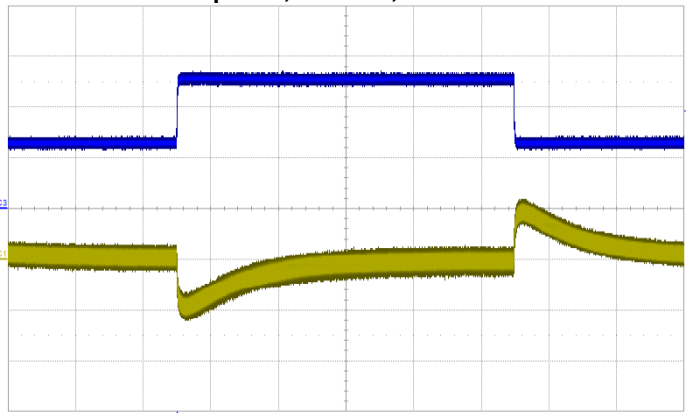
Timebase -2.50 ms Trigger 0300
1.00 ms/div Stop 1.91 A
5.00 MS 500 MS/s Edge Positive

Transient Response, $V_{in}=48V$, $I_o=50\% \sim 100\% \sim 50\%$



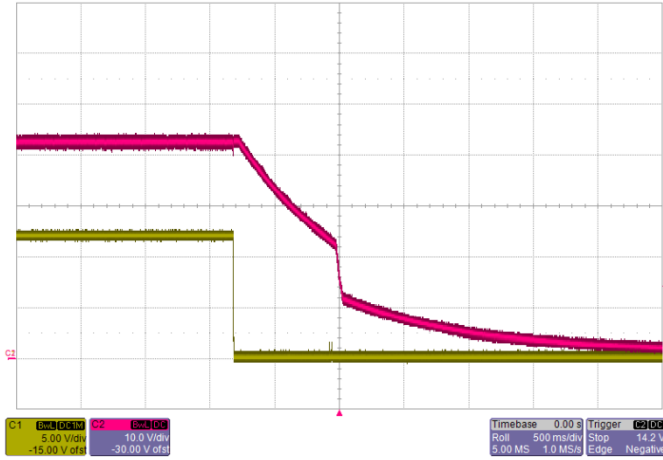
Timebase 80 ns Trigger 0100
2.00 us/div Stop 6.0 mV
100 kS 5.0 GS/s Edge Positive

Noise $V_{IN}=57V$, 5~20MHz Bandwidth

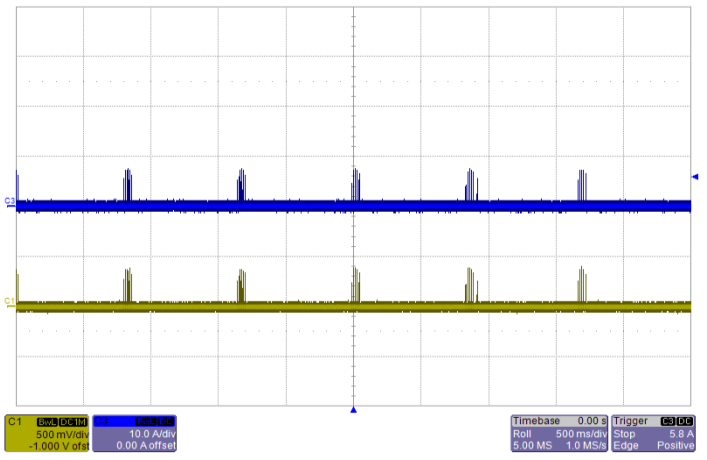


Timebase -2.50 ms Trigger 0300
1.00 ms/div Stop 1.91 A
5.00 MS 500 MS/s Edge Positive

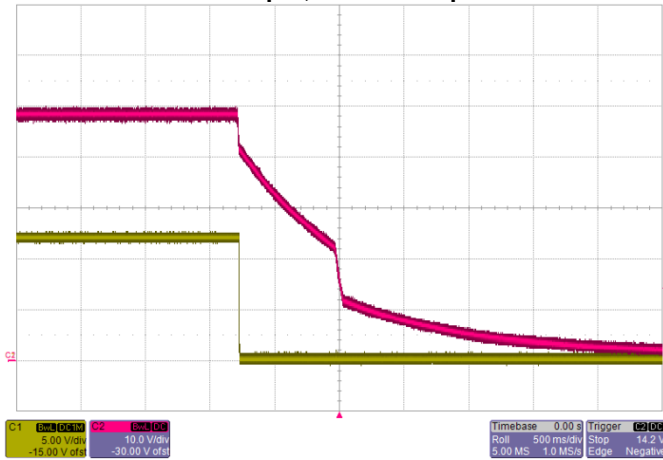
Transient Response $V_{IN}=57V$, $I_o=50\% \sim 100\% \sim 50\%$



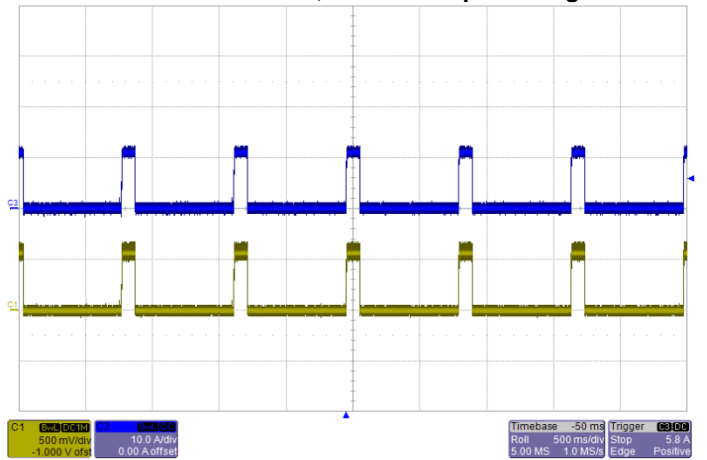
Power Down Vin=42V
Red: Input; Yellow: Output



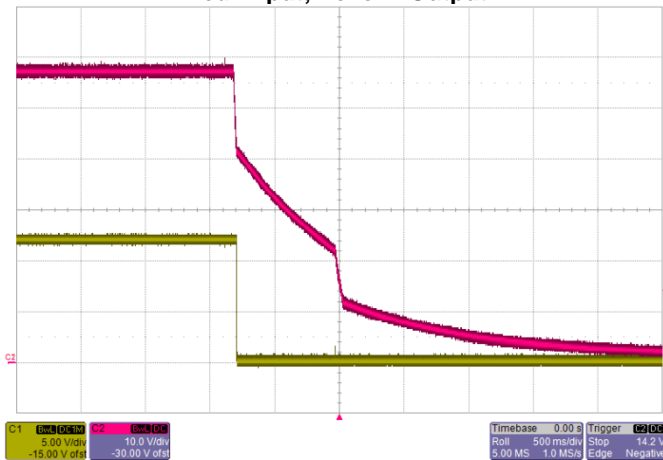
Short-Circuit Output, Vin=42V
Blue: Load current; Yellow: Output Voltage



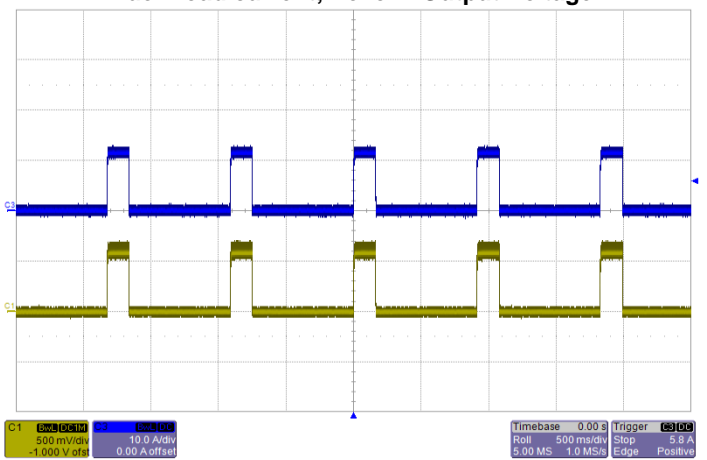
Power Down Vin=48V
Red: Input; Yellow: Output



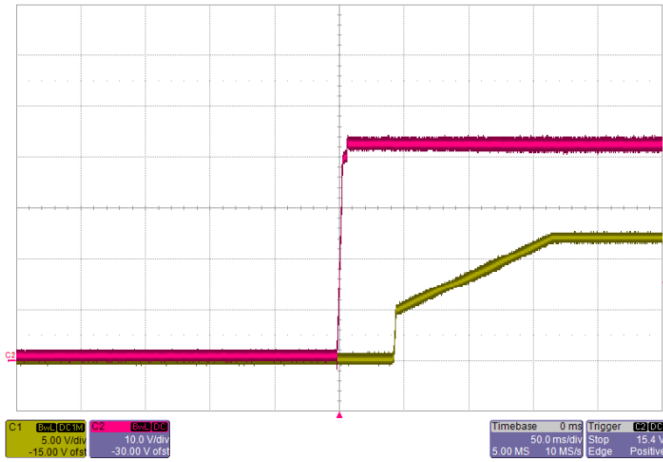
Short-Circuit Output, Vin=48V
Blue: Load current; Yellow: Output Voltage



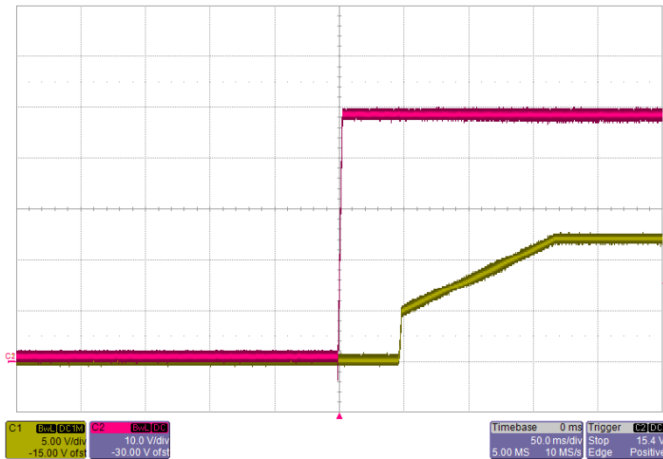
Power Down, Vin=57V
Red: Input; Yellow: Output



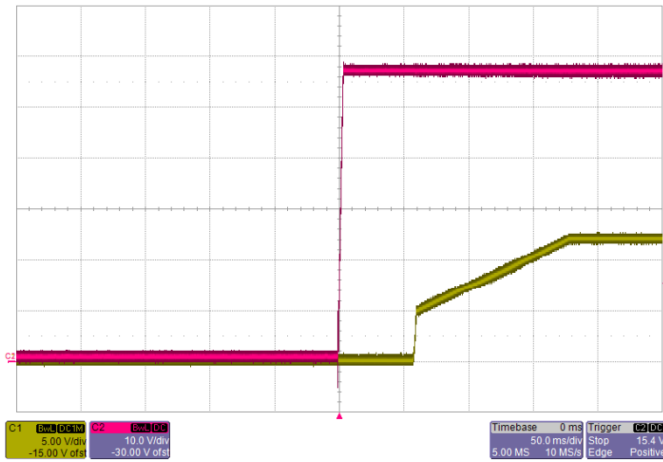
Short-Circuit Output Vin=57V
Blue: Load current; Yellow: Output Voltage



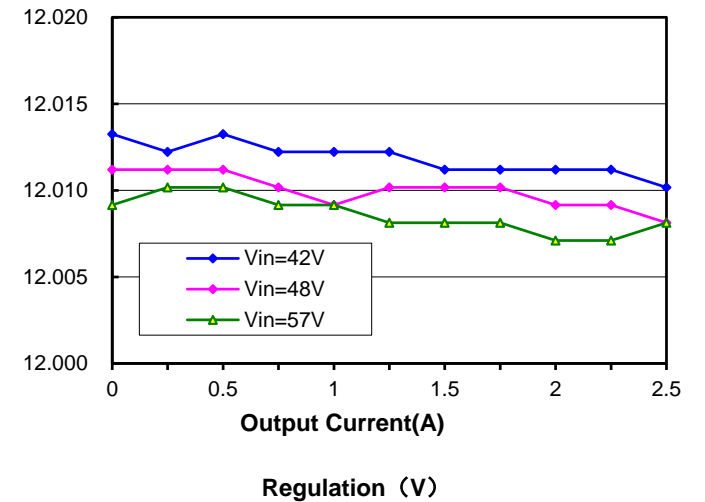
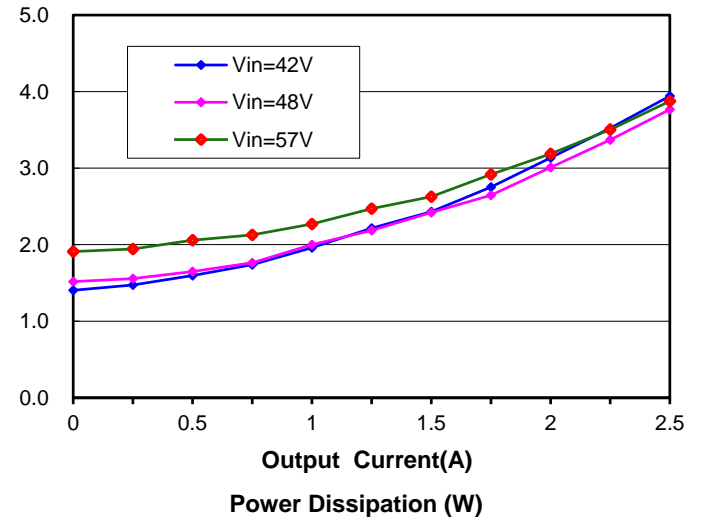
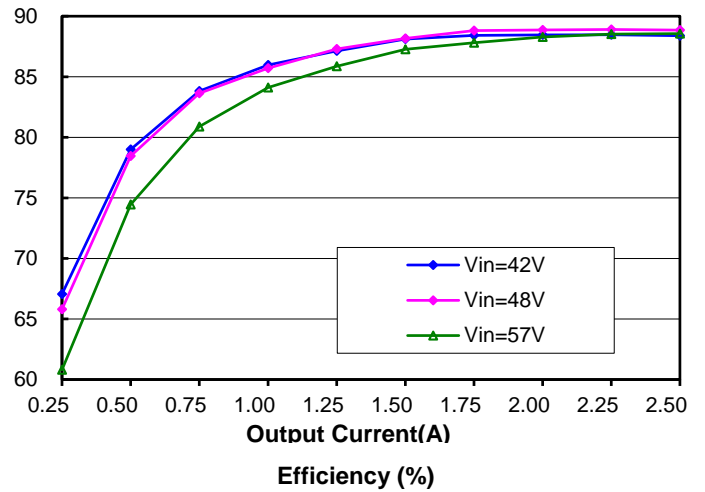
Power Up Vin=42V
Red: Input; Yellow: Output

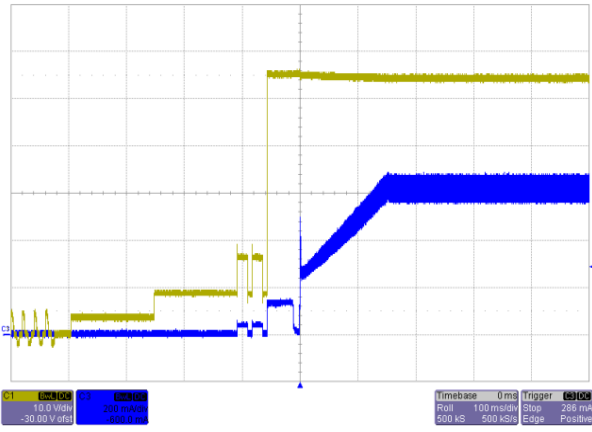


Power Up Vin=48V
Red: Input; Yellow: Output

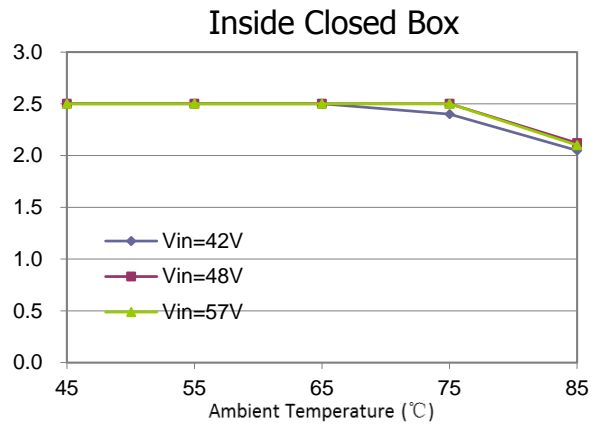


Power Up, Vin=57V
Red: Input; Yellow: Output





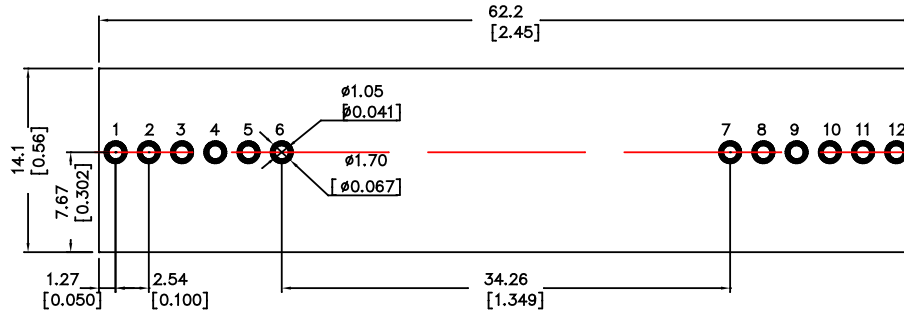
Full load start up from PSE (Model: UM-PSE40M, Union)
 Yellow: Input; Blue: Input current



Derating

Recommended Hole Pattern

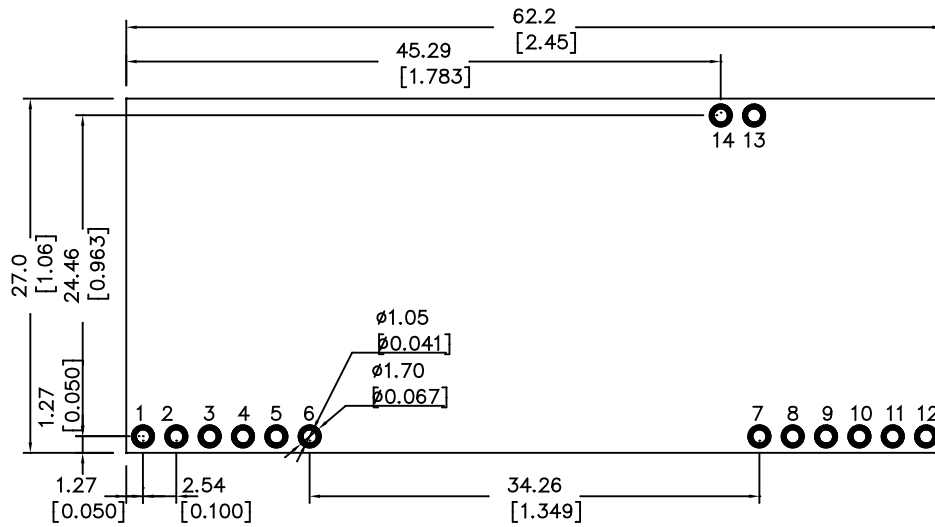
Dimensions are in millimeters (inches)



Component-side footprint

Recommended Hole Pattern for “-R” suffix

Dimensions are in millimeters (inches)



Component-side footprint

