

FEATURES



- Wide operating voltage:
 - 40V ~ 57V
- Output power:
 - MQ7800CP : 7W
 - MQ7800DP: 13W
- Output voltage ripple: 100mV_{pp}, (12V@1.1A)
- High Efficiency 82% (input 48V, [Load12V@1.1A](#), DP)
- Overcurrent /short circuit protection
- High reliability: designed to meet 500k hour MTBF
- Minimal space on PCB for CP:
 - 25.4mm x 14 mm x 13.8 mm or
 - 1.0 in x 0.55 in x 0.54in
- Minimal space on PCB for DP:
 - 35.6mm x 14 mm x 16.2 mm or
 - 1.40 in x 0.55 in x 0.64in
- Operating temperature: -40~+85°C
- No derating to +TBD°C, inside closed box
- UL/IEC/EN60950 compliant

APPLICATIONS

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

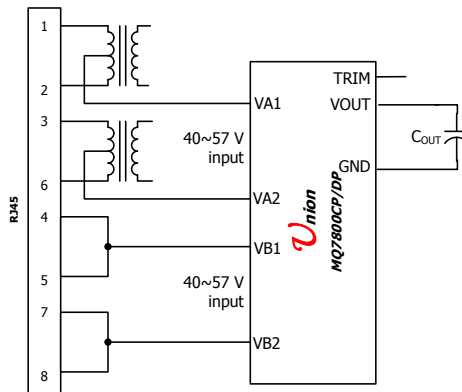
Description

The **POE MQ7800CP/DP** 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 MQ7800CP/DP have two pairs of power inputs pins: - VA1&2 and VB1&2 to accommodate this.

The MQ7800CP/DP signature and control circuit provides the PoE compatibility signature and power classification required by the Power Sourcing Equipment (PSE) before applying up to 13W power to the port. The MQ7800CP/DP is compatible with Class 0 to Class 3 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** *****



- ※ Note: 1. COUT: for MQ7800DP050, 100uF/10V solid cap needed;
- 2.For keeping part operating normally, 0.5W minimum load is required.

Performance Specifications (at Ta=+25°C)

Model	Input V _{IN} Range (V)	Output				Efficiency (%)
		I _{OUT} (A)	V _{out} (V)	Regulation		
				Line (%)	Load (%)	
MQ7800CPT050	40V-57Vdc	1.4	5V	1	1	79
MQ7800CPT120		0.58	12V	1	1	82
MQ7800DPT050		2	5V	1	1	76
MQ7800DPT120		1.1	12V	1	1	82

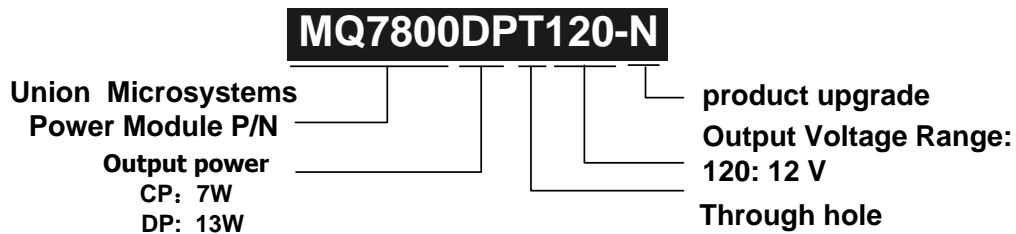
Mechanical Specifications

Dimensions are in inches (millimeters)

Tolerances: x.x ±0.02in(0.5 mm), x.xx ±0.010in(0.25 mm), unless otherwise noted.

<p>"MQ7800CPT"</p>		PIN	DESCRIPTION
<p>"MQ7800DPT"</p>		1	VA1
		2	VA2
		3	VB1
		4	VB2
		5	GND
		6	VOUT

Ordering Information



For examples:

MQ7800CPT120: output voltage is preset to 12V/7W.

MQ7800DPT120 :output voltage is preset to 12V/13W.

Absolute Maximum Ratings

Note: These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability. Proper operation under conditions other than those listed in the Performance Specifications Table is not implied.

Parameter	Symbol	Min	Max	Unit
Input Voltage	V_{IN}	-		V
Storage Temperature	T_{STG}	-40	85	°C

MQ7800CPT050 Electrical Specifications: ($T_A=+25^{\circ}\text{C}$)

Parameter	Condition	Symbol	Min	Typ	Max	Unit
Input Voltage Range		V_{IN}	40		57	V
Output Current		I_o			1.4	A
Output Voltage Set point	100% load	ΔV_o				%
Temperature Regulation	$T_A = T_{A,MIN}$ To $T_{A,MAX}$	-				% $V_{O,SET}$
Line Regulation	See each output's corresponding character figure					
Load Regulation						
Output Ripple and Noise Voltage						
Transient Response	$I_o=1.4A, 0\sim 20\text{MHz}$					
Over current Protection	48Vin	I_o	1.7		2.8	A
Under Voltage Lockout Trip Level	Rising V_{IN} , with 10% full load	V_{IN}	35	37.6	40	V
Under Voltage Lockout Trip Level	Falling V_{IN} , with 10% full load	V_{IN}	29	31.6	35	V
Start-up Time	1.4A resistive load, no external output capacitors		0	8	10	mS
Switching Frequency		F_o		120		kHz
Operating Temperature	Natural convection		-40		85	°C
Vibration	3 Axes, 5 Min Each	10~55Hz, 0.35mm, 5g				
	3 Axes, 6 Times Each	Peak Deviation 300g, Settling Time 6mS				
MTBF			500,000			Hour

MQ7800CPT120 Electrical Specifications: ($T_A=+25^{\circ}\text{C}$)

Parameter	Condition	Symbol	Min	Typ	Max	Unit
Input Voltage Range		V_{IN}	40		57	V
Output Current		I_o	0		0.58	A
Output Voltage Set point	100% load	ΔV_o	-2		+2	%
Temperature Regulation	$T_A = T_{A,MIN}$ To $T_{A,MAX}$	-		0.4		% $V_{O,SET}$
Line Regulation	See each output's corresponding character figure					
Load Regulation						
Output Ripple and Noise Voltage						
Transient Response	$I_o=1.1A, 0\sim 20\text{MHz}$					
Over current Protection	48Vin	I_o		0.79		A
Under Voltage Lockout Trip Level	Rising V_{IN} , with 10% full load	V_{IN}		37		V
Under Voltage Lockout Trip Level	Falling V_{IN} , with 10% full load	V_{IN}		32		V
Start-up Time	0.58A resistive load, no external output capacitors			100		mS
Switching Frequency		F_o		120		kHz
Operating Temperature	Natural convection		-40		85	°C
Vibration	3 Axes, 5 Min Each	10~55Hz, 0.35mm, 5g				
	3 Axes, 6 Times Each	Peak Deviation 300g, Settling Time 6mS				
MTBF			500,000			Hour

MQ7800DPT050 Electrical Specifications: (TA=+25°C)

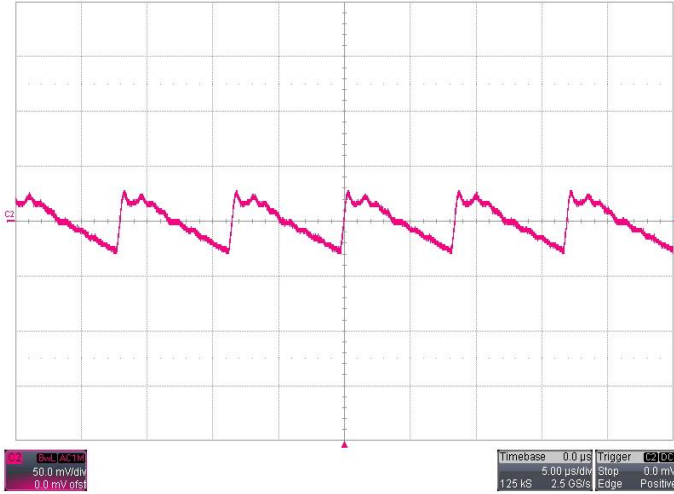
Parameter	Condition	Symbol	Min	Typ	Max	Unit
Input Voltage Range		V _{IN}	40		57	V
Output Current		I _o	0		2	A
Output Voltage Set point	100% load	ΔV _o	-2		+2	%
Temperature Regulation	T _A = T _{A.MIN} To T _{A.MAX}	-		0.4		%V _{O.SET}
Line Regulation	See each output's corresponding character figure					
Load Regulation						
Output Ripple and Noise Voltage	I _o =1.1A,0~20MHz					
Transient Response						
Over current Protection	48Vin	I _o	2.6	3.0	3.2	A
Under Voltage Lockout Trip Level	Rising V _{IN} , with 10% full load	V _{IN}		37.8		V
Under Voltage Lockout Trip Level	Falling V _{IN} , with 10% full load	V _{IN}		31.8		V
Start-up Time	2A resistive load, no external output capacitors			110		mS
Switching Frequency		F _o		120		kHz
Operating Temperature	Natural convection		-40		85	°C
Vibration	3 Axes, 5 Min Each	10~55Hz, 0.35mm, 5g				
	3 Axes, 6 Times Each	Peak Deviation 300g, Settling Time 6mS				
MTBF			500,000			Hour

MQ7800DPT120 Electrical Specifications: (TA=+25°C)

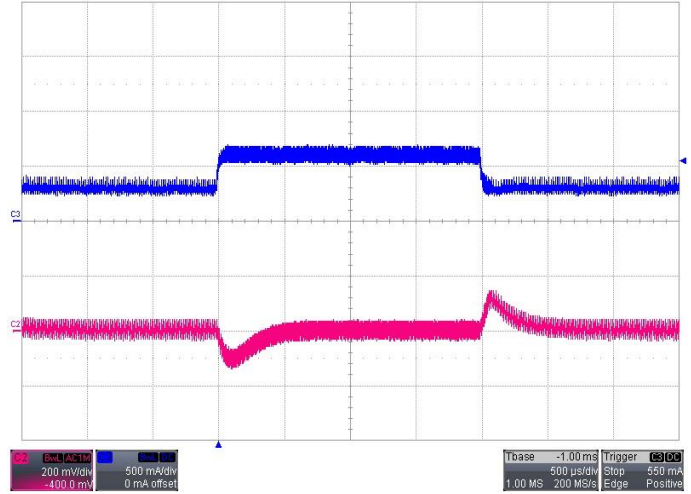
Parameter	Condition	Symbol	Min	Typ	Max	Unit
Input Voltage Range		V _{IN}	40		57	V
Output Current		I _o	0		0.58	A
Output Voltage Set point	100% load	ΔV _o	-2		+2	%
Temperature Regulation	T _A = T _{A.MIN} To T _{A.MAX}	-		0.4		%V _{O.SET}
Line Regulation	See each output's corresponding character figure					
Load Regulation						
Output Ripple and Noise Voltage	I _o =1.1A,0~20MHz					
Transient Response						
Over current Protection	48Vin			1.5		A
Under Voltage Lockout Trip Level	Rising V _{IN} , with 10% full load			38		V
Under Voltage Lockout Trip Level	Falling V _{IN} , with 10% full load			33		V
Start-up Time	1.1A resistive load, no external output capacitors			100		mS
Switching Frequency		F _o		120		kHz
Operating Temperature	Natural convection		-40		85	°C
Vibration	3 Axes, 5 Min Each	10~55Hz, 0.35mm, 5g				
	3 Axes, 6 Times Each	Peak Deviation 300g, Settling Time 6mS				
MTBF			500,000			Hour

Typical Characteristics: MQ7800CPT120

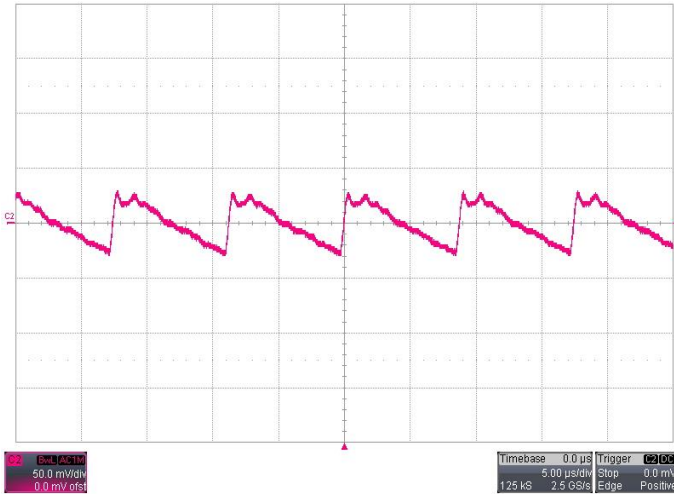
General conditions: NA



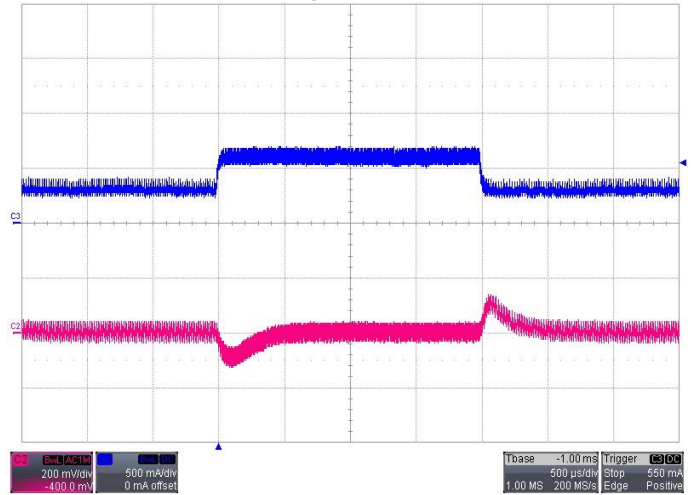
Noise $V_{IN}=40V$, $I_o=0.58A$, 5~20MHz Bandwidth



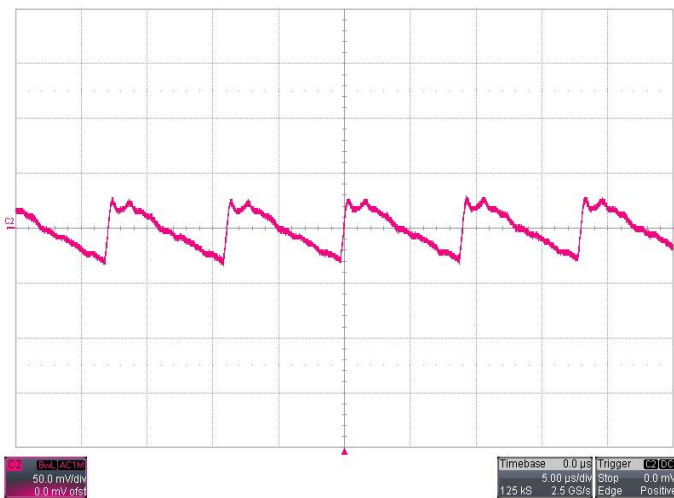
Transient Response, $V_{in}=40V$ $I_o=50\% \sim 100\% \sim 50\%$
(C2-output voltage; C3-output current)



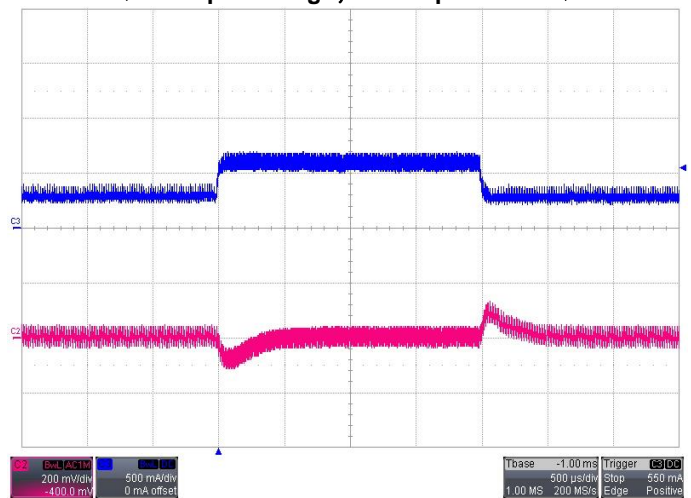
Noise $V_{IN}=48V$, $I_o=0.58A$, 5~20MHz Bandwidth



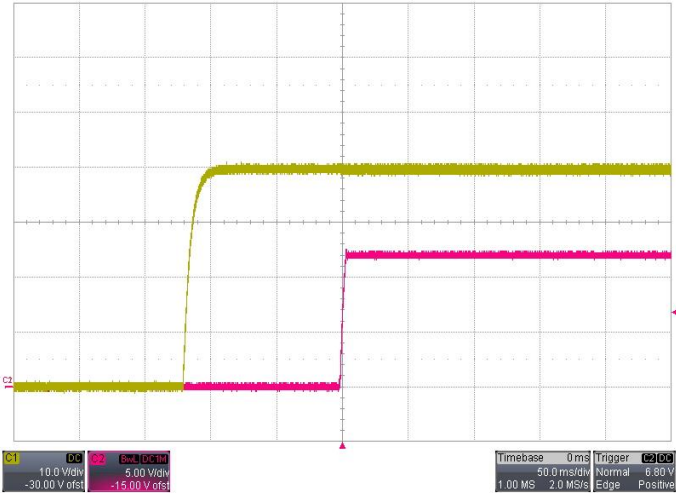
Transient Response, $V_{in}=48V$, $I_o=50\% \sim 100\% \sim 50\%$
(C2-output voltage; C3-output current)



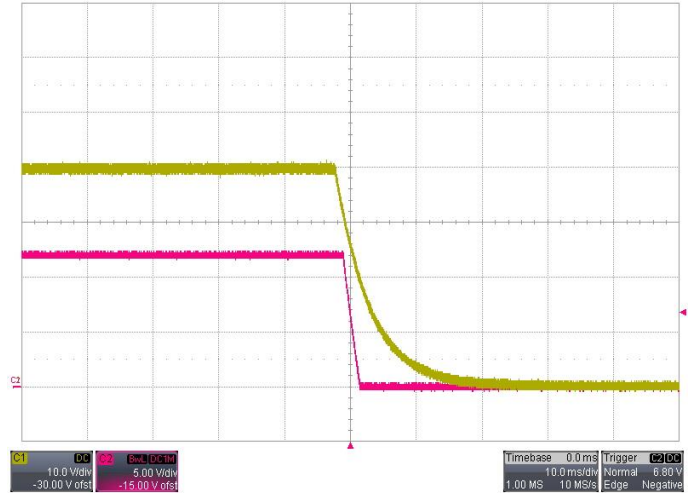
Noise $V_{IN}=57V$, $I_o=0.58A$, 5~20MHz Bandwidth



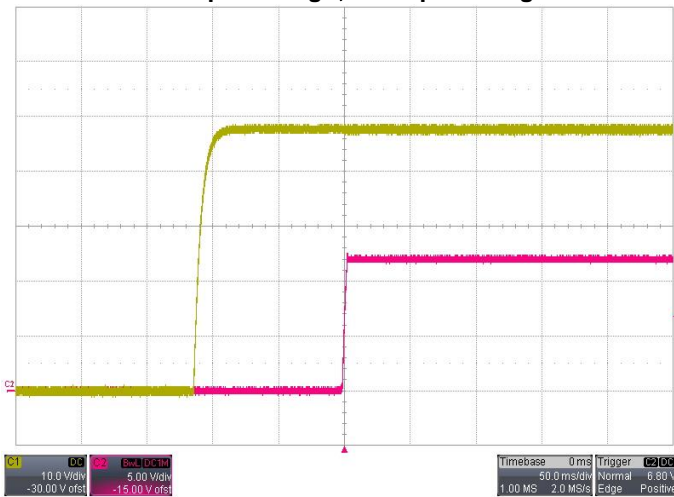
Transient Response $V_{IN}=57V$, $I_o=50\% \sim 100\% \sim 50\%$
(C2-output voltage; C3-output current)



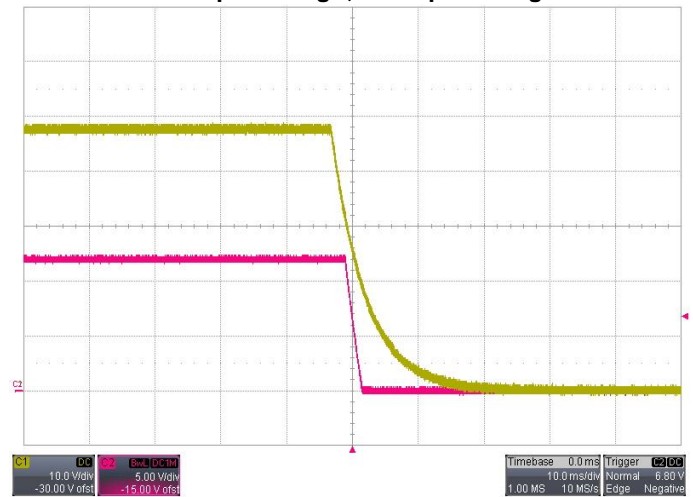
Power Up Vin=40V
(C2-output voltage; C1-input voltage)



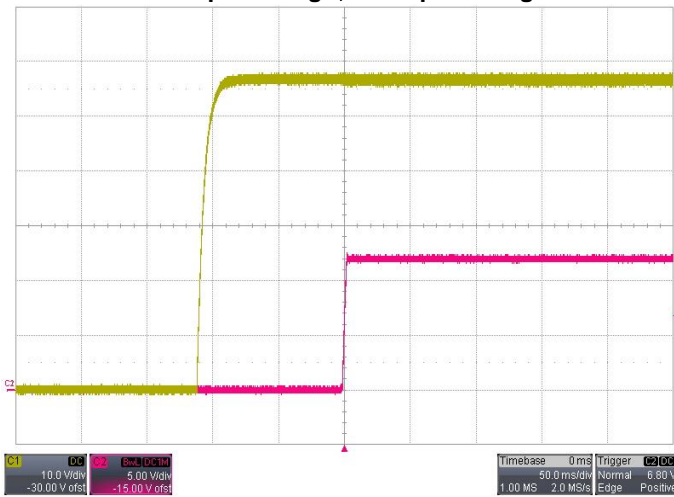
Power Down Vin=40V
(C2-output voltage; C1-input voltage)



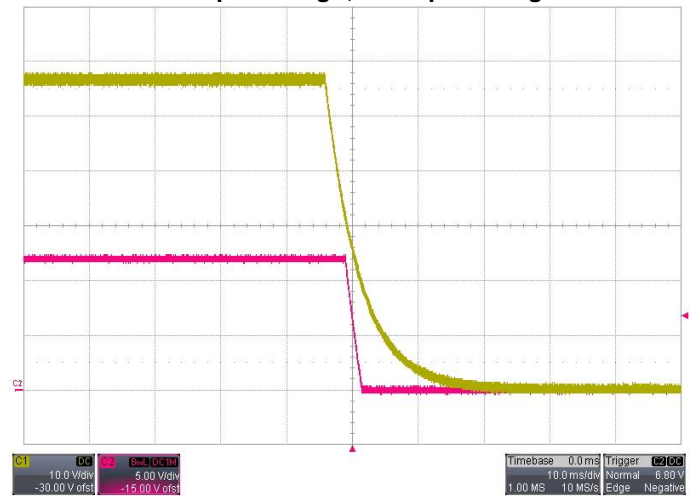
Power Up Vin=48V
(C2-output voltage; C1-input voltage)



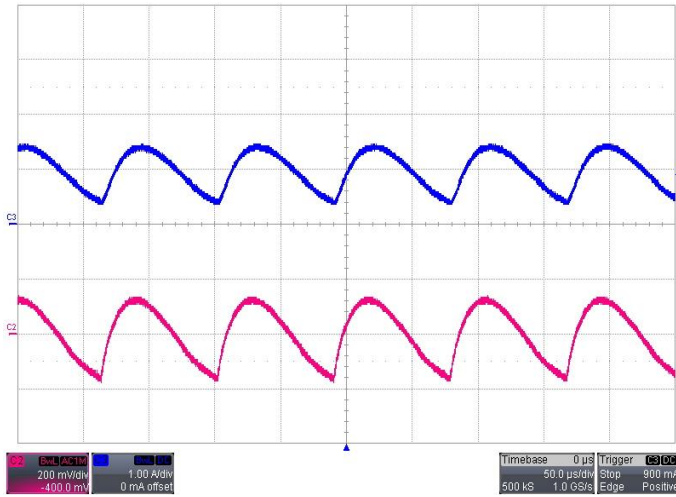
Power Down Vin=48V
(C2-output voltage; C1-input voltage)



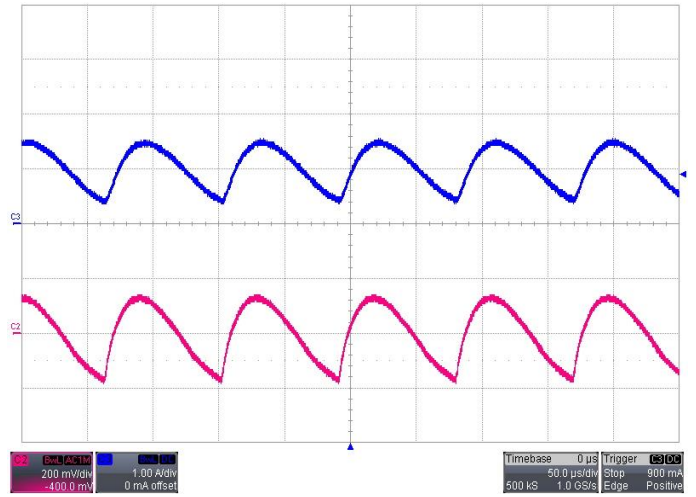
Power Up Vin=57V
(C2-output voltage; C1-input voltage)



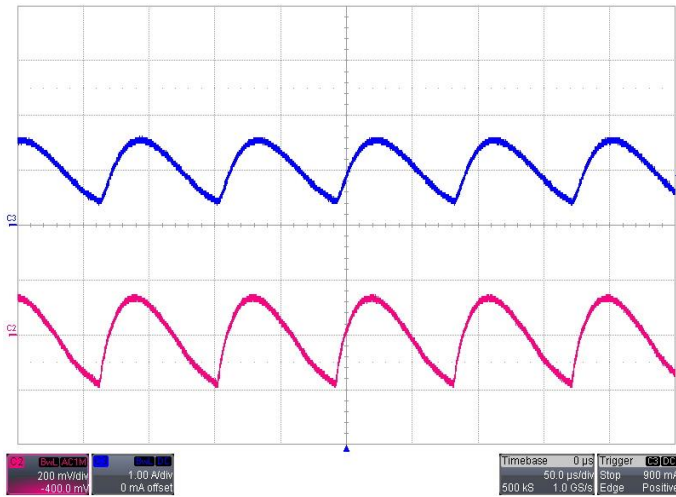
Power Down, Vin=57V
(C2-output voltage; C1-input voltage)



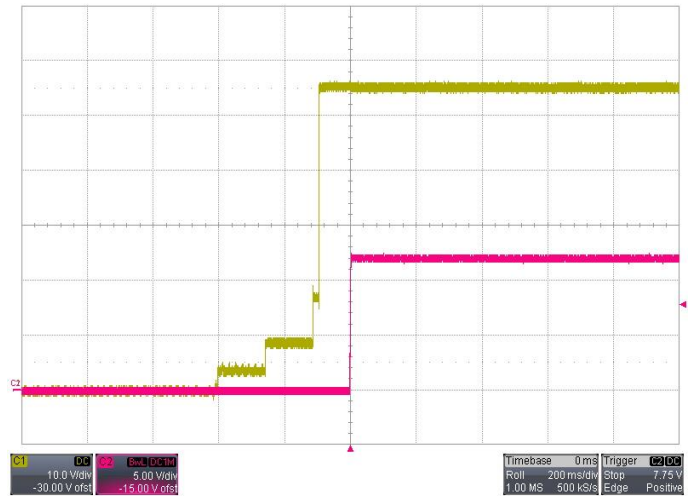
Short-Circuit Output, Vin=40V



Short-Circuit Output, Vin=48V



Short-Circuit Output Vin=57V



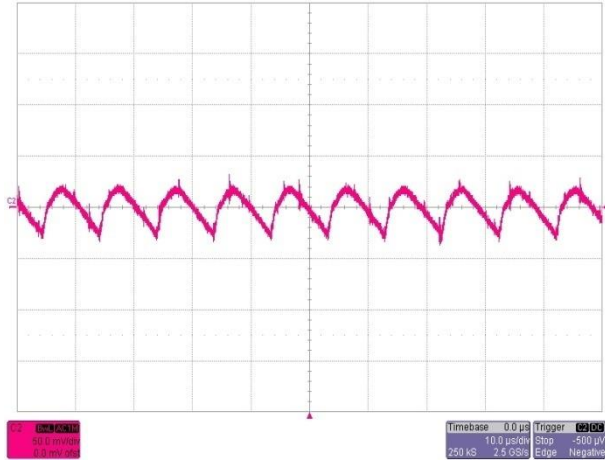
Startup from PSE (100% Load, PSE)
C1-V_{IN};C2-V_{OUT}

Typical Characteristics: MQ7800DPT050

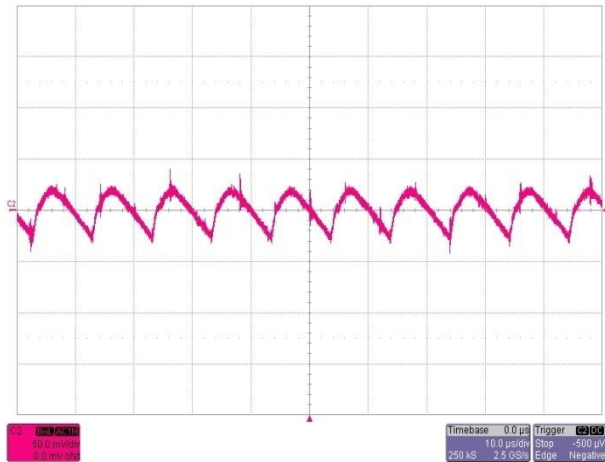
General conditions:

Input filter: N/A

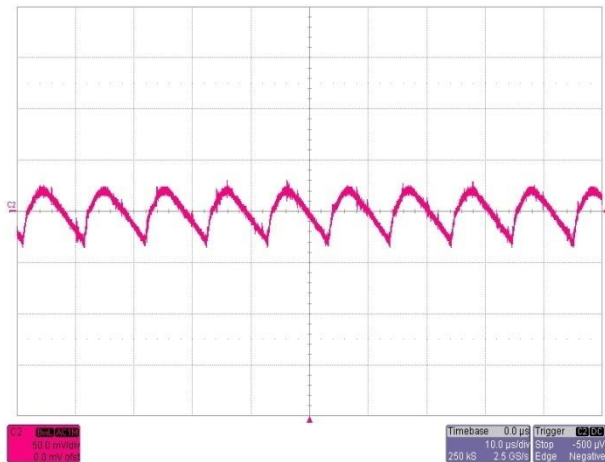
Output filter: 100uF/10V Solid CAP



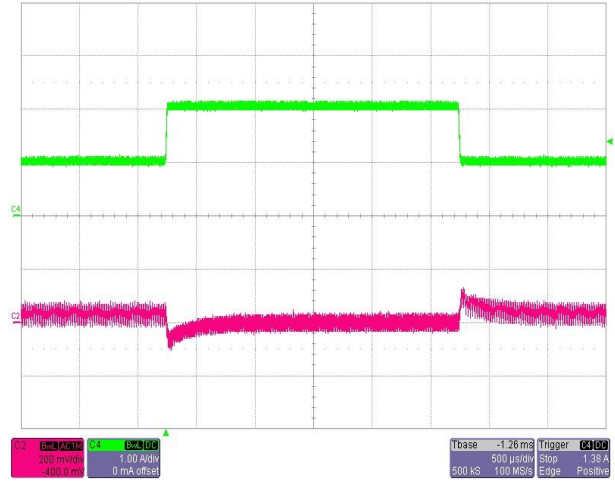
Noise $V_{IN}=40V$, $I_o=2A$, 5~20MHz Bandwidth



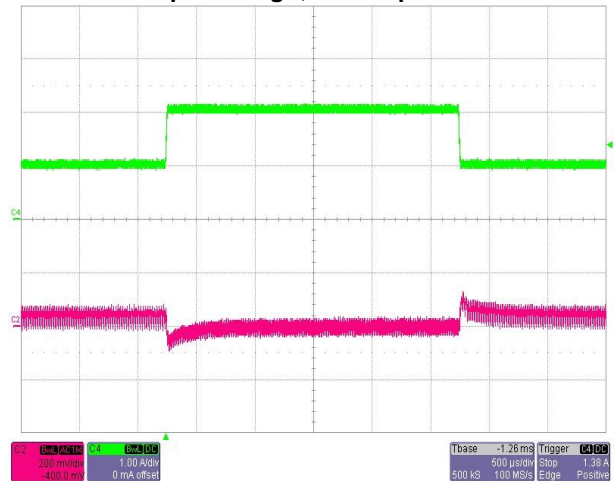
Noise $V_{IN}=48V$, $I_o=2A$, 5~20MHz Bandwidth



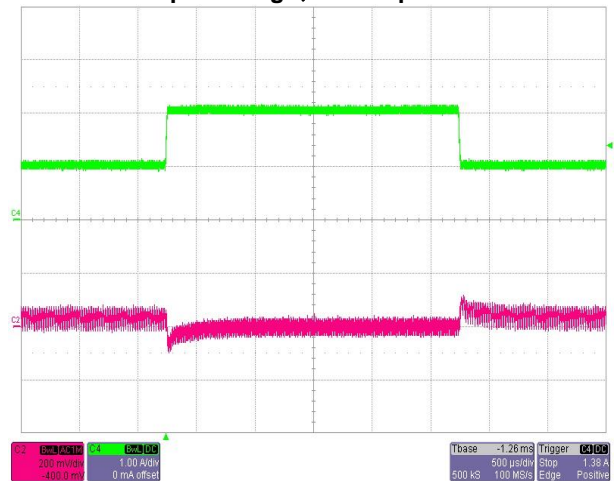
Noise $V_{IN}=57V$, $I_o=2A$, 5~20MHz Bandwidth



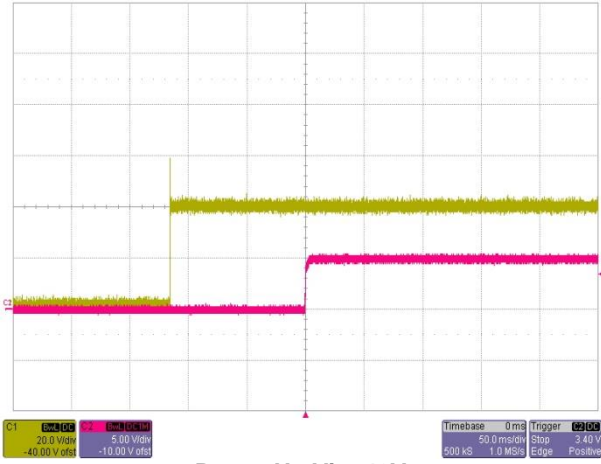
Transient Response, $V_{in}=40V$ $I_o=50\% \sim 100\% \sim 50\%$
(C2-output voltage; C4-output current)



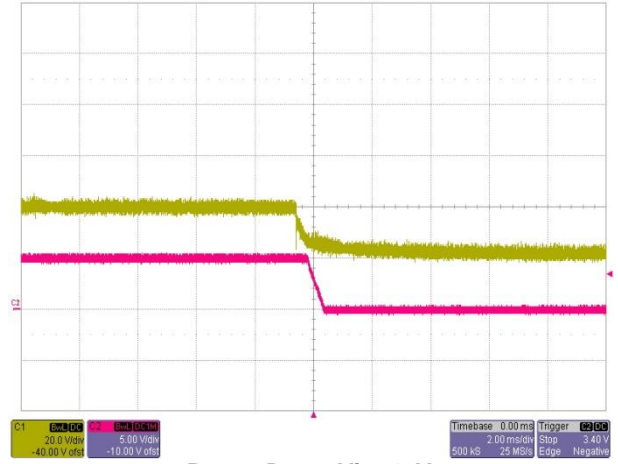
Transient Response, $V_{in}=48V$, $I_o=50\% \sim 100\% \sim 50\%$
(C2-output voltage; C4-output current)



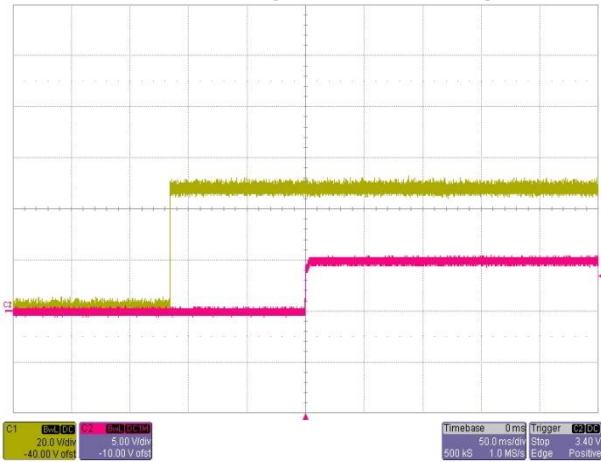
Transient Response $V_{IN}=57V$, $I_o=50\% \sim 100\% \sim 50\%$
(C2-output voltage; C4-output current)



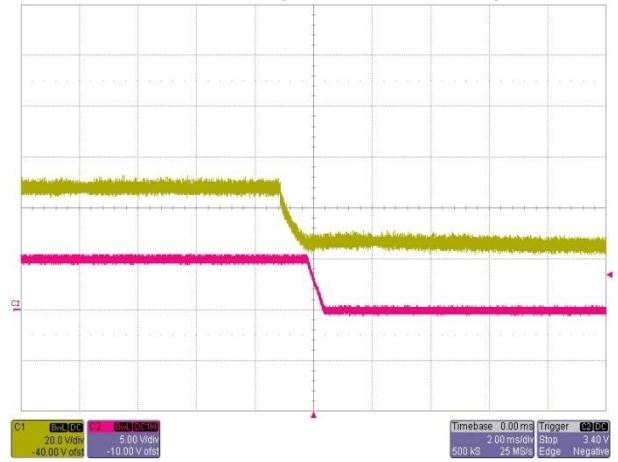
Power Up Vin=40V
(C2-output voltage; C1-input voltage)



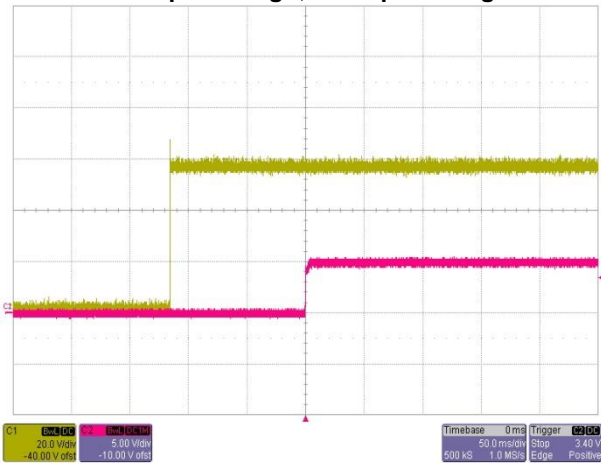
Power Down Vin=40V
(C2-output voltage; C1-input voltage)



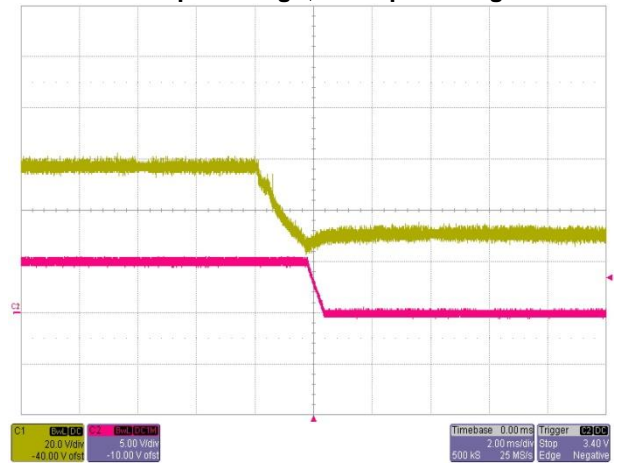
Power Up Vin=48V
(C2-output voltage; C1-input voltage)



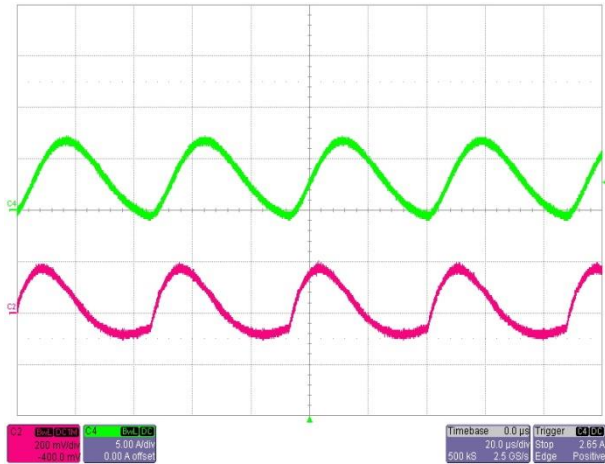
Power Down Vin=48V
(C2-output voltage; C1-input voltage)



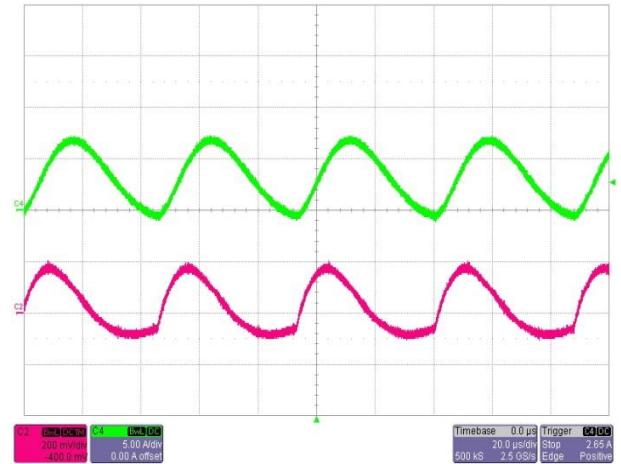
Power Up Vin=57V
(C2-output voltage; C1-input voltage)



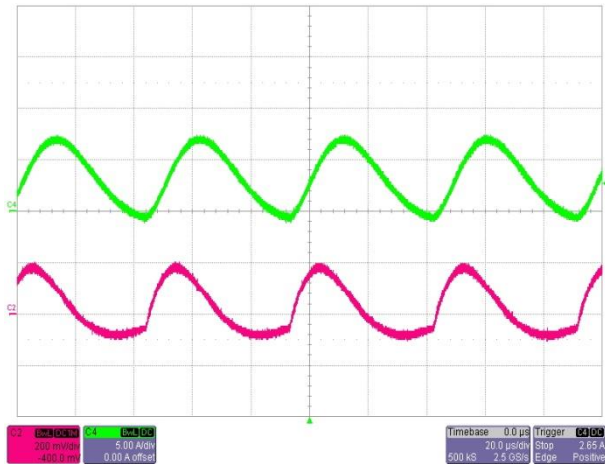
Power Down, Vin=57V
(C2-output voltage; C1-input voltage)



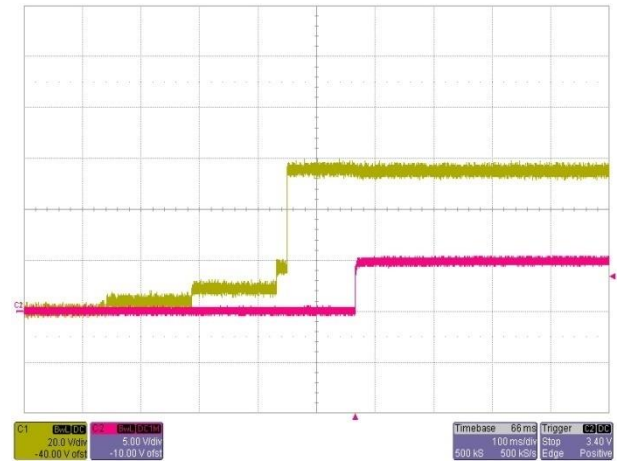
Short-Circuit Output, Vin=40V



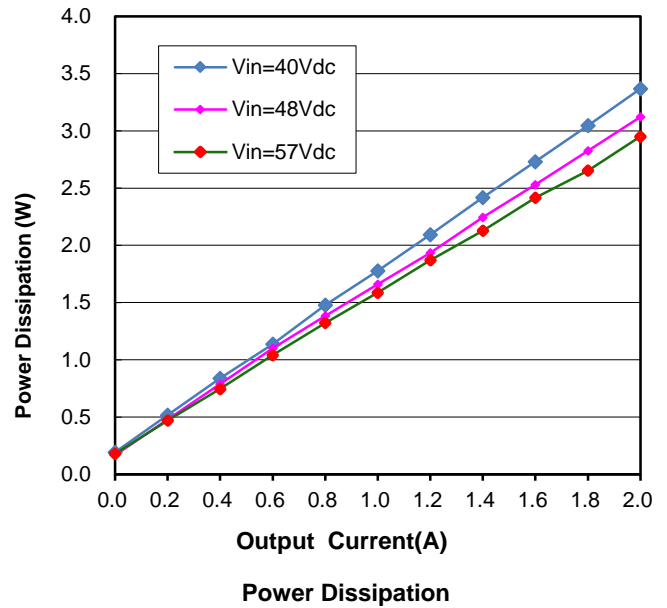
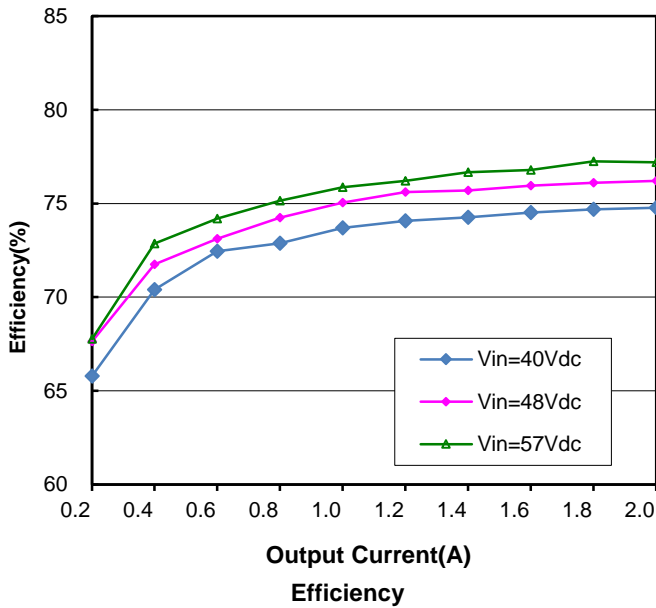
Short-Circuit Output, Vin=48V

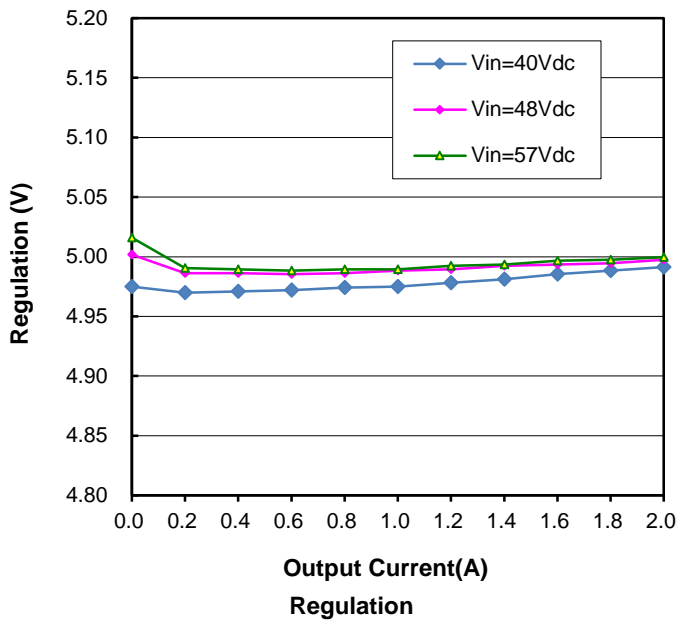


Short-Circuit Output Vin=57V



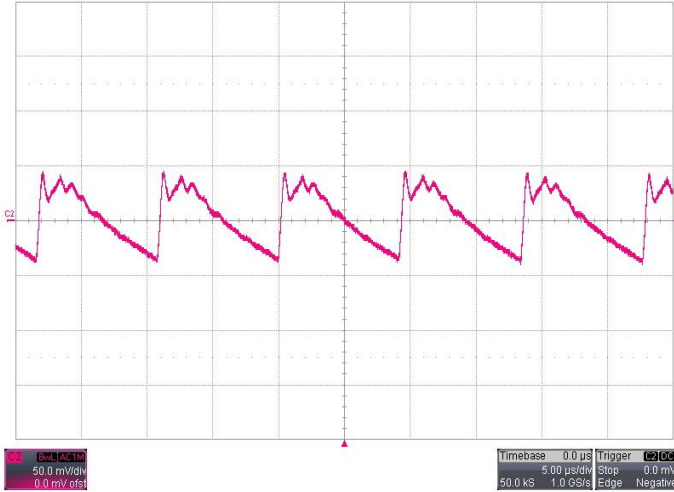
Startup from PSE (100% Load, PSE)
C1-V_{IN};C2-V_{OUT}



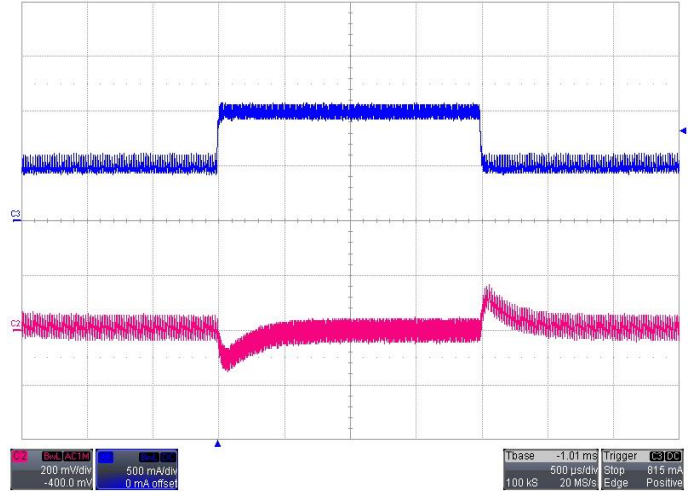


Typical Characteristics: MQ7800DPT120

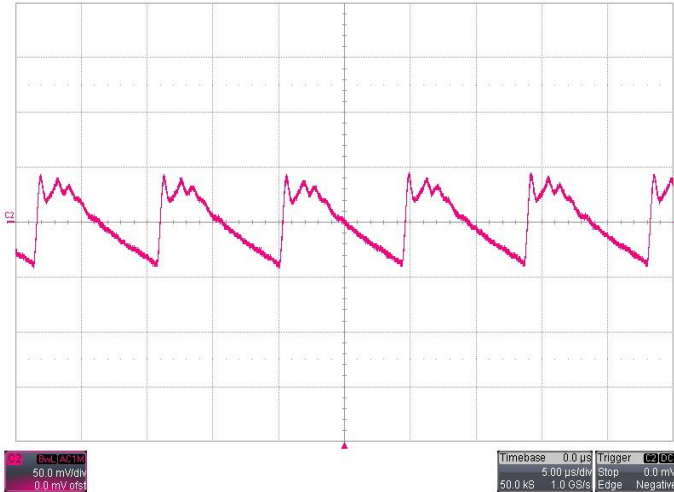
General conditions: NA



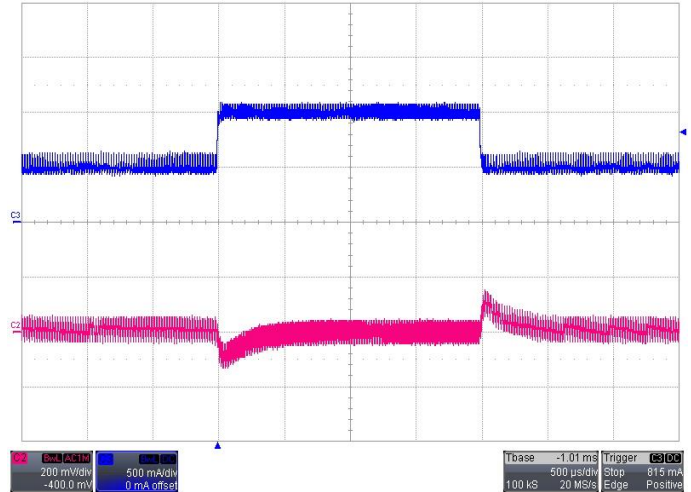
Noise $V_{IN}=40V$, $I_o=1.1A$, 5~20MHz Bandwidth



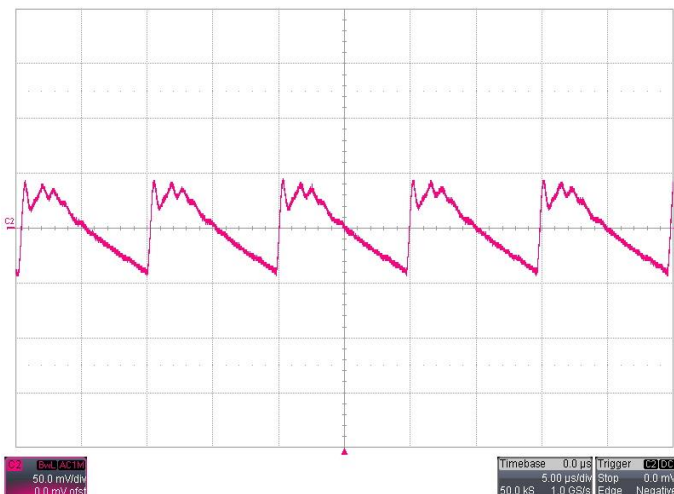
Transient Response, $V_{in}=40V$ $I_o=50\% \sim 100\% \sim 50\%$
(C2-output voltage; C3-output current)



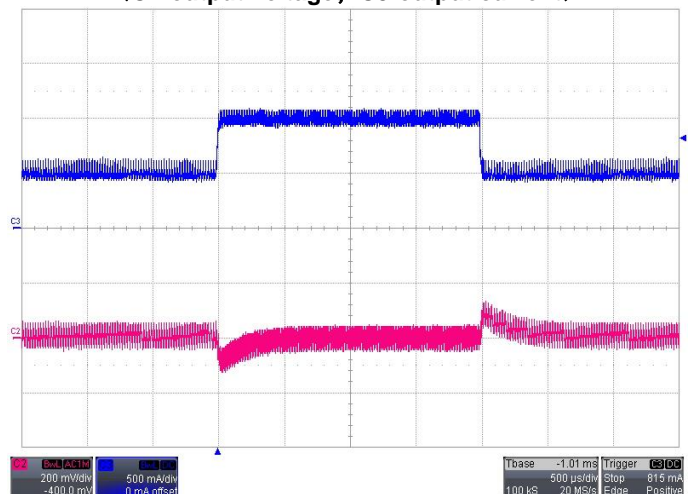
Noise $V_{IN}=48V$, $I_o=1.1A$, 5~20MHz Bandwidth



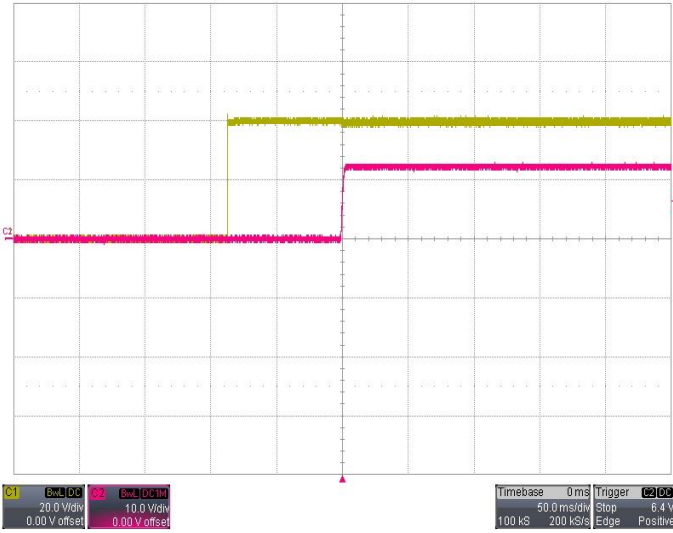
Transient Response, $V_{in}=48V$, $I_o=50\% \sim 100\% \sim 50\%$
(C2-output voltage; C3-output current)



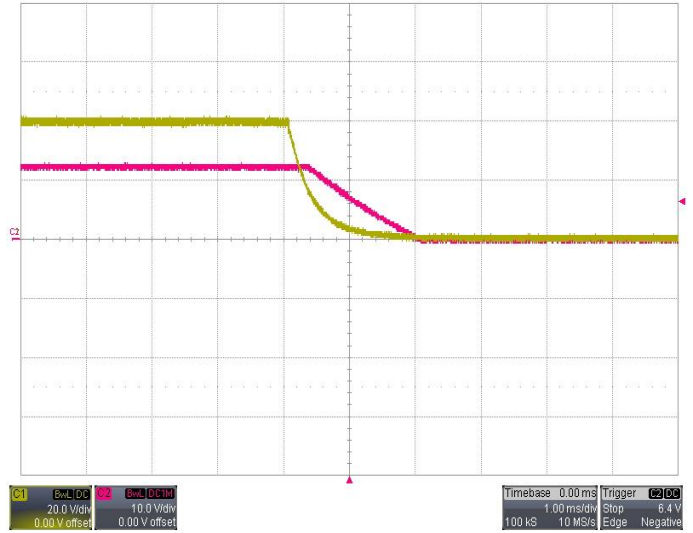
Noise $V_{IN}=57V$, $I_o=1.1A$, 5~20MHz Bandwidth



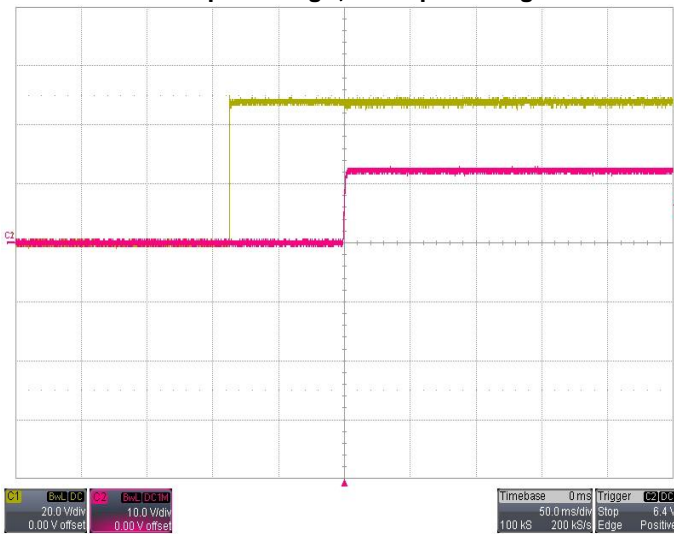
Transient Response $V_{IN}=57V$, $I_o=50\% \sim 100\% \sim 50\%$
(C2-output voltage; C3-output current)



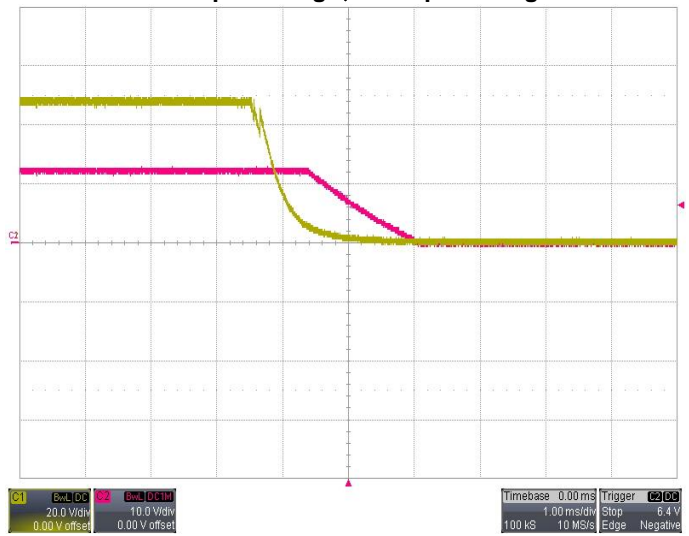
Power Up Vin=40V
(C2-output voltage; C1-input voltage)



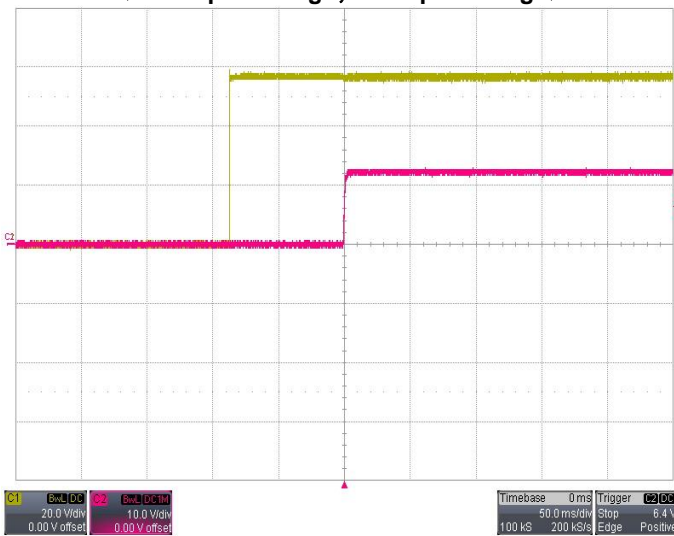
Power Down Vin=40V
(C2-output voltage; C1-input voltage)



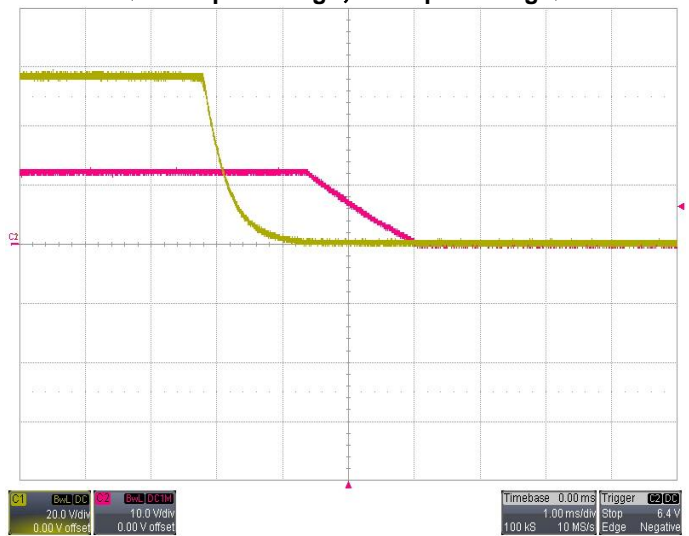
Power Up Vin=48V
(C2-output voltage; C1-input voltage)



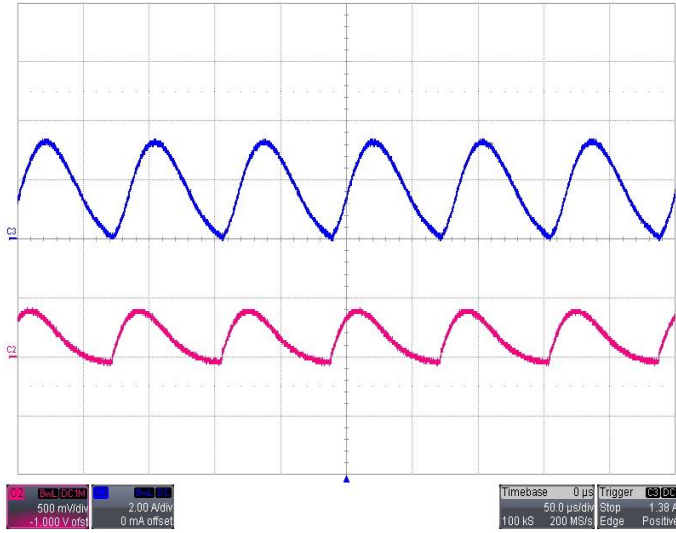
Power Down Vin=48V
(C2-output voltage; C1-input voltage)



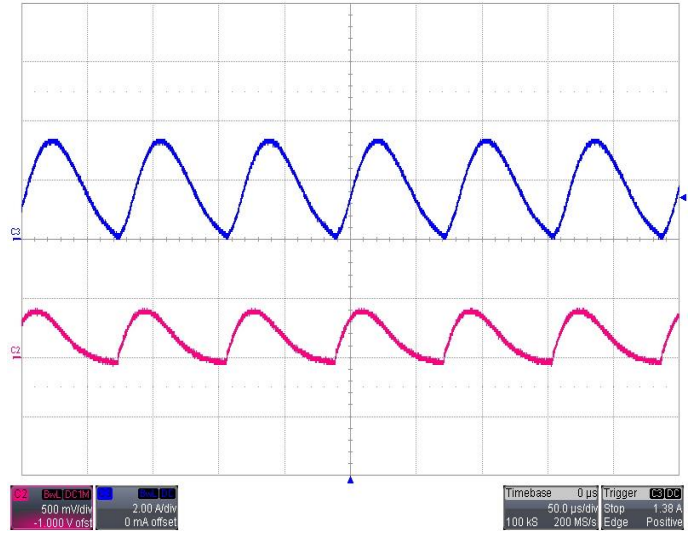
Power Up Vin=57V
(C2-output voltage; C1-input voltage)



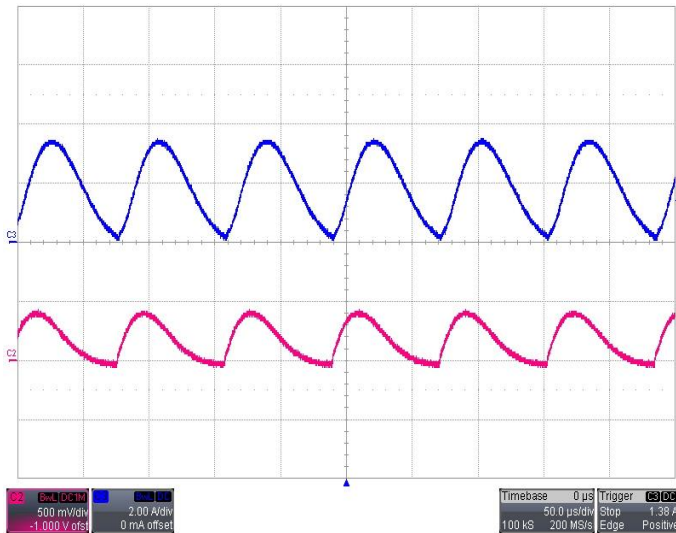
Power Down, Vin=57V
(C2-output voltage; C1-input voltage)



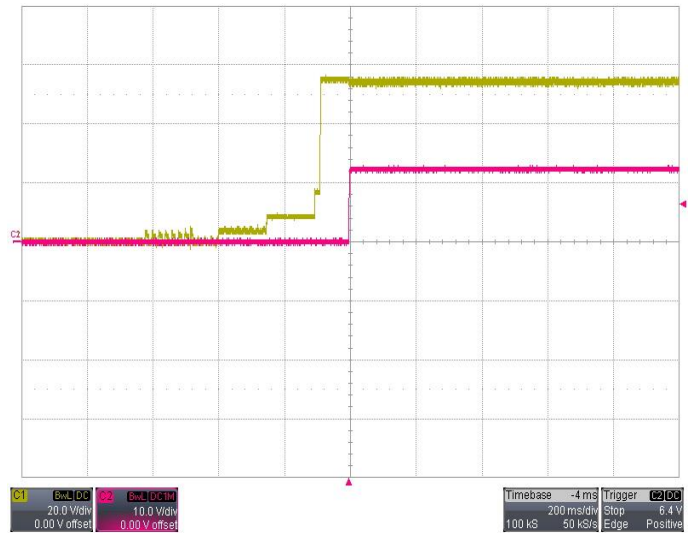
Short-Circuit Output, Vin=40V



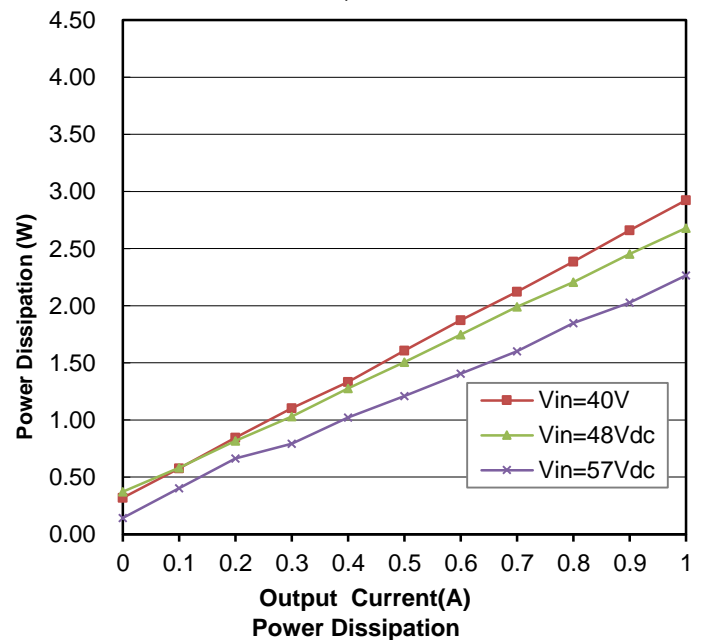
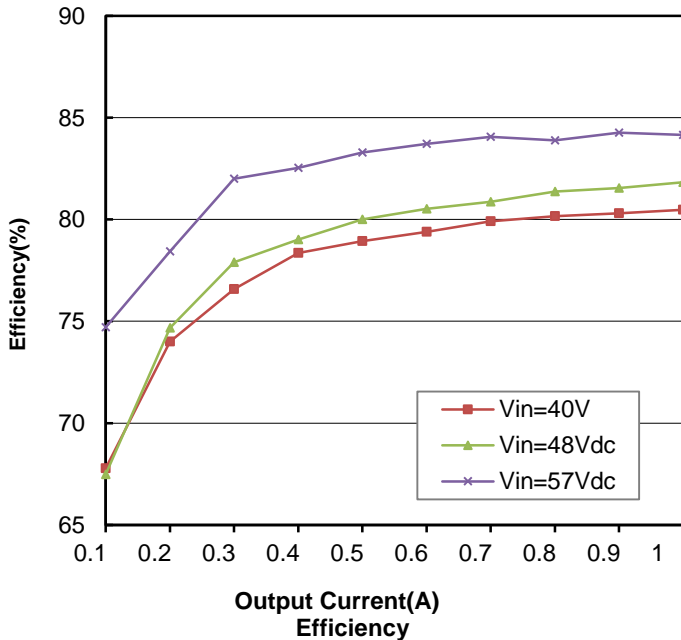
Short-Circuit Output, Vin=48V

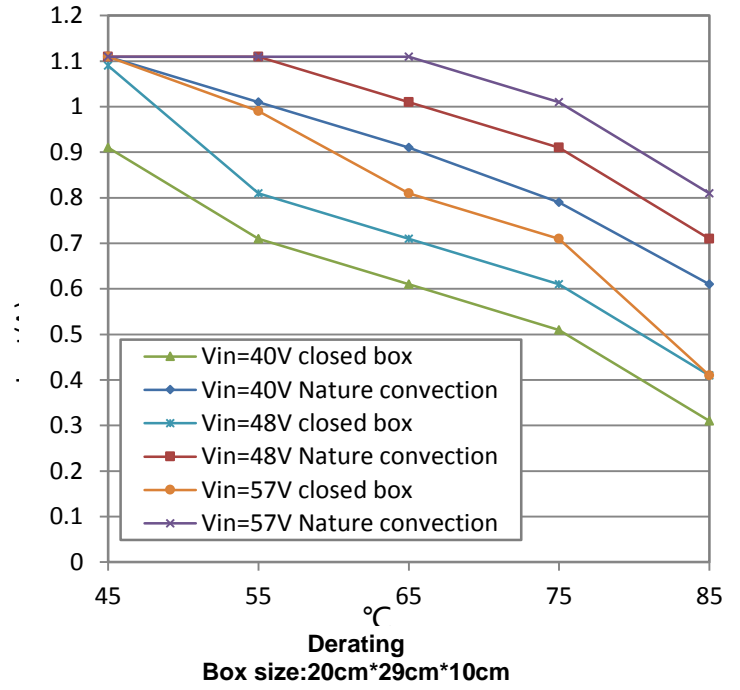
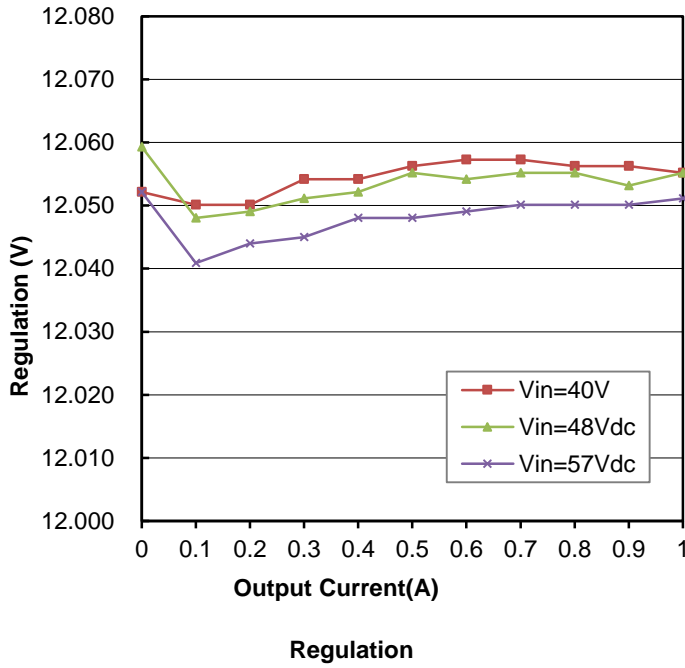


Short-Circuit Output Vin=57V



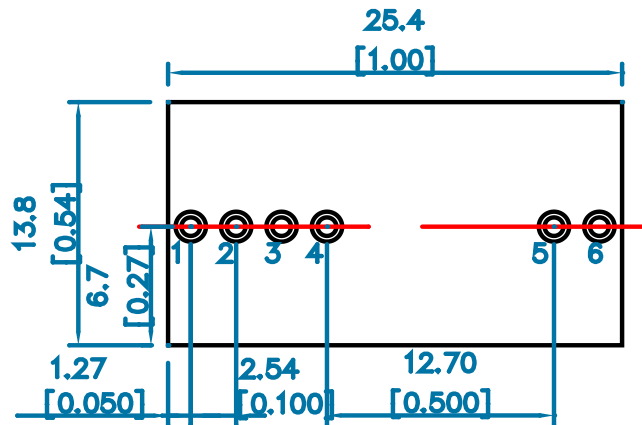
Startup from PSE (100% Load, PSE)
C1-V_{IN};C2-V_{OUT}



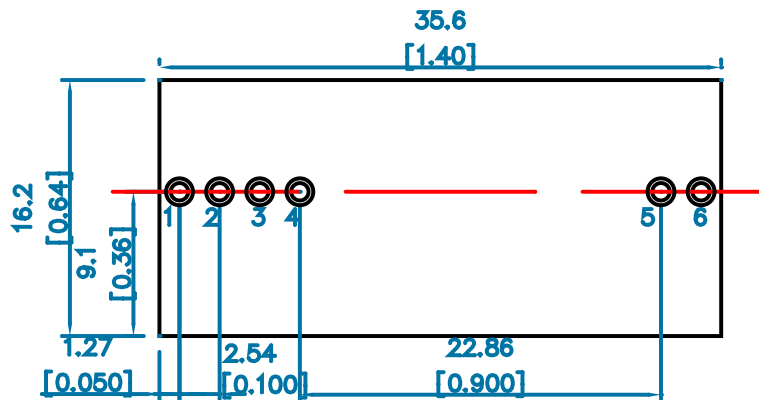


Recommended Hole Pattern

Dimensions are in inches (millimeters)



"MQ7800CPT120"



"MQ7800DPT120"

Component-side footprint