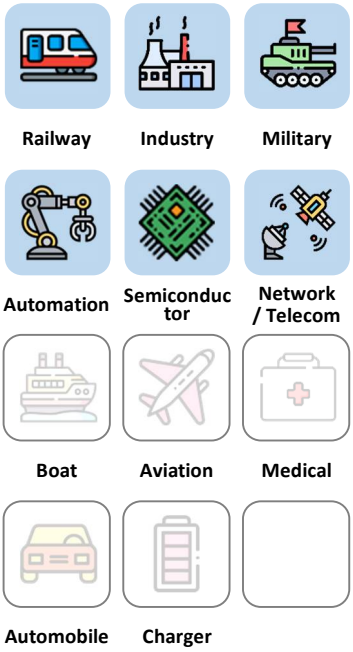
MQB Series
75W / Ultra input
Quarter Brick DC/DC

Applications



3 Years Warranty

CE RoHS COMPLIANT ISO REACH

Features

1/4 Brick	**4:1/8:1/12:1** Wide input range	**DOSA** Pin out	**Single/Dual Multi** Output	**PI FILTER** Built-in	**2250 VDC** Insulation	**MLCC** No life-span constrained	**90 %** High efficiency
ON / OFF REMOTE	**METAL CASE**	**UVLO**	**OCP**	**OVP**	**OTP**		

Model Number Structure

MQB 028 050 - S - P - B 75

Series Name	Input Voltage (VDC)	Output Voltage (VDC)	Output Quantity	Remote Control Option	Shape	Watt
Mercury series **Q**uarter **B**rick	**028** : 9-75 **054** : 14-154	**050** : 5 **120** : 12 **150** : 15 **240** : 24	**S** : Single	**P** : Positive logic **N** : Negative logic	**B** : Base Plate	**50** **75**
		120 : ±12 **150** : ±15 **240** : ±24	**D** : Dual			

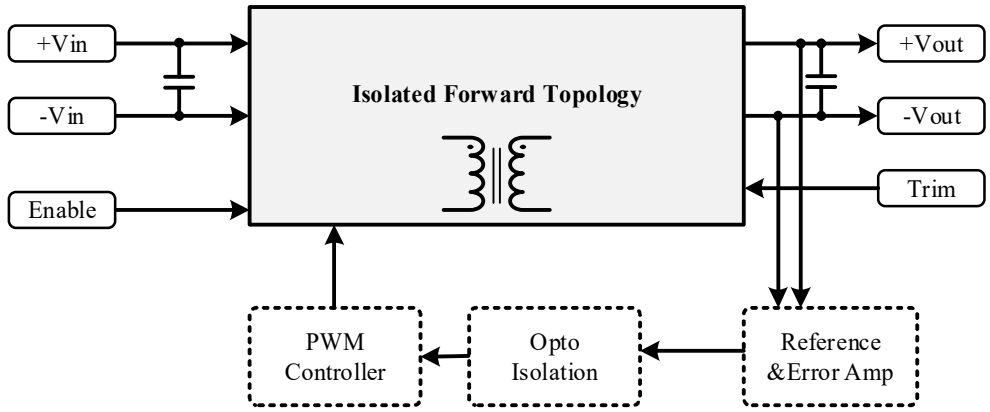
Model Selection Guide

Typical @ Ta=+25 ℃ under nominal line voltage conditions unless noted

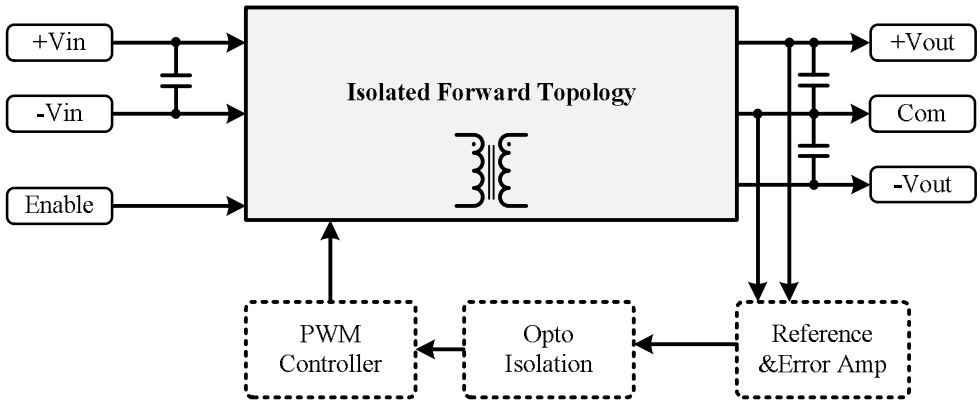
Model	Input			Output			Efficiency	Max. capacitive Load
	Voltage (V)		Current (A)	Voltage	Current	Power		
	Range	Nominal	Full load	(V)	(A)	(W)	Typ.(%)	μF
MQB028050-S-□-B50	9 - 75	28	1.98	5	10.0	50	90	18000
MQB028120-S-□-B50	9 - 75	28	2.01	12	4.2	50	89	5000
MQB028150-S-□-B50	9 - 75	28	2.01	15	3.3	50	89	3200
MQB028240-S-□-B50	9 - 75	28	2.01	24	2.1	50	89	1200
MQB028120-D-□-B50	9 - 75	28	2.01	±12	2.1	50	89	1000
MQB028150-D-□-B50	9 - 75	28	2.01	±15	1.7	50	89	500
MQB028240-D-□-B50	9 - 75	28	2.01	±24	1.0	50	89	200
MQB028050-S-□-B75	9 - 75	28	3.01	5	15	75	89	18000
MQB028120-S-□-B75	9 - 75	28	3.04	12	6.25	75	88	5000
MQB028150-S-□-B75	9 - 75	28	3.04	15	5	75	88	3200
MQB028240-S-□-B75	9 - 75	28	3.04	24	3.125	75	88	1200
MQB028120-D-□-B75	9 - 75	28	3.04	±12	3.13	75	88	1000
MQB028150-D-□-B75	9 - 75	28	3.04	±15	2.5	75	88	500
MQB028240-D-□-B75	9 - 75	28	3.04	±24	1.56	75	88	200
MQB054050-S-□-B50	14 - 154	54	1.03	5	10.0	50	90	18000
MQB054120-S-□-B50	14 - 154	54	1.04	12	4.2	50	89	5000
MQB054150-S-□-B50	14 - 154	54	1.04	15	3.3	50	89	3200
MQB054240-S-□-B50	14 - 154	54	1.04	24	2.1	50	89	1200
MQB054120-D-□-B50	14 - 154	54	1.04	±12	2.1	50	89	1000
MQB054150-D-□-B50	14 - 154	54	1.04	±15	1.7	50	89	500
MQB054240-D-□-B50	14 - 154	54	1.04	±24	1.0	50	89	200
MQB054050-S-□-B75	14 - 154	54	1.56	5	15	75	89	18000
MQB054120-S-□-B75	14 - 154	54	1.58	12	6.25	75	88	5000
MQB054150-S-□-B75	14 - 154	54	1.58	15	5	75	88	3200
MQB054240-S-□-B75	14 - 154	54	1.58	24	3.125	75	88	1200
MQB054120-D-□-B75	14 - 154	54	1.58	±12	3.13	75	88	1000
MQB054150-D-□-B75	14 - 154	54	1.58	±15	2.5	75	88	500
MQB054240-D-□-B75	14 - 154	54	1.58	±24	1.56	75	88	200

Description

Multiple Output series - Quarter Brick converter is composed of Isolated, board-mountable, fixed switching frequency dc-dc converters that use synchronous rectification to achieve extremely high-power conversion efficiency. These DC-DC converter modules use advanced power processing, control, and packaging technologies to enhance the performance, flexibility, reliability, and cost effectiveness of mature power components. Each module is six-sided metal case enclosed to provide protection from the harsh environments seen in many industrial and transportation applications.



MQB Single Series Block Diagram



MQB Dual Series Block Diagram

Electrical Specifications

(Typical @ Ta=+25°C under nominal line voltage conditions unless noted.)

Input Specifications

Parameter	Notes and Conditions	Min.	Typ.	Max.	Unit
Transient Input Voltage Ranges	MQB028 models (100ms Max) MQB054 models (100ms Max)			80 160	VDC
Operating Input Voltage Ranges	MQB028 models MQB054 models	9 14	28 54	75 154	VDC
Under-Voltage Lockout Start up Voltage	MQB028 models MQB054 models			9 14	VDC
Under-Voltage Lockout Shutdown Voltage	MQB028 models MQB054 models		7 12		VDC
Enable Function Input	Positive logic ON Positive logic OFF		Open Short or 0 ~ 1.2		VDC
	Negative logic ON Negative logic OFF		Short or 0 ~ 1.2 Open		VDC

Output Specifications

Parameter	Notes and Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	V_{NOM} 50% Load			±1.5	%
Line Regulation	Low Line to High Line			±0.3	%
Load Regulation	10% to 100% Load			±0.5	%
Minimum Load	Single output	0			%
	Dual output	0			%
Output Ripple & Noise Voltage	Bandwidth 20MHz and with 1µF MLCC Output Capacitor each output		1.5		$\%V_{pk-pk}$
Temperature Drift				±0.04	% /˚C
Transient Recovery Time	25% load step change		800		µSec.
Transient Peak Deviation	ΔIo/Δt=2.5A/us		±2		%Vo
Start-Up Time	When use Enable Function		20		mSec.
Trimming Output Voltage	V_{NOM} 10% Load		±10		%
Over Voltage Protection	V_{NOM} 10% Load		120		%
Output Power Protection	V_{NOM}		120		%

General Specifications & Environmental Specifications

Parameter	Notes and Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	V_{NOM}		220		kHz
Storage Temperature Range	All models	-60		125	˚C
Operating Case Temperature	All models	-45		105	˚C
Over temperature Protection	All models, Auto. Recovery		110		
Isolation Voltage Input to Output Input & Output to Case	All models, 1 Minute		 2250 1500		VDC
Isolation Resistance Input to Output	All models, 500VDC, At 70%RH	100			MΩ
Isolation Capacitance Input to Output	All models		1500		pF
Humidity (non condensing)	All models			95	%
Calculated MTBF	BellCore-TR-332@ 50˚C G.B		1		M HR
Weight	Shape-B		68		g (oz.)
Dimensions	Shape-B	2.36” x 1.57” x 0.49” (60.0 x 40.0 x 12.4mm)			
Case Material	Aluminum				

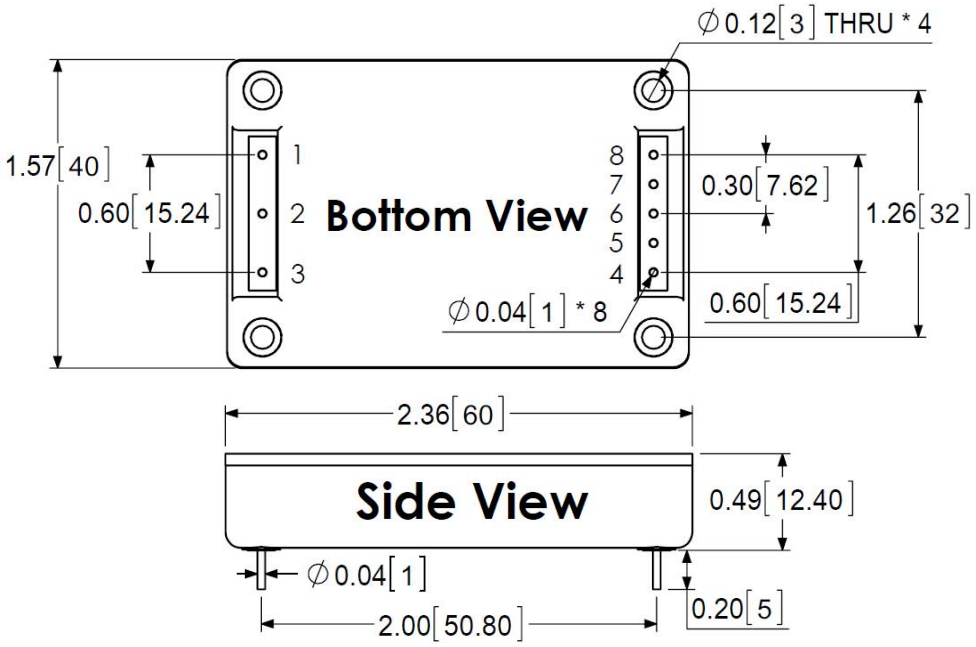
Standards Compliance

Parameter	Standard	Test Conditions	Performance Criteria
Environmental Compliance	Reach; RoHS		PASS
EMI	EN55022		Class A / Class B
ESD	EN61000-4-2	±4 kV Air Discharge ±4 kV Contact Discharge	Crit. A
Radiated Immunity	EN61000-4-3	Level 2, 3 V/m	Crit. A
Fast Transient	EN61000-4-4	±2 kV Applied	Crit. A
Surge	EN61000-4-5	±2 kV Applied	Crit. A
Conducted Immunity	EN61000-4-6	Level 2, 3 V rms	Crit. A

It is recommended to protect the input by fuses or other protection devices.
Modules could meet EN55022 Class A and Class B standard with external components.

Mechanical Dimensions & Pin Assignments

Shape – B



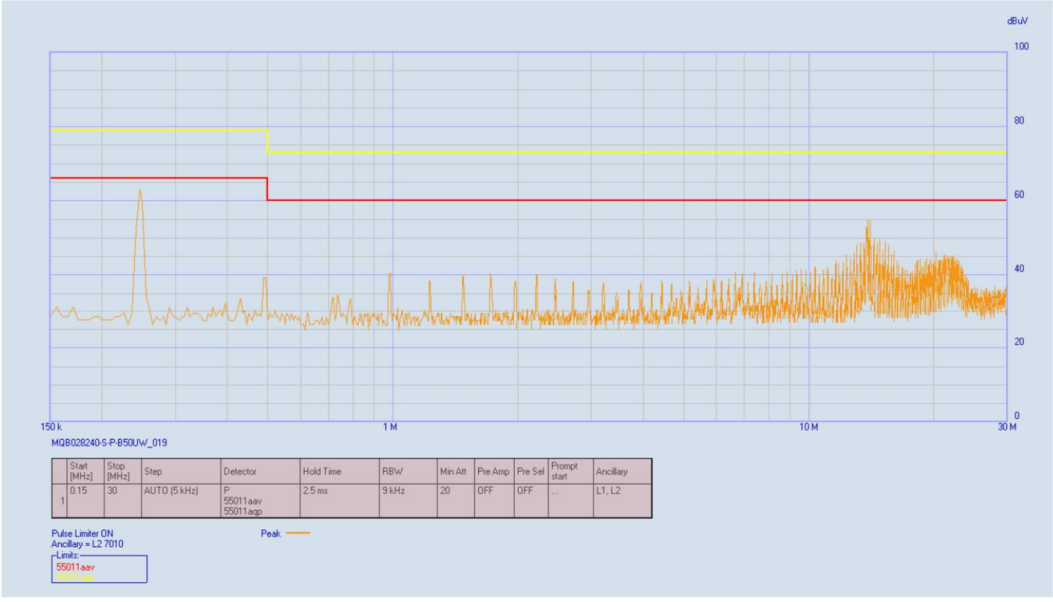
Pin Assignments:

Pin#	Single	Dual
1	-Vin	-Vin
2	Enable	Enable
3	+Vin	+Vin
4	+Vout	+Vout
5	NA	NA
6	Trim	Common
7	NA	NA
8	-Vout	-Vout

Note:
All pins are 0.040" (1.02mm)
Pin Material: Copper Alloy
Pin Plating: Gold
Dimensions in inches [mm]
Tolerances: .XX±0.02 [.X±0.5mm]

Conducted EMI

Input terminal value (typ.) MQB028240-S-P-B50 @Vin = 28VDC, Iout = 2.08A



Characteristic Curves

Testing conditions are at typical input, Ta=+25˚C, full load (horizontal mount) Unless otherwise indicated

The figures of MQB054050-S-P-B50

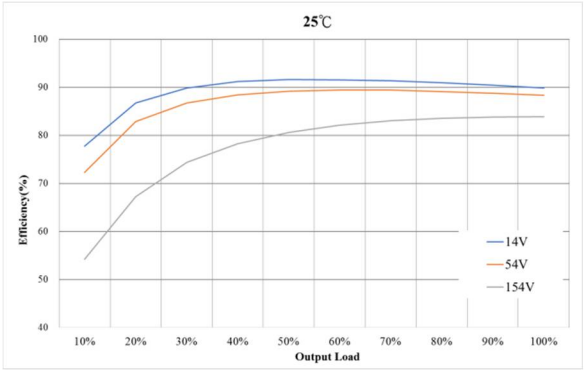


Figure 1 : Efficiency at Minimum, Nominal and Maximum Input Voltages VS. Output Load.

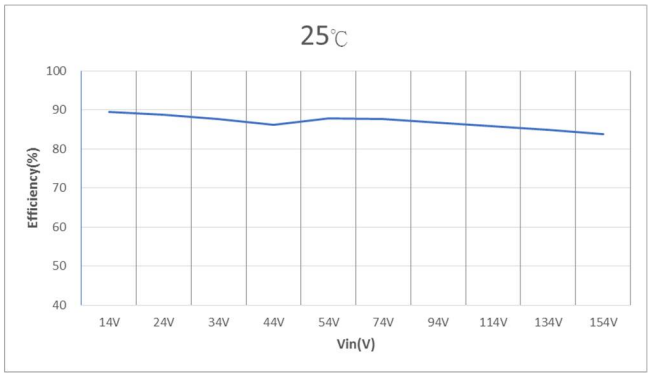


Figure 2 : Efficiency VS. Input Voltages at 100% rated power

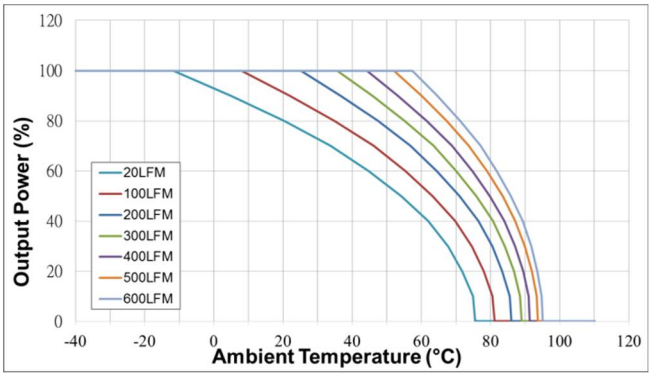


Figure 3 : Ambient Temperature VS. Output Power Derating Curves(Note: 20LFM = Free Air)

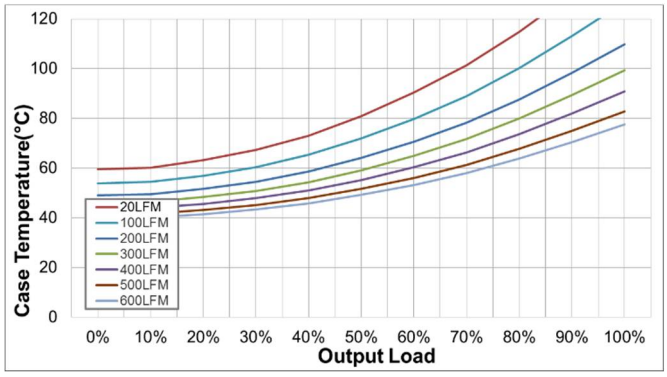


Figure 4 : Case Temperature VS. Output rated Power (Note: 20LFM = Free Air)

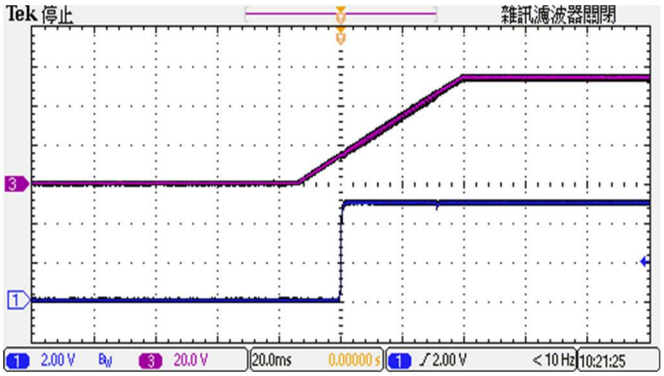


Figure 5 : CH1 = Vout, CH3 = Nominal Input Typical Start-up waveform at Full load.

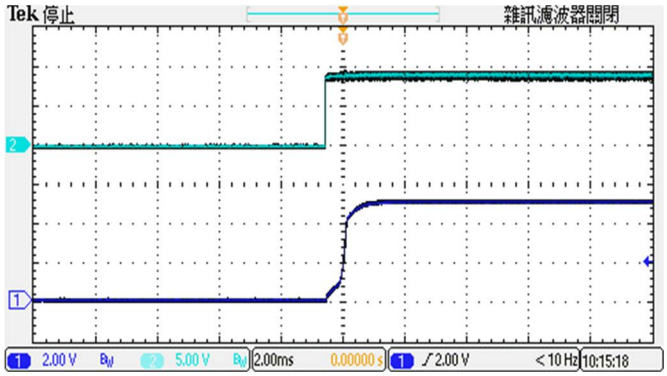


Figure 6 : CH1 = Vout, CH3 = Enable Pin Typical Start-up waveform. Input voltage pre-applied

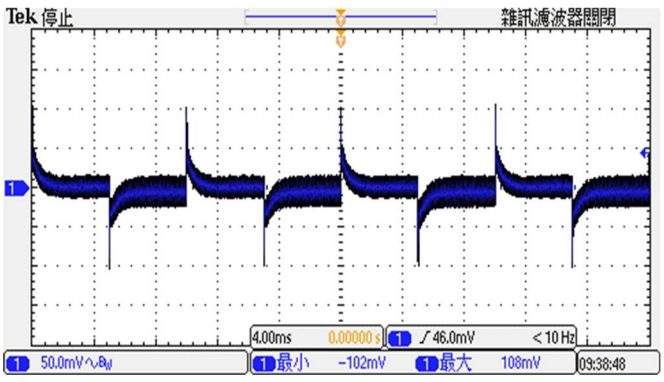


Figure 7 : Transient Response at Output step load
(Vin: Typical ,50~75% of output current; ΔIo/Δt =1A/μS)

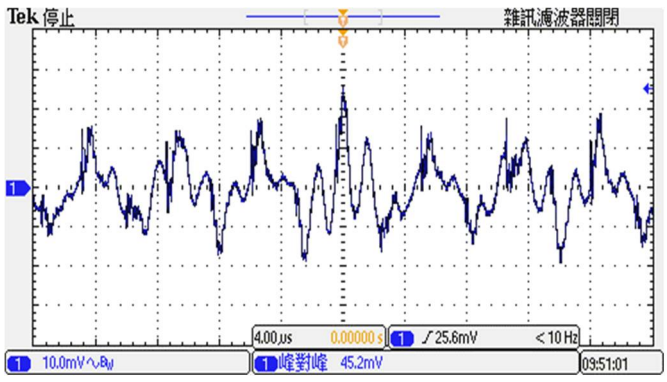


Figure 8 : Output Voltage Ripple & Noise at full load.
(Vin: Typical, With Output Capacitor to add 1uF MLCC)

Trimming Output Voltage – for Single output models

Only the single output converters have a trim function. That allows users to adjust the output voltage from +10% to –10%, please refer to the trim table that follow for details. Adjustments to the output voltage can be used with a simple fixed resistor as shown in Figures 1 and 2. A single fixed resistor can increase or decrease the output voltage depending on its connection.

Note:

※ Trim adjustments higher than the specified range can have an adverse effect on the converter's performance and are not recommended.

※ If the trim function is not used, leave the trim pin open.

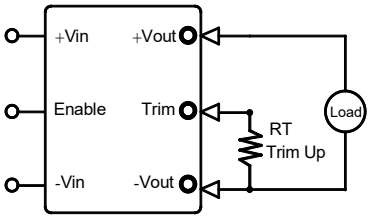


Figure 1. Trim Connections To increase Output Voltages Using Fixed Resistors

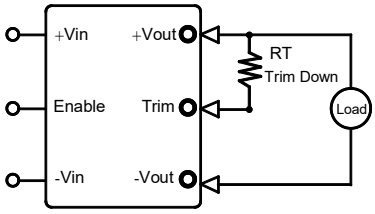


Figure 2. Trim Connections To Decrease Output Voltages Using Fixed Resistors

	Trim up resistor value(KΩ)									
Vout	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
5	112.2	51.1	30.7	20.5	14.4	10.4	7.5	5.3	3.6	2.2
12	267.8	121.9	73.3	49.0	.34.4	24.6	17.7	12.5	8.4	5.2
15	332.9	151.5	91	60.7	42.6	30.5	21.8	15.4	10.3	6.3
24	516.2	232.6	138.1	90.8	62.4	43.5	30	19.9	12	5.7

	Trim down resistor value(KΩ)									
Vout	-1%	-2%	-3%	-4%	-5%	-6%	-7%	-8%	-9%	-10%
5	139.8	63.5	38.1	25.4	17.8	12.7	9.0	6.3	4.2	2.5
12	342.5	155.9	93.7	62.6	44.0	31.5	22.7	16.0	10.8	6.7
15	454.5	205	125.8	84.7	60.1	43.6	31.9	23.1	16.2	10.7
24	797.5	366.1	222.3	150.4	107.3	78.5	58	42.6	30.6	21

Enable Control Function

The primary-side, Enable Control function can be specified to operate with either positive or negative polarity. Positive-polarity devices are enabled when the enable pin is left open or is pulled high. See "Enable Function Input.

Positive-polarity devices are disabled when the enable pin is pulled low (under +1.0V with respect to –input). Negative-polarity devices are off when the enable pin is high/open and on when the enable pin is pulled low. See Figure 3.

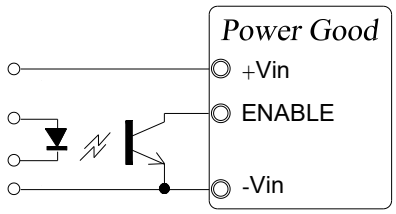


Figure 3. Driving the Enable Control pin

Output Ripple Noise

The two copper strips simulate real-world PCB impedances between the converter and its load. Scope measurements should be made using BNC connectors or the probe ground should be less than 1/2 inch and soldered directly to the fixture.

All external capacitors should have appropriate voltage ratings and be located as close to the converter as possible.

Temperature variations for all relevant parameters should be taken into consideration. The most effective combination of external I/O capacitors will be a function of line voltage and source impedance, as well as particular load and layout conditions. See Figure 4.

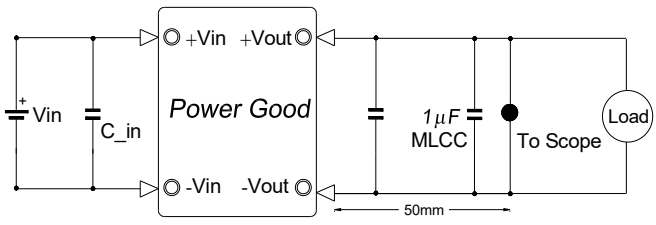


Figure 4. Measuring Output Ripple/Noise(20MHz bandwidth)

PowerGood Tech. Research Co., Ltd.
Address：5F, No. 40, Keya Rd., Daya Dist., Taichung City 42881, Taiwan
Website：www.powergood.com
Email：sales1@powergood.com
TEL：+886 4 2568 0448
FAX：+886 4 2568 0438

MORE INFO