Features

2:1/4:1 Wide Input Range

Operating Temperature Range: -45°C~105°C

Approved to CE, RoHS & REACH

Safety Standards to IEC/EN 62368-1 & EN 50155

Efficiency up to 93%

EMI Class A & B

Single Output 12~48V DC

28MQBxy-x-x-B75-IP Series

DC/DC PCB Mount Power Supply

Ideal Power's 28MQBxy-x-x-B75-IP 75W Quarter Brick DC/DC Converters Series are certified to UKCA, CE, RoHS, REACH & EN 62368-1/IEC 62368-1/EN 50155 Standards and comply with Efficiency Regulations. These are primarily used in ITE, Audio & Video, Railway Industries, and customised solutions are available upon request.

Part Number Structure

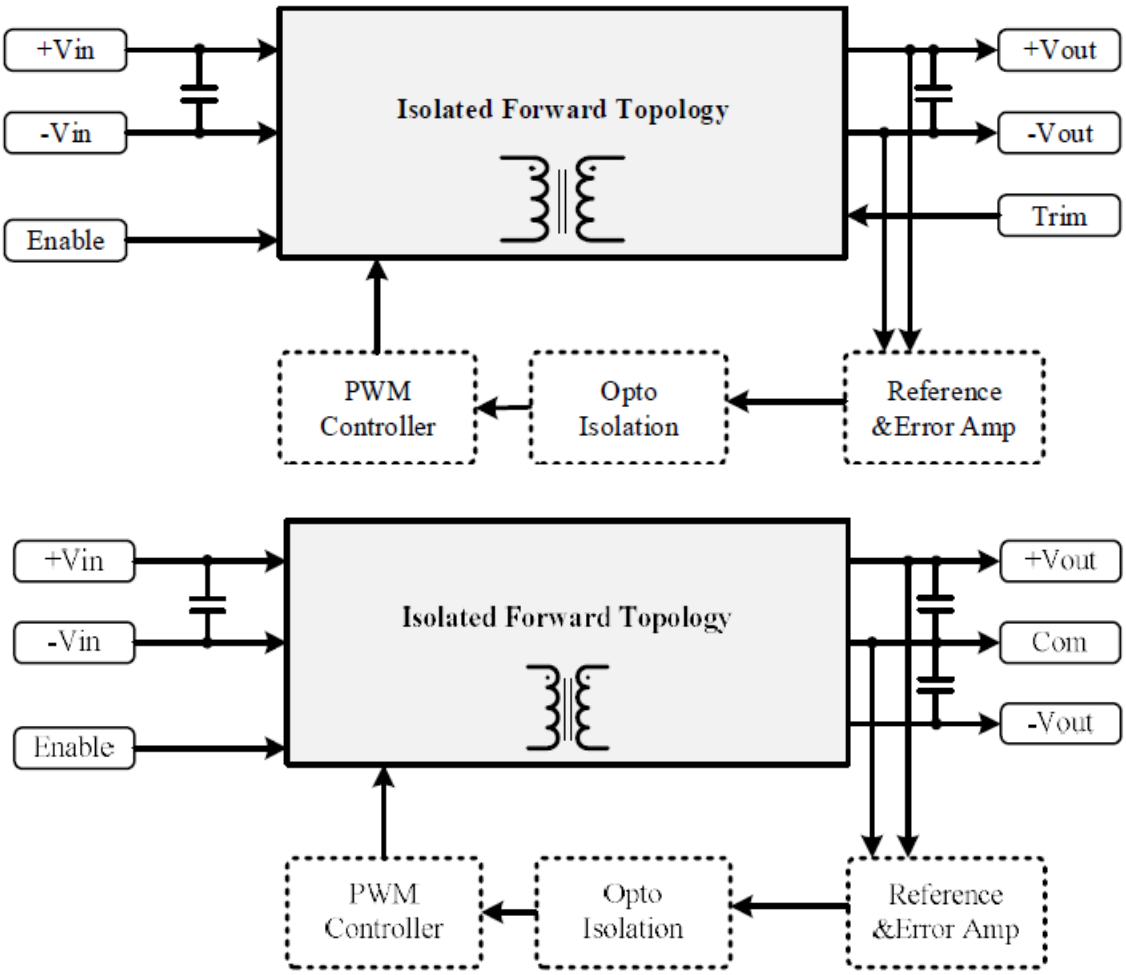
28MQB	-	028	050	-	S	-	P	-	B	75
Series Name		Input Voltage (VDC)	Output Voltage (VDC)		Output Quantity		Remote control option		Shape	Watt
Mercury series **Q**uarter **B**rick		**028 :** 9-75 **054 :** 14-154	**050 :** 5 **120 :** 12 **150 :** 15 **240 :** 24		**S:** Single		P: Positive logic N: Negative logic		**B:** Base Plate	50 75

Models

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

Description

Ideal Power 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.



Input Data

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

Output Data

Parameter	Notes and Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	VNOM 50% Load	--	--	±1.5	%
Line Regulation	Low Line to High Line	--	--	±0.3	%
Load Regulation	10% to 100% Load	--	--	±0.5	%
Ripple & Noise Voltage	Bandwidth 20MHz and with 1μF MLCC Output Capacitor	--	1.5	--	%Vpk-pk
Temperature Coefficient	--	--	--	+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 Protection	VNOM 10% Load	--	+10	--	%
Output power protection	VNOM 10% Load	--	120	--	%
Over-Voltage Protection	VNOM	--	120	--	%
Minimum Load	Single output	0	--	--	%
	Dual Output	0	--	--	%

General Specifications & Environmental Data

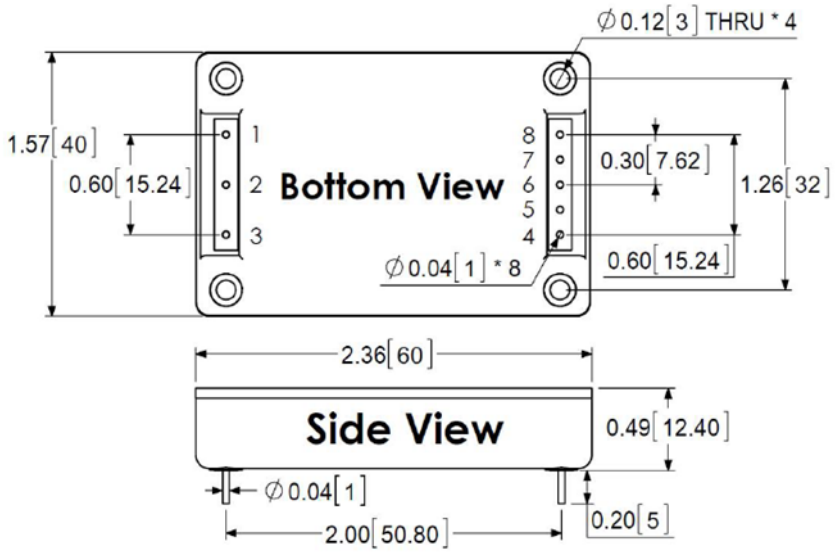
Parameter	Notes and Conditions	Min.	Typ.	Max.	Unit
Switching frequency	V_{NOM}	--	220	--	kHz
Storage temperature range	All models	-60	--	125	C
Operating case temperature	All models	-45	--	105	m
Over temperature protection	All models, Auto. Recovery	--	110	--	C
Isolation Voltage Input to Output Input to 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	Aluminium				

Standards Compliance

Parameter	Standard	Test conditions	Performance criteria
Environmental Compliance	Reach; RoHS	--	Pass
EMI	EN55032	--	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 EN55032 Class A and Class B standard with external components.
The information and specifications contained in this data sheet are believed to be correct at time of publication. All specifications are subject to change without notice. No rights under any patent accompany the sale of any such products or information contained herein.

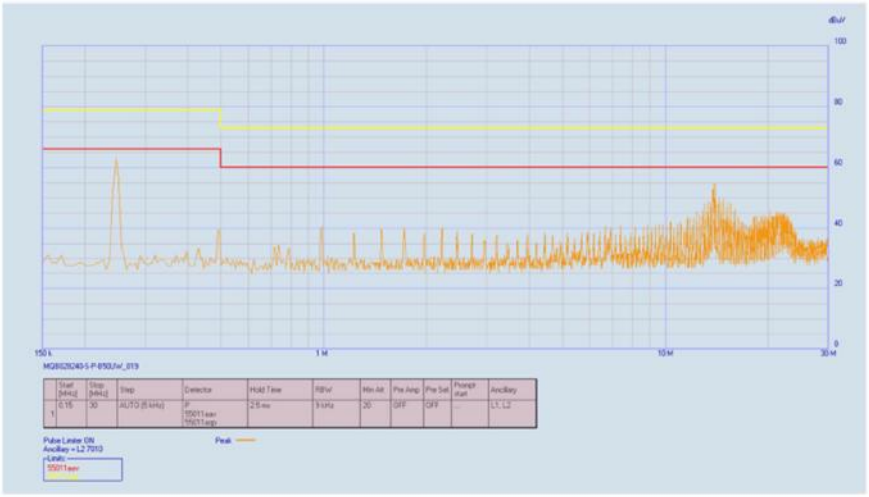
Conducted EMI



Pin#	Single	Dual
1	-Vin	-Vin
2	Enable	Enable
3	+Vin	+Vin
4	+Vout	+Vout
5	TrNA	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



Characteristic curves

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

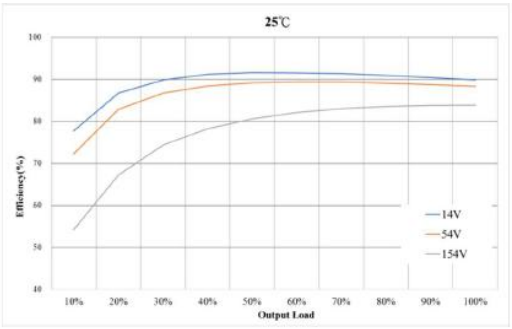


Figure 1 : Efficiency at Minimum, Nominal and Maximum Input Voltages VS. Output Load.

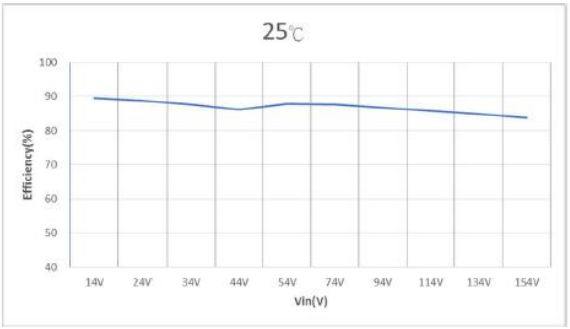


Figure 2 : Efficiency VS. Input Voltages at 100% rated power

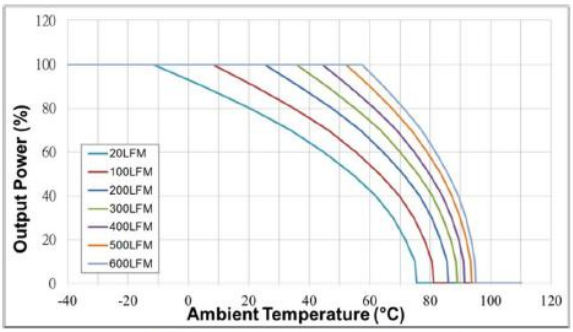


Figure 3 : Ambient Temperature VS. Output Power Derating Curves(Note: 20LFM = Free Air)

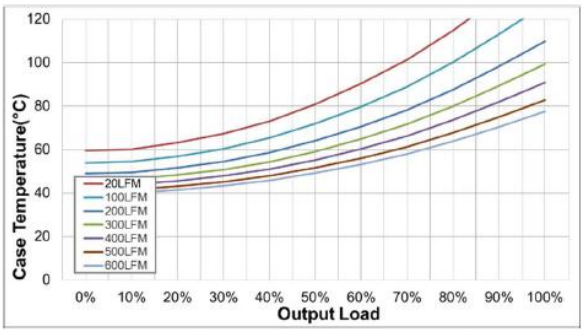


Figure 4 : Case Temperature VS. Output rated Power (Note: 20LFM = Free Air)

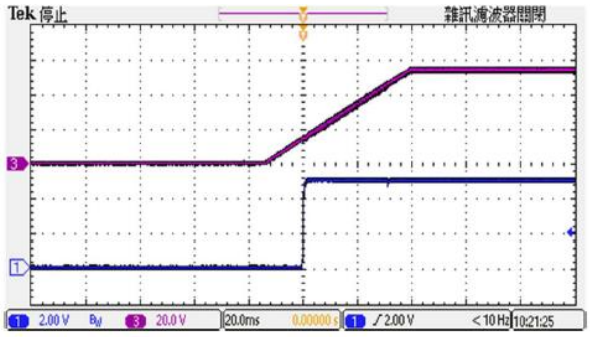


Figure 5 : CH1 = Vout, CH3 = Nominal Input Typical Start-up waveform at Full load.

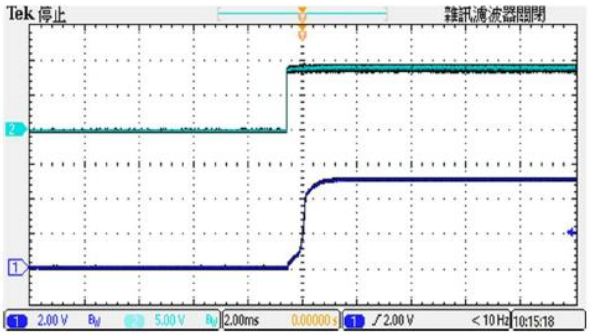


Figure 6 : CH1 = Vout, CH3 = Enable Pin Typical Start-up waveform. Input voltage pre-applied

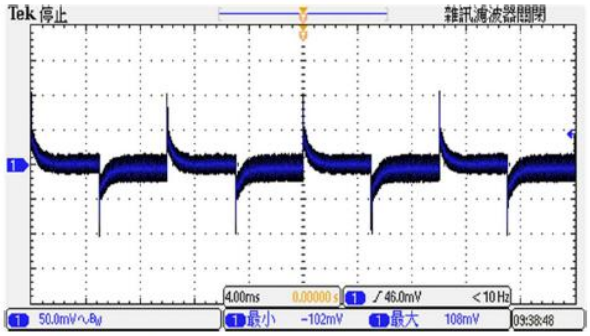


Figure 7 : Transient Response at Output step load (Vin: Typical ,50~75% of output current; Δlo/Δt =1A/μS)

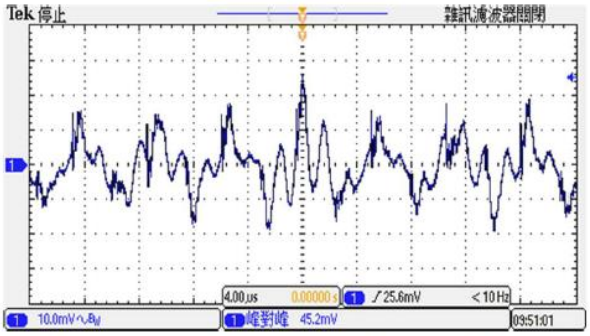


Figure 8 : Output Voltage Ripple & Noise at full load. (Vin: Typical, With Output Capacitor to add 1uF MLCC)

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.

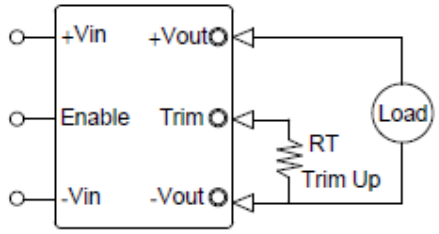


Figure 1. Trim Connections To increase Output Voltages Using Fixed Resistors

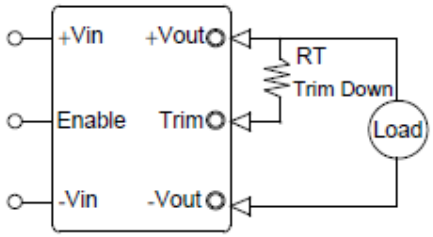


Figure 2. Trim Connections To Decrease Output Voltages Using Fixed Resistors

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.

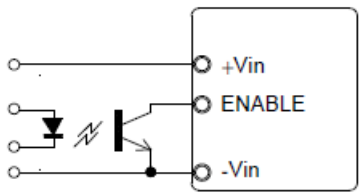


Figure 3. Driving the Enable Control pin

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 load and layout conditions. See Figure 4

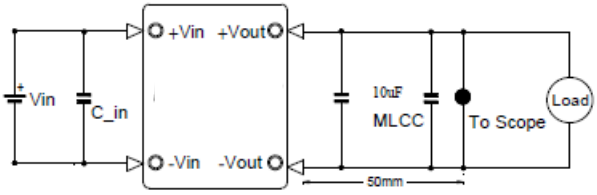


Figure 4. Measuring Output Ripple/Noise(20MHz bandwidth)