

### Applications

- Telecommunications
- Data communications
- Wireless communications
- Servers, workstations

### Benefits

- High efficiency – no heat sink required

### Description

The QME48T20120 converter of the QME-Series provides outstanding thermal performance in high temperature environments. This performance is accomplished through the use of patented/patent-pending circuits, packaging, and processing techniques to achieve ultra-high efficiency, excellent thermal management, and a low-body profile.

The low-body profile and the preclusion of heat sinks minimize impedance to system airflow, thus enhancing cooling for both upstream and downstream devices. The use of 100% automation for assembly, coupled with advanced electronic circuits and thermal design, results in a product with extremely high reliability.

Operating from a 36-75 V input, the QME-Series converters provide outputs that can be trimmed from –20% to +10% of the nominal output voltage, thus providing outstanding design flexibility.

### Features

- RoHS lead free solder and lead-solder-exempted products are available
- Delivers up to 20 A
- Industry-standard quarter-brick pinout
- On-board input differential LC-filter
- Startup into pre-biased load
- No minimum load required
- Dimensions: 1.45" x 2.30" x 0.482" (36.83 x 58.42 x 12.24 mm)
- Weight: 1.25 oz [35.85 g]
- Meets Basic Insulation requirements of EN60950
- Withstands 100 V input transient for 100 ms
- Fixed-frequency operation
- Fully protected
- Remote output sense
- Fully protected with automatic recovery
- Positive or negative logic ON/OFF option
- Output voltage trim range: +10%/–20% with industry-standard trim equations
- High reliability: MTBF approx. 8.7 million hours, calculated per Telcordia TR-332, Method I Case 1
- UL60950 recognized in US and Canada and DEMKO certified per IEC/EN60950
- Designed to meet Class B conducted emissions per FCC and EN55022 when used with external filter
- All materials meet UL94, V-0 flammability rating

**Electrical Specifications**

Conditions:  $T_A = 25\text{ }^\circ\text{C}$ , Airflow = 300 LFM (1.5 m/s),  $V_{in} = 48\text{ VDC}$ , unless otherwise specified.

Parameter	Notes	Min	Typ	Max	Units
<b>Absolute Maximum Ratings</b>					
Input Voltage	Continuous	0		80	VDC
Operating Ambient Temperature		-40		85	$^\circ\text{C}$
Storage Temperature		-55		125	$^\circ\text{C}$
<b>Isolation Characteristics</b>					
I/O Isolation		2000			VDC
Isolation Capacitance			3		nF
Isolation Resistance		10			M $\Omega$
<b>Feature Characteristics</b>					
Switching Frequency			380		kHz
Output Voltage Trim Range <sup>1</sup>	Industry-std. equations	-20		+10	%
Remote Sense Compensation <sup>1</sup>	Percent of $V_{OUT(NOM)}$			+10	%
Output Overvoltage Protection	Non-latching	117	122	127	%
Overtemperature Shutdown (PCB)	Non-latching		125		$^\circ\text{C}$
Auto-Restart Period	Applies to all protection features		200		ms
Turn-On Time			4		ms
ON/OFF Control (Positive Logic)					
Converter Off (logic low)		-20		0.8	VDC
Converter On (logic high)		2.4		20	VDC
ON/OFF Control (Negative Logic)					
Converter Off (logic high)		2.4		20	VDC
Converter On (logic low)		-20		0.8	VDC

Additional Notes:

<sup>1</sup>  $V_{out}$  can be increased up to 10% via the sense leads or up to 10% via the trim function. However, the total output voltage trim from all sources should not exceed 10% of  $V_{OUT(NOM)}$ , in order to ensure specified operation of overvoltage protection circuitry.

<sup>2</sup> Operating ambient temperature range of  $-40\text{ }^\circ\text{C}$  to  $85\text{ }^\circ\text{C}$  for converter.

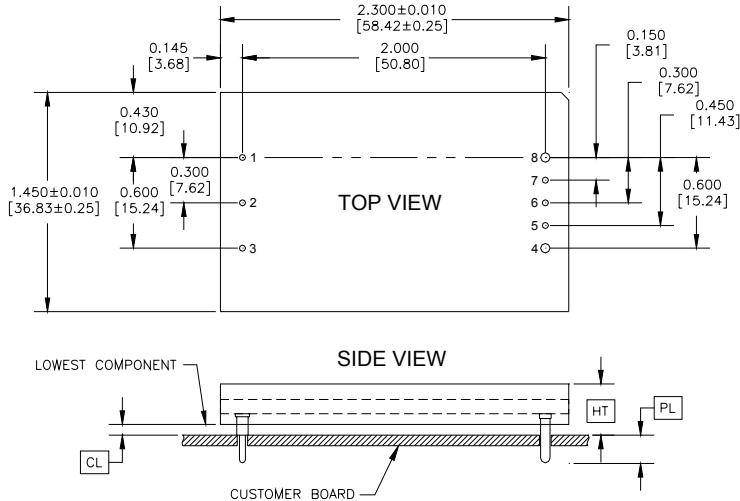
**Electrical Specifications (continued)**

Conditions:  $T_A = 25\text{ }^\circ\text{C}$ , Airflow = 300 LFM (1.5 m/s),  $V_{in} = 48\text{ VDC}$ , unless otherwise specified.

Parameter	Notes	Min	Typ	Max	Units
<b>Input Characteristics</b>					
Operating Input Voltage Range		36	48	75	VDC
Input Under Voltage Lockout	Non-latching				
Turn-on Threshold		33	34	35	VDC
Turn-off Threshold		31	32	33	VDC
Input Voltage Transient	100 ms			100	VDC
Maximum Input Current	20 ADC, 12 VDC Out @ 36 VDC In			7.5	ADC
Input Stand-by Current	$V_{in} = 48\text{ V}$ , converter disabled		3		mADC
Input No Load Current (0 load on the output)	$V_{in} = 48\text{ V}$ , converter enabled		69		mADC
Input Reflected-Ripple Current	25 MHz bandwidth		20		mA <sub>PK-PK</sub>
Input Voltage Ripple Rejection	120 Hz		65		dB
<b>Output Characteristics</b>					
Output Voltage Set Point (no load)		11.88	12.00	12.12	VDC
Output Regulation					
Over Line			±4	±10	mV
Over Load			±4	±10	mV
Output Voltage Range	Over line, load and temperature <sup>2</sup>	11.76		12.24	VDC
Output Ripple and Noise – 25 MHz bandwidth	Full load + 10 $\mu\text{F}$ tantalum + 1 $\mu\text{F}$ ceramic		60	120	mV <sub>PK-PK</sub>
External Load Capacitance	Plus full load (resistive)			2,200	$\mu\text{F}$
Output Current Range		0		20	ADC
Current Limit Inception	Non-latching	22	24	26.6	ADC
Peak Short-Circuit Current	Non-latching, Short = 10 m $\Omega$		50		A
RMS Short-Circuit Current	Non-latching		5		Arms
<b>Dynamic Response</b>					
Load Change 50%-75%-50%, $di/dt = 0.1\text{ A}/\mu\text{s}$	$C_o = 1\text{ }\mu\text{F}$ ceramic		50		mV
$di/dt = 5\text{ A}/\mu\text{s}$	$C_o = 470\text{ }\mu\text{F}$ POS + 1 $\mu\text{F}$ ceramic		120		mV
Settling Time to 1%			30		$\mu\text{s}$
<b>Efficiency</b>					
100% Load			93		%
50% Load			94		%

**Physical Information**

**Standard Model (special features suffix -0)**



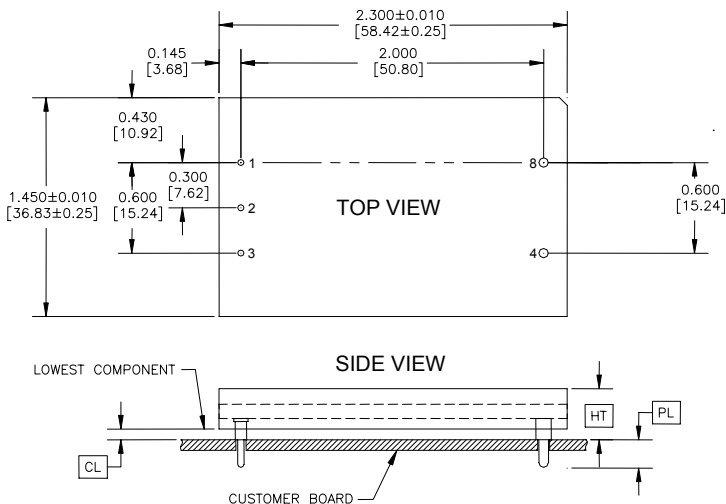
Pad/Pin Connections	
Pad/Pin #	Function
1	Vin (+)
2	ON/OFF
3	Vin (-)
4	Vout (-)
5	SENSE(-)
6	TRIM
7	SENSE(+)
8	Vout (+)

Height Option	HT	CL
	(Max. Height)	(Min. Clearance)
	+0.000 [+0.00] -0.038 [- 0.97]	+0.016 [+0.41] -0.000 [- 0.00]
G	0.482 [12.24]	0.035 [0.89]

- All dimensions are in inches [mm]
- Pins 1-3 and 5-7 are  $\varnothing$  0.040" [1.02] with  $\varnothing$  0.078" [1.98] shoulder
- Pins 4 and 8 are  $\varnothing$  0.062" [1.57] without shoulder
- Pin Material & Finish: Brass Alloy 360 with Matte Tin over Nickel

Pin Option	PL
	Pin Length
	$\pm$ 0.005 [ $\pm$ 0.13]
A	0.188 [4.78]
B	0.145 [3.68]

**Optional Model (special features suffix -T)**



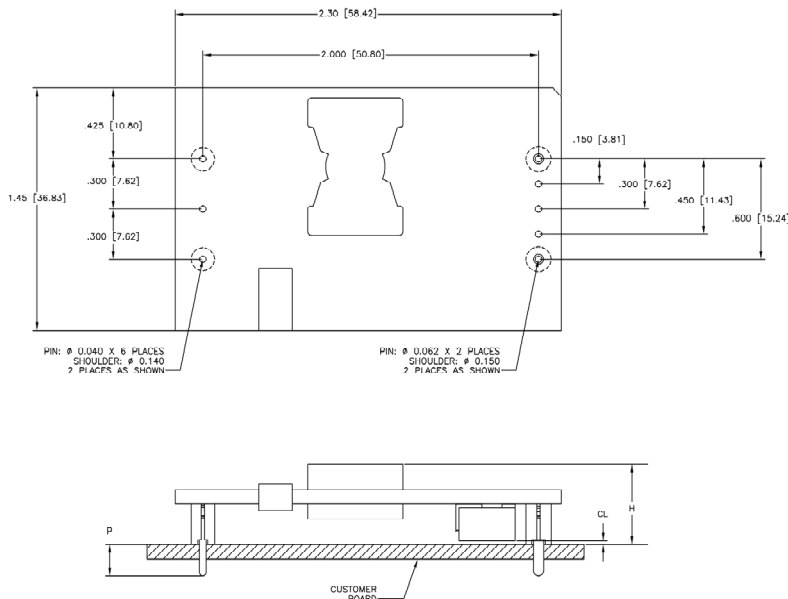
Pad/Pin Connections	
Pad/Pin #	Function
1	Vin (+)
2	ON/OFF
3	Vin (-)
4	Vout (-)
8	Vout (+)

Height Option	HT	CL
	(Max. Height)	(Min. Clearance)
	+0.000 [+0.00] -0.038 [- 0.97]	+0.016 [+0.41] -0.000 [- 0.00]
G	0.482 [12.24]	0.035 [0.89]

- All dimensions are in inches [mm]
- Pins 1-3 are  $\varnothing$  0.040" [1.02] with  $\varnothing$  0.078" [1.98] shoulder
- Pins 4 and 8 are  $\varnothing$  0.062" [1.57] with  $\varnothing$  0.096" [2.44] shoulder
- Pin Material: Pins 1-3 Brass Alloy 360, Pins 4 and 8 – Copper Alloy CDA 145
- Pin Finish - Matte Tin over Nickel

Pin Option	PL
	Pin Length
	$\pm$ 0.005 [ $\pm$ 0.13]
A	0.188 [4.78]

**Optional Model (special features suffix -W)**



Pad/Pin Connections	
Pad/Pin #	Function
1	Vin (+)
2	ON/OFF
3	Vin (-)
4	Vout (-)
5	SENSE(-)
6	TRIM
7	SENSE(+)
8	Vout (+)

Height Option	HT	CL
	(Max. Height)	(Min. Clearance)
	+0.000 [+0.00] -0.038 [- 0.97]	+0.016 [+0.41] -0.000 [- 0.00]
G	0.482 [12.24]	0.035 [0.89]

Pin Option	PL
	Pin Length
	±0.005 [±0.13]
A	0.188 [4.78]
B	0.145 [3.68]

- All dimensions are in inches [mm]
- Pins 1-3 and 5-7 are Ø 0.040" [1.02] without shoulder
- Pins 4 and 8 are Ø 0.062" [1.57] without shoulder
- Pin Material & Finish: Brass Alloy 360 with Matte Tin over Nickel

**Converter Part Numbering/Ordering Information**

Product Series	Input Voltage	Mounting Scheme	Rated Load Current	Output Voltage	ON/OFF Logic	Maximum Height [HT]	Pin Length [PL]	Special Features	Environmental	
QME	48	T	20	120	-	N	G	B	x	y
Quarter-Brick Format	36-75 V	T ⇒ Through-hole	20 A	120 ⇒ 12 V	N ⇒ Negative P ⇒ Positive	G ⇒ 0.482"	A ⇒ 0.188" B ⇒ 0.145"	0 ⇒ Standard  T ⇒ No sense and trim pins (pins 5-7), pins 4 and 8 are Ø 0.062" with Ø 0.096" shoulder  W ⇒ Straight 0.040" and 0.062" pins with Ø 0.140" and Ø 0.150" plastic standoffs	No Suffix Character ⇒ RoHS lead-solder-exempt compliant  G ⇒ RoHS compliant for all six substances	

**Example:** QME48T20120-NGB0: 36-75 V input, through-hole mounting, 20 A @ 12 V output, negative ON/OFF logic, a maximum height of 0.482", a through the board pin length of 0.145", and RoHS lead-solder-exempt compliant. Please consult factory for the complete list of available options.

**Attention:** Special features option "T" is only available with the 0.188" pin length

**Notes:**

1. NUCLEAR AND MEDICAL APPLICATIONS - Power-One products are not designed, intended for use in, or authorized for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems without the express written consent of the respective divisional president of Power-One, Inc.
2. TECHNICAL REVISIONS - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.