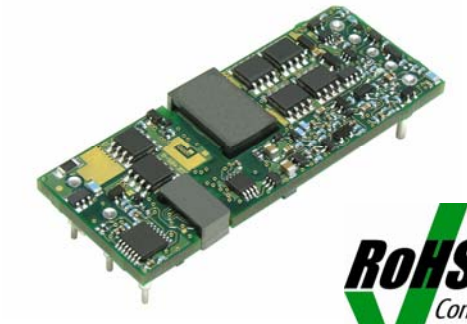


Applications

- Telecommunications
- Data communications
- Wireless communications
- Servers

Benefits

- High efficiency – no heat sink required
- Higher current capability at elevated temperatures than most competitors' 20 A quarter-bricks
- Extremely small footprint: 0.896” x 2.30” (2.06 in^2), 38% smaller than conventional quarter-bricks

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
- Start-up into pre-biased load
- No minimum load required
- Weight: 0.72 oz [20.6 g]
- Meets Basic Insulation requirements of EN60950
- Withstands 100 V input transient for 100 ms
- Fixed-frequency operation
- Fully protected
- Latching and non-latching protection available
- Positive or negative logic ON/OFF option
- Remote output sense
- Output voltage trim range: +10%/−20% with industry-standard trim equations
- High reliability: MTBF = 13.19 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

Description

The new high temperature SQE48-Series of dc-dc converter provides a high efficiency single output in a physical package that is only 62% the size of the industry-standard quarter-brick. Specifically designed for operation in systems that have limited airflow and increased ambient temperatures, the SQE48-Series of converters utilizes the same pinout and functionality of the industry-standard quarter-bricks.

The SQE48-Series of converters provides thermal performance in high temperature environments that exceeds most competitors' 20 A quarter-bricks. 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.

Low-body profile and the preclusion of heat sinks minimize airflow shadowing, thus enhancing cooling for 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.

The SQE48T20050 operates over an input voltage range of 36 to 75 VDC, and provides an output current up to 20 A with a standard output voltage of 5.0 VDC. The output can be trimmed from –20% to +10% of the nominal output voltage, thus providing outstanding design flexibility.

With standard pinout and trim equations, the SQE48 converters are perfect drop-in replacements for the competing quarter-brick designs. Inclusion of this converter in new designs can result in significant board space and cost savings. The designer can expect reliability improvement over other available converters because of the SQE48-Series’ optimized thermal efficiency.

Electrical Specifications

Conditions: T_A = 25 ºC, Airflow=300 LFM (1.5 m/s), Vin = 48 VDC, unless otherwise specified.

Parameter	Notes	Min	Typ	Max	Units
Absolute Maximum Ratings					
Input Voltage	Continuous	0		80	VDC
Operating Ambient Temperature		-40		85	°C
Storage Temperature		-55		125	°C
Input Characteristics					
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
Isolation Characteristics					
I/O Isolation		2250			VDC
	See note *	1500			VDC
Isolation Capacitance			190		pF
	See note *		1200		pF
Isolation Resistance		10			MΩ
Feature Characteristics					
Switching Frequency			460		kHz
Output Voltage Trim Range[1]	Industry-std. equations	-20		+10	%
Remote Sense Compensation[1]	Percent of V_{OUT}(NOM)			+10	%
Output Overvoltage Protection	Latching or Non-latching	117	122	127	%
	Non-latching*	120	125	130	%
Overtemperature Shutdown (PCB)	Non-latching		125		°C
Peak Back-drive Output Current (Sinking current from external source) during startup into pre-biased output	Peak amplitude		1		ADC
	Peak duration		50		µs
Back-drive Output Current (Sinking Current from external source)	Converter Off; external voltage 5 VDC		10	30	mADC
Auto-Restart Period (For non-latching option)	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:

1. Vout 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.

* For models with the special feature “K”.

Electrical Specifications (continued)

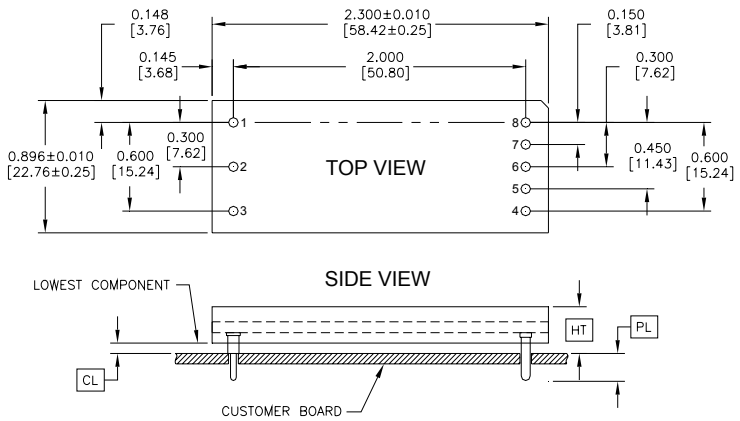
Conditions: T_A = 2 5ºC, Airflow = 300 LFM (1.5 m/s), Vin = 48 VDC, unless otherwise specified.

Parameter	Notes	Min	Typ	Max	Units
Input Characteristics					
Maximum Input Current	20 ADC, 5.0 VDC Out @ 36 VDC In			3.1	ADC
Input Stand-by Current	Vin = 48 V, converter disabled		2		mADC
Input No Load Current (0 load on the output)	Vin = 48 V, converter enabled		40		mADC
Input Reflected-Ripple Current	20 MHz bandwidth		8		mA_{PK-PK}
Input Voltage Ripple Rejection	120Hz		75		dB
Output Characteristics					
Output Voltage Set Point (no load)		4.950	5.000	5.050	VDC
Output Regulation					
Over Line			±2	±5	mV
Over Load			±2	±5	mV
Output Voltage Range	Over line, load and temperature [2]	4.925		5.075	VDC
Output Ripple and Noise - 20MHz bandwidth	Full load + 10 µF tantalum + 1 µF ceramic		50	100	mV_{PK-PK}
External Load Capacitance	Plus full load (resistive)			10,000	µF
Output Current Range		0		20	ADC
Current Limit Inception	Non-latching	22	25	29	ADC
Peak Short-Circuit Current	For non-latching option, Short = 10 mΩ		25		A
RMS Short-Circuit Current	For non-latching option		4	8	Arms
Dynamic Response					
Load Change 50%-100%-50%, di/dt = 0.1 A/µs	Co = 1 µF ceramic		40		mV
di/dt = 5 A/µs	Co = 470 µF POS + 1 µF ceramic		180		mV
Settling Time to 1%			20		µs
Load Change 50%-75%-50%, di/dt = 2.5 A/µs	Co = 2x100 µF TA + 1 µF ceramic		100*		mV
Efficiency					
100% Load			91		%
50% Load			92.5		%

Additional Notes: [2]. -40 ºC to 85 ºC.

* For models with the special feature “K”.

Physical Information (For standard and latching option)



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

SQE48T Pinout (Through-hole)

Height Option	HT (Max. Height)	CL (Min. Clearance)
	+0.000 [+0.00] -0.038 [- 0.97]	+0.016 [+0.41] -0.000 [- 0.00]
G	0.407 [10.34]	0.035 [0.89]

Pin Option	PL Pin Length
	±0.005 [±0.13]
A	0.188 [4.77]
B	0.145 [3.68]

SQE48T Platform Notes

- All dimensions are in inches [mm]
- Pins 1-3 and 5-7 are Ø 0.040" [1.02] with Ø 0.078" [1.98] shoulder
- Pins 4 and 8 are Ø 0.062" [1.57] without shoulder
- Pin Material: Brass Alloy 360
- Pin Finish: Matte Tin over Nickel
- Converter Weight: 0.72 oz [20.6 g]

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	RoHS
SQE	**48**	**T**	**20**	**050**	**-**	**N**	**G**	**B**	**0**	**G**
One-Eighth Brick Format	36-75 V	T⇒ Through-hole	20 A	050 ⇒ 5.0 V		N ⇒ Negative P ⇒ Positive	Through hole G ⇒ 0.407"	Through hole A ⇒ 0.188" B ⇒ 0.145"	0 ⇒ STD (Non-Latching) L ⇒ Latching Option	No Suffix ⇒ RoHS lead-solder-exemption compliant G ⇒ RoHS compliant for all six substances

The example above describes P/N SQE48T20050-NGB0G: 36-75 V input, through-hole mounting, 20 A @ 5.0 V output, negative ON/OFF logic, a maximum height of 0.407", and a through the board pin length of 0.145", standard (non-latching), and RoHS compliant. Please consult factory for the complete list of available options.