75 WATT QCM CHASSIS MOUNT DC/DC CONVERTERS

Features

- Chassis Mount design for excellent thermal performance
- Fast over voltage protection
- Pulse-by-pulse current limiting, dead short current limiting
- Over-temperature protection
- Auto-softstart
- Very Low noise
- Constant frequency for normal operation
- Output trim with very low temperature coefficient
- Remote Sense
- Remote ON/OFF
- Super energy saving, 6 mA input idle current
- Good shock and vibration damping
- Optional Din Mount
- 5 Year Warranty

Description

The 75 Watt single QCM series of DC/DC Converters provide precisely regulated dc outputs. All outputs are fully isolated from the inputs, allowing the output to be used with positive or negative polarity and various grounding options.

The QCM Series meets the most rigorous requirements in a ruggedized chassis mount enclosure with recessed barrier strips for added protection. Standard features include remote sensing, output trim, and remote on/off. Integrated terminal blocks allow for easy connectivity. An optional DIN Rail Adapter is available for DIN Rail Mounting the QCM. See Selection Chart for ordering information.

Selection Chart

Model	Input Range VDC		Iin ADC	Vout VDC	Iout ADC
	Min	Max	TYP		
24S3.20QCM	18	36	3.31	3.3	20
24S5.15QCM	18	36	3.63	5	15
24S12.6QCM	18	36	3.59	12	6.25
24S15.5QCM	18	36	3.55	15	5
24S24.3QCM	18	36	3.55	24	3.13
48S24.3QCM	36	75	1.76	24	3.13

To order with optional DIN Rail Mount specify part number followed by -DIN. i.e. 24S5.15QCM-DIN.

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Unless otherwise stated, these specifications apply for baseplate temperature TB=23±2ºC, nominal input voltage, and rated full load. (1)

Input Parameters							
Model		**24S3.20QCM**	**24S5.15QCM**	**24S12.6QCM**	**24S15.5QCM**	**24S24.3QCM**	**Units**
Voltage Range	MIN TYP MAX			18 24 36			VDC
Input Overvoltage (100 ms)	MAX			50			VDC
Input Ripple Rejection (120Hz)	TYP			60			dB
Undervoltage Lockout				Yes			
Input Reverse Voltage Protection				Yes			
Input Current No Load 100% Load	TYP TYP	50 3.3	50 3.6	50 3.6	50 3.6	50 3.6	mA A
Inrush Current	MAX			0.2			A^2s
Reflected Ripple, 12µH Source Impedance (3)	TYP			10			mA P-P
Efficiency	TYP	79	85	86	87	87	%
Switching Frequency	TYP			360			kHz
Recommended Fuse				(2)			A

Input Parameters			
Model		**48S24.3QCM**	**Units**
Voltage Range	MIN TYP MAX	36 48 75	VDC
Input Overvoltage (100 mSec)	MAX	85	VDC
Input Ripple Rejection (120Hz)	TYP	60	dB
Undervoltage Lockout		Yes	
Input Reverse Voltage Protection		Yes	
Input Current No Load 100% Load	TYP TYP	80 1.8	mA A
Inrush Current	MAX	0.2	A^2s
Reflected Ripple, 12µH Source Impedance (3)	TYP	10	mA P-P
Efficiency	TYP	87	%
Switching Frequency	TYP	360	kHz
Recommended Fuse		(2)	A

* Absolute Maximum Ratings. Caution: Stresses in excess of the Absolute Maximum Ratings can cause permanent damage to the device (see Note 1.)

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Output Parameters							
Model		**24S3.20QCM**	**24S5.15QCM**	**24S12.6QCM**	**24S15.5QCM**	**24S24.3QCM 48S24.3QCM**	**Units**
Output Voltage		3.3	5	12	15	24	V
Output Voltage Setpoint Accuracy	MAX	±1					%
Turn On Overshoot Min-Max Load	TYP	0					%
Temperature Coefficient	TYP MAX	0.005 0.01	0.003 0.005	0.003 0.005	0.003 0.005	0.003 0.005	%/ºC
Noise (8)	TYP	20	20	40	50	70	mV P-P
Ripple	TYP	30	30	75	100	150	mV RMS
Load Current (4)	MIN MAX	1 20	0.75 15	0.32 6.25	0.25 5	0.16 3.13	A
Load Transient Overshoot (7)	TYP	2					%
Load Transient Recovery Time (6)	TYP	0.8					µs
Load Regulation (5) Min-Max Load	TYP MAX	0.05 0.5					%
Line Regulation Vin = Min-Max	TYP MAX	0.02 0.5					%
Overvoltage Protection (OVP) Threshhold OVP Type - Non-latching Open Loop Overvoltage Clamp	MIN MAX	115 135					%
Output Current Limit Vout = 90% of Vout-nom	TYP	120					%
Output Short Circuit Current Vout = 0.1V	TYP	160					%

Notes:

(1) Refer to the CALEX Application Notes for the definition of terms, measurement circuits, and other information.

(2) Refer to the CALEX Application Notes for information on fusing. For inrush current, refer to the specifications above.

(3) 33 µF capacitor connected between the two “Input” terminals. Then insert current sensor in series with 12 µH inductor between 33 µF and the source. The reflected ripple current is measured over a 5 Hz to 20 MHz bandwidth (current sensor is located between the converter input terminal and the 12 µH inductor).

(4) Optimum performance is obtained when this power supply is operated within the minimum to maximum load specifications. No damage to the module will occur when the output is operated at less than minimum load, but the output voltage may contain a low frequency component that may exceed output noise specifications.
At no load the converter output voltage will fall out of regulation, typically rising to the OVP limit. A load current between 0.5% to 1% of maximum rated load will usually suffice to bring the output voltage within regulation.

(5) Load regulation is defined as the output voltage change when changing load current from a maximum to minimum. The voltage is measured at the output terminal.

(6) Load Transient Recovery Time is defined as the time for the output to settle from a 50% to 75% or 25% step load change to a 1% error band of output voltage (rise time of step = 2 µs).

(7) Load Transient Overshoot is defined as the peak overshoot during a transient as defined in the Note 6 above.

(8) Noise is measured per the CALEX Application Notes. Output noise is measured with a 10 µF tantalum capacitor in parallel with a 0.1 µF ceramic capacitor connected across the output terminals. Measurement bandwidth is 0-20 MHz.

(9) When an external ON/OFF switch is used, such as open collector switch, logic high requires the switch to be high-impedance. Switch leakage currents greater than 10µA may be sufficient to trigger the ON/OFF to the logic-low state.

(10) Most switches would be suitable for the logic ON/OFF control. In case there is a problem you can make the following estimations and then leave some margin.
When open collector is used for logic high, “Open Circuit Voltage at ON/OFF Terminal”, “Output Resistance” and “External Leakage Current Allowed for Logic High” are used to estimate the high impedance requirement of open collector.
When switch is used for logic low, “Open Circuit Voltage at ON/OFF Terminal”, “Output Resistance” and “LOW Logic Level” are used to estimate the low impedance requirement of the switch.

(11) The case thermal impedance is specified as the case temperature rise over ambient per package watt dissipated.

(12) Specifications subject to change without notice.

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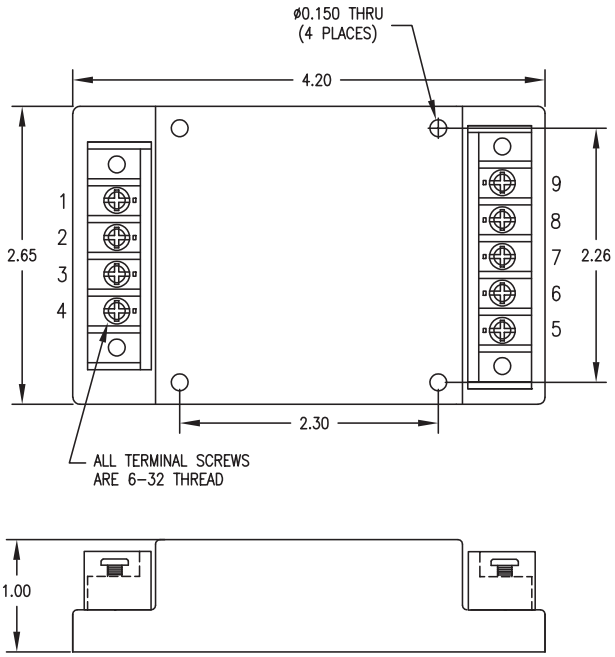
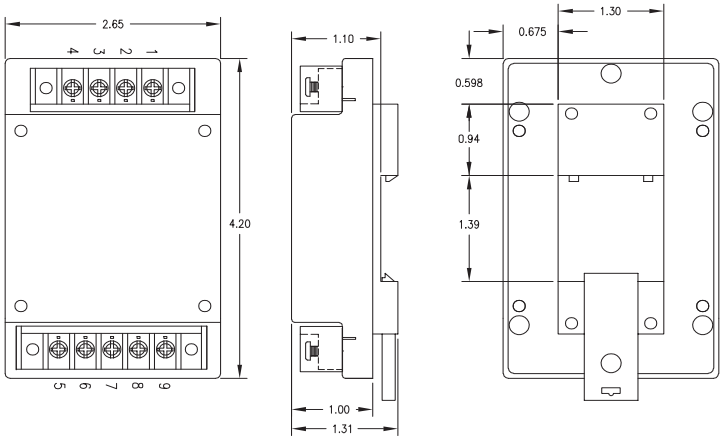
General Specifications			
All Models			**Units**
Remote ON/OFF Function			
HIGH Logic Level or Leave ON/OFF Pin Open	MIN	3.0	VDC
External Leakage Current Allowed for Logic High (9)	MAX	20	µA
Input Diode Protection Voltage	MAX	50	VDC
LOW Logic Level or Tie ON/OFF Pin to -INPUT	MAX	0.8	VDC
Sinking Current for Logic Low	MAX	2	mA
Open Circuit Voltage at Primary ON/OFF Pin (10)	TYP	5.6	VDC
Idle Current (Module is OFF)	TYP	6	mADC
Turn-on Time to 1% error	TYP	8	ms
Output Voltage Trim			
Trim Range	MIN MAX	±10	% of Vout
Input Resistance 3.3V	TYP	5	kΩ
Input Resistance All other voltages	TYP	10	kΩ
Open Circuit Voltage 3.3V	TYP	1.22	V
Open Circuit Voltage All other voltages	TYP	2.5	V
Output Voltage Remote Sensing			
Maximum Voltage Drops on Leads	MAX	0.5	VDC
Line Regulation under remote sensing	TYP MAX	0.02 0.5	%
Load Regulation under remote sensing	TYP MAX	0.05 0.5	%
Sense and Trim Limit			
Maximum Output Voltage	MAX	110	% of Vout
Isolation			
Input to Output Isolation 10µA Leakage Vnom = 24 V models Vnom = 48 V models	 MAX MAX	 700 1544	 VDC VDC
Environmental			
Calculated MTBF, Bellcore Method 1, Case 1	>1,000,000		h
Baseplate Operating Temperature Range	MIN MAX	-40 100	ºC
Storage Temperature	MIN MAX	-40 120	ºC
Thermal Impedance (11)	TYP	3.7	ºC/W
Thermal Shutdown Case Temperature (Auto Restart)	MIN TYP	100 110	ºC
General			
Case Dimension		2.65" x 4.20" x 1.00"	
Unit Weight		0.09 Kg	
Agency Approvals - Designed to Meet		UL/CUL 60950	



Pin	Name
1	+INPUT
2	ON/OFF
3	N/C
4	-INPUT
5	-OUTPUT
6	-SENSE
7	TRIM
8	+SENSE
9	+OUTPUT

TOLERANCE: ALL DIMENSIONS ARE TYPICAL IN INCHES UNLESS OTHERWISE NOTED:	
X.XX	±0.020
X.XXX	±0.005



Optional Din Mount