

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		lin 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±2°C, 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	18					VDC	
	TYP	24						
	MAX	36						
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	TYP	50	50	50	50	50	mA A
	100% Load	TYP	3.3	3.6	3.6	3.6	3.6	
Inrush Current	MAX	0.2					A ² s	
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	36					VDC	
	TYP	48						
	MAX	75						
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	TYP	80					mA A
	100% Load	TYP	1.8					
Inrush Current	MAX	0.2					A ² s	
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	%/°C
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) Threshold 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					%

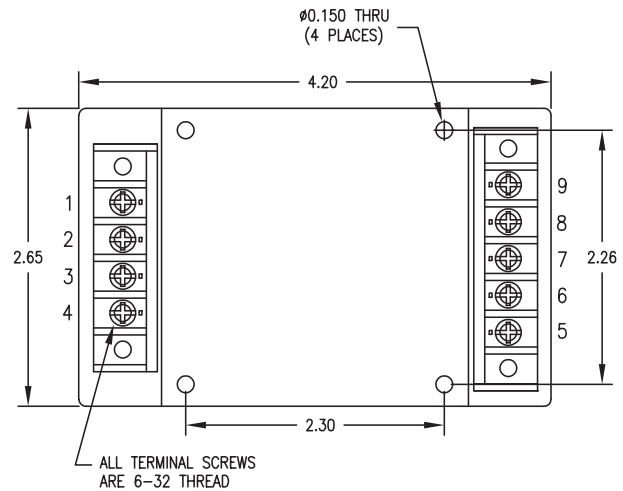
Notes:

- (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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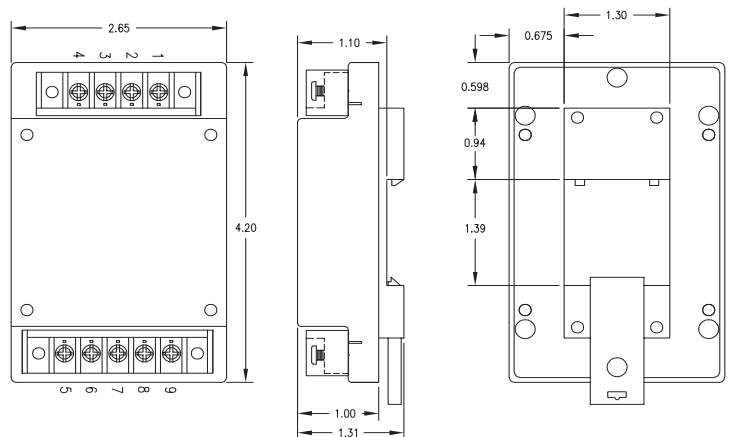


General Specifications			
All Models			Units
Remote ON/OFF Function			
HIGH Logic Level or Leave ON/OFF Pin Open	MIN	3.0	VDC
External Leakage Current Allowed for Logic High (9)	MAX	20	μA
Input Diode Protection Voltage	MAX	50	VDC
LOW Logic Level or Tie ON/OFF Pin to -INPUT	MAX	0.8	VDC
Sinking Current 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	MAX	700	VDC
Vnom = 48 V models	MAX	1544	VDC
Environmental			
Calculated MTBF, Bellcore Method 1, Case 1	>1,000,000		h
Baseplate Operating Temperature Range	MIN MAX	-40 100	°C
Storage Temperature	MIN MAX	-40 120	°C
Thermal Impedance (11)	TYP	3.7	°C/W
Thermal Shutdown Case Temperature (Auto Restart)	MIN TYP	100 110	°C
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

