Powerstax

Q0301 Series

300W Single Output Quarter Brick DC/DC Converters - 1

- STANDARD "QUARTER BRICK" PACKAGE
- POWER DENSITY UP TO 14.4W/CM³ (235W/IN³)
- EFFICIENCIES FROM 90-92%
- 24VDC OR 48VDC INPUT
- 2:1 INPUT VOLTAGE RANGE
- REMOTE ON/OFF
- OPEN-FRAME & ENCLOSED OPTIONS

1
4

CE RoHS

Q0301 SERIES-DC/DC

POWER SUPPLY DESIGN EXCELLENCE

The Q0301 series provides up to 300W/60A outputs in an industry standard quarter brick package; either open-frame or fully enclosed.

The efficient SR stage is combined with a patented "Buck Reset" topology that reduces power loss to achieve 14.4W/cm³ or 235W/in³ power density.

The multi-layer single side circuit board design plus the patented baseplate technology enhances thermal performance and improves reliability.

Q0301 series is designed for Industrial, Telecom, Servers, Networking and other applications that use a 24V or 48V input bus.

STANDARD MODEL [1]	INPUT VOLTAGE (RANGE)	INPUT CURRENT [2]	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT POWER	TYPICAL EFFICIENCY
Q0301-024-0033-c-xy	24V (18-36V)	12.2A	3.3V	60.0A	198W	90%
Q0301-024-0050-c-xy		18.3A	5.0V	60.0A	300W	91%
Q0301-024-0070-c-xy		17.1A	7.0V	40.0A	280W	91%
Q0301-024-0120-c-xy		18.1A	12.0V	25.0A	300W	92%
Q0301-048-0033-c-xy	48V (36-75V)	6.1A	3.3V	60.0A	198W	90%
Q0301-048-0050-c-xy		9.2A	5.0V	60.0A	300W	91%
Q0301-048-0070-c-xy		8.5A	7.0V	40.0A	280W	91%
Q0301-048-0120-c-xy		9.1A	12.0V	25.0A	300W	92%

Notes:
1. See 'model number configuration guide' to specify parameters c, x & y.
2. Based on typical efficiency at minimum input voltage.

OTHER HIGH DENSITY DC-DC
Full Brick to 850W
Half Brick to 600W
Eighth Brick to 132W
Sixteenth Brick to 50W

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INPUT SPECIFICATIONS	24V Input	48V Input
Input Voltage & Current	see model table	
Input Voltage Limit	-0.5V to +40V	-0.5V to +80V
Input Current (standby)	off: <6mA, latched: <8mA	
Vin (on) (input rising)	17-18V	34-36V
Vin (off) (input falling)	15.6V-16.6V	31.2-33.2V
Surge Withstand (100mS)	50V	100V
Reflected Ripple Current	30mA rms/100mA pk-pk (LEXT = 10µH)	
Input Capacitance	33.0uF Max.	12.0uF Max.

OUTPUT SPECIFICATIONS	
Voltage Set-point (typical)	±1.0% Vout nom. (at full load)
Voltage Tolerance Band	±4.0% Vout nom. (all line, load & temperature conditions)
Line Regulation	>0.3% Vout nom. (Vin minimum to Vin maximum)
Load Regulation	>0.3% Vout nom. (2% to 100% load)
Efficiency	see model table
Temperature Coefficient	±0.03%/°C (-40°C to 100°C)
Transient Response	±6.0% Vout/500µA (50-75% load step at 2.5A/µS)
Start-Up Delay Time	20mS-250mS (Full Load)
Input Ripple Rejection	-50dB (<1KHz)
Current Limit	108-125%
Ripple & Noise (20MHz)	3% pk-pk, 1% rms
Overvoltage Protection	115-130% Vout
Trim Range	±10% Vout nom. (10% Full Load)

GENERAL & ENVIRONMENTAL SPECIFICATIONS	
Temperature Range	-40°C to +110°C operating, -55°C to +125°C storage
Overtemperature Protection	110°C(Tc) ±5°C (Internal)
Cooling	Baseplate or Baseplate/Heatsink Combination
Switching Frequency	330kHz
Safety Standards	UL/EN/IEC60950-1 2nd Ed. (UL Pending)
Isolation Voltage	2000VACrms (input/output, reinforced insulation) 1000VACrms (input/baseplate, basic insulation) 1000VACrms (output/baseplate, operational insulation)
Baseplate Material	Aluminium
Weight	Open-Frame 43g with 1mm baseplate, Enclosed 105g with 3mm baseplate
MTBF	2,960,000 hours @ 25°C (Belcore TR332 issue 6)

CONTROL SPECIFICATIONS	
Remote Control Voltage	Logic HI - +3.0 to +6.5V, Logic LO - 0 to +1.0V
Remote Control Current	-0.5 to +1.5mA
Voltage Limit	-0.5 to +12V

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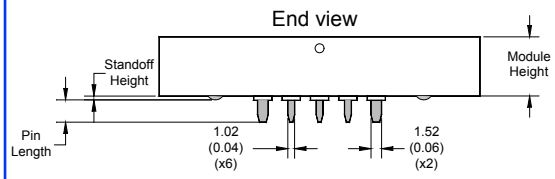
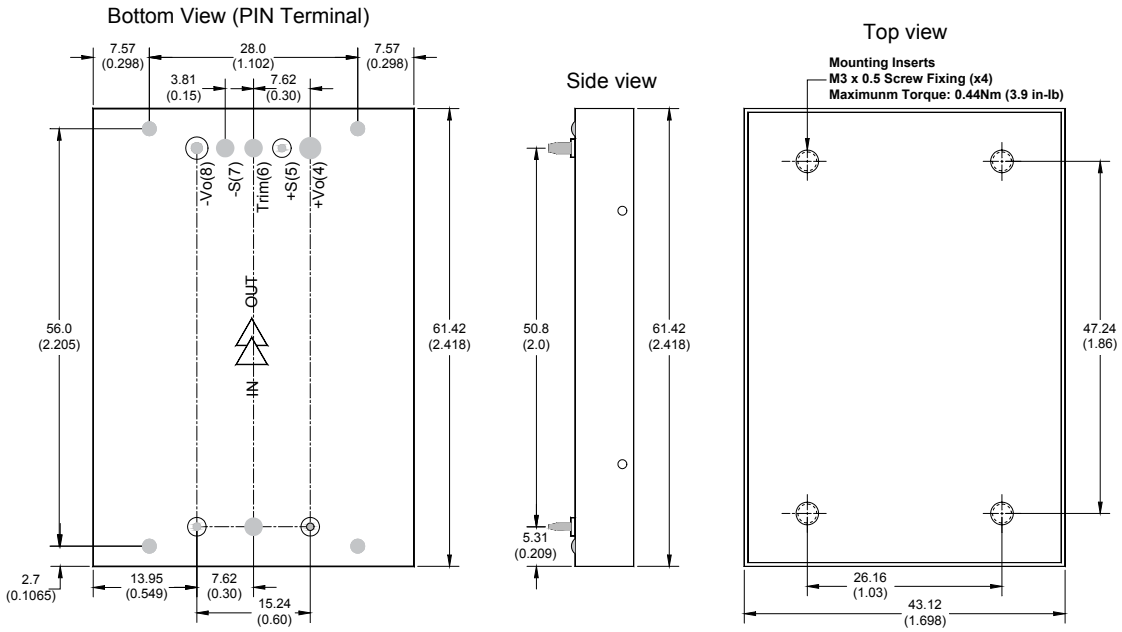
MECHANICALS - ENCLOSED



Overall Height =
Module Height + Standoff Height
See table of page 5 for specific module heights.



PIN DESIGNATIONS		
Pin	Designation	Function
1	-IN	Input -Ve
2	ON/OFF	Remote ON/OFF
3	+IN	Input +Ve
4	+Vo	Output +Ve
5	+S	Remote Sense +Ve
6	Trim	Output Voltage Trim
7	-S	Remote Sense -Ve
8	-Vo	Output -Ve

Dimensions:	mm (inches)
Tolerances:	x.x±0.5 (x.xx±0.02)
	0.x±0.25 (x.xxx±0.01)
Weight:	Enclosed - 105g, 3mm baseplate
	Open-Frame - 43g, 1mm baseplate
Base plate:	Anodised Aluminium Alloy
Mounting inserts:	Stainless Steel
Maximum torque:	0.44Nm (3.9 in-lb)
Pin material:	Copper Alloy or Brass
Pin plating:	Gold over Nickel

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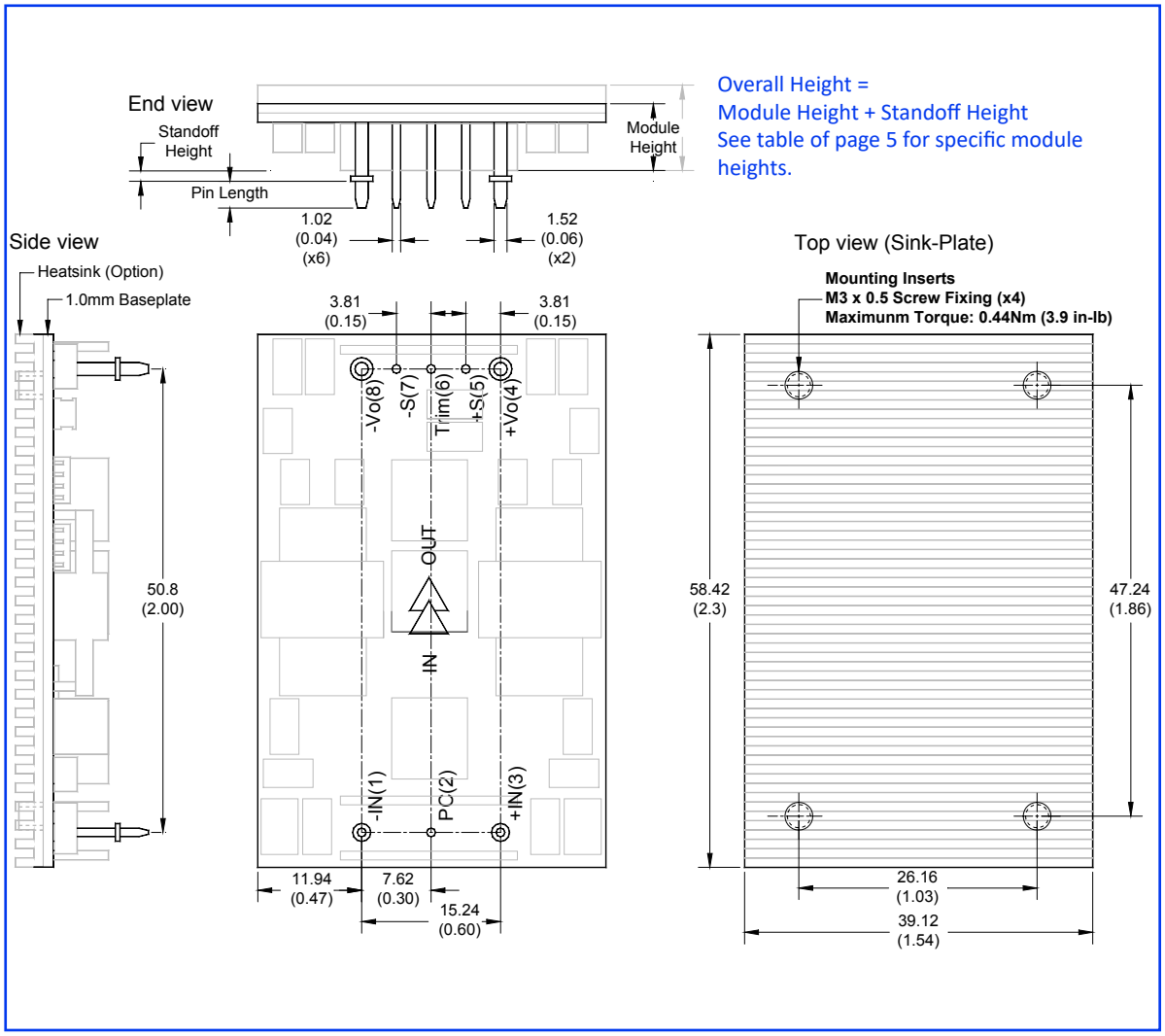
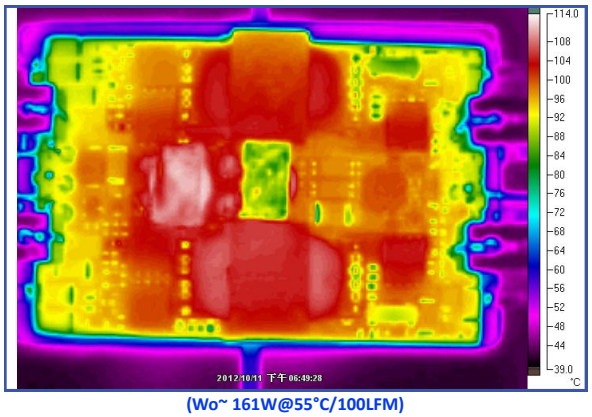
MECHANICALS - OPEN-FRAME

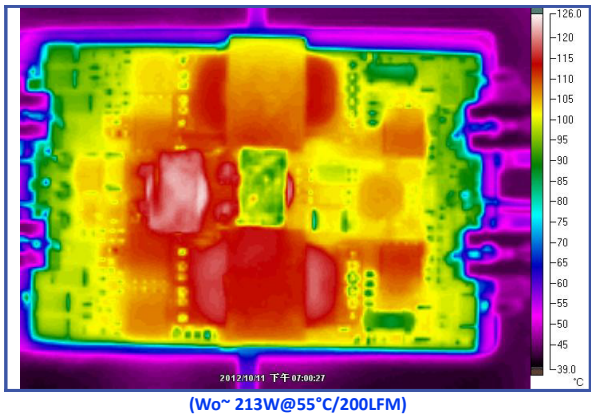


TYPICAL THERMAL PLOTS

OEPN-FRAME FORMAT



(Wo~ 161W@55°C/100LFM)



(Wo~ 213W@55°C/200LFM)

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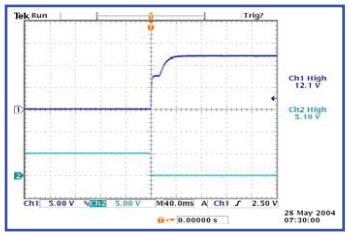
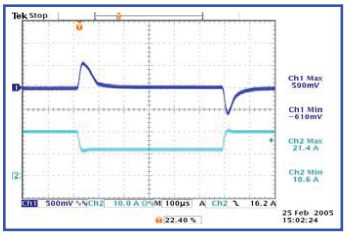
TYPICAL WAVEFORMS & CURVES

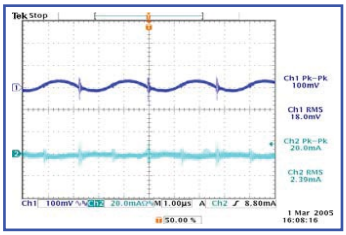
12V OUTPUT UNIT



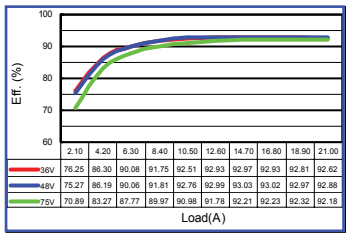
Start-up Waveform



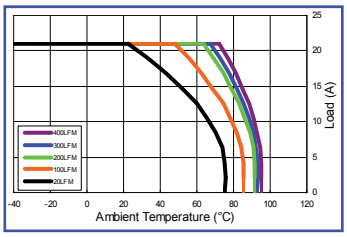
Transient Response



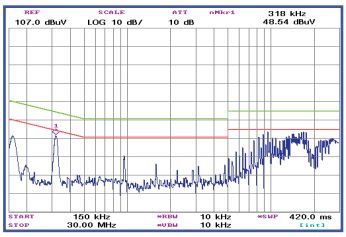
Input & Output Ripple



Efficiency



Derating



EMI

Q0301 SERIES-DC/DC

MODEL NUMBER CONFIGURATION GUIDE

Q0301-iii-oooo-c-xy

- **Series Name (Q= ¼ Brick)**
- **Power Output (W/10)**
- **Number of Outputs**
- **Pin/Standoff/Heatsink (see below)**
- **Remote ON/OFF Polarity (see below)**
- **Output Voltage (see model table)**
- **Input Voltage (see model table)**

REMOTE ON/OFF POLARITY	
Positive	Negative
H	L

Select desired remote on/off polarity and insert in position **c**.

PIN LENGTH / STANDOFF HEIGHT				
mm (inches)		Standoff Height		
		0.51 (0.02)	2.03 (0.08)	4.06 (0.16)
Pin Length	3.05 (0.12)	A	C	D
	4.06 (0.16)	E	G	H
	5.08 (0.20)	J	L	M
	6.10 (0.24)	N	Q	R

Note: 2.03 & 4.06 standoff height options are only available on the Open-Frame format.

Select required Pin Length & Standoff Height combination and insert in position **x**.

FORMAT		MODULE HEIGHT
Open-Frame 1mm Baseplate	A	8.64 (0.34)
Open-Frame 3mm Baseplate	B	10.67 (0.42)
Open-Frame 3mm Baseplate	C	12.7 (0.50)
Open-Frame 3mm Heatsink	D	10.67 (0.42)
Open-Frame 5mm Heatsink	E	12.7 (0.50)
Enclosed 3mm Baseplate	G	12.19 (0.48)
Enclosed 5mm Baseplate	H	14.22 (0.56)

Select desired format and insert in position **y**.

Example: **Q0301-024-0120-H-AE** is 24Vdc input with 12Vdc output, positive polarity, remote on/off, 3.05mm pin length, 0.51mm standoff height and open-frame format with 5mm heat-sink.

All specifications are typical at nominal line input, full load and 25°C unless otherwise stated.

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