0RQB-C5U15x Series

Isolated DC-DC Converter

The 0RQB-C5U15x is an isolated DC/DC converter that operates from a wide input range (18 VDC - 75 VDC) and can cover both 24 VDC and 48 VDC input range. This unit will provide up to 120 W of output power. This unit is designed to be highly efficient and low cost.

Features include remote on/off, over current protection, over voltage shut down, over temperature protection and under voltage lockout. This converter is provided in an industry standard 1/4 brick package.

RoHS Compliant

Key Features & Benefits

- 18 VDC - 75 VDC Input
- 15 VDC / 8 A Output
- Isolated
- Over Temperature Protection
- Fixed Frequency (260 kHz)
- SCP/OCP
- High Efficiency
- Low Cost
- High Power Density
- Remote On/Off
- Input Under-Voltage Lockout
- Basic Isolation
- Output Over-Voltage Shutdown
- Positive/Negative Remote Sense
- Output Voltage Trim
- UL60950-1,2nd version, Recognized

1. MODEL SELECTION

OUTPUT VOLTAGE	INPUT VOLTAGE	MAX. OUTPUT CURRENT	MAX. OUTPUT POWER	TYPICAL EFFICIENCY	MODEL NUMBER ACTIVE LOW	MODEL NUMBER ACTIVE HIGH
15 VDC	18 - 75 VDC	8 A	120 W	93%	0RQB-C5U15L	0RQB-C5U150

NOTE: 1. Add "G" suffix at the end of the model number to indicate Tray Packaging.
2. All part numbers above indicate RoHS 6. .

PART NUMBER EXPLANATION

0	R	QB	-	C5	U	15	x	G
Mounting Type	RoHS Status	Series Name		Output Power	Input Range	Output Voltage	Active Logic	Package
Through hole mount	RoHS	1/4th Brick		120W	18 – 75 V	15 V	0-Active high L-Active Low	G-Tray package

2. ABSOLUTE MAXIMUM RATINGS

PARAMETER	DESCRIPTION	MIN	TYP	MAX	UNITS
Input Voltage		-0.3	-	80	V
Remote On/Off		-0.3	-	18	V
I/O Isolation Voltage		-	-	1500	V
Ambient Temperature		-40	-	85	°C
Storage Temperature		-55	-	125	°C

3. INPUT SPECIFICATIONS

PARAMETER	DESCRIPTION	MIN	TYP	MAX	UNIT
Input Voltage	Operating	18	24/48	75	V
Input Current (full load)	Vin=18 V	-	-	7.8	A
	Vin=75 V	-	-	1.9	
Input Current (no load)		-	100	130	mA
Remote Off Input Current		-	30	45	mA
Input Reflected Ripple Current (pk-pk)	With simulated source impedance of 10 µH, 5 Hz to 20 MHz; Use a 1µF/100V ceramic capacitor and a 100µF/100V electrolytic capacitor with ESR=1 ohm max, at 200KHz@25°C.	-	40	60	mA
Input Reflected Ripple Current (rms)		-	10	15	mA
I^2t Inrush Current Transient		-	0.1	0.5	A^2s
Turn-on Voltage Threshold		16.5	17.0	17.5	V
Turn-off Voltage Threshold		15.5	16.0	16.5	V

NOTE: All specifications are typical at 25 °C unless otherwise stated.

4. OUTPUT SPECIFICATIONS

PARAMETER	DESCRIPTION	MIN	TYP	MAX	UNIT
Output Voltage Set Point	Vin=48 V, Io=50% load	14.7	15.0	15.3	V
Line Regulation		-	±15	±30	mV
Load Regulation		-	±15	±30	mV
Regulation Over Temperature (-40 ℃ – 85 ℃)		-	±30	±60	mV
Output Current Range		0	-	8	A
Output Ripple and Noise (pk-pk)	0 - 20 MHz BW, with 1 µF ceramic load capacitor and a 10 µF tantalum capacitor at output	-	120	180	mV
Output Ripple and Noise (rms)		-	40	60	mV
Output DC Current Limit		9	-	14	A
Short Circuit Surge Transient		-	3	5	A^2s
Turn on Time		-	50	70	ms
Overshoot at Turn on		-	0	3	%
Output Capacitance		0	-	680	µF
TRANSIENT RESPONSE					
ΔV 25% ~ 50% of Max Load — Overshoot	di/dt=0.1A/µs, Vin=48VDC, Ta=25°C, with a 1µF ceramic capacitor and a 10µF Tantalum cap at output. V_0=15 V	-	400	600	mV
ΔV 25% ~ 50% of Max Load — Settling Time		-	200	300	µs
ΔV 50% ~ 25% of Max Load — Overshoot		-	400	600	mV
ΔV 50% ~ 25% of Max Load — Settling Time		-	200	300	µs

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

5. GENERAL SPECIFICATIONS

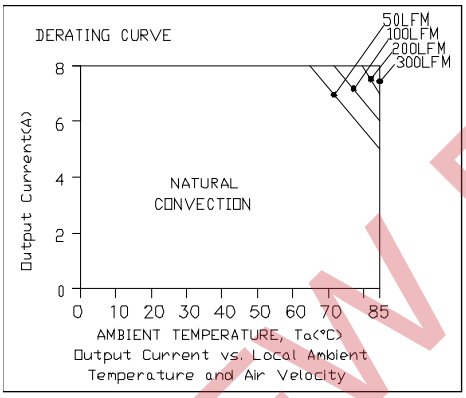
PARAMETER	DESCRIPTION	MIN	TYP	MAX	UNIT
Efficiency		91	93	-	%
Switching Frequency		240	260	280	kHz
Output voltage trim range	The total voltage increased by trim and remote sense should not exceed 15%Vo.	90	-	110	%
Remote Sense Compensation		-	-	10	%
MTBF	Calculated Per Bell Core SR-332 (Vin=48V, Vo=12V, Io=9.6A, Ta = 25 °C, FIT=10^9/MTBF)		TBD		-
Over Temperature Protection		-	125	-	°C
Over Voltage Protection (Static)	Vin=48 V, full load. Hiccup mode	-	18	-	V
ISOLATION CHARACTERISTICS					
Isolation Capacitance		-	1500	-	pF
Weight		-	TBD	-	
Dimensions (L × W ×H)			2.30 x 1.45 x 0.500 58.42 x 36.83 x 12.69		Inch mm

NOTE: All specifications are typical at 25 °C unless otherwise stated.

6. REMOVE ON/OFF

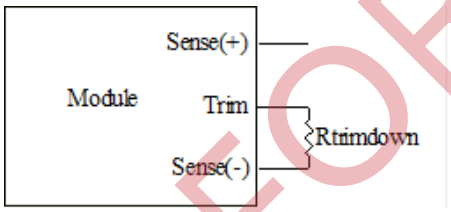
PARAMETER		DESCRIPTION	MIN	TYP	MAX	UNIT
REMOTE ON/OFF						
Signal Low (Unit On)	Active Low	0RQB-C5U12L.	-0.3	-	0.8	V
Signal High (Unit Off)		The remote on/off pin open, Unit off.	2.4	-	18	
Signal Low (Unit Off)	Active High	0RQB-C5U120.	-0.3	-	0.8	V
Signal High (Unit On)		The remote on/off pin open, Unit on.	2.4	-	18	
Current Sink		-	0	-	1	mA

7. THERMAL DERATING CURVES

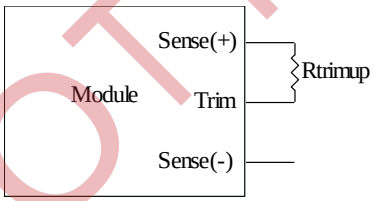


8. OUTPUT TRIM EQUATIONS

Equations for calculating the trim resistor are shown below. The Trim Down resistor should be connected between the Trim pin and GND pin. The Trim Up resistor should be connected between the Trim pin and the Vout. Only one of the resistors should be used for any given application.



$$Rtrimdown = \frac{511}{|delta|} - 10.22[k\Omega]$$

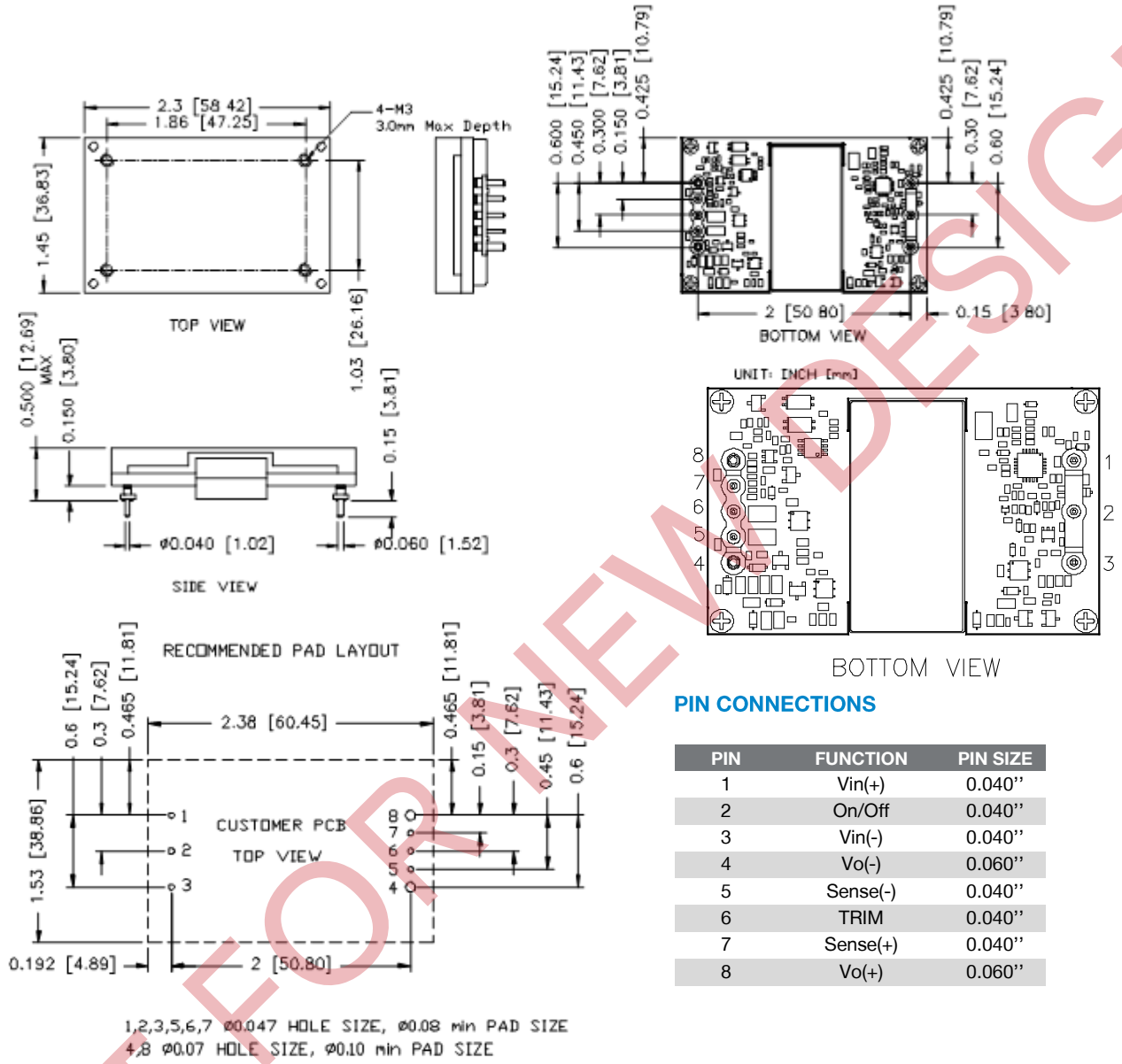


$$Rtrimup = \frac{(100 + delta) \cdot Vo \cdot 5.11 - 626}{1.225 \cdot delta} - 10.22[k\Omega]$$

NOTES: Vo_req=Desired(trimmed) output voltage[V]
Output voltage Vo=15.000V

$$delta = \frac{(Vo\_req - Vo)}{Vo} \times 100[\%]$$

9. MECHANICAL OUTLINE



PIN CONNECTIONS

PIN	FUNCTION	PIN SIZE
1	Vin(+)	0.040''
2	On/Off	0.040''
3	Vin(-)	0.040''
4	Vo(-)	0.060''
5	Sense(-)	0.040''
6	TRIM	0.040''
7	Sense(+)	0.040''
8	Vo(+)	0.060''

NOTE: This module is recommended and compatible with Pb-Free Wave Soldering and must be soldered using a peak solder temperature of no more than 260 °C for less than 5 seconds.

NOTE:

1) All Pins: Material - Copper Alloy;
Finish – 3 micro inches minimum Gold over 50 micro inches minimum Nickel plate.
2) Undimensioned components are shown for visual reference only.
3) All dimensions in inches (mm); Tolerances: x.xx +/-0.02 in. (x.x +/-0.5mm) x.xxx +/-0.010 in. (x.xx +/-0.25mm).

10. REVISION HISTORY

DATE	REVISION	CHANGES DETAIL	APPROVAL
2008-08-26	PA	First release	JZ Wang

For more information on these products consult: tech.support@psbel.com

NUCLEAR AND MEDICAL APPLICATIONS - Products are not designed or intended for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems.
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.

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