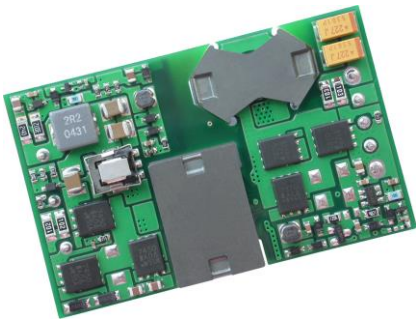


0RQB-C0U12C Series

Isolated DC-DC Converter

The 0RQB-C0U12C is an isolated DC/DC converter that operates from a nominal 48 VDC source. This unit will provide up to 100 W of output power from a nominal 48 VDC input. This unit is designed to be highly efficient and low cost. Typical efficiency at 48 VDC input at full load is 91%. Features include over current protection and under-voltage lockout. These converters are provided in an industry standard quarter brick package.



Key Features & Benefits

- 48 VDC Input
- 12 VDC / 8.35 A Output
- Isolated
- Output Over Voltage Shutdown
- High Efficiency
- OCP/SCP
- High Power Density
- Over Temperature Protection
- Low Cost
- Remote On/Off
- Input Under Voltage Lockout
- Positive/Negative Remote Sense
- Fixed Frequency (285 kHz)
- Input Over Voltage Lockout
- UL60950-1 Recognized (UL/cUL)
- Basic Isolation
- Output Voltage Trim
- Class II, Category 2, Isolated DC/DC Converter (refer to IPC-9592B)

0RQB-C0U12C Series

1. MODEL SELECTION

OUTPUT VOLTAGE	INPUT VOLTAGE	MAX. OUTPUT CURRENT	MAX. OUTPUT POWER	TYPICAL EFFICIENCY	MODEL NUMBER ACTIVE LOW
54 VDC	18 VDC-75 VDC	8.35 A	100W	91%	0RQB-C0U12C

NOTE: 1. Add "G" suffix at the end of the model number to indicate Tray Packaging.
 2. Add "H" suffix at the end of the model number to indicate Tray packaging and RoHS compliant without requiring exemption 7c-III.

PART NUMBER EXPLANATION

0	R	QB	-	C0	U	12	C	G
Through hole mount	RoHS 6	Series Name		Output Power	Input range	Output Voltage	Active Logic	Package
Through Hole	RoHS	1/8 Brick		100 W	18-75 V	12 V	Active Low	G. H-Tray

2. ABSOLUTE MAXIMUM RATINGS

PARAMETER	DESCRIPTION	MIN	TYP	MAX	UNITS
Continuous non-operating Input Voltage	No Operating	-0.5	-	80	V
	Operating	-	-	75	
Remote On/Off		-0.3	-	18	V
I/O Isolation Voltage		-	-	2000	V
Ambient Temperature		-40	-	85	°C
Storage Temperature		-55	-	125	°C

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

3. INPUT SPECIFICATIONS

PARAMETER	DESCRIPTION	MIN	TYP	MAX	UNIT
Input Voltage		18	48	75	V
Input Current (full load)		-	-	7.0	A
Input Current (no load)		-	100	180	mA
Remote Off Input Current		-	20	40	mA
Input Reflected Ripple Current (pk-pk)	Tested with simulated source impedance of 10 μ H, 5 Hz to 20 MHz BW; use a 0.47 μ F/100 V ceramic cap and a 100 μ F/100 V electrolytic cap with ESR = 1 ohm max. at 200 kHz at 25 °C	-	-5	10	mA
Input Reflected Ripple Current (rms)		-	-	15	mA
I ² t Inrush Current Transient		-	0.05	0.1	A ² s
Turn on Voltage Threshold		16.5	17.0	17.5	V
Turn off Voltage Threshold		15.5	16.0	16.5	V
Input Over Voltage Lockout		76	78	80	V

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

4. OUTPUT SPECIFICATIONS

PARAMETER	DESCRIPTION	MIN	TYP	MAX	UNIT
Output Voltage Set Point	Vin=48 V, Io=50% full load	11.82	12.00	12.18	V
Line Regulation		-	±24	±120	mV
Load Regulation		-	±30	±80	mV
Regulation Over Temperature		-	±60	±100	mV
Output Current Range		0	-	8.35	A
Current Limit Threshold		9.2	10.5	13	A
Vin=48 V, Ripple and Noise (pk-pk)		-	30	50	mV
Vin=24 V, Ripple and Noise (rms)	0-20 MHz BW, with a 1 µF ceramic capacitor and a 10 µF Tantalum capacitor at the output.	-	25	40	mV
Vin=48 V, Ripple and Noise (pk-pk)		-	100	150	mV
Vin=24 V, Ripple and Noise (rms)		-	75	120	mV
Overshoot at Turn on		-	0	5	%
Turn on Time		10	-	100	ms
Output Capacitance		0	-	1200	µF
TRANSIENT RESPONSE					
ΔV 50% ~ 75% of Max Load	Overshoot	-	360	480	mV
	Settling Time	-	100	250	µs
ΔV 75% ~ 50% of Max Load	Overshoot	-	360	480	mV
	Settling Time	-	150	250	µs

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

5. GENERAL SPECIFICATIONS

PARAMETER	DESCRIPTION	MIN	TYP	MAX	UNIT
Efficiency		88	91	-	%
		-	92	-	%
Output Voltage Trim Range		-	-	2000	V
Switching Frequency		240	285	320	kHz
Over Temperature Protection		-	125	-	°C
MTBF	Calculated Per Bell Core SR-332 (IO = Nominal; Ta = 25 °C)		TBD		-
Over Voltage Protection	Vin=48 V, full load, Hiccup mode	-	130		%V ₀
ISOLATION CHARACTERISTICS					
Isolation Capacitance		-	1500	-	pF
Input to Output Isolation Voltage		-	-	2250	VDC
Dimensions (L × W × H)			2.30 × 1.45 × 0.395		inch
			58.42 × 36.83 × 10.04		mm
Weight		-	40	-	g

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



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6. EFFICIENCY DATA

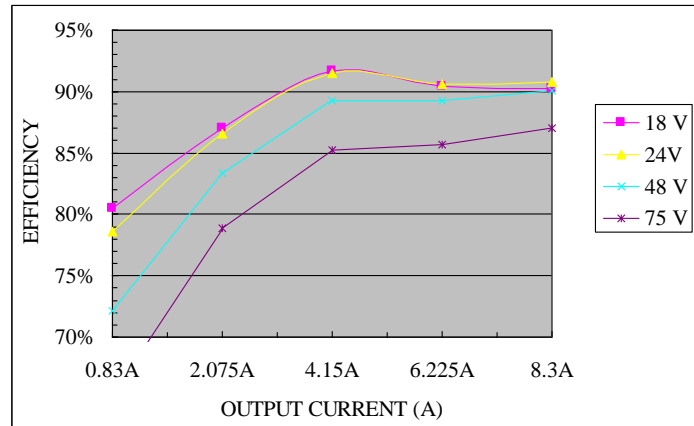


Figure 1. $V_0 = 12V$

7. THERMAL DERATING CURVES

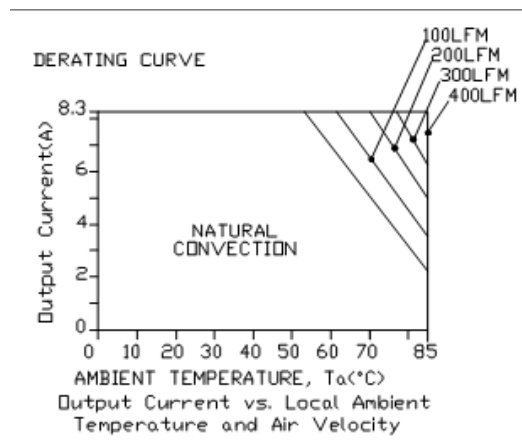
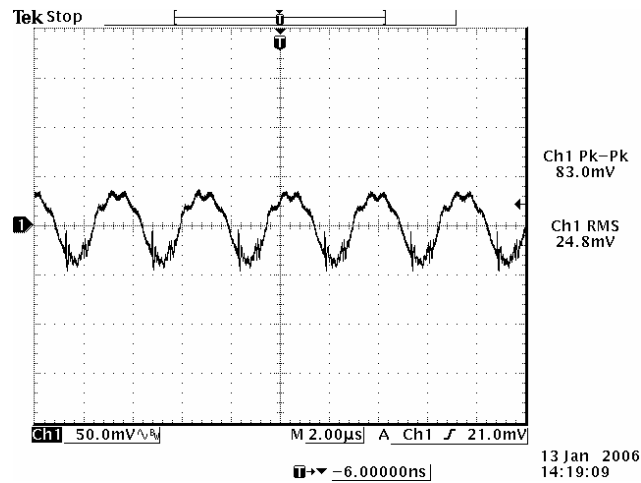


Figure 2. $V_0 = 12V$, $V_{in} = 48V$

8. REMOVE ON/OFF

PARAMETER	DESCRIPTION		MIN	TYP	MAX	UNIT
REMOTE ON/OFF						
Signal Low (Unit On)	Active Low	Remote On/Off pin is open, the module is off.	-0.3	-	0.8	V
Signal High (Unit Off)			2.4	-	15	
Current Sink			0	-	0.75	mA

9. RIPPLE AND NOISE WAVEFORM



NOTE: Ripple and noise at full load, 48 V input, with a 1 μF ceramic capacitor and a 10 μF tantalum capacitor at the output, and Ta=25°C.

10. TRIM

Equations for calculating the trim resistor are shown below (Unit: kΩ). The Trim Down resistor should be connected between the Trim pin and Ground 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.

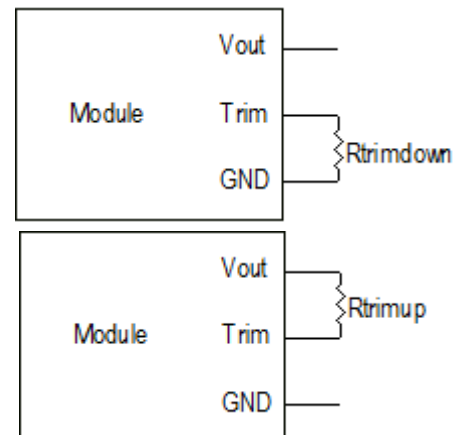
$$R_{trimdown} = \frac{511}{|\Delta|} - 10.22$$

$$R_{trimup} = \frac{(100 + \Delta) \cdot V_o \cdot 5.11 - 626}{1.225 \cdot \Delta} - 10.22$$

NOTES:

$$\Delta = \frac{(V_{o_req} - V_o)}{V_o} \times 100[\%]$$

V_{o_req}=Desired (trimmed) output voltage [V]; V_o=output voltage



11. TRANSIENT RESPONSE WAVEFORMS

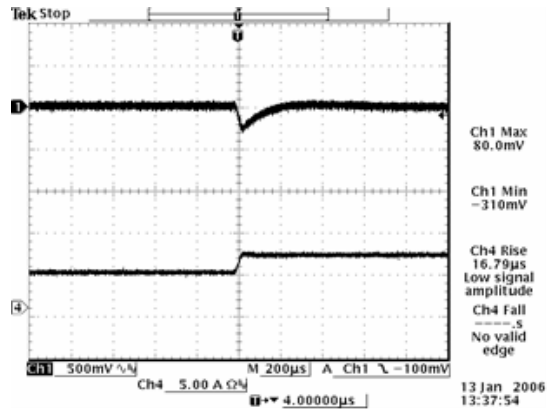


Figure 3. $V_{out}=12\text{ V}$ 50%-75% Load Transients at $V_{in}=48\text{ V}$

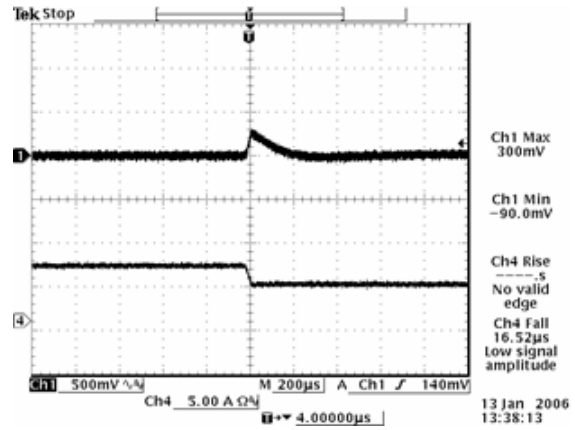
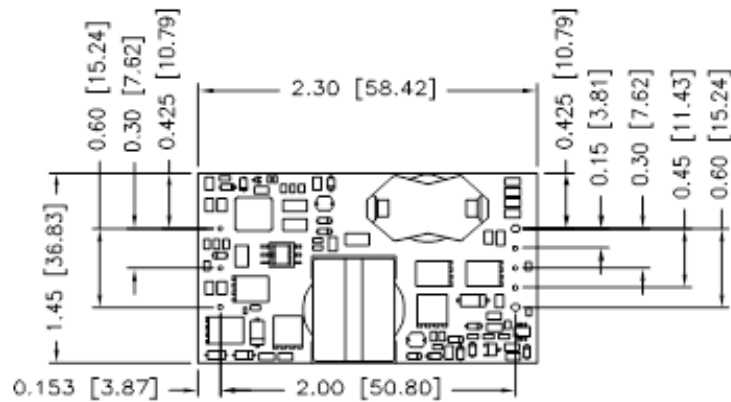


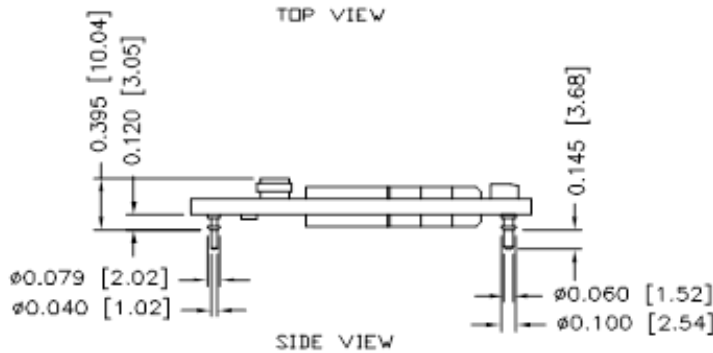
Figure 4. $V_{out}=12\text{ V}$ 75%-50% Load Transients at $V_{in}=48\text{ V}$

NOTE: Transient Response at $V_{in}=48\text{ V}$, $di/dt=0.1\text{ A}/\mu\text{ s}$, $1\mu\text{ F}$ ceramic cap and a $10\mu\text{ F}$ Tantalum capacitor at the output, $T_a=25^\circ\text{ C}$.

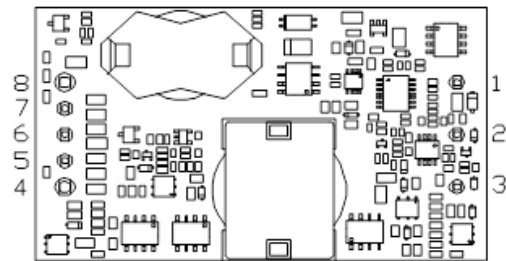
12. MECHANICAL OUTLINE



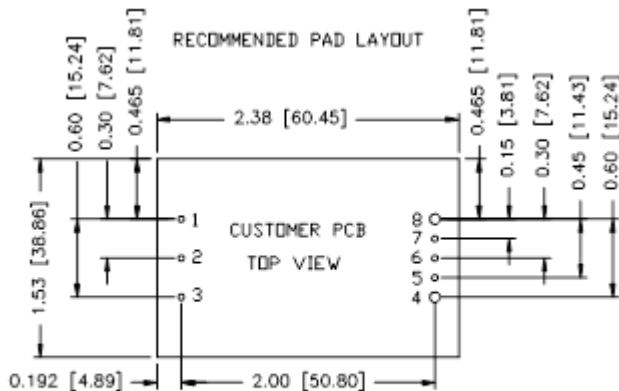
BOTTOM VIEW



SIDE VIEW



BOTTOM VIEW



1,2,3,5,6,7 Ø0.047 HOLE SIZE, Ø0.08 min PAD SIZE
4,8 Ø0.07 HOLE SIZE, Ø0.10 min PAD SIZE

PIN CONNECTIONS

PIN	FUNCTION	PIN SIZE
1	Vin (+)	0.04"
2	Remote On/Off	0.04"
3	Vin (-)	0.04"
4	Vout (-)	0.062"
5	Remote Sense (-)	0.04"
6	Trim	0.04"
7	Remote Sense (+)	0.04"
8	Vout (+)	0.062"

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 - Tin plated

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).

13. REVISION HISTORY

DATE	REVISION	CHANGES DETAIL	APPROVAL
2014-01-27	PA	First release	Han (Y)
2012-07-05	B	Adding the 7C-III compliance suffix statement.	HL

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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