SRXA-60TD10

Isolated DC-DC Converter

The SRXA-60TD10 is isolated dc/dc converter that operates from a nominal 48 Vdc source. This unit will provide up to 60 W of output power from a nominal 48 Vdc input. This unit is designed to be highly efficient and low cost.

Features include remote on/off, over current protection, short circuit protection, input under-voltage lockout, Pre-bias Start Up and SYNC.

This converter is provided in an industry standard package. Target applications include computer, networking and telecommunication industries.

RoHS Compliant

Key Features & Benefits

- 36-72VDC Input
- 4.5V/3.0VDC @ 10A Output
- Isolated
- Fixed Frequency (300 kHz)
- High Efficiency
- High Power Density
- Low Cost
- Pre-Bias Start Up
- Input Under Voltage Lockout
- SYNC
- Output Over-voltage shut down
- Over Temperature Protection
- Remote On/Off
- SCP/OCP
- Output Voltage Trim
- Basic Insulation
- TUV certified to EN 60950-1
- UL 60950-1 Recognized

1. MODEL SELECTION

MODEL NUMBER ACTIVE LOW	OUTPUT VOLTAGE	INPUT VOLTAGE	MAX. OUTPUT CURRENT	MAX. OUTPUT POWER	TYPICAL EFFICIENCY
SRXA-60TD10	4.5/3.0 Vdc	36Vdc - 72 Vdc	10 A	60 W	88%

NOTE: Add "G" suffix at the end of the model number to indicate Tray Packaging.

PART NUMBER EXPLANATION

S	R	XA	-	60	T	D1	0	Y
Mounting Type	RoHS Status	Series Name		Output Power	Input Range	Output Voltage	Active Logic	Package Type
Surface mount	RoHS	1/4th Brick		60W	36-72V	4.5/3.0Vdc	0 – Active low	G – Tray package

2. ABSOLUTE MAXIMUM RATINGS

PARAMETER	DESCRIPTION	MIN	TYP	MAX	UNIT
Continuous Input Voltage		-0.3	-	75	v
Remote On/Off		-0.3	-	15	v
Ambient Temperature		-40	-	85	°C
Storage Temperature		-55	-	130	°C

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

3. INPUT SPECIFICATIONS

PARAMETER	DESCRIPTION	MIN	TYP	MAX	UNIT
Input Voltage	Ta min Ta max, Io=0 Io nom	36	48	72	V
Input Current	Vin=36 V Vin=48 V Vin=72 V	0.01 0.01 0.01	1.90 1.45 1.00	4.0 3.2 2.2	A
Turn-on Voltage Threshold		-	-	32	V
Turn-off Voltage Threshold	Nominal output voltages guaranteed for 2mS at 48Vdc, 360uF on input side and maximum capacitive output load	29	-	32	V
Converter [1]Start-up Time	Worst case condition at Ui min and full load	-	-	1	S
Rise Time [1]	Ui nom, Io=Io nom and both outputs are from 10% to 90% with maximum capacitive load	-	-	12	mS
No Load Input Power (300 kHz)	Io=0, Ui min. Ui max (-40 °C-0°C)	-	-	6	W
	Io=0, Ui min. Ui max (0°C-85°C)	-	-	5	W
Input Voltage Transition Rate		-	-	5	V/mS
Inrush Current Transient Rating	Without external capacitance	-	-	0.01	A^2s
Input Fuse (not internally)	Fast-acting fuse rated at least for 125 Vdc	-	-	4 A	A
Reflected Ripple Current	Vin=48V Io=0 Io nom for each output	-	-	60	mApp

Note: Measured with the max admissible capacitive load on both outputs.

4. OUTPUT SPECIFICATIONS

PARAMETER		DESCRIPTION	MIN	TYP	MAX	UNIT
Output Voltage Set Point	V_{O1}=4.5 V V_{O2}=3.0 V	Vin=48 V, Io=8 A on each output	4.45 2.97	- -	4.55 3.03	V
Total Output Voltage Regulation	V_{O1}=4.5 V V_{O2}=3.0 V	Cross regulation, line, load (0--max), temperature	4.35 2.90	- -	4.65 3.10	V
Output Current		The two output current may not reach the max at the same time to ensure the max output power no more than 60 W	0	8	10	A
Output Current Limit	V_{O1}=3.6 V - 5.5 V V_{O2}=2.2 V - 3.75 V	Output voltage 10% lower than minimum nominal value	12 12	- -	15 15	A
Output Over-Votage Protection			115	-	125	%
Short Circuit Protection	Ton Toff	Exceeding the current limit will activate low frequency hiccup mode on both the outputs	- -	- 250	30 -	mS
Ripple and Noise (rms) Ripple and Noise (pk-pk)	V_{O1}=3.6 V - 5.5 V V_{O2}=2.2 V - 3.75 V V_{O1}=3.6 V - 5.5 V V_{O2}=2.2 V - 3.75 V	Vin=72 V, 0 to 20 MHz Bandwidth, with a 10 uF ceramic capacitor at the output	- - - -	- - - -	30 20 120 100	mV
Output Capacitance			100	-	2000	uF
Overshoot at Turn On			-	-	5	%
Transient Response						
50% ~ 100% Max Load	Overshoot	V_{O1}= 3.6 V - 5.5 V V_{O2}= 3.6 V - 5.5 V di/dt=5 A/us, Vin=48 V, with a 470 uF/6.3 V electrolytic capacitor at the output	-	-	200	mV
	Settling Time		-	-	300	uS
100% ~ 50% Max Load	Overshoot		-	-	200	mV
	Settling Time		-	-	300	uS
50% ~ 100% Max Load	Overshoot		-	-	200	mV
	Settling Time		-	-	300	uS
100% ~ 50% Max Load	Overshoot		-	-	200	mV
	Settling Time		-	-	300	uS

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
Input to Each Output Test Voltage	Test duration 1 minute	-	-	1500	V
Input to Baseplate	Test duration 1 minute	-	-	1500	V
Input to Each Output Resistance	Measured with 500 Vdc	-	-	10	Mohm
Input to Output Capacitance		-	-	20	nF
Switching Frequency	Ui min. Ui max, Io=0. Io nom	280	300	320	kHz
Efficiency[1]	Vin=38.4 V - 72 V max load on each output, V1 = 5.2 V, V2 = 3.3 V	86	88	-	%
	Vin=38.4 V - 72 V max load on each output, V1 = 5.2 V, V2 = 2.5 V	85	87	-	%
Output Voltage Trim Range(V_{O1})		3.6	-	5.5	V
Output Voltage Trim Range(V_{O2})		2.2	-	3.75	V
Over Temperature Protection		-	115	-	℃
Life Time		20	-	-	years
Dimensions Inches (L × W × H) Millimeters (L × W × H)		2.3 x 1.5 x 0.48 58.43 x 38.10 x 12.19			Inches Millimeters
Weight		-	43	-	g

Notes: 1. The efficiency is measured at switching frequency of 300 kHz.

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

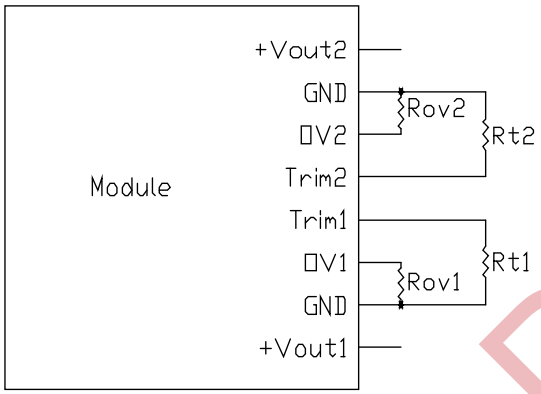
6. REMOTE ON/OFF

PARAMETER	DESCRIPTION	MIN	TYP	MAX	UNIT
Signal High (Unit Off)	Active Low. Remote On/Off pin open, Unit off	2.7	-	15	V
Signal Low (Unit On)		-0.3	-	0.8	V

7. OUTPUT TRIM EQUATIONS

Rt1= (2Vo1 – 5.5) / (5.5 - Vo1) Kohm

Rt2 = (2Vo2 – 3.75) / (3.75 - Vo2) Kohm



Notes:

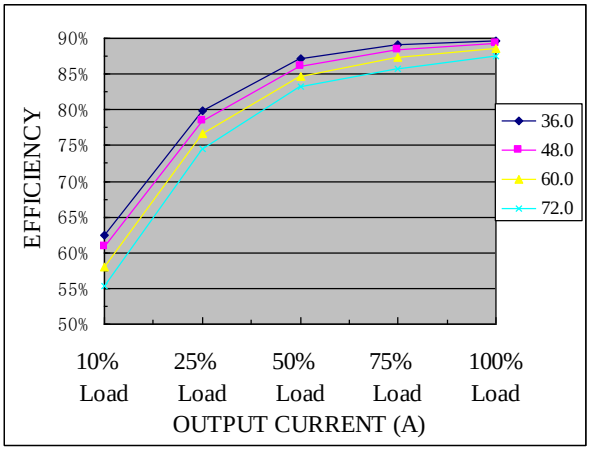
1. To trim down the Vout1: a resistor is to be connected between Trim1 and GND in accordance with the following table. To set the overvoltage protection to 120% of Vout1 the same resistor is to be connected between OV1 and GND.

2. To trim down the Vout2: a resistor is to be connected between Trim2 and GND in accordance with the following table. To set the overvoltage protection to 120% of Vout2 the same resistor is to be connected between OV2 and GND.

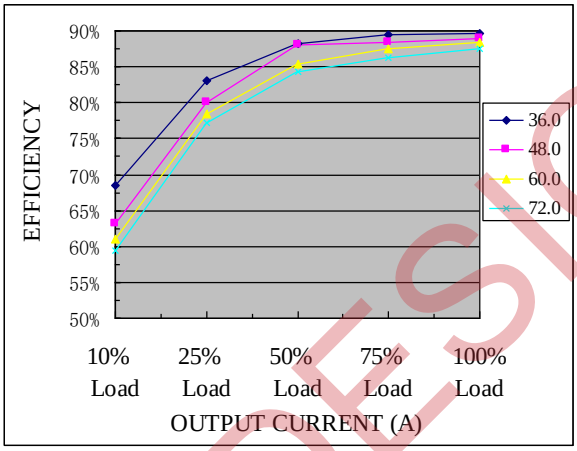
OUTPUT TRIM EQUATIONS(CONTINUED)

Vo1	Rt1 (Kohm)	Vo2	Rt2 (Kohm)
5,50		3,75	
5,45	108,000	3,70	73,000
5,40	53,000	3,65	35,500
5,35	34,667	3,60	23,000
5,30	25,500	3,55	16,750
5,25	20,000	3,50	13,000
5,20	16,333	3,45	10,500
5,15	13,714	3,40	8,714
5,10	11,750	3,35	7,375
5,05	10,222	3,30	6,333
5,00	9,000	3,25	5,500
4,95	8,000	3,20	4,818
4,90	7,167	3,15	4,250
4,85	6,462	3,10	3,769
4,80	5,857	3,05	3,357
4,75	5,333	3,00	3,000
4,70	4,875	2,95	2,688
4,65	4,471	2,90	2,412
4,60	4,111	2,85	2,167
4,55	3,789	2,80	1,947
4,50	3,500	2,75	1,750
4,45	3,238	2,70	1,571
4,40	3,000	2,65	1,409
4,35	2,783	2,60	1,261
4,30	2,583	2,55	1,125
4,25	2,400	2,50	1,000
4,20	2,231	2,45	0,885
4,15	2,074	2,40	0,778
4,10	1,929	2,35	0,679
4,05	1,793	2,30	0,586
4,00	1,667	2,25	0,500
3,95	1,548	2,20	0,419
3,90	1,438	-	-
3,85	1,333	-	-
3,80	1,235	-	-
3,75	1,143	-	-
3,70	1,056	-	-
3,65	0,973	-	-
3,60	0,895	-	-

8. EFFICIENCY DATA

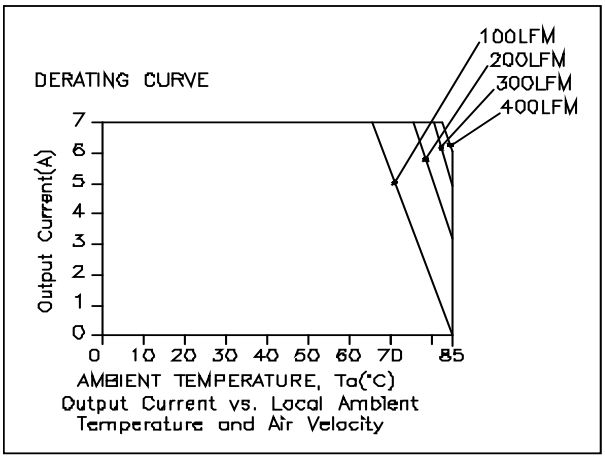


Vo1=5.2 V, Vo2=3.3 V

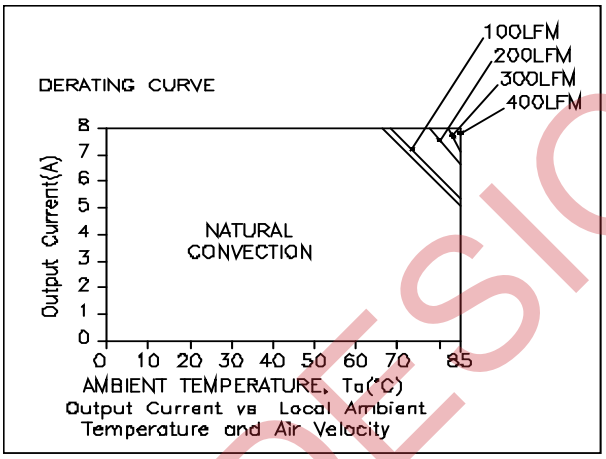


Vo1=4.5 V, Vo2=3.0 V

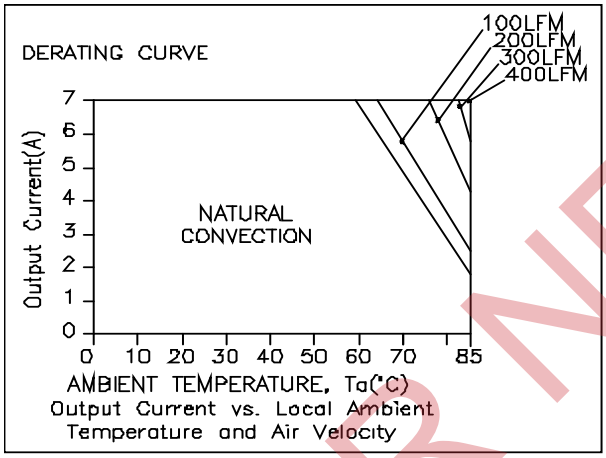
9. THERMAL DERATING CURVES



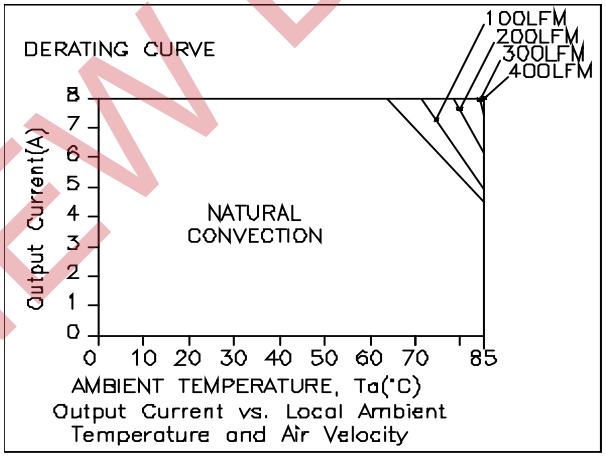
36 V input, 5.2 V/7 A, 3.3 V/7 A output



36 V input, 4.5 V/8 A, 3.0V /8 A output

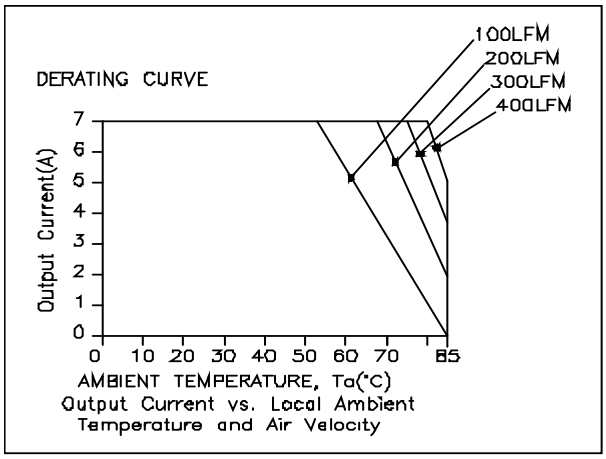


48 input, 5.2 V/7 A, 3.3 V/7 A output

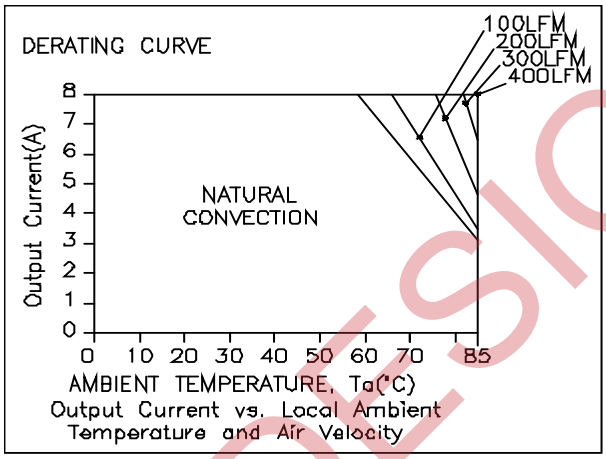


48 V input, 4.5 V/8 A, 3.0V /8 A output

THERMAL DERATING CURVES(CONTINUED)

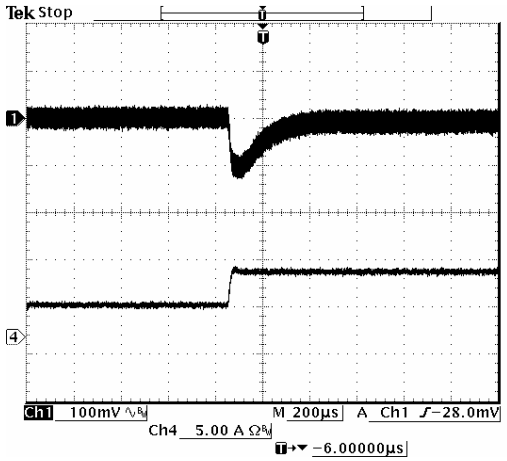


72 V input, 5.2 V/7 A, 3.3 V/7 A output

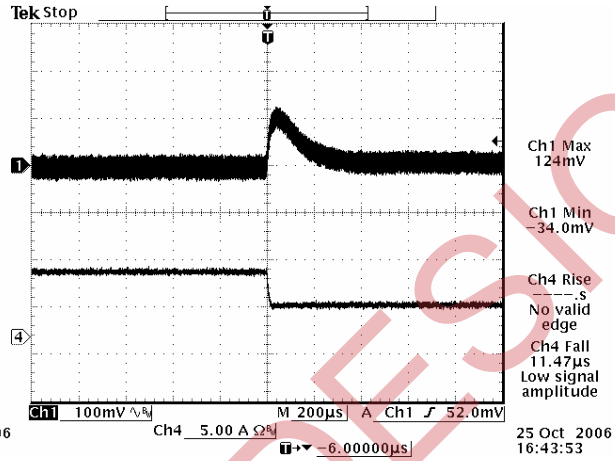


72 V input, 4.5 V/8 A, 3.0V /8 A output

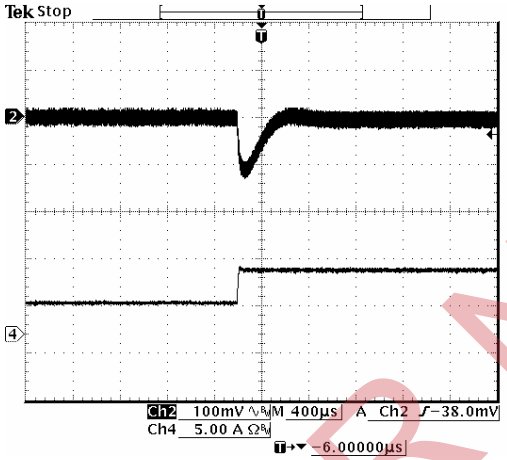
10. TRANSIENT RESPONSE WAVEFORMS



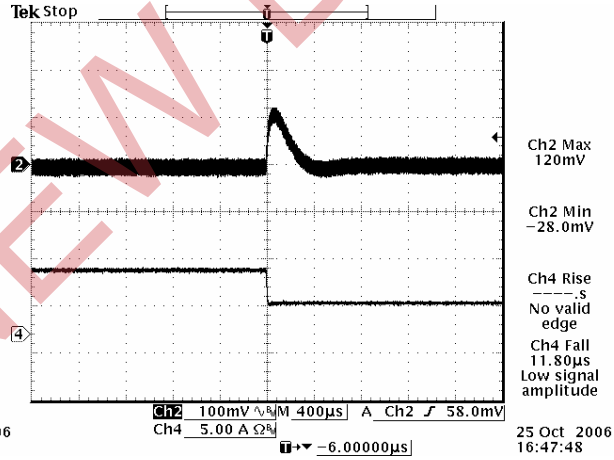
Vo1=5.2 V 50% to 100% Load (3.5 A-7 A) Transients



Vo1=5.2 V 100% to 50% Load (7 A-3.5 A) Transients

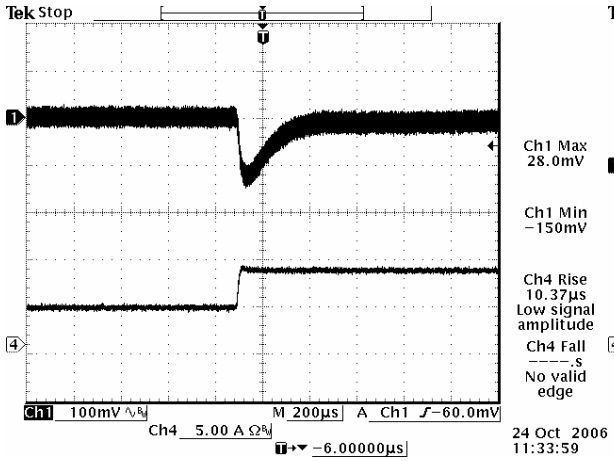


Vo2=3.3 V 50% to 100% Load (3.5 A-7 A) Transients

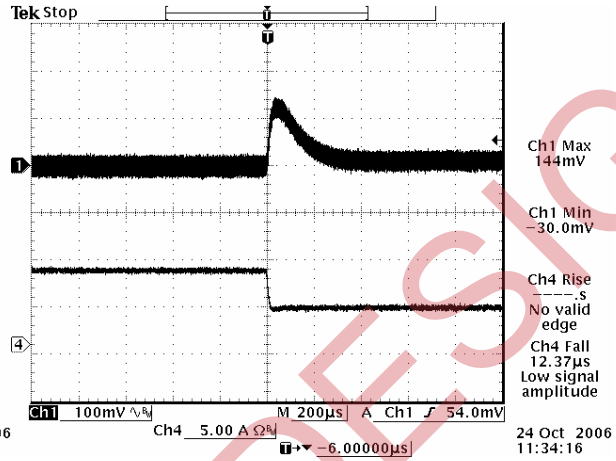


Vo2=3.3 V 100% to 50% Load (7 A-3.5 A) Transients

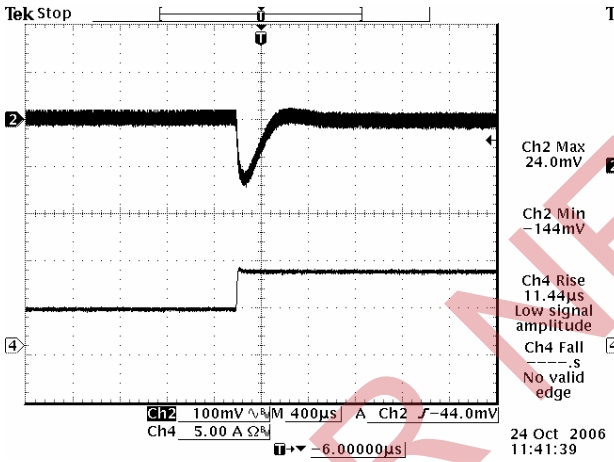
TRANSIENT RESPONSE WAVEFORMS(CONTINUED)



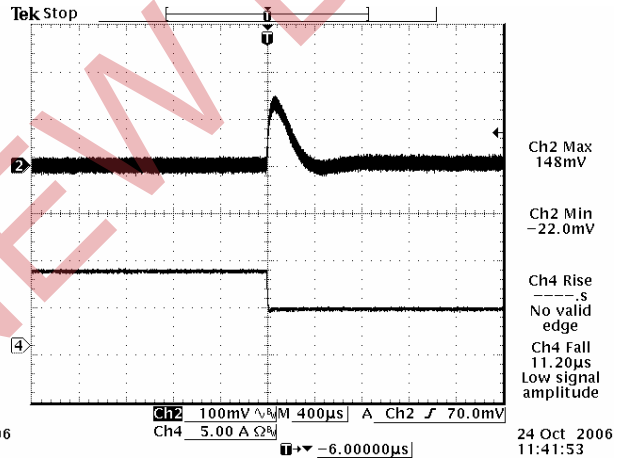
Vo1=4.5 V 50% to 100% Load (4 A-8 A) Transients



Vo1=4.5 V 100% to 50% Load (8 A-4 A) Transients



Vo2=3.0 V 50% to 100% Load (4 A-8 A) Transients

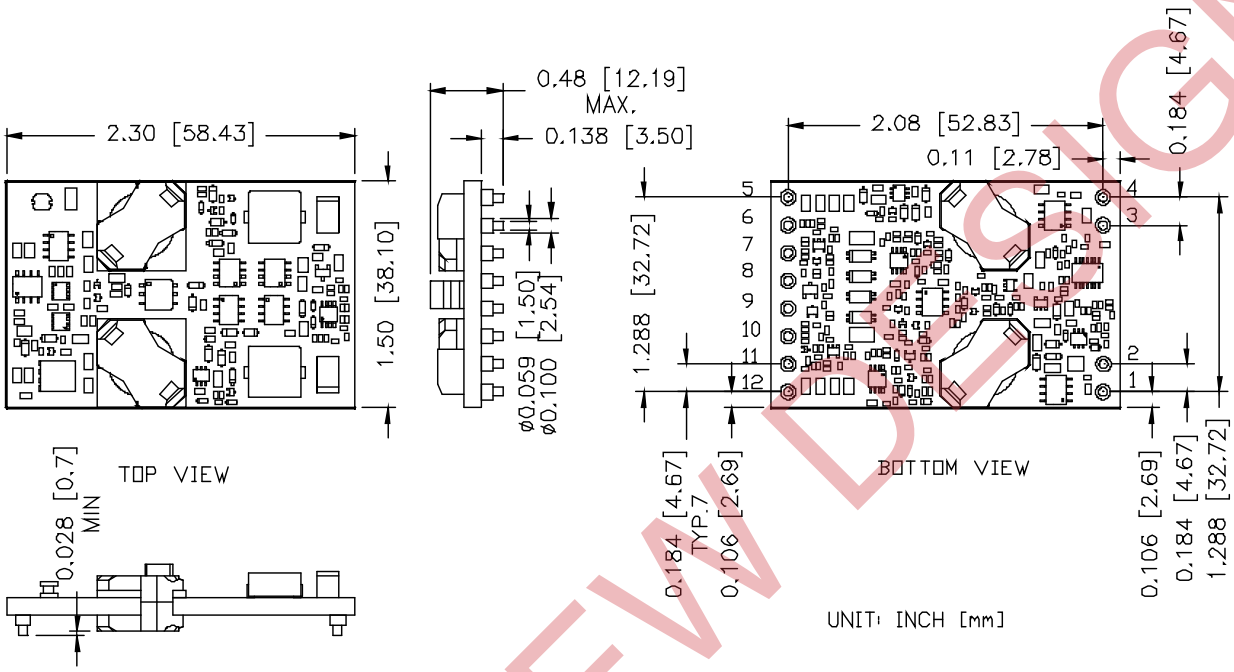


Vo2=3.0 V 100% to 50% Load (8 A-4 A) Transients

Note: Transient response at di/dt=2.5 A/uS, with external 470 uF electrolytic capacitor.

11. MECHANICAL DIMENSIONS

OUTLINE



Notes:

1. The module guarantees at least 0.7mm as clearance distance on bottom side. This issue should be considered if any copper traces are on the top side of the user's board.

2. Co-planarity ⩽ 0.2mm in accordance with Jedec 95-1 appendix B IPC CM770 with datum on sealing plane.

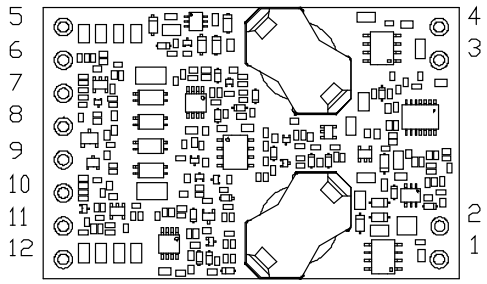
3. Tolerance among one pin (lead) and all the other ones ⩽ 0.3mm.

4. The two metallic pins for manual positioning have 1mm as diameter and must be 0.8÷1.4mm longer than smt pins; however they may be present or not in agreement with soldering process.

Note: These parts are not however compatible with the higher temperatures associated with lead free solder processes and must be soldered using a reflow profile with a peak temperature of no more than 245 °C.

MECHANICAL DIMENSIONS(CONTINUED)

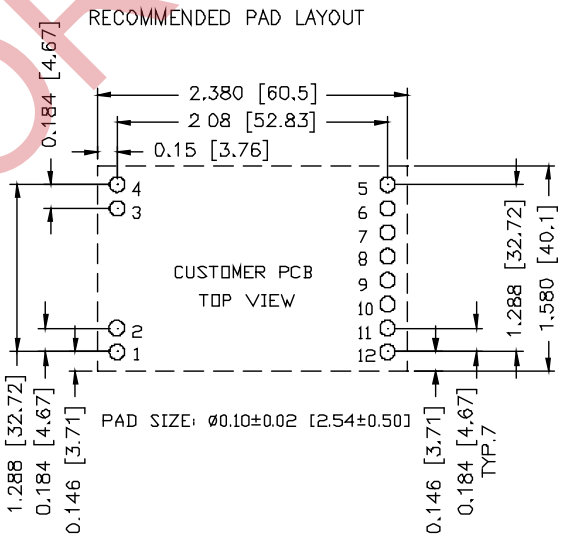
PIN DEFINITIONS



BOTTOM VIEW

PIN	NAME	FUNCTION
1	Sync	Synchronization pin
2	ON/OFF	Remote on/off Control pin
3	Vin(–)	Negative input voltage
4	Vin(+)	Positive input voltage
5	+Vout2	3.0 V Output positive terminal
6	GND	Return terminal for output voltage
7	OV2	Vout2 overvoltage pin
8	TRIM2	Vout2 Trim pin
9	TRIM1	Vout1 Trim pin
10	OV1	Vout1 overvoltage pin
11	GND	Return terminal for output voltage
12	+Vout1	4.5 V Output positive terminal

RECOMMENDED PAD LAYOUT



12. INSTALLATION INSTRUCTION

1) The DC-DC Converter can be operated at an ambient temperature up to 85°C maximum. When installed into final system, the installation must be in accordance with provided installation instruction and the relevant requirements of EN 60950-1:2001 + A11 and IEC 60950-1:2001.

2) The DC-DC converter is not internal fused, the end user is to provide a maximum normal below 4A fuse in unearthed pin when install the converter into final system.

3) The creepage distances, clearances and thickness of insulation between unearthed hazardous voltage input and SELV output circuits have complied with basic insulation requirements according to EN 60950-1:2001 + A11 and IEC 60950-1:2001.

4) The output ratings as shown on the label must not be exceeded.

5) The equipment is to be supplied from a DC source which is separated from AC mains by double or reinforced insulation, or by basic insulation and suitable earthing providing equivalent protection.

6) The equipment is intended to be installed into a class I or Class II system, suitable external protection devices have to provided in the final system. Protective earth has to be reliably identified and if equipment is to be installed into Class I system.

7) The equipment shall be installed with an external cooling condition; typical cooling conditions are given in derating for reference. The airflow direction is towards the side of the equipment.

13. REVISION HISTORY

DATE	REVISION	CHANGES DETAIL	APPROVAL
2007-05-09	A	Change the test condition of normal set point output voltage; Change the on and off time when short circuit protection; Change the Note3 of 'Output Specs' from Tan. Capacitor to electrolytic Capacitor; Updated the 'Trim' Item	HF Fan/HL Lu
2008-03-27	B		
2010-04-19	C		
2011-08-25	D	Update the reflow solder temperature.	HL
2018-06-19	AE	Update Rev.	Jbel Yao

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.