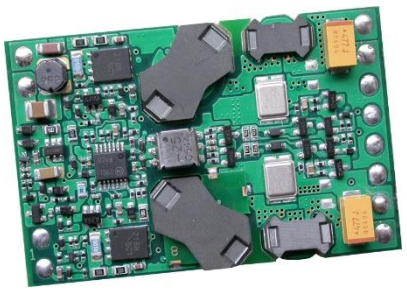
SRXA-50TD10

Isolated DC-DC Converter

The SRXA-50TD10 is isolated DC/DC converter that operates from a nominal 48 VDC source. This unit will provide up to 62 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 – 72 VDC Input
- 3.0 VDC / 10 A, 2.0 VDC / 10 A Dual 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 Shutdown
- Output Voltage Trim
- OCP / SCP
- Over Temperature Protection
- Remote On/Off
- Basic Insulation
- TUV certified to EN 60950-1

Applications

- Networking
- Computers and Peripherals
- Telecommunications

1. MODEL SELECTION

MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	MAX. OUTPUT CURRENT	MAX. OUTPUT POWER	TYPICAL EFFICIENCY
SRXA-50TD10	36 VDC - 72 VDC	3.0 VDC / 2.0 VD	15 A	60 W	89%

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

S	R	XA	- 50	T	D1	x		y
Mount Type	RoHS Status	Series Name	Output power	Input Range	Output Voltage	Active Logic		Package
Surface Mount	RoHS	1/4th brick	60W	36-72 V	3.0V/2.0 V	0-	Active high	G-Tray package

2. ABSOLUTE MAXIMUM RATINGS

PARAMETER	DESCRIPTION	MIN	TYP	MAX	UNIT
Input Voltage	Continuous	-0.3	-	75	V
Remote On/Off	Active Low	-0.3	-	15	V
Ambient Temperature		-40	-	85	°C
Storage Temperature		-55	-	125	°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	0.03 0.03 0.03	1.77 1.40 0.93	2.7 2.1 1.7	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 1Start-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		-	-	3.5	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 125Vdc		-	-	4	A
Reflected Ripple Current	Vin=48V Io=0...Io nom for each output		-	-	60	mApp

[1] Measured with the max admissible capacitive load on both outputs.

4. OUTPUT SPECIFICATIONS

PARAMETER		DESCRIPTION		MIN	TYP	MAX	UNIT
Output Voltage Set Point		Test conditions: Vin=48 V, 50% load	V_{O1} = 3.0 V V_{O2} = 2.0 V	2.97 1.98	- -	3.03 2.02	V
Total Output Voltage Regulation			V_{O1} = 3.0 V V_{O2} = 2.0 V	2.90 1.92	- -	3.10 2.08	V
Output Current			V_{O1} = 3.0 V V_{O2} = 2.0 V	0 0	- -	10 10	A
Output Current Limit			V_{O1} = 3.0 V V_{O2} = 2.0 V	12 12	- -	15 15	A
Output Over-Votage Protection			V_{O1} = 3.0 V V_{O2} = 2.0 V	115 115	- -	125 125	%
Short Circuit Protection			Ton Toff	1 150	- -	50 250	ms
Ripple and Noise (rms)		Test conditions: 0 to 20 MHz BW, with a 10 µF ceramic capacitor at the output.	V_{O1} = 3.0 V V_{O2} = 2.0 V	- -	- -	20 20	mV
Ripple and Noise (pk-pk)			V_{O1} = 3.0 V V_{O2} = 2.0 V	- -	- -	100 80	mV
Output Capacitance			V_{O1} = 3.0 V V_{O2} = 2.0 V	100 100	- -	2000 2000	µF
Overshoot at Turn On				-	-	5	%
Transient Response							
50% ~ 100% Max Load	Overshoot	Test conditions: di/dt = 5 A/ µs, Vin=48 V, with a 470 µF / 6.3 V Tantalum capacitor at the output.	V_{O1} = 3.0 V	-	-	200	mV
	Settling Time			-	-	300	µs
100% ~ 50% Max Load	Overshoot			-	-	200	mV
	Settling Time			-	-	300	µs
50% ~ 100% Max Load	Overshoot		V_{O2} = 2.0 V	-	-	200	mV
	Settling Time			-	-	300	µs
100% ~ 50% Max Load	Overshoot			-	-	200	mV
	Settling Time			-	-	300	µs

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

5. GENERAL SPECIFICATIONS

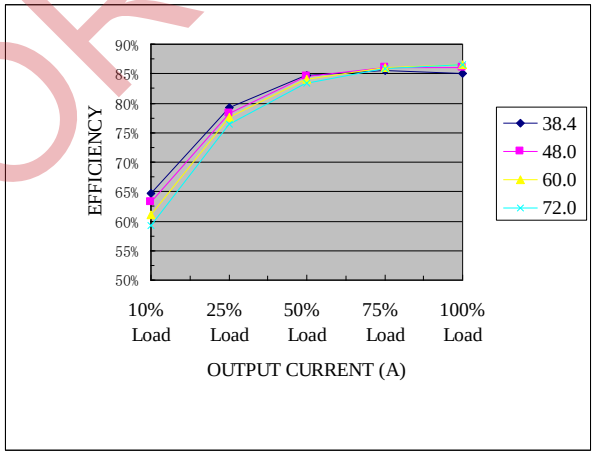
PARAMETER	DESCRIPTION	MIN	TYP	MAX	UNIT
Input to Each Output Test Voltage		-	-	1500	V
Input to Baseplate		-	-	1500	V
Input to Each Output Resistance		-	-	10	Mohm
Isolation Capacitance		-	-	20	nF
Switching Frequency		280	300	320	kHz
Efficiency [2]	Vin = 38.4 – 72 V max load on each output, V1 = 2.5 V, V2 = 1.8 V	82	84	-	%
	Vin = 38.4 – 72 V max load on each output, V1 = 3.3 V, V2 = 2.5 V	85	86	-	%
Output Voltage Trim Range	V_{O1}	80	-	120	%
	V_{O2}	75	-	130	%
Over Temperature Protection		-	115	-	°C
Life Time		20	-	-	years
MTBF	Calculated Per Bell Core SR-332 (I_O = Normal; T_A = 25 °C)		TBD		
Dimensions (L × W × H)			2.3 x 1.5 x 0.48 58.4 x 38.1 x 12.1		in mm
Weight		-	40	-	g

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

6. CONTROL SPECIFICATIONS

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

7. EFFICIENCY DATA



SRXA-50TD10

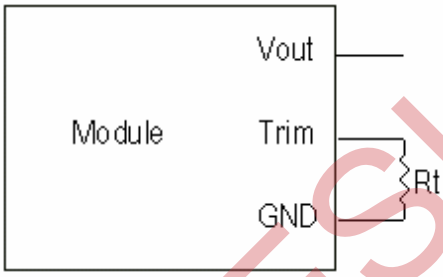
[2] The efficiency is measured at switching frequency of 300 kHz.

8. OUTPUT TRIM EQUATIONS

The resistor should be connected between the Trim pin and Ground.

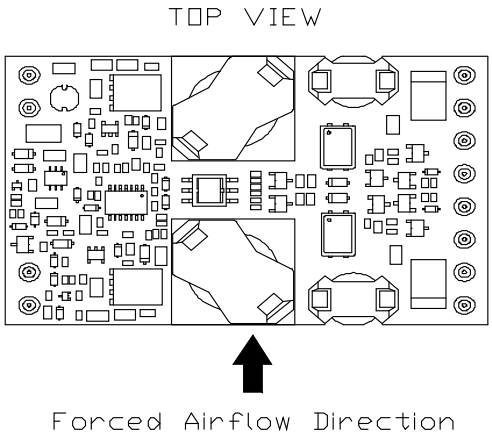
Rt1= (2Vo1 - 3.6) / (3.6 - Vo1)

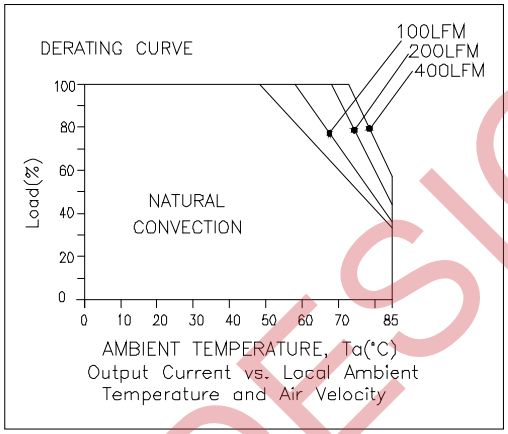
Rt2 = (2Vo2 - 2.6) / (2.6 - Vo2)



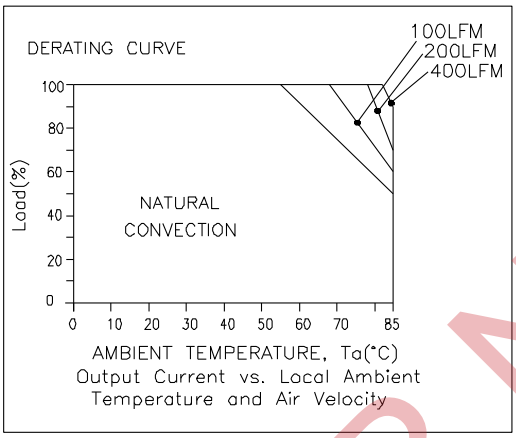
Vo1	Rt1 (Kohm)	Vo2	Rt2 (Kohm)
3,60		2,60	
3,55	70,000	2,55	50,000
3,50	34,000	2,50	24,000
3,45	22,000	2,45	15,333
3,40	16,000	2,40	11,000
3,35	12,400	2,35	8,400
3,30	10,000	2,30	6,667
3,25	8,286	2,25	5,429
3,20	7,000	2,20	4,500
3,15	6,000	2,15	3,778
3,10	5,200	2,10	3,200
3,05	4,545	2,05	2,727
3,00	4,000	2,00	2,333
2,95	3,538	1,95	2,000
2,90	3,143	1,90	1,714
2,85	2,800	1,85	1,467
2,80	2,500	1,80	1,250
2,75	2,235	1,75	1,059
2,70	2,000	1,70	0,889
2,65	1,789	1,65	0,737
2,60	1,600	1,60	0,600
2,55	1,429	1,55	0,476
2,50	1,273	1,50	0,364
2,45	1,130	-	-
2,40	1,000	-	-

9. THERMAL DERATING CURVES

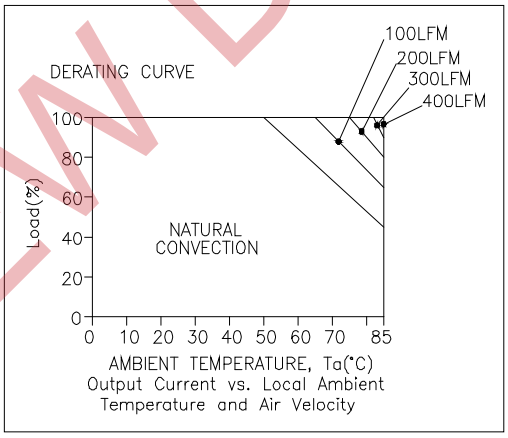




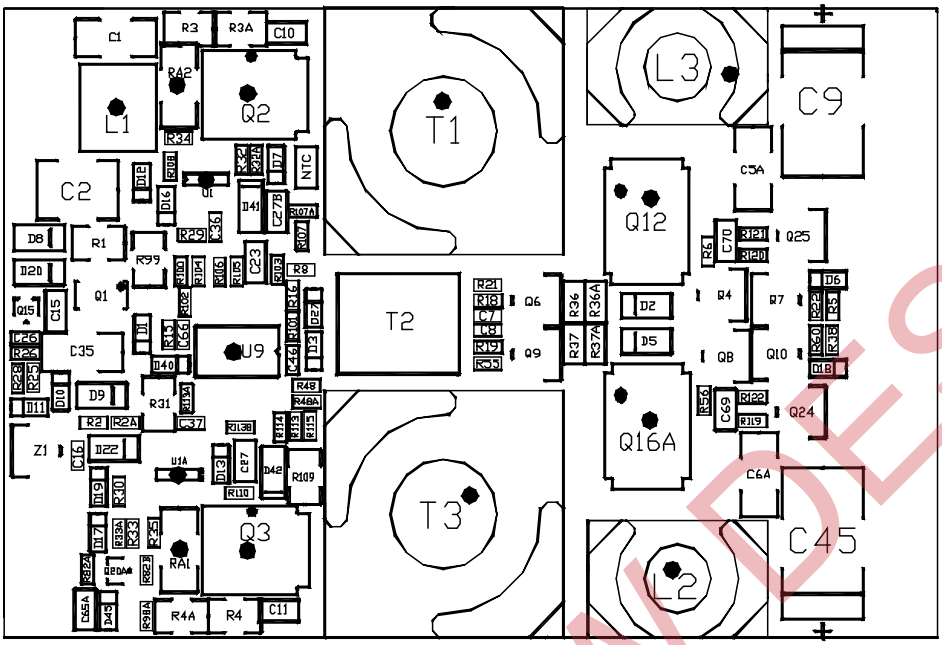
33.6 V/10 A,2.6 V/10 A



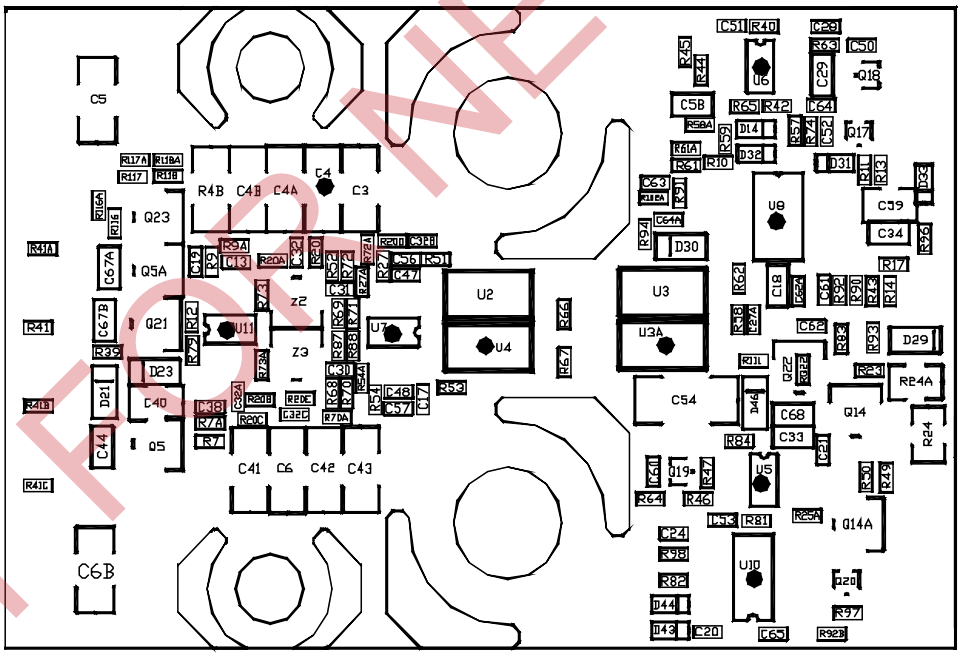
3.3 V/10 A,2.5 V/10 A



3.0 V/10 A,2.0V /10 A



Temperature reference points on top side



Temperature reference points on bottom side

Vin = 36 V		Vin = 48 V		Vin = 75 V	
Iout1=Iout2=10A	Iout1=Iout2=0A	Iout1=Iout2=9.5A	Iout1=Iout2=0A	Iout1=Iout2=8.5A	Iout1=Iout2=0A
RA1=113.7°C	RA1=47.2°C	RA1=108.8°C	RA1=50.0°C	RA1=105.8°C	RA1=55.2°C
RA2=106.8°C	RA2=45.3°C	RA2=101.9°C	RA2=48.4°C	RA2=98.8°C	RA2=53.7°C
Q2=111.3°C	Q2=46.2°C	Q2=106.4°C	Q2=49.2°C	Q2=103.3°C	Q2=54.8°C
Q3=116.3°C	**Q3=46.3°C**	**Q3=111.5°C**	**Q3=49.4°C**	**Q3=108.5°C**	**Q3=54.6°C**
Q12=109.8°C	Q12=44.3°C	Q12=104.9°C	Q12=46.3°C	Q12=101.8°C	Q12=51.4°C
Q16A=110.6°C	Q16A=43.4°C	Q16A=105.4°C	Q16A=46.1°C	Q16A=102.5°C	Q16A=51.3°C
L1=94.5°C	L1=43.3°C	L1=89.3°C	L1=46.3°C	L1=85.4°C	L1=51.4°C

Vout1 = 3 V, Vout2 = 2 V, Ta = 25°C; 0 LFM, fs = 300 kHz

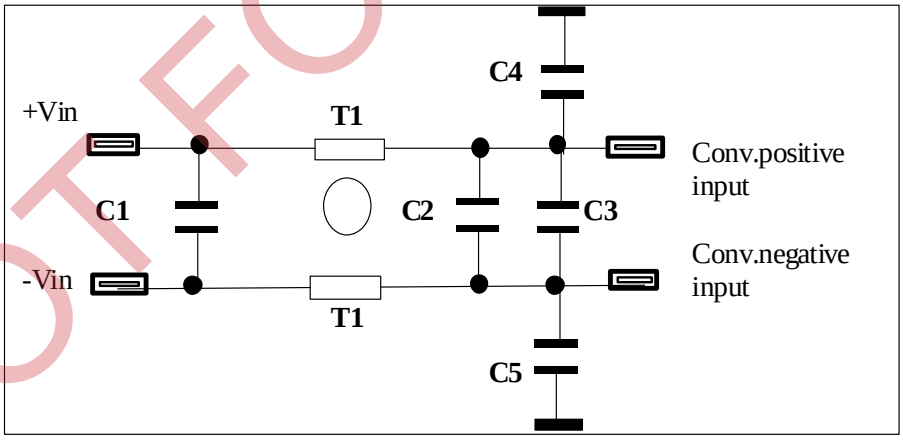
Vin = 36 V		Vin = 48 V		Vin = 75 V	
Iout1=Iout2=9.5A	Iout1=Iout2=0A	Iout1=Iout2=9A	Iout1=Iout2=0A	Iout1=Iout2=8.5A	Iout1=Iout2=0A
RA1=109.2°C	RA1=50.2°C	RA1=105.0°C	RA1=53.6°C	RA1=102.2°C	RA1=58.6°C
RA2=104.2°C	RA2=48.2°C	RA2=98.9°C	RA2=51.6°C	RA2=96.3°C	RA2=56.7°C
Q2=107.5°C	Q2=49.1°C	Q2=102.1°C	Q2=52.2°C	Q2=99.6°C	Q2=57.3°C
Q3=118.8°C	Q3=49.4°C	Q3=111.5°C	Q3=52.4°C	Q3=108.3°C	Q3=57.3°C
Q12=117.5°C	Q12=46.5°C	Q12=110.4°C	Q12=49.2°C	Q12=107.5°C	Q12=54.3°C
Q16A=121.3°C	**Q16A=46.3°C**	**Q16A=116.2°C**	**Q16A=49.2°C**	**Q16A=113.1°C**	**Q16A=54.9°C**
L1=99.6°C	L1=46.7°C	L1=92.3°C	L1=49.4°C	L1=89.2°C	L1=55.0°C

Vout1 = 3.3 V, Vout2 = 2.5 V, Ta = 25°C; 0 LFM, fs = 300 kHz

10. SAFETY

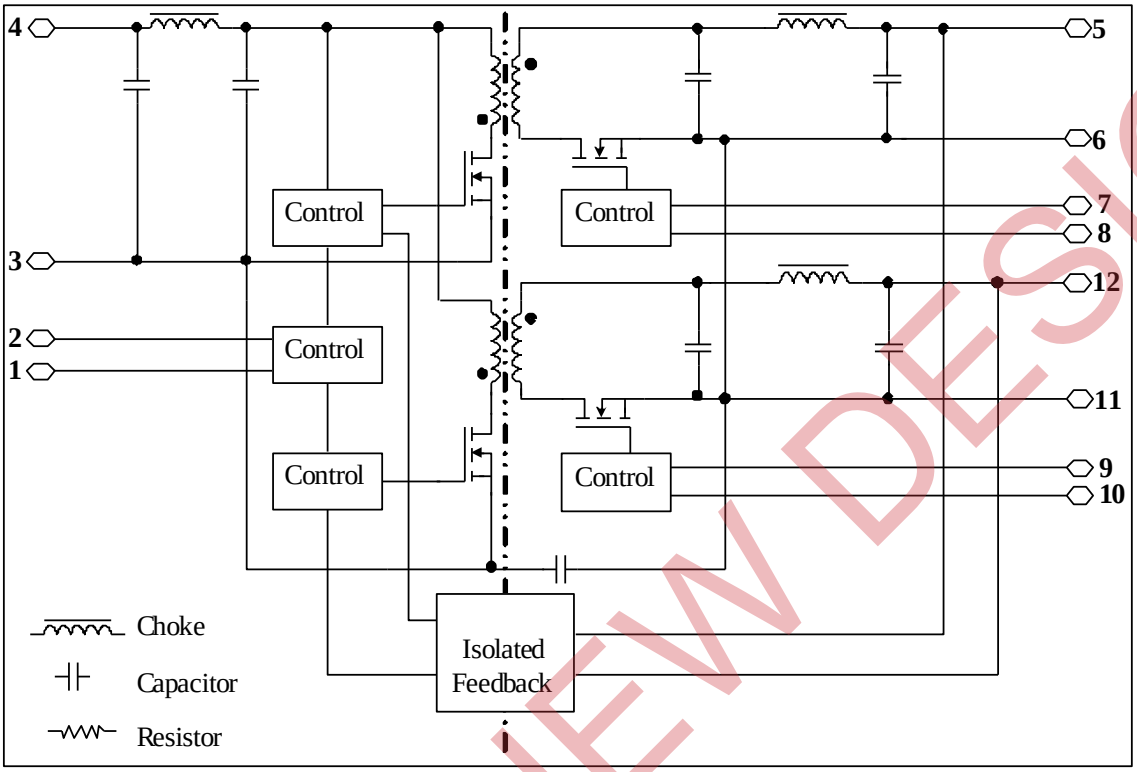
Material flammability: UL94V-0
Electromagnetic Compatibility EMC
1. Electric field IEC801-3(1984), IEC1000-4-3
2. Fast transient/burst IEC801-4(1988), IEC1000-4-4

Input RFI level conducted and radiated (subject to test by customer)
Compliance to EN55022 class A (both q.peak and average) with the following inductive and capacitive filter.

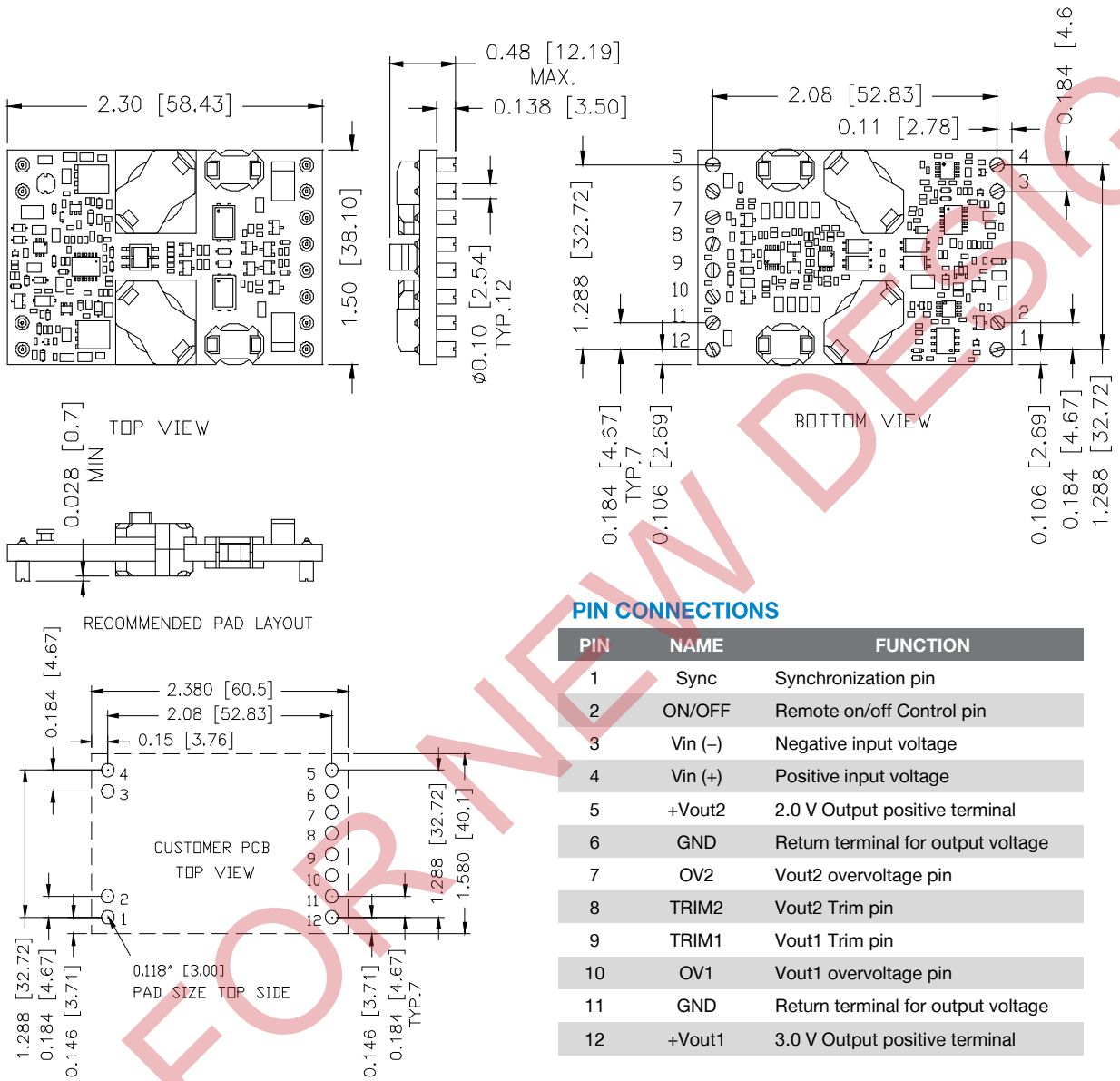


C1=3.3 uF /100 V;
C2=C3= 6 uF/Watt;
C4=C5=1000 pF/250 Volt;
T1=3 mH.

11. FUNDAMENTAL CIRCUIT DIAGRAM



12. MECHANICAL DIMENSIONS



PIN CONNECTIONS

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	2.0 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	3.0 V Output positive terminal

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 ≤ 0.2 mm 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 ≤ 0.3 mm.
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.

13. 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.

REVISION HISTORY

DATE	REVISION	CHANGES DETAIL	APPROVAL
2008-04-09	A		J. Wei
2011-08-25	B	Update the reflow solder temperature.	HL.Lu

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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