

URB2404LD-3000

**3A CONSTANT CURRENT, WIDE INPUT ISOLATED
SINGLE OUTPUT
DC-DC CONVERTER**



RoHS

FEATURES

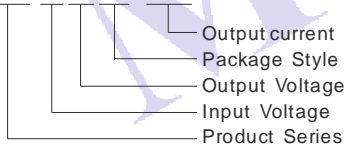
- Wide input voltage range(4:1)
- 1500VDC isolation
- Six-sided metal shield
- Output short circuit protection
- Operating temperature:-40°C~+71°C
- Internal SMD construction
- Industry standard pinout
- MTBF>1,000,000 hours

APPLICATIONS

URB2404LD-3000 offer 3A constant current, wide input voltage: 9-36VDC, and features 1500VDC isolation, six-sided metal shield, under Voltage Lockout protection and over voltage and short circuit protection. All models are particularly suited to auxiliary electric vehicle charging power supply.

MODEL SELECTION

URB2404LD-3000



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PRODUCT PROGRAM

Part Number	Input			Output		Efficiency (%) (typ.)
	Voltage (VDC)			Voltage (VDC)	Current (mA)	
	Nominal	Range	Max ⁽¹⁾			
URB2404LD-3000	24	9-36	40	3.7	3000	74

INPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Under Voltage Lockout	Models ON	--	--	9	VDC
	Models OFF	8	--	--	
Input Filter		L-C			
Ctrl ⁽²⁾	Models ON	3.5-40VDC or Open			
	Models OFF	0-1.2VDC or Short			
	Input current (Models OFF)	--	--	1	mA
No-load power	Input current	--	--	0.5	W

OUTPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Output power		1	--	10	W
Output current	constant current output	--	3	--	A
Output voltage accuracy	Refer to recommended circuit	--	±3	±5	%
Output current accuracy		--	±5	--	
Line regulation	Input voltage range, output constant voltage	--	±0.2	±0.5	
Ripple +Noise	20MHz bandwidth	--	--	120	mV
Transient recovery time	25%~50%~25% load range or	--	--	500	µs
Transient peak deviation	50%~75%~50% load range	--	--	±6	%
Short circuit protection	Full input voltage	Continuous, automatic recovery			
Over voltage protection	3.3V output	--	4.2	--	VDC
Temperature Drift (Vout)	Refer to recommended circuit	--	±0.02	--	%/°C
Trim	Adjusted within the range of the over-voltage protection	--	--	4.2	VDC

COMMON SPECIFICATIONS

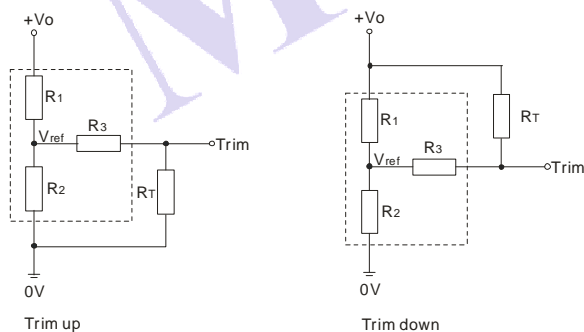
Item	Test conditions	Min.	Typ.	Max.	Units
Storage humidity		5	--	95	%
Operating temperature		-40	--	71	°C
Storage temperature		-55	--	125	
Maximum Case temp.	On work temperature curve	--	--	105	
Lead temperature	1.5mm from case for 10 seconds	--	--	300	
Isolation voltage	Test for 1 minute and 1mA max	1500	--	--	VDC
Isolation resistance	Test at 500VDC	1000	--	--	MΩ
Isolation capacitance	100kHz/0.1V	--	2000	--	pF
Switching frequency	Nominal, full load	--	300	--	kHz
Cooling		Free Air Convection			
Case material		Nickel- coated copper(Six-sided)			
MTBF	MIL-HDBK-217F(25°C)	1000	--	--	k hours
Weight		--	40	--	g

OTHER SPECIFICATIONS

Item	Test conditions	Standard	Level
EMI(CE)	With external component, Refer to figure 6	CISPR25	CLASS I
EMI(RE)		CISPR25	CLASS I
ESD	Without external component	ISO 10605	Air ±8KV / Contact ±6KV perf. Criteria B
R/S		ISO 11452-2	50V/m perf. Criteria A
BCI		ISO 11452-4	50mA perf. Criteria A
Transient conducted immunity	With external component, Refer to figure 6	ISO 7637-2	Level IV perf. Criteria B
Transient coupled interference	Without external component	ISO 7637-3	Level IV perf. Criteria B
EFT/B	With external component, Refer to figure 7	IEC 61000-4-4	±2KV perf. Criteria B
SURGE		IEC 61000-4-5	±2KV perf. Criteria B
Safety		ISO16750	

TRIM APPLICATION & TRIM RESISTANCE

Application circuit for TRIM (Part in broken line is the interior of models)



(Figure 5)

Vo	3.7 (VDC)
Parameter	
R1(kΩ)	5.816
R2(kΩ)	2.863
R3(kΩ)	27
Vref(V)	1.24

(Table 2)

Formula for resistance of Trim

$$\text{up: } R_T = \frac{aR_2}{R_2 - a} - R_3 \quad a = \frac{V_{ref}}{V_o' - V_{ref}} \cdot R_1$$

$$\text{down: } R_T = \frac{aR_1}{R_1 - a} - R_3 \quad a = \frac{V_o' - V_{ref}}{V_{ref}} \cdot R_2$$

Note: Value for R1, R2, R3, and Vref refer to the above table (please refer to above table for the value of R1, R2, F3 & Vref (value above are calculated based on internal circuits, the actual value can be available value that similar to the suggested one).

R_T: Resistance of Trim

a: User-defined parameter, no actual meanings.

Vo': The trim up/down voltage.

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RECOMMENDED CIRCUIT

① Recommended Circuit



(Figure 1)

If you want to further decrease the output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance can't exceed the maximum capacitor load in the list.

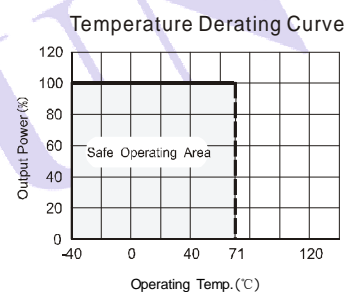
② Recommended capacitance

Output Voltage(V)	Capacitance Cout(μF)	Cin(μF)
3.7	220	100

(Table 1)

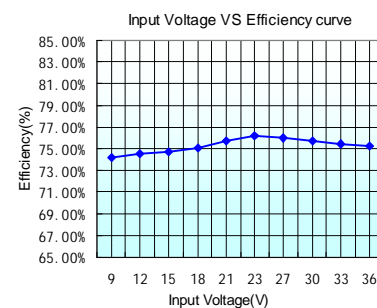
③ No parallel connection or plug and play.

DERATING CURVE

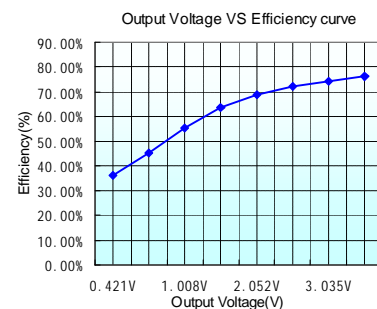


(Figure 2)

EFFICIENCY CURVE

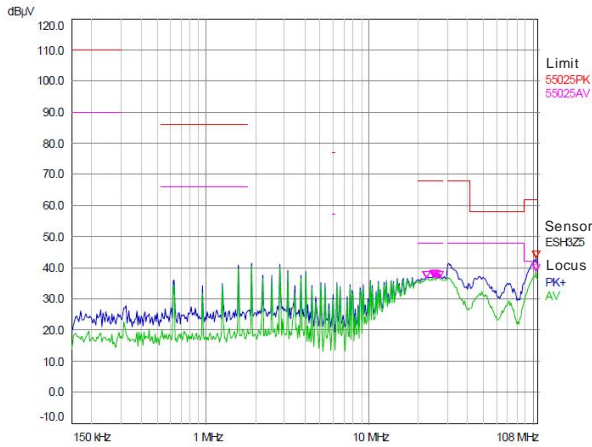


(Figure 3)



(Figure 4)

EMI TEST RESULT CHART(NOMINAL INPUT FULL LOAD)

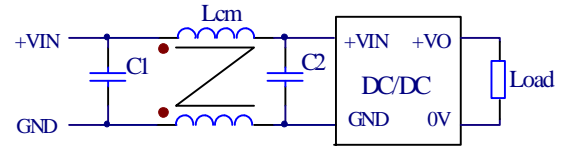


Result	Locus	Frequency (MHz)	Strength (dB μV)	Limit (dB μV)	Increment limit (dB)	Incremental basis (dB)	Remarks
2 AV	22.306	36.75	48.00	-11.25			
2 AV	24.862	36.81	48.00	-11.19			
2 AV	25.182	36.95	48.00	-11.05			
2 AV	25.822	36.93	48.00	-11.07			
2 AV	27.102	36.67	48.00	-11.33			
1 PK+	105.2	43.04	62.00	-18.96			
2 AV	105.2	38.90	48.00	-3.10			

*=Over the limit

(Figure 8)Conducted disturbance testing result chart

EMI RECOMMENDED CIRCUIT

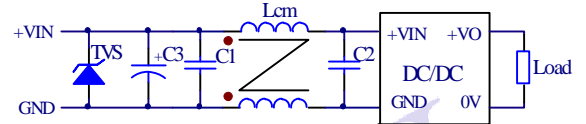


(Figure 6)

EMI recommended external circuit parameters

C1: 475K/50V,1210, MLCC
 C2: 225K/50V,1210, MLCC
 Lcm: 1mH (0.1V,100KHz) 15T(self-made parts),
 core: A10T12*6*4C.(ACME)

EMS RECOMMENDED CIRCUIT

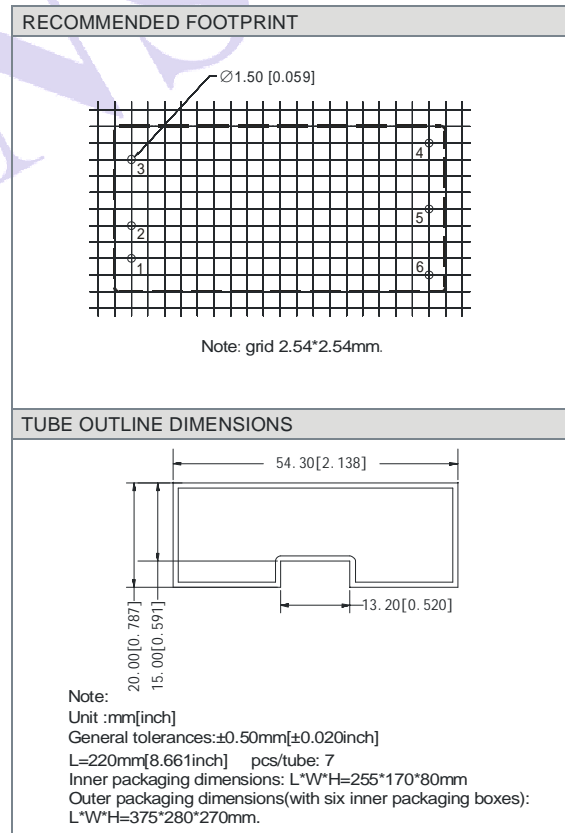
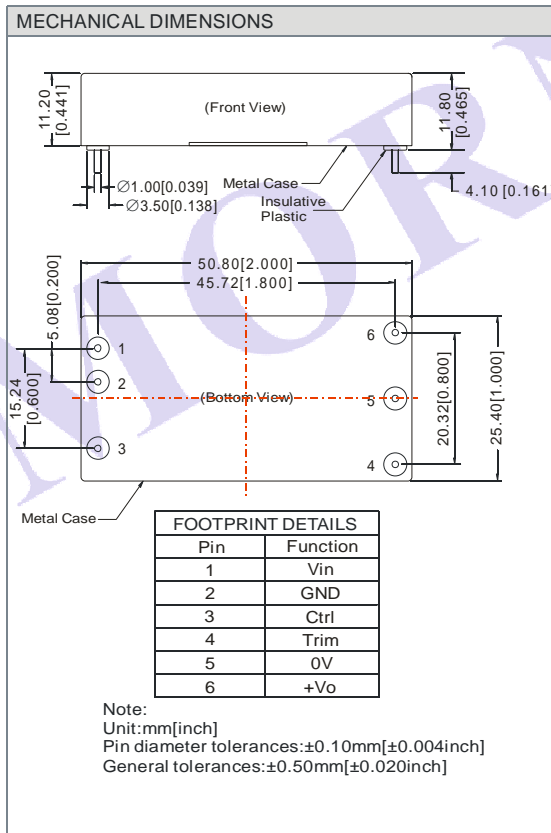


(Figure 7)

EMS recommended external circuit parameters

TVS: SMCJ48A,1500W
 C1: 475K/50V,1210,MLCC
 C2: 225K/50V,1210,MLCC
 C3: 470μF/50V,ESR:55m Ω
 Lcm: 1mH (0.1V,100KHz) 15T(self-made parts),
 core: A10T12*6*4C.(ACME)

OUTLINE DIMENSIONS & FOOTPRINT DETAILS



NOTES

- Input voltage above it may cause permanent damage to the device.
- The Ctrl control pin voltage is referenced to GND.
- Only typical model listed. Non-standard models will be different from the above, please contact us for more details.
- All specifications are measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
- In this datasheet, all the test methods of indications are based on corporate standards.