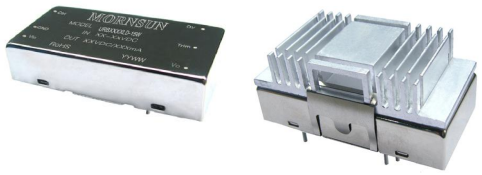
MORNSUN®

URB_LD-15W Series

15W, WIDE INPUT , ISOLATED & REGULATED SINGLE OUTPUT DC-DC CONVERTER



RoHS

FEATURES

- Efficiency up to 85%
- 4:1 wide input voltage range
- 1.5kVDC input/output isolation
- Short circuit protection (automatic recovery)
- Operating temperature: -40°C ~ +85°C
- Internal SMD construction
- Metal shielding package
- Industry standard pinout
- MTBF>1,000,000 hours
- RoHS Compliance

APPLICATION

The URB_LD-15W series offer 15W of output, with 4:1 wide input voltage of 9-36VDC, 18-75VDC and features 1500VDC isolation, over current, over voltage and short-circuit protection, as well as six sided shielding. All models are particularly suited to industrial, tele-communications, test equipments power.

MODEL SELECTION

URB2405LD-15W

- Rated Power
- Package Style
- Output Voltage
- Input Voltage
- Product Series

PRODUCT PROGRAM

Part Number	Input			Output		Efficiency (%, Typ.)	Capacitor Load (3) (max,μF)
	Voltage (VDC)			Voltage (VDC)	Current(2) (mA)		
	Nominal	Range	Max.(1)				
URB2403LD-15W	24	9-36	40	3.3	4000	80	10200
URB2405LD-15W				5	3000	82	4020
URB2412LD-15W				12	1250	85	1035
URB2415LD-15W				15	1000	85	705
URB4803LD-15W	48	18-75	80	3.3	4000	81	10200
URB4805LD-15W				5	3000	83	4020
URB4812LD-15W				12	1250	85	1035
URB4815LD-15W				15	1000	85	705

Note: Add suffix “H” for heatsink mounted, for example URB2405LD-15WH.

INPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Start-up voltage	24 Vin models	--	--	9	VDC
	48 Vin models	--	--	18	
Input filter		LC			
Start-up time		--	10	--	ms
Ctrl(4)	Models ON	3.5 - 40VDC or open circuit			
	Models OFF	0 - 1.2VDC			

OUTPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Output power	See product program	1.5	--	15	W
Output voltage accuracy	Refer to recommended circuit	--	±1	±3	%
Load regulation	From 10% to 100% load	--	±0.5	±1	
Line regulation	Input voltage from low to high	--	±0.2	±0.5	
Ripple and noise	20MHz Bandwidth	55	75	150	mV
Transient recovery time	25%~50%~25% load or 50%~75%~50% load step change	--	200	500	us
Transient peak deviation		--	±2	±5	%
Over current protection	Input voltage range	120	130	150	%
Over voltage protection	3.3V output models	--	3.9	--	VDC
	5V output models	--	6.2	--	
	12V output models	--	15	--	
	15V output models	--	18	--	
Output Short Circuit	Input voltage range	Hiccup, automatics recovery			
Trim		--	±10%Vo	--	VDC
Temperature drift (Vout)	Refer to recommended circuit	--	±0.02	--	%/°C

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COMMON SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Operating temperature		-40	--	85	°C
Storage temperature		-55	--	125	
Storage humidity		5	--	95	%
Cooling		Free Air Convection			
Maximum Case temp.	On working temperature	--	--	105	°C
Lead temperature	1.5mm from case for 10 seconds	--	--	300	
Isolation voltage	Tested for 1 minute and 1mA max	1500	--	--	VDC
Isolation resistance	Test at 500VDC	1000	--	--	MΩ
Isolation capacitance	100kHz /0.1V	--	1000	--	pF
Switching frequency	Nominal, full load	--	300	--	kHz
MTBF	M1L-HDBK-217F	1000	--	--	k hours
Case material		Nickel- coated copper (Six-sided)			
Weight		--	40	--	g

RECOMMENDED CIRCUIT

1) Recommended circuit

(Fig.1)

In order to obtain better performance for the DC/DC models. It's recommended that use input and output filters as Fig.1 shown.

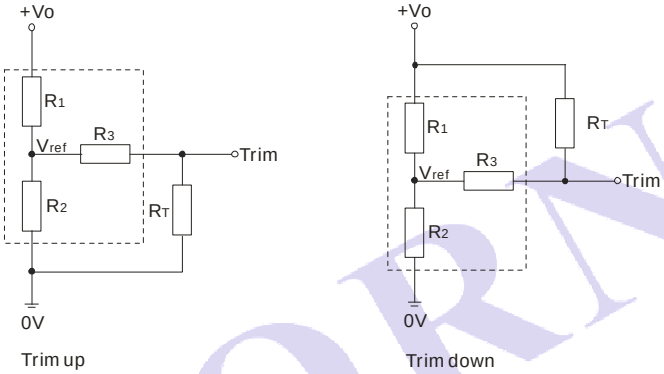
2) Recommended capacitance

Capacitance / Output voltage	Cout	Cin(24V,48V input)
3.3V,5V	470μF	100μF
12V,15V	220μF	

3) No parallel connection or plug and play

TRIM APPLICATION & TRIM RESISTANCE

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



Formula for resistance of Trim

$$\text{up: } R_T = \frac{aR_2}{R_2 - a} - R_3 \qquad a = \frac{Vref}{Vo' - Vref} \cdot R_1$$

$$\text{down: } R_T = \frac{aR_1}{R_1 - a} - R_3 \qquad a = \frac{Vo' - Vref}{Vref} \cdot R_2$$

Note: Value for R1, R2, R3, and Vref refer to the following table.

R_T: Resistance of Trim

a: User-defined parameter, no actual meanings.

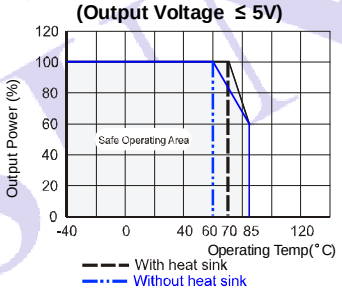
Vo': The trim up/down voltage

Resistance \ Vo	3.3(VDC)	5(VDC)	12(VDC)	15(VDC)
R1(KΩ)	4.801	2.883	10.971	14.497
R2(KΩ)	2.863	2.864	2.864	2.864
R3(KΩ)	15	10	17.8	17.8
Vref(V)	1.24	2.5	2.5	2.5

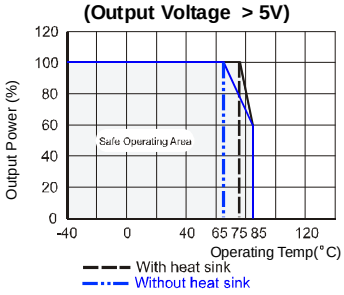
DERATING & EFFICIENCY CURVE

1) Temperature derating curve

(Output Voltage ≤ 5V)

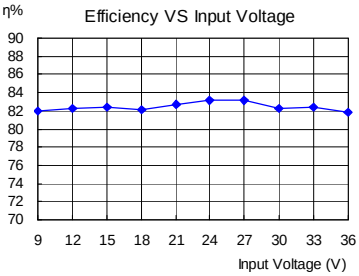


(Output Voltage > 5V)



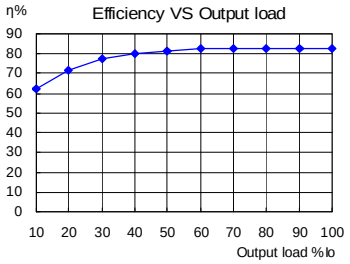
2) Efficiency VS nput voltage (Rated load)

URB2405LD-15W



3) Efficiency VS output Load (Nominal input)

URB2405LD-15W



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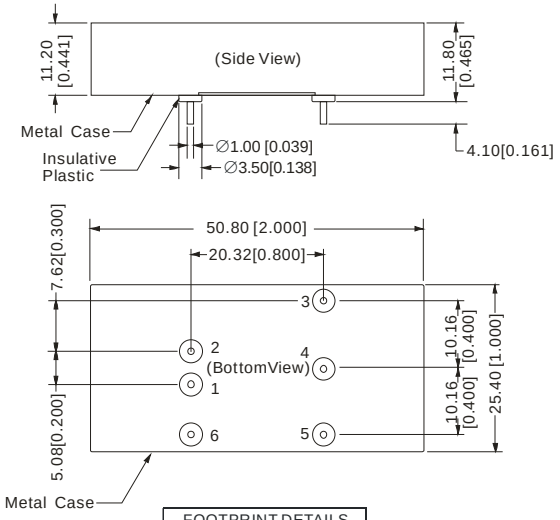
OUTLINE DIMENSIONS & FOOTPRINT DETAILS

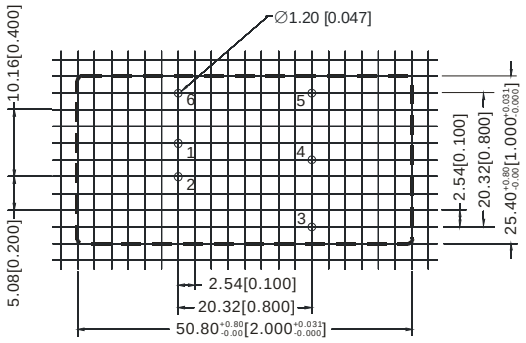
MECHANICAL DIMENSIONS



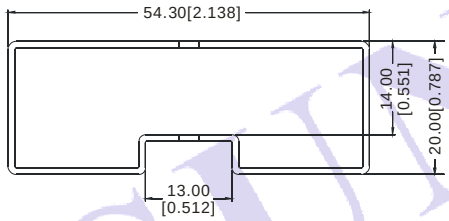
FOOTPRINT DETAILS	
Pin	Function
1	GND
2	Vin
3	+Vo
4	Trim
5	0V
6	Ctrl

Note:
Unit:mm[inch]
Pin diameter tolerances:±0.10mm[±0.004inch]
General tolerances:±0.25mm[±0.010inch]

RECOMMENDED FOOTPRINT(TOP VIEW)

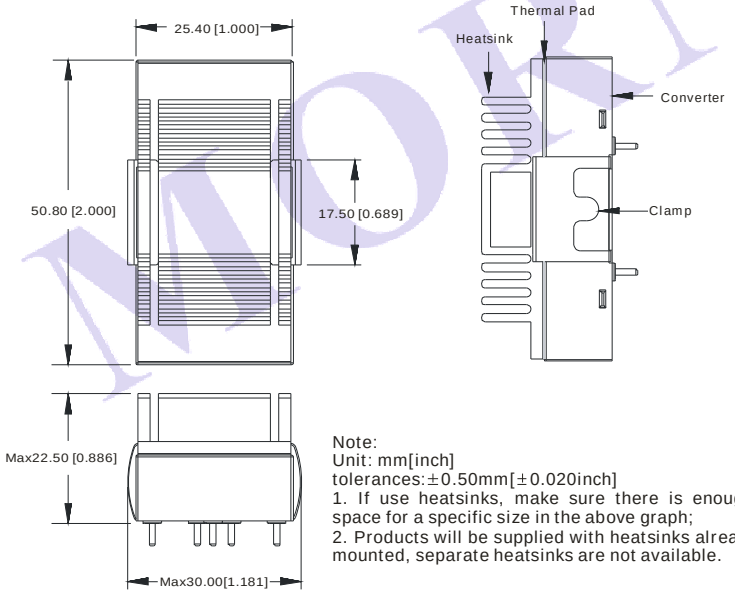


TUBE OUTLINE DIMENSIONS (WITHOUT HEATSINK)



Note:
Unit :mm[inch]
General tolerances: ±0.50mm[±0.020inch]
L=230mm[9.055inch] pcs/tube: 7

HEATSINK ASSEMBLY



Note:
Unit: mm[inch]
tolerances:±0.50mm[±0.020inch]
1. If use heatsinks, make sure there is enough space for a specific size in the above graph;
2. Products will be supplied with heatsinks already mounted, separate heatsinks are not available.

PACKAGE DIAGRAM(WITH HEATSINK)

Package box:
L*W*H=255*170*80mm
Package quantity: 24pcs

NOTE

1. Input voltage can't exceed this value, or will cause the permanent damage.
2. Minimum operating current is 10% of rated current, if less than 10% rated current, output ripple may increase rapidly, the amplitude ≤ 1V.
3. Capacitor MAX load tested at nominal input voltage, full load and constant resistive load.
4. The CTRL control pin voltage is referenced to GND.
5. Only typical model listed. Non-standard models will be different from the above, please contact us for more details.
6. All specifications are measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
7. In this datasheet, all the test methods of indications are based on corporate standards.

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