Typical Characteristics

- Wide input range (4:1), Output: 10W
- Conversion efficiency: 86%(Typ.)
- Isolation voltage: 1500Vdc
- Ultra-low standby power consumption:0.05W(Typ.)
- Ultra-fast startup: 1ms (Typ.)
- Working temperature: -40℃~+85℃
- Protection: input undervoltage, output short-circuit, overcurrent
- Metal housing, low output ripple

10W, ultra-wide input voltage range, isolated regulated single- or dual-output, DIP package, DC-DC power module



RoHS

URB_LD-10WR3 and URA_LD-10WR3 series products feature an output power of 10W, a 4:1 wide input voltage range, efficiency up to 86%, a standard isolation voltage of 1500 VDC, and an operating temperature range of -40° C to +85° C. They include input under-voltage protection, overcurrent protection, and short-circuit protection. The bare unit complies with CISPR 32/EN 55032 Class A, and are widely used in medical, industrial control, power, instrumentation, communications, and railway applications.

Model Number Description

URx xx xx LD -10W R3

- R3: Suffix (3rd-generation product)
- 10W: Rated output power (10W)
- LD: Package type (50.8 x 25.4 mm)
- xx: Output voltage (rated)
- xx: Input voltage (rated)
- x: No. of output channels (B: single, A: dual, 1500 Vdc isolation)
- UR: Product series (UR indicates 4:1 input, VR indicates 2:1 input)

Product selection table

Certification	Model number	Input voltage range (Vdc)		Output Voltage/Current		Ripple and Noise	Maximum capacitive load②	Efficiency @ Full load
		Rated (range)	Max③	Output V (Vdc)	Output I (mA) (Max. Min.)	Full load (mVp-p) (Typ./Max.)	μF (Max.)	% Min./Typ.
	URB2403LD-10WR3	24 (9-36)	40	3.3	2400/0	30/50	2200	75/77
	URB2405LD-10WR3			5	2000/0	30/50	2200	80/82
	URB2412LD-10WR3			12	833/0	50/80	470	84/86
	URB2415LD-10WR3			15	667/0	50/80	330	84/86
	URB2424LD-10WR3			24	416/0	50/80	100	86/88
	URA2405LD-10WR3			±5	±1000/0	30/50	1000	81/83

	URA2412LD-10WR3			±12	±416/0	50/80	470	85/87
	URA2415LD-10WR3			±15	±333/0	50/80	330	85/87
	URA2424LD-10WR3			±24	±208/0	50/80	100	85/87
	URB4803LD-10WR3	48 (18-75)	80	3.3	2400/0	30/50	2200	77/79
	URB4805LD-10WR3			5	2000/0	30/50	2200	81/83
	URB4812LD-10WR3			12	833/0	50/80	470	85/87
	URB4815LD-10WR3			15	667/0	50/80	330	85/87
	URB4824LD-10WR3			24	416/0	50/80	100	86/88
	URA4805LD-10WR3			±5	±1000/0	30/50	1000	81/83
	URA4812LD-10WR3			±12	±416/0	50/80	470	85/87
	URA4815LD-10WR3			±15	±333/0	50/80	330	85/87
	URA4824LD-10WR3			±24	±208/0	50/80	100	85/87
	URB1D03LD-10WR3	110 (40-160)	180	3.3	2400/0	30/50	2500	80/82
	URB1D05LD-10WR3			5	2000/0	30/50	2200	83/85
	URB1D12LD-10WR3			12	833/0	50/80	680	86/88
	URB1D15LD-10WR3			15	666/0	50/80	470	86/88
	URB1D24LD-10WR3			24	416/0	50/80	220	86/88
	URA1D05LD-10WR3			±5	±1000/0	30/50	1100	83/85
	URA1D12LD-10WR3			±12	±416/0	50/80	330	86/88
	URA1D15LD-10WR3			±15	±333/0	50/80	220	86/88
	URA1D24LD-10WR3			±24	±208/0	50/80	100	86/88

Note: 1. Due to space limitations, the above is only a list of representative products. For products not included in this list, please contact our Sales Department.

2. The maximum capacitive load indicates the maximum capacitive load that can be connected to +Vo or -Vo; if this value is exceeded, the product will not start properly.

3. Exceeding the maximum input voltage may cause permanent damage to the product.;

Test Conditions: Unless otherwise specified, all parameter measurements were taken at the rated input voltage, with a purely resistive rated load, and at an ambient temperature of 25° C.

Input characteristics

Items	Working conditions		Min.	Typ.	Max.	Unit
Input Current (Full Load/No Load)	24VDC rated input series, rated input voltage	3.3V	-	429/5	440/12	mA
		Other	-	502/5	521/12	
	48VDC rated input series, rated input voltage	3.3V	-	190/4	215/8	
		Other	-	251/4	258/8	
	110VDC rated input series, rated input voltage	3.3V	-	87/1	90/3	
		Other	-	100/1	109/3	
Reflected ripple current	24VDC rated input series, rated input voltage		-	40	-	mA
	48VDC rated input series, rated input voltage		-	30	-	
	110VDC rated input series, rated input voltage		-	20	-	
Impulse voltage (1 sec. max)	24VDC rated input series, rated input voltage		-0.7	-	50	VDC
	48VDC rated input series, rated input voltage		-0.7	-	100	
	110VDC rated input series, rated input voltage		-0.7	-	200	

Startup voltage	24VDC rated input series, rated input voltage	-	-	9	
	48VDC rated input series, rated input voltage	-	-	18	
	110VDC rated input series, rated input voltage	-	-	40	
Input undervoltage protection	24VDC rated input series, rated input voltage	5.5	6.5	-	
	48VDC rated input series, rated input voltage	12	15.5	-	
	110VDC rated input series, rated input voltage	32	36	-	
Startup time	Rated input voltage and constant-resistance load	-	10	-	mS
Input filter type		PI type			
Hot swap	-	Not supported			
Remote control (Ctrl) *	Module on	Ctrl floating or connected to a TTL high level (3.5-12VDC)			
	Module off	Connect Ctrl to GND or a low level (0-1.2VDC)			
	Input current during turn-off	-	6	10	mA

Note: *The voltage at the Ctrl pin is relative to the GND of the input pin.

Output characteristics

Items	Working and test conditions	+Vo1			-Vo2		
		Min.	Typ.	Max.	Min.	Typ.	Max.
Output load	Load percentage	0%	-	100%	0%	-	100%
Output voltage accuracy		-	±1.0%	±2.0%	-	±2.0%	±3.0%
Line Regulation	Input voltage range	-	±0.2%	±0.5%	-	±1.5%	±2%
Load Regulation	20% to 100% rated load, balanced load	-	±0.5%	±1%	-	±4.0%	±5.0%
Ripple & Noise	Pure resistive load, 20 MHz bandwidth, peak-to-peak value	-	50mVp-p	80mVp-p	-	50mVp-p	80mVp-p
Startup delay		-	1ms	-	-	1ms	-
Output voltage adjustment	Input voltage range	-	Non-adjustable	-	-	Non-adjustable	-
Dynamic response to a step disturbance	25% of the rated load step	-	±3.0%	±5.0%	-	±3.0%	±5.0%
Dynamic response recovery time		-	300μs	500μs	-	300μs	500μs
Output overvoltage protection	Full voltage range input	110% Io	150% Io	200% Io			
Output overcurrent protection	Full voltage range input	Sustainable, self-recovering					

Note: ① For product models with output voltages of ±5 VDC and ±9 VDC, the maximum output voltage accuracy under 0%-5% load conditions is ±5%;

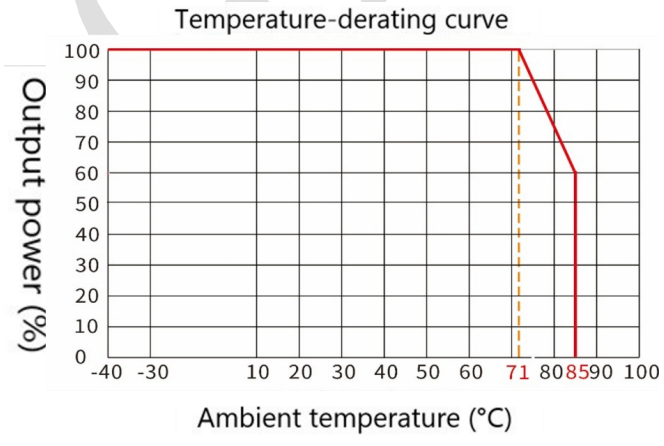
② When tested under 0%-100% load conditions, the load regulation is ±5%;

③ Load ripple and noise at 0%-5% load is less than or equal to 5% of Vo. The test method for ripple and noise is the twisted-pair test; a capacitive load can be applied to the output to reduce light-load ripple.

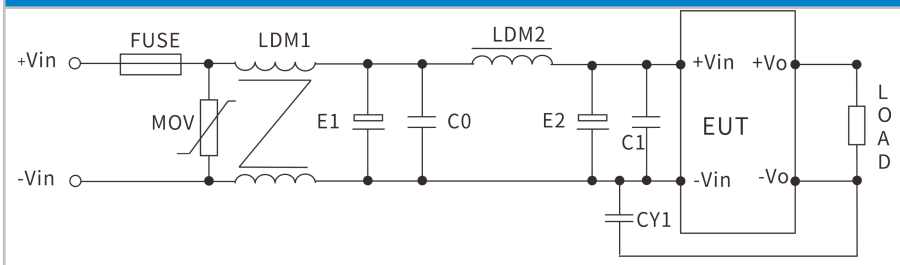
General characteristics

Items	Working conditions	Min.	Typ.	Max.	Unit
Insulation voltage	Input-output, test duration: 1 minute, leakage current less than 1 mA.	1500	--	--	VDC
Insulation resistance	Input-output, insulation voltage 500 VDC.	1000	--	--	MΩ
Isolation capacitor	Input-Output, 100 kHz/0.1 V	--	1000	--	pF
Working temperature	Use the reference temperature derating curve	-40	--	+85	℃
Storage temperature		-40	--	+125	
Maximum operating case temperature		--	--	+100	
Storage humidity	No condensation	5	--	95	%RH
Pin soldering temperature resistance	The solder joint is 1.5 mm from the housing; 10 seconds	--	--	+300	℃
Switching frequency	PWM mode	--	250	--	KHz
Vibration		10-55Hz, 10G, 30 Min. along X, Y and Z			
Housing material		Aluminum alloy housing, plastic bottom cover			
Minimum mean time between failures	MIL-HDBK-217F@25℃	--	$2X10^5$	--	Hrs

Temperature Characteristic Curve



EMC Peripheral Recommended Circuit

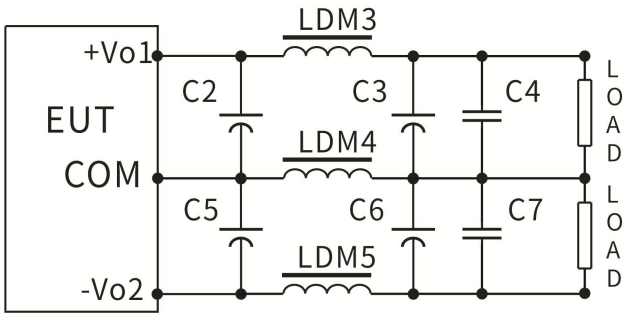


Recommended parameters: The following are typical parameters; please adjust them accordingly based on your specific operating environment.

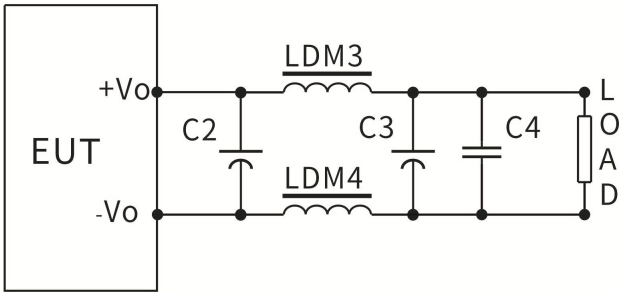
Component code	24V Input	48V Input	110V Input
FMSE fuse	Connect the appropriate fuse based on customer requirements		
MOV varistor	14D560K	14D101K	14D201K
LDM1 common-mode inductor	10 mH	15 mH	30 mH
E1、E2 electrolytic capacitor	100μF/50V	100μF/100V	63μF/200V
C0、D1 ceramic capacitor	1μF/50V	1μF/100V	0.47μF/250V
LDM2 common-mode inductor	10 μH	15 μH	68 μH
CY1 safety Y2 capacitors	1nF/250Vac		

Recommended Peripheral Circuit for Output Filtering

Positive and negative dual output product



Single output product



For general ripple and noise requirements, it is recommended to use only C2 and C5 in the external circuit; for strict ripple and noise requirements, it is recommended to use the circuit shown in the figure above.

Note: 1. Use high-frequency, low-impedance electrolytic capacitors for C2, C3, C5, and C6. The total capacitance must not exceed the maximum capacitive load specified in the manual; otherwise, the module will fail to start normally.

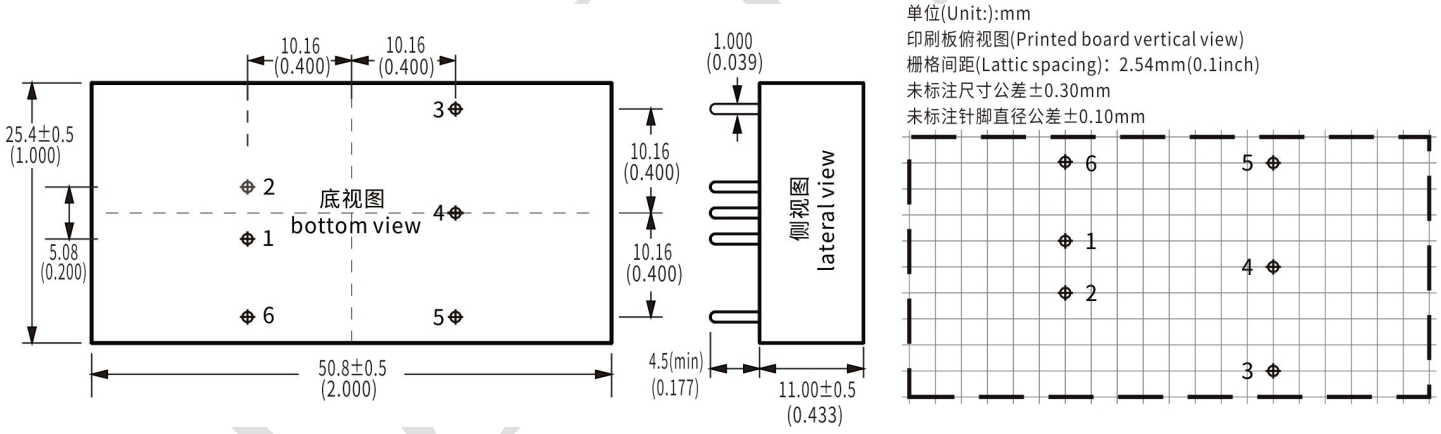
2. When applying a capacitive load, ensure that the minimum load is 3%; otherwise, it will cause abnormal module output.

3. The LDM5 is intended for use only in dual-output products.

Recommended parameters:

Part code	3.3V Output	±5V or 5V Output	±/9V/12V or 9V/12V Output	±15V or 15V Output	±24V or 24V Output
LDM3 inductor	0.47μH	1μH	2.2 μH	2.2 μH	4.7 μH
LDM4 inductor	0.47μH	1μH	2.2 μH	2.2 μH	4.7 μH
LDM5 inductor	-	1μH	2.2 μH	2.2 μH	4.7 μH
C2、C3 electrolytic capacitor	220μF	220μF	100μF	100μF	68μF
C5、C6 electrolytic capacitor	220μF	220μF	100μF	100μF	68μF
C4、C7 ceramic capacitor	1μF/50V				

Package Dimensions and Pin Function Diagram



	1	2	3	4	5	6
Single	-Vin	+Vin	+Vo	NP	-Vo	CTRL
	Negative input	Positive input	Positive output	No pin	Output ground	Remote control
Dual	-Vin	+Vin	+Vo1	COM	-Vo2	CTRL
	Negative input	Positive input	Positive output 1	Common	Negative output 2	Remote control

*Note: If the pin assignments of the power module differ from those in the selection guide, refer to the labels on the actual product.

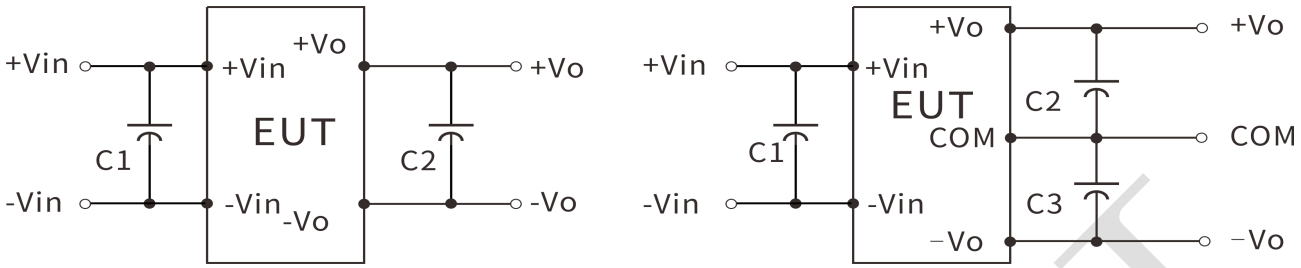
Package Description

Package code	L x W x H	
LD	50.8 X25.4X11.0mm	2.000X 1.000 X0.433 inch

Test Application Reference

Recommended Test Circuit　　1、DC/DC Test Circuit：

Recommended capacitors：C1：47-100μF；C2、C3：10-22μF 。

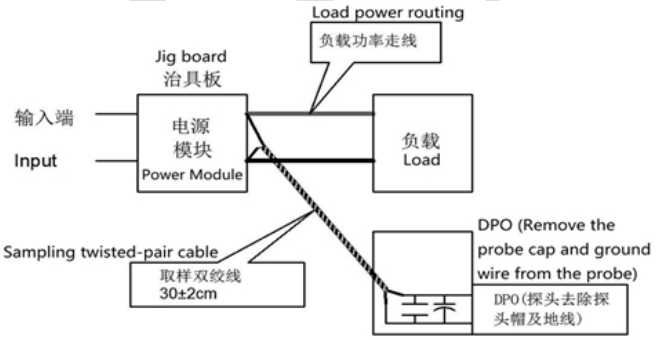


2、Ripple & Noise Testing: (Twisted-pair method, 20 MHz bandwidth)

Test Method:

1. For ripple and noise testing, use a Category 12 twisted-pair cable. Set the oscilloscope bandwidth to 20 MHz and use a 100 MHz bandwidth probe. Connect a 0.1μF polypropylene capacitor and a 47μF high-frequency, low-impedance electrolytic capacitor in parallel at the probe tip. Set the oscilloscope to “Sample” mode.

2. Schematic diagram for output ripple and noise testing: Connect the power supply input to the power source. Connect the power supply output to the electronic load via the fixture board. For testing, use a 30 cm ± 2 cm sampling lead to take a direct sample from the power supply output port. Select insulated wires with appropriate gauge based on the magnitude of the output current.



Contact

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