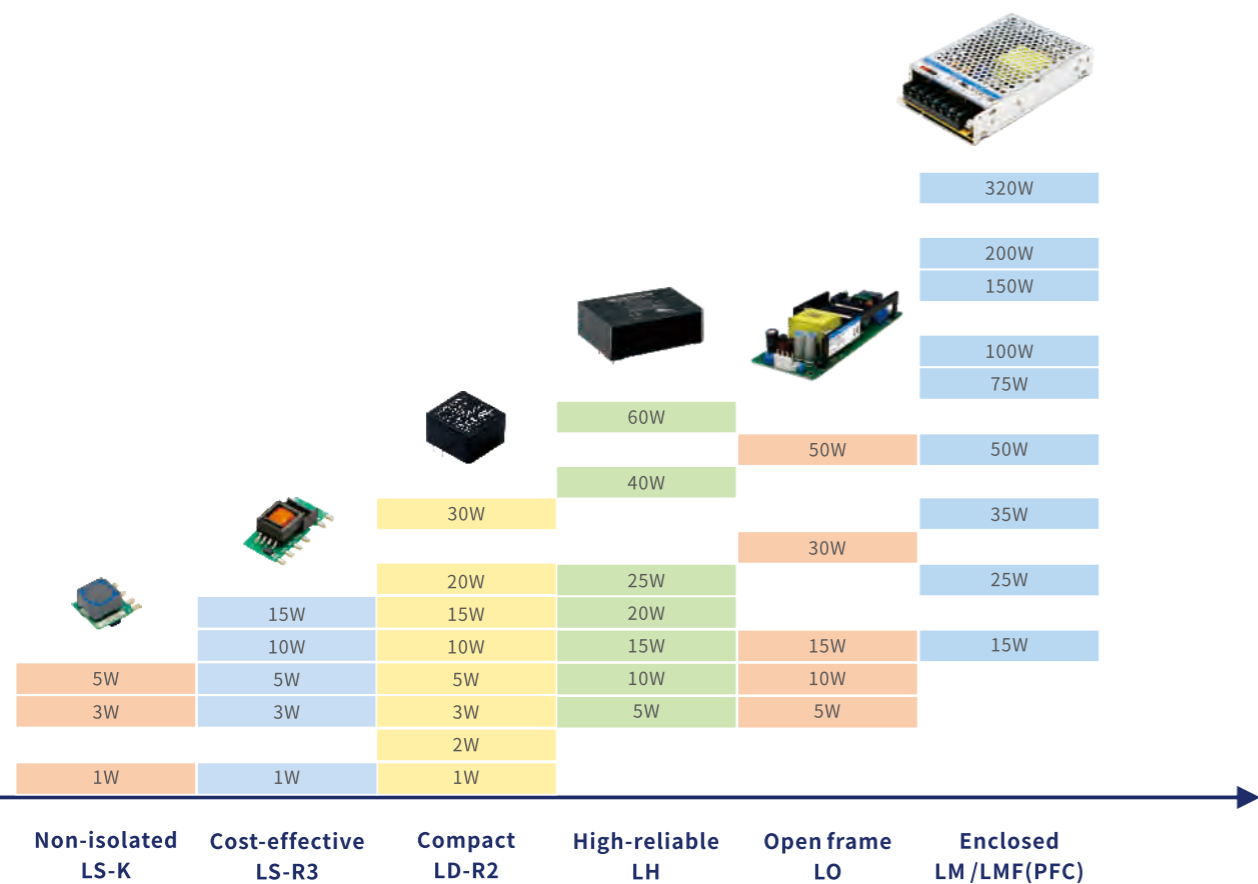


» 305RAC AC/DC Power supply Section Guide «



305RAC

AC/DC Selection Guide



- Reliable Performance
- Fast Delivery
- Controllable Cost



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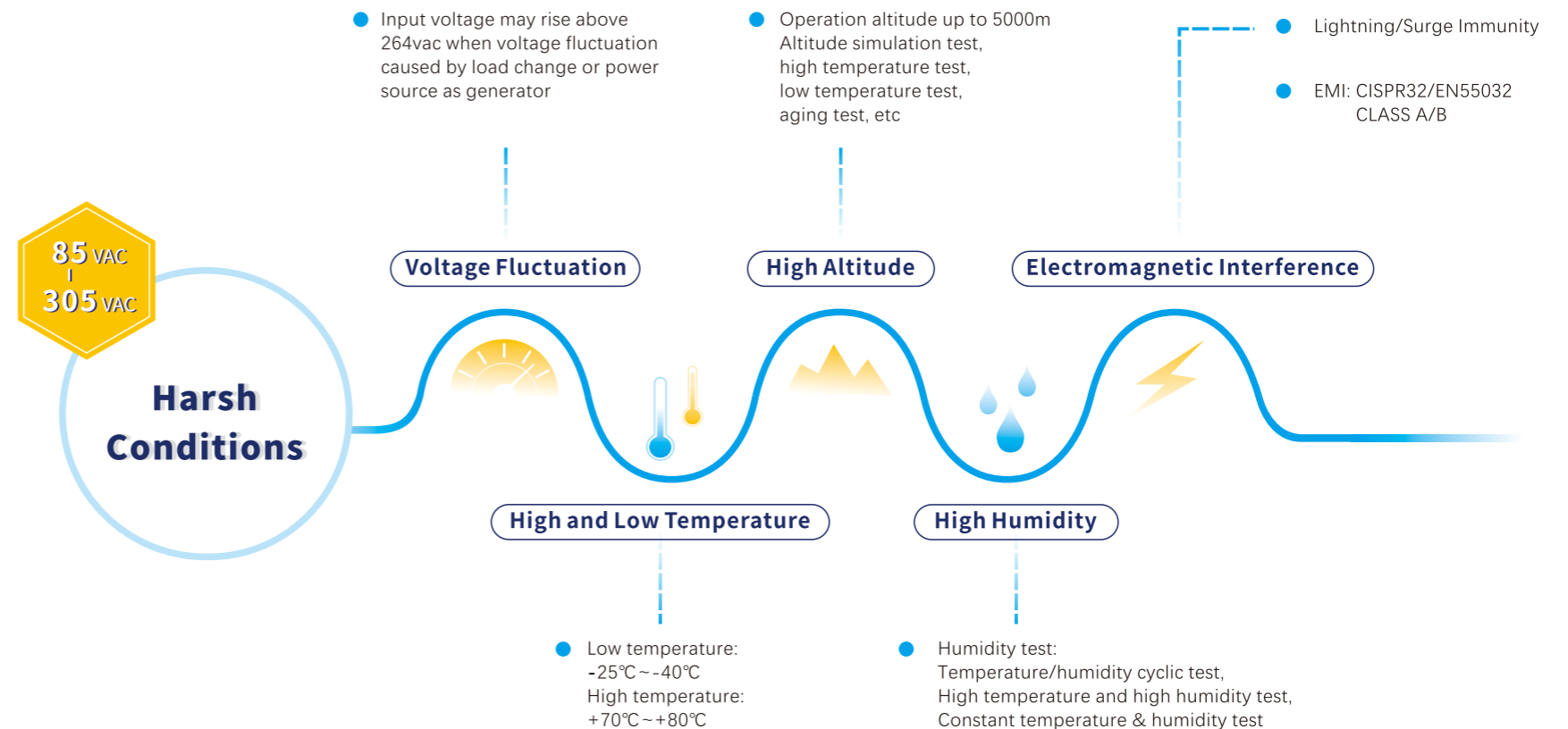


MORNSUN provides one-stop solutions of power supplies, which has endeavored to offer 5000+ high-quality products including AC/DC converter, DC/DC converter, AC/DC enclosed switching power supply, transceiver module, signal conditioning module, IGBT driver, LED driver, EMC auxiliary device, etc. for different demands and numerous industries, such as industrial automation, charging station, photovoltaic, telecommunications, medical, smart home, automotive industry, and more. Guided by the service principle of “trustworthy” and distribution network more than 40+ countries, MORNSUN offers the best product, fast and local service and efficient pre-sale and after-sales for client.



Harsh Conditions in Different Industries

MORNSUN 85-305VAC Input AC/DC converters ensure the stable and reliable performance under almost any harsh conditions.



305RAC -Reliable under All Conditions

305

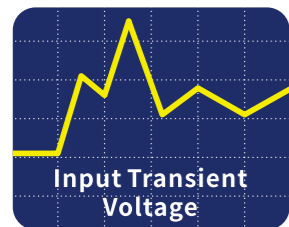
85-305VAC input voltage

RAC (Reliable under All Conditions)

Best-in-class performance. Handle the voltage fluctuation easily. High-input-voltage capability, high-low-temperature reliability, high-humidity reliability, high-altitude reliability and good EMC performance under almost any harsh conditions.

305RAC AC/DC converters with 85-305VAC/100-430VDC input, which solves the three major shortcomings of conventional 85-264VAC input products:

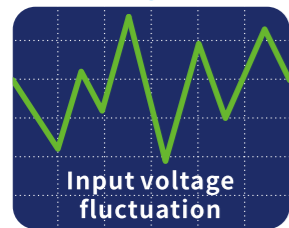
1. It works normally under the high input transient voltage (there are lightning and surge in harsh environment).
2. It solves the power failure caused by voltage fluctuation in grid power distribution or generator.
3. Its ultra wide input voltage of 85-305VAC covers the standard voltage of 110/220/277VAC.



85-305VAC input voltage ensure the module is running normally when there is an input transient voltage.

Common issue:

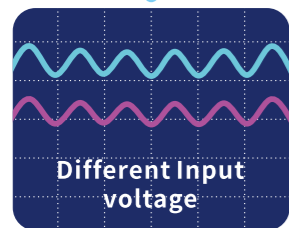
- There are lightning and surge in harsh environment, the input transient voltage is over 264VAC, the normal products with 85-264VAC input may be damaged.



85-305VAC input voltage ensure the module will not be damaged by voltage fluctuation of power grid.

Common issue:

- Voltage of the power grid is over 264VAC during the off-peak hours, the electrolytic capacitor inside the power supply may be damaged.
- Voltage fluctuation is large when powered by generator, the electrolytic capacitor inside the power supply may be damaged.



85-305VAC input voltage ensure the module covers various input requirements.

- 100/110/130/220/230/240/277VAC

Reliability and Availability of 305RAC

1. Optimal circuit topologies.
Suitable topology can reduce voltage, current and thermal stress on build-in components.
2. Components quality and reliability.
It is critical to select the correct grade of components for the expected operating conditions.
3. Manufacturing process.
Manufacturing process is critical to improving end-product quality.

4. Verification for expected operating conditions.

To ensure the products can be used in applications with higher requirements for vibration, altitude, temperature, etc, we conduct various types of testing for reliability of our products.

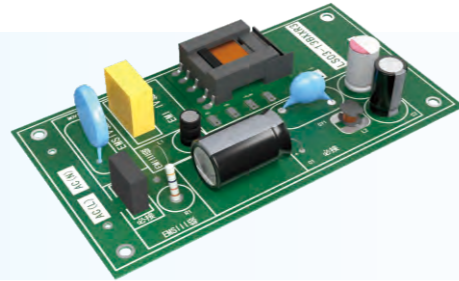
Types	Test	Test
Reliability testing	Low temperature working	Thermal shock
	Low temperature storage	Low temperature altitude
	High temperature working	High temperature low pressure
	High temperature aging	High temperature altitude
	High temperature storage	High temperature high humidity
	Constant temperature & humidity	Input ON/OFF
	Alternating temperature & humidity	Short-circuit for long time
	Drop test	Constant humidity and temperature(500h)
	Sine vibration	High-temperature aging(1000h)
	Temperature cycling	
Structural testing	Strength test of the terminal and the mounting device	

305RAC Product Design and Verification

Design optimization allied with qualified components contribute to the reliable performance.

- Key points of the qualified components, such as filter, capacitor, MOSFET, diode, etc.

- High withstand voltage
- Derating of voltage stress



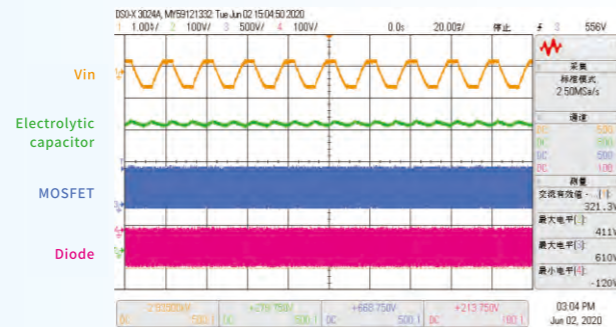
- Design optimization and verification for the harsh environment to ensure the module's reliability, and components inside have enough margin of voltage stress.

Test of LM150-23BXX:

Test 1: Vin=321VAC

MOSFET: rated=650V, actual stress_(Max)=610V;

Diode: rated=150V, actual stress_(Max)=120V;

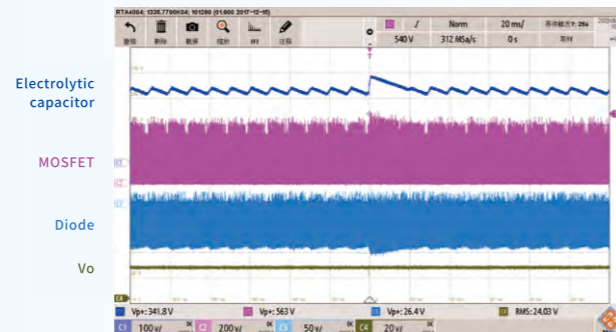


Test 2: Lightning/Surge Immunity

Electrolytic capacitor: actual stress_(Max)=341.8V;

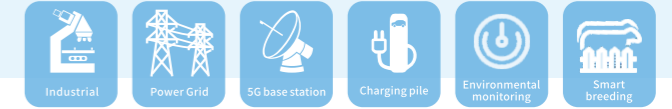
MOSFET: actual stress_(Max)=563V;

Diode: actual stress_(Max)=124V;



305RAC Product Applications

85-305VAC input AC/DC converters can be used in applications of commercial indoor environment, industrial indoor and outdoor environment, special industrial outdoor environment, etc.



- Typical application: DC charging point

Common issue:

1. Large voltage fluctuation of power grid in harsh environment,
2. Input voltage may up to 290VAC as voltage unbalance of three-phase ac distribution system, the electrolytic capacitor inside the power supply may be damaged.

Solution: LMxx-23Bxx



- Typical application: Street lighting controller

Common issue:

There are lightning and surge in harsh environment, the input transient voltage is over 264VAC, the normal products with 85-264VAC input may be damaged.

Solution: LDExx-23Bxx



305RAC Product Applications



15-150W Enclosed Power Supplies LM Series



Isolation voltage up to 4000VAC



Meets 5000m altitude requirement



CE/CCC/UL Certification



Typical application: Protective relay

Common issue: The protective relay is directly applied to the electrical power grid, the working environment it is in is very harsh. Considering reliability, there are high requirements for EMC protection in protective relay.

Solution: **LO30-23B12E** This AC DC power module has an excellent EMS performance of ESD (IEC/EN61000-4-2 Contact $\pm 8KV$ / Air $\pm 15KV$) and Surge (IEC/EN61000-4-5 Line to line $\pm 2KV$ / line to ground $\pm 4KV$), and meets high insulation requirements, while solving the problem of large voltage fluctuations in power grid.



Typical application: Lighting in harsh and hazardous area

Common issue: Lighting in harsh and hazardous areas needs to withstand harsh conditions, such as large voltage fluctuation, extreme temperatures, dust, or moisture.

Solution: **LMF320-23B12** This AC/DC enclosed power module has an ultra-wide input voltage of 85-305VAC with PFC function, while also having conformal coating to improve its reliability.



Specification							
Series	LM15-23B	LM25-23B	LM35-23B	LM50-23B	LM75-23B	LM100-23B	LM150-23B
Power (W)	15	25	35	50	75	100	150
Output Voltage (VDC)	85 - 305VAC/120 - 430VDC						
Nominal output voltage and current (Vo/Io)	3.3V/3.0A (2.85-3.6)	3.3V/6A (2.85-3.6)		5V/10A (4.5-5.5)	5V/14A (4.5-5.5)	5V/18A (4.5-5.5)	12V/12.5A (10.2-13.8)
	5V/3.0A (4.5-5.5)	5V/5A (4.5-5.5)	5V/7A (4.5-5.5)	12V/4.2A (10.2-13.8)	12V/6A (10.2-13.8)	12V/8.5A (10.2-13.8)	15V/10A (13.5-18)
	12V/1.3A (10.2-13.8)	12V/2.1A (10.8-13.2)	12V/3A (10.2-13.8)	15V/3.4A (13.5-18)	15V/5A (13.5-18)	15V/7A (13.5-18)	24V/6.5A (21.6-28.8)
	15V/1.0A (13.5-18)	15V/1.7A (13.5-16.5)	15V/2.4A (13.5-18)	24V/2.2A (21.6-28.8)	24V/3.2A (21.6-28.8)	24V/4.5A (21.6-28.8)	36V/4.3A (32.4-39.6)
	24V/0.625A (21.6-28.8)	24V/1.1A (22-27.6)	24V/1.5A (21.6-28.8)	36V/1.45A (32.4-39.6)	36V/2.1A (32.4-39.6)	36V/2.8A (32.4-39.6)	48V/3.3A (43.2-52.8)
	48V/0.32A (42-54)	48V/0.57A (42-54)		48V/1.1A (43.2-52.8)	48V/1.6A (43.2-52.8)	48V/2.3A (43.2-52.8)	
Efficiency (Max.)	83.0%	87.0%	87.0%	87.0%	90.5%	91.0%	89.0%
Over-current protection (Self-recovery)	$\geq 110\%$ Io	110%-300% Io	110%-200% Io				110%-150% Io
Output short circuit protection	Hiccup, continuous, self-recovery		Hiccup or turning off, continuous, self-recovery		Hiccup, continuous, self-recovery		
Isolation voltage	Input-Output: 4kVAC, Input-PE: 2kVAC, Output-PE: 1.25kVAC						
Operating temperature	-30°C to +70°C						
EMC	EMI	CISPR32/EN55032 CLASS B					
	EMS	IEC/EN 61000-4-2 Contact $\pm 6KV$ / Air $\pm 8KV$, IEC/EN 61000-4-3 10V/m, IEC/EN61000-4-6 10 Vr.m.s, IEC/EN61000-4-4,5,11					
Safety standard	IEC/EN/UL62368/EN60335/GB4943		IEC/EN/UL62368/GB4943, IEC/EN61558-1, 2-16			IEC/EN/UL62368/GB4943/EN60335, IEC/EN61558-1, 2-16	
Dimension (LxWxH) (mm)	65 x 55 x 25	80 x 55 x 25	99 x 82 x 30	99 x 82 x 30	99 x 97 x 30	129 x 97 x 30	159 x 97 x 30
Weight (Typ.)	90g	115g	170g	190g	220g	305g (325g: 5V)	410g (430g: 12V/15V)

▶ 75-320W Enclosed Power Supplies LMF(PFC) Series



Active PFC



CE/CCC/UL Certification



Isolation voltage up to 4000VAC



▶ 1-15W Cost-effective DIY LS-R3 Series



Ease of use



Flexible peripheral



Controllable cost

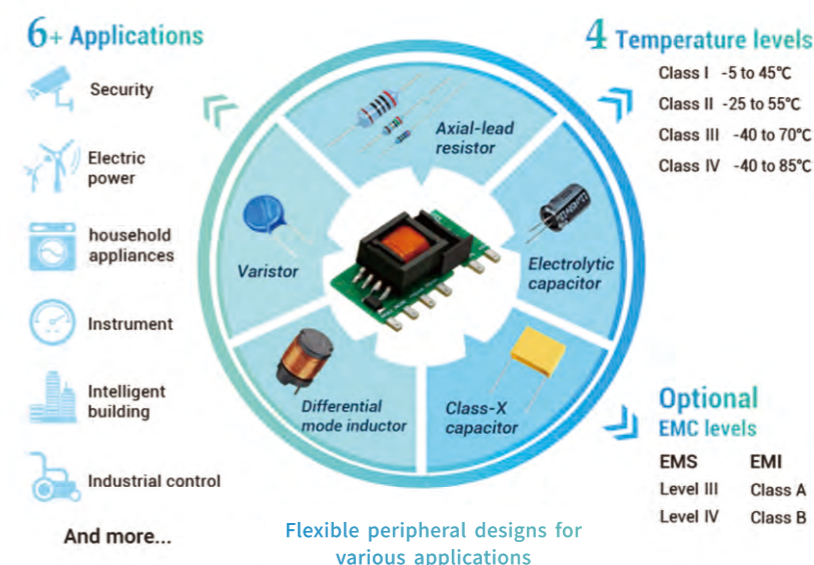


LS-R3 series

Specification

Series	LMF75-23B	LMF100-23B	LMF150-23B	LMF200-23B	LMF320-23B
Power (W)	75	100	150	200	320
Output Voltage (VDC)	85-305 VAC/88 - 430 VDC				
Nominal output voltage and current (Vo/Io)	5V/15A (4.75-5.5) 12V/6.3A (11.4-13.2) 15V/5A (14.3-16.5) 24V/3.2A (22.8-26.4) 48V/1.6A (45.6-52.8)	12V/8.5A (11.4-13.8) 15V/6.7A (14.3-16.5) 24V/4.2A (22.8-27.6) 48V/2.1A (45.6-55.2)	12V/12.5A (10.2-13.8) 15V/10A (13.5-18) 24V/6.3A (21.6-28.8) 48V/3.2A (45.6-55.2)	5V/40A (4.5-5.5) 12V/26.7A (10.2-13.2) 15V/21.4A (13.5-18) 24V/13.4A (20-26.4) 48V/6.7A (41-56)	5V/60A (4.5-5.5) 12V/26.7A (10.2-13.2) 15V/21.4A (13.5-18) 24V/13.4A (20-26.4) 48V/6.7A (41-56)
Efficiency (Max.)	88.0%	87.0%	88.0%	85.0%	90.0%
Power Factor	0.93	0.93	0.98	0.95	0.95
Over-current protection (Self-recovery)	≥105% Io	105%-150% Io	105%-150% Io	105%-150% Io	105%-200% Io
Output short circuit protection	Constant current, continuous, self-recovery		Hiccup, continuous, self-recovery		
Isolation voltage	Input-Output: 4kVAC, Input-PE: 2kVAC, Output-PE: 1.25kVAC				
Operating temperature	-30°C to +70°C				
EMC	EMI	CISPR32/EN55032 CLASS B CISPR32/EN55032 CLASS B	CISPR32/EN55032 CLASS B, CISPR32/EN55032 CLASS B, IEC/EN61000-3-2 CLASS A		
	EMS	IEC/EN 61000-4-2 Contact ±6KV /Air ±8KV; IEC/EN 61000-4-3 10V/m; IEC/EN 61000-4-4 ±2KV; IEC/EN 61000-4-5 ±1KV/±2KV; IEC/EN61000-4-6 10 Vr.m.s			
Safety standard	IEC/EN/UL62368/EN60335/GB4943, IEC/EN61558		UL/EN/IEC/62368/EN60335/GB4943		
Dimension (LxWxH) (mm)	179x 99 x 30			215 x 115 x 30	
Weight (Typ.)	460g	500g	750g	475g	750g

To balance the design cycle, cost, reliability, ease of use, dimensions, performance, and personalization of power supply, LS-R3 series is the first-of-its-kind cost-effective solution. By adopting flexible peripheral circuits, it can be used in a wide range of applications.



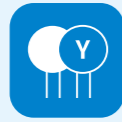
Specification

Product Category	Series	Power (W)	Output Voltage (VDC)	Isolation Voltage (VAC)	Operating Temperature	Package	Dimension (mm)	Certification
Non-isolated LS-K	LSxx-K3BxxSS	1, 3, 5	5, 12, 18	—	-40°C to +85°C	SIP	16.13*15.10*9.50	CE
	Cost-effective LS-R3	LS03-13BxxR3	3	3.3, 5, 9, 12, 15, 24			3000	26.40*12.58*12.00
LS05-13BxxR3		5	32.00*17.20*15.05					
LS10-13BxxR3		10	44.50*24.00*15.00					
LS10-13BxxR3P		10	35.00*18.00*11.00					
LS08-13BxxSS		8	5, 9, 12, 15, 24					
LS10-13BxxSS		10						
LS15-13BxxSS(-F)		15						
LS03-15BxxSR2S(-F)		1						
LS05-15BxxSR2S	5							
LS05-15BxxSR2S(-F)	3							
LS01-15BxxSS(-F)	1	5, 9, 12, 15, 24						

▶ 1-30W Compact LD Series



Industrial operating temperature
-40°C to 85°C



2-Y-capacitors design
match for the home
appliances

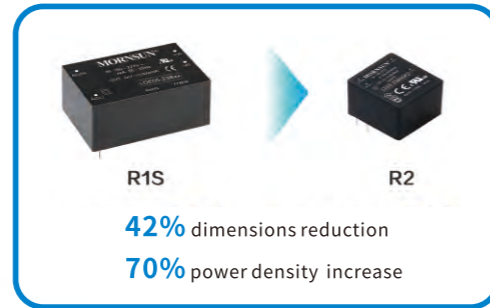
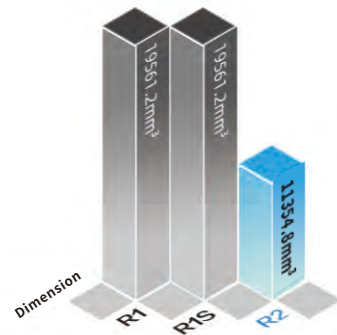


Safety certifications
IEC/EN/UL62368,
EN60335/61558



LD-R2 series

LDxx-23BxxR2 series includes powers of 3W, 5W, 10W, 15W, 20W and 30W. These modules feature an operating temperature range of -40°C to +85°C, no-load power consumption as low as 0.1W, EMI class B without external components requirement. With the safety certifications of EN60335/61558, UL/EN/ICE62368, they are suitable for a wide range of commercial and industrial applications.

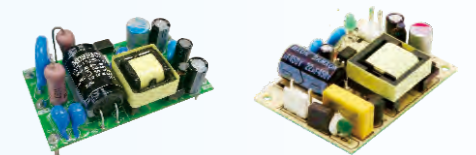


▶ 5-60W High-reliable LH Series



Specification								
Series	Power (W)	Output Voltage (VDC)	Isolation Voltage (VAC)	Operating Temperature	Package	Dimension (mm)	NO. of Outputs	Certification
LHE10-23Bxx	10	3.3,5,9,12,15,24	4000	-40°C to +85°C	DIP	55.00*45.00*21.00	1	CE
LHE15-23Bxx	15	3.3,5,9,12,15,24,48				62.00*45.00*22.50	1	CE,UL,CB
LHE25-23Bxx	25	3.3,5,9,12,15,24,48				70.00*48.00*23.50	1	CE,UL,CB
LHE40-23Bxx	40	3.3,5,9,12,15,24,48				89.00*63.50*25.00	1	CE
LHE60-23Bxx	60	5,9,12,15,24,48	109.00*58.50*30.00	1		CE		
LH05-13Bxx	5	5,9,12,15,24	3000	-40°C to +70°C		55.00*45.00*21.00	1	CE,UL,CB
LH10-13Bxx	10	5,9,12,15,24				55.00*45.00*21.00	1	CE,UL,CB
LH15-13Bxx	15	3.3,5,9,12,15,24,48				62.00*45.00*22.50	1	CE,UL,CB
LH20-13Bxx	20	3.3,5,9,12,15,24				70.00*48.00*23.50	1	CE,UL,CB
LH25-13Bxx	25	3.3,5,9,12,15,24,48				70.00*48.00*23.50	1	CE,UL,CB

▶ 5-15W Open frame LO Series



Specification							
Series	Power (W)	Nominal Output Voltage and Current (Vo/Io)	Isolation Voltage (VAC)	Operating Temperature	Dimension (mm)	NO. of Outputs	EMC Characteristics/Certification
LO05-13D0505-01E	5	5.0V/900mA 5.0V/100mA	3000	-40°C to +70°C	56.20*32.10*26.00	2	EFT surge immunity: ±4KV Perf. Criteria B
LO10-13Bxx	10	3.3, 5, 9, 12, 15, 24	3000	-25°C to +70°C	60.00*42.00*16.30	1	Meets UL/EN/IEC62368, EN/UL60335 standards
LO10-23D0524-02E	10	5V/1000mA 24V/200mA	4000	-40°C to +70°C	61.00*45.00*28.00	2	CE
LO15-23D0524-02E	15	5V/1000mA 24V/200mA	4000	-40°C to +70°C	76.00*45.00*26.00	2	CE

Specification								
Product Category	Series	Power (W)	Output Voltage (VDC)	Isolation Voltage (VAC)	Operating Temperature	Package	Dimension (mm)	Certification
LD-R2	LD03-23BxxR2	3	3.3, 5, 9, 12, 15, 24	4000	-40°C to +85°C	DIP	25.40*25.40*17.60	CE,UL,CB *LD15/20-R2 design Meets IEC/EN60601-1/ANSI/AAMI ES60601-1 Certification standards (2xMOPP)
	LD05-23BxxR2	5		4000			25.40*25.40*17.60	
	LD10-23BxxR2	10		4000			40.00*25.40*21.00	
	LD15-23BxxR2	15		4000			47.60*26.80*23.50	
	LD20-23BxxR2	20		4000			52.40*27.20*24.00	
	LD30-23BxxR2	30		4000			69.50*39.00*24.00	
	LD05-23BxxR2-M	5		4000			45.70*25.40*21.50	
	LD10-23BxxR2-M	10		4000			52.40*27.20*24.00	
LDE-23B	LDE02-23Bxx	2	-40°C to +70°C	4000	-40°C to +70°C	DIP	33.70*22.20*18.00	CE,UL,CB
	LDE05-23Bxx	5		4000			50.80*25.40*15.36	
	LDE10-23Bxx	10		4000			53.80*28.80*19.00	
LD	LD10-13Bxx	10	-25°C to +70°C	3000	-25°C to +70°C	DIP	53.80*28.80*19.00	CE,UL,CB
	LD05-23Bxx	5		3000			50.80*25.40*15.16	
	LD02-10Bxx	2		3000			33.70*22.20*18.00	
	LD01-10Bxx	1		3000			33.70*22.20*18.00	

► 15-50W open-frame LO-E series for electric power

- Wide input voltage range: 85-305VAC/88-430VDC
- Shutdown duration >100ms
- Floating voltage <3VAC, ensuring back-end signal acquisition precision
- Operating temperature range: -40°C to +85°C
- EMI performance meets CISPR32/EN55032 CLASS B
- EMS performance meets IEC/EN61000-4-2/3/4/5/6/11
- Meets impulse voltage requirements of 1.2/50us 5KV
- Operating up to 5000m altitude



Specification			
Series	LO15-23xxE	LO30-23xxE	LO50-23xxE
Power (w)	15	30	50
Output Voltage (VDC)	85-305 VAC/88 - 430 VDC		
Nominal output voltage and current (Vo/Io)	3.3V/3A(2.97-3.63) 5V/3A(4.5-5.5) 12V/1.3A(10.8-13.2) 15V/1A(13.5-16.5) 24V/0.7A(21.6-26.4)	3.3V/6A(2.97-3.63) 5V/6A(4.5-5.5) 12V/2.5A(10.8-13.2) 15V/2A(13.5-16.5) 24V/1.3A(21.6-26.4)	3.3V/10A(2.97-3.63) 5V/10A(4.5-5.5) 9V/5.6A(8.1-9.9) 12V/4.2A(10.8-13.2) 15V/3.4A(13.5-16.5) 24V/2.1A(21.6-26.4) 27V/1.9A(24.3-29.7) 48V/1.1A(43.2-52.8)
Efficiency (Max.)	85.0%	88.0%	89.0%
Over-current protection (Self-recovery)	≥120% Io		≥110% Io
Output short circuit protection	Hiccup, continuous, self-recovery		
Isolation voltage	Input-Output: 4kVA, Input-PE: 2kVAC, Output-PE: 0.5kVAC		
Operating temperature	-40°C to +85°C		
EMC	EMI	CISPR32/EN55032 CLASS B, CISPR32/EN55032 CLASS B	
	EMS	IEC/EN61000-4-2 Contact ±8KV/ Air ±15KV; IEC/EN61000-4-3 10V/m; IEC/EN61000-4-4 ±4KV; IEC/EN61000-4-5 Line to line ±2KV/line to ground ±4KV; IEC/EN61000-4-6 10 Vr.m.s	
Safety standard	IEC/EN/UL62368/EN60335/GB4943		
Dimension (LxWxH) (mm)	87.5×50×22	105×50×30	132×50×27.1
Weight (Typ.)	53g (58g: 15V/24V)	110g	145g

305RAC

• • • • Reliable under All Conditions • • • •

- ⚡ 85-305VAC Input
- 🔥 5,000m ASL
- 🌡️ -40°C to +80°C
- 💧 Humidity proof
- 📄 EMI meets CISPR32/EN55032 CLASS A/B



Website

