

Product Presentation

LD-R2 series



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1. Development background

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Market potential:

- Global: **\$414M** (North America: \$53M)

Market demands:

- High output power under +85°C
- Input voltage up to 305VAC
- Smaller size
- Lower cost
- 60335 & 61558 certification for household applications



Industrial Control



Electricity



Medical



White Goods

MORNSUN released new LD-R2 series to meet the latest market demands



2. Product Layout

-M version: different pin layout

30W	LD30-23B-R2	LD30-23B-R2A2S	LD30-23B-R2A4S	
20W	LD20-23B-R2	LD20-23B-R2A2S	LD20-23B-R2A4S	
15W	LD15-23B-R2 LD15-23B-R2-M	LD15-23B-R2A2S	LD15-23B-R2A4S	
10W	LD10-23B-R2 LD10-23B-R2-M	LD10-23B-R2A2S	LD10-23B-R2A4S	
5W	LD05-23B-R2 LD05-23B-R2-M	LD05-23B-R2A2S	LD05-23B-R2A4S	LD05-23BxxWR2
3W	LD03-23B-R2			LD03-23BxxWR2



PCB mount



Chassis mount



Din Rail



Wire lead



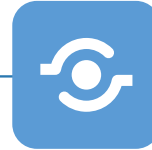
3. Product Features

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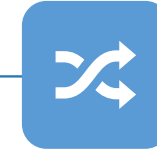
1. Low cost

5%~23% lower than old series



2. Small size

Up to **54.5%** smaller than old series & competitors



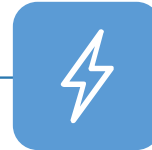
3. Wide input voltage

85 ~ 305VAC input voltage range



4. Wide working temp.

-40°C to +85°C working temperature



5. High isolation

4000VAC reinforce isolation for all series



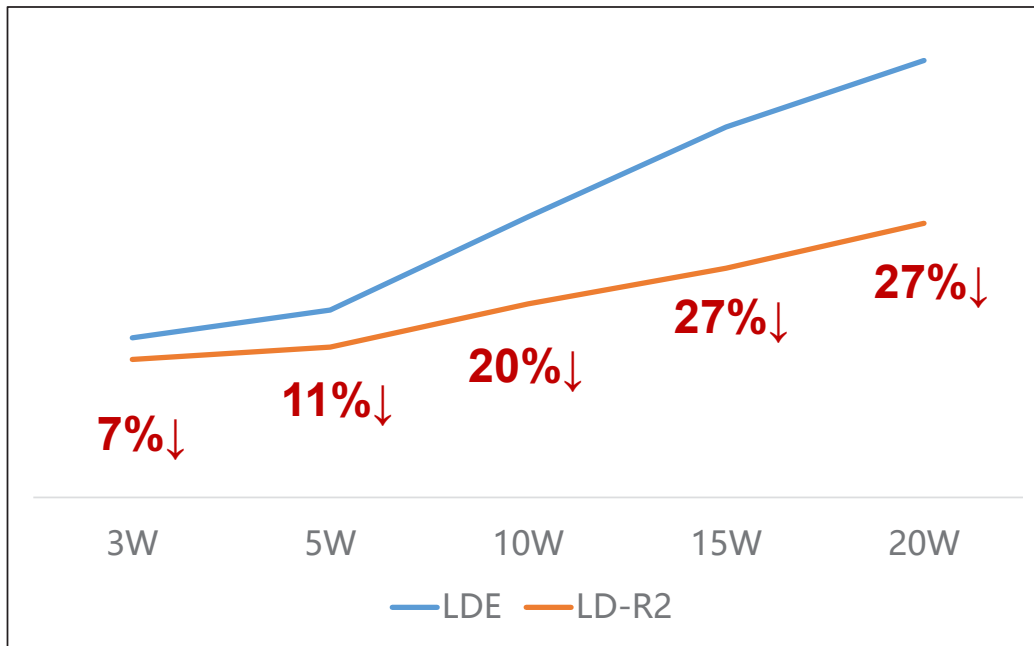
6. Multiple Certification

UL/IEC/EN62368 & **EN60335 & EN61558**



3. Product Features | Low cost

- Cost **7%~27% lower** than old series due to automation and technology improvement



Automation

- Completely mechanized winding transformer
- Through hole reflow soldering
- High production efficiency
- Less labor



Technology

- Few components
- Small size
- Compact circuit

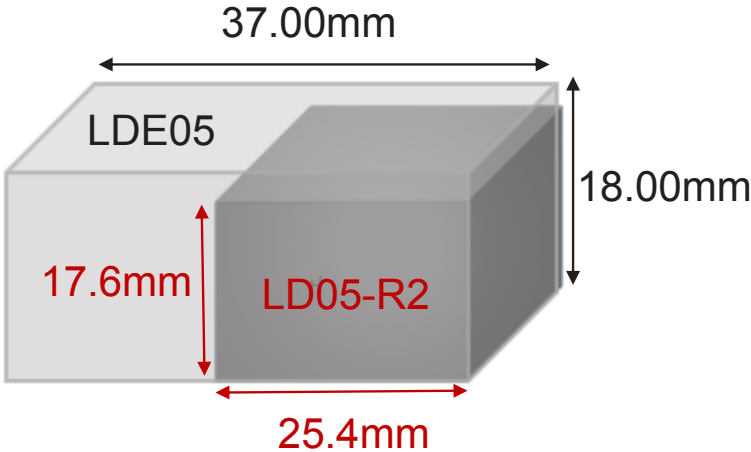


3. Product Features | Small size

- Smaller than old LDE series & mainstream competitor

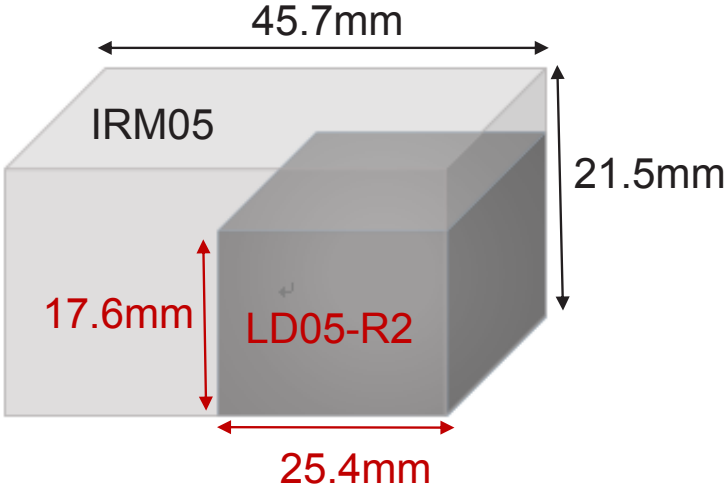
Comparing with old LDE 5W series:

33% ↓ smaller



Comparing with IRM 5W series:

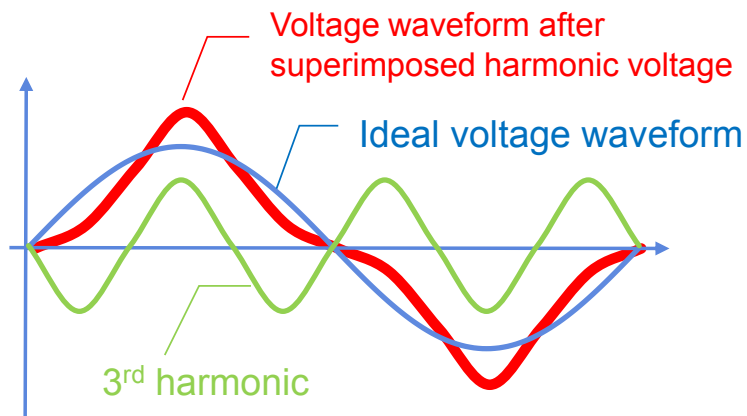
54.5% ↓ smaller



3. Product Features | Wide input voltage

- Input voltage **85~305VAC**, better protection and wider coverage

1) Protect customer system from unstable grid and risks of input overvoltage.



- ✓ Unstable grid: In specific areas like India, input voltage could over 300VAC
- ✓ Large harmonic: In some industries like charging pile, due to harmonics, the input voltage is distorted and could over 300VAC

2) Cover global mainstream input voltage.



100VAC Japan

230VAC EU



277VAC USA



3. Product Features | Wide working temp.

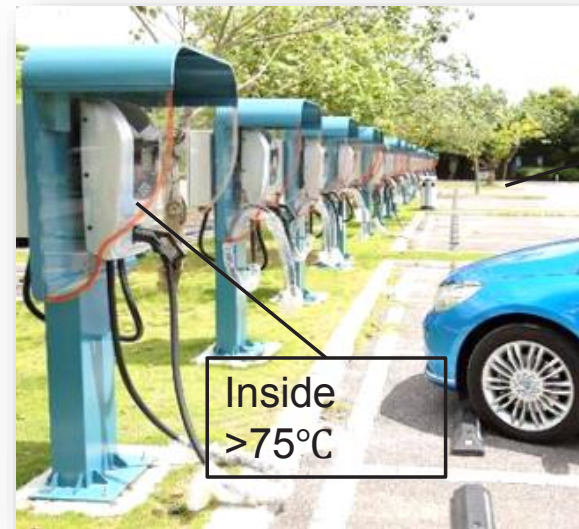
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- Working temp. **-40°C~+85 °C**, widely used in various environment



-40°C in winter

When equipment be sold globally, there are lots of regions can easily go to -40°C in winter



Ambient >50°C

Inside >75°C

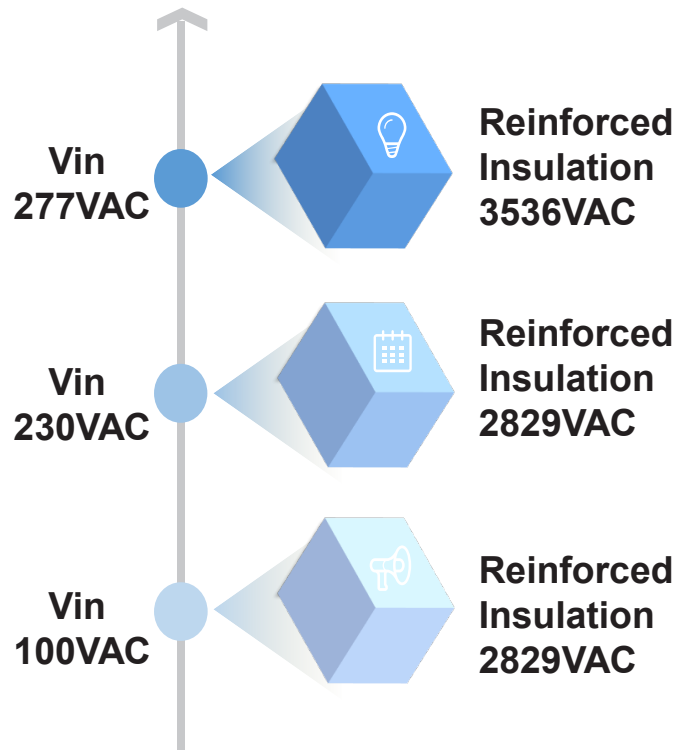
In 2020, the highest temperature in CA is +54.4°C outside, and temp. inside equipment could be >75°C



3. Product Features | High isolation

- Meet reinforced insulation **4000VAC**, to make sure reliability

IEC62368 requirements:



VAC	5W	10W	15W	20W
MORNSUN LD-R2	4000	4000	4000	4000
IRM	3000	3000	3000	3000
RAC-K/277	4200	4000	3000	3000

- According to IEC62368 standard, for the 277Vin grid voltage, reinforced insulation should be **3536kVAC**
- MORNSUN LD-R2 series all meet **4000VAC**

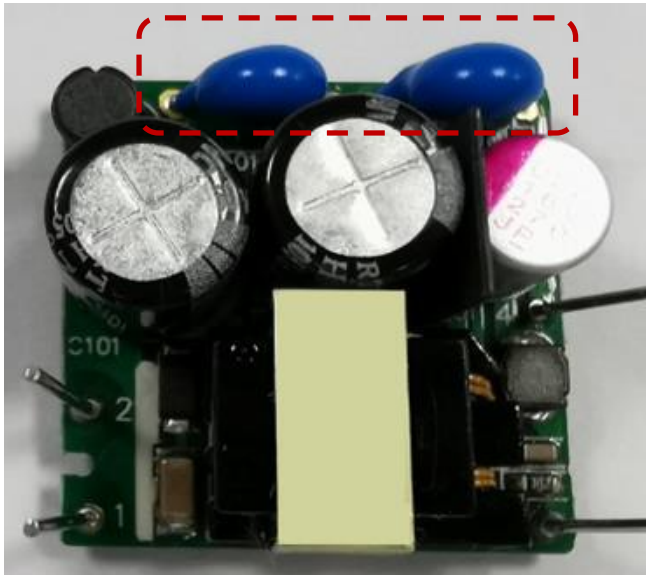


3. Product Features | Multiple Certification

- Certified to **EN60335** and **EN61558**, perfectly use in household application

Household standards requirements:

1) Number of Y capacitors: 2 in series



LD-R2 series design with 2 Y caps

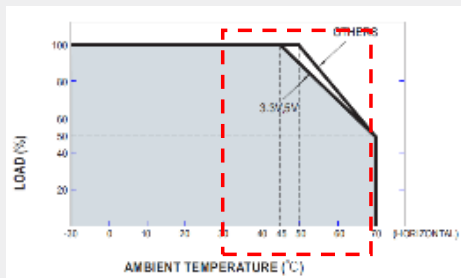
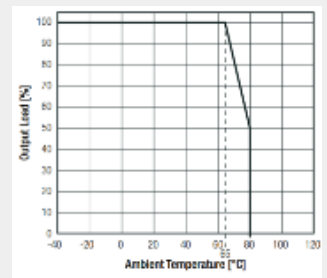
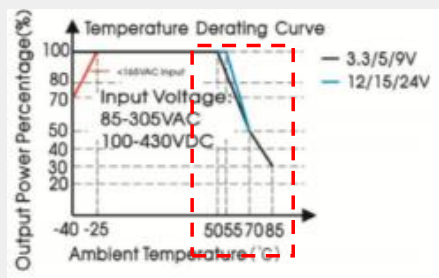
2) Safety distance: Stricter than industrial's

Positions	type	EN62368	EN60335	EN61558
L/N, before fuse (mm)	Cr	2.5	2.5	3
	Cl	1.8	2	3
Basic Insulation (mm)	Cr	2.5	2.5	3
	Cl	1.8	2	3
Supplementary Insulation (mm)	Cr	2.5	2.5	3
	Cl	1.8	2	3
Reinforced Insulation (mm)	Cr	5	5	6
	Cl	3.6	4	5.5

LD-R2 series design according to EN60335/61558



3. Product Features | Competitive analysis

Item	IRM-10	RAC10-K/277	MORNSUN LD10-23B05R2
Certification	IEC/UL/EN 62368, TP TC 004	IEC/UL/EN 62368, IEC/EN60335,	IEC/EN/UL62368 EN60335/EN61558 ▲ Meet EN60601
Input Voltage Range	85-305Vac	85-305Vac	85-305Vac
Dimension(mm)	45.7*25.4*21.5	52.5 x 27.4 x 23	40.00 x 25.40 x 21.00 ▲
Operating Temp.	-30~+70°C	-40~+80°C	-40~+85°C
Ripple & Noise	200mV(Typ.)	60mV(Typ.)	50mV(Typ.) ▲
Isolation	3000Vac	4000Vac	4000Vac ▲
Conducted Emission	Class B	-	PK 8.8dB lower than CLASS B limit ▲
Radiated Emission	Level 3, criteria A	10V/m, 80MHz-1GHz 3V/m, 1.5GHz-2GHz 1V/m, 2GHz-2.7GHz	6.5dB lower than CLASS B limit
De-rating			



4. Product Applications

The module AC/DC LD-R2 series is mainly used in **IOT** and **EV charging station** industry.



Household application

EV charging station application



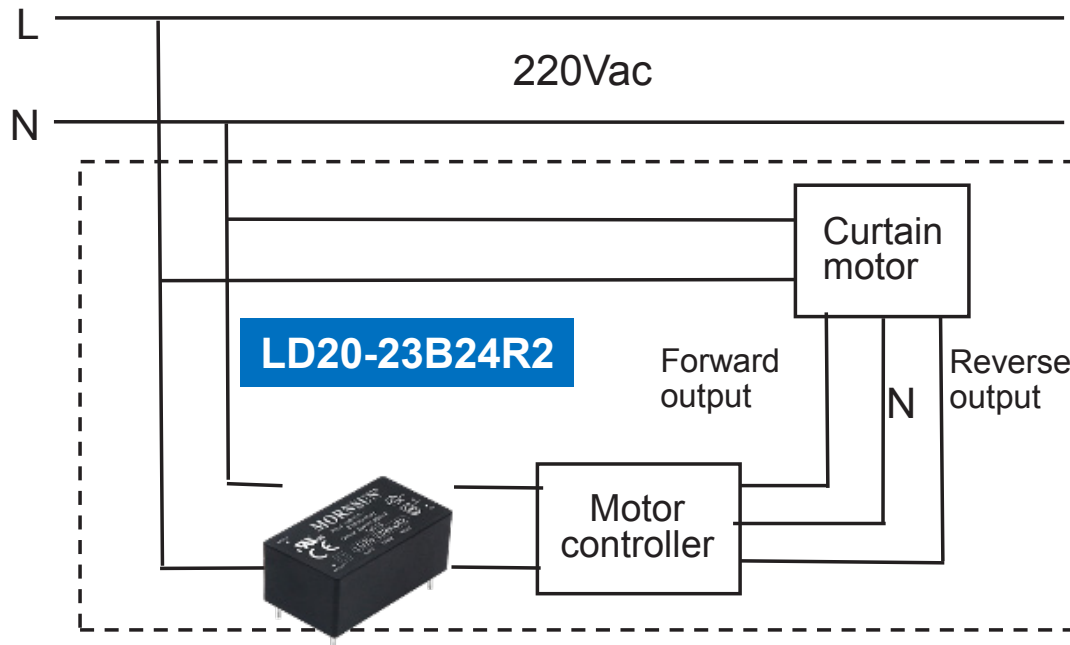
4. Product Applications | Smart curtain

Requirement for power supply :

- Limited space, requiring small size
- High isolation voltage: 4000VAC



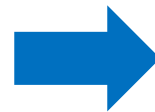
**LD20-23B24R2 to power Curtain motor/
Motor controller/ Power converter**



4. Product Applications | EV charging station

Requirement for power supply :

- Wide input voltage: up to 305VAC
- Wide working temperature (-40~85°C)
- Module design, stable quality
- Small size



Using LD30-23B12R2 as the main power of the whole AC charger control system, which can provide a reliable and stable dc output.

