

## Features

- Ultra-wide 85 - 264V AC and 100 - 370V DC input voltage range
- Accepts AC and/or DC input (dual-use of same terminal)
- Operating Temperature Range: -40~+70°C
- Approved to cURus, CE, RoHS
- Safety Standards to IEC/UL/EN62368-1
- Efficiency up to 78%
- EMC Class A & B
- Single output 3.3~24V DC



Ideal Power's 36LDE03-20Bxx 3W Encapsulated PCB Mount AC/DC Power Supply Converter Series are certified to cURus, CE, RoHS & IEC/EN/UL62368/EN60335/EN61558 Standards and comply with the relevant Efficiency Regulations. These are primarily used in ITE, Audio & Video Industries and customised solutions are available upon request.

## Models

Model Number	Output Power	Output Voltage and Current (Vo/Io) Nominal	Efficiency at 230V AC (%) Typ	Capacitive Load (µF) Max
36LDE03-20B03	3W	3.3V/700mA	66	6000
36LDE03-20B05	3W	5V/600mA	74	6000
36LDE03-20B09	3W	9V/330mA	75	1500
36LDE03-20B12	3W	12V/250mA	77	1500
36LDE03-20B15	3W	15V/200mA	77	1000
36LDE03-20B24	3W	24V/125mA	78	330

## Input Specifications

	Conditions	Min	Typ	Max	Unit
Input voltage range	AC input	85		264	VAC
	DC input	100		370	VDC
Input frequency		47		63	Hz
Input current	115V AC			80	A
	230V AC			45	A
Inrush current	115V AC		10		A
	230V AC		20		A
Leakage current	230V AC/50Hz		0.25mA RMS typ.		
Recommended External Input Fuse		1A/250V, Slow blow, required			
Hot Plug		Unavailable			

**Output Specifications**

Parameter	Conditions	Min	Typ	Max	Unit
Output voltage accuracy	3.3V output Others		±3 ±2		%
Line regulation	Full load		±0.5		%
Load regulation	10% - 100% load		±1		%
Ripple and Noise*	20MHz bandwidth (peak to peak value)		50	100	mV
Temperature coefficient			±0.2		%/°C
Short circuit protection		Hiccup, continuous, self-recovery			
Over current protection		≥ 150%Io, self-recovery			
Over voltage protection	3.3/5V DC output			≤7.5V DC	
	9V DC output			≤15V DC	
	12/15V DC output			≤20V DC	
	24V DC output			≤30V DC	
Minimum load		0			%
Hold up time	115V AC		10		ms
	230V AC		60		

**Note:** \* The “parallel cable” method is used for Ripple and noise test, please refer to AC-DC Converter Application Notes for specific information.

**General Specifications**

Parameter	Conditions	Min	Typ	Max	Unit
Isolation test	Input-Output Electric Strength Test for 1min, (Leakage current <5mA)	4000			V AC
Operating Temperature		-40		+70	°C
Storage Temperature		-40		+105	°C
Storage Humidity				95	%RH
Soldering Temperature	Wave-soldering	260 ± 5°C; time: 5 - 10s			
	Manual-welding	360 ±10°C; time: 3 - 5s			
Switching Frequency			100		kHz
Power Derating	-40°C to -25°C	1.0			°C
	+50°C to +70°C	1.0			
Safety Standard		IEC/EN/UL62368			
Safety Certification		IEC/EN/UL62368			
Safety Class		Class II			
MTBF		MIL-HDBK-217F@25°C ≥ 2602,000 h			

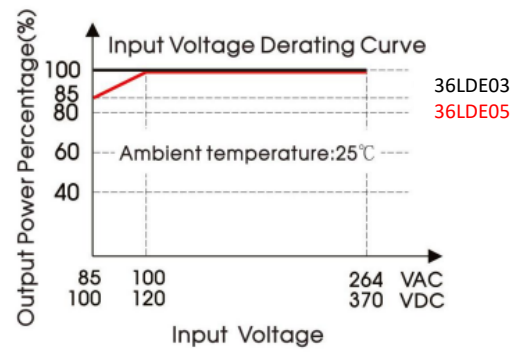
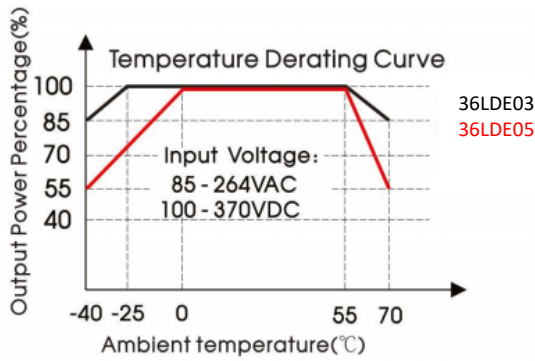
**Mechanical Specifications**

Case material		Black plastic, flame-retardant and heat-resistant (UL94 V-0)
Dimension	DIP	37 x 24.5 x 18mm
Weight	DIP	25.0g (Typ.)
Cooling method		Free air convection

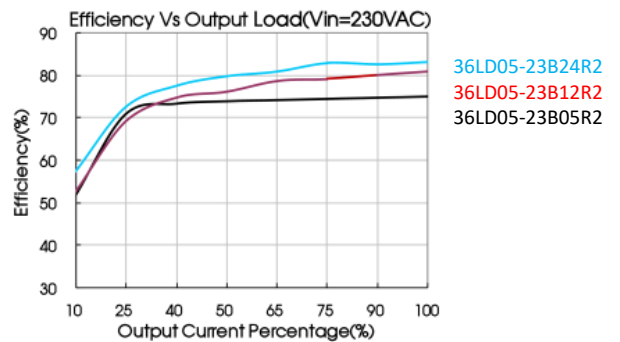
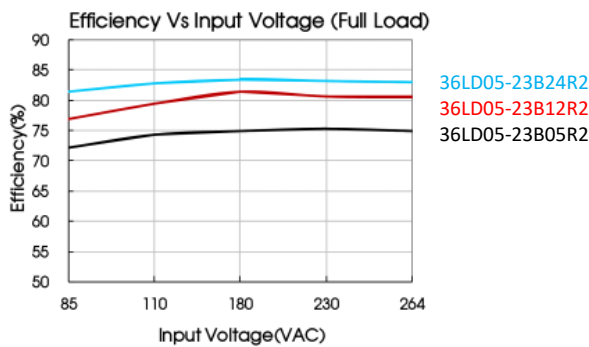
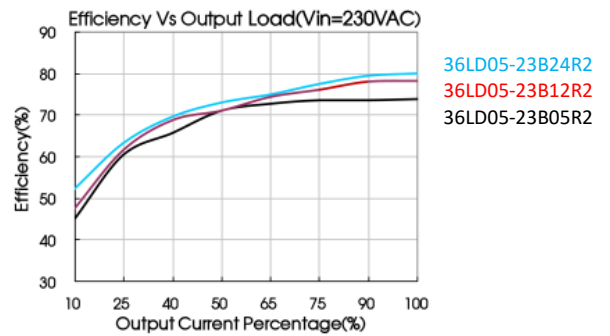
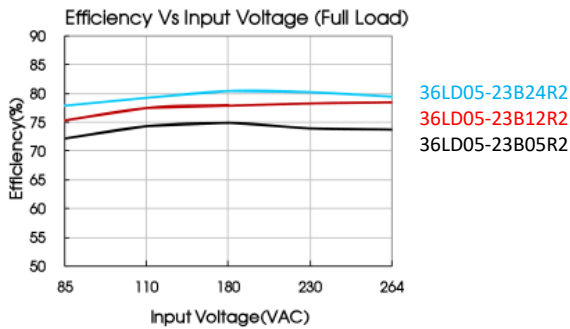
**Electromagnetic Compatibility (EMC)**

Emissions	CE	CISPR32/EN55032 CLASS A	
		CISPR32/EN55032 CLASS B (See Fig. 2 for recommended circuit)	
Emissions	RE	CISPR32/EN55032 CLASS A	
		CISPR32/EN55032 CLASS B (See Fig. 2 for recommended circuit)	
Immunity	ESD	IEC/EN 61000-4-2 Contact $\pm 6\text{KV}$ /Air $\pm 8\text{K}$	Perf. Criteria B
	RS	IEC/EN 61000-4-3 10V/m	Perf. Criteria A
	EFT	IEC/EN 61000-4-4 $\pm 2\text{KV}$ (See Fig. 1 for typical application circuit)	Perf. Criteria B
		IEC/EN 61000-4-4 $\pm 4\text{KV}$ (See Fig. 2 for recommended circuit)	Perf. Criteria B
	Surge	IEC/EN 61000-4-5 line to line $\pm 1\text{kV}$ (See Fig. 1 for typical application circuit)	Perf. Criteria B
		IEC/EN 61000-4-5 line to line $\pm 2\text{Kv}$ / line to ground $\pm 4\text{KV}$ (See Fig. 2 for recommended circuit)	Perf. Criteria B
	CS	IEC/EN61000-4-6 10Vr.m.s	Perf. Criteria A
Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11 0%, 70%	Perf. Criteria B	

**Characteristic Curve**

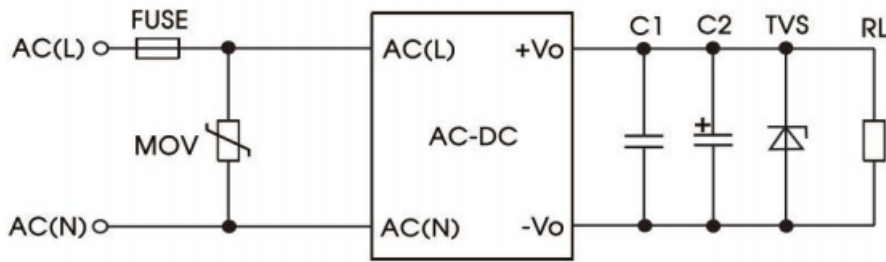


Note: ① With an AC input between 85-100VAC and a DC input between 100-120VDC, the output power must be derated as per temperature derating curves;  
② This product is suitable for applications using natural air cooling;



**Design Reference (Figure 1)**

## 1. Typical application



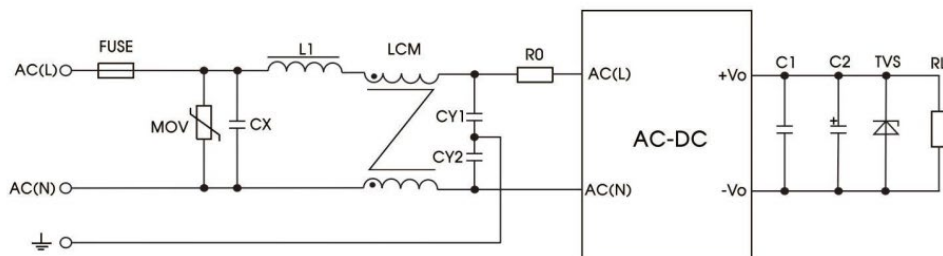
Element Model	MOV1	C1	C2	Fuse	TVS
36LDE03-20B03	S14K350	1 $\mu$ F	150 $\mu$ F	1A/250V, slow blow required	SMBJ7.0A
36LDE03-20B05	S14K350	1 $\mu$ F	150 $\mu$ F		SMBJ7.0A
36LDE03-20B09	S14K350	1 $\mu$ F	120 $\mu$ F		SMBJ12A
36LDE03-20B12	S14K350	1 $\mu$ F	120 $\mu$ F		SMBJ20A
36LDE03-20B15	S14K350	1 $\mu$ F	120 $\mu$ F		SMBJ20A
36LDE03-20B24	S14K350	1 $\mu$ F	68 $\mu$ F		SMBJ30A

**Output Filter Components:**

We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2 (refer to manufacture's datasheet). Choose a capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1 is a ceramic capacitor used for filtering high-frequency noise and TVS is a recommended suppressor diode to protect the application in case of a converter failure.

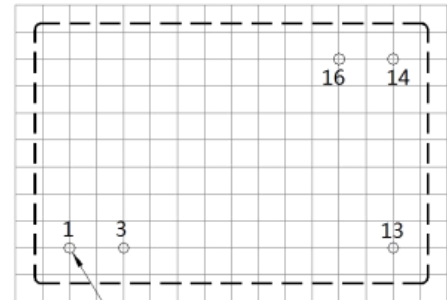
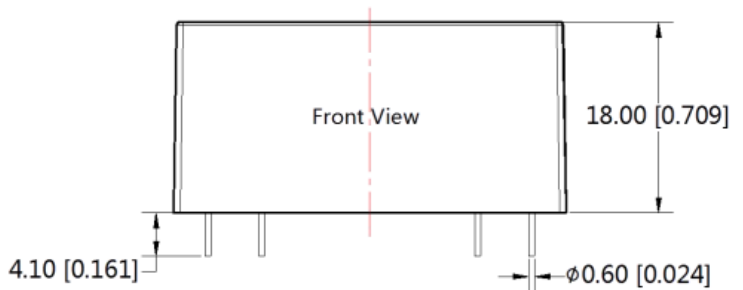
**Design Reference (Figure 2)**

## 2. EMC compliance recommended circuit

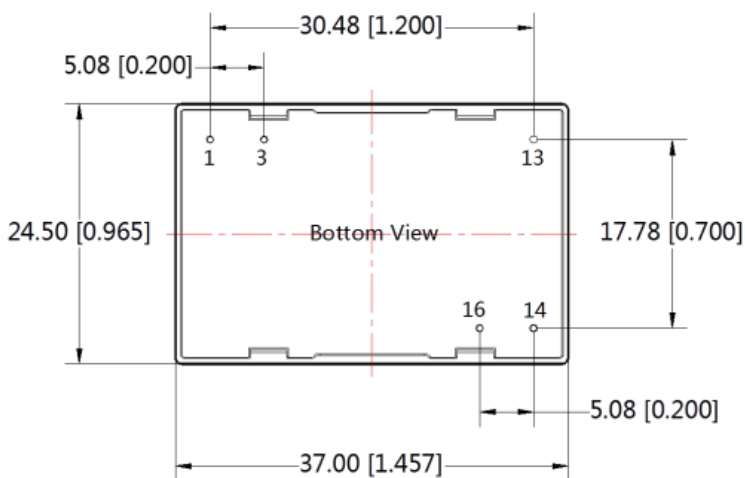


Element Model	Component Values
MOV	S14K350
CX	0.1 $\mu$ F/275VAC
L1	330uH/2.0A
LCM	10mH - 30mH, recommended to use MORNSUN's FL2D-Z5-103
CY1	1nF/400VAC
CY2	1nF/400VAC
FUSE	2A/250V slow-blow required
R0	33 $\Omega$ /3W

**Dimensions and Recommended Layout**

 THIRD ANGLE PROJECTION 


Note: Grid 2.54\*2.54mm



Note:  
 Unit :mm[inch]  
 Pin diameter tolerances : $\pm 0.10[\pm 0.004]$   
 General tolerances: $\pm 0.50[\pm 0.020]$

Pin-Out	
Pin	Function
1	AC(L)
3	AC(N)
13	NC
14	-Vo
16	+Vo

**Notes:**

- For additional information on Product Packaging please refer to [www.idealpower.co.uk](http://www.idealpower.co.uk). Packaging bag number: 58220003(DIP package); 58220022 (A2S/A4S package);
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^\circ\text{C}$ , humidity <75% with nominal input voltage.
- All index testing methods in this datasheet are based on our company corporate standards.
- We can provide product customization service, please contact our technicians directly for specific information.
- Products are related to laws and regulations: see "Features" and "EMC".
- Our products shall be classified according to ISO14001 and related environmental laws and regulations and shall be handled by qualified units.