



## FEATURES

- Ultra-low ripple noise domestic power supply  
RMS value: 200uV (Typ.), peak-to-peak value: 1mV (Typ.)
- Low floating ground voltage mV level
- Remote sense function, output voltage adjustable
- Semi-potted process, fanless design
- EMI compliant to CISPR32/EN55032 CLASS B
- Universal 85-264VAC or 100-370VDC input voltage
- Input withstand 305VAC/5s
- Operating ambient temperature range: -30°C to +70°C
- High I/O isolation voltage up to 4000VAC
- Output short circuit, over-current, over-voltage protection
- OVC II, 5000m altitude (design refer to EN/IEC60601)
- Design refer to UL/EN62368, ES/EN60601, EN61558, EN60335, GB4943, F47 (220-240VAC)

LRN65-20Bxx series is one of Mornsun's power supply for instruments and meters. It features AC input and at the same time accepts DC input voltage, low ripple & noise, common mode noise, differential mode noise, floating ground voltage are low, high efficiency and high reliability. These converters offer excellent EMC performance and design refer to IEC/EN61000-4, CISPR32/EN55032, UL/EN62368, ES/EN60601, EN61558, EN60335, GB4943, F47 (220-240VAC) standards and they are widely used in areas of medical, semiconductor, high-precision instruments, etc.

## Selection Guide

Part No.	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range ADJ (V)	Efficiency at 230VAC (%) Typ.	Capacitive Load (μF) Max.
LRN65-20B12	65	12V/5.42A	10.8-13.2	82	8000
LRN65-20B24		24V/2.71A	21.6-26.4	85	1500

## Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input		85	--	264	VAC
	DC input		100	--	370	VDC
Input Voltage Frequency			47	--	63	Hz
Input Current	115VAC		--	--	1	A
	230VAC		--	--	0.6	
Inrush Current	100VAC	Cold start	--	20	28	
	200VAC		--	40	58	
Power Factor	100VAC	Full load	PF≥0.95			
	200VAC		PF≥0.82			
Leakage Current	264VAC, 50Hz		<0.075mA RMS			
Input Temporary Over-voltage	Rated load output, 305VAC input		5s/time, interval 10s, product without damaging			
Hot Plug			Unavailable			

## Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range		--	±1	--	%
Line Regulation	Rated load		--	±0.4	--	
Load Regulation	230VAC		--	±0.625	--	
Minimum Load			0	--	--	

Ripple & Noise*	20MHz bandwidth (RMS value)	--	200	--	uV
	20MHz bandwidth (peak-to-peak value)	--	1	--	mV
Stand-by Power Consumption	230VAC	--	--	5	W
Temperature Coefficient	0°C to +50°C	--	±0.02	--	%/°C
Short Circuit Protection		Hiccup, continuous, self-recovery			
Over-current Protection		110% - 300% Io, self-recover			
Over-voltage Protection	12V	≤16V	Output voltage hiccup		
	24V	≤32V			
Starting Time		--	--	3	s
Hold-up Time	115VAC/230VAC	--	50	--	ms
Remote Sense	Total compensate voltage (RS+/RS- shorted to Vo+/Vo- respectively)				
ON/OFF Input Signal	Power on	ON/OFF LOW	0	--	0.8
	Power off	ON/OFF High	7	--	17

Note: \*The "Tip and barrel method" is used for ripple and noise test: by using a 12 twisted pair-wire terminated with a 0.1uF & 47uF parallel capacitor, please refer to Enclosed Switching Power Supply Application Notes for specific information.

## General Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Isolation	Input - output	Electric Strength Test for 1min., leakage current <5mA	4000	--	--	VAC
	Input - ⊕		2000	--	--	VDC
	Output - ⊕		708	--	--	VDC
Insulation Resistance	Input - output	Test voltage: 500VDC	100	--	--	MΩ
	Input - ⊕					
	Output - ⊕					
Operating Temperature			-30	--	+70	°C
Storage Temperature			-30	--	+85	
Storage Humidity	Non-condensing		--	--	95	%RH
Operating Humidity			--	--	95	
Output Power Derating	Operating temperature derating	-10°C to -30°C	1.5	--	--	% / °C
		+50°C to +70°C	2.0	--	--	
	Input voltage derating	85VAC - 100VAC	1.33	--	--	%/VAC
	Altitude derating	2000 - 5000m	5	--	--	%/Km
Safety Standard			Design refer to UL/EN62368-1, ES/EN60601-1, EN61558-1, EN60335-1, GB4943.1, F47(220-240VAC)			
Safety Class			CLASS I			
MTBF	MIL-HDBK-217F@25°C		≥300,000 h			

## Mechanical Specifications

Dimension	140.00 x 70.00 x 42.00mm
Weight	410g (Typ.)
Cooling Method	Free air convection

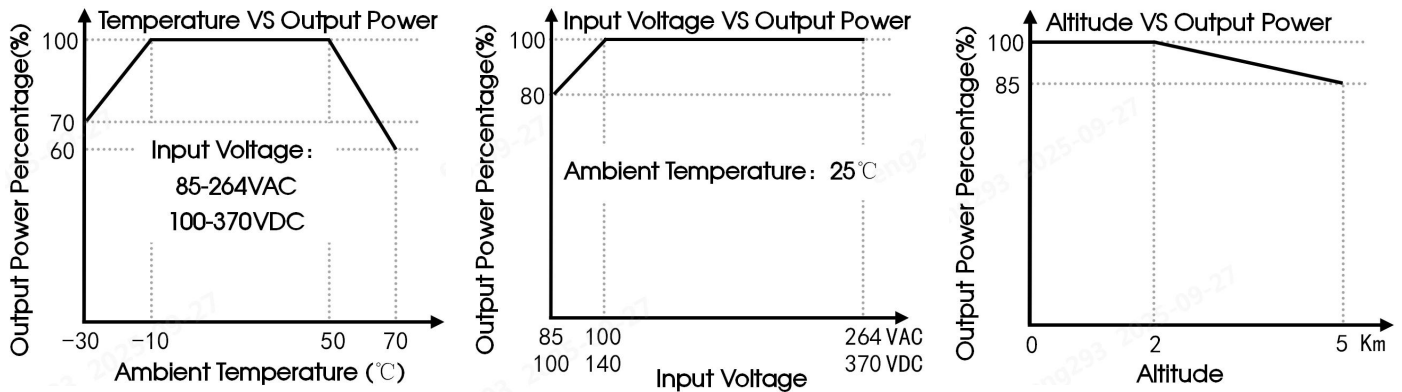
## Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B		
	RE	CISPR32/EN55032	CLASS B		
	Harmonic current	IEC/EN61000-3-2	CLASS A and CLASS D		
	Voltage flicker	IEC/EN 61000-3-3			
Immunity	ESD	IEC/EN61000-4-2	Contact ±8KV / Air ±15KV		Perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m		Perf. Criteria A

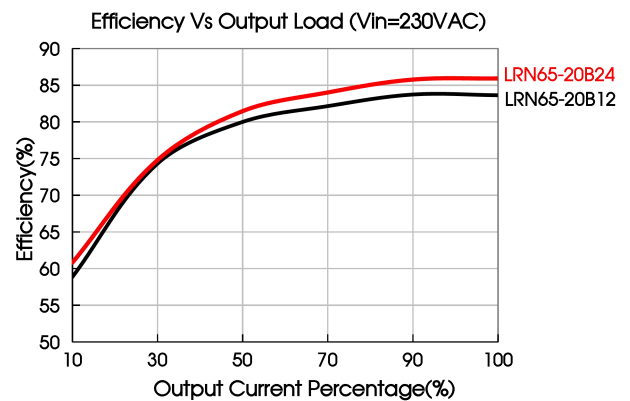
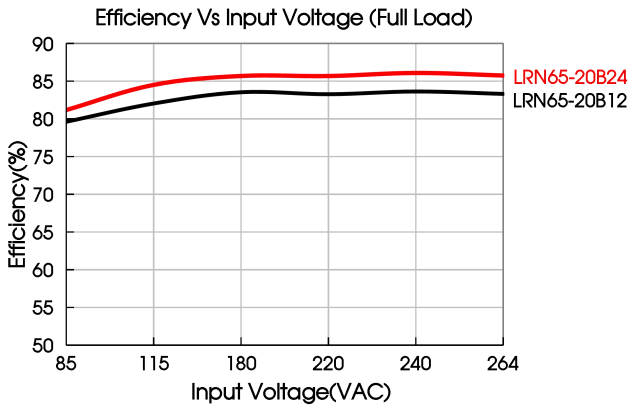
EFT	IEC/EN61000-4-4	±4KV	Perf. Criteria A
Surge	IEC/EN61000-4-5	Line to line ±2KV/line to PE ±4KV	Perf. Criteria A
CS	IEC/EN61000-4-6	10Vr.m.s	Perf. Criteria A
PFMF	IEC/EN61000-4-8	30A/m	Perf. Criteria A
Voltage variations*	IEC/EN61000-4-11	0% Un , 0.5 cycle; Monophase: 0° , 45° , 90° , 135° , 180° , 225° , 270° , 315° 70% Un, 25/30 cycle (50/60Hz); 40% Un, 10/12 cycle (50/60Hz); 0% Un, 1 cycle	Perf. Criteria B
Voltage interruptions*	IEC61000-6-2/IEC61000-4-11	0% Un, 250/300 cycle (50/60Hz)	Perf. Criteria C

Note: \*Un, Maximum input nominal voltage.

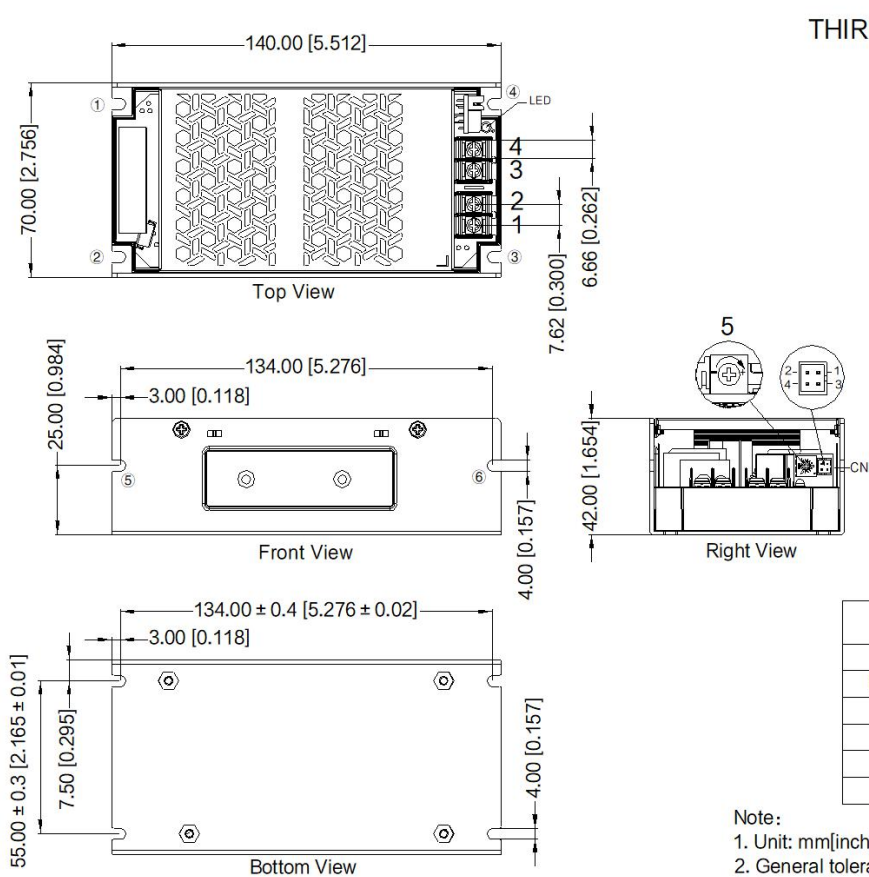
Product Characteristic Curve



Note: 1. With an AC input voltage between 85-100VAC and a DC input between 100-140VDC the output power must be derated as per the temperature derating curves;  
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.



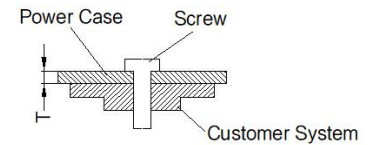
Dimensions and Recommended Layout



THIRD ANGLE PROJECTION

Pin-Out	
Pin	Mark
1	AC(L)
2	AC(N)
3	-Vo
4	+Vo
5	ADJ
①-⑥	

Position	Screw Spec.	T	Recommended Torque
①-④	M3	1.5mm	0.65N · m ± 10%



Pin-Out		Customer Connector
Pin	Mark	
1	RS+	Housing: TKP DH2-4P or HRS DF11-4DS-2C or equivalent
2	ON/OFF+	Contact: TKP DH2-4P or HRS DF11-2C
3	RS-	
4	ON/OFF-	

- Note:
1. Unit: mm[inch]
  2. General tolerances:  $\pm 1.00 [\pm 0.040]$
  3. Connection range: Input: 20-12AWG  
Output: 16-12AWG
  4. Terminal recommended torque: M3, 0.4N · m  $\pm 10\%$

The layout of the device is for reference only, please refer to the actual product

Note:

1. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58220276;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^\circ\text{C}$ , humidity <75% RH with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. The out case needs to be connected to PE(⊕) of system when the terminal equipment in operating;
8. The output voltage can be adjusted by the ADJ, clockwise to increase;
9. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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