



## SLH60-20BXX SERIES

### 60W, AC-DC CONVERTER

SLH60-20BXXseries ----is 60W power converter offered by Schmid-Multitech. It features universal input voltage, taking both DC and AC input voltage, high efficiency, high reliability, low power consumption safer isolation. It offers good EMC performance, meet IEC/EN61000-4, CISPR22/EN55022, UL60950 and EN60950 standards, and widely used in industrial and electricity applications.

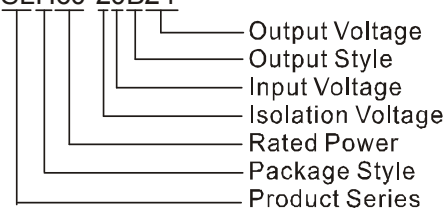


#### PRODUCT FEATURES

1. Universal input range:90 ~ 264VAC/122~370VDC
2. AC and DC all in one (input from the same terminal)
3. Low Standby Power, high efficiency, 4000VAC safer isolation
4. low ripple and noise
5. Input under-voltage, output short circuit, over-current, over-voltage protection
6. Good EMC performance, EFT, Surge meet level 4
7. Meet IEC61000, UL60950and IEC60950 standards
8. 3 years warranty

#### PART NUMBER SYSTEM

SLH60-20B24



#### SELECTION GUIDE

Approval	Model	Package	Power	Output (Vo/Io)	Max. Capacitive Load (μF)	Ripple and Noise (Max)	Efficiency (%) (230Vac, Typ)	Standby Power(Max)
	SLH60-20B05	109.0*58.5*30.0mm	50W	5V/10A	80000	150mV	82	0.5W
	*SLH60-20B09			9V/6.6A	28000		84	
	*SLH60-20B12			12V/5A	14000		86	
	*SLH60-20B15		15V/4A	12000	86			
	SLH60-20B24		60W	24V/2.5A	4000		86	
	SLH60-20B48		48V/1.25A	1000	86			

Note:1. \*Designing;

2. Ripple and Noise are measured by the method of parallel lines;

3. Unless otherwise specified, all specifications above are measured at rated input voltage and rated output load, Ta=25oC, humidity < 75%;

#### INPUT SPECIFICATIONS

Input Voltage Range	90~264VAC, 122~370VDC
Input Under Voltage Protection	Start-up Voltage:65~90 Vac(92~122VDC) Shutdown Voltage: 55~75 Vac(79~105 VDC)
Input Frequency	47~63Hz
Input Current	115VAC 1.4A, typ 230VAC 0.7A, typ
Inrush Current	115VAC 30A, typ 230VAC 50A, typ

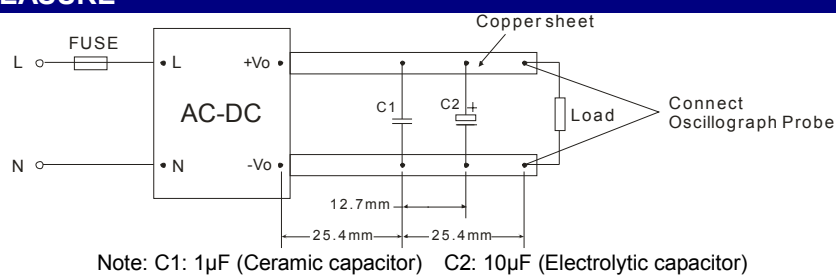
#### OUTPUT SPECIFICATIONS

Output Voltage Accuracy	±2%
Line Regulation(full load)	±0.5% (typ)
Load Regulation (5% to 100%)	±1% (typ)
Ripple& Noise(p-p)	20MHz bandwidth 150mV(max)
Short Circuit Protection	Continuous, and auto resume
Over Current Protection	110~150% , and auto resume
Over Voltage Protection	Zener diode clamp
Min Load	1%
Trim	±10%
Hold Time	115VAC 15ms, typ 230VAC 80ms, typ

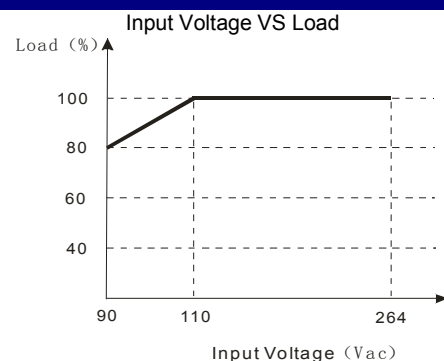
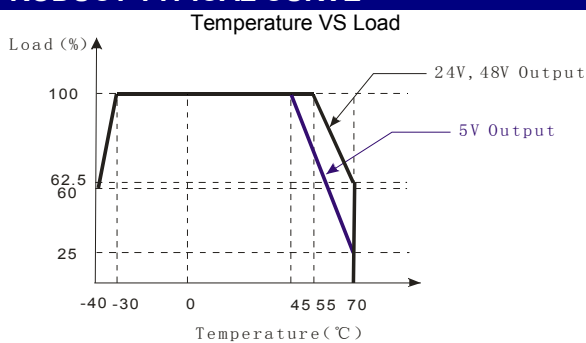
#### COMMON SPECIFICATIONS

Temperature ranges	Operating Temperature		-40°C~+70°C		
	Power derating	-40°C~-30°C	4.0% / °C		
		+45°C~+70°C	3.0% / °C (SLH60-20B05)		
		+55°C~+70°C	2.5% / °C (SLH60-20B24/48)		
	Storage Temperature		-40°C~+85°C		
Humidity	Storage humidity		95%RH (max)		
Temperature coefficient			±0.02% / °C		
Switching Frequency			100kHz(typ)		
I/O-Isolation Voltage	Isolation Resistance		100MΩ (min)		
	input - output		4000VAC/1Min		
	input -FG		1500VAC/1Min		
	output -FG		500VAC/1Min		
EMC	EMI	CE	CISPR22/EN55022, CLASS B		
		RE	CISPR22/EN55022, CLASS B		
	EMS	ESD	IEC/EN61000-4-2 ±6kV/8kV		
		RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
		EFT	IEC/EN61000-4-4	±4KV	perf. Criteria B
		Surge	IEC/EN61000-4-5	±2KV/4KV	perf. Criteria B
		CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A
		PFM	IEC/EN61000-4-8	10A/m	perf. Criteria A
		Voltage dips、 short and interruptions immunity	IEC/EN61000-4-11	95% 5000ms	perf. Criteria B
Safety approvals			Pending		
Safety standards			IEC60950/EN60950/UL60950		
Safety Class			CLASS I		
Case Material			UL 94V-0		
Install			PCB		
Cooling			Free air convection		
MTBF			>200000 h @ 25°C		
Hot swap			Forbid		
Weight			310g (typ)		

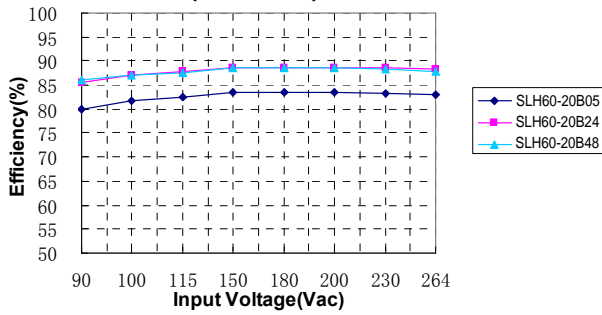
## PARALLEL LINES MEASURE



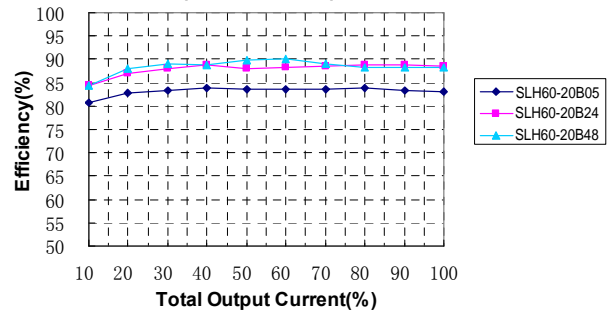
## PRODUCT TYPICAL CURVE



**Efficiency VS Input Voltage curve  
(Full Load)**

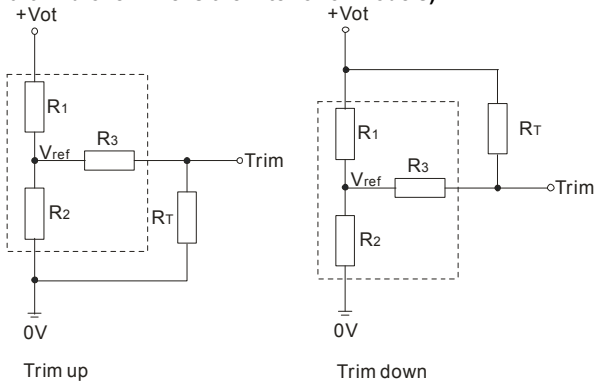


**Efficiency VS Output Load curve  
(Vin=230Vac)**



## TRIM APPLICATION & TRIM CALCULATION

**Application circuit for TRIM**  
(Part in broken line is the interior of models)



**Formula for resistance of Trim:**

$$\text{up: } R_T = \frac{aR_2}{R_2 - a} - R_3 \quad a = \frac{V_{ref}}{V_{ot} - V_{ref}} \cdot R_1$$

$$\text{down: } R_T = \frac{aR_1}{R_1 - a} - R_3 \quad a = \frac{V_{ot} - V_{ref}}{V_{ref}} \cdot R_2$$

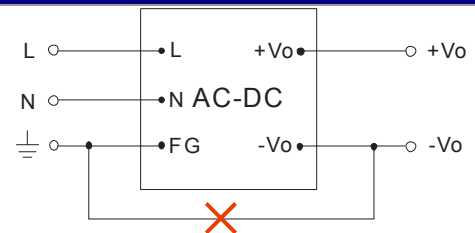
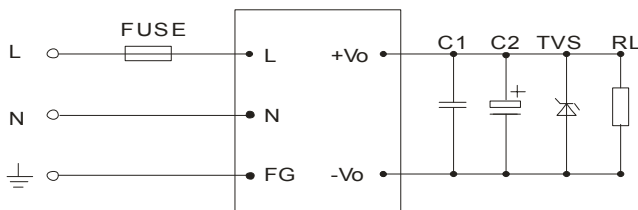
Note: Value for R1, R2, R3, and Vref refer to the following table.

R<sub>T</sub>: Resistance of Trim

a: User-defined parameter, no actual meanings.

Vo(V) / Resistance	5	24	48
R1(KΩ)	3.3	8.66	33
R2(KΩ)	3.3	1	1.8
R3(KΩ)	1	1	1
Vref(V)	2.5	2.5	2.5
Vot(V)	Output voltage of Trim, variation ≤ ±10%		

## TYPICAL APPLICATIONS



Note: This application is not supported for this series.

### EXTERNAL CIRCUIT PARAMETERS

Model	C1	C2	TVS
SLH60-20B05	680	1μF	SMBJ7.0A
SLH60-20B24	200	1μF	SMBJ30A
SLH60-20B48	100	1μF	SMBJ64A

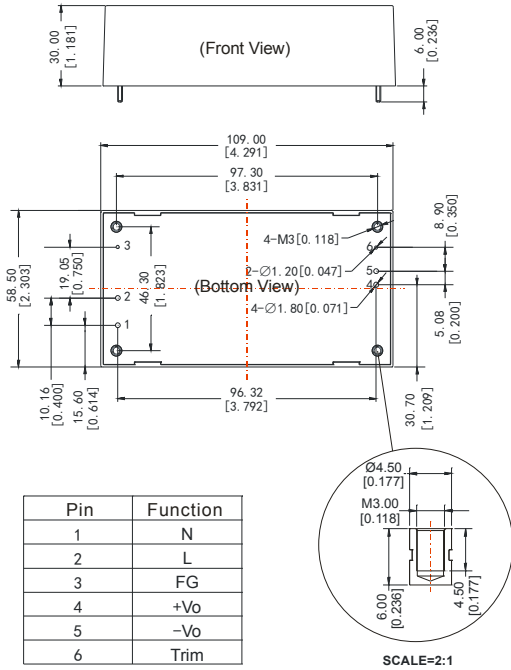
Note:

1. Output filtering capacitors C2 is electrolytic capacitors, It is recommended to use high frequency and low impedance electrolytic capacitors. For capacitance and current of capacitor please refer to manufacture's datasheet. Voltage derating of capacitor should be 80% or above. C1 is ceramic capacitor, it is used to filter high frequency noise. TVS is a recommended component to protect post-circuits (if converter fails).

2. FUSE: Recommended to use 3.15A/250V slow blow.

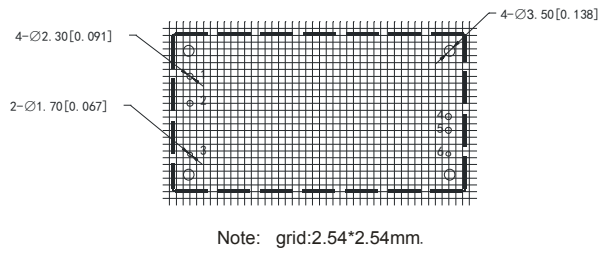
# OUTLINE DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING

## MECHANICAL DIMENSIONS



Note:  
 Unit: mm [inch]  
 Pin 1,2,4,5's diameter: 1.80mm, pin 3,6's diameter: 1.20mm  
 Pin diameter tolerances:  $\pm 0.10\text{mm}$  [ $\pm 0.004$  inch]  
 General tolerances:  $\pm 0.50\text{mm}$  [ $\pm 0.020$  inch]

## RECOMMENDED FOOTPRINT



## PACKAGING



Inner packaging dimensions: L\*W\*H=365\*350\*105mm  
 Packaging quantity: 20 pcs  
 Outer packaging dimensions: L\*W\*H=390\*360\*245mm  
 Packaging quantity: 40 pcs