

AC/DC Converter

SLHE10-20Bxx Series

SCHMID-M

10W, AC-DC converter



UL US CE CB RoHS

FEATURES

- Universal Input : 85 - 264VAC/100 - 370VDC
- Operating temperature range: -40°C to +85°C
- High isolation voltage up to 4K VAC
- Regulated output, Low ripple & noise
- Output short circuit, over-current, over-voltage protection
- High efficiency, high reliability
- Plastic case, meets UL94V-0
- EMI performance meets CISPR32 / EN55032 CLASS B
- Meets IEC62368, UL62368, EN62368 standards (Pending)

SLHE10-20Bxx series — a compact size power converter offered by SCHMID-M It features universal input voltage, taking both DC and AC input voltage, low power consumption, high efficiency, high reliability, safer isolation. It offers good EMC performance, which meet IEC/EN61000-4, CISPR32/EN55032, UL62368 and EN62368 standards, and it's widely used in industrial, office and civil applications. For harsh EMC environment, the application circuit in the datasheet is strongly recommended.

Selection Guide

Certification	Part No.*	Output Power	Nominal Output Voltage and Current	Efficiency (230VAC, %/Typ.)	Max. Capacitive Load(μF)
UL/CE/CB (Pending)	SLHE10-20B03	6.6 W	3.3V/2000mA	70	27000
	SLHE10-20B05	10W	5V/2000mA	76	9500
	SLHE10-20B09		9V/1100mA	78	3600
	SLHE10-20B12		12V/900mA	80	2400
	SLHE10-20B15		15V/700mA	81	1200
	SLHE10-20B24		24V/450mA	82	470

Note:*Part No.with suffix of "A2" means chassis mounting and suffix of "A4" means DIN-Rail mounting (e.g. SLHE10-20B03A2 means chassis mounting; SLHE10-20B03A4 means DIN-Rail mounting)

Input Specifications

Item	Operating 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	115VAC	--	--	0.26	A
	230VAC	--	--	0.16	
Inrush current	115VAC	--	13	--	
	230VAC	--	23	--	
Leakage current		0.3mA RMS typ./230VAC/50Hz			
Recommended External Input Fuse		2A/250V, slow fusing, necessary			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3V output	--	±3	--	%
	Other output	--	±2	--	
Line Regulation	Full load	--	±0.5	--	
Load Regulation	0%-100% load	--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	50	100	mV
Temperature Coefficient		--	±0.02	--	%/°C

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Short Circuit Protection		Continuous, self-recovery			
Over-current Protection		$\geq 110\%$ Io self-recovery			
Over-voltage Protection	3.3 / 5VDC Output	$\leq 7.5\text{VDC}$			
	9VDC Output	$\leq 15\text{VDC}$			
	12 / 15VDC Output	$\leq 20\text{VDC}$			
	24VDC Output	$\leq 30\text{VDC}$			
Min. Load		0	--	--	%
Hold-up Time	115VAC input	--	15	--	ms
	230VAC input	--	80	--	

Note: * Ripple and noise are measured by "parallel cable" method, please see AC-DC Converter Application Notes for specific operation.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	4000	--	--	VAC
	Input-PE	2500	--	--	
Operating Temperature	Test time: 1min (leakage current < 5mA)	-40	--	+85	°C
Storage Temperature		-40	--	+105	
Storage Humidity		--	--	95	%RH
Welding 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	4.0	--	--	% / °C
	+55°C to +70°C	3.3	--	--	
	+70°C to +85°C	2.7	--	--	
	85 - 100VAC	1.67	--	--	% / VAC
	240 - 264VAC	0.83	--	--	
Safety Standard		IEC62368/EN62368/UL62368			
Safety Certification		IEC62368/EN62368/UL62368 (Pending)			
Safety Class		CLASS I			
MTBF		MIL-HDBK-217F@25°C > 300,000 h			

Physical Specifications

Casing Material		Black flame-retardant and heat-resistant plastic (UL94V-0)
Dimension	Horizontal package	55.00*45.00*21.00 mm
	A2 chassis mounting	96.10*54.00*29.50 mm
	A4 Din-Rail mounting	96.10*54.00*34.10 mm
Weight	Horizontal package	75g (Typ.)
	A2 chassis mounting	125g (Typ.)
	A4 Din-Rail mounting	165g (Typ.)
Cooling method		Free air convection

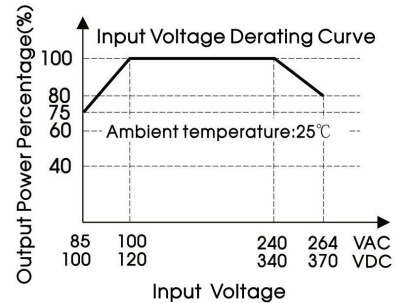
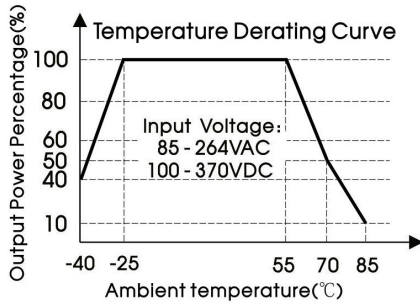
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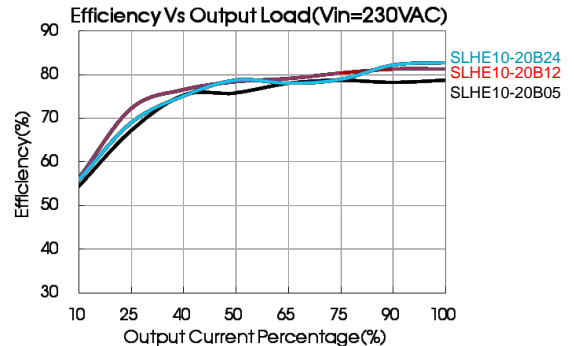
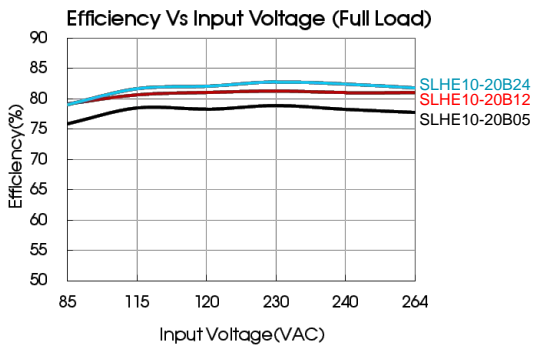
EMC Specifications

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

Product Characteristic Curve



Note: ①When input 85-100VAC/240 - 264VAC/100-120VDC/340 - 370VDC, it need to be voltage derated on basis of temperature derating;
②This product is suitable for use in natural air cooling environments, if in a closed environment, please contact our company's FAE.



Design Reference

1. Typical application circuit

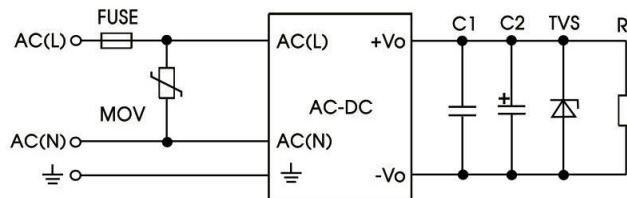


Fig. 1

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Model	C2(μF)	FUSE	MOV	TVS
SLHE10-20B03	470	2A/250V slow fusing, necessary	S14K300	SMBJ7.0A
SLHE10-20B05	330			SMBJ7.0A
SLHE10-20B09	120			SMBJ12A
SLHE10-20B12	120			SMBJ20A
SLHE10-20B15	120			SMBJ20A
SLHE10-20B24	68			SMBJ30A

Note:
Output filtering capacitors C2 is electrolytic capacitors, it is recommended to use high frequency and low impedance electrolytic capacitor. For capacitance and current of capacitor please refer to manufacture's datasheet. Capacitor voltage reduced to at least 80%. C1 is ceramic capacitors, which is used to filter high-frequency noise. TVS is a recommended component to protect post-circuits if converter fails.

2. EMC solution-recommended circuit

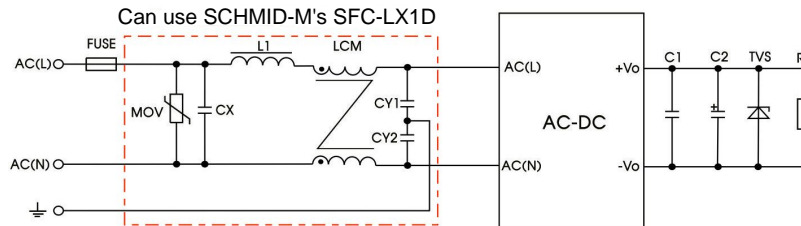
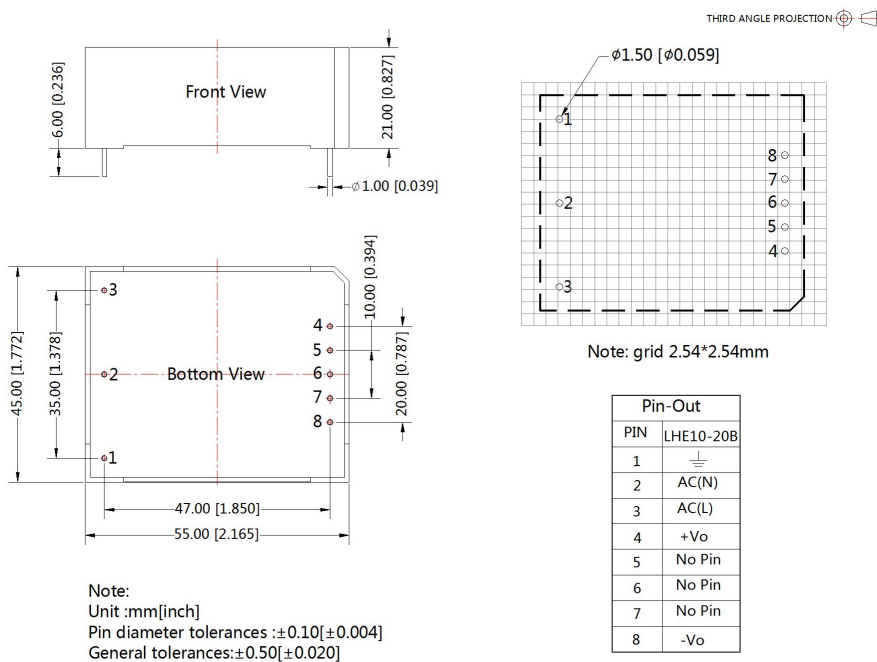


Fig 2: EMC Recommended circuit with higher requirements

Element model	Recommended value
MOV	S14K300
CY1 , CY2	1000pF/400VAC
CX	0.1μF/275VAC
LCM	10mH, recommended to use SCHMID-M's SFL2D-Z5-103
L1	4.7μH/2A
FC-LX1D	2KV/4KV EMC filter
FUSE	2A/250V slow fusing, necessary

Dimensions and Recommended Layout

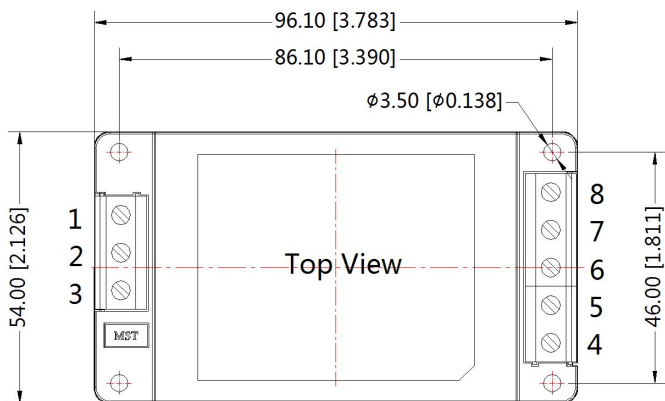


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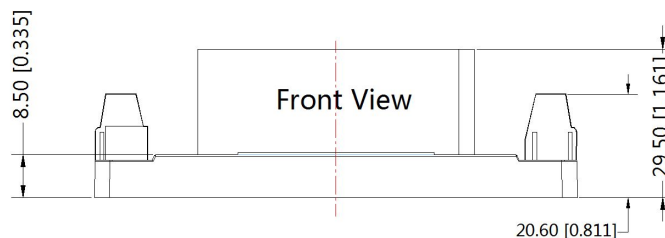
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A2 Dimensions

THIRD ANGLE PROJECTION 



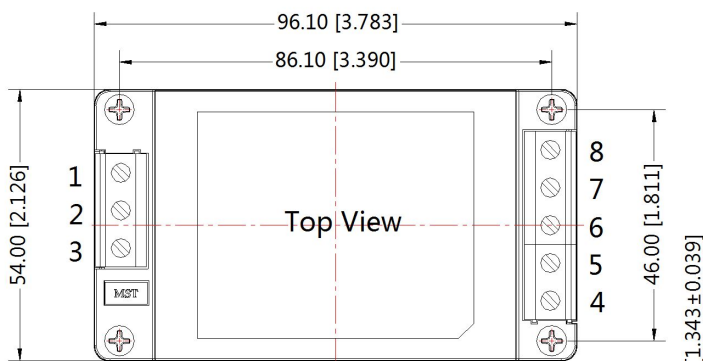
Pin-Out	
Pin	Function
1	\perp
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	NC
7	NC
8	-Vo



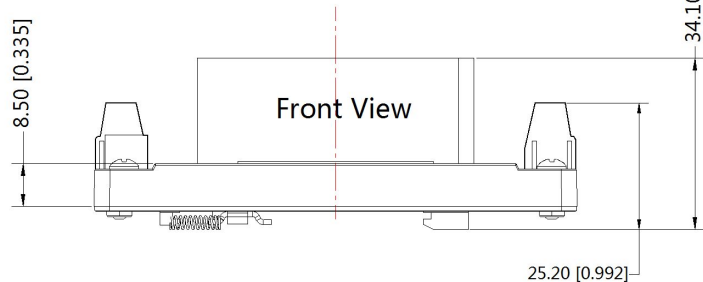
Note:
Unit:mm[inch]
Wire range : 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances:±1.0[±0.040]

A4 Dimensions

THIRD ANGLE PROJECTION 



Pin-Out	
Pin	Function
1	\perp
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	NC
7	NC
8	-Vo



Note:
Unit:mm[inch]
Installed on DIN rail TS35,rail needs to connect safety ground
Wire range : 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances:±1.0[±0.040]

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Note:

1. 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 and rated output load;
2. All index testing methods in this datasheet are based on our Company's corporate standards;
3. We can provide product customization service, please contact our technicians directly for specific information;
4. Products are related to laws and regulations: see "Features" and "EMC";
5. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.