

Product Feature

- ◆ Universal Input: 85-264VAC/100-370VDC
- ◆ Package Type: DIP
- ◆ Operating temperature range: -40°C - 70°C
- ◆ Isolation voltage: 4000VAC
- ◆ High efficiency up to: 85% (Type)
- ◆ Output short-circuit protection function, high efficiency, low power consumption, green and environmentally friendly.
- ◆ Industrial grade product technology design



Selection Guide

Part No.	Input Voltage (VAC)	Output Power (W)	Output Voltage(VDC)/Output Current (mA)Max.				Full Load Efficiency %(Typ.)	Capacitive Load(μF) Max.	
			Vo1	Io1	Vo2	Io2		Vo1	Vo2
SLHE20-20S03R	85-264	13.53	3.3	4100	--	--	74	48000	--
SLHE20-20S05R	85-264	17.5	5	3500	--	--	78	12240	--
SLHE20-20S09R	85-264	20	9	2100	--	--	80	7200	--
SLHE20-20S12R	85-264	20	12	1600	--	--	82	5400	--
SLHE20-20S15R	85-264	20	15	1300	--	--	83	2720	--
SLHE20-20S24R	85-264	20	24	850	--	--	85	1840	--
SLHE20-20D05R	85-264	20	5	2000	-5	2000	75	8000	8000
SLHE20-20D12R	85-264	20	12	830	-12	830	82	960	960
SLHE20-20D15R	85-264	20	15	650	-15	650	83	880	880
SLHE20-20T0505R	85-264	20	5	2500	±5	500	74	11200	4480
SLHE20-20T0512R	85-264	20	5	2000	±12	400	75	16000	1600
SLHE20-20T0515R	85-264	20	5	2000	±15	300	76	13520	370
SLHE20-20T0524R	85-264	20	5	2000	±24	200	77	11200	370
SLHE20-20D0512R	85-264	20	5	2500	12	600	75	32400	3250
SLHE20-20D0515R	85-264	20	5	2500	15	500	76	28000	1980
SLHE20-20D0524R	85-264	20	5	2500	24	300	77	28000	720

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage	AC Input	85	--	264	VAC
	DC Input	100	--	370	VDC
Input Current	110VAC	--	--	0.6	A
	230VAC	--	--	0.4	
Input Frequency		47	--	63	Hz
Fuse		3.15A/250V, slow-blow, required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	5%-100% load	Vo1	--	±2	--	%
		Vo2/Vo3	--	±3	--	%
Linear Regulation	Rated load		--	±0.5	--	%
Load Regulation	10% - 100%load	Vo1	--	±1.0	--	%
		Vo2/Vo3		±3		%
Ripple & Noise	20MHz bandwidth (peak to peak), 10% - 100%load	Vo1	--	100	--	mV
		Vo2/Vo3	--	200	--	mV
Temperature Coefficient			--	±0.02	--	%/°C
Stand-by Power Consumption	230VAC		--	0.30	--	W
Min. Load			10	--	--	%
Over Current Protection			110	--	--	%Io
Short-Circuit Protection			Continuous, Self-Recovery			
Hold-up Time	230VAC		--	40	--	ms

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input to output, test time 1 minute, leakage current<5mA	4000	--	--	VAC
	Output to output, test time 1 minute, leakage current<5mA	1500	--	--	
Power Derating	-40°C - -25°C	3.5	--	--	%°C
	+50°C - +70°C	3.75	--	--	
	85VAC - 100VAC/ 230VAC - 264VAC	1.0	--	--	%/VAC
Operating Temperature		-40	--	+70	°C
Storage Temperature		-40	--	+85	°C
Soldering Profile	Wave-soldering	260 ± 5°C; time: 5 - 10s			
	Manual-welding	360 ± 5°C; time: 3 - 5s			
Safety Standard		IEC/UL62368-1			
Safety Class		CLASS I			
MTBF	MIL-HDBK-217F@25°C	>300,000h			

Mechanical Specification

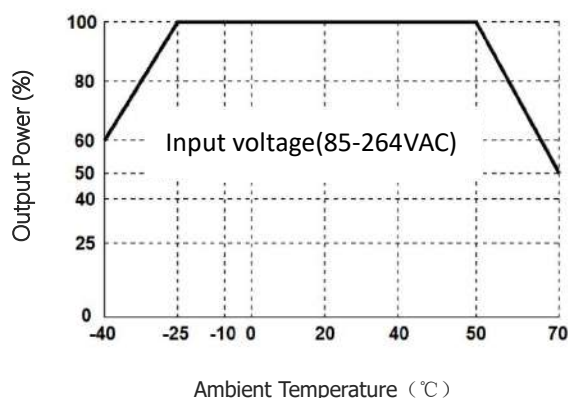
Case Material	Black flame retardant and heat-resistant plastic (UL94V-0)
Package Dimensions	70.00 x 48.00 x 23.50mm
Weight	120g (Typ.)
Cooling Method	Free air convection

EMC Specifications

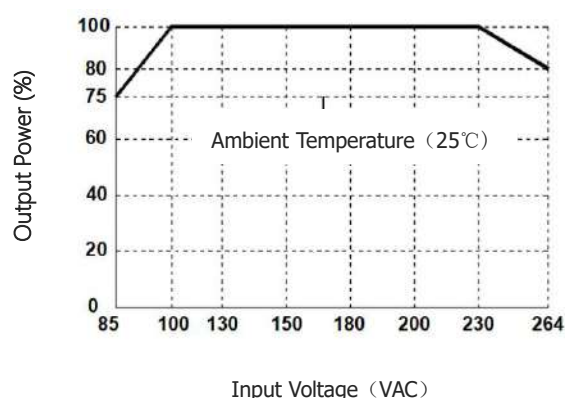
EMI	CE	CISPR32/EN55032 CLASS B	
	RE	CISPR32/EN55032 CLASS B	
EMS	RS	IEC/EN 61000-4-3	perf. Criteria A
	EFT	IEC/EN 61000-4-4 level 3 2kV	perf. Criteria B
	Surge	IEC/EN 61000-4-5 level 3 1kV/2kV	perf. Criteria B
	CS	IEC/EN61000-4-6 10Vr.m.s	perf. Criteria A
	ESD	IEC/EN 61000-4-2 level 3 Contact:±6kV/Air:8kV	perf. Criteria B

Typical Characteristic Curves

Temperature and load relationship diagram

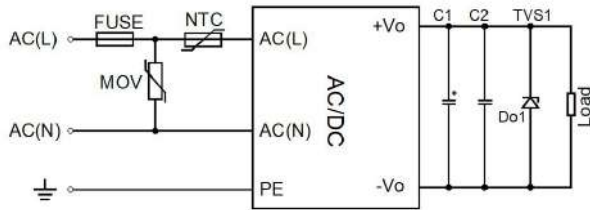


Relationship diagram between input voltage and load

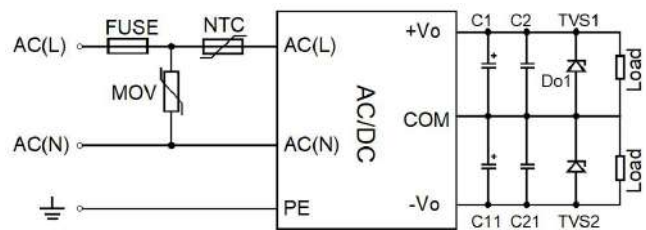


Typical Circuit Design And Application

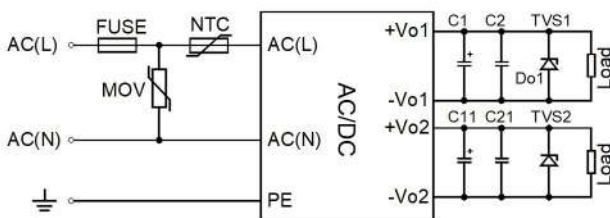
Single Output (Figer 1)



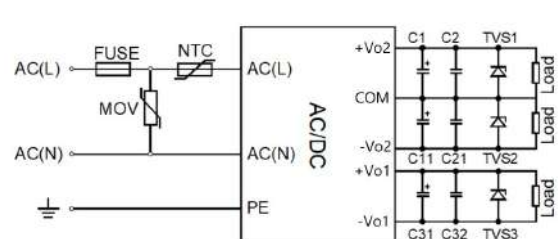
Positive and negative output (Figer 2)



Dual Output (Figer 3)



Triple Output (Figer 4)



Part No.	C2(μF)	C4(μF)	C6(μF)	TVS1	TVS2	TVS3
SLHE20-20S03R	330			SMBJ7.0A		
SLHE20-20S05R	330			SMBJ7.0A		
SLHE20-20S09R	220			SMBJ12A		
SLHE20-20S12R	220			SMBJ20A		
SLHE20-20S15R	220			SMBJ20A		
SLHE20-20S24R	220			SMBJ30A		
SLHE20-20D05R	470	470		SMBJ7.0A	SMBJ7.0A	
SLHE20-20D12R	120	120		SMBJ20A	SMBJ20A	
SLHE20-20D15R	68	68		SMBJ20A	SMBJ20A	
SLHE20-20T0505R	330	120	120	SMBJ7.0A	SMBJ7.0A	SMBJ7.0A
SLHE20-20T0512R	330	120	120	SMBJ7.0A	SMBJ20A	SMBJ20A
SLHE20-20T0515R	330	120	120	SMBJ7.0A	SMBJ20A	SMBJ20A
SLHE20-20T0524R	330	47	47	SMBJ7.0A	SMBJ30A	SMBJ30A
SLHE20-20D0512R	330	220		SMBJ7.0A	SMBJ20A	
SLHE20-20D0515R	330	220		SMBJ7.0A	SMBJ20A	
SLHE20-20D0524R	330	120		SMBJ7.0A	SMBJ30A	

Note:

1. The output filtering capacitors C2, C4, and C6 are electrolytic capacitors. It is recommended to use high-frequency low resistance electrolytic capacitors. Please refer to the technical specifications provided by each manufacturer for the capacity and current flowing through them;

2. Capacitor withstand voltage reduction greater than 80%.

3. C1, C3, and C5 are ceramic capacitors that remove high-frequency noise;

4. TVS tube protects the downstream circuit when the module is abnormal. It is recommended to use;

5. Recommended external NTC thermistor, model: 5D-9;

6. Recommended external FUSE fuse, model: 3.15A/250V, slow blocking;

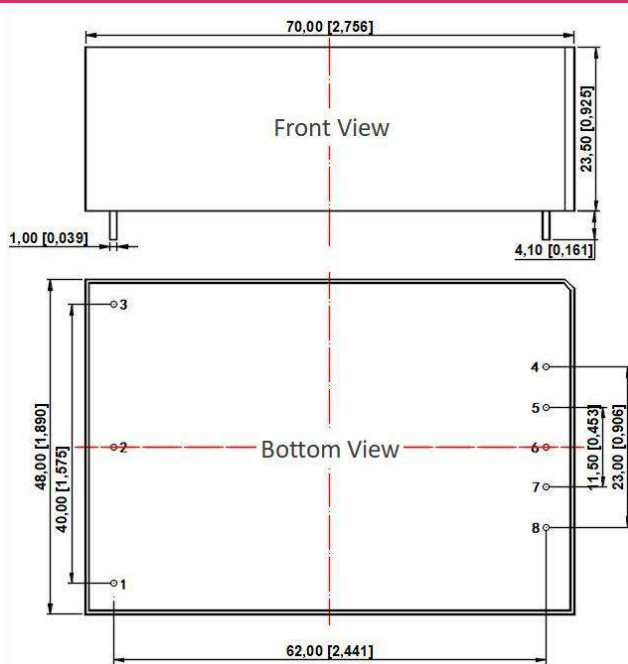
7. Recommended external MOV varistor, model: 14D471K.

EMC Solution - Recommended Circuit

EMC Recommended Circuit (Figer 5)		Parameter Table	
		Component model	Recommended value
		MOV1	14D417K
		CY1 、 CY2	1000pF/400VAC
		CX	0.1μF/275VAC
		LCM	10mH
		L1	4.7μH/2A
		NTC	10D-9
		FUSE	3. 15A/250V , Slow break must be connected

Dimensions and Recommended Layout

Dimensions

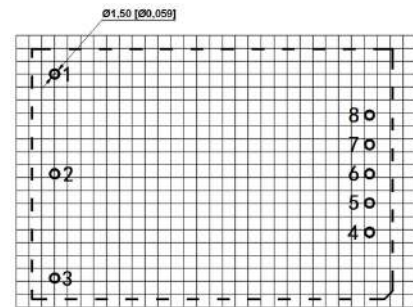


Note:

Unit: mm[inch]

Pin section tolerances: ± 0.10 [± 0.004]General tolerances: ± 0.50 [± 0.020]

PCB Printing Layout



Grid size: 2.54 x 2.54mm

Pin Function Table

Pin	Function			
	Sxx	Dxx	Dxxxx	Txxxx
1				
2	AC(N)	AC(N)	AC(N)	AC(N)
3	AC(L)	AC(L)	AC(L)	AC(L)
4	+Vo	+Vo	+Vo2	+Vo2
5	No Pin	No Pin	-Vo2	COM
6	No Pin	No Pin	No Pin	-Vo2
7	No Pin	No Pin	+Vo1	+Vo1
8	-Vo	-Vo	-Vo1	-Vo1

Note:

- ✦ The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
- ✦ It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
- ✦ Suggested dual output module load imbalance: $\leq \pm 5\%$. If it exceeds $\pm 5\%$, it cannot be guaranteed that the product performance meets all performance indicators in this manual;
- ✦ The maximum capacitive load is tested within the input voltage range and under full load conditions;
- ✦ Unless otherwise specified, all indicators in this manual are measured at $T_a=25^\circ\text{C}$, humidity $<75\%$ RH, nominal input voltage, and output rated load;
- ✦ All indicator testing methods in this manual are based on our company's corporate standards;
- ✦ Our company can provide product customization, and specific requirements can be directly contacted by our technical personnel;
- ✦ Product specifications are subject to change without prior notice.