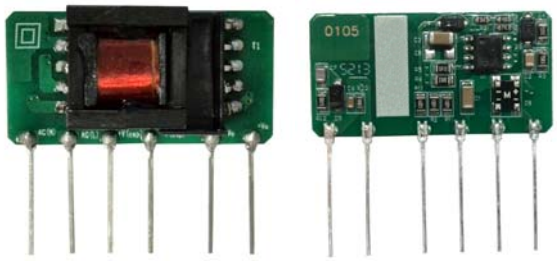
AC/DC Converter

SLS01-15BXXSS Series

1W, AC/DC converter



Model marking with number, such as "0105" means "SLS01-15B05SS"

FEATURES

- Input voltage range: 85-264VAC/70-400VDC
- Over current protection and short circuit protection
- High efficiency, high power density
- Low power consumption, green power
- Industrial grade
- Open frame, urtal-slim SIP package
- Flexible design of peripheral circuit reduces layout problems

SLS01-15BXXSS series is a high efficiency green power modules provided by SCHMID-M. The features of this series are: Accept either AC or DC input, wide input voltage, high efficiency, low loss, safety isolation etc. All models are particularly suitable for the applications such as industrial, electric power, instrumentation, smart home which do not have high requirement on EMC.EMC application circuit must be added if the products need to be applied to EMC harsh environment .

Selection Guide

Model	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency (230VAC,%/Typ.)	Max. Capacitive Load (uF)
SLS01-15B05SS	1W	5V/200mA	66	220
SLS01-15B09SS		9V/111mA	67	100
SLS01-15B12SS		12V/83mA	70	100
SLS01-15B15SS		15V/67mA	69	100
SLS01-15B24SS		24V/42mA	68	100

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	Conventional	100	--	240	VAC
	AC input	85	--	264	
	DC input	70	--	400	VDC
Input frequency		47	--	440	Hz
Input current	115VAC	--	--	0.12	A
	230VAC	--	--	0.06	
Inrush current	115VAC	--	9	--	
	230VAC	--	15	--	

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	SLS01-15B05SS	--	--	±8	%
	SLS01-15B09SS	--	--	±5	
	SLS01-15B12SS	--	--		
	SLS01-15B15SS	--	--		
	SLS01-15B24SS	--	--		
Line Regulation	Full load	--	±1.5	--	
Load Regulation	5%-100% load	--	±2.5	--	
Output Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	50	120	mV
Temperature Drift Coefficient		--	±0.15	--	%/°C
Stand-by Power Consumption		--	--	0.5	W
Short Circuit Protection		Continuous, self-recovery			
Over-current Protection		≥110%Io self-recovery			
Min. Load		5	--	--	%

Hold-up Time	115VAC input	--	40	--	ms
	230VAC input	--	180	--	
Note: *Ripple and Noise measuring refer to "ripple and noise measure figure", please see *AC-DC Converter Application Notes* for specific operation methods.					

General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	Test time: 1min	3000	--	--	VAC
Operating Temperature			-40	--	+85	℃
Storage Temperature			-40	--	+105	
Storage Humidity			--	--	85	%RH
Switching Frequency			--	--	60	kHz
Power Derating		-40℃～-20℃	1.0	--	--	%/℃
		+55℃～+85℃	0.67	--	--	
Safety Standard		IEC60950/EN60950/UL60950				
Safety Class		CLASS II				
Hot Plug		Unavailable				
MTBF		MIL-HDBK-217F@25°C > 200,000 h				

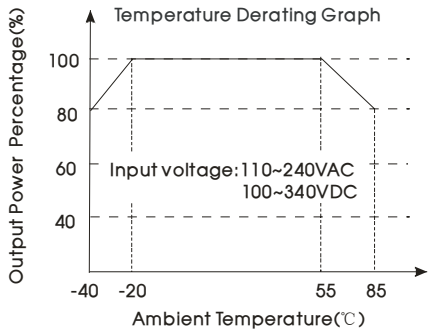
Physical Specifications

Package Dimensions	35.00*18.00*11.00mm
Weight	7 g(Typ)
Cooling method	Free air convection

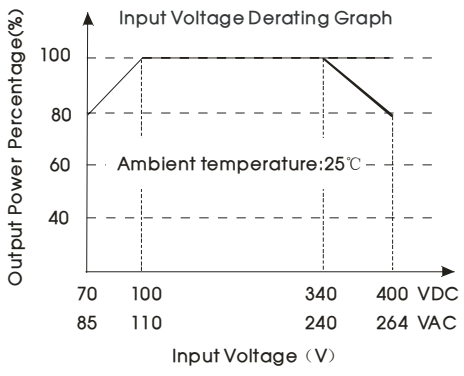
EMC Specifications

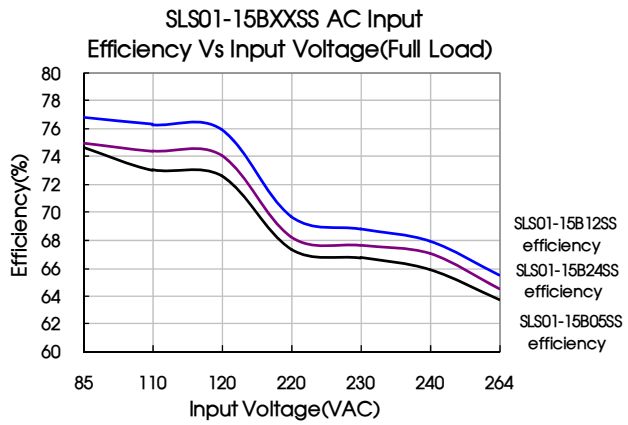
EMI	Conducted Disturbance	CISPR22/EN55022, CLASS A (See Fig. 1 for recommended circuit)	
		CISPR22/EN55022, CLASS B (See Fig. 2 for recommended circuit)	
	Radiated Emission	CISPR22/EN55022, CLASS A (See Fig. 1 for recommended circuit)	
		CISPR22/EN55022, CLASS B (See Fig. 2 for recommended circuit)	
EMS	Electrostatic Discharge	IEC/EN61000-4-2 ±4KV	Perf. Criteria B
	Radiation Immunity	IEC/EN61000-4-3 10V/m (See Fig. 2 for recommended circuit)	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV (See Fig. 1 for recommended circuit)	perf. Criteria B
		IEC/EN61000-4-4 ±4KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	Surge Immunity	IEC/EN61000-4-5 ±1KV/2KV(See Fig. 1 or Fig. 2 for recommended circuit)	perf. Criteria B
	Conducted Disturbance	IEC/EN61000-4-6 10 Vr.m.s(See Fig. 2 for recommended circuit)	perf. Criteria A
	Immunity for Power	IEC/EN61000-4-8 10A/m	perf. Criteria A
	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-11 0%-70%	perf. Criteria B

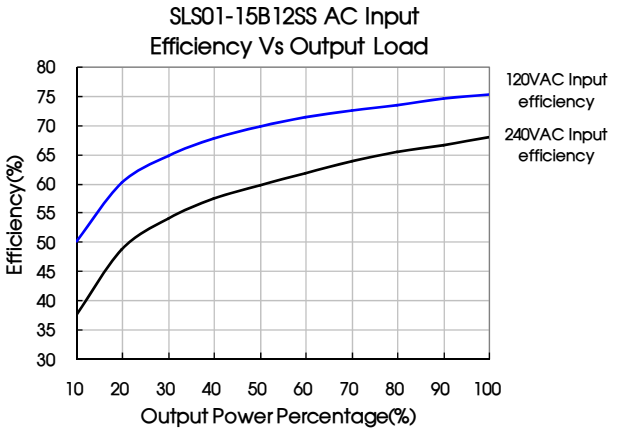
Product Characteristic Curve

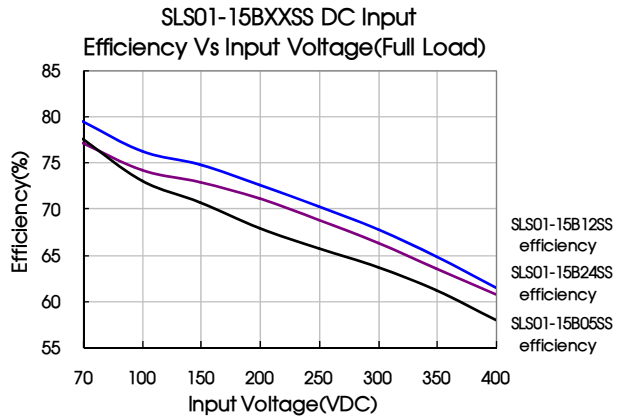


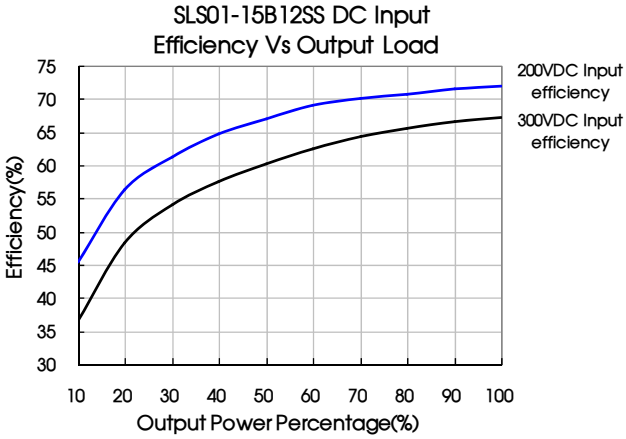
Note: Input voltage should be derated based on temperature derating when it is 85~110VAC /240~264VAC/70~100VDC/340~400VDC.











Design Reference

1. Typical application circuit

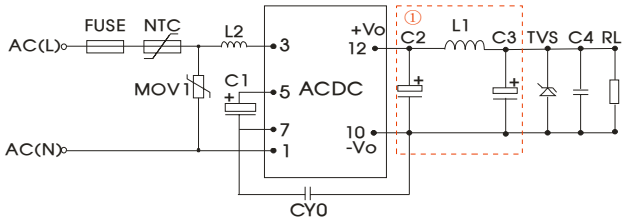


Fig. 1: Typical application circuit

Note: ①is Pi filter circuit.

Model	FUSE (Required)	NTC	MOV1	C1 (Required)	L2	C2 (Required)	L1 (Required)	C3 (Required)	C4	CY0	TVS
SLS01-15B05SS	1A/ 250V	5D-9	S14K350	4.7μF/ 400V	1mH	150μF/ 35V	2.2 μH	68μF/35V	0.1μ F/50 V	1nF/ 400 VAC	SMBJ7.0A
SLS01-15B09SS											SMBJ12A
SLS01-15B12SS						100μF/ 35V					SMBJ20A
SLS01-15B15SS											
SLS01-15B24SS											SMBJ30A

Note:

1. C1,C2and C3 are electrolytic capacitors. They are required both AC input and DC input.
The value of C1 is recommended to be 4.7μF /400V . When the input voltage is above 370VDC, the recommended value of C1 is 4.7μF/450V).C2 and C3 are output filer capacitors, they are recommended to be high frequency and low impedance electrolytic capacitors. Capacitance and rated ripple current of capacitors refer to the datasheets provided by the manufactures. Voltage derating of capacitors should be 80% or above. C4 is a ceramic capacitor, which is used to filter high frequency noise. C2,C3 and L1 form a pi-type filter circuit. Current of L1 and L2 refer to the datasheets provided by the manufactures, current derating should be 80% or above. TVS is a recommended component to protect post-circuits (if converter fails).

2. EMC solution-recommended circuit

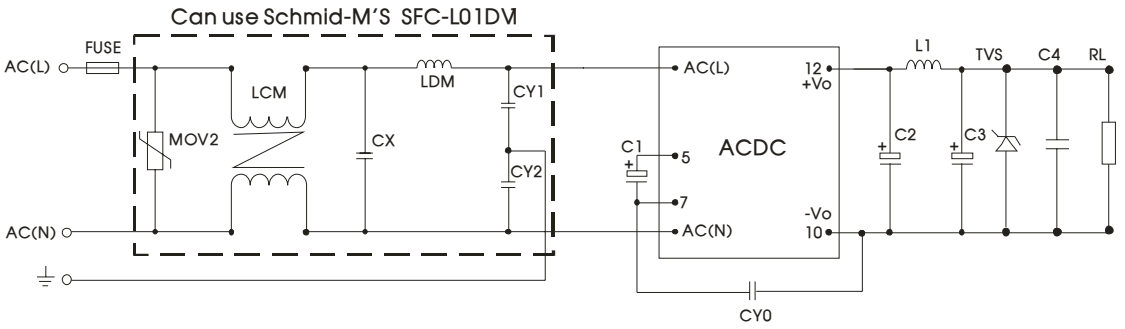


Fig 2: EMC application circuit with higher requirements

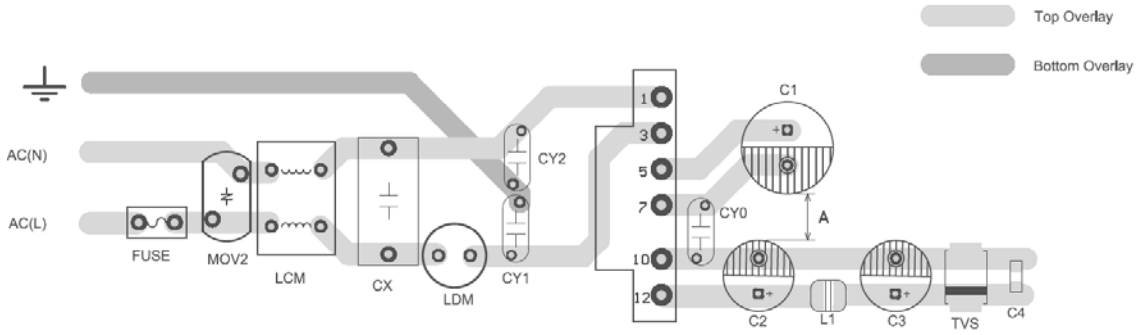


Fig 3: Recommended EMC circuit-PCB layout

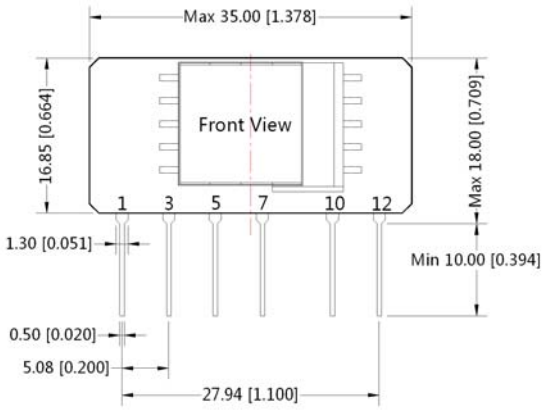
Suggestions for safety regulation and wiring width: wire width ≥3mm, distance between wires ≥6mm, and distance between wire and ground ⩾6mm, A⩾6.4mm

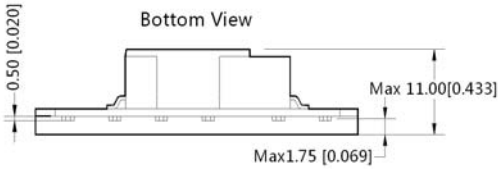
Components	Recommend Parameter
MOV2	S14K350
CY1	1nF/400VAC
CY2	1nF/400VAC
CX	0.1μF/275VAC
LCM	3.5mH
LDM	0.3mH
SFC-L01DV1	SCHMID-M's 1KV/2KV Surge protector
FUSE(Required)	1A/250V, slow fusing

3. For more information please find application notes on www.schmid-m.com

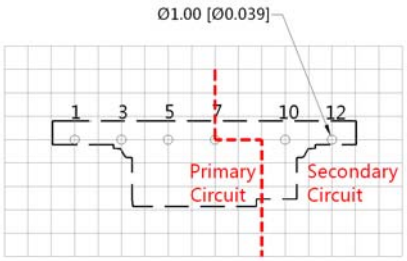
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]



Note:Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	AC (N)
3	AC (L)
5	+V(cap)
7	-V(cap)
10	-Vo
12	+Vo

1.It is necessary to add C1 between pin5 and pin7 ;
2.It is necessary to add pi-type filter circuit to the output,such as the typical application of Figure 1;
3.It is needed to have distance ≥6.4mm for safety between external componets in primary circuit and secondary circuit.

Note:

1. External electrolytic capacitors are required to modules, more details refer to typical applications;
2. This part is open frame, at least 6.4mm safety distance between the the primary and secondary external components of the module is needed to meet the safety requirement;
3. All specifications were measured at Ta=25° C, humidity<75%, nominal input voltage (115VAC or 230VAC)and rated output load unless otherwise specified;
4. In order to increase the conversion efficiency of the product with light load in the design, the product will have slight audio noise when operating with load less than 40% of rated load, but it will not affect the product's reliability and performance;
5. Module required dispensing fixed after assembled;
6. All index testing methods in this datasheet are based on our Company's corporate standards;
7. We can provide product customization service;
8. Specifications of this product are subject to changes without prior notice.