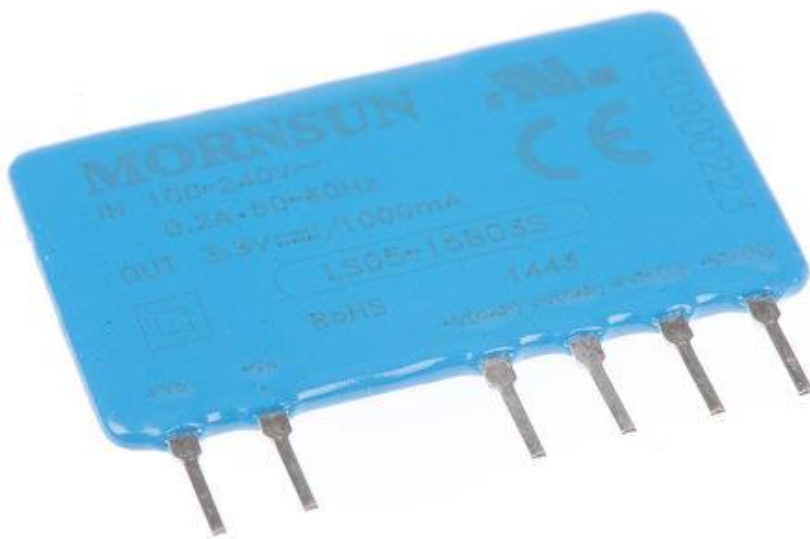


Datasheet

RS 3.3W, 1 Output, Embedded Switch Mode Power Supply (SMPS), 3.3V, 1000mA

RS Stock 786-4725



Description

High efficiency green power modules with miniature packaging.

The features of this series are: wide input voltage, dc and ac all in one, high efficiency, high reliability, low loss, safety isolation etc, meet UL60950/EN60950 standards. All models are suitable for the applications demanding on the volume, need to meet UL/CE standard, less demanding on EMC like industrial, electric power, instrumentation, smart home. For harsh EMC environment, this series of products must use the referred application circuit.

Features

- Wide input voltage: 85 ~ 264Vac (100 ~ 400Vdc)
- Over temperature protection and short circuit protection
- High efficiency, high density
- Low loss, green power
- Ultra-Miniature package
- Meets UL/CE standard

Typical applications

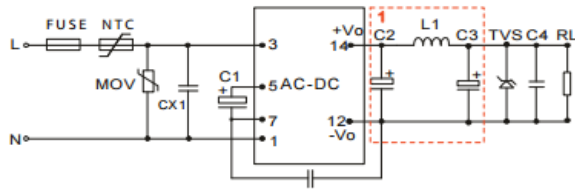


Figure 1 LS05-15BXXS

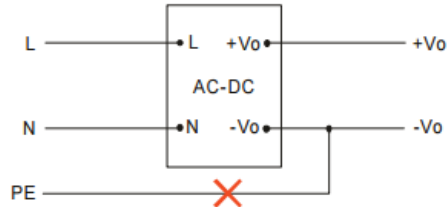
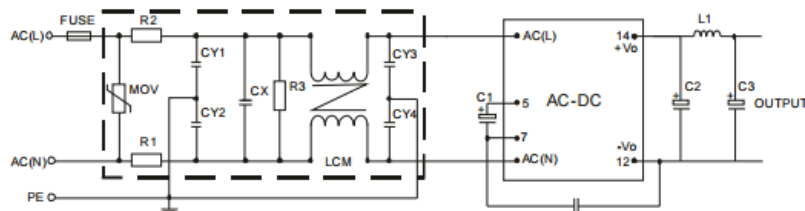


Figure 2 Note: This application is not supported for this series.



Improved EMC circuit protection (external circuit output as figure 1)

GENERAL SPECIFICATIONS

Temperature ranges	Operating		-25°C to +85°C	
	Power derating	(+55 to +85°C)	1.33% / °C	
		(-25 to 0°C)	0.8% / °C	
	Storage		-40°C to +105°C	
Max. case temperature		90°C (Max.)		
Humidity			85% (Max.)	
Temperature coefficient			0.2% / °C	
Switching frequency			100kHz	
Isolation voltage	Input and output		3000Vac / 1 min	
EMC	EMI	CE	CISPR22/EN55022 CLASS A (External Circuit Refer to Figure 1)	
			CISPR22/EN55022 CLASS B (External Circuit Refer to Figure 3)	
		RE	CISPR22/EN55022 CLASS B (External Circuit Refer to Figure 3)	
	EMS	ESD	IEC/EN61000-4-2	Contact ±4kV perf. Criteria B
			RS	IEC/EN61000-4-3 10V/m perf. Criteria A (External Circuit Refer to Figure 3)
		EFT	IEC/EN61000-4-4	±2kV perf. Criteria B (External Circuit Refer to Figure 1)
			IEC/EN61000-4-4	±4kV perf. Criteria B (External Circuit Refer to Figure 3)
		Surge	IEC/EN61000-4-5	±2kV/±4kV perf. Criteria B (External Circuit Refer to Figure 3)
		CS	IEC/EN61000-4-6	3 Vr.m.s perf. Criteria A (External Circuit Refer to Figure 3)
PFM	IEC/EN61000-4-8	10A/m perf. Criteria A		
Voltage dips, short & interruptions immunity		IEC/EN61000-4-11	0%-70% perf. Criteria B	
Case material	UL94V-0			
Installation	PCB			
MTBF	>300,000h @25°C			
Note:				
1. External electrolytic capacitor are required to models when ac input, more details refer to typical applications.				
2. Ripple and Noise were measured by the method of anear measure.				
3. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.				
4. In this datasheet, all the test methods of indications are based on corporate standards.				

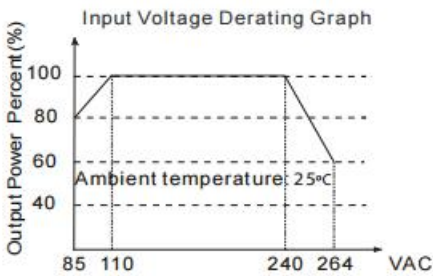
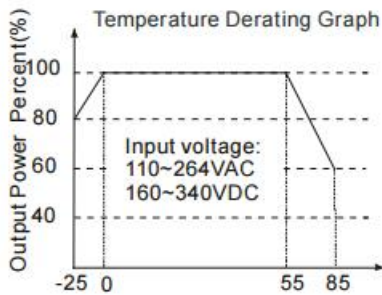
PRODUCT						
RS STOCK NO.	MODEL NO.	PACKAGE (TYP.)	POWER	OUTPUT (Vo / Io)	RIPPLE & NOISE	EFFICIENCY % (TYP.)
786-4725	LS05-15B03S	42.0x27.0x11.0mm	3.3W	3.3V/1000mA	150mV(Max.)	65%
786-4729	LS05-15B05S		5W	5V/1000mA	120mV(Max.)	70%
786-4738	LS05-15B09S			9V/560mA	120mV(Max.)	72%
786-4731	LS05-15B12S			12V/420mA	120mV(Max.)	74%
786-4735	LS05-15B15S			15V/340mA	120mV(Max.)	75%
786-4744	LS05-15B24S			24V/210mA	150mV(Max.)	75%

INPUT SPECIFICATIONS	
Input voltage range	85 ~ 264Vac (100 ~ 400Vdc)
Input current	200mA (Max.)
Inrush current	30A
External input fuse (recomended)	1A/250V slow blow

OUTPUT SPECIFICATIONS			
Input variation	±0.5% (Typ.)	Typ.	Unit
Load variation (10% to 100%)	± 1% (Typ.)		
Output voltage accuracy	3.3Vdc output	±1.0	%
	5Vdc output		
	9Vdc output		
	12Vdc output		
	15Vdc output		
24Vdc output			
Short circuit protection	Continuous, automatic resume		

Temperature vs load

Input voltage vs load



EXTERNAL CAPACITORS TYPICAL VALUE									
MODEL	C1 (Required)	C2 (Required)	L1 (Required)	C3 (Required)	CX1	C4	CY10	FUSE (Required)	TVS
LS05-15B03S	22μF/400V	470μF/10V	0.47uH	150μF/35V	0.1μF/275Vac	100nF/50V	1nF/400Vac	1A/250V	SMBJ7.0A
LS05-15B05S		470μF/16V							SMBJ12A
LS05-15B09S		330μF/25V	1uH	150μF/35V					SMBJ20A
LS05-15B12S									SMBJ20A
LS05-15B15S									SMBJ20A
LS05-15B24S									100μF/35V

Note:
 1. C1, C2 and C3 are electrolytic capacitors. They are required both ac input and dc input. When ac input, C1 is used as filter capacitor, the value of C1 is recommended to be 22μF /400V. When dc input, C1 is used as EMC filter capacitor, the value of C1 is recommended to be 10μF/400V (when the input voltage is above 370Vdc, the recommended value of C1 is 10μF/450V). C2 and C3 are output filter 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 filter circuit. Current of L1 refer to the datasheets provided by the manufactures, current derating should be 80% or above. To protect post-circuits (if converter fails), TVS is recommended. And the external NTC thermistor is recommended to be 5D-9.
 2. For standard EMC requirement, please refer to figure 1. If higher EMC requirement, please refer to figure 3, recommended parameters are shown in the table below.

Recommend Parameter For Higher EMC Standard Circuit	
Components	Recommend Parameter
MOV	S14K350
CY1, CY2, CY3, CY4	1nF/400Vac
CX	0.22μF/275Vac
R1, R2	2Ω/3W Wire-wound resistor
R3	1MΩ/2W
LCM	10mH, recommended to use MORNUSUN's FL2D-Z5-103
FC-L01D	MORNUSUN's 2KV/4KV Surge protector
FUSE	1A/250V, slow blow, it must be connected to FUSE

Outline dimensions & footprint details

Pin	Function
1	-Vin (N)
3	+Vin (L)
5	+CAP
7	GND
12	-Vo
14	+Vo

Note:
 Unit :mm[inch]
 Pin section tolerances :±0.1mm[±0.004inch]
 General tolerances:±0.50mm[±0.020inch]