

157B_3RP series

1Watt, Fixed input voltage, isolated & regulated single output

DC-DC Converter

1 Watt

- ⊕ Continuous short-circuit protection
- ⊕ No-load input current as low as 5mA
- ⊕ Operating temperature range: -40°C to +85°C
- ⊕ High efficiency up to 73%
- ⊕ Isolation voltage: 3kVDC
- ⊕ International standard pin-out
- ⊕ SIP package
- ⊕ UL62368, EN62368 approved (Pending)

The 157B_3RP series are specially designed for applications where an isolated voltage is required in a distributed power supply system.

They are suitable for: preceding-stage interference isolation condition; ground-interference canceled condition; digit circuit condition; Voltage-isolation converting condition; normal low-frequency artificial circuit condition; relay drive circuit condition, etc.



Common specifications					
Item	Operating condition	Min	Typ	Max	Units
Short circuit protection:	Continuous, self-recovery				
Cooling:	Free air convection				
Operating Temperature	Derating when operating temperature up to 71°C (see Fig.)	-40		+85	°C
Case Temperature	Ta=25°C		25		°C
Storage Temperature		-55		+125	°C
Storage Humidity				95	%RH
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds			300	°C
Vibration	10-55Hz, 2G, 30Min. along X, Y and Z				
MTBF	MIL-HDBK-217F@25°C			> 3500	Khrs
Case Material	Black flame-retardant and heat-resistant plastic (UL94 V-0)				
Weight			2.1		g

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input current (no-load/full load)	• 3.3/5VDC input • 9/12VDC input • 15/24VDC input	286/5	303/10	282/12 299/20 274/18 290/30	mA
Reflected ripple current*			15		mA
Input filter	Capacitor				
Hot plug	Unavailable				

* Reflected ripple current testing method please see DC-DC Converter Application Notes for specific operation.

EMC specifications		
EMI	CE	CISPR32/EN55032 CLASS B (see EMC recommended circuit)
EMI	RE	CISPR32/EN55032 CLASS B (see EMC recommended circuit)
EMS	ESD	IEC/EN61000-4-2 Air ±8kV, Contact ±4kV perf. Criteria B

Example:
157B_0505S3RP
 1 = 1Watt; S7 = SIP7; B = Pinning; 5Vin; 5Vout; S = Single Output;
 3 = 3kVDC; R = Regulated Output; P = Short circuit protection

Output specifications					
Item	Test condition	Min	Typ	Max	Units
Output Voltage Accuracy				±3	%
Line Regulation	Input voltage change: ±1			±0.25	%
Load regulation	10%-100% load			±2	
Temperature coefficient	100% load			±0.02	%/°C
Ripple & Noise*	20MHz Bandwidth	30	75		mVp-p
Switching frequency	100% load, nominal input voltage		270		KHz

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

Isolation specifications					
Item	Test condition	Min	Typ	Max	Units
Insulation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	3000			VDC
Insulation Resistance	Input-output, isolation voltage 500VDC	1000			MΩ
Isolation capacitance	Input-output, 100KHz/0.1V		20		pF

Note:

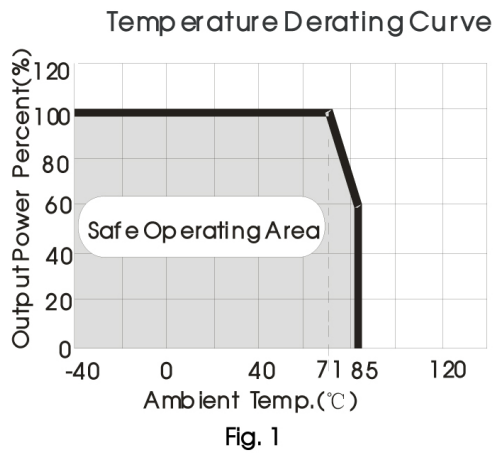
1. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
2. The maximum capacitive load offered were tested at input voltage range and full load;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta = 25°C, humidity <75%RH with nominal input voltage and rated output load;
4. All index testing methods in this datasheet are based on our Company's corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

1S7B_3RP Series Series

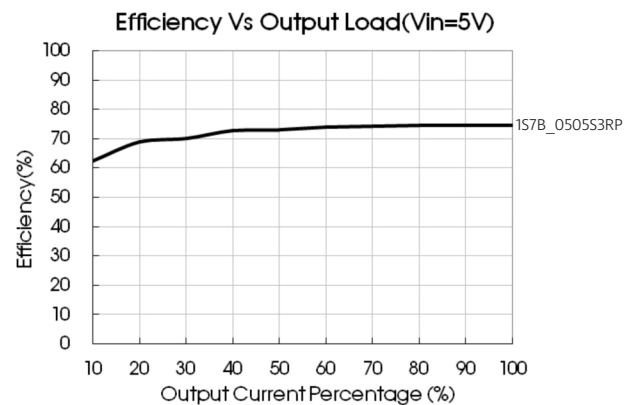
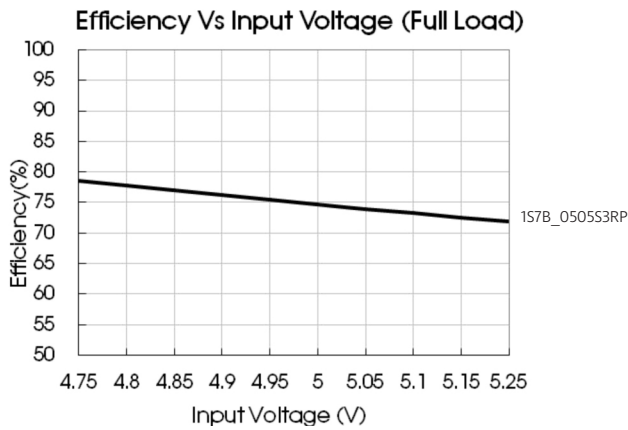
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Certification [Pending]	Part Number	Input Voltage [V]	Output Voltage [VDC]	Output current [mA, max./min]	Capacitive load [μ F, max]	Efficiency [%, typ]
UL/CE	1S7B_0505S3RP	5 (4.75-5.25)	5	200/20	2400	66/70
UL/CE	1S7B_0509S3RP	5 (4.75-5.25)	9	111/12	1000	67/71
UL/CE	1S7B_0512S3RP	5 (4.75-5.25)	12	84/9	560	68/72
UL/CE	1S7B_0515S3RP	5 (4.75-5.25)	15	67/7	470	69/73

Typical characteristics



Efficiency curves

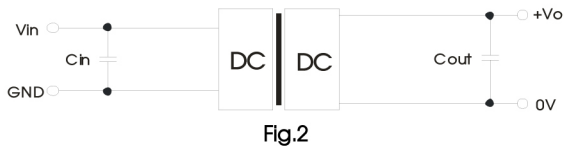


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Typical application circuit

If it is required to further reduce input and output ripple, a filter capacitor may be connected to the input and output terminals, see Fig.2. Moreover, choosing a suitable filter capacitor is very important, start-up problems may be caused if the capacitance is too large. Under the condition of safe and reliable operation, the recommended capacitive load values are shown in Table 1.



Recommended capacitive load value table (Table 1)

V_{in} (VDC)	C_{in} (μ F)	V_o (VDC)	C_{out} (μ F)
5	4.7	5	10
--	--	9/12	2.2
--	--	15	1

EMC solution-recommended circuit

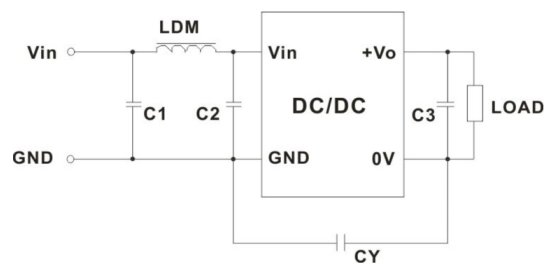


Fig. 3

EMC recommended circuit value table (Table 2)

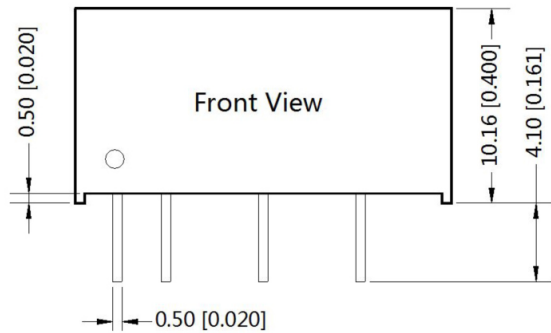
Input voltage 5VDC	EMI	Output voltage (VDC)	5/9	12/15
		$C1/C2$	4.7 μ F /25V	4.7 μ F /25V
	CY	--	1nF/4KVDC VISHAY HGZ102MBP TDK CD45-E2GA102M-GKA	
	$C3$	Refer to the C_{out} in table 1		
	LDM	6.8 μ H	6.8 μ H	

Note: In the case of actual use, the requirements for EMI are high, it is subject to CY (CY : 1nF/4KV).

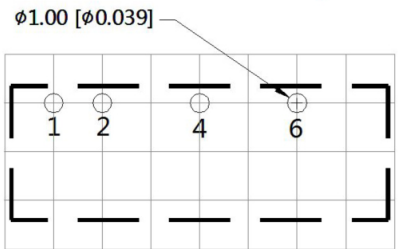
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Mechanical dimensions

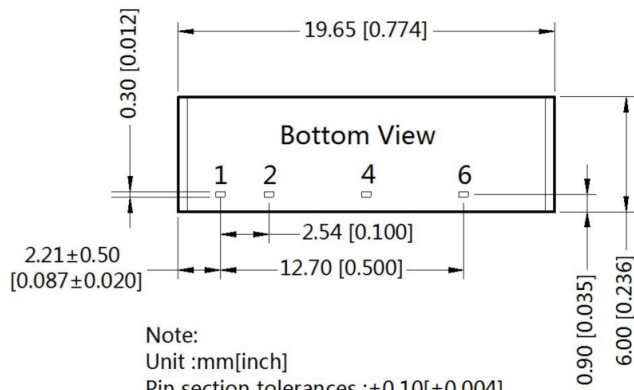


THIRD ANGLE PROJECTION



Note : Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	V _{in}
2	GND
4	0V
6	+V _o



Note:
 Unit :mm[inch]
 Pin section tolerances : $\pm 0.10[\pm 0.004]$
 General tolerances: $\pm 0.25[\pm 0.010]$