

- SIL7 Package
- Input Range $\pm 10\%$
- Efficiency up to 88 %
- Low Coupling Capacity
- Isolation 5200 VDC
- Long Term Short Circuit Protection
- Operation Temperature Range $-40 \sim 80\text{ }^{\circ}\text{C}$ max.
- Dedicated for IGBT Applications

RoHS



Picture similar

Number Structure

RS7	-	05	05	S	20	A	5
Series / Package		Input Voltage	Output Voltage	Output Type	Power	Int. Code	Isolation Voltage
RS7 = SIL7		05 = 5.0 Vdc 12 = 12 Vdc 15 = 15 Vdc 24 = 24 Vdc	03 = 3.3 Vdc 05 = 5.0 Vdc 09 = 9.0 Vdc 12 = 12 Vdc 15 = 15 Vdc	S = Single Output D = Dual Output T = Dual Split (+15 / -9 Vdc)	20 = 2 W	Logistics Code	5 = 5200 Vdc

Model Selection Guide								
Model Number	Input Voltage Range (VDC)	Input Current		Output Voltage (VDC)	Output Current		Efficiency @ FL (% , typ.)	Capacitive Load @ FL (µF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)		Min. Load (mA)	Full Load (mA)		
RS7-0503S20A5	4.5-5.5	40	418	3.3	-	500	79	1000
RS7-0505S20A5	4.5-5.5	40	482	5	-	400	83	470
RS7-0509S20A5	4.5-5.5	40	471	9	-	222	85	470
RS7-0512S20A5	4.5-5.5	40	465	12	-	167	86	220
RS7-0515S20A5	4.5-5.5	40	460	15	-	133	87	220
RS7-1203S20A5	10.8-13.2	30	176	3.3	-	500	78	1000
RS7-1205S20A5	10.8-13.2	30	201	5	-	400	83	470
RS7-1209S20A5	10.8-13.2	30	196	9	-	222	85	470
RS7-1212S20A5	10.8-13.2	30	194	12	-	167	86	220
RS7-1215S20A5	10.8-13.2	30	194	15	-	133	86	220
RS7-1503S20A5	13.5-16.5	25	141	3.3	-	500	78	1000
RS7-1505S20A5	13.5-16.5	25	163	5	-	400	82	470
RS7-1509S20A5	13.5-16.5	25	157	9	-	222	85	470
RS7-1512S20A5	13.5-16.5	25	155	12	-	167	86	220
RS7-1515S20A5	13.5-16.5	25	155	15	-	133	86	220
RS7-2403S20A5	21.6-26.4	20	89	3.3	-	500	77	1000
RS7-2405S20A5	21.6-26.4	20	104	5	-	400	80	470
RS7-2409S20A5	21.6-26.4	20	100	9	-	222	83	470
RS7-2412S20A5	21.6-26.4	20	98	12	-	167	85	220
RS7-2415S20A5	21.6-26.4	20	99	15	-	133	84	220
RS7-0505D20A5	4.5-5.5	40	488	±5	-	±200	82	±220
RS7-0509D20A5	4.5-5.5	40	465	±9	-	±111	86	±220
RS7-0512D20A5	4.5-5.5	40	455	±12	-	±83.3	88	±100
RS7-0515D20A5	4.5-5.5	40	460	±15	-	±66.7	87	±100
RS7-1205D20A5	10.8-13.2	30	201	±5	-	±200	83	±220
RS7-1209D20A5	10.8-13.2	30	194	±9	-	±111	86	±220
RS7-1212D20A5	10.8-13.2	30	194	±12	-	±83.3	86	±100
RS7-1215D20A5	10.8-13.2	30	194	±15	-	±66.7	86	±100
RS7-1505D20A5	13.5-16.5	25	163	±5	-	±200	82	±220
RS7-1509D20A5	13.5-16.5	25	159	±9	-	±111	84	±220
RS7-1512D20A5	13.5-16.5	25	155	±12	-	±83.3	86	±100
RS7-1515D20A5	13.5-16.5	25	155	±15	-	±66.7	86	±100
RS7-2405D20A5	21.6-26.4	20	102	±5	-	±200	82	±220
RS7-2409D20A5	21.6-26.4	20	99	±9	-	±111	84	±220
RS7-2412D20A5	21.6-26.4	20	99	±12	-	±83.3	84	±100
RS7-2415D20A5	21.6-26.4	20	97	±15	-	±66.7	86	±100
RS7-051509T20A5	4.5-5.5	40	465	+15/-9	-	+66.7/-111	86	+100/-220
RS7-121509T20A5	10.8-13.2	30	194	+15/-9	-	+66.7/-111	86	+100/-220
RS7-151509T20A5	13.5-16.5	25	157	+15/-9	-	+66.7/-111	85	+100/-220
RS7-241509T20A5	21.6-26.4	20	99	+15/-9	-	+66.7/-111	84	+100/-220

ALL SPECIFICATIONS ARE TYPICAL AT 25 °C, NOMINAL INPUT AND FULL LOAD UNLESS OTHERWISE NOTED.

Input Specifications					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	5.0 Vdc Input	4.5	5.0	5.5	VDC
	12 Vdc Input	10.8	12	13.2	
	15 Vdc Input	13.5	15	16.5	
	24 Vdc Input	21.6	24	26.4	
Input Current (No Load)		See Table			mA
Input Current (Full Load)		See Table			mA
Input Filter		Capacitor			-
Input Reflected Ripple Current ⁽¹⁾			20		mApk-pk
Start up Time	Nominal Vin and constant resistive load		20		ms
Recommended input fuse (slow blow)	5.0 Vdc Input		1.0		A
	12 Vdc Input		0.4		
	15 Vdc Input		0.3		
	24 Vdc Input		0.2		
Note : 1. Measured with a simulated source inductance of 12 μH and a source capacitor Cin (47 μF, ESR < 1 Ω at 100 kHz).					

Output Specifications						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			-5		+5	%
Line Regulation	For 1% Vin Change		-1.2		+1.2	%
Load Regulation	From 20 % to 100 % Load	RS7-0503S20A5 RS7-0505S20A5			+12	%
		Other Output			+10	
Cross Regulation	Asymmetrical Load 25% / 100% for Dual		-5		+5	%
Ripple & Noise ⁽¹⁾	20 MHz Bandwidth				150	mVpk-pk
Short Circuit Protection			Indefinite (Automatic Recovery)			-
Temperature Coefficient			-0.03		+0.03	%/°C
Maximum Capacitive Load	Minimum Vin and constant resistive load		See Table			-
Note : 1. Measured with a 0.1 μF MLCC and 10 μF electrolytic capacitor.						

Absolute Maximum Ratings					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1000 ms)	5.0 Vdc Input			9	VDC
	12 Vdc Input			18	
	15 Vdc Input			20	
	24 Vdc Input			30	
Soldering Temperature	1.5 mm from case 10 sec. max.			260	°C
Note : These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.					

General Specifications						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Efficiency			See Table			%
Isolation Voltage	Input-output, and rated for 60 sec.	Suffix "5"	5200			VDC
Isolation Resistance	Input-output		1000			MΩ
Isolation Capacitance	Input-output			7		pF
Switching Frequency			50			kHz
Reliability Calculated MTBF	MIL-HDBK-217 F @ 25 °C		3300			k hours
Safety Standard	IEC / EN / UL 62368-1		Designed to meet			
Environmental compliance	RoHS		Designed to meet			

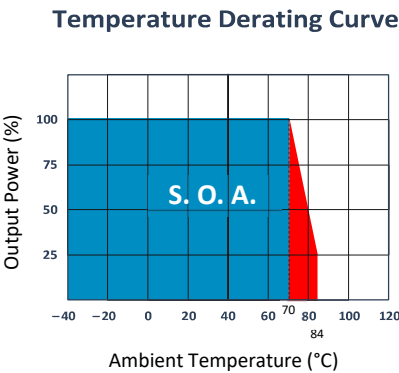
Environmental Specifications						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating Ambient Temperature	See the Derating Curve		-40		80	°C
Maximum Case Temperature					100	°C
Thermal Impedance	Output 3.3 Vdc Models		42.7			°C/W
	Efficiency = 80% ~ 82%		62.3			
	Efficiency = 83% ~ 88%		45.6			
Storage Humidity					95	% rel. H
Storage Temperature			-55		125	°C
Cooling	Natural Convection		30 - 65 LFM			

EMC Specifications			
Parameter	Standard	Condition	Criterion
Conducted Emissions	EN55032	with external components	B
Radiated Emissions	EN55032		B
ESD	IEC 61000-4-2	Air: ±8 kV / Indirect: ±6 kV	A
RS	IEC 61000-4-3	20 V/m	A
EFT	IEC 61000-4-4	±2 kV with external components	A
Surge	IEC 61000-4-5	±2 kV with external components	A
CS	IEC 61000-4-6	10 Vrms	A
PFMF	IEC 61000-4-8	30 A/m	A

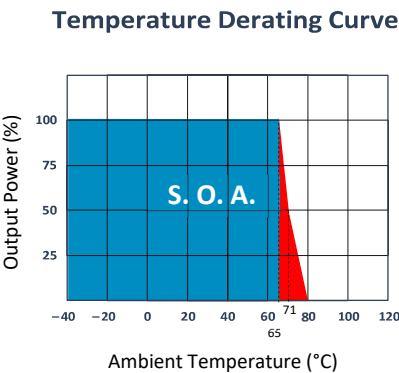
Physical Specifications	
Parameter	Value
Case Material	Nonconductive Black Plastic (UL94V-0 rated)
Pin Material	Tinned copper
Potting Material	Epoxy (UL94V-0 rated)
Weight	2.7 g, typ.
Dimensions	0.76" x 0.28" x 0.39"

Thermal Derating

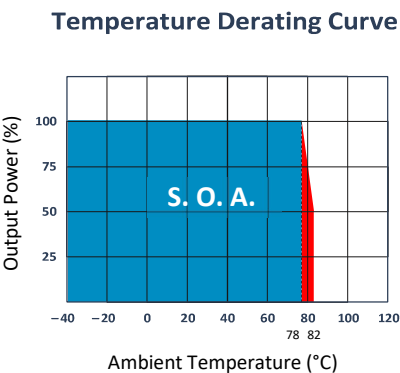
To enhance the system reliability, the power module should always be operated below the maximum operating temperature. If the temperature exceeds the maximum operating temperature, reliability of the unit may be affected.



Output 3.3 Vdc Models



Efficiency = 80% ~ 82%

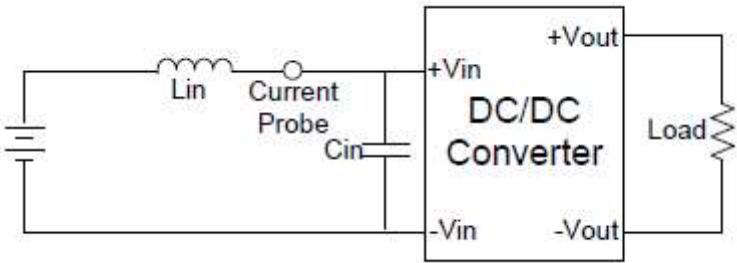


Efficiency = 83% ~ 88%

Test Configurations

Input Reflected Ripple Current Test Step

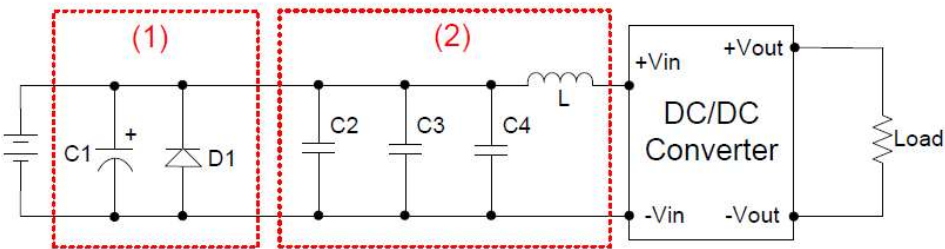
Input reflected ripple current is measured with a source inductor L_{in} (12 μH) and a source capacitor C_{in} (47 μF , ESR < 1.0 Ω at 100 kHz) at nominal input and full load.



EMC Filter Details

EMC Filter

The part (1) Circuit is used to meet Surge & EFT test, and the part (2) Circuit is used to meet EMI test.



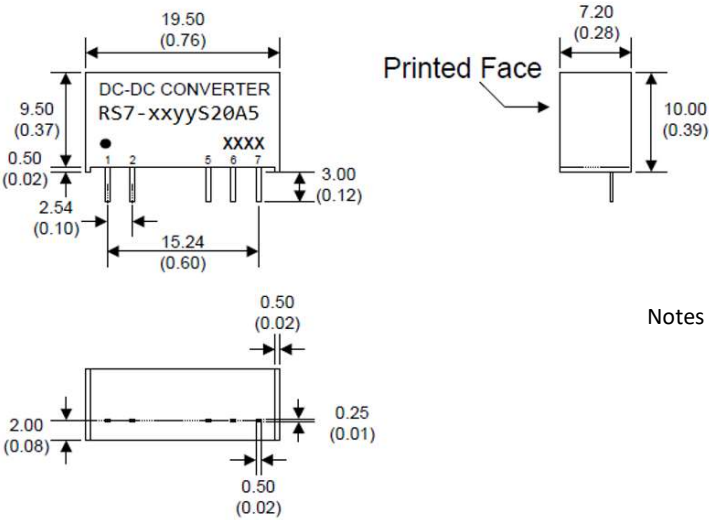
V in	C1	D1	C2	C3 + C4	L
5 V	Nippon Chemi-con KY-Series 330μF / 50V	SMDJ9.0A	MLCC 4.7μF, 16V	/	6.8μH
12 V		SMDJ13A	MLCC 22μF, 25V		
15 V		SMDJ18A			
24 V	Nippon Chemi-con KY-Series 1000μF / 35V	SMDJ24A	MLCC 10μF, 35V	MLCC 10μF, 35V	10μH

Pin Connections

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	N.P.	COM
7	+Vout	+Vout
*N.P. : No PIN		

Mechanical Specifications

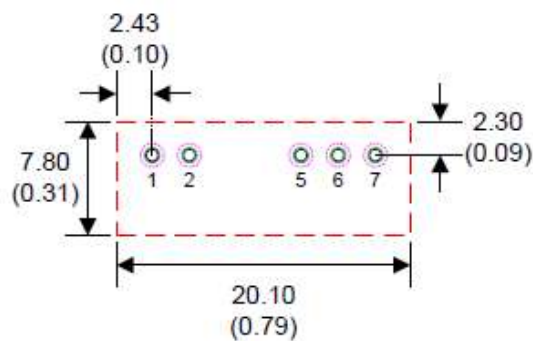
SIL Package



- Notes : All dimensions are typical in millimeters (inches).
- 1. Pin dimension tolerance: ± 0.05 (± 0.002)
 - 2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
 - 3. Pin to case tolerance: ± 0.5 (± 0.02)
 - 4. Case Tolerance: ± 0.5 (± 0.02)

Recommended Footprint Details

SIL Package



- Notes : All dimensions are typical in millimeters (inches).
- 1. Through hole (black): $\varnothing$ 0.80 (0.031)
 - 2. Top view pad (green): $\varnothing$ 1.00 (0.039)
 - 3. Bottom view pad (pink): $\varnothing$ 1.60 (0.063)

Notes

The information and specification contained in this data sheet are believed to be correct at time of publication. However, Acal BFi accepts no responsibility for consequences arising from printing errors or inaccuracies. Specifications are subject to change without notice.