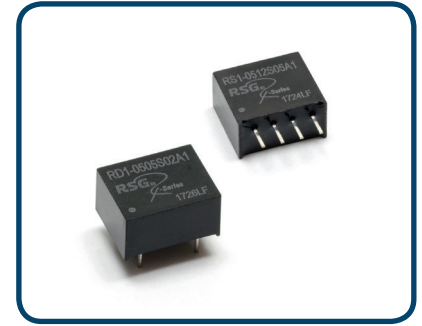


- 4 Pin SIL / 8 Pin DIL Package
- ± 10 % Input Range
- 1000 or 3000 VDC Isolation
- EMI Complies with EN55032 Class B
- Efficiency up to 83 %
- Operating Temperature Range: – 40 °C ~ + 85 °C
- Optional Continuous Short Circuit Protection On Request
- Low Ripple and Noise
- Non Conductive Black Plastic Case

Picture similar



Output Specifications	
Voltage Accuracy	± 3 %, max.
Maximum Output Current	See table
Line Regulation	± 1.2 % max. (per ± 1 % V_{in} Change)
Load Regulation	from 20 % to 100 % Load: ± 10 % max. Output 3.3 V Model: ± 20 %
Cross Regulation (Dual Output)	–
Short Circuit Protection	Optional Continuous SCP on request
Ripple & Noise (20 MHz Bandwidth)	100 mV pk-pk
Temperature Coefficient	± 0.02 % / °C

Input Specifications	
Voltage Range	See table
Start-up Time	–
No-Load/Full-Load Input Current	See table
Input Filter	C / L (see filter details on following pages)
Input Reflected Ripple Current	20 mA pk-pk typ.
Surge Voltage (100 ms) ¹⁾	
3.3 V Models	6 VDC max.
5 V Models	7 VDC max.
12 V Models	15 VDC max.
15 V Models	18 VDC max.
24 V Models	28 VDC max.
48 V Models	54 VDC max.

General Specifications	
I/O Isolation Voltage (60 sec)	1000 ~ 3000 VDC
Out1/Out2 Isolation Voltage (Dual Separate)	–
I/O Isolation Capacitance	60 pF typ.
I/O Isolation Resistance	1000 MΩ, min.
Switching Frequency	Variable 80 kHz
Humidity	95 % rel H
Reliability Calculated MTBF	> 1.121 Mhrs (MIL-HDBK-217 f)
Safety Standard(s)	IEC / EN60950-1 (designed to meet)

Environmental Specifications	
Operating Temperature Range	– 40 °C ~ + 85 °C (see Derating Curve)
Maximum Case Temperature	100 °C
Storage Temperature	– 40 °C ~ + 125 °C
Cooling	Natural Convection
Soldering Profile and Peak Temperature	Wave Flow: 260 °C (1.5 mm from case), 10 s, max.

Physical Specifications	
Case Material	Non-conductive Black Plastic (UL94V-0 rated)
Pin Material SIP Case	0.5 mm Alloy42 Solder-coated
Pin Material DIP Case	0.5 mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight SIP Case	1.5 g
Weight DIP Case	1.8 g
Dimensions SIP Case	0.46" x 0.24" x 0.40"
Dimensions DIP Case	0.50" x 0.40" x 0.27"

EMC Specifications	
Radiated / Conducted Emissions	EN55032 Class B see EMI Filter
ESD	IEC 61000-4-2 Perf. Criteria A
Rad. RF	IEC 61000-4-3 Perf. Criteria A
EFT	IEC 61000-4-4 Perf. Criteria A
Surge	IEC 61000-4-5 Perf. Criteria A
Cond. RF	IEC 61000-4-6 Perf. Criteria A
PFMF	IEC 61000-4-8 Perf. Criteria A
VD/Sl/VV	–

¹⁾ These are stress ratings; exposure of devices to any of these conditions may adversely affect long-term reliability.

All specifications typical at $T_a = 25\text{ °C}$, nominal input voltage and full load, unless otherwise specified.

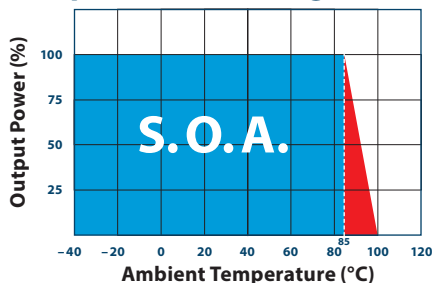
The information and specification contained in this data sheet are believed to be correct at time of publication. However, AcAl BFi accepts no responsibility for consequences arising from printing errors or inaccuracies. Specifications are subject to change without notice.

Number structure RS1 / RD1 Series

RS1	-	05	15	S	10	A	3
Name / package		V-input nom.	V-output	Output type	Power	Int. Code	Isolation
RS1 = SIL4 RD1 = DIL8		03 = 3.3V 05 = 5V ... 48 = 48V	03 = 3.3V 05 = 5V ... 24 = 24V	S = Single D = Dual* E = Separate*	02 = 0.25W 05 = 0.50W ... 30 = 3.00W	Logistics Code	1 = 1.0kVDC 3 = 3.0kVDC

(*RD1 only)

Temperature Derating Curve



Model Selection Guide

Suffix X = 1 means 1 kVDC and X = 3 means 3 kVDC Isolation Voltage

Model Number	Input			Output		Efficiency @ Full Load (%)	Capacitor Load (µF)
	Voltage (VDC)	No-Load Current (mA)	Full Load Current (mA)	Voltage (VDC)	Full Load Current (mA)		
RS1-0303S05AX	3.3	20	205	3.3	152	76	100
RS1-0305S05AX	3.3	25	216	5	100	70	100
RS1-0307S05AX	3.3	25	216	7.2	69	70	100
RS1-0309S05AX	3.3	25	216	9	56	70	100
RS1-0312S05AX	3.3	25	201	12	42	72	100
RS1-0315S05AX	3.3	25	208	15	33	73	100
RS1-0318S05AX	3.3	25	208	18	28	73	100
RS1-0324S05AX	3.3	25	208	24	21	73	100
RS1-0503S05AX	5	20	132	3.3	151.5	76	100
RS1-0505S05AX	5	13	121	5	100	83	100
RS1-0507S05AX	5	15	134	7.2	69.44	75	100
RS1-0509S05AX	5	15	128	9	55.55	78	100
RS1-0512S05AX	5	18	127	12	41.67	79	100
RS1-0515S05AX	5	22	130	15	33.33	77	100
RS1-0518S05AX	5	20	127	18	27.77	79	100
RS1-0524S05AX	5	25	134	24	20.83	75	100
RS1-1203S05AX	12	15	58	3.3	151.5	72	100
RS1-1205S05AX	12	10	54	5	100	78	100
RS1-1207S05AX	12	15	57	7.2	69.44	73	100
RS1-1209S05AX	12	15	57	9	55.56	73	100
RS1-1212S05AX	12	20	58	12	41.67	72	100
RS1-1215S05AX	12	20	61	15	33.33	69	100
RS1-1218S05AX	12	15	61	18	27.77	68	100
RS1-1224S05AX	12	15	59	24	20.83	71	100
RS1-1503S05AX	15	10	44	3.3	151.5	75	100
RS1-1505S05AX	15	8	43	5	100	78	100
RS1-1507S05AX	15	12	44	7.2	69.44	75	100
RS1-1509S05AX	15	12	44	9	55.55	75	100
RS1-1512S05AX	15	10	44	12	41.67	77	100
RS1-1515S05AX	15	15	48	15	33.33	70	100
RS1-1518S05AX	15	12	51	18	27.77	66	100
RS1-1524S05AX	15	10	51	24	20.83	66	100

continued on the next page

Model Selection Guide, continued

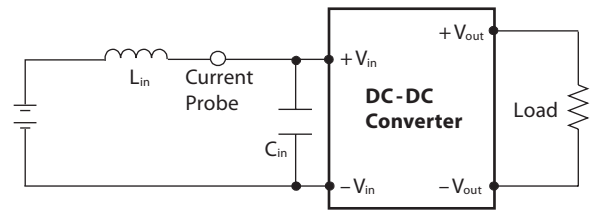
Suffix X = 1 means 1 kVDC and X = 3 means 3 kVDC Isolation Voltage

Model Number	Input			Output		Efficiency	Capacitor Load
	Voltage (VDC)	No-Load Current (mA)	Full Load Current (mA)	Voltage (VDC)	Full Load Current (mA)	@ Full Load (%)	(μ F)
RS1-2403S05AX	24	8	31	3.3	151.5	69	100
RS1-2405S05AX	24	8	29	5	100	73	100
RS1-2407S05AX	24	10	30	7.2	69.44	70	100
RS1-2409S05AX	24	10	30	9	55.55	71	100
RS1-2412S05AX	24	8	30	12	41.67	71	100
RS1-2415S05AX	24	10	29	15	33.33	73	100
RS1-2418S05AX	24	10	29	18	27.77	73	100
RS1-2424S05AX	24	10	29	24	20.83	72	100
RS1-4803S05AX	48	6	17	3.3	151.5	60	100
RS1-485S05AX	48	6	16	5	100	66	100
RS1-4807S05AX	48	6	17	7.2	69.44	60	100
RS1-4809S05AX	48	6	17	9	55.55	62	100
RS1-4812S05AX	48	6	17	12	41.67	64	100
RS1-4815S05AX	48	6	17	15	33.33	62	100
RS1-4818S05AX	48	6	17	18	27.77	62	100
RS1-4824S05AX	48	10	18	24	20.83	61	100
RD1-0303S05AX	3.3	20	205	3.3	152	76	100
RD1-0305S05AX	3.3	25	216	5	100	70	100
RD1-0307S05AX	3.3	25	216	7.2	69	70	100
RD1-0309S05AX	3.3	25	216	9	56	70	100
RD1-0312S05AX	3.3	25	201	12	42	72	100
RD1-0315S05AX	3.3	25	208	15	33	73	100
RD1-0318S05AX	3.3	25	208	18	28	73	100
RD1-0324S05AX	3.3	25	208	24	21	73	100
RD1-0503S05AX	5	16	132	3.3	151.5	76	100
RD1-0505S05AX	5	15	124	5	100	81	100
RD1-0507S05AX	5	15	134	7.2	69.44	75	100
RD1-0509S05AX	5	15	128	9	55.55	78	100
RD1-0512S05AX	5	18	127	12	41.67	79	100
RD1-0515S05AX	5	22	130	15	33.33	77	100
RD1-0518S05AX	5	20	127	18	27.77	79	100
RD1-0524S05AX	5	25	134	24	20.83	75	100
RD1-1203S05AX	12	15	58	3.3	151.5	73	100
RD1-1205S05AX	12	12	54	5	100	78	100
RD1-1207S05AX	12	15	57	7.2	69.44	73	100
RD1-1209S05AX	12	15	58	9	55.56	73	100
RD1-1212S05AX	12	20	58	12	41.67	72	100
RD1-1215S05AX	12	20	61	15	33.33	69	100
RD1-1218S05AX	12	15	61	18	27.77	68	100
RD1-1224S05AX	12	15	59	24	20.83	71	100
RD1-1503S05AX	15	10	44	3.3	151.5	75	100
RD1-1505S05AX	15	8	43	5	100	78	100
RD1-1507S05AX	15	12	44	7.2	69.44	75	100
RD1-1509S05AX	15	12	44	9	55.55	75	100
RD1-1512S05AX	15	10	44	12	41.67	77	100
RD1-1515S05AX	15	15	48	15	33.33	70	100
RD1-1518S05AX	15	12	51	18	27.77	66	100
RD1-1524S05AX	15	10	51	24	20.83	66	100
RD1-2403S05AX	24	8	31	3.3	151.5	69	100
RD1-2405S05AX	24	10	29	5	100	74	100
RD1-2407S05AX	24	10	31	7.2	69.44	69	100
RD1-2409S05AX	24	10	30	9	55.55	71	100
RD1-2412S05AX	24	10	31	12	41.67	69	100
RD1-2415S05AX	24	9	31	15	33.33	69	100
RD1-2418S05AX	24	10	29	18	27.77	73	100
RD1-2424S05AX	24	10	29	24	20.83	72	100

Test Configurations

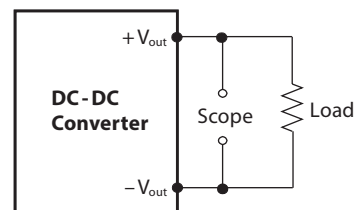
Input Reflected Ripple Current Test Step

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



Output Ripple & Noise Measurement Test

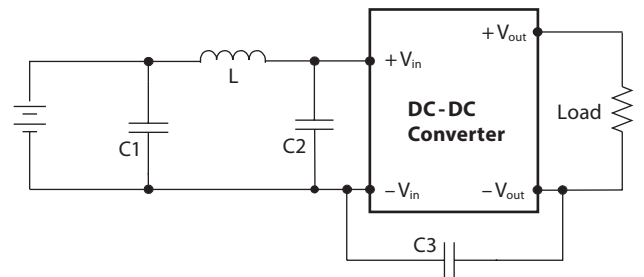
The Scope measurement bandwidth is 20 MHz.



EMI Filter

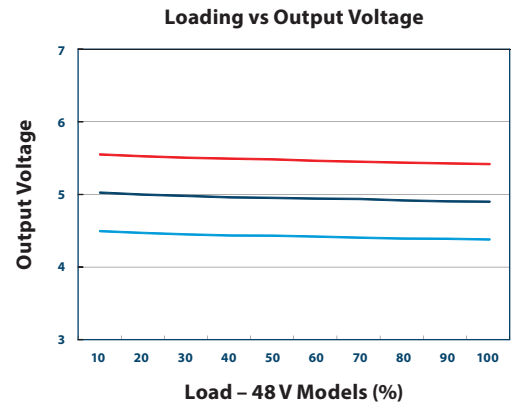
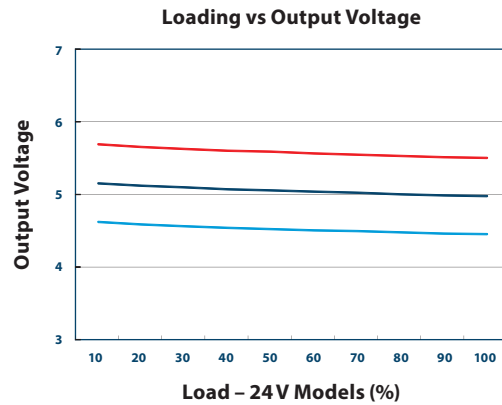
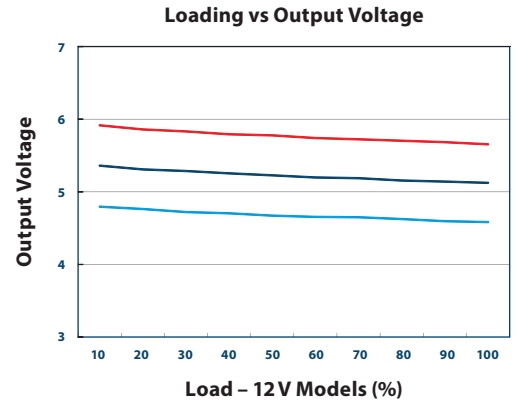
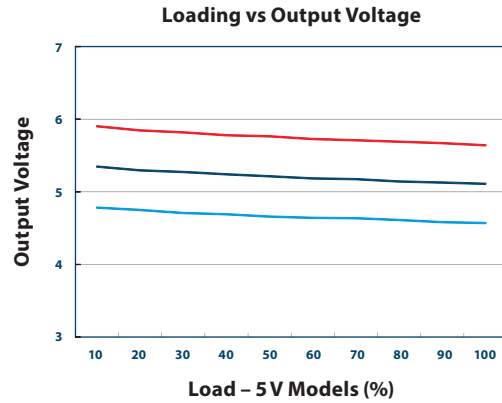
Input filter components (C_1 , L , C_2 , C_3) are used to help meet conducted emissions requirement for the module.

These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



V_{in}	C_1	L	C_2	C_3
3.3V, 5V, 12V, 15V	1210, 2.2 μ F / 100 V	18 μ H		
24V	1210, 2.2 μ F / 100 V	18 μ H	1210, 2.2 μ F / 100 V	1206, 470 pF / 2 kV
48V	Electrolytic capacitor, 10 μ F / 100 V	18 μ H	1210, 2.2 μ F / 100 V	1206, 470 pF / 2 kV

Unregulated Single output

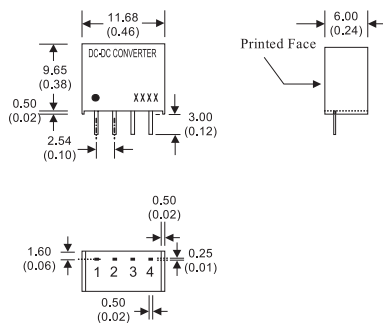


Mechanical Specifications

4 Pin SIL Package

Notes : All dimensions are typical in millimeters (inches).

1. Pin diameter: 0.5 ± 0.05 (0.02±0.002)
 2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
 3. Case Tolerance: ± 0.5 (± 0.02)
- The thickness of 48V input voltage model is 7.50 (0.29)
(The Pin Connection of high isolation one is the same with normal one.)



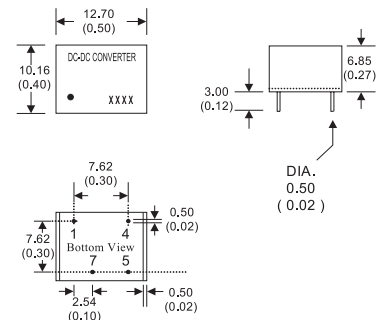
Pin Number	Single
1	-V Input
2	+V Input
3	-V Output
4	+V Output

8 Pin DIL Package

Notes : All dimensions are typical in millimeters (inches).

1. Pin diameter: 0.5 ± 0.05 (0.02±0.002)
 2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
 3. Case Tolerance: ± 0.5 (± 0.02)
- (The Pin Connection of high isolation one is the same with normal one.)

Pin Number	Single
1	-V Input
4	+V Input
5	+V Output
7	-V Output



Notes

- Ripple/Noise measured with 20 MHz bandwidth.
 - Capacitive load is tested at minimal V_{in} and constant resistive load.
 - Measured Input reflected ripple current with a simulated source inductance of 12 μH .
 - Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
 - Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.
 - Input filter components are required to help meet conducted emission class B. Refer to the EMI Filter of design & feature configuration.
 - An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.
- The suggested filter capacitor: Nippon - chemi - con KY series, 470 μF / 100V.

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