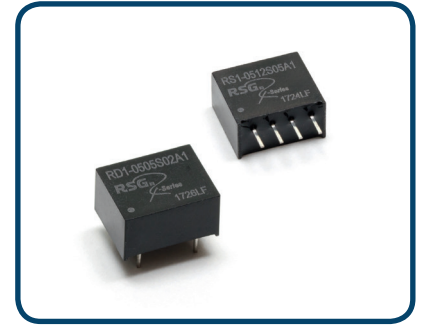


- 4 Pin SIL / 8 Pin DIL Package
- ± 10 % Input Range
- 1000 or 3000 VDC Isolation
- EMI Complies with EN55032 Class B
- Efficiency up to 77 %
- Operating Temperature Range: – 40 °C ~ + 85 °C
- Optional Continuous Short Circuit Protection On Request
- Low Ripple and Noise
- Non Conductive Black Plastic 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	5 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 MHours (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 / SI / 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.

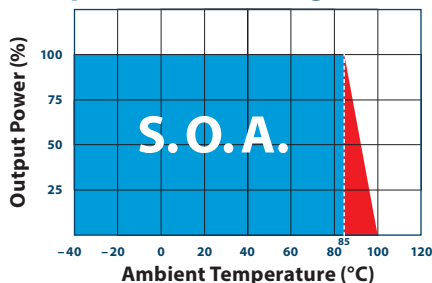
The information and specification contained in this data sheet are believed to be correct at time of publication. However, AcAl BFi accepts no responsibility for consequences arising from printing errors or inaccuracies. Specifications are subject to change without notice.

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 = 3.3 V 05 = 5 V ... 48 = 48 V	03 = 3.3 V 05 = 5 V ... 24 = 24 V	S = Single D = Dual* E = Separate*	02 = 0.25 W 05 = 0.50 W ... 30 = 3.00 W	Logistics Code	1 = 1.0 kVDC 3 = 3.0 kVDC

(*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 (%, typ.)	Capacitor Load @ Full Load (µF, max.)
	Voltage (VDC)	No-Load Current (mA, max.)	Full Load Current (mA, typ.)	Voltage (VDC)	Full Load Current (mA)		
RS1-0303S02AX	3,3	30	120	3,3	75,7	63	100
RS1-0305S02AX	3,3	25	115	5	50	66	100
RS1-0307S02AX	3,3	25	118	7,2	34,7	64	100
RS1-0309S02AX	3,3	25	118	9	27,7	64	100
RS1-0312S02AX	3,3	32	113	12	20,8	67	100
RS1-0315S02AX	3,3	25	118	15	16,6	64	100
RS1-0318S02AX	3,3	25	115	18	13,8	66	100
RS1-0324S02AX	3,3	20	115	24	10,4	66	100
RS1-0503S02AX	5	20	78	3,3	75,7	64	100
RS1-0505S02AX	5	17	70	5	50	71	100
RS1-0507S02AX	5	18	74	7,2	34,7	68	100
RS1-0509S02AX	5	15	68	9	27,7	73	100
RS1-0512S02AX	5	14	66	12	20,8	76	100
RS1-0515S02AX	5	20	70	15	16,6	71	100
RS1-0518S02AX	5	17	69	18	13,8	72	100
RS1-0524S02AX	5	18	65	24	10,4	77	100
RS1-1203S02AX	12	10	32	3,3	75,7	65	100
RS1-1205S02AX	12	12	31	5	50	67	100
RS1-1207S02AX	12	10	31	7,2	34,7	67	100
RS1-1209S02AX	12	12	33	9	27,7	64	100
RS1-1212S02AX	12	15	33	12	20,8	63	100
RS1-1215S02AX	12	13	31	15	16,6	67	100
RS1-1218S02AX	12	13	32	18	13,8	65	100
RS1-1224S02AX	12	18	38	24	10,4	55	100
RS1-1503S02AX	15	12	26	3,3	75,7	63	100
RS1-1505S02AX	15	8	27	5	50	62	100
RS1-1507S02AX	15	12	28	7,2	34,7	60	100
RS1-1509S02AX	15	12	28	9	27,7	60	100
RS1-1512S02AX	15	12	27	12	20,8	62	100
RS1-1515S02AX	15	10	27	15	16,6	61	100
RS1-1518S02AX	15	12	29	18	13,8	57	100
RS1-1524S02AX	15	12	29	24	10,4	57	100

continued on the next page

Model Selection Guide, continued

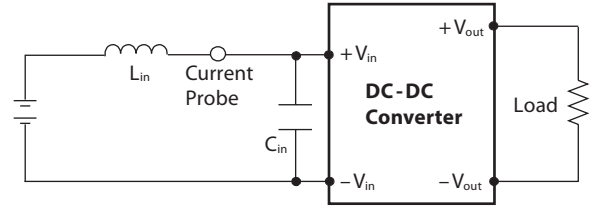
Suffix X = 1 means 1 kVDC and X = 3 means 3 kVDC Isolation Voltage

Model Number	Input			Output		Efficiency	Capacitor Load
	Voltage (VDC)	No-Load Current (mA, max.)	Full Load Current (mA, typ.)	Voltage (VDC)	Full Load Current (mA)	@ Full Load (% , typ.)	@ Full Load (µF, max.)
RS1-2403S02AX	24	8	17	3,3	75,7	60	100
RS1-2405S02AX	24	7	17,95	5	50	58	100
RS1-2407S02AX	24	8	18	7,2	34,7	57	100
RS1-2409S02AX	24	8	17	9	27,7	62	100
RS1-2412S02AX	24	10	19	12	20,8	56	100
RS1-2415S02AX	24	7	19	15	16,6	55	100
RS1-2418S02AX	24	10	18	18	13,8	57	100
RS1-2424S02AX	24	10	18	24	10,4	59	100
RS1-4803S02AX	48	8	9	3,3	75,7	55	100
RS1-4805S02AX	48	8	10	5	50	53	100
RS1-4807S02AX	48	8	10	7,2	34,7	54	100
RS1-4809S02AX	48	8	10	9	27,7	54	100
RS1-4812S02AX	48	8	9	12	20,8	55	100
RS1-4815S02AX	48	8	10	15	16,6	54	100
RS1-4818S02AX	48	8	11	18	13,8	49	100
RS1-4824S02AX	48	10	11	24	10,4	49	100
RD1-0303S02AX	3,3	25	124	3,3	75,7	61	100
RD1-0305S02AX	3,3	25	118	5	50	64	100
RD1-0307S02AX	3,3	25	118	7,2	34,7	64	100
RD1-0309S02AX	3,3	25	118	9	27,7	64	100
RD1-0312S02AX	3,3	25	120	12	20,8	63	100
RD1-0315S02AX	3,3	25	118	15	16,6	64	100
RD1-0318S02AX	3,3	25	115	18	13,8	66	100
RD1-0324S02AX	3,3	20	115	24	10,4	66	100
RD1-0503S02AX	5	20	83	3,3	75,7	60	100
RD1-0505S02AX	5	15	72	5	50	69	100
RD1-0507S02AX	5	18	71	7,2	34,7	70	100
RD1-0509S02AX	5	18	71	9	27,7	70	100
RD1-0512S02AX	5	20	74	12	20,8	68	100
RD1-0515S02AX	5	20	74	15	16,6	68	100
RD1-0518S02AX	5	17	68	18	13,8	73	100
RD1-0524S02AX	5	23	72	24	10,4	69	100
RD1-1203S02AX	12	12	31	3,3	75,7	67	100
RD1-1205S02AX	12	10	32	5	50	65	100
RD1-1207S02AX	12	15	32	7,2	34,7	65	100
RD1-1209S02AX	12	12	35	9	27,7	60	100
RD1-1212S02AX	12	13	31	12	20,8	68	100
RD1-1215S02AX	12	16	37	15	16,6	57	100
RD1-1218S02AX	12	16	38	18	13,8	55	100
RD1-1224S02AX	12	18	41	24	10,4	51	100
RD1-1503S02AX	15	12	26	3,3	75,7	63	100
RD1-1505S02AX	15	10	26	5	50	63	100
RD1-1507S02AX	15	12	28	7,2	34,7	60	100
RD1-1509S02AX	15	12	28	9	27,7	60	100
RD1-1512S02AX	15	12	28	12	20,8	60	100
RD1-1515S02AX	15	13	28	15	16,6	59	100
RD1-1518S02AX	15	12	29	18	13,8	57	100
RD1-1524S02AX	15	12	29	24	10,4	57	100
RD1-2403S02AX	24	8	18	3	75,7	58	100
RD1-2405S02AX	24	7	18	5	50,0	58	100
RD1-2407S02AX	24	8	18	7	34,7	59	100
RD1-2409S02AX	24	8	18	9	27,7	58	100
RD1-2412S02AX	24	10	19	12	20,8	55	100
RD1-2415S02AX	24	7	18	15	16,6	59	100
RD1-2418S02AX	24	10	20	18	13,8	53	100
RD1-2424S02AX	24	10	19	24	10,4	55	100

Test Configurations

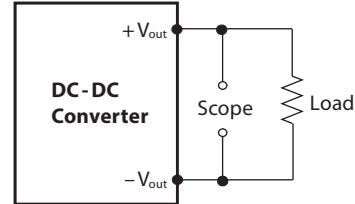
Input Reflected Ripple Current Test Step

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



Output Ripple & Noise Measurement Test

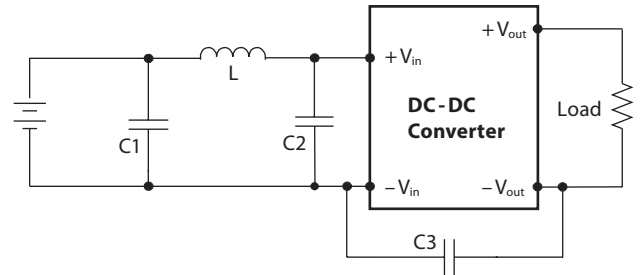
The Scope measurement bandwidth is $20\ \text{MHz}$.



EMI Filter

Input filter components ($C1$, L , $C2$, $C3$) are used to help meet conducted emissions requirement for the module.

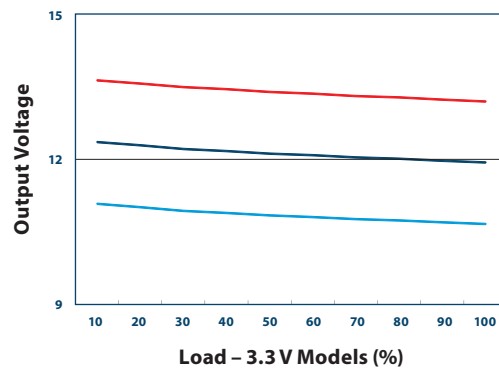
These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



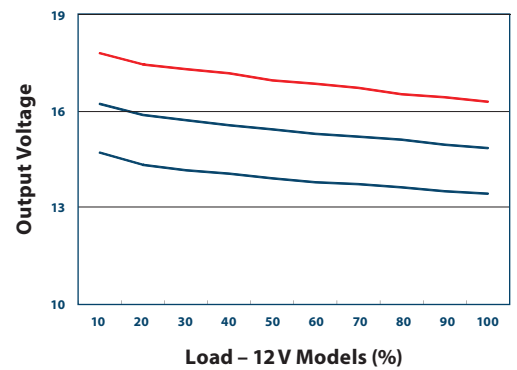
V_{in}	$C1$	L	$C2$	$C3$
3.3V, 5V, 12V, 15V	1210, $2.2\ \mu\text{F}$ / 100 V	$18\ \mu\text{H}$		
24V	1210, $2.2\ \mu\text{F}$ / 100 V	$18\ \mu\text{H}$	1210, $2.2\ \mu\text{F}$ / 100 V	1206, $470\ \text{pF}$ / 2 kV
48V	Electrolytic capacitor, $10\ \mu\text{F}$ / 100 V	$18\ \mu\text{H}$	1210, $2.2\ \mu\text{F}$ / 100 V	1206, $470\ \text{pF}$ / 2 kV

Electrical Characteristic Curves

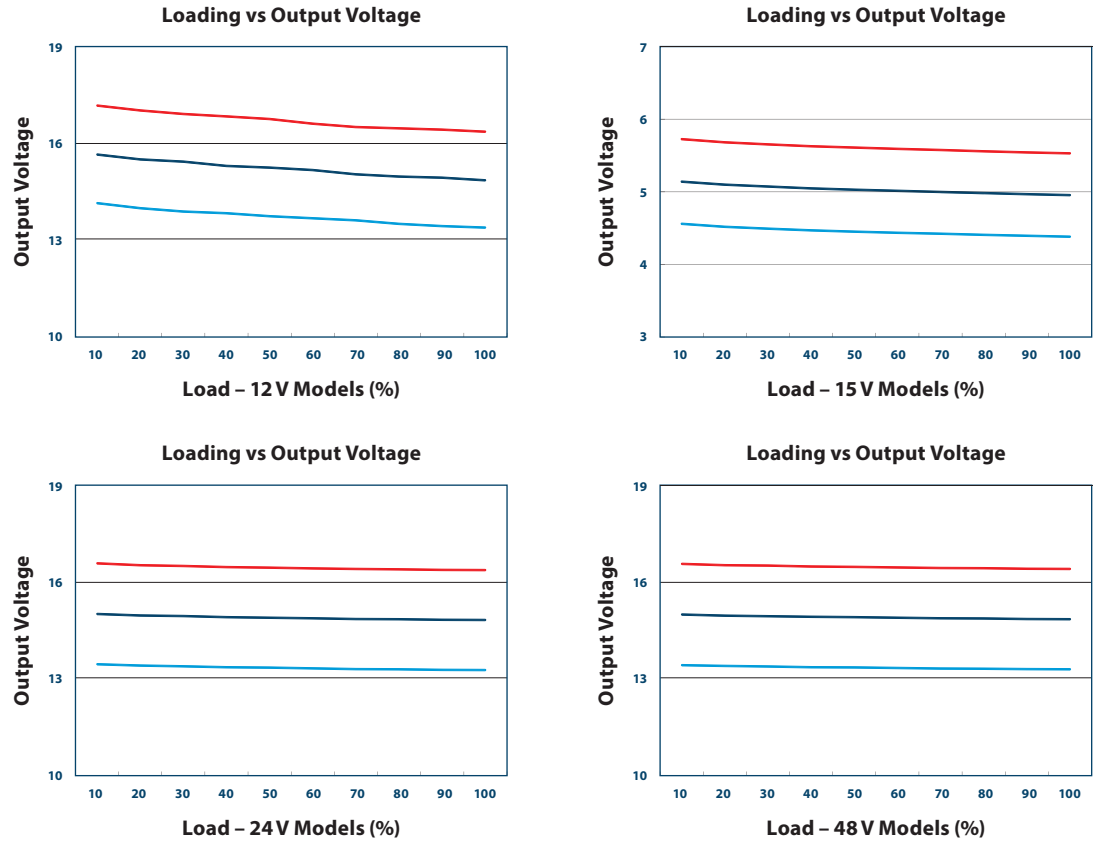
Loading vs Output Voltage



Loading vs Output Voltage



Electrical Characteristic Curves



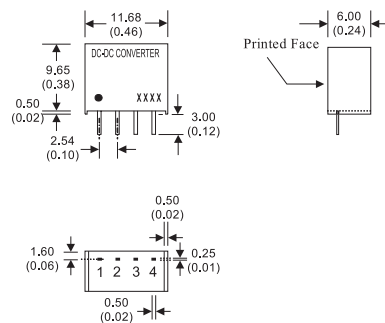
Mechanical Specifications

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)



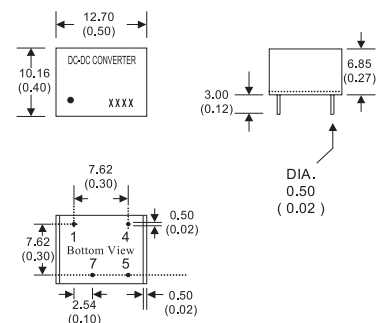
Pin Number	Single
1	-V Input
2	+V Input
3	-V Output
4	+V Output

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)

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



Notes

- Ripple/Noise measured with 20MHz 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 and a source capacitor C_{in} (47 μF , ESR < 1.0W at 100kHz).
 - Natural Convection is usually about 30 ~ 65 LFM but is not equal to still air (0LFM).
 - 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.