

- SIL8 Package
- Wide Input Range 4:1
- Regulated Output
- Efficiency up to 80 %
- Low Ripple and Noise
- Continuous Short Circuit Protection
- Isolation 1600 VDC
- Remote ON OFF Control
- Operation Temperature Range -40 ~ 75 °C max.
- Non Conductive Black Plastic Case

RoHS



Picture similar

Number Structure

RS5	-	48	05	RS	20	A	1	W
Series / Package	Input Voltage		Output Voltage	Output Type	Power	Int. Code	Isolation Voltage	Input Range
RS5 = SIL8	12 = 12 Vdc		03 = 3.3 Vdc	RS = Regulated - Single Out.	20 = 2 W	Logistics Code	1 = 1600 Vdc	Wide 4:1
	24 = 24 Vdc		05 = 5.0 Vdc					
	48 = 48 Vdc		12 = 12 Vdc 15 = 15 Vdc	RD = Regulated - Dual Out.				

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)		
RS5-1203RS20A1W	4.5-18	45	194	3.3	0	500	71	1000
RS5-1205RS20A1W	4.5-18	45	214	5	0	400	78	1000
RS5-1212RS20A1W	4.5-18	40	211	12	0	167	79	220
RS5-1215RS20A1W	4.5-18	45	211	15	0	133	79	100
RS5-2403RS20A1W	9-36	25	95	3.3	0	500	72	1000
RS5-2405RS20A1W	9-36	20	105	5	0	400	79	1000
RS5-2412RS20A1W	9-36	30	104	12	0	167	80	220
RS5-2415RS20A1W	9-36	30	104	15	0	133	80	100
RS5-4803RS20A1W	18-75	10	49	3.3	0	500	70	1000
RS5-4805RS20A1W	18-75	15	55	5	0	400	76	1000
RS5-4812RS20A1W	18-75	15	54	12	0	167	77	220
RS5-4815RS20A1W	18-75	15	55	15	0	133	76	100
RS5-1205RD20A1W	4.5-18	45	216	±5	0	±200	77	±470
RS5-1212RD20A1W	4.5-18	35	208	±12	0	±83	80	±100
RS5-1215RD20A1W	4.5-18	45	211	±15	0	±66	79	±47
RS5-2405RD20A1W	9-36	25	108	±5	0	±200	77	±470
RS5-2412RD20A1W	9-36	35	108	±12	0	±83	77	±100
RS5-2415RD20A1W	9-36	35	105	±15	0	±66	79	±47
RS5-4805RD20A1W	18-75	15	56	±5	0	±200	75	±470
RS5-4812RD20A1W	18-75	15	55	±12	0	±83	76	±100
RS5-4815RD20A1W	18-75	15	55	±15	0	±66	76	±47

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	12 Vdc Input	4.5	12	18	VDC
	24 Vdc Input	9	24	36	
	48 Vdc Input	18	48	75	
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		30		ms
Remote ON OFF Control	Module ON	open or high impedance			
	Module OFF	2 mA ~ 4 mA input current (via 1 kΩ)			
	OFF idle current			2.5	mA
Recommended input fuse (slow blow)	12 Vdc Input		1		A
	24 Vdc Input		0.5		
	48 Vdc Input		0.3		
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			-1.0		+1.0	%
Line Regulation			-0.2		+0.2	%
Load Regulation	From 0 % to 100 % Load	Single Output	-1.0		+1.0	%
	From 10 % to 100 % Load	Dual Output				
Cross Regulation	Asymmetrical Load 25 % / 100 % for Dual		-5		+5	%
Ripple & Noise ⁽¹⁾	20 MHz Bandwidth			30		mVpk-pk
Short Circuit Protection			Indefinite (hiccup) (Automatic Recovery)			
Temperature Coefficient			-0.02		+0.02	%/°C
Maximum Capacitive Load	Minimum Vin and constant resistive load		See Table			-
Transient Recovery Time ⁽²⁾	see Note 2	For All models		250		µs
Transient Response Deviation ⁽²⁾	see Note 2	3.3V Output	-5		+5	%
		Other Output	-3		+3	
Note : 1. Measured with a 1 µF MLCC 2. Nominal Vin and 25% load step change (75%-50%-25% of load)						

Absolute Maximum Ratings					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (100 ms)	12 Vdc Input			25	VDC
	24 Vdc Input			50	
	48 Vdc Input			100	
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 "1"	1600			VDC
Isolation Resistance	Input-output		1000			MΩ
Isolation Capacitance	Input-output			200		pF
Switching Frequency			100			kHz
Reliability Calculated MTBF	MIL-HDBK-217 F @ 25 °C		1700			k hours
Safety Standard	EN 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		75	°C
Maximum Case Temperature					100	°C
Thermal Impedance			38.6			°C/W
Storage Humidity					95	% rel. H
Storage Temperature			-55		125	°C
Cooling	Natural Convection		30 - 65 LFM			

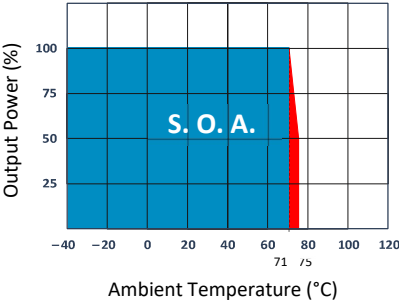
EMC Specifications			
Parameter	Standard	Condition	Criterion
Conducted Emissions	EN55032	with external components	A
Radiated Emissions	EN55032		A
ESD	IEC 61000-4-2	Air: ±8 kV / Indirect: ±6 kV	A
RS	IEC 61000-4-3	10 V/m	A
EFT	IEC 61000-4-4	±2 kV with external components	A
Surge	IEC 61000-4-5	±1 kV with external components	A
CS	IEC 61000-4-6	10 Vrms	A
PFMF	IEC 61000-4-8	1 A/m	A

Physical Specifications	
Parameter	Value
Case Material	Nonconductive Black Plastic (UL94V-0 rated)
Pin Material	Tinned copper
Potting Material	Silicone (UL94V 0 rated)
Weight	4.5 g , typ.
Dimensions	0.86" x 0.36" x 0.44"

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.

Temperature Derating Curve

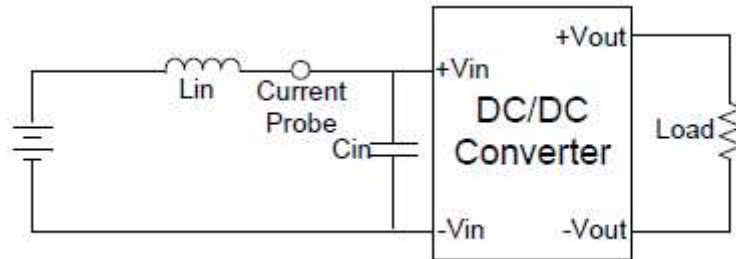


All Models

Test Configurations

Input Reflected Ripple Current Test Step

Input reflected ripple current is measured with 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.

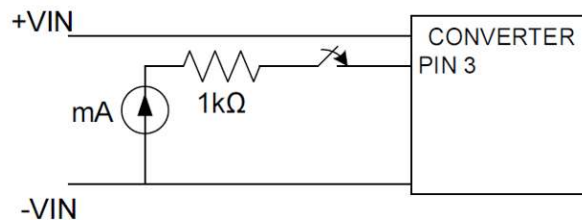


Remote Module ON / OFF

Remote Module ON / OFF

ON: Open or high impedance

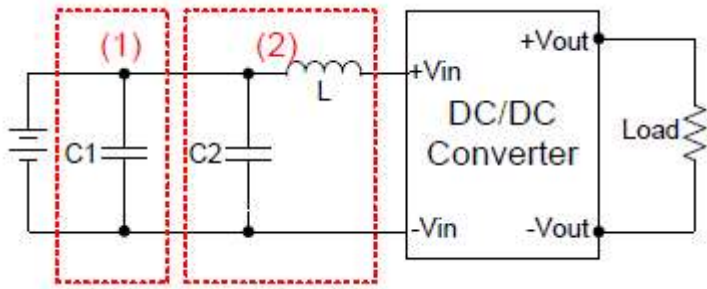
OFF: Input current ($2\ \text{mA} \sim 4\ \text{mA}$) via $1\ \text{k}\Omega$ to Pin3



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.



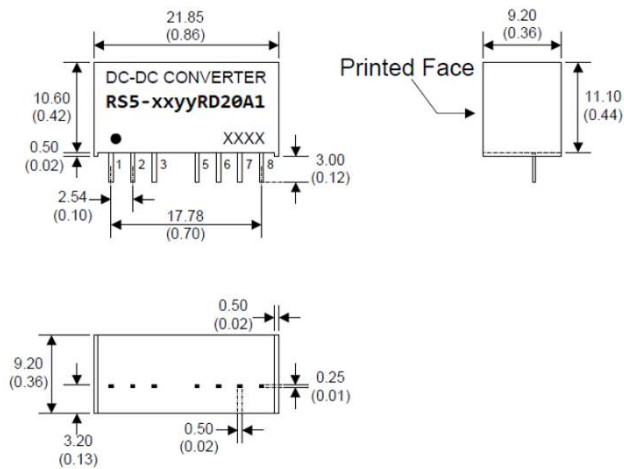
V in	C1	C2	L1
12 V	Nippon Chemi-con KY-Series 220μF / 100V	MLCC 10μF / 35V	2.5μH
24 V		MLCC 2.2μF / 100V	10μH
48 V			18μH

Pin Connections

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	-Vin	-Vin
2	+Vin	+Vin
3	CTRL	CTRL
5	N.C.	N.C.
6	+Vout	+Vout
7	-Vout	COM
8	N.C.	-Vout
	*N.C. : No Connection	
	*CTRL : Control Remote ON/OFF	

Mechanical Specifications

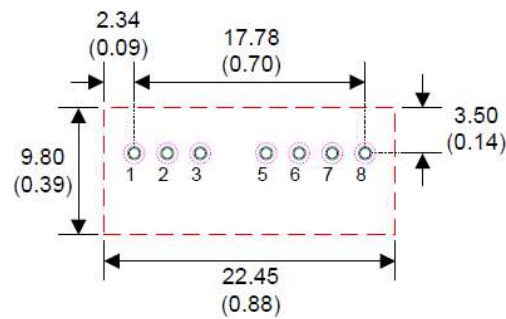
SIL Package



- 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)
 - 5. Stand-off tolerance: ± 0.1 (± 0.004)

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.