RS8-RS/RD30W

3 W Regulated 4:1 Single & Dual Output DC/DC Converter

- **Highest Power Density in SIL6 Package**
- **Wide 4:1 Input Range**
- **Efficiency up to 84 %**
- **Isolation 1600 VDC**
- **Under Voltage Lock Out Circuit**
- **Continuous Short Circuit Protection**
- **EMI Complies with EN55032 Class A**
- **Operation Temperature Range -40 ~ 76 °C max.**
- **Non Conductive Black Plastic Case**
- **Remote ON/OFF Control**

RoHS

Picture similar

Number Structure

RS8	-	05	05	RS	30	A	1	W
Series / Package		**Input Voltage**	**Output Voltage**	**Output Type**	**Power**	**Int. Code**	**Isolation Voltage**	**Input Range**
RS8 = SIL6		12 = 12 Vdc 24 = 24 Vdc 48 = 48 Vdc	03 = 3.3 Vdc 05 = 5.0 Vdc 12 = 12 Vdc 15 = 15 Vdc	RS = Regulated - Single Out. RD = Regulated - Dual Out.	30 = 3 W	Logistics Code	1 = 1600 Vdc	Wide 4:1

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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)		
RS8-1203RS30A1W	4.5-18	45	257	3.3	0	700	75	3300
RS8-1205RS30A1W	4.5-18	45	309	5	0	600	81	1680
RS8-1212RS30A1W	4.5-18	50	301	12	0	250	83	820
RS8-1215RS30A1W	4.5-18	50	301	15	0	200	83	680
RS8-2403RS30A1W	9-36	25	128	3.3	0	700	75	3300
RS8-2405RS30A1W	9-36	25	152	5	0	600	82	1680
RS8-2412RS30A1W	9-36	35	149	12	0	250	84	820
RS8-2415RS30A1W	9-36	35	151	15	0	200	83	680
RS8-4803RS30A1W	18-75	15	64	3.3	0	700	75	3300
RS8-4805RS30A1W	18-75	15	78	5	0	600	80	1680
RS8-4812RS30A1W	18-75	15	76	12	0	250	82	820
RS8-4815RS30A1W	18-75	20	76	15	0	200	82	680
RS8-1205RD30A1W	4.5-18	40	313	±5	0	±300	80	±1000
RS8-1212RD30A1W	4.5-18	50	305	±12	0	±125	82	±470
RS8-1215RD30A1W	4.5-18	50	301	±15	0	±100	83	±330
RS8-2405RD30A1W	9-36	30	154	±5	0	±300	81	±1000
RS8-2412RD30A1W	9-36	35	151	±12	0	±125	83	±470
RS8-2415RD30A1W	9-36	40	151	±15	0	±100	83	±330
RS8-4805RD30A1W	18-75	15	79	±5	0	±300	79	±1000
RS8-4812RD30A1W	18-75	20	76	±12	0	±125	82	±470
RS8-4815RD30A1W	18-75	30	77	±15	0	±100	81	±330

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	
Under Voltage Protection	12V Input	Module ON		4.2		VDC
		Module OFF		3.5		
	24V Input	Module ON		8.5		
		Module OFF		7.0		
	48V Input	Module ON		17.5		
		Module OFF		15.5		
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 ~ 4 mA input current (via 1 kΩ)			-
	OFF idle current				2.5	mA
Recommended input fuse (slow blow)	12 Vdc Input			1.8		A
	24 Vdc Input			0.9		
	48 Vdc Input			0.4		
Note : 1. Measured with a simulated source inductance of 27 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		-1.0		+1.0	%
Cross Regulation	Asymmetrical Load 25% / 100% for Dual		-5		+5	%
Ripple & Noise (1)	20 MHz Bandwidth	Single Output			150	mVpk-pk
		Dual Output			100	
Short Circuit Protection			Indefinite (Automatic Recovery)			-
Temperature Coefficient			-0.02		+0.02	%/°C
Maximum Capacitive Load	Minimum Vin and constant resistive load		See Table			-
Transient Recovery Time	Nominal Vin and 25% load step change (75% - 50% - 25% of load)	All models		500		µs
Transient Response Deviation		Single 3.3V & 5V	-5		+5	%
		Other Output	-3		+3	
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 (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			40		pF
Switching Frequency			100			kHz
Reliability Calculated MTBF	MIL-HDBK-217 F @ 25 °C		956			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		76	°C
Maximum Case Temperature				100	°C
Thermal Impedance		37.2			°C/W
Storage Humidity				95	% rel. H
Storage Temperature		-55		125	°C
Cooling	Natural Convection		30 - 65 LFM		

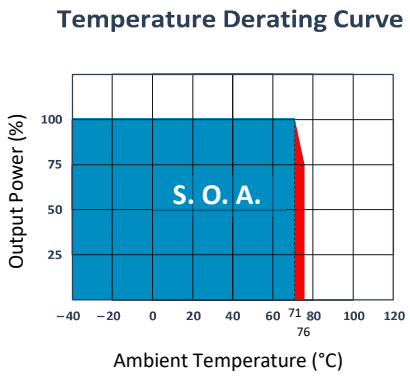
EMC Specifications			
Parameter	Standard	Condition	Criterion
Conducted Emissions	EN55032	with external components	A
Radiated Emissions	EN55032	with external components	A
ESD	IEC 61000-4-2	Air: ±8 kV / Indirect: ±6 kV	A
RS	IEC 61000-4-3	10 V/m	A
EFT	IEC 61000-4-4	±2 kV with external components	A
Surge	IEC 61000-4-5	±2 kV with external components	A
CS	IEC 61000-4-6	10 Vrms	A
PFMF	IEC 61000-4-8	100 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	3.85 g, typ.
Dimensions	0.69” x 0.40” x 0.48”

Electrical Characteristic Curves

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.

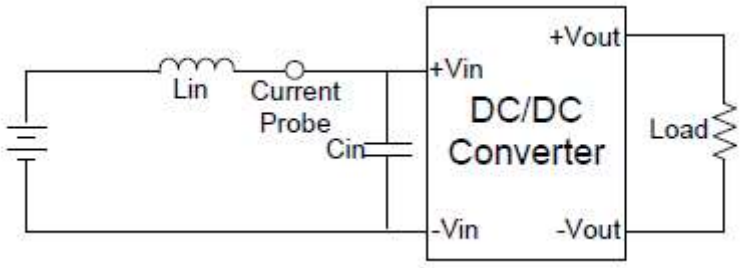


All Models

Test Configurations

Input Reflected Ripple Current Test Step

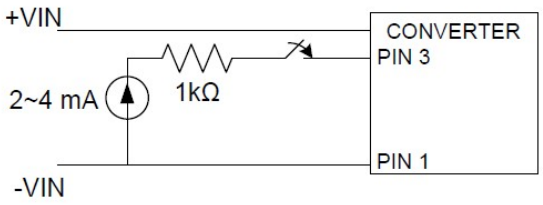
Input reflected ripple current is measured with a source inductor Lin (27 µH) and a source capacitor Cin (47 µF, ESR < 1.0 Ω at 100 kHz) at nominal input and full load.



Design & Feature Configurations

Remote Module ON / OFF

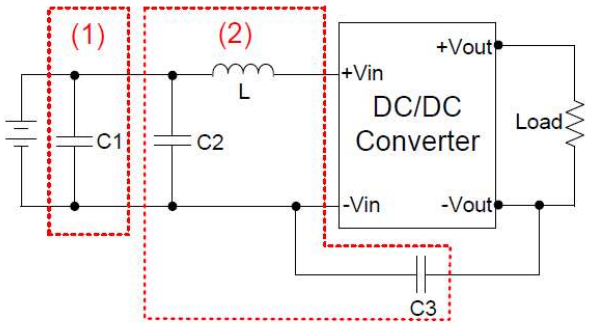
Converter OFF: Input current (2 ~ 4 mA) via 1 kΩ to Pin 3.
Converter ON: Open or high impedance.



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.



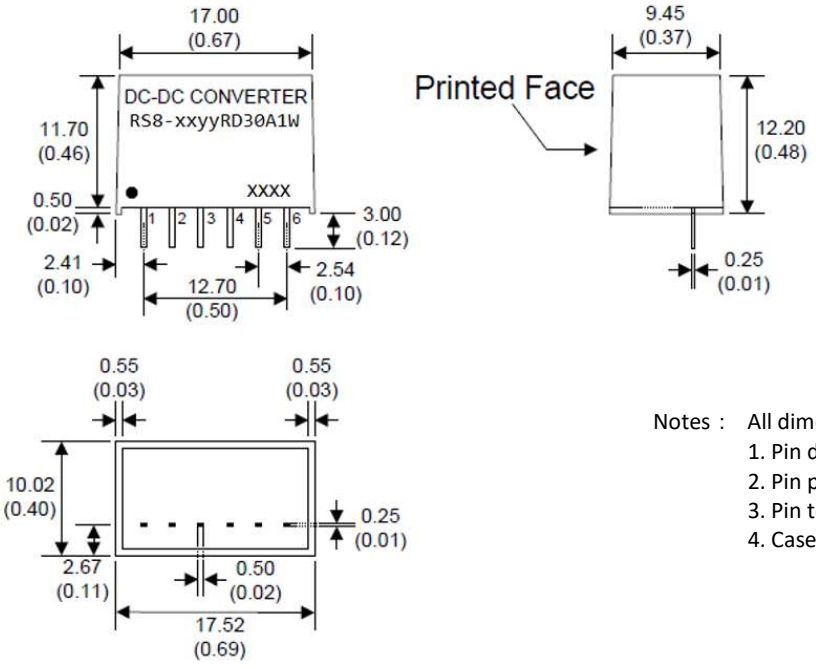
V in	C1	C2	L	C3
12 V	Nippon Chemi-con KY-Series 220µF / 100V	MLCC 10µF / 35V	2.2µH	MLCC 100pF / 2kV
24 V		MLCC 2.2µF / 100V	10µH	
48 V		MLCC 4.7µF / 100V	18µH	

Pin Connections

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

Mechanical Specifications

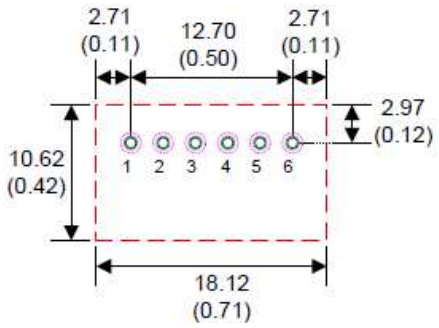
SIL Package



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)

Recommended Footprint Details

SIL Package



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