

2S8W_1RP series

2W - Dual/Single Output - Wide Input - Isolated & Regulated DC-DC Converter



DC-DC Converter 2 Watt

- + 8 Pin SIL
- + Wide 2:1 input voltage range
- + Efficiency up to 80%
- + 2W Single and Dual outputs
- + I/O Isolation 1kVDC and 3kVDC Option
- + Operating Temperature Range: -40°C to +85°C
- + Continuous Short Circuit Protection (SCP)
- + Remote ON/OFF Control

The 2S8W_1RP series is a family of cost effective 2W single & dual output DC-Dc converters, specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:

- 1) Where the voltage of the input power supply is wide range (voltage range $\leq 2:1$)
- 2) Where isolation is necessary between input and output (isolation voltage $\leq 1000\text{VDC}/3000\text{VDC}$)
- 3) Where the regulation of the output voltage and the output ripple noise are demanded



Common specifications	
Short circuit protection:	Continuous
Temperature rise at full load:	15°C TYP
Cooling:	Free air convection
Operation temperature range:	-40°C~+85°C
Operating case temperature:	100°C max.
Storage temperature range:	-40°C ~+125°C
Storage humidity range:	< 95%
Soldering temperature:	260°C max, 1.5mm from case for 10 sec
Switching frequency:	100~650kHz
Temperature coefficient:	0.02%/°C typ.
Operating Frequency:	150kHz min.
Case material:	Non-conductive black plastic [UL94-V0]
Potting material:	Epoxy [UL94-V0]
MTBF (MIL-HDBK-217F):	>1.61 Mhours
Safety standard:	IEC/EN 60950-1
Weight:	Plastic case: 4.5g (SIP)

Output specifications						
Item	Test condition	Min	Typ	Max	Units	
Output voltage accuracy	Nominal Vin and full load	±2			%	
Line regulation	Vin=min to max, full load	±0.5			%	
Load regulation	20% to 100% full load	±1			%	
Cross regulation*	Dual output	±5			%	
Output Ripple & Noise	20MHz Bandwidth	80			mVp-p	

* One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.

EMC specifications		
Radiated emissions	EN55032	CLASS A
Conducted emissions*	EN55032	CLASS A
ESD	IEC61000-4-2	Perfect criteria B
RS	IEC61000-4-3	Perfect criteria A
EFT**	IEC61000-4-4	Perfect criteria B
Surge**	IEC61000-4-5	Perfect criteria B
CS	IEC61000-4-6	Perfect criteria A
PFMF	IEC61000-4-8	Perfect criteria A

* Input filter components are required to help meet conducted emission Class A, which application refer to the EMI filter of design & test configuration.

** An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.

Example:

2S8W_05051RP

2 = 2Watt; S8 = SIP8; W = wide input (2:1); 4,5 - 9Vin; 5Vout;
S = Single Output; 1 = 1000VDC isolation; R = Regulated Output
P = Short Circuit Protection

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input filter	Capacitor				
Input reflected ripple current*		35			mA pk-pk
Input surge voltage	• 5VDC • 12VDC • 24VDC • 48VDC			12 24 40 80	VDC VDC VDC VDC

* Measured input reflected ripple current with a simulated source inductance of 12μH.

Isolation specifications					
Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 second	1000 and 3000		VDC	
Metal case	Input & output	1000		VDC	
Isolation resistance	500VDC, input to output	1000		MΩ	
Isolation capacitance	100KHz	60		pF	

Note:

1. All specifications measured at Ta = 25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.
2. Capacitive load: test by nominal input voltage and constant resistor load.
3. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
4. In this datasheet, all the test methods of indications are based on corporate standards.

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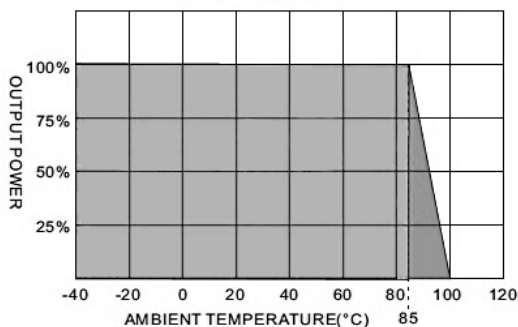
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Part Number	Input Voltage [V]	Input Current [mA, typ]	Output Voltage [VDC]	Output Current [mA, max]	Efficiency [%, typ]	Capacitive Load [μ F, max]
2S8W_xx03SXRP	4.5-9, 9-18, 18-36, 36-72	492, 205, 98, 48	3.3	500	67-71	3300
2S8W_xx05SXRP	4.5-9, 9-18, 18-36, 36-72	571, 216, 108, 56	5	400	70-77	3300
2S8W_xx09SXRP	4.5-9, 9-18, 18-36, 36-72	555, 213, 104, 53	9	222	72-80	470
2S8W_xx12SXRP	4.5-9, 9-18, 18-36, 36-72	555, 208, 104, 53	12	167	72-80	470
2S8W_xx15SXRP	4.5-9, 9-18, 18-36, 36-72	547, 213, 104, 53	15	133	73-80	470
2S8W_xx24SXRP	4.5-9, 9-18, 18-36, 36-72	533, 208, 104, 52	24	83	75-80	220
2S8W_xx03DXRP	4.5-9, 9-18, 18-36, 36-72	471, 188, 94, 47	± 3.3	± 250	70-73	± 1000
2S8W_xx05DXRP	4.5-9, 9-18, 18-36, 36-72	571, 222, 106, 56	± 5	± 200	70-78	± 1000
2S8W_xx09DXRP	4.5-9, 9-18, 18-36, 36-72	540, 210, 105, 53	± 9	± 111	74-79	± 220
2S8W_xx12DXRP	4.5-9, 9-18, 18-36, 36-72	533, 208, 104, 53	± 12	± 83	75-80	± 220
2S8W_xx15DXRP	4.5-9, 9-18, 18-36, 36-72	533, 210, 104, 52	± 15	± 67	75-80	± 220
2S8W_xx24DXRP	4.5-9, 9-18, 18-36, 36-72	563, 219, 106, 55	± 24	± 42	71-78	± 100

- X=1 = 1kVDC or X=3 = 3kVDC
- xx=Input Voltage (possible for other input and output voltage combinations on request)
Vin=4.5-9V, xx=05
Vin=9-18V, xx=12
Vin=18-36V, xx=24
Vin=36-72V, xx=48

Typical characteristics

Derating Curve



Remote On/Off (CTRL)

MCU (Master control unit)

The MCU pin voltage is referenced to -Vin (Pin 1)

ON: 0~0.8VDC max.

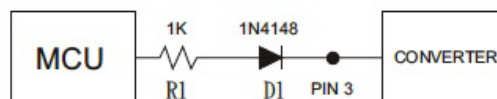
(Short circuit pin 1 and pin 3) or open circuit

OFF: 4.5 to 15VDC max.

(or 3.5mA to 15mA max.) (via R1, D1)

OFF idle current: 5mA typ.

Connection example

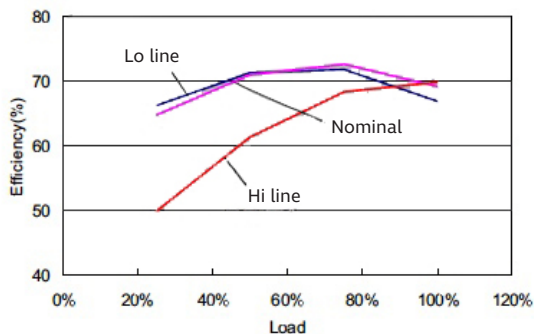


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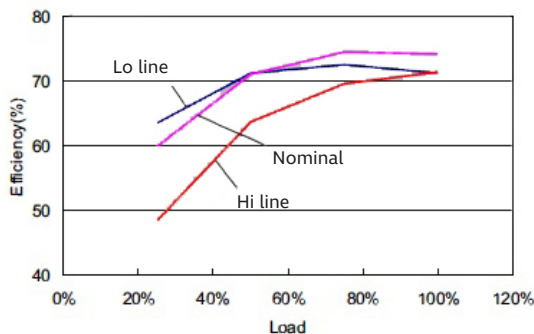
Typical characteristics

EFFICIENCY VS OUTPUT CURRENT



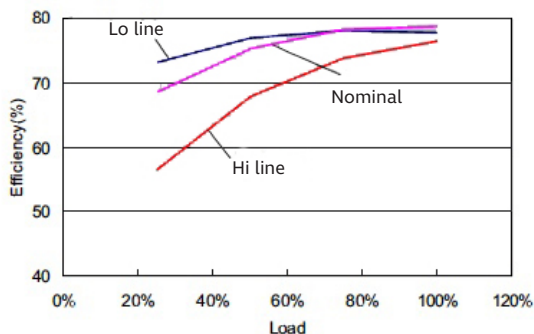
05 Models

EFFICIENCY VS OUTPUT CURRENT



12 Models

EFFICIENCY VS OUTPUT CURRENT

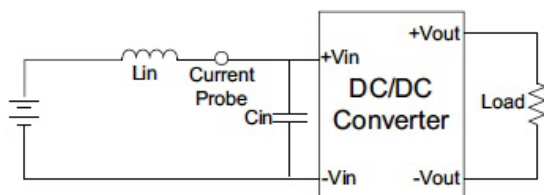


24 Models

Test configurations

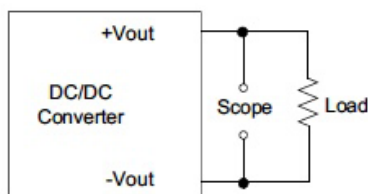
Input reflected ripple current test step

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



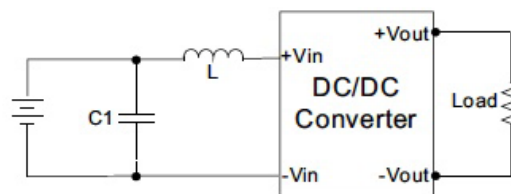
Output ripple & noise measurement test

The scope measurement bandwidth is 20MHz .



EMI filter

Input filter components ($C1$, L) 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.

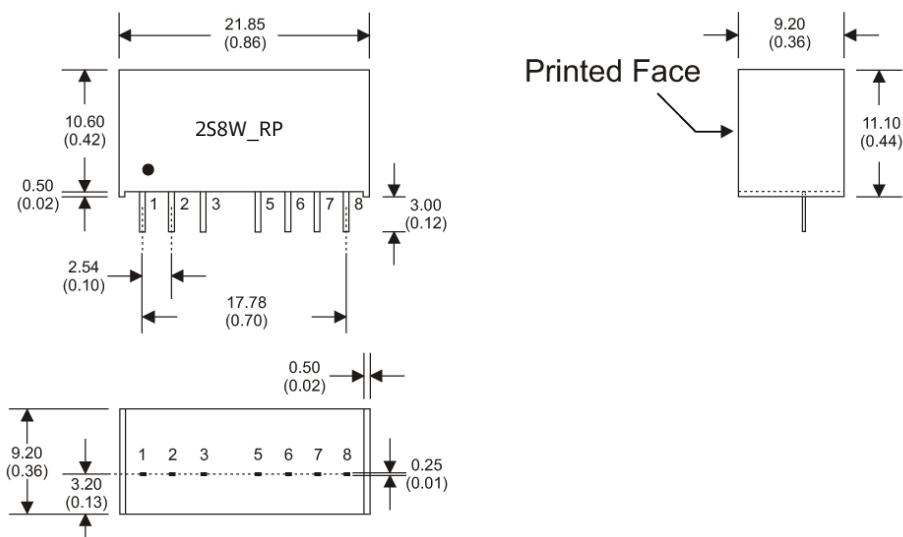


	C1	L
2S8W_RP	100 $\mu\text{F}/100\text{V}$	12 μH

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Mechanical specifications



Pin number	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	N.P.	N.C.
5	N.P.	N.C.
6	+Vout	+Vout
7	-Vout	Common
8	N.C.	-Vout

With control pin:

Pin number	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	Remote On/ Off	Remote On/ Off
5	N.C.	N.C.
6	+Vout	+Vout
7	-Vout	Common
8	N.C.	-Vout

(The pin connections of high isolation are the same as with the normal one)