GAPTEC®
GREEN TECHNOLOGY

1S8W_3RP Serie

1W - Dual/Single Output - Wide Input - Isolated & Regulated DC-DC Converter

DC-DC Converter 1 Watt

- 8 Pin SIL
- Wide 2:1 input voltage range
- Efficiency up to 77%
- 1W Single and Dual outputs
- I/O Isolation 3kVDC
- Operating Temperature Range: -40°C to +85°C
- Continuous Short Circuit Protection (SCP)
- Remote ON/OFF Control

The 1S8W_3RP series is a family of cost effective 1W 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 ≤2:1)
2) Where isolation is necessary between input and output (isolation voltage ≤3000VDC)
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:	Nature 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):	>1.66 Mhours
Safety standard/approvals:	UL7cUL 60950-1, 62368-1 IEC/EN 60950-1, 62368-1
Weight:	Plastic case: 4.5g (SIP)

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	3000			VDC
Metal case	Input & output	3000			VDC
Isolation resistance	500VDC, input to output	3000			MΩ
Isolation capacitance	100KHz			60	pF

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, ther 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 A
RS	IEC61000-4-3	Perfect criteria A
EFT**	IEC61000-4-4	Perfect criteria A
Surge**	IEC61000-4-5	Perfect criteria A
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:
1S8W_0505S3RP
1 = 1Watt; S8 = SIP8; W =wide input (2:1); 4,5 - 9Vin; 5Vout;
S = Single Output; 3 = 3000VDC isolation ; R = Regulated Output
P = Short Circuit Protection

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 absolut 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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Specifications subject to change without notice.

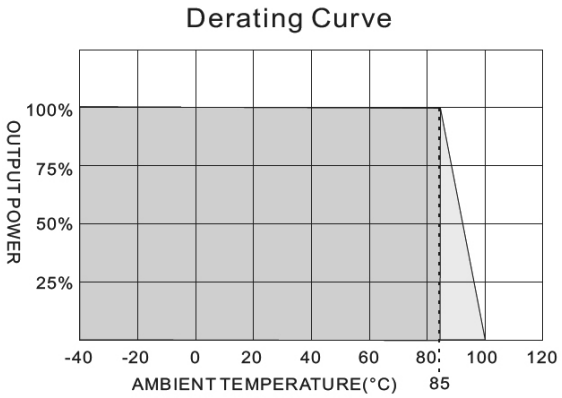
1S8W_3RP Series

1W - Dual/Single Output - Wide Input - Isolated & Regulated
DC-DC Converter

Part Number	Input Voltage [V]	Input Current [mA, typ @full load]	Output Voltage [VDC]	Output Current [mA, @full load]	Efficiency [%, typ]	Capacative Load [µF, max]
1S8W_xx03S3RP	4.5-9, 9-18, 18-36, 36-72	298, 119, 59, 31	3.3	303	67-70	3300
1S8W_xx05S3RP	4.5-9, 9-18, 18-36, 36-72	298, 115, 57, 30	5	200	67-72	3300
1S8W_xx09S3RP	4.5-9, 9-18, 18-36, 36-72	285, 108, 55, 29	9	111	70-77	470
1S8W_xx12S3RP	4.5-9, 9-18, 18-36, 36-72	285, 108, 55, 29	12	83	70-77	470
1S8W_xx15S3RP	4.5-9, 9-18, 18-36, 36-72	285, 108, 55, 29	15	67	70-77	470
1S8W_xx24S3RP	4.5-9, 9-18, 18-36, 36-72	294, 114, 55, 30	24	42	68-75	220
1S8W_xx03D3RP	4.5-9, 9-18, 18-36, 36-72	285, 119, 59, 30	±3.3	±152	70	±1000
1S8W_xx05D3RP	4.5-9, 9-18, 18-36, 36-72	270, 115, 59, 30	±5	±100	70-74	±1000
1S8W_xx09D3RP	4.5-9, 9-18, 18-36, 36-72	270, 109, 54, 28	±9	±56	74-76	±220
1S8W_xx12D3RP	4.5-9, 9-18, 18-36, 36-72	266, 109, 54, 27	±12	±42	75-77	±220
1S8W_xx15D3RP	4.5-9, 9-18, 18-36, 36-72	285, 112, 55, 29	±15	±33	70-75	±220
1S8W_xx24D3RP	4.5-9, 9-18, 18-36, 36-72	298, 124, 59, 30	±24	±21	67-70	±100

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



Remote On/Off (CTRL)

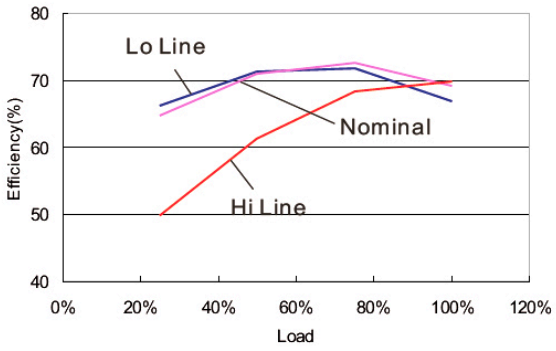
MCU (Master cotrol unit)
The MCU pin voltage is referenced to -Vin (Pin 1)

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

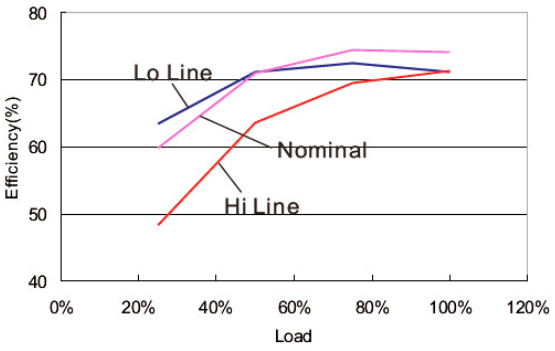
Typical characteristics

EFFICIENCY VS OUTPUT CURRENT



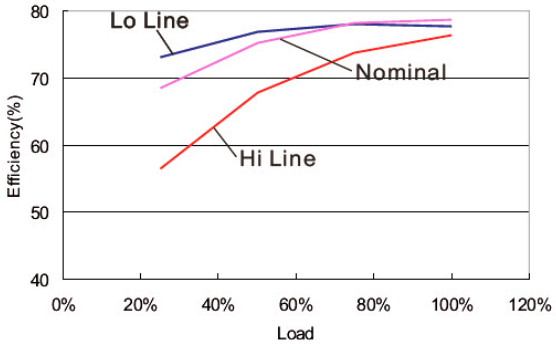
05 models

EFFICIENCY VS OUTPUT CURRENT



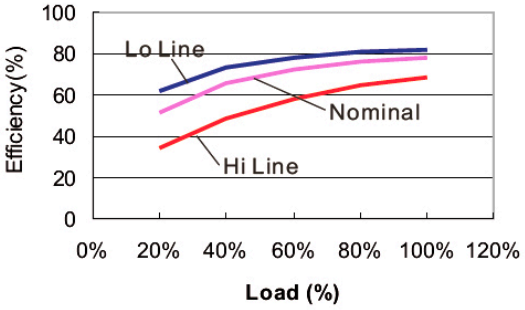
12 models

EFFICIENCY VS OUTPUT CURRENT



24 models

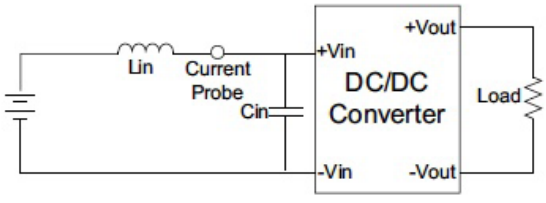
EFFICIENCY VS OUTPUT CURRENT



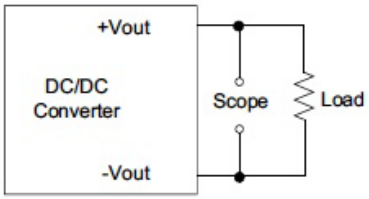
48 models

Test configurations

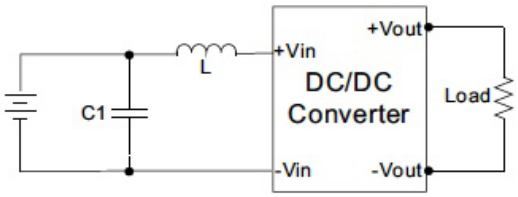
Input reflected ripple current test step
Input reflected ripple current ist measured through a source indicator Lin (12µH) and a source capacitor Cin (47µF, ESR<1.0Ω at 100kHz) at nominal input and full load.



Output ripple & noise measurement test
The scope measurement bandwidth is 20MHz.

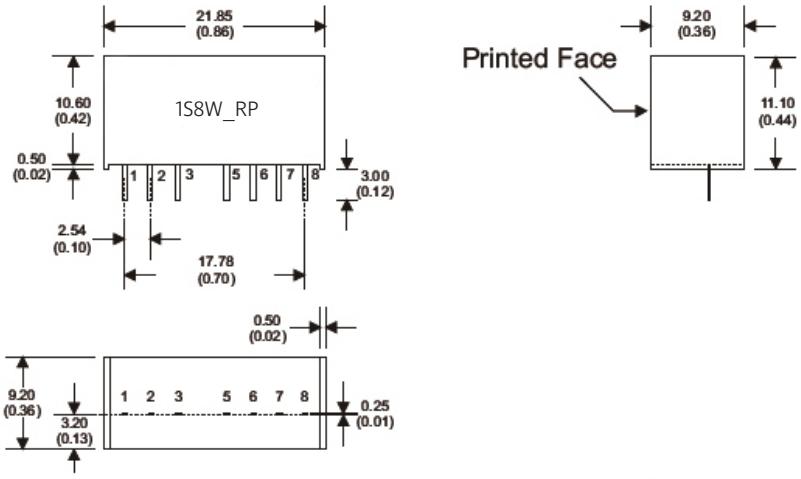


EMI filter
Input filter components (C1, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



	C1	L
1S8W_RP	100µF/100V	12µH

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)

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