3S8W_1.6RP series

3W - Dual/Single Output - Wide Input - Isolated & Regulated DC-DC Converter

DC-DC Converter 3 Watt

- 2:1 wide input voltage range
- 1.6KVDC isolation
- Short circuit protection (SCP; automatic recovery)
- Remote On/Off control
- Optional CTRL-pin (/C) and metal case (/M)
- High power density
- Operating temperature: -40°C to +85°C
- RoHS compliance
- Ultra miniature SIP package
- UL62368 approved

UL62368-1 (E347551)

The 3S8W_1.6RP Series series are isolated 3W DC-DC products with 2:1 input voltage and conventional voltage output. The product has a relatively compact SIP plastic package, and features high efficiency, operating temperature of -40°C~+85°C. The smaller size and fine cost design make the converter an ideal solution in communication, instruments, and industrial electronics applications.

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≤1600VDC)
3) Where the regulation of the output voltage and the output ripple noise are demanded

Common specifications

Short circuit protection:	Continuous, automatic recovery
Case temperature:	100°C MAX
Cooling:	Nature convection
Operation temperature range:	-40°C~+85°C (see derating curve) -40°C~+71°C (for 100% load)
Storage temperature range:	-40°C ~+125°C
Soldering temperature:	260°C MAX, 1.5mm from case for 10 sec
Storage humidity range:	< 95%
Safety standard:	UL/cUL 60950-1, 62368-1 IEC/EN 60950-1, 62368-1
Safety Approvals:	UL/cUL 60950-1, 62368-1 IEC/EN 60950-1, 62368-1
Case material:	Plastic [UL94-V0]
Pin material:	C5191R-H solder-coated
MTBF (MIL-HDBK-217F@25°C):	>1,340,000 hours
Weight:	4.5g
Dimensions:	21.85*9.2*11.1mm

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy				±1	%
Line regulation				±0.5	%
Load regulation	25% to 100% load			±1	%
Cross regulation*	Dual output			±5	%
Temperature coefficient	100% load		±0.02		%/°C
Ripple&Noise	20MHz bandwidth			75	mVpk-pk
Transient recovery time**	25% load step change		300		µs
Transient response deviation**	25% load step change			±3	%
Switching frequency		100		650	KHz

* One load is 25% to 100% load, ther other load is 100% load, the output voltage variable rate is within 5%.
** Test by normal Vin and 100%-25% load.

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current (no load/full load)	no load full load		 750	80	mA mA
Input surge voltage	• 5V • 12V • 24V • 48V			15 36 50 100	VDC VDC VDC VDC
Input filter	Filter capacitor				
Start-up time	Nominal Vin and constant resistive		20		ms
Reflected ripple current*			35		mA
Remote on/off control	• ON • OFF		Open or high resistance 3.0~6.0mA input current (via 1K)		

* Measured input reflected ripple current with a simulated source of 12µH and a source filter capacitor Cin (47µF, ESR<1.0Ω at 100KHz).

EMC specifications

CE*	EN55032	CLASS A
RE	EN55032	CLASS A
ESD	IEC/EN61000-4-2	perf. Criteria A
RS	IEC/EN61000-4-3	perf. Criteria A
EFT**	IEC/EN61000-4-4	perf. Criteria A
Surge**	IEC/EN61000-4-5	perf. Criteria A
CS	IEC/EN61000-4-6	perf. Criteria A
PFMF	IEC/EN61000-4-8	perf. Criteria A

* Input filter components are required to help meet conducted emissions class A, which application refer to the EMI filter section.
** An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute	1600			VDC
Isolation resistance		1000			MΩ
Isolation capacitance				680	pF

Example:
3S8W_0512S1.6RP
3 = 3Watt; S8 = SIP8; W = wide input; 4,5-9Vin; 05 = 5Vin; 12 = 12Vout; S = Single Output; 1.6 = 1600VDC; R = Regulated Output; P = Short Curcuit Protection

GAPTEC-Electronic GmbH & Co. KG
sales@gaptec-electronic.com – www.gaptec-electronic.com

Product Selection Guide

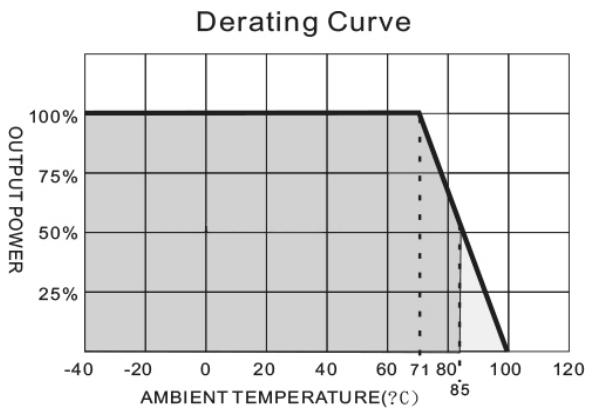
Part Number	Input Voltage [VDC] Nominal	Input Voltage [VDC] Range	Input Current [mA] No load Max	Input Current [mA] Full load Typ	Output Voltage [VDC]	Output Current [mA] Min load typ	Output Current [mA] Full load Typ	Capacitive load [2] [µF, Max.]	Efficiency [%, Typ.]
3S8W_0503S1.6RP	5	4.5-9	65	640	3.3	175	700	2200	74
3S8W_0505S1.6RP	5	4.5-9	70	800	5	150	600	2200	76
3S8W_0512S1.6RP	5	4.5-9	75	750	12	62.5	250	470	82
3S8W_0515S1.6RP	5	4.5-9	75	750	15	50	200	470	82
3S8W_1203S1.6RP	12	9-18	25	260	3.3	175	700	2200	76
3S8W_1205S1.6RP	12	9-18	15	320	5	150	600	2200	81
3S8W_1212S1.6RP	12	9-18	35	305	12	62.5	250	470	84
3S8W_1215S1.6RP	12	9-18	35	305	15	50	200	220	84
3S8W_2403S1.6RP	24	18-36	15	133	3.3	175	700	2200	74
3S8W_2405S1.6RP	24	18-36	15	160	5	150	600	2200	79
3S8W_2412S1.6RP	24	18-36	20	156	12	62.5	250	470	82
3S8W_2415S1.6RP	24	18-36	20	152	15	50	200	470	84
3S8W_4803S1.6RP	48	36-75	10	66	3.3	175	700	2200	75
3S8W_4805S1.6RP	48	36-75	10	82	5	150	600	2200	78
3S8W_4812S1.6RP	48	36-75	15	78	12	62.5	250	470	81
3S8W_4815S1.6RP	48	36-75	15	78	15	50	200	220	81

Part Number	Input Voltage [VDC] Nominal	Input Voltage [VDC] Range	Input Current [mA] No load Max	Input Current [mA] Full load Typ	Output Voltage [VDC]	Output Current [mA] Min load typ	Output Current [mA] Full load Typ	Capacitive load [2] [µF, Max.]	Efficiency [%, Typ.]
3S8W_0505D1.6RP	5	4.5-9	90	800	±5	±75	±300	±470	77
3S8W_0512D1.6RP	5	4.5-9	90	760	±12	±31.25	±125	±220	81
3S8W_0515D1.6RP	5	4.5-9	90	750	±15	±25	±100	±100	82
3S8W_1205D1.6RP	12	9-18	45	320	±5	±75	±300	±470	80
3S8W_1212D1.6RP	12	9-18	45	308	±12	±31.25	±125	±220	83
3S8W_1215D1.6RP	12	9-18	45	312	±15	±25	±100	±100	82
3S8W_2405D1.6RP	24	18-36	20	160	±5	±75	±300	±470	80
3S8W_2412D1.6RP	24	18-36	20	154	±12	±31.25	±125	±220	83
3S8W_2415D1.6RP	24	18-36	20	154	±15	±25	±100	±100	83
3S8W_4805D1.6RP	48	36-75	15	82	±5	±75	±300	±470	78
3S8W_4812D1.5RP	48	36-75	20	80	±12	±31.25	±125	±220	80
3S8W_4815D1.5RP	48	36-75	15	78	±15	±25	±100	±100	81

Suffix /C for optional CTRL-pin (3S8W_4815D1.5RP/C) and suffix /M for optional metal case (3S8W_4815D1.5RP/M)

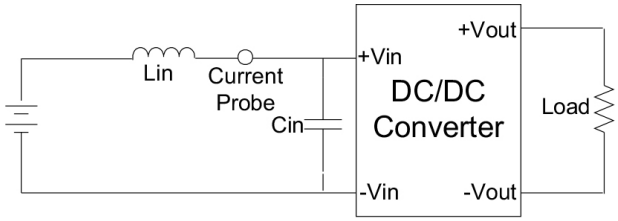
[1] Absolute maximum rating without damage on the converter, but it isn't recommended;
[2] Test by minimal Vin and constant resistive load.

Typical characteristics

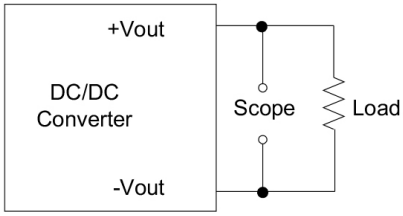


Test configurations

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

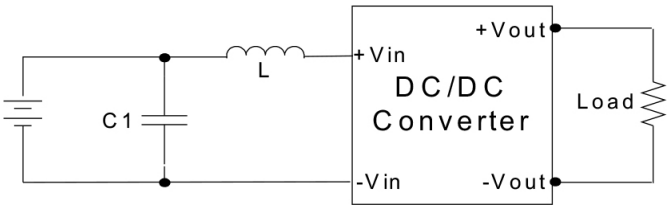


Output ripple & noise measurement test
The scope measurement bandwidth is 20MHz.



EMI Filter

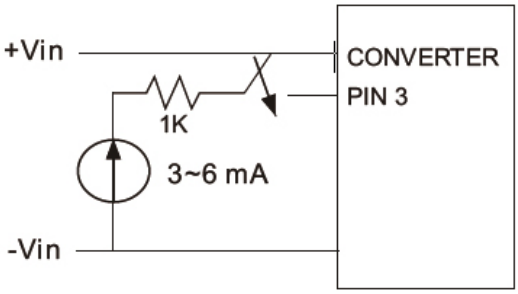
Input filter components (C1, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



		C1	L
3S8W_05xx1.6RP		220µF/25V	5.6µH
3S8W_12xx1.6RP	• Single • Dual	100µF/100V 1210, 2.2µF/100V	18µH 18µH
3S8W_24xx1.6RP		1210, 10µF/100V	18µH
3S8W_48xx1.6RP		100µF/100V	56µH

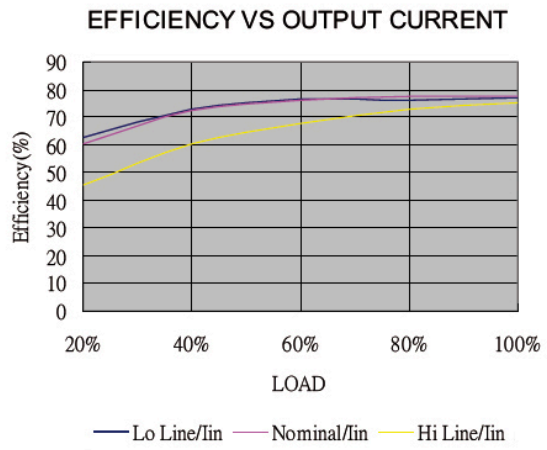
Remote control

Remote on/off control
- ON Open or high resistance
- OFF 3.0~6.0mA input current (via 1K)

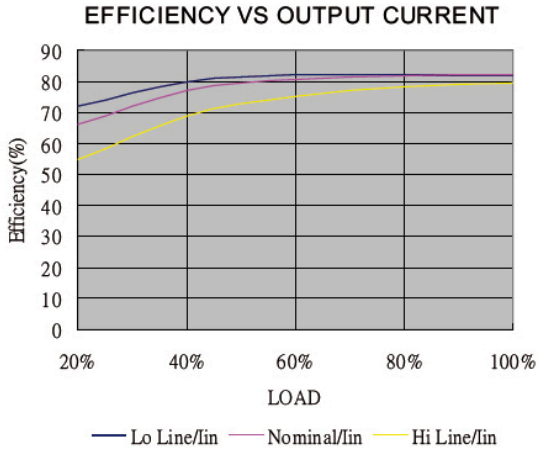


Mechanical dimensions

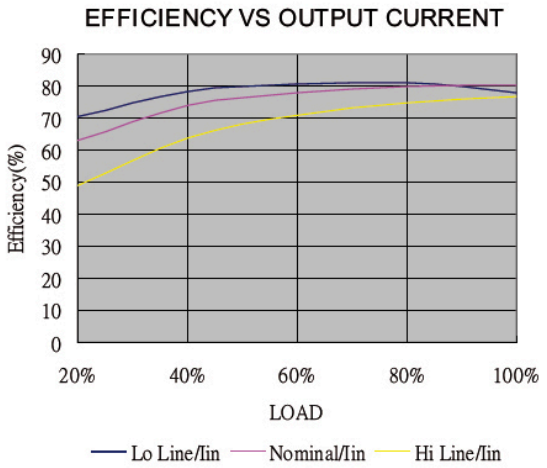
5V models



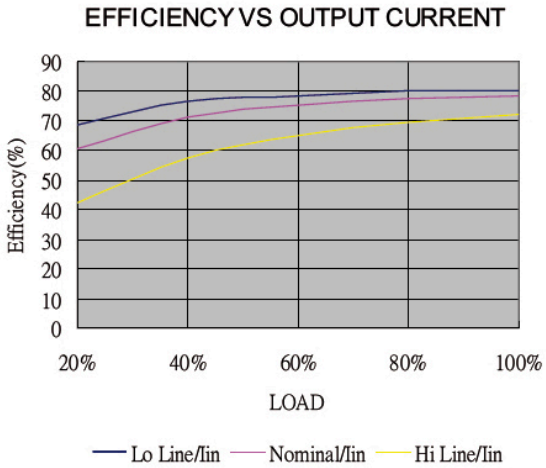
12V models



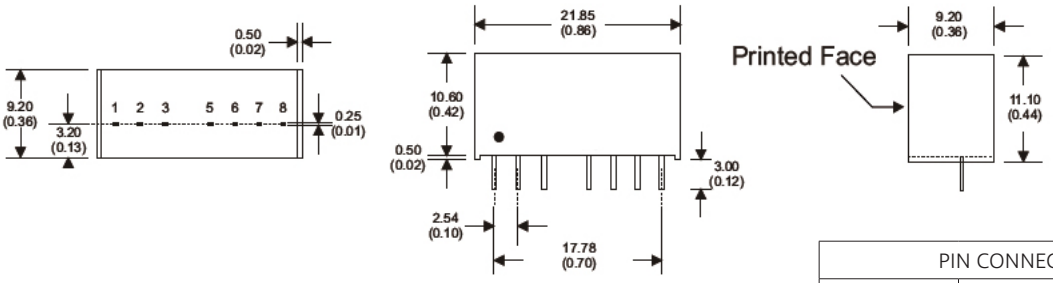
24V models



48V models



Mechanical dimensions



PIN CONNECTIONS		
PIN	Single+C	Dual+C
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

* Example shows pin 3 with suffix „/C“ option.
Standard version is: NP (no pin) for single and dual output.

Note:

1. Min. load shouldn't be less than 5%, otherwise ripple maybe increased dramatically. If the product operates under min. load, it may not be guaranteed to meet all specifications listed. Operation under minimum load will not damage the converter.
2. All specifications measured at Ta = 25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified.
3. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating ratings.
4. In this datasheet, all test methods are based on our corporate standards.
5. All characteristics are for listed models,and non-standard models may perform differently. Please contact our technical support for more details.
6. Please contact our technical support for any specific requirement.
7. Specifications of this product are subject to changes without prior notice.