3S6W4_1.6RP series

3W - Wide Input - Isolated & Regulated DC-DC Converter

DC-DC Converter 3 Watt

- 4:1 wide input voltage range
- 1.6kVDC isolation
- Short circuit protection (SCP)
- Smallest footprint 3W converter
- Full SMD Technology
- High efficiency up to 84%
- Operating temperature: -40°C to +76°C
- International standard pin-out
- Remote on/off control

The Introducing our latest 3W converter 3S6W4_1.6RP series, designed to deliver top performance in the smallest footprint available. With a versatile 4:1 wide input voltage range and robust 1.6kVDC isolation, this converter is engineered for reliability in a wide range of applications. Equipped with short circuit protection (SCP) and built using full SMD technology, it offers high efficiency of up to 84%, ensuring optimal energy utilization. Operating within a temperature range of -40°C to +76°C, this converter is ready to perform under challenging conditions. Featuring an international standard pin-out and a convenient remote on/off control function, this converter is the ideal choice for those seeking a compact, efficient, and reliable power solution.

SHORT CIRCUIT PROTECTED

c UL us
UL62368 - E347551

Common specifications

Short circuit protection:	Continuous, automatic recovery
Cooling:	Nature convection
Operation temperature range:	-40°C~+76°C (with derating) -40°C~+71°C (for 100% load)
Case temperature:	100°C max.
Storage temperature range:	-55°C ~+125°C
Pin welding resistance temperature:	260°C max., 1.5mm from case for 10 sec
Storage humidity range:	< 95%
Vibration:	10-55Hz, 10G, 30 Min. along X, Y and Z
Case material:	Plastic [UL94-V0]
MTBF (MIL-HDBK-217F@25°C):	>956,000 hours
Safety standards:	IEC/UL/EN 62368-1
Weight:	3.85g

Input specifications

Item	Test condition	Min	Typ	Max	Units
Start-up time			30		mS
Reflected ripple current*			20		mApk-pk
Input filter	Capacitor				
Surge voltage	100ms max. • 12V models • 24V • 48V			25 50 100	VDC VDC VDC
Remote on/off	• ON • OFF • Off stand by input current (normal Vin)		open or high impedance 2-4mA input current (via 1K) 2.5		mA

* Measured Input reflected ripple current with a simulated source inductance of 27µH and a source capacitor Cin (47µF, ESR<1.0Ω at 100KHz).

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute, leakage current less than 1 mA	1600			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/0.1V			40	pF

Output specifications

Item	Test condition	Min	Typ	Max	Units
Voltage accuracy			±1		%
Line regulation				±0.2	%
Load regulation	0% to 100% load			±1	%
Cross regulation*	Dual output			±5	%
Temperature coefficient				±0.02	%/°C
Ripple&Noise**	20MHz bandwidth • Single • Dual			 150 100	 mVpp mVpp
Transient recovery time***			500		µs
Transient response deviation***	• Single output 3.3V/5V • Others			±5 ±3	% %
Switching frequency (PFM mode)	100% load, nominal input voltage	100			KHz

* One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
** Ripple/Noise measured with a 10µF electrolytic capacitor and 0.1µF ceramic capacitor.
*** 25% load step change, min. Vin and 100%-25% load

Example:
3S6W4_1205S1.6RP
3 = 3Watt; S6 = SIP6; W4 = wide input; 4.5-18Vin; 12Vout; S = Single Output; 1.6 = 1600VDC; R = Regulated Output; P = Short Circuit Protection

EMC Specifications

Parameter	Standard	Condition	Class
Conducted emissions	EN55032	with external components	A
Radiated emissions	EN55032	with external components	A
ESD	IEC 61000-4-2	Air: ±8kV / indirect: ±6kV	A
RS	IEC 61000-4-3	10V/m	A
EFT	IEC 61000-4-4	±2kV with external components	A
Surge	IEC 61000-4-5	±2kV with external components	A
CS	IEC 61000-4-6	10Vms	A
PFMF	IEC 61000-4-8	100A/m	A

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

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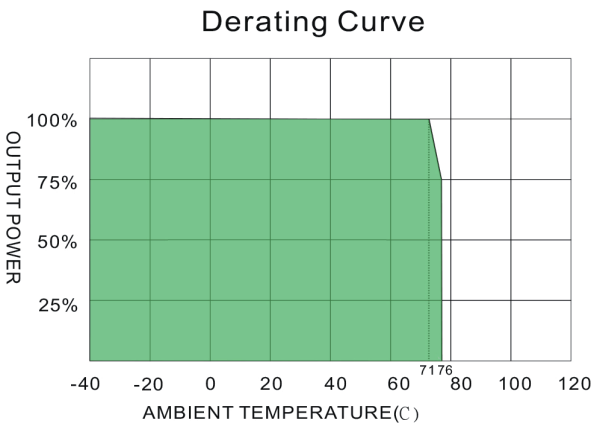
Product Selection Guide

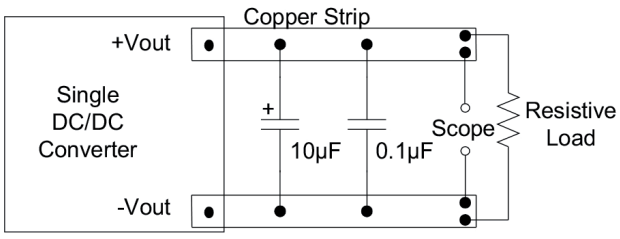
Part Number	Input Voltage [VDC] Nominal	Range	Output Voltage [VDC]	Output Current [mA] Full load	Min. load	Capacitive load [µF, Max.]	Efficiency [%, Typ.]
3S6W4_1203S1.6RP	12	4.5-18	3.3	700	0	3300	75
3S6W4_1205S1.6RP	12	4.5-18	5	600	0	1680	81
3S6W4_1212S1.6RP	12	4.5-18	12	250	0	820	83
3S6W4_1215S1.6RP	12	4.5-18	15	200	0	680	83
3S6W4_2403S1.6RP	24	9-36	3.3	700	0	3300	76
3S6W4_2405S1.6RP	24	9-36	5	600	0	1680	82
3S6W4_2412S1.6RP	24	9-36	12	250	0	820	84
3S6W4_2415S1.6RP	24	9-36	15	200	0	680	84
3S6W4_4803S1.6RP	48	18-75	3.3	700	0	3300	74
3S6W4_4805S1.6RP	48	18-75	5	600	0	1680	81
3S6W4_4812S1.6RP	48	18-75	12	250	0	820	81
3S6W4_4815S1.6RP	48	18-75	15	200	0	680	82
3S6W4_1205D1.6RP	12	4.5-18	±5	300	0	±1000	80
3S6W4_1212D1.6RP	12	4.5-18	±12	125	0	±470	82
3S6W4_1215D1.6RP	12	4.5-18	±15	100	0	±330	83
3S6W4_2405D1.6RP	24	9-36	±5	300	0	±1000	81
3S6W4_2412D1.6RP	24	9-36	±12	125	0	±470	83
3S6W4_2415D1.6RP	24	9-36	±15	100	0	±330	84
3S6W4_4805D1.6RP	48	18-75	±5	300	0	±1000	79
3S6W4_4812D1.6RP	48	18-75	±12	125	0	±470	80
3S6W4_4815D1.6RP	48	18-75	±15	100	0	±330	80

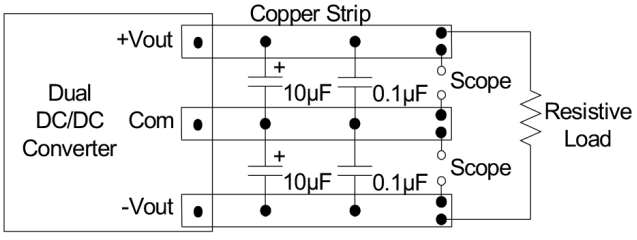
Typical characteristics



Output ripple & noise measurement test

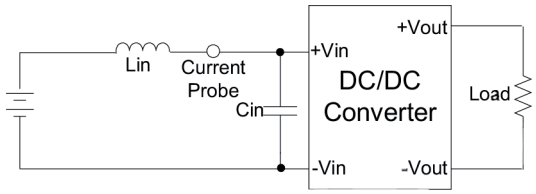
Use a 10µF electrolytic capacitor and 0.1µF ceramic capacitor.
The Scope measurement bandwidth is 20MHz.





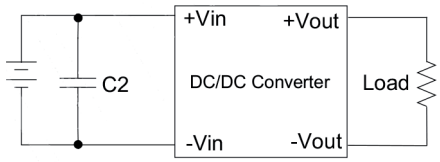
Input reflected current test step

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



EFT/Surge filter

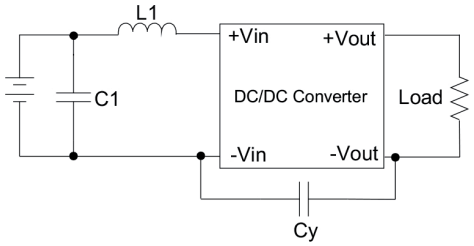
Input filter components (C2) is used to help meet IEC61000-4-4 and IEC61000-4-5 .



	C2
3S6W4_1.6RP	220µF,100V

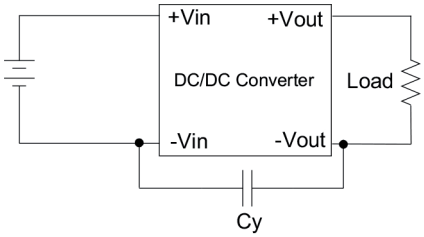
EMI filter

Conducted emissions
Input filter components (C1, Cy, L1) are used to meet EMI test criterial A.
These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



	C1	L1	Cy
3S6W4_12xx_1.6RP	1210,10µF,35V	2.2µH	1206,100pF,1kV
3S6W4_24xx_1.6RP	1210,2.2µF,100V	10µH	1206,100pF,1kV
3S6W4_48xx_1.6RP	1210,4.7µF,100V	18µH	1206,100pF,1kV

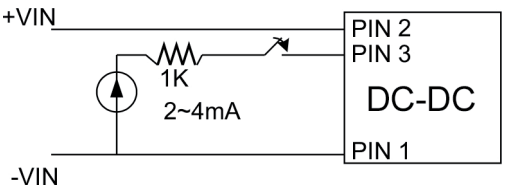
Radiated emissions
Input filter components (Cy) is used to meet EMI test criterial A.
These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



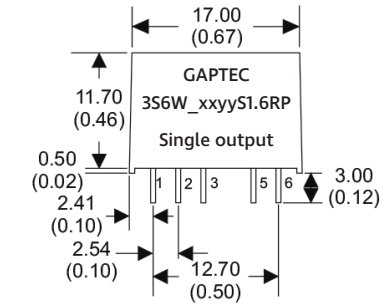
	Cy
3S6W4_1.6RP	1206,100pF,1kV

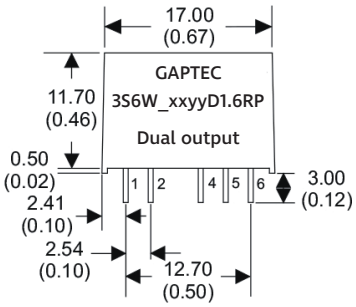
Remote on/off test step

Input current (2~4mA) via 1K to Pin3, converter OFF.
open or high impedance, converter ON.

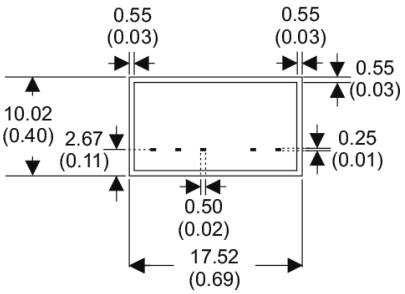


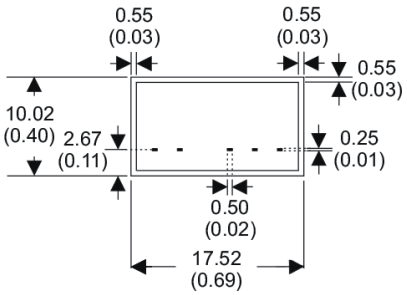
Mechanical dimensions

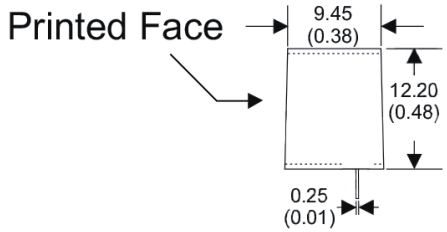




PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	-V Input	-V Input
2	+V Input	+V Input
3	Remote On/Off	N.P.
4	N.P.	+V Output
5	+V Output	Common
6	-V Output	-V Output







6 Pin SIL Package

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±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)

Note:
1. Recommended used in more than 5% load, if the load is lower than 5%, then the ripple index of the product may exceed the specification, but does not affect the reliability of the product;
2. The max. capacitive load should be tested within the input voltage range and under full load conditions;
3. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta = 25°C, humidity <75%RH, when inputting nominal voltage and outputting rated load;
4. All index testing methods in this datasheet are based on our company's corporate standards;
5. We can provide product customization service;
6. Specifications of this product are subject to changes without prior notice.