3D8W4_1.6RP series

3Watt - 4:1 Regulated Single & Dual output

DC-DC Converter 3 Watt

- Wide input range (4:1)
- Highest Power Density in 8 Pin DIL Package
- 1.6kVDC isolation
- Efficiency up to 84%
- Full SMD Technology
- Short circuit protection (SCP)
- Operating temperature range: -40°C ~ +80°C
- Remote on/off Control
- Under Voltage Lock-Out Circuit

The 3D8W4_1.6RP series is a family of cost effective and high performanced 3W single & dual output DC-DC converters. These converters are built in non-conductive black plastic package in a 8-pin DIL miniature compact case with high performance features wide range devices operate over 4:1 input voltage range providing stable output voltage. Devices are encapsulated using flame retardant resin. Input voltages of 12, 24, 48 Vdc with output voltage of 3.3, 5, 12, 15, ±5, ±12, ±15 Vdc. High performance features include high efficiency operation up to 84% and output voltage accuracy of ±1% maximum.

Common specifications	
Efficiency	See table,typ.
Short circuit protection:	Indefinite
Cooling:	Nature Convection
Operation temperature range:	-40°C~+80°C
Storage temperature:	-55°C~+125°C
Storage humidity range:	< 95% reIH
Pin soldering resistance temperature:	300°C MAX, 1.5mm away from case for 10s.
Case material:	Non conductive black plastic (UL94V-0 rated)
MTBF (MIL-HDBK-217F@25°C):	>820,000 hours
Weight:	3.6g
Switing Frqeunchecy	100kHz,min.

Input specifications	
Voltage Range	See table
Start up Time (Nominal Vin and constant resistive load)	30mS, typ.
Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitor
Input Reflected Ripple Current(5)	20mA pk-pk
Remote on/off ON: OFF: Off stand by input current (Nominal Vin)	 open or high impedance 2-4mA input current (via 1K) 2.5mA, max.
Under Voltage Lockout 12V Modes Module ON / OFF 24V Modes Module ON / OFF 48V Modes Module ON / OFF	 4.2Vdc / 3.5Vdc, typ. 8.5Vdc / 7.0Vdc, typ. 17.5Vdc / 15.5Vdc, typ.

Isolation specifications	
Isolation voltage	1600VDC
Isolation resistance	500VDC 1000 MΩ
Isolation capacitance	1000M Ohm,min.

Output specifications	
Voltage accuracy	±1%
Maximun Output Current	See table
No load output voltage accuracy	%
Line regulation	±0.2%,max.
Load regulation	(From 0% to 100% Load) ±1.0%,max.
Cross Regulation (Dual Output)(1)	±5%
Ripple & Noise (20 MHz bandwidth)(2)	Single 150mVpp,max. Dual 100mVpp,max.
Temperature Coefficient	±0.02%/°C
Capacitive Load(3)	See table
Transient Recovery Time (4)	500us, typ.
Transient response deviation(4)	±3%, max. Single Output 3.3V, 5V:±5%, max.

EMC specifications		
CE(8)	EN55032	CLASSA
RE	EN55032	CLASSA
ESD	IEC61000-4-2	perf. Criteria A
RS	IEC61000-4-3	perf. Criteria A
EFT(9)	IEC61000-4.4	perf. Criteria A
Surge(9)	IEC61000-4-5	perf. Criteria A
CS	IEC61000-4-6	perf. Criteria A
PFMF	IEC61000-4-8	perf. Criteria A

Example:
3D8W4_1205S1.6RP
3 = 3Watt; D8 = DIP8; W4 = Wide input (4:1); 12 = 12Vin; 05 = 5Vout; S = Single output; 1.6= 1.6kVDC; R= Regulated output; P= Short circuit protection

Note:

1. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
2. Ripple/Noise measured with a 10μF electrolytic capacitor and 0.1μF ceramic capacitor.
3. Test by minimal Vin and constant resistive load.
4. Test by normal Vin and 100%-25% load,25% load step change.
5. Measured Input reflected ripple current with a simulated source inductance of 27μH and a source capacitor Cin (47μF, ESR<1.0Ω .
6. "Nature Convection" is usually about 30-65 LFM but is not equal to still air (0 LFM).
7. Exceeding the absolute ratings of the unit could cause damage. It's not allowed for continuous operating ratings.
8. Input filter components are required to help meet conducted emission class A, Which application refer to the EMI Filter(Conduct).
9. An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5. The filter capacitor Motien suggest: Nippon - chemi - con KY series, 220μF/100V.

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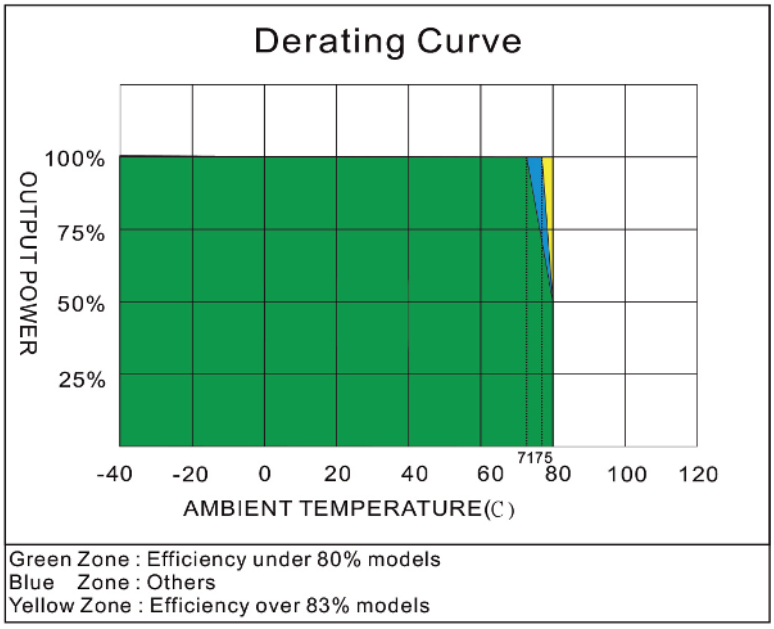
Part Number	Input Voltage Range [V]	Input current [mA, max/min]	Output Voltage [VDC]	Output current [mA, max/min]	Efficiency [%; min/typ]	Capacitive load [µF]
3D8W4_1203S1.6RP	12 (4.5-18)	257/30	3.3	700/0	75	3300
3D8W4_1205S1.6RP	12 (4.5-18)	309/45	5	600/0	81	1680
3D8W4_1212S1.6RP	12 (4.5-18)	301/55	12	250/0	83	470
3D8W4_1215S1.6RP	12 (4.5-18)	301/60	15	200/0	83	330
3D8W4_1205D1.6RP	12 (4.5-18)	313/30	±5	300/0	80	±1000
3D8W4_1212D1.6RP	12 (4.5-18)	305/55	±12	125/0	82	±220
3D8W4_1215D1.6RP	12 (4.5-18)	301/60	±15	100/0	83	±220
3D8W4_243R3S1.6RP	24 (9-36)	127/25	3.3	700/0	76	3300
3D8W4_2405S1.6RP	24 (9-36)	152/20	5	600/0	82	1680
3D8W4_2412S1.6RP	24 (9-36)	149/30	12	250/0	84	470
3D8W4_2415S1.6RP	24 (9-36)	149/35	15	200/0	84	330
3D8W4_2405D1.6RP	24 (9-36)	154/25	±5	300/0	81	±1000
3D8W4_2412D1.6RP	24 (9-36)	151/30	±12	125/0	83	±220
3D8W4_2415D1.6RP	24 (9-36)	149/35	±15	100/0	84	±220
3D8W4_483R3S1.6RP	48 (18-75)	65/10	3.3	700/0	74	3300
3D8W4_4805S1.6RP	48 (18-75)	77/10	5	600/0	81	1680
3D8W4_4812S1.6RP	48 (18-75)	77/15	12	250/0	81	470
3D8W4_4812S1.6RP	48 (18-75)	77/15	12	250/0	81	470
3D8W4_4815S1.6RP	48 (18-75)	76/15	15	200/0	82	330
3D8W4_4805D1.6RP	48 (18-75)	79/20	±5	300/0	79	±1000
3D8W4_4812D1.6RP	48 (18-75)	78/20	±12	125/0	80	±220
3D8W4_4815D1.6RP	48 (18-75)	78/25	±15	100/0	80	±220

Typical characteristics

Temperature derating graph



Green Zone : Efficiency under 80% models
Blue Zone : Others
Yellow Zone : Efficiency over 83% models

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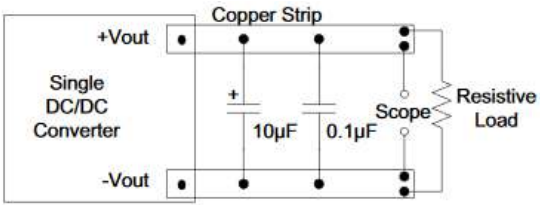
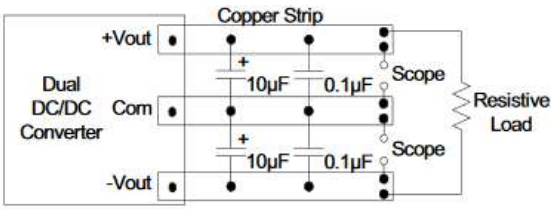
Output Ripple & Noise Measurement Test

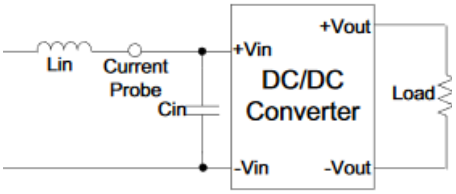
Use a 10μF electrolytic capacitor and 0.1μF ceramic capacitor.
The Scope measurement bandwidth is 20MHz.





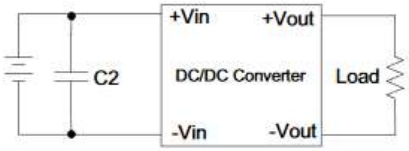
Input Reflected Ripple Current Test Step

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

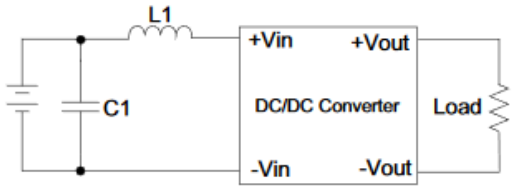
Input filter components (C2) is used to help meet IEC .61000-4-4 and IEC61000-4-5



	C2
3D8W4_1.6RP	220μF,100V

EMI Filter Conducted Emissions

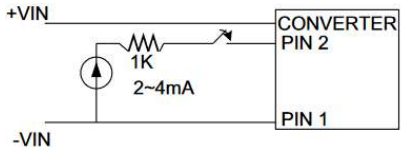
Input filter components (C1,L1) are used to meet EMI test criterial A.
These components should be mounted as close as possible to the module; and all leads should be minimized to decrease



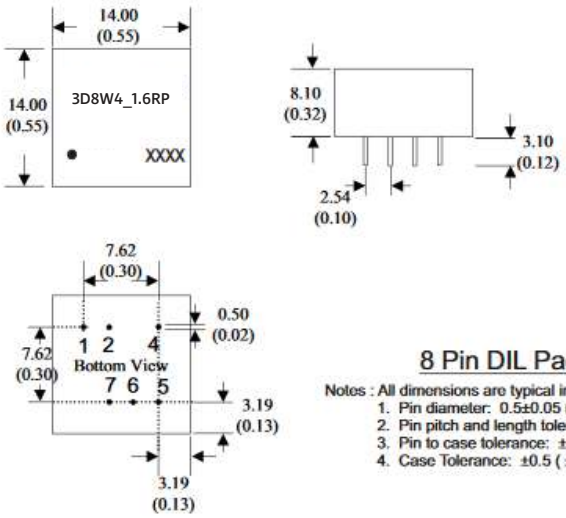
	C1	L1
3D8W4_12XXXXX	1210,10μF,35V	2.2μH
3D8W4_24XXXXX	1210,2.2μF,100V	
3D8W4_48XXXXX	1210,4.7μF,100V	

Remote ON / OFF Test Step

Input current(2~4mA) via 1KΩ to Pin2 , converter OFF.
open or high impedance , converter ON



Mechanical dimensions



8 Pin DIL 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)

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

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