



6DMRW4_2.25R series

6W - Single/Dual Output DC-DC Converter - Wide Input - Isolated & Regulated

DC-DC Converter

6 Watt

- ⊕ 1" x 1" package style
- ⊕ 4:1 input voltage range
- ⊕ Operating temperature range: -40°C to +85°C
- ⊕ 2250VDC isolation
- ⊕ Up to 86% efficiency
- ⊕ Input under voltage protection
- ⊕ Short circuit protection (SCP)
- ⊕ Over current protection
- ⊕ Over-voltage protection
- ⊕ Meets EN50155 railway standard

Introducing our new 6DMRW4_2.25R series. The 6DMRW4_2.25R DC-DC converter series combines high reliability with compact design in a 1" x 1" package. With a wide 4:1 input voltage range and an operating temperature from -40°C to +85°C, it delivers stable performance even in demanding environments. Featuring 2250 VDC isolation and up to 86 percent efficiency, the series is built for durability and energy efficiency. Comprehensive protection functions include input under-voltage, short circuit (SCP), over-current, and over-voltage protection. Fully compliant with the EN50155 railway standard, the 6DMRW4_2.25R series is the ideal choice for robust, mission-critical power applications.



Common specifications

Short circuit protection	Input voltage range, continuous, self-recovery
Switching frequency	300 kHz (PWM Mode)
Operation temperature	-40°C ~+85°C (with derating)
Storage temperature	-55°C ~+125°C
Pin Soldering Resistance Temperature	+300°C (soldering spot is 1.5mm away from case for 10 seconds)
Storage humidity	5~95% RH (non-condensing)
MTBF: (MIL-HDBK-217F@25°C)	1,000,000 hours
Input filter	Pi filter
Hot plug	Unavailable
Vibration	IEC61373 - Category 1, Grade B
Case Material	Aluminum alloy
Package Dimensions	25.4 x 25.40 x 12.00 mm
Weight	21.00g (typ.)
Cooling Method	Free air convection

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input current	(full load / no-load) Nominal input voltage		68/3	70/8	mA
Reflected ripple current	Nominal input voltage		25		mA
Surge voltage	1 sec. max.	-0.7		180	VDC
Start-up voltage				40	VDC
Input under-voltage protection		28	33		VDC
Start-up time	Nominal input voltage & constant resistance load		10		ms
Ctrl	Module on Ctrl pin open or pulled high (3.5-12VDC) Module off Ctrl pin pulled low to GND (0-1.2VDC) Input current when off	-	3	8	mA

Example:

6DMRW4_11015S2.25R

6 = 6Watt; D = DIP; MR = Series; W4 = Wide input; 110 = 110Vin; 15 = 15Vout; S = Single Output; 2.25 = 2250VDC isolation; R = Regulated Output

Output specifications

Item	Test condition	Min	Typ	Max	Units
Voltage Accuracy	0%- 100% load		±1	±3	%
Linear Regulation (Input voltage variation from low to high at full load)	Vo1 Vo2		±0.2 ±0.5	±0.5 ±1	%
Load regulation	0%-100% load 110 single 5%-100% load Vo1 110 dual 5%- 100% load Vo2 110 dual		±0.5 ±0.5	±1 ±1.5	%
Cross regulation	Dual output, Vo1 load at 50%, Vo2 load at range of 25%-100%			±10	%
Transient recovery time	25% load step change, nominal input voltage		300	500	µs
Transient response deviation (25% load step change, nominal input voltage)	5V, ±5V output Others		±3 ±3	±8 ±5	%
Temperature coefficient	Full load		±0.02	±0.03	%/°C
Ripple & noise	20MHz bandwidth, 5%-100% load		50	100	mVp-p
Over-voltage protection	Input voltage range	110		160	%Vo
Over-current protection	Input voltage range	120		210	%Io

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation	Input-output Electric Strength Test for 1 min. with a leakage current of 1mA max.	2250			VDC
Isolation	Input/output-case Electric Strength Test for 1 min. with a leakage current of 1mA max.	1600			VDC
Isolation resistance	Input-output resistance at 500VDC	1000			MΩ
Isolation capacitance	Input-output capacitance at 100kHz/0.1V		1000		pF

- The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
- It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
- Suggested dual output module load imbalance: $\leq \pm 5\%$. If it exceeds $\pm 5\%$, it cannot be guaranteed that the product performance meets all performance indicators in this datasheet;
- The max. capacitive load is tested within the input voltage range and under full load conditions;
- Unless otherwise specified, all indicators in this manual are measured at Ta = 25°C, humidity <75% RH, nominal input voltage, and output rated load;
- All indicator testing methods in this datasheet are based on our company's standards; Product specifications are subject to change without prior notice

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EMC specifications							
EMC	EMI	CE	CISPR32/EN55032	CLASS B (see Fig.3 or Fig.4-② for recommended circuit)			
EMC	EMI	RE	CISPR32/EN55032	CLASS B (see Fig.3 or Fig.4-② for recommended circuit)			
EMC	EMS	ESD	IEC/EN61000-4-2	Contact ±6kV/Air ±8kV		perf. criteria B	
EMC	EMS	RS	IEC/EN61000-4-3	20V/m		perf. criteria A	
EMC	EMS	EFT	IEC/EN61000-4-4	±4kV(see Fig.3 or Fig.4-③ for recommended circuit)		perf. criteria B	
EMC	EMS	Surge	IEC/EN61000-4-5	line to line ±2kV (2Ω, 18μF see fig. 3 for recommended circuit) line to ground ±4kV (12Ω, 9μF see fig. 3 for recommended circuit)		perf. criteria B	
EMC	EMS	CS	IEC/EN61000-4-6	10 Vr.m.s		perf. criteria A	

Product Selection Guide

Approval	Part number	Input Voltage Nominal Range (VDC)	Input Voltage Max. (VDC)	Output Voltage (VDC)	Output Current (mA)	Full Load Efficiency (%) Typ.	Capacitive Load (μF) Max.
	6DMRW4_11005S2.25R	110 (40-160)	170	5	1200/0	80	1000
	6DMRW4_11012S2.25R	110 (40-160)	170	12	500/0	84	470
	6DMRW4_11015S2.25R	110 (40-160)	170	15	400/0	85	220
	6DMRW4_11024S2.25R	110 (40-160)	170	24	250/0	86	100

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	6DMRW4_11012D2.25R	110 (40-160)	170	±12	±250/0	84	100
	6DMRW4_11015D2.25R	110 (40-160)	170	±24	±200/0	85	100

Typical characteristics

Temperature derating graph

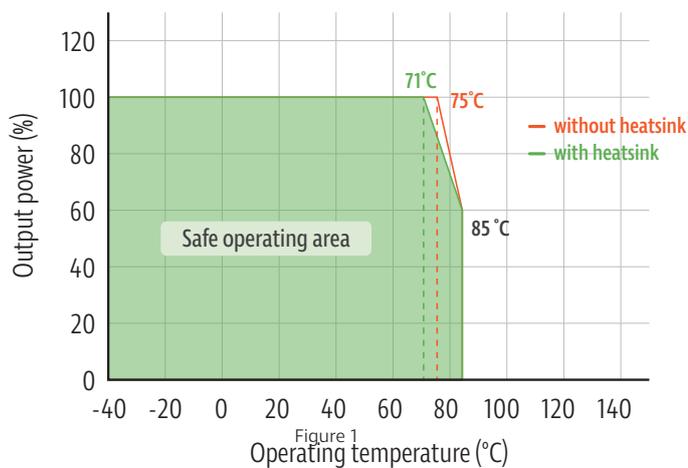


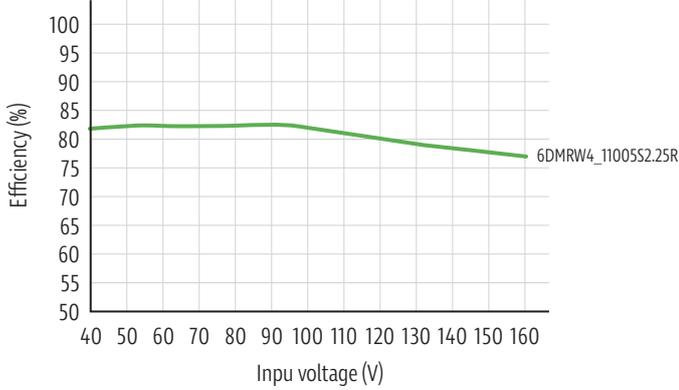
Figure 1
Operating temperature (°C)

6DMRW4_2.25R series

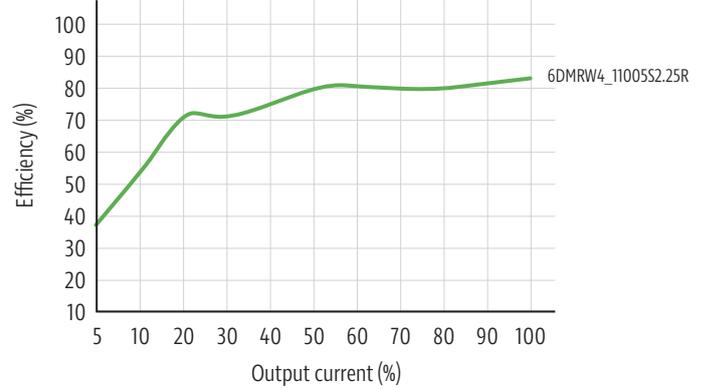
6W - Single/Dual Output DC-DC Converter - Wide Input - Isolated & Regulated

Typical characteristics

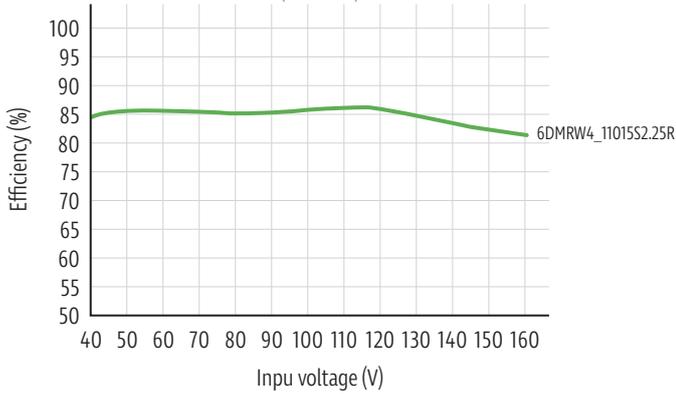
Efficiency vs input voltage
(Full load)



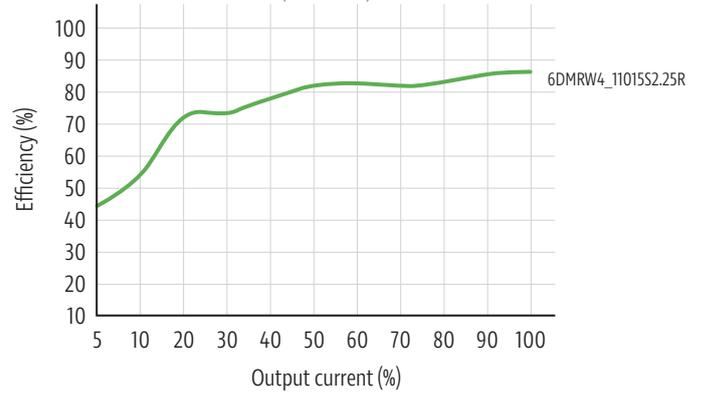
Efficiency vs output load
(Vin = 110V)



Efficiency vs input voltage
(Full load)



Efficiency vs output load
(Vin = 110V)



Typical circuit design and application

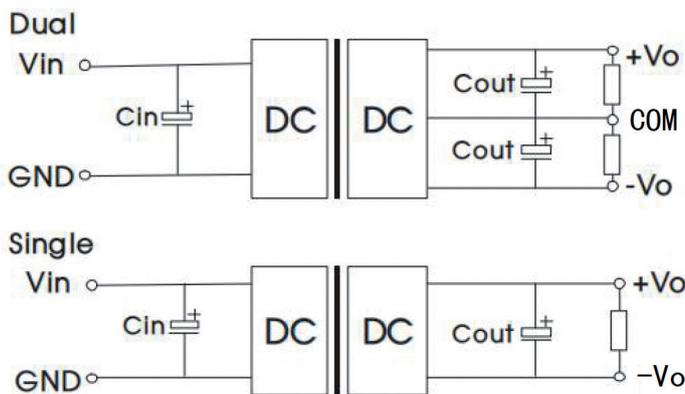


Figure 2

Cin	Vo (VDC)	Cout
10μF/250V -47μF/250V	±5/5	10μF/16V
	±12/12 ±15/15	10μF/25V
	24	10μF/50V

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EMI recommended component parameters

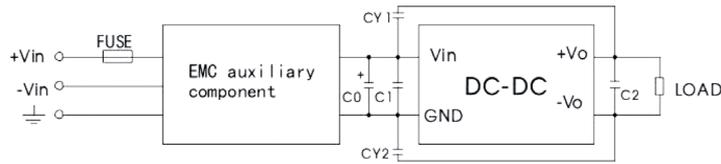


Figure 3

EMI Recommended component parameters

FUSE	EMC auxiliary component	C0	C1	C2	CY1/CY2
Choose according to actual input current	Input voltage range: 40V-160V	100 μ F/200V	Refer to the Cin in Fig.2	Refer to the Cout in Fig.2	1nF/3kV

Trim recommended component parameters

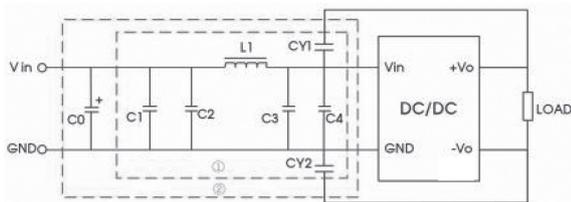
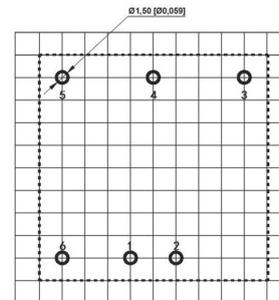
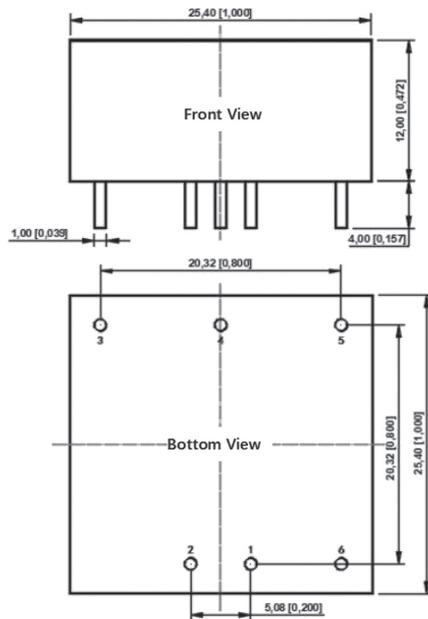


Figure 4

C0	100 μ F/200V
C1/C2/C3/C4	0.22 μ F/250V
L1	68 μ H
CY1/CY2	1nF/3kV

- Note: 1. All DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.
 2. Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the specified max. capacitive load value of the product.
 3. The products do not support parallel connection of their output.

Mechanical dimensions



The grid distance is 2.54 x 2.54mm

Pin Definition Table		
Pin	Single	Dual
1	No pin	Ctrl
2	GND	GND
3	Vin	Vin
4	+Vo	+Vo
5	No pin	0V
6	-Vo	-Vo

Notes:
 Unit: mm [inch]
 Pin section tolerances: ± 0.10 [± 0.004]
 General tolerances: ± 0.50 [± 0.020]