



## 6DMRW4\_2.25 Series

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

## DC-DC Converter 6 Watt

- + Wide 4:1 input voltage range
- + Isolation Voltage: 2.25KVDC
- + Operating Temperature Range: -40°C to +85°C
- + Short circuit protection (SCP)
- + International standard pin-out
- + Meet the IEC60950, UL60950, EN60950 approval
- + High efficiency up to 86%
- + Low ripple & noise
- + Meets requirements of railway standard EN50155
- + RoHS Compliance
- + Over voltage protection
- + Over load protection
- + Input under voltage protection

The 6DMRW4\_2.25 series are isolated 6W DC-DC products with 4:1 input voltage. They feature efficiency up to 86%, 2250VDC isolation with enhanced isolation, operating temperature of -40°C to +85°C, input under-voltage protection, output short circuit, over-current and over-voltage protection. Railway vehicle electronic equipment widely used in 72V, 96V and 110V.



Common specifications	
Short circuit protection:	Continuous, automatic recovery
Cooling:	Free air convection
Operation temperature range:	-40°C~+85°C
Storage temperature range:	-55°C~+125°C
Soldering temperature:	300°C MAX, 1.5mm from case for 10sec
Switching frequency*:	300kHz TYP, PWM mode
Storage humidity range:	95% MAX
Shock and vibration test:	IEC 61373, car body 1 B mold
Case material:	Aluminum alloy
Potting material:	Epoxy (UL94V-0)
MTBF (MIL-HDBK-217F @25°C):	>1,000 Khours
Dimensions:	25.40*25.40*11.70mm 25.40*25.40*16.20mm (heatsink)
Weight:	15g/20g (heatsink)

\* This series of products using reduced frequency technology, the switching frequency is test value of full load, When the load is reduced to below 50%, the switching frequency decreases with decreasing load.

Output specifications							
Item	Test condition	Min	Typ	Max	Units		
Voltage accuracy	0%-100% load		±1	±3	%		
Line regulation	Full load, low to high		±0.2	±0.5	%		
Load regulation	0%-100% load		±0.5	±1	%		
Transient recovery time	25% load step change		300	500	µs		
Transient response deviation	normal Vin, 25% load step change						
		• 5V output		±3	±8	%	
		• Others		±3	±5	%	
Temperature coefficient			±0.02	±0.03	%/°C		
Ripple and noise*	20MHz Bandwidth		50	100	mVp-p		
Over voltage protection	Input voltage range	110		160	%Vo		
Over current protection	Input voltage range	120		210	%Io		

\* 0%-5% load ripple & noise is no more than 5%Vo. Ripple & noise are measured by "parallel cable" method, please see DC-DC converter application notes for specific operation.

Input specifications						
Item	Test condition	Min	Typ	Max	Units	
Input current (full load/no load)	Nominal input voltage		67/3	70/8	mA	
Reflected ripple current	Nominal input voltage		25		mA	
Surge voltage	1sec. max.	-0.7		180	VDC	
Starting voltage	100% load			40	VDC	
Shutdown voltage		28	33		VDC	
Starting time	Nominal Vin and constant resistive load		10		ms	
Input filter	Pi Type					
Hot plug	Unavailable					

Isolation specifications						
Item	Test condition	Min	Typ	Max	Units	
Isolation voltage*	• Input-output	2250			VDC	
	• Input and output respectively on the shell	1600			VDC	
Isolation resistance	Input-output, test at 500VDC	1000			MΩ	
Isolation capacitance	Input-output, 100KHz/0.1V		1000		pF	

\* Test time of 1 minute and the leak current lower than 1mA.

### Example:

**6DMRW4\_11005S2.25**

**6= 6Watt; D= DIP; MR= series; W4= wide input (4:1) 40-160Vin; 5Vout; S= single output; 2.25= 2250VDC**

### Note:

- Only typical model listed. Non-standard models will be different from the above, please contact us for more details.
- All specifications are typical at nominal input, full load and 25°C unless otherwise stated.
- In this datasheet, all the test methods of indications are based on corporate standards.

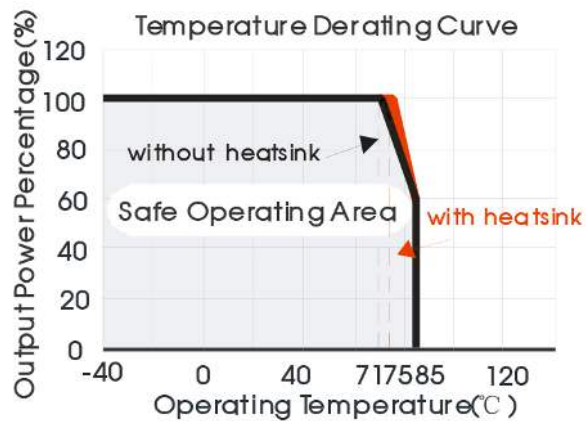
## 6DMRW4\_2.25 Series

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

EMC specifications				
EMI	CE	CISPR22/ EN55022	CLASS B (see EMC recommended circuit, fig. 2 or 3)	
EMI	RE	CISPR22/ EN55022	CLASS B (see EMC recommended circuit, fig. 2 or 3)	
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria B
EMI	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
EMI	EFT	IEC/EN61000-4-4	±4KV (see EMC recommended circuit, fig. 2 or fig. 3)	perf. Criteria B
EMS	Surge	IEC/EN61000-4-5	line to line ±2KV (2Ω 0.5uF see EMC recommended circuit, fig. 2) line to ground ±4KV (12Ω 0.5uF see EMC recommended circuit, fig. 2)	perf. Criteria B
EMS	Surge	EN50121-3-2	line to line ±1KV (42Ω 0.5uF see EMC recommended circuit, fig. 3)	perf. Criteria B
EMI	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A

Part Number	Input Voltage [VDC]		Output Voltage [VDC]	Output Current [mA] Full load	Efficiency [%, typ.]	Capacitor load [μF, max.]
	Nominal	Range				
6DMRW4_11005S2.25	110	40-160	5	1200	80	1000
6DMRW4_11012S2.25	110	40-160	12	500	84	470
6DMRW4_11015S2.25	110	40-160	15	400	85	220
6DMRW4_11024S2.25	110	40-160	24	250	86	100

## Typical characteristics

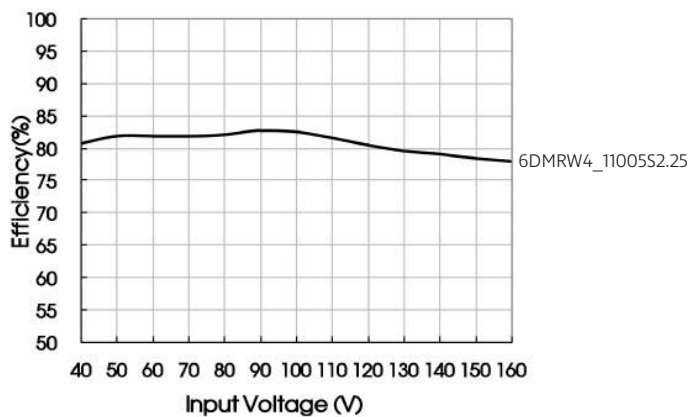


## 6DMRW4\_2.25 Series

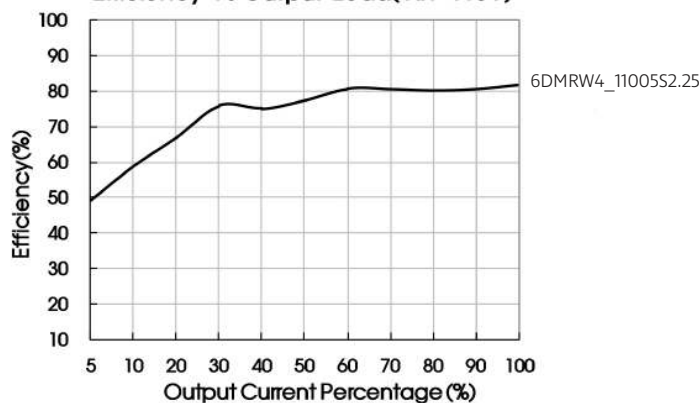
6W - Single Output - Wide Input - Isolated & Regulated DC-DC Converter

### Efficiency

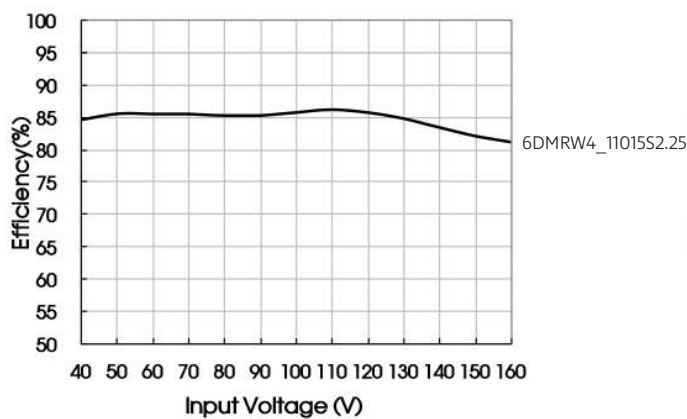
Efficiency Vs Input Voltage (Full Load)



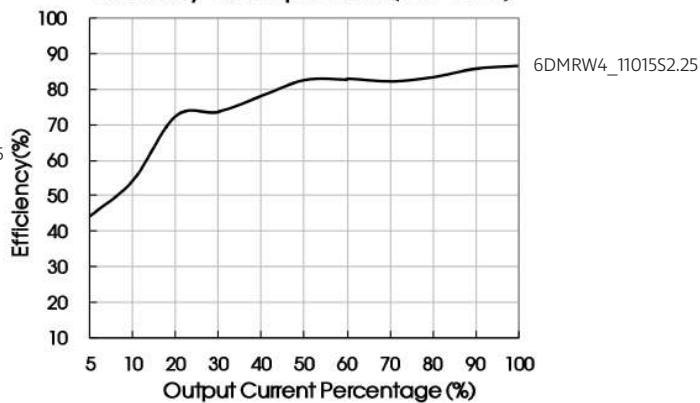
Efficiency Vs Output Load (Vin=110V)



Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load (Vin=110V)



### Typical application

All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 1) before delivery.

If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors  $C_{in}$  and  $C_{out}$  or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.



figure 1

$C_{in}$	$C_{out}$
10 $\mu$ F - 47 $\mu$ F	10 $\mu$ F

## 6DMRW4\_2.25 Series

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

### EMC solution recommended circuit

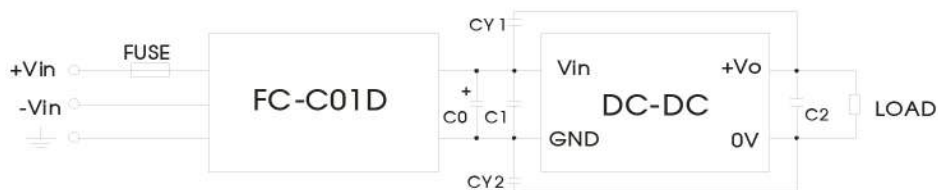
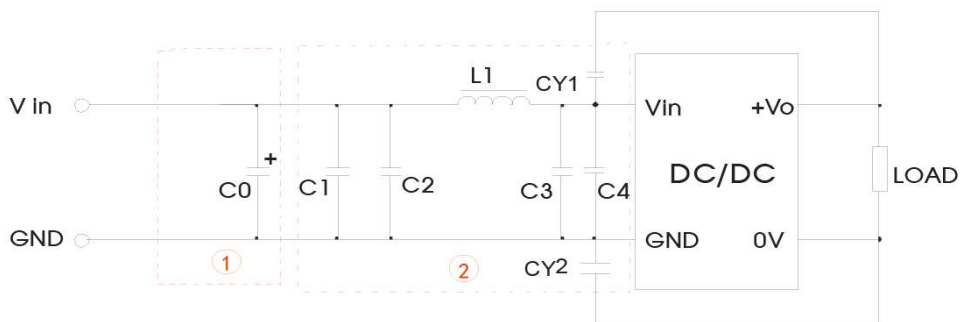


figure 2

Figure 2 parameter description:

FUSE	Choose according to actual input current
FC-CX1D	FC-CX1D is the EMC auxiliary component of our company. Input voltage range: 40V-160V
C0	100 $\mu$ F/200V
C1	Refer to the Cin in Fig. 1
C2	Refer to the Cout in Fig. 1
CY1, CY2	1nF/3KV



Note: Part ① in the Fig. 3 is used for EMS test and part ② for EMI filtering; selected based on needs.

figure 3

Figure 3 parameter description:

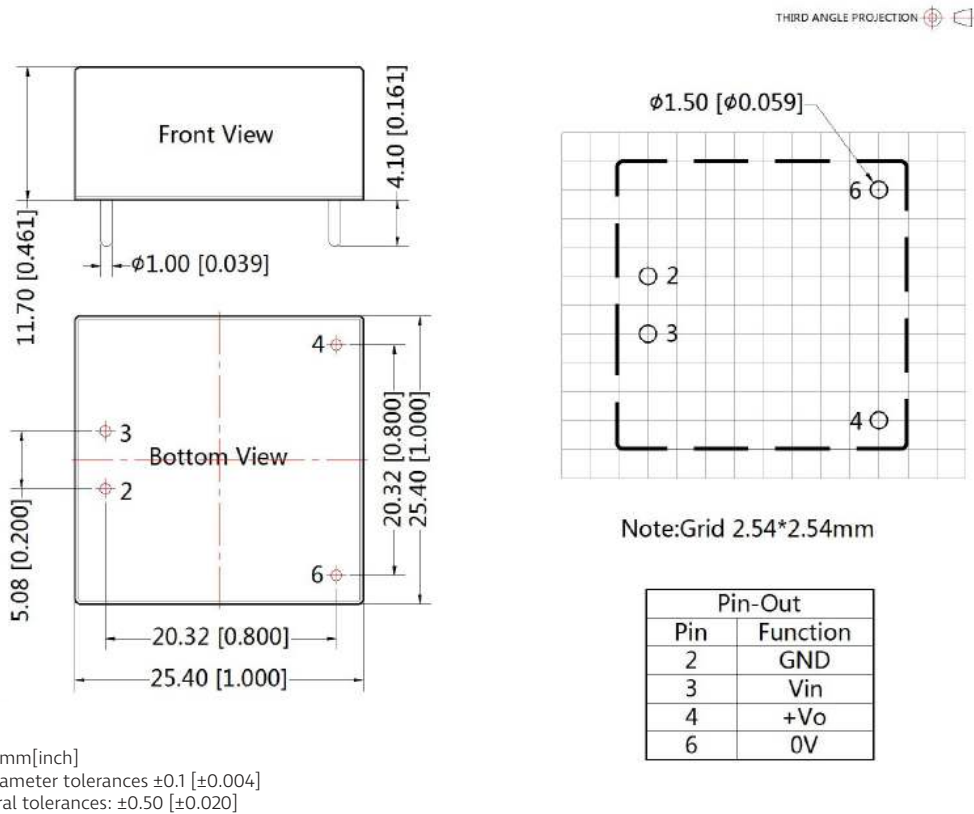
C0	100 $\mu$ F/200V
C1, C2, C3, C4	0.22 $\mu$ F/250V
L1	68 $\mu$ H
CY1, CY2	1nF/3KV

It is not allowed to connect modules output in parallel to enlarge the power.

## 6DMRW4\_2.25 Series

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

### Mechanical dimensions



### Mechanical dimensions (with heatsink)

