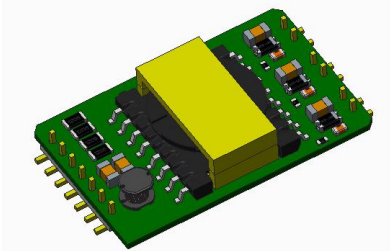


6W isolated DC-DC converter in SMD package  
Wide input and regulated triple output



Patent Protection RoHS



## FEATURES

- Wide input voltage range (9-16VDC)
- High efficiency up to 82%
- No-load power consumption as low as 0.12W
- I/O isolation test voltage 2.7k VDC
- Operating ambient temperature range: -40°C ~ +105°C
- Input under-voltage protection, output short-circuit, over-current, over-voltage protection
- Emissions meets EN55025/CISPR25 CLASS 4 standard
- SMD package

VRC1215JD-6WR3 product is of 6W output power, wide range of voltage input of 9-16VDC. They feature 2700 VDC input to output isolation, input under-voltage, output short-circuit, output over-current and over-voltage protection, Emissions meets EN55025/CISPR25 CLASS 4 standard, products use SMD package process, it is easy for customers to automate machining, which makes it ideal for a wide use in applications such as vehicle electronics, medical care, industrial control, electric power, instrumentation and communications.

## Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output						Full Load Efficiency <sup>②</sup> (%) Min./Typ.	Capacitive Load <sup>③</sup> (μF) Max.
		Nominal (Range)	Max. ①	Voltage (VDC)			Current (mA) Max./Min.				
				Vo1	Vo2	Vo3	Io1	Io2	Io3		
--	VRC1215JD-6WR3	12 (9-16)	36	15	15	15	200/0	100/0	100/0	80/82	100

Notes: ① Exceeding the maximum input voltage may cause permanent damage;  
② Efficiency is measured at nominal input voltage and rated output load;  
③ The specified maximum capacitive load for triple output is identical.

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)		--	813/10	833/20	mA
Surge Voltage (1sec. max.)		-0.7	--	40	VDC
Start-up Voltage		--	--	9	
Under-voltage Protection		5.5	6.5	--	
Input Filter		Pi			
Hot Plug		Unavailable			

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Voltage Accuracy		Vo1	--	±1	±3	%
		Vo2, Vo3	--	±5	±8	
Linear Regulation	Input voltage variation from low to high at full load	Vo1	--	±0.2	±0.5	
		Vo2, Vo3	--	±0.5	±1	
Load Regulation <sup>①</sup>	5%-100% load	Vo1	--	±0.5	±1	
		Vo2, Vo3	--	±1	±2	
Cross Regulation	Three output with main output at 50% load and supplement output from 25%-100%	--	--	±8		
Transient Recovery Time	25% load step change	--	300	1000	μs	
Transient Response Deviation		--	±3	±5	%	

Temperature Coefficient	Full load	--	--	±0.03	%/°C
Ripple & Noise <sup>②</sup>	20MHz bandwidth	--	100	200	mVp-p
Over-voltage Protection	Input voltage range	110	--	160	%Vo
Over-current Protection		110	150	200	%Io
Short-circuit Protection		Continuous, self-recovery			

Notes: ①Load regulation for 0% -100% is ±5%;  
②The "parallel cable" method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information.

### General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.	2700	--	--	VDC
	Output-output Electric Strength Test for 1 minute with a leakage current of 1mA max.	500	--	--	
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	2500	--	pF
Operating Temperature	see Fig. 1	-40	--	105	°C
Storage Temperature		-55	--	125	
Storage Humidity	Non-condensing	5	--	95	%RH
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	°C
Reflow Soldering Temperature		Peak temp. ≤245°C, maximum duration time ≤60s over 217°C. For actual application, please refer to IPC/JEDEC J-STD-020D.1.			
Vibration		JEDEC JESD22-B103(10-1000Hz, 70Hz, 1.0mm, 10G, along X, Y and Z)			
Switching Frequency *	PWM mode	--	210	--	KHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K hours

Note: \* Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

### Mechanical Specifications

Dimensions	42.10 x 25.00 x 10.50 mm
Weight	9.0g(Typ.)
Cooling Method	Free air convection

### Electromagnetic Compatibility (EMC)

Emissions	CE	EN55025/CISPR25	CLASS 4 (see Fig. 3 or Fig. 4 for recommended circuit)
	RE	EN55025/CISPR25	CLASS 4 (see Fig. 3 or Fig. 4 for recommended circuit)

### Typical Characteristic Curves

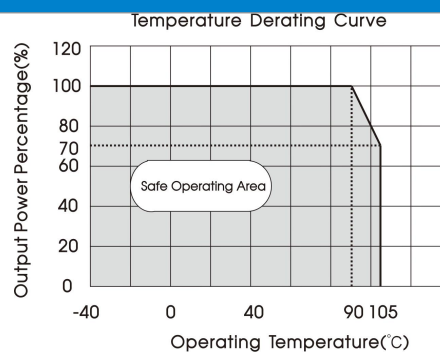


Fig. 1

Design Reference

1. Typical application circuit

All the DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.

Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values  $C_{in}$  and  $C_{out}$  and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the max. capacitive load value of the product.



Vin(VDC)	Cin	Cout
12	100 $\mu$ F	10 $\mu$ F

Fig. 2

2. EMC compliance circuit

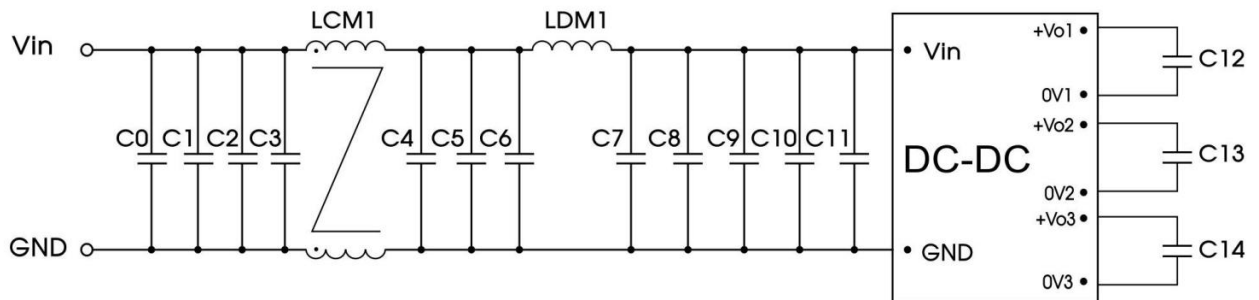


Fig. 3

List of components:

C0	1nF/50V
C1, C4	100nF/50V
C5	1 $\mu$ F/50V
C2, C6, C7	4.7 $\mu$ F/50V
C3, C8, C9, C10, C11, C12, C13, C14	10 $\mu$ F/50V
LCM1	470 $\mu$ H
LDM1	220 $\mu$ H

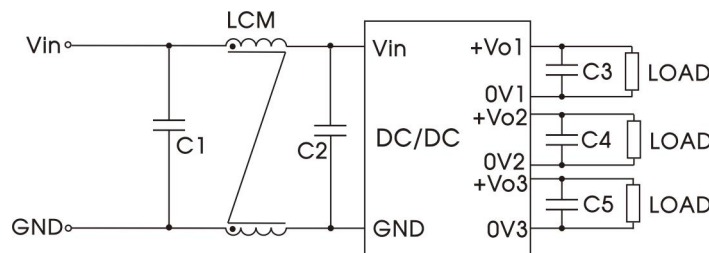


Fig. 4

List of components:

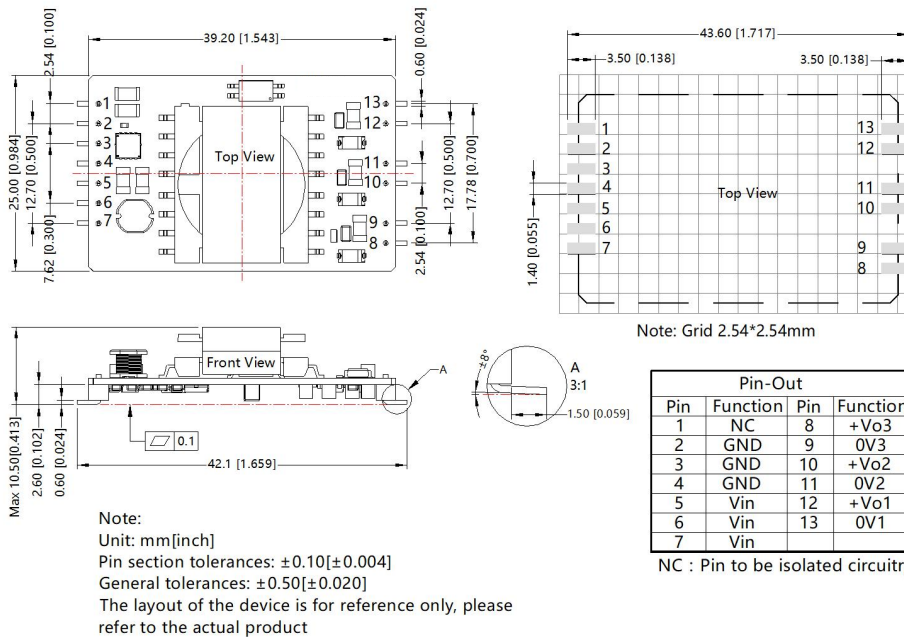
C1, C2, C3, C4, C5	10 $\mu$ F/50V
LCM	1mH

3. The products do not support parallel connection of their output

4. For additional information please refer to DC-DC converter application notes on [www.mornsun.cn](http://www.mornsun.cn)

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Notes:

1. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58210059;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. The maximum capacitive load offered were tested at input voltage range and full load;
4. Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^\circ\text{C}$ , humidity<75%RH with nominal input voltage and rated output load;
5. All index testing methods in this datasheet are based on our company corporate standards;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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