DC/DC Power Module-20W Wide Voltage

- **Operating temperature: -40 to +85°C**
- **Wide voltage input: 4:1**
- **Package size: 1 "x 1"**
- **High efficiency:90%**
- **Isolation voltage: 1500VDC**
- **Input under-voltage protection, output over-current and short-circuit protection (self-recovery)**

Selection Table

Product Model	Input Voltage (VDC)		Output		Full Load efficiency (%) Min./Typ.	Maximum Capacitive Load (μF)
	Nominal value Range	Crest value	Output Voltage (VDC)	Output (mA) Max./Min.		
LRD20-24S03	24 (9-36)	40	3.3	5000/0	84/85	10000
LRD20-24S05			5	4000/0	87/89	10000
LRD20-24S09			9	2222/0	86/88	4700
LRD20-24S12			12	1667/0	88/90	1600
LRD20-24S15			15	1333/0	88/90	1000
LRD20-24S24			24	833/0	88/90	500
LRD20-24D05			±5	±2000/0	85/87	2000
LRD20-24D12			±12	±833/0	87/89	800
LRD20-24D15			±15	±666/0	87/89	600
LRD20-24D24			±24	±416/0	87/89	300
LRD20-48S03	48 (18-75)	80	3.3	5000/0	84/85	10000
LRD20-48S05			5	4000/0	87/89	10000
LRD20-48S09			9	2222/0	86/88	4700
LRD20-48S12			12	1667/0	86/88	4700
LRD20-48S15			15	1333/0	88/90	1600
LRD20-48S24			24	833/0	88/90	1000
LRD20-48D05			±5	±2000/0	84/85	2000
LRD20-48D12			±12	±833/0	85/86	800
LRD20-48D15			±15	±666/0	86/87	600
LRD20-48D24			±24	±416/0	87/89	300

Input Characteristics

Parameter	Condition		Min.	Typ.	Max.	Unit
Input currenton	24VDC nominal input series, nominal input voltage	3.3V output	--	780/30	799/50	mA
		Other	--	926/35	958/70	
	48VDC nominal input series, nominal input voltage	3.3V output	--	391/15	400/30	
		Other	--	463/4	469/15	
Reflection ripple current	24VDC nominal input series		--	40	--	
	48VDC nominal input series		--	30	--	mA
Input surge voltage (1sec.max.)	24VDC nominal input series		-0.7	--	50	VDC
	48VDC nominal input series		-0.7	--	100	
Starting voltage	24VDC nominal input series		--	--	9	
	48VDC nominal input series		--	--	18	
Input under-voltage protection	24VDC nominal input series		--	7	--	
	48VDC nominal input series		--	15.5	--	
Input filter type			PI filter			
Hot swap			Not supported			
CTR control logic	On-state		Floating			
	Off-state		Grounded or below 2VDC			
	Input current in off-state			2		mA

Output Characteristic

Parameter	Condition		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	0% -100% Load		--	±1	±3	%
Linear Rate of adjustment	At full load, the input voltage ranges from low to high.		--	--	±0.5	
Load regulation rate	From 5% to 100% load	positive output	--	--	±1	
		negative output	--	--	±1.5	
Ripple noise	20MHz bandwidth, 5% -100% load		--	50	100	mVp-p
Transient recovery time	25% load step change, nominal input voltage		--	400	500	μs
Transient response deviation		3.3V/5V/±5V output	--	±5	±8	%
		Other voltages	--	±3	±5	
Temperature drift coefficient	loaded to capacity		--	--	±0.03	%/℃
Overcurrent protection			110	150	--	%Io
Short-circuit protection			Sustainable, self-recovering			

General characteristics

Parameter	Condition	Min.	Typ.	Max.	Unit
Isolation voltage	Input-output, test time 1 minute, leakage current less than 1mA	1500	--	--	VDC
Insulation resistance	Input/Output, Insulation Voltage 500VDC	1000	--	--	MΩ
Isolating capacitance	Input-output, 100KHz/0.1V	--	2000	--	pF
Working temperature		-40	--	+85	C°
Storage temperature		-55	--	+125	
Storage humidity	no condensation	5	--	95	%RH
Pin soldering temperature	The solder joint is 1.5mm away from the housing for 10 seconds.	--	--	+300	℃
Switching frequency		--	300	--	kHz
Mean Time Between Failures（MTBF）			1000		kHours
Note: This product series uses frequency reduction technology. The switching frequency is the test value at full load. When the load decreases, the switching frequency decreases accordingly.					

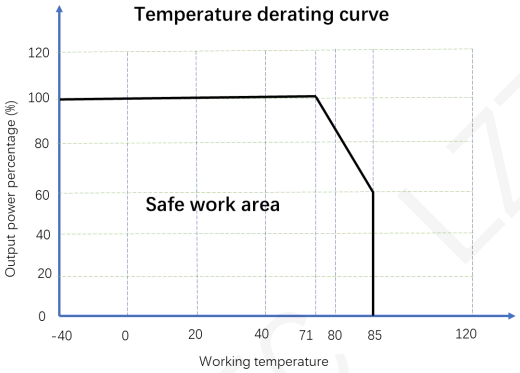
Physical properties

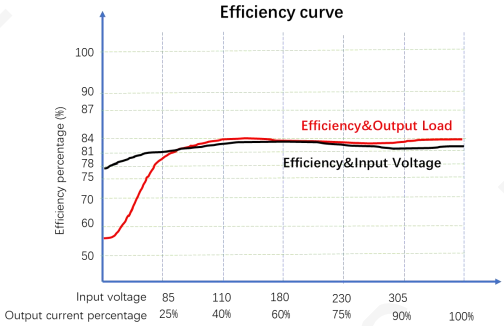
Encapsulation Material	Aluminum Alloy
Encapsulation size	25.50×25.50×12.00mm
Weight	15g
Heat Dissipation Method	Natural Air Cooling

EMC characteristic

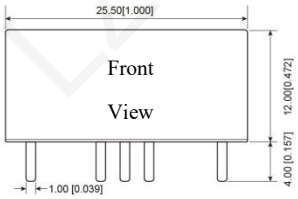
EMI	conduction disturbance	CISPR32/EN55032: CLASS A (bare board) / CLASS B (recommended circuitry
	radiation disturbance	CISPR32/EN55032: CLASS A (bare board) / CLASS B (recommended circuitry
EMS	electrostatic discharge	IEC/EN61000-4-2 Contact±4KV Perf.Criteria B
	radiation immunity	IEC/EN61000-4-3 10V/m Perf.Criteria A
	pulse group anti-jamming capability	IEC/EN61000-4-4 ±2KV (Recommended circuit is shown in Figure 3-①)
	surge immunity	IEC/EN61000-4-5 line to line±2KV (recommended circuit is shown in Figure 3-
	Conduction interference immunity	IEC/EN61000-4-6 3 Vr.m.s Perf.Criteria A

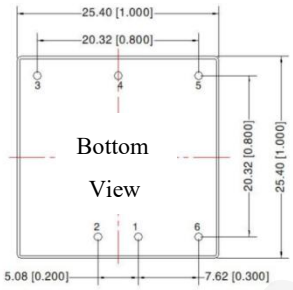
Product Feature Curve Diagram





Dimensions/Recommended print layout





PIN	Single channel	Double channel
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	Trim	COM
5	-Vo	-Vo
6	CTR	CTR

Trim: Single Output Voltage Adjustment Pin
COM: Dual Output Common Terminal
Unit of measurement: mm [inch]
Terminal diameter tolerance: ±0.10 [±0.004]
Unspecified tolerance: ±0.50 [±0.020]

1. Application Circuit

All DC/DC converters in this series undergo testing according to the recommended test circuit (Figure 2) prior to factory release. To further reduce input/output ripple, the external input/output capacitors (Cin and Cout) can be increased in capacitance or replaced with capacitors in series that have lower equivalent impedance. However, the total capacitance must not exceed the product's maximum capacitive load.

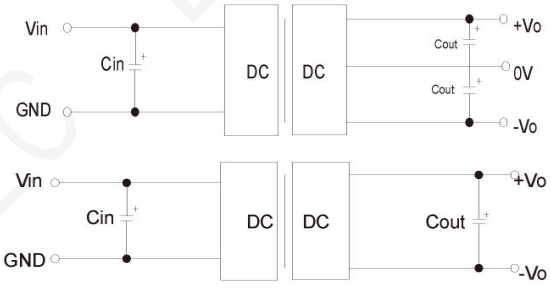


Figure 2

Vin	24V	48V
Cin	100uF	10-47uF
Cout	10uF	10uF

2. EMC Solution----Recommended Circuit

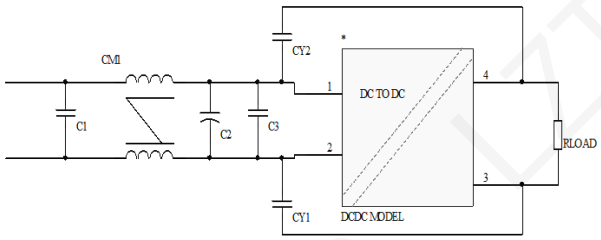


Figure 3

Model	Vin：24V	Vin：48V
FUSE	Select based on the actual current input by the customer	
C2	220uF/50V	220uF/100V
C1	4.7uF/50V	4.7uF/100V
C3	10uF/voltage rating selected based on actual application	
CM1	4.7mH	
CY1、CY2	1nF/2KV	

NOTE

1. If the product operates below the minimum required load, it cannot be guaranteed that all performance metrics specified in this manual will be met.
2. The maximum capacitive load is tested under the condition of input voltage range and full load.
3. Unless otherwise specified, all measurements in this manual are taken at Ta=25℃, temperature <75% RH, nominal input voltage, and rated output load.
4. All test methods in this manual are based on our company's enterprise standards.
5. We offer customized product solutions. For specific requirements, please contact our technical team directly.

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