Descriptions

4.8W isolated，DC/DC Converter



RoHS

Features

- Wide 2:1 input voltage range
- High efficiency up to 85%
- I/O isolation test voltage 3000VDC
- Short circuit protection
- Output over-voltage protection
- Operating ambient temperature range:-40℃ to +85℃
- Industry standard pin-out
- IGBT dedicated regulated DC-DC converter

Applications

- Universal converter
- AC spindle servo drive system
- Electric welding machine
- Uninterruptible Power Supply (UPS)

Selection Guide

Certification	Part No.	Input		Output		Full Load Efficiency (%) Typ.	Capacitive Load(μF) Max.
		Voltage (VDC)	Current (mA) Typ. at full/no-load	Voltage(VDC) +Vo/-Vo	Current (mA) +Io/-Io		
--	DQP5-12D1509V0	12(9-18)	471/16	+15/-9	±200/±10	85	1000
	DQP5-24D1509V0	24(18-36)	235/8	+15/-9	±200/±10	85	1000

Specifications

Product Specifications	Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Specifications	Surge Voltage	12VDC input	-0.7	--	25	VDC
		24VDC input	-0.7	--	50	
	Start-up Voltage	12VDC input	--	--	9	
		24VDC input	--	--	18	
	Input Filter		PI filter			
Output Specifications	Output Power		0.24	--	4.8	W
	Voltage Accuracy	Main output(+15V output)	--	±1	±2	%
		Supplement output(-9V output)	--	±3	±5	
	Linear Regulation	Input voltage variation from low to high at full load	--	±0.2	±0.5	
	Load Regulation	5% to 100% load	--	±0.5	±1	
	Transient Recovery Time	25% load step change	--	300	500	μs
	Transient Response Deviation		--	±3	±5	%
	Temperature Coefficient	100% load	--	--	±0.03	%/℃
	Ripple & Noise*	20MHz bandwidth	--	100	200	mVp-p
	Over-voltage Protection	Input voltage range	110	120	140	% Vo
	Short-circuit Protection		Continuous, self-recovery			
General Specifications	Isolation Voltage	Input-output Electric Strength test for 1 minute with a leakage current of 1mA max.	3000	--	--	VDC
	Isolation Resistance	Input-output insulation at 500VDC	1000	--	--	MΩ
	Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	100	--	pF
	Operating Temperature	Power derating≥71℃, (see Fig. 1)	-40	--	85	℃
	Storage Temperature		-55	--	125	
	Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	
	Case Temperature Rise	Ta=25℃	--	30	40	
	Storage Humidity	Non-condensing	5	--	95	%RH
	Switching frequency	100% load, nominal input voltage	--	300	--	kHz
	MTBF	MIL-HDFK-217F@25℃	1000	--	--	k hours
Mechanical Specifications	Case Material	Black plastic; flame-retardant and heat-resistant（UL94 V-0）				
	Dimensions	31.60 × 20.30 × 10.20 mm				
	Weight	14.0g (Typ.)				
	Cooling Method	Free air convection				

Note: *The "parallel cable" method is used for Ripple and Noise test.

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS A (see Fig. 4-② for recommended circuit)	
	RE	CISPR32/EN55032 CLASS A (see Fig. 4-② for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2 Contact ±4kV	perf. Criteria B
	RI	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2kV (see Fig. 4-① for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5 ±2kV (see Fig. 4-① for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6 3 Vr.m.s	perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-29 0%-70%	perf. Criteria B

Characteristic Curve

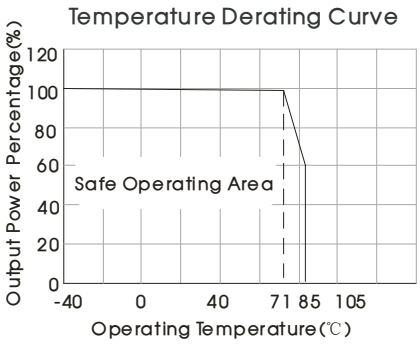
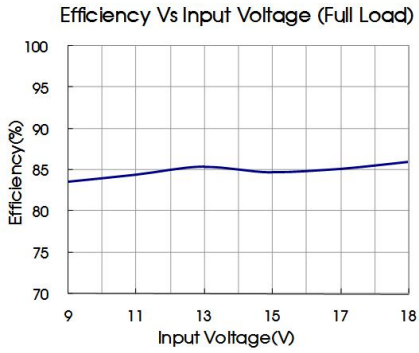
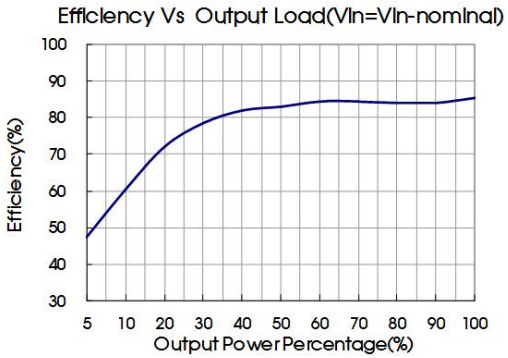


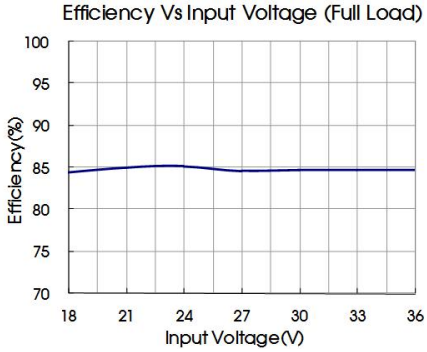
Figure 1



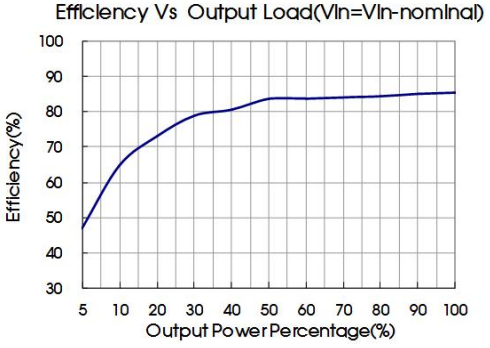
DQP5-12D1509V0



DQP5-12D1509V0



DQP5-24D1509V0



DQP5-24D1509V0

Design Reference

1. Typical application

All the IGBT 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 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.



Fig. 2

Vin	12V/24V
Cin	100μF
Cout	100μF

2. Typical application

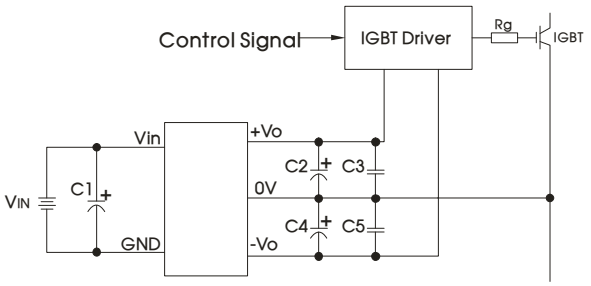


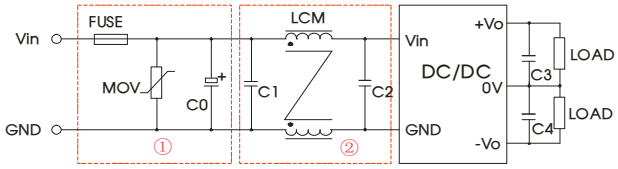
Fig. 3

C1	100uF/63V(Electrolytic capacitor)
C2 /C4	100uF/35V(Electrolytic capacitor)
C3/C5	10uF/25V(Ceramic capacitor)

Application Notes

1. The wire between the converter and IGBT driver must as short as possible.
2. External filter capacitors should be connected as close as possible to the IGBT driver.
3. The peak gate drive current of the IGBT driver is high, so electrolytic capacitors are recommended for the output filter. Use in conjunction with ceramic capacitors to reduce internal resistance.
4. The output average power of the IGBT driver should be less than the output power of DC-DC module.

3.EMC solution-recommended circuit(DQP5-12D1509V0) EMC solution-recommended circuit(DQP5-24D1509V0)



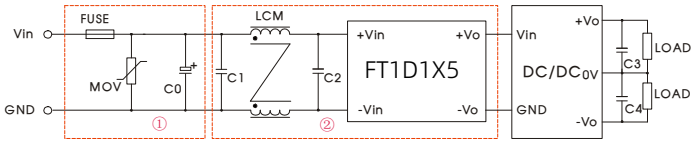
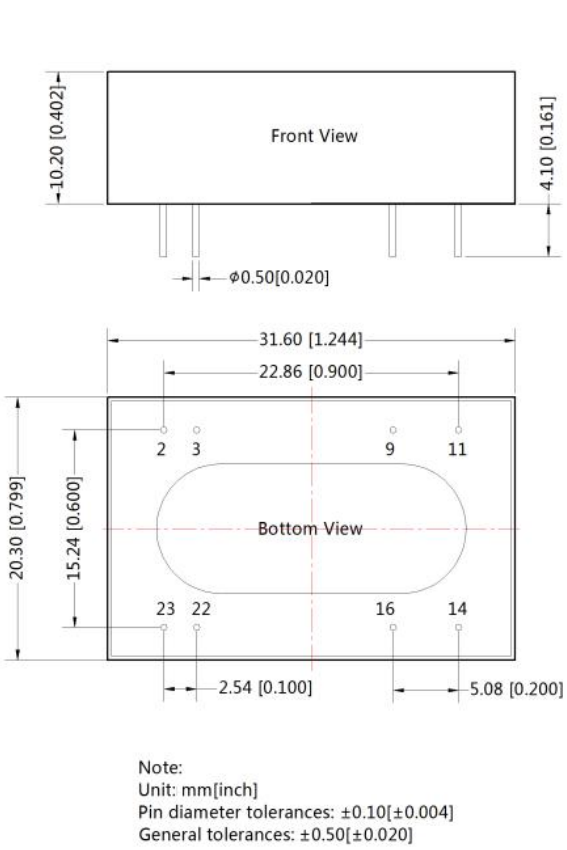


Fig. 4

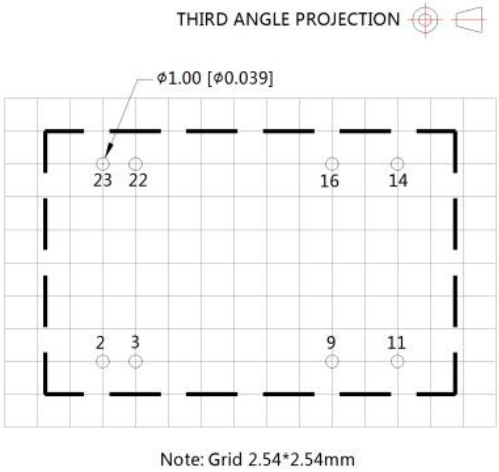
Model	DQP5-12D1509V0	DQP5-24D1509V0
FUSE	Choose according to practical input current	
MOV	14D390K	14D560K
C0	680μF/25V	330μF/50V
C1, C2	4.7μF/50V	
C3, C4	Refer to the Cout in Fig.2	
LCM	1mH	3.3mH
Module	--	FT1D1X5

4. The products do not support parallel connection of their output for power expansion purpose or hot-plug.

Dimensions and Recommended



Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]



Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Function
2,3	GND
9	0V
11	-Vo
14	+Vo
16	0V
22,23	Vin

Notes:

1. The lead connecting the power supply module and IGBT driver should be as short as possible during use;
2. The output filtering capacitor should be as close as possible to the power supply module and IGBT driver;
3. Low ESR electrolytic capacitors are recommended for output filtering (IGBT gate drives have high peak current);
4. The average output power of the driver must be lower than that of the power supply module;
5. Consider fixing with glue near the module if being used in vibration occasion;
6. The max. capacitive load should be tested within the input voltage range and under full load conditions;
7. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
8. All index testing methods in this datasheet are based on our company corporate standards;
9. The above are the performance indicators of the product models listed in this datasheet. Some indicators of non-standard models will exceed the above requirements;
10. Specifications of this product are subject to changes without prior notice.