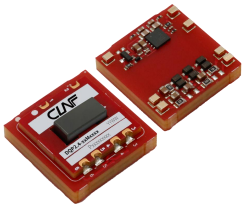
Descriptions

2.4W isolated，DC/DC Converter



RoHS

Report EN62368-1

Report BS EN62368-1

Features

- Reinforced insulation
- Ultra-low isolation capacitance: 2.5pF(typ.)
- I/O isolation test voltage: 5.0kVAC
- Partial Discharge 2.5kV
- CMTI>200 kV/μs
- Max. Capacitive Load: 2200μF
- High efficiency up to 86%
- Operating ambient temperature range: -40℃ to +105℃
- Continuous short-circuit protection
- SMD package
- MSL 1

Applications

- General frequency converter
- AC servo drive system
- Arc welder
- Uninterruptible power supply (UPS)

Selection Guide

Certification	Part No.	Inport		Output		Full load efficiency (%) Min./Typ.	Capacitive Load (μF)Max.①
		Input voltage(VDC) (Range)	Input currenton (mA,Typ.) Full/No load	Voltage(VDC) +Vo/-Vo	Current (mA) +Io/-Io		
EN/BS EN	DQP2.4-12M2005	12 (10.8-13.2)	240/9	+20/-5	+90/-90	80/86	1000
	DQP2.4-12M1803	12 (10.8-13.2)	220/9	+18/-3	+100/-100		1000
	DQP2.4-12M1504	12 (10.8-13.2)	190/9	+15/-4	+100/-100		1000
	DQP2.4-15M2005	15 (13.5-16.5)	180/8	+20/-5	+90/-90		2200
	DQP2.4-15M1803	15 (13.5-16.5)	170/8	+18/-3	+100/-100		2200
	DQP2.4-15M1504	15 (13.5-16.5)	180/8	+15/-4	+120/-120		2200
	DQP2.4-24M2005	24 (21.6- 26.4)	120/7	+20/-5	+90/-90	77/81	2200
	DQP2.4-24M1803	24 (21.6- 26.4)	110/7	+18/-3	+100/-100		2200

	DQP2.4-24M1504	24 (21.6- 26.4)	120/7	+15/-4	+120/-120		2200
	DQP2.4-12M1509	12 (10.8-13.2)	240/9	+15.0/-9.0	+100/-100	80/86	1000
	DQP2.4-15M1509	15 (13.5-16.5)	180/8	+15.0/-9.0	+100/-100	80/86	2200
	DQP2.4-24M1509	24 (21.6-26.4)	120/7	+15.0/-9.0	+100/-100	77/81	2200

Note:
①The output capacitive load per channel is the same;
②Product images are for reference only; the actual product shall prevail.

Limiting Character

Project	Operating Conditions	Min.	Typ.	Max.	Unit
Reflux welding temperature	--	The peak temperature Tc 245℃, the time above 217℃ is maximum 60s, Refer to the IPC / JEDEC J-STD-020D.1 standard for practical application.			

Specifications

Product Specifications	Item			Operating Conditions	Min.	Typ.	Max.	Unit
Input Specifications	Input Voltage (1sec. max.)			Vin=12VDC	-0.7	--	18	VDC
				Vin=15VDC	-0.7	--	21	
				Vin=24VDC	-0.7	--	30	
	Input the filter type				Capacitor filtering			
	Hot plug				Unavailable			
Output Specifications	Output voltage	DQP2.4-1 2M2005	+Vo	Vin=12VDC, Pin7 & Pin10 +Io= +90mA	18.20	19.20	20.20	VDC
			-Vo	Vin=12VDC, Pin7 & Pin8 -Io= -90mA	-4.75	-5.00	-5.25	
		DQP2.4-1 2M1803	+Vo	Vin=12VDC, Pin9 & Pin10 +Io= +100mA	17.10	18.00	18.90	
			-Vo	Vin=12VDC, Pin7 & Pin9 -Io= -100mA	-2.85	-3.00	-3.15	
		DQP2.4-1 2M1504	+Vo	Vin=12VDC, Pin9 & Pin10 +Io= +100mA	14.25	15.00	15.75	
			-Vo	Vin=12VDC, Pin7 & Pin9 -Io= -100mA	-3.60	-3.80	-4.00	
		DQP2.4-1 5M2005	+Vo	Vin=15VDC, Pin7 & Pin10 +Io= +90mA	18.40	19.40	20.40	
			-Vo	Vin=15VDC, Pin7 & Pin8 -Io= -90mA	-4.75	-5.00	-5.25	
		DQP2.4-1 5M1803	+Vo	Vin=15VDC, Pin9 & Pin10 +Io= +100mA	16.38	17.28	18.18	
			-Vo	Vin=15VDC, Pin7 & Pin9 -Io= -100mA	-2.94	-3.09	-3.24	
		DQP2.4-1 5M1504	+Vo	Vin=15VDC, Pin9 & Pin10 +Io= +120mA	13.65	14.40	15.15	
			-Vo	Vin=15VDC, Pin7 & Pin9 -Io= -120mA	-3.72	-3.92	-4.12	
		DQP2.4-2 4M2005	+Vo	Vin=24VDC, Pin7 & Pin10 +Io= +90mA	19.00	20.00	21.00	
			-Vo	Vin=24VDC, Pin7 & Pin8 -Io= -90mA	-4.70	-4.95	-5.20	
		DQP2.4-2 4M1803	+Vo	Vin=24VDC, Pin9 & Pin10 +Io= +100mA	17.10	18.00	18.90	
			-Vo	Vin=24VDC, Pin7 & Pin9 -Io= -100mA	-2.85	-3.00	-3.15	
		DQP2.4-2 4M1504	+Vo	Vin=24VDC, Pin9 & Pin10 +Io= +120mA	14.25	15.00	15.75	
			-Vo	Vin=24VDC, Pin7 & Pin9 -Io= -120mA	-3.80	-4.00	-4.20	
		DQP2.4-1 2M1509	+Vo	Vin=12VDC, Pin9 & Pin10 +Io= +100mA	14.10	14.85	15.60	
			-Vo	Vin=12VDC, Pin8 & Pin9 -Io= -100mA	-8.10	-8.55	-9.00	
		DQP2.4-1 5M1509	+Vo	Vin=15VDC, Pin9 & Pin10 +Io= +100mA	14.25	15.00	15.75	
			-Vo	Vin=15VDC, Pin8 & Pin9 -Io= -100mA	-8.10	-8.55	-9.00	

		DQP2.4-2 4M1509	+Vo	Vin=24VDC，Pin9 & Pin10 +Io= +100mA	13.65	14.40	15.15	
			-Vo	Vin=24VDC，Pin8 & Pin9 -Io= -100mA	-8.28	-8.73	-9.18	
	Voltage Accuracy			10% -100% of load	See output regulation curve (Figure 2-Figure 25)			%
Output Specifications	Linear Regulation	DQP2.4-xx M1803	+Vo	Full voltage input range	--	±1.1	±1.3	--
			-Vo		--	±1.1	±1.4	
		The others	+Vo		--	±1.1	±1.3	
			-Vo		--	±1.1	±1.3	
	Load Regulation	DQP2.4-1 2M2005	+Vo	10% - 100% load	--	8	12	%
			-Vo		--	9	12	
		DQP2.4-1 2M1803	+Vo		--	9	12	
			-Vo		--	12	15	
		DQP2.4-1 2M1504	+Vo		--	9	12	
			-Vo		--	12	15	
		DQP2.4-1 5M2005	+Vo		--	7	10	
			-Vo		--	8	12	
		DQP2.4-1 5M1803	+Vo		--	8	12	
			-Vo		--	12	15	
		DQP2.4-1 5M1504	+Vo		--	10	12	
			-Vo		--	12	15	
		DQP2.4-2 4M2005	+Vo		--	5	10	
			-Vo		--	7	10	
		DQP2.4-2 4M1803	+Vo		--	5	10	
			-Vo		--	9	12	
		DQP2.4-2 4M1504	+Vo		--	7	10	
			-Vo		--	10	12	
		DQP2.4-1 2M1509	+Vo		--	9	12	
			-Vo		--	9	12	
		DQP2.4-1 5M1509	+Vo		--	7	12	
			-Vo		--	8	12	
		DQP2.4-2 4M1509	+Vo		--	5	10	
			-Vo		--	5	10	
	Temperature Coefficient			Full load	--	±0.04	±0.1	%/℃
	Ripple & Noise①			20MHz bandwidth	--	50	--	mVp-p
	Short-circuit Protection			Continuous, self-recovery				
General Specifications	Isolation			Input-output, Test for 1 minute with a leakage current of 1mA max	5000	--	--	VAC
	Continuous barrier withstand voltage			Input- output	--	2500	--	V
	CMTI			Input- output	±200	--	--	kV/μs
	Insulation Resistance			Input-output resistance at 500VDC	1000	--	--	MΩ
	Isolation capacitor			Input- output, capacitor at 100kHz/0.1V	--	2.5	4	pF
	Operating Temperature			Derating when operating temperature≥ 85℃, (see Fig. 1)	-40	--	105	℃

	Storage Temperature		-55	--	125	
	Pin Soldering Resistance Temperature②	Soldering spot is 1.5mm away from the case, 10 seconds max.	--	--	+300	
		Wave soldering, maximum 10 seconds	255	260	265	
	Case Temperature Rise	Ta=25℃, nominal input voltage, full load	--	30	60	
	Storage Humidity	Non-condensing	5	--	95	%RH
	Switching Frequency	Full load, nominal input voltage	--	200	--	kHz
	Safety Standard		--			
	Safety Class		CLASS III			
	MTBF	MIL-HDBK-217F@25℃	3500	15604	--	k hours
Mechanical Specifications	Dimensions	23.11*22.61*9.85mm				
	Weight	6.6g (Typ.)				
	Cooling Method	Natural air cold				

Note:
①The "parallel cable" method is used for Ripple and Noise test;
②The pin soldering temperature tolerance is not the actual temperature set by the soldering iron but the temperature required for proper solder joints. The actual temperature set by the customer should be determined comprehensively based on factors such as PCB thickness, copper coverage, soldering iron power, and soldering iron tip selection.

Electromagnetic Compatibility (EMC)

Emissions (EMI)	CE (12V/15V Series)	CISPR32/EN55032 CLASS B (see Table 2. for recommended circuit)	
	CE (24V Series)	CISPR32/EN55032 CLASS A (see Table 2. for recommended circuit)	
	RE	CISPR32/EN55032 CLASS A (see Table 2. for recommended circuit)	
Immunity (EMS)	ESD	IEC/EN61000-4-2 Contact ±8kV	perf. Criteria B

Characteristic Curve

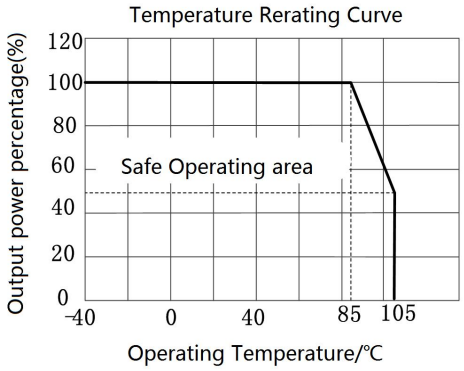


Fig.1

+Vo Output Regulation Curve

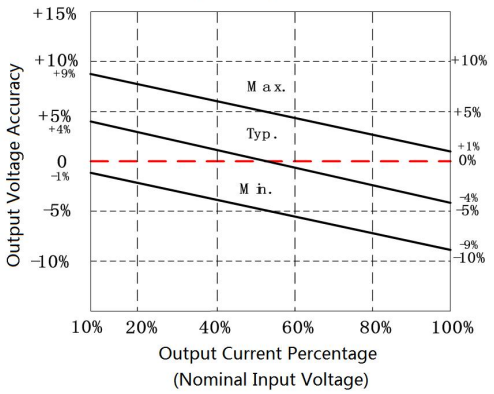


Fig.2(DQP2.4-12M2005)

-Vo Output Regulation Curve

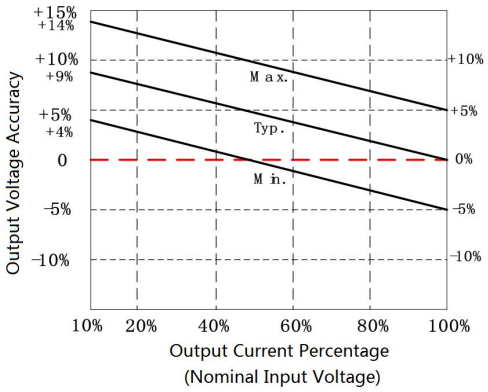


Fig.3(DQP2.4-12M2005)

+Vo Output Regulation Curve

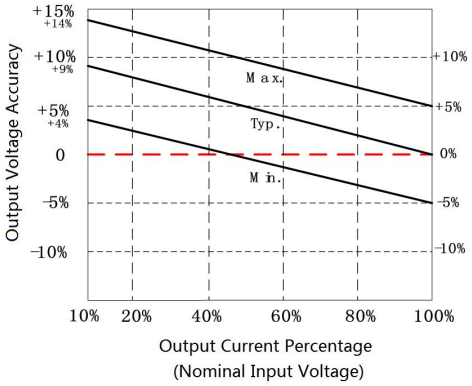


Fig.4(DQP2.4-12M1803)

-Vo Output Regulation Curve

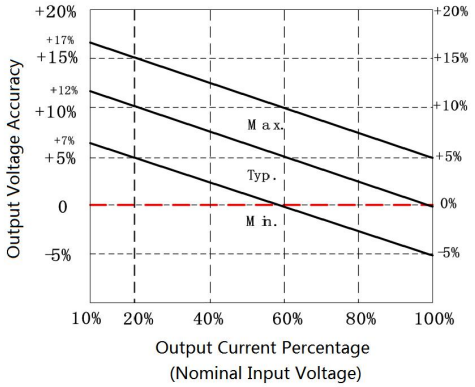


Fig.5(DQP2.4-12M1803)

+Vo Output Regulation Curve

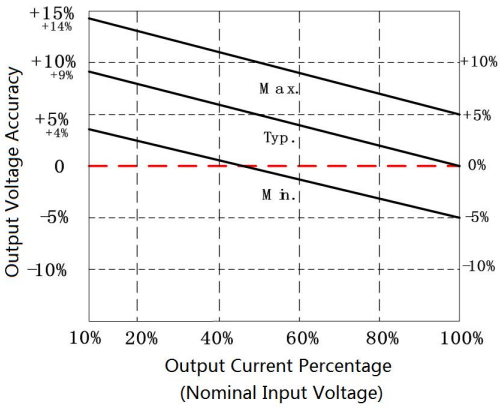


Fig.6(DQP2.4-12M1504)

-Vo Output Regulation Curve

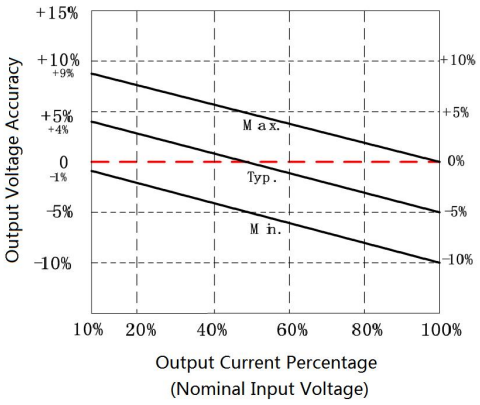


Fig.7(DQP2.4-12M1504)

+Vo Output Regulation Curve

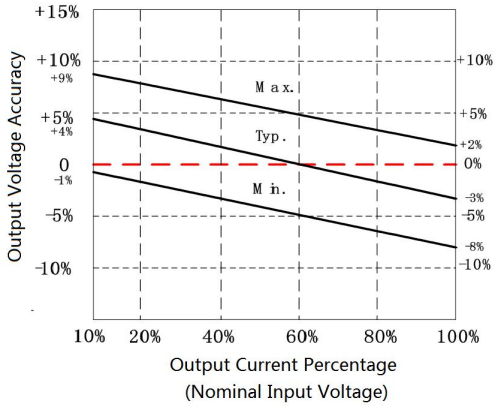


Fig.8(DQP2.4-15M2005)

-Vo Output Regulation Curve

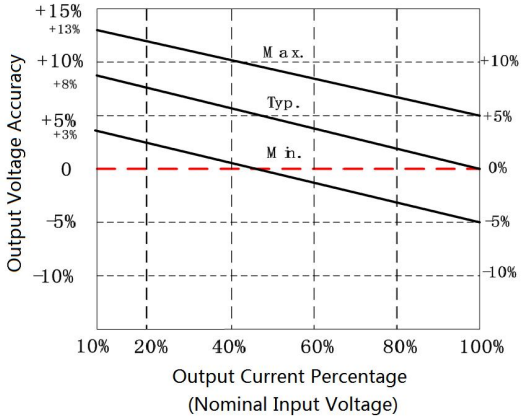


Fig.9(DQP2.4-15M2005)

+Vo Output Regulation Curve

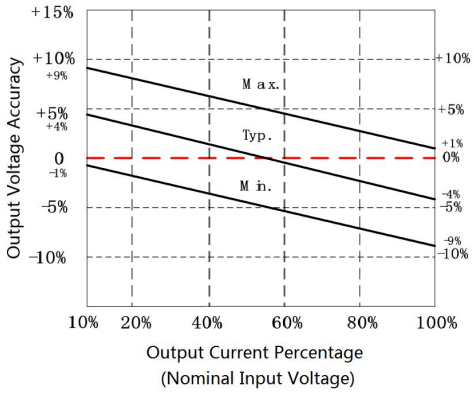


Fig.10(DQP2.4-15M1803)

-Vo Output Regulation Curve

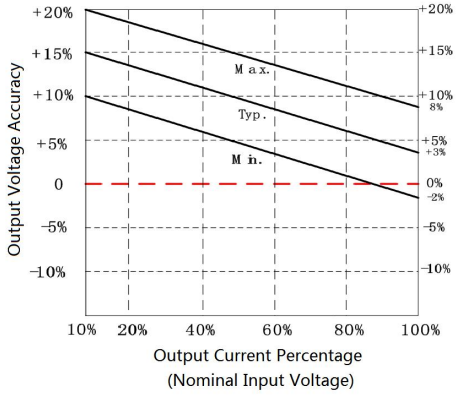


Fig.11(DQP2.4-15M1803)

+Vo Output Regulation Curve

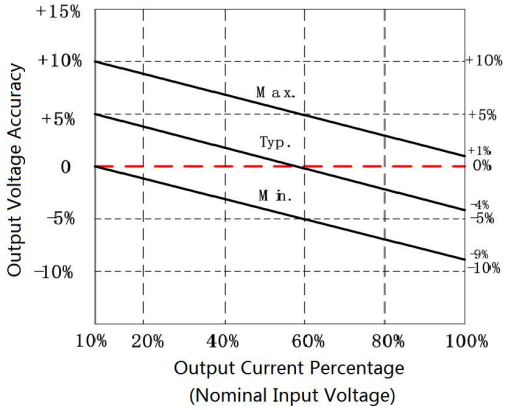


Fig.12(DQP2.4-15M1504)

-Vo Output Regulation Curve

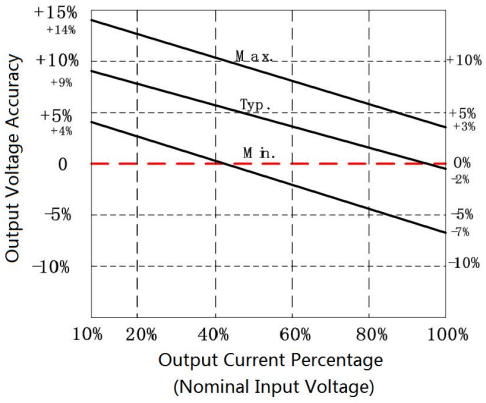


Fig.13(DQP2.4-15M1504)

+Vo Output Regulation Curve

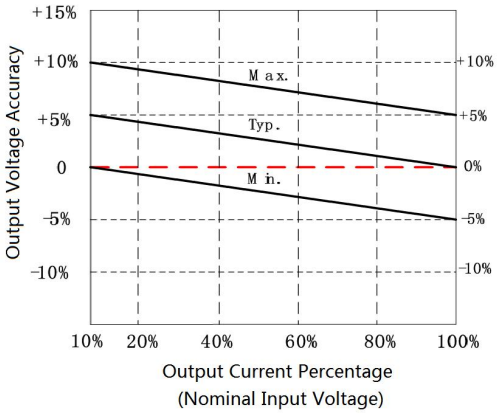


Fig.14(DQP2.4-24M2005)

-Vo Output Regulation Curve

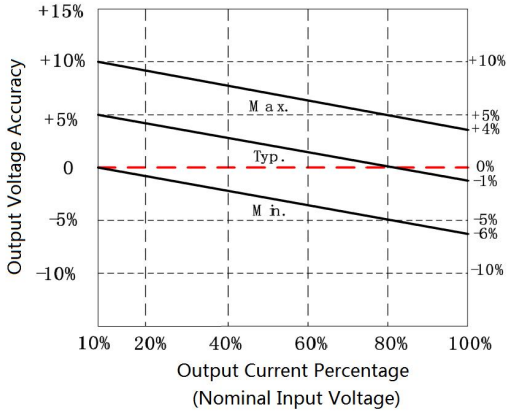


Fig.15(DQP2.4-24M2005)

+Vo Output Regulation Curve

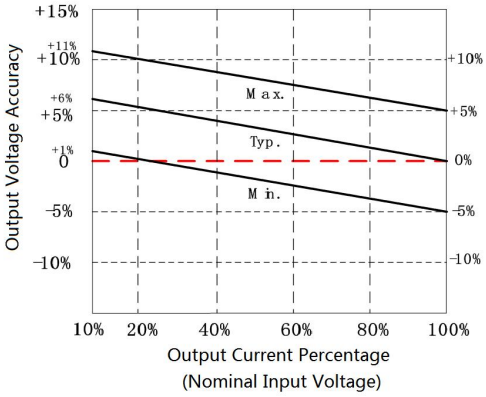


Fig.16(DQP2.4-24M1803)

-Vo Output Regulation Curve

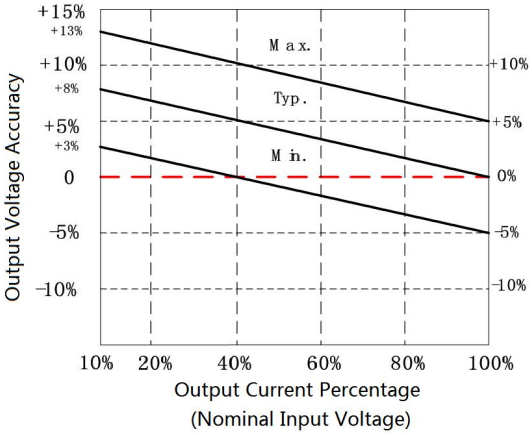


Fig.17(DQP2.4-24M1803)

+Vo Output Regulation Curve

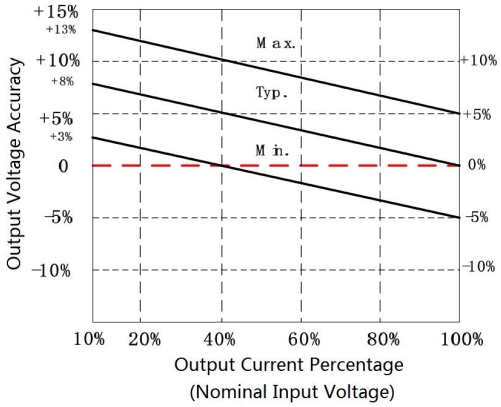


Fig.18(DQP2.4-24M1504)

-Vo Output Regulation Curve

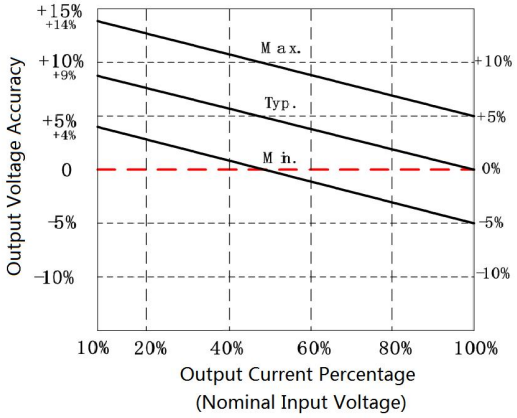


Fig.19(DQP2.4-24M1504)

+Vo Output Regulation Curve

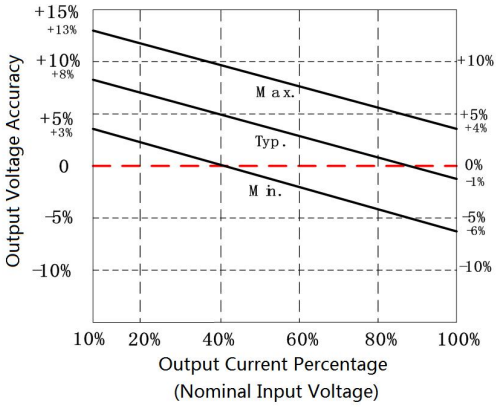


Fig.20(DQP2.4-12M1509)

-Vo Output Regulation Curve

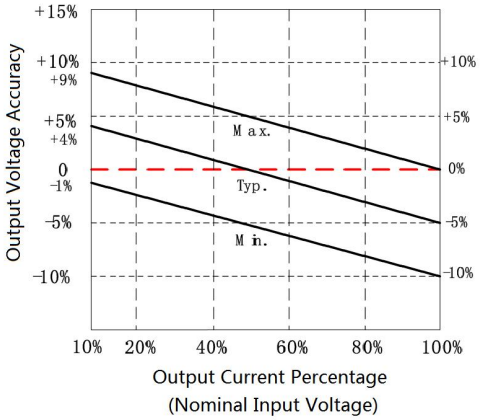


Fig.21(DQP2.4-12M1509)

+Vo Output Regulation Curve

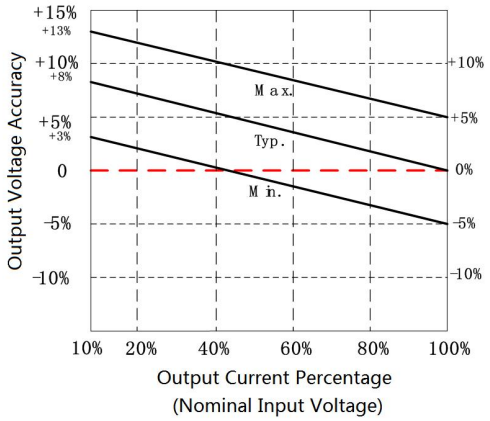


Fig.22(DQP2.4-15M1509)

-Vo Output Regulation Curve

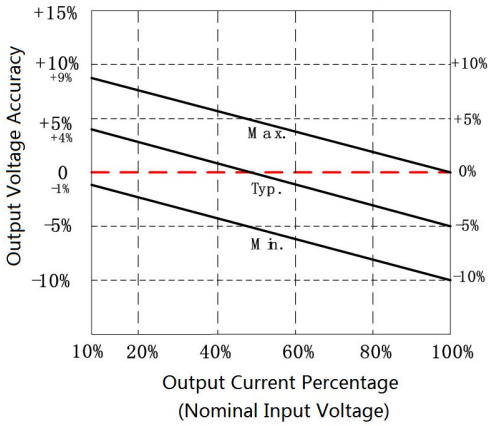


Fig.23(DQP2.4-15M1509)

+Vo Output Regulation Curve

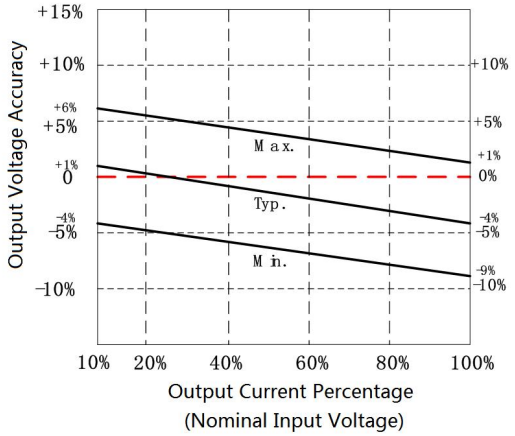


Fig.24(DQP2.4-24M1509)

-Vo Output Regulation Curve

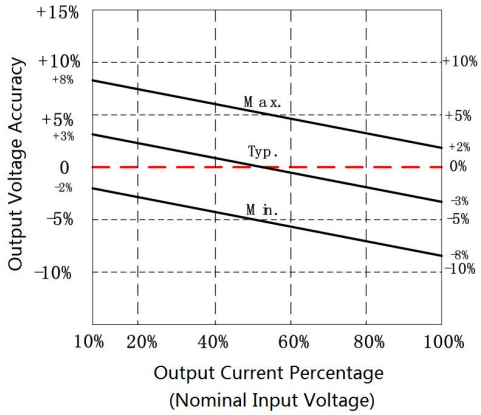


Fig.25(DQP2.4-24M1509)

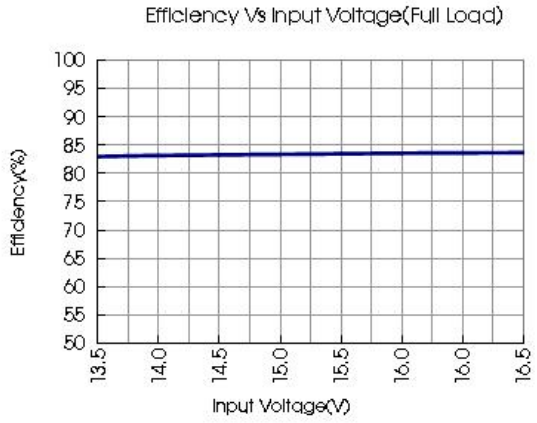


Fig.26

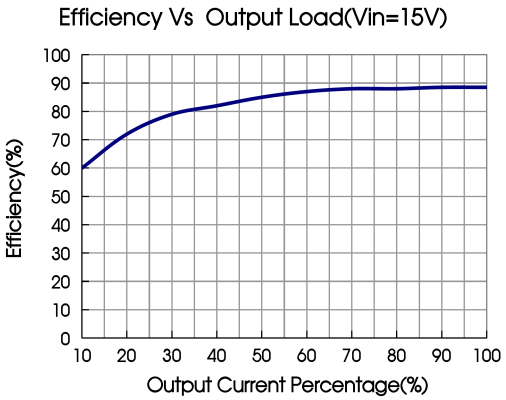


Fig.27

Note: Take DQP2.4-15M2005 as an example, other models can be corresponding reference.

Design Reference

1.Test configurations

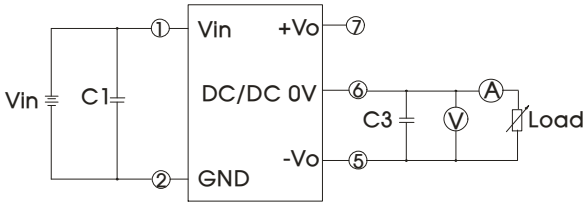


Fig.28

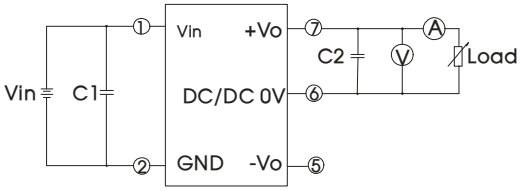


Fig.29

Note: C1, C2, and C3, respectively, are 100 μF/35V (low internal resistance capacitance).

2.Typical applications

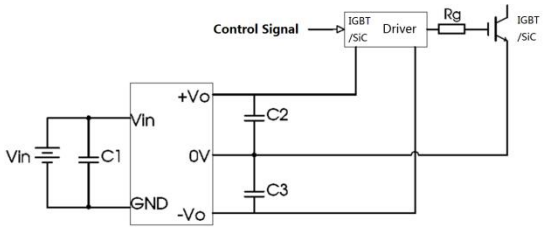


Fig.30

Table 1.

C1/C2/C3
100 μ F / 35V (low internal resistance capacitor)

3.EMC typical recommended circuit

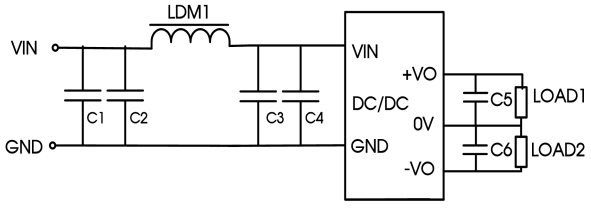


Fig.31

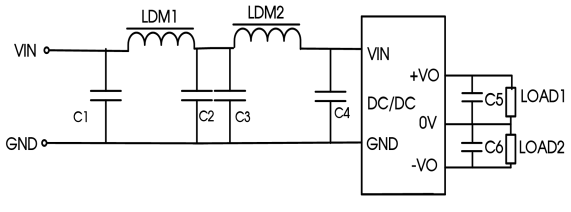


Fig.32

Table 2.

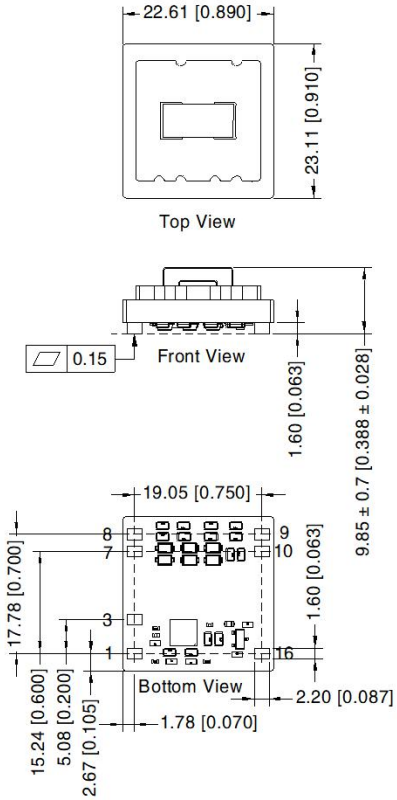
Part No.	Recommended circuit	C1	C2	C3	C4	LDM1	LDM2
DQP2.4-12M2005	Fig.31	1μF/50V	0.1μF/50V	1μF/50V	0.1μF/50V	33μH	--
DQP2.4-12M1803		1μF/50V	0.1μF/50V	1μF/50V	0.1μF/50V	27μH	--
DQP2.4-12M1504							
DQP2.4-15M2005							
DQP2.4-15M1803							
DQP2.4-15M1504	Fig.32	4.7μF/50V	4.7μF/50V	0.1μF/50V	0.1μF/50V	33μH	33μH
DQP2.4-24M2005							
DQP2.4-24M1803	Fig.31	4.7μF/50V	0.1μF/50V	4.7μF/50V	0.1μF/50V	33μH	--
DQP2.4-24M1504							
DQP2.4-12M1509		1μF/50V	0.1μF/50V	1μF/50V	0.1μF/50V	27μH	--
DQP2.4-15M1509		1μF/50V	0.1μF/50V	1μF/50V	0.1μF/50V	27μH	--
DQP2.4-24M1509		4.7μF/50V	0.1μF/50V	4.7μF/50V	0.1μF/50V	33μH	--

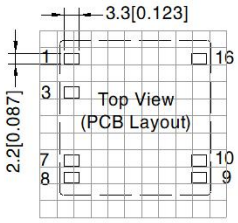
4. Electrolytic capacitors are recommended for external capacitors at the input or output of the product. Tantalum capacitors are not, otherwise there is a risk of failure.

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

Dimensions and Recommended

THIRD ANGLE PROJECTION



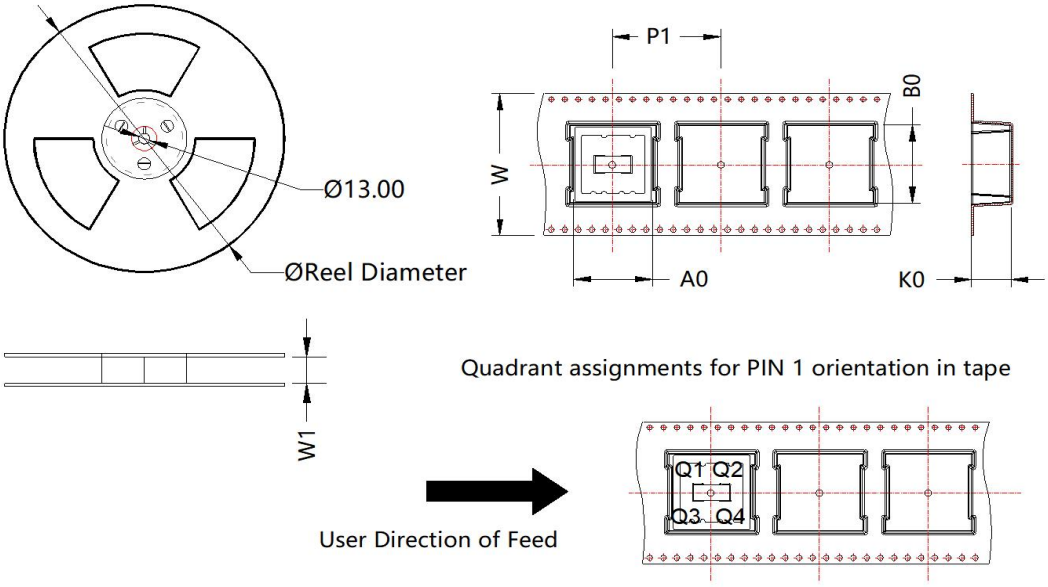


Note: Grid 2.54*2.54mm

Pin-Out		Pin-Out		Pin-Out	
Pin	EP2.4-12M1504 EP2.4-15M1504	Pin	EP2.4-15M2005	Pin	EP2.4-15M1509
1	GND	1	GND	1	GND
3	NC	3	NC	3	NC
7	-V0	7	0V	7	NC
8	NC	8	-V0	8	-V0
9	0V	9	NC	9	0V
10	+V0	10	+V0	10	+V0
16	VCC	16	VCC	16	VCC

Note:
Unit: mm[inch]
Pin size tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]
The layout of the device is for reference only,
please refer to the actual product

Package diagram:



MPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
170	180.0	44.5	23.78	24.28	11.6	32.0	44.0	Q1

Note:

1. The leads for the module and SIC drives are as short as possible;
2. The output filtering capacitor should be as close as possible to the power supply module and SiC driver;
3. The peak of the SiC driver gate drive current is high, so low internal resistance electrolytic capacitor is recommended to be used for the power supply module output filter capacitor;
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 maximum capacitive load offered were tested at nominal input voltage and full load;
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 company corporate standards;
9. He 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. Products are related to laws and regulations: see "Features" and "EMC".
11. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
12. The image certification marks are for reference only; please refer to the selection table for actual specifications. Certification is based on the physical mark or packaging label.