Descriptions

4W isolated，DC/DC Converter

RoHS

Features

- Reinforced insulation
- Isolation test: 5000VAC
- Partial Discharge 1700V
- CMTI>200kV/μs
- Max. Capacitive Load: 2200μF
- Capacitance: 4.2pF (typ.)
- High efficiency up to 85%
- DIP package
- Operating ambient temperature range: -40℃ to +105℃
- Continuous short-circuit protection

Applications

- Universal converter
- AC servo drive system
- Electric welding machine
- Uninterruptible power supply (UPS)

Selection Guide

Certification	Part No.	Input		Output		Full Load Efficiency (%) Typ.	Max. Capacitive Load(μF)*
		Voltage(VDC) (Range)	Current(mA, Typ.) Full Load/No Load	Voltage (VDC) +Vo/-Vo	Current (mA) +Io/-Io		
--	DQP4-12HD1504D	12 (10.8-13.2)	460/15	+15/-4	+120/-120	80/85	2200
	DQP4-12HD1803D	12 (10.8-13.2)	450/15	+18/-3	+110/-110	80/85	2200
	DQP4-12HD2005D	12 (10.8-13.2)	450/16	+20/-5	+90/-90	80/85	2200
	DQP4-15HD1504D	15 (13.5-16.5)	360/13	+15/-4	+120/-120	80/85	2200
	DQP4-15HD1803D	15 (13.5-16.5)	370/14	+18/-3	+110/-110	80/85	2200
	DQP4-15HD2005D	15 (13.5-16.5)	350/13	+20/-5	+90/-90	80/85	2200

--	DQP4-24HD1504D	24 (21.6-26.4)	240/11	+15/-4	+120/-120	74/80	2200
	DQP4-24HD1803D	24 (21.6-26.4)	250/11	+18/-3	+110/-110	74/80	2200
	DQP4-24HD2005D	24 (21.6-26.4)	240/11	+20/-5	+90/-90	74/80	2200
Note:*The specified maximum capacitive load for positive and negative output is identical.							

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 Filter				Capacitance Filter			
	Hot Plug				Unavailable			
Output Specifications	Output Voltage	DQP4-12HD1504D	+Vo1/2	Vin=12VDC, Pin11/14 & Pin12/13 +Io= +120mA	14.34	15.09	15.84	VDC
			-Vo1/2	Vin=12VDC, Pin10/15 & Pin11/14 +Io= -120mA	-4.00	-4.20	-4.40	
		DQP4-12HD1803D	+Vo1/2	Vin=12VDC, Pin11/14 & Pin12/13 +Io= +110mA	16.81	17.71	18.61	
			-Vo1/2	Vin=12VDC, Pin10/15 & Pin11/14 +Io= -110mA	-2.85	-3.00	-3.15	
		DQP4-12HD2005D	+Vo1/2	Vin=12VDC, Pin11/14 & Pin12/13 +Io= +90mA	19.00	20.00	21.00	
			-Vo1/2	Vin=12VDC, Pin10/15 & Pin11/14 +Io= -90mA	-4.65	-4.90	-5.15	
		DQP4-15HD1504D	+Vo1/2	Vin=15VDC, Pin11/14 & Pin12/13 +Io= +120mA	14.55	15.30	16.05	
			-Vo1/2	Vin=15VDC, Pin10/15 & Pin11/14 +Io= -120mA	-3.70	-3.90	-4.10	
		DQP4-15HD1803D	+Vo1/2	Vin=15VDC, Pin11/14 & Pin12/13 +Io= +110mA	17.30	18.20	19.10	
			-Vo1/2	Vin=15VDC, Pin10/15 & Pin11/14 +Io= -110mA	-2.90	-3.05	-3.20	
		DQP4-15HD2005D	+Vo1/2	Vin=15VDC, Pin11/14 & Pin12/13 +Io= +90mA	18.80	19.80	20.80	
			-Vo1/2	Vin=15VDC, Pin10/15 & Pin11/14 +Io= -90mA	-4.85	-5.10	-5.35	
		DQP4-24HD1504D	+Vo1/2	Vin=24VDC, Pin11/14 & Pin12/13 +Io= +120mA	13.76	14.51	15.26	VDC
			-Vo1/2	Vin=24VDC, Pin10/15 &	-3.90	-4.10	-4.30	

				Pin11/14 +Io= -120mA				
		DQP4-24HD1803D	+Vo1/2	Vin=24VDC, Pin11/14 & Pin12/13 +Io= +110mA	17.69	18.59	19.49	
			-Vo1/2	Vin=24VDC, Pin10/15 & Pin11/14 +Io= -110mA	-2.88	-3.03	-3.18	
		DQP4-24HD2005D	+Vo1/2	Vin=24VDC, Pin11/14 & Pin12/13 +Io= +90mA	19.20	20.20	21.20	
			-Vo1/2	Vin=24VDC, Pin10/15 & Pin11/14 +Io= -90mA	-4.65	-4.90	-5.15	
	Voltage Accuracy		10% - 100% load		See output regulation curve (Fig. 2 to19)			%
	Linear Regulation		Full voltage input range	+Vo1/2	--	±1.1	±1.5	--
				-Vo1/2	--	±1.1	±1.5	
	Load Regulation		10% - 100% load	+Vo1/2	--	10	20	%
				-Vo1/2	--	10	20	
	Temperature Coefficient		Full load		--	±0.04	±0.1	%/℃
	Ripple & Noise*		20MHz bandwidth		--	50	100	mVp-p
	Short-circuit Protection				Continuous, self-recovery			
General Specifications	Isolation		Input-output1, Input-output2, test time 1 minute, leakage current less than 1mA		5000	--	--	VAC
			Output1- output2, test time 1 minute, leakage current less than 1mA		3750	--	--	
	Partial Discharge		Input-output1, Input-output2 (According to IEC61800-5-1)		1700	--	--	V
	CMTI		Input-output1, Input-output2		±200	--	--	kV/μs
	Insulation Resistance		Input-output1, Input-output2, insulation voltage 500VDC		1000	--	--	MΩ
	Isolation capacitor		Input-output1, Input-output2, capacitor at 100kHz/0.1V	Vin=12VDC	--	4.2	5.0	pF
				Vin=15VDC	--	5.0	6.0	
				Vin=24VDC	--	5.5	6.5	
	Operating Temperature		Derating when operating temperature≥85℃, (see Fig. 1)		-40	--	105	℃
	Storage Temperature				-55	--	125	
	Pin Soldering Resistance Temperature		Soldering spot is 1.5mm away from case for 10s seconds		--	--	300	
	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
	MTBF		MIL-HDBK-217F@25℃		3500	--	--	k hours
Mechanical	Case Material		Black plastic; flame-retardant and heat-resistant					

Specifications	Dimensions	31.70 x 20.30 x 12.65mm
	Weight	14 g (Typ.)
	Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions (EMI)	CE		CISPR32/EN55032 CLASS A (see Fig. 25 for recommended circuit)
	RE		CISPR32/EN55032 CLASS A (see Fig. 25 for recommended circuit)
Immunity (EMS)	ESD	Vin=12/15VDC series	IEC/EN61000-4-2 Contact ±6kV perf. Criteria B
		Vin=24VDC series	IEC/EN61000-4-2 Contact ±4kV perf. Criteria B

Characteristic Curve

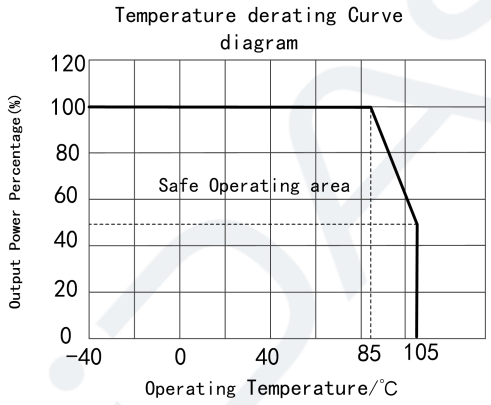


Fig. 1

DQP4-12HD1504D

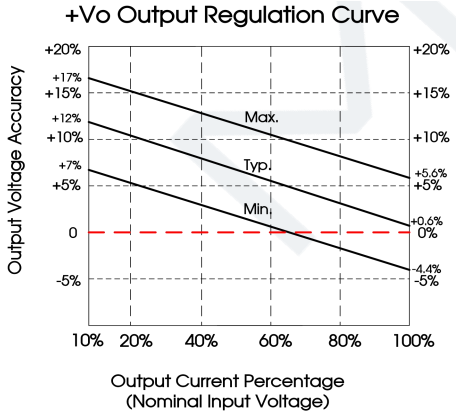


Fig. 2

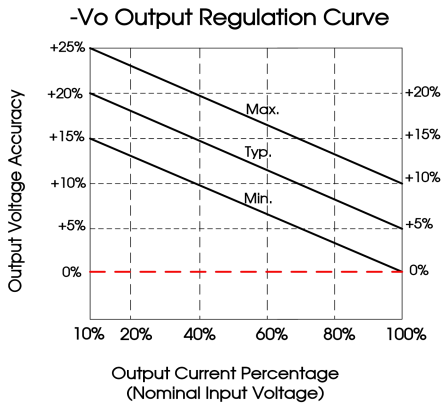


Fig. 3

DQP4-12HD1803D

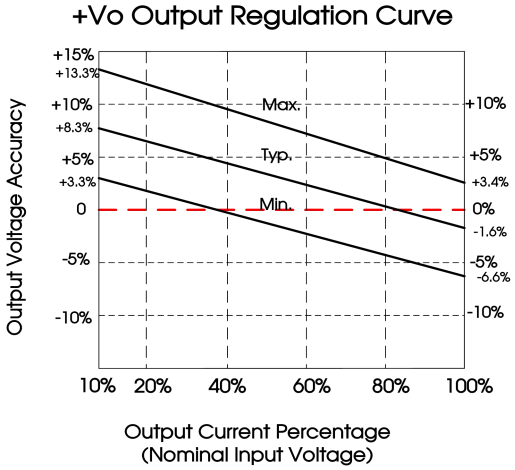


Fig. 4

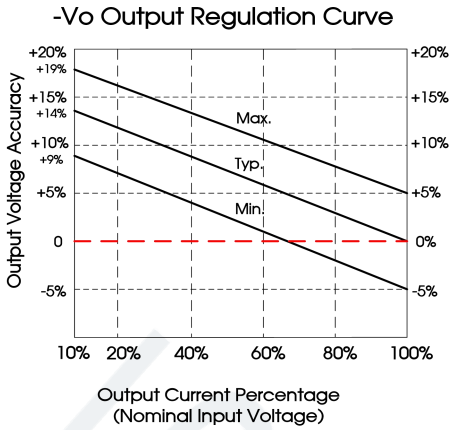


Fig. 5

DQP4-12HD2005D

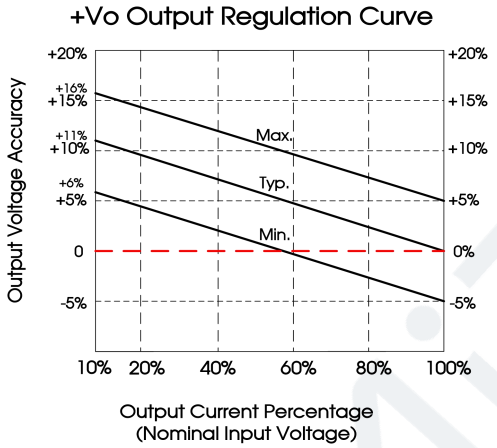


Fig. 6

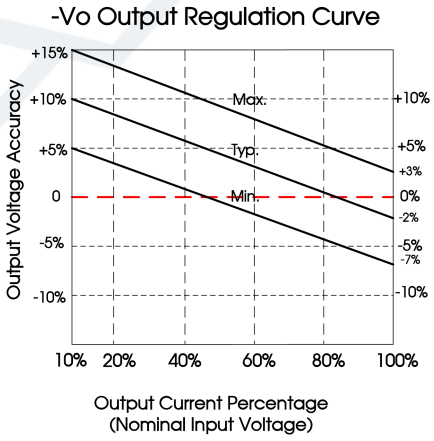


Fig. 7

DQP4-15HD1504D

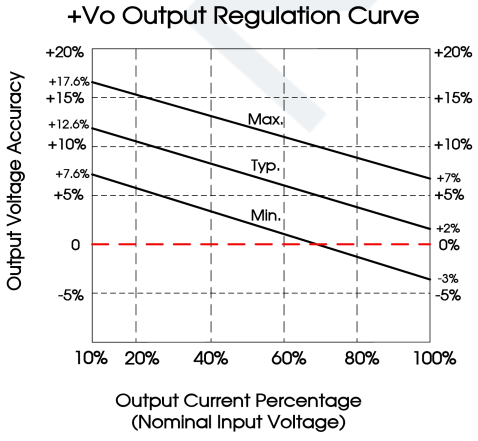


Fig. 8

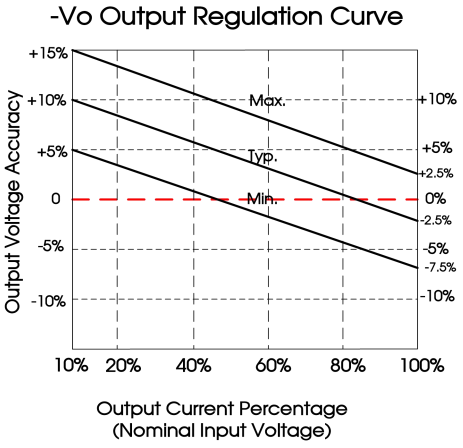


Fig. 9

DQP4-15HD1803D

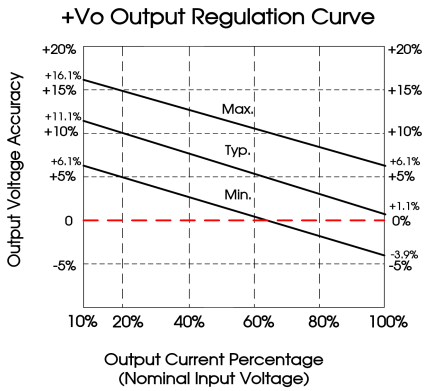


Fig. 10

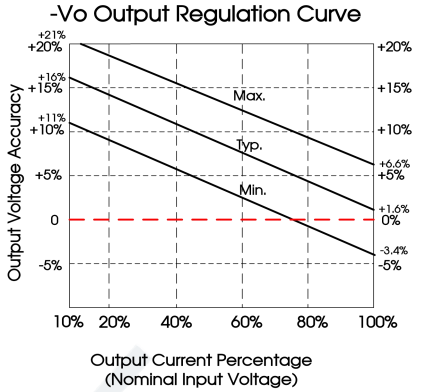


Fig. 11

DQP4-15HD2005D

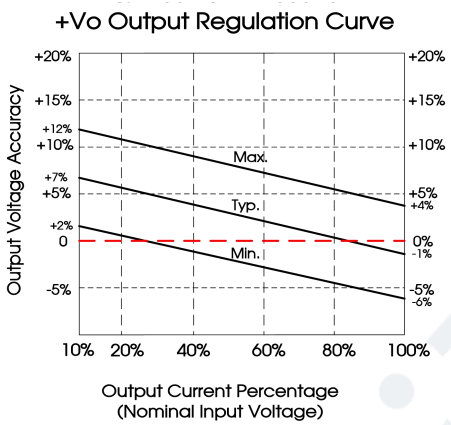


Fig. 12

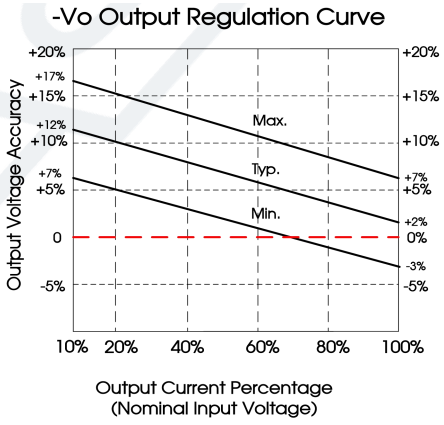


Fig. 13

DQP4-24HD1504D

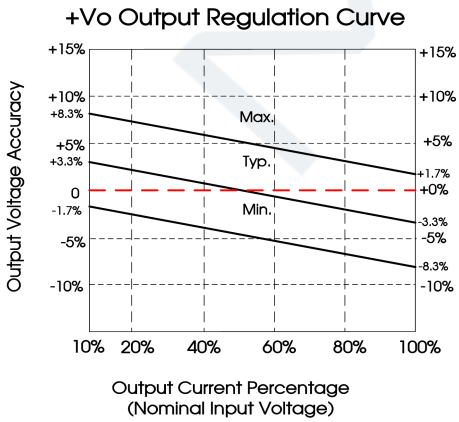


Fig. 14

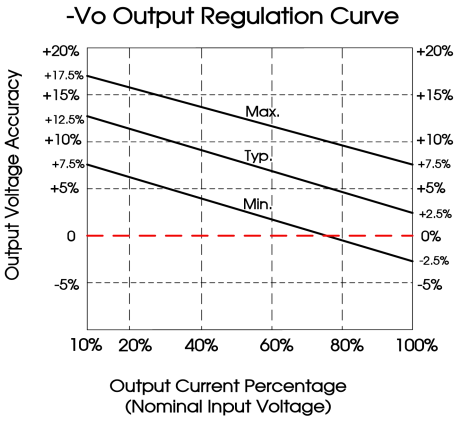


Fig. 15

DQP4-24HD1803D

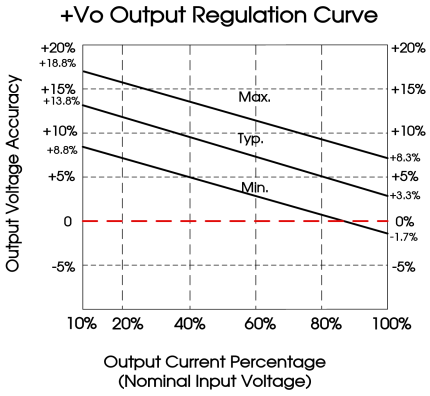


Fig. 16

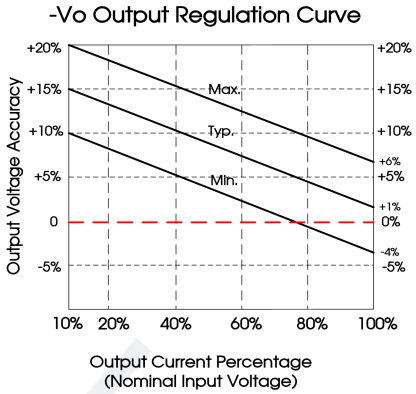


Fig. 17

DQP4-24HD2005D

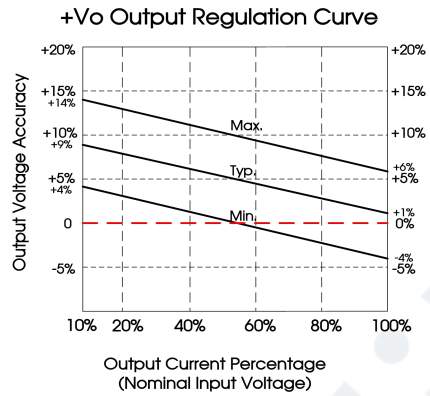


Fig. 18

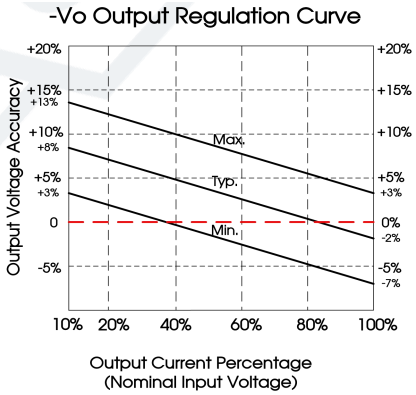


Fig. 19

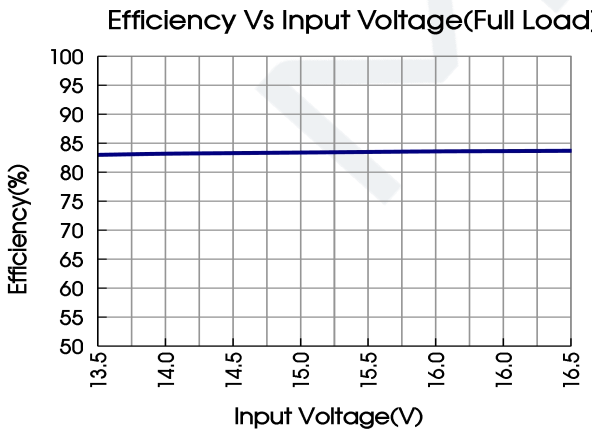


Fig. 20

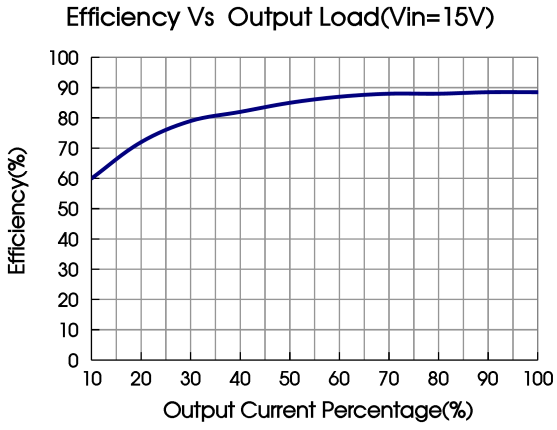


Fig. 21

Note: Take DQP4-15HD1803D as an example, other models can be corresponding reference

Design Reference

1. Test configurations

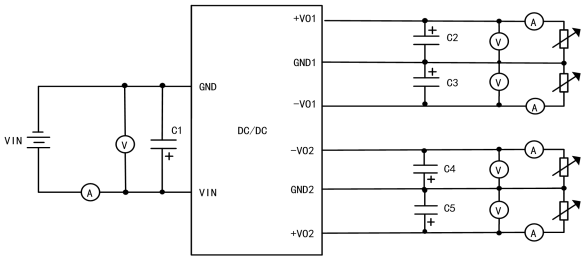


Fig. 22

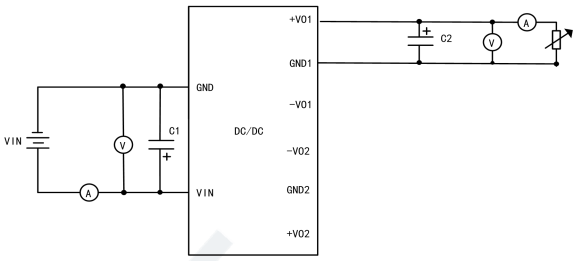


Fig. 23

Note: C1, C2, C3, C4, C5: 100μF/35V(Low internal resistance)

2. Typical application

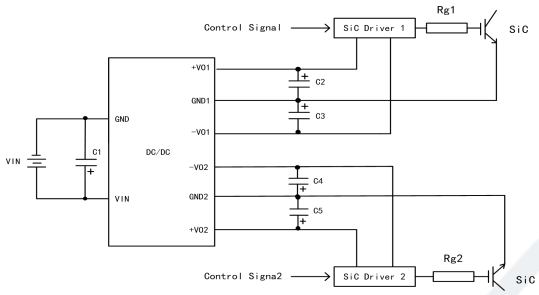


Fig. 24

C1/C2/C3/C4/C5
100μF/35V(Low resistance)

3. EMC typical recommended circuit

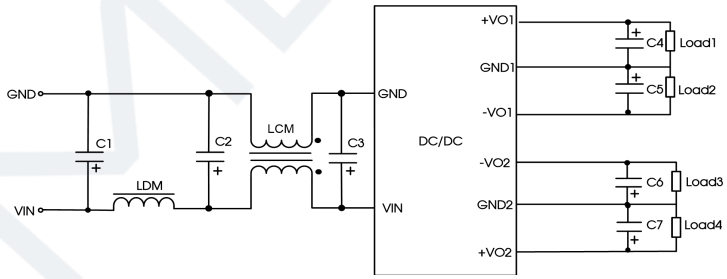


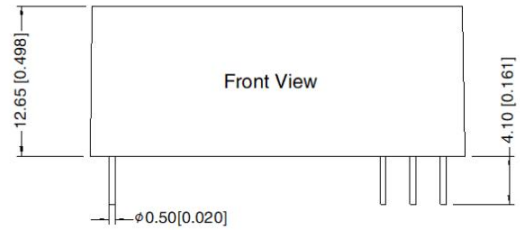
Fig. 25

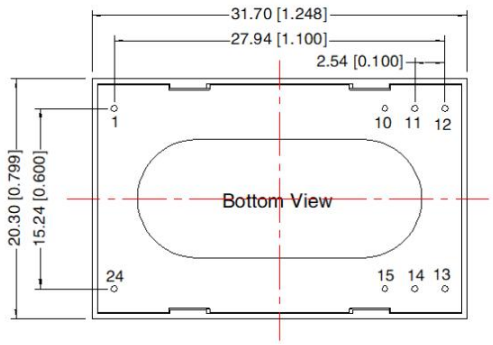
Project		DQP4-xxHD1803D DQP4-xxHD2005D	DQP4-xxHD1504D
EMI	C1/C2	4.7μF /50V	1.0μF /50V
	LDM	33μH	33μH
	C3	1μF /50V	--
	LCM	50uH	--
	C4/C5/C6/C7	10μF /50V(Low resistance)	10μF /50V(Low resistance)

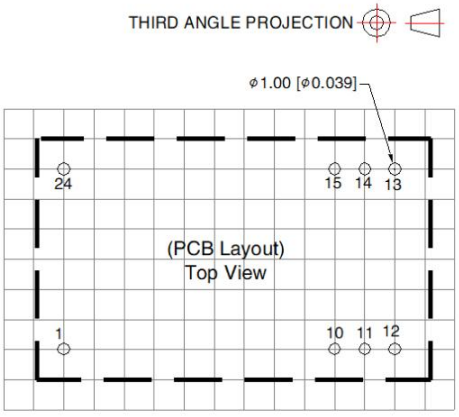
4. Electrolytic capacitors are recommended for external capacitors at the input or output of the product. Tantalum capacitors are not, otherwise there is a risk of failure.

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

Dimensions and Recommended







Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Mark
1	GND
10	-Vo1
11	GND1
12	+Vo1
13	+Vo2
14	GND2
15	-Vo2
24	Vin

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

Notes:

1. The lead connecting the power supply module and SiC 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 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. Products are related to laws and regulations: see "Features" and "EMC";
9. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.