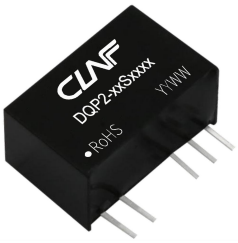
Descriptions

DC-DC Module Power Supply for IGBT/SiC MOSFET Drivers



RoHS

UL62368-1 EN62368-1 BS EN62368-1

Features

- Reinforced insulation
- I/O isolation test voltage: 5.0kVAC
- Partial Discharge 1700V
- Characterised CMTI>200kV/μs
- Max. Capacitive Load: 2200μF
- Ultra-low isolation capacitance: 3.5pF (typ.)
- High efficiency up to 87%
- SIP 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 (%) Min./Typ.	Max. Capacitive Load(μF)①
		Voltage(VDC) Nominal value (Range)	Current (mA, Typ.) Full Load/No Load	Voltage (VDC) +Vo/-Vo	Current (mA) +Io/-Io		
--	DQP2-05S1505	5 (4.5-5.5)	348/31	+15/-5	+80/-40	77/81	1000
	DQP2-05S1509		383/33	+15.0/-8.7	+80/-40		
EN/BS EN	DQP2-05S1803		415/36	+18/-3.5	+80/-80		680
--	DQP2-05S2004		426/32	+20/-4	+80/-40		470
EN/BS EN	DQP2-12S1504	12 (10.8-13.2)	214/12	+15/-4	+120/-120	82/87	1500
UL/EN/BS EN	DQP2-12S1509		231/16	+15.0/-9.0	+100/-100		2200
	DQP2-12S1803		211/17	+18/-3	+100/-100	80/85	1000
EN/BS EN	DQP2-12S2005		216/17	+20/-5	+90/-90	82/87	470

UL/EN/BS EN	DQP2-12S1508V0	12 (9-15)	223/20	+15/-8.0	+100/-80	77/80	220
	DQP2-15S1504	15 (13.5-16.5)	170/11	+15/-4	+120/-120	82/87	2200
UL/EN/BS EN	DQP2-15S1509		189/16	+15.0/-9.0	+100/-100		2200
EN/BS EN	DQP2-15S1803		167/14	+18/-3	+100/-100	80/85	1500
	DQP2-15S2005		171/15	+20/-5	+90/-90	82/87	2200
	DQP2-24S1504	24 (21.6-26.4)	119/12	+15/-4	+120/-120	77/82	
UL/EN/BS EN	DQP2-24S1509		123/13	+15.0/-9.0	+100/-100		
--	DQP2-24S1509V0		135/9				
EN/BS EN	DQP2-24S1803		112/14	+18/-3	+100/-100	73/78	
	DQP2-24S2005		117/16	+20/-5	+90/-90	76/81	
	DQP2-24S1508	24 (23.3-24.7)	81/20	+15/-8.7	+80/-40	77/80	220

Note:
①The specified maximum capacitive load for positive and negative output is identical;
②Product images are for reference only; the actual product shall prevail.

Specifications

Product Specifications	Item			Operating Conditions	Min.	Typ.	Max.	Unit
Input Specifications	Input Voltage (1sec.max.)	Vin=5VDC			-0.7	--	9	VDC
		Vin=12VDC			-0.7	--	18	
		Vin=15VDC			-0.7	--	21	
		Vin=24VDC			-0.7	--	30	
		DQP2-12S1508V0			-0.7	--	15	
		DQP2-24S1508			-0.7	--	26	
	Input Filter				Capacitance Filter			
	Hot Plug				Unavailable			
Output Specifications	Output Voltage	DQP2-05S1505	+Vo	Vin=5VDC, Pin6 & Pin7 +Io= +80mA	14.48	15.23	15.98	VDC
			-Vo	Vin=5VDC, Pin5 & Pin6 -Io= -40mA	-4.43	-4.68	-4.93	
		DQP2-05S1509	+Vo	Vin=5VDC, Pin6 & Pin7 +Io= +80mA	14.40	15.15	15.90	
			-Vo	Vin=5VDC, Pin5 & Pin6 -Io= -40mA	-8.18	-8.61	-9.05	
		DQP2-05S1803	+Vo	Vin=5VDC, Pin6 & Pin7 +Io= +80mA	16.74	17.64	18.54	
			-Vo	Vin=5VDC, Pin5 & Pin6 -Io= -80mA	-3.12	-3.29	-3.47	
		DQP2-05S2004	+Vo	Vin=5VDC, Pin6 & Pin7 +Io= +80mA	18.80	19.80	20.80	
			-Vo	Vin=5VDC, Pin5 & Pin6 -Io= -40mA	-3.78	-3.98	-4.18	
		DQP2-12S1504	+Vo	Vin=12VDC, Pin6 & Pin7 +Io= +120mA	13.80	14.55	15.30	
			-Vo	Vin=12VDC, Pin5 & Pin6 -Io= -120mA	-3.42	-3.62	-3.82	
		DQP2-12S1509	+Vo	Vin=12VDC, Pin6 & Pin7 +Io= +100mA	13.88	14.63	15.38	
			-Vo	Vin=12VDC, Pin5 & Pin6 -Io= -100mA	-8.64	-9.09	-9.54	
		DQP2-12S1803	+Vo	Vin=12VDC, Pin6 & Pin7 +Io= +100mA	17.19	18.09	18.99	
			-Vo	Vin=12VDC, Pin5 & Pin6 -Io= -100mA	-2.87	-3.02	-3.17	
		DQP2-12S2005	+Vo	Vin=12VDC, Pin6 & Pin7 +Io= +90mA	18.40	19.40	20.40	
			-Vo	Vin=12VDC, Pin5 & Pin6 -Io= -90mA	-4.75	-5.00	-5.25	
		DQP2-12S1508V0	+Vo	Vin=12VDC, Pin6 & Pin7 +Io=+100mA	14.25	15	15.75	

			-Vo	Vin=12VDC, Pin5 & Pin6 -Io=-80mA	-7.36	-8	-8.64	
		DQP2-15S1504	+Vo	Vin=15VDC, Pin6 & Pin7 +Io= +120mA	13.58	14.33	15.08	
			-Vo	Vin=15VDC, Pin5 & Pin6 -Io= -120mA	-3.74	-3.94	-4.14	
		DQP2-15S1509	+Vo	Vin=15VDC, Pin6 & Pin7 +Io= +100mA	14.10	14.85	15.60	
			-Vo	Vin=15VDC, Pin5 & Pin6 -Io= -100mA	-8.64	-9.09	-9.54	
		DQP2-15S1803	+Vo	Vin=15VDC, Pin6 & Pin7 +Io= +100mA	17.01	17.91	18.81	
			-Vo	Vin=15VDC, Pin5 & Pin6 -Io= -100mA	-2.70	-2.85	-3.00	
		DQP2-15S2005	+Vo	Vin=15VDC, Pin6 & Pin7 +Io= +90mA	18.30	19.30	20.30	
			-Vo	Vin=15VDC, Pin5 & Pin6 -Io= -90mA	-4.73	-4.98	-5.23	
		DQP2-24S1504	+Vo	Vin=24VDC, Pin6 & Pin7 +Io= +120mA	14.18	14.93	15.68	
			-Vo	Vin=24VDC, Pin5 & Pin6 -Io= -120mA	-3.74	-3.94	-4.14	
		DQP2-24S1509	+Vo	Vin=24VDC, Pin6 & Pin7 +Io= +100mA	14.25	15.00	15.75	
			-Vo	Vin=24VDC, Pin5 & Pin6 -Io= -100mA	-8.28	-8.73	-9.18	
		DQP2-24S1509V0	+Vo	Vin=24VDC, Pin6 & Pin7 +Io= +100mA	14.55	15.30	16.05	
			-Vo	Vin=24VDC, Pin5 & Pin6 -Io= -100mA	-8.37	-8.82	-9.27	
		DQP2-24S1803	+Vo	Vin=24VDC, Pin6 & Pin7 +Io= +100mA	17.01	17.91	18.81	
			-Vo	Vin=24VDC, Pin5 & Pin6 -Io= -100mA	-2.84	-2.99	-3.14	
		DQP2-24S2005	+Vo	Vin=24VDC, Pin6 & Pin7 +Io= +90mA	18.80	19.80	20.80	
			-Vo	Vin=24VDC, Pin5 & Pin6 -Io= -90mA	-4.60	-4.85	-5.10	
		DQP2-24S1508	+Vo	Vin=24VDC, Pin6 & Pin7 +Io= +80mA	14.25	15	15.75	
			-Vo	Vin=24VDC, Pin5 & Pin6 -Io= -40mA	-8.00	-8.7	-9.4	
	Voltage Accuracy	10% - 100% load			See output regulation curve (Fig. 3 to 40)			
	Linear Regulation	5V Input model	Full voltage input range	+Vo Output	--	±1.1	±1.4	--
				-Vo Output	--	±1.1	±1.4	
		Other model		+Vo Output	--	±1.1	±1.5	
				-Vo Output	--	±1.1	±1.5	
		DQP2-12S1508V0 DQP2-24S1508			--	±1.2	±1.5	
	Load Regulation	5V Input model DQP2-12S1508V0 DQP2-24S1508	10% - 100% load	+Vo Output	--	8	15	%
				-Vo Output	--	10	15	
		DQP2-05S1803 DQP2-12S1803		+Vo Output	--	10	17	
				-Vo Output	--	12	17	
		DQP2-12S1504 DQP2-15S1504		+Vo Output	--	14	20	
				-Vo Output	--	16	20	
		Other model		+Vo Output	--	6	15	
				-Vo Output	--	8	15	
	Ripple & Noise①	20MHz	5V Input model		--	50	150	mV
			DQP2-12S1508V0、DQP2-24S1508		--	100	200	
			Other model		--	50	100	
	Temperature Coefficient	DQP2-xxS1509	Full load		--	±0.04	±0.1	%/℃
		DQP2-12S1508V0 DQP2-24S1508			--	--	±0.03	

		Other model		--	±0.02	--	
	Short-circuit Protection			Continuous, self-recovery			
General Specifications	Isolation	DQP2-12S1508V0 DQP2-24S1508	Input- output，Test for 1 minute with a leakage current of 1mA max	3000	--	--	VAC
		Other model		5000	--	--	
	Partial Discharge	Except for DQP2-12S1508V0 DQP2-24S1508	Input- output(According to IEC61800-5-1), leakage charge < 10 pC	1700	--	--	V
	CMTI		Input- output	±200	--	--	kV/μs
	Insulation Resistance	Input- output，500VDC		1000	--	--	MΩ
	Isolation capacitor	Input- output at 100kHz/0.1V	5V Input model	--	5	6.5	pF
			DQP2-12S1508V0、DQP2-24S1508	--	6.6	--	
			Other model	--	3.5	5	
	Operating Temperature	Derating when operating temperature≥85℃, (see Fig. 1, 2)		-40	--	+105	℃
	Storage Temperature			-55	--	+125	
	Storage Humidity	DQP2-12S1508V0 DQP2-24S1508	Non-condensing	--	--	95	%RH
		Other model		5	--	95	
	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	DQP2-12S1508V0 DQP2-24S1508	Ta=25℃, nominal input voltage, full load	--	25	--	
		Other model		--	30	60	
	Switching Frequency	DQP2-12S1508V0 DQP2-24S1508	Full load, nominal input voltage	--	100	300	kHz
		Other model		--	200	--	
	Safety Class			CLASS III			
	MTBF	MIL-HDBK-217F@25℃		3500	--	--	k hours
Mechanical Specifications	Case Material	Black plastic; flame-retardant and heat-resistant					
	Dimensions	19.50 x 9.80 x 12.50mm					
	Weight	4.3g(Typ.)					
	Cooling Method	Free air convection					

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	CE	5V Input model	CISPR32/EN55032 CLASS B (see Fig. 44 for recommended circuit)
		DQP2-12S1508V0 DQP2-24S1508	CISPR32/EN55032 CLASS B (see Fig. 46 for recommended circuit)
		Other Input model	CISPR32/EN55032 CLASS A (see Fig. 44 for recommended circuit)
	RE	5V Input model	CISPR32/EN55032 CLASS A (see Fig. 44 for recommended circuit) CISPR32/EN55032 CLASS B (see Fig. 45 for recommended circuit)
		DQP2-12S1508V0 DQP2-24S1508	CISPR32/EN55032 CLASS B (see Fig. 46 for recommended circuit)
		Other Input model	CISPR32/EN55032 CLASS A (see Fig. 44 for recommended circuit)
Immunity	ESD	5V Input model	IEC/EN61000-4-2 Contact ±6kV perf. Criteria B
		Other Input model	IEC/EN61000-4-2 Contact ±8kV perf. Criteria B

Characteristic Curve

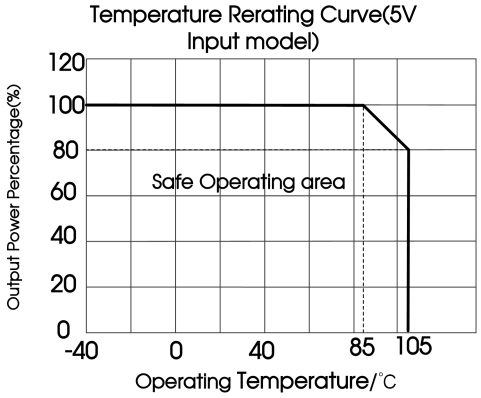


Fig. 1

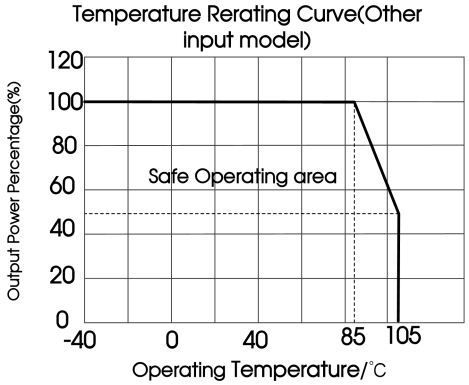


Fig. 2

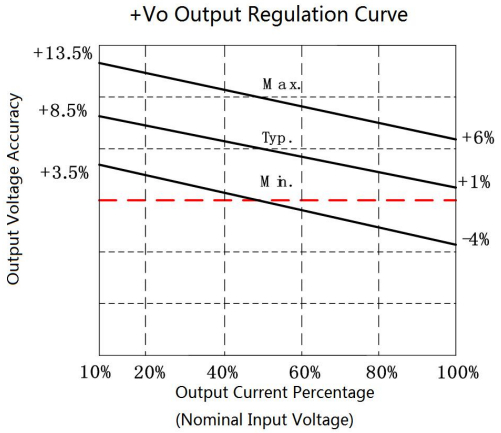


Fig. 3 DQP2-05S1509

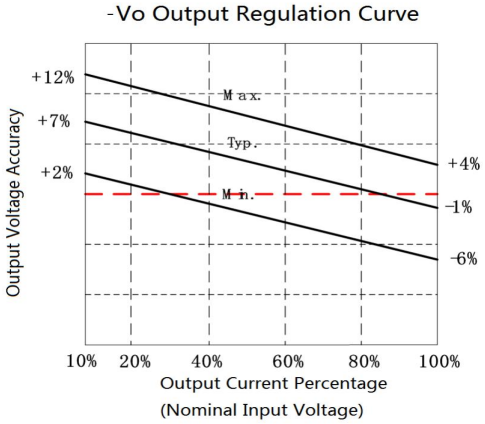


Fig. 4 DQP2-05S1509

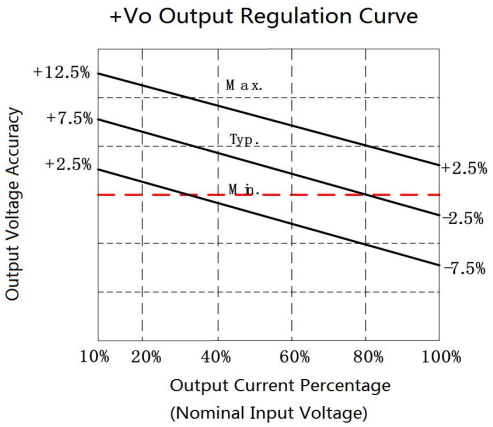


Fig. 5 DQP2-12S1509

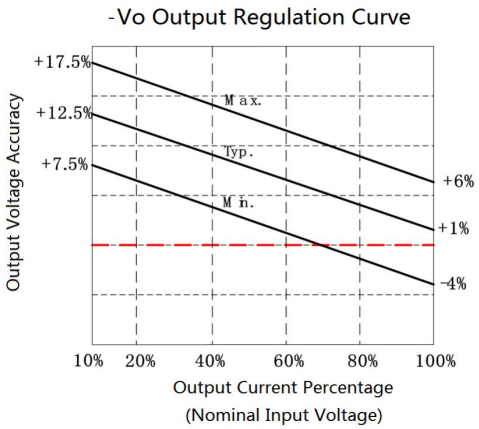


Fig. 6 DQP2-12S1509

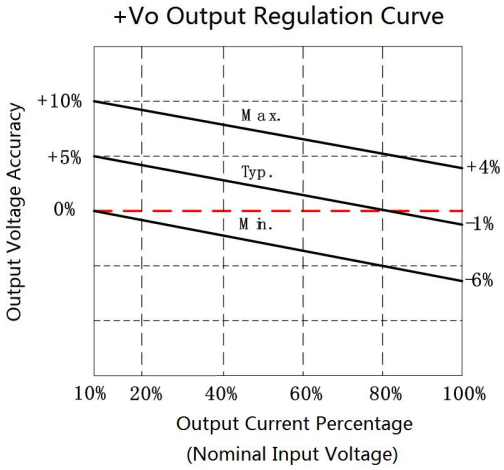


Fig. 7 DQP2-15S1509

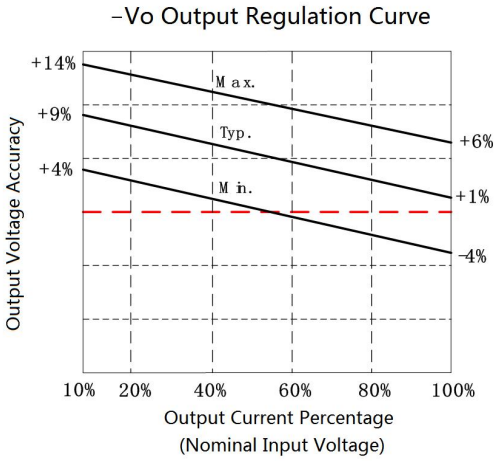


Fig. 8 DQP2-15S1509

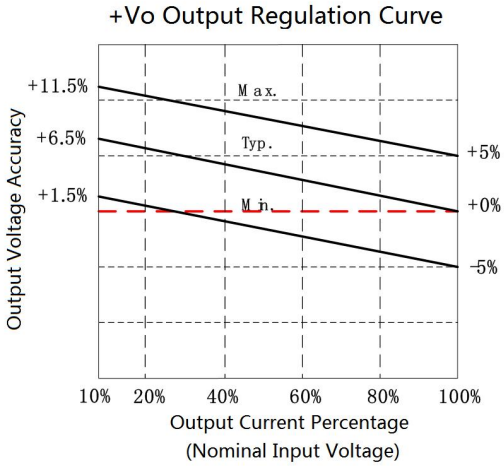


Fig. 9 DQP2-24S1509

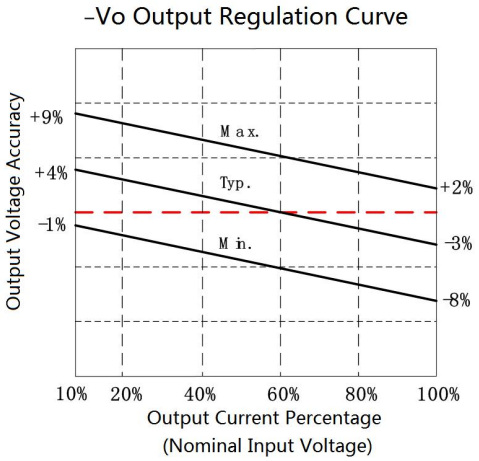


Fig. 10 DQP2-24S1509

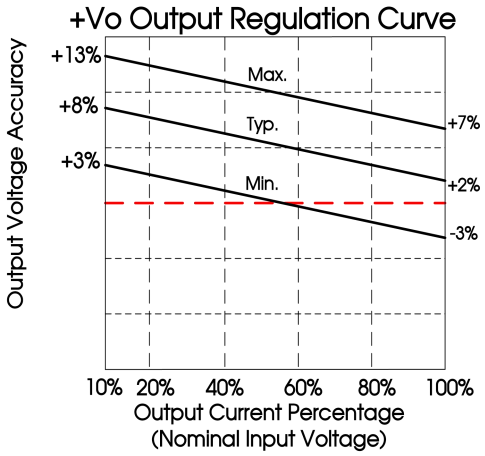


Fig. 11 DQP2-24S1509V0

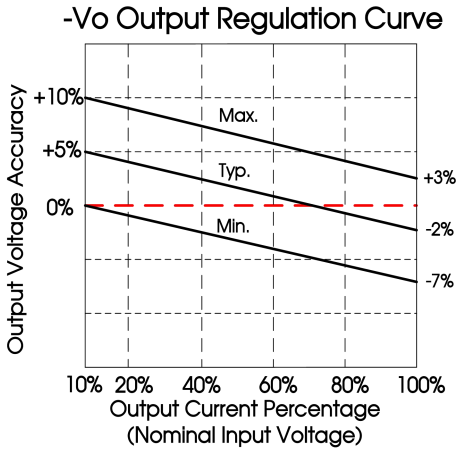


Fig. 12 DQP2-24S1509V0

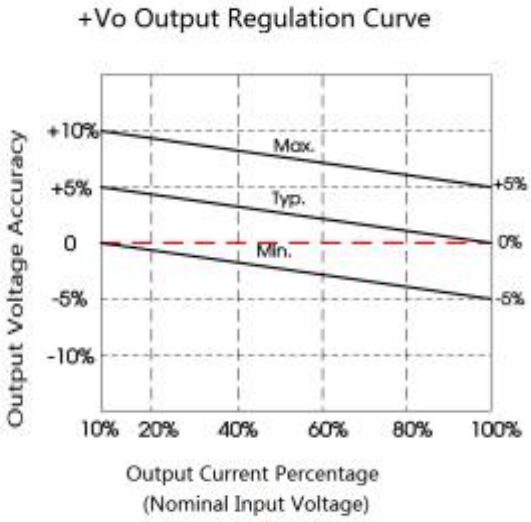


Fig. 13 DQP2-24S1508

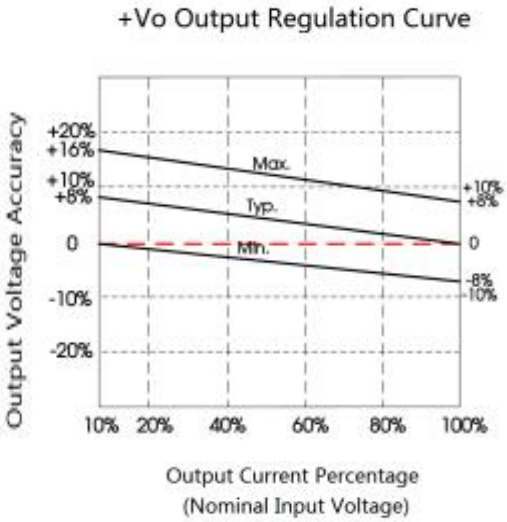


Fig. 14 DQP2-24S1508

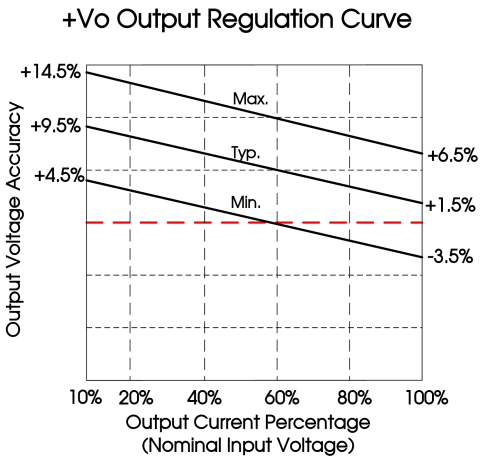


Fig. 15 DQP2-05S1505

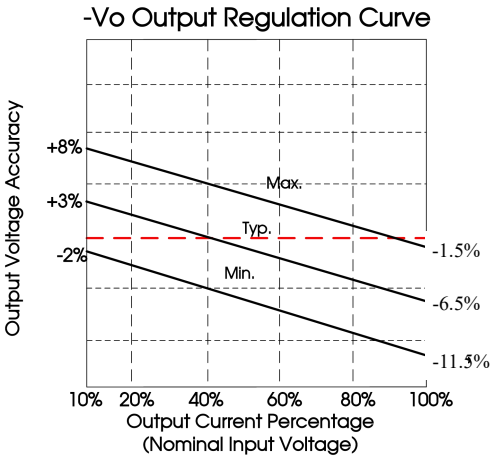


Fig. 16 DQP2-05S1505

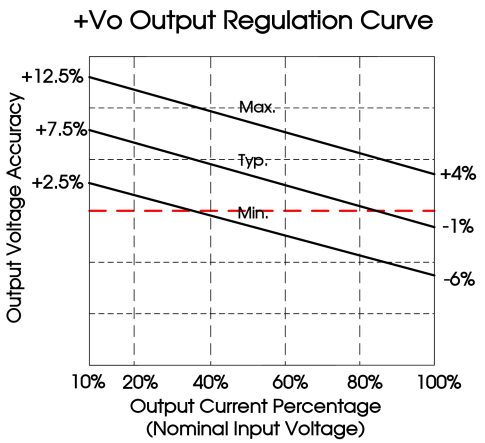


Fig. 17 DQP2-05S2004

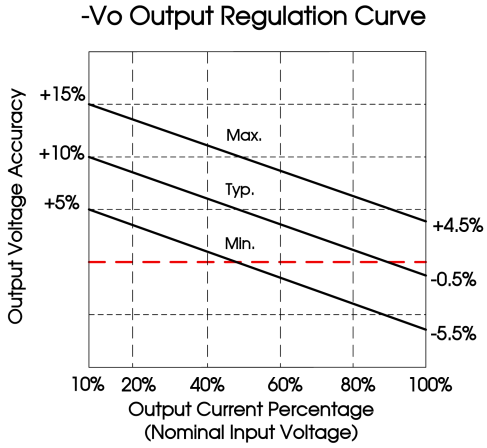


Fig. 18 DQP2-05S2004

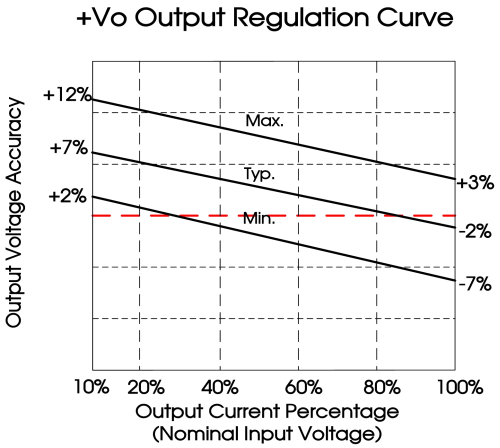


Fig. 19 DQP2-05S1803

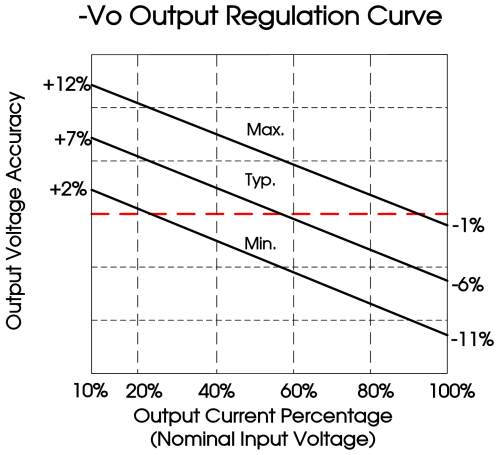


Fig. 20 DQP2-05S1803

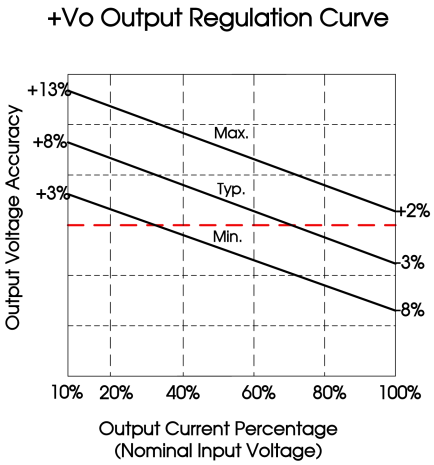


Fig. 21 DQP2-12S1504

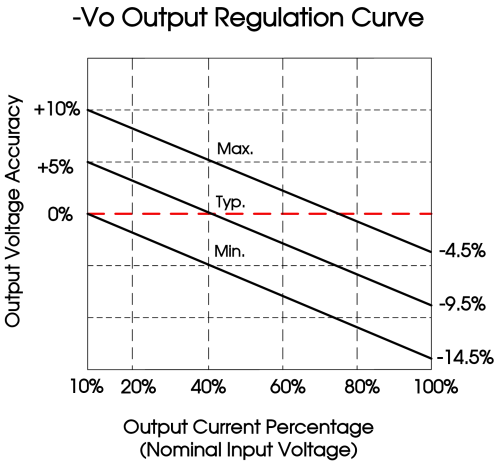


Fig. 22 DQP2-12S1504

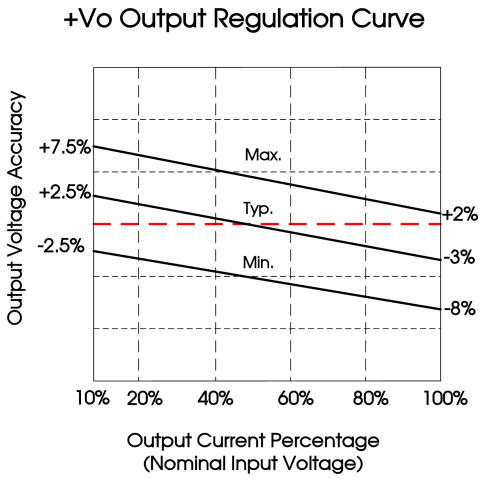


Fig. 23 DQP2-12S2005

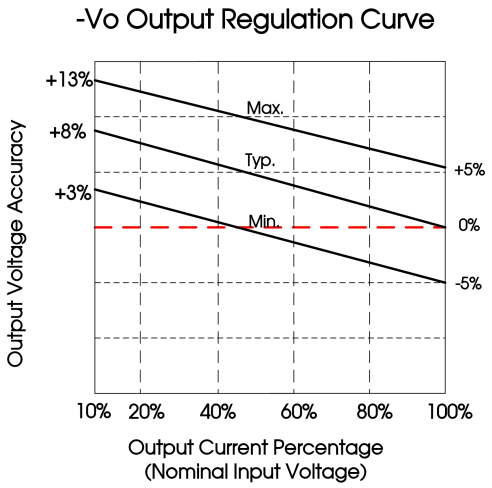


Fig. 24 DQP2-12S2005

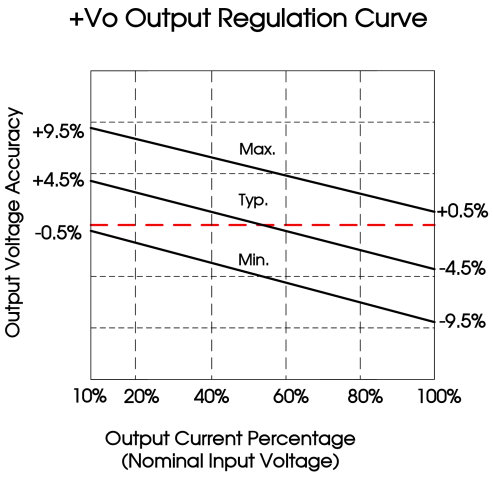


Fig. 25 DQP2-15S1504

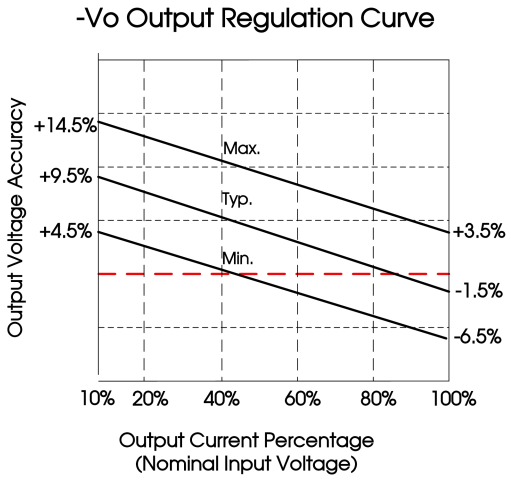


Fig. 26 DQP2-15S1504

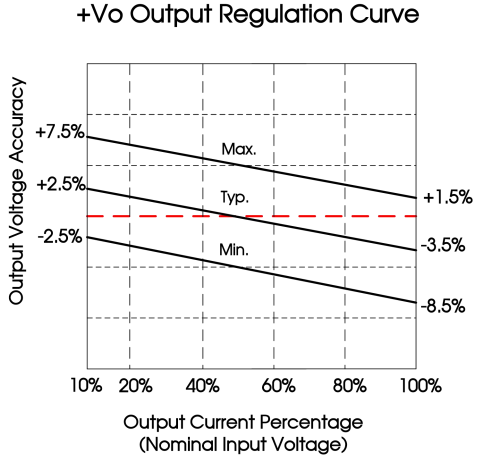


Fig. 27 DQP2-15S2005

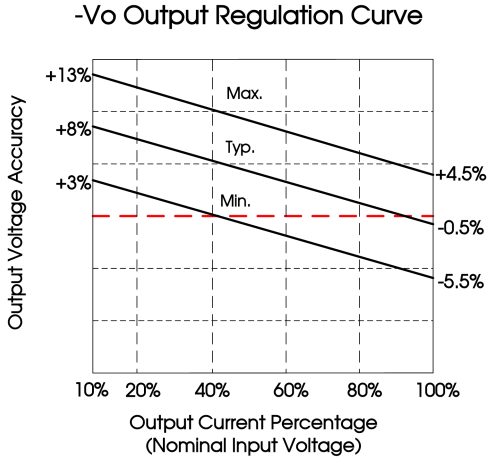


Fig. 28 DQP2-15S2005

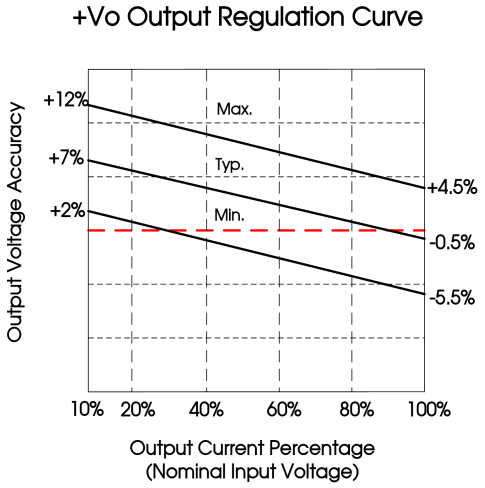


Fig. 29 DQP2-24S1504

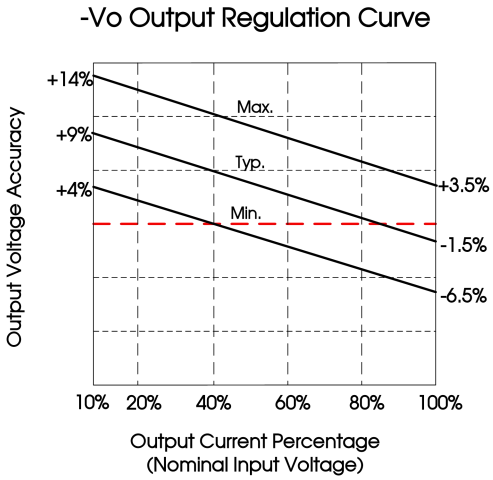


Fig. 30 DQP2-24S1504

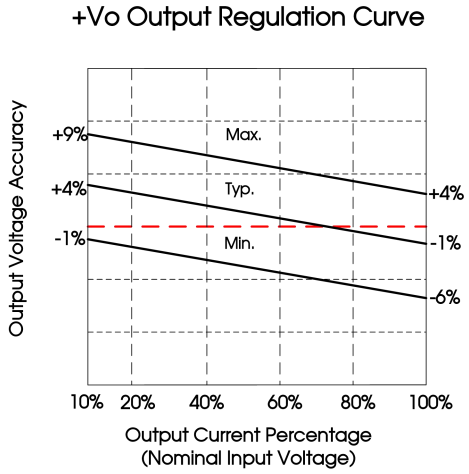


Fig. 31 DQP2-24S2005

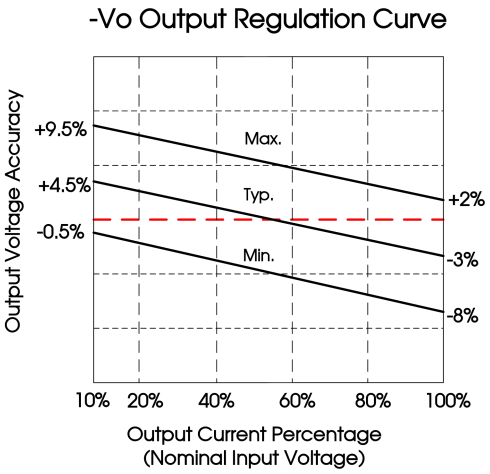


Fig. 32 DQP2-24S2005

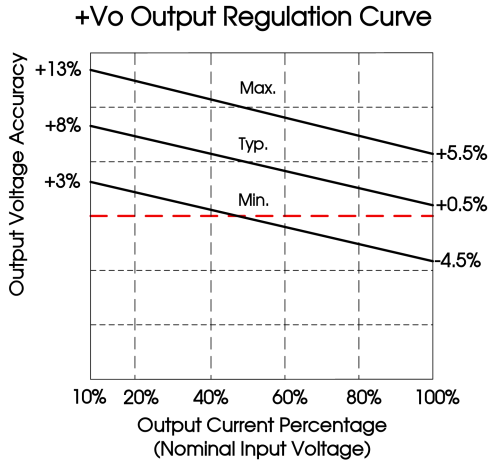


Fig. 33 DQP2-12S1803

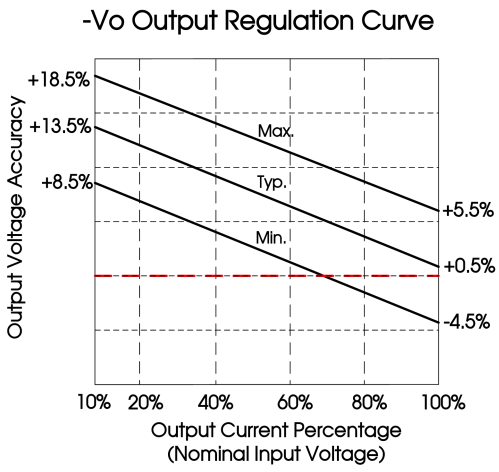


Fig. 34 DQP2-12S1803

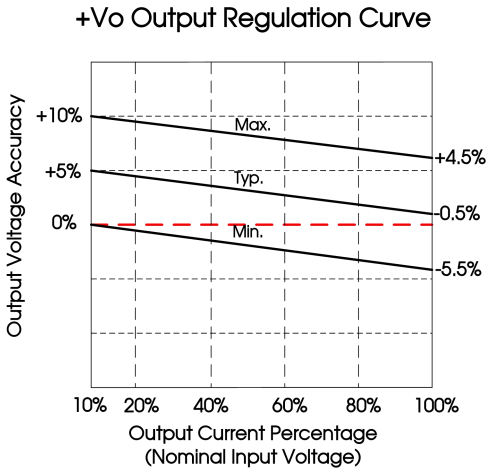


Fig. 35 DQP2-15S1803

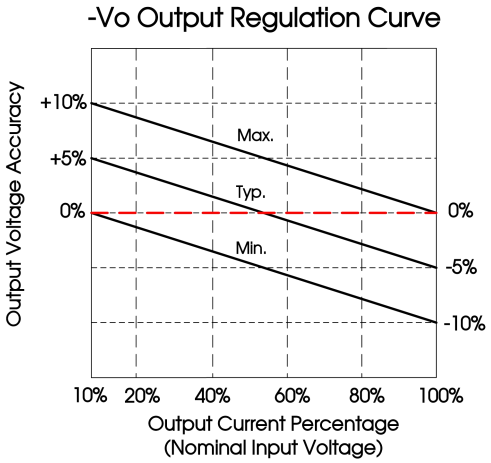


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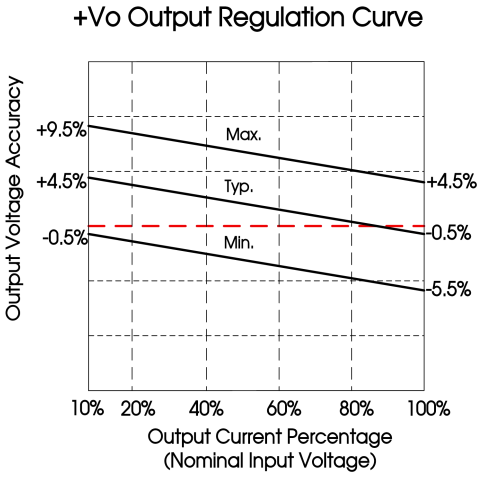


Fig. 37 DQP2-24S1803

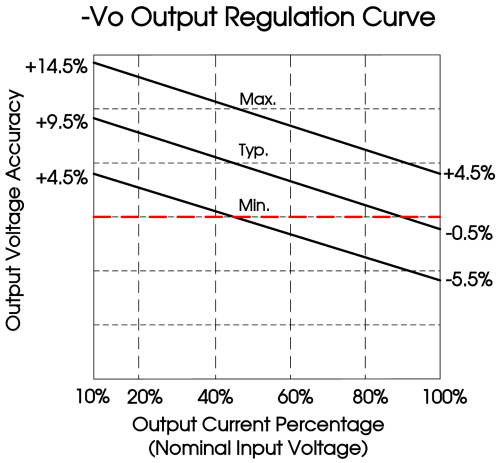


Fig. 38 DQP2-24S1803

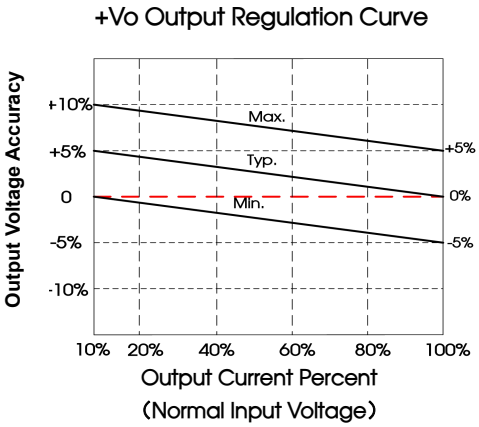


Fig. 39 DQP2-12S1508V0

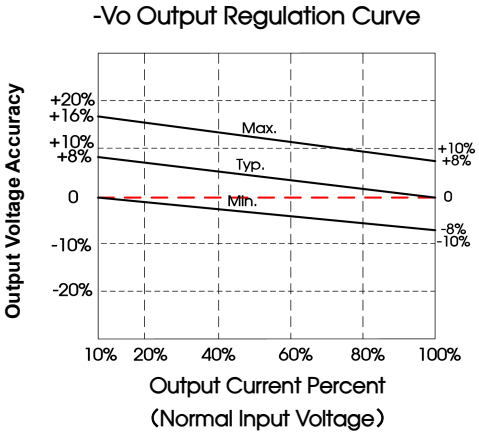


Fig. 40 DQP2-12S1508V0

Design Reference

1. Test configurations

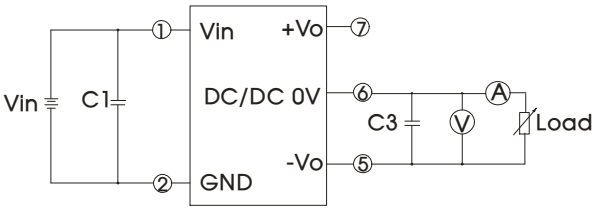


Fig. 41

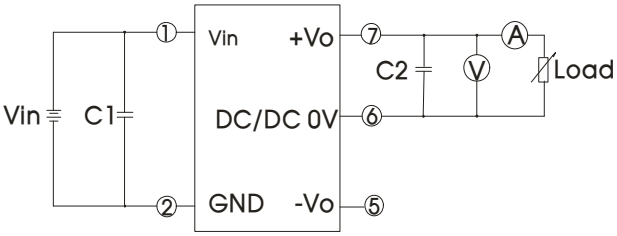


Fig. 42

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

2. Typical application

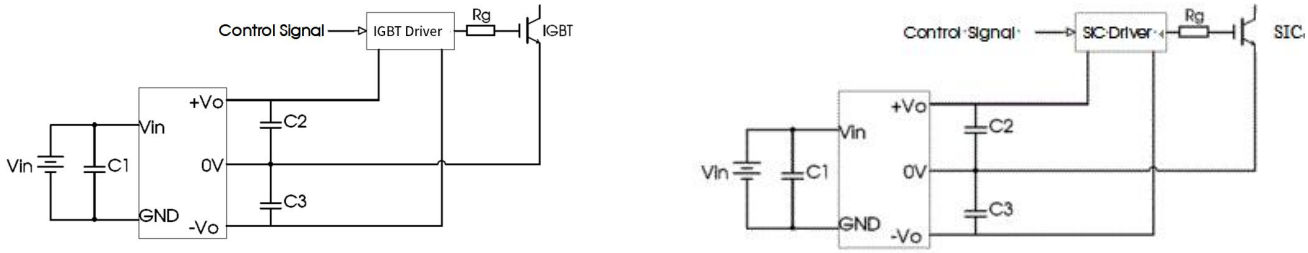


Fig. 43

C1/C2/C3
100μF/35V(Low resistance)

3. EMC typical recommended circuit

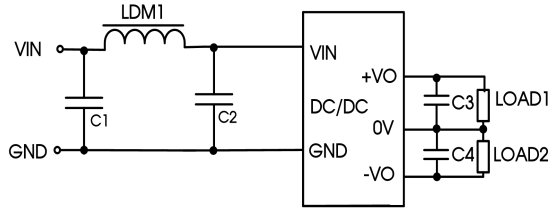


Fig. 44

Device selection			
Project		5V Input model	Other Input model
EMI	C1/C2	4.7μF /16V	1μF/50V
	C3/C4	10μF /50V (Low resistance)	100μF/30V (Low resistance)
	LDM	6.8μH	33μH

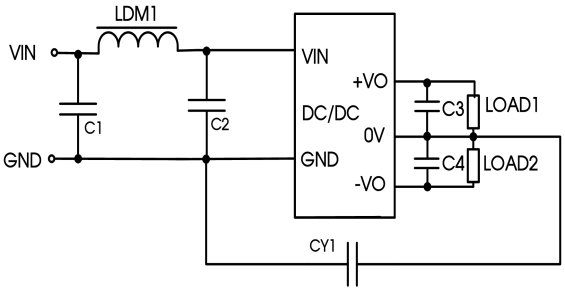


Fig. 45

Device selection		
EMI	C1/C2	4.7μF /16V
	C3/C4	10μF /50V (Low resistance)
	LDM	6.8μH
	CY1	330pF

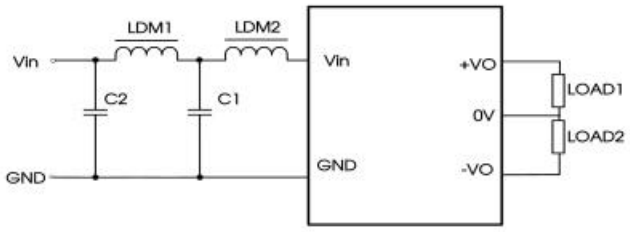


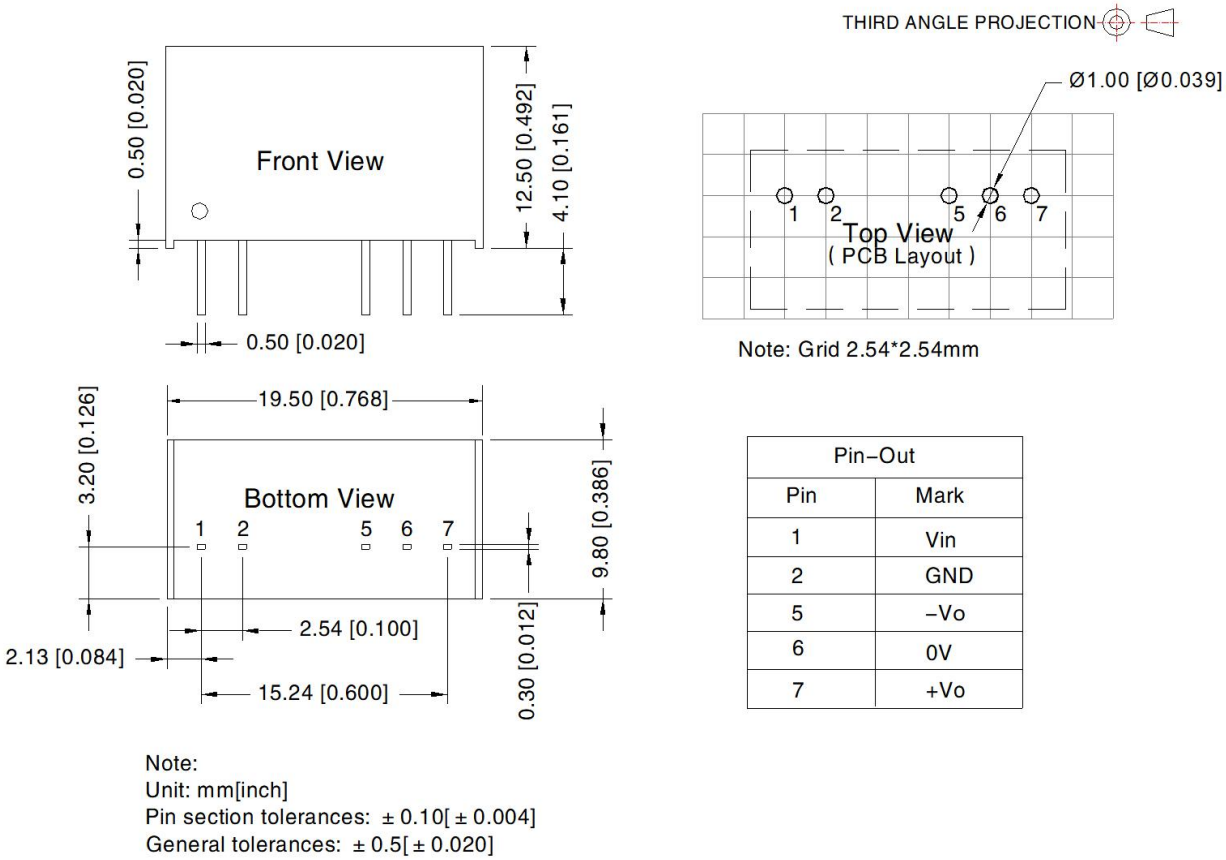
Fig. 46

输入电压		12VDC	24VDC
EMI	C1、C2	4.7μF /50V	
	LDM1	12μH	
	LDM2	47μH	

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



Pin-Out	
Pin	Mark
1	Vin
2	GND
5	-Vo
6	0V
7	+Vo

Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.5[± 0.020]

Note:

1. The lead connecting the power supply module and IGBT/SiC MOSFET 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/SiC MOSFE driver;
3. The peak of the IGBT/SiC MOSFE 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. 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. 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.