

DC/DC Converter for IGBT driver



Patent Protection RoHS

FEATURES

- High efficiency up to 81%
- Ultra compact SIP package
- I/O isolation test voltage 3kVAC
- Max. Capacitive Load: 1000uF
- Ultra low isolation capacitance
- Operating ambient temperature range: -40°C to +105°C
- No-load operation allowed

QAxx1 series are DC-DC converters for IGBT drivers. Their ultra low isolation capacitance can improve the capability of anti-interference. The built-in common-ground mode of the unique asymmetric voltage output mode reduces the driver loss of IGBT driver. They feature short-circuit protection and auto-recovery, and can be widely used in:

1. General inverter
2. AC servo drive system
3. Electric welding machine
4. Uninterruptible power supply (UPS)

Selection Guide

Part No.	Input		Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load (uF) Max.
	Input Voltage(VDC)	Input Current(mA, Typ.) full load/no-load	Voltage(VDC) +Vo/-Vo	Current(mA) +Io/-Io		
	Nominal(Range)					
QA121	12 (11.4-12.6)	280/40	+15/-8.0	+120/-120	78/81	1000
QA151	15 (14.25-15.75)					
QA241	24 (22.8-25.2)					

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Surge Voltage	QA121	DC	-0.7	--	14	VDC
	QA151	DC	-0.7	--	16	
	QA241	DC	-0.7	--	26	
Input Filter			Capacitance filter			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit	
Output Voltage	QA121	+Vo	Vin=12VDC, Pin6 & Pin7 +Io= +120mA	14.10	14.81	15.60	VDC
		-Vo	Vin=12VDC, Pin5 & Pin6 -Io= -120mA	-6.24	-7.84	-9.44	
	QA151	+Vo	Vin=15VDC, Pin6 & Pin7 +Io= +120mA	14.10	14.81	15.60	
		-Vo	Vin=15VDC, Pin5 & Pin6 -Io= -120mA	-6.24	-7.84	-9.44	
	QA241	+Vo	Vin=24VDC, Pin6 & Pin7 +Io= +120mA	14.10	14.81	15.60	
		-Vo	Vin=24VDC, Pin5 & Pin6 -Io= -120mA	-6.24	-7.84	-9.44	
Voltage Accuracy	10% -100% load		See output regulation curve (Fig. 2, Fig. 3)			%	
Linear Regulation	Input voltage range		Positive output	--	±1.1	±1.2	--
			Negative output	--	±1.1	±1.2	
Load Regulation	10%-100% load		Positive output	--	8	15	%
			Negative output	--	10	15	
Temperature Coefficient	Full load		--	±0.04	--	%/°C	
Ripple & Noise*	20MHz bandwidth		--	100	200	mVp-p	

Short-circuit Protection		--	--	1	s
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Note: * The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.	3000	--	--	VAC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	6	10	pF
Operating Temperature	Derating when operating temperature up to 85°C, (see Fig. 1)	-40	--	105	°C
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°C, nominal input, full load output	--	--	40	
Storage Humidity	Non-condensing	5	--	95	%RH
MTBF	MIL-HDBK-217F@25°C	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

Electromagnetic Compatibility (EMC)

Immunity	ESD	IEC/EN61000-4-2	Contact ±8kV	perf. Criteria B
	EFT	IEC/EN61000-4-4	±2kV	perf. Criteria B
	Surge	IEC/EN61000-4-5	±2kV (Input to Outout)	perf. Criteria B

Typical Characteristic Curves

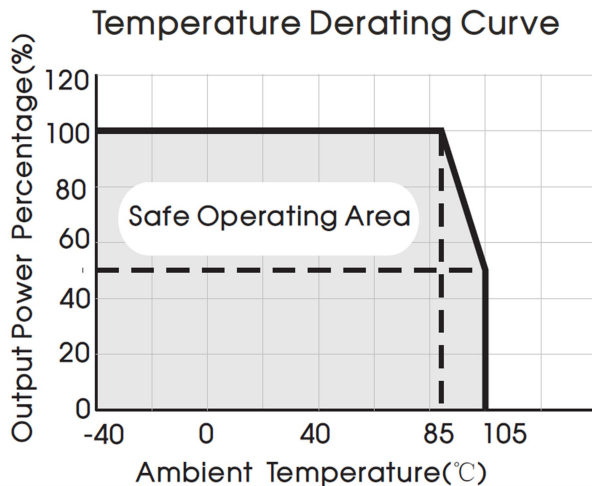


Fig. 1

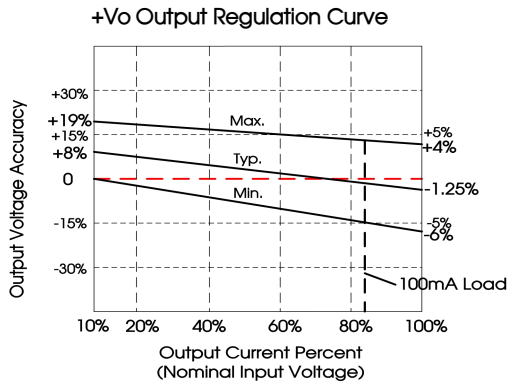


Fig. 2

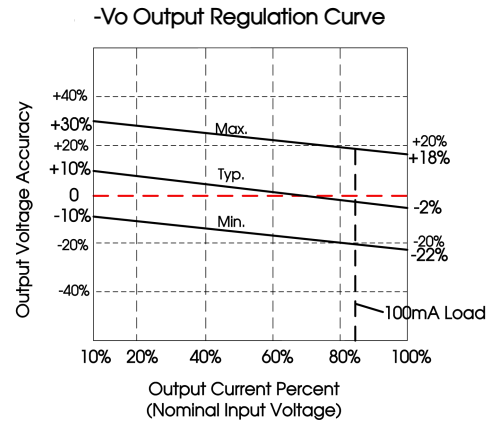
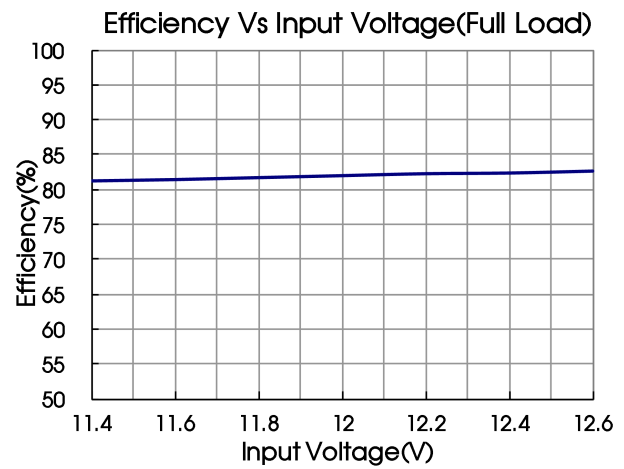
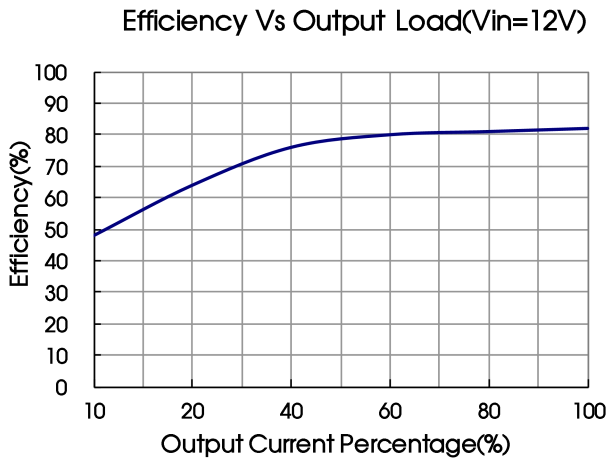


Fig. 3



Note: Take QA121 as an example, other models can be corresponding reference

Design Reference

1. Typical application

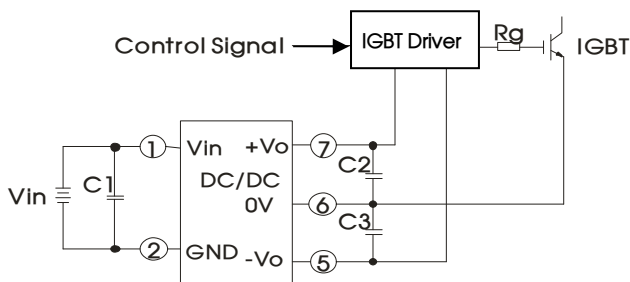


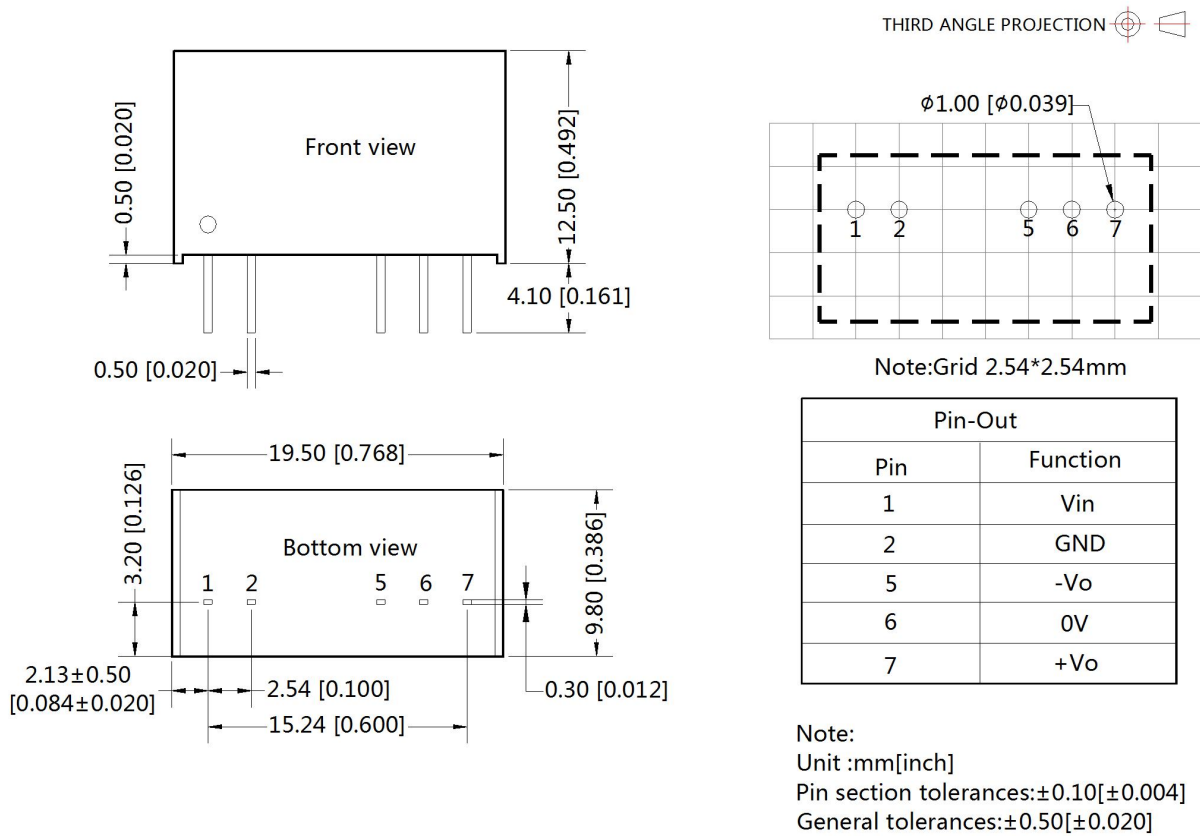
Fig. 4

C1/ C2 /C3
100uF/35V (Low internal resistance capacitance)

Note: On both ends of capacitance C2 and C3 shunt respectively a capacitance value in 1uF -10uF ceramic capacitors.

- The products do not support parallel connection of their output
- For additional information, please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Notes:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58200013;
- The lead wire connecting the power supply module and IGBT driver should be as short as possible during use;
- The output filtering capacitor should be as close as possible to the power supply module and IGBT driver;
- The peak of the IGBT 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;
- The average output power of the driver must be lower than that of the power supply module;
- Consider fixing in place with glue near the module if being used in vibration occasions;
- The maximum capacitive load is measured under the full input voltage range and full load condition;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75%RH with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on our company corporate standards;
- The performance parameters of the product models listed in this manual are as above, but some parameters of non-standard model products may exceed the requirements mentioned above. Please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC".
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.
- We can provide product customization service, please contact our technicians directly for specific information.

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