



## 4.8DBTW\_3 series

4.8W - Dual Output - Wide Input - Isolated & Regulated regulated IGBT dedicated DC-DC converter

### DC-DC Converter

4.8 Watt

- ⊕ 2:1 wide input voltage range
- ⊕ Efficiency up to 85%
- ⊕ Up to 3kVDC isolation
- ⊕ Short circuit protection
- ⊕ Output over-voltage protection
- ⊕ Operating temperature range: -40°C to +85°C
- ⊕ Industry standard pin-out
- ⊕ IGBT dedicated regulated DC-DC converter



The 4.8DBTW\_3 series are designed for the IGBT driver, offer 4.8W of output, with output over-voltage protection and short-circuit protection. General application includes:

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

#### Common specifications

Short circuit protection	Continuous, self-recovery
Operation temperature range	-40°C to +85°C Power derating ≥ 71°C (see Fig. 1)
Storage temperature range	-55°C to +125°C
Casing Temperature Rise	30°C to 40°C; Ta=25°C
Storage Humidity	5 -to 95 %RH (Non-condensing)
Lead temperature	300°C MAX, 1.5mm from case for 10 sec
MTBF	>1,000,000 hours
Case material	Black flame-retardant and heat-resistant plastic [UL94-V0]
Cooling	Free air convection
Weight	14g Typ.
Dimension	31.60*20.30*10.20mm

#### Input specifications

Item	Test condition	Min	Typ	Max	Units
Input voltage	• 12VDC input	-0.7		25	VDC
	• 24VDC input	-0.7		50	VDC
Starting voltage	• 12VDC input		6.5	9	VDC
	• 24VDC input			18	VDC
Input filter	Input Filter Capacitor filter				

#### Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-Output, tested for 1 minute and leakage current less than 1mA	3000			VDC
Isolation resistance	Input-Output, test at 500VDC	1000			MΩ
Isolation capacitance	Input-output, 100KHz/0.1V		100		pF

#### Output specifications

Item	Test condition	Min	Typ	Max	Units
Output Power		0.24		4.8	W
Output voltage accuracy	• Supplement output (-9V output) • Full load, Input voltage from low to high		±1	±2	%
			±3	±5	%
Line regulation	Input voltage varies by ±1%		±0.2	±0.5	%
Load regulation	5%-100% load		±0.5	±1	%
Temperature Recovery Time	25% load step change		0.5	2	μs
Transient Response Deviation	25% load step change		±2.5	±5	%
Temperature Drift Coefficient	100% load			±0.03	%/°C
Ripple & Noise*	20MHz bandwidth		100	200	mVp-p
Switching frequency	Full load, nominal input		300		KHz
Over-voltage Protection		110	120	140	%Vo

\* Ripple and noise tested with "parallel cable" method, please see DC-DC Converter Application Notes for specific operation methods.

#### Example:

**4.8DBTW\_121509\_D3P**  
**4.8 = 4.8 Watt; D = DIP24; BT = IGBT; W = Wide input 2:1 (7-18; 18-36);**  
**12 = 12Vin; 15 = +15Vout; 09 = -9Vout; D = Dual Output;**  
**3 = 3kVDC isolation; P = Short Circuit Protection (SCP)**

### Product Selection Guide

Part Number	Input Voltage [VDC]	Input Current Full Load/No Load [mA,Typ]	Output Voltage [VDC, +Vo/-Vo]	Output current [mA, +Vo/-Vo]	Max. capacitive Load [μF]	Efficiency @ Full Load [% ,Min/typ]
4.8DBTW_121509_D3P	12 ( 7-18 )	471/16	+15/-9	±200/±10	1000	85
4.8DBTW_241509_D3P	24 (18-36)	235/8	+15/-9	±200/±10	1000	85

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### EMC specifications

EMI	Conducted Disturbance	CISPR22/EN55022 CLASS A	(see Fig. 4-② for recommended circuit)	
EMI	Radiated Emission	CISPR22/EN55022 CLASS A	(see Fig. 4-② for recommended circuit)	
EMS	Electrostatic Discharge	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
EMS	Radiation Immunity	IEC/EN61000-4-3	10V/m	perf. Criteria A
EMS	EFT	IEC/EN61000-4-4 ±2KV	(see Fig. 4-③ for recommended circuit)	perf. Criteria B
EMS	Surge Immunity	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A
EMS	Conducted disturbance Immunity	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
EMS	Immunities of voltage dip, voltage drop and short interruption	IEC/EN61000-4-29	0%, 70%	perf. Criteria B

## Typical characteristics

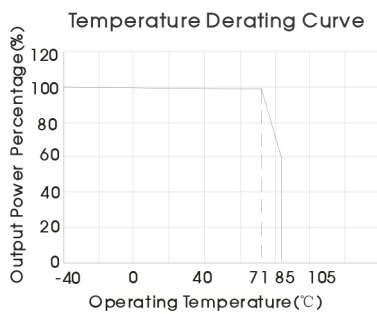
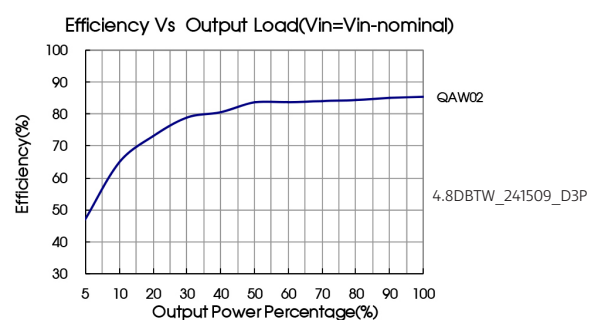
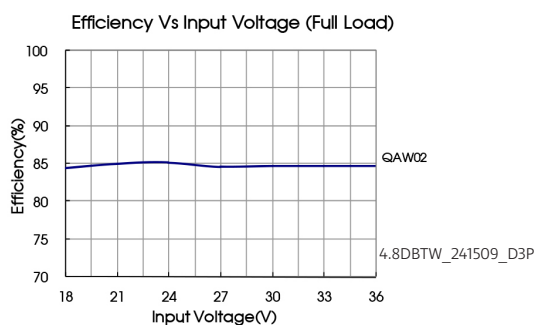
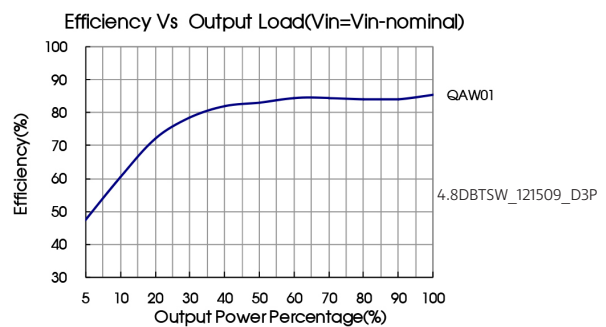
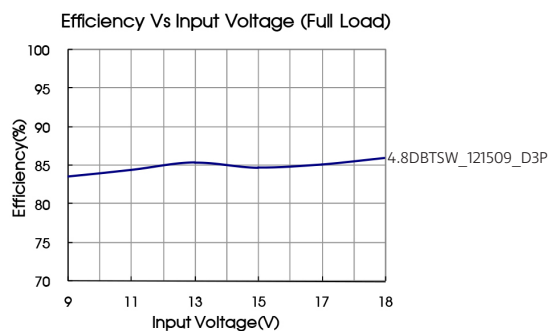


Fig. 1

## Efficiency



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## Typical application

All the IGBT driver of this series are tested according to the recommended circuit (see Fig. 2) before delivery.

If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors  $C_{in}$  and  $C_{out}$  or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.

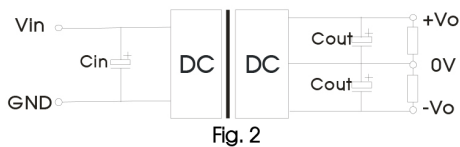


Fig. 2

$V_{in}$	12V/24V
$C_{in}$	100 $\mu$ F
$C_{out}$	100 $\mu$ F

## Application circuit

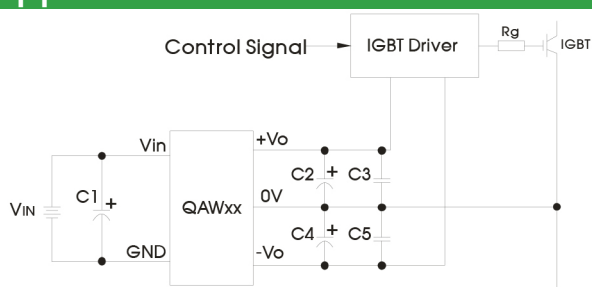


Fig. 3

$C1$	100 $\mu$ F/63V(Electrolytic capacitor)
$C2 / C4$	100 $\mu$ F/35V(Electrolytic capacitor)
$C3 / C5$	10 $\mu$ F/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. To ensure the high peak gate current, the filter capacitors should be electrolytic capacitor and ceramic capacitor collocation.
4. The output average power of the IGBT driver should be less than the output power of DC-DC module.

## EMC solution-recommended

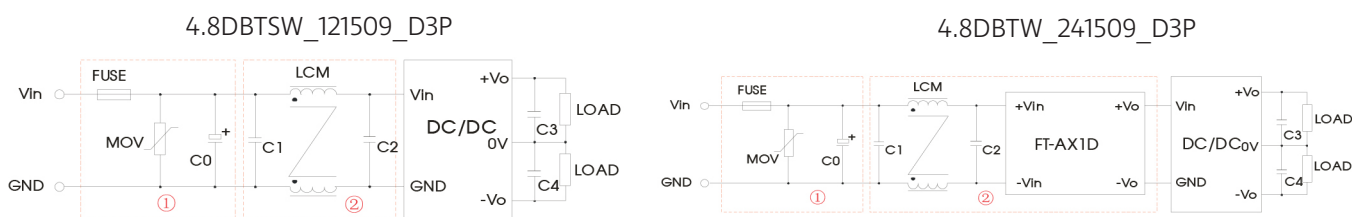


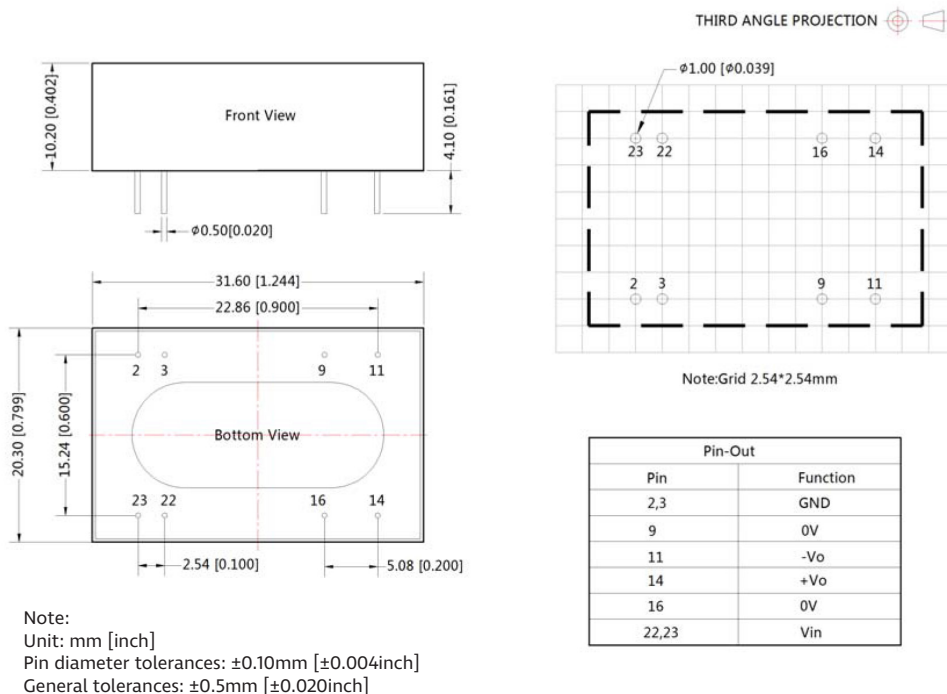
Fig-4

Parameters	4.8DBTSW_121509_D3P	4.8DBTW_241509_D3P
FUSE	Choose according to actual input current	Choose according to actual input current
MOV	S14K25	S14K35
$C0$	680 $\mu$ F/25V	330 $\mu$ F/50V
$C1, C2$	4.7 $\mu$ F/50V	4.7 $\mu$ F/50V
$C3, C4$	Refer to the $C_{out}$ in Fig.2	Refer to the $C_{out}$ in Fig.2
LCM	1mH	3.3mH
Module		FT-AX1D

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## Mechanical dimensions



### Note:

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. 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;
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, data in this datasheet should be tested under the conditions of  $T_a = 25^\circ\text{C}$ , humidity  $< 75\%$  when inputting nominal voltage and outputting rated load;
8. All index testing methods in this datasheet are based on our Company's corporate standards;
9. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technicians for specific information;
10. We can provide product customization service;
11. Specifications of this product are subject to changes without prior notice.
12. The product does not support output in parallel with power per liter or hot-swappable use