



## 1.8S7BT\_D3 series

1.8W - Dual Output - Wide Input - Isolated & Regulated IGBT dedicated DC-DC converter

### DC-DC Converter

1.8 Watt

- ⊕ Efficiency up to 80%
- ⊕ Temperature range: -40°C~+105°C
- ⊕ Dual Output Voltage
- ⊕ 3000VAC isolation voltage
- ⊕ Short circuit protection (SCP)
- ⊕ Ultra low isolation capacitance
- ⊕ Ultra Compact SIP package
- ⊕ Good temperature characteristic
- ⊕ RoHS Compliance
- ⊕ IGBT dedicated regulated DC-DC converter
- ⊕ No-load operation allowed

The 1.8S7BT\_D3 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:

- General inverter
- AC servo drive system
- Electric welding machine
- Uninterruptible power supply (UPS)



Common specifications	
Short circuit protection:	Continuous, automatic recovery
Temperature rise at full load:	30°C TYP, 40°C MAX (Ta=25°C)
Cooling:	Free air convection
Operation temperature range:	-40°C – +105°C
Storage temperature range:	-55°C – +125°C
Lead temperature	300°C MAX, 1.5mm from case for 10 sec
Storage humidity range:	< 95%
Case material:	Black flame-retardant and heat-resistant plastic [UL94-V0]
MTBF:	>3,500,000 hours
Weight:	4.3g

Input specifications						
Item	Test condition	Min	Typ	Max	Units	
Input voltage	• 1.8S7BT_121508_D3P	-0.7		15	VDC	
	• 1.8S7BT_121509_D3P	-0.7		13	VDC	
	• 15VDC	-0.7		16	VDC	
	• 24VDC	-0.7		26	VDC	
Hot plug	Unavailable					
Input filter	Capacitor					

EMC specifications		
EMI	CE	CISPR22/EN55022 CLASS B (External Circuit Refer to EMC recommended circuit)
EMI	RE	CISPR22/EN55022 CLASS B (External Circuit Refer to EMC recommended circuit)
EMS	ESD	IEC/EN61000-4-2 Contact ±8KV perf. Criteria B

Isolation specifications						
Item	Test condition	Min	Typ	Max	Units	
Isolation voltage	Input-Output, tested for 1 minute and leakage current less than 1mA	3000			VAC	
Isolation resistance	Input-Output, test at 500VDC	1000			MΩ	
Isolation capacitance	Input/Output, 100KHz/0.1V		6.6		pF	

#### Example:

#### 1.8S7BT\_121509D3P

1.8 = 1.8 Watt; S7 = SIP7; BT= IGBT Serie; 12 = 12Vin; 15 = +15Vout; 09 = -9Vout; D = Dual Output; 3 = 3kVAC; P = Short Circuit Protection (SCP)

Part Number	Input Voltage (Range) [V]	Input current full load/ no load [mA, typ]	Output Voltage [VDC, +Vo/-Vo]	Output current [mA, +Vo/-Vo]	Max. capacitive load [μF]	Efficiency [%, typ]
1.8S7BT_121508_D3P	12 (9-15)	223/20	+12/-8.0	+100/-80	220	80
1.8S7BT_121509_D3P	12 (11.6-12.4)	162/20	+15/-8.7	+80/-40	220	80
1.8S7BT_151509_D3P	15 (14.5-15.5)	130/20	+15/-8.7	+80/-40	220	80
1.8S7BT_1509_D3P	15 (14.5-15.5)	84/20	+9/-	+111/-	220	80
1.8S7BT_150909_D3P	15 (14.5-15.5)	84/20	+9/-9	+55/-55	220	80
1.8S7BT_151709_D3P	15 (14.5-15.5)	143/20	+17/-8.7	+80/-40	220	80
1.8S7BT_241509_D3P	24 (23.3-24.7)	81/20	+15/-8.7	+80/-40	220	80

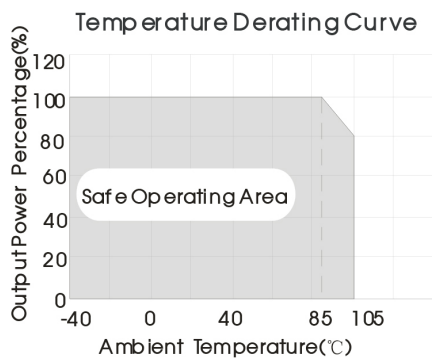
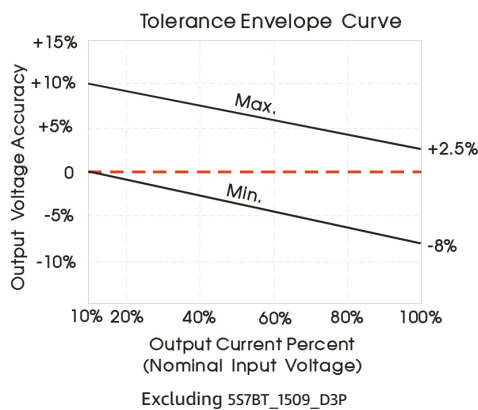
## 1.8S7BT\_D3 series

1.8W - Dual Output - Wide Input - Isolated & Regulated  
IGBT dedicated DC-DC converter

Output specifications						
Item		Test condition	Min	Typ	Max	Units
Output voltage	• 1.8S7BT_121508_D3P	+Vo: Vin=12VDC, Pin6 & Pin7 +Io=+100mA	14	15	16	VDC
		-Vo: Vin=12VDC, Pin5 & Pin6 -Io=-80mA	-7	-8	-9	VDC
	• 1.8S7BT_121509_D3P	+Vo: Vin=12VDC, Pin6 & Pin7 +Io=+80mA	14	15	16	VDC
		-Vo: Vin=12VDC, Pin5 & Pin6 -Io=-40mA	-7	-8.7	-10	VDC
	• 1.8S7BT_151509_D3P	+Vo: Vin=15VDC, Pin6 & Pin7 +Io=+80mA	14	15	16	VDC
		-Vo: Vin=15VDC, Pin5 & Pin6 -Io=-40mA	-7	-8.7	-10	VDC
	• 1.8S7BT_1509_D3P	+Vo: Vin=15VDC, Pin6 & Pin7 +Io=+111mA	8	9	10	VDC
		-Vo: -	-	-	-	VDC
	• 1.8S7BT_150909_D3P	+Vo: Vin=15VDC, Pin6 & Pin7 +Io=+55mA	8	9	10	VDC
		-Vo: Vin=15VDC, Pin5 & Pin6 -Io=-55mA	-8	-9	-10	VDC
• 1.8S7BT_151709_D3P	+Vo: Vin=15VDC, Pin6 & Pin7 +Io=+80mA	16.5	17	18	VDC	
	-Vo: Vin=15VDC, Pin5 & Pin6 -Io=-40mA	-7	-8.7	-10	VDC	
• 1.8S7BT_241509_D3P	+Vo: Vin=24VDC, Pin6 & Pin7 +Io=+80mA	14	15	16	VDC	
	-Vo: Vin=24VDC, Pin5 & Pin6 -Io=-40mA	-7	-8.7	-10	VDC	
Output voltage accuracy	• 1.8S7BT_1509_D3P • Other models	See tolerance envelope curve		±4	±6	%
Line regulation		Input voltage range		±1.2	±1.5	%
Load regulation	• 1.8S7BT_1509_D3P • Other models	10% to 100% load		12	26	%
		10% to 100% load, positive output		8	15	%
		10% to 100% load, negative output		10	15	%
Temperature drift coefficient		100% load			±0.03	%/°C
Ripple & Noise*		20MHz Bandwidth		100	200	mVp-p
Switching frequency		Full load, nominal input		300		KHz

\*Test ripple and noise by "parallel cable" method. See detailed operation instructions at DC-DC application notes.

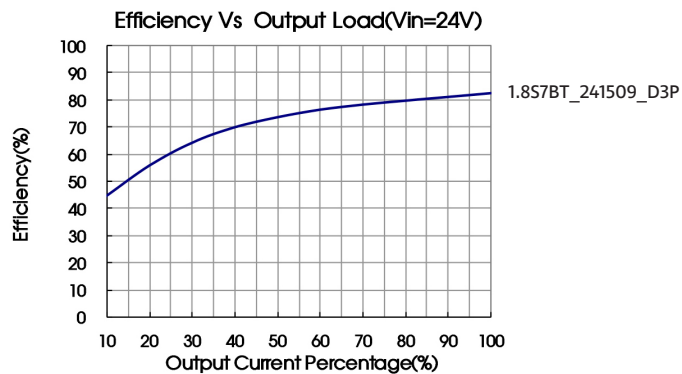
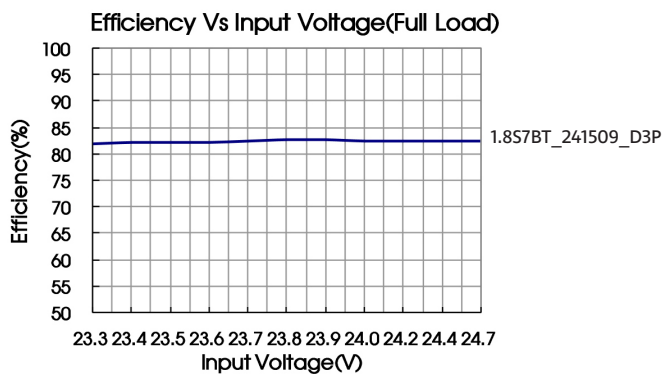
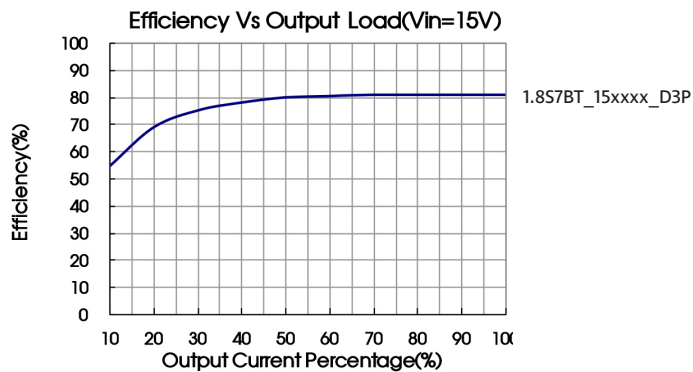
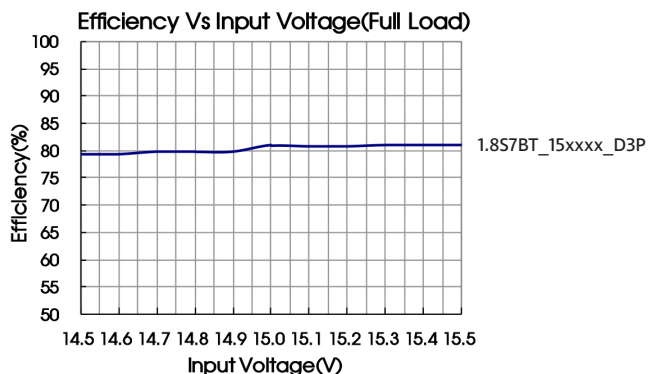
## Typical characteristics



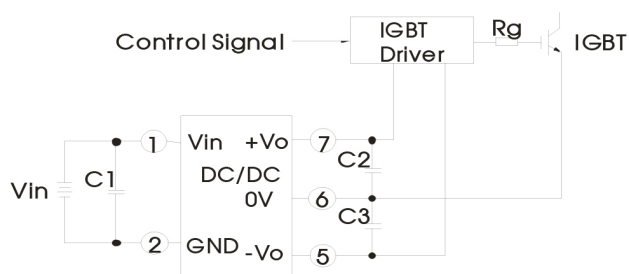
## 1.8S7BT\_D3 series

1.8W - Dual Output - Wide Input - Isolated & Regulated  
IGBT dedicated DC-DC converter

### Efficiency



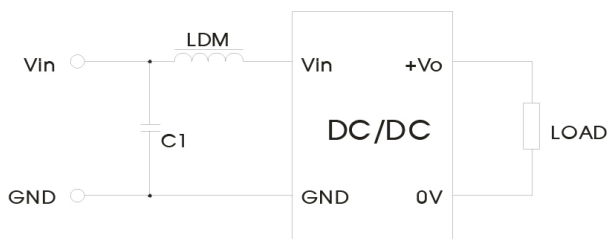
### Typical application



$C1 / C2 / C3$
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.

### EMC solution-recommended circuit



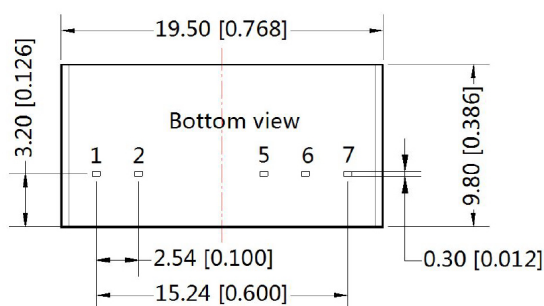
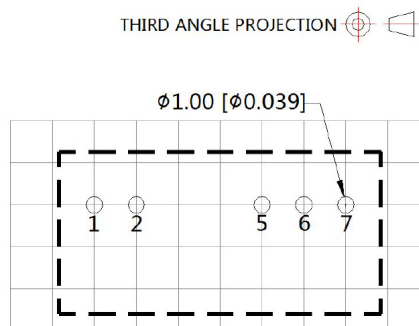
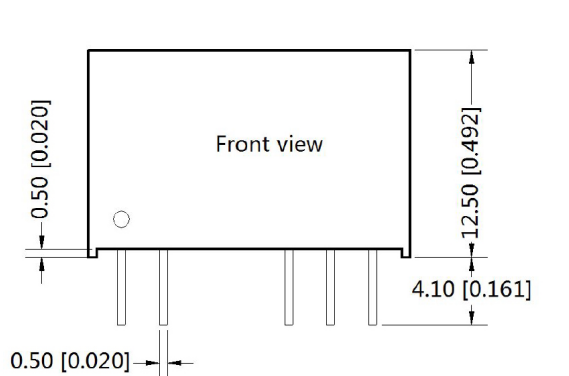
Input voltage (VDC)	12/15/24
EMI / C1	4.7uF/50V
EMI / LDM	12uH

It is not allowed to connect modules output in parallel to enlarge the power.

## 1.8S7BT\_D3 series

1.8W - Dual Output - Wide Input - Isolated & Regulated  
IGBT dedicated DC-DC converter

### Mechanical dimensions



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

Note:  
Unit: mm [inch]  
Pin diameter tolerances:  $\pm 0.10\text{mm} [\pm 0.004\text{inch}]$   
General tolerances:  $\pm 0.5\text{mm} [\pm 0.020\text{inch}]$

#### Note:

- The lead 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 with glue near the module if being used in vibration occasion;
- The max. capacitive load should be tested within the input voltage range and under full load conditions;
- Unless otherwise noted, all specifications are measured at  $T_a = 25^\circ\text{C}$ , humidity <75%, nominal input voltage and rated output load.
- In this datasheet, all test methods are based on our corporate standards.
- All characteristics are for listed models, and non-standard models may perform differently. Please contact our technical support for more detail.
- Please contact our technical support for any specific requirement.
- Specifications of this product are subject to changes without prior notice.