

2S7BE_3U series

2W - Single/Dual Output DC-DC Converter - Fixed Input - Isolated & Unregulated

DC-DC Converter

2 Watt

- ⊕ High efficiency up to 86%
- ⊕ 3000VDC isolation
- ⊕ SIP package
- ⊕ Low ripple and noise
- ⊕ Operating temperature: -40°C to +85°C
- ⊕ International standard pinout
- ⊕ EMI complies with EN55032 Class B

The 2S7BE_3U series meet reinforced insulation requirements. They are specially designed for applications where require compact size, high isolation, low isolation capacitor and low leakage current power. They are widely used in electricity, IGBT drivers and so on.

These products apply to:

- 1) Where the voltage of the input power supply is fixed (voltage variation $\leq \pm 10\%$)
- 2) Where isolation is necessary between input and output (isolation voltage 3000VDC)
- 3) Where do not has high requirement of line regulation and the ripple & noise of the output voltage;

Such as: Collection and isolation, High voltage collection circuit, IGBT-driven circuits, etc.



Common specifications

Short circuit protection:	1 sec. MAX
Cooling:	Nature convection
Operation temperature range:	-40°C – +85°C
Storage temperature range:	-40°C – +125°C
Case temperature:	100°C MAX
Lead temperature:	260°C MAX, 1.5mm from case for 10 sec
Storage humidity range:	< 95%
MTBF (MIL-HDBK-217F@25°C):	>1,121 Mhours
Safety standard:	designed to meet IEC 60950-1
Case material:	Plastic [UL94-V0]
Weight:	2.3g
Dimensions:	19.3x6.1x9.9mm

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input voltage range				± 10	%
Input surge voltage (1sec. max.)	<ul style="list-style-type: none"> • 3.3V input • 5VDC input • 12VDC input • 15VDC input • 24VDC input • 48VDC input 			6 7 15 18 28 54	VDC VDC VDC VDC VDC VDC
Reflected Ripple Current*			20		mApk-pk
Input filter	Capacitor				

* Reflected ripple current measured with a simulated source inductance of 12 μ H and a source capacitor Cin(47 μ F, ESR<1.0 Ω at 100KHz).

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute	3000			VDC
Isolation resistance	Test at 500VDC	1000			M Ω
Isolation capacitance			60		pF

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy				± 3	%
Line regulation	For Vin change of $\pm 1\%$			± 1.2	%
Load regulation	20% to 100% load • 3.3V output • Others			20 10	% %
Temperature coefficient	100% full load		± 0.02		%/°C
Ripple & Noise	20MHz Bandwidth			75	mVp-p
Switching frequency	Full load, nominal input		80		KHz

EMC specifications

EMI	CE*	EN55032	CLASS B
EMI	RE	EN55032	CLASS B
EMS	ESD	IEC/EN61000-4-2	perf. Criteria A
EMS	RS	IEC/EN61000-4-3	perf. Criteria A
EMS	EFT**	IEC/EN61000-4-4	perf. Criteria A
EMS	Surge**	IEC/EN61000-4-5	perf. Criteria A
EMS	CS	IEC/EN61000-4-6	perf. Criteria A
EMS	PFMF	IEC/EN61000-4-8	perf. Criteria A

* Input filter components are required to help meet conducted emissions Class B, also see section EMI filter on page 4.

** An external filter capacitor is required if the module has to meet IEC61000-4-4/IEC61000-4-5, also see section EFT/Surge filter on page 4.

Example:

2S7BE_0505D3U

2 = 2Watt; S7 = SIP7; B = Pinning; E = Cost effective; 5Vin; 5Vout;

D = Dual Output; 3 = 3kVDC; U = Unregulated Output

2S7BE_3U series

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Product Selection Guide

Single Output

Part Number	Input Voltage [V]	Output Voltage [VDC]	Input current [mA]		Output current [mA]	Capacitive load [μ F, max]	Efficiency [%, typ]
			No load	Full load			
2S7BE_0303S3U	3.3	3.3	26	797	400	470	76
2S7BE_0305S3U	3.3	5	30	797	400	470	76
2S7BE_0309S3U	3.3	9	30	758	222.2	470	80
2S7BE_0312S3U	3.3	12	35	748	166.7	470	81
2S7BE_0315S3U	3.3	15	40	777	133.3	470	78
2S7BE_0324S3U	3.3	24	35	767	83.3	470	79
2S7BE_0503S3U	5	3.3	30	367	400	470	72
2S7BE_0505S3U	5	5	30	512	400	470	78
2S7BE_0509S3U	5	9	30	500	222.2	470	80
2S7BE_0512S3U	5	12	30	487	166.7	470	82
2S7BE_0515S3U	5	15	30	487	133.3	470	82
2S7BE_0524S3U	5	24	30	487	83.3	470	82
2S7BE_1203S3U	12	3.3	36	169	400	470	65
2S7BE_1205S3U	12	5	20	216	400	470	77
2S7BE_1209S3U	12	9	20	208	222.2	470	80
2S7BE_1212S3U	12	12	20	203	166.7	470	82
2S7BE_1215S3U	12	15	20	203	133.3	470	82
2S7BE_1224S3U	12	24	20	208	83.3	470	80
2S7BE_2403S3U	24	3.3	10	76	400	470	72
2S7BE_2405S3U	24	5	10	105	400	470	79
2S7BE_2409S3U	24	9	10	104	222.2	470	80
2S7BE_2412S3U	24	12	10	102	166.7	470	80
2S7BE_2415S3U	24	15	10	101	133.3	470	82
2S7BE_2424S3U	24	24	10	104	83.3	470	80
2S7BE_4803S3U	48	3.3	6	45	400	470	60
2S7BE_4805S3U	48	5	6	54	400	470	77
2S7BE_4809S3U	48	9	6	54	222.2	470	77
2S7BE_4812S3U	48	12	6	53	166.7	470	78
2S7BE_4815S3U	48	15	6	53	133.3	470	78
2S7BE_4824S3U	48	24	6	55	83.3	470	75

2S7BE_3U series

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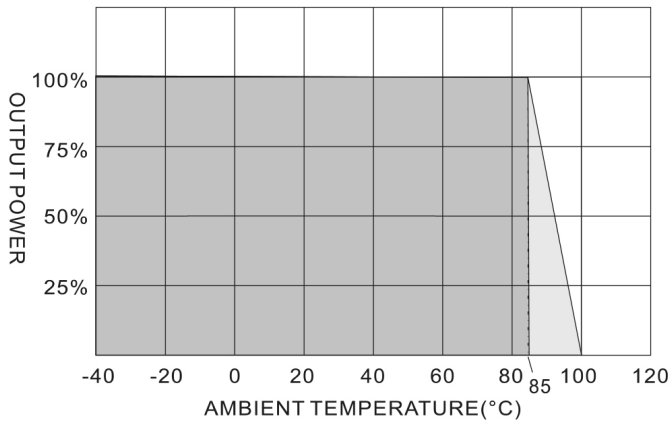
Product Selection Guide

Dual Output

Part Number	Input Voltage [V]	Output Voltage [VDC]	Input current		Output current [mA]	Capacitive load [μ F, max]	Efficiency [%, typ]
			No load [mA, max]	Full load [mA, typ]			
2S7BE_0303D3U	3.3	\pm 3.3	25	797	\pm 200	\pm 220	76
2S7BE_0305D3U	3.3	\pm 5	40	777	\pm 200	\pm 220	78
2S7BE_0309D3U	3.3	\pm 9	40	797	\pm 111.1	\pm 220	76
2S7BE_0312D3U	3.3	\pm 12	45	777	\pm 83.3	\pm 220	78
2S7BE_0315D3U	3.3	\pm 15	45	777	\pm 66.67	\pm 220	78
2S7BE_0324D3U	3.3	\pm 24	45	767	\pm 41.67	\pm 220	79
2S7BE_0503D3U	5	\pm 3.3	30	406	\pm 200	\pm 220	65
2S7BE_0505D3U	5	\pm 5	30	555	\pm 200	\pm 220	72
2S7BE_0509D3U	5	\pm 9	30	519	\pm 111.1	\pm 220	77
2S7BE_0512D3U	5	\pm 12	30	512	\pm 83.3	\pm 220	78
2S7BE_0515D3U	5	\pm 15	30	500	\pm 66.67	\pm 220	80
2S7BE_0524D3U	5	\pm 24	30	500	\pm 41.67	\pm 220	80
2S7BE_1203D3U	12	\pm 3.3	20	164	\pm 200	\pm 220	67
2S7BE_1205D3U	12	\pm 5	20	222	\pm 200	\pm 220	75
2S7BE_1209D3U	12	\pm 9	20	216	\pm 111.1	\pm 220	77
2S7BE_1212D3U	12	\pm 12	20	203	\pm 83.3	\pm 220	82
2S7BE_1215D3U	12	\pm 15	20	203	\pm 66.67	\pm 220	82
2S7BE_1224D3U	12	\pm 24	20	203	\pm 41.67	\pm 220	82
2S7BE_2403D3U	24	\pm 3.3	10	80	\pm 200	\pm 220	68
2S7BE_2405D3U	24	\pm 5	10	111	\pm 200	\pm 220	75
2S7BE_2409D3U	24	\pm 9	10	104	\pm 111.1	\pm 220	80
2S7BE_2412D3U	24	\pm 12	10	101	\pm 83.3	\pm 220	82
2S7BE_2415D3U	24	\pm 15	10	101	\pm 66.67	\pm 220	82
2S7BE_2424D3U	24	\pm 24	10	101	\pm 41.67	\pm 220	82
2S7BE_4803D3U	48	\pm 3.3	6	45	\pm 200	\pm 220	60
2S7BE_4805D3U	48	\pm 5	6	57	\pm 200	\pm 220	73
2S7BE_4809D3U	48	\pm 9	6	54	\pm 111.1	\pm 220	77
2S7BE_4812D3U	48	\pm 12	6	52	\pm 83.3	\pm 220	80
2S7BE_4815D3U	48	\pm 15	6	52	\pm 66.67	\pm 220	80
2S7BE_4824D3U	48	\pm 24	6	52	\pm 41.67	\pm 220	80

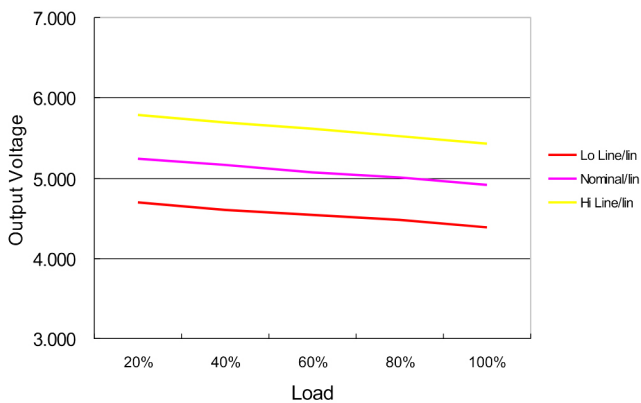
Typical characteristics

Derating Curve



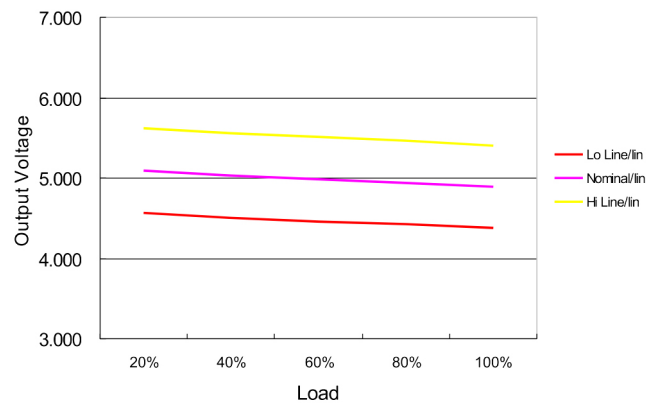
Loading vs. output

LOADING VS OUTPUT VOLTAGE



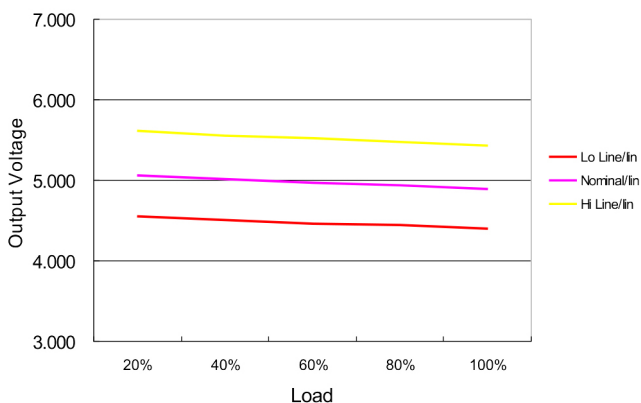
2S7BE_05yy type

LOADING VS OUTPUT VOLTAGE



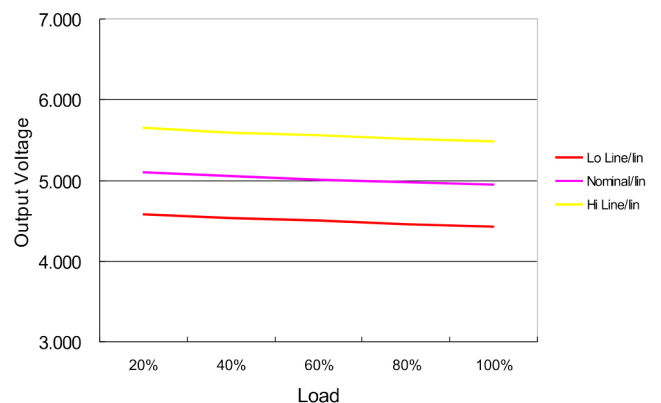
2S7BE_12yy type

LOADING VS OUTPUT VOLTAGE



2S7BE_24yy type

LOADING VS OUTPUT VOLTAGE

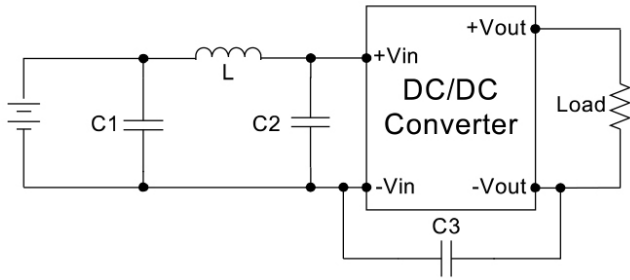


2S7BE_48yy type

2S7BE_3U series

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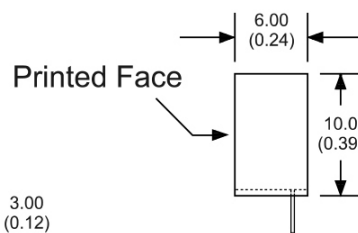
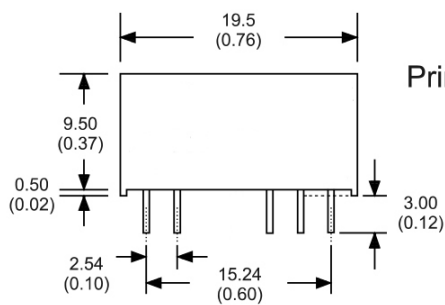
EMI filter



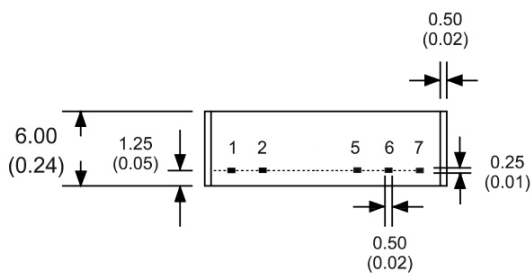
Model	C1	L	C2	C3
2S7BE_03xx3U	1210, 2.2μF/100V	18μH		
2S7BE_05xx3U	1210, 2.2μF/100V	18μH		
2S7BE_12xx3U	1210, 2.2μF/100V	18μH		
2S7BE_15xx3U	1210, 2.2μF/100V	18μH		
2S7BE_24xx3U	1210, 2.2μF/100V	18μH	1210, 2.2μF/100V	1206, 470pF/2KV
2S7BE_48xx3U	Electrolytic capacitor, 10μF/100V	18μH	1210, 2.2μF/100V	1206, 470pF/2KV

Input filter components (C1, L, C2, C3) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.

Mechanical dimensions



* The thickness of 48V input voltage model is 7.20(0.28)



Pin connections		
Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	N.P.	Common
7	+Vout	+Vout

All dimensions are typical in mm (inch)
 Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
 Pin pitch and length tolerance: ± 0.35 (± 0.014)
 Case tolerance: ± 0.5 (± 0.02)