

## 2S7A\_1U series

2W Single Output - Fixed Input - Isolated & Unregulated  
ECO - SIP Package



### DC-DC Converter

2 Watt

-  Small footprint
-  7 Pin SIL package
-  Low ripple and noise
-  1kVDC isolation
-  RoHS compliance
-  Temperature range: -40°C ~ +85°C
-  Efficiency up to 80%
-  Internal SMD construction

The 2S7A\_1U series is a family of cost effective 2W single & dual output DC-DC converters. These converters achieve low cost and ultra-miniature SIP7 pin size. Devices are encapsulated using flame retardant resin. High performance features include 1000VDC input/output isolation, high efficiency operation and output voltage accuracy of  $\pm 3\%$  maximum. Standard features include an input range of  $\pm 10\%$  tolerance and low output ripple and noise.



#### Common specifications

Short circuit protection:	1 second
Case temperature:	100°C MAX
Cooling:	Free air convection
Operation temperature range:	-40°C – +85°C
Storage temperature range:	-55°C – +125°C
Soldering temperature:	260°C (1.5mm from case for 10 sec.)
Storage humidity range:	< 95%
Case material:	Plastic [UL94-V0]
Pin material:	0.5mm Alloy42 solder-coated
Potting material:	Plastic [UL94-V0]
Safety standard:	IEC 60950-1
MTBF:	>3,500,000 hours
Weight:	2.3g
Dimensions:	19.5 x 7 x 10mm

#### Input specifications

Item	Test condition	Min	Typ	Max	Units
Voltage range				$\pm 10$	%
Input filter	Capacitor				
Input reflected ripple current	Simulated source inductance of 12 $\mu$ H		20		mApk-pk
Input surge voltage (100ms)	<ul style="list-style-type: none"> <li>• 3.3VDC input</li> <li>• 5VDC input</li> <li>• 12VDC input</li> <li>• 15VDC input</li> <li>• 24VDC input</li> <li>• 48VDC input</li> </ul>			6 7 15 18 28 54	VDC VDC VDC VDC VDC VDC

#### Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute	1000			VDC
Isolation resistance		1000			M $\Omega$
Isolation capacitance			60		pF

#### Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	100% full load			$\pm 3$	%
Line regulation	Per Vin change of $\pm 1\%$			$\pm 1.2$	%
Load regulation	10% to 100% full load • all output versions			15	%
Temperature coefficient	100% full load			$\pm 0.03$	%/°C
Ripple&Noise	20MHz Bandwidth		75		mVpk-pk
Switching frequency	Full load, nominal input		70		KHz

#### EMC specifications

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

\* Input filter components are required to help meet conducted emissions class B, which application refer to the EMI filter of design & feature configuration.

\*\* An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.

#### Example:

2S7A\_0505S1U  
2= 2Watt; S7= SIP7; A= Pinning; 5Vin; 5Vout; S= Single Output;  
1= 1kVDC; U= Unregulated Output

#### Note:

1. Operation under minimum load will not damage the converter; However, they may not meet all specification listed, and that will reduce the life of product.
2. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
3. In this datasheet, all the test methods of indications are based on corporate standards.
4. Only typical models listed, other models may be different, please contact our technical person for more details.

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Part Number	Input Voltage [V]	Input Current [mA]		Output Voltage [VDC]	Output Current [mA, max]	Efficiency [%, max]	Capacitor load (μF, max)
		no load	full load				
2S7A_0303S1U	3.3	26	797	3.3	400	76	470
2S7A_0305S1U	3.3	30	797	5	400	76	470
2S7A_0307S1U	3.3	30	808	7.2	277.7	75	470
2S7A_0309S1U	3.3	30	758	9	222.2	80	470
2S7A_0312S1U	3.3	35	748	12	166.7	81	470
2S7A_0315S1U	3.3	40	777	15	133.3	78	470
2S7A_0318S1U	3.3	35	787	18	111.1	77	470
2S7A_0324S1U	3.3	35	767	24	83.3	79	470
2S7A_0503S1U	5	30	367	3.3	400	72	470
2S7A_0505S1U	5	30	512	5	400	78	470
2S7A_0507S1U	5	30	500	7.2	277.7	80	470
2S7A_0509S1U	5	30	500	9	222.2	80	470
2S7A_0512S1U	5	30	487	12	166.7	82	470
2S7A_0515S1U	5	30	487	15	133.3	82	470
2S7A_0518S1U	5	30	487	18	111.1	82	470
2S7A_0524S1U	5	30	487	24	83.3	82	470
2S7A_1203S1U	12	36	169	3.3	400	65	470
2S7A_1205S1U	12	20	216	5	400	77	470
2S7A_1207S1U	12	20	208	7.2	277.7	80	470
2S7A_1209S1U	12	20	208	9	222.2	80	470
2S7A_1212S1U	12	20	203	12	166.7	82	470
2S7A_1215S1U	12	20	203	15	133.3	82	470
2S7A_1218S1U	12	20	208	18	111.1	80	470
2S7A_1224S1U	12	20	208	24	83.3	80	470
2S7A_2403S1U	24	10	76	3.3	400	72	470
2S7A_2405S1U	24	10	105	5	400	79	470
2S7A_2407S1U	24	10	104	7.2	277.7	80	470
2S7A_2409S1U	24	10	104	9	222.2	80	470
2S7A_2412S1U	24	10	102	12	166.7	80	470
2S7A_2415S1U	24	10	101	15	133.3	82	470
2S7A_1218S1U	24	10	101	18	111.1	82	470
2S7A_1224S1U	24	10	104	24	83.3	80	470
2S7A_4803S1U	48	6	45	3.3	400	60	470
2S7A_4805S1U	48	6	54	5	400	77	470
2S7A_4807S1U	48	6	54	7.2	277.7	77	470
2S7A_4809S1U	48	6	54	9	222.2	77	470
2S7A_4812S1U	48	6	53	12	166.7	78	470
2S7A_4815S1U	48	6	53	15	133.3	78	470
2S7A_4818S1U	48	6	53	18	111.1	78	470
2S7A_4824S1U	48	6	55	24	83.3	75	470

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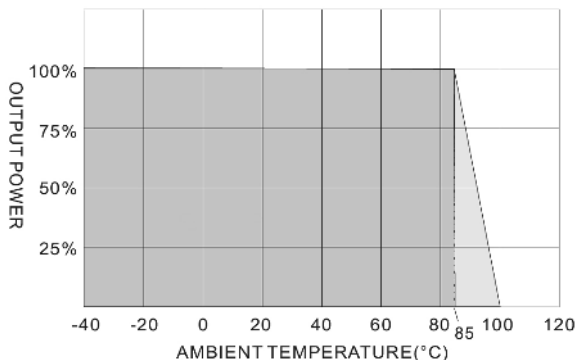
Part Number	Input Voltage [V]	Input Current [mA]		Output Voltage [VDC]	Output Current [mA, max]	Efficiency [%, max]	Capacitor load ( $\mu$ F, max)
		no load	full load				
2S7A_0303D1U	3.3	25	797	$\pm$ 3.3	$\pm$ 200	76	$\pm$ 220
2S7A_0305D1U	3.3	40	777	$\pm$ 5	$\pm$ 200	78	$\pm$ 220
2S7A_0307D1U	3.3	40	797	$\pm$ 7.2	$\pm$ 138.1	76	$\pm$ 220
2S7A_0309D1U	3.3	40	797	$\pm$ 9	$\pm$ 111.1	76	$\pm$ 220
2S7A_0312D1U	3.3	45	777	$\pm$ 12	$\pm$ 83.3	78	$\pm$ 220
2S7A_0315D1U	3.3	45	777	$\pm$ 15	$\pm$ 66.67	78	$\pm$ 220
2S7A_0318D1U	3.3	45	777	$\pm$ 18	$\pm$ 55.55	78	$\pm$ 220
2S7A_0324D1U	3.3	45	767	$\pm$ 24	$\pm$ 41.67	79	$\pm$ 220
2S7A_0503D1U	5	30	406	$\pm$ 3.3	$\pm$ 200	65	$\pm$ 220
2S7A_0505D1U	5	30	555	$\pm$ 5	$\pm$ 200	72	$\pm$ 220
2S7A_0507D1U	5	30	555	$\pm$ 7.2	$\pm$ 138.1	72	$\pm$ 220
2S7A_0509D1U	5	30	519	$\pm$ 9	$\pm$ 111.1	77	$\pm$ 220
2S7A_0512D1U	5	30	512	$\pm$ 12	$\pm$ 83.3	78	$\pm$ 220
2S7A_0515D1U	5	30	500	$\pm$ 15	$\pm$ 66.67	80	$\pm$ 220
2S7A_0518D1U	5	30	500	$\pm$ 18	$\pm$ 55.55	80	$\pm$ 220
2S7A_0524D1U	5	30	500	$\pm$ 24	$\pm$ 41.67	80	$\pm$ 220
2S7A_1203D1U	12	20	164	$\pm$ 3.3	$\pm$ 200	67	$\pm$ 220
2S7A_1205D1U	12	20	222	$\pm$ 5	$\pm$ 200	75	$\pm$ 220
2S7A_1207D1U	12	20	219	$\pm$ 7.2	$\pm$ 138.1	76	$\pm$ 220
2S7A_1209D1U	12	20	216	$\pm$ 9	$\pm$ 111.1	77	$\pm$ 220
2S7A_1212D1U	12	20	203	$\pm$ 12	$\pm$ 83.3	82	$\pm$ 220
2S7A_1215D1U	12	20	203	$\pm$ 15	$\pm$ 66.67	82	$\pm$ 220
2S7A_1218D1U	12	20	203	$\pm$ 18	$\pm$ 55.55	82	$\pm$ 220
2S7A_1224D1U	12	20	203	$\pm$ 24	$\pm$ 41.67	82	$\pm$ 220
2S7A_2403D1U	24	10	80	$\pm$ 3.3	$\pm$ 200	68	$\pm$ 220
2S7A_2405D1U	24	10	111	$\pm$ 5	$\pm$ 200	75	$\pm$ 220
2S7A_2407D1U	24	10	111	$\pm$ 7.2	$\pm$ 138.1	75	$\pm$ 220
2S7A_2409D1U	24	10	104	$\pm$ 9	$\pm$ 111.1	80	$\pm$ 220
2S7A_2412D1U	24	10	101	$\pm$ 12	$\pm$ 83.3	82	$\pm$ 220
2S7A_2415D1U	24	10	101	$\pm$ 15	$\pm$ 66.67	82	$\pm$ 220
2S7A_2418D1U	24	10	101	$\pm$ 18	$\pm$ 55.55	82	$\pm$ 220
2S7A_2424D1U	24	10	101	$\pm$ 24	$\pm$ 41.67	82	$\pm$ 220
2S7A_4803D1U	48	6	45	$\pm$ 3.3	$\pm$ 200	60	$\pm$ 220
2S7A_4805D1U	48	6	57	$\pm$ 5	$\pm$ 200	73	$\pm$ 220
2S7A_4807D1U	48	6	54	$\pm$ 7.2	$\pm$ 138.1	77	$\pm$ 220
2S7A_4809D1U	48	6	54	$\pm$ 9	$\pm$ 111.1	77	$\pm$ 220
2S7A_4812D1U	48	6	52	$\pm$ 12	$\pm$ 83.3	80	$\pm$ 220
2S7A_4815D1U	48	6	52	$\pm$ 15	$\pm$ 66.67	80	$\pm$ 220
2S7A_4818D1U	48	6	52	$\pm$ 18	$\pm$ 55.55	80	$\pm$ 220
2S7A_4824D1U	48	6	52	$\pm$ 24	$\pm$ 41.67	80	$\pm$ 220

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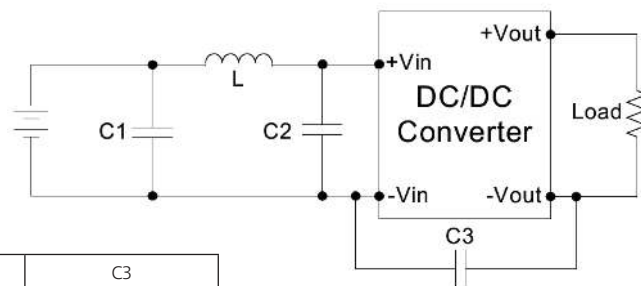
## Typical characteristics

Derating Curve



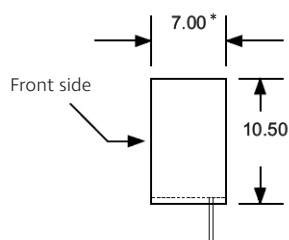
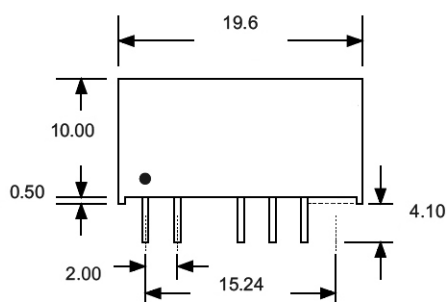
## EMI filter

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.



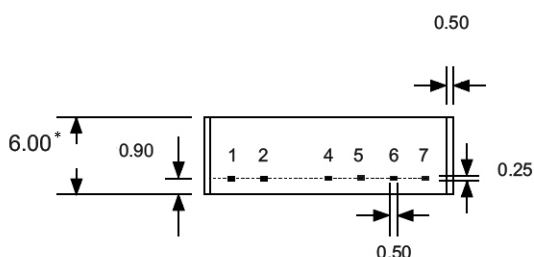
	C1	L	C2	C3
2S7A_03xxS1U	1210, 2.2μF/100V	18μH		
2S7A_05xxS1U	1210, 2.2μF/100V	18μH		
2S7A_12xxS1U	1210, 2.2μF/100V	18μH		
2S7A_15xxS1U	1210, 2.2μF/100V	18μH		
2S7A_24xxS1U	1210, 2.2μF/100V	18μH	1210, 2.2μF/100V	1206, 470pF/2KV
2S7A_48xxS1U	Electrolytic capacitor, 10μF/100V	18μH	1210, 2.2μF/100V	1206, 470pF/2KV

## Mechanical Dimensions



Pin connections:

PIN	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
4	-Vout	-Vout
5	N.P.	Common
6	+Vout	+Vout



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

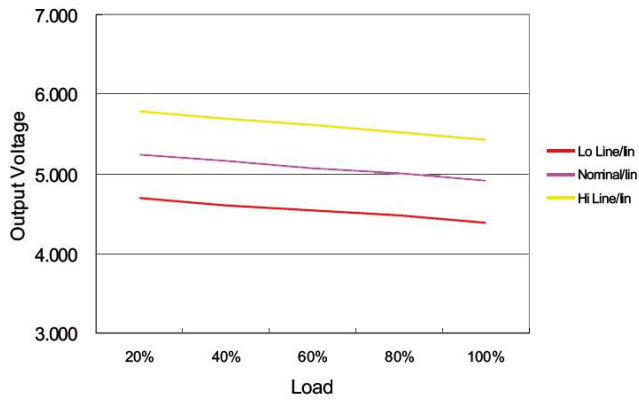
**Note:**  
Unit: mm [inch]  
Pin diameter: 0.5 ±0.05 [0.02 ±0.002]  
Pin pitch and length tolerance: ±0.35 [±0.014]  
Case tolerance: ±0.5 [±0.02]

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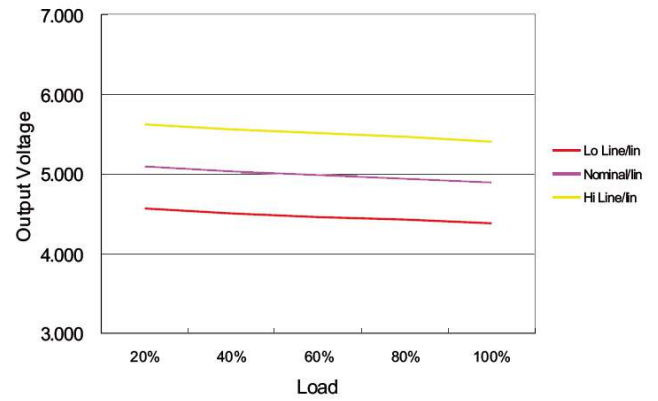
# Loading vs. output voltage

LOADING VS OUTPUT VOLTAGE



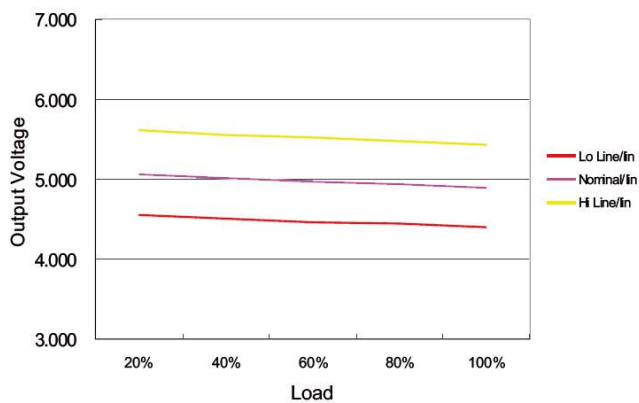
05 Models

LOADING VS OUTPUT VOLTAGE



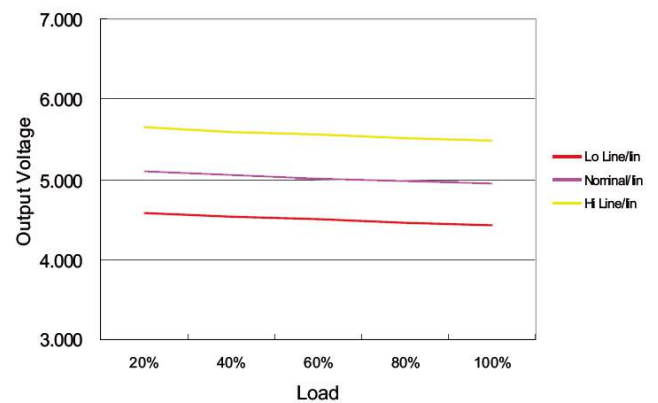
12 Models

LOADING VS OUTPUT VOLTAGE



24 Models

LOADING VS OUTPUT VOLTAGE



48 Models