



1D8E_3U series

1W - Single Output - Fixed Input - Isolated & Unregulated
MINIATURE DIP PACKAGE

DC-DC Converter

1 Watt

- ⊕ Efficiency up to 83%
- ⊕ Small Footprint
- ⊕ Miniature DIP package
- ⊕ Single output voltage
- ⊕ 3kVDC Isolation
- ⊕ Temperature Range: -40°C~+85°C
- ⊕ Industry standard pinout
- ⊕ UL94-V0 package
- ⊕ RoHS compliance
- ⊕ EMI complies with EN55022 Class B
- ⊕ Low ripple and noise

The 1D8E_3U series are specially designed for applications where a single power supply is isolated from the input power supply in a distributed power supply system on a circuit board.

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 the regulation of the output voltage and the output ripple and noise are not demanding.

Such as: purely digital circuits, ordinary low frequency analog circuits and IGBT power device driven circuits, etc.



Common specifications

Short circuit protection:	1 second
Maximum case temperature:	100°C
Cooling:	Nature convection
Operation temperature range:	-40°C~+85°C
Storage temperature range:	-40°C ~+125°C
Storage humidity range:	< 95%
Soldering temperature:	260°C MAX, 1.5mm from case for 10 sec
Safety standard:	IEC 60950-1
Case material:	Plastic [UL94-V0]
Pin material:	0.5mm Alloy42 solder-coated
Potting material:	Epoxy [UL94-V0]
MTBF (MIL-HDBK-217-F):	>1.121 Mhours
Weight:	1.5g
Dimensions:	0.46x0.24x0.40 inch

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input voltage range				± 10	%
Input surge voltage	<ul style="list-style-type: none"> • 3.3V models • 5V models • 12V models • 15V models • 24V models 			6 7 15 18 28	VDC VDC VDC VDC VDC
Input filter	Capacitor				
Reflected ripple current*			20		mApk-pk

* Measured with a simulated source inductance of 12μH.

Isolation specifications

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

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy				± 3	%
Line regulation	For Vin change of 1%			1.2	%
Load regulation	10% to 100% full load			15	%
Temperature drift	100% full load			± 0.02	%/°C
Ripple & noise	20MHz Bandwidth			100	mVp-p
Switching frequency	Full load, nominal input		80		KHz

EMC specifications

CE*	EN55032	CLASS B
RE	EN55032	CLASS B
ESD	IEC 61000-4-2	Perfect criteria A
RS	IEC 61000-4-3	Perfect criteria A
EFT**	IEC 61000-4-4	Perfect criteria A
Surge**	IEC 61000-4-5	Perfect criteria A
ESD	IEC 61000-4-6	Perfect criteria A
ESD	IEC 61000-4-8	Perfect 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 IEC 61000-4-4 and IEC 61000-4-5.

Example:

1D8E_0505S3U

1 = 1Watt; D8 = DIP8; E = Pinning; 05 = 5Vin; 05 = 5Vout;

S = Single Output; 3 = 3kVDC isolation; U = Unregulated Output

Note:

1. All specifications measured at TA = 25°C, humidity < 75%, nominal input voltage and rated output load unless otherwise specified.
2. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
3. Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.

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Part Number	Input Voltage [V]	Input current [mA]		Output Voltage [VDC]	Output current [mA]	Efficiency [%, typ]	Capacitor load* [µF, max]
		no load (max)	full load (typ)				
1D8E_0303S3U	3.3	25	421	3.3	303	72	220
1D8E_0305S3U	3.3	25	394	5	200	77	220
1D8E_0307S3U	3.3	25	384	7.2	138.9	79	220
1D8E_0309S3U	3.3	30	404	9	111.1	75	220
1D8E_0312S3U	3.3	45	473	12	100	77	220
1D8E_0315S3U	3.3	35	384	15	66.6	79	220
1D8E_0318S3U	3.3	35	399	18	55.5	76	220
1D8E_0324S3U	3.3	53	461	24	50	79	220
1D8E_0503S3U	5	20	257	3.3	303	78	220
1D8E_0505S3U	5	25	247	5	200	81	220
1D8E_0507S3U	5	16	241	7.2	138.9	83	220
1D8E_0509S3U	5	26	250	9	111.1	80	220
1D8E_0512S3U	5	25	300	12	100	80	220
1D8E_0515S3U	5	35	244	15	66.6	82	220
1D8E_0518S3U	5	25	247	18	55.5	81	220
1D8E_0524S3U	5	35	289	24	50	83	220
1D8E_1203S3U	12	15	107	3.3	303	78	220
1D8E_1205S3U	12	16	105	5	200	79	220
1D8E_1207S3U	12	16	100	7.2	138.9	83	220
1D8E_1209S3U	12	15	107	9	111.1	78	220
1D8E_1212S3U	12	15	125	12	100	80	220
1D8E_1215S3U	12	15	105	15	66.6	79	220
1D8E_1218S3U	12	20	104	18	55.5	80	220
1D8E_1224S3U	12	25	123	24	50	71	220
1D8E_1503S3U	15	15	89	3.3	303	75	220
1D8E_1505S3U	15	9	82	5	200	81	220
1D8E_1507S3U	15	12	88	7.2	138.9	76	220
1D8E_1509S3U	15	10	90	9	111.1	74	220
1D8E_1512S3U	15	13	100	12	100	80	220
1D8E_1515S3U	15	15	84	15	66.6	79	220
1D8E_1518S3U	15	12	85	18	55.5	78	220
1D8E_1524S3U	15	10	99	24	50	81	220
1D8E_2403S3U	24	8	54	3.3	303	77	220
1D8E_2405S3U	24	8	52	5	200	80	220
1D8E_2407S3U	24	10	54	7.2	138.9	77	220
1D8E_2409S3U	24	7	54	9	111.1	77	220
1D8E_2412S3U	24	8	62	12	100	80	220
1D8E_2415S3U	24	8	51	15	66.6	81	220
1D8E_2418S3U	24	8	52	18	55.5	80	220
1D8E_2424S3U	24	9	60	24	50	83	220

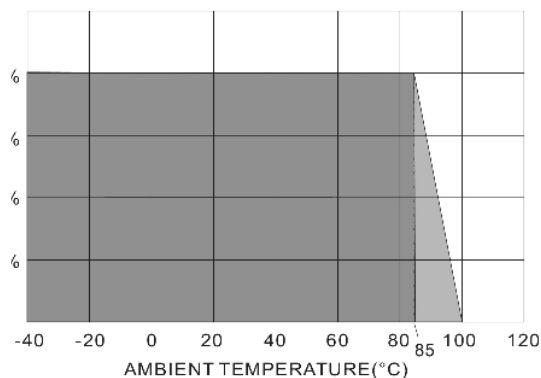
* Tested by minimal Vin and constant resistive load.

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Typical characteristics

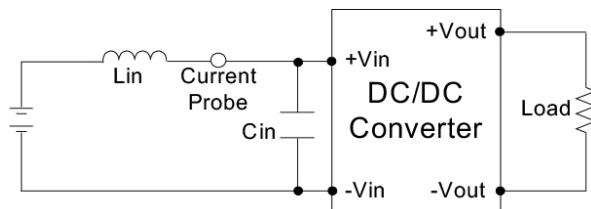
Derating Curve



Test configurations

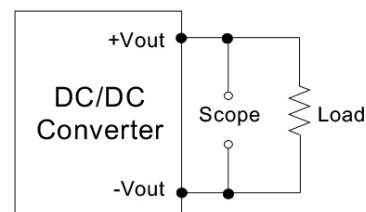
Input reflected ripple current test step

Input reflected ripple current is measured through a source inductor L_{in} ($12\mu H$) and a source capacitor C_{in} ($47\mu F$, $ESR < 1.0\Omega$) at 100KHz) at nominal input and full load.



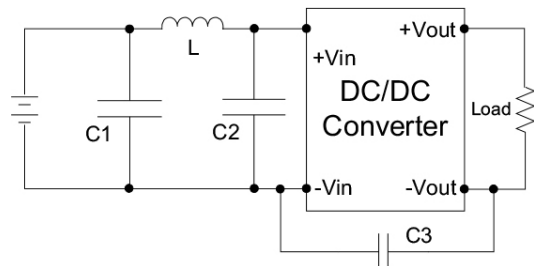
Output ripple & noise measurement test

The scope measurement bandwidth is 20MHz.



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.



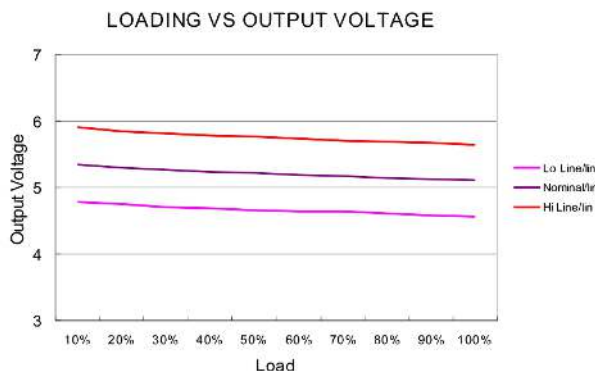
	C1	L	C2	C3
1D8E_03xx_S3U	1210, 2.2 μF /100V	18 μH		
1D8E_05xx_S3U	1210, 2.2 μF /100V	18 μH		
1D8E_12xx_S3U	1210, 2.2 μF /100V	18 μH		
1D8E_15xx_S3U	1210, 2.2 μF /100V	18 μH		
1D8E_24xx_S3U	1210, 2.2 μF /100V	18 μH	1210, 2.2 μF /100V	1206, 470pF/2KV

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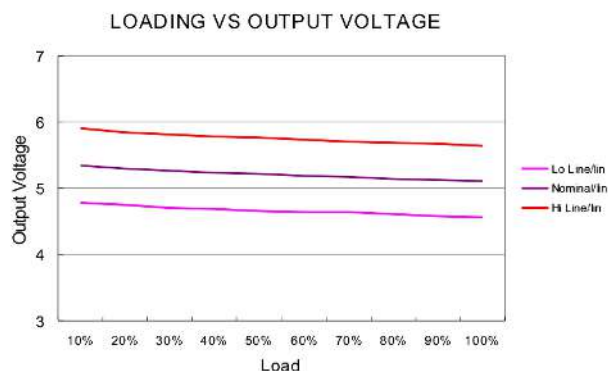
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Loading vs. input

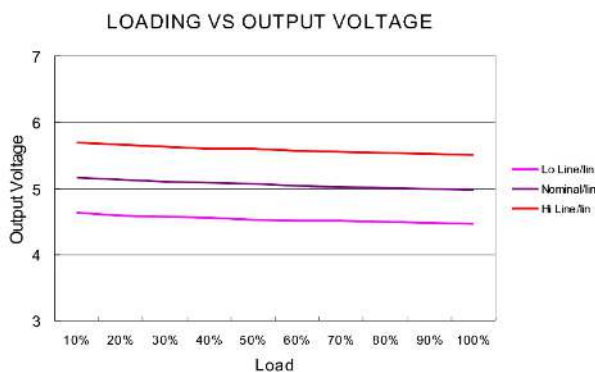
05 models



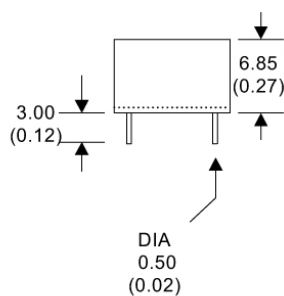
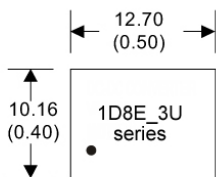
12 models



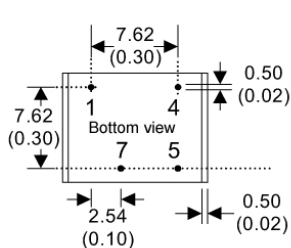
24 models



Mechanical dimensions



Pin connections	
PIN	SINGLE
1	-Vin
4	+Vin
5	+Vout
7	-Vout



Note:

The thickness of 48V input voltage model is 7.50mm (0.29inch)

Unit: mm[inch]

Pin diameter: 0.5mm ± 0.35mm [0.02inch ± 0.002inch]

Pin pitch and length tolerance: ± 0.35mm [± 0.014inch]

Case tolerances: ± 0.5mm [± 0.02inch]