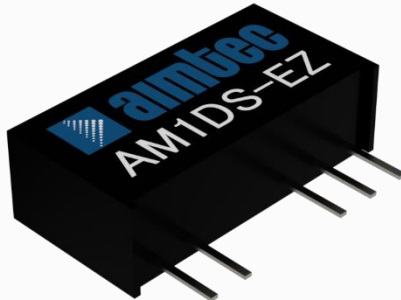


AM1DS-EZ

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samples



SIP7 Package

The AM1DS-EZ is a 1W SIP7 DC/DC converter that offers great cost savings thanks to an improved manufacturing process. It also features excellent reliability and performance while offering a standard input voltage range of 3.3-24VDC as well as an output voltage of -24 to 24V. This compact SIP7 design will surely benefit your new system design.

This new series offers great operating temperatures, from -40 to 105°C with full power up to 100°C. Also, an isolation of 1500VDC or 3000VDC for improved reliability and system safety as well as a great 3,500,000h MTBF come standard.

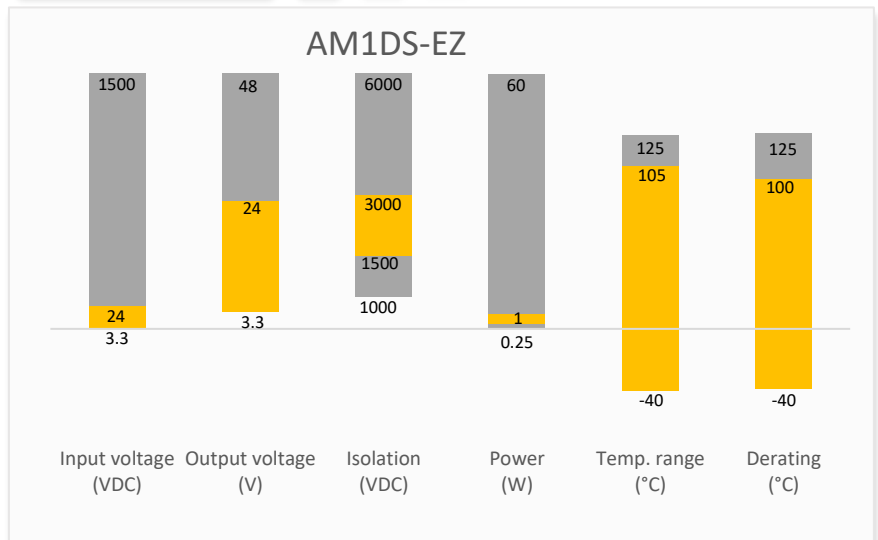
The AM1DS-EZ is suitable for many applications such as for instrumentation, industrial control, industrial applications, communication and IoT applications.

Features

- Continuous Short circuit protection
- Operating Temp: -40 °C to +105 °C
- Industry standard SIP7 pin-out
- Efficiency up to 87%
- Unregulated output
- Designed to Meet UL/cUL/IEC/EN 62368-1



Summary



Training



Product Training Video
(click to open)



Press Release

Coming Soon!

Application Notes

Applications



IoT



Industrial



Telecom



Portable Equipment

Models & Specifications



Single Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current max (mA)	Isolation VDC)	Maximum capacitive Load (μF)	Efficiency Typ. (%)
AM1DS-0303SEZ	3.3 (2.97-3.63)	3.3	303	1500	2400	76
AM1DS-0305SEZ	3.3 (2.97-3.63)	5	200	1500	2400	82
AM1DS-0309SEZ	3.3 (2.97-3.63)	9	112	1500	1000	83
AM1DS-0312SEZ	3.3 (2.97-3.63)	12	84	1500	470	84
AM1DS-0315SEZ	3.3 (2.97-3.63)	15	67	1500	330	84
AM1DS-0324SEZ	3.3 (2.97-3.63)	24	42	1500	100	85
AM1DS-0503SEZ	5 (4.5-5.5)	3.3	303	1500	2400	76
AM1DS-0505SEZ	5 (4.5-5.5)	5	200	1500	2400	82
AM1DS-0509SEZ	5 (4.5-5.5)	9	112	1500	1000	83
AM1DS-0512SEZ	5 (4.5-5.5)	12	84	1500	470	84
AM1DS-0515SEZ	5 (4.5-5.5)	15	67	1500	330	84
AM1DS-0524SEZ	5 (4.5-5.5)	24	42	1500	100	85
AM1DS-0903SEZ	9 (8.1-9.9)	3.3	303	1500	2400	76
AM1DS-0905SEZ	9 (8.1-9.9)	5	200	1500	2400	82
AM1DS-0909SEZ	9 (8.1-9.9)	9	112	1500	1000	83
AM1DS-0912SEZ	9 (8.1-9.9)	12	84	1500	470	84
AM1DS-0915SEZ	9 (8.1-9.9)	15	67	1500	330	84
AM1DS-0924SEZ	9 (8.1-9.9)	24	42	1500	100	85
AM1DS-1203SEZ	12 (9.6-14.4)	3.3	303	1500	2400	78
AM1DS-1205SEZ	12 (9.6-14.4)	5	200	1500	2400	82
AM1DS-1209SEZ	12 (9.6-14.4)	9	112	1500	1000	85
AM1DS-1212SEZ	12 (9.6-14.4)	12	84	1500	680	85
AM1DS-1215SEZ	12 (9.6-14.4)	15	67	1500	330	87
AM1DS-1224SEZ	12 (9.6-14.4)	24	42	1500	220	85
AM1DS-1503SEZ	15 (12-18)	3.3	303	1500	2400	78
AM1DS-1505SEZ	15 (12-18)	5	200	1500	2400	82
AM1DS-1509SEZ	15 (12-18)	9	112	1500	1000	85
AM1DS-1512SEZ	15 (12-18)	12	84	1500	680	85
AM1DS-1515SEZ	15 (12-18)	15	67	1500	330	87
AM1DS-1524SEZ	15 (12-18)	24	42	1500	220	85
AM1DS-2403SEZ	24 (19.2-28.8)	3.3	303	1500	2400	78
AM1DS-2405SEZ	24 (19.2-28.8)	5	200	1500	2400	82
AM1DS-2409SEZ	24 (19.2-28.8)	9	112	1500	1000	85
AM1DS-2412SEZ	24 (19.2-28.8)	12	84	1500	680	85
AM1DS-2415SEZ	24 (19.2-28.8)	15	67	1500	330	87
AM1DS-2424SEZ	24 (19.2-28.8)	24	42	1500	220	85
AM1DS-0303SH30EZ	3.3 (2.97-3.63)	3.3	303	3000	2400	76
AM1DS-0305SH30EZ	3.3 (2.97-3.63)	5	200	3000	2400	82
AM1DS-0309SH30EZ	3.3 (2.97-3.63)	9	112	3000	1000	83
AM1DS-0312SH30EZ	3.3 (2.97-3.63)	12	84	3000	470	84
AM1DS-0315SH30EZ	3.3 (2.97-3.63)	15	67	3000	330	84
AM1DS-0324SH30EZ	3.3 (2.97-3.63)	24	42	3000	100	85
AM1DS-0503SH30EZ	5 (4.5-5.5)	3.3	303	3000	2400	76

AM1DS-0505SH30EZ	5 (4.5-5.5)	5	200	3000	2400	82
AM1DS-0509SH30EZ	5 (4.5-5.5)	9	112	3000	1000	83
AM1DS-0512SH30EZ	5 (4.5-5.5)	12	84	3000	470	84
AM1DS-0515SH30EZ	5 (4.5-5.5)	15	67	3000	330	84
AM1DS-0524SH30EZ	5 (4.5-5.5)	24	42	3000	100	85
AM1DS-0903SH30EZ	9 (8.1-9.9)	3.3	303	3000	2400	76
AM1DS-0905SH30EZ	9 (8.1-9.9)	5	200	3000	2400	82
AM1DS-0909SH30EZ	9 (8.1-9.9)	9	112	3000	1000	83
AM1DS-0912SH30EZ	9 (8.1-9.9)	12	84	3000	470	84
AM1DS-0915SH30EZ	9 (8.1-9.9)	15	67	3000	330	84
AM1DS-0924SH30EZ	9 (8.1-9.9)	24	42	3000	100	85
AM1DS-1203SH30EZ	12 (9.6-14.4)	3.3	303	3000	2400	78
AM1DS-1205SH30EZ	12 (9.6-14.4)	5	200	3000	2400	82
AM1DS-1209SH30EZ	12 (9.6-14.4)	9	112	3000	1000	85
AM1DS-1212SH30EZ	12 (9.6-14.4)	12	84	3000	680	85
AM1DS-1215SH30EZ	12 (9.6-14.4)	15	67	3000	330	87
AM1DS-1224SH30EZ	12 (9.6-14.4)	24	42	3000	220	85
AM1DS-1503SH30EZ	15 (12-18)	3.3	303	3000	2400	78
AM1DS-1505SH30EZ	15 (12-18)	5	200	3000	2400	82
AM1DS-1509SH30EZ	15 (12-18)	9	112	3000	1000	85
AM1DS-1512SH30EZ	15 (12-18)	12	84	3000	680	85
AM1DS-1515SH30EZ	15 (12-18)	15	67	3000	330	87
AM1DS-1524SH30EZ	15 (12-18)	24	42	3000	220	85
AM1DS-2403SH30EZ	24 (19.2-28.8)	3.3	303	3000	2400	78
AM1DS-2405SH30EZ	24 (19.2-28.8)	5	200	3000	2400	82
AM1DS-2409SH30EZ	24 (19.2-28.8)	9	112	3000	1000	85
AM1DS-2412SH30EZ	24 (19.2-28.8)	12	84	3000	680	85
AM1DS-2415SH30EZ	24 (19.2-28.8)	15	67	3000	330	87
AM1DS-2424SH30EZ	24 (19.2-28.8)	24	42	3000	220	85

Dual Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Output Current max (mA)	Isolation VDC)	Maximum capacitive Load (μF)	Efficiency Typ. (%)
AM1DS-0303DEZ	3.3 (2.97-3.63)	±3.3	±151	1500	±1200	76
AM1DS-0305DEZ	3.3 (2.97-3.63)	±5	±100	1500	±1200	82
AM1DS-0309DEZ	3.3 (2.97-3.63)	±9	±56	1500	±470	83
AM1DS-0312DEZ	3.3 (2.97-3.63)	±12	±42	1500	±220	84
AM1DS-0315DEZ	3.3 (2.97-3.63)	±15	±34	1500	±220	84
AM1DS-0324DEZ	3.3 (2.97-3.63)	±24	±21	1500	±47	85
AM1DS-0503DEZ	5 (4.5-5.5)	±3.3	±151	1500	±1200	76
AM1DS-0505DEZ	5 (4.5-5.5)	±5	±100	1500	±1200	82
AM1DS-0509DEZ	5 (4.5-5.5)	±9	±56	1500	±470	83
AM1DS-0512DEZ	5 (4.5-5.5)	±12	±42	1500	±220	84
AM1DS-0515DEZ	5 (4.5-5.5)	±15	±34	1500	±220	84
AM1DS-0524DEZ	5 (4.5-5.5)	±24	±21	1500	±47	85
AM1DS-0903DEZ	9 (8.1-9.9)	±3.3	±151	1500	±1200	76
AM1DS-0905DEZ	9 (8.1-9.9)	±5	±100	1500	±1200	82
AM1DS-0909DEZ	9 (8.1-9.9)	±9	±56	1500	±470	83

AM1DS-0912DEZ	9 (8.1-9.9)	±12	±42	1500	±220	84
AM1DS-0915DEZ	9 (8.1-9.9)	±15	±34	1500	±220	84
AM1DS-0924DEZ	9 (8.1-9.9)	±24	±21	1500	±47	85
AM1DS-1203DEZ	12 (9.6-14.4)	±3.3	±151	1500	±1200	78
AM1DS-1205DEZ	12 (9.6-14.4)	±5	±100	1500	±1200	82
AM1DS-1209DEZ	12 (9.6-14.4)	±9	±56	1500	±680	85
AM1DS-1212DEZ	12 (9.6-14.4)	±12	±42	1500	±330	85
AM1DS-1215DEZ	12 (9.6-14.4)	±15	±34	1500	±220	87
AM1DS-1224DEZ	12 (9.6-14.4)	±24	±21	1500	±100	85
AM1DS-1503DEZ	15 (12-18)	±3.3	±151	1500	±1200	78
AM1DS-1505DEZ	15 (12-18)	±5	±100	1500	±1200	82
AM1DS-1509DEZ	15 (12-18)	±9	±56	1500	±680	85
AM1DS-1512DEZ	15 (12-18)	±12	±42	1500	±330	85
AM1DS-1515DEZ	15 (12-18)	±15	±34	1500	±220	87
AM1DS-1524DEZ	15 (12-18)	±24	±21	1500	±100	85
AM1DS-2403DEZ	24 (19.2-28.8)	±3.3	±151	1500	±1200	78
AM1DS-2405DEZ	24 (19.2-28.8)	±5	±100	1500	±1200	82
AM1DS-2409DEZ	24 (19.2-28.8)	±9	±56	1500	±680	85
AM1DS-2412DEZ	24 (19.2-28.8)	±12	±42	1500	±330	85
AM1DS-2415DEZ	24 (19.2-28.8)	±15	±34	1500	±220	87
AM1DS-2424DEZ	24 (19.2-28.8)	±24	±21	1500	±100	85
AM1DS-0303DH30EZ	3.3 (2.97-3.63)	±3.3	±151	3000	±1200	76
AM1DS-0305DH30EZ	3.3 (2.97-3.63)	±5	±100	3000	±1200	82
AM1DS-0309DH30EZ	3.3 (2.97-3.63)	±9	±56	3000	±470	83
AM1DS-0312DH30EZ	3.3 (2.97-3.63)	±12	±42	3000	±220	84
AM1DS-0315DH30EZ	3.3 (2.97-3.63)	±15	±34	3000	±220	84
AM1DS-0324DH30EZ	3.3 (2.97-3.63)	±24	±21	3000	±47	85
AM1DS-0503DH30EZ	5 (4.5-5.5)	±3.3	±151	3000	±1200	76
AM1DS-0505DH30EZ	5 (4.5-5.5)	±5	±100	3000	±1200	82
AM1DS-0509DH30EZ	5 (4.5-5.5)	±9	±56	3000	±470	83
AM1DS-0512DH30EZ	5 (4.5-5.5)	±12	±42	3000	±220	84
AM1DS-0515DH30EZ	5 (4.5-5.5)	±15	±34	3000	±220	84
AM1DS-0524DH30EZ	5 (4.5-5.5)	±24	±21	3000	±47	85
AM1DS-0903DH30EZ	9 (8.1-9.9)	±3.3	±151	3000	±1200	76
AM1DS-0905DH30EZ	9 (8.1-9.9)	±5	±100	3000	±1200	82
AM1DS-0909DH30EZ	9 (8.1-9.9)	±9	±56	3000	±470	83
AM1DS-0912DH30EZ	9 (8.1-9.9)	±12	±42	3000	±220	84
AM1DS-0915DH30EZ	9 (8.1-9.9)	±15	±34	3000	±220	84
AM1DS-0924DH30EZ	9 (8.1-9.9)	±24	±21	3000	±47	85
AM1DS-1203DH30EZ	12 (9.6-14.4)	±3.3	±151	3000	±1200	78
AM1DS-1205DH30EZ	12 (9.6-14.4)	±5	±100	3000	±1200	82
AM1DS-1209DH30EZ	12 (9.6-14.4)	±9	±56	3000	±680	85
AM1DS-1212DH30EZ	12 (9.6-14.4)	±12	±42	3000	±330	85
AM1DS-1215DH30EZ	12 (9.6-14.4)	±15	±34	3000	±220	87
AM1DS-1224DH30EZ	12 (9.6-14.4)	±24	±21	3000	±100	85
AM1DS-1503DH30EZ	15 (12-18)	±3.3	±151	3000	±1200	78
AM1DS-1505DH30EZ	15 (12-18)	±5	±100	3000	±1200	82
AM1DS-1509DH30EZ	15 (12-18)	±9	±56	3000	±680	85
AM1DS-1512DH30EZ	15 (12-18)	±12	±42	3000	±330	85

AM1DS-1515DH30EZ	15 (12-18)	±15	±34	3000	±220	87
AM1DS-1524DH30EZ	15 (12-18)	±24	±21	3000	±100	85
AM1DS-2403DH30EZ	24 (19.2-28.8)	±3.3	±151	3000	±1200	78
AM1DS-2405DH30EZ	24 (19.2-28.8)	±5	±100	3000	±1200	82
AM1DS-2409DH30EZ	24 (19.2-28.8)	±9	±56	3000	±680	85
AM1DS-2412DH30EZ	24 (19.2-28.8)	±12	±42	3000	±330	85
AM1DS-2415DH30EZ	24 (19.2-28.8)	±15	±34	3000	±220	87
AM1DS-2424DH30EZ	24 (19.2-28.8)	±24	±21	3000	±100	85

Input Specification

Parameters	Conditions	Typical	Maximum	Units
Filter	Capacitor			
Voltage rating	Vo, Io Nom @Vin: 3.3V,5V,9V	±10		VDC
	Vo, Io Nom @ Vin:12V,15V,24V	±20		VDC

Isolation Specification

Parameters	Conditions	Typical	Maximum	Units
Tested I/O voltage	60 sec / 0.5mA, SEZ and DEZ models	1500		VDC
	60 sec / 0.5mA, SH30EZ and DH30EZ models	3000		VDC
Resistance	500VDC	>1000		MΩ
Capacitance	100kHz/0.1V	20		pF

Output Specification

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy	100% full load		±5	%
Line regulation	Per 1% Vin change	1.2		%
Load regulation	10-100% load, 3.3Vout model	15	20	%
	10-100% load, 5Vout model	10	15	%
	10-100% load, 9Vout model	8	10	%
	10-100% load, 12Vout model	7	10	%
	10-100% load, 15Vout model	6	10	%
	10-100% load, 24Vout model	5	10	%
Ripple & Noise*	3.3V, 5V, 9V, 12V, 15Vout models	30	75	mV pk-pk
	24Vout model	50	100	mV pk-pk

* Ripple and Noise are measured at 20MHz bandwidth. Please refer to Typical test circuit.

General Specifications

Parameters	Conditions	Typical	Maximum	Units
Switching frequency	Full load, nominal input, @3.3V 5V Vin models	215/370		KHz
	Full load, nominal input, other Vin models	250		KHz
Short circuit protection	Continuous			
Operating temperature	With derating	-40 to +105		°C
Storage temperature		-55 to +125		°C
Cooling	Free air convection			
Humidity	Non-condensing		95	% RH
Case material	DAP			

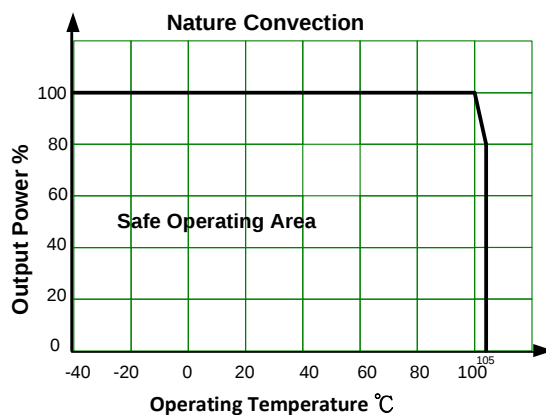
Weight		2.1		g
Dimensions (L x W x H)	0.77 x 0.24 x 0.39 inches (19.50 x 6.00 x 10.00 mm)			
MTBF	3 500 000 hrs (MIL-HDBK -217F, t=+25°C) / Full Load			
NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.				

Safety Specifications

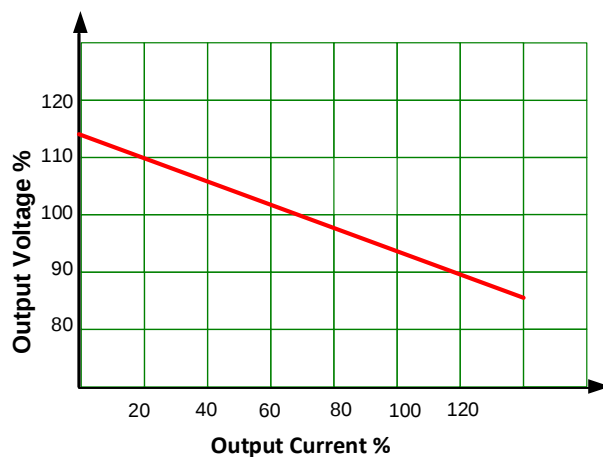
Parameters

Standards	Information technology Equipment	Design to meet UL/cUL/IEC/EN 62368-1
	EMC - Conducted and radiated emission	CISPR32 / EN55032, class B. See Recommended EMC circuit
	Electrostatic Discharge Immunity	IEC 61000-4-2 Air ±8KV, Contact ±6KV, Criteria B

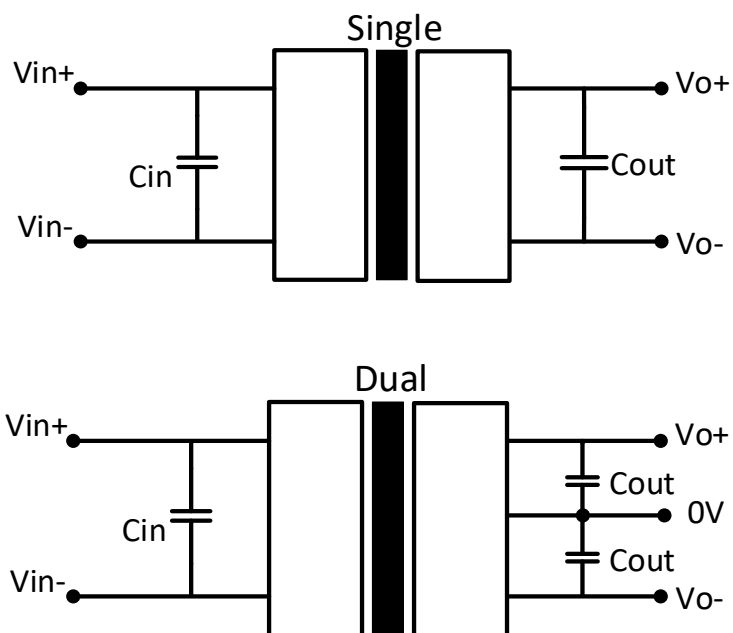
Derating



Tolerance Envelop Graph



Typical test circuit

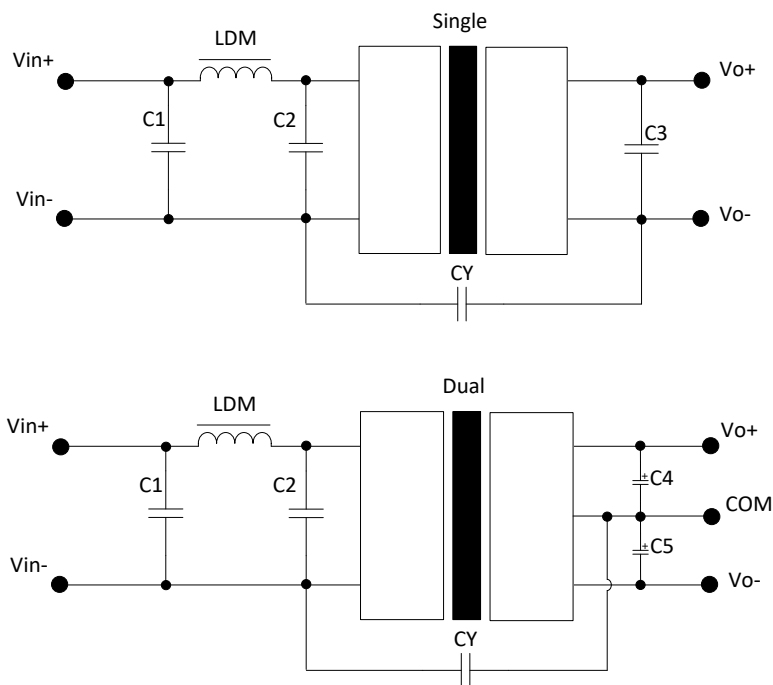


Vin	Cin
3.3VDC	4.7μF/25V
5VDC	4.7μF/25V
9VDC	4.7μF/25V
12VDC	2.2μF/25V
15VDC	2.2μF/25V
24VDC	1μF/50V

Single Vout	Cout
3.3VDC	10μF/16V
5VDC	10μF/16V
9VDC	2.2μF/16V
12VDC	2.2μF/25V
15VDC	1μF/25V
24VDC	1μF/50V

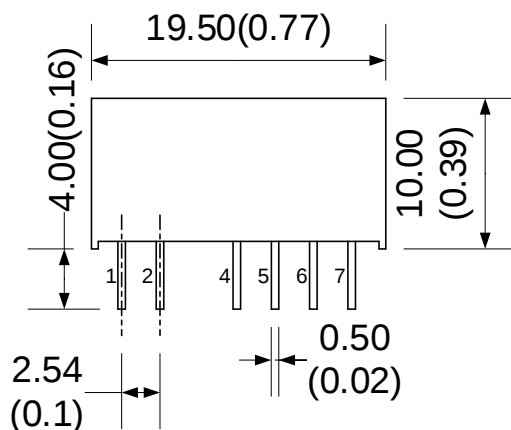
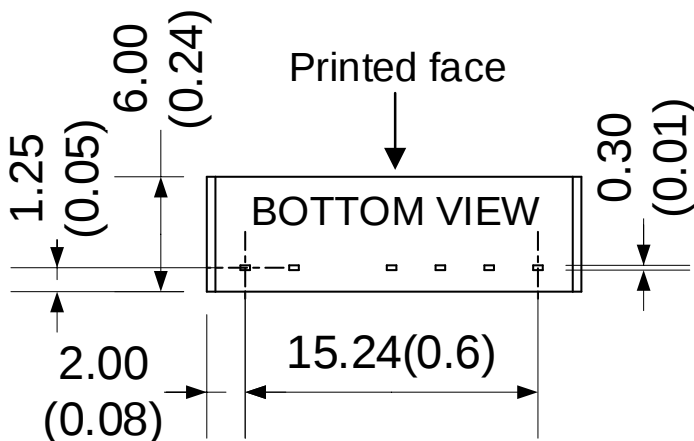
Dual Vout	Cout
±3.3VDC	±4.7μF/16V
±5VDC	±4.7μF/16V
±9VDC	±1μF/16V
±12VDC	±1μF/25V
±15VDC	±1μF/25V
±24VDC	±1μF/50V

Recommended EMC circuit



EMC recommended circuit value table	
C1	4.7μF/50V
C2	4.7μF/50V
C3,C4,C5	Refer Typical test circuit
LDM	6.8μH
CY	1nF/4kV

Dimensions



Note:

Unit: mm(inch)

General tolerances: $\pm 0.25(\pm 0.010)$

Pin Out Specifications

Pin	1.5KV isolation Single output	1.5KV isolation Dual output	3KV isolation Single output	3KV isolation Dual output
1	+V Input	+V Input	+V Input	+V Input
2	-V Input	-V Input	-V Input	-V Input
4	-V Output	-V Output	No pin	No pin
5	No pin	Com	-V Output	-V Output
6	+V Output	+V Output	No pin	Com
7	No pin	No pin	+V Output	+V Output

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