

1W, DC/DC Power Converter

SDM01T-D



Introduction

The SDM01T-D series are unregulated DC/DC converters offered in compact SMD package with 3KVDC isolation. These converters feature high efficiency, low ripple and noise, continuous short circuit protection, and wide operating temperature range -40 ~ +105°C. They are widely used in distributed power system in industrial applications where isolation and voltage converting is needed.

Features

- Rated power: 1W max
- Input voltage range $\pm 10\%$
- Unregulated output
- High efficiency up to 85%
- Isolation voltage 3KVDC
- Small no load input current, only about 3mA
- Operating temperature range: -40 ~ +105°C ambient
- RoHS compliant
- Compact SMD package
- Continuous short circuit protection
- Designed to meet UL/EN/IEC 62368-1
- 3 year warranty

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Part numbers

Model Number	Input Voltage [VDC] $\pm 10\%$	Output Voltage (VDC)	Output Current (mA) Max	Output Current (mA) Min	Efficiency (%) Typ.	Capacitive Load (μ F) Max.
SDM01T0303D	3.3	± 3.3	± 152	± 15	77	1200
SDM01T0305D	3.3	± 5	± 100	± 10	82	1200
SDM01T0309D	3.3	± 9	± 56	± 5	82	470
SDM01T0312D	3.3	± 12	± 42	± 5	82	220
SDM01T0315D	3.3	± 15	± 34	± 4	82	220
SDM01T0324D	3.3	± 24	± 21	± 2	84	100
SDM01T0503D	5	± 3.3	± 152	± 15	74	1200
SDM01T0505D	5	± 5	± 100	± 10	82	1200
SDM01T0509D	5	± 9	± 56	± 5	83	470
SDM01T0512D	5	± 12	± 42	± 5	83	220
SDM01T0515D	5	± 15	± 34	± 4	83	220
SDM01T0524D	5	± 24	± 21	± 3	85	100
SDM01T1203D	12	± 3.3	± 152	± 15	77	1200
SDM01T1205D	12	± 5	± 100	± 10	82	1200
SDM01T1207D	12	± 7.5	± 67	± 7	82	470
SDM01T1209D	12	± 9	± 56	± 6	83	470
SDM01T1212D	12	± 12	± 42	± 5	83	220
SDM01T1215D	12	± 15	± 34	± 4	83	220
SDM01T1224D	12	± 24	± 21	± 3	85	100
SDM01T1515D	15	± 15	± 34	± 4	83	220
SDM01T2405D	24	± 5	± 100	± 10	82	1200

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SDM01T2409D	24	±9	±56	±6	83	470
SDM01T2412D	24	±12	±42	±5	83	220
SDM01T2415D	24	±15	±34	±4	83	220
SDM01T2424D	24	±24	±21	±3	85	100

* Only typical models are listed. Other models may be available upon request.

* Operating with less than 10% of rated load will not cause permanent damage to the converters, but the performances data may not fall into the specifications, and reliable operating is not assured.

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Electrical characteristics

Unless otherwise indicated, specifications are measured at TA=25°C, humidity <75%, nominal input voltage and rated output load.

Parameter	Condition	Min.	Type	Max.	Unit	Note
Input current Full load	V _{IN} =3.3V		370		mA	
	V _{IN} =5V		240			
	V _{IN} =12V	-	108	-		
	V _{IN} =15V		99			
	V _{IN} =24V		51			
Input current No load		-	10	-	mA	
Reflected Ripple Current		-	15	-	mA	
Surge voltage 1 second max	V _{IN} =3.3V	-0.7	-	5	VDC	
	V _{IN} =5V	-0.7		9		
	V _{IN} =12V	-0.7		18		
	V _{IN} =15V	-0.7		21		
	V _{IN} =24V	-0.7		30		
Output voltage accuracy	All models	Refer to graphic in “Characteristic Curves” section				
Line regulation For V _{IN} change of ±1%	V _{OUT} =±3.3V All others	-	-	±1.5 ±1.2	%	
Load regulation I _{OUT} =10% to 100% of I _{OUT, rated}	V _{OUT} =±3.3V		15	20	%	
	V _{OUT} =±5V	-	10	15		
	All others		8	10		
Temperature coefficiency	Full load	-	±0.02	-	%/°C	
Output ripple and noise	20MHz bandwidth		60	150	mVp-p	

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Output short circuit protection		Continuous, automatic recovery
Input filter		Capacitor
Hot plug		None

* Dual output models need to operate with balanced load. The load difference between two outputs over 10% may cause unstable operating of the converter.

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General Specifications

Parameters	Condition	Min.	Typ.	Max.	Unit
Isolation voltage 1 minute, leakage current <1mA	Input to Output	3000	-	-	VDC
Isolation resistance Tested at 500VDC	Input to Output	1000	-	-	M ohm
Isolation capacitance 100KHz, 0.1V	Input to Output	-	20	-	pF
Operating temperature	See "Derating Curve"	-40	-	+105	°C
Storage temperature		-55	-	+125	°C
Case temperature rise		-	25	-	°C
Storage humidity	Non-condensing	5	-	95	%RH
Switching frequency	Full load	-	220	-	KHz
Reflow soldering temperature		Peak temp. 217 - 245°C, maximum duration 60s			
Vibration		10-150Hz, 5G, 0.75mm along X, Y and Z			
Cooling method		Free air convection			
Design based on standards		UL/EN/IEC 62368-1			
Safety certifications		EN/IEC 62368-1			
EMC	Emissions Immunity	CISPR32, EN55032 Class B* IEC/EN61000-4-2, air ±8kV, contact ±4kV			
MTBF	MIL-HDBK-217F	>3,500,000 Hours, T _A =25°C			
Moisture sensitivity level (MSL)		IPC/JEDEC J-STD-020D.1 Level 1			
Size		15.24 x 11.4 x 7.25 mm			

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Weight	1.7g Typ.
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*External circuit is required in order to meet Class B, refer to Figure 2 in Recommended External Circuit.

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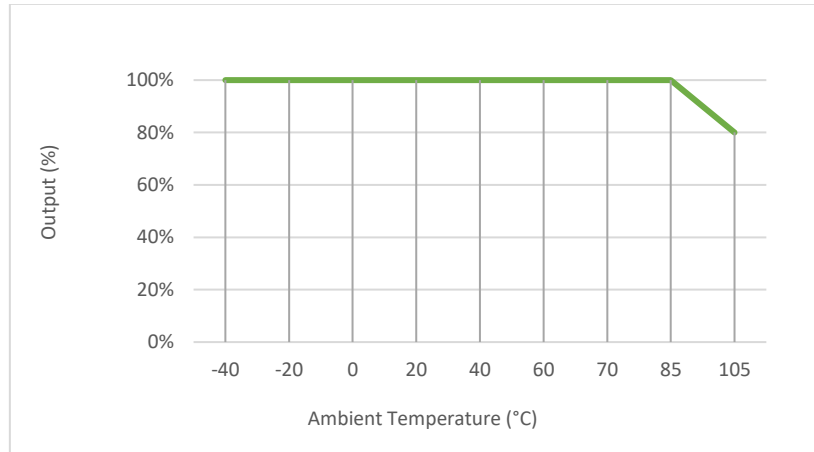
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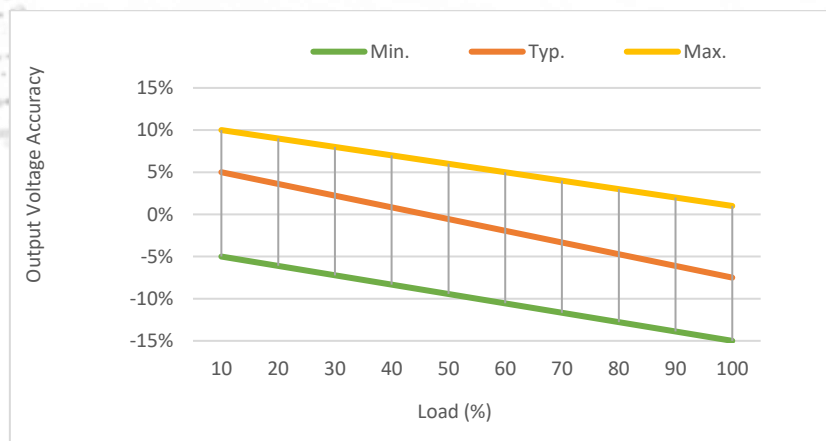
Characteristics Curves

Derating Curve

Output vs Ambient Temperature



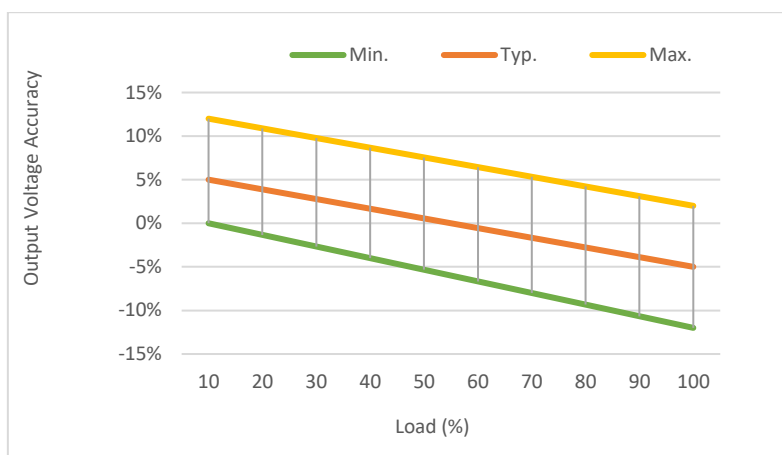
Output Voltage Accuracy vs Load



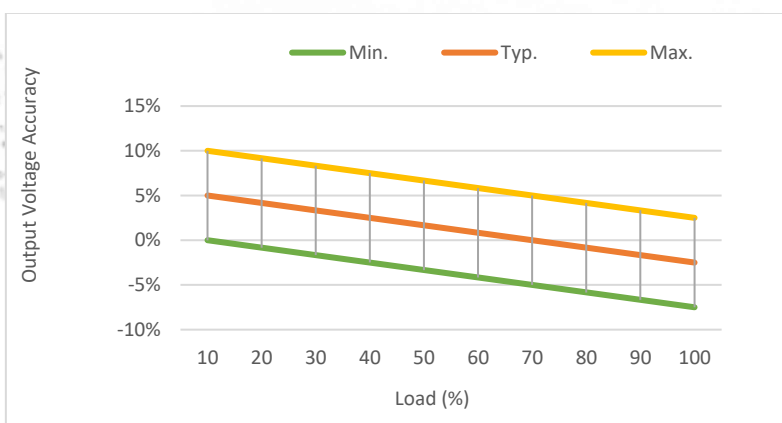
3.3V input models, and $V_{OUT}=3.3V$

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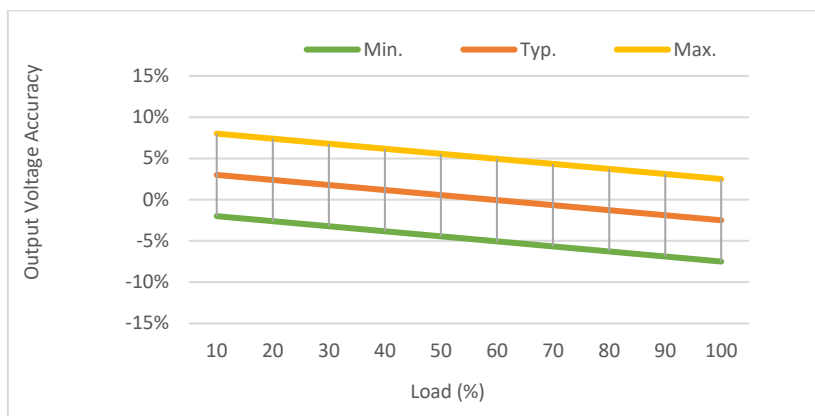
5V input models, and $V_{OUT}=3.3V$



3.3V or 5V input models, and $V_{OUT}=None$ 3.3V

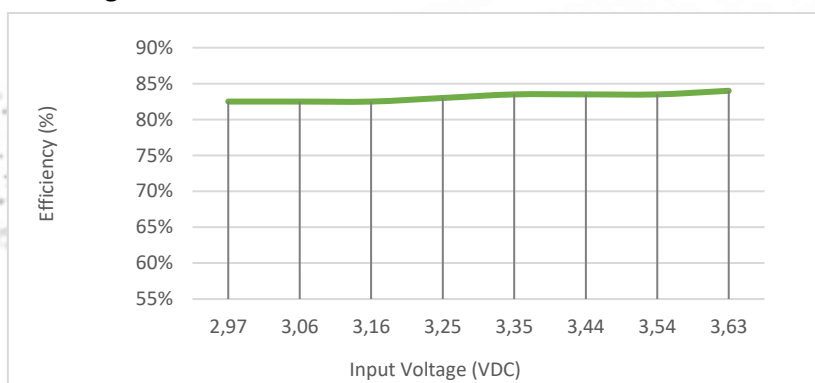
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Efficiency Curves

Efficiency vs Input Voltage



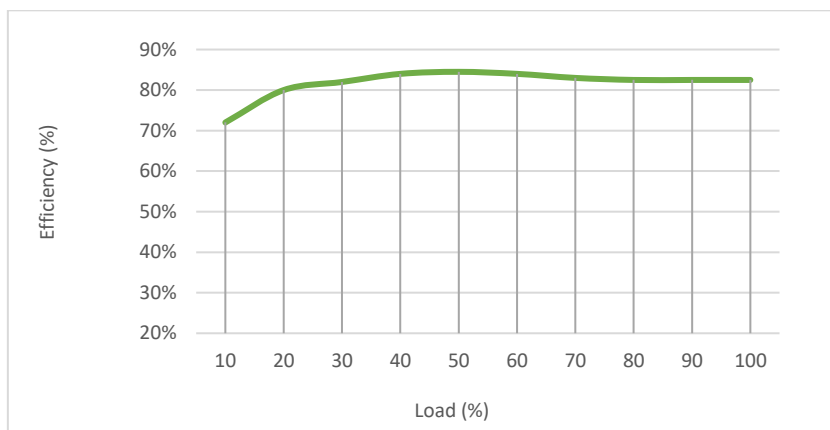
SDM01T0303D with full Load

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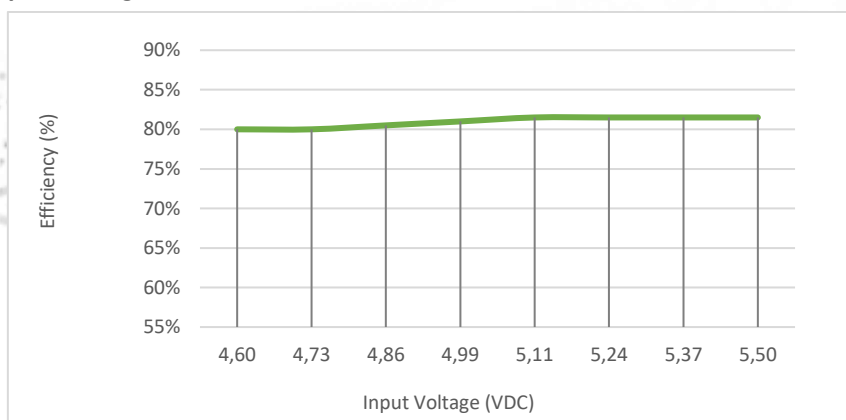


Efficiency vs Load



SDM01T0303D, with nominal input voltage

Efficiency vs Input Voltage



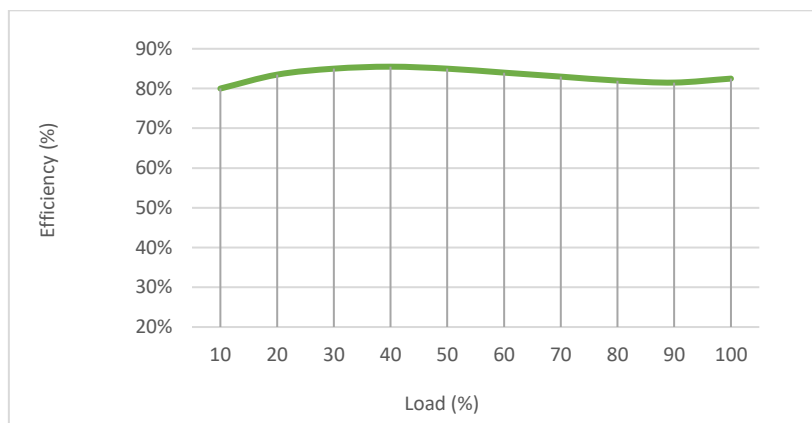
SDM01T0503D, with full Load

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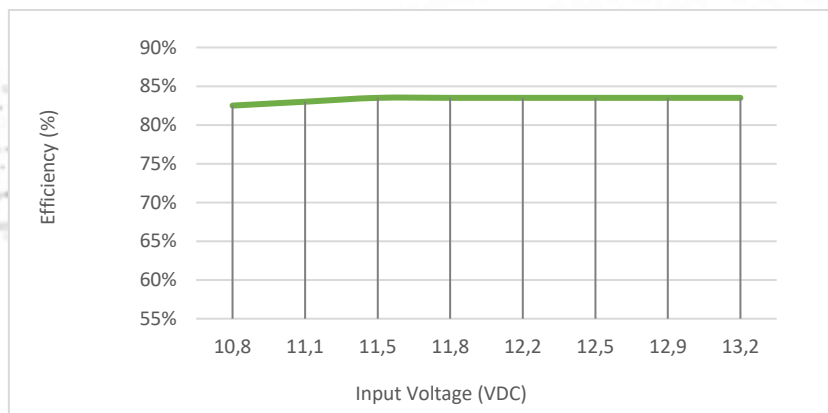


Efficiency vs Load



SDM01T0503D, with nominal input voltage

Efficiency vs Input Voltage



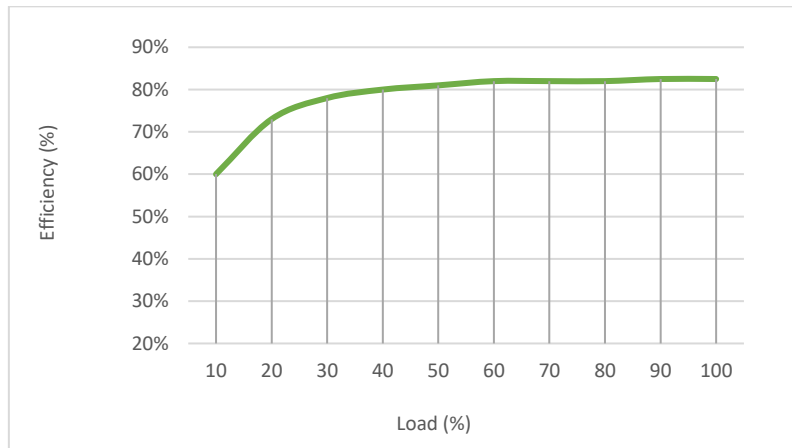
SDM01T1205D, with full Load

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Efficiency vs Load



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Recommended External Circuit

Typical Application Circuit

*Typical application circuit is to further lower the input and output ripple. It is not required for general use.

*Recommended component specifications are typical values. Excessive external capacitive load may cause startup problem.

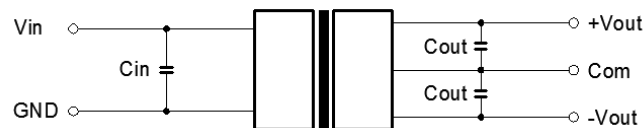


Figure 1: Typical External circuit

Recommended component spec

Input voltage	3.3V	5V	12V	15V	24V
C _{IN}	10uF, 16V	4.7uF, 16V	2.2uF, 25V	2.2uF, 25V	1uF, 50V

Recommended component spec

Output voltage	±3.3, ±5V	±9V	±12V	±15V	±24V
C _{OUT}	10uF, 16V	2.2uF, 16V	2.2uF, 25V	1uF, 25V	1uF, 50V

Circuit for EMC Enhancement

*Use this application circuit to meet Class B EMC performance.

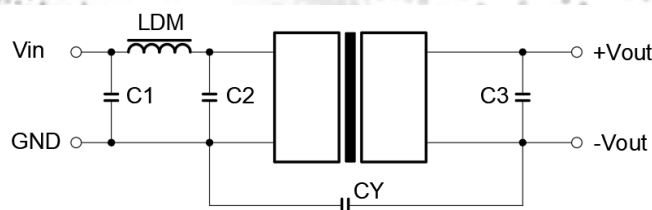


Figure 2: Circuit for EMC Enhancement

Recommended component spec

Component	LDM	C1, C2	CY [3.3...9V _{OUT}]	CY [12...24V _{OUT}]
Spec	6.8uH	4.7uF, 50V	100pF, 4KV	1nF, 4KV

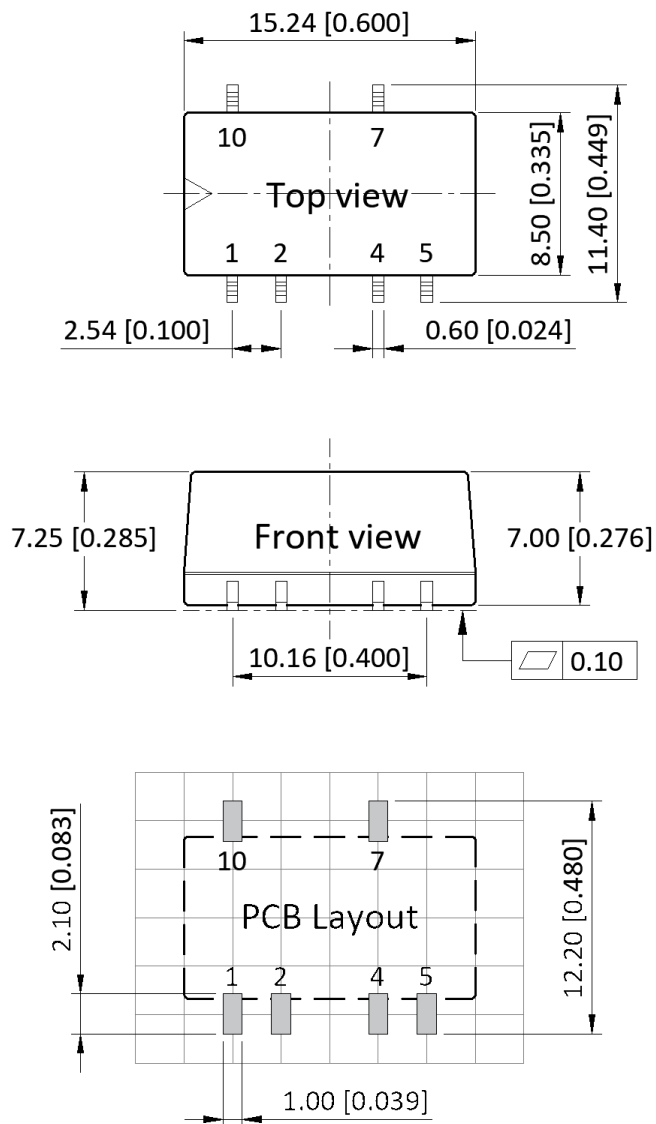
*C3 refer to C_{OUT} in

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Mechanical Specifications



Pin Definition

Pin #	Dual Out	
1	GND	
2	V _{IN}	
4	0V	
5	-V _{OUT}	
7	+V _{OUT}	
10	No connection	

* Unless otherwise specified unit:
mm [inch]

* General tolerance: ± 0.25 [± 0.010]

* Pin thickness: ± 0.10 [± 0.004]

* Footprint grid 2.54 x 2.54 mm

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Ordering information

Ordering can be done via www.summit-electronics.com or via info@summit-electronics.com. Please contact us for more information. Customisation of the product is available on request.

Technical support

For all product questions please contact us via info@summit-electronics.com

Document revision

Rev	Date	Changes
2025v0.1	27-08-2025	First issue of document