

1W, DC/DC Power Converter

SDF01T



Introduction

The SDF01T 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 88%
- 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 (uF) Max.
SDF01T0303	3.3	3.3	303	30	80	3000
SDF01T0305	3.3	5	200	20	82	3000
SDF01T0309	3.3	9	111	11	83	1200
SDF01T0312	3.3	12	83	8	84	820
SDF01T0315	3.3	15	67	7	84	560
SDF01T0324	3.3	24	42	4	84	220
SDF01T0503	5	3.3	303	30	82	3000
SDF01T0505	5	5	200	20	85	3000
SDF01T0509	5	9	111	12	86	1200
SDF01T0512	5	12	84	9	86	820
SDF01T0515	5	15	67	7	86	680
SDF01T0524	5	24	42	4	87	330
SDF01T1203	12	3.3	303	30	82	3000
SDF01T1205	12	5	200	20	85	3000
SDF01T1209	12	9	111	12	86	1200
SDF01T1212	12	12	84	9	86	820
SDF01T1215	12	15	67	7	86	680
SDF01T1224	12	24	42	4	88	330
SDF01T1505	15	5	200	20	86	3000
SDF01T1512	15	12	84	9	87	820
SDF01T1515	15	15	67	7	88	680
SDF01T2403	24	3.3	303	30	82	3000
SDF01T2405	24	5	200	20	85	3000

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SDF01T2409	24	9	111	12	86	1200
SDF01T2412	24	12	84	9	87	820
SDF01T2415	24	15	67	7	87	680
SDF01T2424	24	24	42	4	88	330

* 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 $T_A=25^{\circ}\text{C}$, nominal input voltage, full load after warm up.

Parameter	Condition	Min.	Type	Max.	Unit	Note
Input current Full load	$V_{IN}=3.3\text{V}$		370			
	$V_{IN}=5\text{V}$		230			
	$V_{IN}=12\text{V}$	-	99	-	mA	
	$V_{IN}=15\text{V}$		80			
	$V_{IN}=24\text{V}$		51			
Input current No load		-	10	-	mA	
Reflected Ripple Current		-	15	-	mA	
Surge voltage 1 second max	$V_{IN}=3.3\text{V}$	-0.7		5		
	$V_{IN}=5\text{V}$	-0.7		9		
	$V_{IN}=12\text{V}$	-0.7	-	18	VDC	
	$V_{IN}=15\text{V}$	-0.7		21		
	$V_{IN}=24\text{V}$	-0.7		30		
Output voltage accuracy	All models	Refer to graphic in "Characteristic Curves" section				
Line regulation For V_{IN} change of $\pm 1\%$	$V_{OUT}=3.3\text{V}$	-	-	± 1.5	%	
	All others			± 1.2		
Load regulation $I_{OUT}=10\%$ to 100% of $I_{OUT, \text{rated}}$	$V_{OUT}=3.3\text{V}$		15	20		
	$V_{OUT}=5\text{V}$		10	15		
	$V_{OUT}=9\text{V}$	-	9	10	%	
	$V_{OUT}=12\text{V}$		8	10		
	$V_{OUT}=15\text{V}$		7	10		
	$V_{OUT}=24\text{V}$		6	10		
Temperature coefficient	Full load	-	± 0.02	-	$\%/^{\circ}\text{C}$	

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Output ripple and noise	20MHz bandwidth		60	120	mVp-p	
Output short circuit protection		Continuous, automatic recovery				
Input filter		Capacitor				
Hot plug		None				

* 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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General Specifications

Parameters	Condition	Min.	Typ.	Max.	Unit	Notes
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	Full load	-	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		IEC/EN/UL 62368-1				
Safety certifications		IEC/EN 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				

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Moisture sensitivity level (MSL)		IPC/JEDEC J-STD-020D.1 Level 1
Size		13.5 x 11 x 7.25 mm
Weight		1.6 Typ.

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

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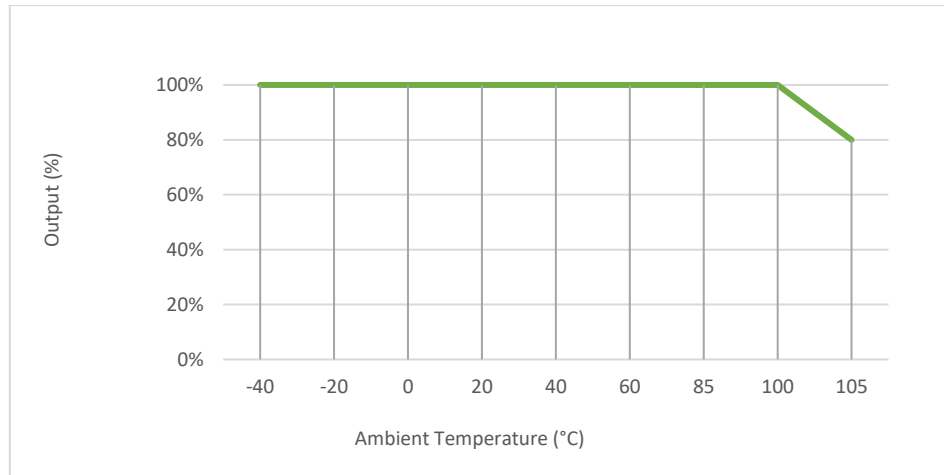
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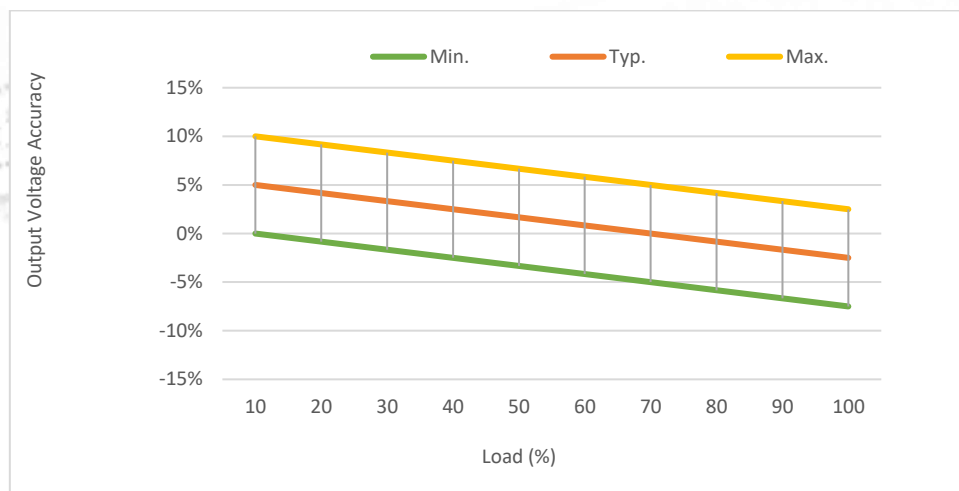
Characteristics Curves

Derating Curve

Output vs Ambient Temperature



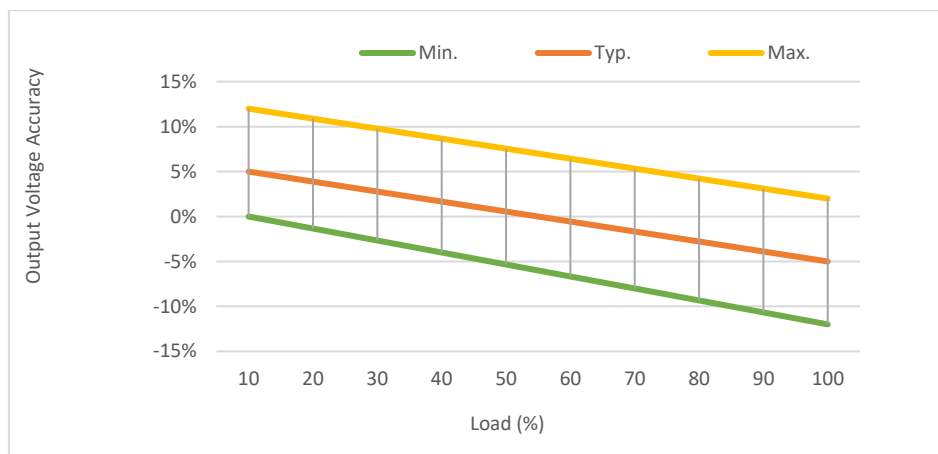
Output Voltage Accuracy vs Load



None 3.3V output models

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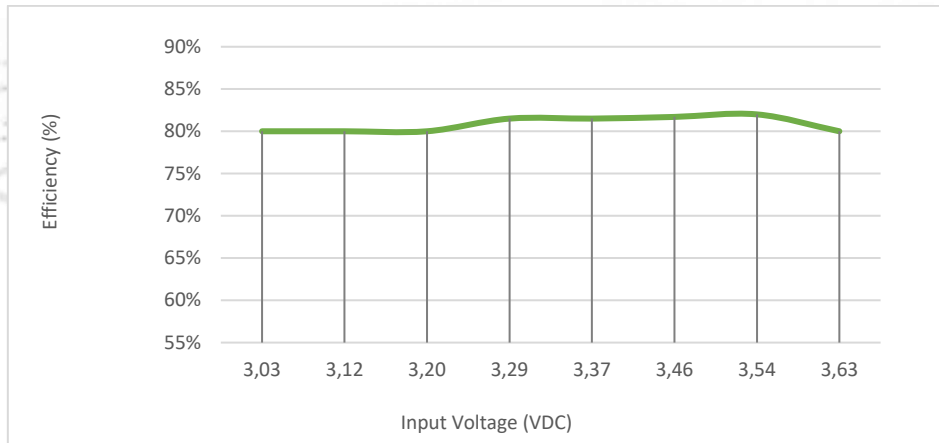
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3.3V output models

Efficiency Curves

Efficiency vs Input Voltage



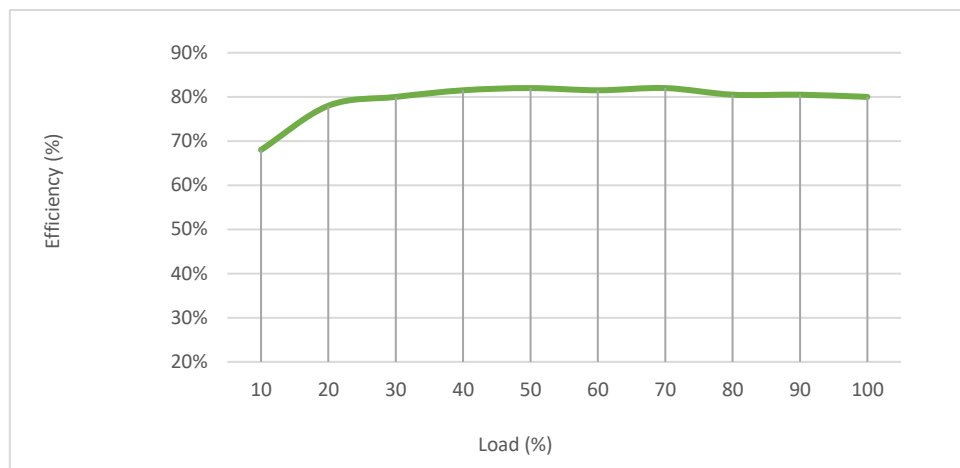
SDF01T0305, with full Load

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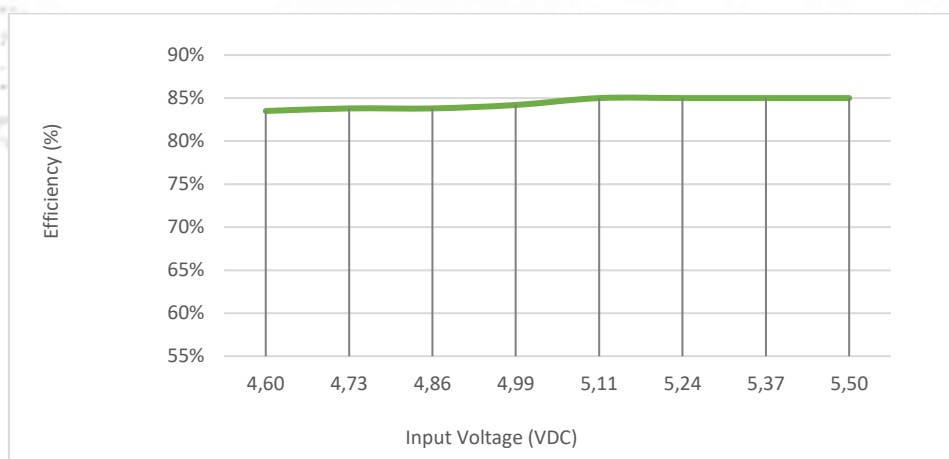


Efficiency vs Load



SDF01T0305, with nominal input voltage

Efficiency vs Input Voltage



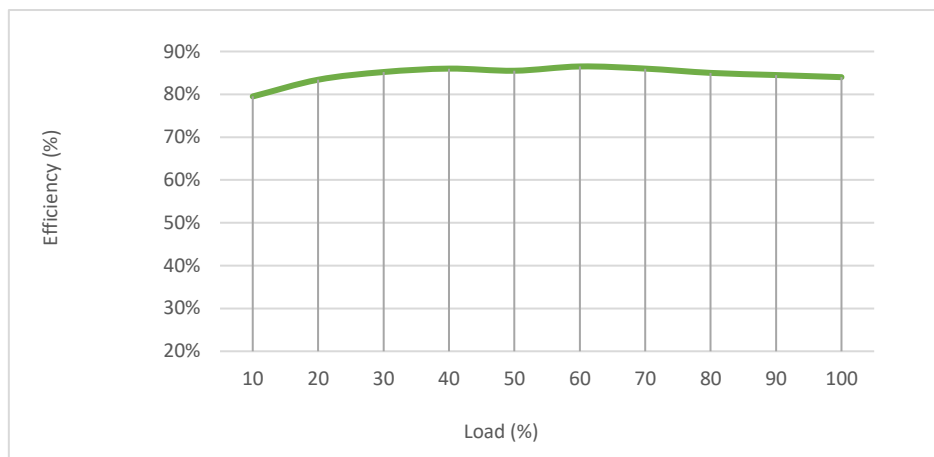
SDF01T0505, with full Load

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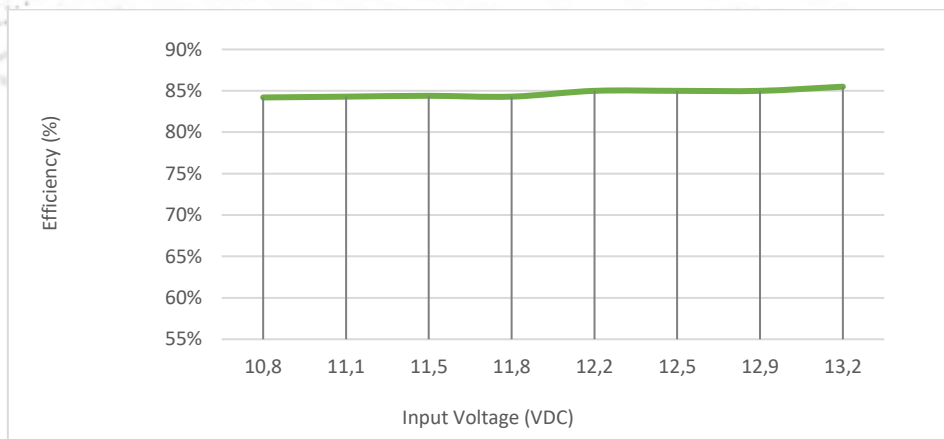


Efficiency vs Load



SDF01T0505, with nominal input voltage

Efficiency vs Input Voltage



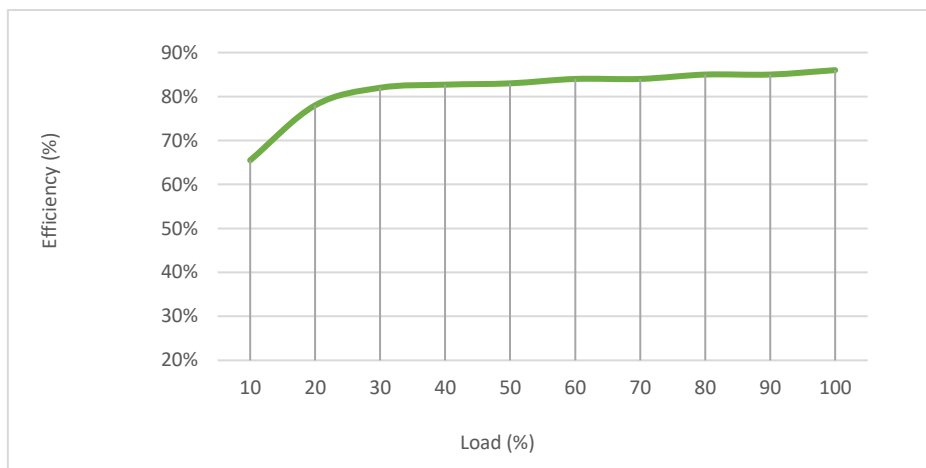
SDF01T1205, with full Load

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Efficiency vs Load



SDF01T1205, with nominal input voltage

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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.

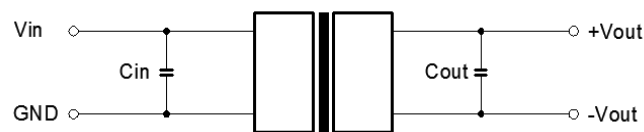


Figure 1: Typical External circuit

Recommended component spec

Input voltage	3.3, 5V	12V	15V	24V
C _{IN}	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	4.7uF, 16V	2.2uF, 25V	1uF, 25V	0.47uF, 50V

Circuit for EMC Enhancement

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

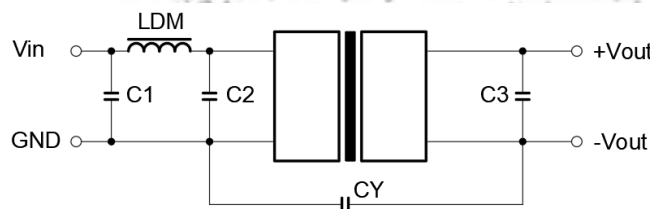


Figure 2: Circuit for EMC Enhancement

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Recommended component spec

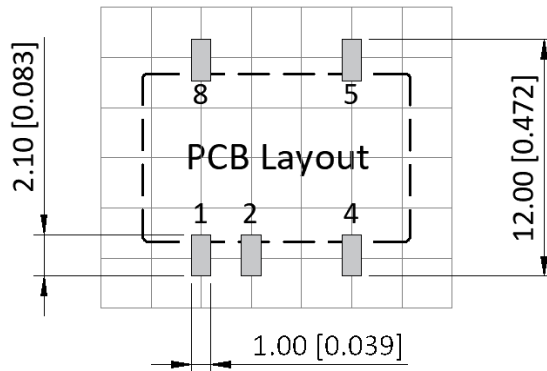
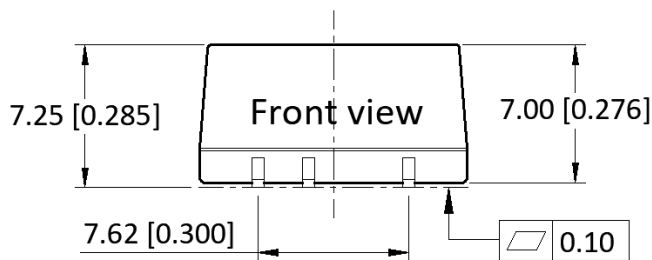
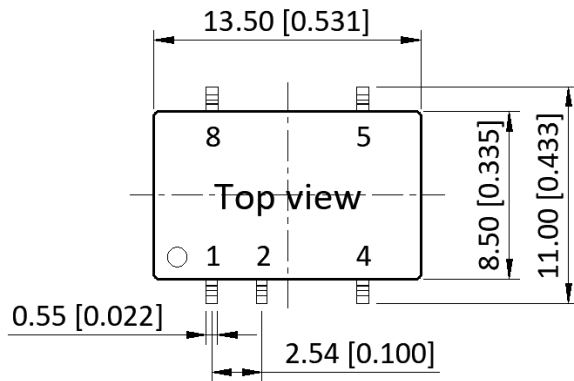
Component	LDM	C1, C2	CY	C3
C _{OUT}	6.8uH	4.7uF, 50V	270pF, 4KV	Refer to C _{OUT} in [Table 2]

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Mechanical Specifications



Pin Definition

Pin #	Single Out	
1	GND	
2	V _{IN}	
4	0V	
5	+V _{OUT}	
8	No connection	

- * Unless otherwise specified unit: mm [inch]
- * General tolerance: ± 0.50 [± 0.020]
- * 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