Features

Regulated Converters

- Compact 10.35 x 7.5mm SMD package
- Low profile (2.5mm)
- 3kVDC/1min isolation
- Low EMI emissions
- Ultra-wide temperature range -40°C to +125°C
- Fully automated, high-reliability design
- Semi-regulated 5V output

RECOM
DC/DC Converter

RxxCTExxS

1 Watt 16-Pin SOIC Single Output

3 YEAR warranty

IEC/EN62368-1 3rd Edition certified
CB Report

Description

The R05CTE05S is a low cost, low profile, 1W SMD isolated DC/DC single output converter with 4.5-5.5V input range and a semi-regulated 5V output. There is no minimum load requirement which is ideal for applications which switch into very light load operation modes. Standard isolation is 3kVDC/1min, and the operating temperature is from -40°C up to +125°C with derating. The fully-automated design which is equipped with short-circuit, over-current, and over-temperature protection ensures the highest reliability in applications such as communication, current sensing, and COM port isolation.

Selection Guide

Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Power [W]	Efficiency typ. (1) [%]
R05CTE05S	4.5-5.5	5	1	54

Notes:

Note1: nom. V_{IN}= 5VDC, V_{OUT}= 5VDC, full load

Model Numbering

R__CTE__ S-__

- R__ : nom. Input Voltage
- CTE__ : nom. Output Voltage
- S-__ : Packaging (2)
- S-__ : Single Output

Notes:

Note2: add suffix "-R" for standard tape and reel packaging
add suffix "-CT" for bag packaging for more details refer to **"PACKAGING INFORMATION"**

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

ABSOLUTE MAXIMUM RATINGS (3)

Parameter	Condition	Min.	Typ.	Max.
Absolute Maximum Voltage	$+V_{IN}$ to $-V_{IN}$	-0.3VDC		6VDC
	$+V_{IN}$ to $-V_{IN}$ or $SGND_{IN}$	-0.3VDC		6VDC
	$+V_{OUT}$ to $-V_{OUT}$ or $SGND_{OUT}$	-0.3VDC		6VDC
Operating IC Junction Temperature (T_J)				+150°C
Lead Temperature				+260°C
Storage Temperature (T_{STO})		-65°C		+150°C

Notes:

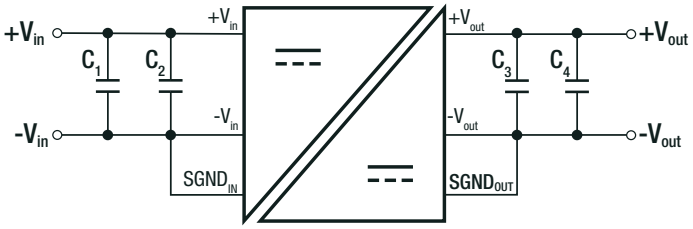
Note3: Stresses beyond those listed under absolute maximum ratings can cause permanent damage to the device. (Values are at non-operating)

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

BASIC CHARACTERISTICS

Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range		4.5VDC	5VDC	5.5VDC
Under Voltage Lockout (UVLO)	DC-DC ON		3.28VDC	
	DC-DC OFF		2.88VDC	
Under Voltage Lockout Hysteresis			190mV	
Input Current Range			370mA	
Quiescent Current			7mA	
Minimum Load		0%		
Internal Operating Frequency			30MHz	
Output Ripple Voltage			50mVp-p	100mVp-p

Typical Application Circuit

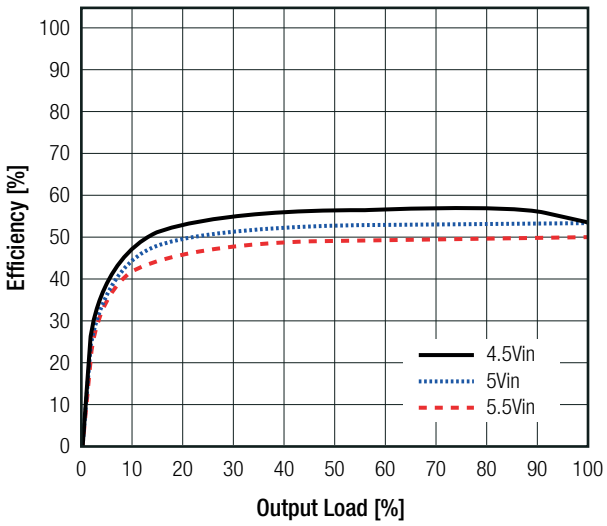


Input and Output Capacitors*

C_1	C_2	C_3	C_4
10µF	0.1µF	10µF	0.1µF

*these capacitors are mandatory for stable operation

Efficiency vs. Load



REGULATION

Parameter	Condition	Min.	Typ.	Max.
Output Voltage Accuracy	V_{IN}= 4.5-5.5VDC, load= 0A		±1.5%	
Line Regulation	V_{IN}= 4.75-5.25VDC, load= 0.2A		±1.5%	
	V_{IN}= 4.5-5.5VDC, load= 0.2A		±5.0%	
Load Regulation	0% - 100% load		1.0%	

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

PROTECTIONS		
Parameter	**Condition**	**Values**
Short Circuit Protection (SCP)		continuous , hiccup mode
Over Current Protection		250mA, hiccup mode
Over Temperature Protection		automatic restart after cool down
Thermal Shutdown	IC junction temperature	+160°C
	hysteresis	+20°C
Isolation Voltage	tested for 1second	3.6kVDC
	rated for 1 minute	3kVDC
Isolation Resistance	V_{ISO}= 500VDC, 25°C	50GΩ typ.
Isolation Capacitance		7pF typ.
Isolation Grade	according to 62368-1	functional
External Clearance		>8mm
External Creepage		>8mm

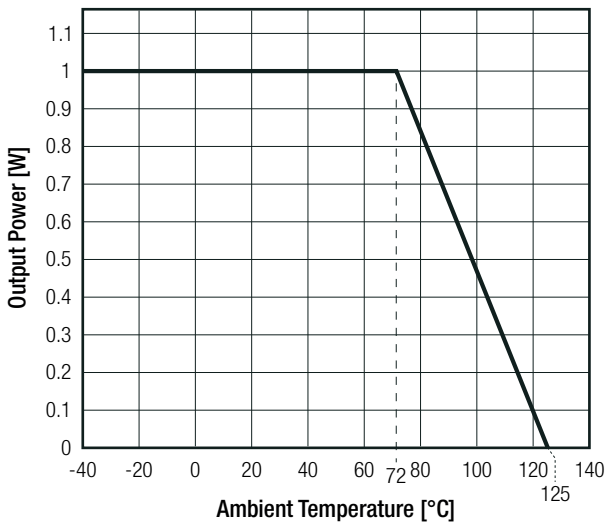
ENVIRONMENTAL			
Parameter	**Condition**		**Value**
Operating Temperature Range	@ natural convection 0.1m/s	with derating	-40°C to +125°C
ESD	human-body model (HBM), ANSI/ESDA/JEDEC JS-001		±6.0kV
	charged-device model (CDM), JEDEC JESD22-C101		±2.0kV
Moisture Sensitive Level	MSL peak temp. (5)		Level 3, 260°C, 168hrs
Thermal Impedance (6)	junction to T_{AMB}		63.8K/W
	junction to case (top)		21.4K/W
	junction to case (bottom)		37.2K/W
	junction to board		38.5K/W

Notes:

Note5: The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature

Note6: Tested with 54.0 x 85.6mm 2 layer PCB with 105µm copper

Thermal Derating (6)

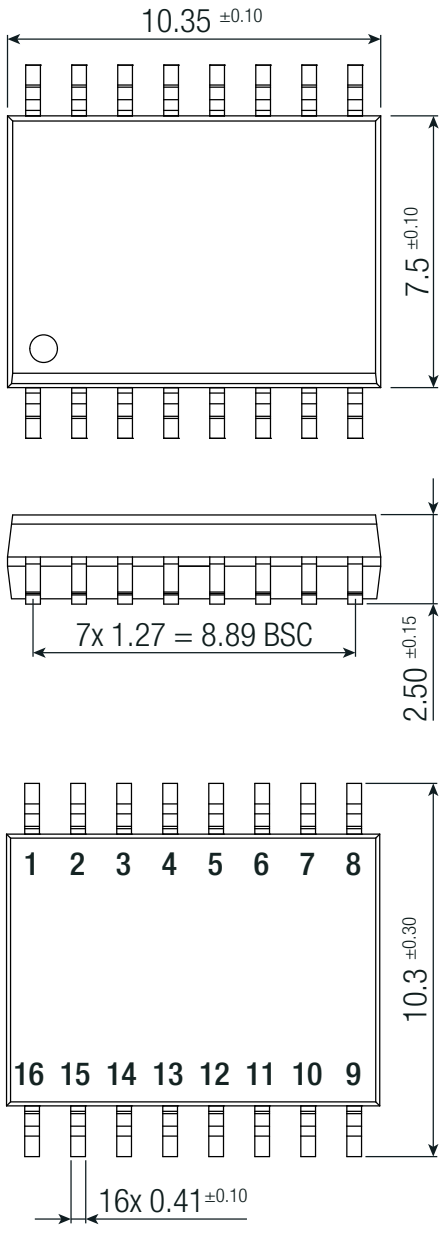


Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	**Report Number**	**Standard**
Information Technology Equipment, General Requirements for Safety (CB Scheme)	DK-139515-A1-UL	IEC62368-1:2018, 3rd Edition
Information Technology Equipment, General Requirements for Safety	S20230116152501	EN IEC 62368-1:2020 + A11:2020
RoHS2		RoHS 2011/65/EU + AM2015/863

DIMENSION AND PHYSICAL CHARACTERISTICS		
Parameter	**Type**	**Value**
Dimension (LxWxH)		10.35 x 7.5 x 2.50mm
Weight		0.1g typ.

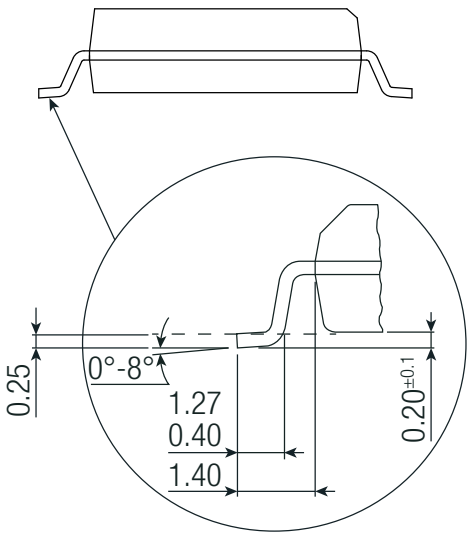
Dimension Drawing (mm)



Pin Information

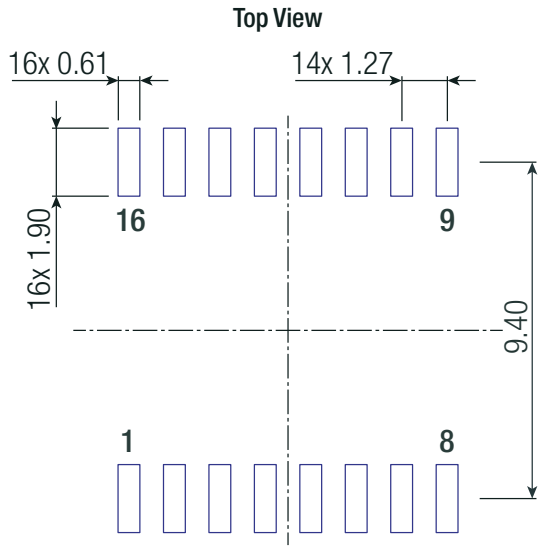
Pad #	Function
1,2	$-V_{IN}$
3,4	$+V_{IN}$
5,6,7,8	$SGND_{IN}$
9,11,12	$SGND_{OUT}$
10	DNC (do not connect)
13,14	$+V_{OUT}$
15,16	$-V_{OUT}$

Tolerances: x.x= ±0.1mm
x.xx= ±0.05mm



Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Footprint Details



PACKAGING INFORMATION		
Parameter	**Type**	**Value**
Packaging Dimension (LxWxH)	reel (diameter + width)	Ø177.8 + 16.4mm height
	tape and reel (carton)	260.0 x 240.0 x 60.0mm
	moisture barrier bag ("-CT")	100.0 x 100.0 x 30mm
Tape Width		16mm
Packaging Quantity	tape and reel	500pcs
	moisture barrier bag ("-CT")	10pcs
Storage Temperature Range		-65°C to +150°C