



**THE DATASHEET OF  
R05CTE05S-R**



# Features

- 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

# Regulated Converters



# RxxCTExxS

**1 Watt**  
**16-Pin SOIC**  
**Single Output**



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.

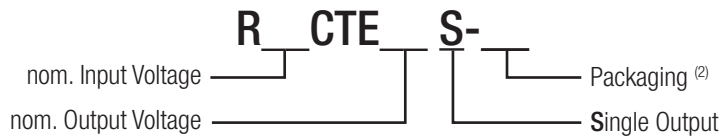
## Selection Guide

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



**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 @ $T_a$ = 25°C, nom. $V_{in}$ , 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:**

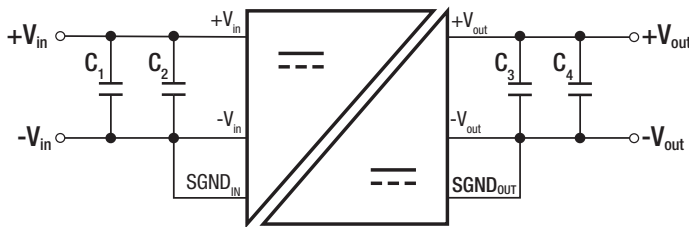
Note3: Stresses beyond those listed under absolute maximum ratings can cause permanent damage to the device. (Values are at non-operating)

**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**

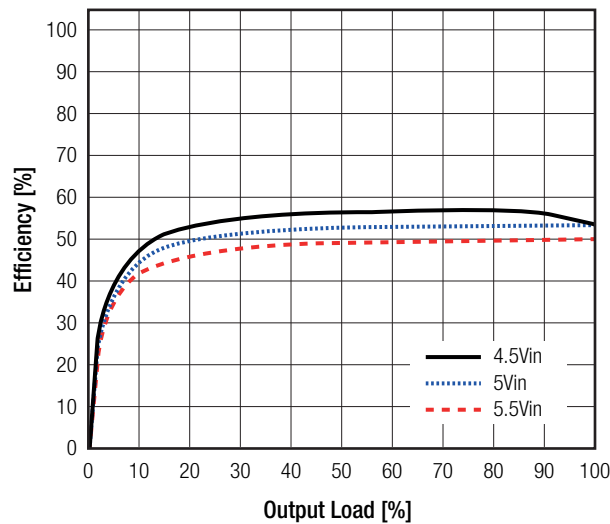


**Input and Output Capacitors\***

C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	C <sub>4</sub>
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 <sub>IN</sub> = 4.5-5.5VDC, load= 0A		±1.5%	
Line Regulation	V <sub>IN</sub> = 4.75-5.25VDC, load= 0.2A		±1.5%	
	V <sub>IN</sub> = 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 <sub>ISO</sub> = 500VDC, 25°C	50GΩ typ.
Isolation Capacitance		7pF typ.
External Clearance		>8mm
External Creepage		>8mm

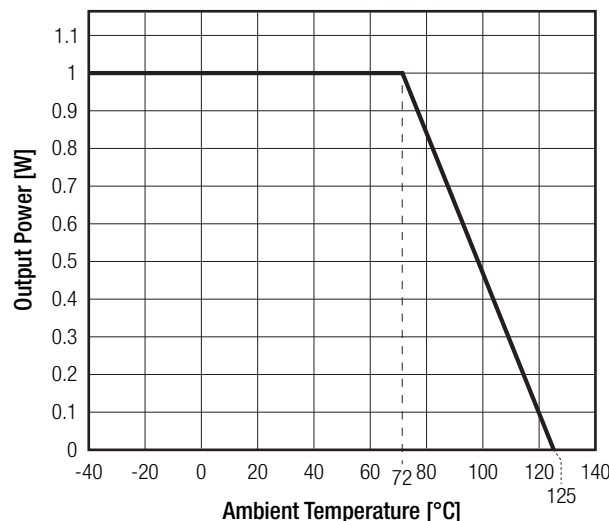
ENVIRONMENTAL		
Parameter	Condition	Value
Operating Temperature Range	@ natural convection 0.1m/s	with derating
ESD	human-body model (HBM), ANSI/ESDA/JEDEC JS-001	±6.0kV
	charged-device model (CDM), JEDEC JESD22-C101	±2.0kV
Moisture Sensitive Level	MSL peak temp. <sup>(5)</sup>	Level 3, 260°C, 168hrs
Thermal Impedance <sup>(6)</sup>	junction to T <sub>AMB</sub>	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 <sup>(6)</sup>**



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

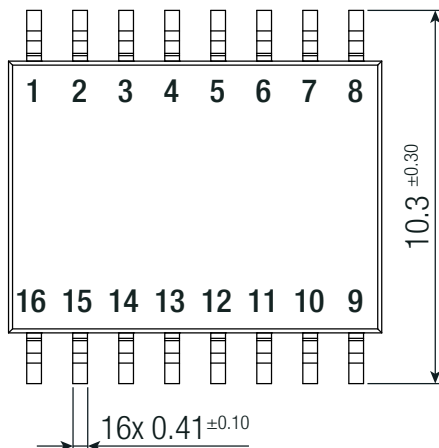
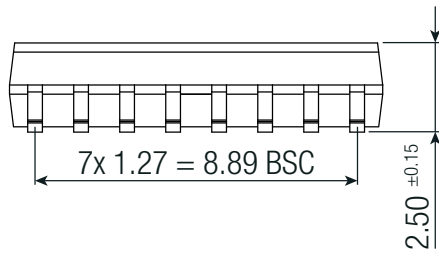
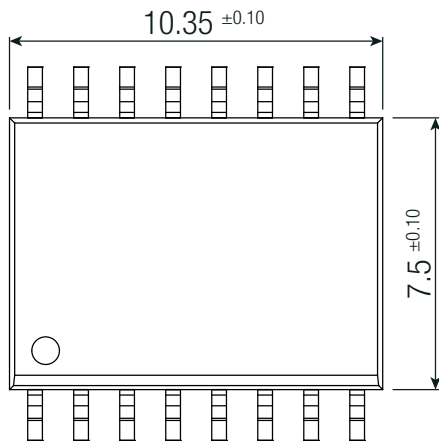
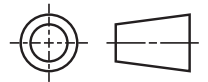
**SAFETY AND CERTIFICATIONS**

Certificate Type (Safety)	Report Number	Standard
Information Technology Equipment, General Requirements for Safety (CB Scheme)	S20230116152501	IEC62368-1:2018, 3rd Edition
Information Technology Equipment, General Requirements for Safety		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.

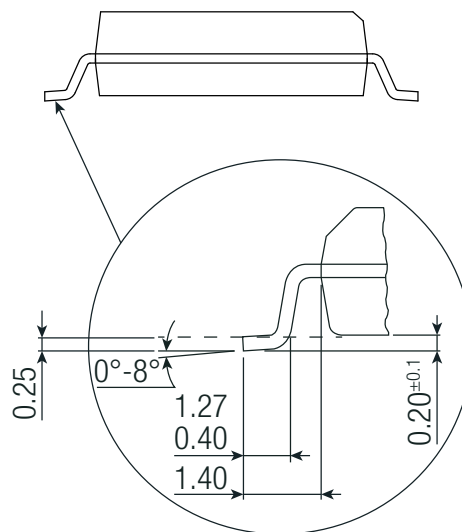
Dimension Drawing (mm)



**Pin Information**

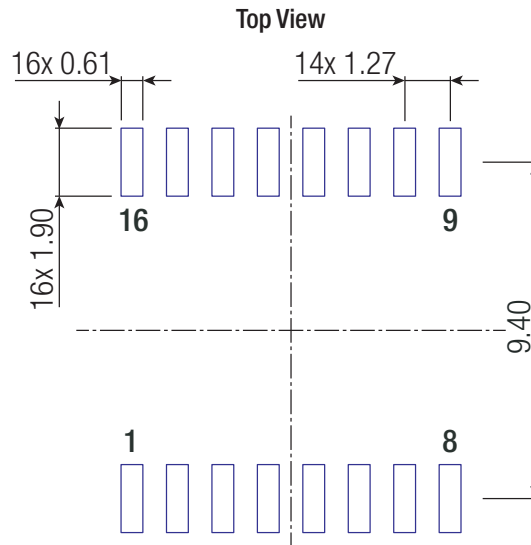
Pad #	Function
1,2	-VIN
3,4	+VIN
5,6,7,8	SGND <sub>IN</sub>
9,11,12	SGND <sub>OUT</sub>
10	DNC (do not connect)
13,14	+V <sub>OUT</sub>
15,16	-V <sub>OUT</sub>

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

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