

Features

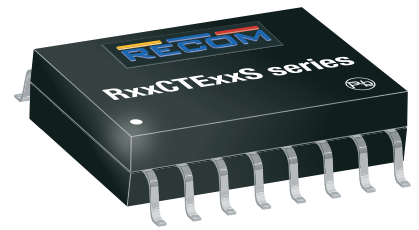
Regulated Converters

- 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



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.

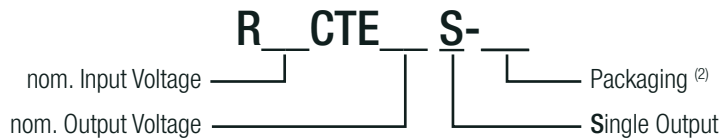
Selection Guide

| 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 @ 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:

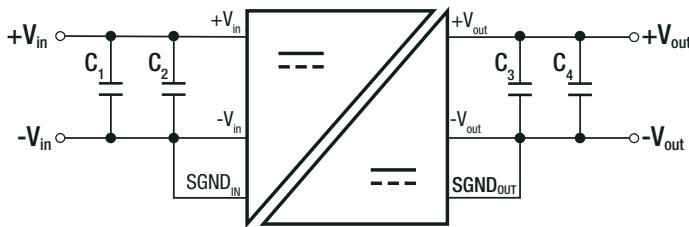
Note3: Stresses beyond those listed under absolute maximum ratings can cause permanent damage to the device. (Values are at non-operating)

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

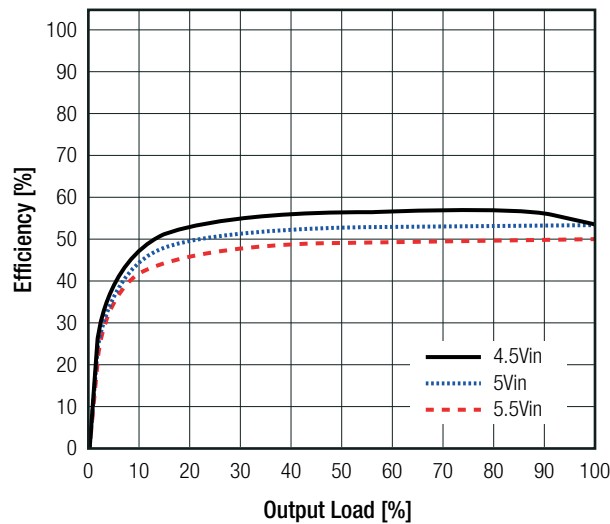


Input and Output Capacitors*

| 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 |

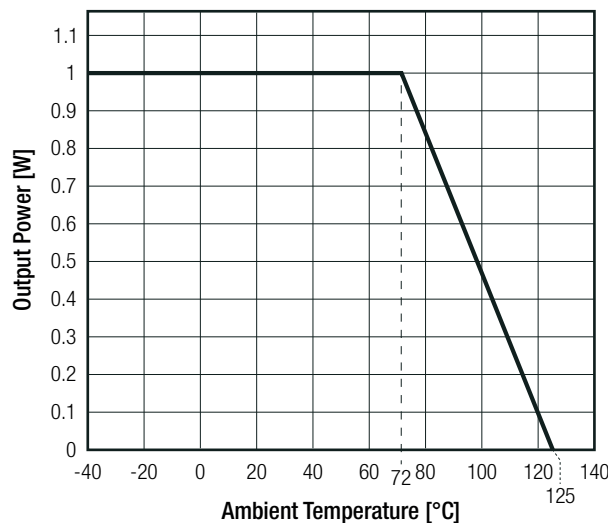
| ENVIRONMENTAL | | |
|----------------------------------|--|------------------------|
| Parameter | Condition | Value |
| Operating Temperature Range | @ natural convection 0.1m/s | -40°C to +125°C |
| ESD | human-body model (HBM), ANSI/ESDA/JEDEC JS-001 | ±6.0kV |
| | charged-device model (CDM), JEDEC 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)

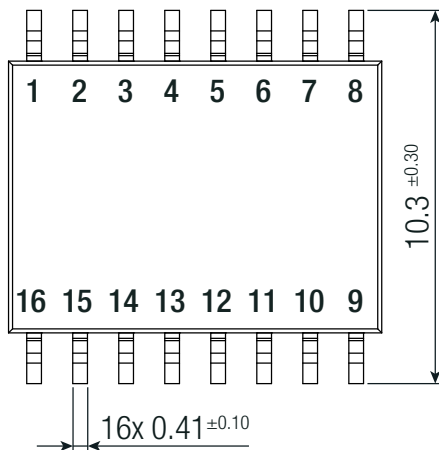
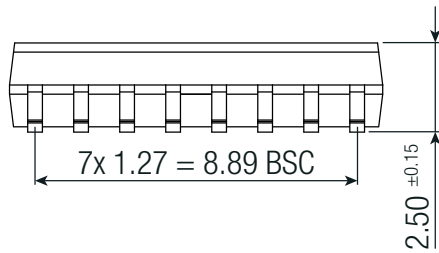
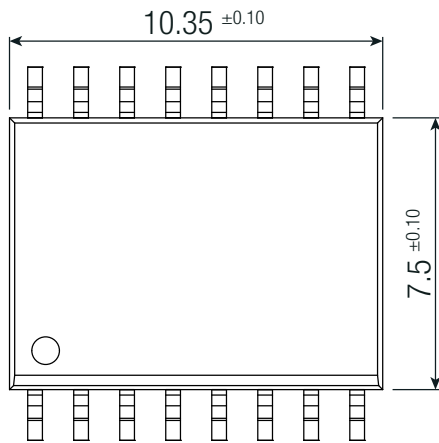
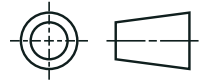
SAFETY AND CERTIFICATIONS

| 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. |

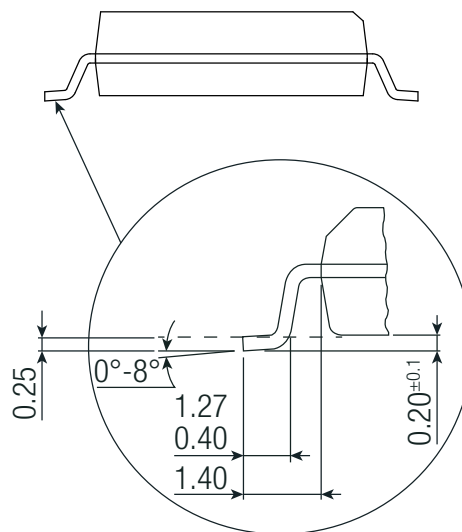
Dimension Drawing (mm)



Pin Information

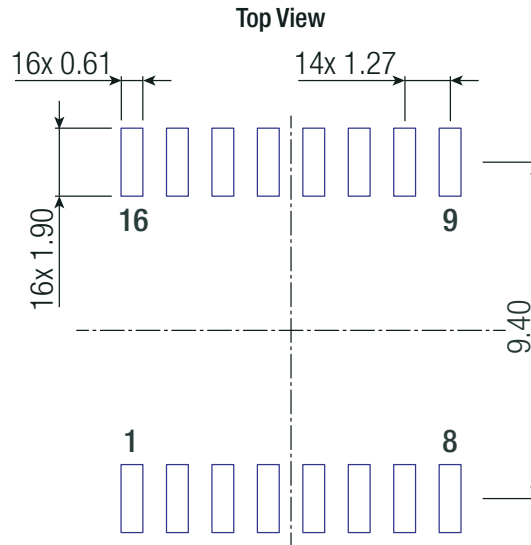
| Pad # | Function |
|---------|----------------------|
| 1,2 | -VIN |
| 3,4 | +VIN |
| 5,6,7,8 | SGND _{IN} |
| 9,11,12 | SGND _{OUT} |
| 10 | DNC (do not connect) |
| 13,14 | +V _{OUT} |
| 15,16 | -V _{OUT} |

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 |

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