

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

Description

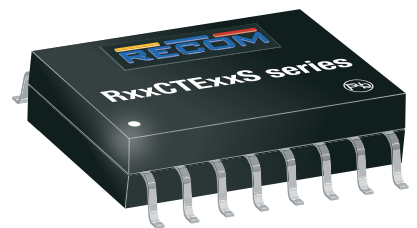
The R05CTE05S is a low cost, low profile, 1W SMD isolated DC/DC single output converter with 4.5-5.5V input range and a semi-regulated 5V output. There is no minimum load requirement which is ideal for applications which switch into very light load operation modes. Standard isolation is 3kVDC/1min, and 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

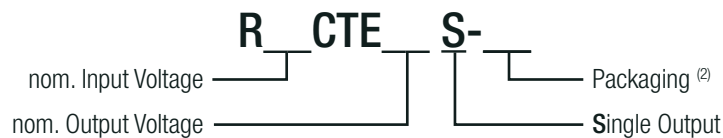
Notes:

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



IEC/EN62368-1 pending

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:

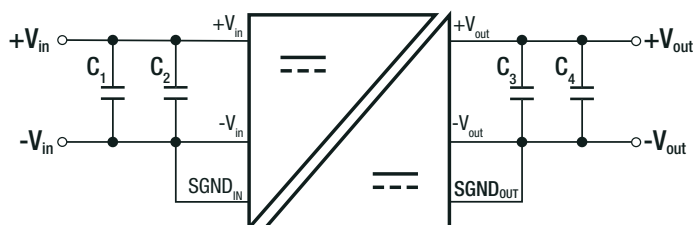
Note3: Stresses beyond those listed under absolute maximum ratings can cause permanent damage to the device. (Values are at non-operating)

Specifications (measured @ $T_a = 25^\circ\text{C}$, nom. V_{in} , 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 DC-DC OFF		3.28VDC 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

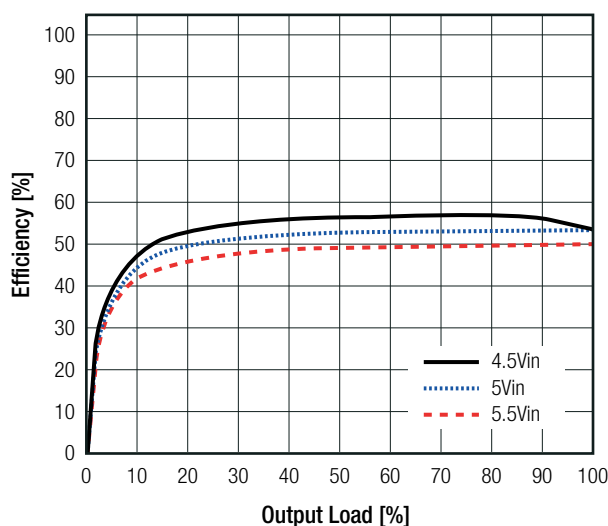


Input and Output Capacitors*

C_1	C_2	C_3	C_4
10 μF	0.1 μF	10 μF	0.1 μF

*these capacitors are mandatory for stable operation

Efficiency vs. Load



REGULATION

Parameter	Condition	Min.	Typ.	Max.
Output Voltage Accuracy	$V_{IN} = 4.5\text{--}5.5\text{VDC}$, load= 0A		$\pm 1.5\%$	
Line Regulation	$V_{IN} = 4.75\text{--}5.25\text{VDC}$, load= 0.2A $V_{IN} = 4.5\text{--}5.5\text{VDC}$, load= 0.2A		$\pm 1.5\%$ $\pm 5.0\%$	
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 hysteresis	+160°C +20°C
Isolation Voltage	tested for 1second rated for 1 minute	3.6kVDC 3kVDC
Isolation Resistance	V _{ISO} = 500VDC, 25°C	50GΩ typ.
Isolation Capacitance		7pF typ.
External Clearance		>8mm
External Creepage		>8mm

ENVIRONMENTAL

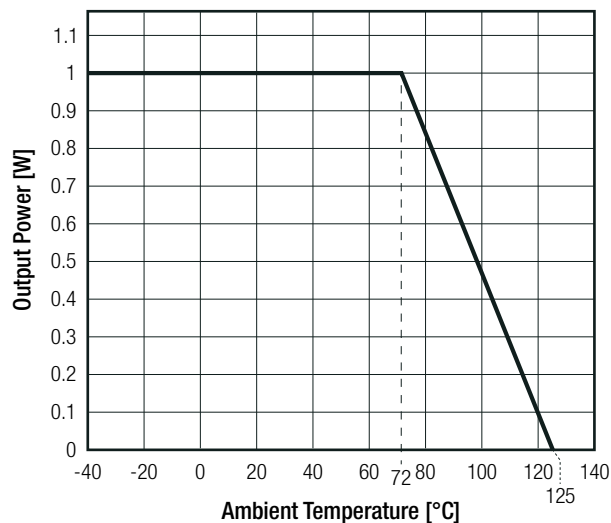
Parameter	Condition		Value
Operating Temperature Range	@ natural convection 0.1m/s	with derating	-40°C to +125°C
ESD	human-body model (HBM), ANSI/ESDA/JEDEC JS-001		±6.0kV
	charged-device model (CDM), JEDEC JESD22-C101		±2.0kV
Moisture Sensitive Level	MSL peak temp. ⁽⁵⁾		Level 3, 260°C, 168hrs
Thermal 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)

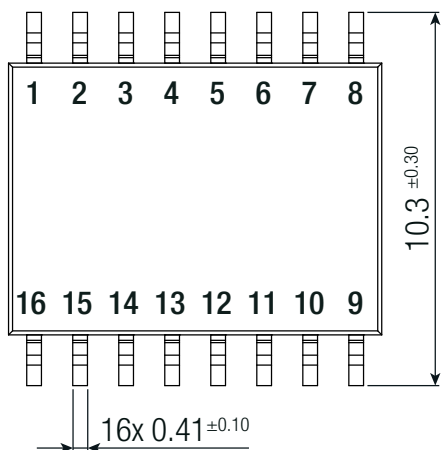
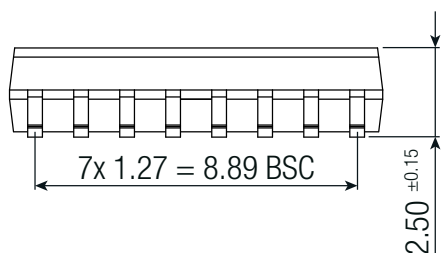
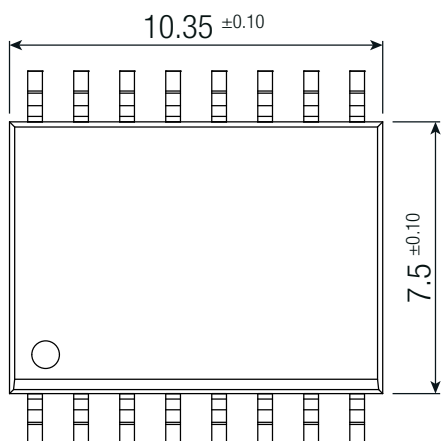
SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report Number	Standard
Information Technology Equipment, General Requirements for Safety (CB Scheme)	pending	IEC62368-1:2018, 3rd Edition
Information Technology Equipment, General Requirements for Safety		EN62368-1:2020 + 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.

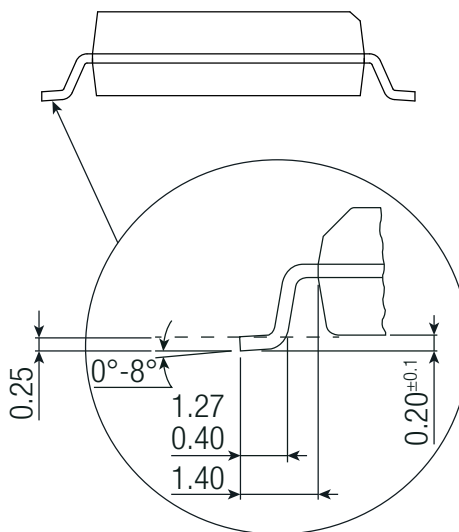
Dimension Drawing (mm)



Pin Information

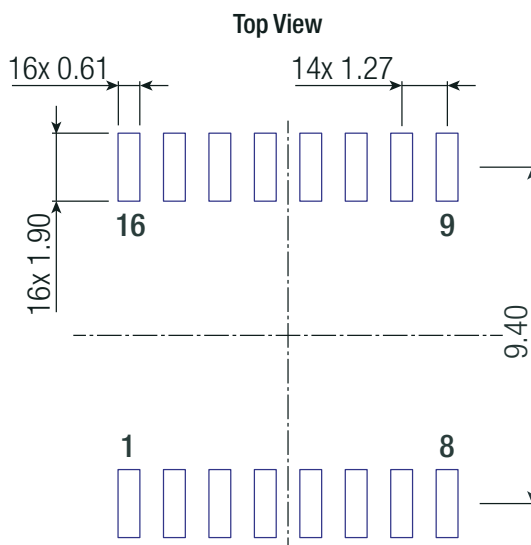
Pad #	Function
1,2	-V _{IN}
3,4	+V _{IN}
5,6,7,8	SGND _{IN}
9,11,12	SGND _{OUT}
10	DNC (do not connect)
13,14	+V _{OUT}
15,16	-V _{OUT}

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

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