

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



RxxC05TExxS

0.5 Watt
16-Pin SOIC
Single Output



IEC/EN62368-1 pending

Description

The R05C05TE05S is a low cost, low profile, 0.5W 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. The device is also able to deliver a 600mW for applications requiring additional power for short peak 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⁾ [%]
R05C05TE05S	4.5-5.5	5	0.5	53

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:

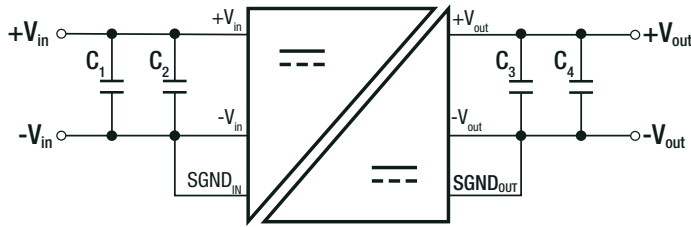
Note3: Stresses beyond those listed under absolute maximum ratings can cause permanent damage to the device. (Values are at non-operating)

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 DC-DC OFF		3.28VDC 2.88VDC	
Under Voltage Lockout Hysteresis			190mV	
Input Current Range	P _{OUT} = 0.5W P _{OUT} = 0.6W		240mA 255mA	
Quiescent Current			7mA	
Minimum Load		0%		
Internal Operating Frequency			30MHz	
Output Ripple Voltage			50mVp-p	100mVp-p

Typical Application Circuit

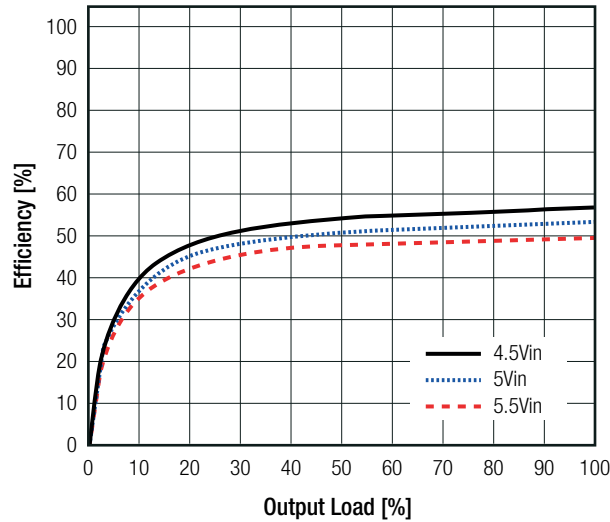


Input and Output Capacitors*

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} = 4.5-5.5VDC, load= 0.12A		±0.5%	
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		220mA, 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

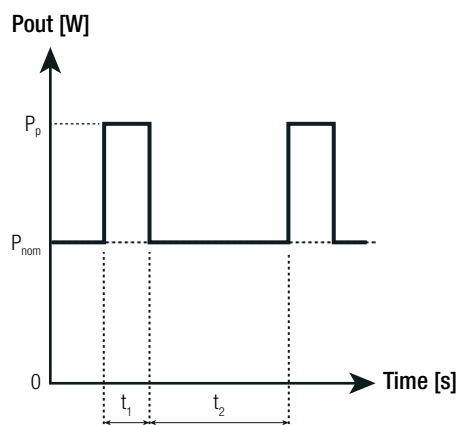
Parameter	Condition	Value
Operating Temperature Range	@ natural convection 0.1m/s with derating	-40°C to +125°C
ESD	human-body model (HBM), ANSI/ESDA/JEDEC JS-001	±6.0kV
	charged-device model (CDM), JEDEC JESD22-C101	±2.0kV
Moisture Sensitive Level	MSL peak temp. ⁽⁵⁾	Level 3, 260°C, 168hrs
Thermal Impedance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

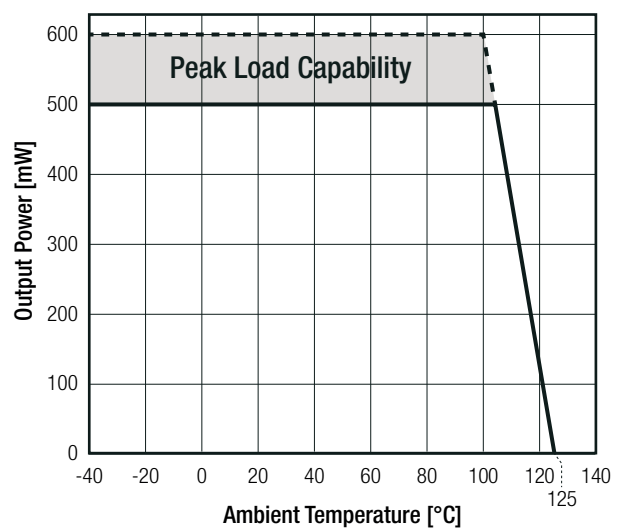
Note6: Tested with 54.0 x 85.6mm 2 layer PCB with 105µm copper

Peak Load Capability



- P_{nom} = nom. output power (0.5W) [W]
- P_p = peak output power ($\leq 0.6W$) [W]
- t_1 = peak time set (60s max.) [s]
- t_2 = recovery time (min. $3 \times t_1$) [s]

Thermal Derating ⁽⁶⁾



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

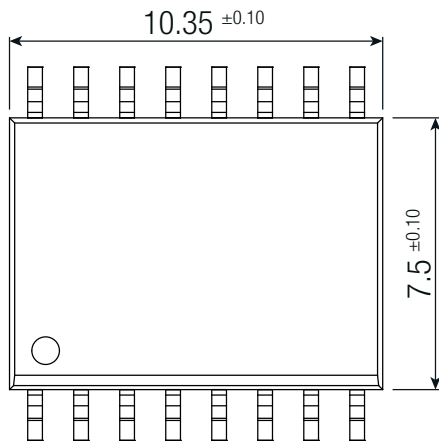
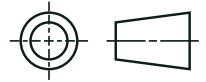
SAFETY AND CERTIFICATIONS

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.

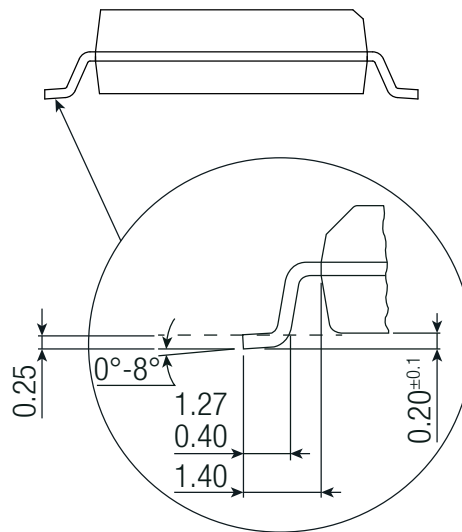
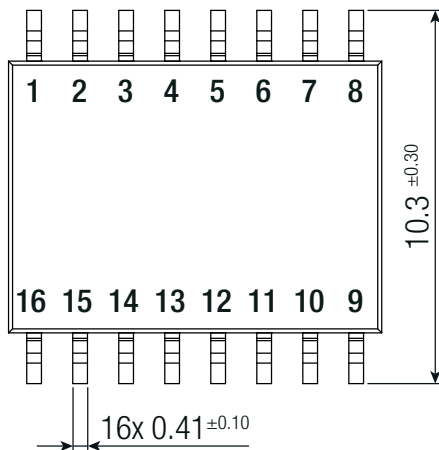
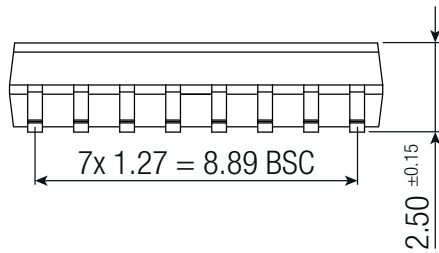
Dimension Drawing (mm)



Pin Information

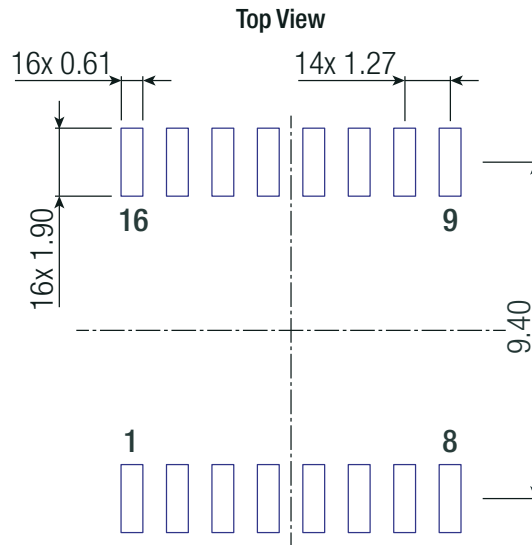
Pad #	Function
1,2	-VIN
3,4	+VIN
5,6,7,8	SGND _{IN}
9,11,12	SGND _{OUT}
10	DNC (do not connect)
13,14	+V _{OUT}
15,16	-V _{OUT}

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 + 24.4mm 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		24mm
Packaging Quantity	tape and reel	500pcs
	moisture barrier bag ("-CT")	10pcs
Storage Temperature Range		-65°C to +150°C

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