# Features

## Unregulated Converter

- 1 : 1 Input Range
- 0.5W SMD Package
- Efficiency up to 80%
- Approved for Medical Applications
- 1kVDC and 3 kVDC Isolation Option
- Operating Temperature from -40°C to +100°C

**ECONOLINE**
DC/DC-Converter
with 3 year Warranty

RECOM

# 0.5 Watt SMD Isolated Single or Dual Output

RoHS 2011/65/EU 6/6

c UL us
E358085

**UL-60950-1 Certified**

# R0.5S_D

## Specifications (measured at $T_A$ = 25°C, nominal input voltage, full load and after warm-up)

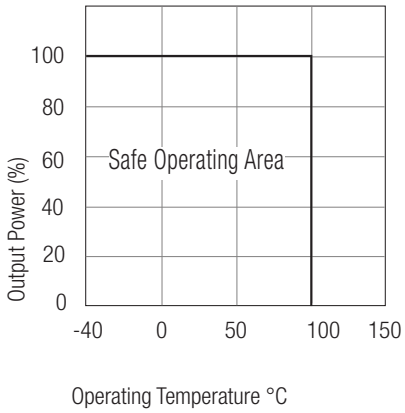
| Part Number SMD | Input Voltage (VDC) | Output Voltage (VDC) | Output Current (mA) | Efficiency typ. (%) | Max Capacitive Load[1]** |
|---|---|---|---|---|---|
| R0.5S**-3.305* | 3.3 | 5 | 100 | 80 | 1000µF |
| R0.5S**-3.312* | 3.3 | 12 | 42 | 77 | 150µF |
| R0.5S**-3.315* | 3.3 | 15 | 33 | 77 | 150µF |
| R0.5S**-0505* | 5 | 5 | 100 | 72 | 1000µF |
| R0.5S**-0512* | 5 | 12 | 42 | 77 | 150µF |
| R0.5S**-0515* | 5 | 15 | 33 | 79 | 150µF |
| R0.5S**-1205* | 12 | 5 | 100 | 74 | 1000µF |
| R0.5S**-1212* | 12 | 12 | 42 | 75 | 150µF |
| R0.5S**-1215* | 12 | 15 | 33 | 75 | 150µF |
| R0.5S**-2405* | 24 | 5 | 100 | 75 | 1000µF |
| R0.5S**-2412* | 24 | 12 | 42 | 77 | 150µF |
| R0.5S**-2415* | 24 | 15 | 33 | 77 | 150µF |
| R0.5D**-3.305* | 3.3 | ±5 | ±50 | 79 | ±470µF |
| R0.5D**-3.312* | 3.3 | ±12 | ±21 | 76 | ±68µF |
| R0.5D**-3.315* | 3.3 | ±15 | ±17 | 77 | ±68µF |
| R0.5D**-0505* | 5 | ±5 | ±50 | 79 | ±470µF |
| R0.5D**-0512* | 5 | ±12 | ±21 | 77 | ±68µF |
| R0.5D**-0515* | 5 | ±15 | ±17 | 79 | ±68µF |
| R0.5D**1205* | 12 | ±5 | ±50 | 76 | ±470µF |
| R0.5D**1212* | 12 | ±12 | ±21 | 75 | ±68µF |
| R0.5D**1215* | 12 | ±15 | ±17 | 75 | ±68µF |
| R0.5D**2405* | 24 | ±5 | ±50 | 77 | ±470µF |
| R0.5D**2412* | 24 | ±12 | ±21 | 75 | ±68µF |
| R0.5D**2415* | 24 | ±15 | ±17 | 75 | ±68µF |

*add Suffix "/H" for 3kVDC Isolation Voltage
*add Suffix "/P" for continuous short circuit protection
*add Suffix "-R" for tape & reel packing
For more details and dimensions of the tapes and reels see Application Notes

R0.5S**:
**without marking denotes 5 pins out of 8 fitted (includes „/H" option)
**with marking 8 denotes 8 pins out of 8 fitted („/H" option not available)
**with marking 12 denotes 10 pins out of 12 fitted (includes „/H" option)

R0.5D**:
**without marking denotes 6 pins out of 10 fitted (includes „/H" option)
**with marking 10 denotes 10 pins out of 10 fitted („/H" option not available)
**with marking 12 denotes 10 pins out of 12 fitted (includes „/H" option)

## Derating-Graph
(Ambient Temperature)




**Refer to Application Notes**

## Specifications (measured at $T_A$ = 25°C, nominal input voltage, full load and after warm-up)

| | | | |
|---|---|---|---|
| Input Voltage Range | | | ±10% max. |
| Voltage Set Accuracy | | 100% Load/nominal Vin | -1% typ. / ±5% max. |
| Line Regulation | | Low Line to High Line @ max. Load | 1.2% typ. |
| Load Regulation | | 5V output | 6% typ. / 15% max. |
| (10% to 100% Load) | | 12/15V output | 5%typ. / 10% max. |
| Ripple & Noise @ 20MHz BW | | | 50 mVp-p typ. / 100mVp-p max. |
| Efficiency at Full Load | | | 70% min. |
| Operating Temperature | | | -40°C to +100°C |
| Storage Temperature | | | -55°C to +125°C |
| Isolation Voltage | | (tested for 1 second) | 1000VDC |
| | | (rated for 1 minute***) | 500VAC / 60Hz |
| Isolation Voltage | H-Suffix | (tested for 1 second) | 3000VDC |
| | H-Suffix | (rated for 1 minute***) | 1500VAC / 60Hz |
| Isolation Capacitance | | | 75pF max. |
| Isolation Resistance | | Viso = 500V | 10 GΩ min. |
| Humidity | | | 95% max. |
| Operating Frequency | | Vin (nom.) | 20kHz min. / 50 kHz typ. / 90 kHz max. |
| Short-Circuit Protection | | | 1 Second |
| MTBF | | Using MIL-HDBK 217F (+100°C) | 1003 x $10^3$ hours |
| Using MIL-HDBK 217F (+25°C) | | 3962 x $10^3$ hours | *Detailed Information see Application Notes chapter „MTBF“* |
| Weight | | Single Types | 1.0 g |
| | | Dual Types | 1.2 g |
| Certification | | | |
| UL General Safety | | Report: E358085 | UL 60950-1 2nd Ed. |

***Any data referred to in this datasheet are of indicative nature and based on our practical experience only. For further details, please refer to our Application Notes.

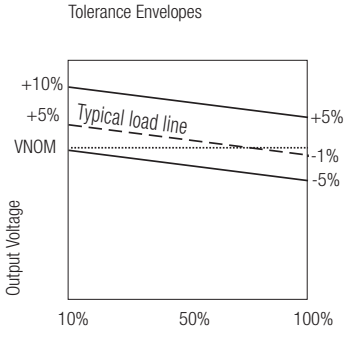
Notes

Note1: Maximum capacitive load is defined as the capacitive load that will allow start up in under 1second without damage to the converter.



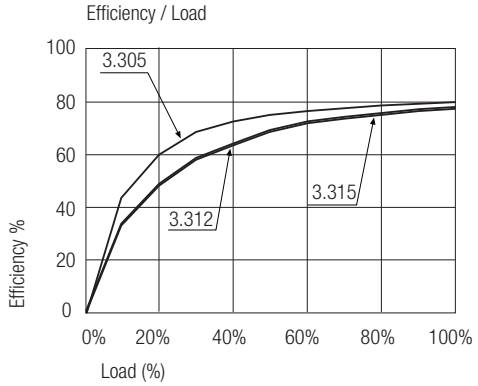
## Typical Characteristics

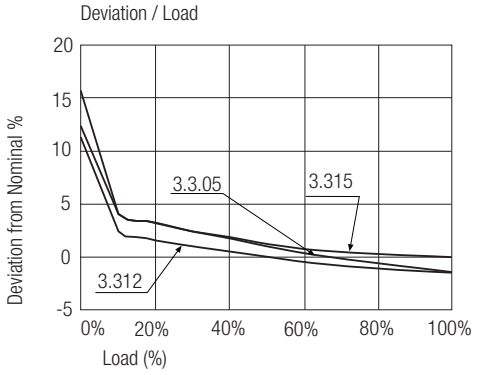
### Tolerance Envelope



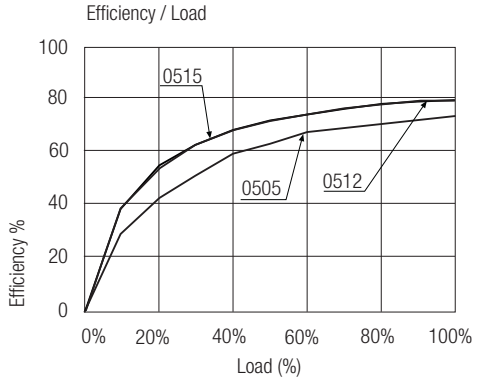
## Typical Characteristics

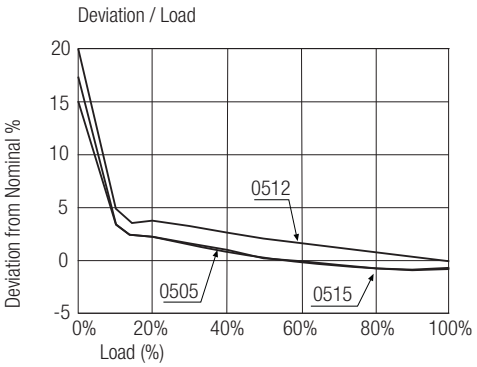
### R0.5S-3.3xx



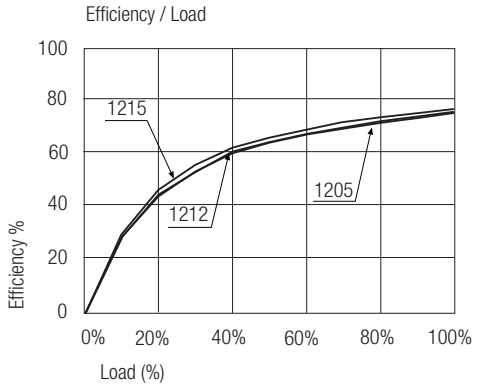



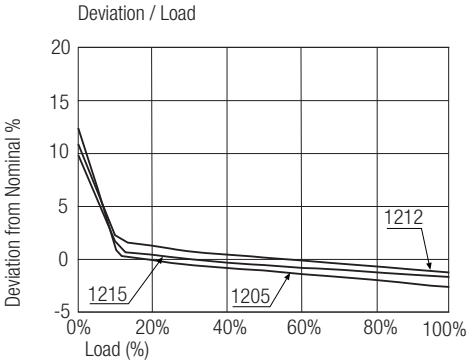

### R0.5S-05xx



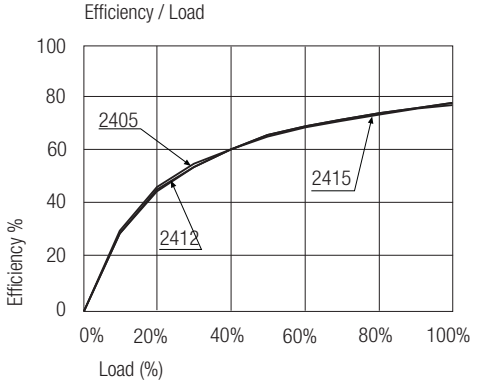



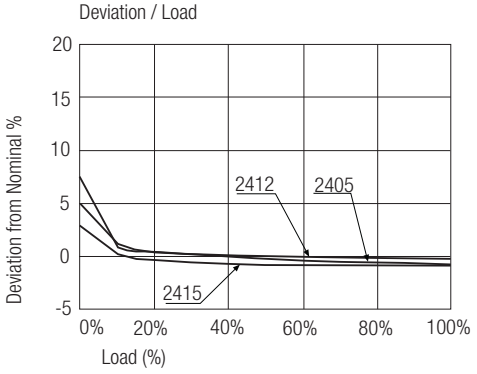

### R0.5S-12xx



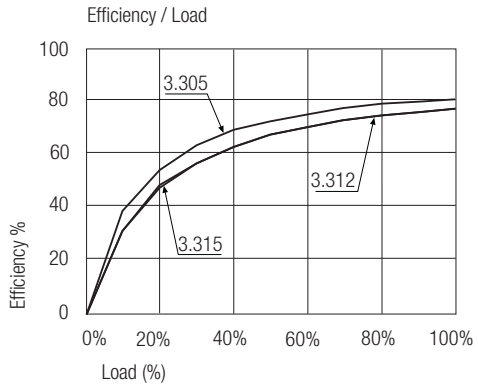

### R0.5S-24xx

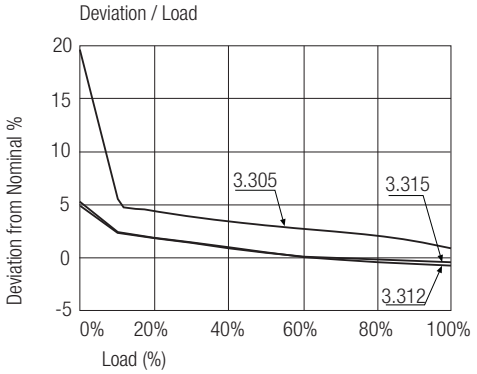


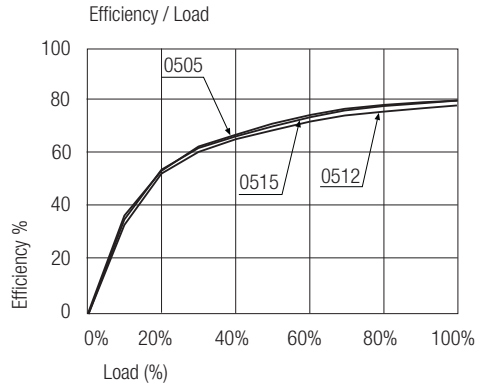
## Typical Characteristics

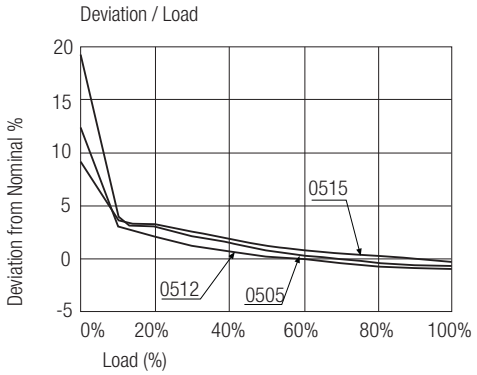
### R0.5D-3.3xx



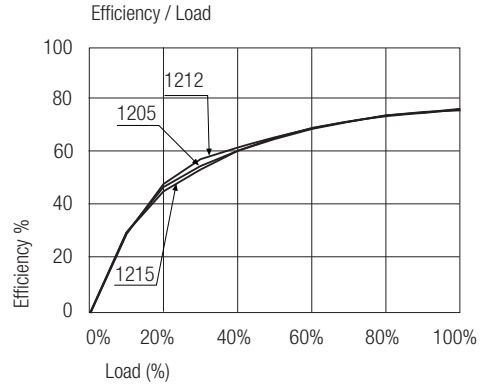



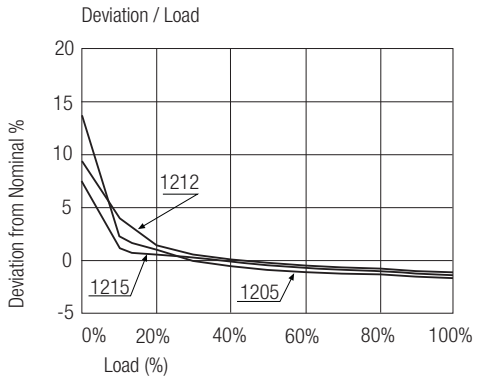

### R0.5D-05xx



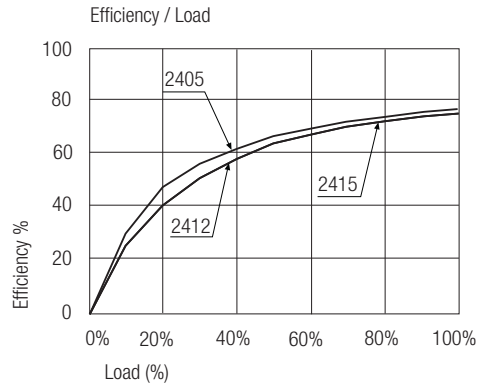



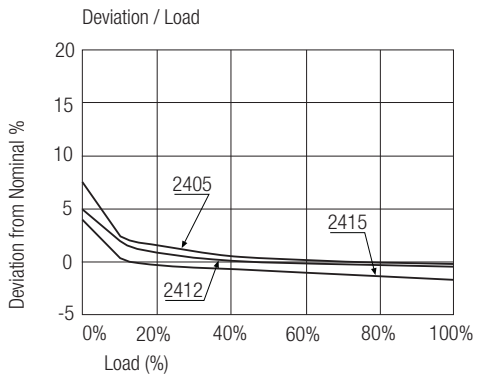

### R0.5D-12xx



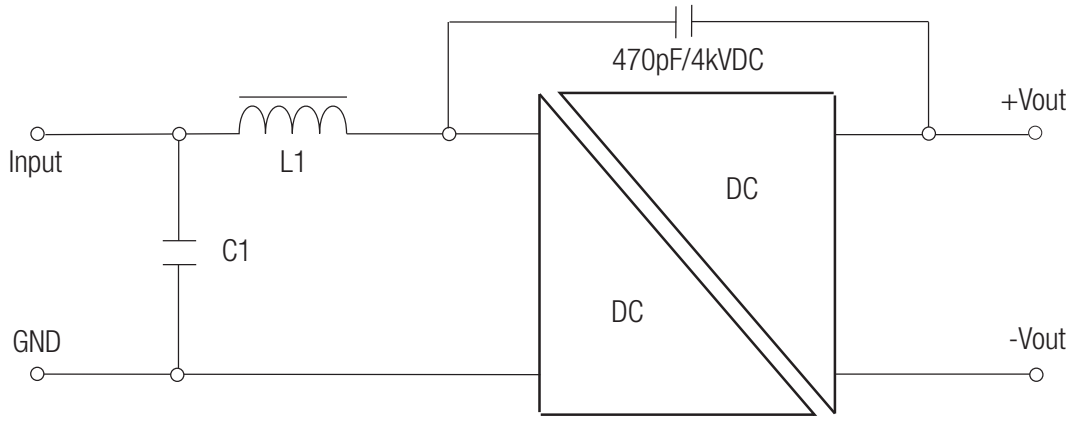

### R0.5D-24xx



## EMC Filtering - Suggestion for EN55022 Class B (Conducted and Emitted)

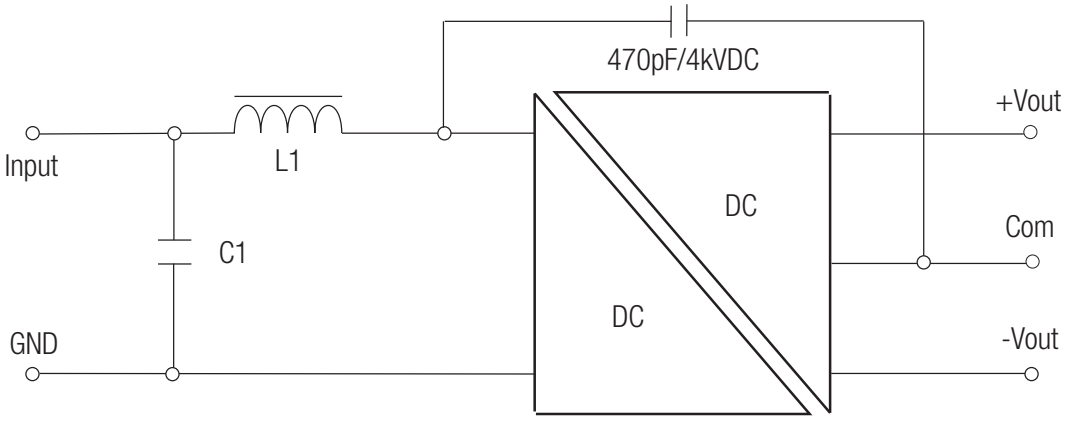
### Single Output




Except „/P“ Verions

| C1 | L1 | Vin |
|---|---|---|
| 4.7µF | 4.7µH | 3.3V |
| 4.7µF | 4.7µH | 5V |
| 4.7µF | 4.7µH | 12V |
| 2.2µF | 4.7µH | 15V |

### Dual Output



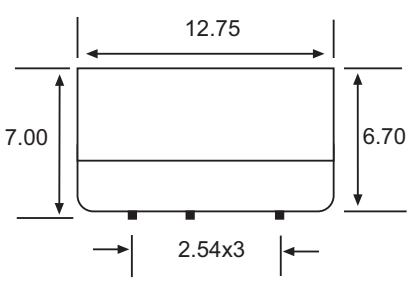

Except „/P“ Verions

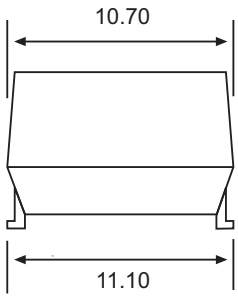
| C1 | L1 | Vin |
|---|---|---|
| 4.7µF | 10µH | 3.3V |
| 4.7µF | 4.7µH | 5V |
| 4.7µF | 2.2µH | 12V |
| 4.7µF | 2.2µH | 15V |

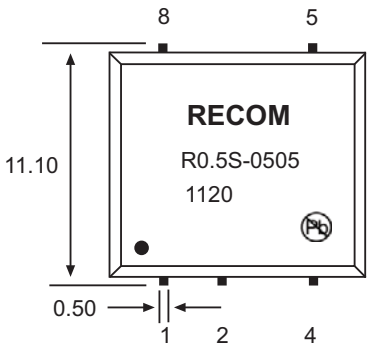
C1 = MLCC
L1 = SMD Inductor

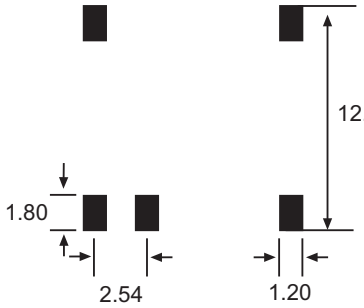
## Package Style and Pinning (mm)

### 5 PINS Single SMD Package




***Footprint***

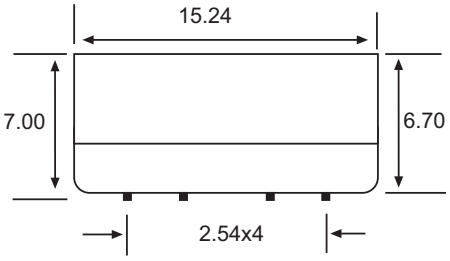
**Pin Connections**

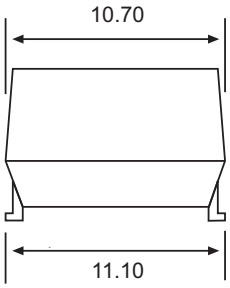
| Pin # | Single | Dual |
|---|---|---|
| 1 | –Vin | –Vin |
| 2 | +Vin | +Vin |
| 4 | -Vout | Com. |
| 5 | +Vout | –Vout |
| 7 | No Pin | +Vout |
| 8 | NC | No Pin |
| 10 | No Pin | NC |

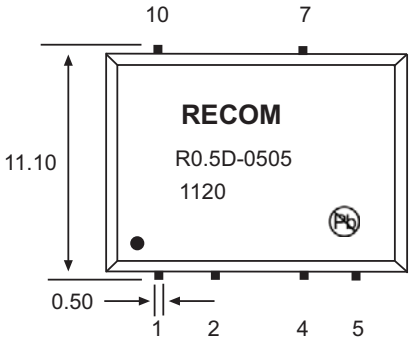
NC= No Connection

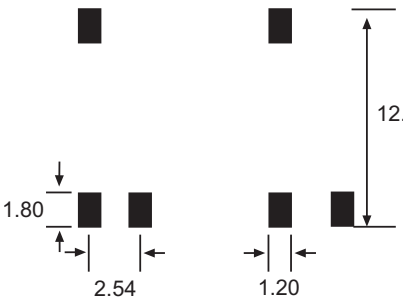
UNIT: mm
TOL.: ± 0.25 mm

### 6 PINS Dual SMD Package



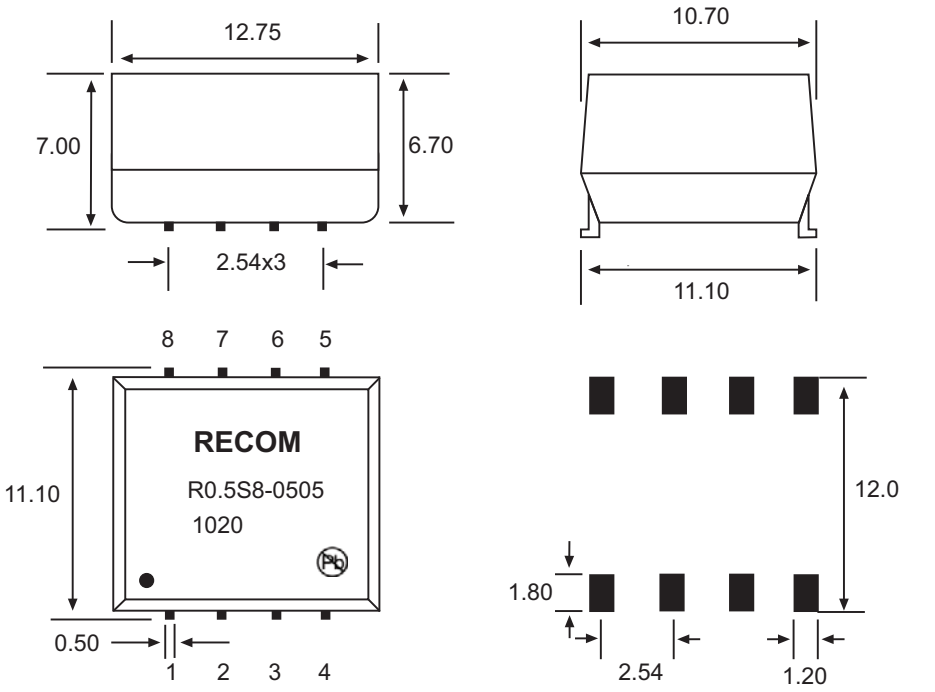




***Footprint***

## Package Style and Pinning (mm)

### 8 PINS Single SMD Package




***Footprint***

**Pin Connections**

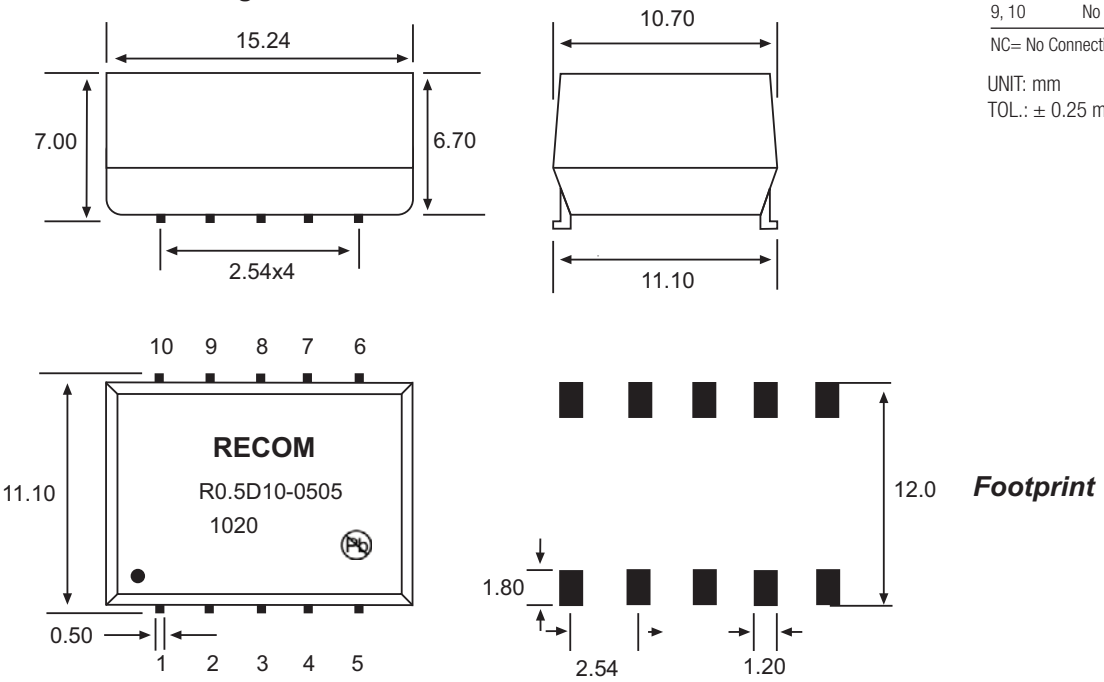
| Pin # | Single | Dual |
|---|---|---|
| 1 | –Vin | –Vin |
| 2 | +Vin | +Vin |
| 4 | -Vout | Com. |
| 5 | +Vout | –Vout |
| 7 | NC | +Vout |
| 3, 6, 8 | NC | NC |
| 9, 10 | No Pin | NC |

NC= No Connection

UNIT: mm
TOL.: ± 0.25 mm

R0.5S_D

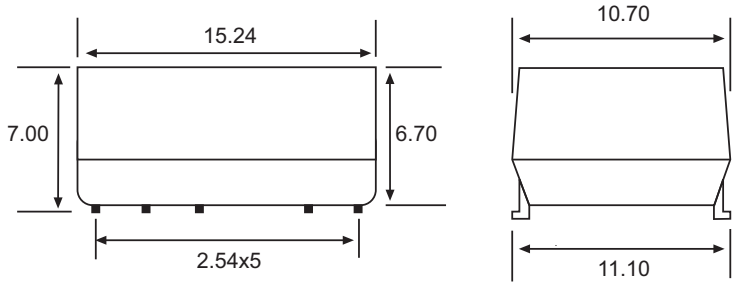
### 10 PINS Dual SMD Package




***Footprint***

## Package Style and Pinning (mm)

### 12 PINS Dual SMD Package



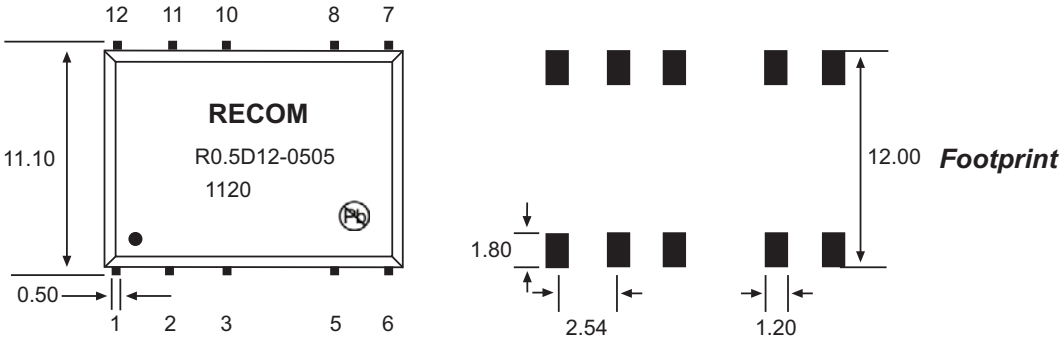

**Pin Connections**

| Pin # | Function Single | Function Dual |
|---|---|---|
| 1 | –Vin | –Vin |
| 2 | +Vin | +Vin |
| 5 | -Vout | Com. |
| 6 | NC | –Vout |
| 8 | +Vout | +Vout |
| 3,7,10,11,12 | NC | NC |

NC= No Connection

Unit: mm

TOL.: ± 0.25 mm



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