



**THE DATASHEET OF
REC5-1205SRW/H6/A/M/CTRL/X2**



Features

Regulated Converters

- 1.6kVDC, 2kVDC, 4kVDC or 6kVDC isolation
- Industry standard 5W DIP24 or SMD package
- Feedback regulated output
- Continuous short circuit protection
- Wide 2:1 or 4:1 input
- 3 case styles
- CTRL pin option (A pinning only)

RECOM
DC/DC Converter

REC5-S(D)RW(Z)

5 Watt
DIP24 or
SMD Case
Single and Dual



C **UL** US
E358085



IEC60950-1 certified
UL60950-1 certified
CAN/CSA-C22.2 No. 60950-1-03 certified
EN55032 compliant

PREFERRED ALTERNATIVES

For new medical applications:

REM5E



Description

This series offers standard isolation of 2kVDC/1s with 4kVDC/1s (= „/H4“) or 6kVDC/1s (= „/H6“) options making it ideal for both industrial, medical and other sophisticated high end applications. Packaging can be either DIP24 non-conductive plastic or 5-side-shielded DIP24 metal case (= option „/M“) as well as DIP24-SMD case (= option „/SMD“). For all the above variants, 2 industry-standard pinouts (= option „/A“ or „/C“) are available. „B“ pinning is also available with „/H“ isolation of 1.6kVDC. Remote on/off control is possible with the /CTRL option („A“ pinning only). The converters can deliver 140% rated power for short periods of time to cope with applications with large capacitive loads or high start up currents.

Selection Guide

| Part Number | Input Voltage Range ⁽¹⁾ [VDC] | Output Voltage [VDC] | Output Current [mA] | Efficiency typ. ⁽²⁾ [%] | max. Capacitive Load ⁽³⁾ [µF] |
|----------------|--|----------------------|---------------------|------------------------------------|--|
| REC5-xx3.3SRW | 4.5-9, 9-18, 18-36, 36-72 | 3.3 | 1000 | 75-77 | 6800 |
| REC5-xx05SRW | 9-18, 18-36, 36-72 4.5-9 | 5 | 1000 | 79-81 75 | 6800 |
| REC5-xx09SRW | 9-18, 18-36, 36-72 4.5-9 | 9 | 556 | 82-83 73 | 6800 |
| REC5-xx12SRW | 9-18, 18-36, 36-72 4.5-9 | 12 | 420 | 84-85 74 | 6800 |
| REC5-xx15SRW | 9-18, 18-36, 36-72 4.5-9 | 15 | 340 | 85-86 75 | 6800 |
| REC5-xx05DRW | 9-18, 18-36, 36-72 4.5-9 | ±5 | ±500 | 79-81 72 | ±2200 |
| REC5-xx09DRW | 9-18, 18-36, 36-72 4.5-9 | ±9 | ±278 | 82-84 74 | ±2200 |
| REC5-xx12DRW | 9-18, 18-36, 36-72 4.5-9 | ±12 | ±210 | 84-85 75 | ±2200 |
| REC5-xx15DRW | 9-18, 18-36, 36-72 4.5-9 | ±15 | ±170 | 85-86 75 | ±2200 |
| REC5-xx3.3SRWZ | 9-36, 18-72 | 3.3 | 1000 | 75-76 | 6800 |
| REC5-xx05SRWZ | 9-36, 18-72 | 5 | 1000 | 81-82 | 6800 |
| REC5-xx09SRWZ | 9-36, 18-72 | 9 | 556 | 82-83 | 6800 |
| REC5-xx12SRWZ | 9-36, 18-72 | 12 | 420 | 83-84 | 6800 |
| REC5-xx15SRWZ | 9-36, 18-72 | 15 | 340 | 84-85 | 6800 |
| REC5-xx05DRWZ | 9-36, 18-72 | ±5 | ±500 | 81-82 | ±2200 |
| REC5-xx09DRWZ | 9-36, 18-72 | ±9 | ±278 | 82-84 | ±2200 |
| REC5-xx12DRWZ | 9-36, 18-72 | ±12 | ±210 | 82-83 | ±2200 |
| REC5-xx15DRWZ | 9-36, 18-72 | ±15 | ±170 | 84-85 | ±2200 |

Notes:

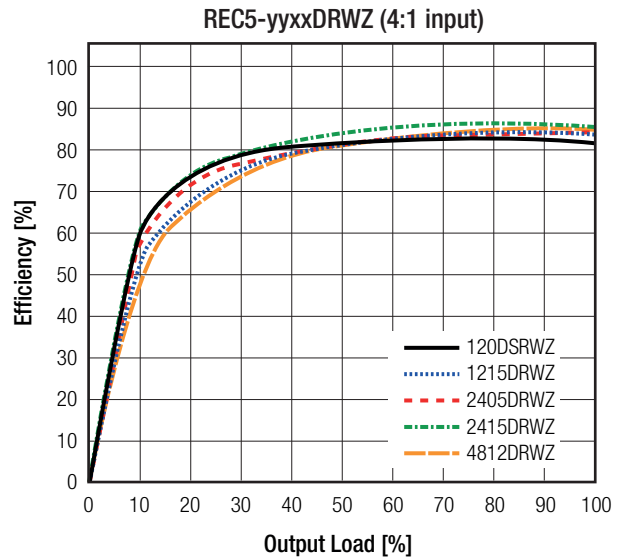
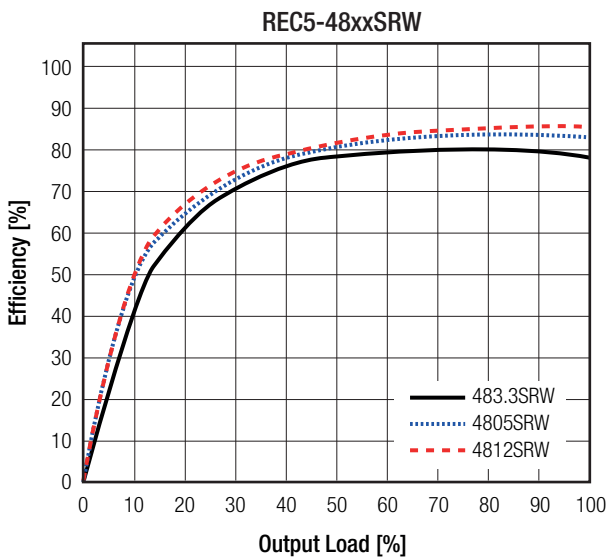
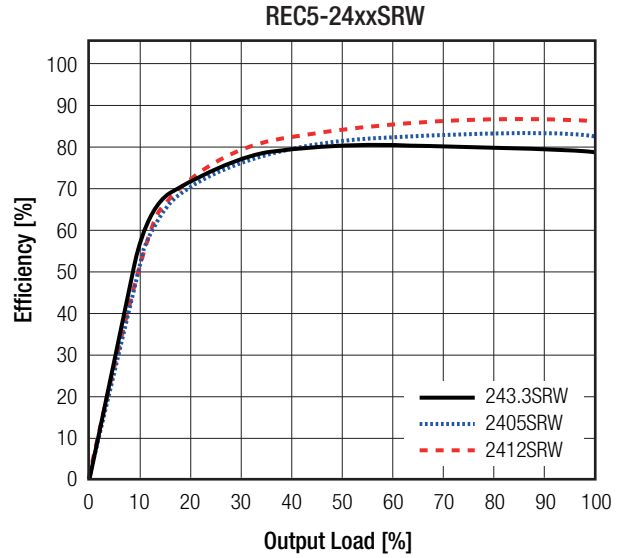
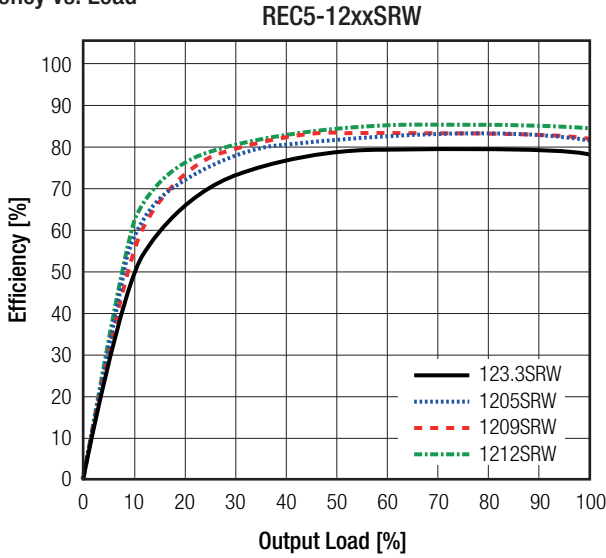
Note1: Refer to “Input Voltage Range”

Note2: Efficiency is tested at nominal input and full load at +25°C ambient

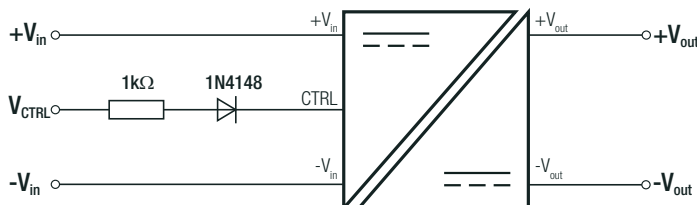
Note3: Max Cap Load is tested at nominal input and full resistive load

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

Efficiency vs. Load



ON/OFF CTRL (“/A” pinning only)



DC-DC ON: $0V < V_{CTRL} < 1.2VDC$
DC-DC OFF: $2.2V < V_{CTRL} < 12VDC$

REGULATIONS

| Parameter | Condition | Value |
|-----------------|-----------------------|------------|
| Output Accuracy | | ±2.0% max. |
| Line Regulation | low line to high line | ±0.3% max. |
| Load Regulation | 20% to 100% load | ±0.6% max. |

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

PROTECTIONS

| Parameter | Type | Value | |
|--|---------------------|---------------------------|-------------|
| Short Circuit Protection (SCP) ⁽¹⁴⁾ | below 100mΩ | continuous, auto recovery | |
| Isolation Voltage ⁽¹⁵⁾ | with suffix "/H" | tested for 1 second | 1.6kVDC |
| | | rated for 1 minute | 500VAC/60Hz |
| | with suffix "/H2" | tested for 1 second | 2kVDC |
| | | rated for 1 minute | 1kVAC/60Hz |
| | with suffix "/H3" | tested for 1 second | 4kVDC |
| | | rated for 1 minute | 2kVAC/60Hz |
| with suffix "/H6" | tested for 1 second | 6kVDC | |
| | rated for 1 minute | 3kVAC/60Hz | |
| Isolation Resistance | | 1GΩ min. | |
| Isolation Capacitance | | 60pF typ. | |
| Insulation Grade | | functional | |

Notes:

Note14: Max. Temperature = +50°C during the short circuit conditions.

Note15: For repeat Hi-Pot testing, reduce the time and/or the test voltage

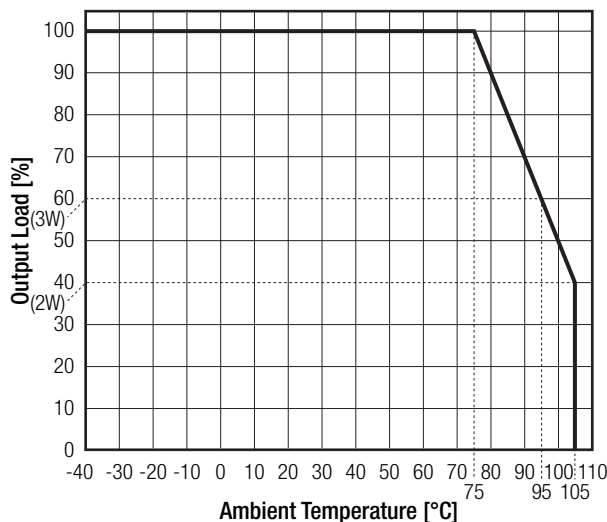
Note16: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

ENVIRONMENTAL

| Parameter | Condition | Value | |
|-----------------------------|---|-----------------|-----------------------------|
| Operating Temperature Range | with derating @ free air convection (refer to "Derating Graph") | -40°C to +105°C | |
| Thermal Impedance | plastic case | 20K/W | |
| | metal case | 12K/W | |
| Operating Altitude | | 2000m | |
| Operating Humidity | non-condensing | 95% RH max. | |
| Pollution Degree | | PD2 | |
| MTBF | according to MIL-HDBK-217F, G.B. | +25°C | 850 x 10 ³ hours |
| | | +75°C | 206 x 10 ³ hours |

Derating Graph

(@ Chamber and free air convection 0.1m/s)



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

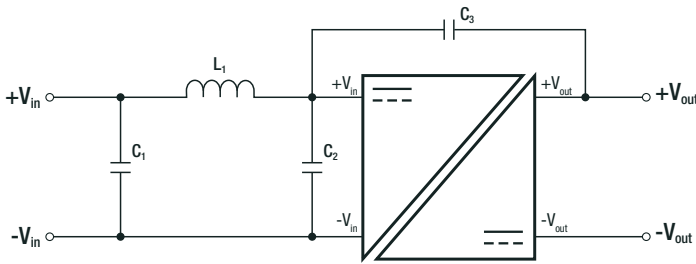
SAFETY AND CERTIFICATIONS

| Certificate Type (Safety) | Report / File Number | Standard |
|---|----------------------|---|
| Information Technology Equipment, General Requirements for Safety | E358085 | UL60950-1, 1st Edition, 2007 CAN/CSA-C22.2 No. 60950-1-03, 1st Edition, 2006 |
| Information Technology Equipment, General Requirements for Safety | LVD1605077-10 | IEC60950-1:2005, 2nd Edition + A2:2013 |
| Medical Electric Equipment, General Requirements for Safety and Essential Performance | SPC1006048 | IEC60601-1:1988 + A2:1995 EN60601-1:1990 + A13 :1996 |
| EAC | RU-AT.AB49.B.09571 | TP TC 004/2011 |
| RoHS2 | TWNC00677039 | RoHS, 2011/65/EU + AM-2015/863 |

EMC Compliance

| EMC Compliance | Condition | Standard / Criterion |
|---|---|----------------------|
| Electromagnetic compatibility of multimedia equipment - Emission requirements ⁽¹⁷⁾ | with external filter (see filter suggestion below) | EN55032, Class A/B |

EMC Filtering Suggestions according to EN55032



Component List Class A

| MODEL | C1 | C2 | C3 | L1 |
|-------------------|-----|--------------|-------|------------------------------|
| REC5-0505SRW/H4/A | N/A | 10µF MLCC | 150pF | N/A |
| REC5-1205SRW/H4/A | | | | 12µH RLS-126 |
| REC5-2405SRW/H4/A | | | 330pF | 22µH RLS-226 |
| REC5-4805SRW/H2/A | | | | |

Component List Class B

| MODEL | C1 | C2 | C3 | L1 |
|-------------------|--------------|--------------|-------|-------------------------------|
| REC5-0505SRW/H4/A | 10µF MLCC | 10µF MLCC | 150pF | 18µH RLS-186 |
| REC5-1205SRW/H4/A | | | | 12µH RLS-126 |
| REC5-2405SRW/H4/A | | | 1nF | 22µH RLS-226 |
| REC5-4805SRW/H2/A | | | | 100µH RLS-105 |

Notes:

Note17: Filter suggestions are valid for indicated part numbers only. For other part numbers, please contact Recom tech support advice

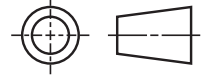
DIMENSION AND PHYSICAL CHARACTERISTICS

| Parameter | Type | Value | |
|-------------------|-------------------------|--|----------------------|
| Material | plastic case | non-conductive black plastic, (UL94 V-0) | |
| | metal case ("M" option) | nickel plated copper | |
| | PCB | FR4, (UL94 V-0) | |
| | potting | epoxy, (UL94 V-0) | |
| Dimension (LxWxH) | DIP24 | plastic case | 31.8 x 20.3 x 10.2mm |
| | | metal case ("M" option) | 32.0 x 20.3 x 10.5mm |
| | SMD | plastic case | 31.8 x 20.3 x 10.9mm |
| | | metal case ("M" option) | 32.0 x 20.3 x 10.9mm |
| Weight | | 13g typ. | |

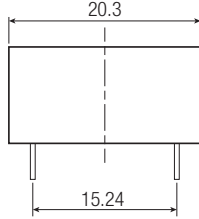
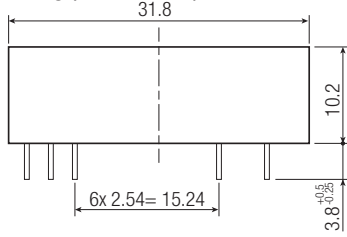
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Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

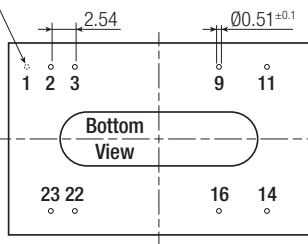
Dimension Drawing DIP24 plastic case (mm)



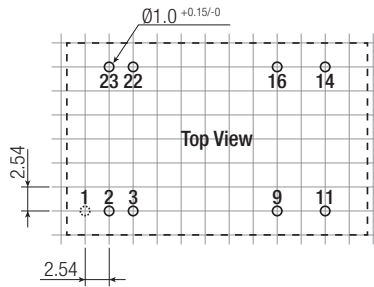
„A“ Pinning (/H2, /H4, /H6)



CTRL option



Recommended Footprint Details

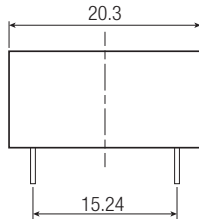
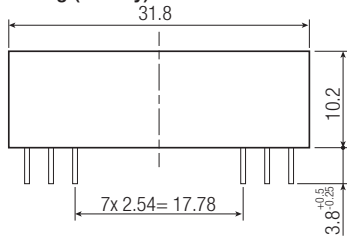


„A“ Pinning (/H2,/H4,/H6)

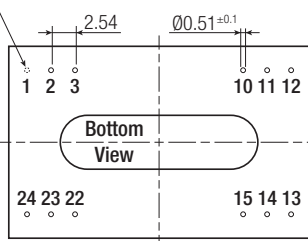
| Pin # | Single | Single/X2 | Dual |
|-----------|--------|-----------|-------|
| 1 „Note8“ | CTRL | CTRL | CTRL |
| 2,3 | -Vin | -Vin | -Vin |
| 9 | NC | no pin | Com |
| 11 | NC | NC | -Vout |
| 14 | +Vout | +Vout | +Vout |
| 16 | -Vout | -Vout | Com |
| 22,23 | +Vin | +Vin | +Vin |

NC= No Connection

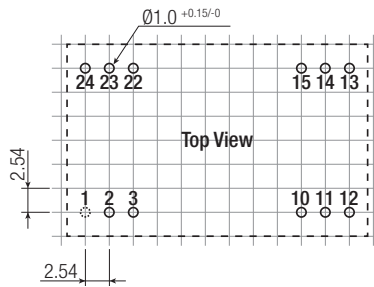
„B“ Pinning (/H only)



CTRL option



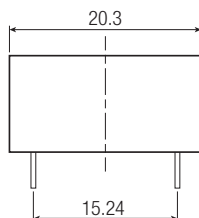
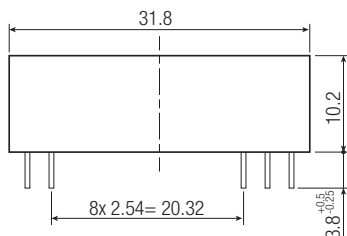
Recommended Footprint Details



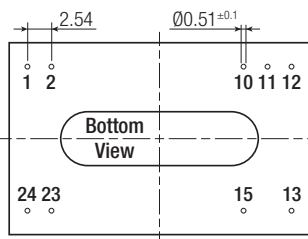
„B“ Pinning (/H only)

| Pin # | Single | Dual |
|-------|--------|-------|
| 1 | +Vin | +Vin |
| 2 | no pin | -Vout |
| 3 | no pin | Com |
| 10 | -Vout | Com |
| 11,14 | +Vout | +Vout |
| 12,13 | -Vin | -Vin |
| 15 | -Vout | Com |
| 22 | no pin | Com |
| 23 | no pin | -Vout |
| 24 | +Vin | +Vin |

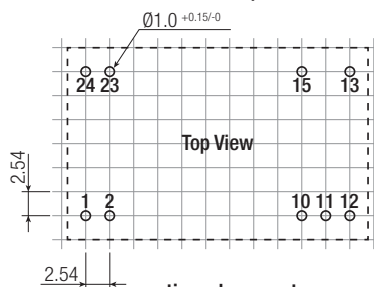
„C“ Pinning (/H2, /H4, /H6)



CTRL option



Recommended Footprint Details



„C“ Pinning (/H2,/H4,/H6)

| Pin # | Single | Dual |
|-------|--------|-------|
| 1,2 | +Vin | +Vin |
| 10,11 | NC | COM |
| 12 | -Vout | NC |
| 13 | +Vout | -Vout |
| 15 | NC | +Vout |
| 23,24 | -Vin | -Vin |

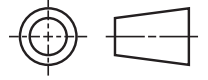
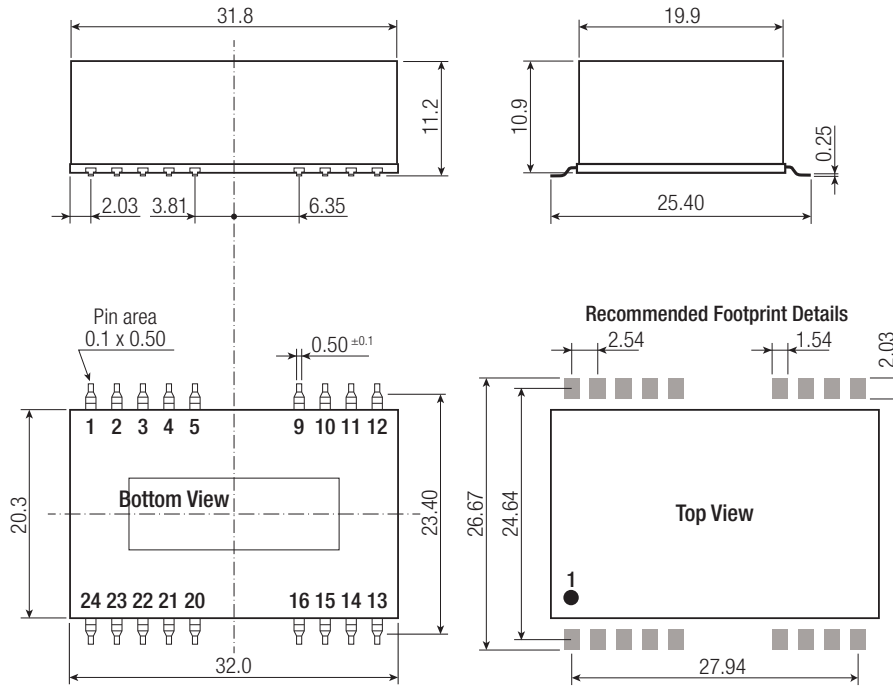
NC= No Connection

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tolerance ±0.25mm

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

Dimension Drawing SMD plastic case (mm)



„A“ Pinning

| Pin # | Single | Dual |
|--------------------------|--------|-------|
| 1 <small>„Note8“</small> | CTRL | CTRL |
| 2,3 | -Vin | -Vin |
| 4,5 | NC | NC |
| 9 | NC | Com |
| 10,12,13,15 | NC | NC |
| 11 | NC | -Vout |
| 14 | +Vout | +Vout |
| 16 | -Vout | Com |
| 20,21,24 | NC | NC |
| 22,23 | +Vin | +Vin |

NC= No Connection

„B“ Pinning

| Pin # | Single | Dual |
|----------|--------|-------|
| 1 | +Vin | +Vin |
| 2 | NC | -Vout |
| 3 | NC | Com |
| 4,5,9 | NC | NC |
| 10 | -Vout | Com |
| 11 | +Vout | +Vout |
| 12,13 | -Vin | -Vin |
| 14 | +Vout | +Vout |
| 15 | -Vout | Com |
| 16,20,21 | NC | NC |
| 22 | NC | Com |
| 23 | NC | -Vout |
| 24 | +Vin | +Vin |

NC= No Connection

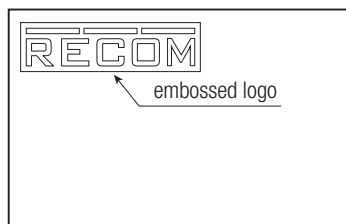
„C“ Pinning

| Pin # | Single | Dual |
|-------------|--------|-------|
| 1,2 | +Vin | +Vin |
| 3,4,5,9 | NC | NC |
| 10,11 | NC | Com |
| 12 | -Vout | NC |
| 13 | +Vout | -Vout |
| 14 | NC | NC |
| 15 | NC | +Vout |
| 16,20,21,22 | NC | NC |
| 23,24 | -Vin | -Vin |

NC= No Connection

Notes:

Note18: All models with plastic housings have an embossed RECOM logo. See below top view:

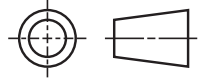


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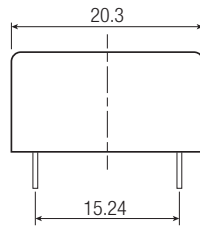
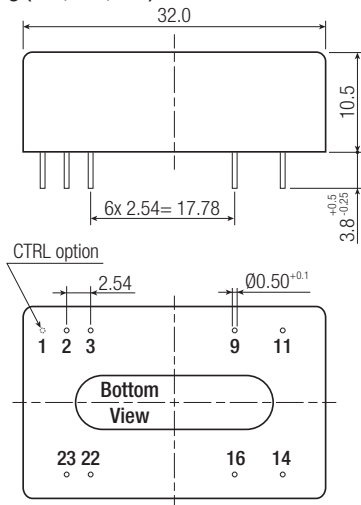
tolerance ±0.35mm

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

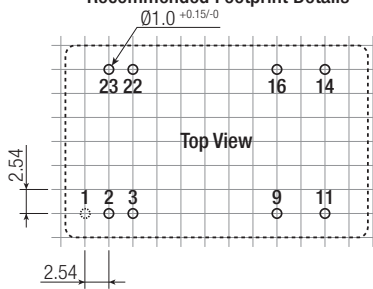
Dimension Drawing DIP24 metal case (mm)



„A“ Pinning (/H2, /H4, /H6)



Recommended Footprint Details

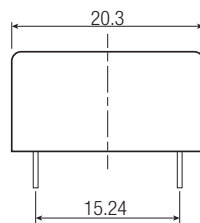
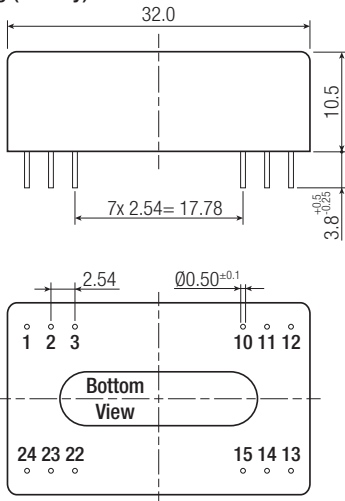


„A“ Pinning (/H2,/H4,/H6)

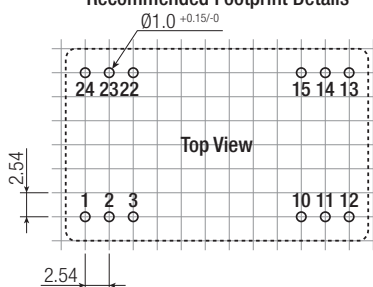
| Pin # | Single | Single/X2 | Dual |
|-----------|--------|-----------|-------|
| 1 „Note8“ | CTRL | CTRL | CTRL |
| 2,3 | -Vin | -Vin | -Vin |
| 9 | NC | no pin | Com |
| 11 | NC | NC | -Vout |
| 14 | +Vout | +Vout | +Vout |
| 16 | -Vout | -Vout | Com |
| 22,23 | +Vin | +Vin | +Vin |

NC: No Connection

„B“ Pinning (/H only)



Recommended Footprint Details

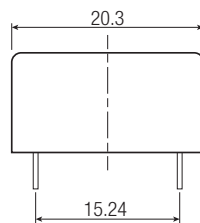
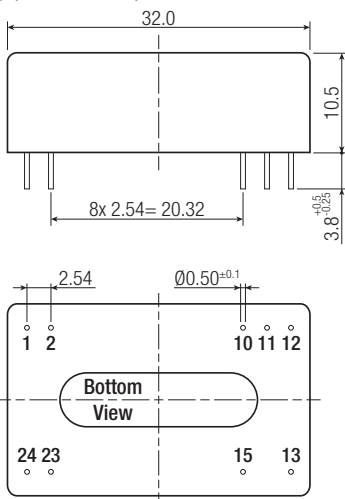


„B“ Pinning (/H only)

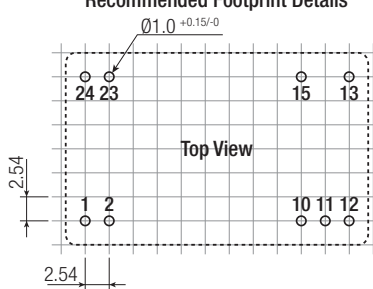
| Pin # | Single | Dual |
|-------|--------|-------|
| 1 | +Vin | +Vin |
| 2 | no pin | -Vout |
| 3 | no pin | Com |
| 10 | -Vout | Com |
| 11,14 | +Vout | +Vout |
| 12,13 | -Vin | -Vin |
| 15 | -Vout | Com |
| 22 | no pin | Com |
| 23 | no pin | -Vout |
| 24 | +Vin | +Vin |

NC= No Connection

„C“ Pinning (/H2, /H4, /H6)



Recommended Footprint Details



„C“ Pinning (/H2,/H4,/H6)

| Pin # | Single | Dual |
|-------|--------|-------|
| 1,2 | +Vin | +Vin |
| 10,11 | NC | COM |
| 12 | -Vout | NC |
| 13 | +Vout | -Vout |
| 15 | NC | +Vout |
| 23,24 | -Vin | -Vin |

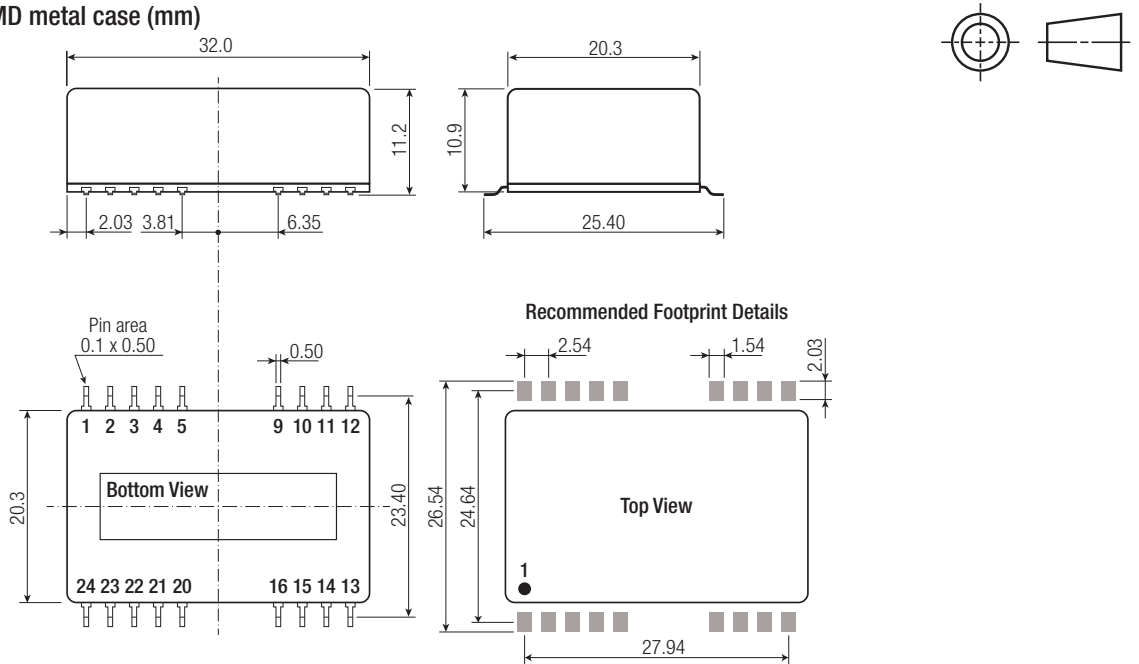
NC= No Connection

tolerance ±0.25mm

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

Dimension Drawing SMD metal case (mm)



„A“ Pinning

| Pin # | Single | Dual |
|-------------|--------|-------|
| 1 „Note8“ | CTRL | CTRL |
| 2,3 | -Vin | -Vin |
| 4,5 | NC | NC |
| 9 | NC | Com |
| 10,12,13,15 | NC | NC |
| 11 | NC | -Vout |
| 14 | +Vout | +Vout |
| 16 | -Vout | Com |
| 20,21,24 | NC | NC |
| 22,23 | +Vin | +Vin |

NC= No Connection

„B“ Pinning

| Pin # | Single | Dual |
|----------|--------|-------|
| 1 | +Vin | +Vin |
| 2 | NC | -Vout |
| 3 | NC | Com |
| 4,5,9 | NC | NC |
| 10 | -Vout | Com |
| 11 | +Vout | +Vout |
| 12,13 | -Vin | -Vin |
| 14 | +Vout | +Vout |
| 15 | -Vout | Com |
| 16,20,21 | NC | NC |
| 22 | NC | Com |
| 23 | NC | -Vout |
| 24 | +Vin | +Vin |

NC= No Connection

„C“ Pinning

| Pin # | Single | Dual |
|-------------|--------|-------|
| 1,2 | +Vin | +Vin |
| 3,4,5,9 | NC | NC |
| 10,11 | NC | Com |
| 12 | -Vout | NC |
| 13 | +Vout | -Vout |
| 14 | NC | NC |
| 15 | NC | +Vout |
| 16,20,21,22 | NC | NC |
| 23,24 | -Vin | -Vin |

NC= No Connection

tolerance ±0.35mm



PACKAGING INFORMATION

| Parameter | Type | Value | |
|-----------------------------|---------------------------|------------------------|-----------------------|
| Packaging Dimension (LxWxH) | tube | THT | 530.0 x 23.0 x 19.0mm |
| | | SMD | 530.0 x 32.0 x 19.0mm |
| | tape and reel (“-R” only) | 355.0 x 342.0 x 70.0mm | |
| Tape Width | | 44mm | |
| Packaging Quantity | tube | 15pcs | |
| | tape and reel | 100pcs | |
| Storage Temperature Range | | -55°C to +125°C | |
| Storage Humidity | non-condensing | 95% RH max. | |

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.

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