

Features

- 2:1 input voltage range
- 1.6kVDC isolation
- UL60950-1 certified
- Efficiency up to 87%
- Low profile, 10.2mm height
- Over current protection

Regulated Converter



RP08-A

8 Watt
DIP24/SMD
 Single and Dual Output

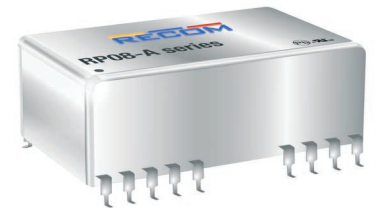


Description

The RP08-A series DC/DC converters are certified to UL60950-1 and cUL60950-1. This makes them ideal for all telecom and industrial applications where approved safety standards are required. The DIP24 package is available in both pinned and SMD case styles and meets military standards for thermal shock and vibration tolerance.

Selection Guide

| Part Number | Input Voltage Range [VDC] | Output Voltage [VDC] | Output Current [mA] | Input Current (1) [mA] | Efficiency (1) typ. [%] | Max. Capacitive Load (2) [µF] |
|------------------|---------------------------|----------------------|---------------------|------------------------|-------------------------|-------------------------------|
| RP08-123.3SA (3) | 9-18 | 3.3 | 2000 | 688 | 80 | 3300 |
| RP08-1205SA (3) | 9-18 | 5 | 1500 | 753 | 83 | 1600 |
| RP08-1212SA (3) | 9-18 | 12 | 666 | 757 | 88 | 350 |
| RP08-1215SA (3) | 9-18 | 15 | 533 | 766 | 87 | 240 |
| RP08-243.3SA (3) | 18-36 | 3.3 | 2000 | 344 | 80 | 3300 |
| RP08-2405SA (3) | 18-36 | 5 | 1500 | 377 | 83 | 1600 |
| RP08-2412SA (3) | 18-36 | 12 | 666 | 387 | 86 | 350 |
| RP08-2415SA (3) | 18-36 | 15 | 533 | 392 | 85 | 240 |
| RP08-483.3SA (3) | 36-75 | 3.3 | 2000 | 172 | 80 | 3300 |
| RP08-4805SA (3) | 36-75 | 5 | 1500 | 188 | 83 | 1600 |
| RP08-4812SA (3) | 36-75 | 12 | 666 | 194 | 86 | 350 |
| RP08-4815SA (3) | 36-75 | 15 | 533 | 194 | 86 | 240 |
| RP08-1205DA (3) | 9-18 | ±5 | ±800 | 803 | 83 | ±1000 |
| RP08-1212DA (3) | 9-18 | ±12 | ±333 | 766 | 87 | ±160 |
| RP08-1215DA (3) | 9-18 | ±15 | ±267 | 785 | 85 | ±100 |
| RP08-2405DA (3) | 18-36 | ±5 | ±800 | 407 | 82 | ±1000 |
| RP08-2412DA (3) | 18-36 | ±12 | ±333 | 387 | 86 | ±160 |
| RP08-2415DA (3) | 18-36 | ±15 | ±267 | 393 | 85 | ±100 |
| RP08-4805DA (3) | 36-75 | ±5 | ±800 | 196 | 85 | ±1000 |
| RP08-4812DA (3) | 36-75 | ±12 | ±333 | 191 | 87 | ±160 |
| RP08-4815DA (3) | 36-75 | ±15 | ±267 | 192 | 87 | ±100 |

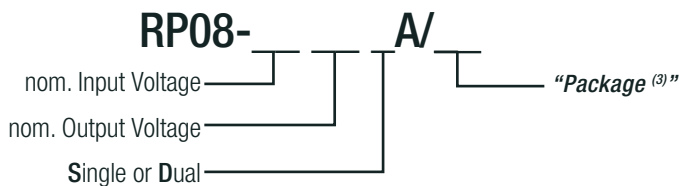


Notes:

- Note1: Maximum values at nominal input voltage and full load
 Note2: Max. Cap load is tested at minimum Input and constant resistive load

UL60950-1 certified
 EN55032 compliant

Model Numbering



Notes:

- Note3: no suffix for standard DIP24 package
 add suffix "/SMD" for SMD package

Ordering Examples

- RP08-4805SA/SMD = 48V Input, 5V Output, Single, SMD Package
 RP08-1205DA = 12V Input, 5V Output, Dual, DIP24 Package

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

BASIC CHARACTERISTICS

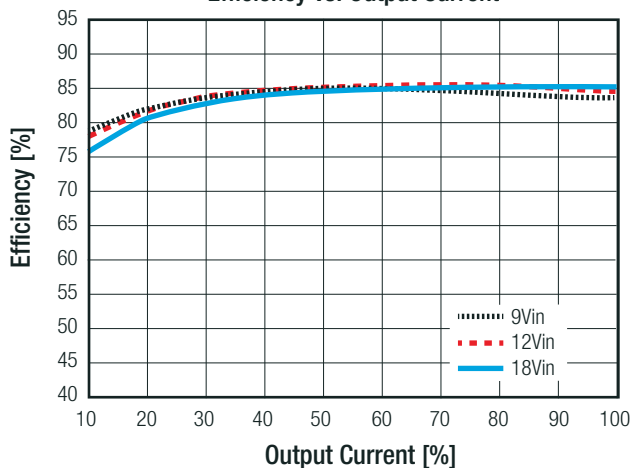
| Parameter | Condition | | Min. | Typ. | Max. |
|--------------------------------|--|--|--|-------------------------|--------------------------|
| Input Filter | | | Pi-Type | | |
| Input Voltage Range | nom. Vin = 12VDC nom. Vin = 24VDC nom. Vin = 48VDC | | 9VDC 18VDC 36VDC | 12VDC 24VDC 48VDC | 18VDC 36VDC 75VDC |
| Input Surge Voltage | 100ms max. | nom. Vin = 12VDC nom. Vin = 24VDC nom. Vin = 48VDC | | | 36VDC 50VDC 100VDC |
| Input Reflected Ripple Current | | | | 20mA _{p-p} | |
| Start-up time | Power up ON/OFF CTRL | | | 700ms 5ms | |
| Operating Frequency Range | | | 270kHz | 300kHz | 330kHz |
| Minimum Load ⁽⁴⁾ | | | 10% | | |
| ON/OFF CTRL ⁽⁵⁾ | Positive Logic | DC-DC ON DC-DC OFF | Open or 3.0VDC < V _{CTRL} < 12VDC Short or 0VDC < V _{CTRL} < 1.2VDC | | |
| Input Current of CTRL pin | DC-DC ON | | -0.5mA | | +0.5mA |
| Standby Current | DC-DC OFF | | | 2.5mA | |
| Ripple and Noise | 20MHz BW | | | 50mV _{p-p} | |

Notes:

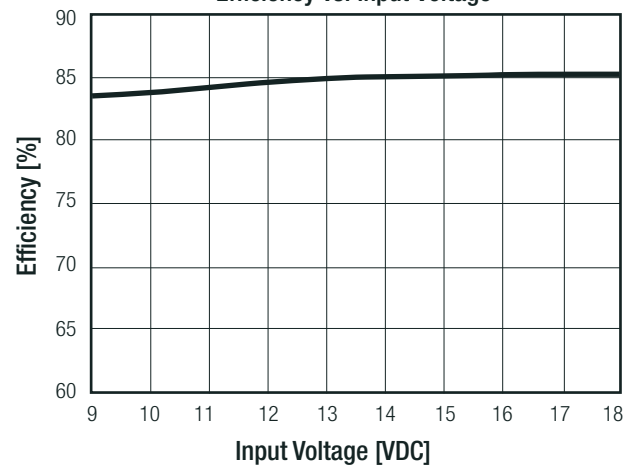
- Note4: The RP08 series requires a minimum of 10% loading on the output to maintain specified regulation
Operation under no-load condition will not damage these devices, however they may not meet all listed specification
- Note5: The pin voltage is referenced to -Vin pin

RP08-1205SA

Efficiency vs. Output Current



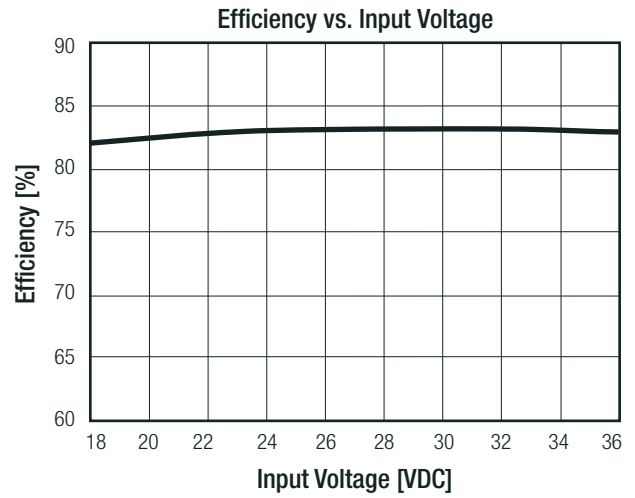
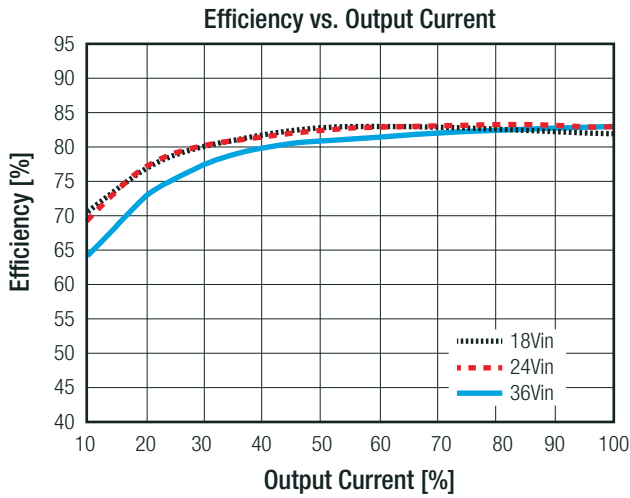
Efficiency vs. Input Voltage



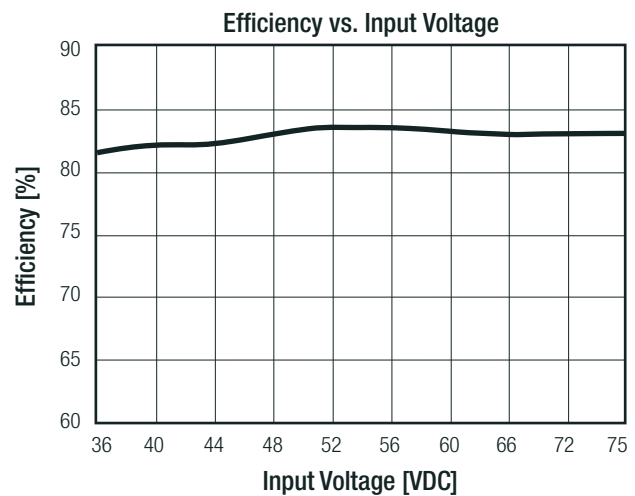
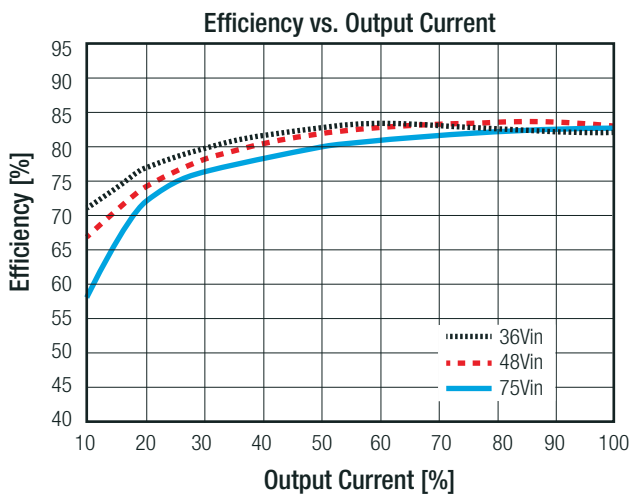
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Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

RP08-2405SA



RP08-4805SA



REGULATIONS

| Parameter | Condition | | Value |
|----------------------------------|----------------------------------|--------------|----------------|
| Output Accuracy | | | ±1.0% max. |
| Line Regulation | low line to high line, full load | | ±0.2% max. |
| Load Regulation | Single (0% to 100% load) | DIP24 SMD | ±0.5% ±1.0% |
| | Dual (0% to 100% load) | DIP24, SMD | ±1.0% |
| Cross Regulation | asymmetrical 25%<->100% load | | ±5.0% |
| Transient Response Recovery Time | 25% load step change | | 200µs typ. |

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

PROTECTIONS

| Parameter | Condition | | Value |
|----------------------------------|-----------------|---------------------------------|--------------------------------------|
| Short Circuit Protection (SCP) | | | continuous, automatic recovery |
| Over Load Protection (OLP) | % of lout rated | | 150% typ. |
| Isolation Voltage ⁽⁶⁾ | DIP24 | I/P to O/P; I/P (O/P) to case | 1.6kVDC/1 minute |
| | SMD | I/P to O/P I/P (O/P) to case | 1.6kVDC/1 minute 1.0kVDC/1 minute |
| Isolation Resistance | Viso= 500VDC | | 1GΩ min. |
| Isolation Capacitance | | | 300pF max. |

Notes:

Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

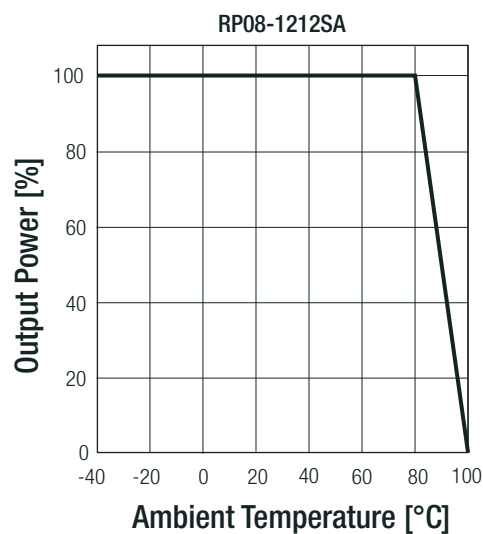
Note7: This power module is not internally fused. An input line fuse must always be used

Recom suggests: 12Vin=T2A; 24Vin=T1A; 48Vin=T0.5A slow blow

ENVIRONMENTAL

| Parameter | Condition | Value |
|-----------------------------|---------------------------------------|------------------------------|
| Operating Temperature Range | without derating | -40°C to +80°C |
| | with derating | -40°C to +100°C |
| Maximum Case Temperature | | +100°C |
| Temperature Coefficient | | ±0.02%/K max. |
| Thermal Impedance | @ natural convection 0.1m/s | 20K/W typ. |
| Operating Altitude | | 4000m |
| Operating Humidity | non-condensing | 5% - 95% RH |
| Pollution Degree | | PD2 |
| Shock | | according to MIL-STD-810F |
| Vibration | | according to MIL-STD-810F |
| MTBF | MIL-HDBK-217F, G.B. | 3543 x 10 ³ hours |
| | BELLCORE TR-NWT-000332 ⁽⁸⁾ | 3165 x 10 ³ hours |

Derating Graph ⁽⁹⁾



Notes:

Note8: BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C (Ground fixed and controlled environment)

Note9: Derating graphs are valid only for the shown part numbers. If you need detailed derating-information about a part-number not shown here please contact RECOM Techsupport for detailed information

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

SAFETY AND CERTIFICATIONS

| Certificate Type (Safety) | Condition | Standard |
|---|----------------|---|
| Information Technology Equipment, General Requirements for Safety | E196683 | UL60950-1, 2nd Edition, 2014 C22.2 No. 60950-1-07, 2nd Edition, 2014 |
| EAC | RU-AT.49.09571 | TP TC 004/2011 |
| RoHS2 | | RoHS-2011/65/EU + AM-2015/863 |

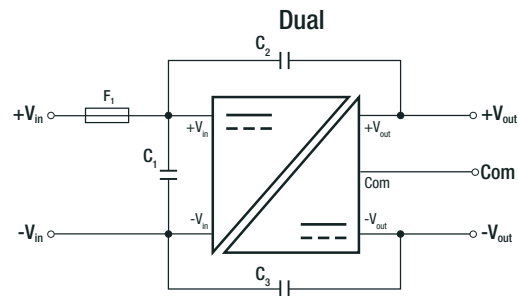
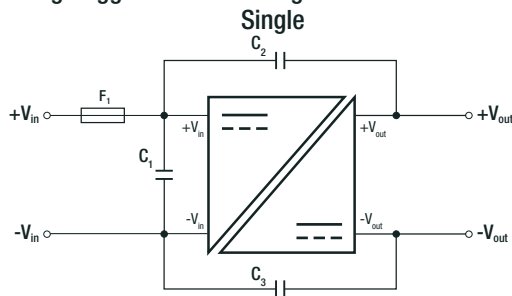
EMC Compliance

| EMC Compliance | Condition | Standard / Criterion |
|---|---|-------------------------|
| Electromagnetic compatibility of multimedia equipment - Emission requirements | with external filter (see filter suggestion below) | EN55032, Class A and B |
| ESD Electrostatic discharge immunity test | Air ±8kV and Contact ±6kV | EN61000-4-2, Criteria A |
| Radiated, radio-frequency, electromagnetic field immunity test | 10 V/m | EN61000-4-3, Criteria A |
| Fast Transient and Burst Immunity ⁽¹⁰⁾ | ±2kV | EN61000-4-4, Criteria A |
| Surge Immunity ⁽¹⁰⁾ | ±1kV | EN61000-4-5, Criteria A |
| Immunity to conducted disturbances, induced by radio-frequency fields | 10 Vr.m.s | EN61000-4-6, Criteria A |
| Power Magnetic Field Immunity | 100A/m continuous; 1000A/m 1s | EN61000-4-8, Criteria A |

Notes:

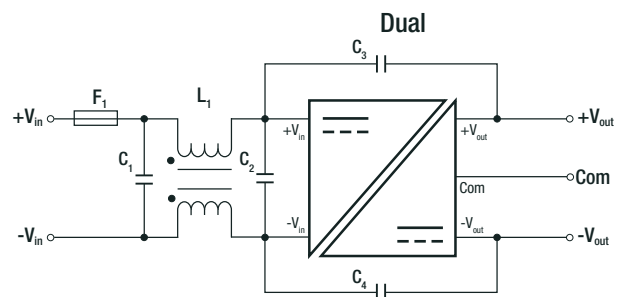
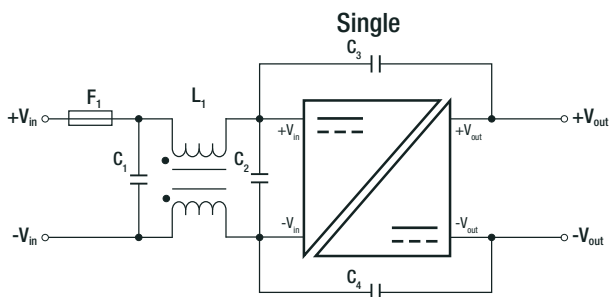
Note10: An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5
Recom suggests Nippon chemi-con KY series 220µF/100V

EMC Filtering Suggestions according to EN55032



Component List Class A

| MODEL | C1 | C2/C3 |
|----------------------------------|----------------------|-----------------------|
| RP08-12xxS_DA, RP08-12xxS_DA/SMD | 4.7µF/25V, 1210 MLCC | 1000pF/2kV, 1206 MLCC |
| RP08-24xxS_DA, RP08-24xxS_DA/SMD | N/A | 1000pF/2kV, 1206 MLCC |
| RP08-48xxS_DA, RP08-48xxS_DA/SMD | N/A | 1000pF/2kV, 1206 MLCC |



Component List Class B

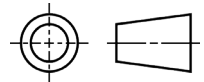
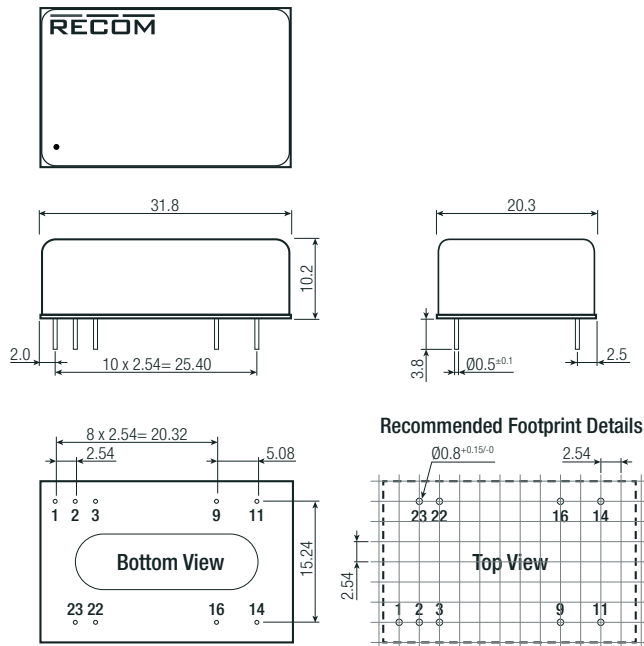
| MODEL | C1 | C2 | C3/C4 | L1 |
|------------------------------------|-----------------------|-----------------------|-----------------------|---|
| RP08-12xxS_DA RP08-12xxS_DA/SMD | 4.7µF/25V, 1210 MLCC | N/A | 1000pF/2kV, 1206 MLCC | CMC :325µH ref: WE 744290321 or CMC-06 |
| RP08-24xxS_DA RP08-24xxS_DA/SMD | 6.8µF/50V, 1812 MLCC | N/A | 1000pF/2kV, 1206 MLCC | CMC: 325µH ref: WE 744290321 or CMC-06 |
| RP08-48xxS_DA RP08-48xxS_D/SMD | 2.2µF/100V, 1812 MLCC | 2.2µF/100V, 1812 MLCC | 1000pF/2kV, 1206 MLCC | CMC: 325µH ref: WE 744290321 or CMC-06 |

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

DIMENSIONS and PHYSICAL CHARACTERISTICS

| Parameter | Type | Value |
|--------------------|---------|------------------------------|
| Material | case | nickel coated copper |
| | base | non-conductive black plastic |
| | potting | epoxy (UL94 V-0) |
| Dimensions (LxWxH) | DIP24 | 31.8 x 20.3 x 10.2mm |
| | SMD | 32.0 x 20.3 x 11.2mm |
| Weight | DIP24 | 16g |
| | SMD | 18g |

DIP24 Dimension Drawing (mm)

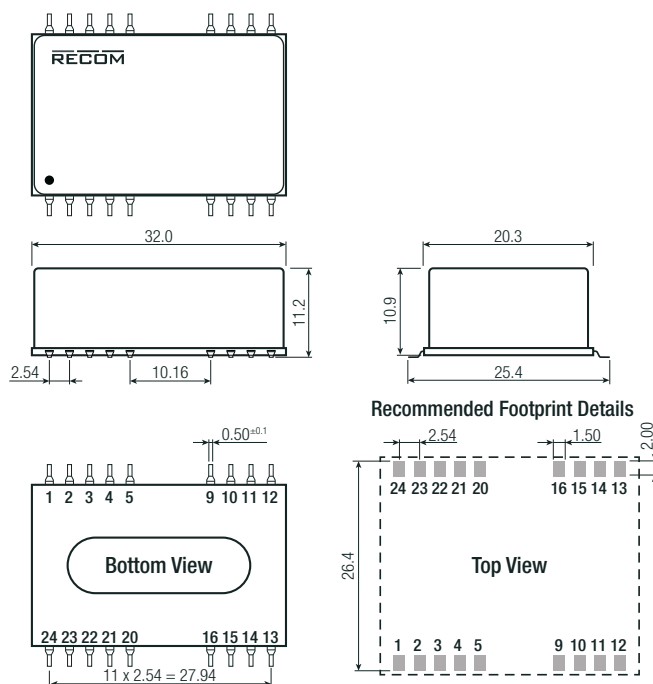


Pin Connections DIP24

| Pin # | Single | Dual |
|-------|--------|-------|
| 1 | CTRL | CTRL |
| 2 | -Vin | -Vin |
| 3 | -Vin | -Vin |
| 9 | NC | Com |
| 11 | NC | -Vout |
| 14 | +Vout | +Vout |
| 16 | -Vout | Com |
| 22 | +Vin | +Vin |
| 23 | +Vin | +Vin |

NC = No Connection
 Pin Pitch Tolerance $\pm 0.25\text{mm}$
 xx.x = $\pm 0.5\text{mm}$
 xx.xx = $\pm 0.25\text{mm}$

SMD Dimension Drawing (mm)



Pin Connections SMD

| Pin # | Single | Dual |
|--------|--------|-------|
| 1 | CTRL | CTRL |
| 2 | -Vin | -Vin |
| 3 | -Vin | -Vin |
| 9 | NC | Com |
| 11 | NC | -Vout |
| 14 | +Vout | +Vout |
| 16 | -Vout | Com |
| 22 | +Vin | +Vin |
| 23 | +Vin | +Vin |
| Others | NC | NC |

NC = No Connection
 Pin Pitch Tolerance $\pm 0.25\text{mm}$
 xx.x = $\pm 0.5\text{mm}$
 xx.xx = $\pm 0.25\text{mm}$

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

| PACKAGING INFORMATION | | | |
|-----------------------------|----------------|-------|-----------------------|
| Parameter | Type | | Value |
| Packaging Dimension (LxWxH) | tube | DIP24 | 255.0 x 23.0 x 19.0mm |
| | | SMD | 255.0 x 32.0 x 16.0mm |
| Packaging Quantity | DIP24, SMD | | 7pcs |
| Storage Temperature Range | | | -55°C to +125°C |
| Storage Humidity | non-condensing | | 5% - 95% RH |

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