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RNS DC-DC Series Data Sheet **10W SMT Converter • Wide Input • 2.5V to 15V**



Applications

- Distributed power architectures
- Telecommunications equipment
- LAN/WAN applications
- Data processing

Features

- RoHS lead free and lead-solder-exempt products are available
- Single board design
- Basic isolation
- Synchronization function
- Low profile – 8.5 mm height
- Excellent co-planarity
- Input-to-output isolation: 1500 VDC
- Convection cooling
- Low conducted and radiated EMI
- Wide input range
- Output overcurrent protection
- Remote on/off (primary referenced)
- Output voltage trim adjust, positive or negative
- Operating temperature to 110 °C
- UL, CSA, and EN/IEC60950 (3rd ed.) approved

Description

The RNS Series of converters are industry standard, 2" x 1" size, low profile, single output, DC-DC converters intended for SMT placement and reflow soldering. The product provides onboard conversion of a wide range of standard telecom, datacom and industrial input voltages to isolated low output voltages without the need for any additional cooling. Proprietary patented manufacturing process ensures optimal quality through full process automation. The converters are cost effective high performance alternatives to competing products on the market.

| Model Selection | | | | | | |
|------------------------|---------------------------|-------------------------------|----------------------------|----------------------------------|-----------------------------------|------------------------------|
| Model | Input Voltage, VDC | Input Current, Max ADC | Output voltage, VDC | Output Rated Current, ADC | Output Ripple/Noise, mVp-p | Typical Efficiency, % |
| RNS01EE-M6 | 18-72 | 0.5 | 3.30 | 1.5 | 25 | 78 |
| RNS03ZE-M6 | 38-75 | 0.4 | 2.50* / 3.30 | 3.0 | 50 | 79 |
| RNS01EG-M6 | 18-72 | 0.5 | 5.05 | 1.2 | 25 | 79 |
| RNS02ZG-M6 | 38-75 | 0.4 | 5.05 | 2.0 | 50 | 83 |
| RNS0.9ET-M6 | 18-72 | 0.5 | 7.00 | 0.9 | 25 | 80 |
| RNS0.6ZH-M6 | 38-75 | 0.3 | 12.0 / 15.0* | 0.6 | 40 | 83 |

* Output voltage with trim adjustment



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Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings may cause performance degradation, adversely affect long-term reliability and cause permanent damage to the converter. Specifications apply over specified input voltage, output load and temperature range, unless otherwise noted.

| Parameter | Conditions/Description | Min | Max | Units |
|--------------------------------|---------------------------------------|------|------|-------|
| Input voltage (Vin) | Continuous (RNS01EE/RNS01EG/RNS0.9ET) | (18) | (72) | VDC |
| | Continuous (RNS03ZE/RNS02ZG/RNS0.6ZH) | 38 | 75 | VDC |
| Transient Input Voltage (Vint) | Transient, 100 ms | | 100 | VDC |
| Operating CaseTemp. (Tc) | All operating conditions | -45 | 110 | °C |
| Storage Temperature (Ts) | | -55 | 125 | °C |
| ON/OFF Control Voltage (Vrc) | Referenced to -Vin | -5 | 16 | VDC |

Environmental and Mechanical Specifications

Specifications apply over specified input voltage, output load and temperature range, unless otherwise noted.

| Parameter | Conditions/Description | Min | Nom | Max | Units |
|----------------------|---|-----|-------|--------|-------|
| Shock | IEC68-2-27 | | | 100 | g |
| Sinusoidal Vibration | IEC68-2-6 | | | 10 | g |
| Weight | | | | 0.6/17 | oz/g |
| Water Washing | Standard process | | Yes | | |
| MTBF | Per Bellcore TR-NWT-000332 (100% load at 25 °C,GB) | | 4,590 | | kHrs |

Isolation Specifications

Specifications apply over specified input voltage, output load and temperature range, unless otherwise noted.

| Parameter | Conditions/Description | Min | Nom | Max | Units |
|-----------------------------|------------------------|-----|-------|-------|-------|
| Insulation Safety Rating | | | Basic | | |
| Isolation Voltage (Vps) | | | | 1,500 | VDC |
| Isolation Resistance (Rps) | | 10 | | | MΩ |
| Isolation Capacitance (Cps) | | | 2,200 | | pF |

Input Specifications

Specifications apply over specified input voltage, output load and temperature range, unless otherwise noted.

| Parameter | Conditions/Description | Min | Nom | Max | Units |
|----------------------------------|-----------------------------------|------|------|------|-------|
| Input Voltage (Vin) | Continuous (4:1 input range) | (18) | (48) | (72) | VDC |
| | Continuous standard input range | 38 | 48 | 75 | |
| Input Current when Shutdown | Vin.Nom, Remote Control activated | | | 3 | mADC |
| Input Current No Load | Vin.Nom, Io = 0 (4:1 range) | | | (30) | mADC |
| | Vin.Nom, Io = 0 std input range | | | 10 | |
| Turn-On Input Voltage 18-72 Vin | Ramping Up, Io.Max | 16.5 | 17.5 | 18 | VDC |
| Turn-On Input Voltage 38-75 Vin | Ramping Up, Io.Max | 34 | 36 | 38 | VDC |
| Turn-Off Input Voltage 18-72 Vin | Ramping Down, Io.Max | 15.5 | 16 | 16.5 | VDC |
| Turn-Off Input Voltage 38-75 Vin | Ramping Down, Io.Max | 30 | 33 | 36 | VDC |
| Turn-On Time | To Output Regulation Band | | 250 | 400 | ms |
| | After Remote Control | | 25 | | ms |
| | Rise Time | | 5 | | ms |
| Input Reflected Ripple Current | Vin.Max, Io.Max | | | 30 | mAp-p |
| Input Capacitance | | | | 1.4 | μF |



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Output Specifications

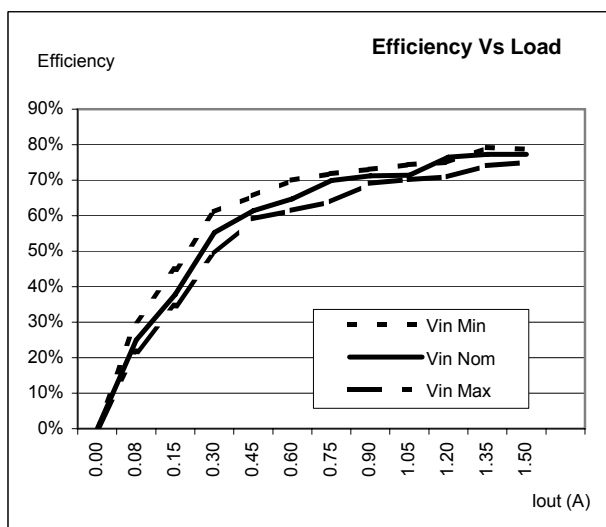
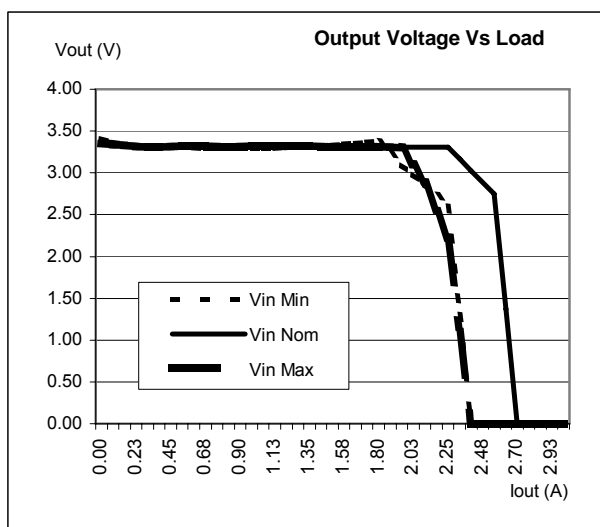
All specifications apply over input voltage, output load and temperature of 25 °C, unless otherwise noted.

RNS01EE : 3.3V/1.5A

| Parameter | | Conditions/Description | Min | Nom | Max | Units |
|----------------------------------|-------|--|------|------|-------|---------|
| Output Voltage Setpoint Accuracy | Vo | Vin.Nom, Io = 1.5 A, 25 °C | 3.27 | 3.30 | 3.33 | VDC |
| Output Current * | Io | Vin.Min to Vin.Max | 0.15 | | 1.5 | ADC |
| Line Regulation | | Vin.Min to Vin.Max, 50% Io.Max | | 25 | 70 | mV |
| Load Regulation | | Vin.Nom, Io.Min to Io.Max | | 35 | 90 | mV |
| Dynamic Regulation | | 50-100% Io.Max load step change. | | | 300 | ± mV |
| Peak Deviation | | to 1% error band | | | 300 | µs |
| Settling Time | | | | | | |
| Output Voltage Ripple | Vr | Vin.Min to Vin.Max, Io.Min to Io Max, 20 MHz Bandwidth | | 25 | 50 | mVp-p |
| Admissible Load Capacitance | Comax | Io.Max, Vin.Nom | | | 2,200 | µF |
| Output Current Limit Threshold | Icl | Vout ≤0.90 Vo.Nom | 110 | | 150 | %Io.Max |
| Switching Frequency | Fs | Vin.Nom, Io.Max | | 410 | | kHz |
| Temperature Coefficient | Tco | | | | 0.02 | %Vo/°C |
| Trim Range | Vt | Io.Min to Io.Max, Vin.Min to Vin.Max | 2.75 | | 3.85 | Vo |

* At Iout<Iout.Min, the output may contain low frequency component that exceeds ripple specifications.

RNS01EE Typical Characteristic Curves





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Output Specifications

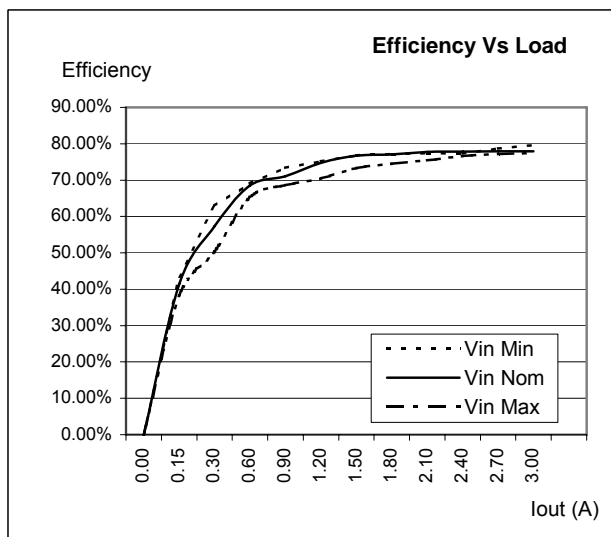
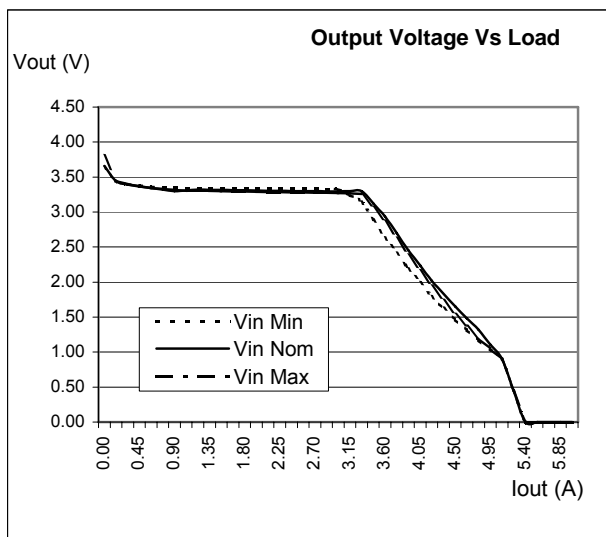
All specifications apply over input voltage, output load and temperature range, unless otherwise noted.

RNS03ZE : 3.3V/3.0A

| Parameter | | Conditions/Description | Min | Nom | Max | Units |
|----------------------------------|-------|--|------|------|--------|---------|
| Output Voltage Setpoint Accuracy | Vo | Vin.Nom, Io = 2.0 A, 25 °C | 3.27 | 3.30 | 3.33 | VDC |
| Output Current * | Io | Vin.Min to Vin.Max | 0.3 | | 3.0 | ADC |
| Line Regulation | | Vin.Min to Vin.Max, 50% Io.Max | | | 50 | mV |
| Load Regulation | | Vin.Nom, Io.Min to Io.Max | | | 120 | mV |
| Dynamic Regulation | | 25-75% Io.Max load step change. | | | 300 | ± mV |
| Peak Deviation | | to 1% error band | | | 300 | µs |
| Settling Time | | | | | | |
| Output Voltage Ripple | Vr | Vin.Min to Vin.Max, Io.Min to Io Max, 20 MHz Bandwidth | | 50 | 70 | mVp-p |
| Admissible Load Capacitance | Comax | Io.Max, Vin.Nom | | | 15,000 | µF |
| Output Current Limit Threshold | Icl | Vout ≤0.90 Vo.Nom | 110 | | 140 | %Io.Max |
| Switching Frequency | Fs | Vin.Nom, Io.Max | | 400 | | kHz |
| Temperature Coefficient | Tco | | | | 0.02 | %Vo/°C |
| Trim Range | Vt | Io.Min to Io.Max, Vin.Min to Vin.Max | 2.3 | | 4.0 | Vo |

* At Iout<Iout.Min, the output may contain low frequency component that exceeds ripple specifications. The output voltage may rise to a maximum of 4.0V.

RNS03ZE Typical Characteristic Curves





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Output Specifications

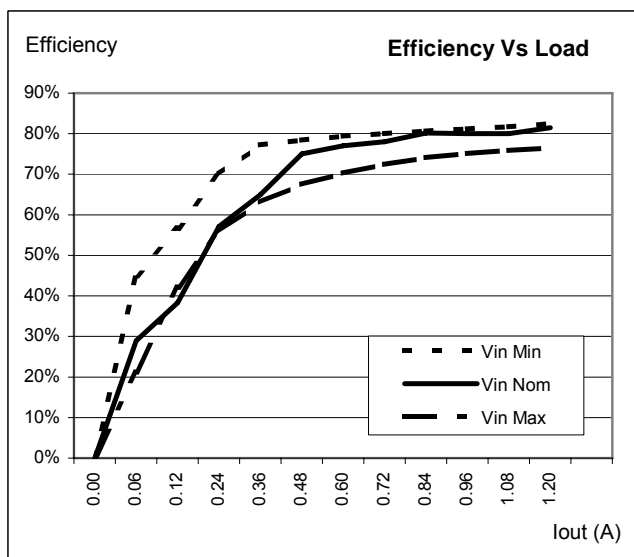
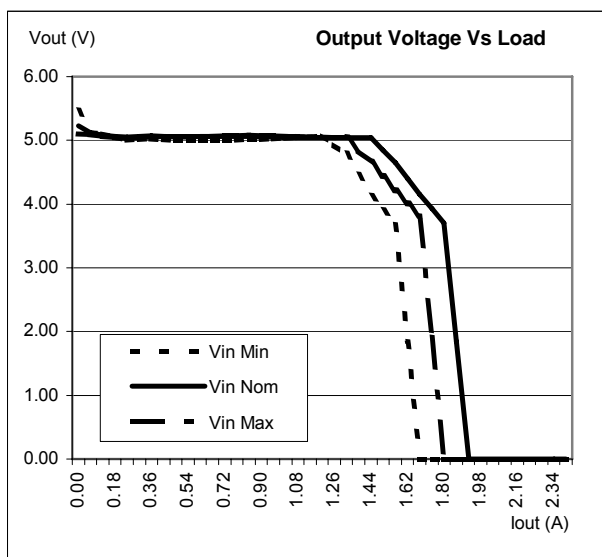
All specifications apply over input voltage, output load and temperature of 25 °C, unless otherwise noted.

RNS01EG : 5.05V/1.2A

| Parameter | | Conditions/Description | Min | Nom | Max | Units |
|----------------------------------|-------|--|------|------|-------|---------|
| Output Voltage Setpoint Accuracy | Vo | Vin.Nom, Io = 0.2 A, 25 °C | 5.02 | 5.05 | 5.08 | VDC |
| Output Current * | Io | Vin.Min to Vin.Max | 0.15 | | 1.2 | ADC |
| Line Regulation | | Vin.Min to Vin.Max, 50% Io.Max | | 60 | 100 | mV |
| Load Regulation | | Vin.Nom, Io.Min to Io.Max | | 40 | 100 | mV |
| Dynamic Regulation | | 50-100% Io.Max load step change. | | | 250 | ± mV |
| Peak Deviation | | to 1% error band | | | 300 | µs |
| Settling Time | | | | | | |
| Output Voltage Ripple | Vr | Vin.Min to Vin.Max, Io.Min to Io Max, 20 MHz Bandwidth | | 25 | 50 | mVp-p |
| Admissible Load Capacitance | Comax | Io.Max, Vin.Nom | | | 2,200 | µF |
| Output Current Limit Threshold | Icl | Vout ≤0.90 Vo.Nom | 110 | | 150 | %Io.Max |
| Switching Frequency | Fs | Vin.Nom, Io.Max | | 410 | | kHz |
| Temperature Coefficient | Tco | | | | 0.02 | %Vo/°C |
| Trim Range | Vt | Io.Min to Io.Max, Vin.Min to Vin.Max | 4.3 | | 5.9 | Vo |

* At Iout<Iout.Min, the output may contain low frequency component that exceeds ripple specifications.

RNS01EG Typical Characteristic Curves





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10W SMT Converter • Wide Input • 2.5V to 15V

Output Specifications

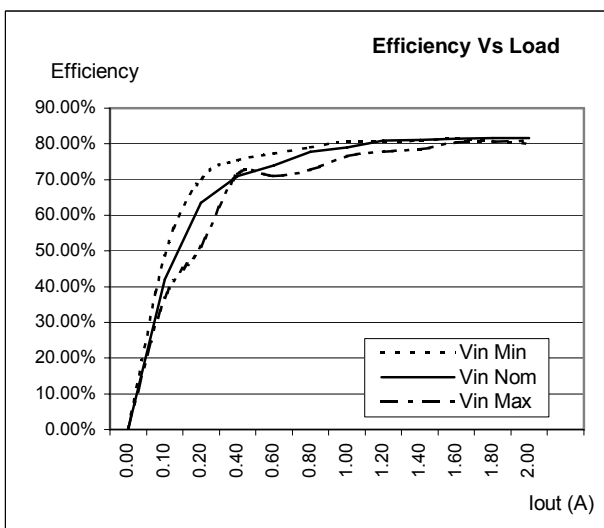
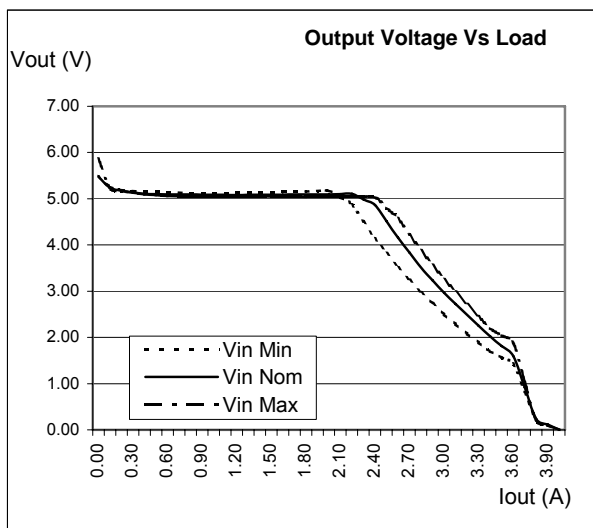
All specifications apply over input voltage, output load and temperature range, unless otherwise noted.

RNS02ZG : 5.05V/2.0A

| Parameter | | Conditions/Description | Min | Nom | Max | Units |
|----------------------------------|-------|--|------|------|--------|---------|
| Output Voltage Setpoint Accuracy | Vo | Vin.Nom, Io = 1.5 A, 25 °C | 5.02 | 5.05 | 5.08 | VDC |
| Output Current * | Io | Vin.Min to Vin.Max | 0.2 | | 2.0 | ADC |
| Line Regulation | | Vin.Min to Vin.Max, 50% Io.Max | | | 100 | mV |
| Load Regulation | | Vin.Nom, Io.Min to Io.Max | | | 180 | mV |
| Dynamic Regulation | | 25-75% Io.Max load step change. | | | 250 | ± mV |
| Peak Deviation | | to 1% error band | | | 300 | µs |
| Settling Time | | | | | | |
| Output Voltage Ripple | Vr | Vin.Min to Vin.Max, Io.Min to Io Max, 20 MHz Bandwidth | | 50 | 70 | mVp-p |
| Admissible Load Capacitance | Comax | Io.Max, Vin.Nom | | | 10,000 | µF |
| Output Current Limit Threshold | Icl | Vout ≤ 0.90 Vo.Nom | 110 | | 140 | %Io.Max |
| Switching Frequency | Fs | Vin.Nom, Io.Max | | 400 | | kHz |
| Temperature Coefficient | Tco | | | | 0.02 | %Vo/°C |
| Trim Range | Vt | Io.Min to Io.Max, Vin.Min to Vin.Max | 4.0 | | 6.0 | Vo |

* At Iout < Iout.Min, the output may contain low frequency component that exceeds ripple specifications. The output voltage may rise to a maximum of 6.0V

RNS02ZG Typical Characteristic Curves





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10W SMT Converter • Wide Input • 2.5V to 15V

Output Specifications

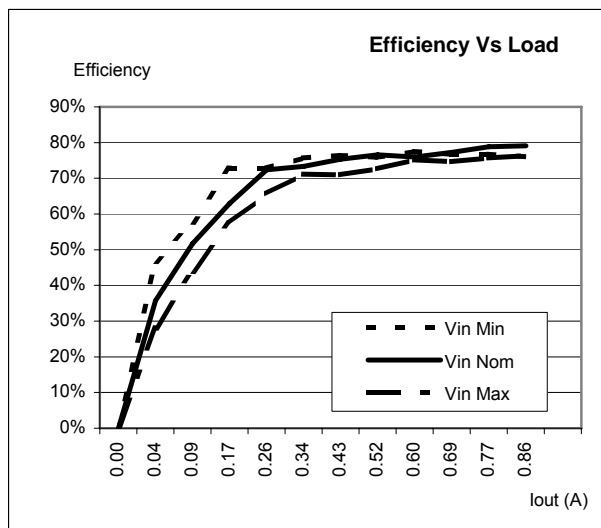
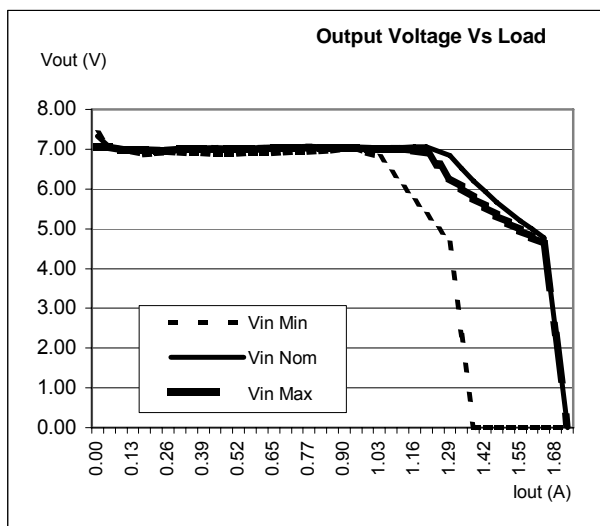
All specifications apply over input voltage, output load and temperature of 25 °C, unless otherwise noted.

RNS0.9ET : 7.0V/0.86A

| Parameter | | Conditions/Description | Min | Nom | Max | Units |
|----------------------------------|-------|--|------|------|-------|---------|
| Output Voltage Setpoint Accuracy | Vo | Vin.Nom, Io = 0.72 A, 25 °C | 6.95 | 7.00 | 7.05 | VDC |
| Output Current * | Io | Vin.Min to Vin.Max | 0.08 | | 0.86 | ADC |
| Line Regulation | | Vin.Min to Vin.Max, 50% Io.Max | | 80 | 100 | mV |
| Load Regulation | | Vin.Nom, Io.Min to Io.Max | | 50 | 100 | mV |
| Dynamic Regulation | | 50-100% Io.Max load step change. | | | 250 | ± mV |
| Peak Deviation | | to 1% error band | | | 250 | µs |
| Settling Time | | | | | | |
| Output Voltage Ripple | Vr | Vin.Min to Vin.Max, Io.Min to Io Max, 20 MHz Bandwidth | | 25 | 50 | mVp-p |
| Admissible Load Capacitance | Comax | Io.Max, Vin.Nom | | | 2,200 | µF |
| Output Current Limit Threshold | Icl | Vout ≤0.90 Vo.Nom | 110 | | 150 | %Io.Max |
| Switching Frequency | Fs | Vin.Nom, Io.Max | | 410 | | kHz |
| Temperature Coefficient | Tco | | | | 0.02 | %Vo/°C |
| Trim Range | Vt | Io.Min to Io.Max, Vin.Min to Vin.Max | 5.95 | | 8.05 | Vo |

* At Iout<Iout.Min, the output may contain low frequency component that exceeds ripple specifications.

RNS0.9ET Typical Characteristic Curves





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10W SMT Converter • Wide Input • 2.5V to 15V

Output Specifications

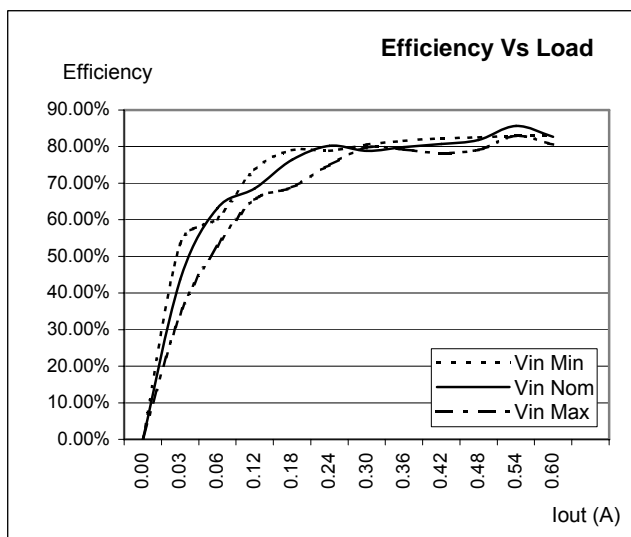
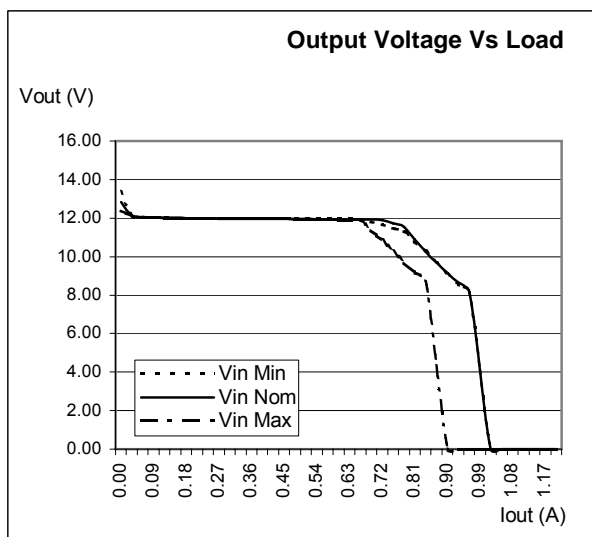
All specifications apply over input voltage, output load and temperature range, unless otherwise noted.

RNS0.6ZH : 12.0V/0.6A

| Parameter | | Conditions/Description | Min | Nom | Max | Units |
|----------------------------------|-------|--|-------|-------|-------|---------|
| Output Voltage Setpoint Accuracy | Vo | Vin.Nom, Io = 0.3 A, 25 °C | 11.83 | 12.00 | 12.18 | VDC |
| Output Current * | Io | Vin.Min to Vin.Max | 0.06 | | 0.6 | ADC |
| Line Regulation | | Vin.Min to Vin.Max, 50% Io.Max | | | 50 | mV |
| Load Regulation | | Vin.Nom, Io.Min to Io.Max | | | 250 | mV |
| Dynamic Regulation | | 25-75% Io.Max load step change. | | | 400 | ± mV |
| Peak Deviation | | to 1% error band | | | 250 | µs |
| Settling Time | | | | | | |
| Output Voltage Ripple | Vr | Vin.Min to Vin.Max, Io.Min to Io Max, 20 MHz Bandwidth | | 40 | 100 | mVp-p |
| Admissible Load Capacitance | Comax | Io.Max, Vin.Nom | | | 220 | µF |
| Output Current Limit Threshold | Icl | Vout ≤0.90 Vo.Nom | 110 | | 140 | %Io.Max |
| Switching Frequency | Fs | Vin.Nom, Io.Max | | 400 | | kHz |
| Temperature Coefficient | Tco | | | | 0.02 | %Vo/°C |
| Trim Range | Vt | Io.Min to Io.Max, Vin.Min to Vin.Max | 9.0 | | 15.0 | Vo |

* At Iout<Iout.Min, the output may contain low frequency component that exceeds ripple specifications. The output voltage may rise to a maximum of 14.0V

RNS0.6ZH Typical Characteristic Curves





RNS DC-DC Series Data Sheet

10W SMT Converter • Wide Input • 2.5V to 15V

Feature Specifications

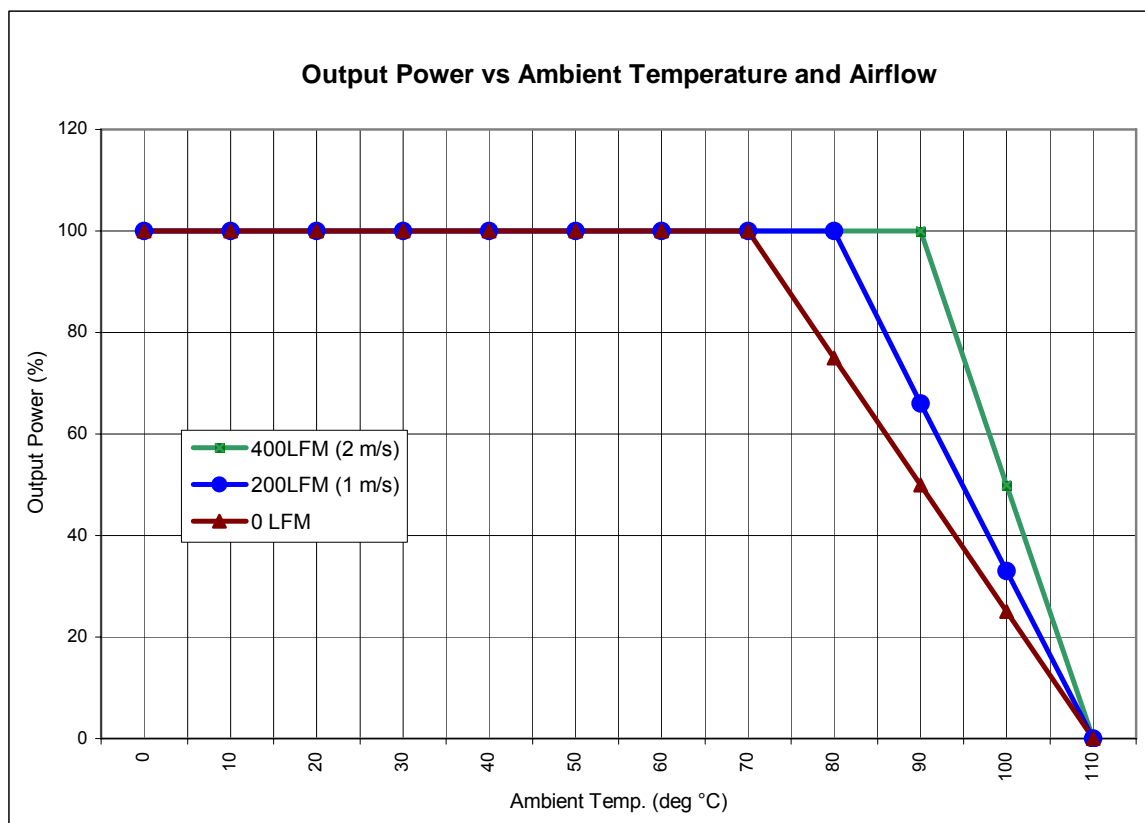
All specifications apply over input voltage, output load and temperature range, unless otherwise noted.

| Parameter | Conditions/Description | Min | Nom | Max | Units |
|-------------------|--|--------------|-----|--------------|-------|
| Remote Control: | | | | | |
| Converter OFF | RC pin is pulled low | -1.0 | | 1.0 | VDC |
| Converter ON | Voltage source or open circuit | 4.0 | | 6 | VDC |
| Sink Current | Vin=Vin.Nom | | 0.3 | | mADC |
| Synchronization:* | | | | | |
| Frequency Range | TTL compatible square wave on sync pin. Referenced to -Vin (4:1 input range) | 450 (520) | | 600 (688) | kHz |

* RNS0.6ZH does not have this feature

Temperature Derating Curves

The derating curves below give an indication of the output power achievable with and without forced-air cooling. However in the final application, in order to ensure the reliability of the unit, care must be taken to ensure the maximum case temperature is not exceeded under any conditions.





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Typical Application

This series of converters does not require any external components for proper operation. However, if the distribution of the input voltage to the converter contains significant inductance, a capacitor across the input terminals may be required to stabilize the input voltage. A minimum of 1 μ F, quality electrolytic / ceramic capacitor is recommended for this purpose. For output decoupling it is recommended to connect, directly across the output pins, a 1 μ F ceramic capacitor (for 3.3 V and 5 V outputs) or a 0.27 μ F ceramic capacitor (for 7 V and 12 V outputs).

Remote Control Feature

The remote control pin functions as a normal soft shutdown. It is referenced to the -Vin pin. With positive logic, when the remote control pin is pulled low, the output is turned off and the unit goes into a very low input power mode.

An open collector switch is recommended to control the voltage between the remote control pin and the -Vin pin of the converter. The remote control pin is pulled up internally, so no external voltage source is required. The user should avoid connecting a resistor between the remote control pin and the +Vin pin.

The user must take care to ensure that the pin reference for the control is connected close to the -Vin pin. The control signal must not be referenced ahead of EMI filtering, or remotely from the unit. If the remote control pin is not used, it can be left floating.

Synchronization Feature

It is possible to synchronize the switching frequency of one or more converters to an external symmetrical clock signal. It is recommended that the signal be driven by a TTL compatible output. The rise time of the clock signal should be less than 10ns. If the synchronization feature is not used, it should be left open circuit.

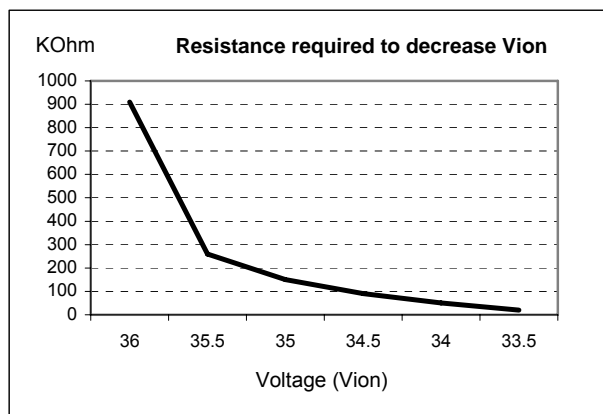
Turn-On Input Voltage

Note:- this feature is not available on 4:1 input range devices, RNS01EE/RNS01EG/RNS0.9ET.

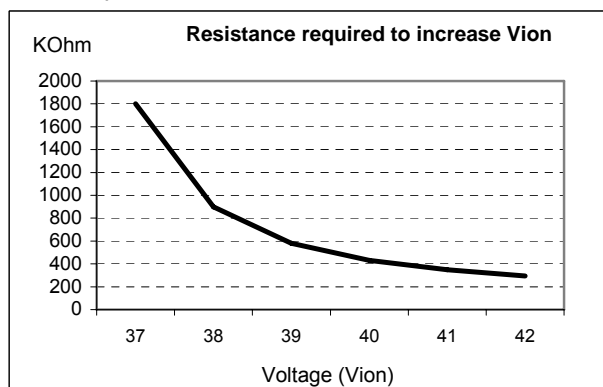
An external resistor can program the input voltage at which the converter switches on. The voltage at which the unit switches off is typically 1V below the turn-on input voltage (Vion).

The characteristic curves below shows the typical resistor values required to achieve adjustment of turn-on input voltage (Vion).

To decrease Vion the resistor should be connected between pins 10 and 11.



To increase Vion the resistor should be connected between pins 11 and 17.





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Output Voltage Trim

Note: For setting nominal output voltage pin 8 MUST be connected to pin 9.

The trim feature allows the user to adjust the output voltage from the nominal. This can be used to accommodate a different requirement or to do production margin testing.

Output voltage can be adjusted by an external resistor. If pin 8 and pin 9 are not connected together the output will decrease to a low value. To increase V_o a resistor should be connected between pin 8 / 9 and pin 17 (-Vin). To decrease V_o , a resistor should be connected between pin 8 and 9 (NOR).

To **increase** V_o :

$R_{adj} = A \times (B - V_d) / (V_d - V_o)$, k Ω
Where: V_d = Desired output voltage
 V_o = Nominal output voltage.

To **reduce** V_o :

$R_{adj} = C \times (V_o - V_d) / (V_d - D)$, k Ω
Where: V_d = Desired output voltage
 V_o = Nominal output voltage.

| Model | A | B | C | D |
|----------|-------|-------|-------|-------|
| RNS01EE | 3.18 | 3.86 | 13 | 2.75 |
| RNS03ZE | 4.21 | 4.12 | 17.58 | 1.75 |
| RNS01EG | 3.18 | 5.93 | 12.6 | 4.28 |
| RNS02ZG | 4.21 | 6.39 | 17.97 | 2.62 |
| RNS0.9ET | 3.18 | 8.05 | 12.6 | 5.95 |
| RNS0.6ZH | 0.489 | 16.27 | 2.832 | 8.715 |

Notes:

- When the output voltage is trimmed up, the output power from the converter must not exceed its maximum rating. This is determined by measuring the output voltage on the output pins, and multiplying it by the output current.
- The trim feature allows the generation of additional standard voltages such as 2.5 V from 3.3 V model, 15 V from 12 V model and 6 V or 8 V from the 7 V model.

Output Current Limiting

When the output is overloaded above the maximum output current rating, the voltage will start to reduce to maintain the output power to a safe level. In a condition of high overload or short-circuit where the output voltage is pulled below approximately 30% of $V_{o.Nom}$, the unit will enter a 'Hiccup' mode of operation. Under this condition the unit will attempt to restart, approximately every 100 ms until the overload has cleared.

Parallel Operation

Paralleling of two converters is possible by direct connection of the output voltage terminal pins. The load regulation characteristic is designed to facilitate current sharing (typically $\pm 20\%$).

Thermal Considerations

The converter is designed for natural or forced convection cooling. The output power of the converter is limited by the maximum case temperature (T_c). To ensure reliable long term operation of the converters, and to comply with safety agency requirements, Power-One limits maximum allowable case temperature (T_c) to 110°C (see Mechanical Drawings).



RNS DC-DC Series Data Sheet

10W SMT Converter • Wide Input • 2.5V to 15V

Safety Considerations

These converters feature 1500 VDC isolation from input to output. The input-to-output resistance is greater than 10MΩ. These converters are provided with Basic Insulation between input and output circuits according to EN60950 / UL1950 / CSA60950-00. Nevertheless, if the system using the converter needs to receive safety agency approval, certain rules must be followed in the design of the system. In particular, all of the creepage and clearance requirements of the end-use safety requirements must be observed. These documents include UL60950, CSA60950-00 and EN60950, although specific applications may have additional requirements.

In order for the output of the converter to be considered as SELV (Safety Extra Low Voltage) or TNV-1, according to EN60950 / UL1950 / CSA60950-00, one of the following requirements must be met in the system design:

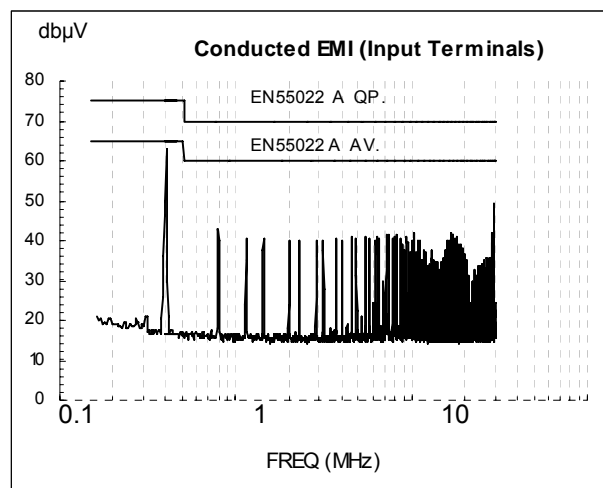
- The converter has no internal fuse. The external fuse must be provided to protect the system from catastrophic failure. The fuse with a rating not greater than 2.0 A is recommended. The user can select a lower rating fuse based upon the inrush transient and the maximum input current of the converter, which occurs at the minimum input voltage. Both input traces and the chassis ground trace (if applicable) must be capable of conducting a current of 1.5 times the value of the fuse without opening. The fuse must not be placed in the grounded input line, if any.
- If the voltage source feeding the module is SELV, the output of the converter is considered SELV and may be grounded or ungrounded.
- The components on the converter carry transients, which exceed the input voltage. Even if the input voltage is SELV (<60V) the components on the primary side of the converter may have to be considered as hazardous. A safety interlock may be needed to prevent the user from accessing the converter while operational.

EMC Specifications

Conducted Noise:

The converters meet the requirements of EN55022, CISPR22 and FCC CFR title 47 Part 15 Sub-part J - Conducted (conducted noise on the input terminals) without any external components. The results for this solution are displayed below.

To meet level B for the above standards it is necessary to fit a 3.3 μF ceramic capacitor across the input terminals.



Electromagnetic Susceptibility:

| Standard | Applied Stress | Class Level | Performance Outcome * |
|--|------------------|-------------|-----------------------|
| Electrostatic Discharge EN61000-4-2 | 2 kV to pins | 1 | B |
| Electromagnetic Field EN61000-4-3 | 3 V/m | 2 | A |
| Electrical Fast Transient EN61000-4-4 | 2000 Vp to input | 3 | B |
| Conducted Disturbances EN61000-4-6 | 3 Vrms to input | 2 | B |

* **A** denotes normal operation, no deviation from specification. **B** denotes temporary deviation from specification is possible.



RNS DC-DC Series Data Sheet

10W SMT Converter • Wide Input • 2.5V to 15V

Surface Mount Assembly

Soldering:

The following instructions must be observed when soldering the unit. Failure to observe these instructions may result in failure or significant degradation of the module performance. Power-One will not honor any warranty claims arising from failure to observe these instructions.

This product is approved for forced convection reflow soldering only.

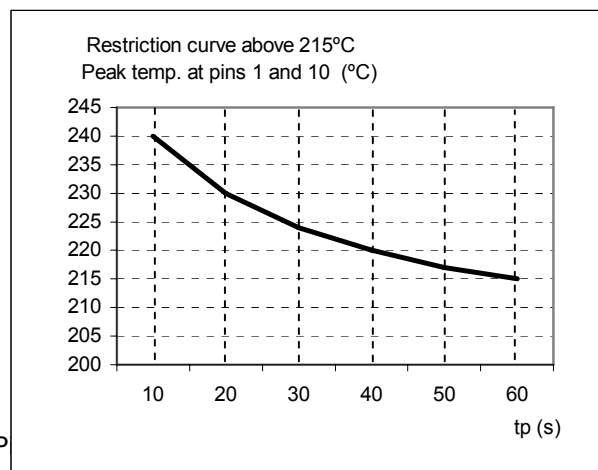
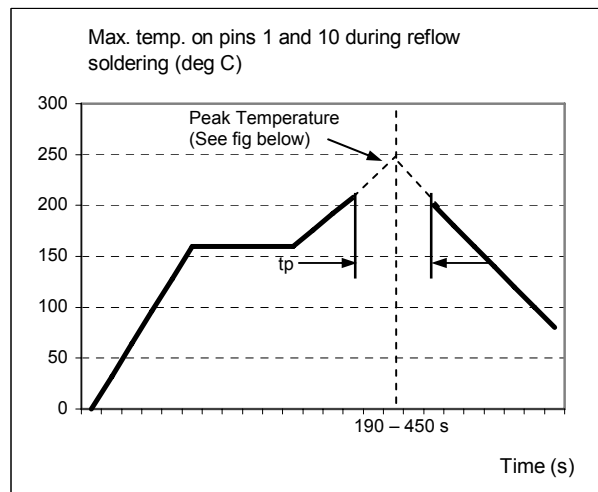
The curves below define the maximum peak reflow temperature permissible measured on Pins 1 and 10 of the converter.

The lead-frame is constructed from a high temperature glass filled, UL94V0 flame retardant, diallyl ortho-phthalate moulding compound commonly used for packaging of electronics components. It has passed NASA outgassing tests and is certified to MIL-M-14. The coefficient of thermal expansion is equivalent to FR4.

The gull wing leads are formed to ensure optimal solder joint strength and structure. Furthermore they facilitate visual inspection (manual or automatic). The leads are formed from a 97% Cu alloy plated with Cu and Sn 90. This material is commonly used in the manufacture of integrated circuits. It has good corrosion resistance and exhibits the nobility inherent to all high copper alloys. Unlike brasses, this material is essentially immune to stress corrosion cracking. It also exhibits excellent solderability. It is readily wetted by solders and performs well in standard solderability tests. (Dip of Class II or better).

The product is manufactured with a patented process, which is fully automated, and 'in-line'. This ensures that there is no contamination or mechanical stress on the lead-frame so that the co planarity and solderability are maintained.

The product is shipped in JEDEC trays to ensure preservation of the co-planarity and enable fully automated assembly in the final application (within 0.1mm).



P

The product is designed with a large flat area in the center of the top surface to serve as a pick up point for automated vacuum pick and place equipment. The 'open board' construction of the unit ensures that weight is kept to a minimum. However due to the relatively large size of the component, a large nozzle (> 8.0mm, depending on vacuum pressure) is recommended for picking and placing.

The unit may also be automatically handled using 'odd-form' placement equipment, with mechanical grippers. For this type of equipment the end edges of the device, which have no leads and also feature the greatest dimensional accuracy, should be used as pick-up points.

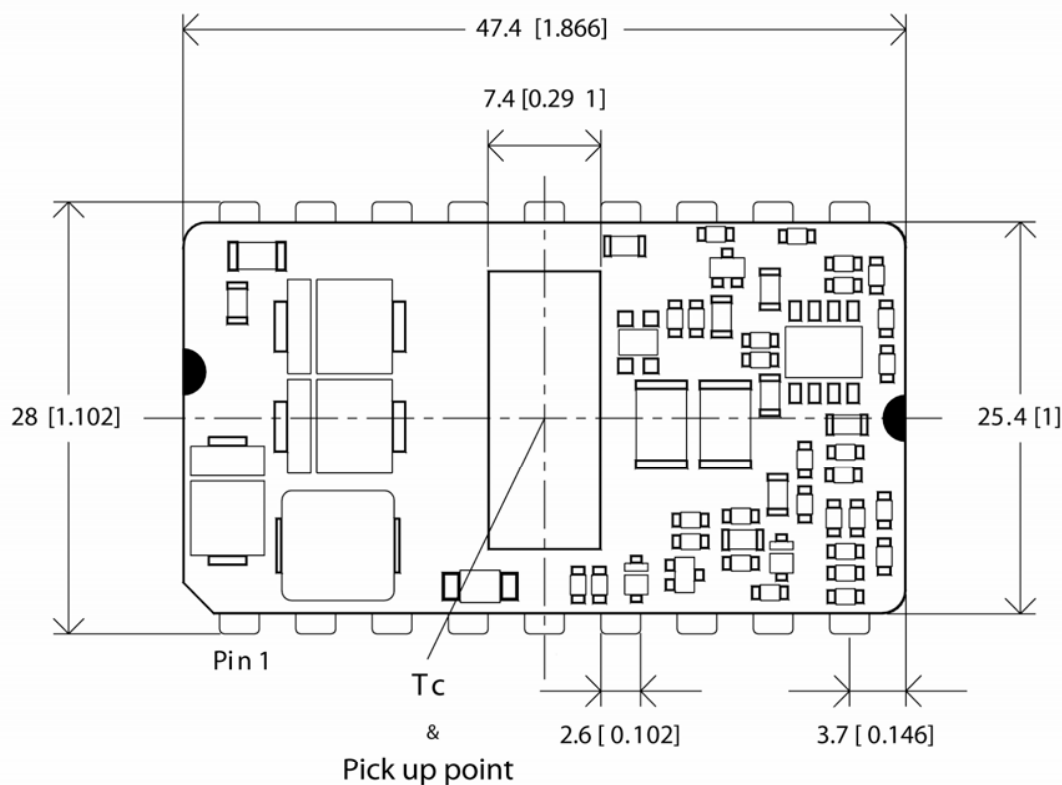


RNS DC-DC Series Data Sheet

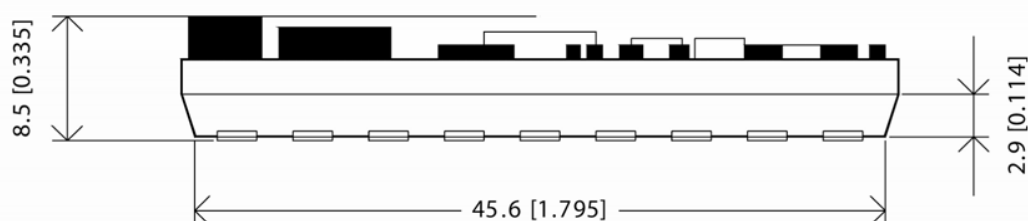
10W SMT Converter • Wide Input • 2.5V to 15V

Mechanical Drawing

Note:- mm[inches]
Tolerances: -
0.5-10 ± 0.1
10-100 ± 0.2



Top View

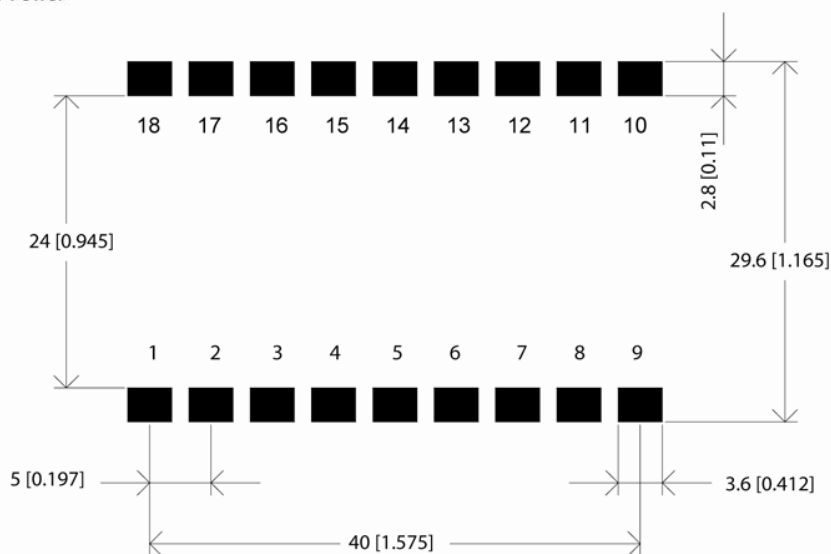


Height P rofile

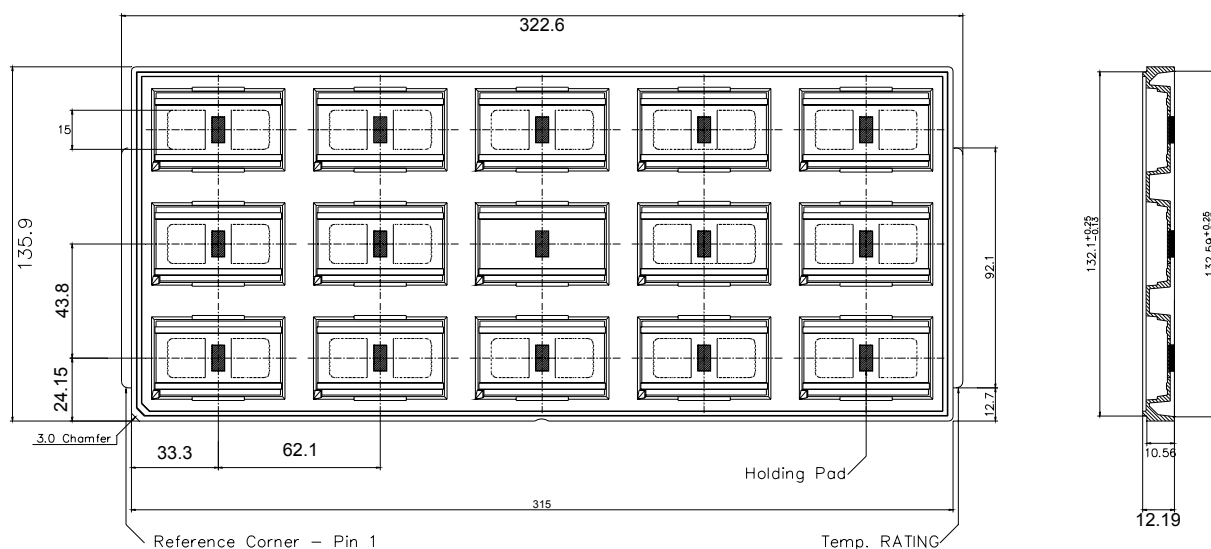


RNS DC-DC Series Data Sheet

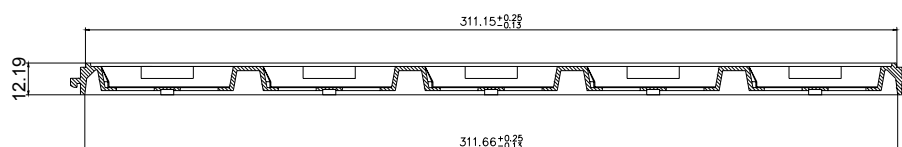
10W SMT Converter • Wide Input • 2.5V to 15V



Recommended land pattern



JEDEC TRAY





RNS DC-DC Series Data Sheet **10W SMT Converter • Wide Input • 2.5V to 15V**

Pinout

| Pin | Designation | Function | Reference |
|-----|-------------|--|-----------|
| 1 | +Vout | Positive output voltage | Secondary |
| 2 | -Vout | Output voltage return | Secondary |
| 3 | NC | Not connected | Secondary |
| 4 | NC | Not connected | Secondary |
| 5 | NC | Not connected | Secondary |
| 6 | NC | Not connected | Primary |
| 7 | Sync | Synchronization input | Primary |
| 8 | Trim | Output voltage adjust. Note: - To set nominal output voltage connect pins 8 and 9 together | Primary |
| 9 | NOR | Connection for nominal output voltage | Primary |
| 10 | TOA | Turn-on/off input voltage adjust Note: - Not Connected on RNS01EE/RNS01EG/RNS0.9ET | Primary |
| 11 | RC | Remote control. Pull low to turn unit off | Primary |
| 12 | NC | Not connected | Primary |
| 13 | NC | Not connected | Primary |
| 14 | NC | Not connected | Primary |
| 15 | NC | Not connected | Primary |
| 16 | NC | Not connected | Primary |
| 17 | -Vin | Negative input voltage | Primary |
| 18 | +Vin | Positive input voltage | Primary |

Ordering Information

| Options | Suffixes to add to part number |
|--|---|
| RoHS lead-solder exempt compliant ¹ | No RoHS suffix character required |
| RoHS compliant for all six substances | Add "G" as the last character of the part number. |

¹ The solder exemption refers to all the restricted materials except lead in solder.

NUCLEAR AND MEDICAL APPLICATIONS - Power-One products are not designed, intended for use in, or authorized for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems without the express written consent of the respective divisional president of Power-One, Inc.

TECHNICAL REVISIONS - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.