

Features

- Power Supply Range:
 - Signal Supply : 3V to 20V
 - Dual Supply : $\pm 1.5V$ to $\pm 10V$
- Large DC Voltage Gain : 100dB
- Large Output Swing : $0V \sim V_{DD} - 1.5V$
- Bandwidth(unity gain) : 2MHz
- Internally Frequency Compensated for Unity Gain
- Low Input Offset Voltage : 1mV
- Lead Free Available (RoHS Compliant)

Applications

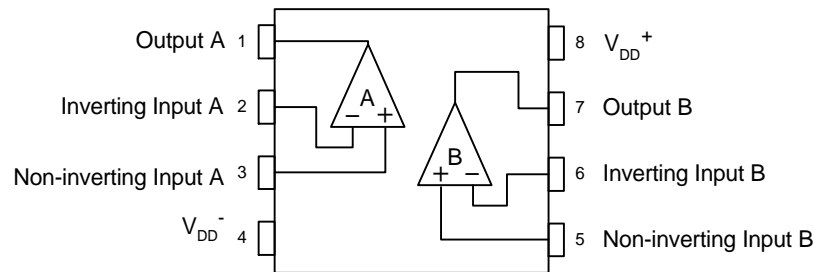
- Amplifiers
- Filters
- Analog Circuit

General Description

The JRC4558 consists of two independent, high gain, internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply up to 20 volts. Operation from dual power supplies is also possible and the power supply current drain is essentially independent of the magnitude of the power supply voltage.

Application areas include transducer amplifiers, DC gain blocks and all the conventional OP amplifier circuits which can be more easily implemented in single power supply systems. (For example, the JRC4558 can be directly operated from the standard +5V power supply voltage which is normally used in digital systems).

Block Diagram



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$)

| Symbol | Parameter | Rating | Unit |
|-----------|--------------------------------------|---------------|------------------|
| V_{DD} | Supply Voltage | 20 | V |
| V_{ID} | Differential Input Voltage | 20 | V |
| V_I | Input Voltage | -0.3V to +20V | V |
| P_D | Power Dissipation | 500 | mW |
| T_A | Operating Free-air Temperature Range | 0 to 70 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | -40 to +150 | $^\circ\text{C}$ |

Electrical Characteristics ($V_{DD} = \pm 10\text{V}$, $T_A = 25^\circ\text{C}$)

| Symbol | Parameter | Test Conditions | JRC4558 | | | Unit |
|------------|---------------------------------|--|-----------|-----------|------|-------------------------|
| | | | Min. | Typ. | Max. | |
| V_{IO} | Input Offset Voltage | $R_S \leq 10\text{k}\Omega$ | | 1 | 6 | mV |
| I_{IO} | Input Offset Current | | | 5 | 200 | nA |
| I_{BIAS} | Input Bias Current | | | 25 | 500 | nA |
| R_{IN} | Input Resistance | | 0.3 | 5 | | $\text{M}\Omega$ |
| A_V | Large Signal Voltage Gain | $R_L \geq 2\text{k}\Omega$, $V_O = \pm 10\text{V}$ | 86 | 100 | | dB |
| V_{OM1} | Maximum Output Voltage Swing 1 | $R_L \geq 10\text{k}\Omega$ | ± 9 | ± 9.5 | | V |
| V_{OM2} | Maximum Output Voltage Swing 2 | $R_L \geq 2\text{k}\Omega$ | ± 8.5 | ± 9.0 | | V |
| V_{ICM} | Input Common-Mode Voltage Range | | ± 9 | ± 9.5 | | V |
| CMRR | Common-Mode Rejection Ratio | $R_S \leq 10\text{k}\Omega$ | | 90 | | dB |
| SVRR | Supply Voltage Rejection Ratio | $R_S \leq 10\text{k}\Omega$, $V_{P-P} = 100\text{mV}$, $f_{IN} = 100\text{HZ}$ | 60 | 65 | | dB |
| I_{CC} | Operating Current | | | 3.7 | 6 | mA |
| V_{NI} | Equivalent Input Noise Voltage | RIAA, $R_S = 1\text{k}\Omega$, 30kHz, LPF | | 1.4 | | μVrms |
| SR | Slew Rate | | | 650 | | $\text{mV}/\mu\text{s}$ |
| GBWP | Gain Bandwidth Product | | | 2 | | MHz |

Typical Characteristics

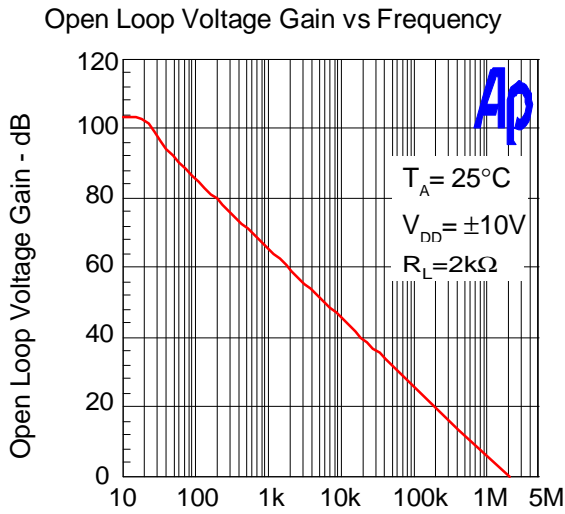


Figure 1 : Frequency (Hz)

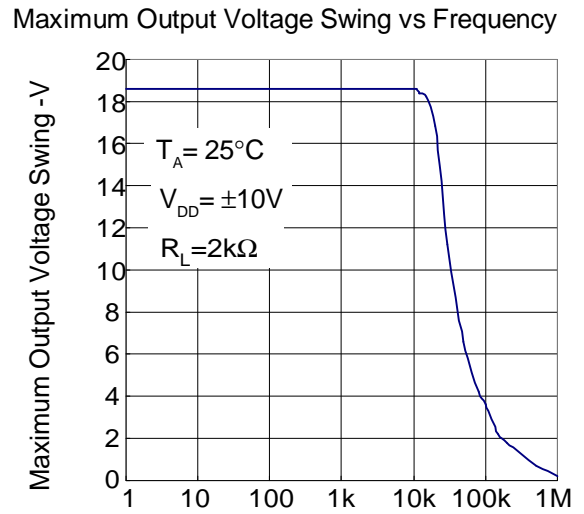


Figure 2 : Frequency (Hz)

Maximum Output Voltage Swing vs Load Resistance

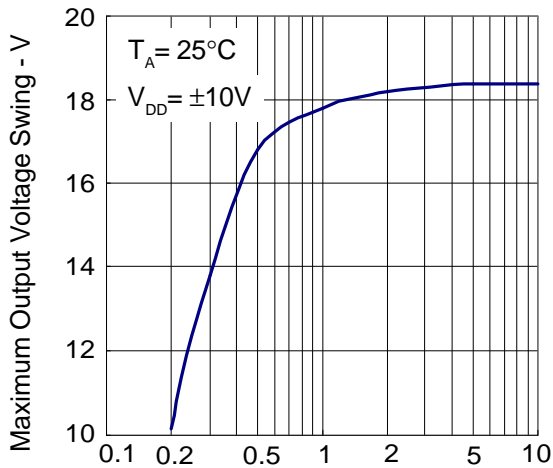


Figure 3 : Load Resistance - $\text{k}\Omega$

Operating Current vs Temperature

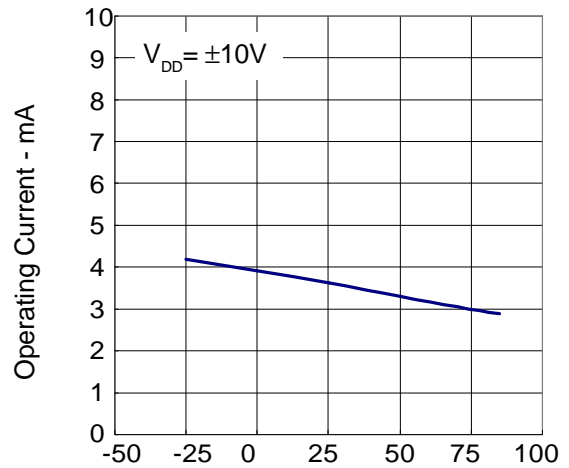


Figure 4 : Temperature - $^\circ\text{C}$

Typical Characteristics Cont.

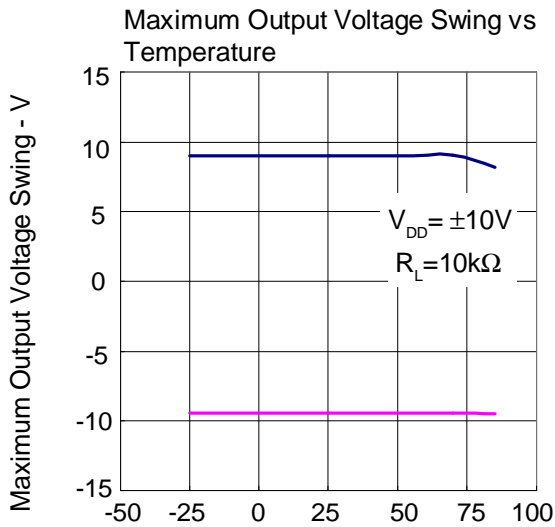


Figure 5 : Temperature - °C

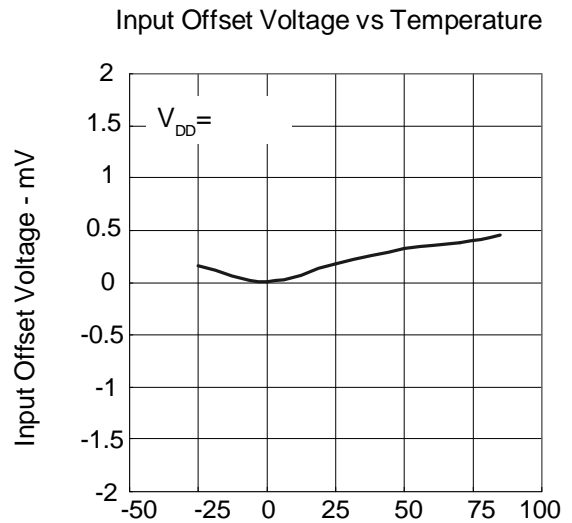


Figure 6 : Temperature - °C

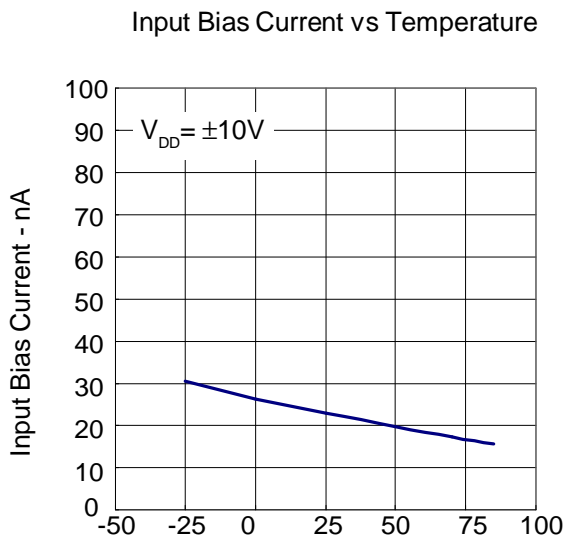


Figure 7 : Temperature - °C

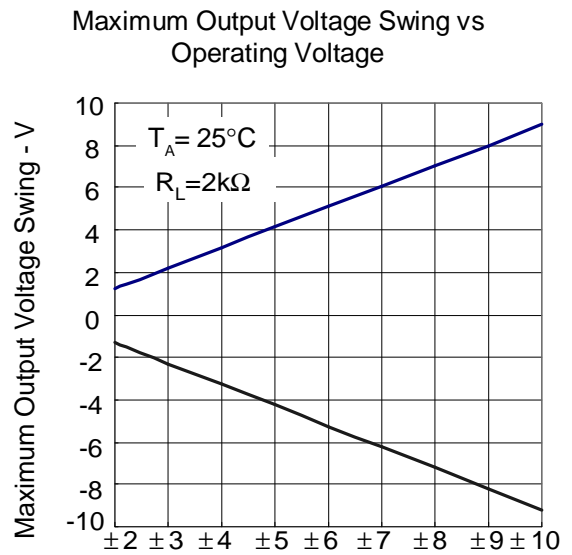


Figure 8 : Operating Voltage - V

Typical Characteristics Cont.

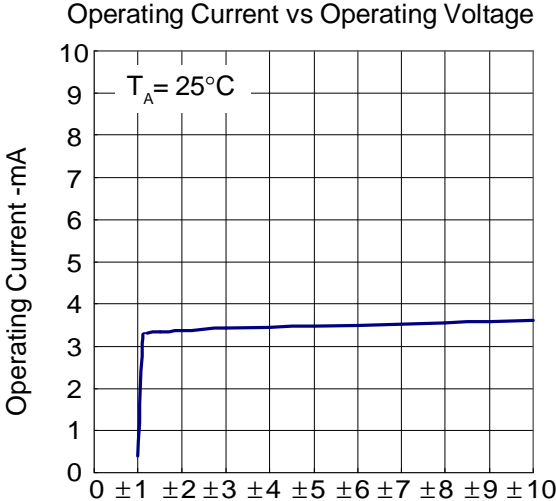


Figure 8 : Operating Voltage - V

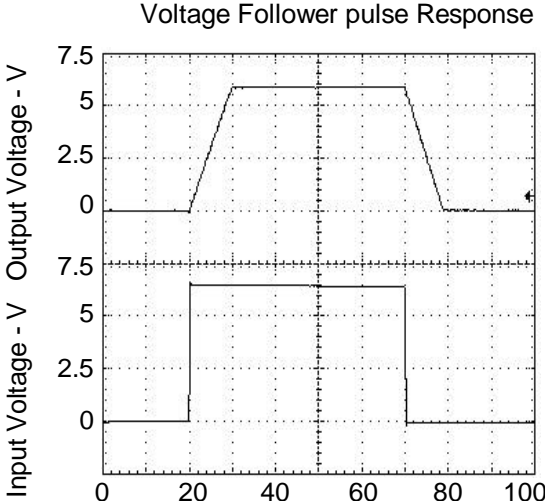
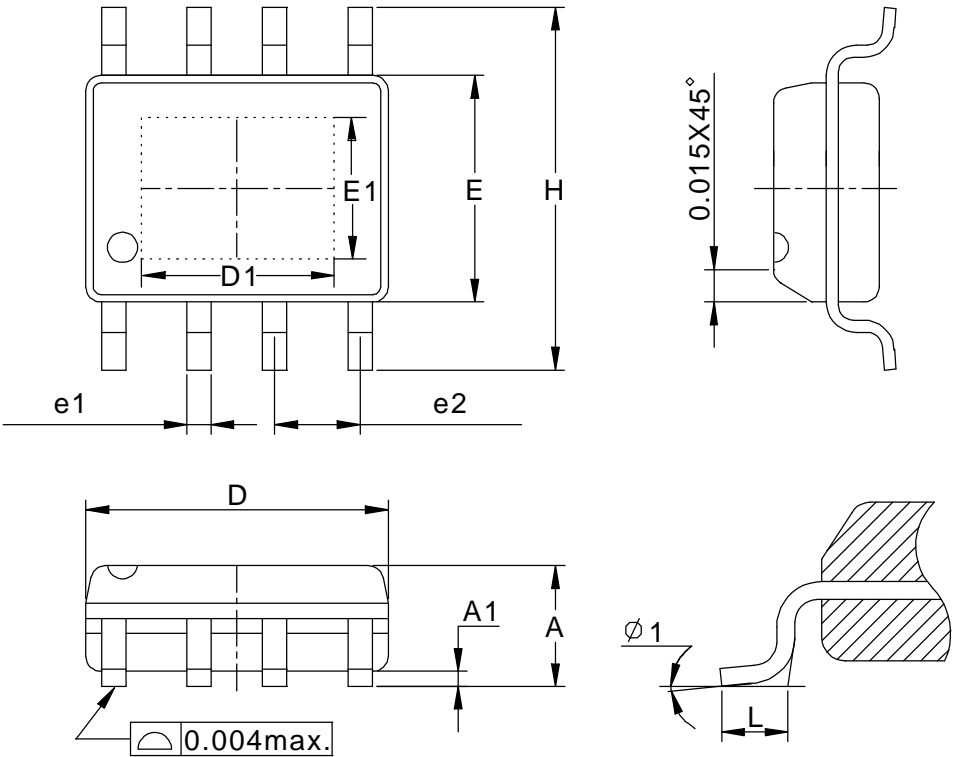


Figure 9 : Time - μs

Packaging Information

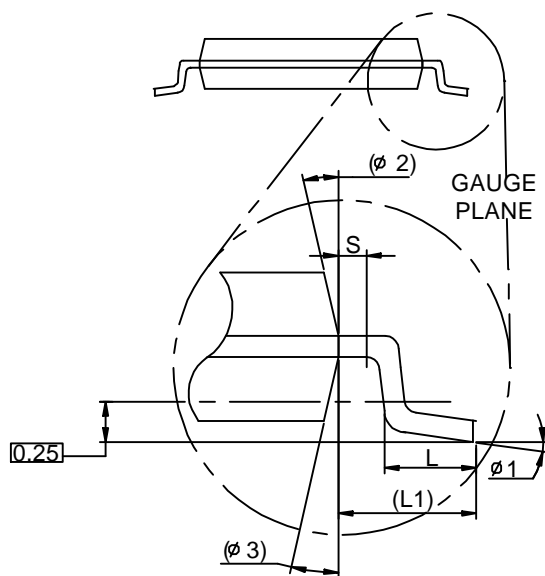
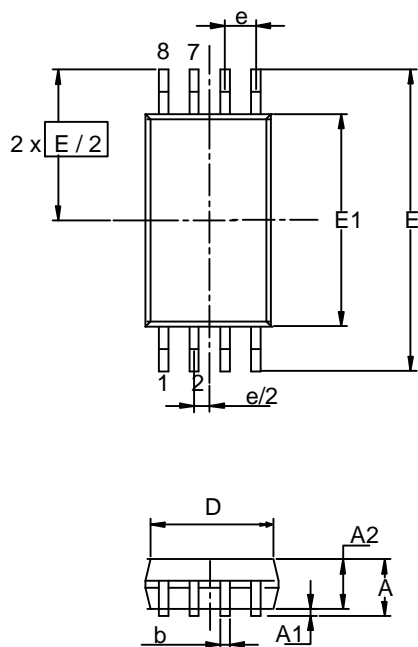
SOP-8-P pin (Reference JEDEC Registration MS-012)



| Dim | Millimeters | | Inches | |
|-------|-------------|------|----------|-------|
| | Min. | Max. | Min. | Max. |
| A | 1.35 | 1.75 | 0.053 | 0.069 |
| A1 | 0 | 0.15 | 0 | 0.006 |
| D | 4.80 | 5.00 | 0.189 | 0.197 |
| D1 | 3.00REF | | 0.118REF | |
| E | 3.80 | 4.00 | 0.150 | 0.157 |
| E1 | 2.60REF | | 0.102REF | |
| H | 5.80 | 6.20 | 0.228 | 0.244 |
| L | 0.40 | 1.27 | 0.016 | 0.050 |
| e1 | 0.33 | 0.51 | 0.013 | 0.020 |
| e2 | 1.27BSC | | 0.50BSC | |
| phi 1 | 8° | | 8° | |

Packaging Information

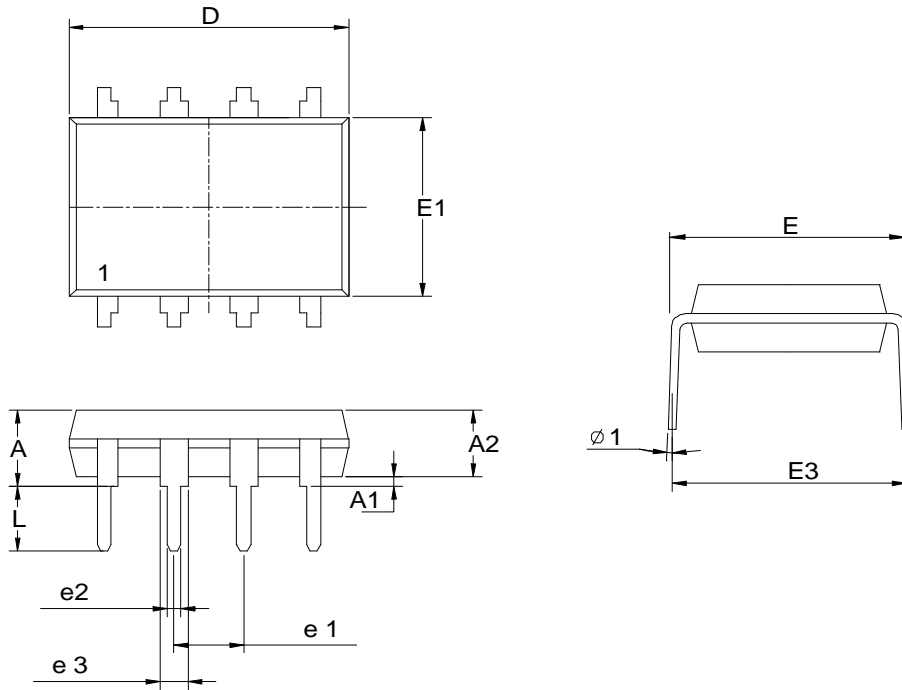
TSSOP-8



| Dim | Millimeters | | Inches | |
|----------|-------------|------|-----------|-------|
| | Min. | Max. | Min. | Max. |
| A | | 1.2 | | 0.047 |
| A1 | 0.00 | 0.15 | 0.000 | 0.006 |
| A2 | 0.80 | 1.05 | 0.031 | 0.041 |
| b | 0.19 | 0.30 | 0.007 | 0.012 |
| D | 2.9 | 3.1 | 0.114 | 0.122 |
| e | 0.65 BSC | | 0.026 BSC | |
| E | 6.40 BSC | | 0.252 BSC | |
| E1 | 4.30 | 4.50 | 0.169 | 0.177 |
| L | 0.45 | 0.75 | 0.018 | 0.030 |
| L1 | 1.0 REF | | 0.039 REF | |
| R | 0.09 | | 0.004 | |
| R1 | 0.09 | | 0.004 | |
| S | 0.2 | | 0.008 | |
| $\phi 1$ | 0° | 8° | 0° | 8° |
| $\phi 2$ | 12° REF | | 12° REF | |
| $\phi 3$ | 12° REF | | 12° REF | |

Packaging Information

PDIP-8 pin (Reference JEDEC Registration MS-001)

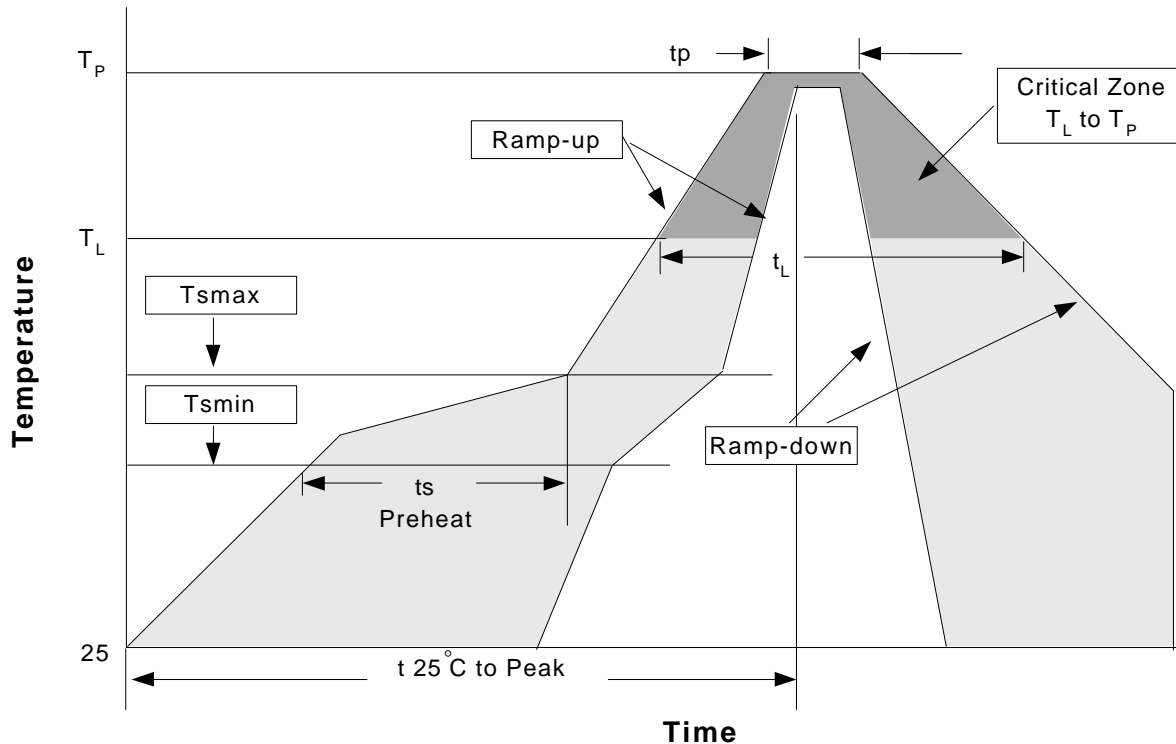


| Dim | Millimeters | | Inches | |
|-----|-------------|-------|-----------|-------|
| | Min. | Max. | Min. | Max. |
| A | | 5.33 | | 0.210 |
| A1 | 0.38 | | 0.015 | |
| A2 | 2.92 | 3.68 | 0.115 | 0.145 |
| D | 9.02 | 10.16 | 0.355 | 0.400 |
| e1 | 2.54 BSC | | 0.100 BSC | |
| e2 | 0.36 | 0.56 | 0.014 | 0.022 |
| e3 | 1.14 | 1.78 | 0.045 | 0.070 |
| E | 7.62 BSC | | 0.300 BSC | |
| E1 | 6.10 | 7.11 | 0.240 | 0.280 |
| E3 | | 10.92 | | 0.430 |
| L | 2.92 | 3.81 | 0.115 | 0.150 |
| φ1 | 15° REF | | 15° REF | |

Physical Specifications

| | |
|--------------------|--|
| Terminal Material | Solder-Plated Copper (Solder Material : 90/10 or 63/37 SnPb), 100%Sn |
| Lead Solderability | Meets EIA Specification RSI86-91, ANSI/J-STD-002 Category 3. |

Reflow Condition (IR/Convection or VPR Reflow)



Classification Reflow Profiles

| Profile Feature | Sn-Pb Eutectic Assembly | Pb-Free Assembly |
|--|-------------------------|------------------|
| Average ramp-up rate (T _L to T _P) | 3°C/second max. | 3°C/second max. |
| Preheat | | |
| - Temperature Min (T _{smmin}) | 100°C | 150°C |
| - Temperature Max (T _{smmax}) | 150°C | 200°C |
| - Time (min to max) (t _s) | 60-120 seconds | 60-180 seconds |
| Time maintained above: | | |
| - Temperature (T _L) | 183°C | 217°C |
| - Time (t _L) | 60-150 seconds | 60-150 seconds |
| Peak/Classification Temperature (T _p) | See table 1 | See table 2 |
| Time within 5°C of actual Peak Temperature (t _p) | 10-30 seconds | 20-40 seconds |
| Ramp-down Rate | 6°C/second max. | 6°C/second max. |
| Time 25°C to Peak Temperature | 6 minutes max. | 8 minutes max. |

Notes: All temperatures refer to topside of the package .Measured on the body surface.