

ZRA125

PRECISION 1.25 VOLT MICROPPOWER VOLTAGE REFERENCE

DESCRIPTION

The ZRA125 uses a bandgap circuit design to achieve a precision micropower voltage reference of 1.25 volts. The device is available in small outline surface mount packages, ideal for applications where space saving is important.

The ZRA125 design provides a stable voltage without an external capacitor and is stable with capacitive loads. The ZRA125 is recommended for operation between 50 μ A and 5mA and so is ideally suited to low power and battery powered applications.

Excellent performance is maintained to a suggested absolute maximum of 25mA, however the rugged design and 20 volt processing allows the reference to withstand transient effects and currents up to 200mA. Superior switching capability allows the device to reach stable operating conditions in only a few microseconds.

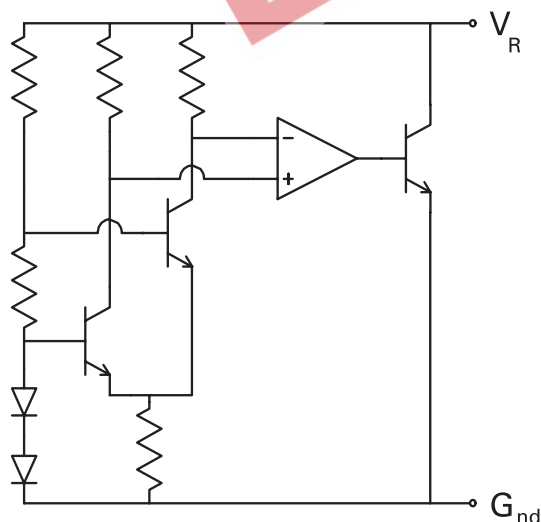
FEATURES

- No stabilizing capacitor required
- Typical T_c 30ppm/ $^{\circ}$ C
- Typical slope resistance 0.65 Ω
- \pm 3% and 2% tolerance
- Industrial temperature range
- Operating current 50 μ A to 5mA
- Transient response, stable in less than 10 μ s
- Small outline SOT23 package

APPLICATIONS

- Battery powered and portable equipment
- Metering and measurement systems
- Instrumentation
- Data acquisition systems
- Precision power supplies
- Test equipment

SCHEMATIC DIAGRAM



ZRA125

ABSOLUTE MAXIMUM RATINGS

| | |
|-----------------------|--------------|
| Reverse current | 25mA |
| Forward current | 25mA |
| Operating temperature | -40 to 85°C |
| Storage temperature | -55 to 150°C |

POWER DISSIPATION ($T_{amb} = 25^{\circ}C$)

| | |
|-------|-------|
| SOT23 | 330mW |
|-------|-------|

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}C$ unless otherwise stated)

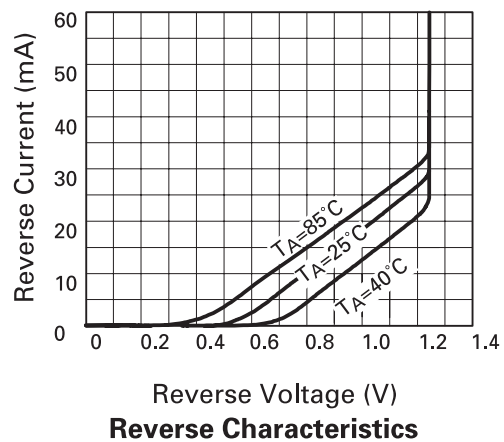
| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | TOL % | UNITS |
|-------------|---|---|---------------|--------------|---------------|--------|------------------|
| V_R | Reverse breakdown voltage | $I_R = 150\mu A$ | 1.225 1.21 | 1.25 1.25 | 1.275 1.29 | 2 3 | V V |
| I_{MIN} | Minimum operating current | | | 30 | 50 | | μA |
| I_R | Recommended operating current | | 0.05 | | 5 | | mA |
| $T_C^{(1)}$ | Average reverse breakdown voltage temp. co. | $I_R(\min)$ to $I_R(\max)$ | | 30 | 90 | | ppm/ $^{\circ}C$ |
| $R_S^{(2)}$ | Slope resistance | | | 0.65 | 2 | | Ω |
| Z_R | Reverse dynamic impedance | $I_R = 1mA$ $f = 100Hz$ $I_{AC} = 0.1I_R$ | | 0.5 | 1 | | Ω |
| E_N | Wideband Noise Voltage | $I_R = 150\mu A$ $f = 100Hz$ to $10kHz$ | | 40 | | | $\mu V(rms)$ |

NOTES:

$$(1) \quad T_C = \frac{V_R \text{ change} \times 1,000,000}{V_R \times \text{temperature change}}$$

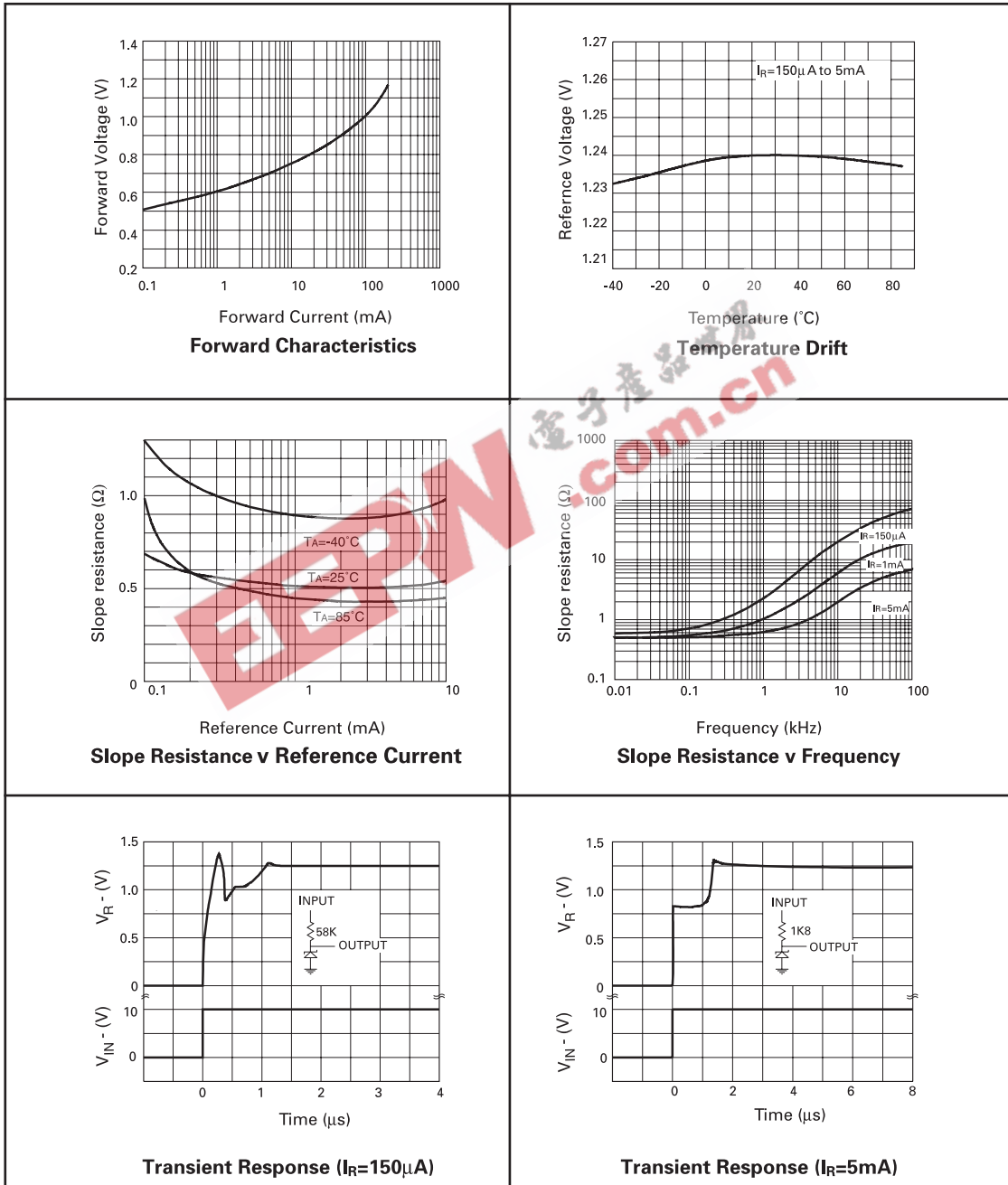
T_C is a characterized parameter not measured on individual devices.

$$(2) \quad R_S = \frac{V_R \text{ change } (I_R(\min) \text{ to } I_R(\max))}{I_R(\max) - I_R(\min)}$$



ZRA125

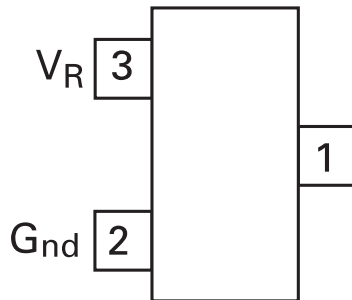
TYPICAL CHARACTERISTICS



ZRA125

CONNECTION DIAGRAM

Package Suffix - F



TOP VIEW

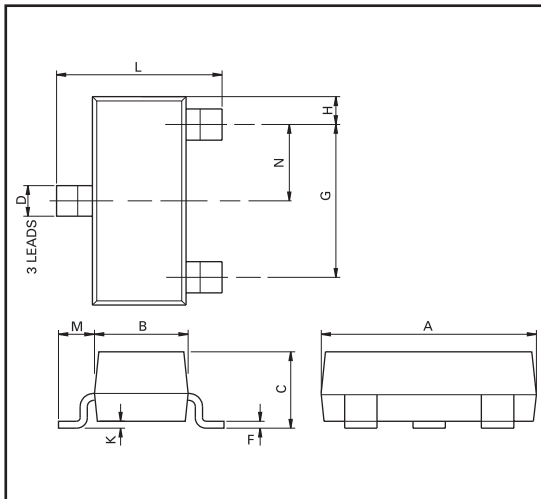
Pin 1 floating or connected to pin 2

ORDERING INFORMATION

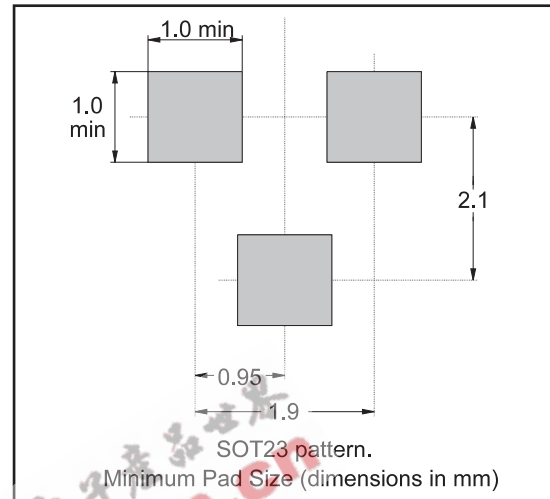
| Part Number | Tol % | Package | Part Mark | Reel Size | Quantity per reel |
|-------------|-------|---------|-----------|-----------|-------------------|
| ZRA125F02TA | 2 | SOT23 | 12B | 7" | 3,000 |
| ZRA125F03TA | 3 | SOT23 | 12A | 7" | 3,000 |

ZRA125

PACKAGE OUTLINE



PAD LAYOUT DETAILS



Controlling dimensions are in millimeters. Approximate conversions are given in inches

PACKAGE DIMENSIONS

| DIM | Millimeters | | Inches | | DIM | Millimeters | | Inches | |
|-----|-------------|------|-----------|--------|-----|-------------|------|------------|--------|
| | Min | Max | Min | Max | | Min | Max | Max | Max |
| A | 2.67 | 3.05 | 0.105 | 0.120 | H | 0.33 | 0.51 | 0.013 | 0.020 |
| B | 1.20 | 1.40 | 0.047 | 0.055 | K | 0.01 | 0.10 | 0.0004 | 0.004 |
| C | — | 1.10 | — | 0.043 | L | 2.10 | 2.50 | 0.083 | 0.0985 |
| D | 0.37 | 0.53 | 0.015 | 0.021 | M | 0.45 | 0.64 | 0.018 | 0.025 |
| F | 0.085 | 0.15 | 0.0034 | 0.0059 | N | 0.95 NOM | | 0.0375 NOM | |
| G | 1.90 NOM | | 0.075 NOM | | — | — | | — | |

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