

ZXRE125

SOT23 MICROPOWER 1.22V VOLTAGE REFERENCE

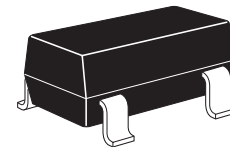
SUMMARY

DESCRIPTION

The ZXRE125 is a bandgap circuit designed to achieve a precision micropower voltage reference of 1.22 volts. The device is available in the small outline SOT23 surface mount package which is ideal for applications where space saving is important.

SOT23 tolerance is available to 0.5% for precision applications. Excellent performance is maintained over the 8 μ A to 20mA operating current range with a typical temperature coefficient of only 20ppm/ $^{\circ}$ C. The device has been designed to be highly tolerant of capacitive loads so maintaining excellent stability.

This device offers a SOT23 pin for pin compatible replacement of the ZRA124 and ZRA125 series of voltage references. An E-Line (TO92 style) package is also available.



SOT23



E-line

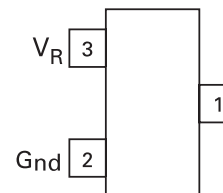
FEATURES

- High performance 1.220V reference
- 0.5%, 1%, 2% and 3% tolerance
- 4 μ A knee current
- 20ppm/ $^{\circ}$ C typical temperature coefficient
- Unconditionally stable
- Small outline SOT23

APPLICATIONS

- Battery powered equipment
- Precision power supplies
- Portable instrumentation
- Portable communications devices
- Data acquisition systems

SOT23
Package Suffix - F



Top view -
Pin 1 floating or
connected to pin 2

E-line
Package Suffix - R



Bottom view -
Pin 3 floating or
connected to pin 1

ORDERING INFORMATION

| DEVICE | TOL% | GRADE | PACKAGE | PARTMARKING | REEL | QUANTITY PER REEL |
|---------------|------|-------|---------|-------------|------|-------------------|
| ZXRE125CFTA | 0.5 | C | SOT23 | 12J | 7" | 3,000 |
| ZXRE125DFTA | 1 | D | SOT23 | 12H | 7" | 3,000 |
| ZXRE125EFTA | 2 | E | SOT23 | 12G | 7" | 3,000 |
| ZXRE125FFTA | 3 | F | SOT23 | 12F | 7" | 3,000 |
| ZXRE125DRSTOA | 1 | | E-line | ZXRE125D | - | 2,000 |
| ZXRE125ERSTOA | 2 | | E-line | ZXRE125E | - | 2,000 |
| ZXRE125FRSTOA | 3 | | E-line | ZXRE125F | - | 2,000 |

NOTE:

E-line parts available loose in boxes of 2,000 units, omit "STOA" from order code i.e. ZXRE125DR

ZXRE125

ABSOLUTE MAXIMUM RATINGS

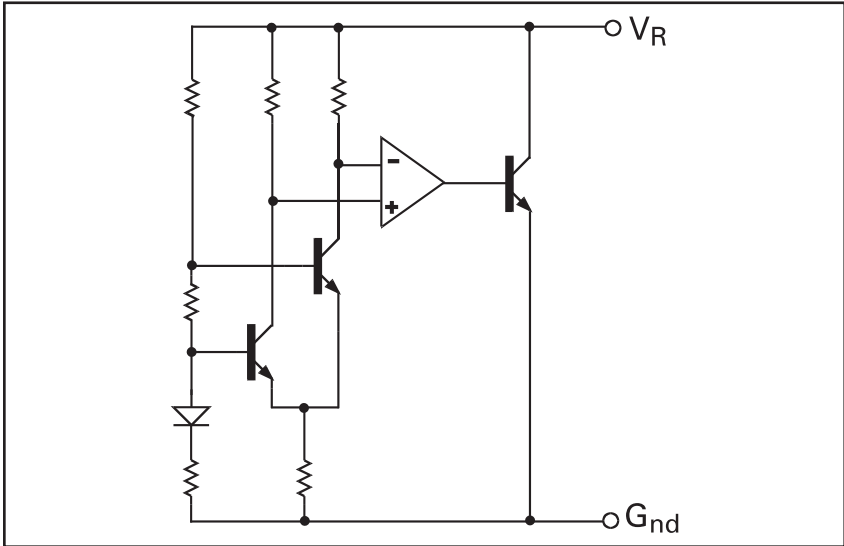
| PARAMETER | SYMBOL | LIMIT | UNIT |
|-----------------------|-----------|------------|------|
| Reverse current | V_Z | 30 | mA |
| Forward current | | 10 | mA |
| Operating temperature | T_{OMP} | -40 to 85 | °C |
| Storage temperature | T_{STG} | -55 to 125 | °C |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

POWER DISSIPATION (at $T_{amb} = 25^{\circ}\text{C}$, $T_{jmax} = 25^{\circ}\text{C}$)

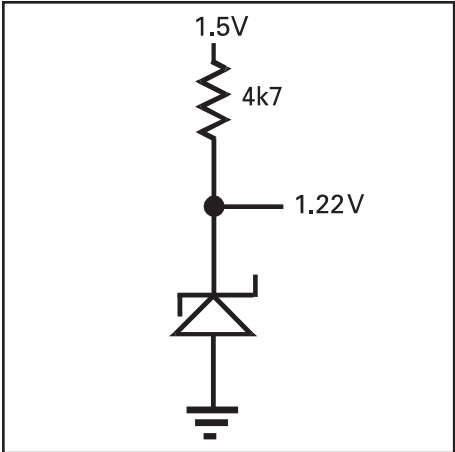
| PACKAGE | VALUE | UNIT |
|---------|-------|------|
| SOT23 | 330 | mW |
| E-line | 500 | mW |

ZXRE125

SCHEMATIC DIAGRAM



APPLICATIONS CIRCUIT



ZXRE125

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

| PARAMETER | SYMBOL | CONDITIONS | MIN. | TYP. | MAX. | GRADE/ TOL% | UNITS |
|---|---------------------------------|---|-------|-------|-------|----------------------|-------------------------|
| Reverse Breakdown Voltage | V_R | $I_R = 100\mu\text{A}$ | 1.214 | 1.220 | 1.226 | C/0.5 ⁽¹⁾ | V |
| | | | 1.208 | 1.220 | 1.232 | D/1 | V |
| | | | 1.196 | 1.220 | 1.244 | E/2 | V |
| | | | 1.183 | 1.220 | 1.257 | F/3 | V |
| Minimum Knee Current | I_{MIN} | | | 4 | 8 | | μA |
| Recommended Operating Current Range | I_R | | 0.008 | | 20 | | mA |
| Average Reverse Breakdown Voltage Temperature Coefficient | $T_C^{(2)}$ | $I_{R(min)}$ to $I_{R(max)}$ | | 20 | 75 | | ppm/ $^{\circ}\text{C}$ |
| Reverse Breakdown Change with Current Voltage | $\frac{\Delta V_R}{\Delta I_R}$ | $I_R = 30\mu\text{A}$ to 1 mA $I_R = 1\text{mA}$ to 5mA | | | 1 | | mV |
| | | | | | 10 | | mV |
| Reverse Dynamic Impedance | Z_R | $I_R = 1\text{mA}$ $f = 100\text{Hz}$ $I_{AC} = 0.1I_R$ | | 0.2 | 0.6 | | Ω |
| Wideband Noise Voltage | E_N | $I_R = 8\mu\text{A}$ to $100\mu\text{A}$ $f = 10\text{Hz}$ to 10kHz | | 60 | | | $\mu\text{V(rms)}$ |

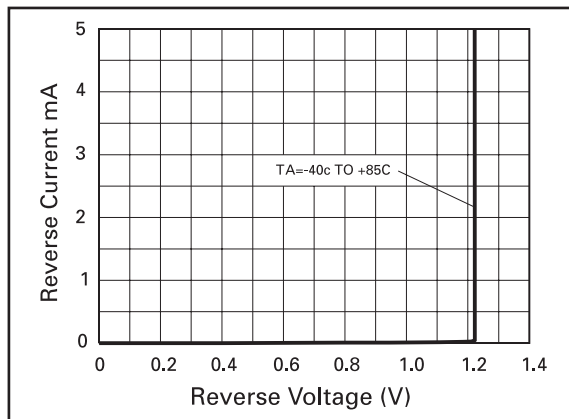
NOTE:

(1) 0.5% SOT23 only

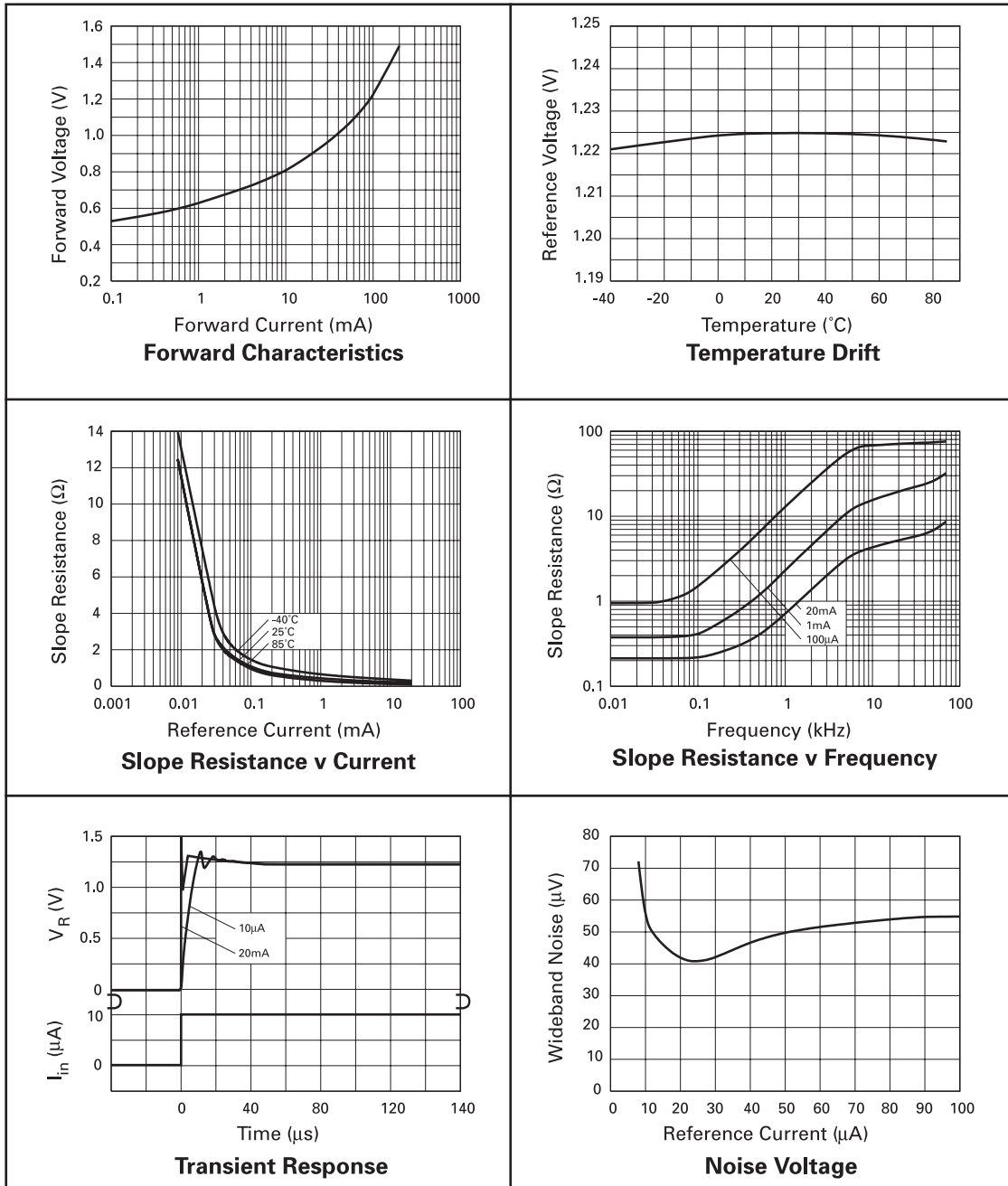
$$(2) T_C = \frac{(V_{R(max)} - V_{R(min)}) \times 1000000}{V_R \times (T_{(max)} - T_{(min)})}$$

$V_{R(max)} - V_{R(min)}$ is the maximum deviation in reference voltage measured over the full operating temperature range

REVERSE CHARACTERISTICS



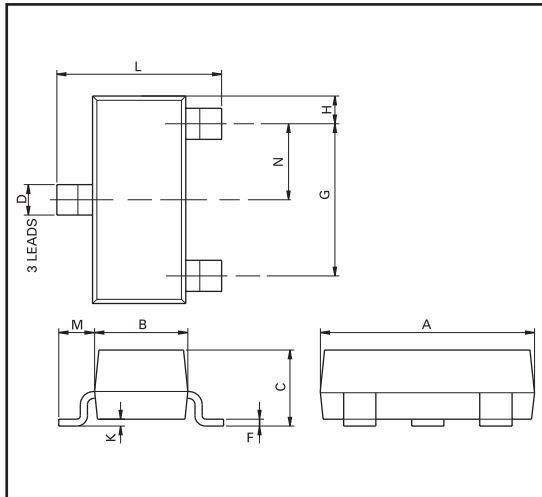
TYPICAL CHARACTERISTICS



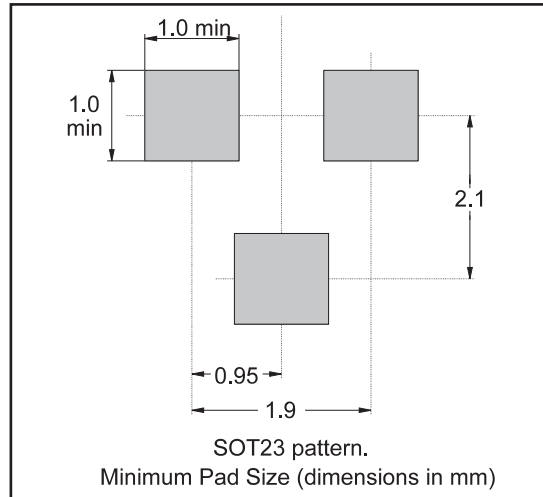
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SOT23 PACKAGE OUTLINE AND PAD LAYOUT DETAILS

PACKAGE OUTLINE



PAD LAYOUT



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

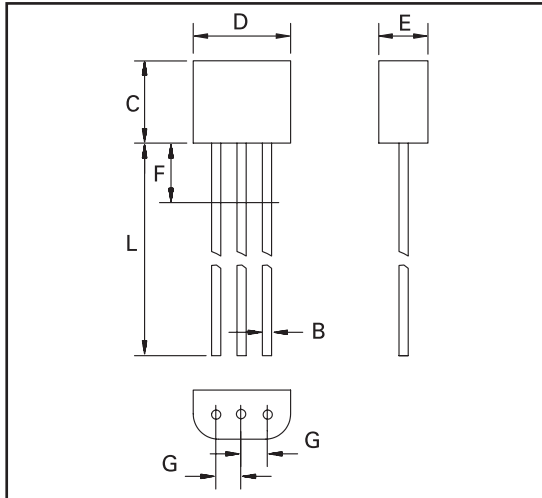
PACKAGE DIMENSIONS

| DIM | Millimetres | | Inches | | DIM | Millimetres | | Inches | |
|-----|-------------|------|--------|--------|-----|-------------|------|-----------|--------|
| | Min | Max | Min | Max | | Min | Max | Min | Max |
| A | 2.67 | 3.05 | 0.105 | 0.120 | G | NOM 1.9 | | NOM 0.037 | |
| 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 | 0.0145 | 0.021 | N | NOM 0.95 | | NOM 0.037 | |
| F | 0.085 | 0.15 | 0.0033 | 0.0059 | | | | | |

ZXRE125

E-LINE PACKAGE OUTLINE

PACKAGE OUTLINE



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

PACKAGE DIMENSIONS

| DIM | Millimetres | | Inches | |
|-----|-------------|-------|-----------|--------|
| | Min | Max | Min | Max |
| A | 0.41 | 0.495 | 0.016 | 0.0195 |
| B | 0.41 | 0.495 | 0.016 | 0.0195 |
| C | 3.61 | 4.01 | 0.142 | 0.158 |
| D | 4.37 | 4.77 | 0.172 | 0.188 |
| E | 2.16 | 2.41 | 0.085 | 0.095 |
| F | — | 2.50 | — | 0.098 |
| G | 1.27 NOM | | 0.050 NOM | |
| L | 13.00 | 13.97 | 0.512 | 0.550 |

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