

SOT23 MICROPOWER (4 μ A) 1.22V VOLTAGE REFERENCE

DESCRIPTION

The ZXLT1004 is a 1.22 volt bandgap reference circuit designed for ultra low current operation, typically 4 μ A. The device is available in a SOT23 surface mount package offering the ultimate in space and power saving. These features make the ZXLT1004 particularly suitable for portable and battery powered applications.

SOT23 tolerance selection 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.

As well as the SOT23, the ZXLT1004 can offer a pin for pin compatible alternative to the REF1004, LT1004 and LM185/385 series of voltage references with E-Line (TO92 style) equivalent.

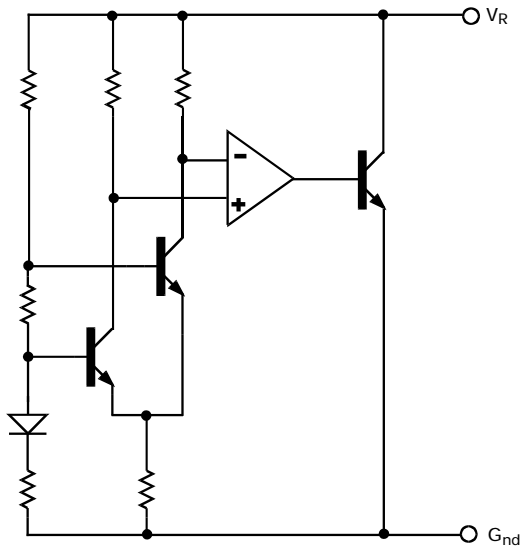
FEATURES

- High performance alternative to REF1004, LT1004 and LM185/385 references
- 4 μ A typical knee current
- Small outline SOT23 package
- E-Line alternative available
- 20ppm/ $^{\circ}$ C typical temperature coefficient
- Unconditionally stable
- 0.5%, 1%, 2% and 3% tolerance
- Contact Zetex marketing for availability of tighter tolerance devices

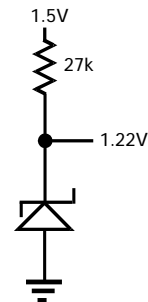
APPLICATIONS

- Battery powered equipment
- Precision power supplies
- Portable instrumentation
- Portable communications devices
- Notebook and palmtop computers
- Data acquisition systems
- A/D and D/A converters
- Test equipment

SCHEMATIC DIAGRAM



APPLICATIONS CIRCUIT



Ultra low quiescent reference from a 1.5V battery source.

ZXLT1004

ABSOLUTE MAXIMUM RATINGS

| | |
|------------------------|--------------|
| Reverse Current | 30mA |
| Forward Current | 10mA |
| Operating temperature. | -40 to 85°C |
| Storage temperature. | -55 to 125°C |

| | |
|--|-------|
| Power Dissipation ($T_{amb}=25^{\circ}\text{C}$) | |
| SOT23 | 330mW |
| E-Line | 500mW |

ELECTRICAL CHARACTERISTICS

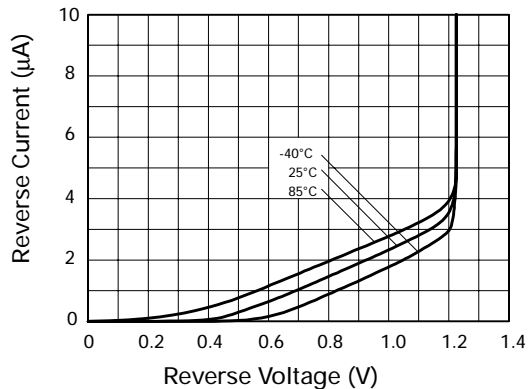
TEST CONDITIONS (Unless otherwise stated) $T_{amb}=25^{\circ}\text{C}$

| SYMBOL | PARAMETER | CONDITIONS | LIMITS | | | TOL. % | UNITS |
|---------------------------------|---|---|----------------------------------|------------------------------|----------------------------------|----------------------|-------------------------|
| | | | MIN | TYP | MAX | | |
| V_R | Reverse Breakdown Voltage | $I_R=100\mu\text{A}$ | 1.214 1.208 1.196 1.183 | 1.22 1.22 1.22 1.22 | 1.226 1.232 1.244 1.257 | 0.5 † 1 2 3 | V |
| I_{MIN} | Minimum Knee Current | | | 4 | 8 | | μA |
| I_R | Recommended Operating Current Range | | 0.008 | | 20 | | mA |
| $T_C \dagger$ | Average Reverse Breakdown Voltage Temperature Coefficient | $I_{R(min)}$ to $I_{R(max)}$ | | 20 | 75 | | ppm/ $^{\circ}\text{C}$ |
| $\frac{\Delta V_R}{\Delta I_R}$ | Reverse Breakdown Voltage change with Current | $I_R=8\mu\text{A}$ to 1mA $I_R=1\text{mA}$ to 20mA | | | 1 10 | | mV mV |
| Z_R | Reverse Dynamic Impedance | $I_R=1\text{mA}$ $f=100\text{Hz}$ $I_{AC}=0.1 I_R$ | | 0.2 | 0.6 | | Ω |
| E_N | Wideband Noise Voltage | $I_R=8\mu\text{A}$ to 100 μA $f=10\text{Hz}$ to 10kHz | | 60 | | | $\mu\text{V(rms)}$ |

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

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

‡ Note: 0.5% SOT23 only

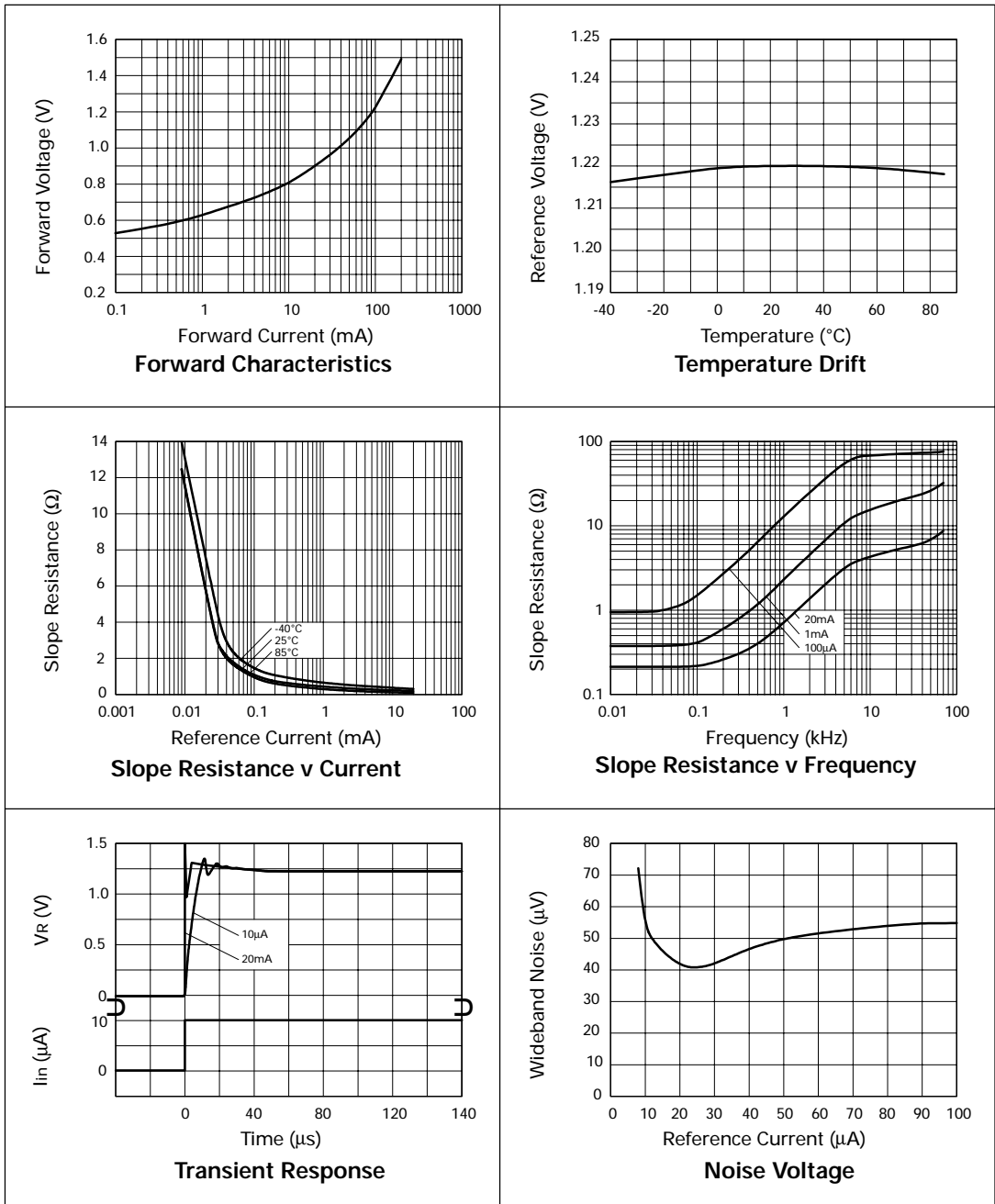


Reverse Characteristics

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TYPICAL CHARACTERISTICS



ZXLT1004

Ordering Information

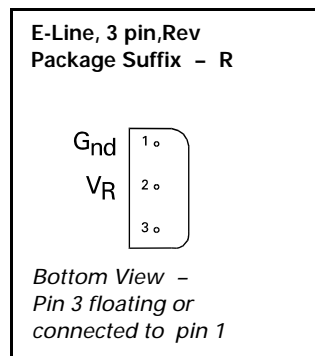
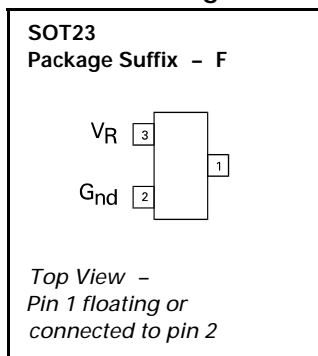
| Device | TOL% | Package | Partmarking |
|--------------|------|---------|-------------|
| ZXLT1004CF | 0.5 | SOT23 | 10D |
| ZXLT1004DF | 1 | SOT23 | 10C |
| ZXLT1004EF | 2 | SOT23 | 10B |
| ZXLT1004FF | 3 | SOT23 | 10A |
| ZXLT1004DR † | 1 | E-Line | ZXRE1004D |
| ZXLT1004ER † | 2 | E-Line | ZXRE1004E |
| ZXLT1004FR † | 3 | E-Line | ZXRE1004F |

†Contact Zetex marketing for availability of these package options

NOTE:

for tape and reel options add suffix TA to the part number
eg ZXLT1004DFTA

Connection Diagrams



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