

**ZXRE125**  
**SOT23 MICROPOWER 1.22V VOLTAGE REFERENCE**

**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 8µA to 20mA operating current range with a typical temperature coefficient of only 20ppm/°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.

**Features**

- High performance 1.220V reference
- Small outline SOT23
- 4µA knee current
- 20ppm/°C typical temperature coefficient
- Unconditionally stable
- 0.5%, 1%, 2%, and 3% tolerance
- Green molding compound (No Br, Sb)

**Applications**

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

**Application Circuit**



**Pin Assignments**

SOT23 Package Suffix - F



(Top View)

Pin 1 floating or connected to pin 2

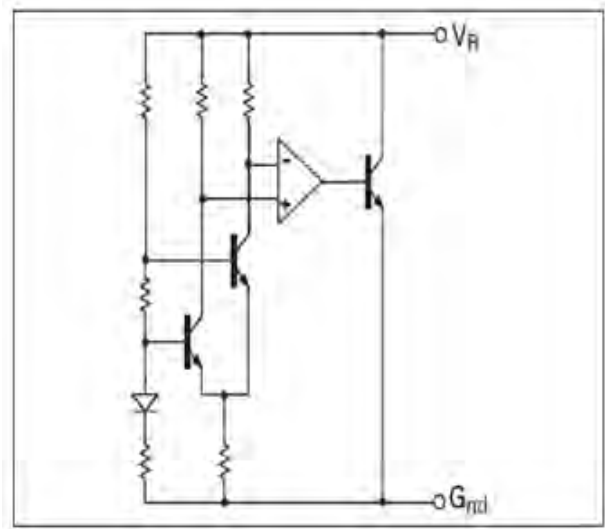
E-line  
Package Suffix - R



(Bottom View)

Pin 3 floating or connected to pin 1

**Schematic Diagram**



**Absolute Maximum Ratings** (Voltages to GND Unless Otherwise Stated)

Parameter	Symbol	Rating	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 ( $T_{AMB} = 25^{\circ}C$ )	$P_D$	330	mW

**Electrical Characteristics** (Test conditions:  $T_{amb} = 25^{\circ}C$ , unless otherwise specified.)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Tol. (%)	Unit
$V_R$	Reverse breakdown voltage	$I_R = 100\mu A$	1.214 1.208 1.196 1.183	1.220 1.220 1.220 1.220	1.226 1.232 1.244 1.257	C/0.5 <sup>(1)</sup> D/1 E/2 F/3	V
$I_{MIN}$	Minimum operating current			4	8		$\mu A$
$I_R$	Recommended operating current		0.008		20		mA
$T_C^{(*)}$	Average reverse breakdown voltage temperature coefficient	$I_{R(min)}$ to $I_{R(max)}$		20	75		ppm/°C
$\frac{\Delta V_R}{\Delta I_R}$	Reverse Breakdown Change with Current Voltage	$I_R = 30\mu A$ to 1mA $I_R = 1mA$ to 12mA			1 10		mV
$Z_R$	Reverse dynamic impedance	$I_R = 1mA$ $f = 100Hz$ $I_{AC} = 0.1I_R$		0.2	0.6		$\Omega$
$E_N$	Wideband noise voltage	$I_R = 8\mu A$ to 100 $\mu A$ $f = 10Hz$ to 10kHz		60			$\mu V(rms)$

Notes:

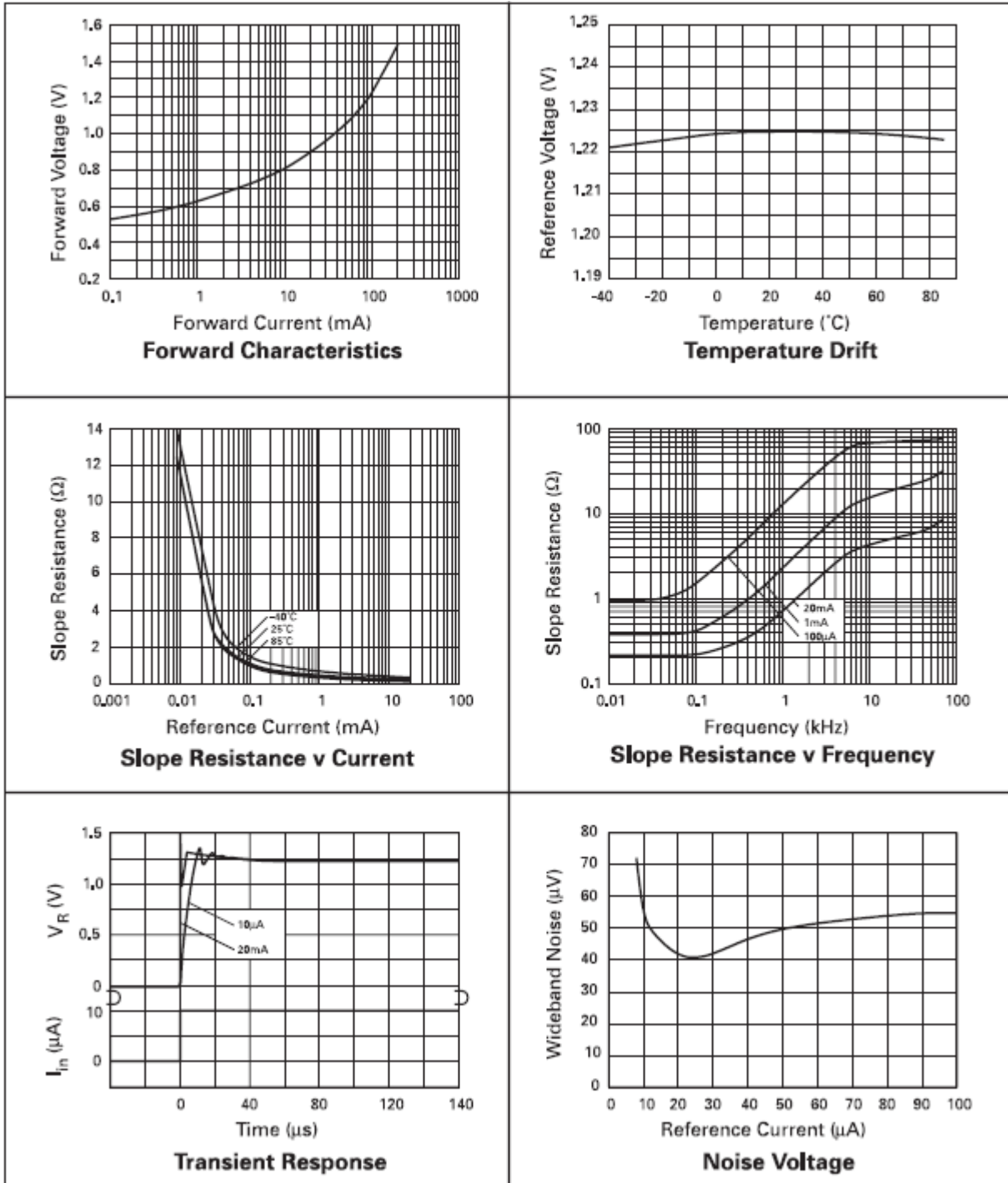
1. 
$$(*) T_C = \frac{(V_{R(MAX)} - V_{R(MIN)}) \times 1000000}{V_R \times (T_{(MAX)} - T_{(MIN)})}$$

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

**REVERSE CHARACTERISTICS**



**Typical Characteristics**

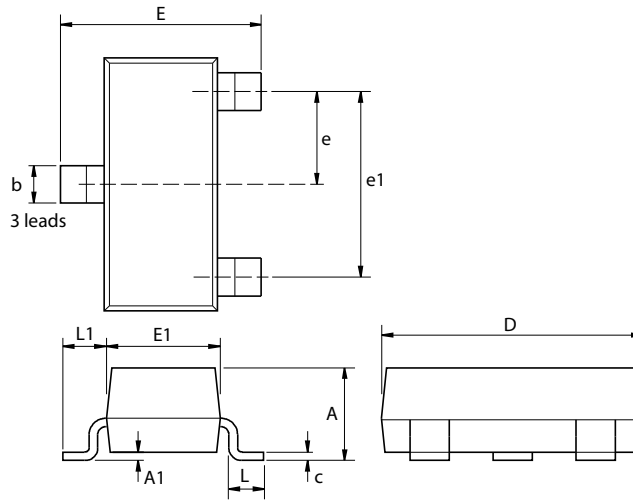


**Ordering Information<sup>(\*)</sup>**

Order Reference	Tol (%)	Device Mark	Grade	Status (*)	Reel Size (inches)	Quantity per reel	Tape Width (mm)
ZXRE125CFTA	0.5	12J	C	Released	7	3000	8
ZXRE125DFTA	1	12H	D	Released	7	3000	8
ZXRE125EFTA	2	12G	E	Released	7	3000	8
ZXRE125FFTA	3	12F	F	Released	7	3000	8

Notes: \* All ZXRE125 E-line variants are obsolete and no longer available for sale.

**Package Outline Dimensions**



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	-	1.12	-	0.044	e1	1.90 NOM		0.075 NOM	
A1	0.01	0.10	0.0004	0.004	E	2.10	2.64	0.083	0.104
b	0.30	0.50	0.012	0.020	E1	1.20	1.40	0.047	0.055
c	0.085	0.20	0.003	0.008	L	0.25	0.60	0.0098	0.0236
D	2.80	3.04	0.110	0.120	L1	0.45	0.62	0.018	0.024
e	0.95 NOM		0.037 NOM		-	-	-	-	-

**Note:** Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

#### IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.

Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

#### LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or
2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2010, Diodes Incorporated

[www.diodes.com](http://www.diodes.com)