ZR4040-2.5

PRECISION 2.5 VOLT MICROPOWER VOLTAGE REFERENCE

Description

The ZR4040-2.5 uses a bandgap circuit design to achieve a precision micropower voltage reference of 2.5 volts. The device is available in a small outline surface mount package, ideal for applications where space saving is important, as well as packages for through hole requirements.

The ZR4040-2.5 design provides a stable voltage without an external capacitor and is stable with capacitive loads. The ZR4040-2.5 is recommended for operation between 60µA and 15mA and so is ideally suited to low power and battery powered applications.

Excellent performance is maintained to an 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

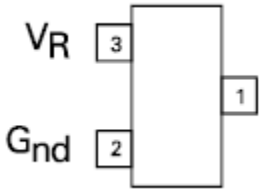
- Small outline SOT23 package
- No stabilizing capacitor required
- Typical T_C 30ppm/°C
- Typical slope resistance 0.4Ω
- 2%, 1% and 0.5% tolerance
- Industrial temperature range
- Operating current 60µA to 15mA
- Transient response, stable in less than 10µs
- Green molding compound (No Br, Sb)

Applications

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

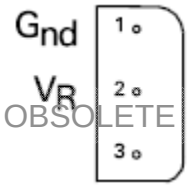
Pin Assignments

SOT23 Package Suffix - F



(Top View)
Pin 1 floating or connected to pin 2

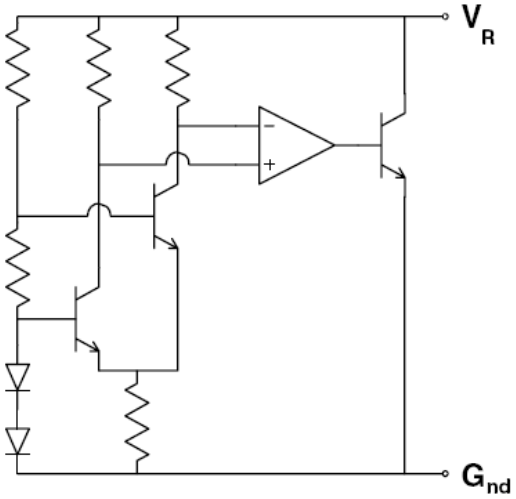
E-Line, 3 pin, Rev Package Suffix – R



OBSOLETE

(Bottom View)
Pin 3 floating or connected to pin 1

Typical Application Circuit



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Absolute Maximum Ratings (Voltages to GND Unless Otherwise Stated)

Parameter	Rating	Unit
Reverse Current	25	mA
Forward Current	25	mA
Operating Temperature	-40 to 85	°C
Storage Temperature	-55 to 125	°C
Power Dissipation (T_{AMB} = 25°C) SOT23	330	mW

Electrical Characteristics (Test conditions: T_{amb} = 25°C, unless otherwise specified.)

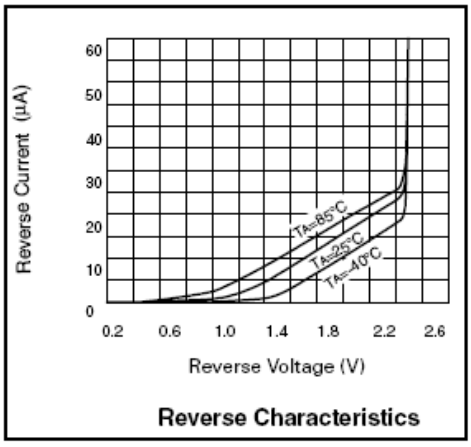
Symbol	Parameter	Condition	Min.	Typ.	Max.	Tol. (%)	Unit
V_R	Reverse breakdown voltage	I_R = 150µA	2.4875 2.475 2.45	2.5 2.5 2.5	2.5125 2.525 2.55	0.5 1 2	V
I_{MIN}	Minimum operating current			25	60		µA
I_R	Recommended operating current		0.06		15		mA
T_C(*)	Average reverse breakdown voltage temperature coefficient	$I_{R(MIN)}$ to $I_{R(MAX)}$		30	100		ppm/°C
R_S(†)	Slope resistance			0.4	2		Ω
Z_R	Reverse dynamic impedance	I_R = 1mA f = 100Hz $I_{AC} = 0.1I_R$		0.3	0.8		Ω
E_N	Wideband noise voltage	I_R = 1mA f = 10Hz to 10kHz		45			µV(rms)

Notes:

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

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

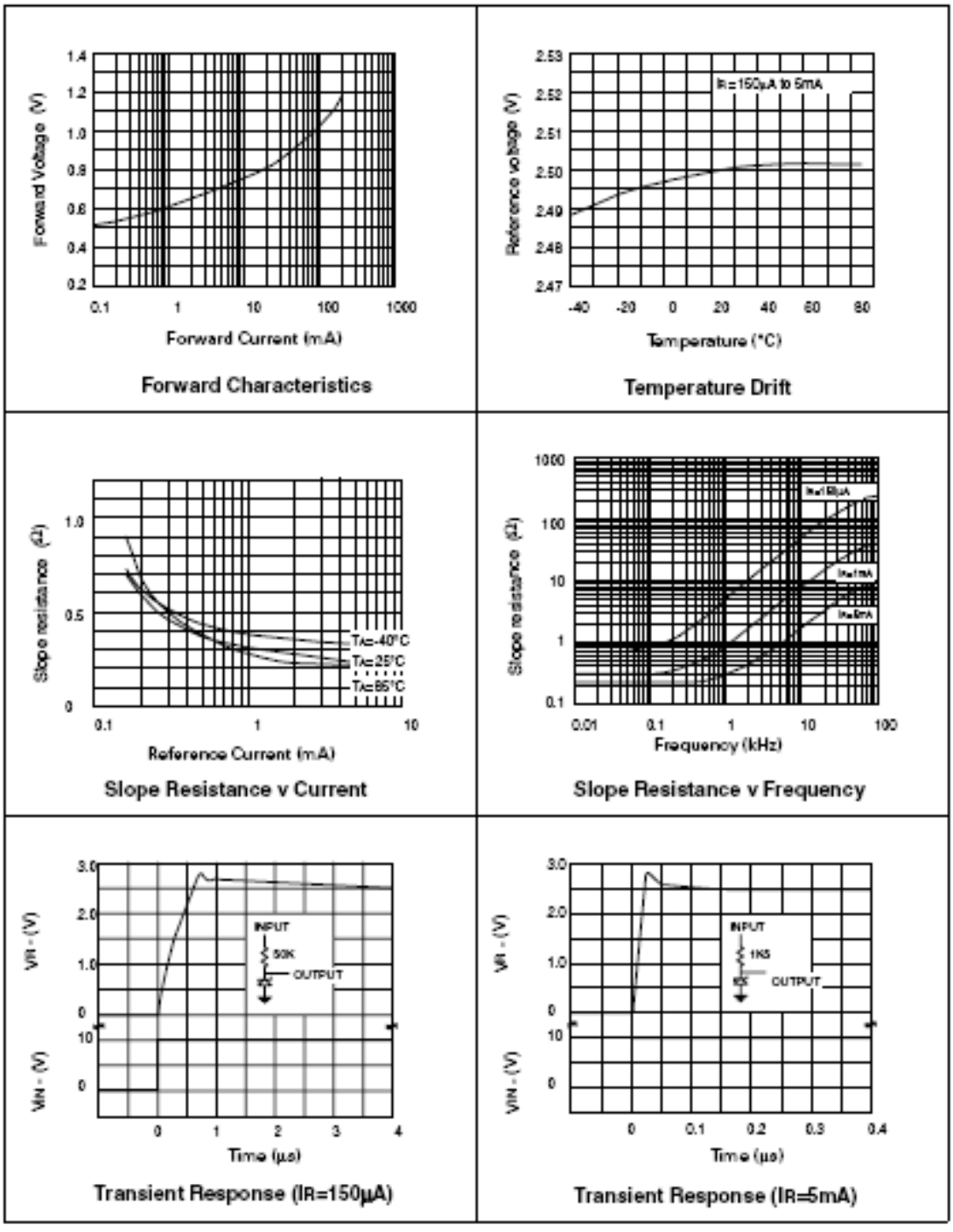
(†) $$R_S = \frac{V_R \text{ Change } (I_{R(MIN)} \text{ to } I_{R(MAX)})}{I_{R(MAX)} - I_{R(MIN)})}$$



Reverse Characteristics

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Typical Characteristics



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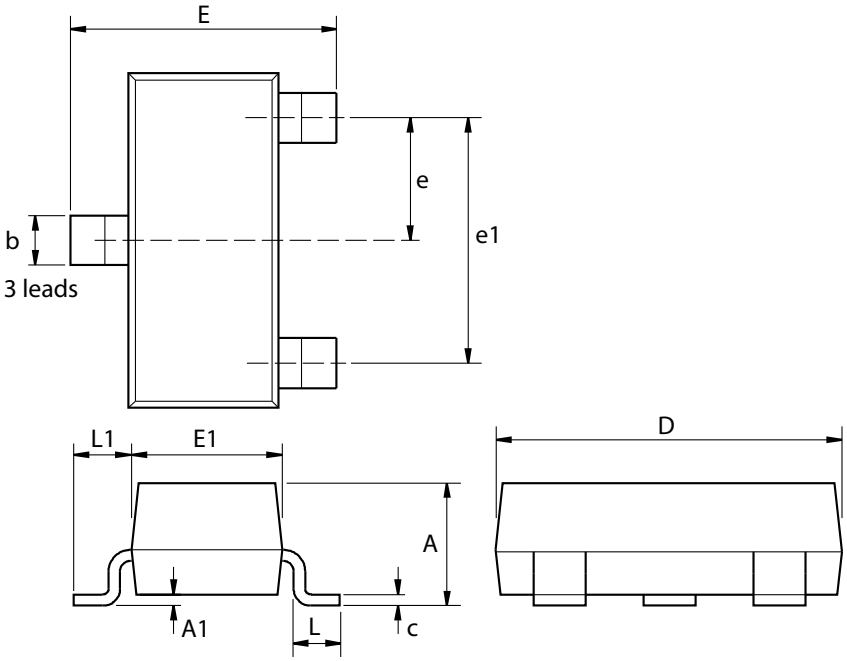
Ordering Information*

Order Reference	Tol (%)	Package	Device Mark	Status (*)	Reel Size (inches)	Quantity per reel	Tape Width (mm)
ZR40401F25TA	1	SOT23	25M	Released	7	3000	8
ZR40402F25TA	2	SOT23	25L	Released	7	3000	8
ZR404005F25TA	0.5	SOT23	25V	Released	7	3000	8

Notes: *All ZR4040R25 variants (E-Line) are obsolete and no longer available for sale. The closest alternative is the SOT23.

Package Outline Dimensions

SOT23



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

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