

# ZR285-2.5

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## PRECISION 2.5 VOLT MICROPOWER VOLTAGE REFERENCE

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### DEVICE DESCRIPTION

The ZR285 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.

The ZR285 design provides a stable voltage without an external capacitor and is stable with capacitive loads. The ZR285 is recommended for operation between 20 $\mu$ A and 20mA and so is ideally suited to low power and battery powered applications.

Excellent performance is maintained to an absolute maximum of 30mA, 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.

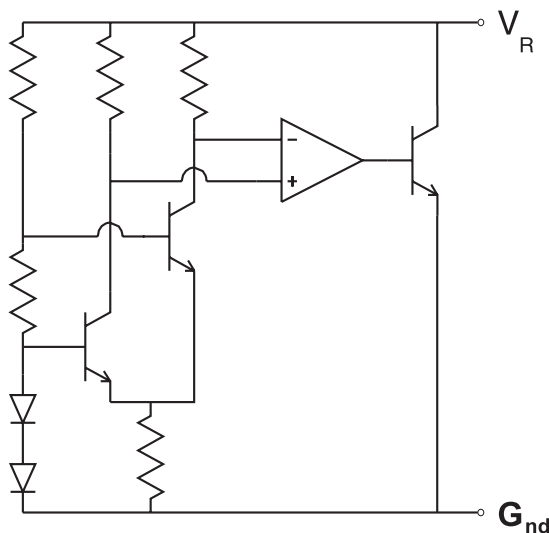
### FEATURES

- Small outline SOT23 package
- No stabilising capacitor required
- Low knee current, 15 $\mu$ A typical
- Typical  $T_C$  30ppm / $^{\circ}$ C
- Typical slope resistance 0.4 $\Omega$
- $\pm$  3%, 2% and 1% tolerance
- Industrial temperature range
- Operating current 20 $\mu$ A to 20mA

### APPLICATIONS

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

### SCHEMATIC DIAGRAM



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## ABSOLUTE MAXIMUM RATING

Reverse current	30mA	<b>Power dissipation (T<sub>amb</sub>=25°C)</b>	
Forward current	25mA	SOT23	330mW
Operating temperature	-40 to 85°C		
Storage temperature	-55 to 150°C		

## ELECTRICAL CHARACTERISTICS TEST CONDITIONS (Unless otherwise stated) T<sub>amb</sub>=25°C

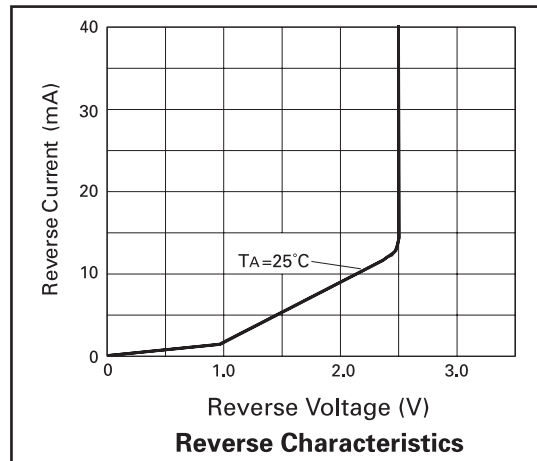
SYMBOL	PARAMETER	CONDITION	LIMITS			TOL. %	UNITS
			MIN	TYP	MAX		
V <sub>R</sub>	Reverse breakdown voltage	I <sub>R</sub> = 150μA	2.475 2.45 2.425	2.5 2.5 2.5	2.525 2.55 2.575	1 2 3	V
I <sub>MIN</sub>	Minimum operating current			13	20		μA
I <sub>R</sub>	Recommended operating current		0.02		20		mA
T <sub>C</sub> <sup>(1)</sup>	Average reverse breakdown voltage temp. co.	I <sub>R</sub> = 1mA to 20mA		30	90		ppm/°C
R <sub>S</sub> <sup>(2)</sup>	Slope resistance			0.4	1		Ω
Z <sub>R</sub>	Reverse dynamic impedance	I <sub>R</sub> = 1mA f = 100Hz I <sub>AC</sub> = 0.1 I <sub>R</sub>		0.3	0.8		Ω
E <sub>N</sub>	Wideband noise voltage	I <sub>R</sub> = 150μA f = 10Hz to 10kHz		60			μV (rms)

### NOTES:

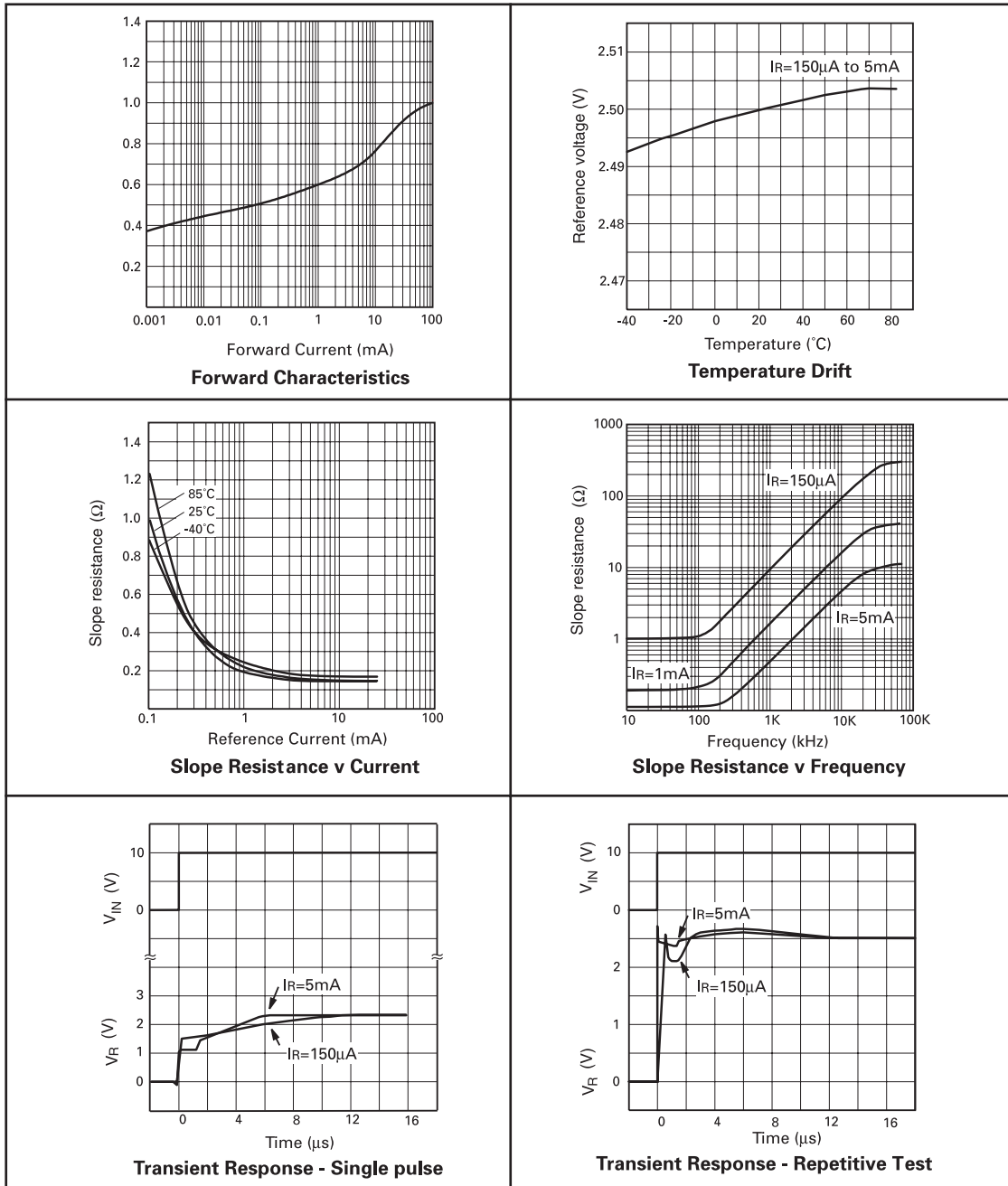
$$(1) T_c = \frac{(V_{R(max)} - V_{R(min)}) \times 1000000}{V_R \times (T_{(max)} - T_{(min)})}$$

Note: V<sub>R(max)</sub> - V<sub>R(min)</sub> is the maximum deviation in reference voltage measured over the full operating temperature range.

$$(2) R_s = \frac{V_R \text{ Change } (I_{R(min)} \text{ to } I_{R(max)})}{I_{R(max)} - I_{R(min)}}$$

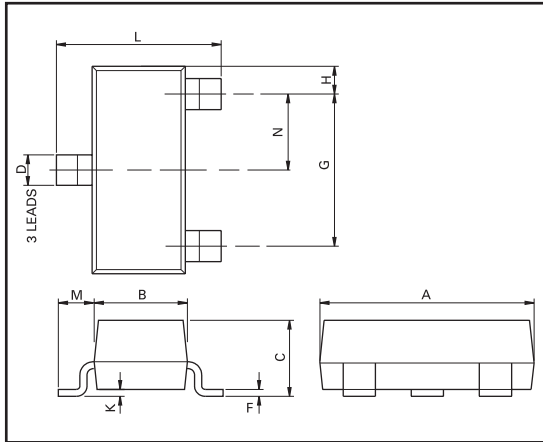


## TYPICAL CHARACTERISTICS



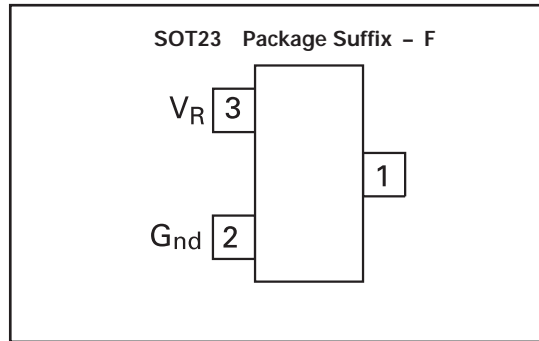
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## PACKAGE OUTLINE



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

## CONNECTION DIAGRAM



Top view - Pin 1 floating or connected to pin 2

## ORDERING INFORMATION

Part No	ToI%	Package	Partmark
ZR285F03TA	3	SOT23	28A
ZR285F02TA	2	SOT23	28B
ZR285F01TA	1	SOT23	28C

7" reels of 3,000 units

## 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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