



ZRC500

PRECISION 5.0 VOLT LOW KNEE CURRENT VOLTAGE REFERENCE

Description

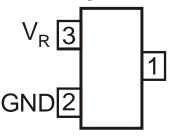
The ZRC500 uses a bandgap circuit design to achieve a precision micropower voltage reference of 5.0 volts. The device is available in small outline surface mount packages, ideal for applications where space saving is important, as well as packages for through hole requirements.

The ZRC500 design provides a stable voltage without an external capacitor and is stable with capacitive loads. The ZRC500 is recommended for operation between 25µA and 5mA 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.

Pin Assignments

SOT23 Package Suffix - F



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

Typical Application Circuit

Features

- Small outline SOT23 packages
- No stabilizing capacitor required
- Low knee current, 19µA typical
- Typical T_C 30ppm/°C
- Typical slope resistance 0.4Ω
- ±2 and ±1% tolerance
- Industrial temperature range
- Operating current 25µA to 5mA
- Transient response, stable in less than 10µs
- Green molding compound (No Br, Sb)

Applications

- Battery powered and portable equipment
- Instrumentation
- Test equipment
- Metering and measurement systems

o GND



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Absolute Maximum Ratings

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.)

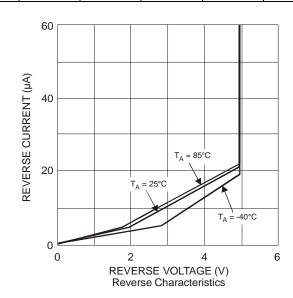
Symbol	Parameter	Condition	Min.	Тур.	Max.	Tol. (%)	Unit
V _R Reverse breakdown voltage	I _R = 150μA	4.95	5.0	5.05	1	V	
		4.9	5.0	5.1	2	V	
I _{MIN}	Minimum operating current			19	25		μΑ
I_R	Recommended operating current		0.025		5		mA
T _C ^(*)	Average reverse breakdown voltage temperature coefficient	I _{R(MIN)} to		30	90		ppm/°C
Rs ^(†)	Slope resistance	IR(MAX)		0.4	2		Ω
Z _R	Reverse dynamic impedance	$I_{R} = 1 \text{mA}$ $f = 100 \text{Hz}$ $I_{AC} = 0.1 I_{R}$		0.3	0.8		Ω
E _N	Wideband noise voltage	$I_R = 150\mu A$ f = 10Hz to 10kHz		105			μV(rms)

Note:

(*)
$$T_C = \frac{\left(V_{R(MAX)} - V_{R(MIN)}\right)x1000000}{V_R x \left(T_{(MAX)} - T_{(MIN)}\right)}$$

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

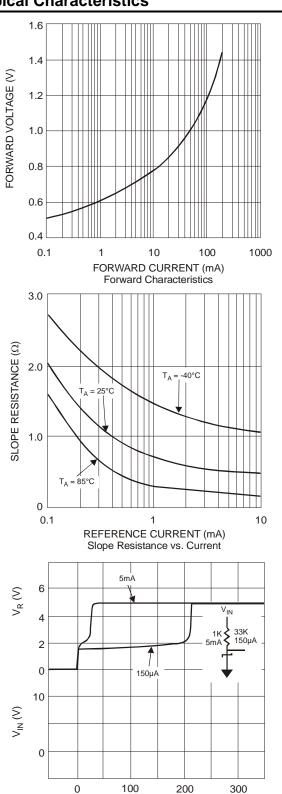
(†)
$$R_S = \frac{V_R Change(I_{R(MIN)} to I_{R(MAX)})}{I_{R(MAX)} - I_{R(MIN)}}$$





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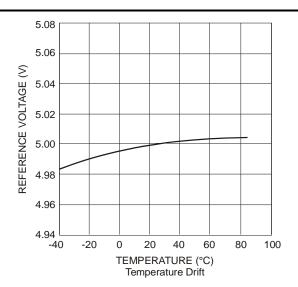
Typical Characteristics

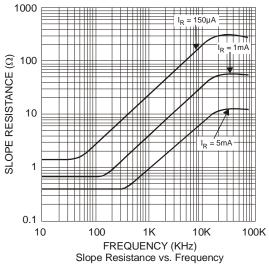


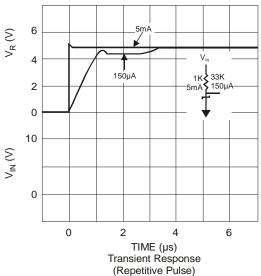
TIME (µs)

Transient Response

(Single Pulse)









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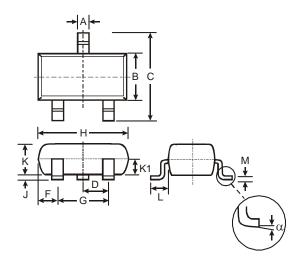
Ordering Information*

Order Reference	Tol (%)	Device Mark	Reel Size (inches)	Quantity per reel	Tape Width (mm)
ZRC500F02TA	2	50T	7	3000	8
ZRC500F01TA	1	50X	7	3000	8

Notes: *All ZRC500A variants (E-Line 3-pin), ZRC500Y variants (E-Line 2-pin), ZRC500R variants (E-Line 3-pin reversed) and ZRC500N8 variants (SO-8) are obsolete.

Package Outline Dimensions

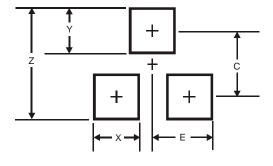
SOT23



SOT23				
Dim	Min	Max	Тур	
Α	0.37	0.51	0.40	
В	1.20	1.40	1.30	
С	2.30	2.50	2.40	
D	0.89	1.03	0.915	
F	0.45	0.60	0.535	
G	1.78	2.05	1.83	
Н	2.80	3.00	2.90	
J	0.013	0.10	0.05	
K	0.903	1.10	1.00	
K1	-	1	0.400	
L	0.45	0.61	0.55	
М	0.085	0.18	0.11	
α	0°	8°	-	
All Dimensions in mm				

Suggested Pad Layout

SOT23



Dimensions	Value (in mm)
Z	2.9
Х	0.8
Y	0.9
С	2.0
E	1.35



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