PRECISION 1.25 VOLT MICROPOWER VOLTAGE REFERENCE

ZRA124

ISSUE 2 - FEBRUARY 1997

DEVICE DESCRIPTION

The ZRA124 uses a bandgap circuit design to achieve a precision micropower voltage reference of 1.24 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 ZRA124 design provides a stable voltage without an external capacitor and is stable with capacitive loads. The ZRA124 is recommended for operation between $50\mu A$ and 5mA and so is ideally suited to low power and battery powered applications.

Excellent performance is maintained to a suggested 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, SO8 and TO92 style packages
- No stabilising capacitor required

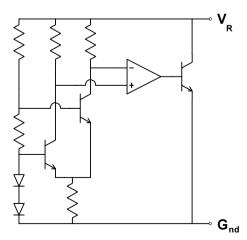
SCHEMATIC DIAGRAM

Typical T_C 30ppm/°C

- Typical slope resistance 0.65Ω
- ± 1% tolerance
- Industrial temperature range
- Operating current 50μA to 5mA
- Transient response, stable in less than 10µs

APPLICATIONS

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



ZRA124

ABSOLUTE MAXIMUM RATING

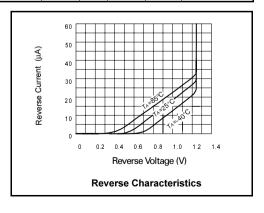
Power Dissipation (Tamb=25°C) Reverse Current 25mA SOT23 330mW **Forward Current** 25mA E-Line, 3 pin (TO92) 500mW -40 to 85°C Operating Temperature E-Line, 2 pin (TO92) 500mW Storage Temperature -55 to 125°C **SO8** 625mW

ELECTRICAL CHARACTERISTICS TEST CONDITIONS (Unless otherwise stated) Tamb=25°C

SYMBOL	PARAMETER	CONDITIONS	LIMITS		TOL.	UNITS	
			MIN	TYP	MAX		
V_{R}	Reverse Breakdown Voltage	I _R =150μA	1.228	1.24	1.252	1	V
I _{MIN}	Minimum Operating Current			30	50		μΑ
I _R	Recommended Operating Current		0.05		5		mA
T _C †	Average Reverse Breakdown Voltage Temp. Co.	I _{R(min)} to		30	90		ppm/°C
R _S §	Slope Resistance			0.65	2		Ω
Z _R	Reverse Dynamic Impedance	$I_{R} = 1mA$ $f = 100Hz$ $I_{AC} = 0.1 I_{R}$		0.5	1		Ω
E _N	Wideband Noise Voltage	I _R = 150μA f = 100Hz to 10kHZ		40			μV(rms)

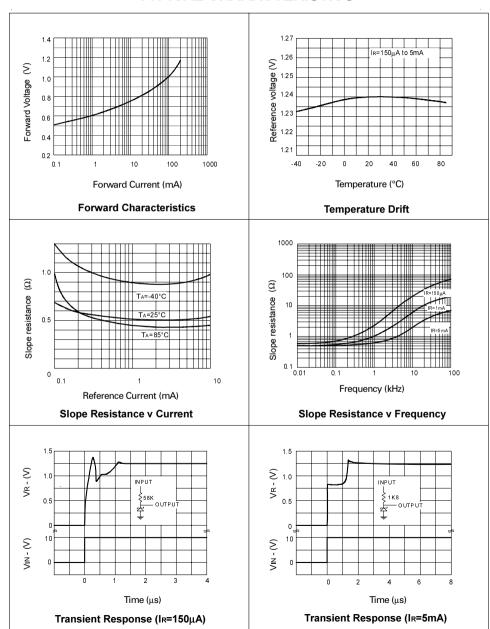
†
$$T_C = \frac{V_R \ Changex \ 1000000}{V_R \ x \ Temperature \ Change}$$

§
$$R_S = \frac{V_R \ Change(I_R \ (min) \ to \ I_R \ (max))}{I_R \ (max) - I_R \ (min)}$$



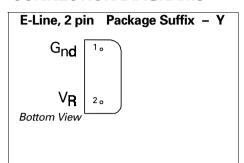
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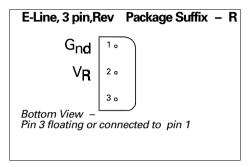
TYPICAL CHARACTERISTICS

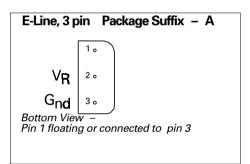


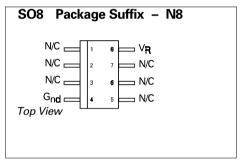
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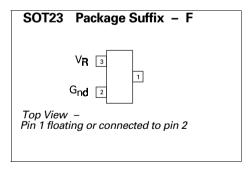
CONNECTION DIAGRAMS











ORDERING INFORMATION

Part No	Tol%	Package	Partmark	
ZRA124A01	1	E-Line •	ZRA12401	
ZRA124F01	1	SOT23	12C	
ZRA124N801	1	SO8	ZRA12401	
ZRA124R01	1	E-Line *	ZRA124R1	
ZRA124Y01	1	E-Line †	ZRA12401	

- * E-Line 3 pin Reversed
- † E-Line 2 pin
- E-Line 3 pin