PRECISION 2.45 VOLT VOLTAGE REFERENCE

ISSUE 3 — MARCH 1998

ZRA245

DEVICE DESCRIPTION

The ZRA245 uses a bandgap circuit design to achieve a precision voltage reference of 2.45 volts. The device is available in small outline surface mount packages, ideal for applications where space saving is important.

The ZRA245 design provides a stable voltage without an external capacitor and is stable with capacitive loads. The ZRA245 is recommended for operation between 2mA and 120mA.

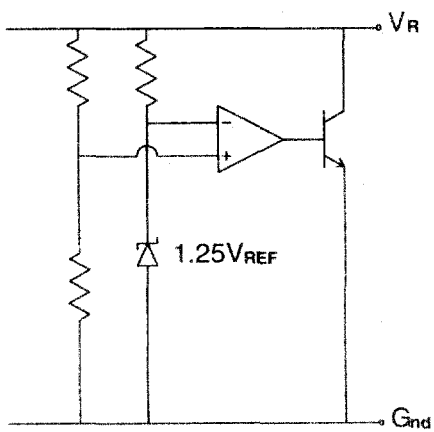
FEATURES

- Small outline SOT23, SO8 and TO92 style package
- No stabilising capacitor required
- Typical T_C 15ppm/°C
- Typical slope resistance 0.26Ω
- ± 3% , 2% and 1% tolerance
- Industrial temperature range
- Operating current 2mA to 120mA

APPLICATIONS

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

SCHEMATIC DIAGRAM



ZRA245

ABSOLUTE MAXIMUM RATING

Reverse Current	200mA
Forward Current	25mA
Operating Temperature	-40 to 85°C
Storage Temperature	-55 to 125°C

Power Dissipation (T_{amb}=25°C)

SOT23	330mW
E-Line, 3 pin (TO92)	500mW
E-Line, 2 pin (TO92)	500mW
SO8	625mW

ELECTRICAL CHARACTERISTICS
TEST CONDITIONS (Unless otherwise stated) T_{amb}=25°C

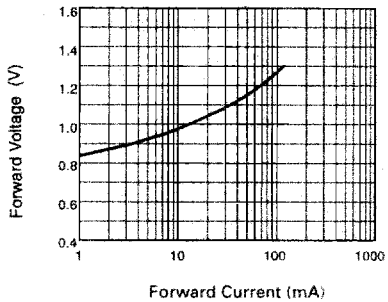
SYMBOL	PARAMETER	CONDITIONS	LIMITS			TOL. %	UNITS
			MIN	TYP	MAX		
V_R	Reverse Breakdown Voltage	I_R=5mA	2.43 2.40 2.38	2.45 2.45 2.45	2.47 2.50 2.52	1 2 3	V
I_{MIN}	Minimum Operating Current				2		mA
I_R	Recommended Operating Current		2		120		mA
T_C †	Average Reverse Breakdown Voltage Temp. Co.	$I_{R(min)}$ to $I_{R(max)}$		15	50		ppm/°C
R_S §	Slope Resistance			0.26	0.5		Ω
Z_R	Reverse Dynamic Impedance	I_R = 5mA f = 100Hz I_{AC}=0.1 I_R		0.28	1		Ω
E_N	Wideband Noise Voltage	I_R = 5mA f = 10Hz to 10kHz		65			µV(rms)

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

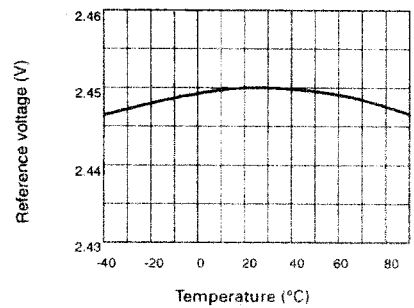
Note: $V_{R(max)}$ - $V_{R(min)}$ is the maximum deviation in reference voltage measured over the full operating temperature range.

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

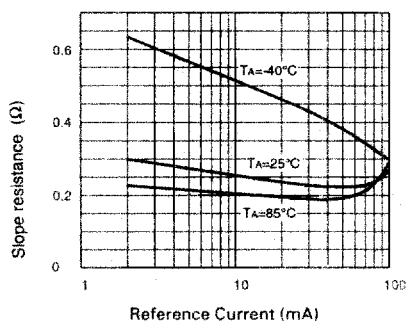
TYPICAL CHARACTERISTICS



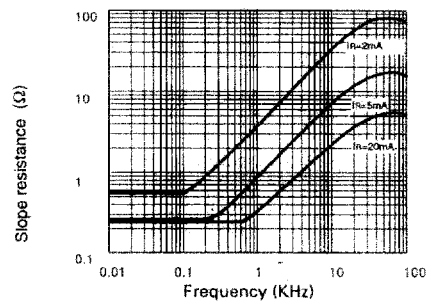
Forward Characteristics



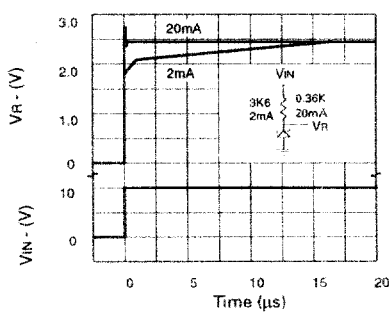
Temperature Drift



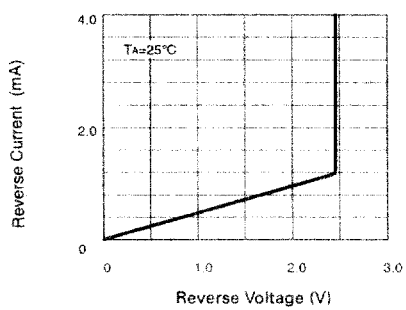
Slope Resistance v Current



Slope Resistance v Frequency



Transient Response



Reverse Characteristics

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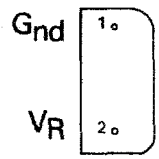
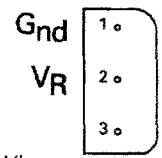
CONNECTION DIAGRAMS

E-Line, 2 pin Package Suffix – Y



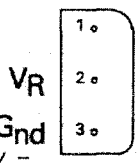
Bottom View

E-Line, 3 pin,Rev Package Suffix – R



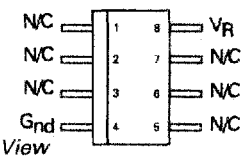
Bottom View –
Pin 3 floating or connected to pin 1

E-Line, 3 pin Package Suffix – A



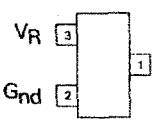
Bottom View –
Pin 1 floating or connected to pin 3

SO8 Package Suffix – N8



Top View

SOT23 Package Suffix – F



Top View –
Pin 1 floating or connected to pin 2

ORDERING INFORMATION

Part No	Tol%	Package	Partmark
ZRA245A03	3	E-Line •	ZRA24503
ZRA245A02	2	E-Line •	ZRA24502
ZRA245A01	1	E-Line •	ZRA24501
ZRA245F03	3	SOT23	24A
ZRA245F02	2	SOT23	24B
ZRA245F01	1	SOT23	24C
ZRA245N803	3	SO8	ZRA24503
ZRA245N802	2	SO8	ZRA24502
ZRA245N801	1	SO8	ZRA24501

Part No	Tol%	Package	Partmark
ZRA245R03	3	E-Line *	ZRA245R3
ZRA245R02	2	E-Line *	ZRA245R2
ZRA245R01	1	E-Line *	ZRA245R1
ZRA245Y03	3	E-Line †	ZRA24503
ZRA245Y02	2	E-Line †	ZRA24502
ZRA245Y01	1	E-Line †	ZRA24501

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