Advanced Monolithic Systems

AMS255

MICROPOWER SHUNT VOLTAGE REFERENCE

FEATURES

- **Low Temperature Coefficient**
- **Low Output Noise**
- **Operating Current 100µA to 5mA**
- **Low Dynamic Impedance**
- **Tight Output Voltage Tolerance**
- **Available in the sub-miniature SOT-23 Package**

APPLICATIONS

- **Battery Powered Systems**
- **Instrumentation**
- **Energy Management**
- **Automotive**
- **Precision Audio Components**
- **Data Acquisition Systems**

GENERAL DESCRIPTION

The AMS255 is a two-terminal band-gap voltage reference diode featuring low dynamic impedance and good temperature coefficient, operating over a 100µA to 5mA current range. On-chip trimming is used to provide tight voltage tolerance. Since the AMS255 band-gap reference uses only transistors and resistors, low noise and good long term stability result. The wide dynamic operating range allows its use with widely varying supplies with excellent regulation. These voltage references can be used to make portable meters, regulators or general purpose analog circuitry.

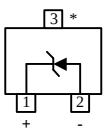
The AMS255 is operational in the full industrial temperature range of -40°C to +85°C and is available in small space saving SOT-23 package.

ORDERING INFORMATION:

MAX. TEMPCO	PACKAGE TYPE 3 LEAD SOT-23	OPERATING TEMP. RANGE
50ppm/°C	AMS255AM	-40 to +85°C
100ppm/°C	AMS255BM	-40 to +85°C

PIN CONNECTIONS

3L SOT-23
(M)



*This pin must be left floating or connected to pin 2

Top View

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ABSOLUTE MAXIMUM RATINGS (Note 1)

Reverse Current	10mA	Storage temperature	-65°C to +150°C
Forward Current	10mA	Internal Power Dissipation (P_D)	
Lead Temperature		SOT-23 Package	0.28W
SOT-23 packages:		Thermal Resistance (θ_{JA})	
Vapor phase (60 sec)	215°C	SOT-23 Package	410°C/W
Infrared (15 sec.)	220°C		

ELECTRICAL CHARACTERISTICS

Electrical Characteristics at I_R =1000 µA and T_A = +25°C unless otherwise specified.

Parameter	Conditions	AMS255A			AMS255B			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Output Voltage		2.475	2.500	2.525	2.450	2.500	2.550	V
Output Impedance			0.6	2		0.6	2	Ω
RMS Noise Voltage	10Hz ≤ f ≤ 10kHz		15			30		μV_{rms}
Temperature Coefficient	T_A = Full Range			**60**			**100**	ppm/°C
Turn-On Settling	0.1% of V_{OUT}		30			30		µsec
Operating Current	(Note 3)	0.1		5	0.1		5	mA

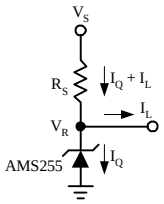
Note1: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. For guaranteed specifications and test conditions, see the Electrical Characteristics. The guaranteed specifications apply only for the test conditions listed.

Note 2: Parameters identified with **boldface type** apply at temperature extremes. All other numbers apply at $T_A = T_J = 25°C$.

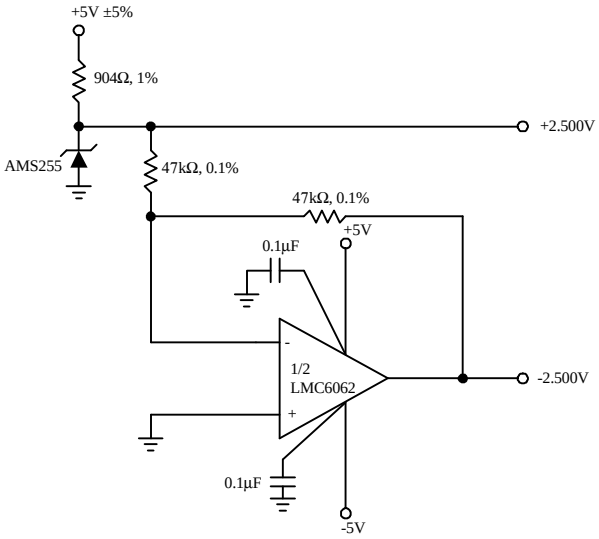
Note 3: Optimum performance is obtained at currents below 1000µA.

TYPICAL APPLICATIONS

Shunt Regulator

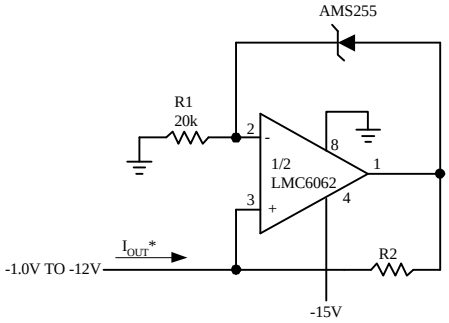


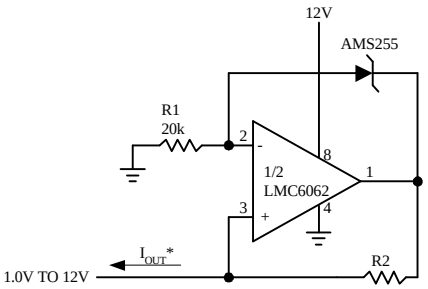
Precision ± 2.500V Reference



TYPICAL APPLICATIONS

Precision 1µA to 1mA Current Sources

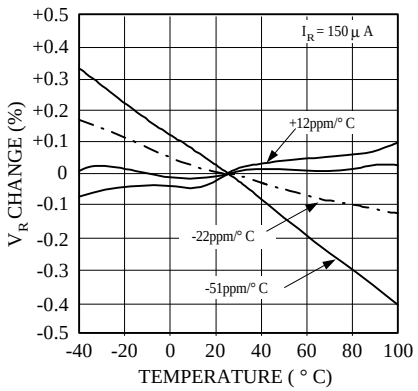




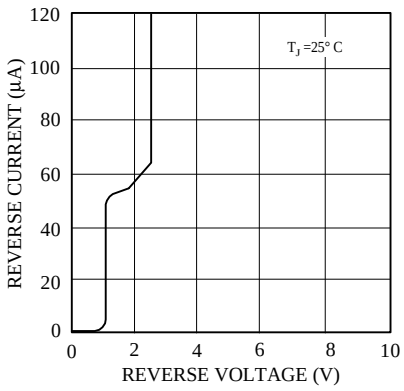
I_{OUT}=2.5V/R2

TYPICAL PERFORMANCE CHARACTERISTICS

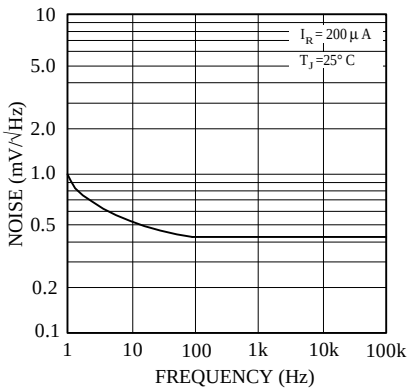
Temperature Drift for Different Average Temperature Coefficient



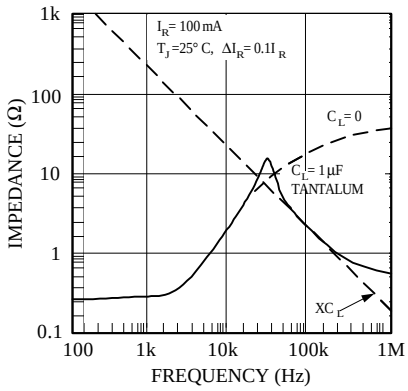
Reverse Characteristics and Minimum Operating Current



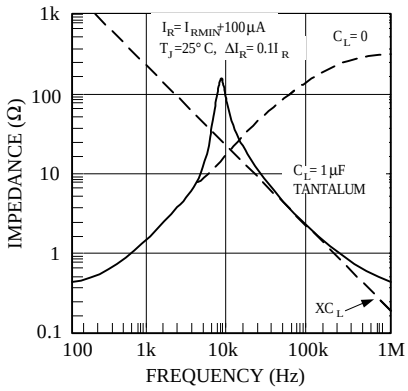
Noise Voltage vs Frequency



Ouput Impedance vs Frequency



Ouput Impedance vs Frequency



PACKAGE DIMENSIONS inches (millimeters) unless otherwise noted.

3 LEAD SOT-23 PLASTIC PACKAGE (M)

