Micropower Dual Reference

DESCRIPTION

The RH1034-1.2 is a micropower, precision 1.2V reference combined with a 7V auxiliary reference. The 1.2V reference is a trimmed, thin-film, band-gap, voltage reference operating on only 20µA of quiescent current. The RH1034-1.2 offers guaranteed drift, low temperature cycling hysteresis and good long-term stability. The low dynamic impedance makes the RH1034-1.2 easy to use from unregulated supplies. The 7V reference is a subsurface zener device for less demanding applications.

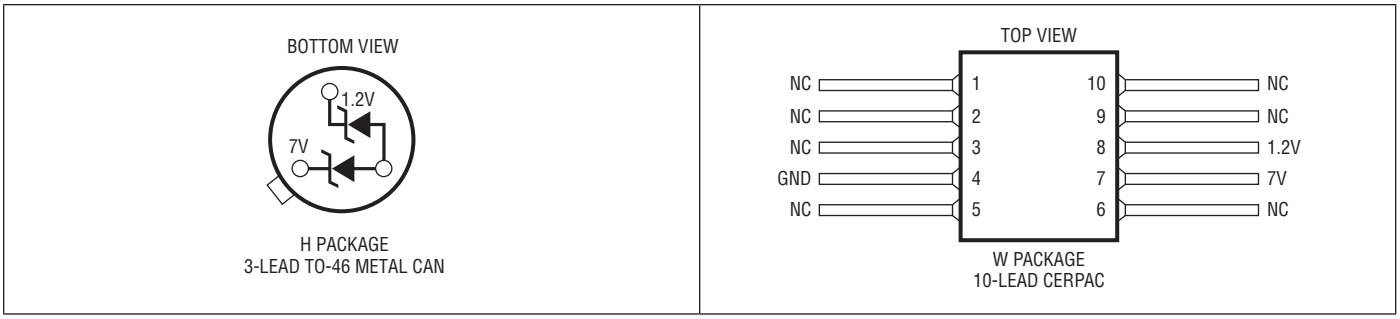
The wafer lots are processed to Linear Technology's in-house Class S flow to yield circuits usable in stringent military applications.

ABSOLUTE MAXIMUM RATINGS

(Note 1)

Operating Current 20mA
Forward Current (Note 2).....20mA
Operating Temperature Range..... –55°C to 125°C
Storage Temperature Range..... –65°C to 150°C
Lead Temperature (Soldering, 10 sec) ..... 300°C

PACKAGE INFORMATION



BURN-IN CIRCUIT

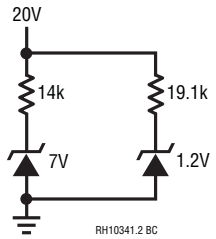


TABLE 1: ELECTRICAL CHARACTERISTICS (Preirradiation)

SYMBOL	PARAMETER	CONDITIONS	NOTES	T_A = 25°C MIN	TYP	MAX	SUB-GROUP	–55°C ≤ T_A ≤ 125°C MIN	TYP	MAX	SUB-GROUP	UNITS
1.2V Reference												
V_Z	Reverse Breakdown Voltage	I_R = 100µA		1.210		1.240	1	1.195		1.255	2, 3	V
$\frac{\Delta V_Z}{\Delta I_R}$	Reverse Breakdown Voltage Change with Current	20µA ≤ I_R ≤ 2mA 2mA ≤ I_R ≤ 20mA				2.0 8.0	1 1			4.0 15.0	2, 3 2, 3	mV mV
	Minimum Operating Current					20	1			30	2, 3	µA
	Temperature Coefficient	I_R = 100µA				60	1			60	2, 3	ppm/°C
rz	Reverse Dynamic Impedance	I_R = 100µA	3			1.0	1			2.0	2, 3	Ω
	Low Frequency Noise	I_R = 100µA, 0.1Hz ≤ f ≤ 10Hz			4							μV_{P-P}
	Long-Term Stability	I_R = 100µA			20							ppm/$\sqrt{kHrs}$
7V Reference												
V_Z	Reverse Breakdown Voltage	I_R = 100µA		6.70		7.30	1	6.60		7.40	2, 3	V
$\frac{\Delta V_Z}{\Delta I_R}$	Reverse Breakdown Voltage Change with Current	100µA ≤ I_R ≤ 1mA 1mA ≤ I_R ≤ 20mA				140 250	1 1			190 350	2, 3 2, 3	mV mV
	Temperature Coefficient	I_R = 100µA			60							ppm/°C
	Long-Term Stability	I_R = 100µA			20							ppm/$\sqrt{kHrs}$

TABLE 2: ELECTRICAL CHARACTERISTICS (Postirradiation) T_A = 25°C.

SYMBOL	PARAMETER	CONDTIONS	NOTES	10KRAD(Si) MIN	MAX	20KRAD(Si) MIN	MAX	50KRAD(Si) MIN	MAX	100KRAD(Si) MIN	MAX	200KRAD(Si) MIN	MAX	UNITS
1.2V Reference														
V_Z	Reverse Breakdown Voltage	I_R = 100µA		1.202	1.248	1.197	1.253	1.187	1.263	1.172	1.278	1.142	1.308	V
$\frac{\Delta V_Z}{\Delta I_R}$	Reverse Breakdown Voltage Change with Current	20µA ≤ I_R ≤ 2mA 2mA ≤ I_R ≤ 20mA			2.8 8.8		3.2 9.7		4.0 11.2		5.0 14.5		7.5 22.5	mV mV
rz	Reverse Dynamic Impedance	I_R = 100µA	3		1.4		1.6		2.0		2.5		3.75	Ω
7V Reference														
V_Z	Reverse Breakdown Voltage	I_R = 100µA		6.796	7.304	6.796	7.304	6.796	7.304	6.791	7.309	6.786	7.314	V
$\frac{\Delta V_Z}{\Delta I_R}$	Reverse Breakdown Voltage Change with Current	100µA ≤ I_R ≤ 1mA 1mA ≤ I_R ≤ 20mA			150 275		150 275		150 275		150 275		150 275	mV mV

Note 1: Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. Exposure to any Absolute Maximum Rating condition for extended periods may affect device reliability and lifetime.

Note 2: Forward biasing either diode will affect the operation of the other diode.

Note 3: This parameter guaranteed by "reverse breakdown voltage change with current" test.

TABLE 3: POST BURN-IN ENDPOINTS AND DELTA LIMITS REQUIREMENTS T_A = 25°C

SYMBOL	PARAMETER	CONDITIONS	ENDPOINTS LIMITS MIN	ENDPOINTS LIMITS MAX	DELTA LIMITS MIN	DELTA LIMITS MAX	UNITS
V_Z	Reverse Breakdown Voltage	I_R = 100µA	1.210	1.240	–0.003	0.003	V

TABLE 4: ELECTRICAL TEST REQUIREMENTS

MIL-STD-883 TEST REQUIREMENTS	SUBGROUP
Final Electrical Test Requirements (Method 5004)	1*,2,3
Group A Test Requirements (Method 5005)	1,2,3
Group B and D for Class S, End Point Electrical Parameters (Method 5005)	1,2,3

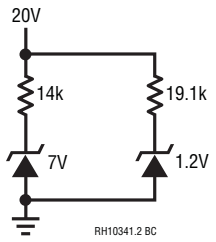
*PDA applies to subgroup 1. See PDA Test Notes.

PDA Test Notes

The PDA is specified as 5% based on failures from group A, subgroup 1, tests after cooldown as the final electrical test in accordance with method 5004 of MIL-STD-883. The verified failures of group A, subgroup 1, after burn-in divided by the total number of devices submitted for burn-in in that lot shall be used to determine the percent for the lot.

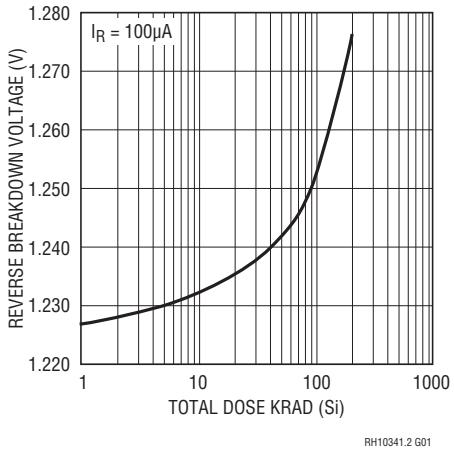
Linear Technology Corporation reserves the right to test to tighter limits than those given.

TOTAL DOSE BIAS CIRCUIT

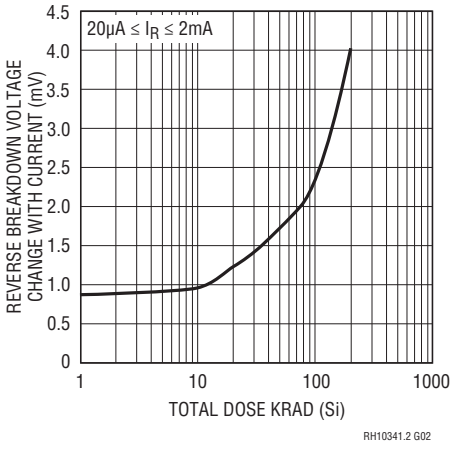


TYPICAL PERFORMANCE CHARACTERISTICS

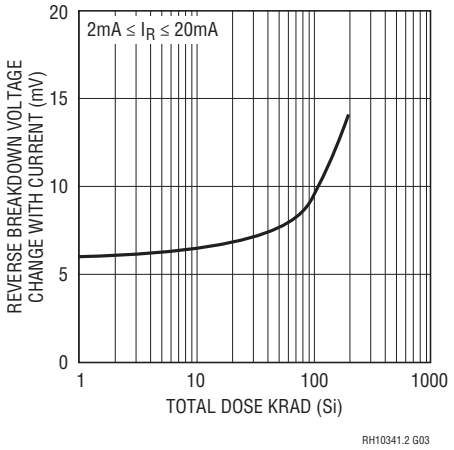
Reverse Breakdown Voltage (1.2V)



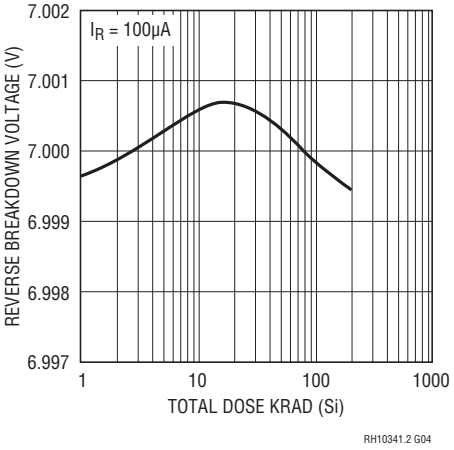
Reverse Breakdown Voltage Change with Current (1.2V)



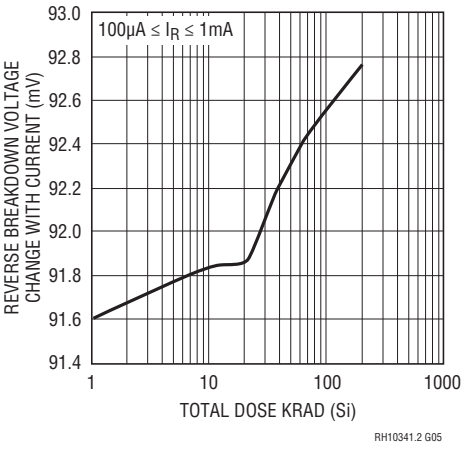
Reverse Breakdown Voltage Change with Current (1.2V)



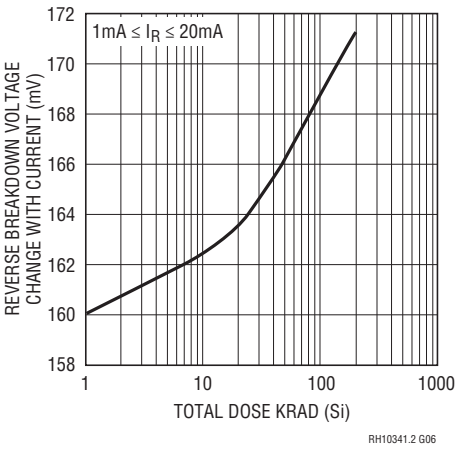
Reverse Breakdown Voltage (7V)



Reverse Breakdown Voltage Change with Current (7V)



Reverse Breakdown Voltage Change with Current (7V)



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