

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 20 μ A 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.

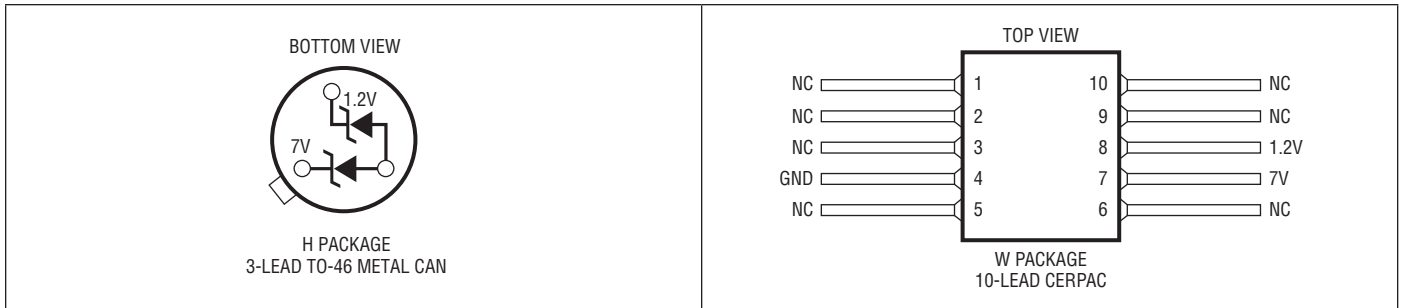
ABSOLUTE MAXIMUM RATINGS

(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

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PACKAGE INFORMATION



BURN-IN CIRCUIT

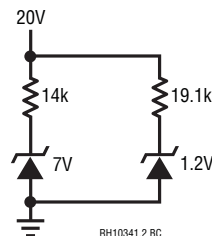


TABLE 1: ELECTRICAL CHARACTERISTICS (Preirradiation)

SYMBOL	PARAMETER	CONDITIONS	NOTES	$T_A = 25^\circ\text{C}$			SUB-GROUP	$-55^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$			SUB-GROUP	UNITS
				MIN	TYP	MAX		MIN	TYP	MAX		
1.2V Reference												
V_Z	Reverse Breakdown Voltage	$I_R = 100\mu\text{A}$		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	$20\mu\text{A} \leq I_R \leq 2\text{mA}$				2.0	1			4.0	2, 3	mV
		$2\text{mA} \leq I_R \leq 20\text{mA}$				8.0	1			15.0	2, 3	mV
	Minimum Operating Current					20	1			30	2, 3	μA
	Temperature Coefficient	$I_R = 100\mu\text{A}$				60	1			60	2, 3	ppm/ $^\circ\text{C}$
r_z	Reverse Dynamic Impedance	$I_R = 100\mu\text{A}$	3			1.0	1			2.0	2, 3	Ω
	Low Frequency Noise	$I_R = 100\mu\text{A}$, $0.1\text{Hz} \leq f \leq 10\text{Hz}$				4						$\mu\text{V}_{\text{p-p}}$
	Long-Term Stability	$I_R = 100\mu\text{A}$				20						ppm/ $\sqrt{\text{kHrs}}$
7V Reference												
V_Z	Reverse Breakdown Voltage	$I_R = 100\mu\text{A}$		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	$100\mu\text{A} \leq I_R \leq 1\text{mA}$				140	1			190	2, 3	mV
		$1\text{mA} \leq I_R \leq 20\text{mA}$				250	1			350	2, 3	mV
	Temperature Coefficient	$I_R = 100\mu\text{A}$				60						ppm/ $^\circ\text{C}$
	Long-Term Stability	$I_R = 100\mu\text{A}$				20						ppm/ $\sqrt{\text{kHrs}}$

TABLE 2: ELECTRICAL CHARACTERISTICS (Postirradiation) $T_A = 25^\circ\text{C}$.

SYMBOL	PARAMETER	CONDITIONS	NOTES	10KRAD(Si)		20KRAD(Si)		50KRAD(Si)		100KRAD(Si)		200KRAD(Si)		UNITS
				MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
1.2V Reference														
V_Z	Reverse Breakdown Voltage	$I_R = 100\mu\text{A}$		1.202	1.305	1.202	1.315	1.202	1.325	1.202	1.340	1.202	1.370	V
$\frac{\Delta V_Z}{\Delta I_R}$	Reverse Breakdown Voltage Change with Current	$20\mu\text{A} \leq I_R \leq 2\text{mA}$			7.0		7.5		8.5		10.0		12.5	mV
		$2\text{mA} \leq I_R \leq 20\text{mA}$			15.0		16.5		18.5		22.5		30.5	mV
r_z	Reverse Dynamic Impedance	$I_R = 100\mu\text{A}$	3		3.5		3.75		4.25		5.0		6.25	Ω
7V Reference														
V_Z	Reverse Breakdown Voltage	$I_R = 100\mu\text{A}$		6.686	7.314	6.686	7.314	6.686	7.314	6.686	7.324	6.686	7.334	V
$\frac{\Delta V_Z}{\Delta I_R}$	Reverse Breakdown Voltage Change with Current	$100\mu\text{A} \leq I_R \leq 1\text{mA}$			175		175		175		175		175	mV
		$1\text{mA} \leq I_R \leq 20\text{mA}$			300		300		300		300		300	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 $T_A = 25^\circ\text{C}$

SYMBOL	PARAMETER	CONDITIONS	ENDPOINTS LIMITS		DELTA LIMITS		UNITS
			MIN	MAX	MIN	MAX	
V_Z	Reverse Breakdown Voltage	$I_R = 100\mu\text{A}$	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

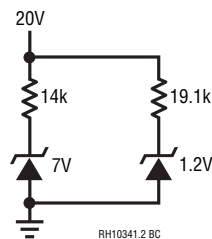
*PDA applies to subgroup 1. See PDA Test Notes.

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.

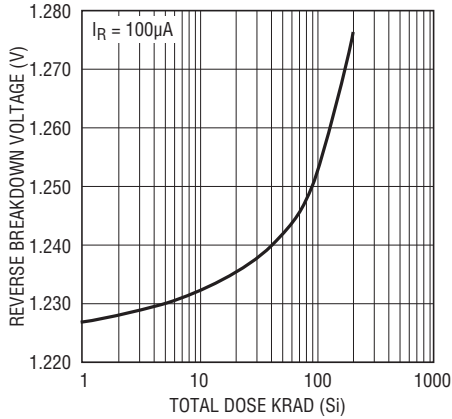
Linear Technology Corporation reserves the right to test to tighter limits than those given.

TOTAL DOSE BIAS CIRCUIT



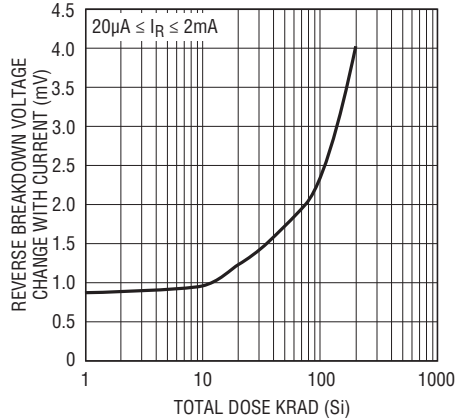
TYPICAL PERFORMANCE CHARACTERISTICS

Reverse Breakdown Voltage (1.2V)



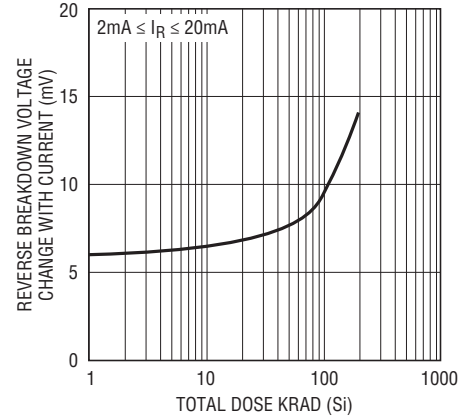
RH10341.2 G01

Reverse Breakdown Voltage Change with Current (1.2V)



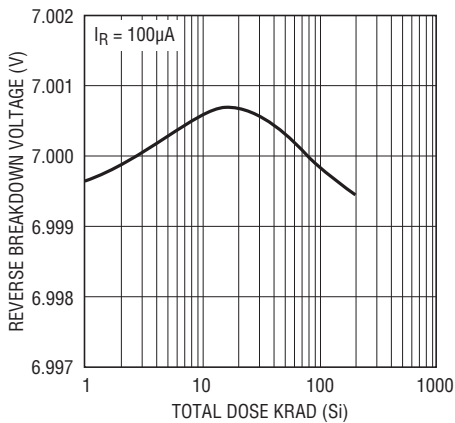
RH10341.2 G02

Reverse Breakdown Voltage Change with Current (1.2V)



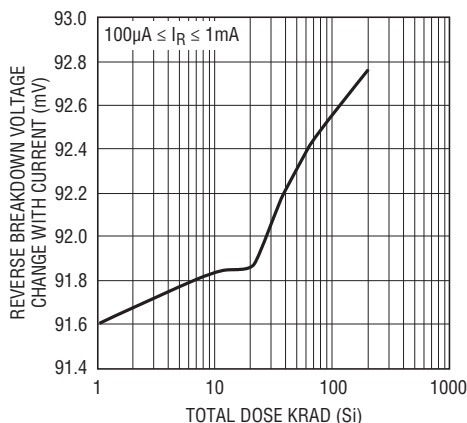
RH10341.2 G03

Reverse Breakdown Voltage (7V)



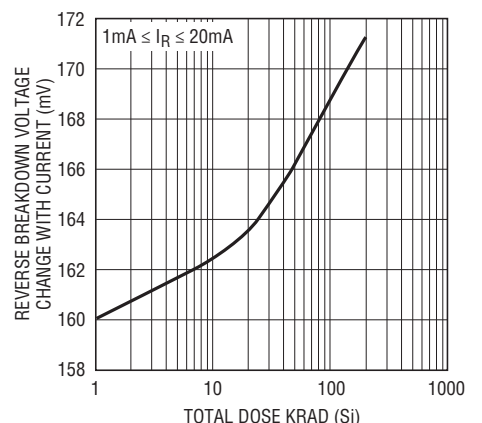
RH10341.2 G04

Reverse Breakdown Voltage Change with Current (7V)



RH10341.2 G05

Reverse Breakdown Voltage Change with Current (7V)



RH10341.2 G06