



DESCRIPTION

The LT1083-5/-12/883 positive fixed regulators are designed to provide 7.5A with higher efficiency than currently available devices. All internal circuitry is designed to operate down to 1V input to output differential and the dropout voltage is fully specified as a function of load current. Dropout is guaranteed at a maximum of 1.5V at maximum output current, decreasing at lower load currents. On-chip trimming adjusts the output voltage to 1%. Current limit is also trimmed, minimizing the stress on both the regulator and power source circuitry under overload conditions.

The LT1083-5/-12/883 series devices are pin compatible with older 3 terminal regulators. A 10µF output capacitor is required on these new devices; however, this is usually included in most regulator designs.

Unlike PNP regulators, where up to 10% of the output current is wasted as quiescent current, the LT1083/883 quiescent current flows into the load, increasing efficiency.

These devices are processed to the requirements of MIL-STD-883 Class B to yield circuits usable in precision military applications.

7.5A Low Dropout Positive Fixed Regulators

ABSOLUTE MAXIMUM RATINGS

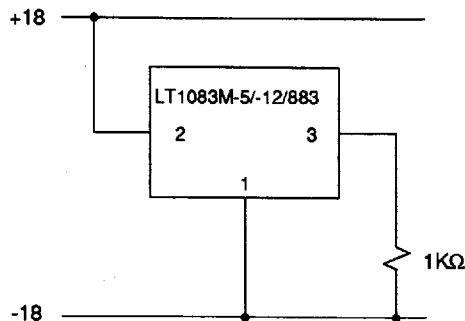
Power Dissipation	Internally Limited
Input Voltage (Note E)	30V
Operating Input Voltage	
5V Devices	20V
12V Devices	25V
Operating Junction Temperature Range	
Control Section	-55°C to 150°C
Power Transistor	-55°C to 200°C
Storage Temperature Range	-65°C to 150°C
Lead Temperature (Soldering, 10 sec.)	300°C

Note E: Although the devices maximum operating voltage is limited, (20V for a 5V device, and 25V for a 12V device) the devices are guaranteed to withstand transient input voltages up to 30V. For input voltages greater than the maximum operating input voltage some degradation of specifications will occur. For input/output voltage differentials greater than 15V, a minimum external load of 5mA is required to maintain regulation.

PRECONDITIONING

100% Thermal Limit Burn-In

BURN-IN CIRCUIT



PACKAGE/ORDER INFORMATION

<p>BOTTOM VIEW K PACKAGE 2 LEAD TO 3 METAL CAN</p>	ORDER PART NUMBER
	LT1083MK-5/883 LT1083MK-12/883
	PART MARKING†
	LT1083MK-5/883C LT1083MK-12/883C

† The suffix letter "C" of the part mark indicates compliance per MIL-STD-883, para 1.2.1.

TABLE 2: ELECTRICAL TEST REQUIREMENTS

MIL-STD-883 TEST REQUIREMENTS	SUBGROUP
Final Electrical Test Requirements (Method 5004)	1*,2,3,5,6
Group A Test Requirements (Method 5005)	1,2,3,5,6
Group C and D End Point Electrical Parameters (Method 5005)	1

* 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 in accordance with method 5004 of MIL-STD-883 Class B. 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 defective for the lot.

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



TABLE 1: ELECTRICAL CHARACTERISTICS

T-58-11-13

PARAMETER	CONDITONS	NOTES	T _J = 25°C			SUBGRO UP	-55° ≤ T _J ≤ 150°C			SUBGRO UP	UNITS
			MIN	TYP	MAX		MIN	TYP	MAX		
Output Voltage LT1083-5/883	I _{OUT} = 0mA, V _{IN} = 8V (K Pkg Only) 0 ≤ I _{OUT} ≤ I _{FULL LOAD} , 6.5V ≤ V _{IN} ≤ 20V		4.95	5.00	5.05	1	4.90	5.00	5.10	2,3	V
LT1083-12/883	I _{OUT} = 0mA, V _{IN} = 15V (K Pkg Only) 0 ≤ I _{OUT} ≤ I _{FULL LOAD} , 13.5V ≤ V _{IN} ≤ 25V		11.88	12.00	12.12	1	11.76	12.00	12.24	2,3	V
Line Regulation LT1083-5/883	I _{OUT} = 0mA, 6.5V ≤ V _{IN} ≤ 20V	A,B		0.5	10	1		1.0	10	2,3	mV
LT1083-12/883	I _{OUT} = 0mA, 13.5V ≤ V _{IN} ≤ 25V	A,B		1.0	25	1		2.0	25	2,3	mV
Load Regulation LT1083-5/883	V _{IN} = 8V, 0 ≤ I _{OUT} ≤ I _{FULL LOAD} V _{IN} = 15V, 0 ≤ I _{OUT} ≤ I _{FULL LOAD}	A,B,C A,B,C		5	20	1		10	35	2,3	mV
LT1083-12/883				12	36	1		24	72	2,3	mV
Dropout Voltage (V _{IN} - V _{OUT}) LT1083-5/883	ΔV _{OUT} = 50mV, I _{OUT} = I _{FULL LOAD} ΔV _{OUT} = 120mV, I _{OUT} = I _{FULL LOAD}	D D			1.5	1		1.3	1.5	2,3	V
LT1083-12/883					1.5	1		1.3	1.5	2,3	V
Current Limit LT1083-5/883	V _{IN} = 10V V _{IN} = 17V		8.0			1	8.0	9.5		2,3	A
LT1083-12/883			8.0			1	8.0	9.5		2,3	A
Quiescent Current LT1083-5/883	V _{IN} = 20V V _{IN} = 25V				10	1		5.0	10.0	2,3	mA
LT1083-12/883					10	1		5.0	10.0	2,3	mA
Thermal Regulation	T _A = 25°C, 30ms pulse			0.002	0.01	4					%/W
Ripple Rejection LT1083-5/883	f = 120Hz, C _{OUT} = 25μF Tantalum I _{OUT} = I _{FULL LOAD} V _{IN} = 8V		60	68		4	60	68		5,6	dB
LT1083-12/883	V _{IN} = 15V		54	60		4	54	60		5,6	dB
Temperature Stability							0.5				%
Long Term Stability	T _A = 125°C, 1000 Hrs.			0.03							%
RMS Output Noise (% of V _{OUT})	T _A = 25°C, 10Hz ≤ f ≤ 10kHz			0.003							%
Thermal Resistance Junction to Case	Control Circuitry/Power Transistor			0.6/1.6							°C/W

Note A: See thermal regulation specifications for changes in output voltage due to heating effects. Load and line regulation are measured at a constant junction temperature by low duty cycle pulse testing.

Note B: Line and load regulation are guaranteed up to the maximum power dissipation (60W for the LT1083/883, 45W for the LT1084/883, 30W for the LT1085/883). Power dissipation is determined by the input/output differential and the output current. Guaranteed maximum power dissipation will not be available over the full input/output voltage range.

Note C: I_{FULL LOAD} is defined in the current limit curves on the standard data sheet. I_{FULL LOAD} curve is defined as the minimum value of current limit as a function of input to output voltage. Note that the 60W power dissipation for the LT1083/883 (45W for the LT1084/883 or 30W for the LT1085/883) is achievable over a limited range of input to output voltage. For compliance with 883 revision C current density specifications, the LT1083M-5/883 and LT1083M-12/883 is rated for 5A.

Note D: Dropout voltage is specified over the full output current range of the device. Test points and limits are shown on the Dropout Voltage curves on the standard data sheet.