



LM138/883

5 Amp Positive Adjustable Regulator

DESCRIPTION

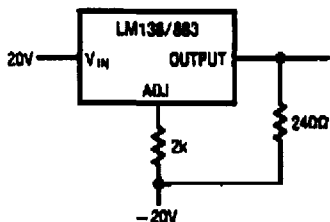
The LM138/883 is a 3 terminal positive adjustable regulator capable of supplying up to 5A. The output is adjusted using 2 external resistors for a range of 1.2V to 32V. The devices have full current limit, thermal overload and safe area protection, all of which remain functional even if the adjustment terminal is disconnected.

The LM138/883 is fully processed to MIL-STD-883 Class B to yield a device usable in military applications. In addition to 883 processing, the LM138/883 is subjected to 100% burn-in in thermal limit.

ABSOLUTE MAXIMUM RATINGS

Power Dissipation Internally Limited
 Input to Output Voltage Differential 35V
 Operating Junction Temperature Range..... -55°C to 150°C
 Storage Temperature Range..... -65°C to 150°C
 Lead Temperature (Soldering, 10 sec.)..... 300°C

BURN-IN CIRCUIT



PACKAGE/ORDER INFORMATION

<p>BOTTOM VIEW ADJ 1 2 CASE IS OUTPUT VIN K PACKAGE 2-LEAD TO-3 METAL CAN</p>	ORDER PART NUMBER
	LM138K/883
	PART MARKING†
	LM138K/883C

†The suffix letter "C" of the part mark indicates compliance per MIL-STD-883, para 1.7.1.1.

LITCSD103/



LM138/883

TABLE 1: ELECTRICAL CHARACTERISTICS (Note A)

SYMBOL	PARAMETER	CONDITIONS	NOTES	T _J = 25°C		SUBGROUP	-55°C ≤ T _J ≤ 150°C		SUBGROUP	UNITS
				MIN	MAX		MIN	MAX		
V _{REF}	Reference Voltage	3V ≤ (V _{IN} - V _{OUT}) ≤ 35V 10mA ≤ I _{OUT} ≤ 5A, P ≤ 50W		1.19	1.29	1	1.19	1.29	2, 3	V
$\frac{\Delta V_{OUT}}{\Delta V_{IN}}$	Line Regulation	3V ≤ (V _{IN} - V _{OUT}) ≤ 35V I _{OUT} = 10mA	B		0.01	1		0.04	2, 3	%/V
$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	Load Regulation	10mA ≤ I _{OUT} ≤ 5A, V _{OUT} ≤ 5V V _{OUT} ≥ 5V	B B		15 0.3	1 1		30 0.6	2, 3 2, 3	mV %
	Thermal Regulation	20ms Pulse			0.01	1				%/W
	Ripple Rejection	V _{OUT} = 10V, f = 120Hz, C _{ADJ} = 0 C _{ADJ} = 10μF	C	60 (typ) 60			60 (typ) 60			dB dB
I _{ADJ}	Adjust Pin Current				100	1		100	2, 3	μA
ΔI _{ADJ}	Adjust Pin Current Change	10mA ≤ I _{OUT} ≤ 5A 3V ≤ (V _{IN} - V _{OUT}) ≤ 35V			5	1		5	2, 3	μA
I _{MIN}	Minimum Load Current	(V _{IN} - V _{OUT}) = 35V			5	1		5	2, 3	mA
	Current Limit	(V _{IN} - V _{OUT}) ≤ 10V (V _{IN} - V _{OUT}) = 35V	DC 0.5ms peak	5 7 1 (typ)		1 1	5 7		2, 3 2, 3	A A A
$\frac{\Delta V_{OUT}}{\Delta Temp}$	Temperature Stability	-55°C ≤ T _J ≤ 150°C					1 (typ)			%
$\frac{\Delta V_{OUT}}{\Delta Time}$	Long Term Stability	T _A = 125°C, 1000 Hours	C				1			%
e _n	RMS Output Noise	10Hz ≤ f ≤ 10kHz			0.003 (typ)					%
θ _{JC}	Thermal Resistance (Junction to Case)		C		1					°C/W

Note A: Unless otherwise specified, these specifications apply for V_{IN} - V_{OUT} = 5V; and I_{OUT} = 2.5A. Although power dissipation is internally limited, these specifications are applicable for power dissipations up to 50W.

Note B: Regulation is measured at a constant junction temperature using pulse testing with a low duty cycle. Changes in output voltage due to heating effects are covered under the specification for thermal regulation.

Note C: Guaranteed by design, characterization, or correlation to other tested parameters.

TABLE 2: 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 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 as the final electrical test 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 lighter limits than those given.