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MX884

High-Side Current Monitor With 10-Bit Serial Digital Output

Features:

- 3-60 V Operating Voltage Range
- Integrated 10-bit ADC
- 3 wire serial interface
- Microcontroller Compatible
- Low Power
- Minimum External Components
- TSOT-23 RoHS Compliant Package

Applications:

- Lighting Management
- Current Shunt Measurement
- Remote Sensing
- Battery Monitoring
- Microprocessor Controlled Power Management

Ordering Information

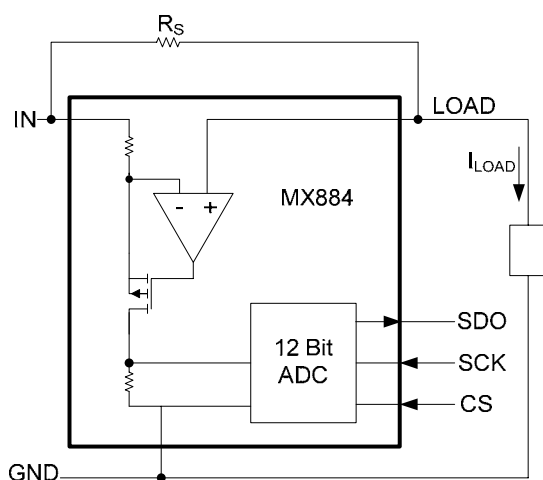
Part No.	Description	Qty
MX884HTTR	6L TSOT23 Tape & Reel	3,000

General Description

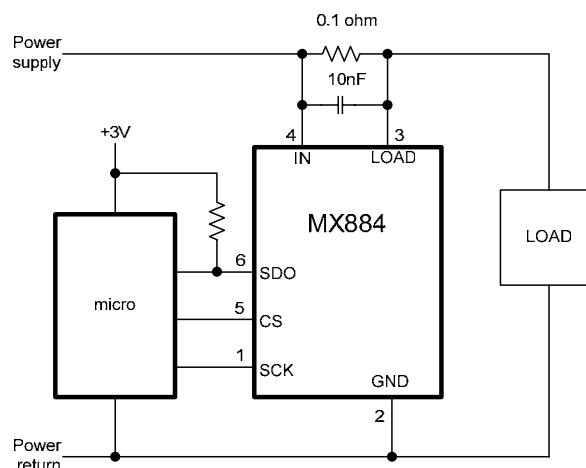
The MX884 targets power management applications where high noise immunity and low cost are primary requirements. Its integrated 10-bit ADC provides high resolution, making it ideal for current monitoring systems. The MX884 enables digital power management, in which a microcontroller can readily monitor the current in a system and perform other control functions in power systems and motion control products.

The MX884 converts a small voltage developed across an external "current" sense resistor to a 10-bit digital output. It features a wide common mode input supply voltage range of 3V to 60V and easily interfaces to most microcontrollers. The design is simple yet cost-effective, requiring very few external components, making it especially suitable for high volume applications.

Functional Block Diagram



Typical Application Circuit (1 Amp full scale)



MX884



Absolute Maximum Ratings

T_A = +25°C unless otherwise noted, Voltages with respect to GND = 0V

Parameter	Symbol	Min	Max	Unit
IN Supply Voltage			70	V
LOAD			70	V
SCK, CS Input Voltage			6	V
SDO Open Drain Pull Up Voltage			6	V
Operating Temperature Range	T _A	-40	+85	°C
Storage Temperature Range	T _{STG}	-55	+150	°C

Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this data sheet is not implied. Exposure of the device to the absolute maximum ratings for an extended period may degrade the device and affect its reliability.

Pin Description and Configuration

Pin No.	Name	Description
1	SCK	Serial Clock
2	GND	Ground
3	LOAD	Load-Side Connection to the External Sense Resistor
4	IN	Positive Supply Terminal and Power Connection for the External Sense Resistor
5	CS	Chip Select (Active Low)
6	SDO	Serial Data Output (Open Drain)

DC Electrical Characteristics

V_{IN} = 5 V, T = +25°C

Parameter	Condition	Min	Typ	Max	Unit
Operating Voltage Range (V _{IN})		3		60	V
Supply Current	I _{LOAD} =0		0.25		mA
Average A/D Reading	10 mV Sense Voltage	90	100	110	LSB
Average A/D Reading	100 mV Sense Voltage	992	1000	1008	LSB
Output Noise	C _S 10nF parallel R _S =10 ohm		1.5		RMS LSB
SCK pulse period		5			μS
SCK pulse width	high or low	200			nS
CS pulse period		100			μS
CS falling to first SCK rising		200			nS
Last SCK falling to CS rising		100			nS
SCK falling to SDO valid	SDO falling			80	nS
	SDO rising	Depends on SDO R, C			

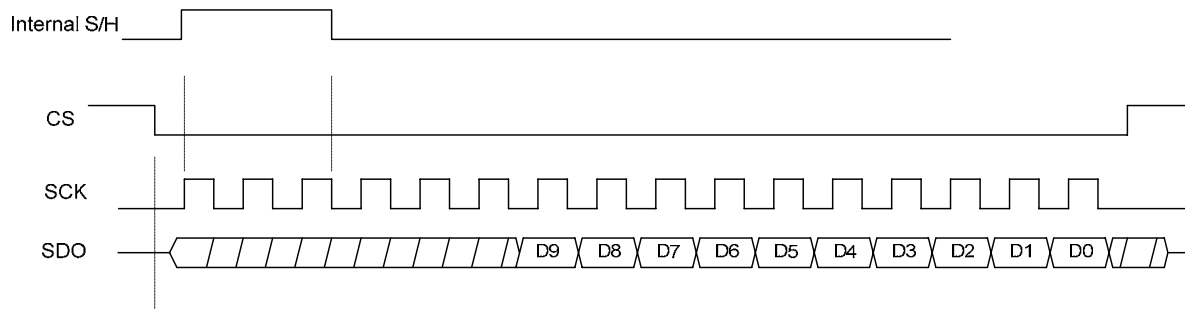
MX884



Functional Description

The MX884 converts a small voltage developed across an external sense resistor (R_s) to a 10-bit digital output. Pin IN connects to the 3V to 60V power input. The external current sense resistor connects between pins IN and LOAD. The nominal A/D range is 100 mV $V(IN)-V(LOAD)$ across R_s . The A/D least significant bit typically equals 0.1 mV across R_s . Inputs CS and SCK are TTL-level compatible, 5.5V maximum input voltage. Inputs can be driven from CMOS microcontrollers operating at supply voltages of 2.4 to 5.5V. Serial data output pin SDO is configured as open drain, maximum 5.5V external pull-up. SCK is used internally to clock the successive approximation register of the A/D.

Serial Timing Diagram

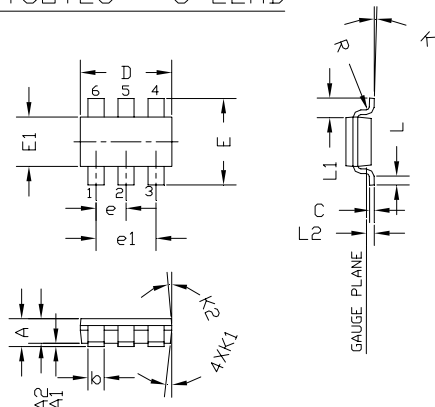


MX884



TSOT-23 6 Lead

TSOT23 - 6 LEAD



1. DIMENSION "D" DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS AND GATE BURRS SHALL NOT EXCEED .004 IN. (0.10MM) PER SIDE.
2. DIMENSION "E" DOES NOT INCLUDE INTER-LEAD FLASH OR PROTRUSIONS. INTER-LEAD FLASH AND PROTRUSION SHALL NOT EXCEED .006" (0.15MM) PER SIDE.
3. PACKAGE TOP MAY BE SMALLER THAN PACKAGE BOTTOM. DIMENSIONS D AND E1 ARE DETERMINED AT THE OUTERMOST EXTREME OF THE PLASTIC BODY EXCLUDING MOLD FLASH, TIE BAR BURRS, GATE BURRS AND INTERLEAD FLASH, BUT INCLUDING ANY MISMATCH BETWEEN TOP AND BOTTOM OF THE PLASTIC BODY.

NOTES: (UNLESS OTHERWISE SPECIFIED)

DIM.	DIMENSIONS					
	INCH			MILLIMETER		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.030	-	0.035	0.75	-	0.90
A1	0.000	-	0.004	0.00	-	0.10
A2	0.028	0.030	0.031	0.70	0.75	0.80
b	0.014	-	0.020	0.35	-	0.51
c	0.004	-	0.010	0.10	-	0.25
D	0.110	0.114	0.118	2.80	2.90	3.00
E	0.102	0.110	0.118	2.60	2.80	3.00
E1	0.059	0.063	0.067	1.50	1.60	1.70
e	0.0374 BSC			0.95 BSC		
e1	0.0748 BSC			1.90 BSC		
L	0.015	-	-	0.37	-	-
L1	0.0236 REF			0.60 REF		
L2	0.0098 BSC			0.25 BSC		
y	-	-	0.004	-	-	0.10
R	0.004	-	-	0.10	-	-
K	0°	-	8°	0°	-	8°
K1	7° NOM			7° NOM		
K2	5° NOM			5° NOM		

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Specification: MX884
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