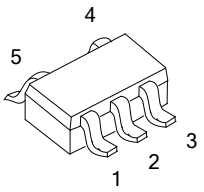
BIDIRECTIONAL PRECISION HIGH-SIDE CURRENT MONITOR



SOT-25

■ DESCRIPTION

The UTC **UCM101** is a bidirectional precision high-side current sense monitor. It uses UTC's advanced technology to provide customers with a minimum operating current, high accuracy, high side voltage and a fixed gain of 10, etc.

The UTC **UCM101**'s output voltage is proportional to the differential input voltage. Direction of current flow is indicated by the Flag pin.

The UTC **UCM101** is suitable for widely voltage range applications and portable battery equipment.

■ FEATURES

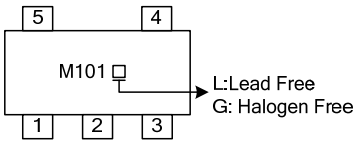
* Low operating current
* High side voltage (2.7~20V)
* A fixed gain of 10
* High accuracy (typ=1%)

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
UCM101L-AF5-R	UCM101G-AF5-R	SOT-25	Tape Reel

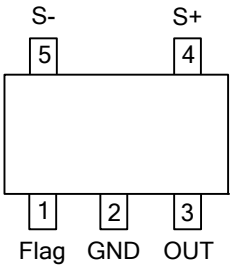
UCM101L-AF5-R (1)Packing Type (2)Package Type (3)Lead Free	(1) R: Tape Reel (2) AF5: SOT-25 (3) L: Lead Free, G: Halogen Free

■ MARKING



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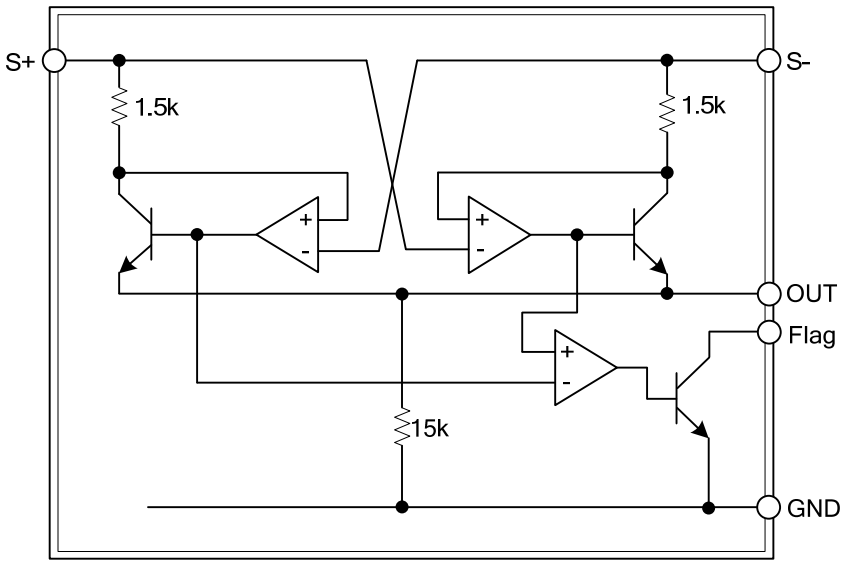
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	Flag	This is the current direction pin. It is open collector and allows the logic high level to be set independent of V_{S+} voltage. Low indicates V_{S+} is greater than V_{S-}
2	GND	Ground pin
3	OUT	Output voltage pin
4	S+	This is the positive input of the current monitor. It also acts as the supply voltage pin providing current for internal circuitry. The current through this pin varies with differential sense voltage
5	S-	This is the negative input of the current monitor. The current through this pin varies with differential sense voltage

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Voltage on V_{S-} and V_{S+}			-0.6~20	V
Voltage on all Other Pins			-0.6~(V_{S+} or V_{S-})+0.6	V
V_{sense} [(V_{S+}) - (V_{S-})]			+/-6	V
Package Power Dissipation	at T_A=25°C (De-rate to zero at 150°C)	P_D	300	mW
Operating Temperature		T_A	-40~125	°C
Storage Temperature		T_{STG}	-55~150	°C
Maximum Junction Temperature		T_J	150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ RECOMMENDED OPERATIONG CONDITIONS

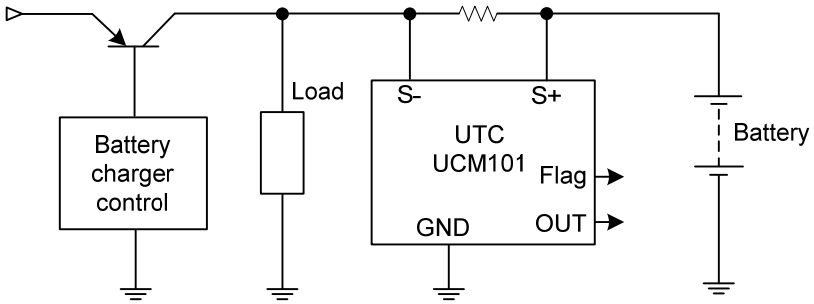
PARAMETER	SYMBOL	RATINGS	UNIT
Common-Mode Sense Input Range	$V_{S\pm}$	2.7~20	V
Current Direction Flag Output	Flag	0~$V_{S\pm}$	V
Differential Sense Input Voltage Range	V_{SENSE}	0~±0.8	V
Output Voltage Range	V_{OUT}	0~$V_{S\pm}$-1.5	V
Ambient Temperature Range	T_A	-40~125	°C

■ ELECTRICAL CHARACTERISTICS (Test conditions T_A=25°C, V_{S+}=10V, V_{SENSE}=100mV)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Ground Pin Current		I_Q		15	35	50	µA
V_{S+} Input Current		I_{S+}	V_{SENSE}=0V	10	17	24	µA
V_{S-} Input Current		I_{S-}	V_{SENSE}=0V	10	17	24	µA
Output Voltage		V_{OUT}	V_{SENSE}=+150mV	1.55	1.5	1.45	V
	Flag High		V_{SENSE}=+100mV	1.02	1	0.98	V
			V_{SENSE}=+30mV	309	300	291	mV
			V_{SENSE}=0V	0		15	mV
	Flag Low		V_{SENSE}=-30mV	285	300	315	mV
			V_{SENSE}=-100mV	0.95	1	1.05	V
			V_{SENSE}=-150mV	1.42	1.50	1.58	V
V_{OUT} Variation with Temperature		V_{OUT} TC	V_{SENSE}=±100mV		30		ppm/ºC
V_{OUT}/V_{SENSE}		Gain			10		
Total Output Error (Gain + Offset)		Accuracy	V_{SENSE}=100mV			±2	%
			V_{SENSE}=-100mV			±5	%
Bandwidth		BW	$V_{SENSE(DC)}$=100mV $V_{SENSE(AC)}$=63mV_{PP}		300		kHz
V_{S+} Common Mode Rejection Ratio		CMRR	V_{IN}=2.7~20V		60		dB
Flag Trip Point		Flag TP	Referred to V_{SENSE}	-2.5		+2.5	mV
Flag Low Output Voltage		V_{FL}	I_{SINK}=100µA		60	200	mV
Flag High Leakage Current		I_{FH}	V_{OH}=5V			1	µA

■ APPLICATION INFORMATION

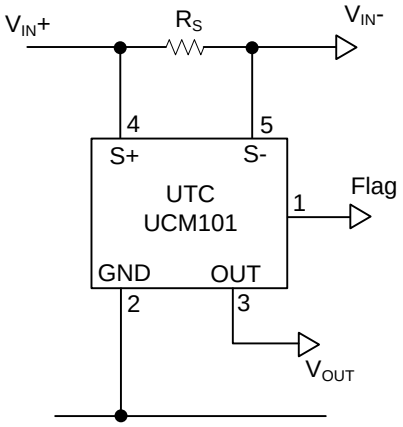
A common application for micro-power current monitors is measuring the discharge current of a rechargeable lithium ion/polymer battery. The UTC **UCM101** enables measuring both the charge and discharge current into the battery and with its wide operating voltage of 2.5~20V enables it to measure the currents in to/ out of up to 4 cells connected in series.



When choosing appropriate values for R_{SENSE} a compromise must be reached between in-line signal loss (including potential power dissipation effects) and small signal accuracy.

Higher values for R_{SENSE} gives better accuracy at low load currents by reducing the inaccuracies due to internal offsets. For best operation the UTC **UCM101** has been designed to operate with V_{SENSE} of the order of 50mV~150mV.

■ TYPICAL APPLICATION CIRCUIT



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.