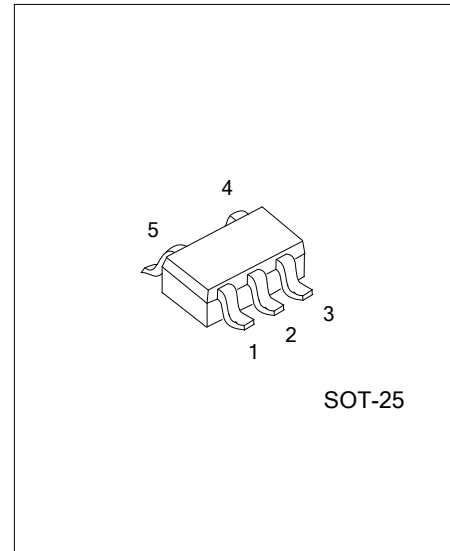




BIDIRECTIONAL PRECISION HIGH-SIDE CURRENT MONITOR



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

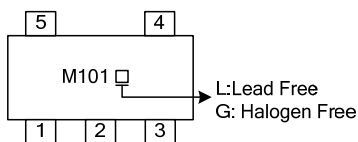
- * Low operating current
- * High side voltage (2.7~20V)
- * A fixed gain of 10
- * High accuracy (typ=1%)

ORDERING INFORMATION

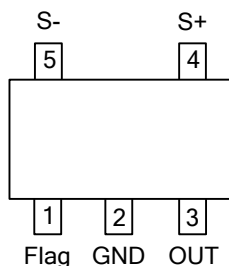
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UCM101L-AF5-R	UCM101G-AF5-R	SOT-25	Tape Reel

<p>UCM101L-AF5-R</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Lead Free 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) AF5: SOT-25 (3) L: Lead Free, G: Halogen Free
------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------

MARKING



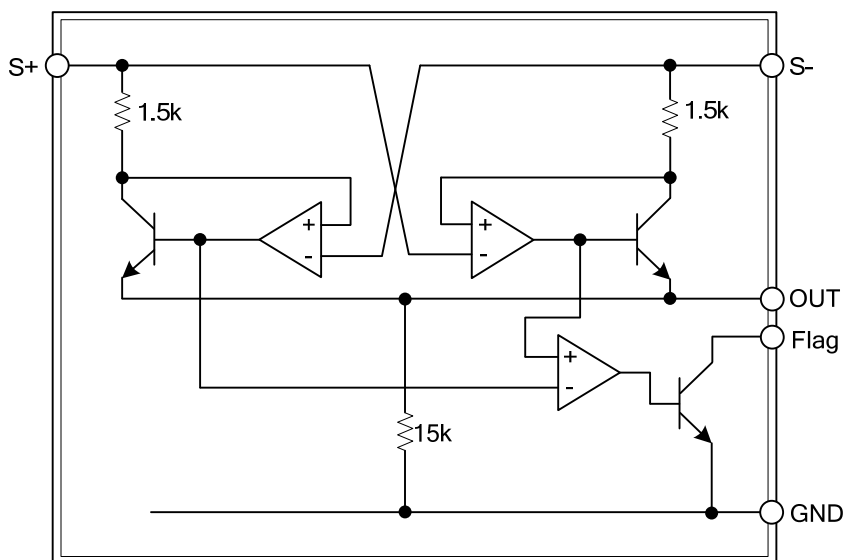
■ PIN CONFIGURATION



■ 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	P_D	300	mW
at $T_A=25^{\circ}C$ (De-rate to zero at $150^{\circ}C$)			
Operating Temperature	T_A	-40~125	$^{\circ}C$
Storage Temperature	T_{STG}	-55~150	$^{\circ}C$
Maximum Junction Temperature	T_J	150	$^{\circ}C$

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 OPERATING CONDITIONS

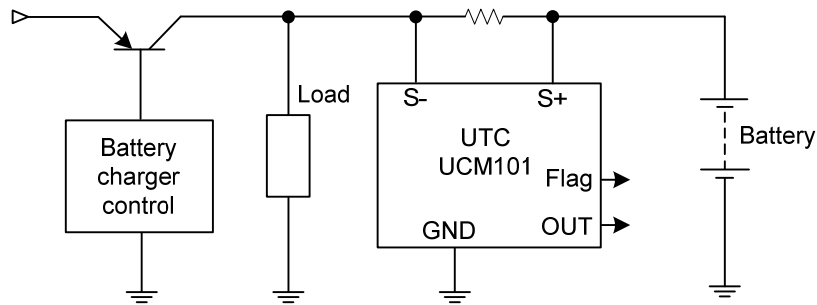
PARAMETER	SYMBOL	RATINGS	UNIT
Common-Mode Sense Input Range	$V_{S\pm}$	2.7~20	V
Current Direction Flag Output	Flag	0~ $V_{S\pm}$	V
Differential Sense Input Voltage Range	V_{SENSE}	0~ ± 0.8	V
Output Voltage Range	V_{OUT}	0~ $V_{S\pm}-1.5$	V
Ambient Temperature Range	T_A	-40~125	$^{\circ}C$

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

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	Flag High	$V_{SENSE}=+150mV$	1.55	1.5	1.45	V	
		$V_{SENSE}=+100mV$	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	$V_{OUT} TC$	$V_{SENSE}=\pm 100mV$		30		ppm/ $^{\circ}C$	
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	$V_{IN}=2.7\sim 20V$		60		dB	
Flag Trip Point	Flag TP	Referred to V_{SENSE}	-2.5		+2.5	mV	
Flag Low Output Voltage	V_{FL}	$I_{SINK}=100\mu A$		60	200	mV	
Flag High Leakage Current	I_{FH}	$V_{OH}=5V$			1	μA	

■ APPLICATION INFORMATION

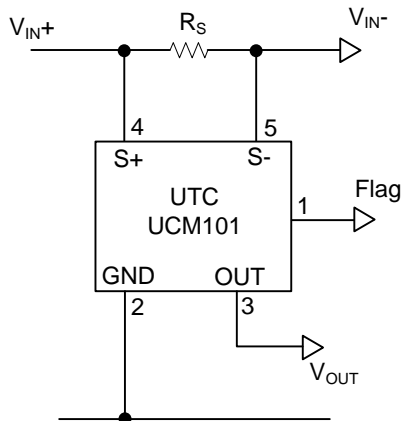
A common application for micro-power current monitors is measuring the discharge current of a rechargeable lithium ion/polymer battery. The UTC **UCM101** enables measuring both the charge and discharge current into the battery and with its wide operating voltage of 2.5~20V enables it to measure the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