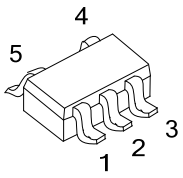
LD3870

LINEAR INTEGRATED CIRCUIT

LOW DROPOUT VOLTAGE REGULATOR



SOT-25

■ DESCRIPTION

The UTC **LD3870** is low dropout voltage regulator designed for cellular phone application.

■ FEATURES

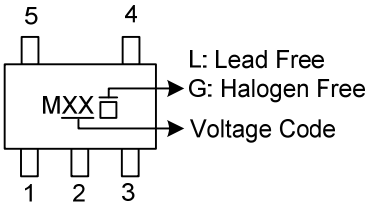
* High Ripple Rejection: 56dB≤RR(DC<f<60kHz)
  66dB typ. (f=100Hz)
  60dB typ. (f=1kHz)
* Output Noise Voltage: e_N=30MV , Cp=0.01μF
* Output Current: $I_{O(MAX)}$=150mA
* High Precision Output: V_O±2%
* Low Dropout Voltage: V_D=0.12V typ.
  (I_O=60mA,Vo≥1.8V)
* Input Voltage range: +2~+14V(V_O =1.5V Version)
* ON/OFF Control: Active High
* Output capacitor with 4.7uF ceramic capacitor
* Internal Short Circuit Current Limit
* Internal Thermal Overload Protection

■ ORDERING INFORMATION

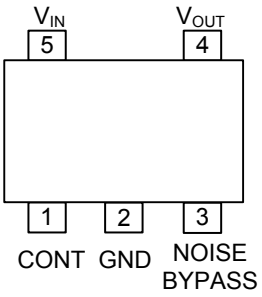
Ordering Number		Package	Packing
Lead Free	Halogen Free		
LD3870L-xx-AF5-R	LD3870G-xx-AF5-R	SOT-25	Tape Reel

LD3870G-xx-AF5-R (1)Packing Type (2)Package Type (3)Output Voltage Code (4)Green Package	(1) R: Tape Reel (2) AF5: SOT-25 (3) xx: refer to Marking Information (4) G: Halogen Free and Lead Free, L: Lead Free

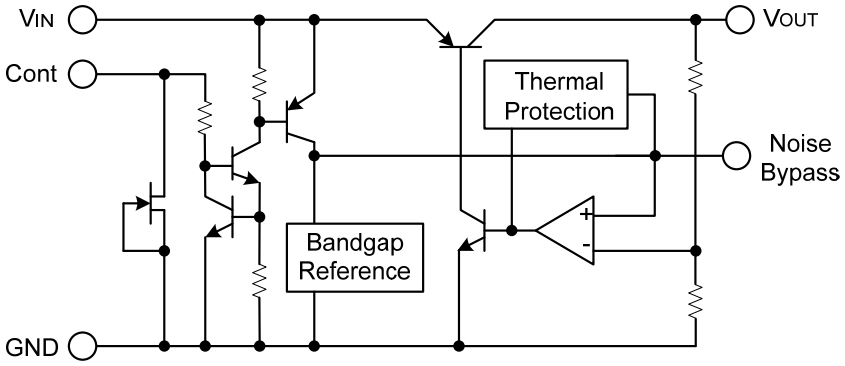
■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-25	15:1.5V 18:1.8V 25:2.5V 27:2.7V 30:3.0V 33:3.3V 50:5.0V	

■ PIN CONFIGURATION



■ BLOCK DAGRAM



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	+14	V
Control Voltage	V_{CONT}	+14(Note 2)	V
Power Dissipation	P_D	300	mW
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature	T_{STG}	-40 ~ +125	°C

Note 1: 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.
2. When input voltage is less than +14V, the absolute maximum control voltage is equal to the input voltage.

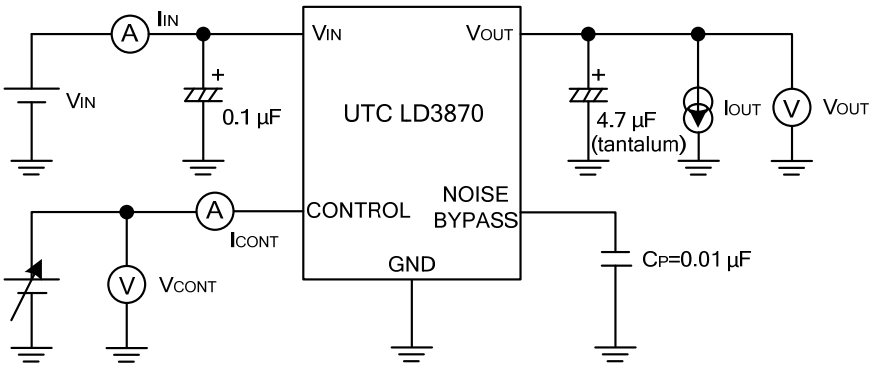
■ ELECTRICAL CHARACTERISTICS

(V_{IN}=V_{OUT}+1V, C_{IN}=0.1μF, C_{OUT}=4.7μF, Cp=0.01μF, T_A=25°C)

PARAMETER		SYMBOL	TEST CONDITONS	MIN	TYP	MAX	UNIT
Output Voltage		V_{OUT}	I_{OUT}=30mA	-2%		+2%	V
Quiescent Current		I_Q	I_{OUT}=0mA, expect I_{CONT}		200	300	μA
Quiescent Current At Control OFF		$I_{Q(OFF)}$	V_{CONT}=0V			5	μA
Output Current		I_{OUT}	V_{OUT}-0.3V	150	200		mA
Line Regulation		$\triangle V_{OUT}/\triangle V_{IN}$	V_{IN}=V_{OUT}+1V ~ 14V, I_{OUT}=1mA			0.15	%/V
Load Regulation		$\triangle V_{OUT}/\triangle I_{OUT}$	I_{OUT}=0 ~ 100mA			0.03	%/mA
Dropout Voltage		V_D	I_{OUT}=60mA		0.12	0.2	V
Ripple Rejection		RR	e_{IN}=200mVrms, f=1kHz, I_{OUT}=10mA, V_{IN}=V_{OUT}+2V, V_{OUT}=3V Version		60		dB
Average Temperature Coefficient of Output Voltage		$\triangle V_{OUT}/\triangle T_A$	T_A=0~85°C, I_{OUT}=10mA, V_{OUT}=3V Version		0.2		mV/°C
Output Noise Voltage		e_N	f=10Hz ~ 80kHz, I_{OUT}=10mA, V_{OUT}=3V Version		30		μVrms
Control Voltage	ON	$V_{CONT(ON)}$		1.6			V
	OFF	$V_{CONT(OFF)}$				0.6	V

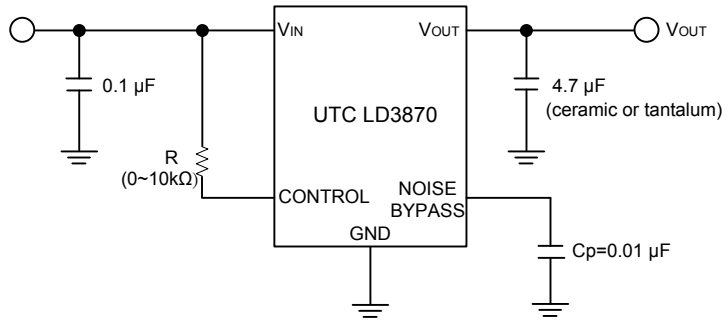
Note: The above specification is a common specification for all output voltages. Therefore, it may be different from the individual specification for a specific output voltage.

■ TEST CIRCUIT



■ TYPICAL APPLICATON

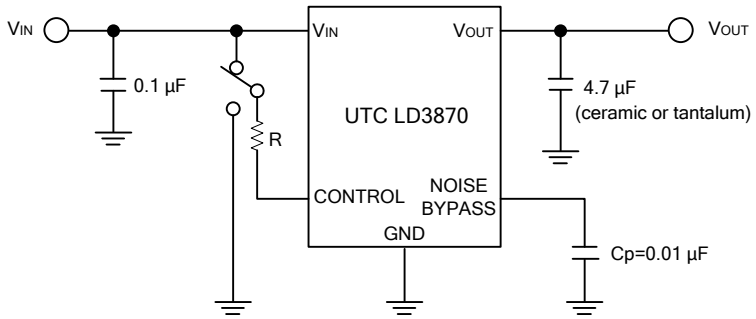
For ON/OFF Control is not required:



Connect control terminal to V_{IN} terminal

The quiescent current can be reduced by using a resistance “R”. Instead, it increases the minimum operating voltage. For further information, please refer to Figure ”Output Voltage vs. Control Voltage”.

For In use of ON/OFF CONTROL:



State of control terminal:

* ”H” → Output is enables.
* ”L”or “open” → Output is disabled.
* Noise bypass Capacitance Cp
  - Noise bypass capacitance Cp reduces noise generated by hand-gap reference circuit.
  - Noise level and ripple rejection will be improved when larger Cp is used.
  - Use of smaller Cp value may cause oscillation.
  - Use the Cp value of 0.01uF greater to avoid the problem.