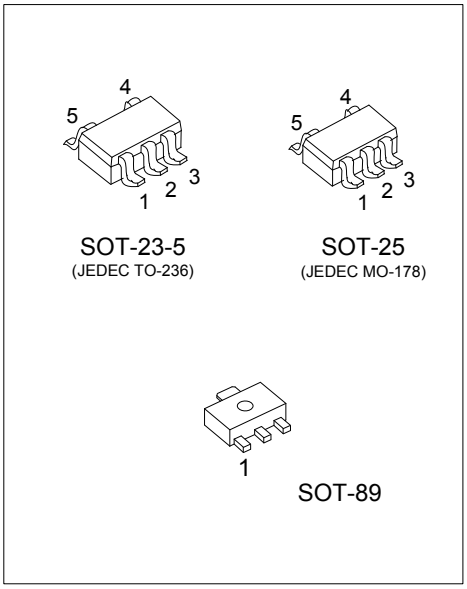
L1131A

CMOS IC

LOW NOISE 150mA LDO REGULATOR



■ DESCRIPTION

The UTC **L1131A** is a COMS positive linear regulator. One of it's feature is the very low quiescent current typical as low as 10μA and its dropout voltage is extremely low with 150mA output current, and high ripple rejection. Each of these ICs consists of a voltage reference unit, an error amplifier, resistor-net for voltage setting, a short current limit circuit, a chip enable circuit, and so on.

These ICs perform with low dropout voltage and the chip-enable function. The supply current at no load of this IC is only 4.3μA, and the line transient response and the load transient response of the UTC **L1131A** Series are excellent, thus these ICs are very suitable for the power supply for hand-held communication equipment.

■ FEATURES

* Low supply current Typ. 4.3μA
* Standby mode Typ. 0.1μA
* Output Voltage Range 1.2V~5.0V
* Excellent line regulation Typ. 0.02%/V
* Built-in fold back protection circuit
* Ceramic capacitors are recommended to be used with this IC C_{IN}=C_{OUT}=1μF

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
L1131AL-xx-AB3-R	L1131AG-xx-AB3-R	SOT-89	Tape Reel
L1131AL-xx-AE5-R	L1131AG-xx-AE5-R	SOT-23-5	Tape Reel
L1131AL-xx-AF5-R	L1131AG-xx-AF5-R	SOT-25	Tape Reel

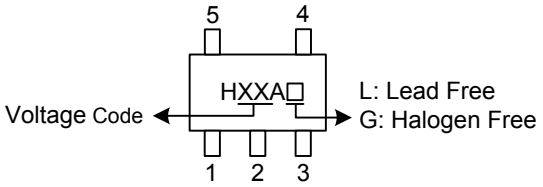
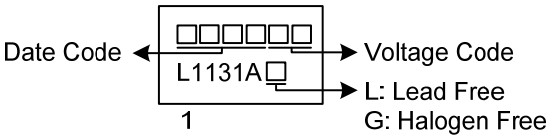
Note: xx: Output Voltage, refer to Marking Information.

L1131AG-xx-AB3-R

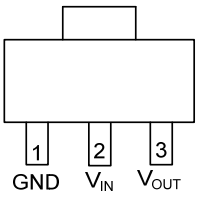
(1)Packing Type
(2)Package Type
(3)Output Voltage Code
(4)Green Package

(1) R: Tape Reel
(2) AB3: SOT-89, AE5: SOT-23-5, AF5: SOT-25
(3) xx: refer to Marking Information
(4) G: Halogen Free and Lead Free, L: Lead Free

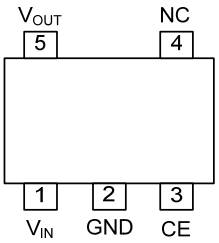
■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-23-5 SOT-25	15: 1.5V 20: 2.0V 25: 2.5V 28: 2.8V 33: 3.3V 50: 5.0V	
SOT-89		

■ PIN CONFIGURATION



SOT-89

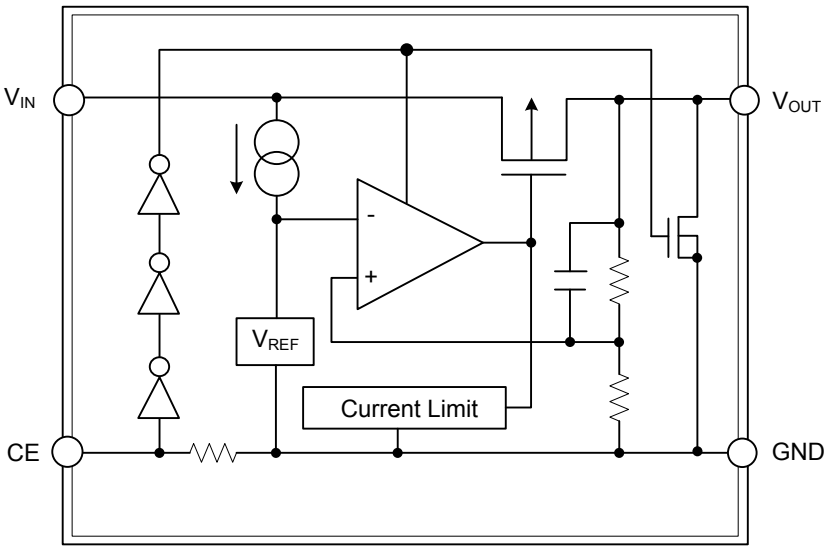


SOT-23-5 / SOT-25

■ PIN DESCRIPTION

PIN NO.		PIN NAME	DESCRIPTION
SOT-89	SOT-23-5 SOT-25		
1	2	GND	Ground pin
2	1	V_{IN}	Input pin
3	5	V_{OUT}	Output pin
-	3	CE	Chip enable pin
-	4	NC	No connection

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Input Voltage		V_{IN}	6.5	V
Input Voltage (CE Pin)		V_{CE}	6.5	V
Output Voltage		V_{OUT}	-0.3 ~ V_{IN}+0.3	V
Output Current		I_{OUT}	160	mA
Power Dissipation	SOT-23-5	P_D	360	mW
	SOT-25		420	mW
	SOT-89		500	mW
Operating Temperature Range		T_{OPT}	-40 ~ +85	°C
Storage Temperature Range		T_{STG}	-55 ~ +125	°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.

■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN} = Set V_{OUT}+1V, 1mA ≤ I_{OUT} ≤30mA	V_{OUT}≤3.0V	×0.985		×1.015	V
			V_{OUT}>3.0V	×0.980		×1.020	
Output Current	I_{OUT}	V_{IN}-V_{OUT}=1.0V		150			mA
Load Regulation	$\Delta V_{OUT}/\Delta I_{OUT}$	V_{IN}=Set V_{OUT}+1V, 1mA≤I_{OUT}≤150mA, 1.2V≤V_{OUT}<2.0V,			28	55	mV
		2.0V≤V_{OUT}<3.0V			33	66	mV
		3.0V≤V_{OUT}			35	80	mV
Dropout Voltage	V_{DIF}	refer to the ELECTRICAL CHARACTERISTICS by OUTPUT VOLTAGE					
Supply Current	I_{SS}	V_{IN}=Set V_{OUT}+1V, I_{OUT}=0mA			4.3	18	μA
Supply Current (Standby)	Istandby	V_{IN}=Set V_{OUT}+1V, V_{CE} =GND			0.1	1.0	μA
Line Regulation	$\Delta V_{OUT}/\Delta V_{IN}$	Set V_{OUT}+0.5V≤V_{IN}≤6.0V, I_{OUT}=30mA			0.02	0.10	%/V
Ripple Rejection	RR	f=1kHz			50		dB
		f=10kHz, Ripple 0.2Vp-p, V_{IN}-V_{OUT}=1.0V, I_{OUT}=30mA			45		dB
Input Voltage	V_{IN}			1.8		6.0	V
Output Voltage Temperature Coefficient	$\Delta V_{OUT}/\Delta T$	I_{OUT}=30mA, -40°C≤T_{OPT}≤85°C			±100		ppm/°C
Short Current Limit	I_{LIM}	V_{OUT}=0V			60		mA
CE Pull-Down Resistance	I_{PD}				0.5		μA
CE Input Voltage “H”	V_{CEH}			1.5		6.0	V
CE Input Voltage “L”	V_{CEL}			0.0		0.3	V
Output Noise	en	BW=10Hz~100kHz			30		μVrms
On Resistance of Nch Tr. for auto-discharge (Only for D version)	R_{LOW}	V_{CE}=0V			70		Ω

■ ELECTRICAL CHARACTERISTICS BY OUTPUT VOLTAGE

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Dropout Voltage	V_{DIF}	I_{OUT}=150mA	V_{OUT}=1.2V		0.65		V
			1.5V<V_{OUT}≤1.6V		0.48		V
			1.6V<V_{OUT}≤1.7V		0.41		V
			1.7V<V_{OUT}≤2.0V		0.35		V
			2.0V<V_{OUT}≤2.7V		0.21		V
			2.7V<V_{OUT}≤5.0V		0.18		V

■ TEST CIRCUIT

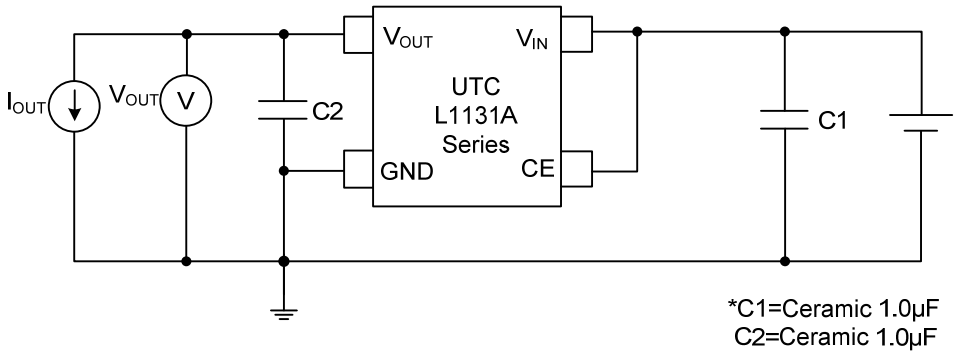


Fig.1 Standard test Circuit

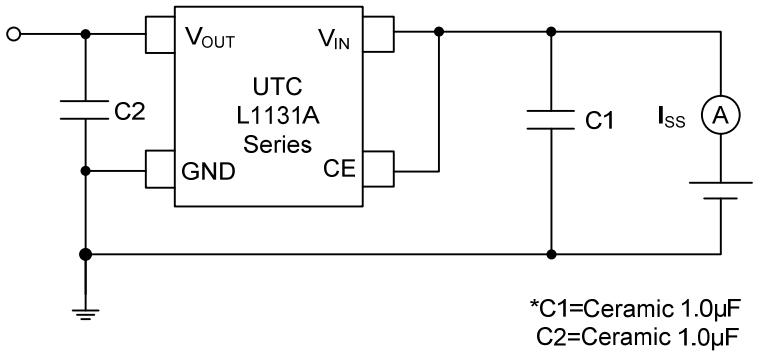


Fig.2 Supply Current Test Circuit

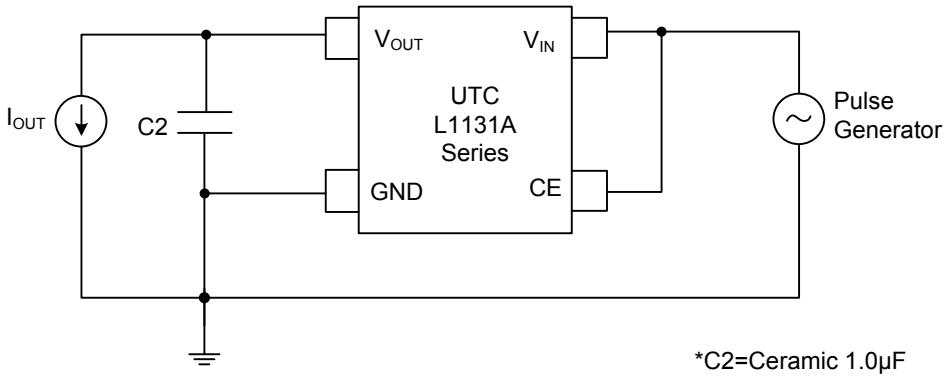
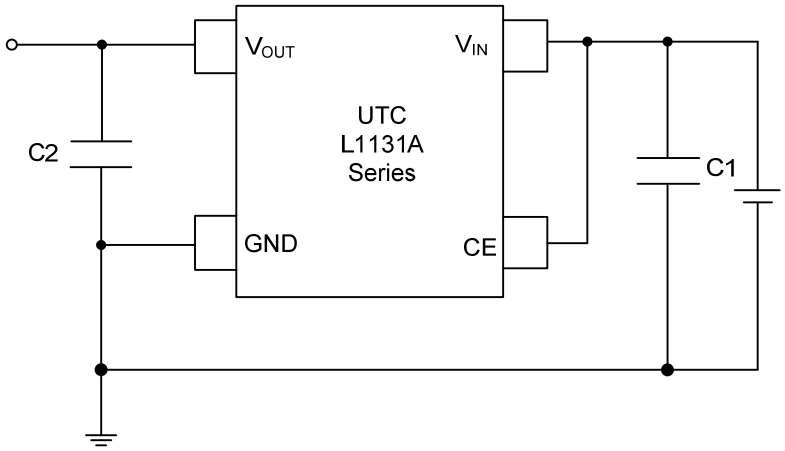


Fig.3 Ripple Rejection, Line Transient

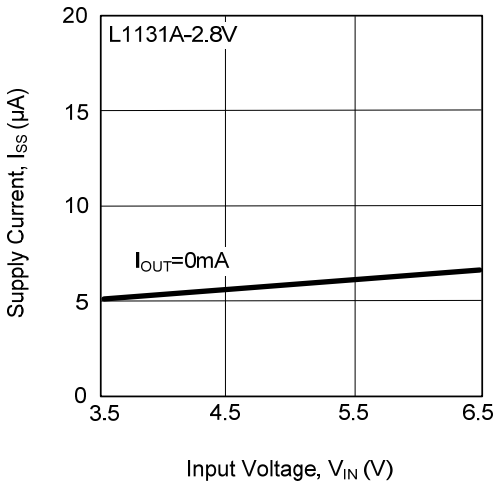
■ TYPICAL APPLICATION CIRCUIT



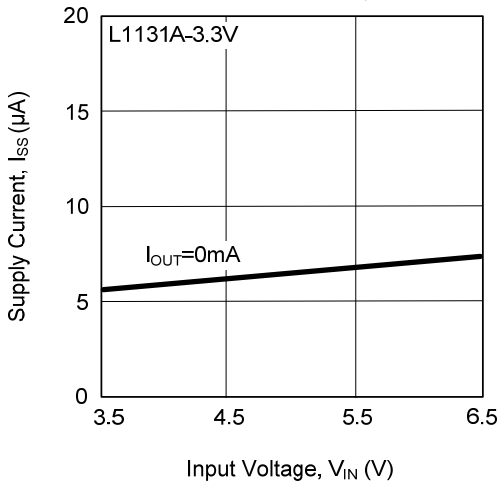
(External Components)
C1 Ceramic 1.0μF
C2 Ceramic 1.0μF

■ TYPICAL CHARACTERISTICS

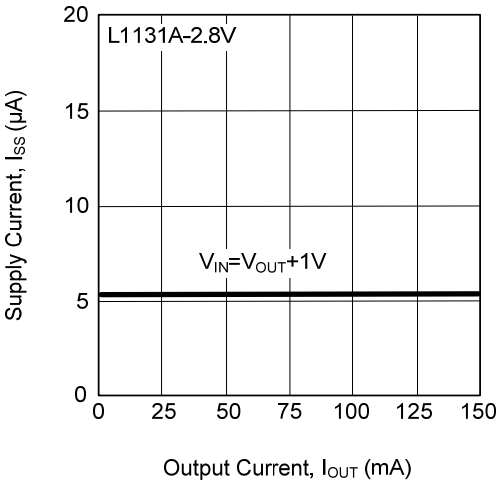
Input Voltage vs. Supply Current



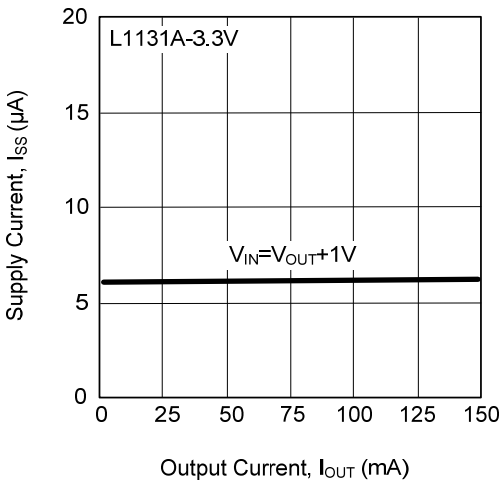
Input Voltage vs. Supply Current



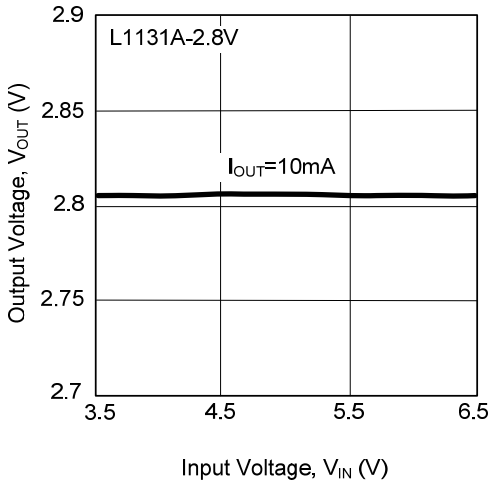
Output Current Vs. Supply Current



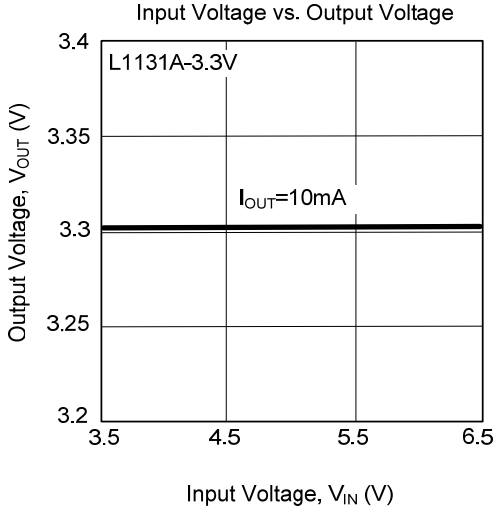
Output Current Vs. Supply Current



Input Voltage vs. Output Voltage



Input Voltage vs. Output Voltage



■ TYPICAL CHARACTERISTICS