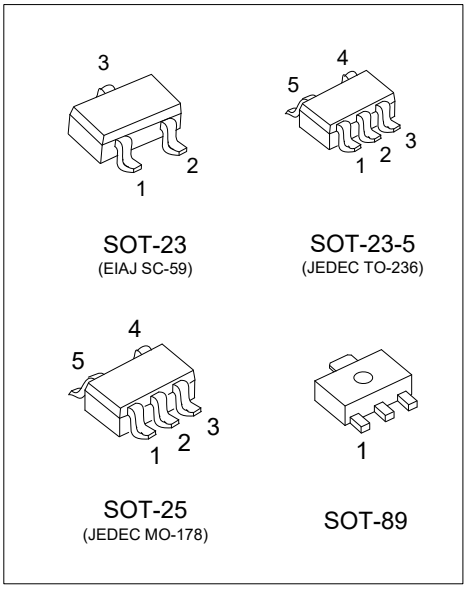
L1131B

CMOS IC

LOW NOISE 200mA LDO REGULATOR



■ DESCRIPTION

The UTC **L1131B** is a COMS positive linear regulator. One of it's feature is the very low quiescent current typical as low as 1.5μA and its dropout voltage is extremely low with 200mA 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 1.5μA, and the line transient response and the load transient response of the UTC **L1131B** Series are excellent, thus these ICs are very suitable for the power supply for hand-held communication equipment.

■ FEATURES

* Low supply current Typ. 1.5μA
* Standby mode Typ. 0.1μA
* Output Voltage Range 1.2V ~ 5.0V
* Built-in fold back protection circuit
* Ceramic capacitors are recommended to be used with this IC C_{IN}=C_{OUT}=1μF

■ ORDERING INFORMATION

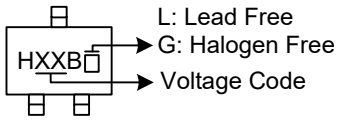
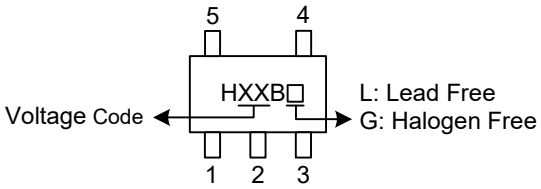
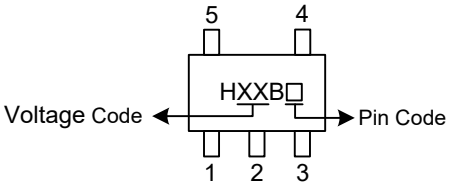
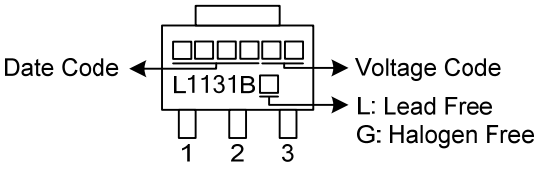
Ordering Number		Package	Packing
Lead Free	Halogen Free		
L1131BL-xx-AB3-R	L1131BG-xx-AB3-R	SOT-89	Tape Reel
L1131BL-xx-AE3-R	L1131BG-xx-AE3-R	SOT-23	Tape Reel
L1131BL-xx-AE5-R	L1131BG-xx-AE5-R	SOT-23-5	Tape Reel
L1131BL-xx-AF5-R	L1131BG-xx-AF5-R	SOT-25	Tape Reel
L1131BL-xx-AE5-F-R	L1131BG-xx-AE5-F-R	SOT-23-5	Tape Reel
L1131BL-xx-AF5-F-R	L1131BG-xx-AF5-F-R	SOT-25	Tape Reel
L1131BL-xx-AF5-Z-R	L1131BG-xx-AF5-Z-R	SOT-25	Tape Reel

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

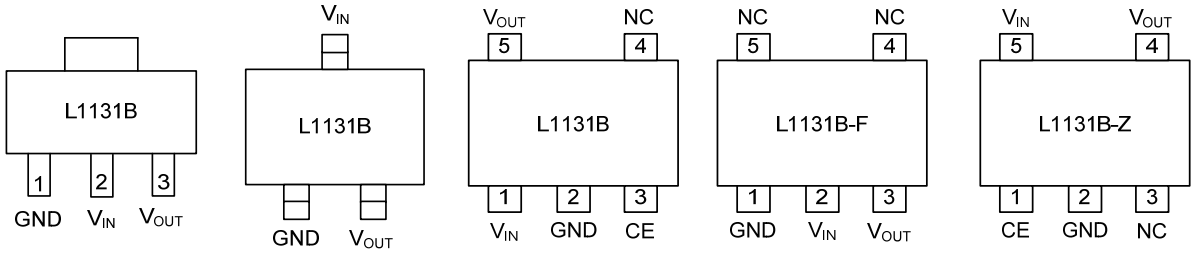
L1131BG-xx-AE5-F-R
(1)Packing Type
(2)Pin Assignment
(3)Package Type
(4)Output Voltage Code
(5)Green Package

(1) R: Tape Reel, B: Tape Box, K: Bulk
(2) refer to Pin Assignment
(3) AB3: SOT-89, AE3: SOT-23, AE5: SOT-23-5, AF5: SOT-25
(4) xx: refer to Marking Information
(5) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-23	15: 1.5V 20: 2.0V 22: 2.2V 25: 2.5V 28: 2.8V 30: 3.0V 33: 3.3V 36: 3.6V 50: 5.0V	
SOT-23-5 SOT-25		
SOT-23-5 SOT-25 (L1131B-x)		
SOT-89		

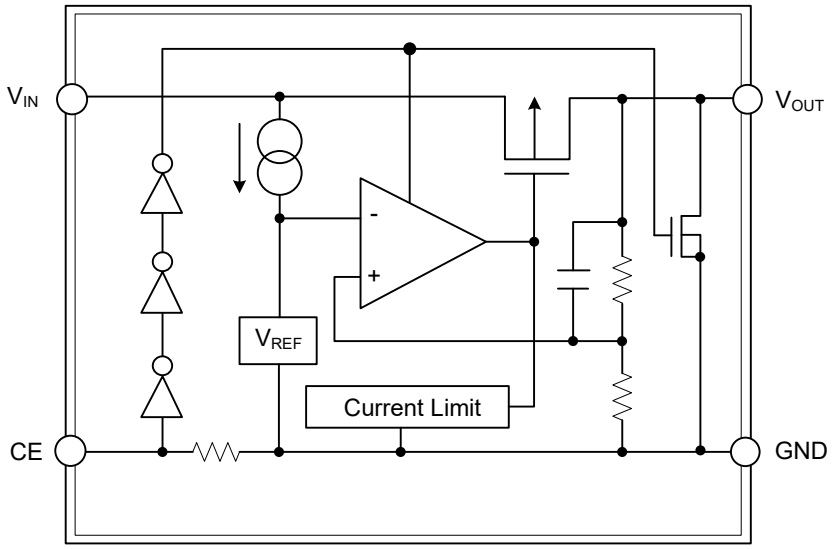
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.					PIN NAME	DESCRIPTION
L1131B			L1131B-F	L1131B-Z		
SOT-23	SOT-89	SOT-23-5 SOT-25	SOT-23-5 SOT-25	SOT-25		
1	1	2	1	2	GND	Ground pin
2	3	5	3	4	V_{OUT}	Output pin
3	2	1	2	5	V_{IN}	Input pin
-	-	3	-	1	CE	Chip enable pin
-	-	4	4, 5	3	NC	No connection

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Input Voltage		V_{IN}	11	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}	200	mA
Power Dissipation	SOT-23 SOT-25	P_D	500	mW
	SOT-23-5		350	mW
	SOT-89		550	mW
Operating Temperature Range		T_{OPR}	-40 ~ +125	°C
Storage Temperature Range		T_{STG}	-40 ~ +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.

■ 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	V
Output Current	I_{OUT}	V_{IN}-V_{OUT}=1.0V		200			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	SOT-23 SOT-89			3.0	μA
			SOT-23-5 SOT-25		1.5	2.5	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}≤10V, I_{OUT}=30mA				0.3	%/V
Ripple Rejection	RR	f=1kHz			50		dB
Input Voltage	V_{IN}			1.8		10	V
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
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}=0.95×$V_{OUT(NOM)}$	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

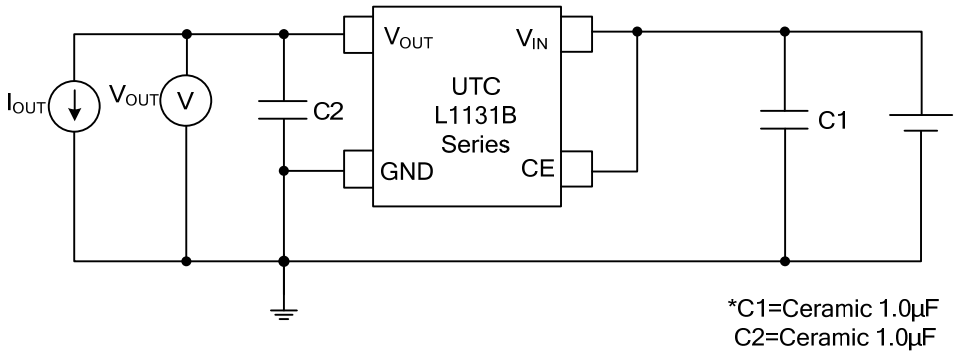


Fig.1 Standard test Circuit

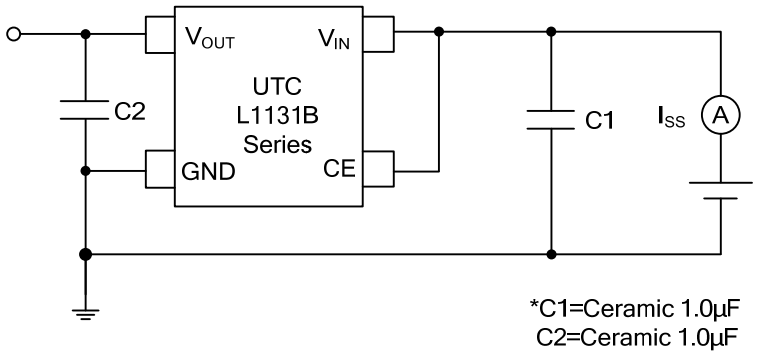


Fig.2 Supply Current Test Circuit

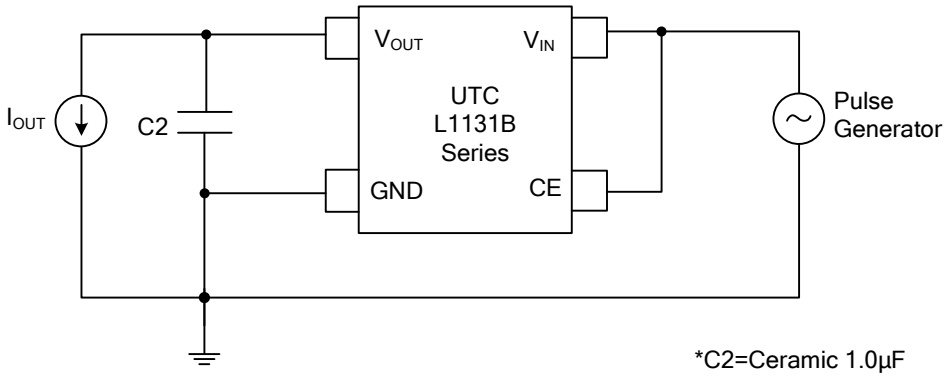
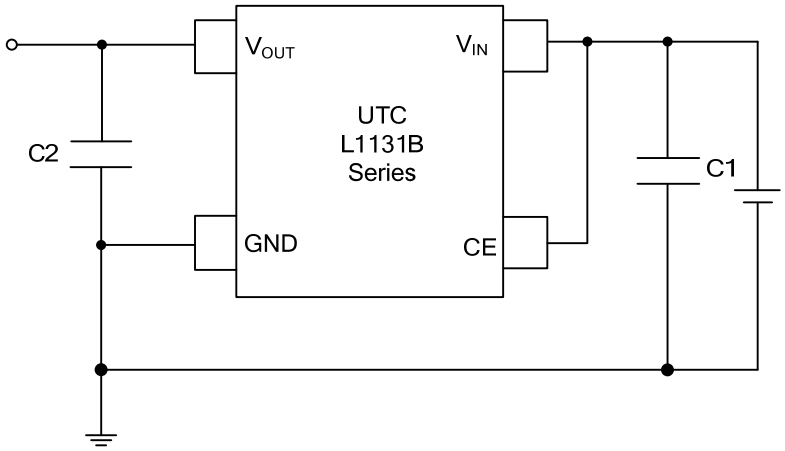


Fig.3 Ripple Rejection, Line Transient

■ TYPICAL APPLICATION CIRCUIT

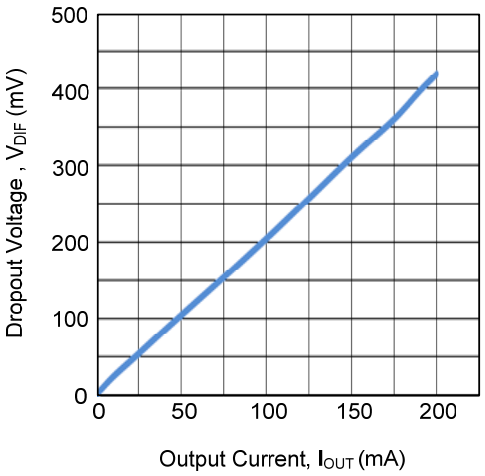


(External Components)
C1 Ceramic 1.0μF
C2 Ceramic 1.0μF

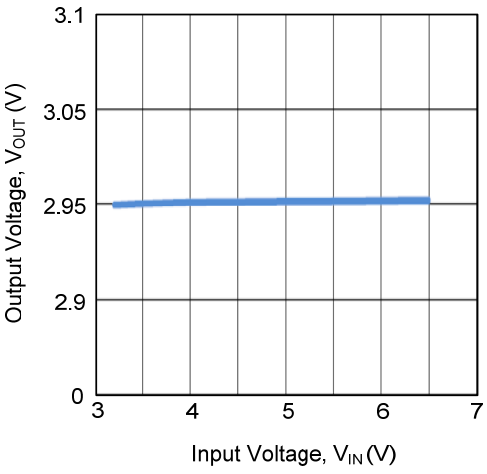
■ TYPICAL CHARACTERISTICS

L1131B-3.0V

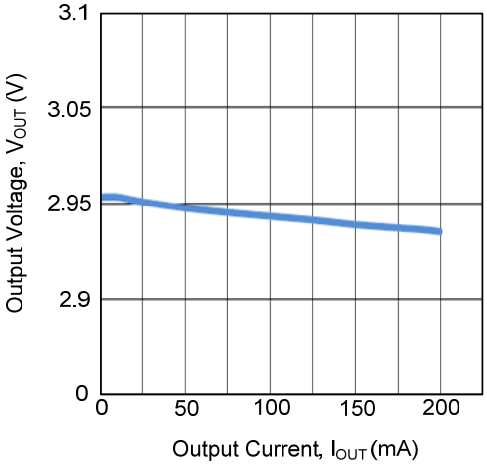
Dropout Voltage vs. Output Current



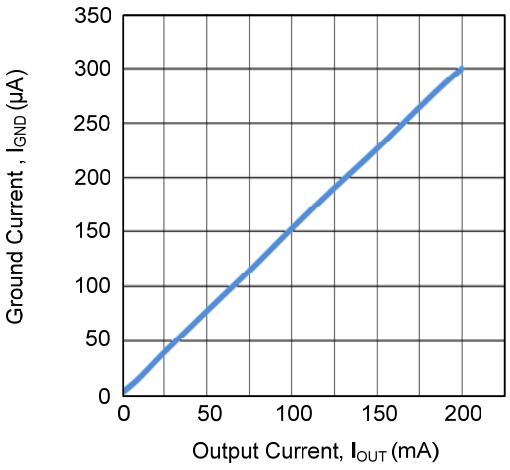
Output Voltage vs. Input Voltage



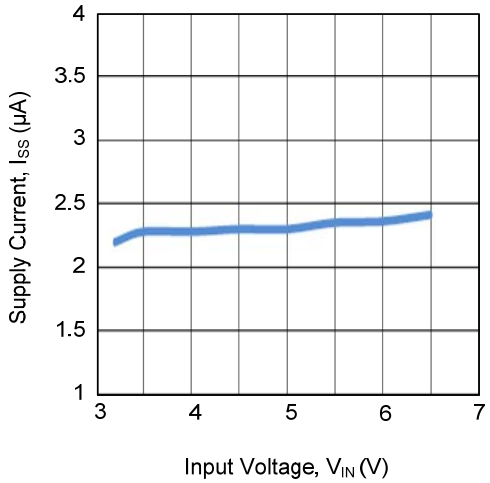
Output Voltage vs. Output Current



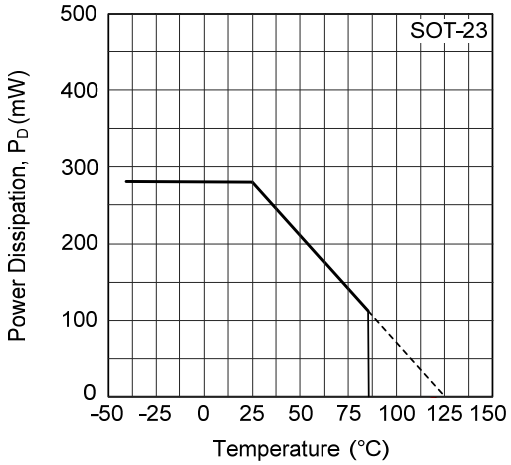
Ground Current vs. Output Current



Supply Current vs. Input Voltage



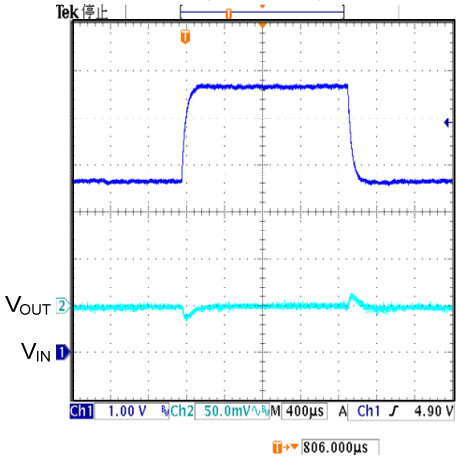
Power Dissipation vs. Temperature



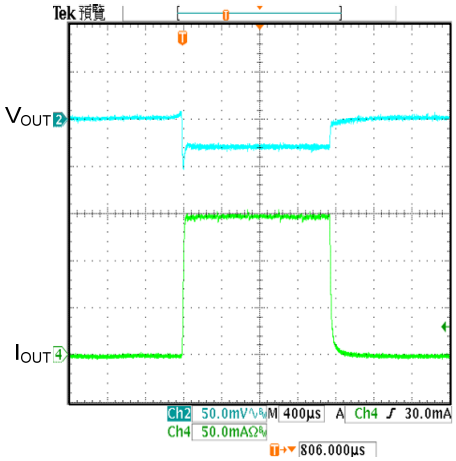
■ TYPICAL CHARACTERISTICS (Cont.)

L1131B-3.0V

Line Regulation vs. Output Current
(I_{OUT}=10mA)

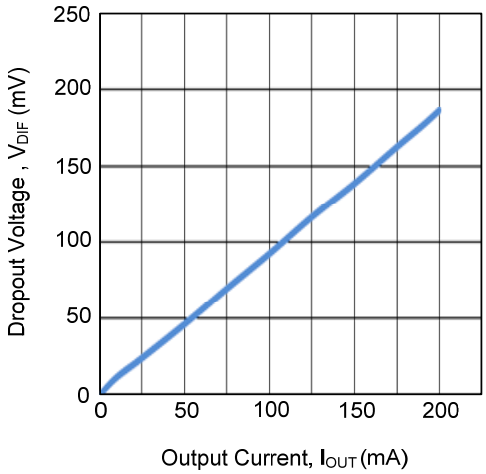


Load Regulation vs. Output Current

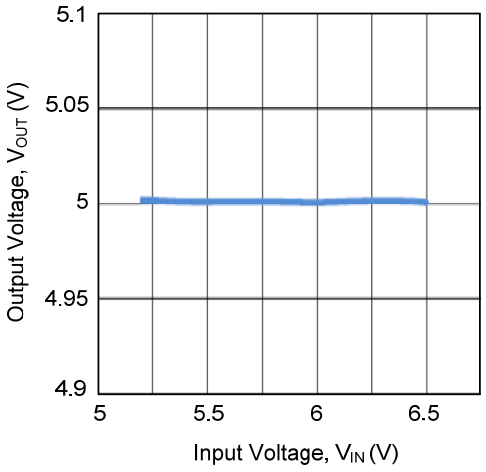


L1131B-5.0V

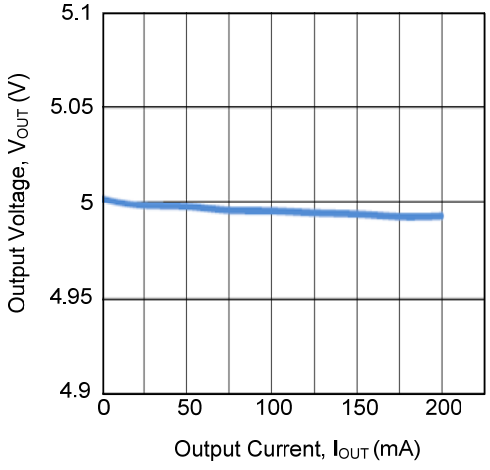
Dropout Voltage vs. Output Current



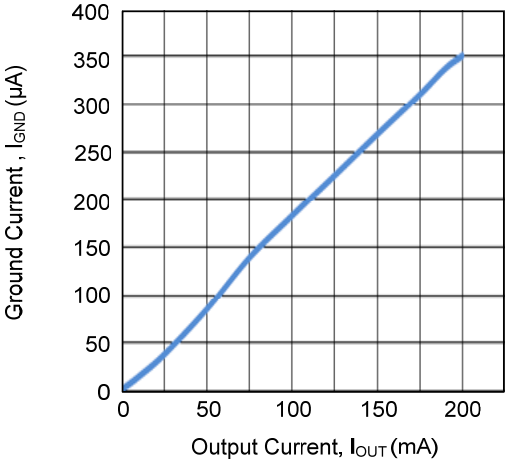
Output Voltage vs. Input Voltage



Output Voltage vs. Output Current



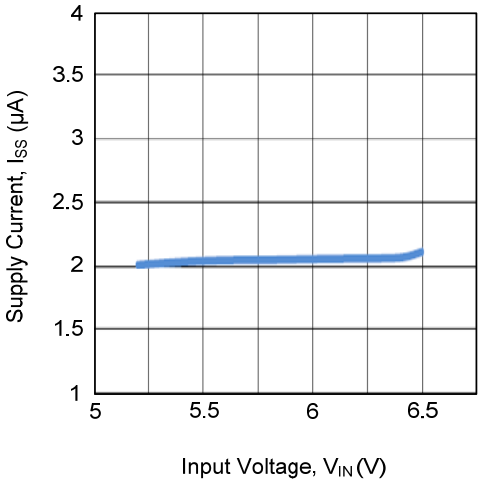
Ground Current vs. Output Current



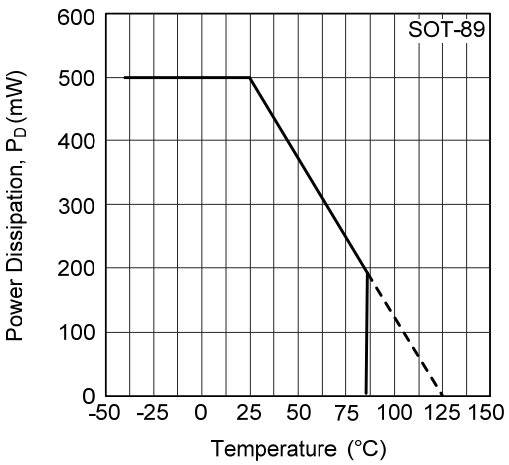
■ TYPICAL CHARACTERISTICS (Cont.)

L1131B-5.0V

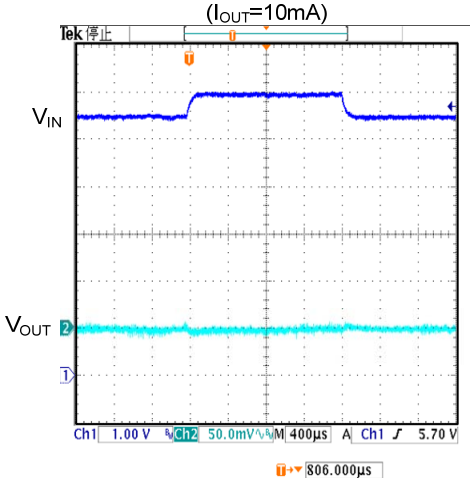
Supply Current vs. Input Voltage



Power Dissipation vs. Temperature



Line Regulation vs. Output Current (I_{OUT}=10mA)



Load Regulation vs. Output Current