ILC7071

100mA SOT-23-5 Ultra Low Noise CMOS RF-LDO™ Regulator

Features

- 1% output voltage accuracy
- Only 10µV_{RMS} noise from 300Hz to 100kHz
- Uses low ESR ceramic or Tantalum output capacitor to minimize noise and output ripple
- Only 90µA ground current at 100mA load
- Ripple rejection up to 70dB at 1kHz, 60dB at 1MHz
- Excellent line and load transient response
- Guaranteed to 100mA output current
- Industry standard five lead SOT-23-5 packages
- Fixed 2.8V, 3.0V, 3.3V,3.6V, 4.7V, 5.0V, output voltage options
- Metal mask option available for custom voltages between 2.5V and 8V

Applications

- Cellular phones
- Wireless communicators
- PDAs / palmtops / organizers
- Battery powered portable electronics

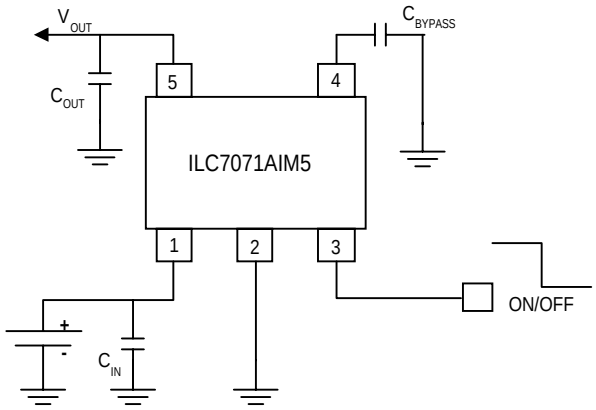
Description

The ILC7071 is a 100mA, Ultra Low Noise, Low Dropout (LDO) linear regulator, designed and processed in Impala's proprietary CMOS process technology This process combines the best CMOS features of low quiescent current, small size and low dropout voltage with the best bipolar features of high ripple rejection, ultra low noise and power handling capability. The ILC7071 offers a quiescent current of less than 100µA, a logic level enable (regulator on/off) pin, and a low dropout voltage of 50mV at 10mA. With better than 70dB (1kHz) of ripple rejection, ultra low noise of 10µV_{RMS} and 1% output voltage accuracy, the ILC7071 sets a new standard in linear regulators for communications and personal electronics applications.

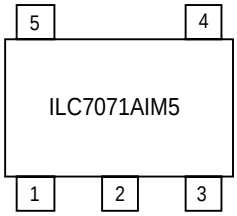
The ILC7071 is designed to operate with small, low cost, ceramic capacitors and is stable over a wide range of ESR values. In addition to the output capacitor, the ILC7071 requires only a 1µF input capacitor. The enable pin can be tied to V_{IN} for easy device layout. The ILC7071 is available in a number of fixed output voltages ranging from 2.5V to 8V. An adjustable version will be available shortly.

The ILC7071 is ideally suited for use in small size cordless and cellular handsets as well as many other low battery powered electronic devices. Please contact Fairchild for samples and application information.

Typical Applications



Pin Assignments



Pin Definitions

Pin Number	Pin Name	Pin Function Description
1	V_{IN}	Connect Directly to Supply
2	GND	Ground pin. Local ground for C_{OUT}
3	On/Off	On > 1.0V, off < 0.4V. Can be connected to V_{IN}
4	C_{NOISE}	Noise Bypass Capacitor. Do Not Pin Connect Directly to GND
5	V_{OUT}	Regulator Output, Connect C_{OUT} between this pin and the GND (pin 3)

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Units
Input Voltage ILC7071	V_{IN}	-0.3 to 9V	V
ON/OFF Input Voltage	$V_{ON/OFF}$	-0.3 to V_{IN}	V
Output Current	I_{OUT}	Short Circuit Protected	mA
Output Voltage	V_{OUT}	-0.3 to V_{IN} +0.3	V
Package Power Dissipation	P_D	TBD	mW
Maximum Junction Temp. Range	$T_{J(MAX)}$	-40 to +125	°C
Storage Temperature	T_{STG}	-40 to +125	°C
Operation Ambient Temperature	T_{AMB}	-40 to +85	°C

Electrical Characteristics ILC7071

Unless otherwise specified, all limits are at T_A = 25°C, V_{IN} = $V_{OUT(NOM)}$ + 1V, I_{OUT} = 1mA, C_{OUT} = 1µF, $V_{ON/OFF}$ = 2V

Parameter	Symbol	Conditions		Typ.	Units
Input Voltage Range	V_{IN}			2.5-8	V
Output Voltage Accuracy				±1	%
Line Regulation	ΔV_{OUT}/ (V_{OUT}*ΔV_{IN})	$V_{OUT\ (NOM)}$ + < 8V		0.007	%/V
Dropout Voltage (Note 3)	ΔV_{IN} V_{OUT} V_{DO}	I_{OUT} = 10µa		0.1	mV
		I_{OUT} = 10mA		50	
		I_{OUT} = 20mA		70	
		I_{OUT} = 100mA		235	
Ground Pin Current	I_{GND}	I_{OUT} = 0mA		66	µA
		I_{OUT} = 10mA		67	
		I_{OUT} =100mA		90	
Shutdown (OFF) Current	$I_{ON/OFF}$	$V_{ON/OFF}$ = 0V		0.1	µA
ON/OFF Input Voltage	$V_{ON/OFF}$	High = Regulator On Low = Regulator Off		1.5 0.6	V
ON/OFF Pin Input Current (Note 5)	$I_{IN\ ON/\overline{OFF}}$	$V_{ON/OFF}$ 0.6V Regulator OFF $V_{ON/OFF}$ 2V Regulator ON		0.3 1	µA
Peak Output Current (Note 4)	$I_{OUT\ (peak)}$	V_{OUT} Š 0.95V $_{OUT(NOM)}$, t_{PW} = 2ms		120	mA
Output Noise Voltage (RMS)	e_N	BW = 300Hz to 50kHz, C_{IN} = 1µF C_{NOISE} = 0.01µF, C_{OUT} = 1.0µF, I_{OUT} = 10mA		TBD	μV_{RMS}
Ripple Rejection	$\Delta V_{OUT}/\Delta V_{IN}$	C_{OUT} = 1.0µF I_{OUT} = 100mA	Freq = 1kHz	70	dB
			Freq = 10kHz	50	
			Freq = 1MHz	65	
Dynamic Line Regulation	$\Delta V_{OUT(line)}$	V_{IN}: $V_{OUT(NOM)}$ + 1V to $V_{OUT(NOM)}$ + 2V, tr/tf = 2µs; I_{OUT} = 80mA		14	mv
Dynamic Load Regulation	$\Delta V_{OUT(load)}$	I_{OUT}: 1mA to 100mA; tr,5µS		40	mv
Short Circuit Current	I_{SC}	V_{OUT} = 0V		200	mA
Resistance Shutdown Discharge				1.5	kΩ

Notes:

1: Absolute maximum ratings indicate limits which when exceeded may result in damage to the component. Electrical specifications do not apply when operating the device outside of its rated operating conditions.

2: Specified Min/Max limits are production tested or guaranteed through correlation based on statistical control methods. Measurements are taken at constant junction temperature as close to ambient as possible using low duty pulse testing.

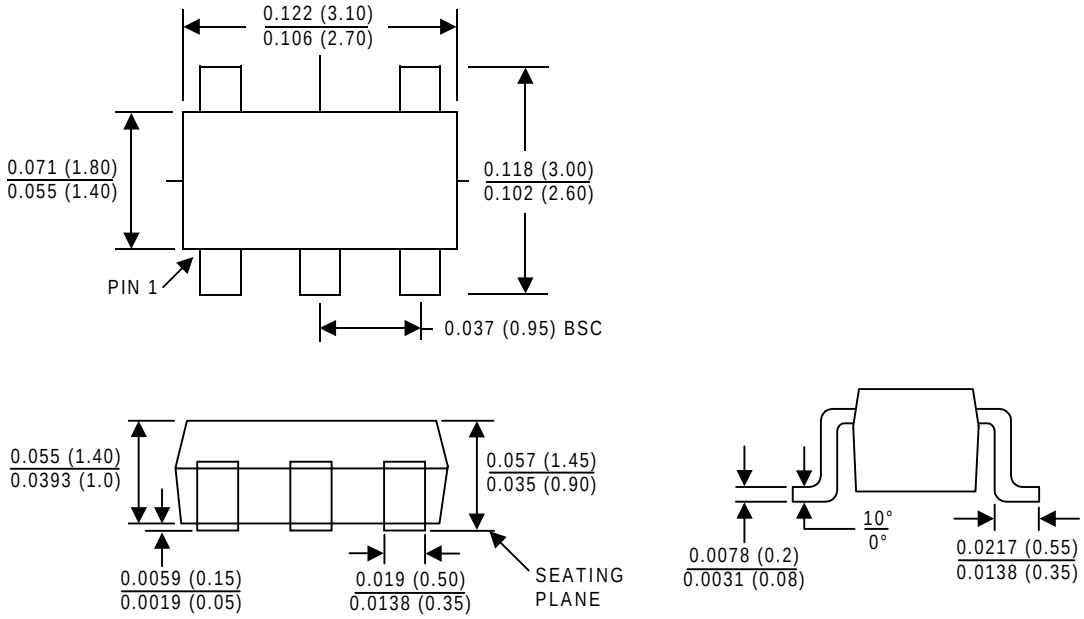
3: Dropout voltage is defined as the input to output differential voltage at which the output voltage drops 2% below the nominal value measured with a 1V differential.

4: Guaranteed by design

5: The device's shutdown pin includes a 2MΩ internal pull down resistor connected to ground.

Package Dimensions

Dimensions shown in inches and (mm)
5-Lead plastic surface mount (SOT-23-5)



SOT-23-5 Package Markings ILC7071AIM5-xx

Output Voltage	Grade	Order Information	Supplied As:
2.8	A	ILC7071AIM5-28	3K Units on Tape and Reel
3.0	A	ILC7071AIM5-30	3K Units on Tape and Reel
3.3	A	ILC7071AIM5-33	3K Units on Tape and Reel
3.6	A	ILC7071AIM5-36	3K Units on Tape and Reel
4.7	A	ILC7071AIM5-47	3K Units on Tape and Reel
5.0	A	ILC7071AIM5-50	3K Units on Tape and Reel

Ordering Information (T_A = -40°C to +85°C)

Product Number	Package
ILC7071AIM5-X	100mA, fixed voltage, SOT-23 package

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