FAIRCHILD

SEMICONDUCTOR®

ILC7362
CMOS Negative LDO Regulator

Features

- Ultra-Low Supply Current (3µA typ.)
- All-CMOS Design in SOT-23 and SOT-89 Packages
- ±2% Precision Output Voltage
- Output Current Limit
- Package and Voltage Options allow:
  100mA/-6V Regulator
  100mA/-5V Regulator
  60mA/-3V Regulator

Applications

- Battery-Operated Systems
- Portable Computers and Cameras
- Cellular/GSM/PHS Phones
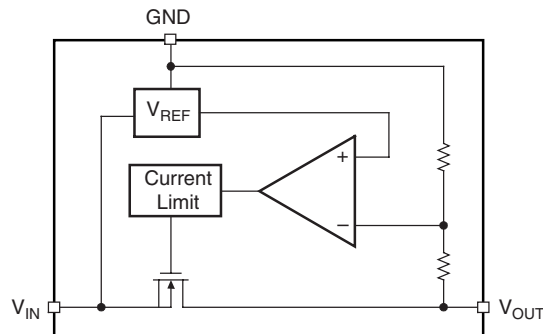- PDAs

General Description

The ILC7362 is a low quiescent current, negative voltage LDO. It provides up to 60 or 100mA output current with low power consumption and small input-output differential voltage.

The ILC7362 is available in SOT23-3 (max.150mW) or SOT89-3 (max.500mW) package, for a number of fixed voltage and current offerings.
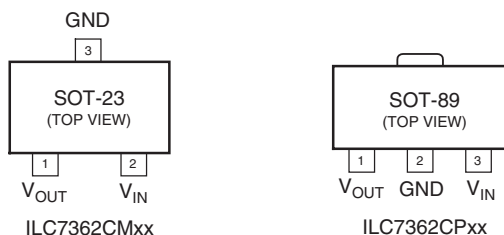
Block Diagram

Pin Configurations

GND

SOT-23	SOT-89
3	

SOT-23
(TOP VIEW)

SOT-89
(TOP VIEW)

1   V_{OUT} 2 V_{IN}

1 V_{OUT} 2 GND   3 V_{IN}

ILC7362CMxx

ILC7362CPxx

Pin Definitions

Pin Number		Pin Name	Pin Function Description
SOT-23	SOT-89		
1	1	V_{OUT}	Regulated Voltage Output
2	3	V_{IN}	Power Supply Input
3	2	GND	Ground Connection

Absolute Maximum Ratings

Absolute maximum ratings are the values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

Parameter		Min.	Max.	Units
Supply Voltage: V_{IN} to GND			-12	V
Output Current: I_{OUT}			200	mA
Output Voltage: V_{OUT} to GND		0.3	V_{IN} - 0.3	V
Junction Temperature (T_J)		-40	125	°C
Storage Temperature		-40	125	°C
Lead Soldering Temperature, 10 seconds			300	°C
Continuous Total Power Dissipation (P_D) at T_A=25°C	SOT-23		150	mW
	SOT-89		500	

Recommended Operating Conditions

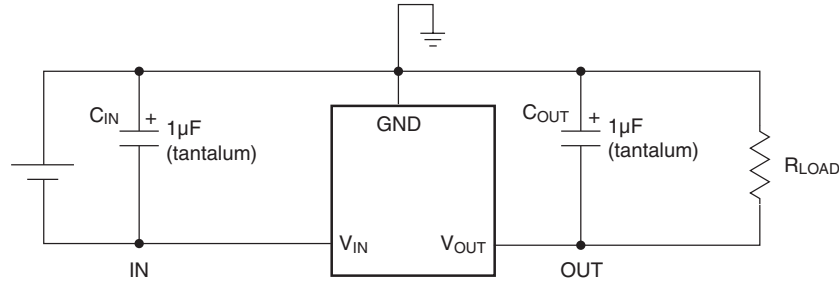| Parameter	Conditions	Min.	Typ.	Max.	Units
Supply Voltage Range V_{IN}		$V_{OUT} - V_{DO}$	$V_{OUT} - 1$	-10	V
Ambient Operating Temperature		-30	25	80	°C

Figure 1. Test Circuit

Electrical Specifications ILC7362Cx-60

($V_{IN} = V_{OUT} - 1V$, and $T_A = 25°C$ using circuit in Figure 1, unless otherwise noted.)

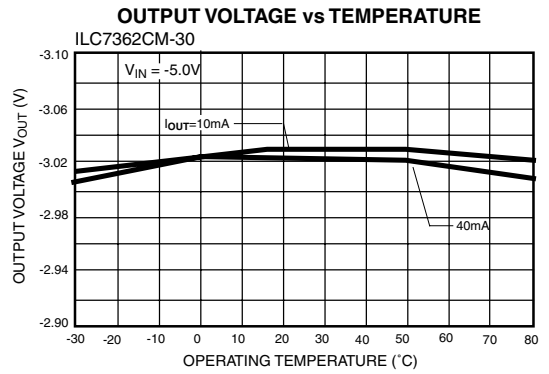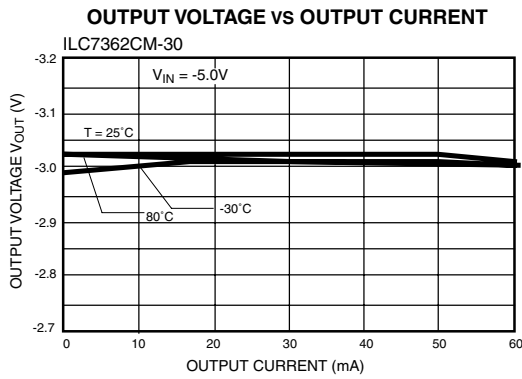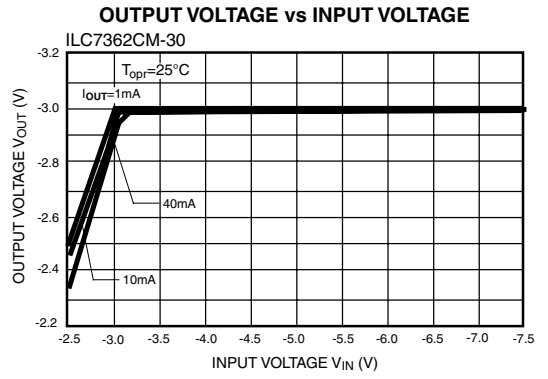| Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}	$I_{OUT} = 20mA$	0.98 V_{OUTnom}	$V_{OUTnom} = -6.0$	1.02 V_{OUTnom}	V
Maximum Output Current, Note 1	$I_{OUTMAX.}$	$-V_{OUT} \geq -0.9V_{OUTnom}$	100			mA
Load Regulation	ΔV_{OUT}	$1mA \leq I_{OUT} \leq 50mA$		40	80	mV
Dropout Voltage, Note 2	V_{DO}	$I_{OUT} = 50mA$		120	300	mV
		$I_{OUT} = 100mA$		380	600	
Ground Current	I_{GND}			3.0	7.0	µA
Line Regulation	$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	$I_{OUT} = 20mA$ $7V \leq -V_{IN} \leq 10V$		0.1	0.3	%/V
Output Voltage Temperature Coefficient	$\dfrac{\Delta V_{OUT}}{\Delta T \times V_{OUT}}$	$I_{OUT} = 30mA$ $-30°C \leq T \leq 80°C$		±100		ppm/°C

Electrical Specifications ILC7362Cx-50

($V_{IN} = V_{OUT} - 1V$, and $T_A = 25°C$ using circuit in Figure 1, unless otherwise noted.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}	$I_{OUT} = 20mA$	0.98 V_{OUTnom}	$V_{OUTnom} = -5.0$	1.02 V_{OUTnom}	V
Maximum Output Current, Note 1	$I_{OUTMAX.}$	$-V_{OUT} \geq -0.9V_{OUTnom}$	100			mA
Load Regulation	ΔV_{OUT}	$1mA \leq I_{OUT} \leq 50mA$		40	80	mV
Dropout Voltage, Note 2	V_{DO}	$I_{OUT} = 50mA$		120	300	mV
		$I_{OUT} = 100mA$		380	600	
Ground Current	I_{GND}			3.0	7.0	µA
Line Regulation	$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	$I_{OUT} = 20mA$ $7V \leq -V_{IN} \leq 10V$		0.1	0.3	%/V
Output Voltage Temperature Coefficient	$\dfrac{\Delta V_{OUT}}{\Delta T \times V_{OUT}}$	$I_{OUT} = 30mA$ $-30°C \leq T \leq 80°C$		±100		ppm/°C

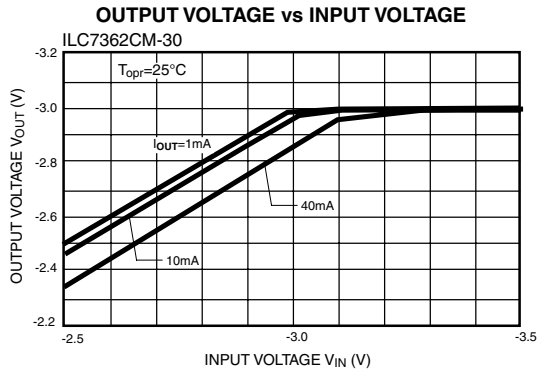## Electrical Specifications ILC7362Cx-30

(V_{IN} = V_{OUT} −1V, and T_A = 25°C using circuit in Figure 1, unless otherwise noted.)

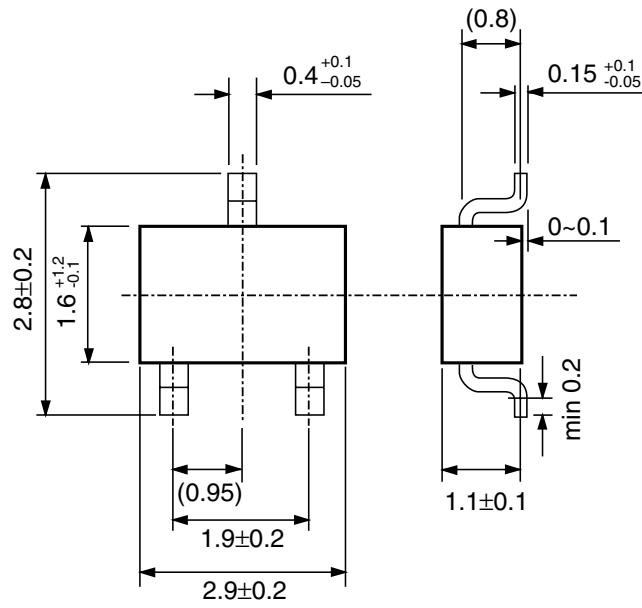| Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Voltage	V_{OUT}	I_{OUT} = 20mA	0.98 V_{OUTnom}	V_{OUTnom} = -3.0	1.02 V_{OUTnom}	V
Maximum Output Current, Note 1	$I_{OUTMAX.}$	-$V_{OUT} \geq$ -0.9V_{OUTnom}	60			mA
Load Regulation	ΔV_{OUT}	1mA $\leq I_{OUT} \leq$ 50mA		40	80	mV
Dropout Voltage, Note 2	V_{DO}	I_{OUT} = 40mA		120	300	mV
		I_{OUT} = 80mA		380	600	
Ground Current	I_{GND}			2.5	6.0	µA
Line Regulation	$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT} = 20mA 4V $\leq$ -$V_{IN} \leq$ 10V		0.1	0.3	%/V
Output Voltage Temperature Coefficient	$\dfrac{\Delta V_{OUT}}{\Delta T \times V_{OUT}}$	I_{OUT} = 30mA -30°C $\leq$ T $\leq$ 80°C		$\pm$100		ppm/ °C

Notes:

1. I_{OUTMAX} is limited also by the maximum allowable power dissipation for the package.

2. V_{DO} is the input to output differential voltage at which the output voltage drop 2% below V_{OUT}.
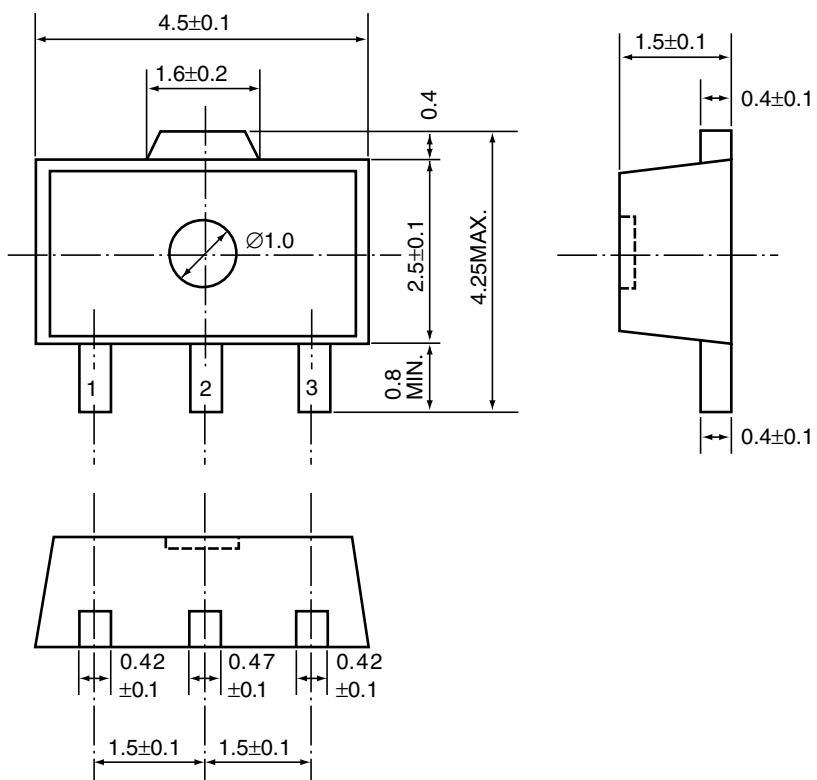
Typical Characteristics

OUTPUT VOLTAGE vs INPUT VOLTAGE

ILC7362CM-30

OUTPUT VOLTAGE vs INPUT VOLTAGE

ILC7362CM-30

OUTPUT VOLTAGE vs OUTPUT CURRENT

ILC7362CM-30

OUTPUT VOLTAGE vs TEMPERATURE

ILC7362CM-30

Mechanical Dimensions

SOT-23-3

$0.4^{+0.1}_{-0.05}$

(0.8)

$0.15^{+0.1}_{-0.05}$

$0~0.1$

2.8 ± 0.2

$1.6^{+1.2}_{-0.1}$

min 0.2

(0.95)

1.9 ± 0.2

1.1 ± 0.1

2.9 ± 0.2

SOT-89-3

Ordering Information

Part Number	V$_{OUT}$ (V)	Temperature Range (°C)	Package
ILC7362CP50X	−5	−30 to +80 °C	SOT89
ILC7362CP30X	−3	−30 to +80 °C	SOT89
ILC7362CM60X	−6	−30 to +80 °C	SOT23
ILC7362CM50X	−5	−30 to +80 °C	SOT23
ILC7362CM30X	−3	−30 to +80 °C	SOT23