

100mA Low Power LDO

General Description

The FC75xx series is a set of three-terminal high current low voltage regulator implemented in CMOS technology. They can deliver 100mA output current and allow an input voltage as high as 24V. CMOS technology ensures low voltage drop and low quiescent current. They are available with several fixed output voltages ranging from 1.5V to 5.0V. In addition, output voltage can be set internally. It is selectable in 0.1V increments within a range of 1.5V to 5.0V.

Features

- Ultra low quiescent current: 3.5 μ A typically
- Maximum output current: 100mA
- High input voltage (up to 24V)
- Output voltage: 1.5V~ 5.0V (0.1V increments)
- Low dropout voltage
- Output voltage accuracy: tolerance $\pm 3\%$
- Low temperature coefficient

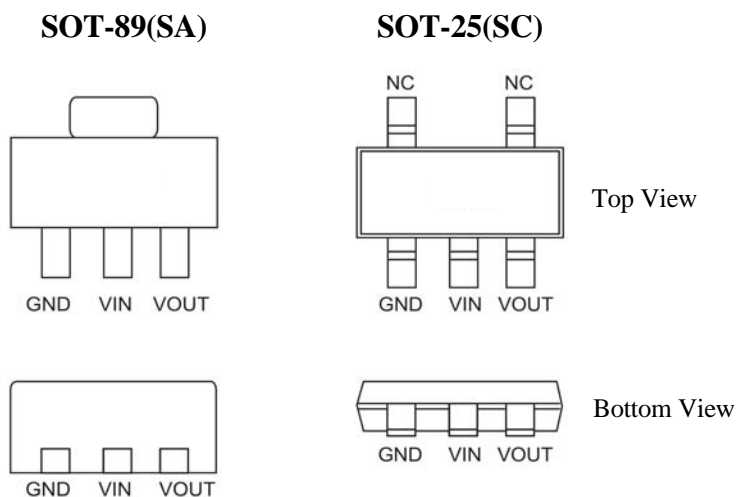
Applications

- Battery-powered equipment
- Reference voltage sources
- Cameras, Video cameras
- Portable AV systems
- Communication tools
- Portable games

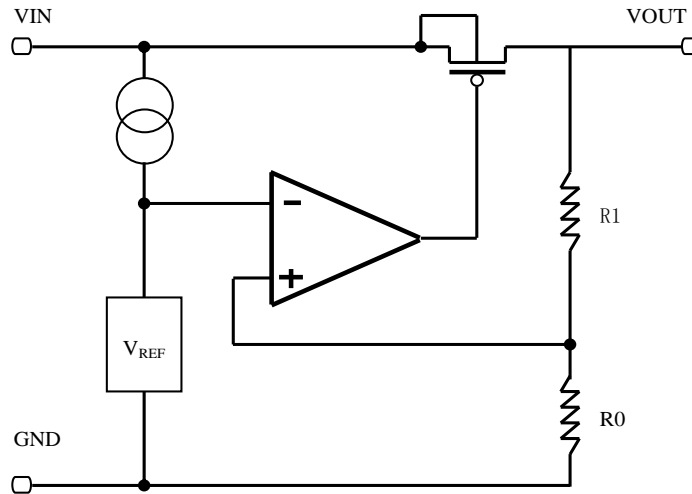
Selection Table

Model No. (Package)	Output Voltage	Tolerance	Marking
FC75xxSA (SOT-89) FC75xxSC (SOT-25)	1.5V	$\pm 3\%$	FC75xxSA for SOT-89 FC75xxSC for SOT-25
	1.6V	$\pm 3\%$	
	1.8V	$\pm 3\%$	
	2.0V	$\pm 3\%$	
	2.5V	$\pm 3\%$	
	2.8V	$\pm 3\%$	
	3.0V	$\pm 3\%$	
	3.3V	$\pm 3\%$	
	3.6V	$\pm 3\%$	
	4.0V	$\pm 3\%$	
	4.4V	$\pm 3\%$	
	5.0V	$\pm 3\%$	

Pin Configuration



Block Diagram



Absolute Maximum Rating

Parameter	Symbol	Range	Unit
Supply Voltage	V_{DD}	-0.3 ~ +24	V
Power Consumption	SOT-89	P_{C1}	250
	SOT-25	P_{C2}	150
Storage Temperature	T_{STG}	-50 ~ +125	° C
Operating Temperature	T_{OPR}	-40 ~ +85	° C

Note: These are stress ratings only. Stresses exceeding the range specified under “Absolute Maximum Ratings” may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

Electrical Characteristics

FC7515 , +1.5V output type

$T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Testing Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage Tolerance	V_{OUT}	3.5V	$I_{OUT} = 10\text{mA}$	1.455	1.500	1.545	V
Output Current	I_{OUT}	3.5V	-	60	100	-	mA
Load Regulation	ΔV_{OUT}	3.5V	$1\text{mA} \leq I_{OUT} \leq 50\text{mA}$	-	60	150	mV
Voltage Drop	V_{DIF}	-	$I_{OUT} = 1\text{mA}$	-	100	-	mV
Current Consumption	I_{SS}	3.5V	No Load	-	3.5	7	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	$2.5\text{V} \leq V_{IN} \leq 24\text{V}, I_{OUT} = 1\text{mA}$	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	24	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_a}$	3.5V	$0 \leq T_a \leq 70^\circ\text{C}, I_{OUT} = 10\text{mA}$	-	± 0.45	-	mV/°C



FC75XXSA/SC

FC7516 , +1.6V output type

Ta=25 °C

Parameter	Symbol	Testing Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
Output Voltage Tolerance	V _{OUT}	3.6V	I _{OUT} =10mA	1.552	1.600	1.648	V
Output Current	I _{OUT}	3.6V	-	60	100	-	mA
Load Regulation	ΔV _{OUT}	3.6V	1mA ≤ I _{OUT} ≤ 50mA	-	60	150	mV
Voltage Drop	V _{DIF}	-	I _{OUT} =1mA	-	100	-	mV
Current Consumption	I _{SS}	3.6V	No Load	-	3.5	7	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	2.6V ≤ V _{IN} ≤ 24V, I _{OUT} =1mA	-	0.2	-	%/V
Input Voltage	V _{IN}	-	-	-	-	24	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_a}$	3.6V	0 ≤ T _A ≤ 70°C, I _{OUT} =10mA	-	±0.45	-	mV/°C

FC7518 , +1.8V output type

Ta=25 °C

Parameter	Symbol	Testing Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
Output Voltage Tolerance	V _{OUT}	3.8V	I _{OUT} =10mA	1.746	1.800	1.854	V
Output Current	I _{OUT}	3.8V	-	60	100	-	mA
Load Regulation	ΔV _{OUT}	3.8V	1mA ≤ I _{OUT} ≤ 50mA	-	60	150	mV
Voltage Drop	V _{DIF}	-	I _{OUT} =1mA	-	100	-	mV
Current Consumption	I _{SS}	3.8V	No Load	-	3.5	7	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	2.8V ≤ V _{IN} ≤ 24V, I _{OUT} =1mA	-	0.2	-	%/V
Input Voltage	V _{IN}	-	-	-	-	24	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_a}$	3.8V	0 ≤ T _A ≤ 70°C, I _{OUT} =10mA	-	±0.45	-	mV/°C

FC7520 , +2.0V output type

Ta=25 °C

Parameter	Symbol	Testing Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
Output Voltage Tolerance	V _{OUT}	4.0V	I _{OUT} =10mA	1.940	2.000	2.060	V
Output Current	I _{OUT}	4.0V	-	60	100	-	mA
Load Regulation	ΔV _{OUT}	4.0V	1mA ≤ I _{OUT} ≤ 50mA	-	60	150	mV
Voltage Drop	V _{DIF}	-	I _{OUT} =1mA	-	100	-	mV
Current Consumption	I _{SS}	4.0V	No Load	-	3.5	7	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	3.0V ≤ V _{IN} ≤ 24V, I _{OUT} =1mA	-	0.2	-	%/V
Input Voltage	V _{IN}	-	-	-	-	24	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_a}$	4.0V	0 ≤ T _A ≤ 70°C, I _{OUT} =10mA	-	±0.45	-	mV/°C

FC7525 , +2.5V output type

Ta=25 °C

Parameter	Symbol	Testing Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
Output Voltage Tolerance	V _{OUT}	4.5V	I _{OUT} =10mA	2.425	2.500	2.575	V
Output Current	I _{OUT}	4.5V	-	60	100	-	mA
Load Regulation	ΔV _{OUT}	4.5V	1mA ≤ I _{OUT} ≤ 50mA	-	60	150	mV
Voltage Drop	V _{DIF}	-	I _{OUT} =1mA	-	100	-	mV
Current Consumption	I _{SS}	4.5V	No Load	-	3.5	7	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	3.5V ≤ V _{IN} ≤ 24V, I _{OUT} =1mA	-	0.2	-	%/V
Input Voltage	V _{IN}	-	-	-	-	24	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_a}$	4.5V	0 ≤ T _A ≤ 70°C, I _{OUT} =10mA	-	±0.45	-	mV/°C



FC75XXSA/SC

FC7528 , +2.8V output type

Ta=25 °C

Parameter	Symbol	Testing Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
Output Voltage Tolerance	V _{OUT}	4.8V	I _{OUT} =10mA	2.716	2.800	2.884	V
Output Current	I _{OUT}	4.8V	-	60	100	-	mA
Load Regulation	ΔV _{OUT}	4.8V	1mA ≤ I _{OUT} ≤ 50mA	-	60	150	mV
Voltage Drop	V _{DIF}	-	I _{OUT} =1mA	-	100	-	mV
Current Consumption	I _{SS}	4.8V	No Load	-	3.5	7	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	3.8V ≤ V _{IN} ≤ 24V, I _{OUT} =1mA	-	0.2	-	%/V
Input Voltage	V _{IN}	-	-	-	-	24	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_a}$	4.8V	0 ≤ T _A ≤ 70°C, I _{OUT} =10mA	-	±0.45	-	mV/ °C

FC7530 , +3.0V output type

Ta=25 °C

Parameter	Symbol	Testing Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
Output Voltage Tolerance	V _{OUT}	5.0V	I _{OUT} =10mA	2.910	3.000	3.090	V
Output Current	I _{OUT}	5.0V	-	60	100	-	mA
Load Regulation	ΔV _{OUT}	5.0V	1mA ≤ I _{OUT} ≤ 50mA	-	60	150	mV
Voltage Drop	V _{DIF}	-	I _{OUT} =1mA	-	100	-	mV
Current Consumption	I _{SS}	5.0V	No Load	-	3.5	7	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	4.0V ≤ V _{IN} ≤ 24V, I _{OUT} =1mA	-	0.2	-	%/V
Input Voltage	V _{IN}	-	-	-	-	24	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_a}$	5.0V	0 ≤ T _A ≤ 70°C, I _{OUT} =10mA	-	±0.45	-	mV/ °C

FC7533 , +3.3V output type

Ta=25 °C

Parameter	Symbol	Testing Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
Output Voltage Tolerance	V _{OUT}	5.3V	I _{OUT} =10mA	3.201	3.300	3.399	V
Output Current	I _{OUT}	5.3V	-	60	100	-	mA
Load Regulation	ΔV _{OUT}	5.3V	1mA ≤ I _{OUT} ≤ 50mA	-	60	150	mV
Voltage Drop	V _{DIF}	-	I _{OUT} =1mA	-	100	-	mV
Current Consumption	I _{SS}	5.3V	No Load	-	3.5	7	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	4.3V ≤ V _{IN} ≤ 24V, I _{OUT} =1mA	-	0.2	-	%/V
Input Voltage	V _{IN}	-	-	-	-	24	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_a}$	5.3V	0 ≤ T _A ≤ 70°C, I _{OUT} =10mA	-	±0.50	-	mV/ °C

FC7536 , +3.6V output type

Ta=25 °C

Parameter	Symbol	Testing Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
Output Voltage Tolerance	V _{OUT}	5.6V	I _{OUT} =10mA	3.492	3.600	3.708	V
Output Current	I _{OUT}	5.6V	-	60	100	-	mA
Load Regulation	ΔV _{OUT}	5.6V	1mA ≤ I _{OUT} ≤ 50mA	-	60	150	mV
Voltage Drop	V _{DIF}	-	I _{OUT} =1mA	-	100	-	mV
Current Consumption	I _{SS}	5.6V	No Load	-	3.5	7	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	4.6V ≤ V _{IN} ≤ 24V, I _{OUT} =1mA	-	0.2	-	%/V
Input Voltage	V _{IN}	-	-	-	-	24	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_a}$	5.6V	0 ≤ T _A ≤ 70°C, I _{OUT} =10mA	-	±0.60	-	mV/ °C

FC7540, +4.0V output type

Ta=25 °C

Parameter	Symbol	Testing Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
Output Voltage Tolerance	V _{OUT}	6.0V	I _{OUT} =10mA	3.880	4.000	4.120	V
Output Current	I _{OUT}	6.0V	-	60	100	-	mA
Load Regulation	ΔV _{OUT}	6.0V	1mA ≤ I _{OUT} ≤ 50mA	-	60	150	mV
Voltage Drop	V _{DIF}	-	I _{OUT} =1mA	-	100	-	mV
Current Consumption	I _{SS}	6.0V	No Load	-	3.5	7	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	5.0V ≤ V _{IN} ≤ 24V, I _{OUT} =1mA	-	0.2	-	%/V
Input Voltage	V _{IN}	-	-	-	-	24	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_a}$	6.0V	0 ≤ T _A ≤ 70°C, I _{OUT} =10mA	-	±0.65	-	mV/°C

FC7544, +4.4V output type

Ta=25 °C

Parameter	Symbol	Testing Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
Output Voltage Tolerance	V _{OUT}	6.4V	I _{OUT} =10mA	4.268	4.400	4.532	V
Output Current	I _{OUT}	6.4V	-	60	100	-	mA
Load Regulation	ΔV _{OUT}	6.4V	1mA ≤ I _{OUT} ≤ 50mA	-	60	150	mV
Voltage Drop	V _{DIF}	-	I _{OUT} =1mA	-	100	-	mV
Current Consumption	I _{SS}	6.4V	No Load	-	3.5	7	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	5.4V ≤ V _{IN} ≤ 24V, I _{OUT} =1mA	-	0.2	-	%/V
Input Voltage	V _{IN}	-	-	-	-	24	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_a}$	6.4V	0 ≤ T _A ≤ 70°C, I _{OUT} =10mA	-	±0.70	-	mV/°C

FC7550, +5.0V output type

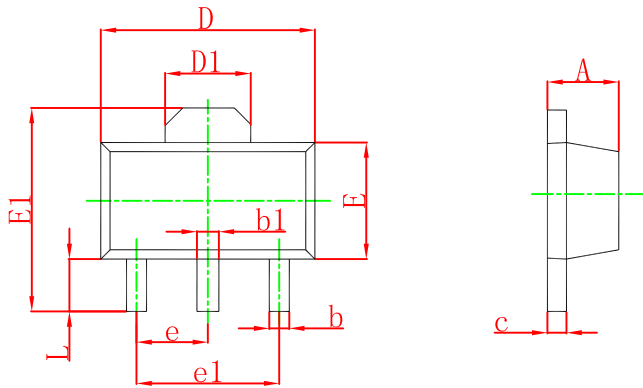
Ta=25 °C

Parameter	Symbol	Testing Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
Output Voltage Tolerance	V _{OUT}	7.0V	I _{OUT} =10mA	4.850	5.000	5.150	V
Output Current	I _{OUT}	7.0V	-	60	100	-	mA
Load Regulation	ΔV _{OUT}	7.0V	1mA ≤ I _{OUT} ≤ 50mA	-	60	150	mV
Voltage Drop	V _{DIF}	-	I _{OUT} =1mA	-	100	-	mV
Current Consumption	I _{SS}	7.0V	No Load	-	3.5	7	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	6.0V ≤ V _{IN} ≤ 24V, I _{OUT} =1mA	-	0.2	-	%/V
Input Voltage	V _{IN}	-	-	-	-	24	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_a}$	7.0V	0 ≤ T _A ≤ 70°C, I _{OUT} =10mA	-	±0.70	-	mV/°C

FC75xx, +xxV output type, Ta=25 °C, xx is specified output voltage selectable in 0.1V increments within a range of 1.5V to 5.0V

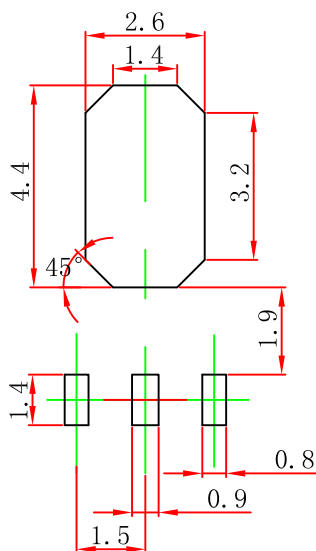
Parameter	Symbol	Testing Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
Output Voltage Tolerance	V _{OUT}	(2+xx)V	I _{OUT} =10mA	0.97 × xx	1.00 × xx	1.03 × xx	V
Output Current	I _{OUT}	(2+xx)V	-	60	100	-	mA
Load Regulation	ΔV _{OUT}	(2+xx)V	1mA ≤ I _{OUT} ≤ 50mA	-	60	150	mV
Voltage Drop	V _{DIF}	-	I _{OUT} =1mA	-	100	-	mV
Current Consumption	I _{SS}	(2+xx)V	No Load	-	3.5	7	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	(1+xx)V ≤ V _{IN} ≤ 24V, I _{OUT} =1mA	-	0.2	-	%/V
Input Voltage	V _{IN}	-	-	-	-	24	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_a}$	(2+xx)V	0 ≤ T _A ≤ 70°C, I _{OUT} =10mA	-	±0.70	-	mV/°C

SOT- 89 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

SOT- 89 Suggested Pad Layout



Note:
 1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.

SOT-23-5 Package Outline Dimensions

