

IP Library: Very Low Power, Adjustable Output Voltage², 25mA Low Dropout Voltage Regulator

PRODUCT PREVIEW

- ANALOG BASEBAND REGULATOR
- VERY LOW DROPOUT VOLTAGE : 60mV
- HIGH PSRR: 60dB
- LOW QUIESCENT CURRENT
- 20µA STD-BY MODE CURRENT
- NO CURRENT IN POWER DOWN MODE
- SHORT CIRCUIT PROTECTION
- SMALL DECOUPLING CERAMIC CAPACITOR

TYPICAL APPLICATIONS

- Cellular and Cordless phones supplied by 1 cell Lithium-ion battery / 3 cells Ni-MH or Ni-Cd battery.
- PDA (Personal Digital Assistant), Smart phone.
- Portable equipment.
- Supply for Digital (DSP/Microcontroller) devices.

APPLICATION NOTE

An external capacitor (C_{OUT} = 1 μ F typical) with an equivalent serial resistance (ESR) in the range 0.02 to 0.6 Ω is used to ensure stability.

Figure 1: Block Diagram

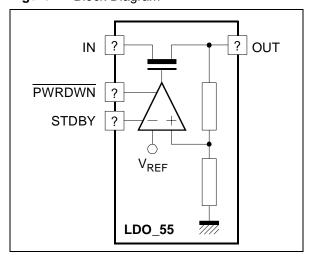
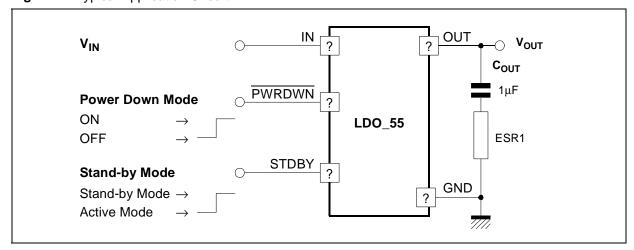


Figure 2: Typical Application Circuit



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ELECTRICAL CHARACTERISTICS

 $3V < V_{IN} < 5.5V, -30^{\circ}C < T < +125^{\circ}C, \, 0.8\mu F < C_{OUT} < 1.2\mu F, \, 20m\Omega < ESR < 0.6\Omega, \, 100\mu A < I_{LOAD} < 25mA.$

Typical case : $V_{IN} = 4V$, T = 25°C, $I_{OUT} = 12.5$ mA.

Parameter	Symbol	Test Condition	Min	Тур	Max	Unit
Input Voltage Range (Note 1)	V _{IN}		3		5,5	V
Output Voltage	V _{OUT}	Adj = 0		1,8		V
		Adj = 1		3		
Output Voltage Accuracy				3		%
Output current	I _{OUT}	Active mode	0,1		25	mA
		Sleep mode	5		500	μΑ
P _{MOS} Output Resistance	R _{ON}				0,6	Ω
Dropout Voltage	ΔV_{DO}	$\Delta V_{OUT} = 50 \text{mV},$ $I_{LOAD} = 25 \text{mA}$			60	mV
		(Note 2)	170			
Quiescent current	l _Q	$I_{LOAD} = 100 \mu A$,		30	40	μΑ
		$I_{LOAD} = 25mA$		60	80	μΑ
Stand-by mode current	I _{QSTDBY}	$I_{LOAD} = 500\mu A$ $V_{OUT} = 3V$		20	30	μΑ
Power down mode quiescent current	I _{QPRWDWN}	Power down active		100	1 000	nA
Power Supply Rejection Ratio	PSRR	f < 10KHz	40	50		dB
Load Regulation	Ldr			15	25	mV
Line Regulation	Lir	I _{LOAD} = 25mA		5	10	mV
Line Transient	Lirt	$\Delta V_{IN} = 300 \text{mV}$ $t_{RISE} = t_{FALL} = 10 \mu \text{s}$			1	mV
Load Transient	Ldtr	10% to 90% and 90% to 10% of 25mA in 10μs			1	mV
Output decoupling capacitor	C _{OUT}			1		μF
Settling time (from power down to active mode)	t _{RISE}	From power down to active mode		30	70	μs
	t _{FALL}	From active mode to power down		60	200	μs
Short Circuit Current Limit	I _{SHORT}		100	200	250	mA

Notes: 1. Above characteristics are given for 3V minimum input operating range voltage, but regulator is operational with 2.7V minimum input voltage.

2. All parameters are guaranteed with 170mV Dropout voltage.

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