LDO_55

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} = 1µF typical) with an equivalent serial resistance (ESR) in the range 0.02 to 0.6Ω is used to ensure stability.

Figure 1 : Block Diagram

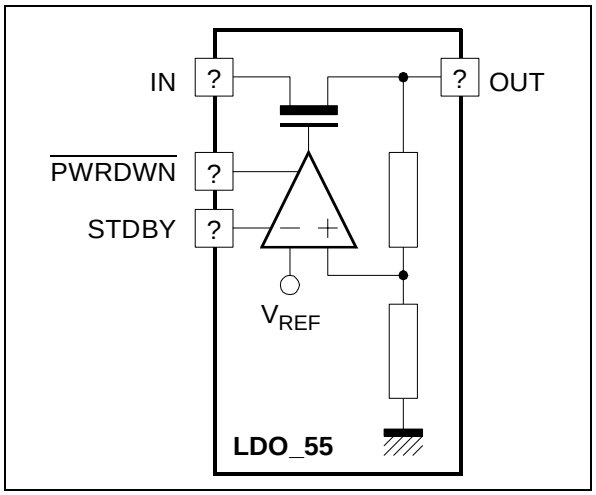
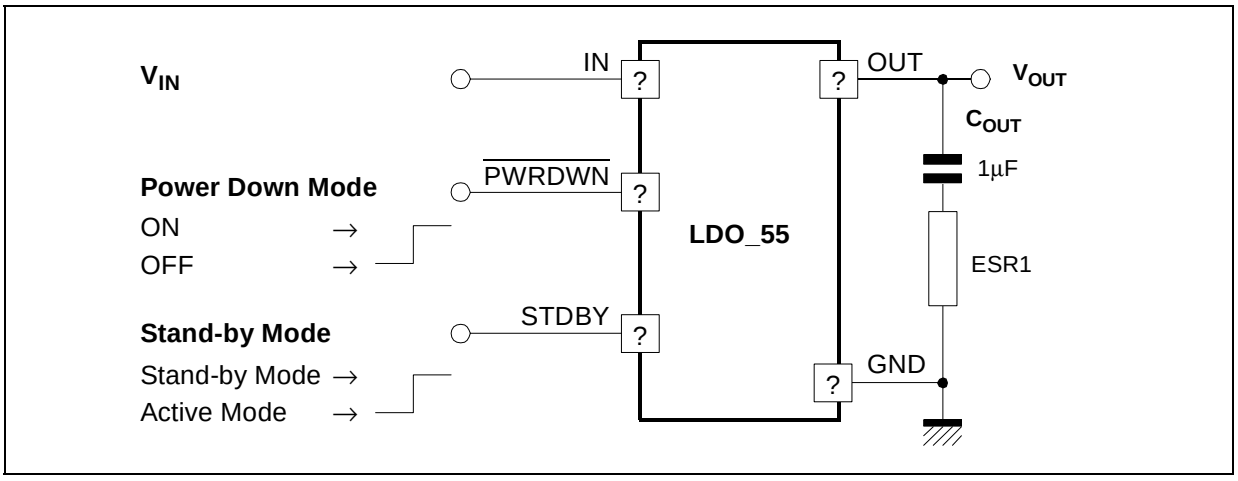


Figure 2 : Typical Application Circuit



ELECTRICAL CHARACTERISTICS

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

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

Parameter	Symbol	Test Condition	Min	Typ	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	µA
P_{MOS} Output Resistance	R_{ON}				0,6	Ω
Dropout Voltage	ΔV_{DO}	ΔV_{OUT} = 50mV, I_{LOAD} = 25mA			60	mV
		(Note 2)	170			
Quiescent current	I_Q	I_{LOAD} = 100µA,		30	40	µA
		I_{LOAD} = 25mA		60	80	µA
Stand-by mode current	I_{QSTDBY}	I_{LOAD} = 500µA V_{OUT} = 3V		20	30	µA
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	ΔV_{IN} = 300mV $t_{RISE} = t_{FALL}$ = 10µs			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.