LDOC_516

IP Library: High PSRR, Low Power, 100mA Low Dropout Voltage Regulator

PRODUCT PREVIEW

- CMOS REGULATOR
- VERY LOW DROPOUT VOLTAGE : 50mV
- LOW CONSUMPTION : 170µA FULL LOAD
- LOW NOISE : 200µV
- HIGH PSRR : 55dB
- OUTPUT CURRENT : 100mA
- SMALL OUTPUT DECOUPLING CAPACITOR
- NO CURRENT IN POWER DOWN MODE
- SHORT CIRCUIT PROTECTION

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 RF devices for cellular phone

APPLICATION NOTE

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

Figure 1 : Block Diagram

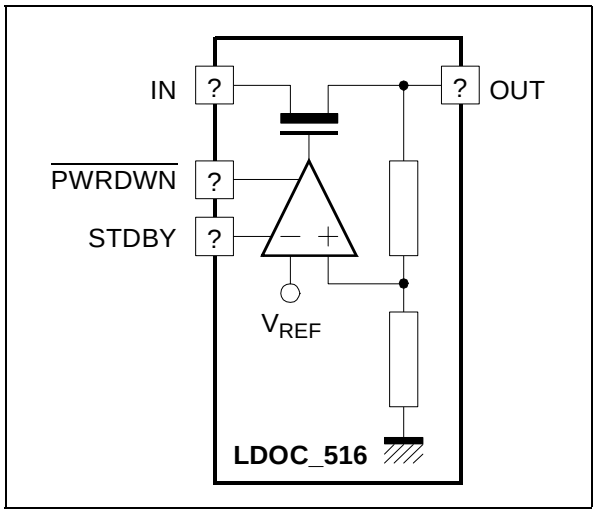
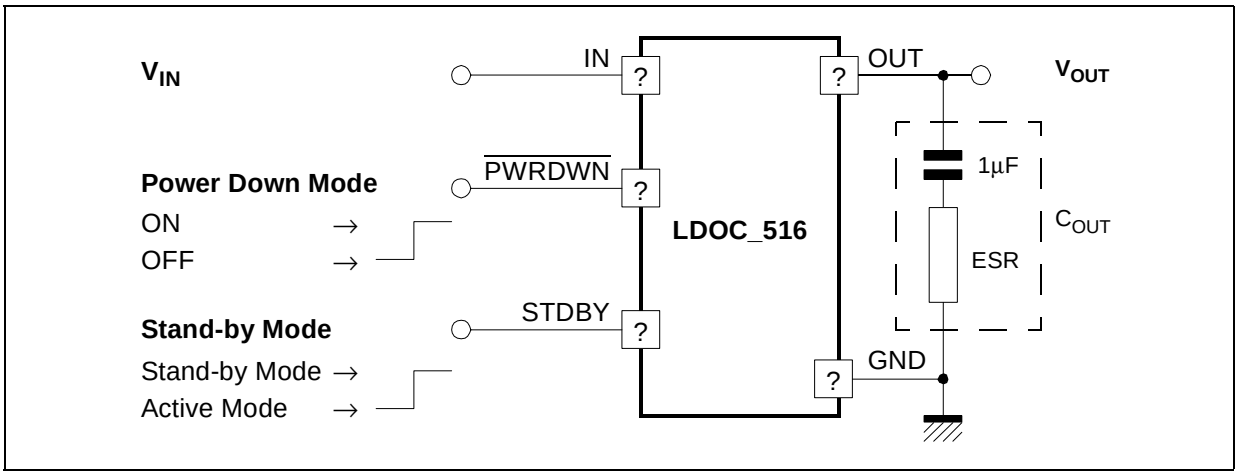


Figure 2 : Typical Application Circuit



This is advance information on a new product now in development or undergoing evaluation. Details are subject to change without notice.

ELECTRICAL CHARACTERISTICS

3V < V_{IN} < 5.5V, -55°C < T_A < +125°C, C_{OUT} = 1µF ±20%, 20mΩ < ESR < 0.6Ω, I_{LOAD} = 100mA.
Typical case : V_{IN} = 4V, T = 25°C, C_{OUT} = 1µF.

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input Voltage Range (Note 1)	V_{IN}		3		5.5	V
Output Voltage	V_{OUT}			2.8		V
Output Voltage Accuracy				3		%
Output current	I_{OUT}				100	mA
Dropout Voltage	ΔV_{DO}	ΔV_{OUT} = 50mV, I_{LOAD} = 100mA			50	mV
		(Note 2)	200			
Quiescent current	I_Q	I_{LOAD} = 100µA		45	65	µA
		I_{LOAD} = 100mA		600	750	
Power down mode quiescent current	I_{QPDM}	Power down active		100		nA
Power Supply Rejection Ratio	PSRR	DC ; Dropout = 200mV	40	55		dB
		f = 10KHz	40	55		
		f = 100KHz	35	45		
Line Regulation	L_{IR}	I_{LOAD} = 100mA, V_{IN} = 3V to 5.5V		3.5	6.5	mV
Load Regulation	L_{DR}	I_{LOAD} = 100µA - 100mA		20	25	mV
Line Transient	L_{IRT}	ΔV_{IN} = 300mV $t_{RISE} = t_{FALL}$ = 5µs			1	mV
Load Transient	L_{DTR}	I_{LOAD} = 100µA - 100mA in 5µs		2		mV
Output Noise Voltage	en	100Hz		1.2		$\frac{\mu V}{\sqrt{Hz}}$
		1KHz		400		$\frac{nV}{\sqrt{Hz}}$
		10KHz		200		
	en_{RMS}	BW : 100Hz to 100KHz		60		μV_{RMS}
Output decoupling Capacitor	C_{OUT}			1		µF
Settling time		I_{LOAD} = 100mA		15	40	µs
Short Circuit Current Limit	I_{SHORT}			400	700	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 200mV min Dropout voltage.

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