



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 ($C_{OUT} = 1\mu\text{F}$) with an equivalent serial resistance (ESR) in the range 0.02 to 0.6Ω is used for regulator stability.

Figure 1 : Block Diagram

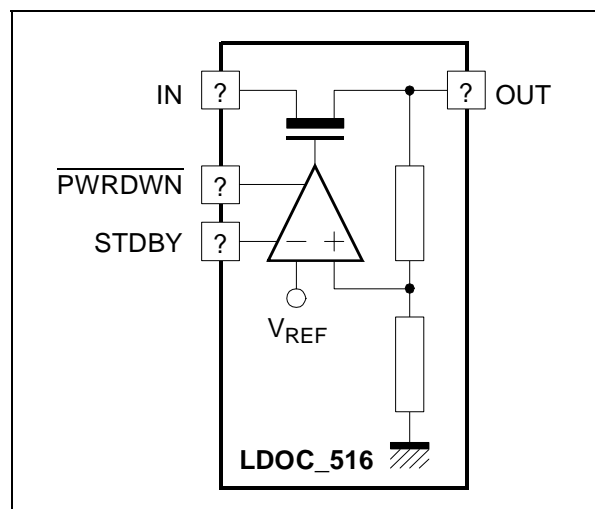
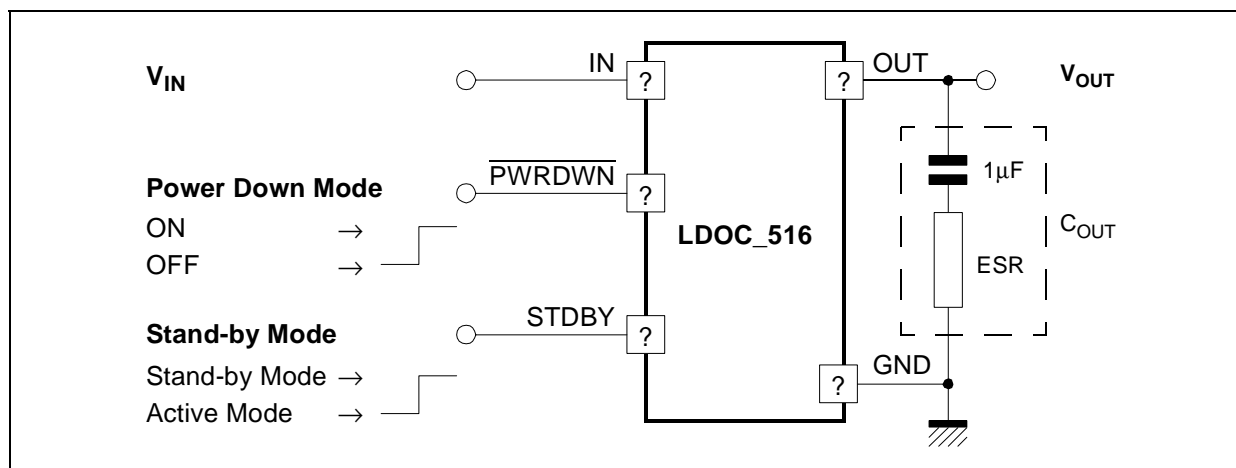


Figure 2 : Typical Application Circuit



ELECTRICAL CHARACTERISTICS

$3V < V_{IN} < 5.5V$, $-55^{\circ}C < T_A < +125^{\circ}C$, $C_{OUT} = 1\mu F \pm 20\%$, $20m\Omega < ESR < 0.6\Omega$, $I_{LOAD} = 100mA$.

Typical case : $V_{IN} = 4V$, $T = 25^{\circ}C$, $C_{OUT} = 1\mu F$.

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}	$\Delta V_{OUT} = 50mV$, $I_{LOAD} = 100mA$			50	mV
		(Note 2)	200			
Quiescent current	I_Q	$I_{LOAD} = 100\mu A$		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}	$I_{LOAD} = 100mA$, $V_{IN} = 3V \text{ to } 5.5V$		3.5	6.5	mV
Load Regulation	L_{DR}	$I_{LOAD} = 100\mu A - 100mA$		20	25	mV
Line Transient	L_{IRT}	$\Delta V_{IN} = 300mV$ $t_{RISE} = t_{FALL} = 5\mu s$			1	mV
Load Transient	L_{DTR}	$I_{LOAD} = 100\mu A - 100mA$ in $5\mu s$		2		mV
Output Noise Voltage	en	100Hz		1.2		$\frac{\mu V}{\sqrt{Hz}}$
		1KHz		400		$\frac{nV}{\sqrt{Hz}}$
		10KHz		200		$\frac{nV}{\sqrt{Hz}}$
	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.

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 2002 STMicroelectronics - All Rights Reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco
Singapore - Spain - Sweden - Switzerland - United Kingdom - United States

<http://www.st.com>