



LDOC_515

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

PRODUCT PREVIEW

- CMOS REGULATOR
- VERY LOW CONSUMPTION : 170 μ A FULL LOAD
- VERY LOW DROPOUT VOLTAGE : 50mV
- HIGH PSRR : 60dB
- OUTPUT CURRENT : 100mA
- 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 ($C_{OUT} = 4.7\mu F$) with an equivalent serial resistance (ESR) in the range 0.02 to 0.6 Ω is used for regulator stability.

Figure 1 : Block Diagram

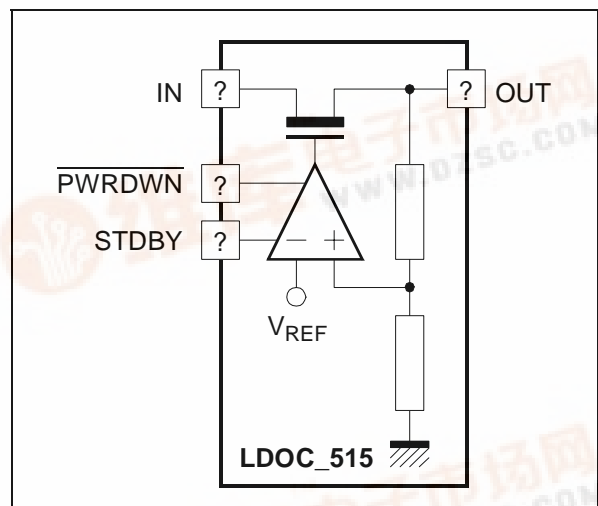
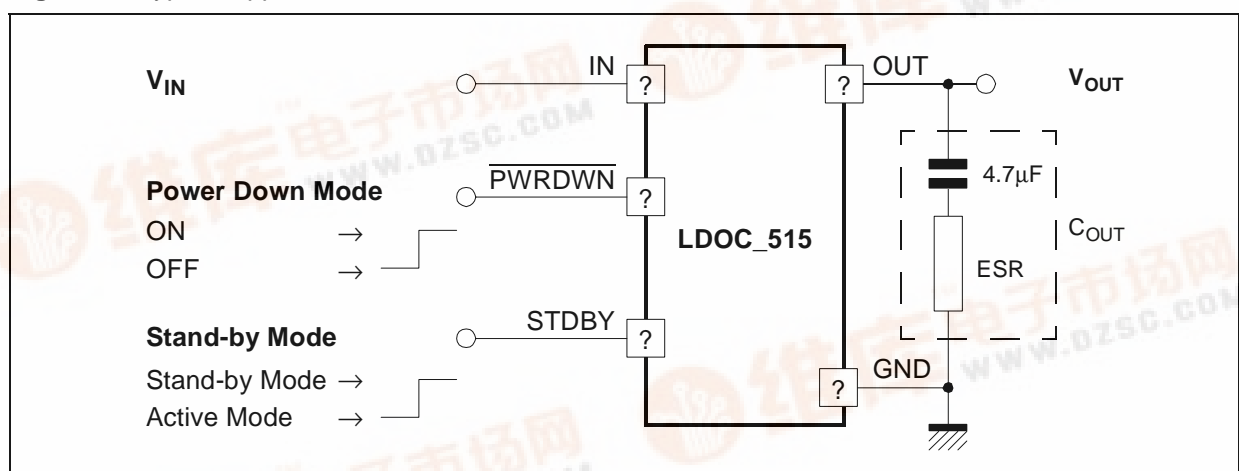


Figure 2 : Typical Application Circuit



ELECTRICAL CHARACTERISTICS

3V < V_{IN} < 5.5V, -30°C < T_A < +85°C, C_{OUT} = 4.7μF ±20%, 20mΩ < ESR < 0.6Ω, I_{LOAD} = 100mA.

Typical case : V_{IN} = 4V, T = 25°C, C_{OUT} = 4.7μF.

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)	150			
Quiescent current	I _Q	I _{LOAD} = 100μA		30	40	μA
		I _{LOAD} = 100mA		170	220	
Power down mode quiescent current	I _{QPDM}	Power down active		100		nA
Power Supply Rejection Ratio	PSRR	DC ; Dropout = 200mV		60		dB
		f = 10KHz	40	55		
		f = 100KHz	35	40		
Line Regulation	L _{IR}	I _{LOAD} = 100mA, V _{IN} = 3V to 5.5V		2.5	3.5	mV
Load Regulation	L _{DR}	I _{LOAD} = 100μA - 100mA		25	35	mV
Line Transient	L _{IRT}	ΔV _{IN} = 300mV t _{RISE} = t _{FALL} = 5μs		<1	1.5	mV
Load Transient	L _{DTR}	I _{LOAD} = 100μA - 100mA in 5μs		1	2	mV
Output Noise Voltage	en	100Hz		2		$\frac{\mu V}{\sqrt{Hz}}$
		1KHz		650		$\frac{nV}{\sqrt{Hz}}$
		10KHz		250		
	en _{RMS}	BW : 100Hz to 100KHz		70		μV _{RMS}
Output decoupling Capacitor	C _{OUT}			4.7		μF
Settling time		I _{LOAD} = 100mA		40	120	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 150mV min Dropout voltage.

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