LDOC_515

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

PRODUCT PREVIEW

- CMOS REGULATOR
- VERY LOW CONSUMPTION : 170µA 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} = 4.7µF) with an equivalent serial resistance (ESR) in the range 0.02 to 0.6Ω is used for regulator stability.

Figure 1 : Block Diagram

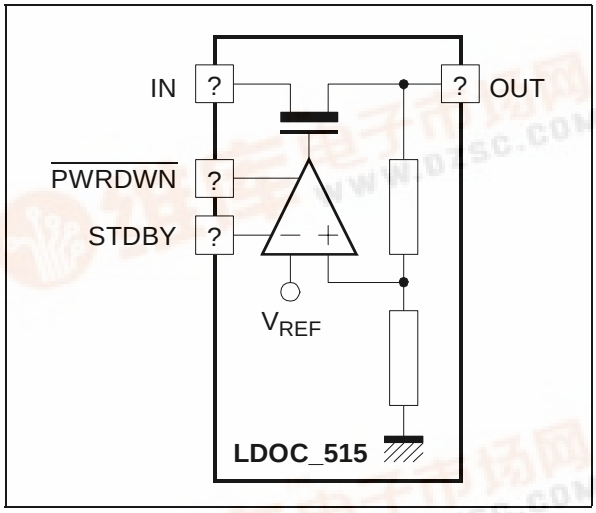
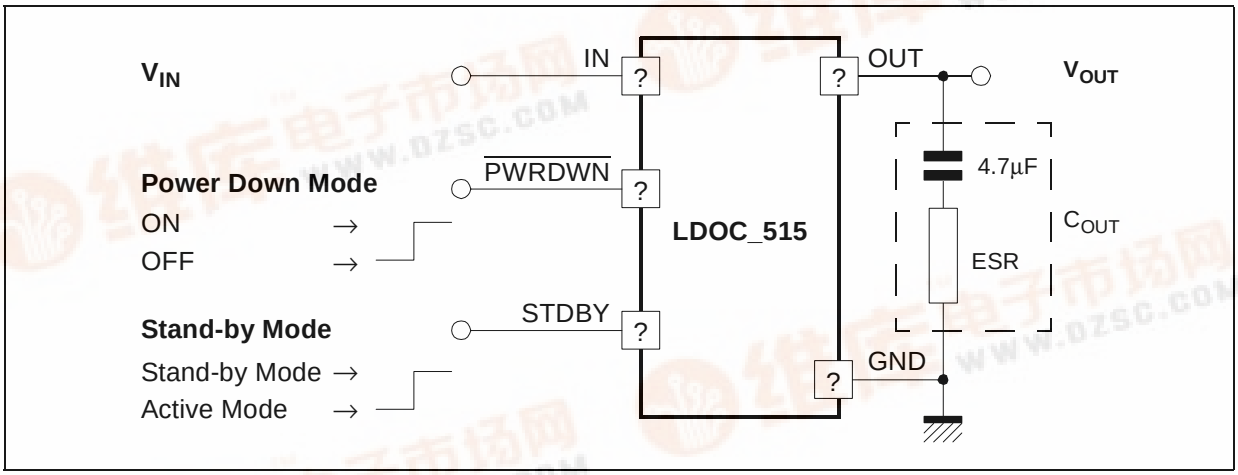


Figure 2 : Typical Application Circuit



ELECTRICAL CHARACTERISTICS

$3V < V_{IN} < 5.5V$, $-30°C < T_A < +85°C$, $C_{OUT} = 4.7\mu F \pm 20\%$, $20m\Omega < ESR < 0.6\Omega$, $I_{LOAD} = 100mA$.
Typical case : $V_{IN} = 4V$, $T = 25°C$, $C_{OUT} = 4.7\mu F$.

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}	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.