36V Low Current Consumption 300mA CMOS Voltage Regulator

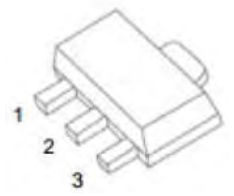
CJ75XXS

INTRODUCTION

The CJ75XXS Series are a group of positive voltage regulators manufactured by CMOS technologies with low power consumption and low dropout voltage, which provide large output currents even when the difference of the input-out-put voltage is small.

The CJ75XXS Series can deliver 300 mA output current and allow an input voltage as high as 36V. The series are very suitable for the battery powered equipments, such as RF applications and other systems requiring a quiet voltage source.

SOT-89-3L



1.GND
2.IN
3.OUT

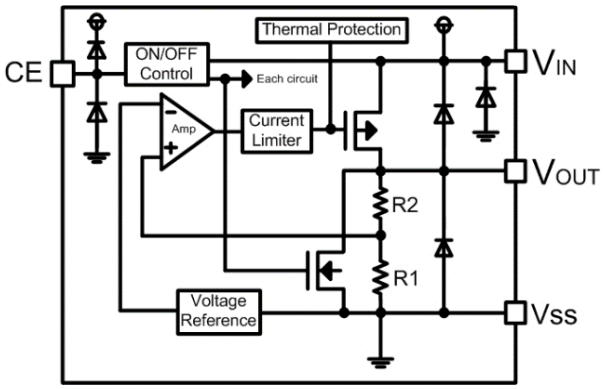
FEATURES

- Low Quiescent Current: 2μA
- Operating Voltage Range: 2.5V～36V
- Output Current: 300mA
- Low Dropout Voltage：
  200mV@100mA(V_{OUT}=3.3V)
- Output Voltage: 1.2~ 12V
- High Accuracy: ±2%(Typ.)
- High Power Supply Rejection Ratio:
  70dB@1kHz
- Low Output Noise:
  27xV_{OUT} μV_{RMS}(10Hz~100kHz)
- Excellent Line and Load Transient Response
- Built-in Current Limiter, Short-Circuit Protection
- Over-Temperature Protection

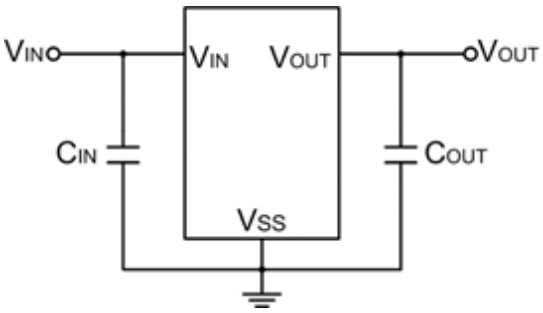
APPLICATIONS

- Cordless Phones
- Radio control systems
- Laptop, Palmtops and PDAs
- Single-lens reflex DSC
- PC peripherals with memory
- Wireless Communication Equipments
- Portable Audio Video Equipments
- Car Navigation Systems
- LAN Cards
- Ultra Low Power Microcontrollers

BLOCK DIAGRAM



TYPICAL APPLICATION CIRCUIT



For CJ75XXS series, input and output capacitors are required to achieve stability and help the equipment obtain better transient response and PSRR. It is recommended to use 1μF input and 1μF output capacitors.

Electrical Characteristics

ABSOLUTE MAXIMUM RATINGS

(Unless otherwise specified, T_A=25℃)

PARAMETER	SYMBOL	RATINGS	UNITS
Input Voltage(2)	V_{IN}	-0.3~40	V
Output Voltage(2)	V_{OUT}	-0.3~13	V
Power Dissipation	P_D	0.6	W
Operating Ambient Temperature Range	T_A	-40~+85	°C
Operating Junction Temperature Range(3)	T_j	-40~+125	°C
Storage Temperature	T_{stg}	-40~+125	°C
Lead Temperature(Soldering, 10 sec)	T_{solder}	260	°C
ESD rating	Human Body Model -(HBM)	2	kV
	Machine Model- (MM)	200	V

(1) Stresses beyond those listed under *absolute maximum ratings may* cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under *recommended operating conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods my affect device reliability.

(2) All voltages are with respect to network ground terminal.

(3) This IC includes over temperature protection that is intended to protect the device during momentary overload. Junction temperature will exceed 125°C when over temperature protection is active. Continuous operation above the specified maximum operating junction temperature may impair device reliability.

RECOMMENDED OPERATING CONDITIONS

PARAMETER	MIN.	NOM.	MAX.	UNITS
Supply voltage at V_{IN}	2.5		36	V
Operating junction temperature range, T_j	-40		125	°C
Operating free air temperature range, T_A	-40		85	°C

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, TA=25°C)

PARAMETER	SYMBOL	CONDITIONS		MIN.	TYP.(4)	MAX.	UNITS
Input Voltage	V_{IN}			2.5	—	36	V
Output Voltage Range	V_{OUT}			2.1	—	12	V
DC Output Accuracy		I_{OUT}=1mA		-2	—	2	%
Dropout Voltage	V_{dif}(5)	I_{OUT} =100mA,V_{OUT}=3.3V		—	200	—	mV
Supply Current	I_{SS}	I_{OUT}=0A	1.2≤V_{OUT}≤7.0V	—	2	5	μA
			7.0<V_{OUT}≤12V	—	3	6	μA
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta V_{IN}}$	I_{OUT} =10mA V_{OUT} +1V≤V_{IN}≤36V		—	0.01	0.3	%/V
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT} +1V, 1mA≤I_{OUT}≤100mA		—	10	—	mV
Temperature Coefficient	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta T_A}$	I_{OUT}=10mA, -40°C<T_j<125°C			50		ppm
Output Current Limit	I_{LIM}	V_{OUT}= 0.5 x $V_{OUT(Normal)}$, Vin=5.0V		350	600		mA
Short Current	I_{SHORT}	V_{OUT} =V_{SS}		—	100	—	mA
Power Supply Rejection Ratio	PSRR	I_{OUT}=50mA	100Hz		75		dB
			1kHz	—	70	—	
			10kHz	—	55	—	
			100kHz	—	40	—	
Output Noise Voltage	V_{ON}	BW=10Hz to 100kHz		—	27 x V_{OUT}	—	μV_{RMS}
Thermal Shutdown Temperature	T_{SD}	——		—	160	—	°C
Thermal Shutdown Hysteresis	ΔT_{SD}	——		—	20	—	°C

(4) Typical numbers are at 25°C and represent the most likely norm.

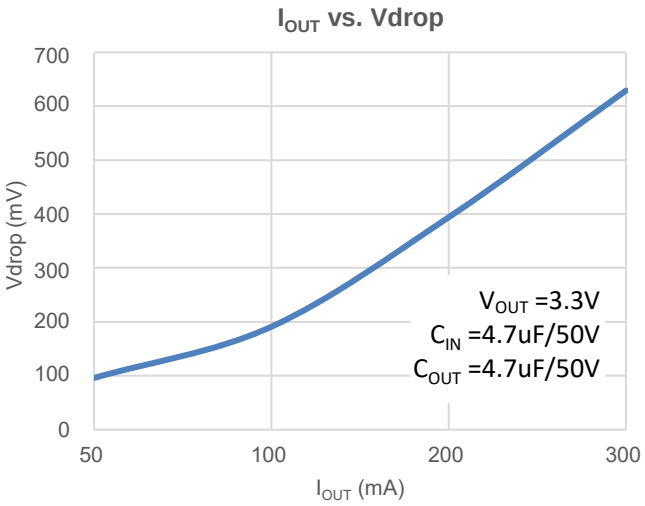
(5)V_{dif}: The Difference Of Output Voltage And Input Voltage When Input Voltage Is Decreased Gradually Till Output Voltage Equals To 98% Of V_{OUT} (E).

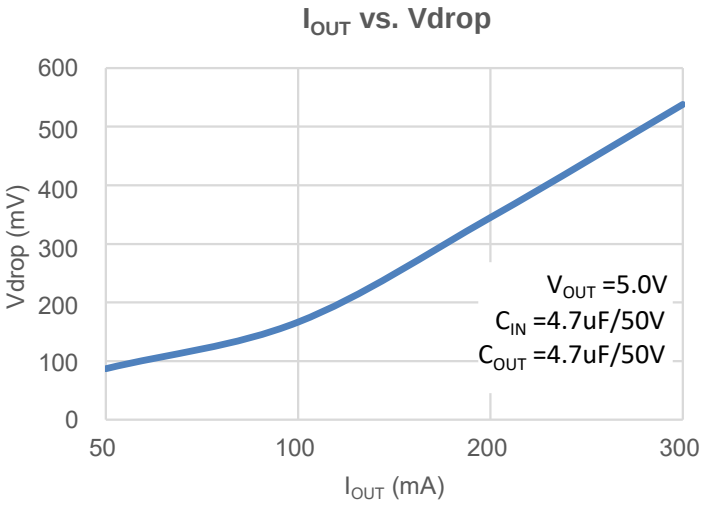
MODEL DEFINITION INFORMATION

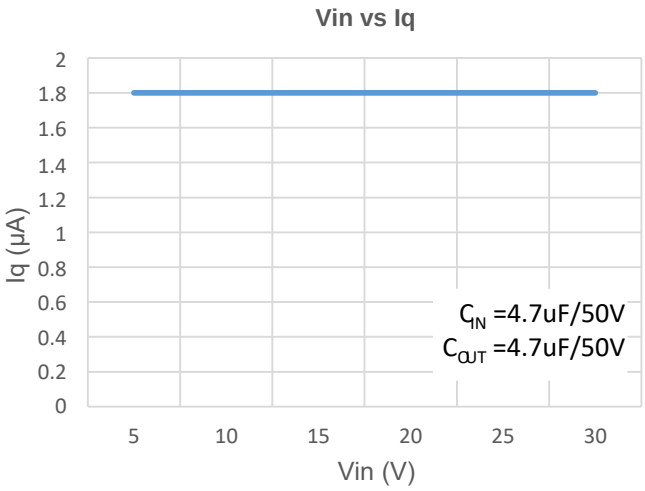
Model	Output Voltage
CJ7533S	3.3V
CJ7550S	5.0V
CJ75C0S	12.0V

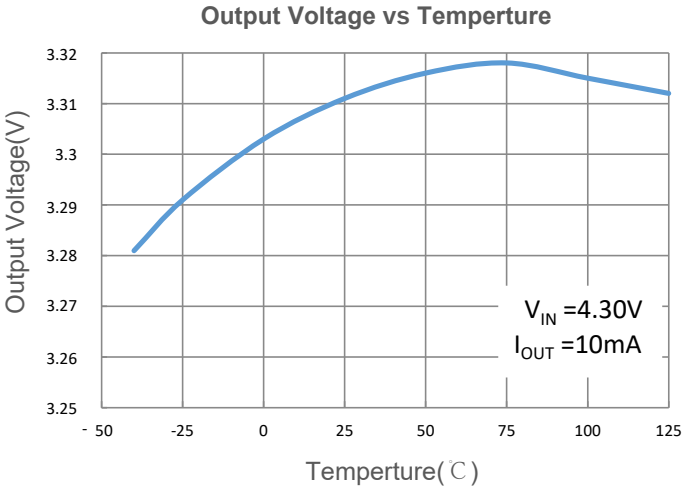
Typical Characteristics

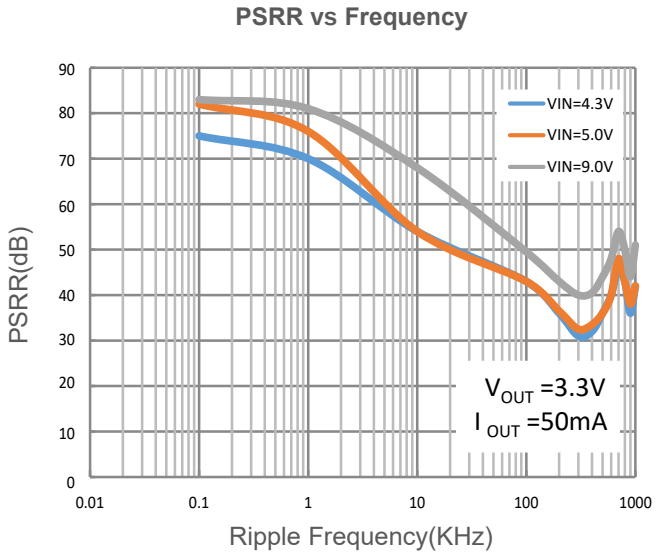
(Unless otherwise specified, T_A=25°C)







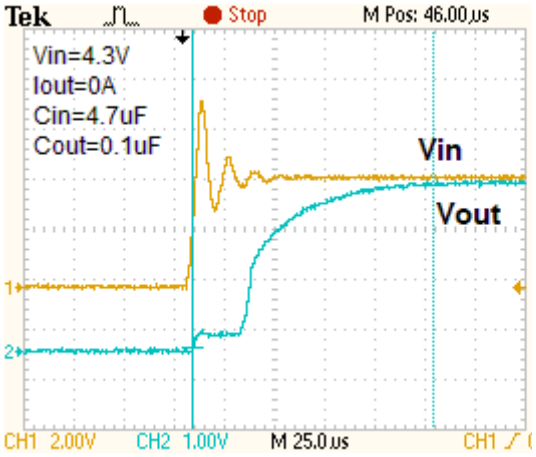




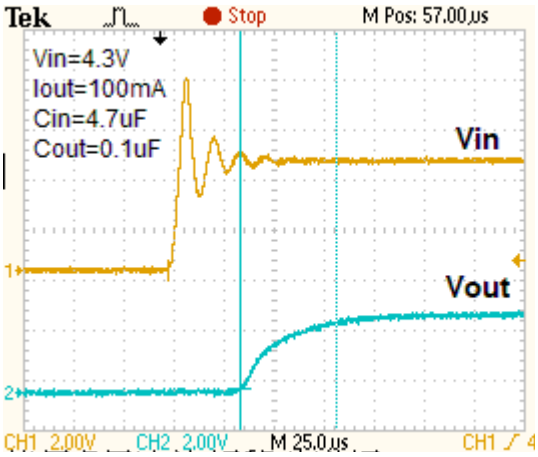
Typical Characteristics

(Unless otherwise specified, T_A=25°C)

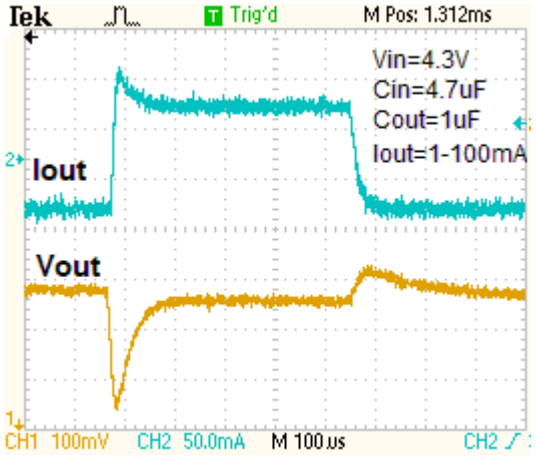
Power Up Response



Power Up Response



Load Transient Response



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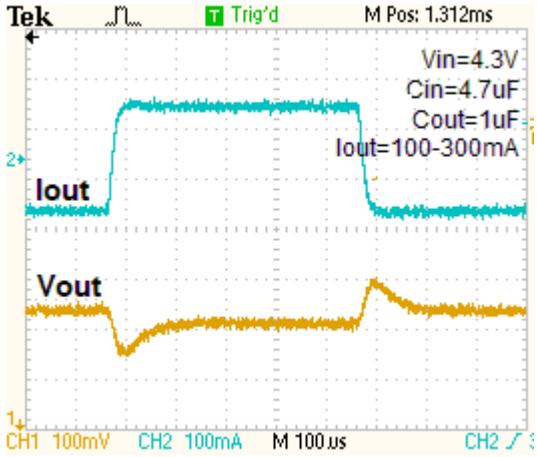
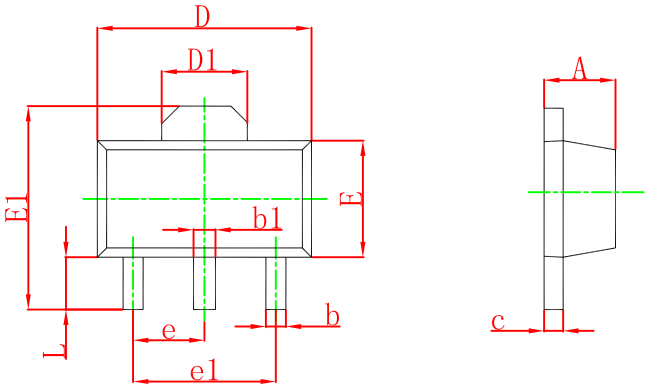
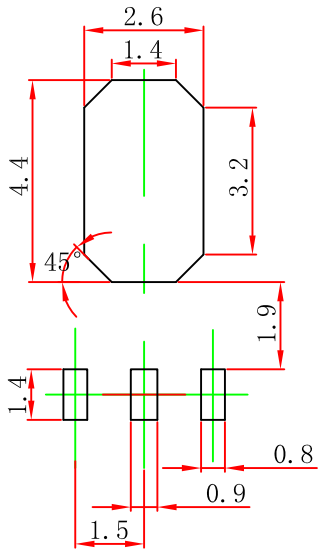


SOT-89-3L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060 TYP	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.200	0.035	0.047

SOT-89-3L Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

DISCLAIMER

IMPORTANT NOTICE, PLEASE READ CAREFULLY

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