45V Low Current Consumption 250mA CMOS Voltage Regulator

CJ86L05

■ INTRODUCTION

CJ86L05 is a positive voltage regulator manufactured by CMOS technology. It has the characteristics of low power consumption and low voltage. Even if the difference between input and output voltage is very small, it can also provide large output current.

CJ86L05 can provide 250 mA output current, allowing input voltage up to 45 V. Therefore, CJ86L05 is very suitable for battery powered devices, such as RF applications and other systems requiring quiet voltage sources.

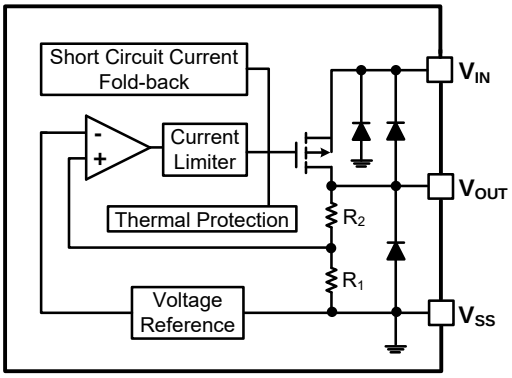
■ FEATURES

- Low Quiescent Current: 2μA
- Operating Voltage Range: 2.5V ~ 45V
- Output Current: 250mA
- Low Dropout Voltage: 700mV@100mA(V_{OUT} = 3.3V)
- Output Voltage: 5V ± 2%
- 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
- Stable with Ceramic or Tantalum Capacitor

■ APPLICATIONS

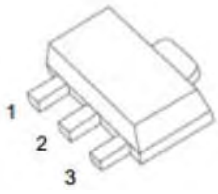
- Cordless Phones
- Radio Control Systems
- Laptop, Palmtops and PDAs
- Single-lens Reflex DSC
- PC Peripherals with Memory
- LAN Cards
- Ultra Low Power Microcontrollers
- Wireless Communication Equipments
- Portable Audio Video Equipments
- Car Navigation Systems

BLOCK DIAGRAM

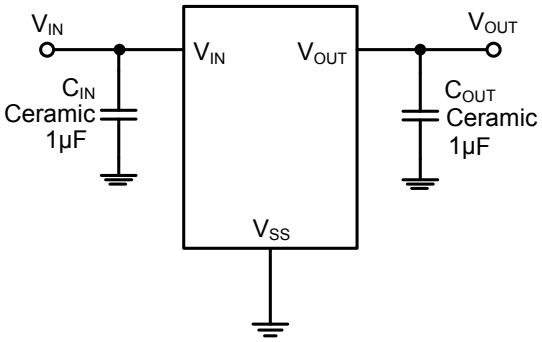


■ PACKAGE

SOT-89-3L



1.V_{OUT} 2.GND 3.V_{IN}



■ ABSOLUTE MAXIMUM RATINGS(1)

(Unless otherwise specified, T_A=25°C)

PARAMETER	SYMBOL	RATINGS	UNITS
Input Voltage(2)	V_{IN}	-0.3~50	V
Output Voltage(2)	V_{OUT}	5±2%	V
Output Current	I_{OUT}	250	mA
Power Dissipation	P_D	0.6	W
Operating Ambient Temperature Range(3)	T_A	-40~+85	°C
Operating Junction Temperature Range(3)	T_j	-40~+125	°C
Storage Temperature	T_{stg}	-40~+125	°C
Soldering Temperature	T_{solder}	260°C, 10s	

(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 over-load. 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		45	V
Operating junction temperature range, T_j	-40		125	°C
Operating Ambient temperature range, T_A	-40		85	°C

Electrical Characteristics

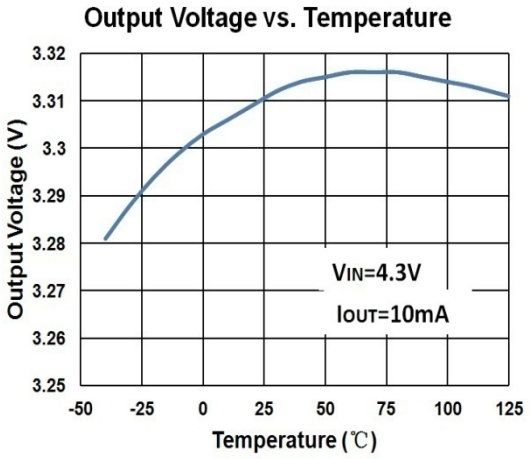
CJ86L05 **(V_{IN}=V_{OUT}+2V, C_{IN}=C_{OUT}=1μF, T_A=25℃, unless otherwise specified)**

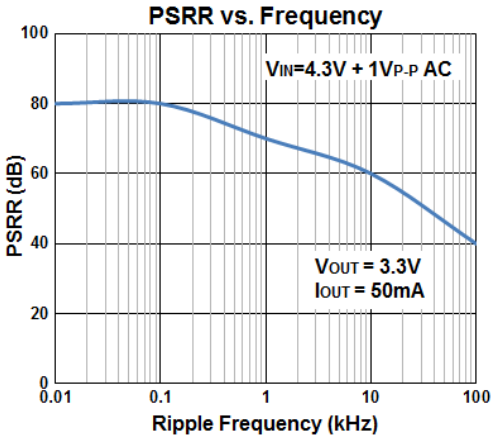
PARAMETER	SYMBOL	CONDITIONS		MIN.	TYP.(4)	MAX.	UNITS
Input Voltage	V_{IN}			2.5	—	45	V
Output Voltage Range	V_{OUT}				5		V
DC Output Accuracy		I_{OUT}=10mA		-2	—	2	%
Dropout Voltage	V_{dif}(5)	I_{OUT} =100mA, V_{OUT}=3.3V		—	700	—	mV
Supply Current	I_{SS}	I_{OUT}=0A		—	2	10	μA
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta V_{IN}}$	I_{OUT} =10mA V_{OUT} +1V≤V_{IN}≤36V		—	0.01	0.3	%/V
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT} +2V, 1mA≤I_{OUT}≤100mA		—	8	—	mV
Temperature Coefficient	$\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta T_A}$	I_{OUT}=40mA, -40°C<T_A<85°C			50		ppm
Output Current Limit	I_{LIM}	V_{OUT}= 0.5 x $V_{OUT(Normal)}$			260		mA
Short Current	I_{SHORT}	V_{OUT} =V_{SS}		—	30	—	mA
Power Supply Rejection Ratio	PSRR	I_{OUT}=50mA	100Hz		80		dB
			1kHz	—	70	—	
			10kHz	—	60	—	
			100kHz	—	50	—	
Output Noise Voltage	V_{ON}	BW=10Hz to 100kHz		—	27 x V_{OUT}	—	μV_{RMS}
Thermal Shutdown Temperature	T_{SD}	I_{LOAD} = 30mA		—	160	—	°C
Thermal Shutdown Hysteresis	ΔT_{SD}	——		—	20	—	°C

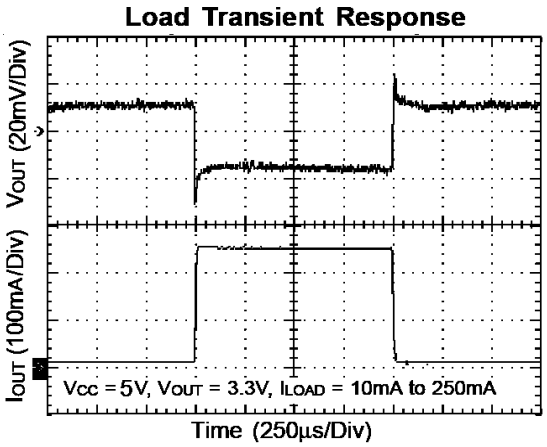
(4) Typical numbers are at 25°C and represent the most likely norm.

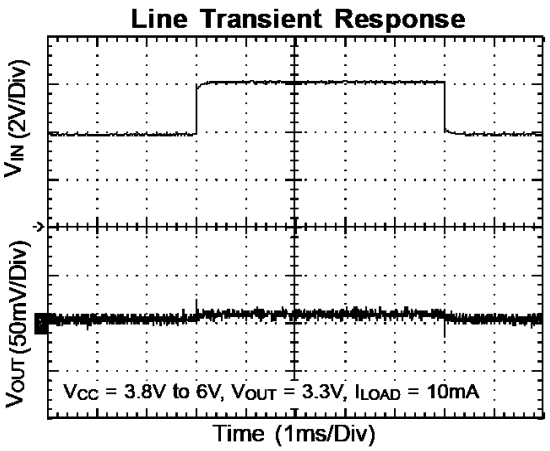
(5)V_{dif}: The Difference Of Output Voltage And Input Voltage When Input Voltage Is Decreased Gradually Till Output Voltage Equals To 98% Of V_{OUT} (E).

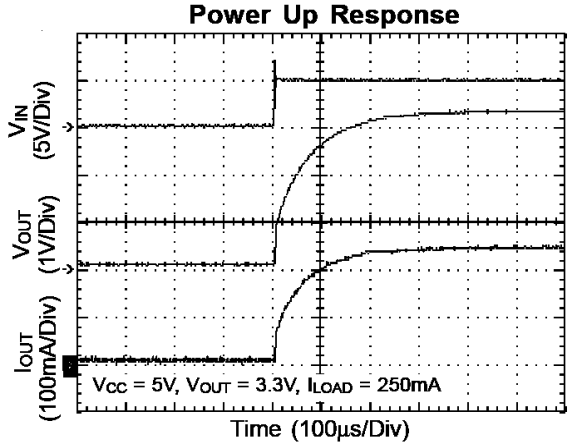
Typical Characteristics

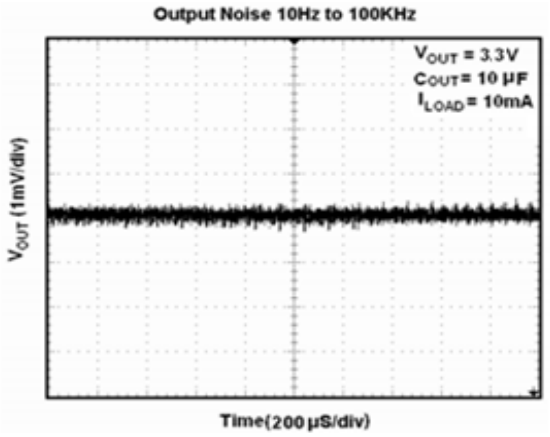




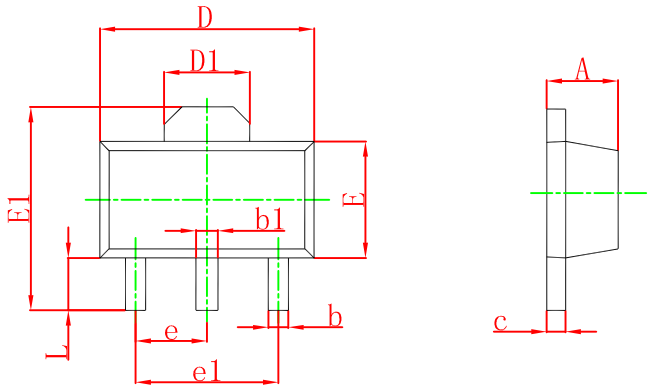






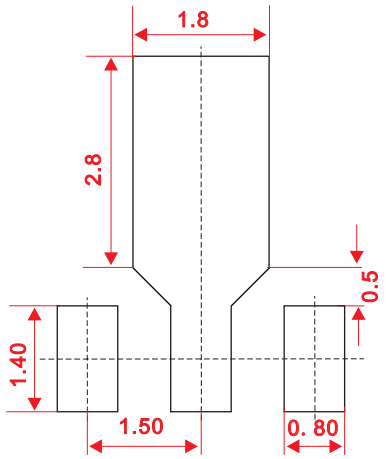


SOT-89-3L Package Outline Dimensions



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	0.020
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.

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