High Input Very-Low I_Q 200mA LDO

General Description

JC78L05C-(A/B) is the high input very low I_Q 200mA LDO, is designed specifically for portable battery-powered applications which require ultra-low quiescent current. The very-low consumption of type 2.5uA ensures long battery life and dynamic transient buck feature improves device transient response for wireless communication applications.

JC78L05C-(A/B) is offered SOT89-3 package

Features

- Wide input voltage range from 5V to36V
- Up to 200mA Load Current
- Very low I_Q is 2.5μA typical
- Low dropout is 420mV at 100mA Load @V_{OUT}=5V
- Low dropout is 670mV at 150mA Load @V_{OUT}=5V
- Short current protection is100mA
- Excellent load/line transient response
- Line regulation is 0.01%/V typical
- Package is SOT89-3

Label information

JC78L05C-(A/B)

Package : SOT89-3
A：1% B：2%
Output Voltage Output Voltage is 5.0V

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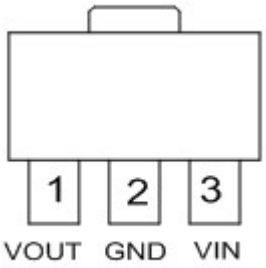
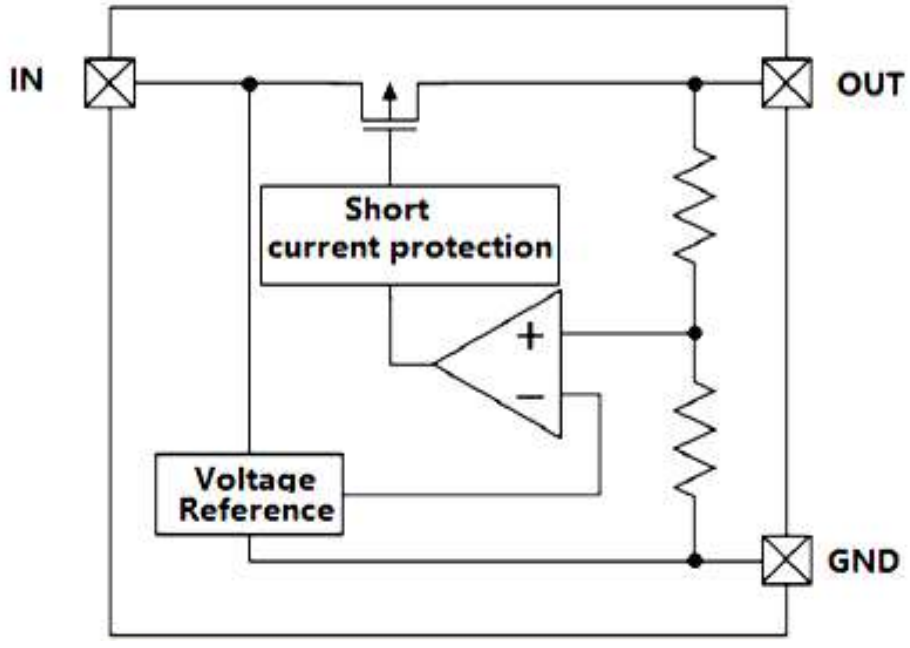
http://www.qunchi.com

Pin Configuration



Top View

Block Diagram



Functional Description

Input Capacitor

Aluminum electrolytic capacitor with capacitance above 100uF is recommended to connect between V_{IN} and GND pins to decouple input power supply glitchand noise and avoid overshoot voltage. The amount of the capacitance may be increased without limit. This input capacitor must be located as close as possible to the VIN and GND pins to assure input stability and less noise. For PCB layout, a wide copper trace is required for both V_{IN} and GND.

Output Capacitor

An output capacitor is required for the stability of the LDO. The recommended output capacitance is from 1μF to 10μF, Equivalent Series Resistance (ESR) is from 5mΩ to 100mΩ, and temperature characteristics areX7R or X5R.Higher capacitance values help to improve load/line transient response. The output capacitance may be increased to keep low undershoot/overshoot. Place output capacitor as close as possible to OUT and GND pins.

Low Quiescent Current

The JC78L05C-(A/B) consuming only around 2.5μA for all input range and output loading, provides great power saving in portable and low power applications.

Short Current Limit Protection

When output current at the OUT pin is higher than current limit threshold or the OUT pin is short-circuit to GND, the short current limit protection will be triggered and clamp the output current to approximately 100mA to prevent over-current and to protect the regulator from damage due to overheating.

Absolute Maximum Ratings

Parameter	Rating		Unit
IN pin to GND pin	-0.3 to 40.0		V
OUT pin to GND pin	-0.3 to 6.0		V
Thermal Resistance (Junction to Ambient)	SOT89-3	135	℃/W
Power Dissipation @25℃	SOT89-3	750	mW
Operating Junction Temperature	-40 to 125		℃
Storage Temperature	-65 to 150		℃
Lead Temperature (Soldering, 10 sec)	300		℃
ESD (HBM mode)	ESDA/JEDEC JS-001-2017		±2000V

Electrical Characteristics

JC78L05C-(A/B)

(V_{IN}= 7V, T_a= 25°，C_{IN}=1uF，C_{OUT}=1uF unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage Operation Range	V_{IN}		5		36	V
Dropout Voltage	V_{DROP}	V_{OUT}=5V, I_{OUT} = 150mA		670	900	mV
		V_{OUT}=5V, I_{OUT} = 100mA		420	600	
DC Supply Quiescent Current	I_Q			2.5	4	μA
Regulated Output Voltage (A)	V_{OUT}	I_{OUT}=1mA	4.95		5.05	V
Regulated Output Voltage (B)	V_{OUT}	I_{OUT}=1mA	4.90		5.10	V
Output Voltage Line Regulation	Reg_{LINE}	V_{IN} = V_{OUT} +1V to 30V, I_{OUT} = 10mA （$\Delta V_{OUT}/\Delta V_{IN}/V_{OUT}$）		0.01	0.04	%/V
Output Voltage Load Regulation	Reg_{LOAD}	I_{OUT} from 1mA to 150mA V_{IN}=V_{OUT}+2V		5	20	mv
		I_{OUT} from 1mA to 150mA V_{IN}=10V		25	60	mv
Maximum Output Current	I_{OUT}	V_{IN} = V_{OUT} +1V	150			mA
Short Current Protection	I_{SHORT}	OUT short to GND		100		mA
Output Noise	e_N	10Hz to 100kHz, I_{OUT} =30mA		120		μV_{RMS}

Typical Performance Characteristics

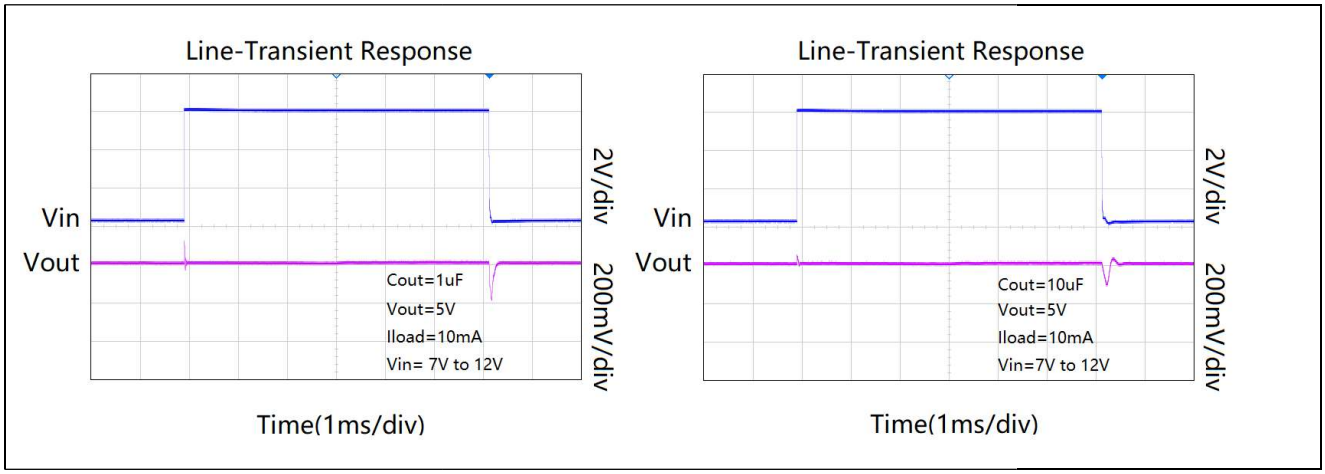


Fig1. Line-Transient Response

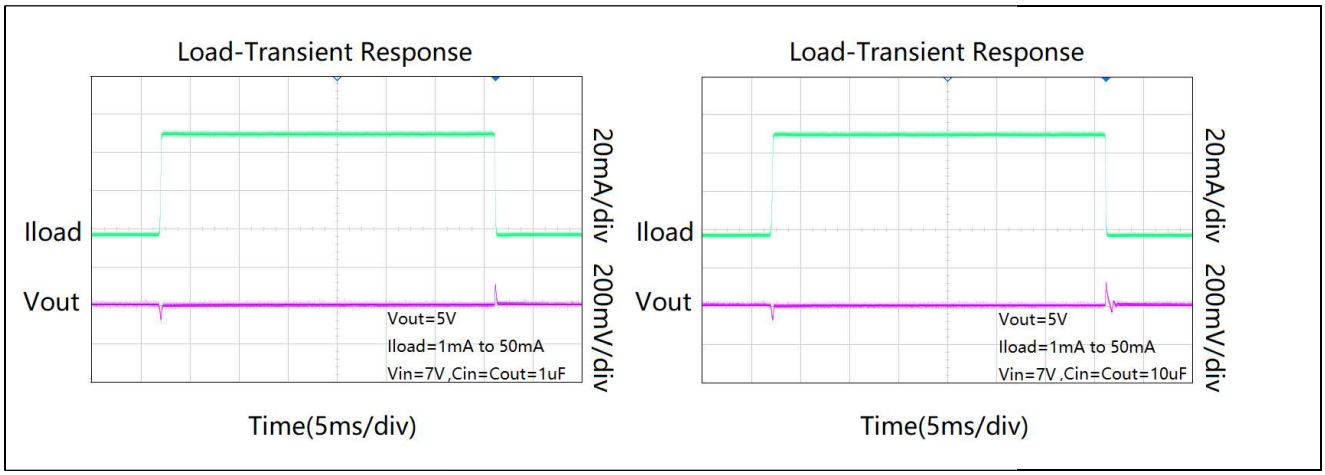


Fig2. Load-Transient Response

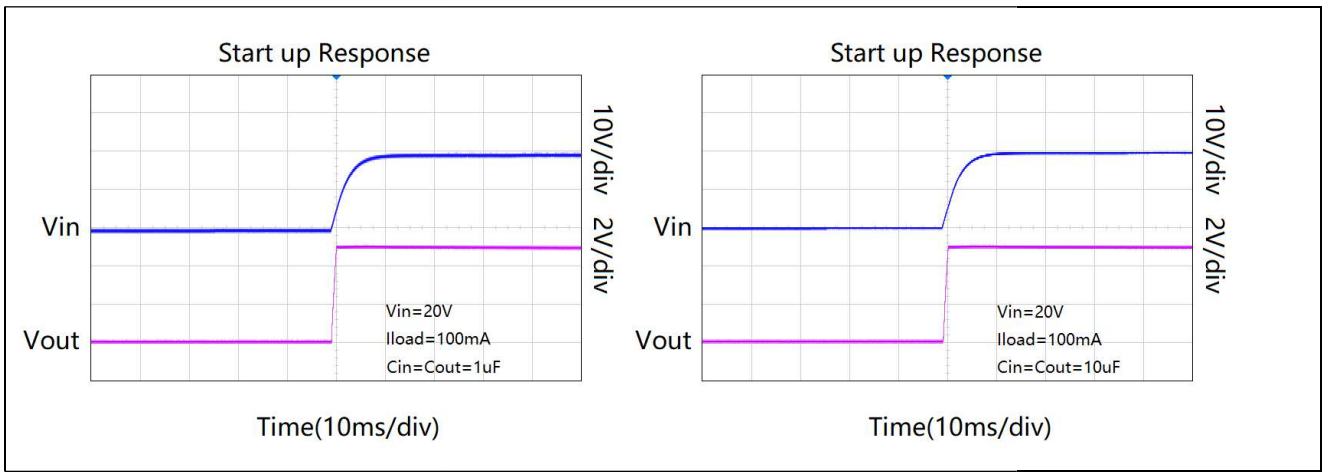


Fig3. Startup Response

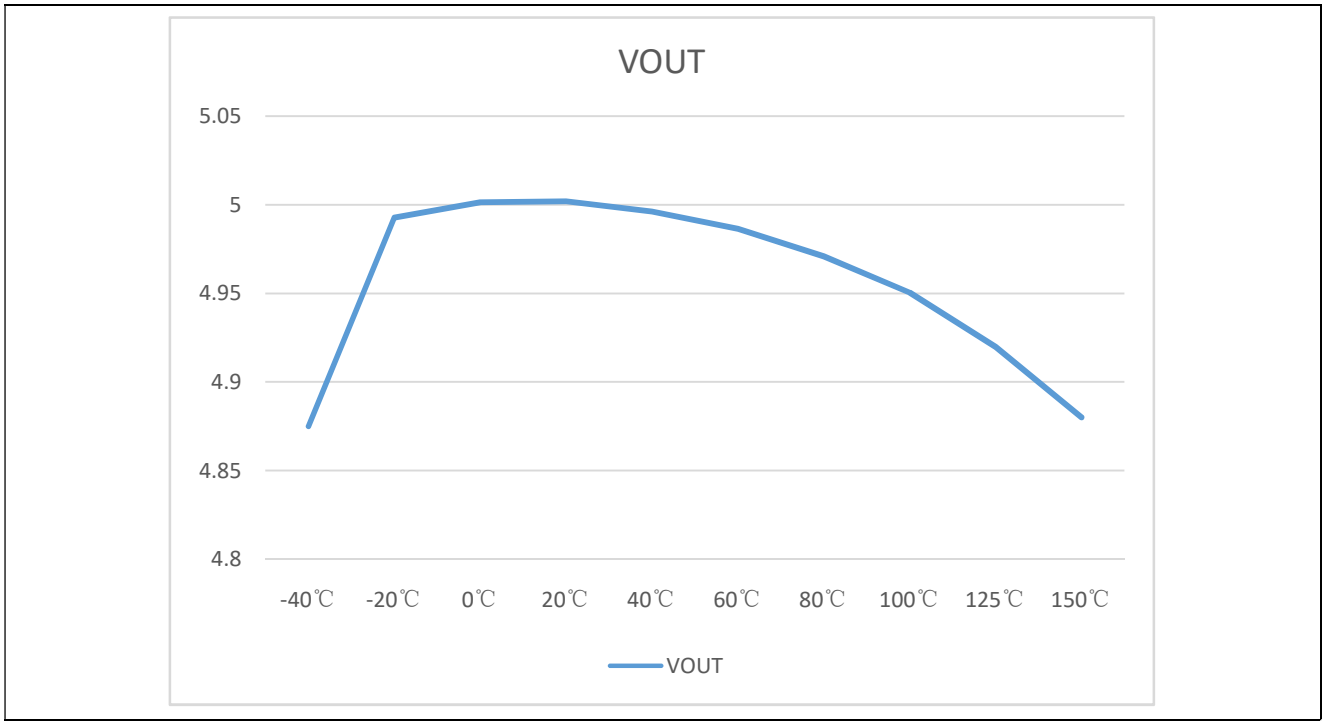
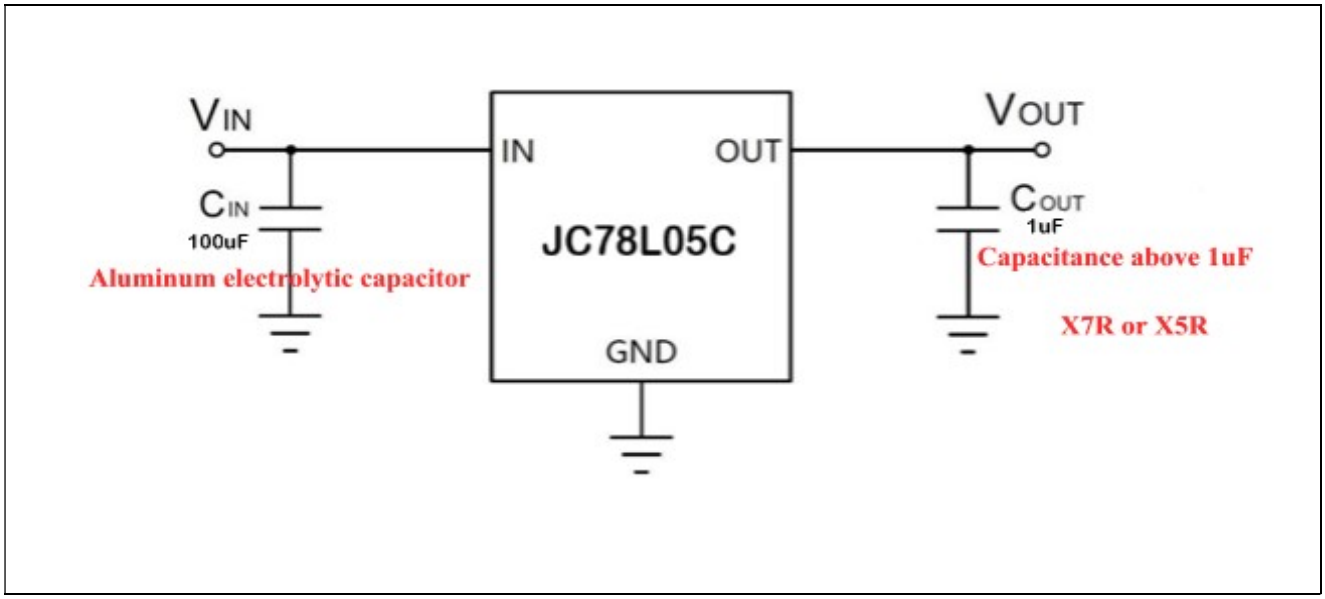


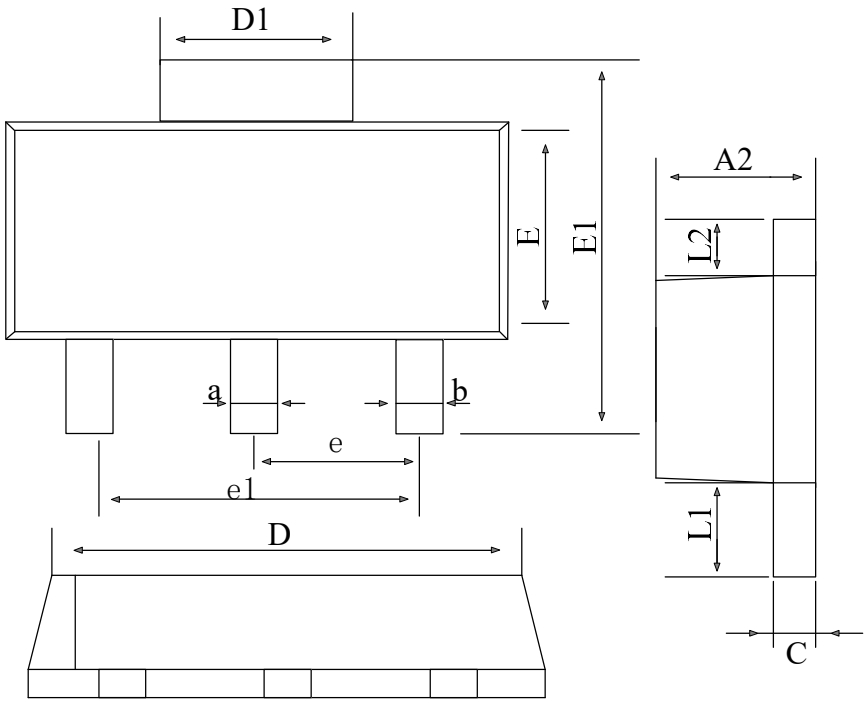
Fig4. V_{OUT} VS Temperature

Application Circuits



Package Dimension

SOT89-3



REF.	Millimeter	
	Min.	Max.
A2	1. 4	1. 6
a	0. 45	0. 55
b	0. 38	0. 48
c	0. 36	0. 46
D	4. 40	4. 60
D1	1. 60	1. 80
E	2. 40	2. 60
E1	4. 00	4. 30
e	1. 00	2. 00
e1	2. 95	3. 05
L1	0. 80	1. 00
L2	0. 65	0. 75

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作者:	上海集驰电子有限公司
关键词:	
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