



DESCRIPTION

The A78L05B-Q is fix 5V monolithic integrated circuit voltage regulators are suitable for applications that required supply current up to 100mA.

The A78L05B-Q is available in SOT89-3 and SOP8 packages.

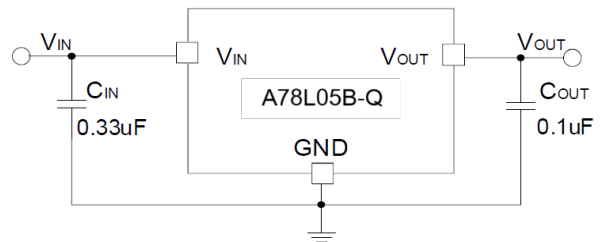
FEATURES

- Maximum Output current: 0.1A
- Output Voltage: 5V
- Thermal Overload Protection
- 2% Output Voltage Accuracy

ORDERING INFORMATION

Package Type	Part Number	
SOT89-3 SPQ: 1,000pcs/Reel	K3	A78L05BK3R-Q
		A78L05BK3VR-Q
SOP8 SPQ: 3,000pcs/Reel	M8	A78L05BM8R-Q
		A78L05BM8VR-Q
Note	V: Halogen free Package R: Tape & Reel Q: AEC-Q	
AiT provides all RoHS products		

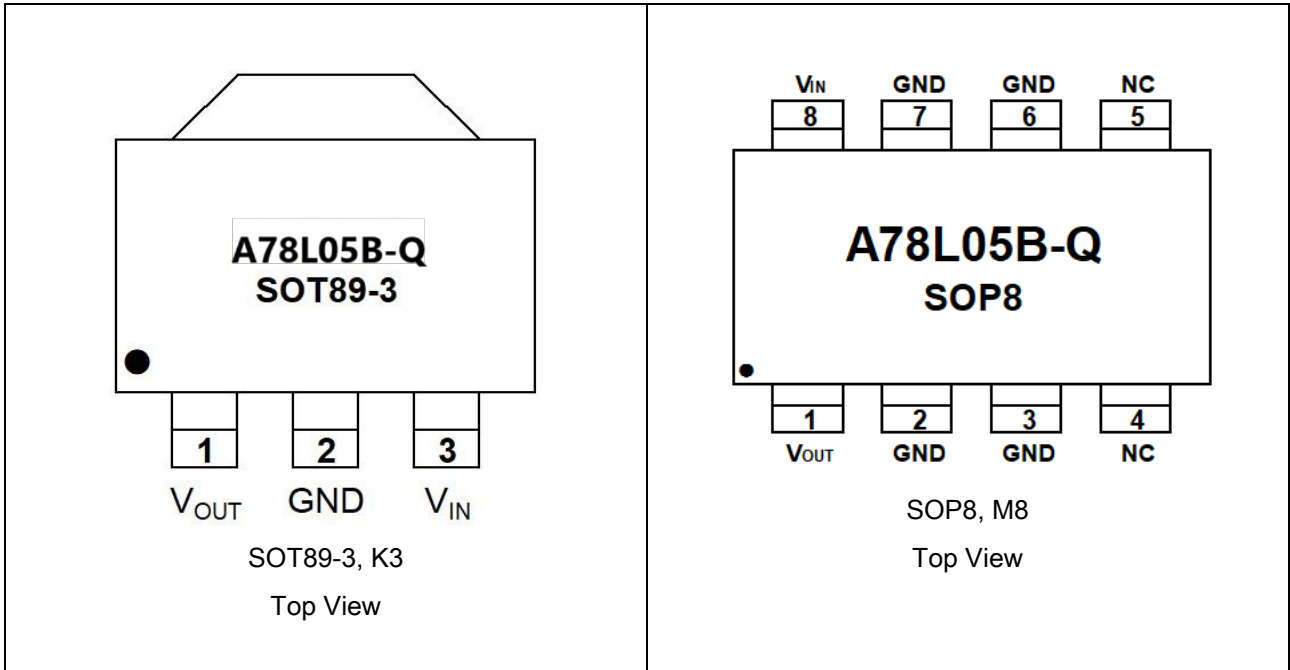
APPLICATION CIRCUIT



NOTE: Bypass capacitors are recommended for optimum stability and transient response and should be located as close as Possible to the regulators.



PIN DESCRIPTION



Pin #		Symbol	Function
SOT89-3	SOP8		
1	1	V _{OUT}	Output
2	2,3,6,7	GND	Ground
3	8	V _{IN}	Power Input
-	4,5	NC	No Connect



ABSOLUTE MAXIMUM RATINGS

V _{IN} , Input Voltage		30 V
P _D , Power Dissipation ⁽¹⁾	SOT89-3	1.47 W
	SOP8	0.92 W
R _{θJA} , Thermal Resistance (Junction to ambient)	SOT89-3	85 °C/W
	SOP8	136 °C/W
T _A , Operating Ambient Temperature Range		-40°C ~ +125 °C
T _J , Operating Junction Temperature Range		-40°C ~ +150 °C
T _{STG} , Storage Temperature Range		-40°C ~ +150 °C
HBM, ESD Capability, Human Body Model		2000 V

- (1) SOP8 package used for voltage regulators is modified internally to have pins 2, 3, 6 and 7 electrically communed to the die attach flag. This particular frame decreases the total thermal resistance of the package and increases its ability to dissipate power when an appropriate area of copper on the printed circuit board is available for heat-sinking. See details in Figure 12.
- (2) The maximum allowable power dissipation is a function of the maximum junction temperature T_{J(MAX)}, the junction-to- ambient thermal resistance R_{θJA}, and the ambient temperature T_A. The maximum allowable continuous power dissipation at any ambient temperature is calculated by $P_{D(MAX)} = (T_{J(MAX)} - T_A) / R_{\theta JA}$.
- (3) Chip is soldered to 2500mm² (50mm*50mm) copper (top side solder mask) on 1oz.2 layers FR-4 PCB.

Stresses above 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 in the Electrical Characteristics is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

**ELECTRICAL CHARACTERISTICS** $V_{IN}=10V$, $I_O=40mA$, $T_A=25^\circ C$, $C_{IN}=0.33\mu F$, $C_{OUT}=0.1\mu F$, unless otherwise noted

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	-	4.8	5	5.2	V
Output Voltage ($-40^\circ C < T_A < +125^\circ C$)	V_{OUT}	$7V \leq V_{IN} \leq 20V$, $1mA \leq I_O \leq 40mA$ $V_{IN} = 10V$, $1mA \leq I_O \leq 70mA$	4.75	5	5.25	V
Load Regulation	Reg_{load}	$I_O = 1mA \sim 100mA$	-	11	60	mV
		$I_O = 1mA \sim 40mA$	-	5	30	
Line Regulation	Reg_{line}	$7V \leq V_{IN} \leq 20V$	-	50	150	mV
		$8V \leq V_{IN} \leq 20V$	-	45	100	
Input Bias Current	I_{IB}	-	-	3	5.5	mA
Input Bias Current Change	ΔI_{IB}	$8V \leq V_{IN} \leq 20V$	-	-	1.5	mA
		$1mA \leq I_O \leq 40mA$	-	-	0.2	
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$	-	63	-	μV
Ripple Rejection	RR	$10V \leq V_{IN} \leq 20V$; $f = 120Hz$;	41	60	-	dB
Dropout Voltage	V_{I-VO}	-	-	1.7	-	V



TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Output Characteristics

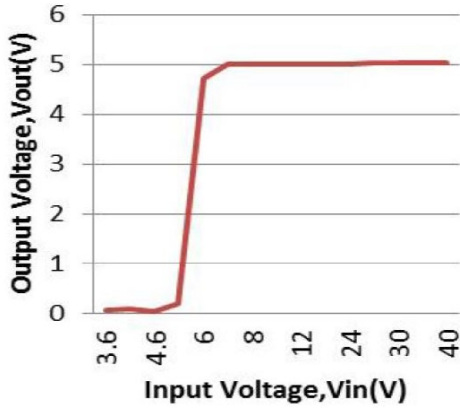


Fig 2. Quiescent Current vs. Input Voltage

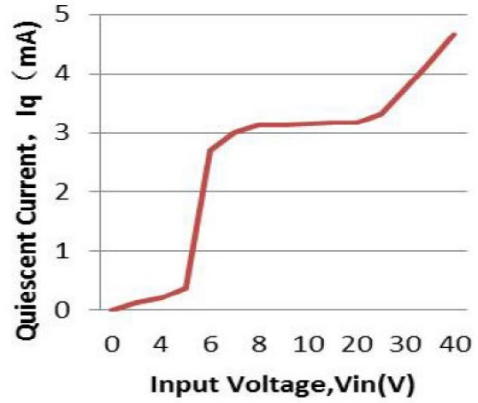


Fig 3. Input Voltage vs. Bias Current

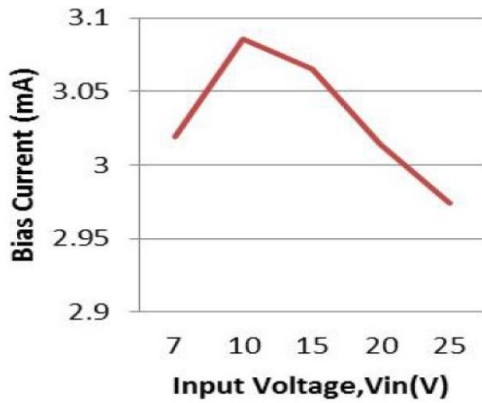


Fig 4. Load Current vs. Bias Current

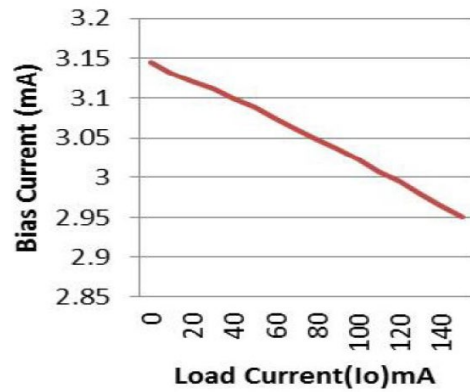


Fig 5. Output Fluctuation

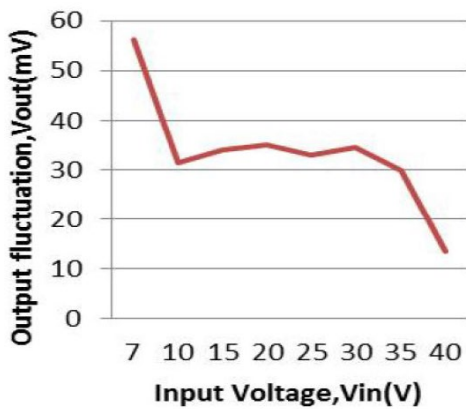


Fig6. Ambient temperature vs. Power Dissipation

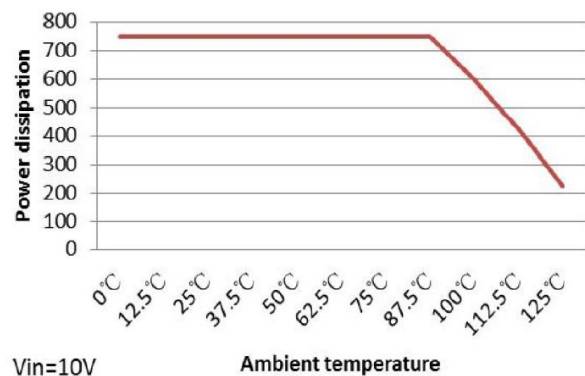




Fig 7. Load current temperature vs. Minimum voltage difference

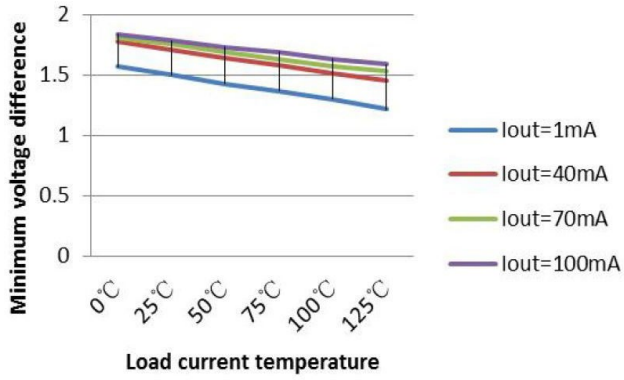
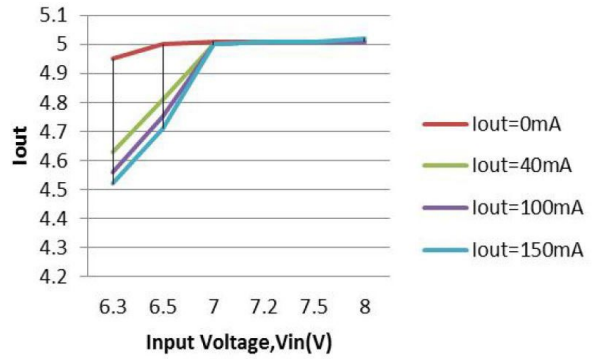


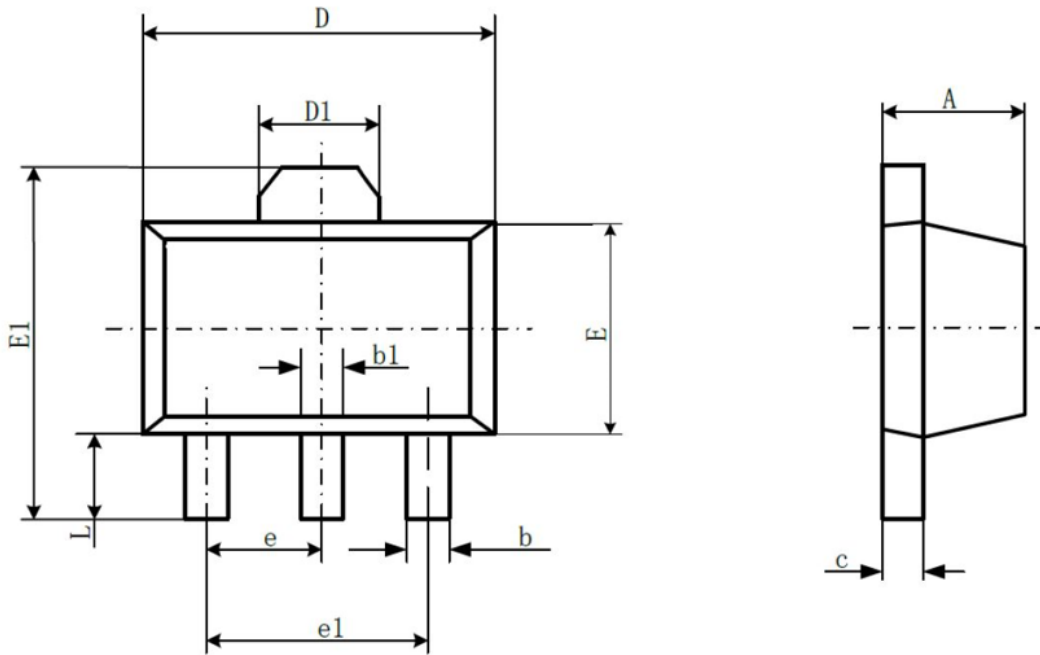
Fig 8. Dropout Characteristics





PACKAGE INFORMATION

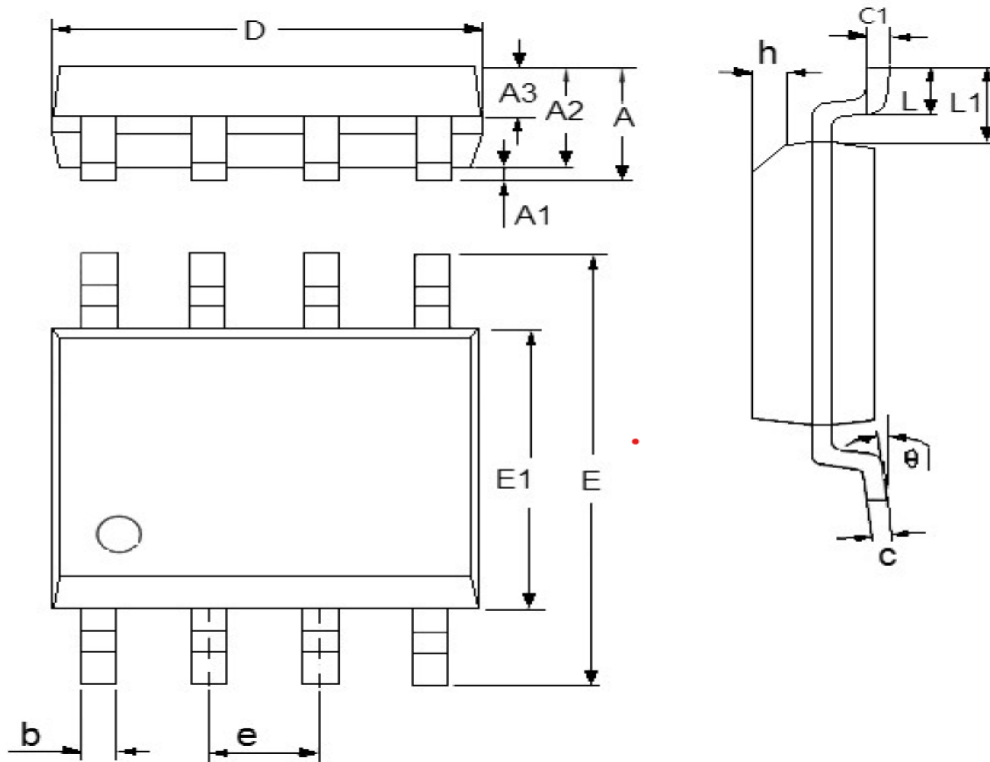
Dimension in SOT89-3 (Unit: mm)



Symbol	MILLIMETERS	
	Min.	Max.
A	1.400	1.600
b	0.380	0.460
b1	0.460	0.560
c	0.380	0.420
D	4.400	4.600
D1	1.620	1.830
E	2.400	2.600
E1	3.950	4.250
e	1.500 BSC	
e1	3.000 BSC	
L	0.890	1.200



Dimension in SOP8 (Unit: mm)



Symbol	Millimeter	
	Min.	Max.
A	-	1.750
A1	0.100	0.225
A2	1.300	1.500
A3	0.500	0.700
b	0.390	0.470
c	0.200	0.240
D	4.800	5.000
E	5.800	6.200
E1	3.800	4.000
e	1.270 TYP.	
h	0.250	0.500
L	0.500	0.800
L1	1.050 TYP.	
theta	0	8°
c1	0.250 TYP.	



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