

KA78L05AI

3-Terminal 0.1A 5V Positive Voltage Regulator

Features

- Maximum Output Current of 100mA
- Output Voltage of 5V
- Thermal Overload Protection
- Short Circuit Current Limiting
- Output Voltage Offered in $\pm 5\%$ Tolerance

Description

The KA78L05AI of fixed voltage monolithic integrated circuit voltage regulators are suitable for application that required supply current up to 100mA.

SOT-89



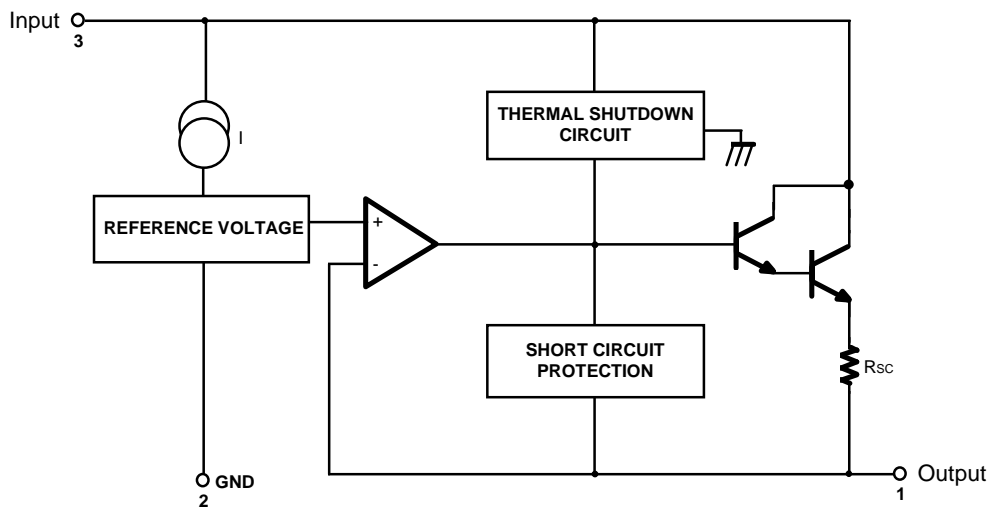
1. Output 2. GND 3. Input

8-SOP



1. Output 2. GND 3. GND 4. NC
5. NC 6. GND 7. GND 8. Input

Internal Block Diagram



Absolute Maximum Ratings

($T_a=25^{\circ}\text{C}$, Unless otherwise noted, Note 5)

Parameter	Symbol	Value	Unit
Input Voltage	V_I	30	V
Maximum Operating Junction Temperature	T_J	150	$^{\circ}\text{C}$
Operating Temperature Range	T_{OPR}	-40 ~ +125	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-65 ~ +150	$^{\circ}\text{C}$
Thermal Resistance Junction-Air SOT-89 8-SOP	$R_{\theta JA}$	225 160	$^{\circ}\text{C}/\text{W}$ $^{\circ}\text{C}/\text{W}$

Electrical Characteristics

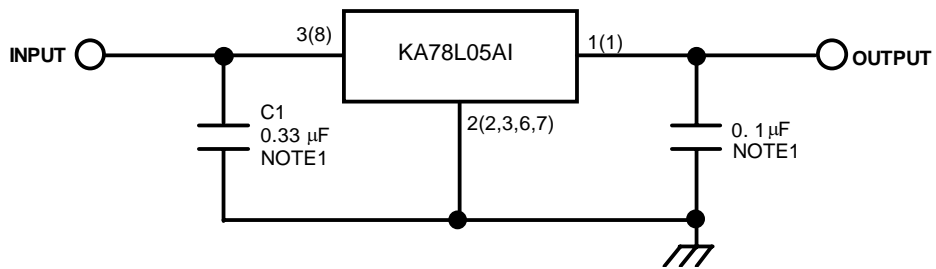
($V_I = 10\text{V}$, $I_O = 40\text{mA}$, $-40^{\circ}\text{C} \leq T_J \leq 125^{\circ}\text{C}$, $C_I = 0.33\mu\text{F}$, $C_O = 0.1\mu\text{F}$, unless otherwise specified. (Note1))

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	V_O	$T_J = 25^{\circ}\text{C}$	4.8	5.0	5.2	V	
Line Regulation (Note1)	ΔV_O	$T_J = 25^{\circ}\text{C}$	$7\text{V} \leq V_I \leq 20\text{V}$	-	8	150	mV
			$8\text{V} \leq V_I \leq 20\text{V}$	-	6	100	mV
Load Regulation (Note1)	ΔV_O	$T_J = 25^{\circ}\text{C}$	$1\text{mA} \leq I_O \leq 100\text{mA}$	-	11	60	mV
			$1\text{mA} \leq I_O \leq 40\text{mA}$	-	5.0	30	mV
Output Voltage	V_O	$7\text{V} \leq V_I \leq 20\text{V}$	$1\text{mA} \leq I_O \leq 40\text{mA}$	4.75	-	5.25	V
		$7\text{V} \leq V_I \leq V_{MAX}$ (Note2)	$1\text{mA} \leq I_O \leq 70\text{mA}$	4.75	-	5.25	V
Quiescent Current	I_Q	$T_J = 25^{\circ}\text{C}$	-	2.0	5.5	mA	
Quiescent Current Change	With Line	ΔI_Q	$8\text{V} \leq V_I \leq 20\text{V}$	-	-	1.5	mA
	With Load	ΔI_Q	$1\text{mA} \leq I_O \leq 40\text{mA}$ (Note3)	-	-	0.5	mA
Output Noise Voltage(Note3)	V_N	$T_A = 25^{\circ}\text{C}$, $10\text{Hz} \leq f \leq 100\text{kHz}$	-	40	-	$\mu\text{V}/V_O$	
Temperature Coefficient of V_O (Note3)	$\Delta V_O/\Delta T$	$I_O = 5\text{mA}$	-	-0.65	-	$\text{mV}/^{\circ}\text{C}$	
Ripple Rejection(Note3,4)	RR	$f = 120\text{Hz}$, $8\text{V} \leq V_I \leq 18\text{V}$, $T_J = 25^{\circ}\text{C}$	41	80	-	dB	
Dropout Voltage	V_D	$T_J = 25^{\circ}\text{C}$	-	1.7	-	V	

Note:

1. The maximum steady state usable output current and input voltage are very dependent on the heat sinking and/or lead length of the package. The data above represent pulse test conditions with junction temperature as indicated at the initiation of tests.
2. Power dissipation $P_D \leq 0.75\text{W}$.
3. These parameters although guaranteed over the recommended operating conditions are not 100% tested in production.
4. Recommend minimum load capacitance of $0.01\mu\text{F}$ to limit high frequency noise.
5. Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Electrical specifications do not apply when operating the device outside of its stated operating conditions.

Typical Application



'()' : 8SOP Type

Note:

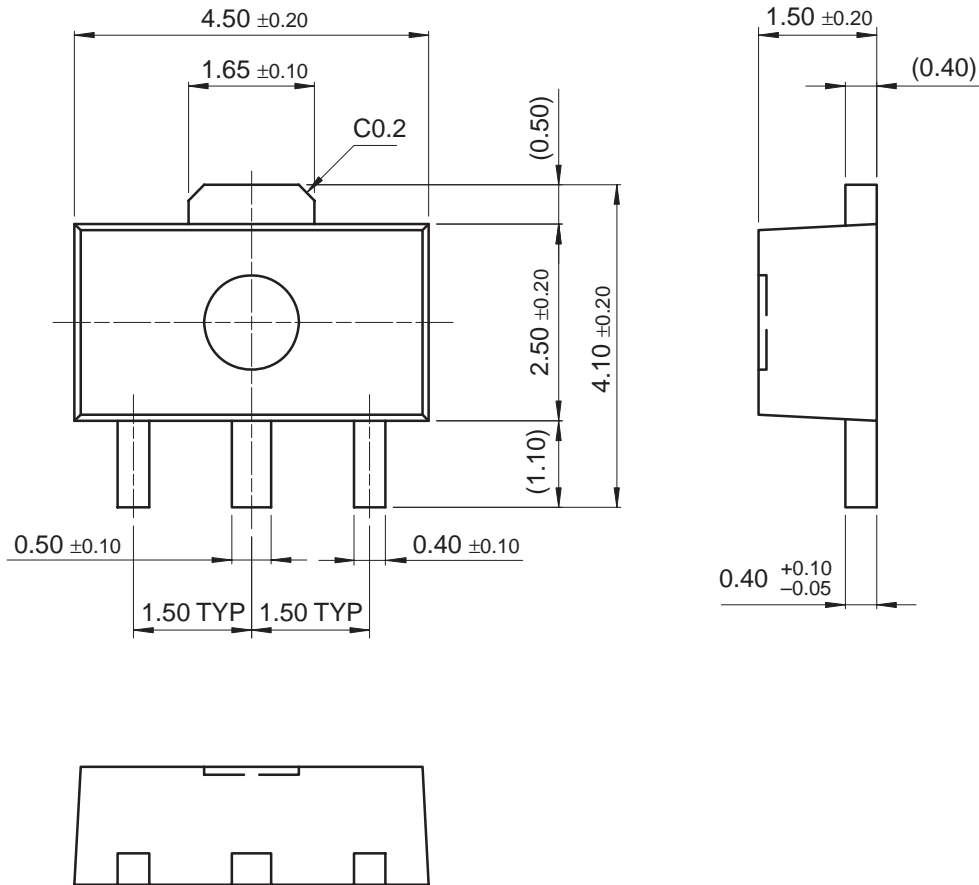
1. Bypass Capacitors are recommend for optimum stability and transient response and should be located as close as possible to the regulator

Mechanical Dimensions

Package

Dimensions in millimeters

SOT-89

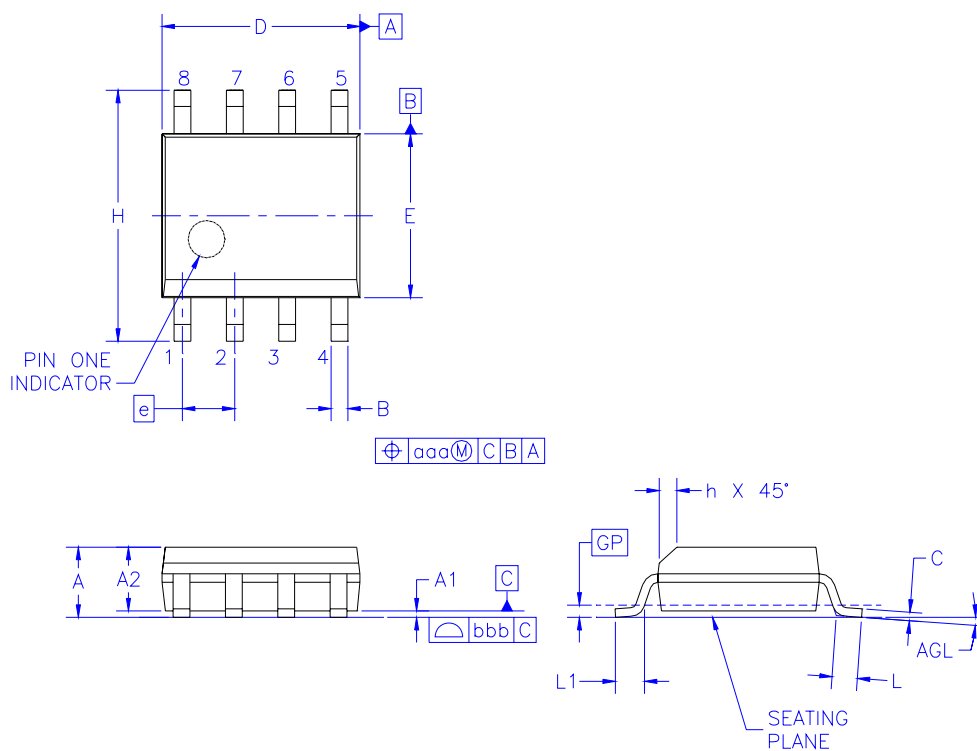


Mechanical Dimensions (Continued)

Package

Dimensions in millimeters

8-SOP



Symbol	Min	Nom	Max
A	-	-	1.75
A1	0.10	0.15	0.25
A2	1.25	1.45	1.50
B	0.35	0.37	0.51
C	0.19	0.20	0.25
D	4.80	4.90	5.00
E	3.80	3.90	4.00
e	1.27BSC		
H	5.79	5.99	6.20
h	0.25	-	0.50
L	0.50	0.70	0.90
GP	0.36 BSC		
q	0	-	8
aaa	-	-	0.25
bbb	-	-	0.10

Ordering Information

Product Number	Package	Output Voltage Tolerance	Operating Temperature
KA78L05AIMTF	SOT-89	5%	-40 ~ +125°C
KA78L05AIDTF	8-SOP		

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