

# KA79L05A

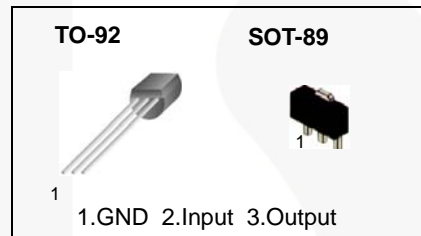
## 3-Terminal 0.1 A Negative Voltage Regulator

### Features

- Output Current up to 100 mA
- No External Components
- Internal Thermal Over load Protection
- Internal Short-Circuit Current Limiting
- Output Voltage Offered in  $\pm 5\%$  Tolerance
- Output Voltage: -5 V

### Description

These regulators employ internal current limiting and thermal shutdown.



### Ordering Information

Part Number	Operating Temperature Range	Top Mark	Package	Packing Method
KA79L05AMTF	0 ~ +125°C	9A	SOT-89	Tape and Reel
KA79L05AZTA		KA79L05AZ	TO-92	Ammo

### Block Diagram

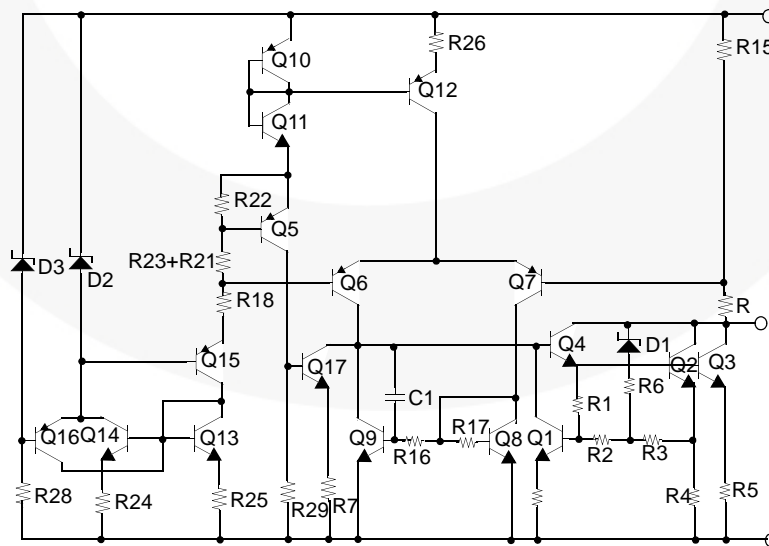


Figure 1. Block Diagram

## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$V_I$	Input Voltage	-30	V
$T_{OPR}$	Operating Temperature Range	0 ~ +125	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-65 ~ +150	$^\circ\text{C}$

## Electrical Characteristics

$V_I = -10\text{ V}$ ,  $I_O = 40\text{ mA}$ ,  $C_I = 0.33\text{ }\mu\text{F}$ ,  $C_O = 0.1\text{ }\mu\text{F}$ ,  $0^\circ\text{C} \leq T_J \leq +125^\circ\text{C}$ , unless otherwise specified.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_O$	Output Voltage	$T_J = +25^\circ\text{C}$	-4.8	-5.0	-5.2	V
$\Delta V_O$	Line Regulation <sup>(1)</sup>	$T_J = +25^\circ\text{C}$	-7.0 V $\geq V_I \geq$ -20 V	15	150	mV
			-8 V $\geq V_I \geq$ -20 V		100	mV
$\Delta V_O$	Load Regulation <sup>(1)</sup>	$T_J = +25^\circ\text{C}$	1.0 mA $\leq I_O \leq$ 100 mA	20	60	mV
			1.0 mA $\leq I_O \leq$ 40 mA	10	30	mV
$V_O$	Output Voltage	-7.0 V $\geq V_I \geq$ -20 V, 1.0 mA $\leq I_O \leq$ 40 mA	-4.75		-5.25	V
		$V_I = -10\text{ V}$ , 1.0 mA $\leq I_O \leq$ 70 mA	-4.75		-5.25	V
$I_Q$	Quiescent Current	$T_J = +25^\circ\text{C}$		2.0	5.5	mA
		$T_J = +125^\circ\text{C}$			6.0	
$\Delta I_Q$	Quiescent Current Change	With Line	-8 V $\geq V_I \geq$ -20 V		1.5	mA
$\Delta I_Q$		With Load	1.0 mA $\leq I_O \leq$ 40 mA		0.1	mA
$V_N$	Output Noise Voltage	$T_A = +25^\circ\text{C}$ , 10 Hz $\leq f \leq$ 100 kHz		30		$\mu\text{V}$
RR	Ripple Rejection	$f = 120\text{ Hz}$ , -8 V $\geq V_I \geq$ -18 V, $T_J = +25^\circ\text{C}$	41	60		dB
$V_D$	Dropout Voltage	$T_J = +25^\circ\text{C}$		1.7		V

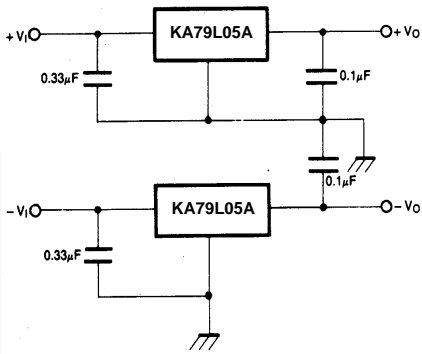
### Note:

1. Load and line regulation are specified at constant junction temperature. Changes in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.

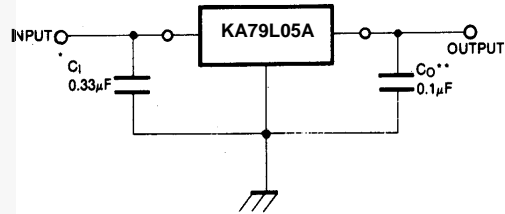
## Typical Application

### Design Considerations

The KA79L05A fixed voltage-regulator is designed with thermal overload protection that shuts down the circuit when subjected to an excessive power overload condition. Internal short-circuit protection limits the maximum current the circuit will pass. In many low current applications, compensation capacitors are not required. However, it is recommended that the regulator input be bypassed with a capacitor if the regulator is connected to the power supply filter with long wire lengths, or if the output load capacitance is large. An input bypass capacitor should be selected to provide good high-frequency characteristics to ensure stable operation under all load conditions. A 0.33  $\mu\text{F}$  or larger tantalum, mylar, or other capacitor having low internal impedance at high frequencies should be chosen. The bypass capacitor should be mounted with the shortest possible leads directly across the regulator's input terminals. Good construction techniques should be used to minimize ground loops and lead resistance drops since the regulator has no external sense lead. Bypassing the output is also recommended.



**Figure 2. Positive and Negative Regulator**



**Figure 3. Typical Application**

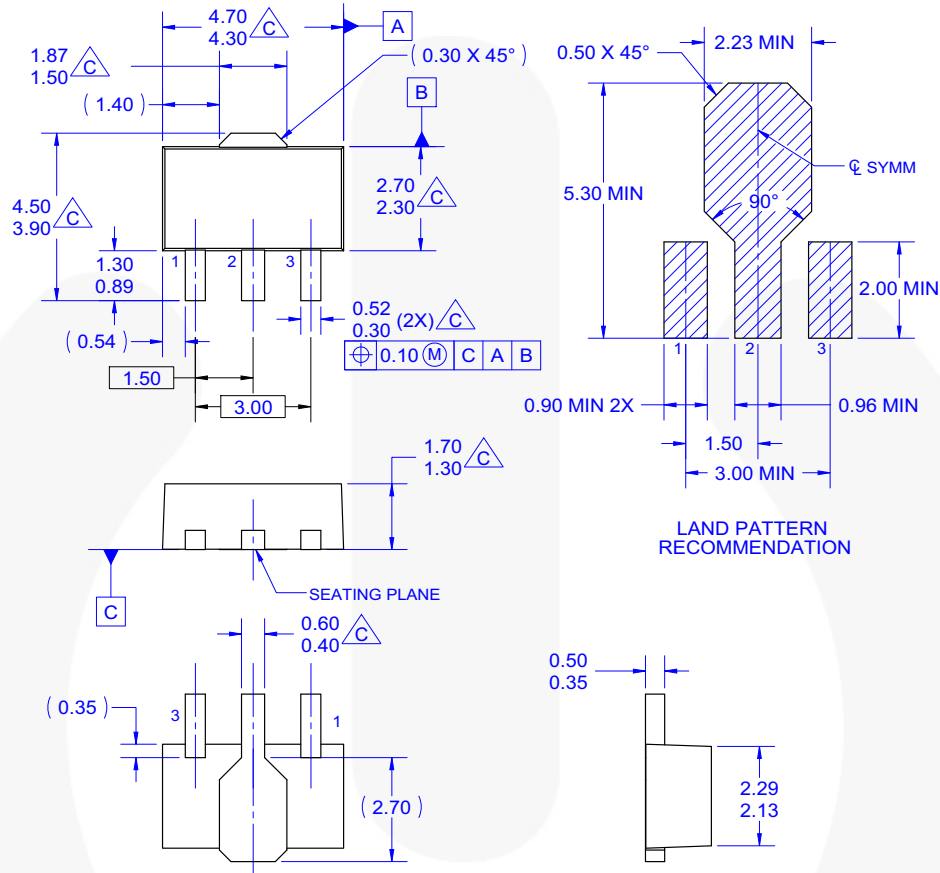
A common ground is required between the input and the output voltages. The input voltage must remain typically 2.0 V above the output voltage, even during the low point on the input ripple voltage.

\*  $C_1$  is required if regulator is located an appreciable distance from power supply filter.

\*\*  $C_o$  improves stability and transient response.

**Physical Dimensions**

**SOT-89**



- NOTES: UNLESS OTHERWISE SPECIFIED.
- A. REFERENCE TO JEDEC TO-243 VARIATION AA.
  - B. ALL DIMENSIONS ARE IN MILLIMETERS.
  - $\triangle C$  DOES NOT COMPLY JEDEC STANDARD VALUE.
  - D. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSION.
  - E. DIMENSION AND TOLERANCE AS PER ASME Y14.5-1994.
  - F. DRAWING FILE NAME: MA03CREV2

**Figure 4. 3-Lead, SOT-89, JEDEC TO-243, Option AA**

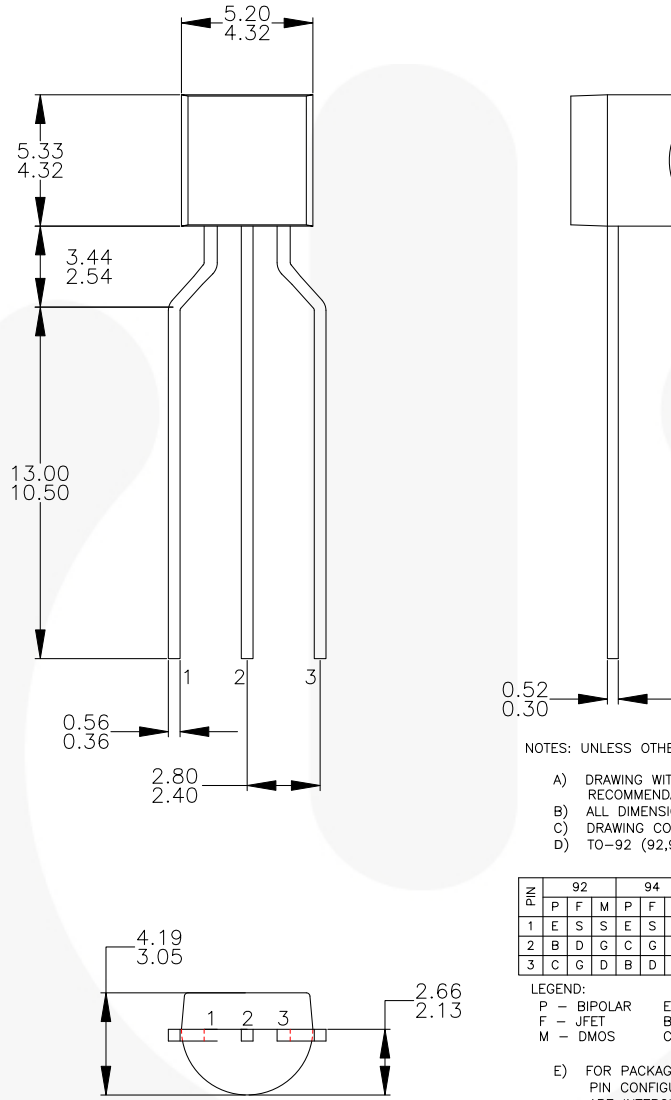
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**Physical Dimensions** (Continued)

**TO-92 Ammo Type**



NOTES: UNLESS OTHERWISE SPECIFIED

- A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DRAWING CONFORMS TO ASME Y14.5M-1994.
- D) TO-92 (92,94,96,97,98) PIN CONFIGURATION:

PIN	92			94			96			97			98		
	P	F	M	P	F	M	B	F	M	P	F	M	P	F	M
1	E	S	S	E	S	S	B	D	G	C	G	D	C	G	D
2	B	D	G	C	G	D	E	S	S	B	D	G	E	S	S
3	C	G	D	B	D	G	C	G	D	E	S	S	B	D	G

LEGEND:

- P - BIPOLAR
- F - JFET
- M - DMOS
- E - EMITTER
- B - BASE
- C - COLLECTOR
- D - DRAIN
- S - SOURCE
- G - GATE

- E) FOR PACKAGE 92, 94, 96, 97 AND 98: PIN CONFIGURATION DRAIN "D" AND SOURCE "S" ARE INTERCHANGEABLE AT JFET "F" OPTION.
- F) DRAWING FILENAME: MKT-ZA03FREV2.

**Figure 5. 3-Lead, TO-92, Molded, 0.200 in Line Spacing Lead Form**

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| 2Cool™                                                                                       | F-PFS™                                         | PowerTrench®                                                                                       | The Power Franchise®                                                                        |
| AccuPower™                                                                                   | FRFET®                                         | PowerXS™                                                                                           | the power franchise                                                                         |
| AX-CAP™*                                                                                     | Global Power Resource <sup>SM</sup>            | Programmable Active Droop™                                                                         | TinyBoost™                                                                                  |
| BitSiC™                                                                                      | GreenBridge™                                   | QFET®                                                                                              | TinyBuck™                                                                                   |
| Build it Now™                                                                                | Green FPS™                                     | QS™                                                                                                | TinyCalc™                                                                                   |
| CorePLUS™                                                                                    | Green FPS™ e-Series™                           | Quiet Series™                                                                                      | TinyLogic®                                                                                  |
| CorePOWER™                                                                                   | Gmax™                                          | RapidConfigure™                                                                                    | TINYOPTO™                                                                                   |
| CROSSVOLT™                                                                                   | GTO™                                           |  ™                | TinyPower™                                                                                  |
| CTL™                                                                                         | IntelliMAX™                                    | Saving our world, 1mW/W/kW at a time™                                                              | TinyPWM™                                                                                    |
| Current Transfer Logic™                                                                      | ISOPLANAR™                                     | SignalWise™                                                                                        | TinyWire™                                                                                   |
| DEUXPEED®                                                                                    | Making Small Speakers Sound Louder and Better™ | SmartMax™                                                                                          | TranSiC™                                                                                    |
| Dual Cool™                                                                                   | MegaBuck™                                      | SMART START™                                                                                       | TriFault Detect™                                                                            |
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| ESBC™                                                                                        | MicroPak™                                      | STEALTH™                                                                                           |  SerDes™ |
|  Fairchild® | MicroPak2™                                     | SuperFET®                                                                                          | UHC <sup>OS</sup>                                                                           |
| Fairchild Semiconductor®                                                                     | MillerDrive™                                   | SuperSOT™-3                                                                                        | Ultra FRFET™                                                                                |
| FACT Quiet Series™                                                                           | MotionMax™                                     | SuperSOT™-6                                                                                        | UniFET™                                                                                     |
| FACT®                                                                                        | mW saver™                                      | SuperSOT™-8                                                                                        | VCX™                                                                                        |
| FAST®                                                                                        | OptoHiT™                                       | SupreMOS®                                                                                          | VisualMax™                                                                                  |
| FastvCore™                                                                                   | OPTOLOGIC®                                     | SyncFET™                                                                                           | VoltagePlus™                                                                                |
| FETBench™                                                                                    | OPTOPLANAR®                                    | Sync-Lock™                                                                                         | XS™                                                                                         |
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