

# KA79MXX

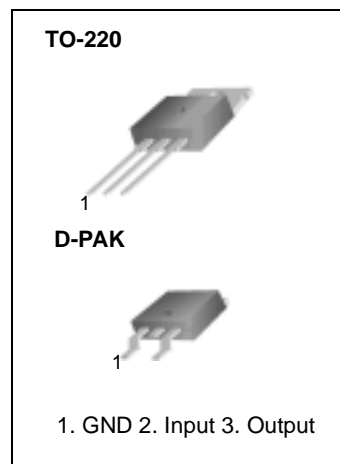
## 3-Terminal 0.5A Negative Voltage Regulator

### Features

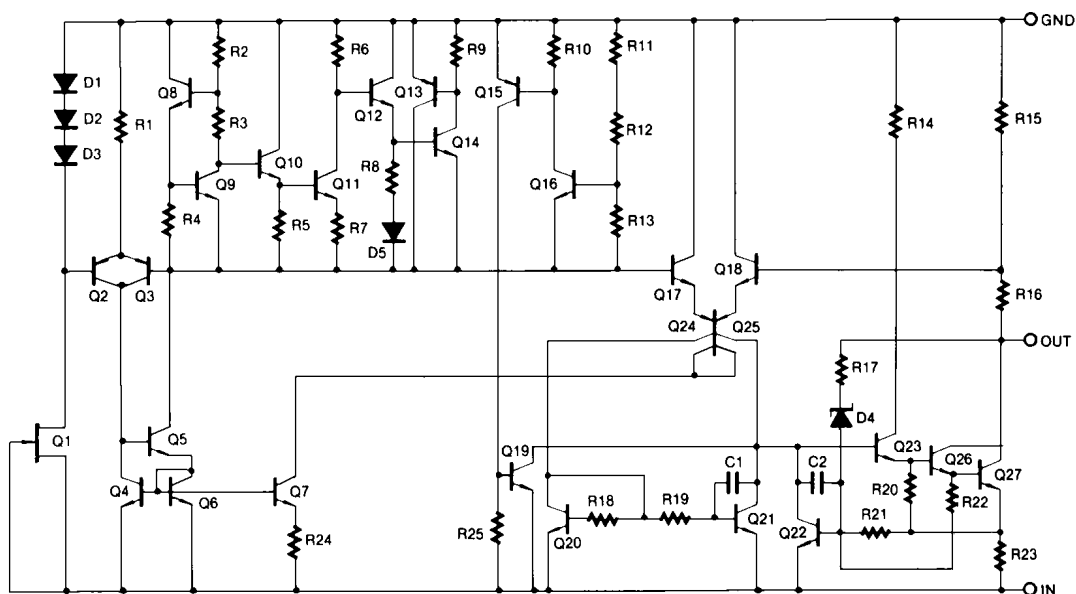
- No external components required
- Output current in excess of 0.5A
- Internal thermal overload
- Internal short circuit current limiting
- Output transistor safe area compensation
- Output voltages of -5V, -6V, -8V, -12V, -15V, -18V, -24V

### Description

The KA79MXX series of 3-Terminal medium current negative voltage regulators are monolithic integrated circuits designed as fixed voltage regulators. These regulators employ internal current limiting, thermal shutdown and safe area compensation making them essentially indestructible.



### Schematic Diagram



## Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input Voltage(for $V_O = -5V$ to $-18V$ ) (for $V_O = -24V$ )	$V_I$	-35	V
	$V_I$	-40	V
Thermal Resistance Junction-Cases	$R_{\theta JC}$	5	$^{\circ}C/W$
Thermal Resistance Junction-Air	$R_{\theta JA}$	65	$^{\circ}C/W$
Operating Temperature Range	$T_{OPR}$	0 ~ +125	$^{\circ}C$
Storage Temperature Range	$T_{STG}$	-65 ~ +125	$^{\circ}C$

## Electrical Characteristics (KA79M05/KA79M05R)

(Refer to test circuit,  $0^{\circ}C \leq T_J \leq +125^{\circ}C$ ,  $I_O = 350mA$ ,  $V_I = -10V$ , unless otherwise specified,  $C_I = 0.33\mu F$ ,  $C_O = 0.1\mu F$ )

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25^{\circ}C$	-4.8	-5	-5.2	V	
		$I_O = 5mA$ to $350mA$ $V_I = -7V$ to $-25V$	-4.75	-5	-5.25		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25^{\circ}C$	$V_I = -7V$ to $-25V$	-	7.0	50	mV
			$V_I = -8V$ to $-25V$	-	2.0	30	
Load Regulation (Note1)	$\Delta V_O$	$I_O = 5mA$ to $500mA$ $T_J = +25^{\circ}C$	-	30	100	mV	
Quiescent Current	$I_Q$	$T_J = +25^{\circ}C$	-	3.0	6.0	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5mA$ to $350mA$	-	-	0.4	mA	
		$I_O = 200mA$ $V_I = -8V$ to $-25V$	-	-	0.4		
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5mA$	-	-0.2	-	mV/ $^{\circ}C$	
Output Noise Voltage	$V_N$	$f = 10Hz, 100KHz$ $T_A = +25^{\circ}C$	-	40	-	$\mu V$	
Ripple Rejection	RR	$f = 120Hz$ $V_J = -8V$ to $-18V$	54	60	-	dB	
Dropout Voltage	$V_D$	$T_J = +25^{\circ}C$ , $I_O = 500mA$	-	1.1	-	V	
Short Circuit Current	$I_{SC}$	$T_J = +25^{\circ}C$ , $V_I = -35V$	-	140	-	mA	
Peak Current	$I_{PK}$	$T_J = +25^{\circ}C$	-	650	-	mA	

### Note:

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

## Electrical Characteristics (KA79M06)

(Refer to test circuit,  $0\text{ }^{\circ}\text{C} \leq T_J \leq +125\text{ }^{\circ}\text{C}$ ,  $I_O = 350\text{mA}$ ,  $V_I = -11\text{V}$ , unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	- 5.75	- 6.0	- 6.25	V	
		$I_O = 5\text{mA}$ to $350\text{mA}$ $V_I = -8.0\text{V}$ to $-25\text{V}$	- 5.7	- 6.0	- 6.3		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	$V_I = -8\text{V}$ to $-25\text{V}$	-	7.0	60	mV
			$V_I = -9\text{V}$ to $-19\text{V}$	-	2.0	40	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	$I_O = 5.0\text{mA}$ to $500\text{mA}$	-	30	120	mV
Quiescent Current	$I_Q$	$T_J = +25\text{ }^{\circ}\text{C}$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5\text{mA}$ to $350\text{mA}$		-	-	0.4	mA
		$V_I = -8\text{V}$ to $-25\text{V}$		-	-	0.4	
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$		-	0.4	-	mV/ $^{\circ}\text{C}$
Output Noise Voltage	$V_N$	$f = 10\text{Hz}$ to $100\text{kHz}$ , $T_A = +25\text{ }^{\circ}\text{C}$		-	50	-	$\mu\text{V}$
Ripple Rejection	RR	$f = 120\text{Hz}$ , $V_I = -9\text{V}$ to $-19\text{V}$		54	60	-	dB
Dropout Voltage	$V_D$	$I_O = 500\text{mA}$ , $T_J = +25\text{ }^{\circ}\text{C}$		-	1.1	-	V
Short Circuit Current	$I_{SC}$	$V_I = -35\text{V}$ , $T_J = +25\text{ }^{\circ}\text{C}$		-	140	-	mA
Peak Current	$I_{PK}$	$T_J = +25\text{ }^{\circ}\text{C}$		-	650	-	mA

### Note:

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

## Electrical Characteristics (KA79M08/KA79M08R)

(Refer to test circuit,  $0\text{ }^{\circ}\text{C} \leq T_J \leq +125\text{ }^{\circ}\text{C}$ ,  $I_O = 350\text{mA}$ ,  $V_I = -14\text{V}$ , unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	- 7.7	- 8.0	- 8.3	V	
		$I_O = 5\text{mA to } 350\text{mA}$ $V_I = -10.5\text{V to } -25\text{V}$	- 7.6	- 8.0	- 8.4		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	$V_I = -10.5\text{V to } -25\text{V}$	-	7.0	80	mV
			$V_I = -11\text{V to } -21\text{V}$	-	2.0	50	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	$I_O = 5.0\text{mA to } 500\text{mA}$	-	30	160	mV
Quiescent Current	$I_Q$	$T_J = +25\text{ }^{\circ}\text{C}$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5\text{mA to } 350\text{mA}$	-	-	0.4	mA	
		$V_I = -8\text{V to } -25\text{V}$	-	-	0.4		
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$	-	-0.6	-	mV/ $^{\circ}\text{C}$	
Output Noise Voltage	$V_N$	$f = 10\text{Hz to } 100\text{KHz}$ , $T_A = +25\text{ }^{\circ}\text{C}$	-	60	-	$\mu\text{V}$	
Ripple Rejection	RR	$f = 120\text{Hz}$ , $V_I = -9\text{V to } -19\text{V}$	54	59	-	dB	
Dropout Voltage	$V_D$	$I_O = 500\text{mA}$ , $T_J = +25\text{ }^{\circ}\text{C}$	-	1.1	-	V	
Short Circuit Current	$I_{SC}$	$V_I = -35\text{V}$ , $T_J = +25\text{ }^{\circ}\text{C}$	-	140	-	mA	
Peak Current	$I_{PK}$	$T_J = +25\text{ }^{\circ}\text{C}$	-	650	-	mA	

### Note:

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

## Electrical Characteristics (KA79M12)

(Refer to test circuit,  $0\text{ }^{\circ}\text{C} \leq T_J \leq +125\text{ }^{\circ}\text{C}$ ,  $I_O = 350\text{mA}$ ,  $V_I = -19\text{V}$ , unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	-11.5	-12	-12.5	V	
		$I_O = 5\text{mA to } 350\text{mA}$ $V_I = -14.5\text{V to } -30\text{V}$	-11.4	-12	-12.6		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	$V_I = -14.5\text{V to } -30\text{V}$	-	8.0	80	mV
			$V_I = -15\text{V to } -25\text{V}$	-	3.0	50	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	$I_O = 5.0\text{mA to } 500\text{mA}$	-	30	240	mV
Quiescent Current	$I_Q$	$T_J = +25\text{ }^{\circ}\text{C}$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5\text{mA to } 350\text{mA}$		-	-	0.4	mA
		$V_I = -14.5\text{V to } -30\text{V}$		-	-	0.4	
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$		-	-0.8	-	mV/ $^{\circ}\text{C}$
Output Noise Voltage	$V_N$	$f = 10\text{Hz to } 100\text{kHz}, T_A = +25\text{ }^{\circ}\text{C}$		-	75	-	$\mu\text{V}$
Ripple Rejection	RR	$f = 120\text{Hz}, V_I = -15\text{V to } -25\text{V}$		54	60	-	dB
Dropout Voltage	$V_D$	$I_O = 500\text{mA}, T_J = +25\text{ }^{\circ}\text{C}$		-	1.1	-	V
Short Circuit Current	$I_{SC}$	$V_I = -35\text{V}, T_J = +25\text{ }^{\circ}\text{C}$		-	140	-	mA
Peak Current	$I_{PK}$	$T_J = +25\text{ }^{\circ}\text{C}$		-	650	-	mA

### Note:

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

## Electrical Characteristics (KA79M15)

(Refer to test circuit,  $0\text{ }^{\circ}\text{C} \leq T_J \leq +125\text{ }^{\circ}\text{C}$ ,  $I_O = 350\text{mA}$ ,  $V_I = -23\text{V}$ , unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	- 14.4	- 15	- 15.6	V	
		$I_O = 5\text{mA to } 350\text{mA}$ $V_I = -17.5\text{V to } -30\text{V}$	-14.25	- 15	-15.75		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	$V_I = -17.5\text{V to } -30\text{V}$	-	9.0	80	mV
			$V_I = -18\text{V to } -28\text{V}$	-	5.0	50	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	$I_O = 5.0\text{mA to } 500\text{mA}$	-	30	240	mV
Quiescent Current	$I_Q$	$T_J = +25\text{ }^{\circ}\text{C}$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5\text{mA to } 350\text{mA}$		-	-	0.4	mA
		$V_I = -17.5\text{V to } -28\text{V}$		-	-	0.4	
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$		-	-1.0	-	mV/ $^{\circ}\text{C}$
Output Noise Voltage	$V_N$	$f = 10\text{Hz to } 100\text{kHz}, T_A = +25\text{ }^{\circ}\text{C}$		-	90	-	$\mu\text{V}$
Ripple Rejection	RR	$f = 120\text{Hz}, V_I = -18.5\text{V to } -28.5\text{V}$		54	59	-	dB
Dropout Voltage	$V_D$	$I_O = 500\text{mA}, T_J = +25\text{ }^{\circ}\text{C}$		-	1.1	-	V
Short Circuit Current	$I_{SC}$	$V_I = -35\text{V}, T_J = +25\text{ }^{\circ}\text{C}$		-	140	-	mA
Peak Current	$I_{PK}$	$T_J = +25\text{ }^{\circ}\text{C}$		-	650	-	mA

### Note:

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

## Electrical Characteristics (KA79M18)

(Refer to test circuit,  $0\text{ }^{\circ}\text{C} \leq T_J \leq +125\text{ }^{\circ}\text{C}$ ,  $I_O = 350\text{mA}$ ,  $V_I = -27\text{V}$ , unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	- 17.3	- 18	- 18.7	V	
		$I_O = 5\text{mA}$ to $350\text{mA}$ $V_I = -21\text{V}$ to $-33\text{V}$	- 17.1	- 18	- 18.9		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	$V_I = -21\text{V}$ to $-33\text{V}$	-	9.0	80	mV
			$V_I = -24\text{V}$ to $-30\text{V}$	-	5.0	80	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	$I_O = 5.0\text{mA}$ to $500\text{mA}$	-	30	360	mV
Quiescent Current	$I_Q$	$T_J = +25\text{ }^{\circ}\text{C}$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5\text{mA}$ to $350\text{mA}$	-	-	0.4	mA	
		$V_I = -21\text{V}$ to $-33\text{V}$	-	-	0.4		
Output Voltage Drift	$\Delta V_O/\Delta T$	$I_O = 5\text{mA}$	-	-1.0	-	mV/ $^{\circ}\text{C}$	
Output Noise Voltage	$V_N$	$f = 10\text{Hz}$ to $100\text{kHz}$ , $T_A = +25\text{ }^{\circ}\text{C}$	-	110	-	$\mu\text{V}$	
Ripple Rejection	RR	$f = 120\text{Hz}$ , $V_I = -22\text{V}$ to $-32\text{V}$	54	59	-	dB	
Dropout Voltage	$V_D$	$I_O = 500\text{mA}$ , $T_J = +25\text{ }^{\circ}\text{C}$	-	1.1	-	V	
Short Circuit Current	$I_{SC}$	$V_I = -35\text{V}$ , $T_J = +25\text{ }^{\circ}\text{C}$	-	140	-	mA	
Peak Current	$I_{PK}$	$T_J = +25\text{ }^{\circ}\text{C}$	-	650	-	mA	

### Note;

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

## Electrical Characteristics (KA79M24)

(Refer to test circuit,  $0\text{ }^{\circ}\text{C} \leq T_J \leq +125\text{ }^{\circ}\text{C}$ ,  $I_O = 350\text{mA}$ ,  $V_I = -33\text{V}$ , unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Output Voltage	$V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	- 23	- 24	- 25	V	
		$I_O = 5\text{mA to } 350\text{mA}$ $V_I = -27\text{V to } -38\text{V}$	- 22.8	- 24	- 25.2		
Line Regulation (Note1)	$\Delta V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	$V_I = -27\text{V to } -38\text{V}$	-	9.0	80	mV
			$V_I = -30\text{V to } -36\text{V}$	-	5.0	70	
Load Regulation (Note1)	$\Delta V_O$	$T_J = +25\text{ }^{\circ}\text{C}$	$I_O = 5.0\text{mA to } 500\text{mA}$	-	30	300	mV
Quiescent Current	$I_Q$	$T_J = +25\text{ }^{\circ}\text{C}$	-	3	6	mA	
Quiescent Current Change	$\Delta I_Q$	$I_O = 5\text{mA to } 350\text{mA}$		-	-	0.4	mA
		$V_I = -27\text{V to } -38\text{V}$		-	-	0.4	
Output Voltage Drift	$\Delta V_O / \Delta T$	$I_O = 5\text{mA}$		-	-1.0	-	mV/ $^{\circ}\text{C}$
Output Noise Voltage	$V_N$	$f = 10\text{Hz to } 100\text{KHz}, T_A = +25\text{ }^{\circ}\text{C}$		-	180	-	$\mu\text{V}$
Ripple Rejection	RR	$f = 120\text{Hz}, V_I = -28\text{V to } -38\text{V}$		54	58	-	dB
Dropout Voltage	$V_D$	$I_O = 500\text{mA}, T_J = +25\text{ }^{\circ}\text{C}$		-	1.1	-	V
Short Circuit Current	$I_{SC}$	$V_I = -35\text{V}, T_J = +25\text{ }^{\circ}\text{C}$		-	140	-	mA
Peak Current	$I_{PK}$	$T_J = +25\text{ }^{\circ}\text{C}$		-	650	-	mA

### Note:

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



## Typical Applications

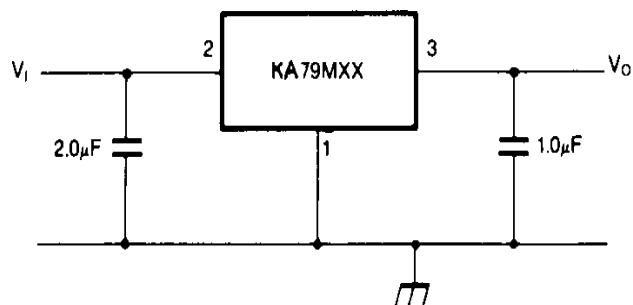


Figure 1. Fixed Output Regulator

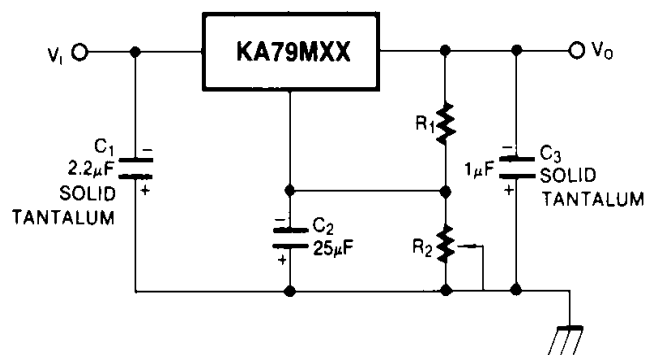


Figure 2. Variable Output

### Notes:

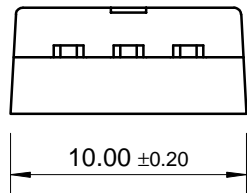
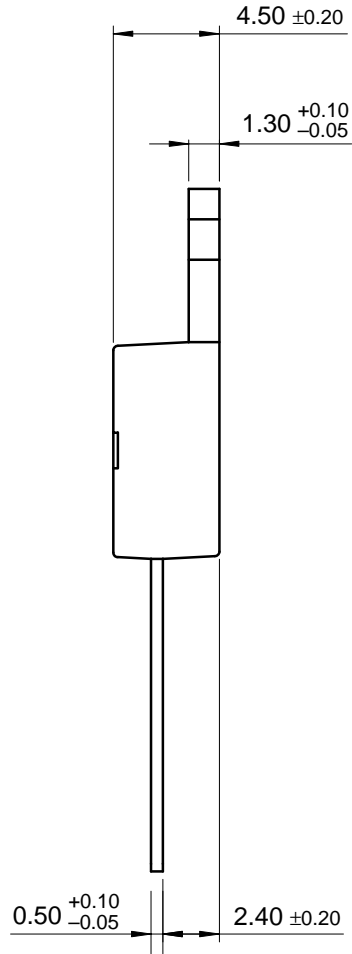
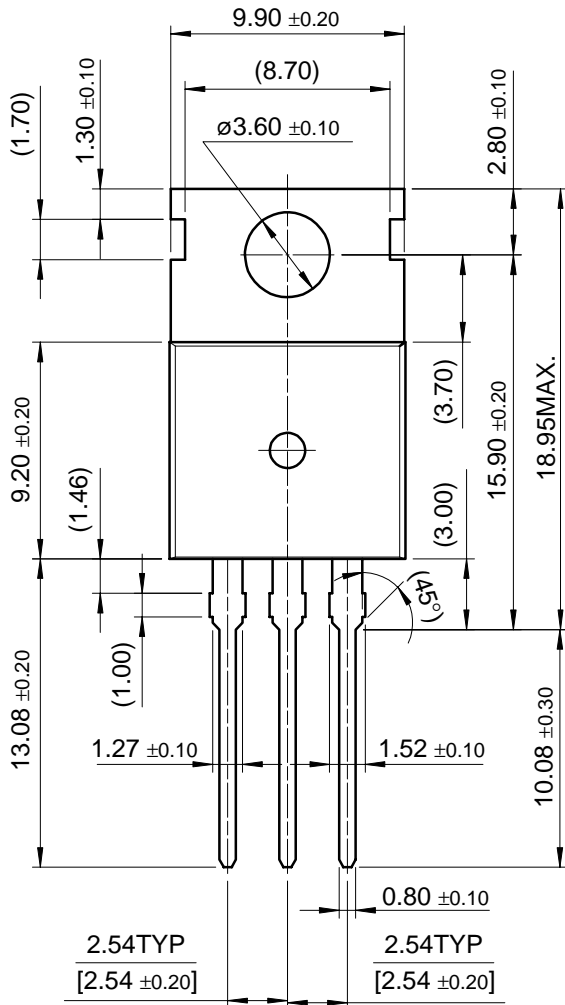
1. Required for stability. For value given, capacitor must be solid tantalum. 25µF aluminum electrolytic may be substituted.
2. C2 improves transient response and ripple rejection. Do not increase beyond 50µF.

# Mechanical Dimensions

## Package

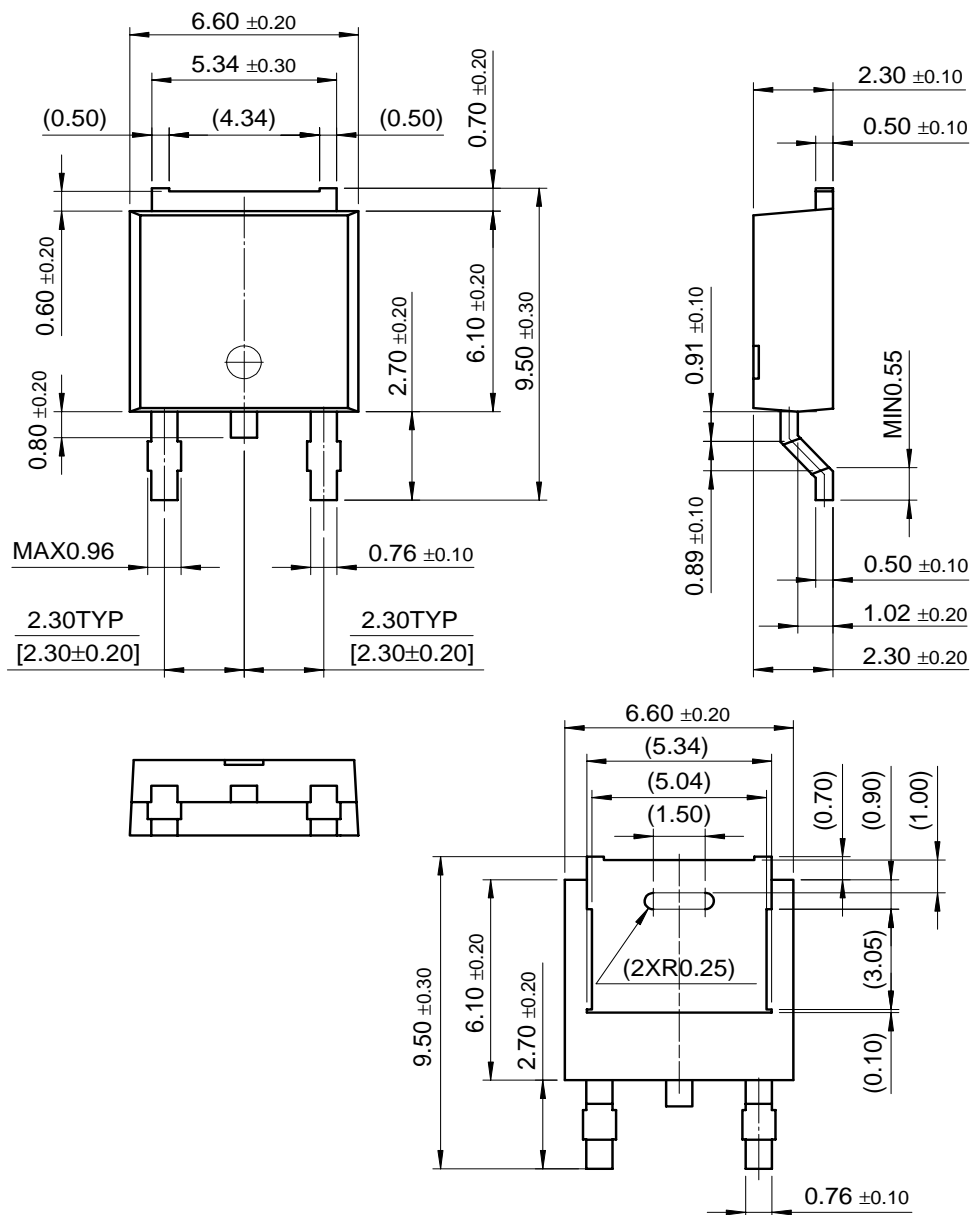
Dimensions in millimeters

### TO-220



**Mechanical Dimensions** (Continued)**Package**

Dimensions in millimeters

**D-PAK**

**Ordering Information**

Product Number	Package	Operating Temperature
KA79M05	TO-220	0 ~ + 125°C
KA79M06		
KA79M08		
KA79M12		
KA79M15		
KA79M18		
KA79M24		
KA79M05R	D-PAK	
KA79M08R		
KA79M12R		



**DISCLAIMER**

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

**LIFE SUPPORT POLICY**

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

Fairchild Semiconductor

SEARCH | [Parametric](#) | [Cross Reference](#)[space](#)[Product Folders and](#)[Applies](#)[find products](#)[Home >> Find products >>](#)[Products groups](#)[Analog and Mixed](#)[Signal](#)[Discrete](#)[Interface](#)[Logic](#)[Microcontrollers](#)[Non-Volatile](#)[Memory](#)[Optoelectronics](#)[Markets and](#)[applications](#)[New products](#)[Product selection and](#)[parametric search](#)[Cross-reference](#)[search](#)

KA79M05

Fixed Negative Voltage Regulator

Contents

[General description](#) | [Features](#) | [Product status/pricing/packaging](#)

General description

The KA79MXX series of 3-Terminal medium current negative voltage regulators are monolithic integrated circuits designed as fixed voltage regulators. These regulators employ internal current limiting, thermal shutdown and safe-area compensation making them essentially in destructible.

[back to top](#)

Features

- No external components required
- Output current in excess of 0.5A
- Internal thermal-overload
- Internal short circuit current limiting
- Output transistor safe-area compensation
- Output Voltages of -5V, -6V,-8V,-12V,-15V,-18V, -24V

[back to top](#)

Product status/pricing/packaging

Product	Product status	Package type	Leads	Packing method
KA79M05TSTU	Full Production	TO-220	3	RAIL
KA79M05RTM	Full Production	TO-252(DPAK)	2	TAPE REEL
KA79M05TU	Full Production	TO-220	3	RAIL
KA79M05	Full Production	TO-220	3	BULK

Related Links

[Request samples](#)[Dotted line](#)[How to order products](#)[Dotted line](#)[Product Change Notices](#)[\(PCNs\)](#)[Dotted line](#)[Support](#)[Dotted line](#)[Distributor and field sales](#)[representatives](#)[Dotted line](#)[Quality and reliability](#)[Dotted line](#)[Design tools](#)

Datasheet

[Download this datasheet](#)[PDF](#)[e-mail this datasheet](#)[\[E-](#)This page [Print version](#)

KA79M05RTF	Full Production	TO-252(DPAK)	2	TAPE REEL
------------	-----------------	--------------	---	-----------

[back to top](#)

[Home](#) | [Find products](#) | [Technical information](#) | [Buy products](#) |  
[Support](#) | [Company](#) | [Contact us](#) | [Site index](#) | [Privacy policy](#)

---

[© Copyright 2002 Fairchild Semiconductor](#)

---