FAIRCHILD SEMICONDUCTOR®

August 2013

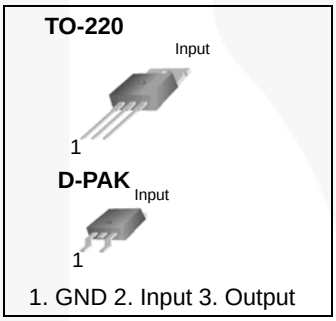
KA79MXX / LM79MXX
3-Terminal 0.5 A Negative Voltage Regulator

Features

- No External Components Required
- Output Current in Excess of 0.5 A
- Internal Thermal Overload
- Internal Short-Circuit Current Limiting
- Output Transistor Safe Area Compensation
- Output Voltages: -5 V, -12 V

Description

The KA79MXX / LM79MXX series of three 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.



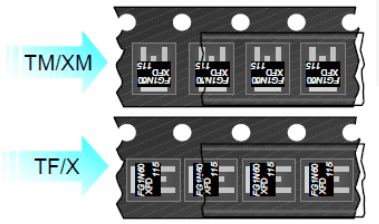
1. GND 2. Input 3. Output

Ordering Information[1]

Product Number	Package	Packing Method	Operating Temperature
KA79M05TU	TO-220 (Dual Gauge)	Rail	0 to +125°C
KA79M05RTM	D-PAK	Tape and Reel	
KA79M05RTF			
KA79M12RTM			
KA79M12RTF			
LM79M05CT	TO-220 (Single Gauge)	Rail	

Note:

1. Refer to below figure for TM / TF suffix of DPAK packing option.



D-PAK Unit Orientation

Block Diagram

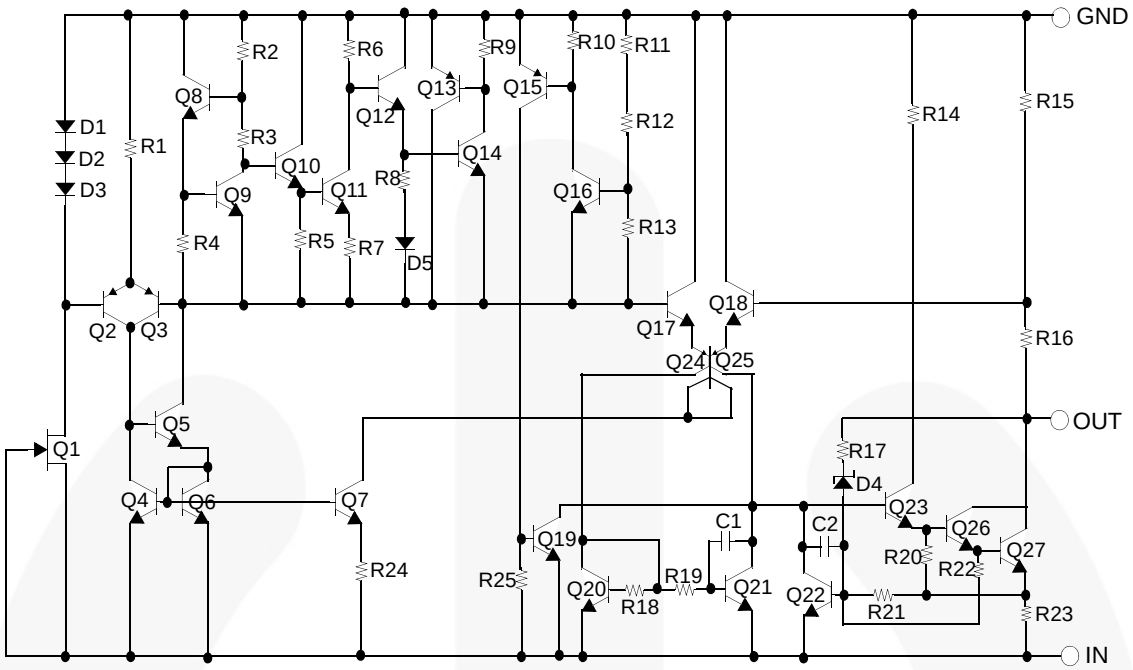


Figure 1. Block Diagram

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.

Symbol	Parameter		Value	Unit
V_I	Input Voltage	V_O = -5 V to -12 V	-35	V
$R_{\theta JC}$	Thermal Resistance, Junction-Case	TO-220	5	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-Air	TO-220	65	°C/W
T_{OPR}	Operating Temperature Range		0 to +125	°C
T_{STG}	Storage Temperature Range		-65 to +150	°C

Electrical Characteristics (KA79M05 / KA79M05R / LM79M05)

Refer to test circuit, 0°C ≤ T_J ≤ +125°C, I_O = 350 mA, V_I = -10 V, C_I = 0.33 µF, C_O = 0.1 µF unless otherwise specified.

Symbol	Parameter	Conditions		Min.	Typ.	Max.	Unit
V_O	Output Voltage	T_J = +25°C		-4.80	-5.00	-5.20	V
		I_O = 5 mA to 350 mA, V_I = -7 V to -25 V		-4.75	-5.00	-5.25	
ΔV_O	Line Regulation(2)	T_J =+25°C	V_I = -7 V to -25 V		7	50	mV
			V_I = -8 V to -25 V		2	30	
ΔV_O	Load Regulation(2)	I_O = 5 mA to 500 mA, T_J = +25°C			30	100	mV
I_Q	Quiescent Current	T_J= +25°C			3.0	6.0	mA
ΔI_Q	Quiescent Current Change	I_O = 5 mA to 350 mA				0.4	mA
		I_O = 200 mA, V_I = -8 V to -25 V				0.4	
ΔVo/ΔT	Output Voltage Drift	I_O = 5 mA			-0.2		mV/°C
V_N	Output Noise Voltage	f = 10 Hz to 100 kHz, T_A = +25°C			40		µV
RR	Ripple Rejection	f = 120 Hz, V_J = -8 V to -18 V		54	60		dB
V_D	Dropout Voltage	T_J = +25°C, I_O = 500 mA			1.1		V
I_{SC}	Short-Circuit Current	T_J = +25°C, V_I = -35 V			140		mA
I_{PK}	Peak Current	T_J = +25°C			650		mA

Note:

2. 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 (KA79M12R)

Refer to test circuit, $0°C \le T_J \le +125°C$, I_O = 350 mA, V_I = -19 V, C_I = 0.33 µF, C_O = 0.1 µF unless otherwise specified.

Symbol	Parameter	Conditions		Min.	Typ.	Max.	Unit
V_O	Output Voltage	T_J = +25°C		-11.5	-12.0	-12.5	V
		I_O = 5 mA to 350 mA, V_I = -14.5 V to -30 V		-11.4	-12.0	-12.6	
ΔV_O	Line Regulation(3)	T_J =+25°C	V_I = -14.5 V to -30 V		8.0	80	mV
			V_I = -15 V to -25 V		3.0	50	
ΔV_O	Load Regulation(3)	T_J = +25°C	I_O = 5.0 mA to 500 mA		30	240	mV
I_Q	Quiescent Current	T_J = +25°C			3	6	mA
ΔI_Q	Quiescent Current Change	I_O = 5 mA to 350 mA				0.4	mA
		V_I = -14.5 V to -30 V				0.4	
$\Delta V_O/\Delta T$	Output Voltage Drift	I_O = 5 mA			-0.8		mV/°C
V_N	Output Noise Voltage	f = 10 Hz to 100 kHz, T_A = +25°C			75		µV
RR	Ripple Rejection	f = 120 Hz, V_I = -15 V to -25 V		54	60		dB
V_D	Dropout Voltage	I_O = 500 mA, T_J = +25°C			1.1		V
I_{SC}	Short Circuit Current	V_I = -35 V, T_J = +25°C			140		mA
I_{PK}	Peak Current	T_J = +25°C			650		mA

Note:

3. 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 Performance Characteristics

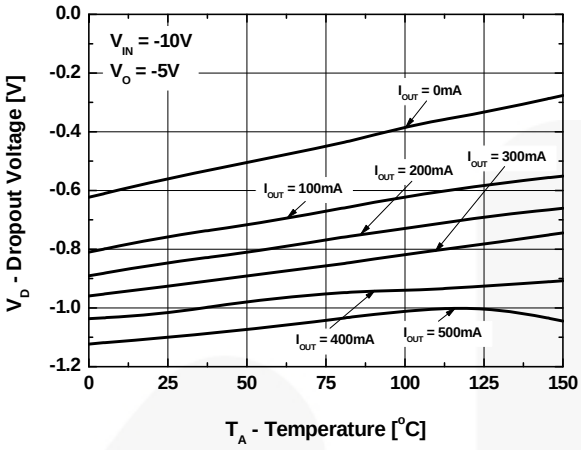


Figure 2. Dropout Voltage

Typical Applications

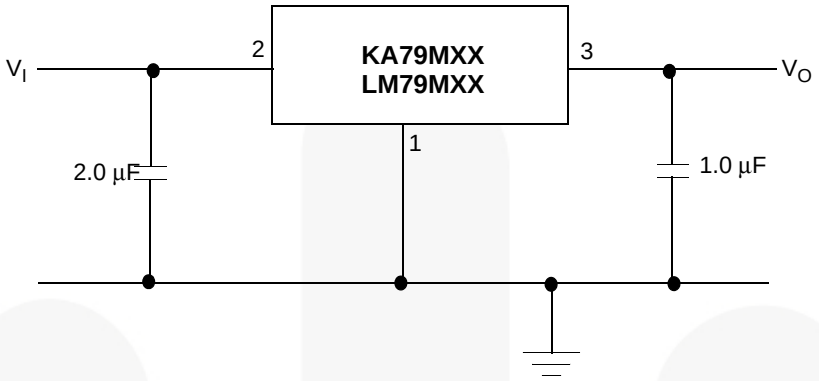


Figure 3. Fixed Output Regulator

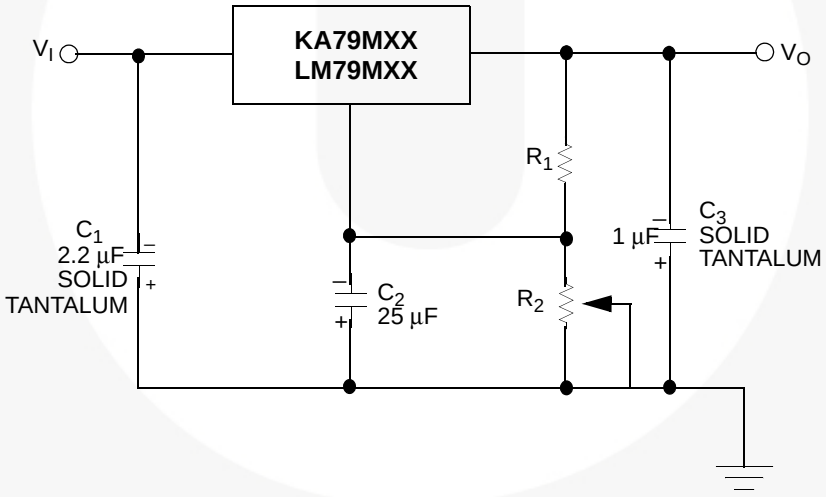


Figure 4. Variable Output

Notes:

4. To specify an output voltage, substitute voltage value for "XX".
5. C_I is required if the regulator is located an appreciable distance from the power supply filter. For value given, capacitor must be solid tantalum. If aluminium electronics are used, 25 µF aluminum electrolytic may be substituted.
6. C_2 improves transient response and ripple rejection. Do not increase beyond 50 µF.

Physical Dimensions

TO-220 (SINGLE GAUGE)

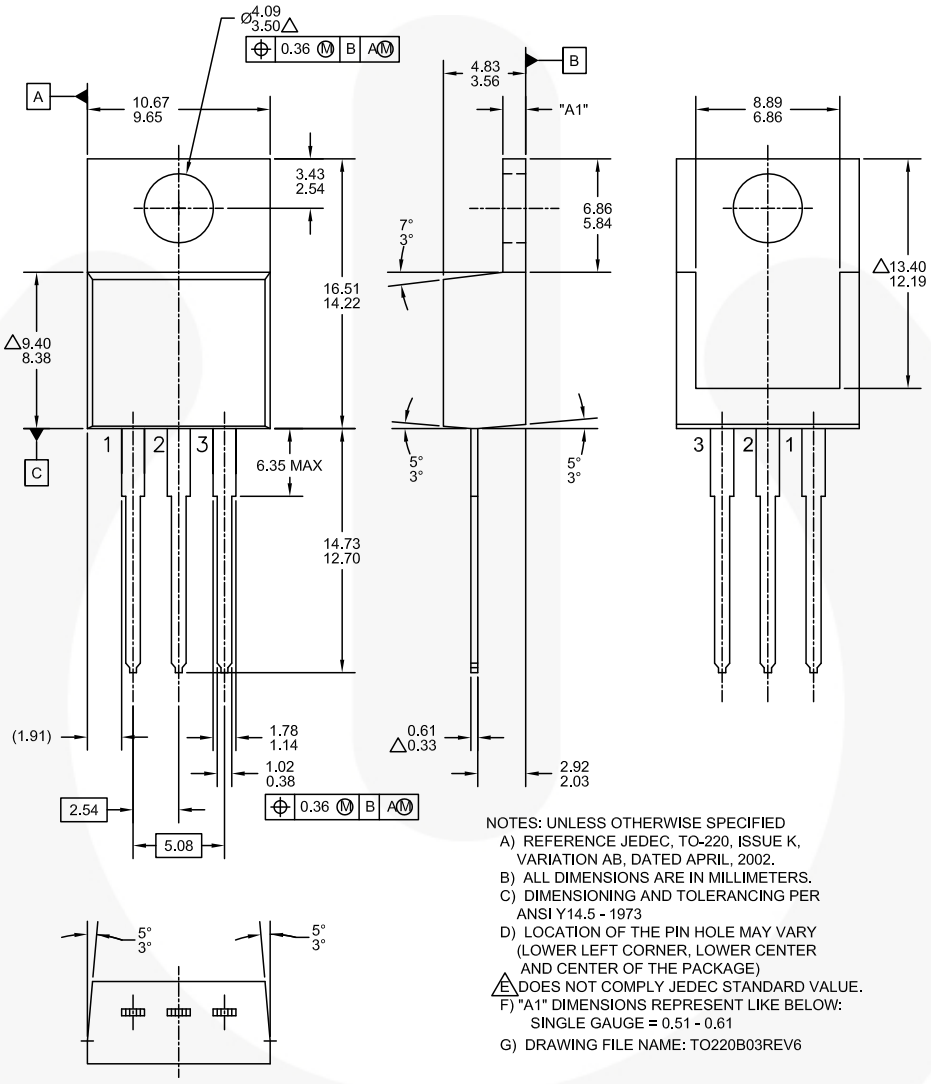


Figure 5. TO-220, MOLDED, 3-LEAD, JEDEC VARIATION AB

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Physical Dimensions (Continued)

TO-220 (DUAL GAUGE)

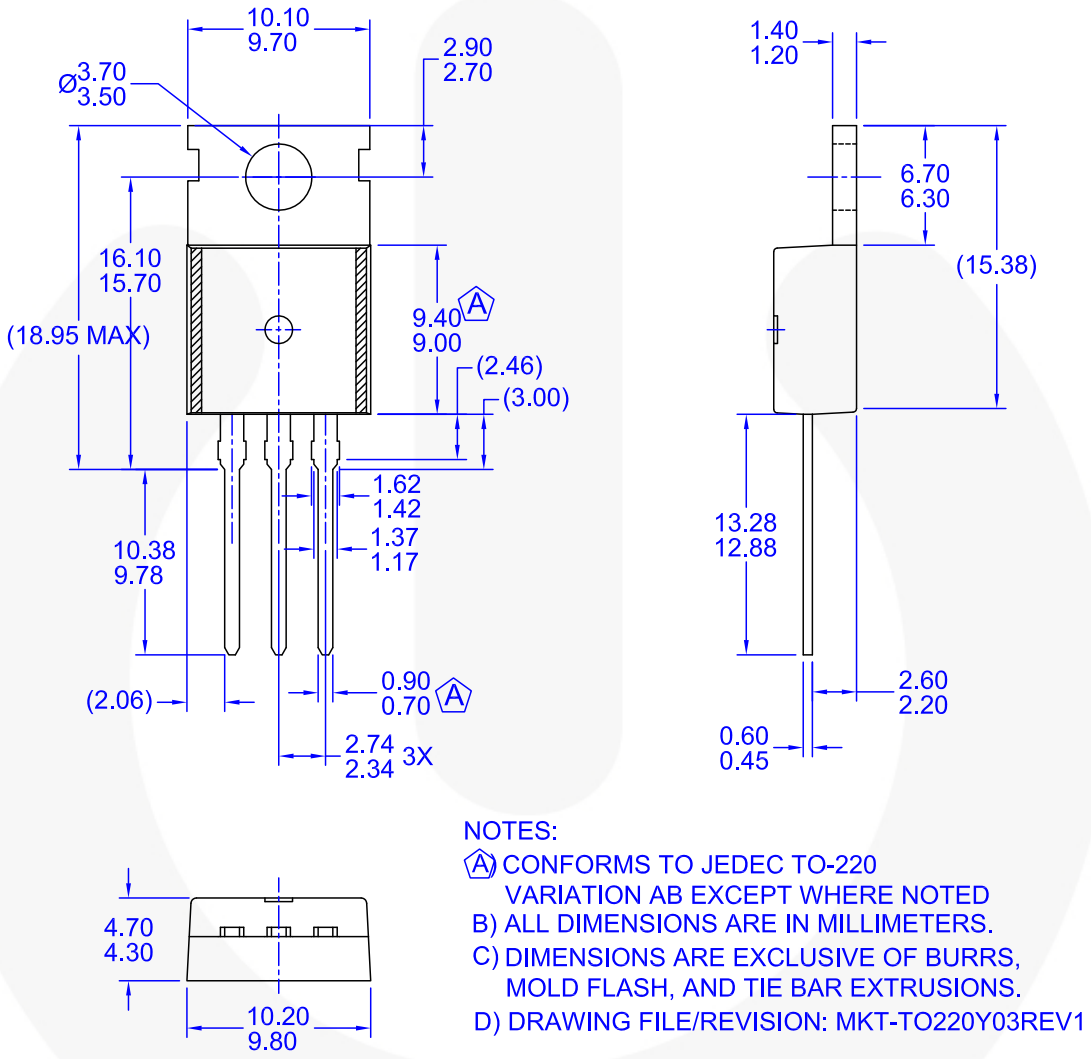

Figure 6. TO220, MOLDED, 3-LEAD, NON-JEDEC VARIATION AB [DUAL GUAGE]

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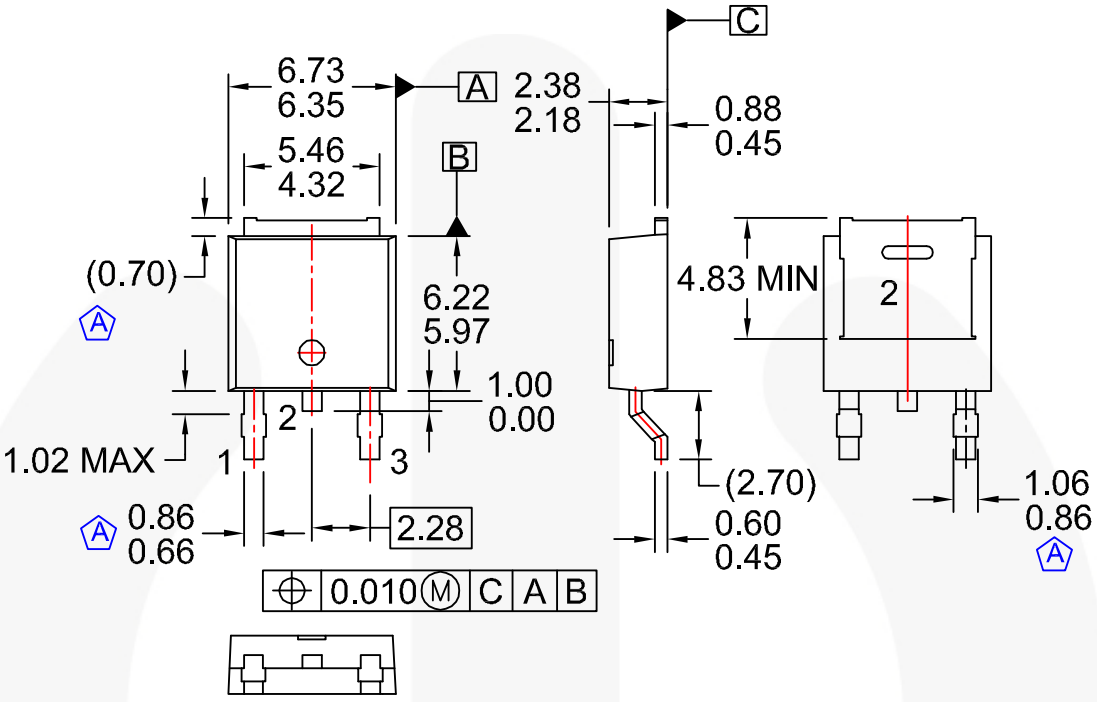
Physical Dimensions (Continued)

D-PAK



NOTES: UNLESS OTHERWISE SPECIFIED

A) CONFORMS TO JEDEC TO-252 VARIATION AB EXCEPT WHERE NOTED

B) ALL DIMENSIONS ARE IN MILLIMETERS.

C) DRAWING CONFORMS TO ASME Y14.5M-1994

D) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

E) FORMERLY NAMED BD1733

F) DRAWING FILE NAME: MKT-TO252D03REV1

Figure 7. 3-LEAD, TO-252, JEDEC TO-252 VAR. AB, SURFACE MOUNT (DPAK)

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