

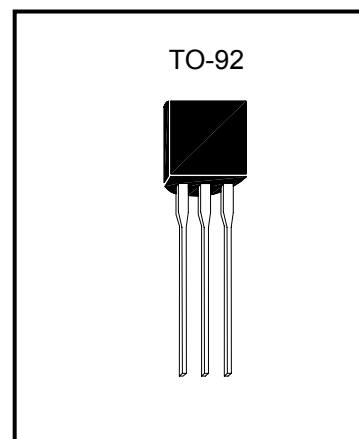
Three Terminal Medium Current Positive Voltage Regulators

LM78M05XA3

Description

These regulators employ internal current-limiting and thermal-shutdown, making them essentially indestructible. They can deliver up to 500mA output current, if the case temperature can be kept at $T_c=25^{\circ}\text{C}$.

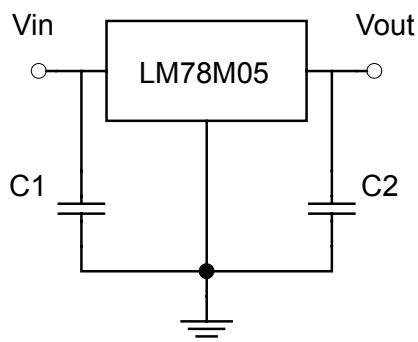
They are intended as fixed voltage regulators in a wide range of applications including local (on-card) regulation for elimination of noise and distribution problems associated with single-point regulation. In addition, they can be used with power pass elements to make high-current voltage regulators. The LM78M05XA3 used as a Zener diode/resistor combination replacement, offers an effective output impedance improvement of typically two orders of magnitude, along with lower quiescent current and lower noise.



Absolute Maximum Ratings ($T_a=25^{\circ}\text{C}$)

- Input Voltage..... 30 V
- Total Power Dissipation..... Internally limited
- Operating Temperature Range..... 0°C to $+125^{\circ}\text{C}$
- Maximum Junction Temperature..... 125°C
- Storage Temperature Range..... -55°C to $+150^{\circ}\text{C}$
- Lead Temperature (Soldering 10S)..... 260°C

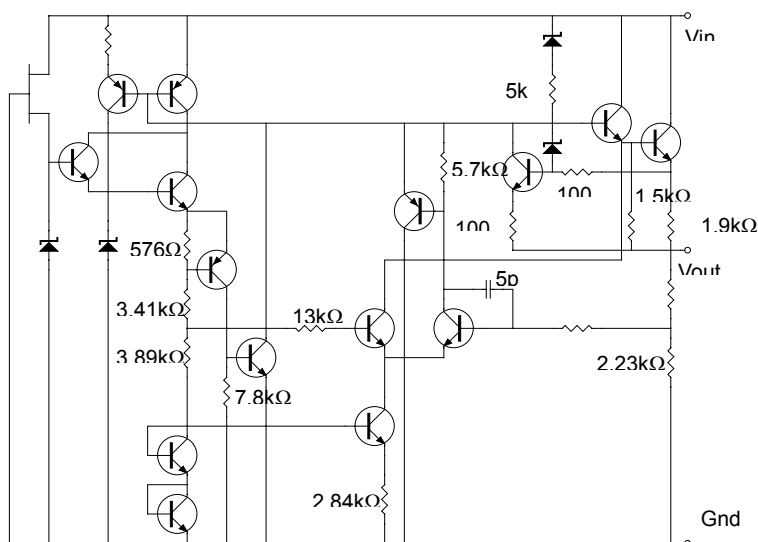
Typical Application



Note:

C1 and C2 are required if regulator is located far from power supply filter and load, or oscillation may induced on the loop.

Schematic Diagram





Ordering Information

Device	Output Voltage Range
LM78M05AA3	4.8V~4.9V
LM78M05BA3	4.9V~5.1V
LM78M05CA3	5.1V~5.2V

Electrical Characteristics

$V_{in}=10V$, $I_{out}=350mA$, $P_D \leq 5W$, $0^\circ C \leq T_j \leq 125^\circ C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$ (unless otherwise noted)

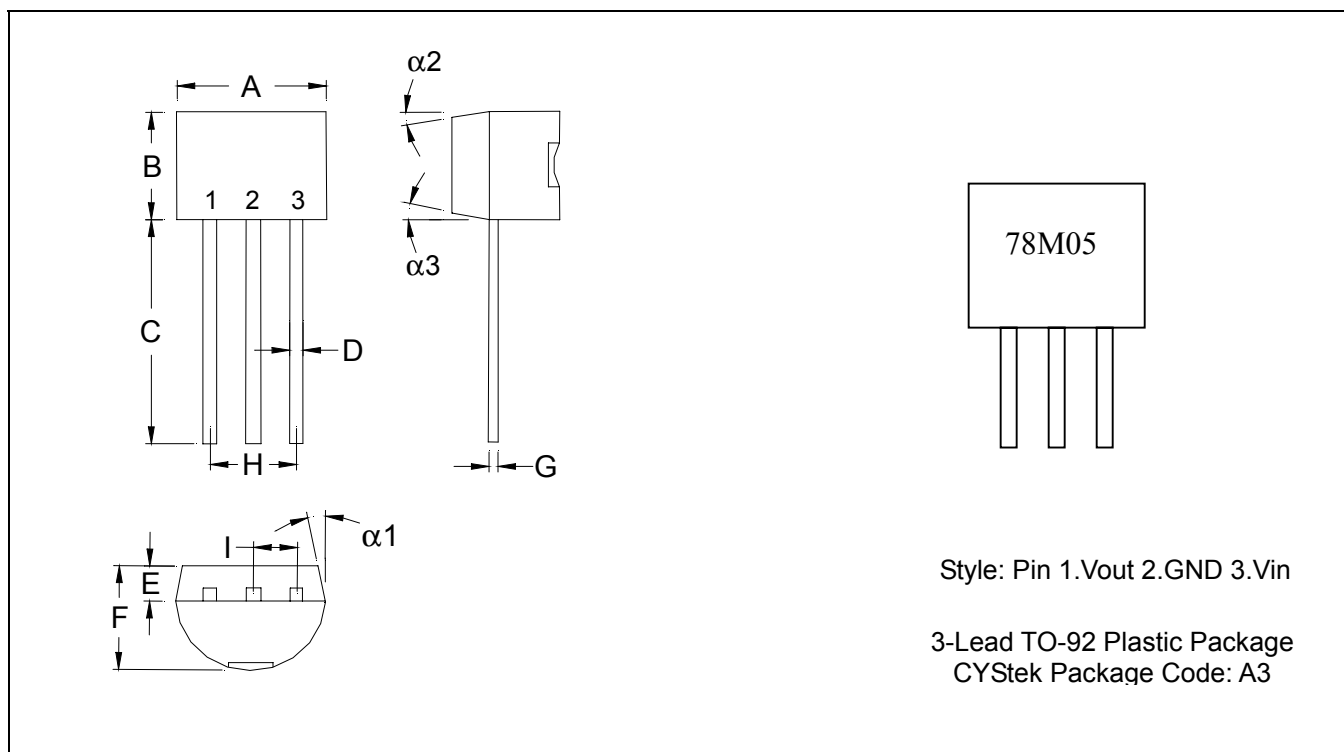
Symbol	Parameter	Conditions	LM78M05A			Units
			Min	Typ	Max	
V_o	Output Voltage	$T_j=25^\circ C$	4.80	-	4.90	V
		$5mA \leq I_o \leq 350mA$ and $7V \leq V_{in} \leq 20V$	4.75	-	5.25	
ΔV_o	Line Regulation	$T_j=25^\circ C$, $7V \leq V_{in} \leq 25V$	-	3	100	mV
		$T_j=25^\circ C$, $8V \leq V_{in} \leq 25V$	-	-	50	
ΔV_o	Load Regulation	$T_j=25^\circ C$, $5mA \leq I_o \leq 500mA$	-	15	100	mV
		$T_j=25^\circ C$, $5mA \leq I_o \leq 200mA$	-	-	50	
I_Q	Quiescent Current	$T_j=25^\circ C$	-	3.2	6	mA
ΔI_Q	Quiescent Current Change	$5mA \leq I_o \leq 350mA$	-	-	0.5	mA
		$8V \leq V_{in} \leq 25V$, $I_o=200mA$	-	-	0.8	
V_n	Output Noise Voltage	$T_a=25^\circ C$, $10Hz \leq f \leq 10KHz$	-	40	100	μV
RR	Ripple Rejection	$8V \leq V_{in} \leq 18V$, $I_o=300mA$, $f=120Hz$	62	78	-	dB
VD	Dropout Voltage	$T_j=25^\circ C$, $I_o=500mA$	-	2	-	V
IOS	Output Short Circuit Current	$T_j=25^\circ C$, $V_{in}=30V$		300		mA
IMAX	Peak Output Current	$T_j=25^\circ C$		700		mA
TCV _o	Temperature Coefficient of Output Voltage	$I_o=5mA$		-1.1		$mV/^\circ C$



Symbol	Parameter	Conditions	LM78M05B			Units
			Min	Typ	Max	
Vo	Output Voltage	Tj=25°C	4.90	5.00	5.1	V
		5mA≤Io≤350mA and 7V≤Vin≤20V	4.75	-	5.25	
ΔVo	Line Regulation	Tj=25°C, 7V≤Vin≤25V	-	3	100	mV
		Tj=25°C, 8V≤Vin≤25V	-	-	50	
ΔVo	Load Regulation	Tj=25°C, 5mA≤Io≤500mA	-	15	100	mV
		Tj=25°C, 5mA≤Io≤200mA	-	-	50	
IQ	Quiescent Current	Tj=25°C	-	3.2	6	mA
ΔIQ	Quiescent Current Change	5mA≤Io≤350mA	-	-	0.5	mA
		8V≤Vin≤25V, Io=200mA	-	-	0.8	
Vn	Output Noise Voltage	Ta=25°C, 10Hz≤f≤10KHz	-	40	100	uV
RR	Ripple Rejection	8V≤Vin≤18V, Io=300mA, f=120Hz	62	78	-	dB
VD	Dropout Voltage	Tj=25°C, Io=500mA	-	2	-	V
IOS	Output Short Circuit Current	Tj=25°C, Vin=30V		300		mA
IMAX	Peak Output Current	Tj=25°C		700		mA
TCVo	Temperature Coefficient of Output Voltage	Io=5mA		-1.1		mV/°C

Symbol	Parameter	Conditions	LM78M05C			Units
			Min	Typ	Max	
Vo	Output Voltage	Tj=25°C	5.10	-	5.2	V
		5mA≤Io≤350mA and 7V≤Vin≤20V	5.05	-	5.25	
ΔVo	Line Regulation	Tj=25°C, 7V≤Vin≤25V	-	3	100	mV
		Tj=25°C, 8V≤Vin≤25V	-	-	50	
ΔVo	Load Regulation	Tj=25°C, 5mA≤Io≤500mA	-	15	100	mV
		Tj=25°C, 5mA≤Io≤200mA	-	-	50	
IQ	Quiescent Current	Tj=25°C	-	3.2	6	mA
ΔIQ	Quiescent Current Change	5mA≤Io≤350mA	-	-	0.5	mA
		8V≤Vin≤25V, Io=200mA	-	-	0.8	
Vn	Output Noise Voltage	Ta=25°C, 10Hz≤f≤10KHz	-	40	100	uV
RR	Ripple Rejection	8V≤Vin≤18V, Io=300mA, f=120Hz	62	78	-	dB
VD	Dropout Voltage	Tj=25°C, Io=500mA	-	2	-	V
IOS	Output Short Circuit Current	Tj=25°C, Vin=30V		300		mA
IMAX	Peak Output Current	Tj=25°C		700		mA
TCVo	Temperature Coefficient of Output Voltage	Io=5mA		-1.1		mV/°C

TO-92 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1704	0.1902	4.33	4.83	G	0.0142	0.0220	0.36	0.56
B	0.1704	0.1902	4.33	4.83	H	-	*0.1000	-	*2.54
C	0.5000	-	12.70	-	I	-	*0.0500	-	*1.27
D	0.0142	0.0220	0.36	0.56	$\alpha 1$	-	*5°	-	*5°
E	-	*0.0500	-	*1.27	$\alpha 2$	-	*2°	-	*2°
F	0.1323	0.1480	3.36	3.76	$\alpha 3$	-	*2°	-	*2°

Notes: 1.Controlling dimension: millimeters.

2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.

3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: 42 Alloy ; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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