

Three Terminal Low Current Positive Voltage Regulators

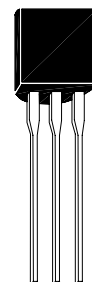
LM78L05XA3

Description

These regulators employ internal current-limiting and thermal-shutdown, making them essentially indestructible. They can deliver up to 100mA output current, if the case temperature can keep in $T_c=25^{\circ}\text{C}$.

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 LM78L05 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.

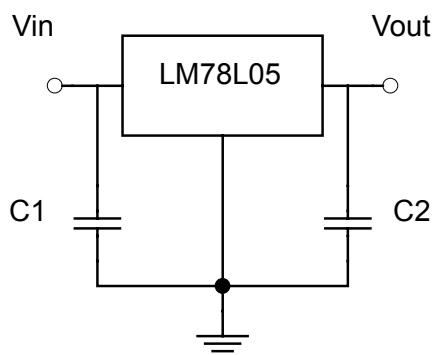
TO-92



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

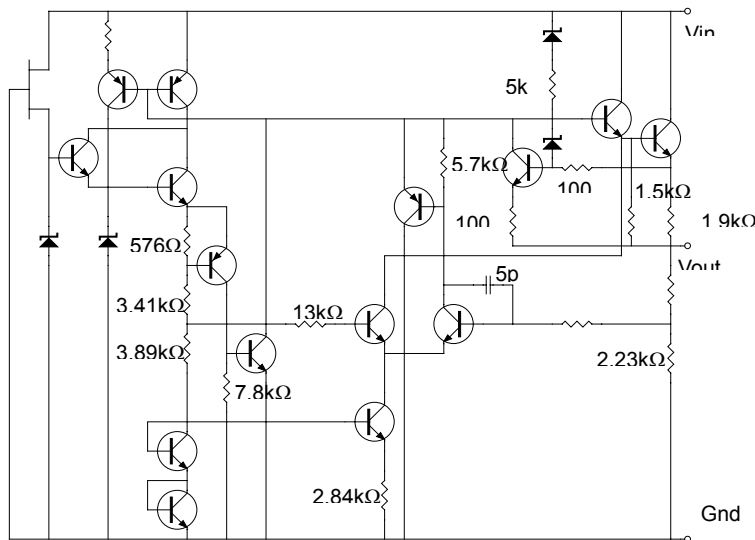
Typical Application



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 Tolerance
LM78L05AA3	3%
LM78L05BA3	5%

Electrical Characteristics

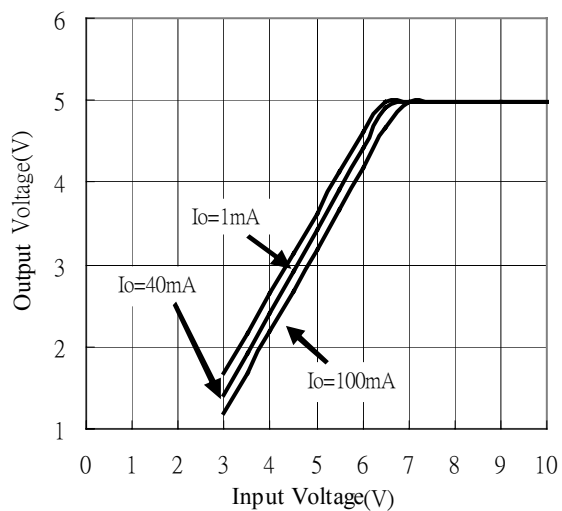
$V_{in}=10V$, $I_{out}=40mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$ (unless otherwise noted)

Symbol	Parameter		Conditions	LM78L05A			Units
				Min	Typ	Max	
V_o	Output Voltage		$T_j=25^{\circ}C$	4.85	5.00	5.15	V
			$1mA \leq I_o \leq 70mA$	4.85	-	5.15	
			$1mA \leq I_o \leq 40mA$ and $7V \leq V_{in} \leq 20V$	4.85	-	5.15	
ΔV_o	Line Regulation		$T_j=25^{\circ}C$, $7V \leq V_{in} \leq 20V$	-	-	150	mV
			$T_j=25^{\circ}C$, $8V \leq V_{in} \leq 20V$	-	-	100	
ΔV_o	Load Regulation		$T_j=25^{\circ}C$, $1mA \leq I_o \leq 40mA$	-	-	30	mV
			$T_j=25^{\circ}C$, $1mA \leq I_o \leq 100mA$	-	-	100	
I_Q	Quiescent Current		$T_j=25^{\circ}C$	-	3	6	mA
			$T_j=125^{\circ}C$	-	-	5.5	
ΔI_Q	Quiescent Current Change	with load	$1mA \leq I_o \leq 40mA$	-	-	0.1	mA
		with line	$8V \leq V_{in} \leq 20V$	-	-	1.5	
V_n	Output Noise Voltage		$T_a=25^{\circ}C$, $10Hz \leq f \leq 10KHz$	-	40	-	μV
$\Delta V_{in} / \Delta V_{out}$	Ripple Rejection		$8V \leq V_{in} \leq 16V$, $f=120Hz$	47	62	-	dB
VD	Dropout Voltage		$T_j=25^{\circ}C$	-	1.7	-	V

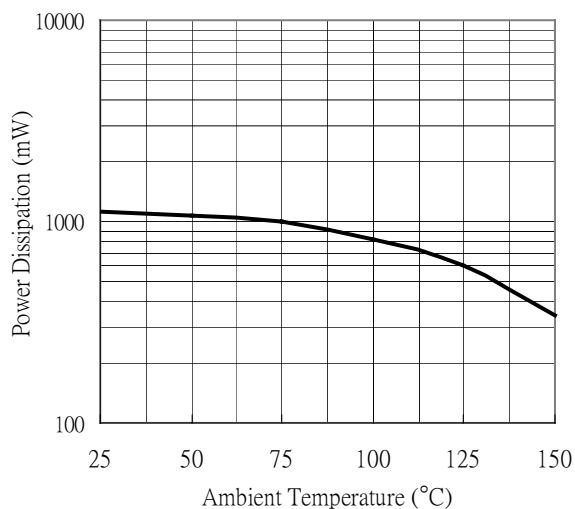
Symbol	Parameter		Conditions	LM78L05B			Units
				Min	Typ	Max	
V_o	Output Voltage		$T_j=25^{\circ}C$	4.80	5.00	5.20	V
			$1mA \leq I_o \leq 70mA$	4.75	-	5.25	
			$1mA \leq I_o \leq 40mA$ and $7V \leq V_{in} \leq 20V$	4.75	-	5.25	
ΔV_o	Line Regulation		$T_j=25^{\circ}C$, $7V \leq V_{in} \leq 20V$	-	-	150	mV
			$T_j=25^{\circ}C$, $8V \leq V_{in} \leq 20V$	-	-	100	
ΔV_o	Load Regulation		$T_j=25^{\circ}C$, $1mA \leq I_o \leq 40mA$	-	-	30	mV
			$T_j=25^{\circ}C$, $1mA \leq I_o \leq 100mA$	-	-	100	
I_Q	Quiescent Current		$T_j=25^{\circ}C$	-	3	6	mA
			$T_j=125^{\circ}C$	-	-	5.5	
ΔI_Q	Quiescent Current Change	with load	with load	-	-	0.1	mA
		with line	with line	-	-	1.5	
V_n	Output Noise Voltage		$T_a=25^{\circ}C$, $10Hz \leq f \leq 10KHz$	-	40	-	μV
$\Delta V_{in} / \Delta V_{out}$	Ripple Rejection		$8V \leq V_{in} \leq 16V$, $f=120Hz$	47	62	-	dB
VD	Dropout Voltage		$T_j=25^{\circ}C$	-	1.7	-	V

Characteristic Curves

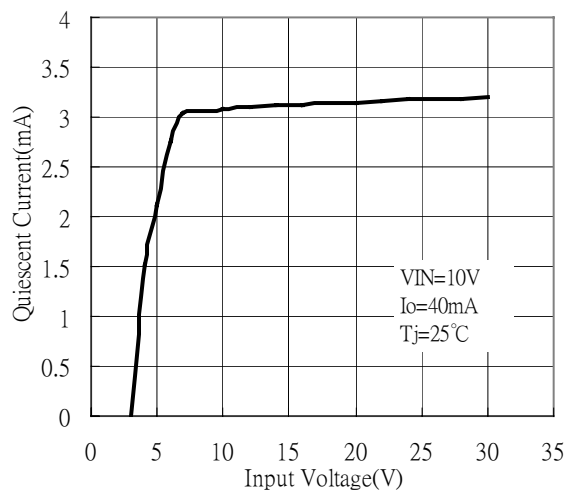
Dropout Characteristics



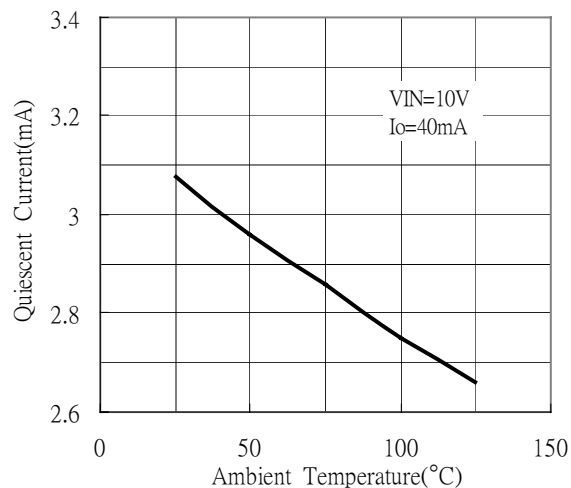
Maximum Average Power Dissipation



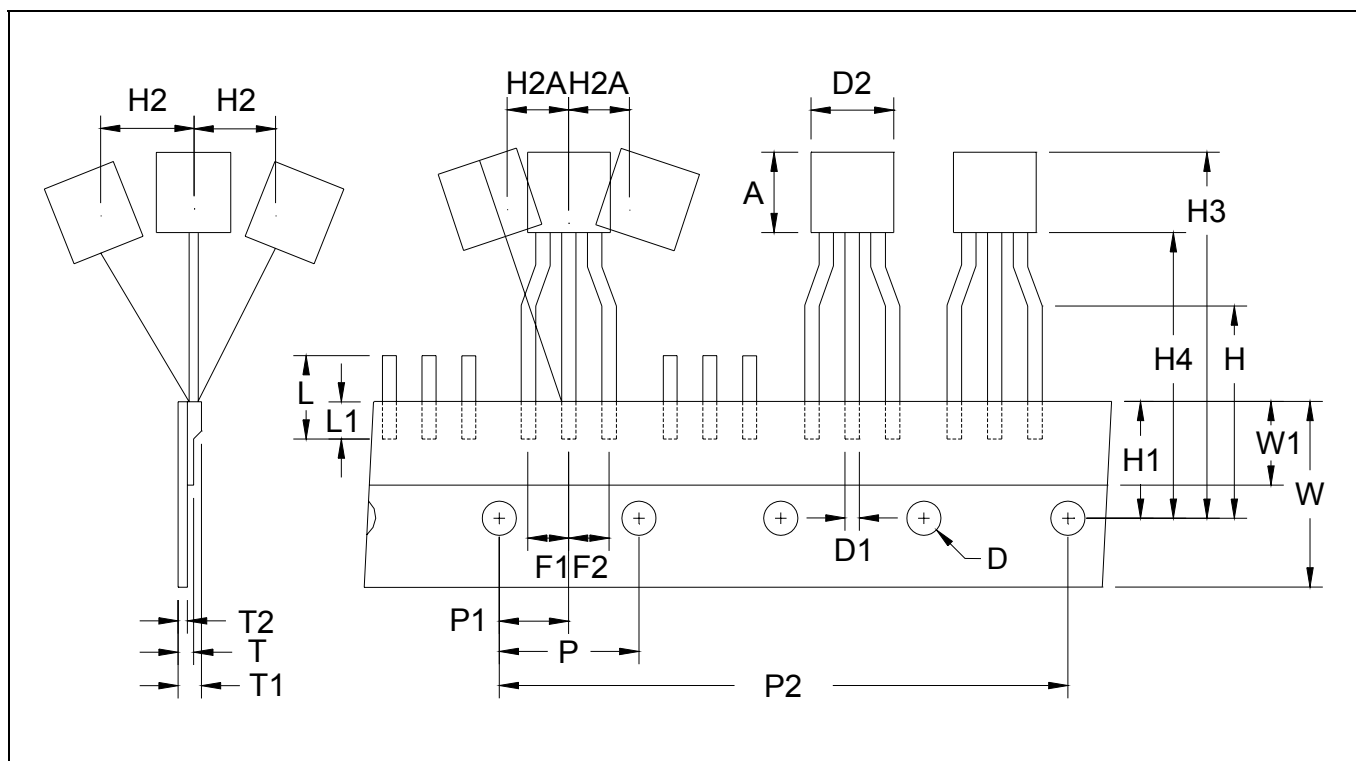
Quiescent Current



Quiescent Current

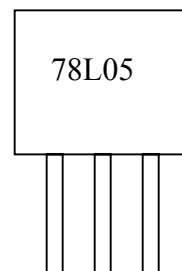
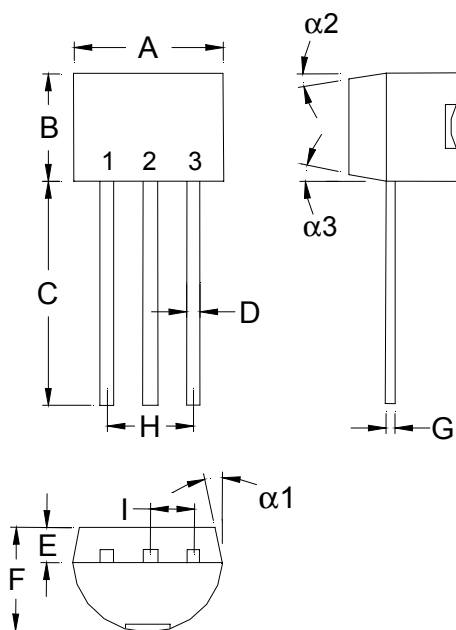


TO-92 Taping Outline



DIM	Item	Millimeters	
		Min.	Max.
A	Component body height	4.33	4.83
D	Tape Feed Diameter	3.80	4.20
D1	Lead Diameter	0.36	0.53
D2	Component Body Diameter	4.33	4.83
F1,F2	Component Lead Pitch	2.40	2.90
F1,F2	F1-F2	-	±0.3
H	Height Of Seating Plane	15.50	16.50
H1	Feed Hole Location	8.50	9.50
H2	Front To Rear Deflection	-	1
H2A	Deflection Left Or Right	-	1
H3	Component Height	-	27
H4	Feed Hole To Bottom Of Component	-	21
L	Lead Length After Component Removal	-	11
L1	Lead Wire Enclosure	2.50	-
P	Feed Hole Pitch	12.50	12.90
P1	Center Of Seating Plane Location	5.95	6.75
P2	4 Feed Hole Pitch	50.30	51.30
T	Over All Tape Thickness	-	0.55
T1	Total Taped Package Thickness	-	1.42
T2	Carrier Tape Thickness	0.36	0.68
W	Tape Width	17.50	19.00
W1	Adhesive Tape Width	5.00	7.00
-	20 pcs Pitch	253	255

TO-92 Dimension



Style: Pin 1.Vout 2.GND 3.Vin

3-Lead TO-92 Plastic Package
CYStek Package Code: A3

*: 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	α1	-	*5°	-	*5°
E	-	*0.0500	-	*1.27	α2	-	*2°	-	*2°
F	0.1323	0.1480	3.36	3.76	α3	-	*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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