

## THREE TERMINAL POSITIVE VOLTAGE REGULATOR

### Description

The YJ78L series are fixed-voltage monolithic integrated circuit voltage regulators. They can deliver up to 100mA of output current. In addition, the YJ78L series integrate internal current limit, short-circuit protection and thermal shutdown, so that they are basically not affected by overload. Therefore, the YJ78L series are widely used in various scenarios, such as on-card regulation for elimination of noise and distribution problems associated with single-point regulation.

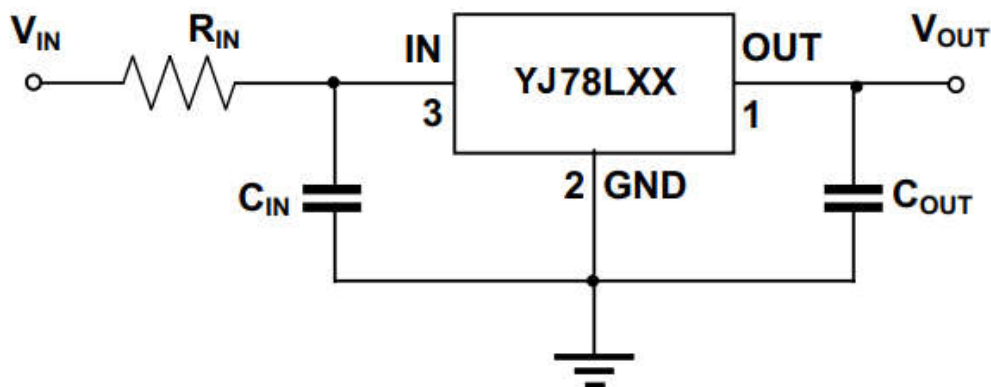
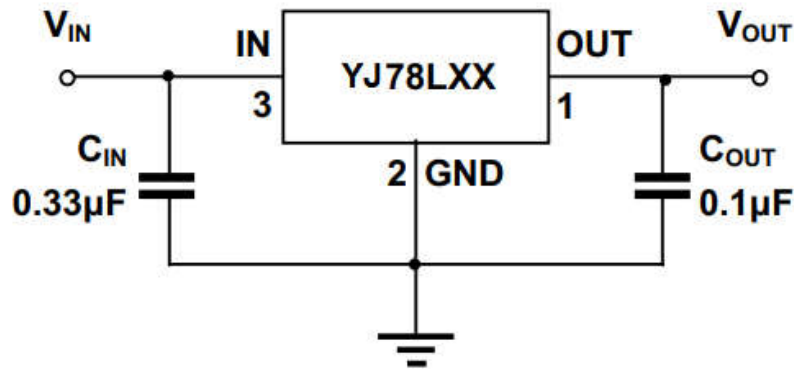
### Features

- Fixed Output Voltage of 5V,6V,8V,9V,10V, 12V,15V,18V and 24V Available.
- Output Current Up to 100mA.
- Thermal Overload Shutdown Protection.
- Short Circuit Protection.
- No External Components.

### Applications

- TV Board
- Air Conditioner
- Vehicle Mounted Radar
- Charging Device

### ■ Typical Application



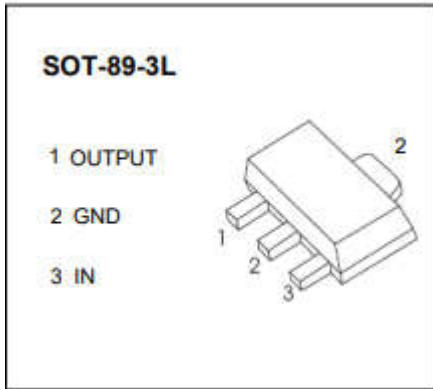


# YJ78L Series

## ■ Package and Ordering Information

Model	Part Number	Package Description	Temperature Range	Ordering Number	Marking Information	Packing Option
YJ78LXX	YJ78L05	SOT-89-3L	-40°C ~ 125°C	YJ78L05LH3Y	78L05 YWWXXX	Tape & Reel 1000
	YJ78L06	SOT-89-3L	-40°C ~ 125°C	YJ78L06LH3Y	78L06 YWWXXX	Tape & Reel 1000
	YJ78L08	SOT-89-3L	-40°C ~ 125°C	YJ78L08LH3Y	78L08 YWWXXX	Tape & Reel 1000
	YJ78L09	SOT-89-3L	-40°C ~ 125°C	YJ78L09LH3Y	78L09 YWWXXX	Tape & Reel 1000
	YJ78L10	SOT-89-3L	-40°C ~ 125°C	YJ78L10LH3Y	78L10 YWWXXX	Tape & Reel 1000
	YJ78L12	SOT-89-3L	-40°C ~ 125°C	YJ78L12LH3Y	78L12 YWWXXX	Tape & Reel 1000
	YJ78L15	SOT-89-3L	-40°C ~ 125°C	YJ78L15LH3Y	78L15 YWWXXX	Tape & Reel 1000
	YJ78L18	SOT-89-3L	-40°C ~ 125°C	YJ78L18LH3Y	78L18 YWWXXX	Tape & Reel 1000
	YJ78L24	SOT-89-3L	-40°C ~ 125°C	YJ78L24LH3Y	78L24 YWWXXX	Tape & Reel 1000

## ■ Pin Configuration and Top Mark



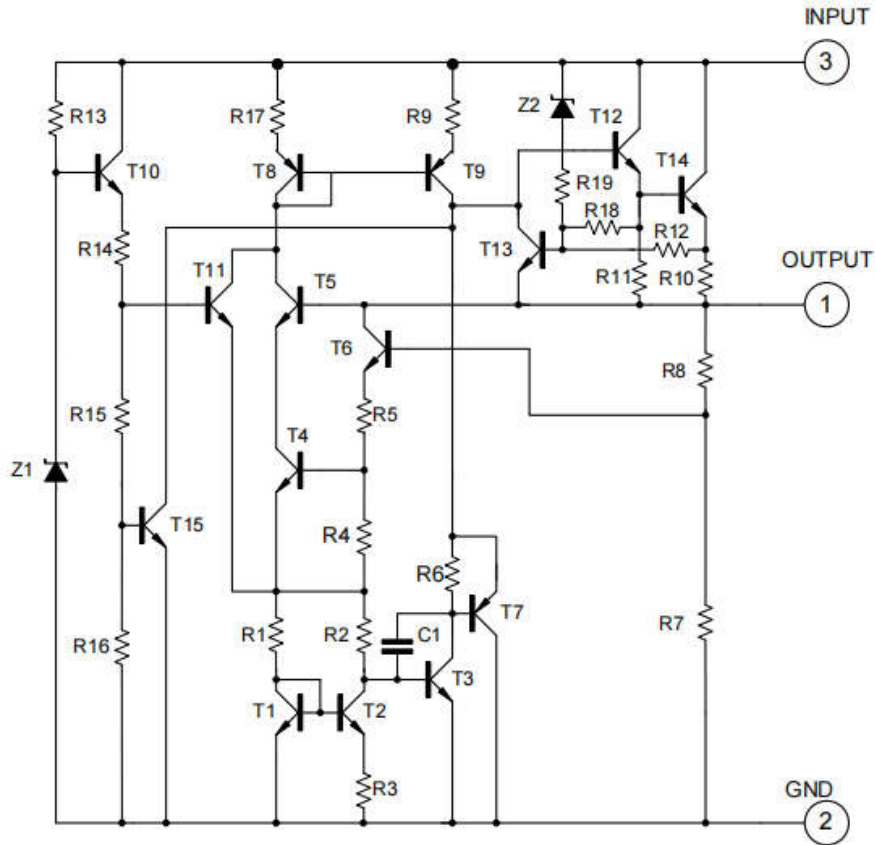
78LXX : Part No.  
XX : Output Voltage  
YWW : Date Code  
XXX : Tracking No.

XX	Output Voltage (V)	XX	Output Voltage (V)
05	5	12	12
06	6	15	15
08	8	18	18
09	9	24	24
10	10	-	-



# YJ78L Series

## Functional Block Diagram



## Absolute Maximum Ratings (unless otherwise noted)

Parameter	Symbol	Ratings	Unit	
DC Input Voltage	$V_{IN}$	$5V \leq V_{OUT} \leq 10V$	30	V
		$12V \leq V_{OUT} \leq 18V$	35	
		$V_{OUT} = 24V$	40	
Operating Junction Temperature	$T_J$	-40 to +125	°C	
Storage Temperature	$T_{STG}$	-65 to +150	°C	
Lead Temperature (Soldering, 10sec)	$T_{LEAD}$	260	°C	

Notes:

1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.
2. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
3. This condition is only determined from design. It can't be 100% tested in mass production.

## Recommended Operating Ratings

Parameter	Symbol	Ratings		Unit	
		Min	Max		
Input Voltage	$V_{IN}$	YJ78L05	7	20	V
		YJ78L06	8	20	
		YJ78L08	10.5	23	
		YJ78L09	11.5	24	
		YJ78L10	12.5	25	
		YJ78L12	14.5	27	
		YJ78L15	17.5	30	
		YJ78L18	20.5	33	
		YJ78L24	26.5	39	
Output Current	$I_{OUT}$	-	100	mA	
Operating Junction Temperature	$T_J$	-40	125	°C	



## YJ78L Series

### ■ Electrical Characteristics ( $C_{IN}=0.33\mu F$ , $C_{OUT}=0.1\mu F$ , unless otherwise noted)

For YJ78L05( $V_{IN}=10V$ ,  $I_O=40mA$ )

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	$V_{OUT}$	$T_J=25^\circ C$	4.8	5	5.2	V
		$1mA \leq I_{OUT} \leq 40mA$ , $7V \leq V_{IN} \leq 20V$	4.75	5	5.25	
		$1mA \leq I_{OUT} \leq 70mA$	4.75	5	5.25	
Line Regulation	LNR	$7V \leq V_{IN} \leq 20V$ , $T_J=25^\circ C$	-	32	150	mV
		$8V \leq V_{IN} \leq 20V$ , $T_J=25^\circ C$	-	26	100	
Load Regulation	LDR	$1mA \leq I_{OUT} \leq 100mA$ , $T_J=25^\circ C$	-	15	60	mV
		$1mA \leq I_{OUT} \leq 40mA$ , $T_J=25^\circ C$	-	8	30	
Dropout Voltage	$V_{DROP}$	$T_J=25^\circ C$	-	1.7	-	V
Quiescent Current	$I_Q$	$I_{OUT}=0$ , $T_J=25^\circ C$	-	3.8	6	mA
		$I_{OUT}=0$ , $T_J=125^\circ C$	-	-	5.5	
Quiescent Current Change	$\Delta I_Q$	$8V \leq V_{IN} \leq 20V$	-	-	1.5	mA
		$1mA \leq I_{OUT} \leq 40mA$	-	-	0.1	
Ripple Rejection	PSRR	$8V \leq V_{IN} \leq 18V$ , $f = 120Hz$ , $T_J=25^\circ C$	41	49	-	dB
Output Noise Voltage	$V_N$	$10Hz \leq f \leq 100KHz$ , $T_J=25^\circ C$	-	42	-	$\mu V$

For YJ78L06( $V_{IN}=11V$ ,  $I_O=40mA$ )

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	$V_{OUT}$	$T_J=25^\circ C$	5.75	6	6.25	V
		$1mA \leq I_{OUT} \leq 40mA$ , $8V \leq V_{IN} \leq 20V$	5.7	6	6.3	
		$1mA \leq I_{OUT} \leq 70mA$	5.7	6	6.3	
Line Regulation	LNR	$8V \leq V_{IN} \leq 20V$ , $T_J=25^\circ C$	-	35	175	mV
		$9V \leq V_{IN} \leq 20V$ , $T_J=25^\circ C$	-	29	125	
Load Regulation	LDR	$1mA \leq I_{OUT} \leq 100mA$ , $T_J=25^\circ C$	-	16	80	mV
		$1mA \leq I_{OUT} \leq 40mA$ , $T_J=25^\circ C$	-	9	40	
Dropout Voltage	$V_{DROP}$	$T_J=25^\circ C$	-	1.7	-	V
Quiescent Current	$I_Q$	$I_{OUT}=0$ , $T_J=25^\circ C$	-	3.9	6	mA
		$I_{OUT}=0$ , $T_J=125^\circ C$	-	-	5.5	
Quiescent Current Change	$\Delta I_Q$	$9V \leq V_{IN} \leq 20V$	-	-	1.5	mA
		$1mA \leq I_{OUT} \leq 40mA$	-	-	0.1	
Ripple Rejection	PSRR	$9V \leq V_{IN} \leq 19V$ , $f = 120Hz$ , $T_J=25^\circ C$	40	48	-	dB
Output Noise Voltage	$V_N$	$10Hz \leq f \leq 100KHz$ , $T_J=25^\circ C$	-	46	-	$\mu V$

For YJ78L08( $V_{IN}=14V$ ,  $I_O=40mA$ )

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	$V_{OUT}$	$T_J=25^\circ C$	7.7	8	8.3	V
		$1mA \leq I_{OUT} \leq 40mA$ , $10.5V \leq V_{IN} \leq 23V$	7.6	8	8.4	
		$1mA \leq I_{OUT} \leq 70mA$	7.6	8	8.4	
Line Regulation	LNR	$10.5V \leq V_{IN} \leq 23V$ , $T_J=25^\circ C$	-	42	175	mV
		$11V \leq V_{IN} \leq 23V$ , $T_J=25^\circ C$	-	36	125	
Load Regulation	LDR	$1mA \leq I_{OUT} \leq 100mA$ , $T_J=25^\circ C$	-	18	80	mV
		$1mA \leq I_{OUT} \leq 40mA$ , $T_J=25^\circ C$	-	10	40	
Dropout Voltage	$V_{DROP}$	$T_J=25^\circ C$	-	1.7	-	V
Quiescent Current	$I_Q$	$I_{OUT}=0$ , $T_J=25^\circ C$	-	4	6	mA
		$I_{OUT}=0$ , $T_J=125^\circ C$	-	-	5.5	
Quiescent Current Change	$\Delta I_Q$	$11V \leq V_{IN} \leq 23V$	-	-	1.5	mA
		$1mA \leq I_{OUT} \leq 40mA$	-	-	0.1	
Ripple Rejection	PSRR	$13V \leq V_{IN} \leq 23V$ , $f = 120Hz$ , $T_J=25^\circ C$	37	46	-	dB
Output Noise Voltage	$V_N$	$10Hz \leq f \leq 100KHz$ , $T_J=25^\circ C$	-	54	-	$\mu V$



# YJ78L Series

For YJ78L09( $V_{IN}=16V$ ,  $I_O=40mA$ )

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	$V_{OUT}$	$T_J=25^{\circ}C$	8.6	9	9.4	V
		$1mA \leq I_{OUT} \leq 40mA$ , $12V \leq V_{IN} \leq 24V$	8.55	9	9.45	
		$1mA \leq I_{OUT} \leq 70mA$	8.55	9	9.45	
Line Regulation	LNR	$12V \leq V_{IN} \leq 24V$ , $T_J=25^{\circ}C$	-	45	175	mV
		$13V \leq V_{IN} \leq 24V$ , $T_J=25^{\circ}C$	-	40	125	
Load Regulation	LDR	$1mA \leq I_{OUT} \leq 100mA$ , $T_J=25^{\circ}C$	-	19	90	mV
		$1mA \leq I_{OUT} \leq 40mA$ , $T_J=25^{\circ}C$	-	11	40	
Dropout Voltage	$V_{DROP}$	$T_J=25^{\circ}C$	-	1.7	-	V
Quiescent Current	$I_Q$	$I_{OUT}=0$ , $T_J=25^{\circ}C$	-	4.1	6	mA
		$I_{OUT}=0$ , $T_J=125^{\circ}C$	-	-	5.5	
Quiescent Current Change	$\Delta I_Q$	$13V \leq V_{IN} \leq 24V$	-	-	1.5	mA
		$1mA \leq I_{OUT} \leq 40mA$	-	-	0.1	
Ripple Rejection	PSRR	$15V \leq V_{IN} \leq 24V$ , $f = 120Hz$ , $T_J=25^{\circ}C$	38	45	-	dB
Output Noise Voltage	$V_N$	$10Hz \leq f \leq 100KHz$ , $T_J=25^{\circ}C$	-	58	-	$\mu V$

For YJ78L10( $V_{IN}=17V$ ,  $I_O=40mA$ )

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	$V_{OUT}$	$T_J=25^{\circ}C$	9.6	10	10.4	V
		$1mA \leq I_{OUT} \leq 40mA$ , $13V \leq V_{IN} \leq 25V$	9.5	10	10.5	
		$1mA \leq I_{OUT} \leq 70mA$	9.5	10	10.5	
Line Regulation	LNR	$13V \leq V_{IN} \leq 25V$ , $T_J=25^{\circ}C$	-	51	175	mV
		$14V \leq V_{IN} \leq 25V$ , $T_J=25^{\circ}C$	-	42	125	
Load Regulation	LDR	$1mA \leq I_{OUT} \leq 100mA$ , $T_J=25^{\circ}C$	-	20	90	mV
		$1mA \leq I_{OUT} \leq 40mA$ , $T_J=25^{\circ}C$	-	11	40	
Dropout Voltage	$V_{DROP}$	$T_J=25^{\circ}C$	-	1.7	-	V
Quiescent Current	$I_Q$	$I_{OUT}=0$ , $T_J=25^{\circ}C$	-	4.2	6	mA
		$I_{OUT}=0$ , $T_J=125^{\circ}C$	-	-	5.5	
Quiescent Current Change	$\Delta I_Q$	$14V \leq V_{IN} \leq 25V$	-	-	1.5	mA
		$1mA \leq I_{OUT} \leq 40mA$	-	-	0.1	
Ripple Rejection	PSRR	$15V \leq V_{IN} \leq 25V$ , $f = 120Hz$ , $T_J=25^{\circ}C$	37	44	-	dB
Output Noise Voltage	$V_N$	$10Hz \leq f \leq 100KHz$ , $T_J=25^{\circ}C$	-	62	-	$\mu V$

For YJ78L12( $V_{IN}=19V$ ,  $I_O=40mA$ )

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	$V_{OUT}$	$T_J=25^{\circ}C$	11.5	12	12.5	V
		$1mA \leq I_{OUT} \leq 40mA$ , $14.5V \leq V_{IN} \leq 27V$	11.4	12	12.6	
		$1mA \leq I_{OUT} \leq 70mA$	11.4	12	12.6	
Line Regulation	LNR	$14.5V \leq V_{IN} \leq 27V$ , $T_J=25^{\circ}C$	-	55	250	mV
		$16V \leq V_{IN} \leq 27V$ , $T_J=25^{\circ}C$	-	49	200	
Load Regulation	LDR	$1mA \leq I_{OUT} \leq 100mA$ , $T_J=25^{\circ}C$	-	22	100	mV
		$1mA \leq I_{OUT} \leq 40mA$ , $T_J=25^{\circ}C$	-	13	50	
Dropout Voltage	$V_{DROP}$	$T_J=25^{\circ}C$	-	1.7	-	V
Quiescent Current	$I_Q$	$I_{OUT}=0$ , $T_J=25^{\circ}C$	-	4.3	6.5	mA
		$I_{OUT}=0$ , $T_J=125^{\circ}C$	-	-	6	
Quiescent Current Change	$\Delta I_Q$	$16V \leq V_{IN} \leq 27V$	-	-	1.5	mA
		$1mA \leq I_{OUT} \leq 40mA$	-	-	0.1	
Ripple Rejection	PSRR	$15V \leq V_{IN} \leq 25V$ , $f = 120Hz$ , $T_J=25^{\circ}C$	37	42	-	dB
Output Noise Voltage	$V_N$	$10Hz \leq f \leq 100KHz$ , $T_J=25^{\circ}C$	-	70	-	$\mu V$



# YJ78L Series

For YJ78L15( $V_{IN}=23V$ ,  $I_O=40mA$ )

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	$V_{OUT}$	$T_J=25^{\circ}C$	14.4	15	15.6	V
		$1mA \leq I_{OUT} \leq 40mA$ , $17.5V \leq V_{IN} \leq 30V$	14.25	15	15.75	
		$1mA \leq I_{OUT} \leq 70mA$	14.25	15	15.75	
Line Regulation	LNR	$17.5V \leq V_{IN} \leq 30V$ , $T_J=25^{\circ}C$	-	65	300	mV
		$19V \leq V_{IN} \leq 30V$ , $T_J=25^{\circ}C$	-	58	250	
Load Regulation	LDR	$1mA \leq I_{OUT} \leq 100mA$ , $T_J=25^{\circ}C$	-	25	150	mV
		$1mA \leq I_{OUT} \leq 40mA$ , $T_J=25^{\circ}C$	-	15	75	
Dropout Voltage	$V_{DROP}$	$T_J=25^{\circ}C$	-	1.7	-	V
Quiescent Current	$I_Q$	$I_{OUT}=0$ , $T_J=25^{\circ}C$	-	4.6	6.5	mA
		$I_{OUT}=0$ , $T_J=125^{\circ}C$	-	-	6	
Quiescent Current Change	$\Delta I_Q$	$19V \leq V_{IN} \leq 30V$	-	-	1.5	mA
		$1mA \leq I_{OUT} \leq 40mA$	-	-	0.1	
Ripple Rejection	PSRR	$18.5V \leq V_{IN} \leq 28.5V$ , $f = 120Hz$ , $T_J=25^{\circ}C$	34	39	-	dB
Output Noise Voltage	$V_N$	$10Hz \leq f \leq 100KHz$ , $T_J=25^{\circ}C$	-	82	-	$\mu V$

For YJ78L18( $V_{IN}=26V$ ,  $I_O=40mA$ )

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	$V_{OUT}$	$T_J=25^{\circ}C$	17.3	18	18.7	V
		$1mA \leq I_{OUT} \leq 40mA$ , $20.5V \leq V_{IN} \leq 33V$	17.1	18	18.9	
		$1mA \leq I_{OUT} \leq 70mA$	17.1	18	18.9	
Line Regulation	LNR	$20.5V \leq V_{IN} \leq 33V$ , $T_J=25^{\circ}C$	-	70	360	mV
		$22V \leq V_{IN} \leq 33V$ , $T_J=25^{\circ}C$	-	64	300	
Load Regulation	LDR	$1mA \leq I_{OUT} \leq 100mA$ , $T_J=25^{\circ}C$	-	27	180	mV
		$1mA \leq I_{OUT} \leq 40mA$ , $T_J=25^{\circ}C$	-	19	90	
Dropout Voltage	$V_{DROP}$	$T_J=25^{\circ}C$	-	1.7	-	V
Quiescent Current	$I_Q$	$I_{OUT}=0$ , $T_J=25^{\circ}C$	-	4.7	6.5	mA
		$I_{OUT}=0$ , $T_J=125^{\circ}C$	-	-	6	
Quiescent Current Change	$\Delta I_Q$	$22V \leq V_{IN} \leq 33V$	-	-	1.5	mA
		$1mA \leq I_{OUT} \leq 40mA$	-	-	0.1	
Ripple Rejection	PSRR	$21.5V \leq V_{IN} \leq 31.5V$ , $f = 120Hz$ , $T_J=25^{\circ}C$	32	36	-	dB
Output Noise Voltage	$V_N$	$10Hz \leq f \leq 100KHz$ , $T_J=25^{\circ}C$	-	89	-	$\mu V$

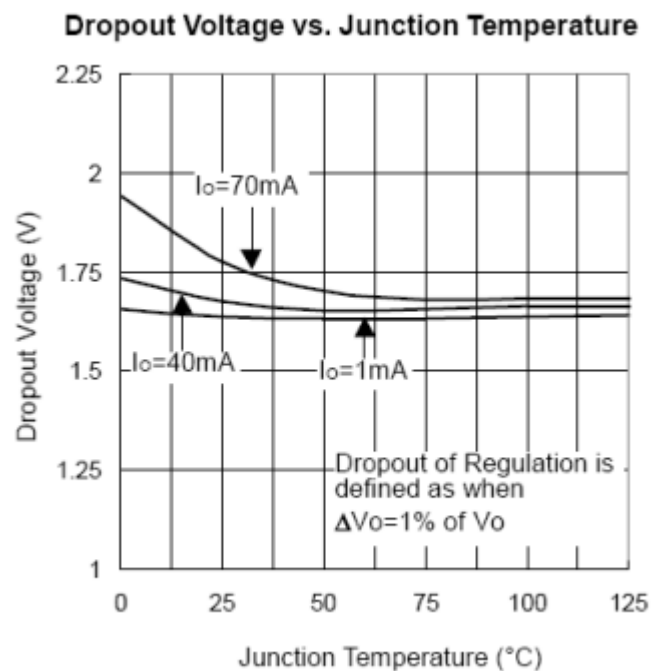
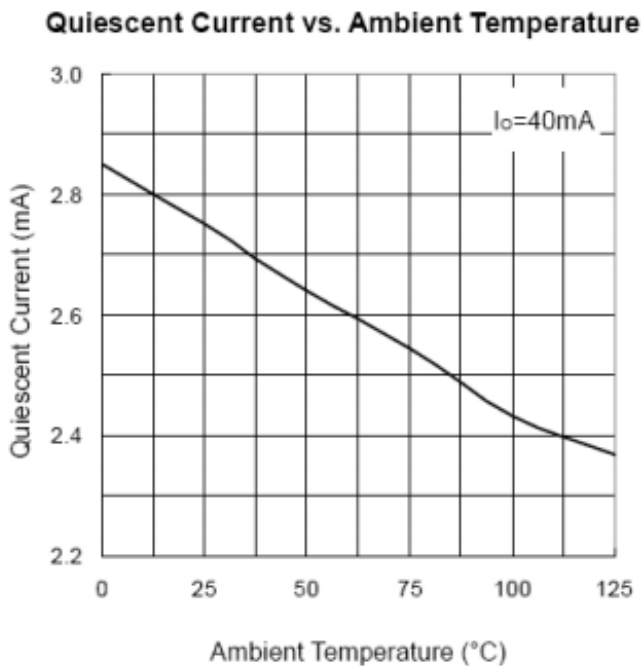
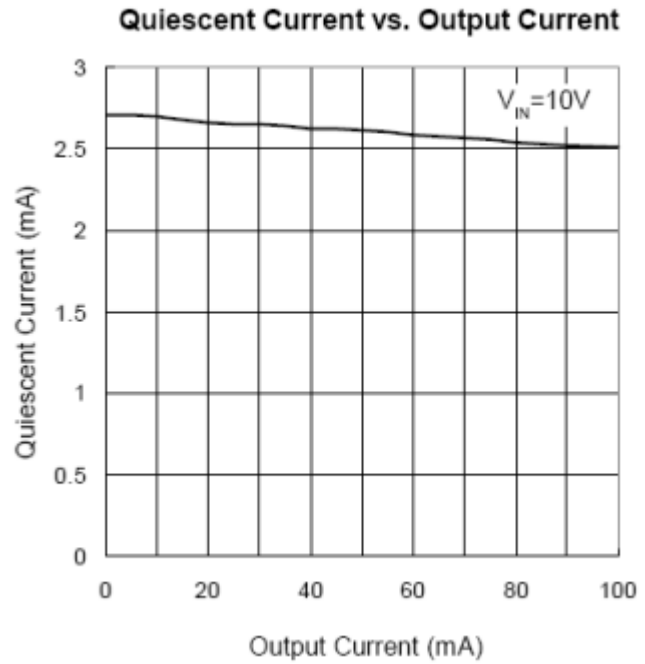
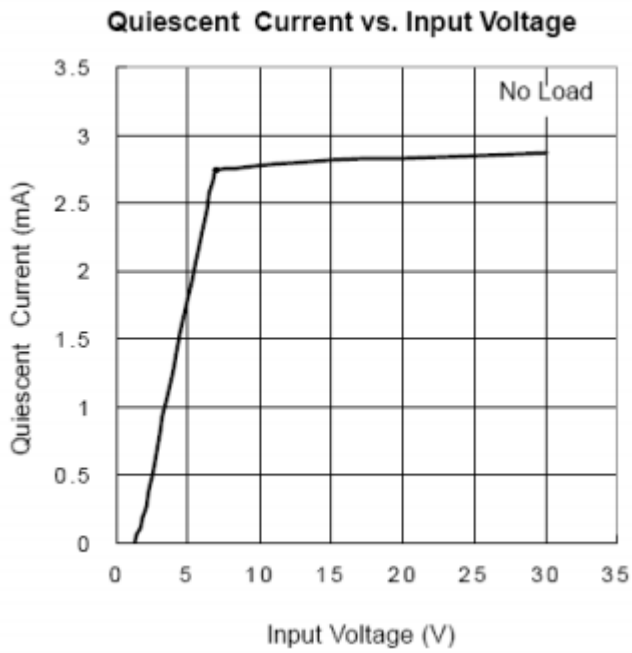
For YJ78L24( $V_{IN}=32V$ ,  $I_O=40mA$ )

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	$V_{OUT}$	$T_J=25^{\circ}C$	23	24	25	V
		$1mA \leq I_{OUT} \leq 40mA$ , $26.5V \leq V_{IN} \leq 39V$	22.8	24	25.2	
		$1mA \leq I_{OUT} \leq 70mA$	22.8	24	25.2	
Line Regulation	LNR	$26.5V \leq V_{IN} \leq 39V$ , $T_J=25^{\circ}C$	-	95	480	mV
		$29V \leq V_{IN} \leq 39V$ , $T_J=25^{\circ}C$	-	78	400	
Load Regulation	LDR	$1mA \leq I_{OUT} \leq 100mA$ , $T_J=25^{\circ}C$	-	41	240	mV
		$1mA \leq I_{OUT} \leq 40mA$ , $T_J=25^{\circ}C$	-	28	120	
Dropout Voltage	$V_{DROP}$	$T_J=25^{\circ}C$	-	1.7	-	V
Quiescent Current	$I_Q$	$I_{OUT}=0$ , $T_J=25^{\circ}C$	-	4.8	6.5	mA
		$I_{OUT}=0$ , $T_J=125^{\circ}C$	-	-	6	
Quiescent Current Change	$\Delta I_Q$	$28V \leq V_{IN} \leq 39V$	-	-	1.5	mA
		$1mA \leq I_{OUT} \leq 40mA$	-	-	0.1	
Ripple Rejection	PSRR	$27.5V \leq V_{IN} \leq 37.5V$ , $f = 120Hz$ , $T_J=25^{\circ}C$	30	33	-	dB
Output Noise Voltage	$V_N$	$10Hz \leq f \leq 100KHz$ , $T_J=25^{\circ}C$	-	97	-	$\mu V$



# YJ78L Series

## ■ Typical Characteristics(78L05)

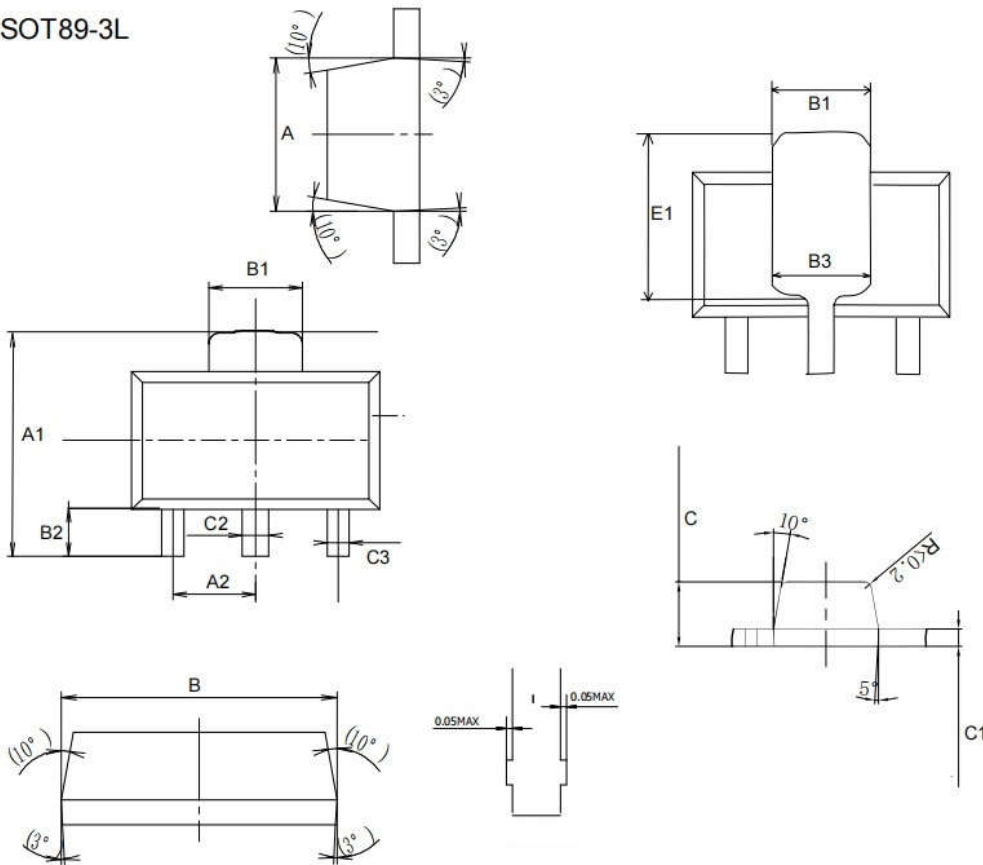




# YJ78L Series

## Package Outline Drawing

SOT89-3L



COMMON DIMENSIONS UNITS MEASURE=MILLIMETER			
SYMBOL	MIN	NOM	MAX
A	2.35	2.45	2.55
A1	4.00	4.10	4.20
A2	1.45	1.50	1.55
B	4.40	4.50	4.60
B1		1.55 REF	
B2	1.00	1.10	1.20
B3		1.63 REF	
C	1.45	1.50	1.55
C1	0.39	0.40	0.41
C2	0.4	0.48	0.55
C3	0.35	0.4	0.45
E1	2.65	2.75	2.85





## YJ78L Series

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### Disclaimer

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