

TO-92

Pin Definition:

1. Output
2. Ground
3. Input



SOT-23

Pin Definition:

1. Output
2. Input
3. Ground



SOP-8

Pin Definition:

1. Output
2. Ground
3. Ground
4. N/C
5. N/C
6. Ground
7. Ground
8. Input



SOT-89

Pin Definition:

1. Output
2. Ground
3. Input



TS78L00CY

1. Input
2. Ground
3. Output

General Description

The TS78L00 Series of positive voltage Regulators are inexpensive, easy-to-use devices suitable for a multitude of applications that require a regulated supply of up to 100mA. Like their higher power TS7800 and TS78M00 Series cousins, these regulators feature internal current limiting and thermal shutdown making them remarkably rugged. No external components are required with the TS78L00 devices in many applications.

These devices offer a substantial performance advantage over the traditional zener diode-resistor combination, as output impedance and quiescent current are substantially reduced.

Features

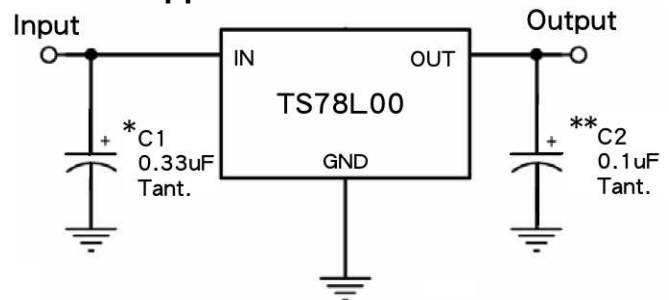
- Output Voltage Range 3.3 to 24V
- Output current up to 100mA
- No external components required
- Internal thermal overload protection
- Internal short-circuit current limiting
- Output transistor safe-area compensation
- Output voltage offered in 4% tolerance

Ordering Information

| Part No. | Package | Packing |
|----------------------|---------|--------------------|
| TS78L $_{xx}$ CT B0 | TO-92 | 1Kpcs / Bulk |
| TS78L $_{xx}$ CT A3 | TO-92 | 2Kpcs/ Ammo |
| TS78L $_{xx}$ ACY RM | SOT-89 | 1Kpcs / 7" Reel |
| TS78L $_{xx}$ CY RM | SOT-89 | 1Kpcs / 7" Reel |
| TS78L $_{xx}$ CS RL | SOP-8 | 2.5Kpcs / 13" Reel |
| TS78L $_{xx}$ CX RF | SOT-23 | 3Kpcs / 7" Reel |

Note: Where $_{xx}$ denote voltage option

Standard Application Circuit



A common ground is required between the input and the output voltages. The input voltage must remain typically 2.0V above the output voltage even during the low point on the Input ripple voltage.

XX = these two digits of the type number indicate voltage.

* = Cin is required if regulator is located an appreciable distance from power supply filter.

** = Co is not needed for stability; however, it does improve transient response.

Absolute Maximum Rating (Ta = 25°C unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|--------------------------------|------------------|------------------|------|
| DC Input Voltage | V _{IN} | 30 | V |
| | | 35 | |
| | | 40 | |
| Power Dissipation | P _D | Internal Limited | W |
| Operating Junction Temperature | T _J | 0 ~ +125 | °C |
| Storage Temperature Range | T _{STG} | -65~+150 | °C |

TS78L03 Electrical Characteristics

($V_{in}=8.3V$, $I_{out}=40mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$; unless otherwise specified.)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|-------------------------------|--|-------|---------|----------|-----------------|
| Output voltage | Vout | $T_j=25^{\circ}C$ | 3.173 | 3.3 | 3.432 | V |
| | | $5.8V \leq V_{in} \leq 20V$, $5mA \leq I_{out} \leq 100mA$ | 3.142 | 3.3 | 3.465 | |
| Line Regulation | REGline | $T_j=25^{\circ}C$ $5.8V \leq V_{in} \leq 20V$ $I_{out}=40mA$ | -- | 50 | 150 | mV |
| Load Regulation | REGload | $T_j=25^{\circ}C$ $5mA \leq I_{out} \leq 100mA$ $5mA \leq I_{out} \leq 40mA$ | -- | 15 5 | 60 30 | |
| Quiescent Current | Iq | $I_{out}=0$, $T_j=25^{\circ}C$ | -- | 3 | 6 | mA |
| Quiescent Current Change | ΔIq | $5.8V \leq V_{in} \leq 20V$ | -- | -- | 1.5 | |
| | | $5mA \leq I_{out} \leq 40mA$ | -- | -- | 0.1 | |
| Output Noise Voltage | Vn | $10Hz \leq f \leq 100KHz$, $T_j=25^{\circ}C$ | -- | 40 | -- | μV |
| Ripple Rejection Ratio | RR | $f=120Hz$, $5.8V \leq V_{in} \leq 20V$ | 41 | 49 | -- | dB |
| Voltage Drop | Vdrop | $I_{out}=100mA$, $T_j=25^{\circ}C$ | -- | 2 | -- | V |
| Peak Output Current | I _{o peak} | $T_j=25^{\circ}C$ | -- | 0.15 | -- | A |
| Temperature Coefficient of Output Voltage | $\Delta V_{out} / \Delta T_j$ | $I_{out}=5mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$ | -- | -0.2 | -- | mV/ $^{\circ}C$ |

TS78L05 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 specified.)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|-------------------------------|--|------|----------|----------|-----------------|
| Output voltage | Vout | $T_j=25^{\circ}C$ | 4.80 | 5 | 5.20 | V |
| | | $7.5V \leq V_{in} \leq 20V$, $5mA \leq I_{out} \leq 100mA$ | 4.75 | 5 | 5.25 | |
| Line Regulation | REGline | $T_j=25^{\circ}C$ $7.5V \leq V_{in} \leq 20V$ $I_{out}=100mA$ | -- | 50 | 150 | mV |
| Load Regulation | REGload | $T_j=25^{\circ}C$ $5mA \leq I_{out} \leq 100mA$ $5mA \leq I_{out} \leq 40mA$ | -- | 20 10 | 60 30 | |
| Quiescent Current | Iq | $I_{out}=0$, $T_j=25^{\circ}C$ | -- | 3 | 6 | mA |
| Quiescent Current Change | ΔIq | $7.5V \leq V_{in} \leq 20V$ | -- | -- | 1.5 | |
| | | $5mA \leq I_{out} \leq 40mA$ | -- | -- | 0.1 | |
| Output Noise Voltage | Vn | $10Hz \leq f \leq 100KHz$, $T_j=25^{\circ}C$ | -- | 40 | -- | μV |
| Ripple Rejection Ratio | RR | $f=120Hz$, $7.5V \leq V_{in} \leq 20V$ | 41 | 49 | -- | dB |
| Voltage Drop | Vdrop | $I_{out}=100mA$, $T_j=25^{\circ}C$ | -- | 1.7 | -- | V |
| Peak Output Current | I _{o peak} | $T_j=25^{\circ}C$ | -- | 0.15 | -- | A |
| Temperature Coefficient of Output Voltage | $\Delta V_{out} / \Delta T_j$ | $I_{out}=5mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$ | -- | -0.65 | -- | mV/ $^{\circ}C$ |

- Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible, and thermal effects must be taken into account separately.
- This specification applies only for DC power dissipation permitted by absolute maximum ratings.

TS78L06 Electrical Characteristics

$V_{in}=12V$, $I_{out}=40mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$; unless otherwise specified.)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|-------------------------------|--|------|---------|------------|----------------|
| Output voltage | Vout | $T_j=25^{\circ}C$ | 5.76 | 6 | 6.24 | V |
| | | $8.5V \leq V_{in} \leq 21V$, $5mA \leq I_{out} \leq 100mA$ | 5.70 | 6 | 6.30 | |
| Line Regulation | REGline | $T_j=25^{\circ}C$ $8.5V \leq V_{in} \leq 21V$ $I_{out}=40mA$ | -- | 50 | 150 | mV |
| Load Regulation | REGload | $T_j=25^{\circ}C$ $5mA \leq I_{out} \leq 100mA$ $5mA \leq I_{out} \leq 40mA$ | -- | 12 4 | 60 30 | |
| Quiescent Current | Iq | $I_{out}=0$, $T_j=25^{\circ}C$ | -- | 3 | 6 | mA |
| Quiescent Current Change | ΔIq | $8.5V \leq V_{in} \leq 21V$ $5mA \leq I_{out} \leq 40mA$ | -- | -- | 1.5 0.1 | |
| Output Noise Voltage | Vn | $10Hz \leq f \leq 100KHz$, $T_j=25^{\circ}C$ | -- | 40 | -- | μV |
| Ripple Rejection Ratio | RR | $f=120Hz$, $8.5V \leq V_{in} \leq 21V$ | 41 | 49 | -- | dB |
| Voltage Drop | Vdrop | $I_{out}=100mA$, $T_j=25^{\circ}C$ | -- | 1.7 | -- | V |
| Peak Output Current | I _{o peak} | $T_j=25^{\circ}C$ | -- | 0.15 | -- | A |
| Temperature Coefficient of Output Voltage | $\Delta V_{out} / \Delta T_j$ | $I_{out}=5mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$ | -- | -0.75 | -- | $mV/^{\circ}C$ |

TS78L08 Electrical Characteristics

$V_{in}=14V$, $I_{out}=40mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$; unless otherwise specified.)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|-------------------------------|--|------|----------|------------|----------------|
| Output voltage | Vout | $T_j=25^{\circ}C$ | 7.69 | 8 | 8.32 | V |
| | | $10.5V \leq V_{in} \leq 23V$, $5mA \leq I_{out} \leq 100mA$ | 7.61 | 8 | 8.40 | |
| Line Regulation | REGline | $T_j=25^{\circ}C$ $10.5V \leq V_{in} \leq 23V$ $I_{out}=40mA$ | -- | 80 | 160 | mV |
| Load Regulation | REGload | $T_j=25^{\circ}C$ $5mA \leq I_{out} \leq 100mA$ $5mA \leq I_{out} \leq 40mA$ | -- | 25 10 | 80 40 | |
| Quiescent Current | Iq | $I_{out}=0$, $T_j=25^{\circ}C$ | -- | 3 | 6 | mA |
| Quiescent Current Change | ΔIq | $10.5V \leq V_{in} \leq 23V$ $5mA \leq I_{out} \leq 40mA$ | -- | -- | 1.5 0.1 | |
| Output Noise Voltage | Vn | $10Hz \leq f \leq 100KHz$, $T_j=25^{\circ}C$ | -- | 60 | -- | μV |
| Ripple Rejection Ratio | RR | $f=120Hz$, $10.5V \leq V_{in} \leq 23V$ | 37 | 57 | -- | dB |
| Voltage Drop | Vdrop | $I_{out}=100mA$, $T_j=25^{\circ}C$ | -- | 1.7 | -- | V |
| Peak Output Current | I _{o peak} | $T_j=25^{\circ}C$ | -- | 0.15 | -- | A |
| Temperature Coefficient of Output Voltage | $\Delta V_{out} / \Delta T_j$ | $I_{out}=5mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$ | -- | -0.8 | -- | $mV/^{\circ}C$ |

- Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible, and thermal effects must be taken into account separately.
- This specification applies only for DC power dissipation permitted by absolute maximum ratings.

TS78L09 Electrical Characteristics

$V_{in}=15V$, $I_{out}=40mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$; unless otherwise specified.)

| Parameter | Symbol | Test Condition | | Min | Typ | Max | Unit |
|---|---------------------|--|---|------|----------|------------|-------|
| Output voltage | Vout | Tj=25°C | | 8.65 | 9 | 9.36 | V |
| | | 11.5V ≤ Vin ≤ 23V, 5mA ≤ Iout ≤ 100mA | | 8.57 | 9 | 9.45 | |
| Line Regulation | REGline | Tj=25°C | 11.5V ≤ Vin ≤ 23V Iout=40mA | -- | 90 | 180 | mV |
| Load Regulation | REGload | Tj=25°C | 5mA ≤ Iout ≤ 100mA 5mA ≤ Iout ≤ 40mA | -- | 30 15 | 90 45 | |
| Quiescent Current | Iq | Iout=0, Tj=25°C | | -- | 3 | 6 | mA |
| Quiescent Current Change | ΔIq | 11.5V ≤ Vin ≤ 23V 5mA ≤ Iout ≤ 40mA | | -- | -- | 1.5 0.1 | |
| Output Noise Voltage | Vn | 10Hz ≤ f ≤ 100KHz, Tj=25°C | | -- | 60 | -- | μV |
| Ripple Rejection Ratio | RR | f=120Hz, 11.5V ≤ Vin ≤ 23V | | 37 | 57 | -- | dB |
| Voltage Drop | Vdrop | Iout=100mA, Tj=25°C | | -- | 1.7 | -- | V |
| Peak Output Current | I _{o peak} | Tj=25°C | | -- | 0.15 | -- | A |
| Temperature Coefficient of Output Voltage | ΔVout/ ΔTj | Iout=5mA, 0°C ≤ Tj ≤ 125°C | | -- | -0.9 | -- | mV/°C |

TS78L12 Electrical Characteristics

$V_{in}=19V$, $I_{out}=40mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$; unless otherwise specified.)

| Parameter | Symbol | Test Condition | | Min | Typ | Max | Unit |
|---|---------------------|--|---|-------|----------|------------|-------|
| Output voltage | Vout | Tj=25°C | | 11.53 | 12 | 12.48 | V |
| | | 14.5V ≤ Vin ≤ 27V, 5mA ≤ Iout ≤ 100mA | | 11.42 | 12 | 12.60 | |
| Line Regulation | REGline | Tj=25°C | 14.5V ≤ Vin ≤ 27V Iout=40mA | -- | 120 | 240 | mV |
| Load Regulation | REGload | Tj=25°C | 5mA ≤ Iout ≤ 100mA 5mA ≤ Iout ≤ 40mA | -- | 40 20 | 120 60 | |
| Quiescent Current | Iq | Iout=0, Tj=25°C | | -- | 3 | 6.5 | mA |
| Quiescent Current Change | ΔIq | 14.5V ≤ Vin ≤ 27V 5mA ≤ Iout ≤ 40mA | | -- | -- | 1.5 0.1 | |
| Output Noise Voltage | Vn | 10Hz ≤ f ≤ 100KHz, Tj=25°C | | -- | 80 | -- | μV |
| Ripple Rejection Ratio | RR | f=120Hz, 14.5V ≤ Vin ≤ 27V | | 37 | 42 | -- | dB |
| Voltage Drop | Vdrop | Iout=100mA, Tj=25°C | | -- | 1.7 | -- | V |
| Peak Output Current | I _{o peak} | Tj=25°C | | -- | 0.15 | -- | A |
| Temperature Coefficient of Output Voltage | ΔVout/ ΔTj | Iout=5mA, 0°C ≤ Tj ≤ 125°C | | -- | -1.0 | -- | mV/°C |

- Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible, and thermal effects must be taken into account separately.
- This specification applies only for DC power dissipation permitted by absolute maximum ratings.

TS78L15 Electrical Characteristics

$V_{in}=23V$, $I_{out}=40mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$; unless otherwise specified.)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|-------------------------------|--|-------|----------|-----------|-----------------|
| Output voltage | Vout | $T_j=25^{\circ}C$ | 14.42 | 15 | 15.60 | V |
| | | $17.5V \leq V_{in} \leq 30V$, $5mA \leq I_{out} \leq 100mA$ | 14.28 | 15 | 15.75 | |
| Line Regulation | REGline | $T_j=25^{\circ}C$ $17.5V \leq V_{in} \leq 30V$ $I_{out}=40mA$ | -- | 150 | 300 | mV |
| Load Regulation | REGload | $T_j=25^{\circ}C$ $5mA \leq I_{out} \leq 100mA$ $5mA \leq I_{out} \leq 40mA$ | -- | 50 25 | 150 75 | |
| Quiescent Current | Iq | $I_{out}=0$, $T_j=25^{\circ}C$ | -- | 3 | 6.6 | mA |
| Quiescent Current Change | ΔIq | $17.5V \leq V_{in} \leq 30V$ | -- | -- | 1.5 | |
| | | $5mA \leq I_{out} \leq 40mA$ | -- | -- | 0.1 | |
| Output Noise Voltage | Vn | $10Hz \leq f \leq 100KHz$, $T_j=25^{\circ}C$ | -- | 90 | -- | μV |
| Ripple Rejection Ratio | RR | $f=120Hz$, $17.5V \leq V_{in} \leq 30V$ | 34 | 39 | -- | dB |
| Voltage Drop | Vdrop | $I_{out}=100mA$, $T_j=25^{\circ}C$ | -- | 1.7 | -- | V |
| Peak Output Current | I _{o peak} | $T_j=25^{\circ}C$ | -- | 0.15 | -- | A |
| Temperature Coefficient of Output Voltage | $\Delta V_{out} / \Delta T_j$ | $I_{out}=5mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$ | -- | -1.3 | -- | mV/ $^{\circ}C$ |

TS78L18 Electrical Characteristics

$V_{in}=27V$, $I_{out}=40mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$; unless otherwise specified.)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|-------------------------------|--|-------|----------|-----------|-----------------|
| Output voltage | Vout | $T_j=25^{\circ}C$ | 17.30 | 18 | 18.72 | V |
| | | $21V \leq V_{in} \leq 33V$, $5mA \leq I_{out} \leq 100mA$ | 17.14 | 18 | 18.90 | |
| Line Regulation | REGline | $T_j=25^{\circ}C$ $21 \leq V_{in} \leq 33V$ $I_{out}=40mA$ | -- | 180 | 360 | mV |
| Load Regulation | REGload | $T_j=25^{\circ}C$ $5mA \leq I_{out} \leq 100mA$ $5mA \leq I_{out} \leq 40mA$ | -- | 60 30 | 180 90 | |
| Quiescent Current | Iq | $I_{out}=0$, $T_j=25^{\circ}C$ | -- | 3 | 6.5 | mA |
| Quiescent Current Change | ΔIq | $21V \leq V_{in} \leq 33V$ | -- | -- | 1.5 | |
| | | $5mA \leq I_{out} \leq 40mA$ | -- | -- | 0.1 | |
| Output Noise Voltage | Vn | $10Hz \leq f \leq 100KHz$, $T_j=25^{\circ}C$ | -- | 150 | -- | μV |
| Ripple Rejection Ratio | RR | $f=120Hz$, $21V \leq V_{in} \leq 33V$ | 33 | 48 | -- | dB |
| Voltage Drop | Vdrop | $I_{out}=100mA$, $T_j=25^{\circ}C$ | -- | 1.7 | -- | V |
| Peak Output Current | I _{o peak} | $T_j=25^{\circ}C$ | -- | 0.15 | -- | A |
| Temperature Coefficient of Output Voltage | $\Delta V_{out} / \Delta T_j$ | $I_{out}=5mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$ | -- | -1.5 | -- | mV/ $^{\circ}C$ |

- Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible, and thermal effects must be taken into account separately.
- This specification applies only for DC power dissipation permitted by absolute maximum ratings.

TS78L24 Electrical Characteristics

$V_{in}=33V$, $I_{out}=40mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$; unless otherwise specified.)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|-------------------------------|--|-------|----------|------------|----------------|
| Output voltage | Vout | $T_j=25^{\circ}C$ | 23.07 | 24 | 24.96 | V |
| | | $27V \leq V_{in} \leq 38V$, $5mA \leq I_{out} \leq 100mA$ | 22.85 | 24 | 25.20 | |
| Line Regulation | REGline | $T_j=25^{\circ}C$ $27 \leq V_{in} \leq 38V$ $I_{out}=40mA$ | -- | 200 | 400 | mV |
| Load Regulation | REGload | $T_j=25^{\circ}C$ $5mA \leq I_{out} \leq 100mA$ $5mA \leq I_{out} \leq 40mA$ | -- | 80 40 | 240 120 | |
| Quiescent Current | Iq | $I_{out}=0$, $T_j=25^{\circ}C$ | -- | 4 | 7 | mA |
| Quiescent Current Change | ΔIq | $27V \leq V_{in} \leq 38V$ | -- | -- | 1.5 | |
| | | $5mA \leq I_{out} \leq 40mA$ | -- | -- | 0.1 | |
| Output Noise Voltage | Vn | $10Hz \leq f \leq 100KHz$, $T_j=25^{\circ}C$ | -- | 200 | -- | μV |
| Ripple Rejection Ratio | RR | $f=120Hz$, $27V \leq V_{in} \leq 38V$ | 31 | 45 | -- | dB |
| Voltage Drop | Vdrop | $I_{out}=100mA$, $T_j=25^{\circ}C$ | -- | 1.7 | -- | V |
| Peak Output Current | I _{o peak} | $T_j=25^{\circ}C$ | -- | 0.15 | -- | A |
| Temperature Coefficient of Output Voltage | $\Delta V_{out} / \Delta T_j$ | $I_{out}=5mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$ | -- | -2.0 | -- | $mV/^{\circ}C$ |

- Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible, and thermal effects must be taken into account separately.
- This specification applies only for DC power dissipation permitted by absolute maximum ratings.

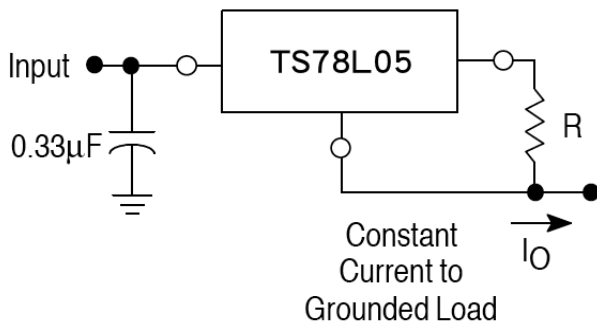
Application Information

Design Considerations

The TS78L00 Series of fixed voltage regulators are designed with Thermal Overload Protection that shuts down the circuit when subjected to an excessive power overload condition. Internal Short Circuit protection Limits the maximum current the circuit will pass.

In many low current applications, compensation capacitors are not required. However, it is recommended that the regulator input be bypassed with a capacitor if the regulator is connected to the power supply filter with long wire lengths, or if the output load capacitance is large. The input bypass capacitor should be selected to provide good high-frequency characteristics to insure stable operation under all load conditions. A 0.33µF or larger tantalum, mylar, or other capacitor having low internal impedance at high frequencies should be chosen. The bypass capacitor should be mounted with the shortest possible leads directly across the regulators input terminals. Good construction techniques should be used to minimize ground loops and lead resistance drops since the regulator has no external sense lead. Bypassing the output is also recommended.

FIGURE 7 – Current Regulator



The TS78L00 regulators can also be used as a current source when connected as above. In order to minimize dissipation the TS78L05 is chosen in this application. Resistor R determines the current as follows:

$$I_O = \frac{5.0V}{R} + I_B$$

$I_B = 3.8mA$ over lined and load changes

For example, a 100mA current source would require R to be a 50Ω, 1/2W resistor and the output voltage compliance would be the input voltage less 7V.

FIGURE 2 – ±15V Tracking Voltage Regulator

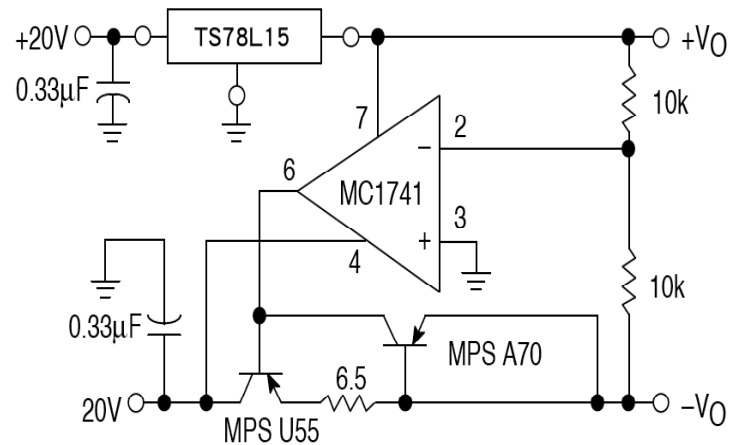
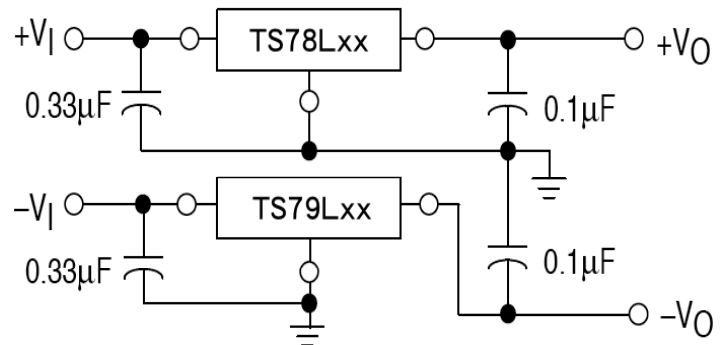
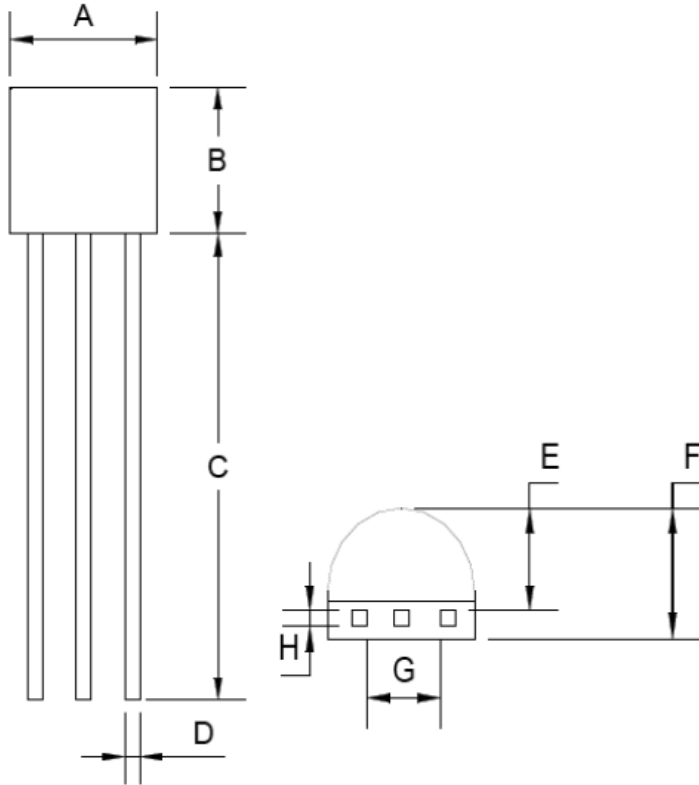


FIGURE 8 – ±15V Tracking Voltage Regulator

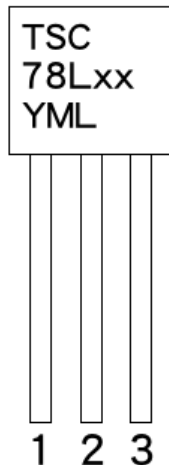


TO-92 Mechanical Drawing



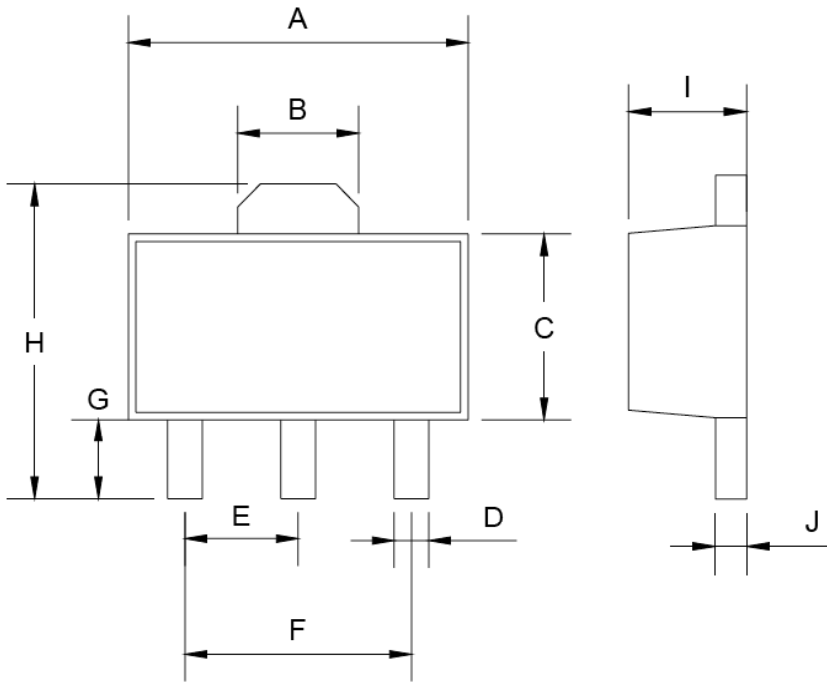
| TO-92 DIMENSION | | | | |
|-----------------|-------------|------|------------|-------|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 4.30 | 4.70 | 0.169 | 0.185 |
| B | 4.30 | 4.70 | 0.169 | 0.185 |
| C | 14.30(typ) | | 0.563(typ) | |
| D | 0.43 | 0.49 | 0.017 | 0.019 |
| E | 2.19 | 2.81 | 0.086 | 0.111 |
| F | 3.30 | 3.70 | 0.130 | 0.146 |
| G | 2.42 | 2.66 | 0.095 | 0.105 |
| H | 0.37 | 0.43 | 0.015 | 0.017 |

Marking Diagram



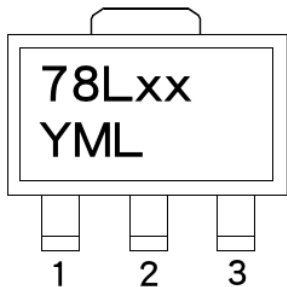
- XX** = Output Voltage
(03=3.3V, 05=5V, 06=6V, 08=8V, 09=9V, 12=12V, 15=15V, 18=18V, 24=24V)
- Y** = Year Code
- M** = Month Code
(**A**=Jan, **B**=Feb, **C**=Mar, **D**=Apr, **E**=May, **F**=Jun, **G**=Jul, **H**=Aug, **I**=Sep, **J**=Oct, **K**=Nov, **L**=Dec)
- L** = Lot Code

SOT-89 Mechanical Drawing

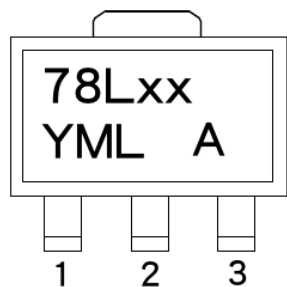


| SOT-89 DIMENSION | | | | |
|------------------|-------------|------|--------|-------|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 4.40 | 4.60 | 0.173 | 0.181 |
| B | 1.50 | 1.7 | 0.059 | 0.070 |
| C | 2.30 | 2.60 | 0.090 | 0.102 |
| D | 0.40 | 0.52 | 0.016 | 0.020 |
| E | 1.50 | 1.50 | 0.059 | 0.059 |
| F | 3.00 | 3.00 | 0.118 | 0.118 |
| G | 0.89 | 1.20 | 0.035 | 0.047 |
| H | 4.05 | 4.25 | 0.159 | 0.167 |
| I | 1.4 | 1.6 | 0.055 | 0.068 |
| J | 0.35 | 0.44 | 0.014 | 0.017 |

Marking Diagram

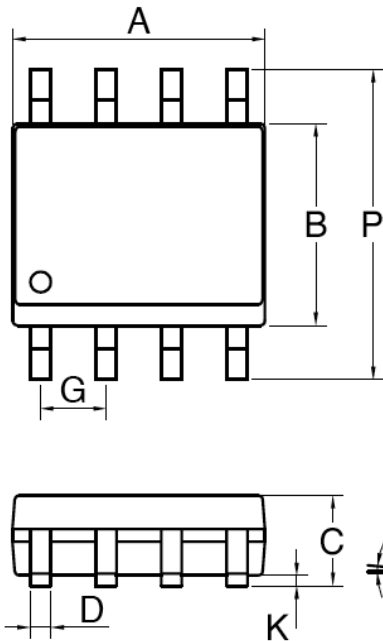


- XX** = Output Voltage
(03=3.3V, 05=5V, 06=6V, 08=8V, 09=9V, 12=12V, 15=15V, 18=18V, 24=24V)
- Y** = Year Code
- M** = Month Code
(A=Jan, B=Feb, C=Mar, D=Apl, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
- L** = Lot Code



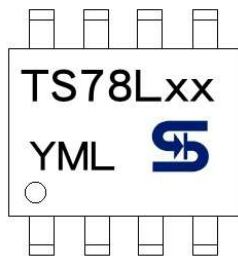
- XX** = Output Voltage
(03=3.3V, 05=5V, 06=6V, 08=8V, 09=9V, 12=12V, 15=15V, 18=18V, 24=24V)
- Y** = Year Code
- M** = Month Code
(A=Jan, B=Feb, C=Mar, D=Apl, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
- L** = Lot Code
- A** = TS78LxxACY

SOP-8 Mechanical Drawing



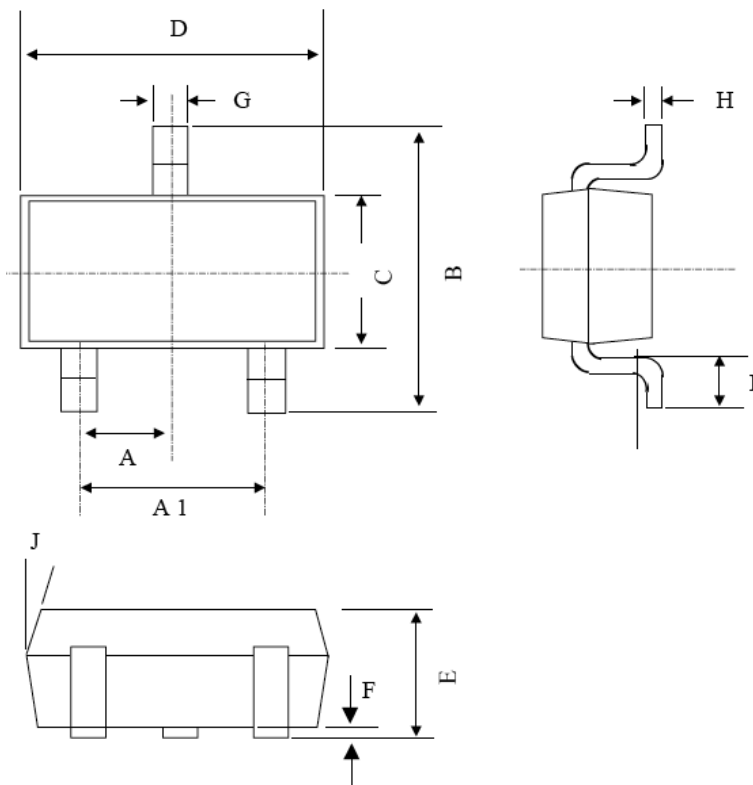
| SOP-8 DIMENSION | | | | |
|-----------------|-------------|------|---------|-------|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX. |
| A | 4.80 | 5.00 | 0.189 | 0.196 |
| B | 3.80 | 4.00 | 0.150 | 0.157 |
| C | 1.35 | 1.75 | 0.054 | 0.068 |
| D | 0.35 | 0.49 | 0.014 | 0.019 |
| F | 0.40 | 1.25 | 0.016 | 0.049 |
| G | 1.27BSC | | 0.05BSC | |
| K | 0.10 | 0.25 | 0.004 | 0.009 |
| M | 0° | 7° | 0° | 7° |
| P | 5.80 | 6.20 | 0.229 | 0.244 |
| R | 0.25 | 0.50 | 0.010 | 0.019 |

Marking Diagram



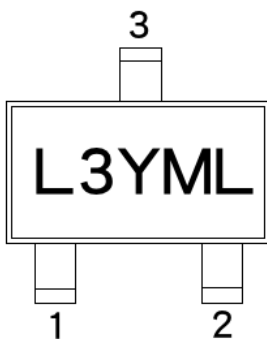
- XX** = Output Voltage
(03=3.3V, 05=5V, 06=6V, 08=8V, 09=9V, 12=12V, 15=15V, 18=18V, 24=24V)
- Y** = Year Code
- M** = Month Code
(**A**=Jan, **B**=Feb, **C**=Mar, **D**=Apr, **E**=May, **F**=Jun, **G**=Jul, **H**=Aug, **I**=Sep, **J**=Oct, **K**=Nov, **L**=Dec)
- L** = Lot Code

SOT-23 Mechanical Drawing



| SOT-23 DIMENSION | | | | |
|------------------|-------------|------|-----------|-------|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX. |
| A | 0.95 BSC | | 0.037 BSC | |
| A1 | 1.9 BSC | | 0.074 BSC | |
| B | 2.60 | 3.00 | 0.102 | 0.118 |
| C | 1.40 | 1.70 | 0.055 | 0.067 |
| D | 2.80 | 3.10 | 0.110 | 0.122 |
| E | 1.00 | 1.30 | 0.039 | 0.051 |
| F | 0.00 | 0.10 | 0.000 | 0.004 |
| G | 0.35 | 0.50 | 0.014 | 0.020 |
| H | 0.10 | 0.20 | 0.004 | 0.008 |
| I | 0.30 | 0.60 | 0.012 | 0.024 |
| J | 5° | 10° | 5° | 10° |

Marking Diagram



- L3** = Device Voltage Code
(L3=3.3V, L5=5V, L6=6V, L8=8V, L9=9V, L1=10V, L2=12V, A=15V, D=18V, J=24V)
- Y** = Year Code
- M** = Month Code
(A=Jan, B=Feb, C=Mar, D=Apl, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
- L** = Lot Code

TS78L00 Series

3-Terminal 100mA Positive Voltage Regulator

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