

3-TERMINAL 0.3A POSITIVE VOLTAGE REGULATORS

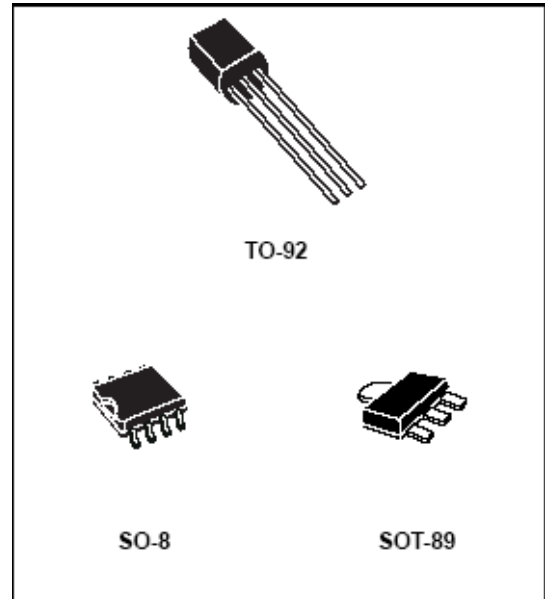
This series of fixed-voltage monolithic integrated-circuit voltage regulators is designed for a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. In addition, they can be used with power-pass elements to make high current voltage regulators. Each of these regulators can deliver up to 100mA output current.

The internal limiting and thermal shutdown features of these regulators make them essentially immune to overload.

When used as a replacement for a zener diode-resistor combination, an effective improvement in output impedance can be obtained together with lower-bias current.

Features

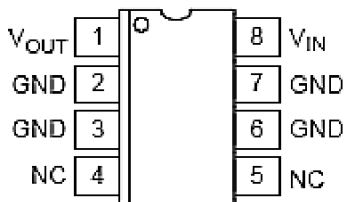
- Output current Up to 300mA
- No External Components
- Internal Thermal Overload Protection
- Internal Short-Circuit Limiting
- Output Voltage of 5V, 6V, 8V, 9V, 10V, 12V, 15V, 18V and 24V



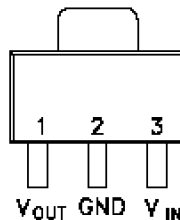
ORDERING INFORMATION

| Device | Operating Temperature Range | Package | Packing |
|-------------|---------------------------------|---------|-------------|
| HT78HXXATZ | T _A = -40° to 125° C | TO-92 | Bulk |
| HT78HXXARTZ | | TO-92 | Taping |
| HT78HXXARZ | | SO-8 | Tape & Reel |
| HT78HXXARDZ | | SOT-89 | Tape & Reel |

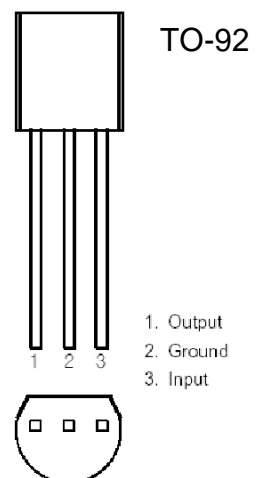
Pin Configuration



SO-8



SOT-89



1. Output
2. Ground
3. Input

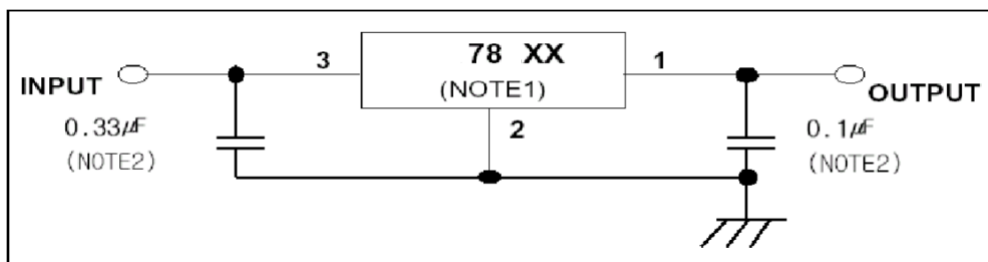
Absolute Maximum Ratings

| Characteristic | | Symbol | Value | Unit |
|--------------------------------|-------------------|--------|------------|------|
| Input voltage | HT78H05 ~ HT78H10 | VI | 30 | V |
| | HT78H12 ~ HT78H18 | | 35 | |
| | HT78H24 | | 40 | |
| Power Dissipation | TO-92 | Pd | 625 | mW |
| | SOT-89 | | 500 | |
| | SOP-8 | | 625 | |
| Operating junction temperature | | Topr | -40 ~ +150 | °C |
| Storage temperature | | Tstg | -65 ~ +150 | |
| Soldering temperature and time | | Tsol | 260/10sec | |

* Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

RECOMMENDED OPERATING CONDITIONS

| 78Hxx | | Min. | Max. | Unit |
|--|---------|------|------|------|
| Input voltage, VI | HT78H05 | 7 | 20 | V |
| | HT78H06 | 8 | 20 | |
| | HT78H08 | 10.5 | 23 | |
| | HT78H09 | 11.5 | 24 | |
| | HT78H10 | 12.5 | 25 | |
| | HT78H12 | 14.5 | 27 | |
| | HT78H15 | 17.5 | 30 | |
| | HT78H18 | 20.5 | 33 | |
| | HT78H24 | 26.5 | 39 | |
| Output current, Io | | | 300 | mA |
| Operating virtual junction temperature, Tj | | -40 | 125 | °C |

TYPICAL APPLICATION

Notes

1. To specify an output voltage, substitute voltage for "XX"
2. Bypass capacitors are recommended for optimum stability and transient response and should be located as close as possible to the regulators.

HT78H05 ELECTRICAL CHARACTERISTICS

 (At specified virtual junction temperature, $V_i=10V$, $I_o=40mA$ (unless otherwise noted))

| Characteristic | Symbol | Test condition * | | Min | Typ. | Max. | Unit |
|----------------------|------------------|---|-------------|------|------|------|------|
| Output voltage ** | V _{out} | 25°C | | 4.8 | 5 | 5.2 | V |
| | | 1 mA ≤ I _o ≤ 40 mA 7V ≤ V _I ≤ V _{max} | -40 ~ 125°C | 4.75 | 5 | 5.25 | |
| | | 1 mA ≤ I _o ≤ 70 mA | | 4.75 | 5 | 5.25 | |
| Line regulation | Reg line | 7 ≤ V _I ≤ 20V | 25°C | | 32 | 150 | mV |
| | | 8 ≤ V _I ≤ 20V | | | 26 | 100 | |
| Load regulation | Reg load | 1 mA ≤ I _o ≤ 100 mA | 25°C | | 15 | 60 | mV |
| | | 1 mA ≤ I _o ≤ 40 mA | | | 8 | 30 | |
| Bias current | I _B | | 25°C | | 3.8 | 6 | mA |
| | | | 125°C | | | 5.5 | |
| Bias current change | ΔI _B | 9 ≤ V _I ≤ 20V | -40 ~ 125°C | | | 1.5 | mA |
| | | 1 mA ≤ I _o ≤ 40 mA | | | | 0.1 | |
| Output noise voltage | V _N | 10 Hz ≤ f ≤ 100 kHz | 25°C | | 42 | | μV |
| Ripple rejection | RR | 8 ≤ V _I ≤ 20V f=120 Hz | 25°C | 41 | 49 | | dB |
| Dropout voltage | V _D | | 25°C | | 1.7 | | V |

Notes

*. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible.

Thermal effects must be taken into account separately.

All characteristics are measured with a 0.33 μF capacitor across the input and a 0.1 μF capacitor across the output.

** This specification applies only for DC power dissipation permitted by absolute maximum ratings.

HT78H06 ELECTRICAL CHARACTERISTICS

 (At specified virtual junction temperature, $V_i=12V$, $I_o=40mA$ (unless otherwise noted))

| Characteristic | Symbol | Test condition * | | Min | Typ. | Max. | Unit |
|----------------------|------------------|--|-------------|------|------|------|------|
| Output voltage ** | V _{out} | | 25°C | 5.75 | 6 | 6.25 | V |
| | | 1 mA ≤ I _o ≤ 40 mA 8V ≤ V _I ≤ 20V | -40 ~ 125°C | 5.7 | 6 | 6.3 | |
| | | 1 mA ≤ I _o ≤ 70 mA | | 5.7 | 6 | 6.3 | |
| Line regulation | Reg line | 8 ≤ V _I ≤ 20V | 25°C | | 35 | 175 | mV |
| | | 9 ≤ V _I ≤ 20V | | | 29 | 125 | |
| Load regulation | Reg load | 1 mA ≤ I _o ≤ 100 mA | 25°C | | 16 | 80 | mV |
| | | 1 mA ≤ I _o ≤ 40 mA | | | 9 | 40 | |
| Bias current | I _B | | 25°C | | 3.9 | 6 | mA |
| | | | 125°C | | | 5.5 | |
| Bias current change | ΔI _B | 9 ≤ V _I ≤ 20V | -40 ~ 125°C | | | 1.5 | mA |
| | | 1 mA ≤ I _o ≤ 40 mA | | | | 0.1 | |
| Output noise voltage | V _N | 10 Hz ≤ f ≤ 100 kHz | 25°C | | 46 | | μV |
| Ripple rejection | RR | 9 ≤ V _I ≤ 19V f = 120 Hz | 25°C | 40 | 48 | | dB |
| Dropout voltage | V _D | | 25°C | | 1.7 | | V |

Notes

- *. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible.
Thermal effects must be taken into account separately.
All characteristics are measured with a 0.33 μF capacitor across the input and a 0.1 μF capacitor across the output.
- ** This specification applies only for DC power dissipation permitted by absolute maximum ratings.

HT78H08 ELECTRICAL CHARACTERISTICS

 (At specified virtual junction temperature, $V_I=14V$, $I_o=40mA$ (unless otherwise noted))

| Characteistic | Symbol | Test condition * | | Min | Typ. | Max. | Unit |
|----------------------|------------------|---|-------------|-----|------|------|------|
| Output voltage ** | V _{out} | | 25°C | 7.7 | 8 | 8.3 | V |
| | | 1 mA ≤ I _o ≤ 40 mA 10.5V ≤ V _I ≤ 23V | -40 ~ 125°C | 7.6 | 8 | 8.4 | |
| | | 1 mA ≤ I _o ≤ 70 mA | | 7.6 | 8 | 8.4 | |
| Line regulation | Reg line | 10.5 ≤ V _I ≤ 23V | 25°C | | 42 | 175 | mV |
| | | 11 ≤ V _I ≤ 23V | | | 36 | 125 | |
| Load regulation | Reg load | 1 mA ≤ I _o ≤ 100 mA | 25°C | | 18 | 80 | mV |
| | | 1 mA ≤ I _o ≤ 40 mA | | | 10 | 40 | |
| Bias current | I _B | | 25°C | | 4 | 6 | mA |
| | | | 125°C | | | 5.5 | |
| Bias current change | ΔI _B | 11 ≤ V _I ≤ 23V | -40 ~ 125°C | | | 1.5 | mA |
| | | 1 mA ≤ I _o ≤ 40 mA | | | | 0.1 | |
| Output noise voltage | V _N | 10 Hz ≤ f ≤ 100 kHz | 25°C | | 54 | | μV |
| Ripple rejection | RR | 13 ≤ V _I ≤ 23V f=120 Hz | 25°C | 37 | 46 | | dB |
| Dropout voltage | V _D | | 25°C | | 1.7 | | V |

Notes

*. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible.

Thermal effects must be taken into account separately.

All characteristics are measured with a 0.33 μF capacitor across the input and a 0.1 μF capacitor across the output.

** This specification applies only for DC power dissipation permitted by absolute maximum ratings.

HT78H09 ELECTRICAL CHARACTERISTICS

 (At specified virtual junction temperature, $V_I=14V$, $I_o=40mA$ (unless otherwise noted))

| Characteristic | Symbol | Test condition * | | Min | Typ. | Max. | Unit |
|----------------------|------------------|---|-------------|------|------|------|------|
| Output voltage ** | V _{out} | | 25°C | 806 | 9 | 9.4 | V |
| | | 1 mA ≤ I _o ≤ 40 mA 12V ≤ V _I ≤ 24V | -40 ~ 125°C | 8.55 | 9 | 9.45 | |
| | | 1 mA ≤ I _o ≤ 70 mA | | 8.55 | 9 | 9.45 | |
| Line regulation | Reg line | 12 ≤ V _I ≤ 24V | 25°C | | 45 | 175 | mV |
| | | 13 ≤ V _I ≤ 24V | | | 40 | 125 | |
| Load regulation | Reg load | 1 mA ≤ I _o ≤ 100 mA | 25°C | | 19 | 90 | mV |
| | | 1 mA ≤ I _o ≤ 40 mA | | | 11 | 40 | |
| Bias current | I _B | | 25°C | | 4.1 | 6 | mA |
| | | | 125°C | | | 5.5 | |
| Bias current change | ΔI _B | 13 ≤ V _I ≤ 24V | -40 ~ 125°C | | | 1.5 | mA |
| | | 1 mA ≤ I _o ≤ 40 mA | | | | 0.1 | |
| Output noise voltage | V _N | 10 Hz ≤ f ≤ 100 kHz | 25°C | | 58 | | μV |
| Ripple rejection | RR | 13 ≤ V _I ≤ 23V f=120 Hz | 25°C | 38 | 45 | | dB |
| Dropout voltage | V _D | | 25°C | | 1.7 | | V |

Notes

*. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible.

Thermal effects must be taken into account separately.

All characteristics are measured with a 0.33 μF capacitor across the input and a 0.1 μF capacitor across the output.

** This specification applies only for DC power dissipation permitted by absolute maximum ratings.

HT78H10 ELECTRICAL CHARACTERISTICS

 (At specified virtual junction temperature, $V_I=16V$, $I_o=40mA$ (unless otherwise noted))

| Characteristic | Symbol | Test condition * | | Min | Typ. | Max. | Unit |
|----------------------|------------------|---|-------------|-----|------|------|------|
| Output voltage ** | V _{out} | | 25°C | 9.6 | 10 | 10.4 | V |
| | | 1 mA ≤ I _o ≤ 40 mA 13V ≤ V _I ≤ 25V | -40 ~ 125°C | 9.5 | 10 | 10.5 | |
| | | 1 mA ≤ I _o ≤ 70 mA | | 9.5 | 10 | 10.5 | |
| Line regulation | Reg line | 13 ≤ V _I ≤ 25V | 25°C | | 51 | 175 | mV |
| | | 14 ≤ V _I ≤ 25V | | | 42 | 125 | |
| Load regulation | Reg load | 1 mA ≤ I _o ≤ 100 mA | 25°C | | 20 | 90 | mV |
| | | 1 mA ≤ I _o ≤ 40 mA | | | 11 | 40 | |
| Bias current | I _B | | 25°C | | 4.2 | 6 | mA |
| | | | 125°C | | | 5.5 | |
| Bias current change | ΔI _B | 14 ≤ V _I ≤ 25V | -40 ~ 125°C | | | 1.5 | mA |
| | | 1 mA ≤ I _o ≤ 40 mA | | | | 0.1 | |
| Output noise voltage | V _N | 10 Hz ≤ f ≤ 100 kHz | 25°C | | 62 | | μV |
| Ripple rejection | RR | 15 ≤ V _I ≤ 25V f=120 Hz | 25°C | 37 | 44 | | dB |
| Dropout voltage | V _D | | 25°C | | 1.7 | | V |

Notes

*. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible.

Thermal effects must be taken into account separately.

All characteristics are measured with a 0.33 μF capacitor across the input and a 0.1 μF capacitor across the output.

** . This specification applies only for DC power dissipation permitted by absolute maximum ratings.

HT78H12 ELECTRICAL CHARACTERISTICS

 (At specified virtual junction temperature, $V_i=17V$, $I_o=40mA$ (unless otherwise noted))

| Characteristic | Symbol | Test condition * | | Min | Typ. | Max. | Unit |
|----------------------|-----------------|---|-------------|------|------|------|------|
| Output voltage ** | Vout | | 25°C | 11.5 | 12 | 12.5 | V |
| | | 1 mA ≤ I _o ≤ 40 mA 14V ≤ V _I ≤ 27V | -40 ~ 125°C | 11.4 | 12 | 12.6 | |
| | | 1 mA ≤ I _o ≤ 70 mA | | 11.4 | 12 | 12.6 | |
| Line regulation | Reg line | 14.5 ≤ V _I ≤ 27V | 25°C | | 55 | 250 | mV |
| | | 16 ≤ V _I ≤ 27V | | | 49 | 200 | |
| Load regulation | Reg load | 1 mA ≤ I _o ≤ 100 mA | 25°C | | 22 | 100 | mV |
| | | 1 mA ≤ I _o ≤ 40 mA | | | 13 | 50 | |
| Bias current | I _B | | 25°C | | 4.3 | 6.5 | mA |
| | | | 125°C | | | 6 | |
| Bias current change | ΔI _B | 16 ≤ V _I ≤ 27V | -40 ~ 125°C | | | 1.5 | mA |
| | | 1 mA ≤ I _o ≤ 40 mA | | | | 0.1 | |
| Output noise voltage | V _N | 10 Hz ≤ f ≤ 100 kHz | 25°C | | 70 | | μV |
| Ripple rejection | RR | 15 ≤ V _I ≤ 25V f=120 Hz | 25°C | 37 | 42 | | dB |
| Dropout voltage | V _D | | 25°C | | 1.7 | | V |

Notes

*. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible.

Thermal effects must be taken into account separately.

All characteristics are measured with a 0.33 μF capacitor across the input and a 0.1 μF capacitor across the output.

** This specification applies only for DC power dissipation permitted by absolute maximum ratings.

HT78H15 ELECTRICAL CHARACTERISTICS

 (At specified virtual junction temperature, $V_i=19V$, $I_o=40mA$ (unless otherwise noted))

| Characteristic | Symbol | Test condition * | | Min | Typ. | Max. | Unit |
|----------------------|------------------|---|-------------|-------|------|-------|------|
| Output voltage ** | V _{out} | | 25°C | 14.4 | 15 | 15.6 | V |
| | | 1 mA ≤ I _o ≤ 40 mA 17.5V ≤ V _I ≤ 30V | -40 ~ 125°C | 14.25 | 15 | 15.75 | |
| | | 1 mA ≤ I _o ≤ 70 mA | | 14.25 | 15 | 15.75 | |
| Line regulation | Reg line | 17.5 ≤ V _I ≤ 30V | 25°C | | 65 | 300 | mV |
| | | 19 ≤ V _I ≤ 30V | | | 58 | 250 | |
| Load regulation | Reg load | 1 mA ≤ I _o ≤ 100 mA | 25°C | | 25 | 150 | mV |
| | | 1 mA ≤ I _o ≤ 40 mA | | | 15 | 75 | |
| Bias current | I _B | | 25°C | | 4.2 | 6.5 | mA |
| | | | 125°C | | | 6 | |
| Bias current change | ΔI _B | 19 ≤ V _I ≤ 30V | -40 ~ 125°C | | | 1.5 | mA |
| | | 1 mA ≤ I _o ≤ 40 mA | | | | 0.1 | |
| Output noise voltage | V _N | 10 Hz ≤ f ≤ 100 kHz | 25°C | | 82 | | μV |
| Ripple rejection | RR | 18.5 ≤ V _I ≤ 28.5V f=120 Hz | 25°C | 37 | 44 | | dB |
| Dropout voltage | V _D | | 25°C | | 1.7 | | V |

Notes

*. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible.

Thermal effects must be taken into account separately.

All characteristics are measured with a 0.33 μF capacitor across the input and a 0.1 μF capacitor across the output.

** This specification applies only for DC power dissipation permitted by absolute maximum ratings.

HT78H18 ELECTRICAL CHARACTERISTICS

 (At specified virtual junction temperature, $V_I=23V$, $I_O=40mA$ (unless otherwise noted))

| Characteristic | Symbol | Test condition * | | Min | Typ. | Max. | Unit |
|----------------------|------------------|---|-------------|------|------|------|------|
| Output voltage ** | V _{out} | | 25°C | 17.3 | 18 | 18.7 | V |
| | | 1 mA ≤ I _o ≤ 40 mA 20.5V ≤ V _I ≤ 33V | -40 ~ 125°C | 17.1 | 18 | 18.9 | |
| | | 1 mA ≤ I _o ≤ 70 mA | | 17.1 | 18 | 18.9 | |
| Line regulation | Reg line | 20.5 ≤ V _I ≤ 33V | 25°C | | 70 | 360 | mV |
| | | 22 ≤ V _I ≤ 33V | | 64 | 300 | | |
| Load regulation | Reg load | 1 mA ≤ I _o ≤ 100 mA | 25°C | | 27 | 180 | mV |
| | | 1 mA ≤ I _o ≤ 40 mA | | 19 | 90 | | |
| Bias current | I _B | | 25°C | | 4.7 | 6.5 | mA |
| | | | 125°C | | | 6 | |
| Bias current change | ΔI _B | 22 ≤ V _I ≤ 33V | -40 ~ 125°C | | | 1.5 | mA |
| | | 1 mA ≤ I _o ≤ 40 mA | | | | 0.1 | |
| Output noise voltage | V _N | 10 Hz ≤ f ≤ 100 kHz | 25°C | | 82 | | μV |
| Ripple rejection | RR | 21.5 ≤ V _I ≤ 31.5V f=120 Hz | 25°C | 32 | 36 | | dB |
| Dropout voltage | V _D | | 25°C | | 1.7 | | V |

Notes

*. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible.

Thermal effects must be taken into account separately.

All characteristics are measured with a 0.33 μF capacitor across the input and a 0.1 μF capacitor across the output.

** This specification applies only for DC power dissipation permitted by absolute maximum ratings.

HT78H24 ELECTRICAL CHARACTERISTICS

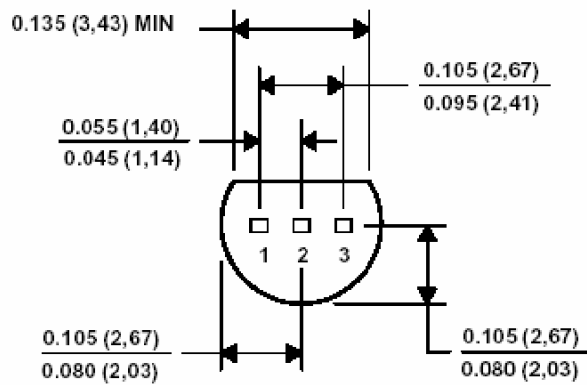
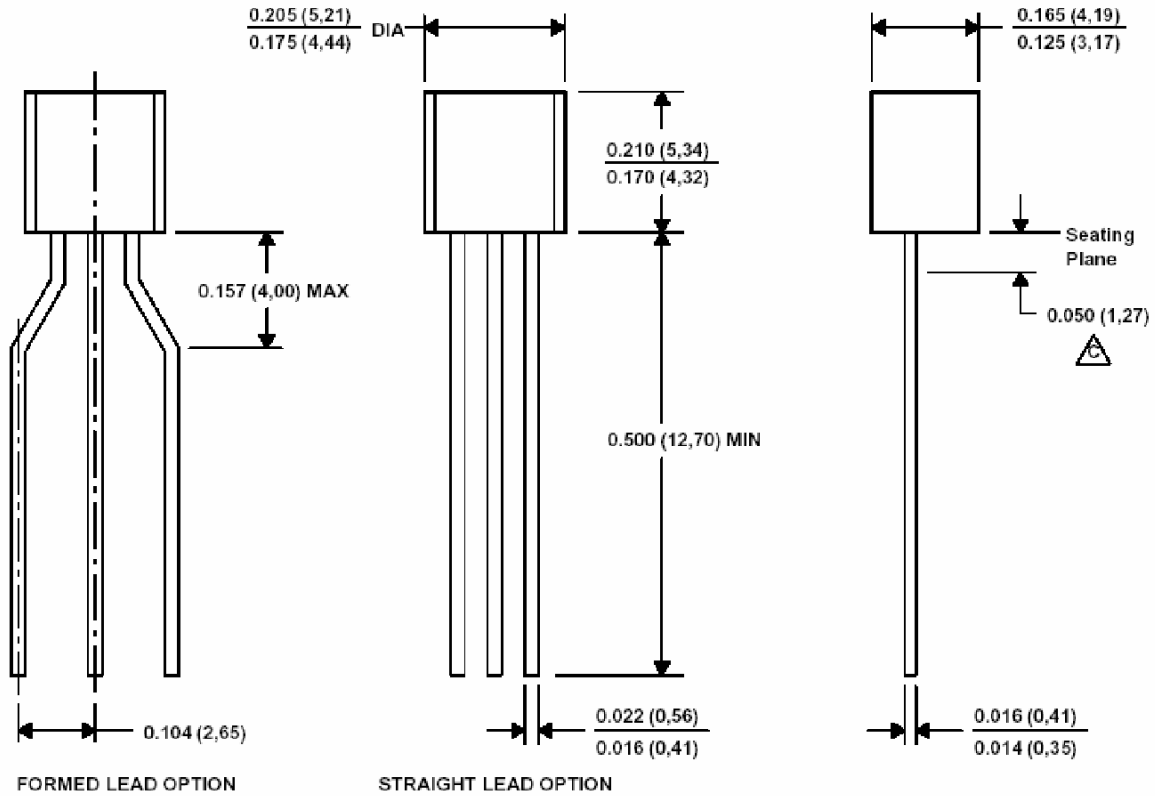
 (At specified virtual junction temperature, $V_I=26V$, $I_O=40mA$ (unless otherwise noted))

| Characteristic | Symbol | Test condition * | | Min | Typ. | Max. | Unit |
|----------------------|------------------|---|-------------|------|------|------|------|
| Output voltage ** | V _{out} | | 25°C | 23 | 24 | 25 | V |
| | | 1 mA ≤ I _o ≤ 40 mA 26.5V ≤ V _I ≤ 39V | -40 ~ 125°C | 22.8 | 24 | 25.2 | |
| | | 1 mA ≤ I _o ≤ 70 mA | | 22.8 | 24 | 25.2 | |
| Line regulation | Reg line | 26.5 ≤ V _I ≤ 39V | 25°C | | 95 | 480 | mV |
| | | 29 ≤ V _I ≤ 39V | | | 78 | 400 | |
| Load regulation | Reg load | 1 mA ≤ I _o ≤ 100 mA | 25°C | | 41 | 240 | mV |
| | | 1 mA ≤ I _o ≤ 40 mA | | | 28 | 120 | |
| Bias current | I _B | | 25°C | | 4.8 | 6.5 | mA |
| | | | 125°C | | | 6 | |
| Bias current change | ΔI _B | 28 ≤ V _I ≤ 39V | -40 ~ 125°C | | | 1.5 | mA |
| | | 1 mA ≤ I _o ≤ 40 mA | | | | 0.1 | |
| Output noise voltage | V _N | 10 Hz ≤ f ≤ 100 kHz | 25°C | | 82 | | μV |
| Ripple rejection | RR | 27.5 ≤ V _I ≤ 37.5V f=120 Hz | 25°C | 30 | 33 | | dB |
| Dropout voltage | V _D | | 25°C | | 1.7 | | V |

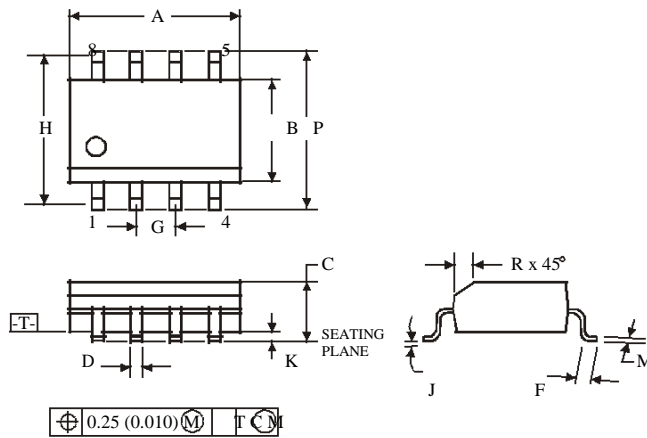
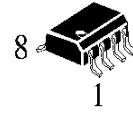
Notes

- *. Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.
All characteristics are measured with a 0.33 μF capacitor across the input and a 0.1 μF capacitor across the output.
- ** This specification applies only for DC power dissipation permitted by absolute maximum ratings.

• TO-92



• SO-8

D SUFFIX SOIC
(MS - 012AA)


| Symbol | Dimension, mm | |
|--------|---------------|------|
| | MIN | MAX |
| A | 4.8 | 5 |
| B | 3.8 | 4 |
| C | 1.35 | 1.75 |
| D | 0.33 | 0.51 |
| F | 0.4 | 1.27 |
| G | 1.27 | |
| H | 5.72 | |
| J | 0° | 8° |
| K | 0.1 | 0.25 |
| M | 0.19 | 0.25 |
| P | 5.8 | 6.2 |
| R | 0.25 | 0.5 |

NOTES:

1. Dimensions A and B do not include mold flash or protrusion.
2. Maximum mold flash or protrusion 0.15 mm (0.006) per side for A; for B - 0.25 mm (0.010) per side.

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [Linear Voltage Regulators](#) category:

Click to view products by [HTCSEMI](#) manufacturer:

Other Similar products are found below :

[LV56831P-E](#) [LV5684PVD-XH](#) [MCDTSA6-2R](#) [L7815ACV-DG](#) [PQ3DZ53U](#) [LV56801P-E](#) [TLE42794G](#) [L78L05CZ/1SX](#) [L78LR05DL-MA-E](#) [636416C](#) [714954EB](#) [BA033LBSG2-TR](#) [LV5680P-E](#) [L78M15CV-DG](#) [TLS202B1MBV33HTSA1](#) [L79M05T-E](#) [TLS202A1MBVHTSA1](#) [L78LR05D-MA-E](#) [NCV317MBTG](#) [NTE7227](#) [LV5680NPVC-XH](#) [LT1054CN8](#) [MP2018GZD-5-Z](#) [MP2018GZD-33-Z](#) [MIC5281-3.3YMM](#) [MC78L06BP-AP](#) [TA48LS05F\(TE85L,F\)](#) [TA78L12F\(TE12L,F\)](#) [TC47BR5003ECT](#) [TCR2LN12,LF\(S](#) [TCR2LN28,LF\(S](#) [TCR2LN30,LF\(S](#) [TCR3DF295,LM\(CT](#) [TCR3DF40,LM\(CT](#) [BA178M20CP-E2](#) [L78M12ABDT](#) [LM7812SX/NOPB](#) [LR645N3-G-P003](#) [LR645N3-G-P013](#) [ZXTR2005P5-13](#) [SCD7812BTG](#) [TCR3DF335,LM\(CT](#) [ZXTR2012K-13](#) [TLE42994E V33](#) [ZXTR2008K-13](#) [ZXTR2005K-13](#) [L88R05DL-E](#) [ADP3300ARTZ-2.7RL7](#) [LM120K-15/883](#) [IFX54441LDVXUMA1](#)