

BIPOLAR ANALOG INTEGRATED CIRCUIT
 μ PC79M00 Series

THREE TERMINAL NEGATIVE VOLTAGE REGULATOR

μ PC79M00 series are monolithic three terminal negative regulators which employ internally current limiting, thermal shut down, output transistor safe operating area protection make them essentially indestructible.

They are intended as fixed voltage regulators in a wide range of application including local on card regulation for elimination of distribution problems associated wide single point regulation.

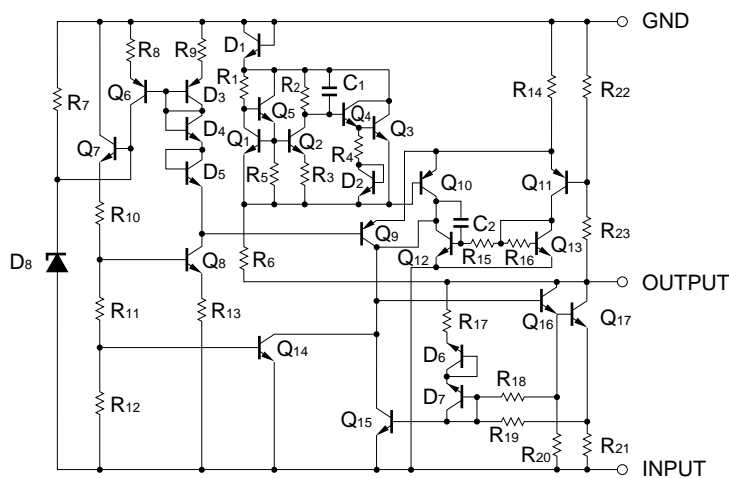
FEATURES

- Output current out of 500 mA.
- On-chip some protection circuit (over current protection, SOA protection and thermal shut down).
- Low noise.

★ ORDERING INFORMATION

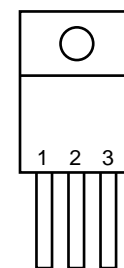
| Part Number | Package | Output Voltage |
|-----------------|--|----------------|
| μ PC79M05HF | 3-pin plastic SIP (MP-45G) (isolated TO-220) | -5 V |
| μ PC79M08HF | 3-pin plastic SIP (MP-45G) (isolated TO-220) | -8 V |
| μ PC79M12HF | 3-pin plastic SIP (MP-45G) (isolated TO-220) | -12 V |
| μ PC79M15HF | 3-pin plastic SIP (MP-45G) (isolated TO-220) | -15 V |
| μ PC79M18HF | 3-pin plastic SIP (MP-45G) (isolated TO-220) | -18 V |
| μ PC79M24HF | 3-pin plastic SIP (MP-45G) (isolated TO-220) | -24 V |

EQUIVALENT CIRCUIT



PIN CONFIGURATION (Marking Side)

3-pin plastic SIP (MP-45G)



- 1: GND
- 2: INPUT
- 3: OUTPUT

The information in this document is subject to change without notice.

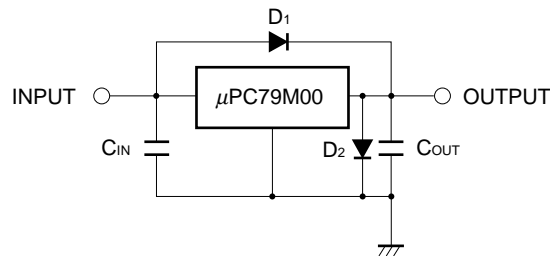
ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise specified)

| Parameter | Symbol | Rating | Unit |
|--|----------------------|---------------------------|------|
| Input Voltage | V _{IN} | -35/-40 ^{Note 1} | V |
| Internal Power Dissipation | P _T | 15 ^{Note 2} | V |
| Operating Ambient Temperature | T _A | -20 to +85 | °C |
| Operating Junction Temperature | T _J | -20 to +150 | °C |
| Storage Temperature | T _{stg} | -55 to +150 | °C |
| Thermal Resistance (junction to case) | R _{th(J-C)} | 7 | °C/W |
| Thermal Resistance (junction to ambient) | R _{th(J-A)} | 65 | °C/W |

- Notes**
1. μPC79M05, 08, 12, 15, 18: -35 V, μPC79M24: -40 V
 2. Internally limited. When operating junction temperature rise up to 150 °C, the internal circuit shutdown output voltage.

Caution Exposure to Absolute Maximum Ratings for extended periods may affect device reliability; exceeding the ratings could cause permanent damage. The parameters apply independently. The device should be operated within the limits specified under DC and AC Characteristics.

TYPICAL CONNECTION



- C_{IN} : More than 2 μF.
- C_{OUT}: More than 1 μF.
- D₁ : Needed for V_{IN} > V_O.
- D₂ : Needed for V_O > GND.

RECOMMENDED OPERATING CONDITIONS

| Parameter | Symbol | Part Number | MIN. | TYP. | MAX. | Unit |
|--------------------------------|-----------------|-------------|-------|------|------|------|
| Input Voltage | V _{IN} | μPC79M05 | -7 | -10 | -25 | V |
| | | μPC79M08 | -10.5 | -14 | -25 | |
| | | μPC79M12 | -14.5 | -19 | -30 | |
| | | μPC79M15 | -17.5 | -23 | -30 | |
| | | μPC79M18 | -21 | -27 | -33 | |
| | | μPC79M24 | -27 | -33 | -38 | |
| Output Current | I _O | All | 5 | | 350 | mA |
| Operating Junction Temperature | T _J | All | -20 | | +125 | °C |

ELECTRICAL CHARACTERISTICS

μPC79M05

($V_{IN} = -10\text{ V}$, $I_o = 350\text{ mA}$, $0\text{ }^{\circ}\text{C} \leq T_J \leq +125\text{ }^{\circ}\text{C}$, $C_{IN} = 2.2\text{ }\mu\text{F}$, $C_{OUT} = 1\text{ }\mu\text{F}$, unless otherwise specified)

| Parameter | Symbol | Test Conditions | MIN. | TYP. | MAX. | Unit |
|---|-----------------------|--|-------|------|-------|------------------------------|
| Output Voltage | V_o | $T_J = 25\text{ }^{\circ}\text{C}$ | -4.8 | -5.0 | -5.2 | V |
| | | $-7\text{ V} \leq V_{IN} \leq -25\text{ V}$, $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | -4.75 | | -5.25 | |
| Line Regulation | REG _{IN} | $T_J = 25\text{ }^{\circ}\text{C}$, $-7\text{ V} \leq V_{IN} \leq -25\text{ V}$ | | 18 | 50 | mV |
| | | $T_J = 25\text{ }^{\circ}\text{C}$, $-8\text{ V} \leq V_{IN} \leq -18\text{ V}$ | | 10 | 30 | |
| Load Regulation | REG _L | $T_J = 25\text{ }^{\circ}\text{C}$, $5\text{ mA} \leq I_o \leq 500\text{ mA}$ | | 15 | 100 | mV |
| | | $T_J = 25\text{ }^{\circ}\text{C}$, $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | | 10 | | |
| Quiescent Current | I_{BIAS} | $T_J = 25\text{ }^{\circ}\text{C}$ | | 4.3 | 6.0 | mA |
| Quiescent Current Change | ΔI_{BIAS} | $-8\text{ V} \leq V_{IN} \leq -25\text{ V}$ | | | 0.5 | mA |
| | | $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | | | 0.4 | |
| Output Noise Voltage | V_n | $T_J = 25\text{ }^{\circ}\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$ | | 45 | 200 | $\mu\text{V}_{r.m.s.}$ |
| Ripple Rejection | $R \cdot R$ | $T_J = 25\text{ }^{\circ}\text{C}$, $f = 120\text{ Hz}$, $-8\text{ V} \leq V_{IN} \leq -18\text{ V}$, $I_o = 100\text{ mA}$ | 50 | 72 | | dB |
| Dropout Voltage | V_{DIF} | $T_J = 25\text{ }^{\circ}\text{C}$ | | 1.1 | | V |
| Short Circuit Current | I_{Oshort} | $T_J = 25\text{ }^{\circ}\text{C}$, $V_{IN} = -25\text{ V}$ | | 500 | | mA |
| Peak Output Current | I_{Opeak} | $T_J = 25\text{ }^{\circ}\text{C}$ | 620 | 880 | 1 020 | mA |
| Temperature Coefficient of Output Voltage | $\Delta V_o/\Delta T$ | $I_o = 5\text{ mA}$ | | 0.2 | | $\text{mV}/^{\circ}\text{C}$ |

μPC79M08

($V_{IN} = -14\text{ V}$, $I_o = 350\text{ mA}$, $0\text{ }^{\circ}\text{C} \leq T_J \leq +125\text{ }^{\circ}\text{C}$, $C_{IN} = 2.2\text{ }\mu\text{F}$, $C_{OUT} = 1\text{ }\mu\text{F}$, unless otherwise specified)

| Parameter | Symbol | Test Conditions | MIN. | TYP. | MAX. | Unit |
|---|-----------------------|---|------|------|-------|------------------------------|
| Output Voltage | V_o | $T_J = 25\text{ }^{\circ}\text{C}$ | -7.7 | -8.0 | -8.3 | V |
| | | $-10.5\text{ V} \leq V_{IN} \leq -25\text{ V}$, $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | -7.6 | | -8.4 | |
| Line Regulation | REG _{IN} | $T_J = 25\text{ }^{\circ}\text{C}$, $-10.5\text{ V} \leq V_{IN} \leq -25\text{ V}$ | | 20 | 80 | mV |
| | | $T_J = 25\text{ }^{\circ}\text{C}$, $-11\text{ V} \leq V_{IN} \leq -21\text{ V}$ | | 15 | 50 | |
| Load Regulation | REG _L | $T_J = 25\text{ }^{\circ}\text{C}$, $5\text{ mA} \leq I_o \leq 500\text{ mA}$ | | 20 | 160 | mV |
| | | $T_J = 25\text{ }^{\circ}\text{C}$, $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | | 15 | | |
| Quiescent Current | I_{BIAS} | $T_J = 25\text{ }^{\circ}\text{C}$ | | 4.3 | 6.0 | mA |
| Quiescent Current Change | ΔI_{BIAS} | $-10.5\text{ V} \leq V_{IN} \leq -25\text{ V}$ | | | 0.5 | mA |
| | | $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | | | 0.4 | |
| Output Noise Voltage | V_n | $T_J = 25\text{ }^{\circ}\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$ | | 65 | 220 | $\mu\text{V}_{r.m.s.}$ |
| Ripple Rejection | $R \cdot R$ | $T_J = 25\text{ }^{\circ}\text{C}$, $f = 120\text{ Hz}$, $-11.5\text{ V} \leq V_{IN} \leq -21.5\text{ V}$, $I_o = 100\text{ mA}$ | 50 | 66 | | dB |
| Dropout Voltage | V_{DIF} | $T_J = 25\text{ }^{\circ}\text{C}$ | | 1.1 | | V |
| Short Circuit Current | I_{Oshort} | $T_J = 25\text{ }^{\circ}\text{C}$, $V_{IN} = -25\text{ V}$ | | 500 | | mA |
| Peak Output Current | I_{Opeak} | $T_J = 25\text{ }^{\circ}\text{C}$ | 620 | 880 | 1 020 | mA |
| Temperature Coefficient of Output Voltage | $\Delta V_o/\Delta T$ | $I_o = 5\text{ mA}$ | | 0.3 | | $\text{mV}/^{\circ}\text{C}$ |

μPC79M12

($V_{IN} = -19\text{ V}$, $I_o = 350\text{ mA}$, $0\text{ °C} \leq T_J \leq +125\text{ °C}$, $C_{IN} = 2.2\text{ }\mu\text{F}$, $C_{OUT} = 1\text{ }\mu\text{F}$, unless otherwise specified)

| Parameter | Symbol | Test Conditions | MIN. | TYP. | MAX. | Unit |
|---|-----------------------|--|-------|------|-------|------------------------|
| Output Voltage | V_o | $T_J = 25\text{ °C}$ | -11.5 | -12 | -12.5 | V |
| | | $-14.5\text{ V} \leq V_{IN} \leq -30\text{ V}$, $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | -11.4 | | -12.6 | |
| Line Regulation | REG _{IN} | $T_J = 25\text{ °C}$, $-14.5\text{ V} \leq V_{IN} \leq -30\text{ V}$ | | 25 | 80 | mV |
| | | $T_J = 25\text{ °C}$, $-15\text{ V} \leq V_{IN} \leq -25\text{ V}$ | | 20 | 50 | |
| Load Regulation | REG _L | $T_J = 25\text{ °C}$, $5\text{ mA} \leq I_o \leq 500\text{ mA}$ | | 35 | 240 | mV |
| | | $T_J = 25\text{ °C}$, $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | | 25 | | |
| Quiescent Current | I_{BIAS} | $T_J = 25\text{ °C}$ | | 4.4 | 6.0 | mA |
| Quiescent Current Change | ΔI_{BIAS} | $-14.5\text{ V} \leq V_{IN} \leq -30\text{ V}$ | | | 0.5 | mA |
| | | $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | | | 0.4 | |
| Output Noise Voltage | V_n | $T_J = 25\text{ °C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$ | | 125 | 280 | $\mu\text{V}_{r.m.s.}$ |
| Ripple Rejection | $R \cdot R$ | $T_J = 25\text{ °C}$, $f = 120\text{ Hz}$, $-15\text{ V} \leq V_{IN} \leq -25\text{ V}$, $I_o = 100\text{ mA}$ | 50 | 64 | | dB |
| Dropout Voltage | V_{DIF} | $T_J = 25\text{ °C}$ | | 1.1 | | V |
| Short Circuit Current | I_{Oshort} | $T_J = 25\text{ °C}$, $V_{IN} = -30\text{ V}$ | | 400 | | mA |
| Peak Output Current | I_{Opeak} | $T_J = 25\text{ °C}$ | 620 | 880 | 1 020 | mA |
| Temperature Coefficient of Output Voltage | $\Delta V_o/\Delta T$ | $I_o = 5\text{ mA}$ | | 0.4 | | $\text{mV}/\text{°C}$ |

μPC79M15

($V_{IN} = -23\text{ V}$, $I_o = 350\text{ mA}$, $0\text{ °C} \leq T_J \leq +125\text{ °C}$, $C_{IN} = 2.2\text{ }\mu\text{F}$, $C_{OUT} = 1\text{ }\mu\text{F}$, unless otherwise specified)

| Parameter | Symbol | Test Conditions | MIN. | TYP. | MAX. | Unit |
|---|-----------------------|--|--------|------|--------|------------------------|
| Output Voltage | V_o | $T_J = 25\text{ °C}$ | -14.4 | -15 | -15.6 | V |
| | | $-17.5\text{ V} \leq V_{IN} \leq -30\text{ V}$, $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | -14.25 | | -15.75 | |
| Line Regulation | REG _{IN} | $T_J = 25\text{ °C}$, $-17.5\text{ V} \leq V_{IN} \leq -30\text{ V}$ | | 30 | 80 | mV |
| | | $T_J = 25\text{ °C}$, $-18\text{ V} \leq V_{IN} \leq -28\text{ V}$ | | 25 | 50 | |
| Load Regulation | REG _L | $T_J = 25\text{ °C}$, $5\text{ mA} \leq I_o \leq 500\text{ mA}$ | | 50 | 240 | mV |
| | | $T_J = 25\text{ °C}$, $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | | 35 | | |
| Quiescent Current | I_{BIAS} | $T_J = 25\text{ °C}$ | | 4.4 | 6.0 | mA |
| Quiescent Current Change | ΔI_{BIAS} | $-17.5\text{ V} \leq V_{IN} \leq -30\text{ V}$ | | | 0.5 | mA |
| | | $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | | | 0.4 | |
| Output Noise Voltage | V_n | $T_J = 25\text{ °C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$ | | 150 | 360 | $\mu\text{V}_{r.m.s.}$ |
| Ripple Rejection | $R \cdot R$ | $T_J = 25\text{ °C}$, $f = 120\text{ Hz}$, $-18.5\text{ V} \leq V_{IN} \leq -28.5\text{ V}$, $I_o = 100\text{ mA}$ | 50 | 62 | | dB |
| Dropout Voltage | V_{DIF} | $T_J = 25\text{ °C}$ | | 1.1 | | V |
| Short Circuit Current | I_{Oshort} | $T_J = 25\text{ °C}$, $V_{IN} = -30\text{ V}$ | | 400 | | mA |
| Peak Output Current | I_{Opeak} | $T_J = 25\text{ °C}$ | 620 | 880 | 1 020 | mA |
| Temperature Coefficient of Output Voltage | $\Delta V_o/\Delta T$ | $I_o = 5\text{ mA}$ | | 0.6 | | $\text{mV}/\text{°C}$ |

μPC79M18

($V_{IN} = -27\text{ V}$, $I_o = 350\text{ mA}$, $0\text{ }^{\circ}\text{C} \leq T_J \leq +125\text{ }^{\circ}\text{C}$, $C_{IN} = 2.2\text{ }\mu\text{F}$, $C_{OUT} = 1\text{ }\mu\text{F}$, unless otherwise specified)

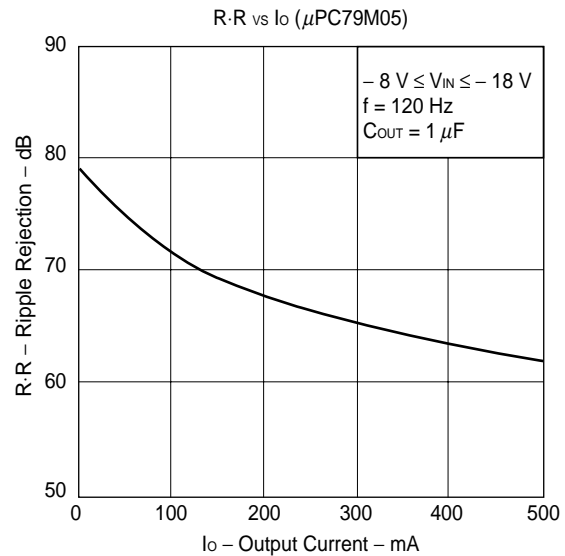
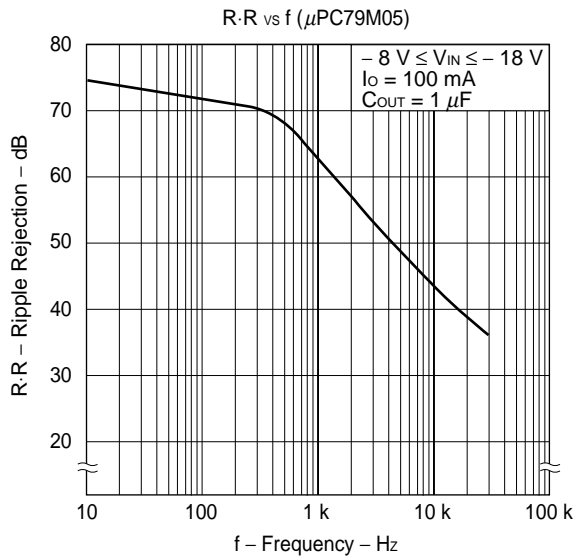
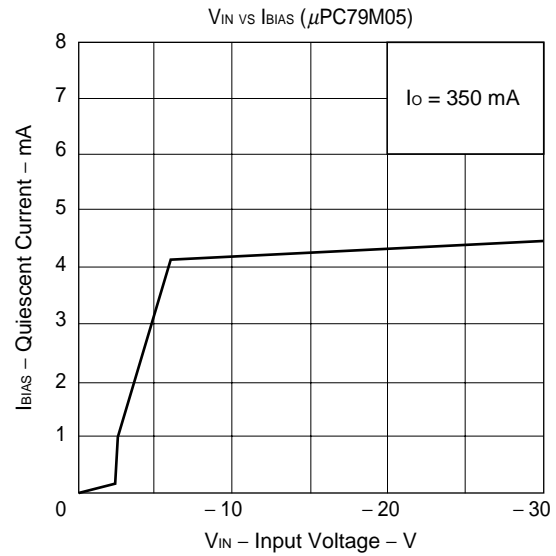
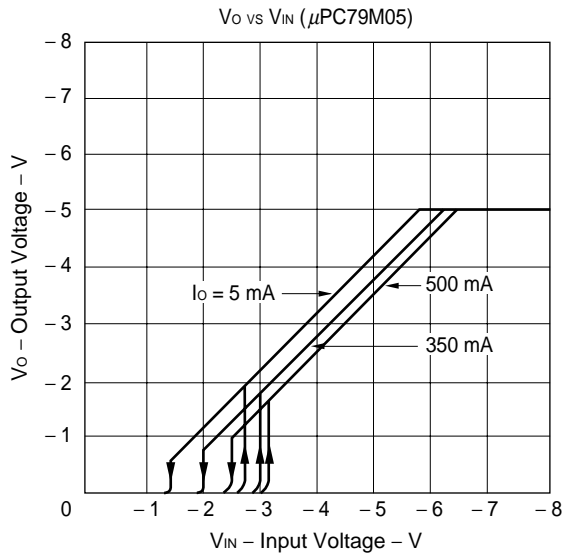
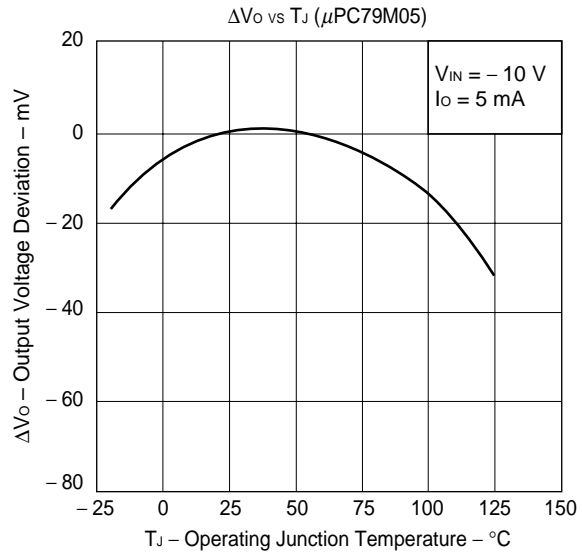
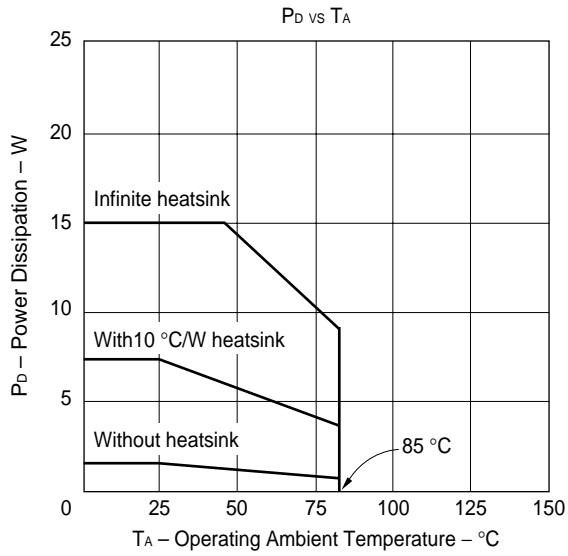
| Parameter | Symbol | Test Conditions | MIN. | TYP. | MAX. | Unit |
|---|-----------------------|--|-------|------|-------|------------------------------|
| Output Voltage | V_o | $T_J = 25\text{ }^{\circ}\text{C}$ | -17.3 | -18 | -18.7 | V |
| | | $-21\text{ V} \leq V_{IN} \leq -33\text{ V}$, $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | -17.1 | | -18.9 | |
| Line Regulation | REG _{IN} | $T_J = 25\text{ }^{\circ}\text{C}$, $-21\text{ V} \leq V_{IN} \leq -33\text{ V}$ | | 30 | 80 | mV |
| | | $T_J = 25\text{ }^{\circ}\text{C}$, $-24\text{ V} \leq V_{IN} \leq -30\text{ V}$ | | 25 | 50 | |
| Load Regulation | REG _L | $T_J = 25\text{ }^{\circ}\text{C}$, $5\text{ mA} \leq I_o \leq 500\text{ mA}$ | | 60 | 300 | mV |
| | | $T_J = 25\text{ }^{\circ}\text{C}$, $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | | 45 | | |
| Quiescent Current | I_{BIAS} | $T_J = 25\text{ }^{\circ}\text{C}$ | | 4.4 | 6.0 | mA |
| Quiescent Current Change | ΔI_{BIAS} | $-21\text{ V} \leq V_{IN} \leq -33\text{ V}$ | | | 0.5 | mA |
| | | $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | | | 0.4 | |
| Output Noise Voltage | V_n | $T_J = 25\text{ }^{\circ}\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$ | | 200 | 440 | $\mu\text{V}_{r.m.s.}$ |
| Ripple Rejection | $R \cdot R$ | $T_J = 25\text{ }^{\circ}\text{C}$, $f = 120\text{ Hz}$, $-22\text{ V} \leq V_{IN} \leq -32\text{ V}$, $I_o = 100\text{ mA}$ | 50 | 60 | | dB |
| Dropout Voltage | V_{DIF} | $T_J = 25\text{ }^{\circ}\text{C}$ | | 1.1 | | V |
| Short Circuit Current | I_{short} | $T_J = 25\text{ }^{\circ}\text{C}$, $V_{IN} = -33\text{ V}$ | | 350 | | mA |
| Peak Output Current | I_{peak} | $T_J = 25\text{ }^{\circ}\text{C}$ | 620 | 880 | 1 020 | mA |
| Temperature Coefficient of Output Voltage | $\Delta V_o/\Delta T$ | $I_o = 5\text{ mA}$ | | 0.8 | | $\text{mV}/^{\circ}\text{C}$ |

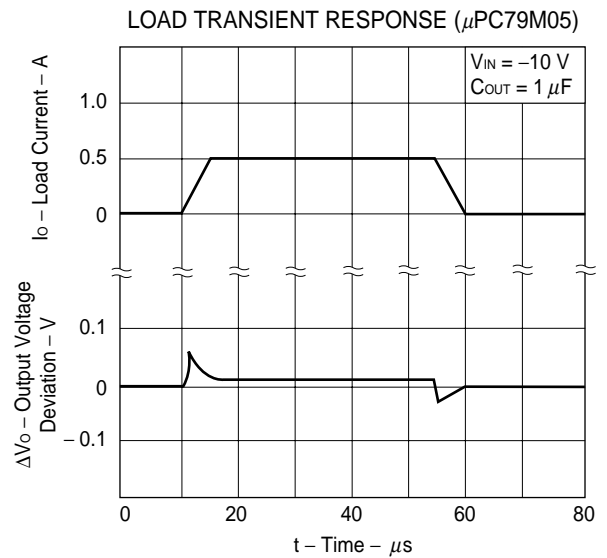
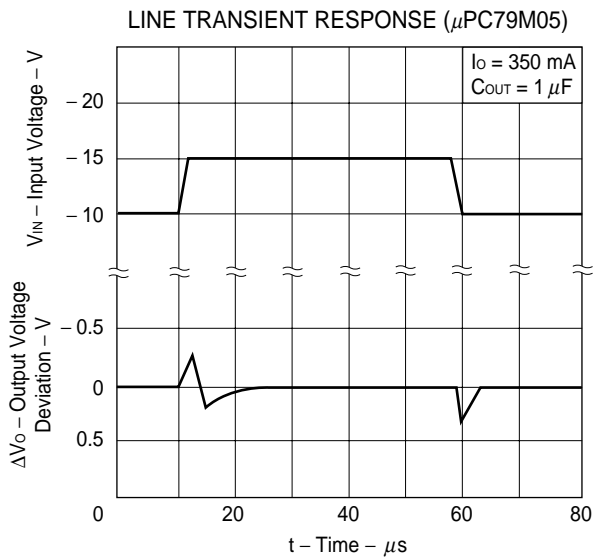
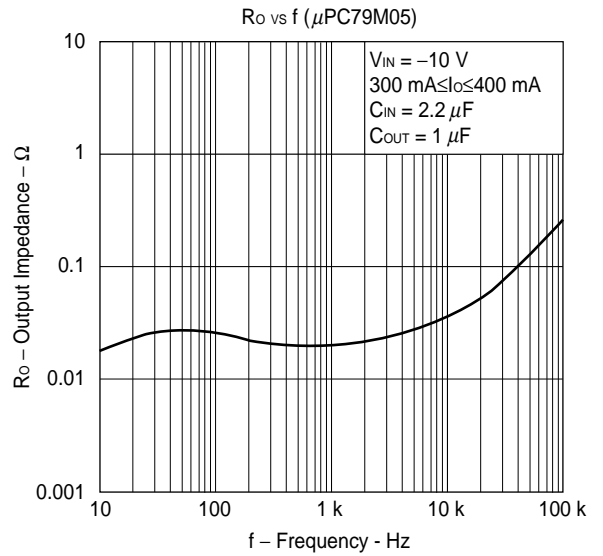
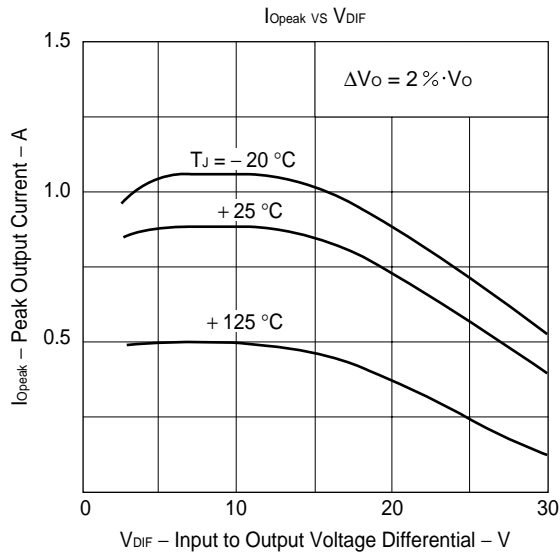
μPC79M24

($V_{IN} = -33\text{ V}$, $I_o = 350\text{ mA}$, $0\text{ }^{\circ}\text{C} \leq T_J \leq +125\text{ }^{\circ}\text{C}$, $C_{IN} = 2.2\text{ }\mu\text{F}$, $C_{OUT} = 1\text{ }\mu\text{F}$, unless otherwise specified)

| Parameter | Symbol | Test Conditions | MIN. | TYP. | MAX. | Unit |
|---|-----------------------|--|-------|------|-------|------------------------------|
| Output Voltage | V_o | $T_J = 25\text{ }^{\circ}\text{C}$ | -23.0 | -24 | -25.0 | V |
| | | $-27\text{ V} \leq V_{IN} \leq -38\text{ V}$, $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | -22.8 | | -25.2 | |
| Line Regulation | REG _{IN} | $T_J = 25\text{ }^{\circ}\text{C}$, $-27\text{ V} \leq V_{IN} \leq -38\text{ V}$ | | 30 | 80 | mV |
| | | $T_J = 25\text{ }^{\circ}\text{C}$, $-30\text{ V} \leq V_{IN} \leq -36\text{ V}$ | | 25 | 50 | |
| Load Regulation | REG _L | $T_J = 25\text{ }^{\circ}\text{C}$, $5\text{ mA} \leq I_o \leq 500\text{ mA}$ | | 80 | 360 | mV |
| | | $T_J = 25\text{ }^{\circ}\text{C}$, $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | | 50 | | |
| Quiescent Current | I_{BIAS} | $T_J = 25\text{ }^{\circ}\text{C}$ | | 4.5 | 6.0 | mA |
| Quiescent Current Change | ΔI_{BIAS} | $-27\text{ V} \leq V_{IN} \leq -38\text{ V}$ | | | 0.5 | mA |
| | | $5\text{ mA} \leq I_o \leq 350\text{ mA}$ | | | 0.4 | |
| Output Noise Voltage | V_n | $T_J = 25\text{ }^{\circ}\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$ | | 250 | 600 | $\mu\text{V}_{r.m.s.}$ |
| Ripple Rejection | $R \cdot R$ | $T_J = 25\text{ }^{\circ}\text{C}$, $f = 120\text{ Hz}$, $-28\text{ V} \leq V_{IN} \leq -38\text{ V}$, $I_o = 100\text{ mA}$ | 50 | 57 | | dB |
| Dropout Voltage | V_{DIF} | $T_J = 25\text{ }^{\circ}\text{C}$ | | 1.1 | | V |
| Short Circuit Current | I_{short} | $T_J = 25\text{ }^{\circ}\text{C}$, $V_{IN} = -38\text{ V}$ | | 200 | | mA |
| Peak Output Current | I_{peak} | $T_J = 25\text{ }^{\circ}\text{C}$ | 620 | 880 | 1 020 | mA |
| Temperature Coefficient of Output Voltage | $\Delta V_o/\Delta T$ | $I_o = 5\text{ mA}$ | | 1.0 | | $\text{mV}/^{\circ}\text{C}$ |

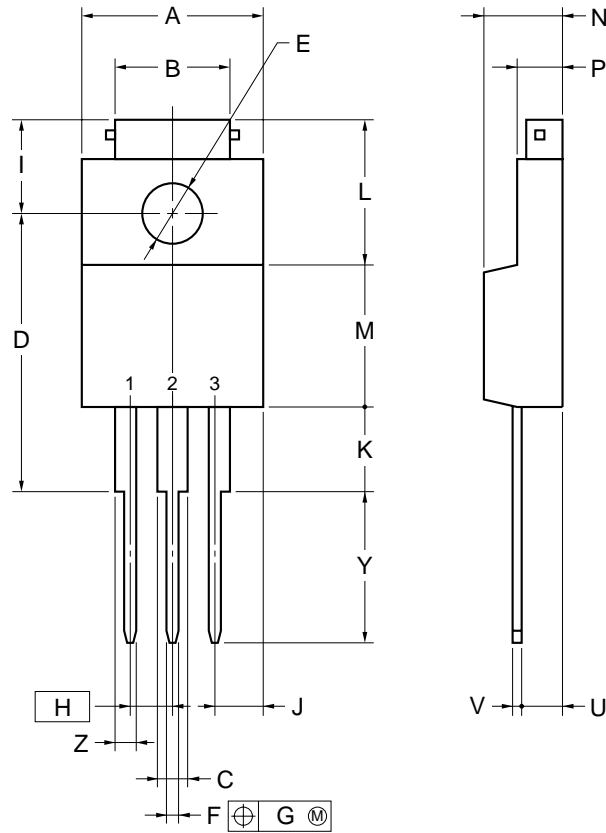
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise specified)





PACKAGE DRAWINGS

3PIN PLASTIC SIP (MP-45G)



NOTE

Each lead centerline is located within 0.25 mm (0.01 inch) of its true position (T.P.) at maximum material condition.

| ITEM | MILLIMETERS | INCHES |
|------|-------------|---|
| A | 10.4 MAX. | 0.410 MAX. |
| B | 7.0 | 0.276 |
| C | 1.2 MIN. | 0.047 MIN. |
| D | 17.0±0.3 | 0.669 ^{+0.013} _{-0.012} |
| E | φ3.3±0.2 | φ0.130±0.008 |
| F | 0.75±0.10 | 0.030 ^{+0.004} _{-0.005} |
| G | 0.25 | 0.010 |
| H | 2.54 (T.P.) | 0.100 (T.P.) |
| I | 5.0±0.3 | 0.197±0.012 |
| J | 2.66 MAX. | 0.105 MAX. |
| K | 4.8 MIN. | 0.188 MIN. |
| L | 8.5 | 0.335 |
| M | 8.5 | 0.335 |
| N | 4.5±0.2 | 0.177±0.008 |
| P | 2.8±0.2 | 0.110 ^{+0.009} _{-0.008} |
| U | 2.4±0.5 | 0.094 ^{+0.021} _{-0.020} |
| V | 0.65±0.10 | 0.026 ^{+0.004} _{-0.005} |
| Y | 8.9±0.7 | 0.350±0.028 |
| Z | 1.0 MIN. | 0.039 MIN. |

P3HF-254B-3

RECOMMENDED SOLDERING CONDITIONS

When soldering these products, it is highly recommended to observe the conditions as shown below. If other soldering processes are used, or if the soldering is performed under different conditions, please make sure to consult with our sales offices.

For more details, refer to our document “**SEMICONDUCTOR DEVICE MOUNTING TECHNOLOGY MANUAL**” (C10535E).

Type of Through-hole Devices

μPC79M05HF, 79M08HF, 79M12HF, 79M15HF, 79M18HF, 79M24HF: 3-pin plastic SIP (MP-45G)

| Process | Conditions |
|-----------------------------------|--|
| Wave soldering (only to leads) | Solder temperature: 260 °C or below, Flow time: 10 seconds or less. |

Caution For through-hole device, the wave soldering process must be applied only to leads, and make sure that the package body does not get jet soldered.

★ **REFERENCE DOCUMENTS**

| | |
|---|----------|
| Quality Grades on NEC Semiconductor Devices | C11531E |
| Semiconductor Device Mounting Technology Manual | C10535E |
| IC Package Manual | C10943X |
| Guide to Quality Assurance for Semiconductor Devices | MEI-1202 |
| Semiconductors Selection Guide | X10679E |
| NEC Semiconductor Device Reliability/Quality Control System | IEI-1212 |
| -Three Terminal Regulator | |

[MEMO]

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The application circuits and their parameters are for reference only and are not intended for use in actual design-ins.

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NEC devices are classified into the following three quality grades:

"Standard", "Special", and "Specific". The Specific quality grade applies only to devices developed based on a customer designated "quality assurance program" for a specific application. The recommended applications of a device depend on its quality grade, as indicated below. Customers must check the quality grade of each device before using it in a particular application.

Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

Specific: Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

The quality grade of NEC devices is "Standard" unless otherwise specified in NEC's Data Sheets or Data Books. If customers intend to use NEC devices for applications other than those specified for Standard quality grade, they should contact an NEC sales representative in advance.

Anti-radioactive design is not implemented in this product.