- **Very Low Dropout Voltage, Less Than 0.6 V at 750 mA**
- **Low Quiescent Current**
- **TTL- and CMOS-Compatible Enable on TL751M Series**
- **60-V Load-Dump Protection**
- **Overvoltage Protection**
- **Internal Thermal Overload Protection**
- **Internal Overcurrent-Limiting Circuitry**

## description

The TL750M and TL751M series are low-dropout positive voltage regulators specifically designed for battery-powered systems. The TL750M and TL751M series incorporate onboard overvoltage and current-limiting protection circuitry to protect the devices and the regulated system. Both series are fully protected against 60-V load-dump and reverse-battery conditions. Extremely low quiescent current, even during full-load conditions, makes the TL750M and TL751M series ideal for standby power systems.

The TL750M and TL751M series offers 5-V, 8-V, 10-V, and 12-V options. The TL751M series has the addition of an enable ($\overline{\text{ENABLE}}$) input. The $\overline{\text{ENABLE}}$ input gives the designer complete control over power up, allowing sequential power up or emergency shutdown. When $\overline{\text{ENABLE}}$ is high, the regulator output is placed in the high-impedance state. The $\overline{\text{ENABLE}}$ input is TTL- and CMOS-compatible.

The TL750MxxC and TL751MxxC are characterized for operation over the virtual junction temperature range 0°C to 125°C.

**AVAILABLE OPTIONS**

| $T_J$ | $V_O$ TYP (V) | PACKAGED DEVICES | | | | CHIP FORM (Y) |
|---|---|---|---|---|---|---|
| | | HEAT-SINK MOUNTED (3-PIN) (KC) | PLASTIC FLANGE MOUNT (KTE) | PLASTIC FLANGE MOUNT (KTG) | PLASTIC FLANGE MOUNT (KTP) | |
| 0°C to 125°C | 5 | TL750M05CKC | TL750M05CKTE | TL751M05CKTG | TL750M05CKTPR | TL750M05Y |
| | 8 | TL750M08CKC | TL750M08CKTE | TL751M08CKTG | TL750M08CKTPR | TL750M08Y |
| | 10 | TL750M10CKC | TL750M10CKTE | TL751M10CKTG | TL750M10CKTPR | TL750M10Y |
| | 12 | TL750M12CKC | TL750M12CKTE | TL751M12CKTG | TL750M12CKTPR | TL750M12Y |

The KTE and KTG packages are available taped and reeled. The KTP is only available taped and reeled. Add the suffix R to device type (e.g., TL750M05CKTER). Chip forms are tested at 25°C.

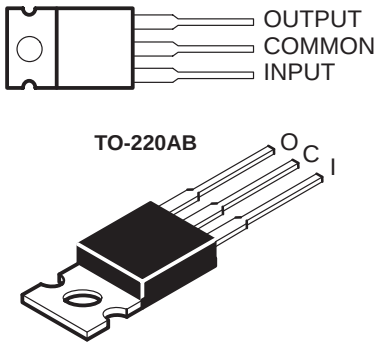


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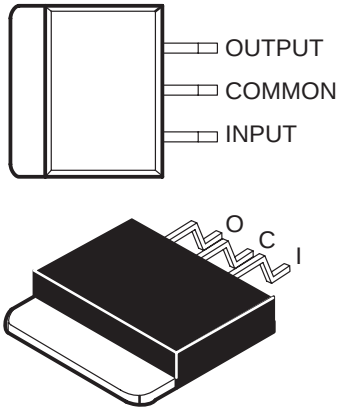
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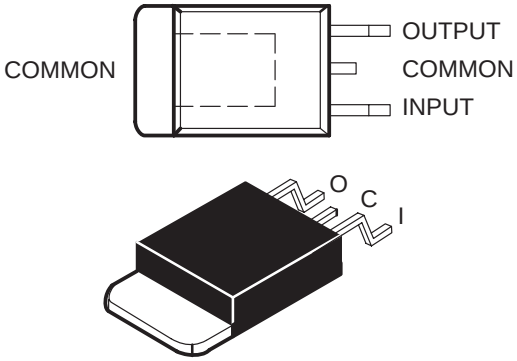
**TL750M . . . KC PACKAGE†**
**(TOP VIEW)**



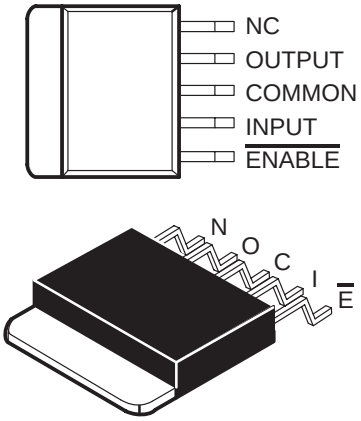

**TL750M . . . KTE PACKAGE†**
**(TOP VIEW)**




**TL750M . . . KTP PACKAGE†**
**(TOP VIEW)**

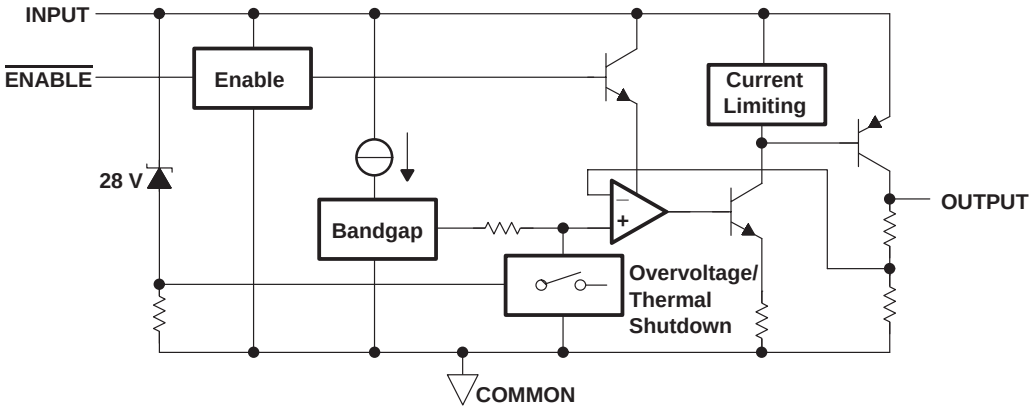



**TL751M . . . KTG PACKAGE†**
**(TOP VIEW)**




† The common terminal is in electrical contact with the mounting base.
NC – No internal connection

## TL751Mxx functional block diagram




| DEVICE COMPONENT COUNT | |
|---|---|
| Transistors | 46 |
| Diodes | 14 |
| Resistors | 44 |
| Capacitors | 4 |
| JFETs | 1 |
| Tunnels (emitter R) | 2 |

### absolute maximum ratings over virtual junction temperature range (unless otherwise noted)†

Continuous input voltage . . . . . 26 V
Transient input voltage (see Figure 3) . . . . . 60 V
Continuous reverse input voltage . . . . . –15 V
Transient reverse input voltage: t = 100 ms . . . . . –50 V
Package thermal impedance, $\theta_{JA}$ (see Notes 1 and 2): KC package . . . . . 22°C/W
KTE package . . . . . 23°C/W
KTG package . . . . . 23°C/W
KTP package . . . . . 28°C/W
Virtual junction temperature range, $T_J$ . . . . . 0°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds . . . . . 260°C
Storage temperature range, $T_{stg}$ . . . . . –65°C to 150°C

† 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.

NOTES: 1. Maximum power dissipation is a function of $T_J(max)$, $\theta_{JA}$, and $T_A$. The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(max) – T_A)/\theta_{JA}$. Operating at the absolute maximum $T_J$ of 150°C can impact reliability. Due to variation in individual device electrical characteristics and thermal resistance, the built-in thermal overload protection may be activated at power levels slightly above or below the rated dissipation.
2. The package thermal impedance is calculated in accordance with JESD 51.

### recommended operating conditions

| | | MIN | MAX | UNIT |
|---|---|---|---|---|
| Input voltage range, $V_I$ | TL75xM05 | 6 | 26 | V |
| | TL75xM08 | 9 | 26 | |
| | TL75xM10 | 11 | 26 | |
| | TL75xM12 | 13 | 26 | |
| High-level $\overline{\text{ENABLE}}$ input voltage, $V_{IH}$ | TL751Mxx | 2 | 15 | V |
| Low-level $\overline{\text{ENABLE}}$ input voltage, $V_{IL}$ | TL751Mxx | 0 | 0.8 | V |
| Output current range, $I_O$ | TL75xMxxC | | 750 | mA |
| Operating virtual junction temperature range, $T_J$ | TL75xMxxC | 0 | 125 | °C |

### electrical characteristics, $V_I$ = 14 V, $I_O$ = 300 mA, $T_J$ = 25°C

| PARAMETER | TL751MXXX | | | UNIT |
|---|---|---|---|---|
| | MIN | TYP | MAX | |
| Response time, $\overline{\text{ENABLE}}$ to output | | 50 | | µs |

## electrical characteristics, $V_I$ = 14 V, $I_O$ = 300 mA, $\overline{\text{ENABLE}}$ at 0 V for TL751M05, $T_J$ = 25°C (unless otherwise noted) (see Note 3)

| PARAMETER | TEST CONDITIONS | | TL750M05C TL751M05C | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage | | | 4.95 | 5 | 5.05 | V |
| | $T_J$ = 0°C to 125°C | | 4.9 | | 5.1 | |
| Input voltage regulation | $V_I$ = 9 V to 16 V, | $I_O$ = 250 mA | | 10 | 25 | mV |
| | $V_I$ = 6 V to 26 V, | $I_O$ = 250 mA | | 12 | 50 | |
| Ripple rejection | $V_I$ = 8 V to 18 V, | f = 120 Hz | 50 | 55 | | dB |
| Output voltage regulation | $I_O$ = 5 mA to 750 mA | | | 20 | 50 | mV |
| Dropout voltage | $I_O$ = 500 mA | | | | 0.5 | V |
| | $I_O$ = 750 mA | | | | 0.6 | |
| Output noise voltage | f = 10 Hz to 100 kHz | | | 500 | | μV |
| Bias current | $I_O$ = 750 mA | | | 60 | 75 | mA |
| | $I_O$ = 10 mA | | | | 5 | |
| Bias current (TL751M05C and TL751M05Q only) | $\overline{\text{ENABLE}}$ $V_{IH} \geq$ 2 V | | | | 200 | μA |

NOTE 3: Pulse-testing techniques 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 0.1-μF capacitor across the input and a 10-μF tantalum capacitor on the output, with equivalent series resistance within the guidelines shown in Figure 3.

## electrical characteristics, $V_I$ = 14 V, $I_O$ = 300 mA, $\overline{\text{ENABLE}}$ at 0 V for TL751M08, $T_J$ = 25°C (unless otherwise noted) (see Note 3)

| PARAMETER | TEST CONDITIONS | | TL750M08C TL751M08C | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage | | | 7.92 | 8 | 8.08 | V |
| | $T_J$ = 0°C to 125°C | | 7.84 | | 8.16 | |
| Input voltage regulation | $V_I$ = 10 V to 17 V, | $I_O$ = 250 mA | | 12 | 40 | mV |
| | $V_I$ = 9 V to 26 V, | $I_O$ = 250 mA | | 15 | 68 | |
| Ripple rejection | $V_I$ = 11 V to 21 V, | f = 120 Hz | 50 | 55 | | dB |
| Output voltage regulation | $I_O$ = 5 mA to 750 mA | | | 24 | 80 | mV |
| Dropout voltage | $I_O$ = 500 mA | | | | 0.5 | V |
| | $I_O$ = 750 mA | | | | 0.6 | |
| Output noise voltage | f = 10 Hz to 100 kHz | | | 500 | | μV |
| Bias current | $I_O$ = 750 mA | | | 60 | 75 | mA |
| | $I_O$ = 10 mA | | | | 5 | |
| Bias current (TL751Mxx only) | $\overline{\text{ENABLE}}$ $V_{IH} \geq$ 2 V | | | | 200 | μA |

NOTE 3: Pulse-testing techniques 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 0.1-μF capacitor across the input and a 10-μF tantalum capacitor on the output, with equivalent series resistance within the guidelines shown in Figure 3.

### electrical characteristics, $V_I$ = 14 V, $I_O$ = 300 mA, $\overline{\text{ENABLE}}$ at 0 V for TL751M10, $T_J$ = 25°C (unless otherwise noted) (see Note 3)

| PARAMETER | TEST CONDITIONS | | TL750M10C TL751M10C | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage | | | 9.9 | 10 | 10.1 | V |
| | $T_J$ = 0°C to 125°C | | 9.8 | | 10.2 | |
| Input voltage regulation | $V_I$ = 12 V to 18 V, | $I_O$ = 250 mA | | 15 | 43 | mV |
| | $V_I$ = 11 V to 26 V, | $I_O$ = 250 mA | | 20 | 75 | |
| Ripple rejection | $V_I$ = 13 V to 23 V, | f = 120 Hz | 50 | 55 | | dB |
| Output voltage regulation | $I_O$ = 5 mA to 750 mA | | | 30 | 100 | mV |
| Dropout voltage | $I_O$ = 500 mA | | | | 0.5 | V |
| | $I_O$ = 750 mA | | | | 0.6 | |
| Output noise voltage | f = 10 Hz to 100 kHz | | | 1000 | | μV |
| Bias current | $I_O$ = 750 mA | | | 60 | 75 | mA |
| | $I_O$ = 10 mA | | | | 5 | |
| Bias current (TL751Mxx only) | $\overline{\text{ENABLE}}$ $V_{IH} \geq$ 2 V | | | | 200 | μA |

NOTE 3: Pulse-testing techniques 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 0.1-μF capacitor across the input and a 10-μF tantalum capacitor on the output, with equivalent series resistance within the guidelines shown in Figure 3.

### electrical characteristics, $V_I$ = 14 V, $I_O$ = 300 mA, $\overline{\text{ENABLE}}$ at 0 V for TL751M12, $T_J$ = 25°C (unless otherwise noted) (see Note 3)

| PARAMETER | TEST CONDITIONS | | TL750M12C TL751M12C | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage | | | 11.88 | 12 | 12.12 | V |
| | $T_J$ = 0°C to 125°C | | 11.76 | | 12.24 | |
| Input voltage regulation | $V_I$ = 14 V to 19 V, | $I_O$ = 250 mA | | 15 | 43 | mV |
| | $V_I$ = 13 V to 26 V, | $I_O$ = 250 mA | | 20 | 78 | |
| Ripple rejection | $V_I$ = 13 V to 23 V, | f = 120 Hz | 50 | 55 | | dB |
| Output voltage regulation | $I_O$ = 5 mA to 750 mA | | | 30 | 120 | mV |
| Dropout voltage | $I_O$ = 500 mA | | | | 0.5 | V |
| | $I_O$ = 750 mA | | | | 0.6 | |
| Output noise voltage | f = 10 Hz to 100 kHz | | | 1000 | | μV |
| Bias current | $I_O$ = 750 mA | | | 60 | 75 | mA |
| | $I_O$ = 10 mA | | | | 5 | |
| Bias current (TL751Mxx only) | $\overline{\text{ENABLE}}$ $V_{IH} \geq$ 2 V | | | | 200 | μA |

NOTE 3: Pulse-testing techniques 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 0.1-μF capacitor across the input and a 10-μF tantalum capacitor on the output, with equivalent series resistance within the guidelines shown in Figure 3.

### electrical characteristics, $V_I$ = 14 V, $I_O$ = 300 mA, $\overline{\text{ENABLE}}$ at 0 V, $T_J$ = 25°C (unless otherwise noted) (see Note 3)

| PARAMETER | TEST CONDITIONS | | TL750M05Y | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage | | | | 5 | | V |
| Input voltage regulation | $V_I$ = 9 V to 16 V, | $I_O$ = 250 mA | | 10 | | mV |
| | $V_I$ = 6 V to 26 V, | $I_O$ = 250 mA | | 12 | | |
| Ripple rejection | $V_I$ = 8 V to 18 V, | f = 120 Hz | | 55 | | dB |
| Output voltage regulation | $I_O$ = 5 mA to 750 mA | | | 20 | | mV |
| Output noise voltage | f = 10 Hz to 100 kHz | | | 500 | | μV |
| Bias current | $I_O$ = 750 mA | | | 60 | | mA |

NOTE 3: Pulse-testing techniques 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 0.1-μF capacitor across the input and a 10-μF tantalum capacitor on the output, with equivalent series resistance within the guidelines shown in Figure 3.

### electrical characteristics, $V_I$ = 14 V, $I_O$ = 300 mA, $\overline{\text{ENABLE}}$ at 0 V, $T_J$ = 25°C (unless otherwise noted) (see Note 3)

| PARAMETER | TEST CONDITIONS | | TL750M08Y | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage | | | | 8 | | V |
| Input voltage regulation | $V_I$ = 10 V to 17 V, | $I_O$ = 250 mA | | 12 | | mV |
| | $V_I$ = 9 V to 26 V, | $I_O$ = 250 mA | | 15 | | |
| Ripple rejection | $V_I$ = 11 V to 21 V, | f = 120 Hz | | 55 | | dB |
| Output voltage regulation | $I_O$ = 5 mA to 750 mA | | | 24 | | mV |
| Output noise voltage | f = 10 Hz to 100 kHz | | | 500 | | μV |
| Bias current | $I_O$ = 750 mA | | | 60 | | mA |

NOTE 3: Pulse-testing techniques 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 0.1-μF capacitor across the input and a 10-μF tantalum capacitor on the output, with equivalent series resistance within the guidelines shown in Figure 3.

### electrical characteristics, $V_I$ = 14 V, $I_O$ = 300 mA, $\overline{\text{ENABLE}}$ at 0 V, $T_J$ = 25°C (unless otherwise noted) (see Note 3)

| PARAMETER | TEST CONDITIONS | | TL750M10Y | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage | | | | 10 | | V |
| Input voltage regulation | $V_I$ = 12 V to 18 V, | $I_O$ = 250 mA | | 15 | | mV |
| | $V_I$ = 11 V to 26 V, | $I_O$ = 250 mA | | 20 | | |
| Ripple rejection | $V_I$ = 13 V to 23 V, | f = 120 Hz | | 55 | | dB |
| Output voltage regulation | $I_O$ = 5 mA to 750 mA | | | 30 | | mV |
| Output noise voltage | f = 10 Hz to 100 kHz | | | 1000 | | μV |
| Bias current | $I_O$ = 750 mA | | | 60 | | mA |

NOTE 3: Pulse-testing techniques 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 0.1-μF capacitor across the input and a 10-μF tantalum capacitor on the output, with equivalent series resistance within the guidelines shown in Figure 3.

**TL751M12Y electrical characteristics, $V_I$ = 14 V, $I_O$ = 300 mA, $\overline{\text{ENABLE}}$ at 0 V, $T_J$ = 25°C (unless otherwise noted) (see Note 3)**

| PARAMETER | TEST CONDITIONS | | TL750M12Y | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage | | | | 12 | | V |
| Input voltage regulation | $V_I$ = 14 V to 19 V, | $I_O$ = 250 mA | | 15 | | mV |
| | $V_I$ = 13 V to 26 V, | $I_O$ = 250 mA | | 20 | | |
| Ripple rejection | $V_I$ = 13 V to 23 V, | f = 120 Hz | | 55 | | dB |
| Output voltage regulation | $I_O$ = 5 mA to 750 mA | | | 30 | | mV |
| Output noise voltage | f = 10 Hz to 100 kHz | | | 1000 | | μV |
| Bias current | $I_O$ = 750 mA | | | 60 | | mA |

NOTE 3: Pulse-testing techniques 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 0.1-μF capacitor across the input and a 10-μF tantalum capacitor on the output, with equivalent series resistance within the guidelines shown in Figure 3.

## PARAMETER MEASUREMENT INFORMATION

The TL751Mxx is a low-dropout regulator. This means that the capacitance loading is important to the performance of the regulator because it is a vital part of the control loop. The capacitor value and the equivalent series resistance (ESR) both affect the control loop and must be defined for the load range and the temperature range. Figures 1 and 2 can establish the capacitance value and ESR range for the best regulator performance.

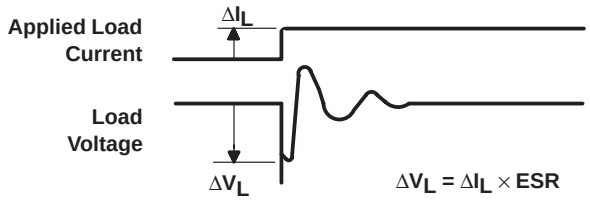
Figure 1 shows the recommended range of ESR for a given load with a 10-μF capacitor on the output. This figure also shows a maximum ESR limit of 2 Ω and a load-dependent minimum ESR limit.

For applications with varying loads, the lightest load condition should be chosen because it is the worst case. Figure 2 shows the relationship of the reciprocal of ESR to the square root of the capacitance with a minimum capacitance limit of 10 μF and a maximum ESR limit of 2 Ω. This figure establishes the amount that the minimum ESR limit shown in Figure 1 can be adjusted for different capacitor values. For example, where the minimum load needed is 200 mA, Figure 2 suggests an ESR range of 0.8 Ω to 2 Ω for 10 μF. Figure 2 shows that changing the capacitor from 10 μF to 400 μF can change the ESR minimum by greater than 3/0.5 (or 6). Therefore, the new minimum ESR value is 0.8/6 (or 0.13 Ω). This allows an ESR range of 0.13 Ω to 2 Ω, achieving an expanded ESR range by using a larger capacitor at the output. For better stability in low-current applications, a small resistance placed in series with the capacitor (see Table 1) is recommended, so that ESRs better approximate those shown in Figures 1 and 2.

## PARAMETER MEASUREMENT INFORMATION

**Table 1. Compensation for Increased Stability at Low Currents**

| MANUFACTURER | CAPACITANCE | ESR TYP | PART NUMBER | ADDITIONAL RESISTANCE |
|---|---|---|---|---|
| AVX | 15 μF | 0.9 Ω | TAJB156M010S | 1 Ω |
| KEMET | 33 μF | 0.6 Ω | T491D336M010AS | 0.5 Ω |



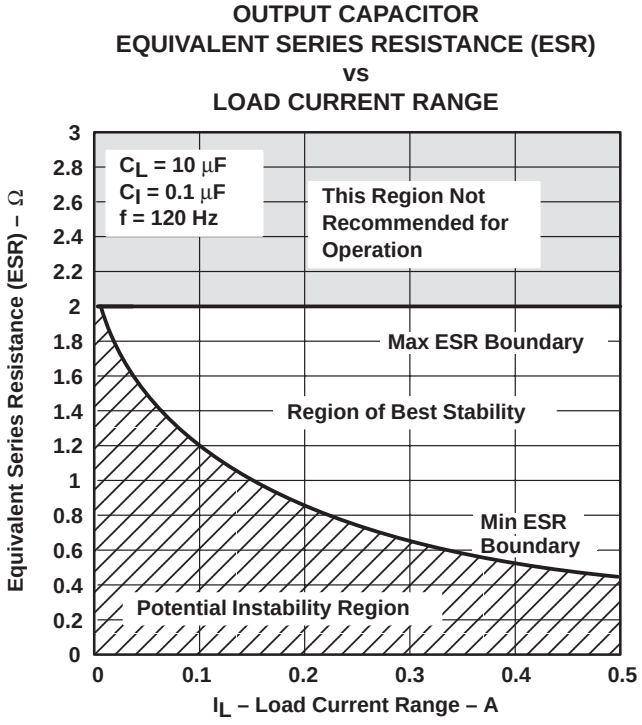




**Figure 1**

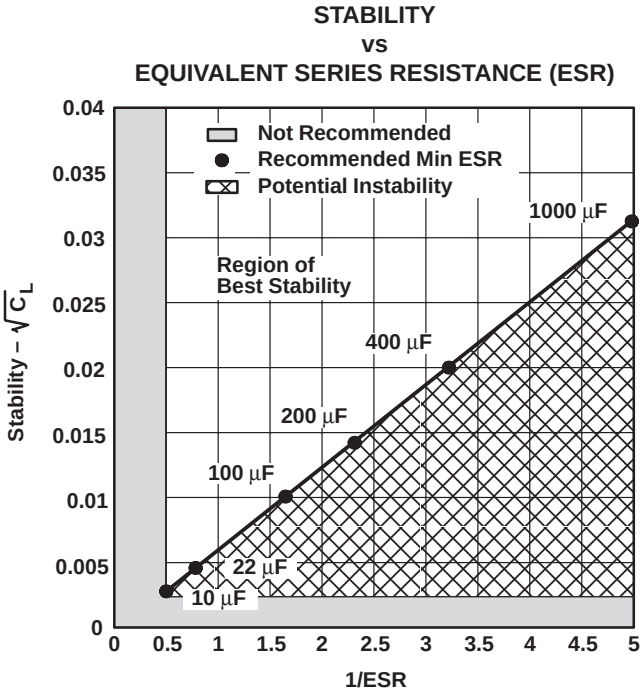



**Figure 2**

## TYPICAL CHARACTERISTICS

### Table of Graphs


| | | FIGURE |
|---|---|---|
| Transient input voltage vs Time | | 3 |
| Output voltage vs Input voltage | | 4 |
| Input current vs Input voltage | $I_O$ = 10 mA | 5 |
| | $I_O$ = 100 mA | 6 |
| Dropout voltage vs Output current | | 7 |
| Quiescent current vs Output current | | 8 |
| Load transient response | | 9 |
| Line transient response | | 10 |


**TRANSIENT INPUT VOLTAGE vs TIME**

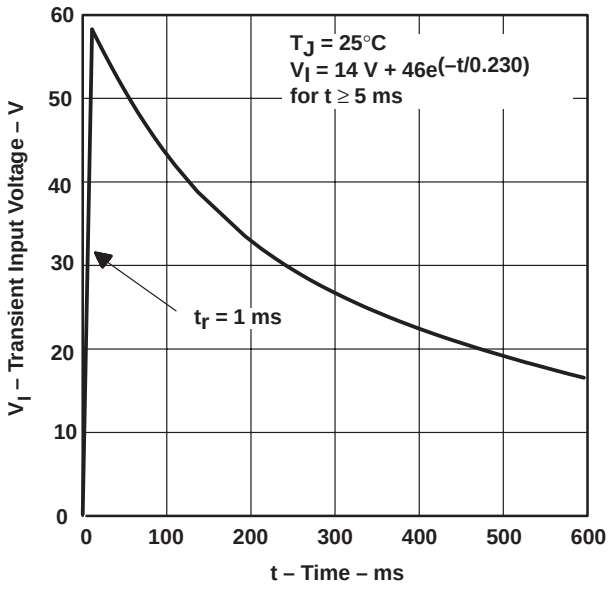



Figure 3

**OUTPUT VOLTAGE vs INPUT VOLTAGE**

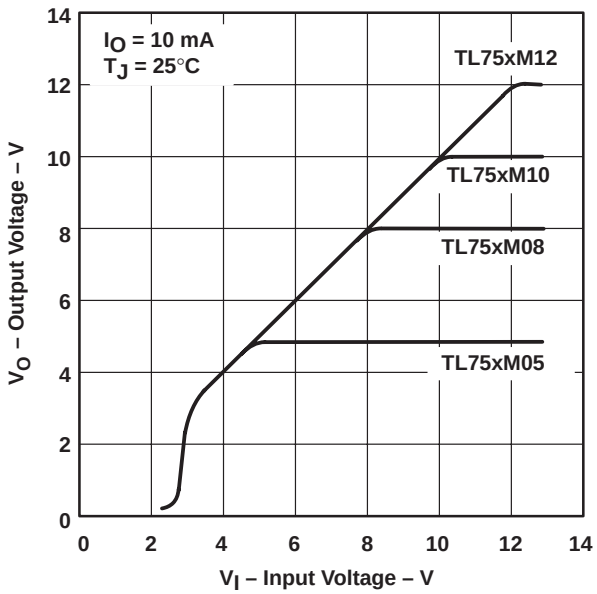



Figure 4

## TYPICAL CHARACTERISTICS

**INPUT CURRENT vs INPUT VOLTAGE**

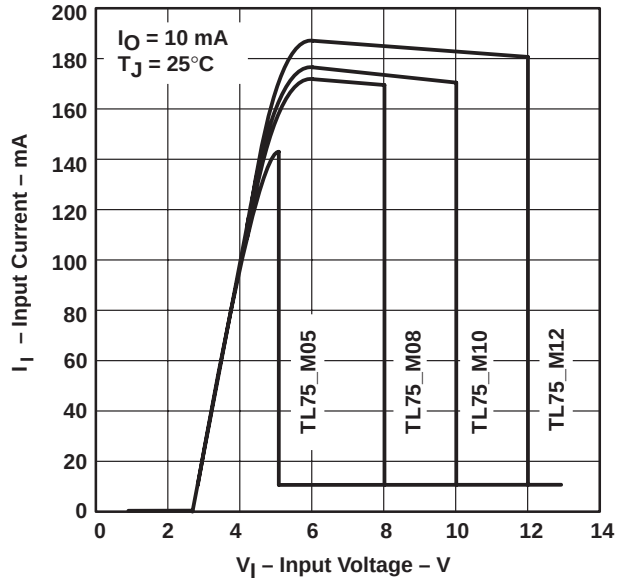



Figure 5

**INPUT CURRENT vs INPUT VOLTAGE**

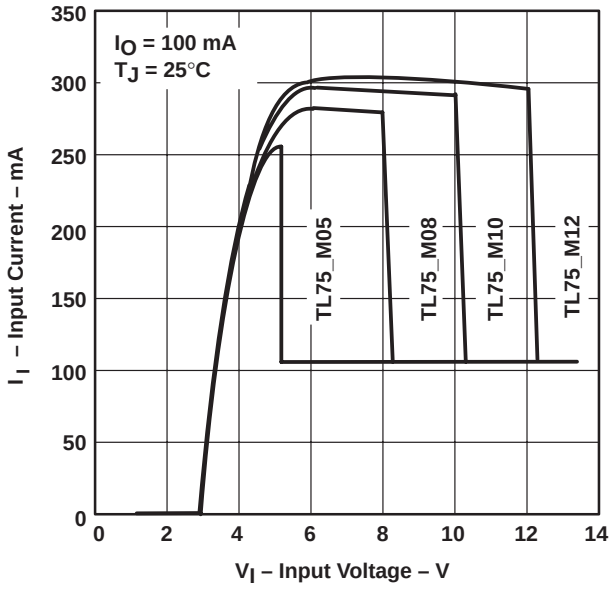



Figure 6

**DROPOUT VOLTAGE vs OUTPUT CURRENT**

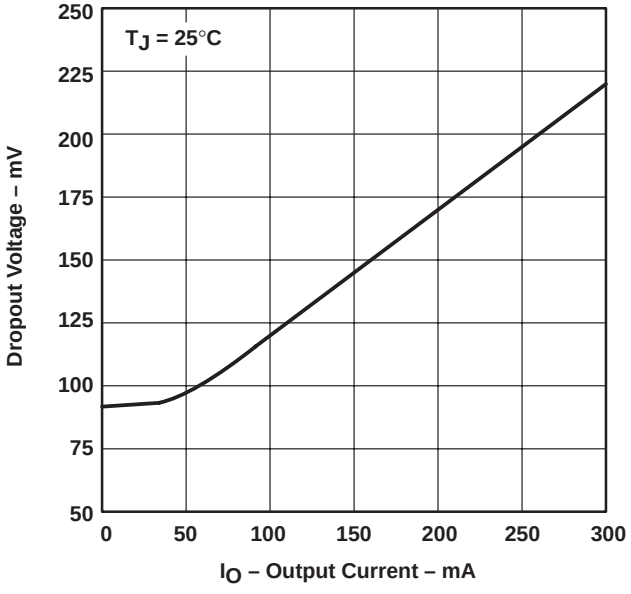



Figure 7

**QUIESCENT CURRENT vs OUTPUT CURRENT**

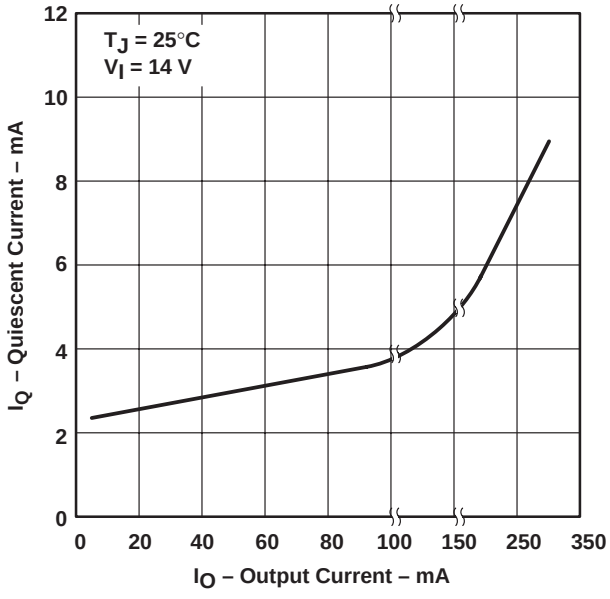



Figure 8

## TYPICAL CHARACTERISTICS

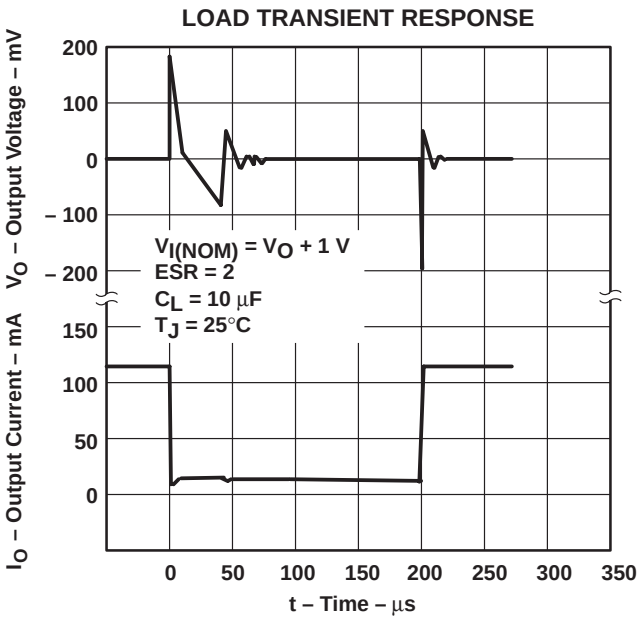



Figure 9

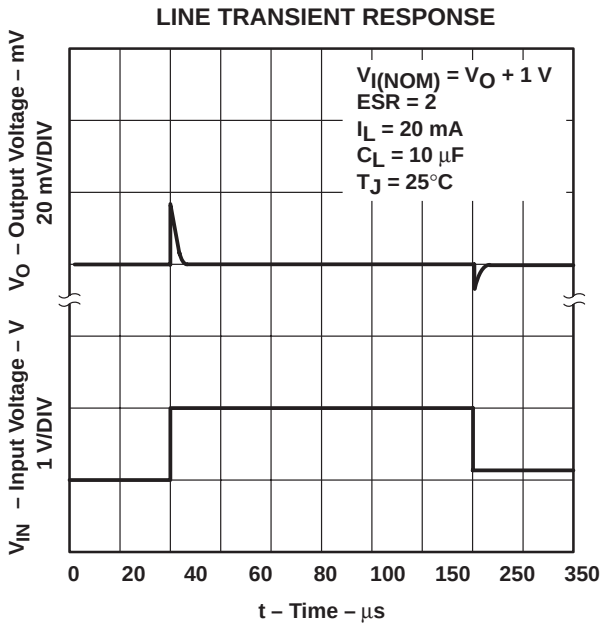



Figure 10

## PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) |
|---|---|---|---|---|---|---|---|---|
| TL750M05CKC | ACTIVE | TO-220 | KC | 3 | 50 | TBD | Call TI | Level-1-220C-UNLIM |
| TL750M05CKTER | ACTIVE | PFM | KTE | 3 | 2000 | TBD | Call TI | Level-1-220C-UNLIM |
| TL750M05CKTPR | ACTIVE | PFM | KTP | 2 | 3000 | TBD | CU SNPB | Level-1-220C-UNLIM |
| TL750M10CKC | PREVIEW | TO-220 | KC | 3 | 50 | TBD | Call TI | Call TI |
| TL750M12CKC | PREVIEW | TO-220 | KC | 3 | 50 | TBD | Call TI | Call TI |
| TL751M05CKTGR | PREVIEW | PFM | KTG | 5 | 2000 | TBD | Call TI | Level-1-220C-UNLIM |

(1) The marketing status values are defined as follows:
**ACTIVE:** Product device recommended for new designs.
**LIFEBUY:** TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
**NRND:** Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
**PREVIEW:** Device has been announced but is not in production. Samples may or may not be available.
**OBSOLETE:** TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
**TBD:** The Pb-Free/Green conversion plan has not been defined.
**Pb-Free (RoHS):** TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
**Green (RoHS & no Sb/Br):** TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

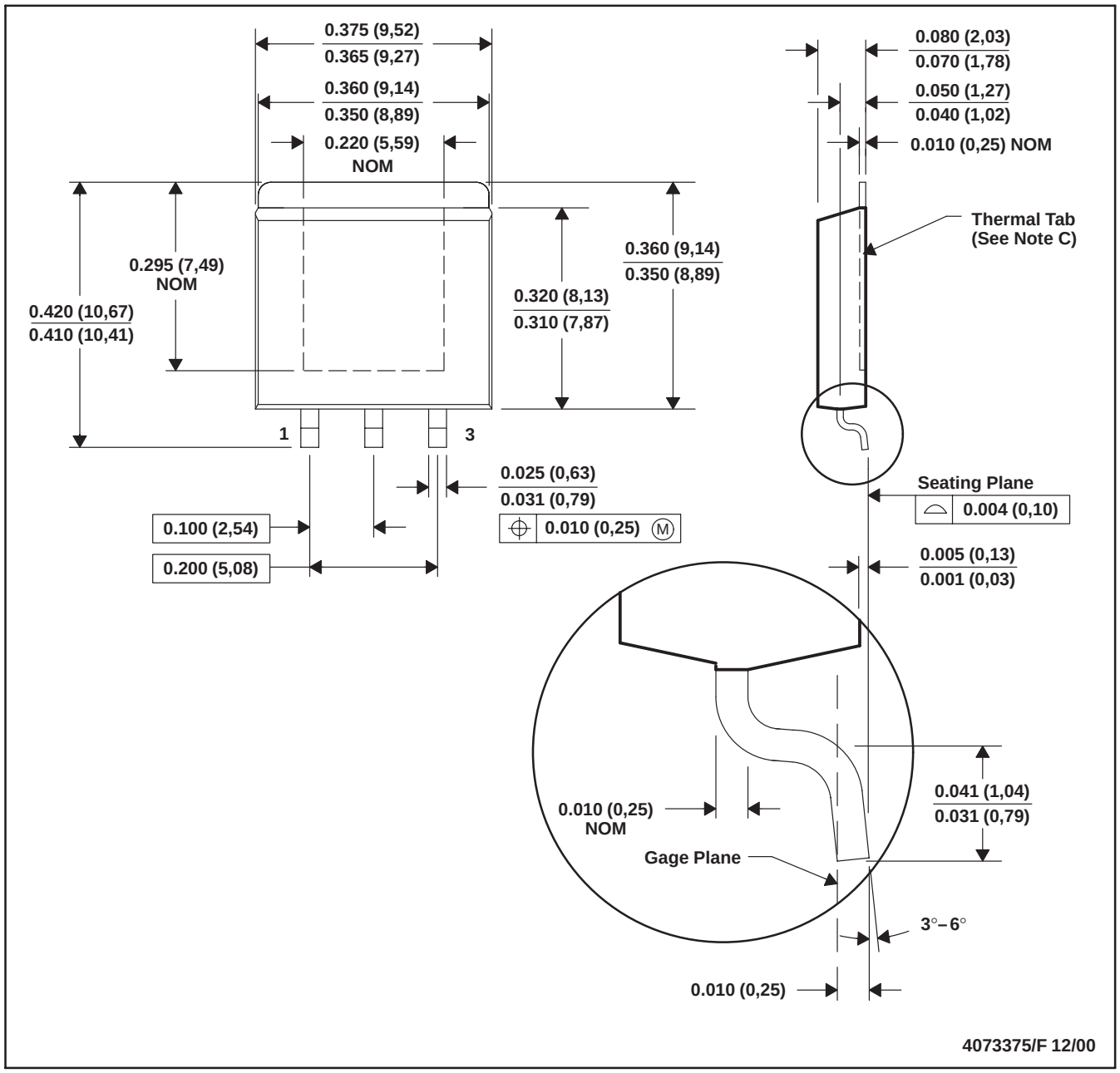
(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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MPFM001E – OCTOBER 1994 – REVISED JANUARY 2001

**KTE (R-PSFM-G3)** **PowerFLEX™ PLASTIC FLANGE-MOUNT**

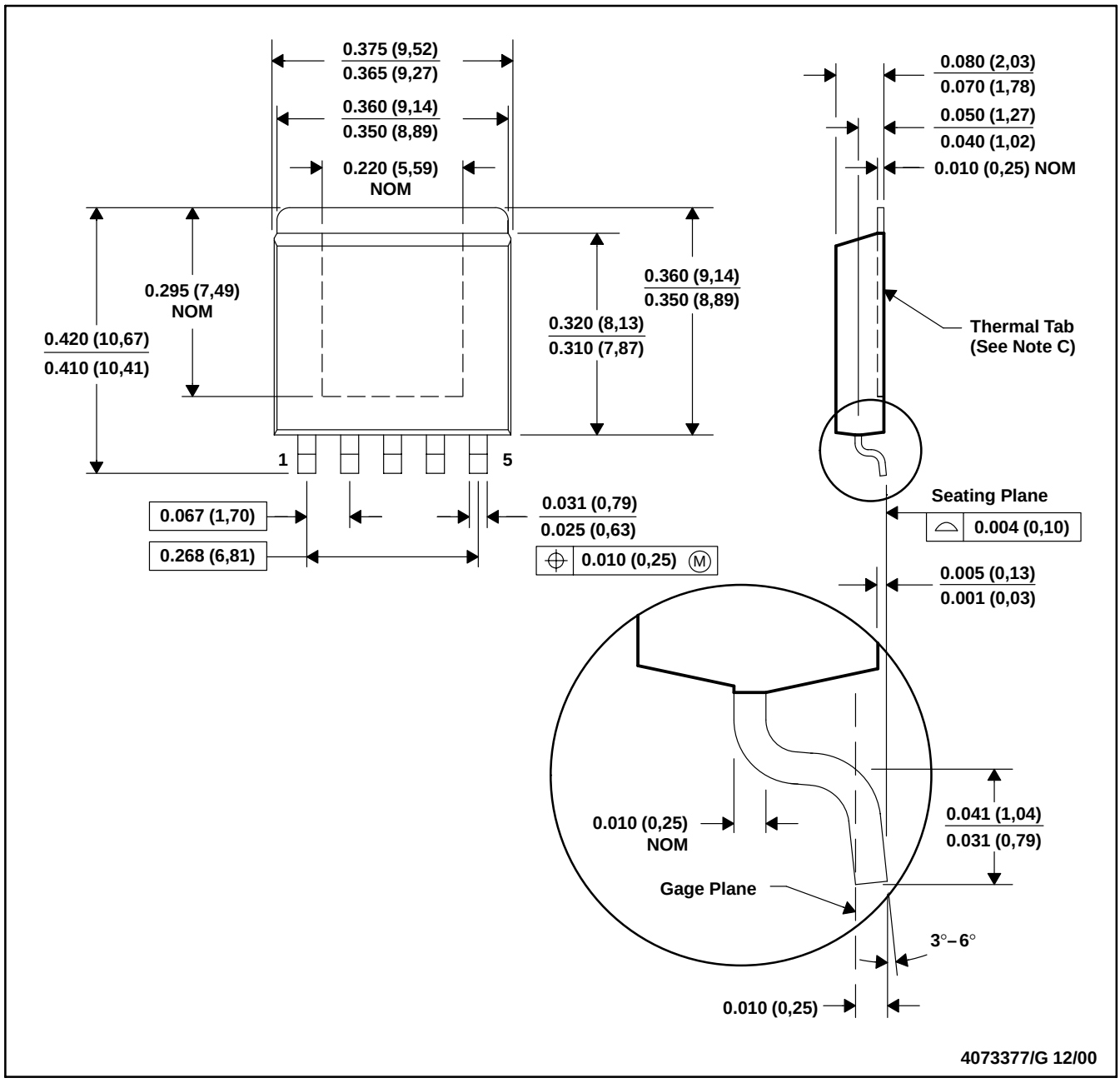



NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. The center lead is in electrical contact with the thermal tab.
D. Dimensions do not include mold protrusions, not to exceed 0.006 (0,15).
E. Falls within JEDEC MO-169

PowerFLEX is a trademark of Texas Instruments.

MPFM003F – OCTOBER 1994 – REVISED MARCH 2002

**KTG (R-PSFM-G5)** **PowerFLEX™ PLASTIC FLANGE-MOUNT PACKAGE**

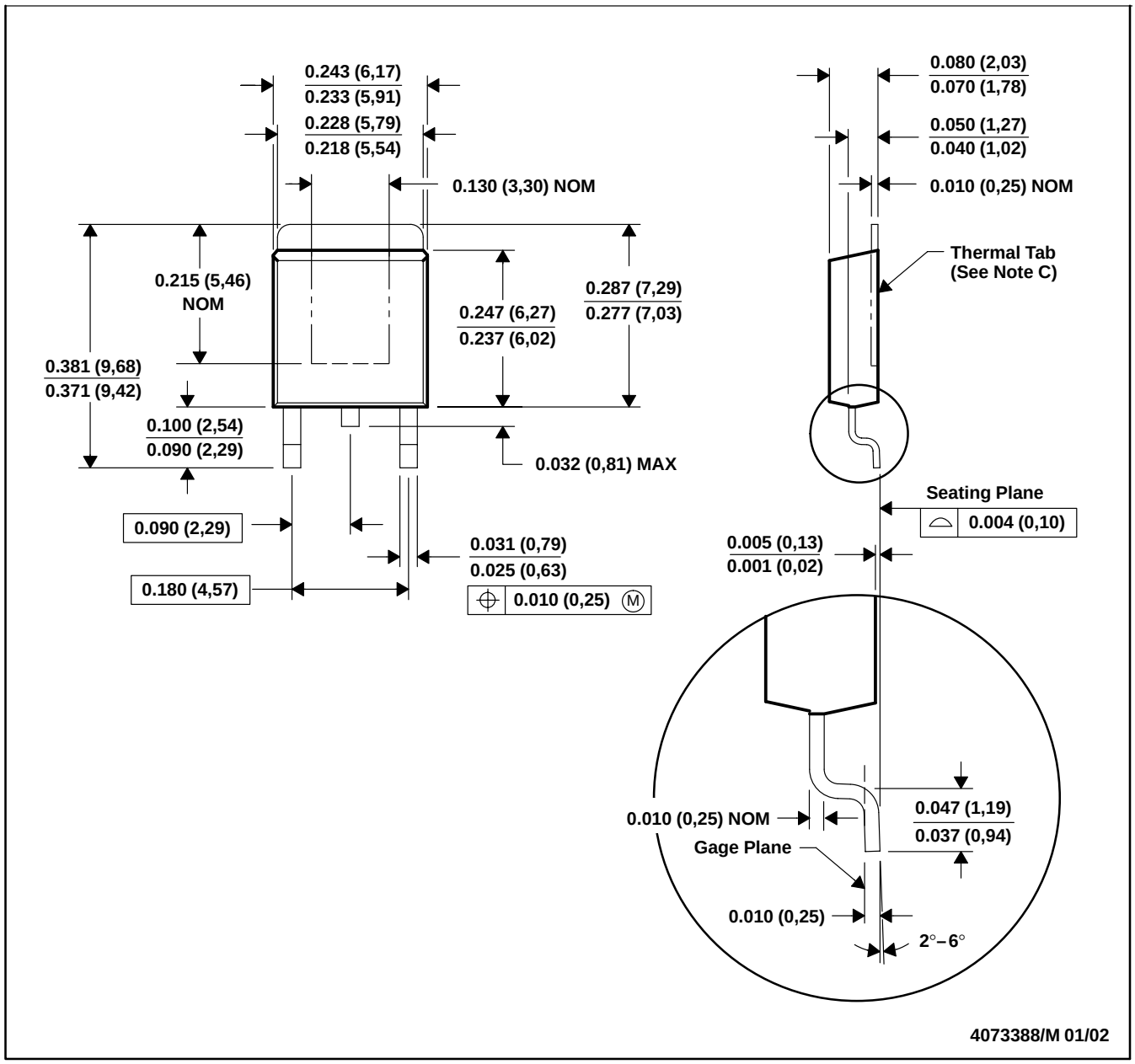



NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. The center lead is in electrical contact with the thermal tab.
D. Dimensions do not include mold protrusions, not to exceed 0.006 (0,15).
E. FAlls within JEDEC MO–169

PowerFLEX is a trademark of Texas Instruments.

MPSF001F – JANUARY 1996 – REVISED JANUARY 2002

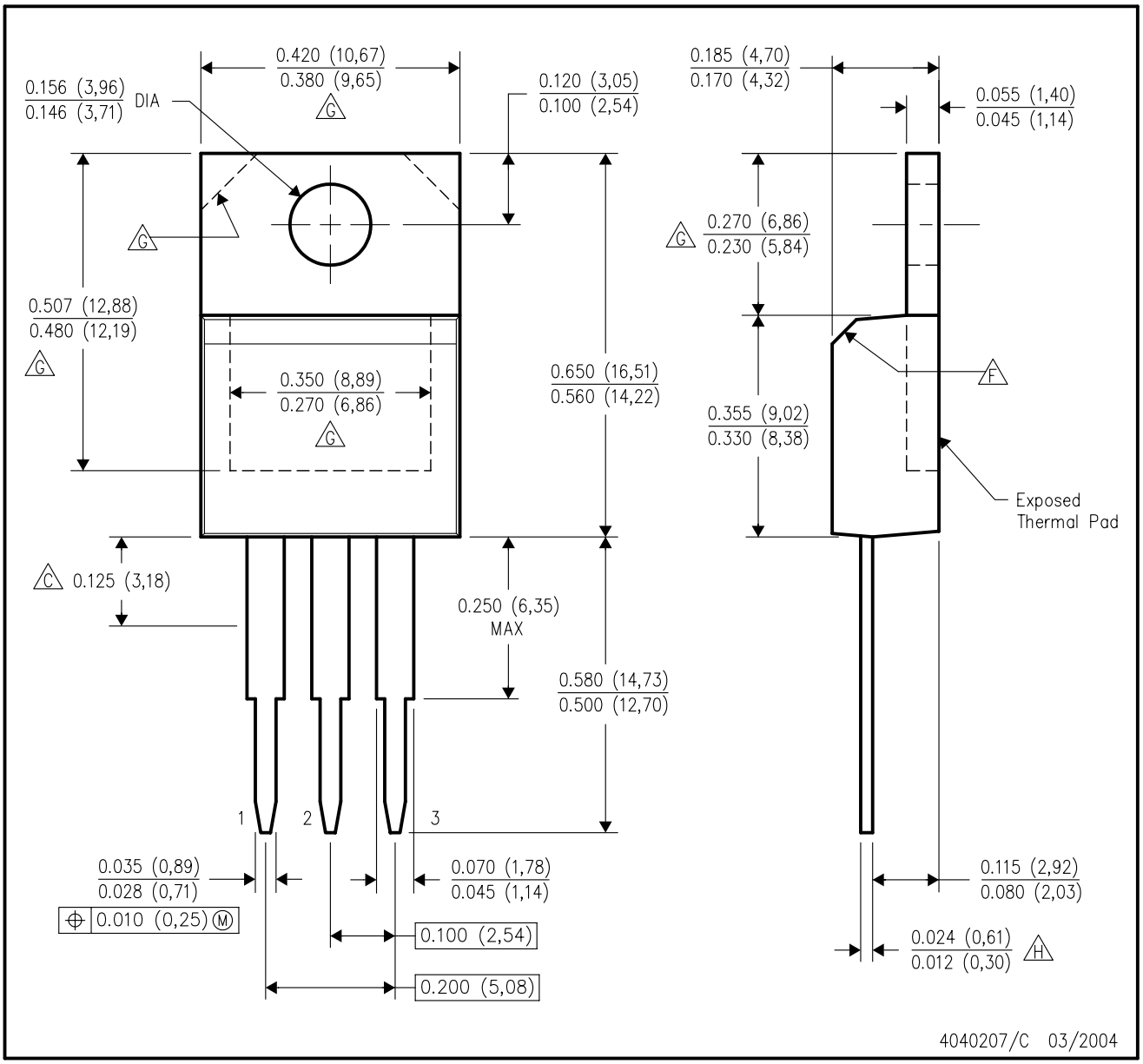
**KTP (R-PSFM-G2)** **PowerFLEX™ PLASTIC FLANGE-MOUNT PACKAGE**




NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. The center lead is in electrical contact with the thermal tab.
D. Dimensions do not include mold protrusions, not to exceed 0.006 (0,15).
E. Falls within JEDEC TO-252 variation AC.

PowerFLEX is a trademark of Texas Instruments.

## KC (R–PSFM–T3) PLASTIC FLANGE–MOUNT PACKAGE




NOTES:
- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. Lead dimensions are not controlled within this area.
- D. All lead dimensions apply before solder dip.
- E. The center lead is in electrical contact with the mounting tab.
- F. The chamfer is optional.
- G. Thermal pad contour optional within these dimensions.
- H. Falls within JEDEC TO–220 variation AB, except minimum lead thickness.

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