

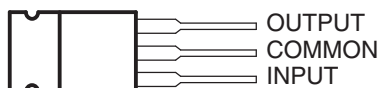
LOW-DROPOUT VOLTAGE REGULATORS

Check for Samples: [TL750M SERIES](#)

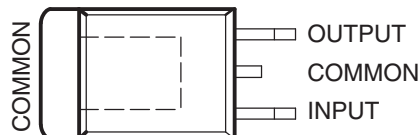
FEATURES

- Low Dropout Voltage, Less Than 0.6 V at 750 mA
- Low Quiescent Current
- 60-V Load-Dump Protection
- Overvoltage Protection
- Internal Thermal-Overload Protection
- Internal Overcurrent-Limiting Circuitry

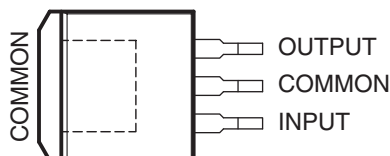
KCS PACKAGE⁽¹⁾
(TOP VIEW)



KVU PACKAGE⁽¹⁾
(TOP VIEW)



KTT PACKAGE⁽¹⁾
(TOP VIEW)



(1) The common terminal is in electrical contact with the mounting base.

DESCRIPTION/ORDERING INFORMATION

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

The TL750M offers 5-V, 8-V, 10-V, and 12-V options. The devices are characterized for operation over the virtual junction temperature range 0°C to 125°C.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of the Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

Copyright © 1988–2010, Texas Instruments Incorporated



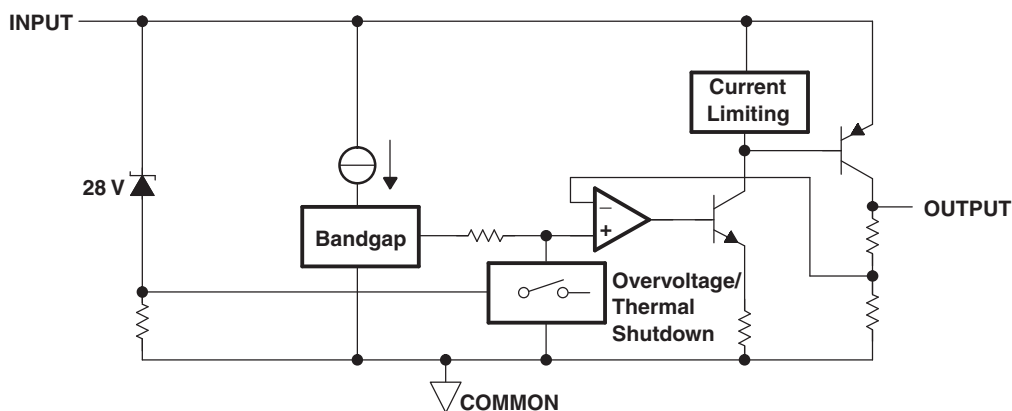
These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

ORDERING INFORMATION⁽¹⁾

| T_J | V_O TYP | PACKAGE ⁽²⁾ | | ORDERABLE PART NUMBER | TOP-SIDE MARKING |
|--------------|-----------|------------------------|--------------|--------------------------|------------------|
| 0°C to 125°C | 5 V | PowerFLEX™ – KVVU | Reel of 3000 | TL750M05CKVUR | 750M05C |
| | | TO-220 – KCS | Tube of 50 | TL750M05CKCS | TL750M05C |
| | | TO-263 – KTT | Reel of 500 | TL750M05CKTTR | TL750M05C |
| | 8 V | TO-220 – KCS | Tube of 50 | TL750M08CKCS | TL750M08C |
| | | PowerFLEX – KVVU | Reel of 3000 | TL750M08CKVUR | 750M08C |
| | 10 V | TO-220 – KCS | Tube of 50 | TL750M10CKCS | TL750M10C |
| | | PowerFLEX – KVVU | Reel of 3000 | TL750M10CKVUR | 750M10C |
| | 12 V | TO-220 – KCS | Tube of 50 | TL750M12CKCS | TL750M12C |
| | | PowerFLEX – KVVU | Reel of 3000 | TL750M12CKVUR | 750M12C |

- (1) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI web site at www.ti.com.
- (2) Package drawings, thermal data, and symbolization are available at www.ti.com/packaging.

FUNCTIONAL BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS⁽¹⁾

over virtual junction temperature range (unless otherwise noted)

| | | MIN | MAX | UNIT |
|---------------|---|-------------|------|------|
| | 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 |
| θ_{JA} | Package thermal impedance ^{(2) (3)} | KCS package | 22 | °C/W |
| | | KTT package | 25.3 | |
| | | KVU package | 28 | |
| T_J | Virtual-junction temperature range | 0 | 150 | °C |
| T_{stg} | Storage temperature range | –65 | 150 | °C |

- (1) 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.
- (2) Maximum power dissipation is a function of $T_J(\text{max})$, θ_{JA} , and T_A . The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(\text{max}) - T_A)/\theta_{JA}$. Operating at the absolute maximum T_J of 150°C can affect 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.
- (3) The package thermal impedance is calculated in accordance with JESD 51.

THERMAL INFORMATION

| THERMAL METRIC ⁽¹⁾⁽²⁾ | | TL750M | | | UNITS |
|----------------------------------|--|--------------|--------------|--------------|-------|
| | | KCS (3 PINS) | KVU (3 PINS) | KTT (3 PINS) | |
| θ_{JA} | Junction-to-ambient thermal resistance | 28.7 | 50.9 | 27.5 | °C/W |
| θ_{JCTop} | Junction-to-case (top) thermal resistance | 59.8 | 57.9 | 43.2 | |
| θ_{JB} | Junction-to-board thermal resistance | 0.5 | 34.8 | 17.3 | |
| ψ_{JT} | Junction-to-top characterization parameter | 5.3 | 6 | 2.8 | |
| ψ_{JB} | Junction-to-board characterization parameter | 0.4 | 23.7 | 9.3 | |
| θ_{JCbott} | Junction-to-case (bottom) thermal resistance | 0.1 | 0.4 | 0.3 | |

- (1) For more information about traditional and new thermal metrics, see the *IC Package Thermal Metrics* application report, [SPRA953](#).
- (2) For thermal estimates of this device based on PCB copper area, see the [TI PCB Thermal Calculator](#).

RECOMMENDED OPERATING CONDITIONS

| | | MIN | MAX | UNIT |
|-------|--|----------|-----|------|
| V_I | Input voltage | TL750M05 | 6 | 26 |
| | | TL750M08 | 9 | 26 |
| | | TL750M10 | 11 | 26 |
| | | TL750M12 | 13 | 26 |
| I_O | Output current | | 750 | mA |
| T_J | Operating virtual-junction temperature | 0 | 125 | °C |

TL750M05 ELECTRICAL CHARACTERISTICS⁽¹⁾ $V_I = 14\text{ V}$, $I_O = 300\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | TL750M05 | | | UNIT |
|---------------------------|--|----------|-----|------|---------------|
| | | MIN | TYP | MAX | |
| Output voltage | | 4.95 | 5 | 5.05 | V |
| | $T_J = 0^\circ\text{C to } 125^\circ\text{C}$ | 4.9 | | 5.1 | |
| Input voltage regulation | $V_I = 9\text{ V to } 16\text{ V}$, $I_O = 250\text{ mA}$ | | 10 | 25 | mV |
| | $V_I = 6\text{ V to } 26\text{ V}$, $I_O = 250\text{ mA}$ | | 12 | 50 | |
| Ripple rejection | $V_I = 8\text{ V to } 18\text{ V}$, $f = 120\text{ Hz}$ | 50 | 55 | | dB |
| Output regulation voltage | $I_O = 5\text{ mA to } 750\text{ mA}$ | | 20 | 50 | mV |
| Dropout voltage | $I_O = 500\text{ mA}$ | | | 0.5 | V |
| | $I_O = 750\text{ mA}$ | | | 0.6 | |
| Output noise voltage | $f = 10\text{ Hz to } 100\text{ kHz}$ | | 500 | | μV |
| Bias current | $I_O = 750\text{ mA}$ | | 60 | 75 | mA |
| | $I_O = 10\text{ mA}$ | | | 5 | |

(1) 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 $0.1\text{-}\mu\text{F}$ capacitor across the input and a $10\text{-}\mu\text{F}$ tantalum capacitor on the output, with equivalent series resistance within the guidelines shown in [Figure 1](#).

TL750M08 ELECTRICAL CHARACTERISTICS⁽¹⁾ $V_I = 14\text{ V}$, $I_O = 300\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | TL750M08 | | | UNIT |
|---------------------------|---|----------|-----|------|---------------|
| | | MIN | TYP | MAX | |
| Output voltage | | 7.92 | 8 | 8.08 | V |
| | $T_J = 0^\circ\text{C to } 125^\circ\text{C}$ | 7.84 | | 8.16 | |
| Input voltage regulation | $V_I = 10\text{ V to } 17\text{ V}$, $I_O = 250\text{ mA}$ | | 12 | 40 | mV |
| | $V_I = 9\text{ V to } 26\text{ V}$, $I_O = 250\text{ mA}$ | | 15 | 68 | |
| Ripple rejection | $V_I = 11\text{ V to } 21\text{ V}$, $f = 120\text{ Hz}$ | 50 | 55 | | dB |
| Output regulation voltage | $I_O = 5\text{ mA to } 750\text{ mA}$ | | 24 | 80 | mV |
| Dropout voltage | $I_O = 500\text{ mA}$ | | | 0.5 | V |
| | $I_O = 750\text{ mA}$ | | | 0.6 | |
| Output noise voltage | $f = 10\text{ Hz to } 100\text{ kHz}$ | | 500 | | μV |
| Bias current | $I_O = 750\text{ mA}$ | | 60 | 75 | mA |
| | $I_O = 10\text{ mA}$ | | | 5 | |

(1) 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 $0.1\text{-}\mu\text{F}$ capacitor across the input and a $10\text{-}\mu\text{F}$ tantalum capacitor on the output, with equivalent series resistance within the guidelines shown in [Figure 1](#).

TL750M10 ELECTRICAL CHARACTERISTICS⁽¹⁾

 $V_I = 14\text{ V}$, $I_O = 300\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | TL750M10 | | | UNIT |
|---------------------------|---|----------|------|------|---------------|
| | | MIN | TYP | MAX | |
| Output voltage | | 9.9 | 10 | 10.1 | V |
| | $T_J = 0^\circ\text{C to } 125^\circ\text{C}$ | 9.8 | | 10.2 | |
| Input voltage regulation | $V_I = 12\text{ V to } 18\text{ V}$, $I_O = 250\text{ mA}$ | | 15 | 43 | mV |
| | $V_I = 11\text{ V to } 26\text{ V}$, $I_O = 250\text{ mA}$ | | 20 | 75 | |
| Ripple rejection | $V_I = 13\text{ V to } 23\text{ V}$, $f = 120\text{ Hz}$ | 50 | 55 | | dB |
| Output regulation voltage | $I_O = 5\text{ mA to } 750\text{ mA}$ | | 30 | 100 | mV |
| Dropout voltage | $I_O = 500\text{ mA}$ | | | 0.5 | V |
| | $I_O = 750\text{ mA}$ | | | 0.6 | |
| Output noise voltage | $f = 10\text{ Hz to } 100\text{ kHz}$ | | 1000 | | μV |
| Bias current | $I_O = 750\text{ mA}$ | | 60 | 75 | mA |
| | $I_O = 10\text{ mA}$ | | | 5 | |

(1) 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 1](#).

TL750M12 ELECTRICAL CHARACTERISTICS⁽¹⁾

 $V_I = 14\text{ V}$, $I_O = 300\text{ mA}$, $T_J = 25^\circ\text{C}$ (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | TL750M12 | | | UNIT |
|---------------------------|---|----------|------|-------|---------------|
| | | MIN | TYP | MAX | |
| Output voltage | | 11.88 | 12 | 12.12 | V |
| | $T_J = 0^\circ\text{C to } 125^\circ\text{C}$ | 11.76 | | 12.24 | |
| Input voltage regulation | $V_I = 14\text{ V to } 19\text{ V}$, $I_O = 250\text{ mA}$ | | 15 | 43 | mV |
| | $V_I = 13\text{ V to } 26\text{ V}$, $I_O = 250\text{ mA}$ | | 20 | 78 | |
| Ripple rejection | $V_I = 13\text{ V to } 23\text{ V}$, $f = 120\text{ Hz}$ | 50 | 55 | | dB |
| Output regulation voltage | $I_O = 5\text{ mA to } 750\text{ mA}$ | | 30 | 120 | mV |
| Dropout voltage | $I_O = 500\text{ mA}$ | | | 0.5 | V |
| | $I_O = 750\text{ mA}$ | | | 0.6 | |
| Output noise voltage | $f = 10\text{ Hz to } 100\text{ kHz}$ | | 1000 | | μV |
| Bias current | $I_O = 750\text{ mA}$ | | 60 | 75 | mA |
| | $I_O = 10\text{ mA}$ | | | 5 | |

(1) 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 1](#).

PARAMETER MEASUREMENT INFORMATION

The TL750Mxx 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. Figure 1 and Figure 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 1 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 Figure 1 and Figure 2.

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 | T491D336M010 AS | 0.5 Ω |

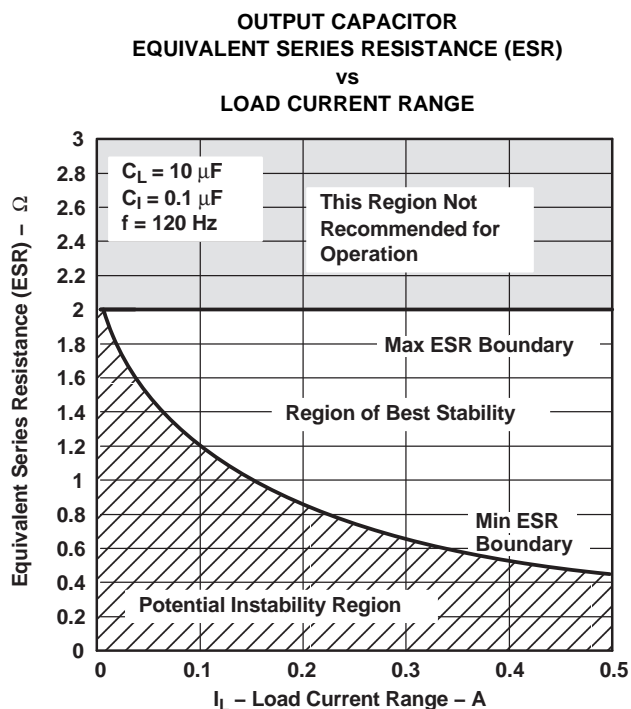
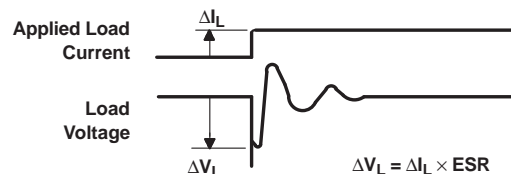


Figure 1.

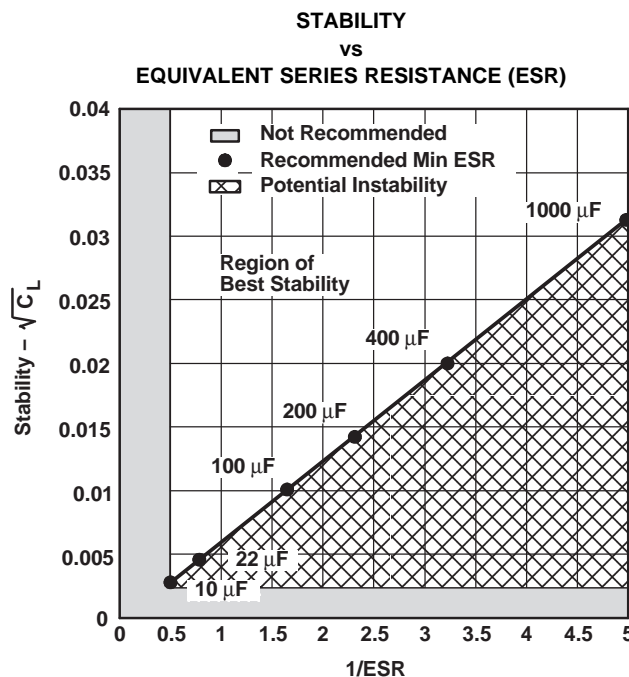


Figure 2.

TYPICAL CHARACTERISTICS

Table 2. Table of Graphs

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

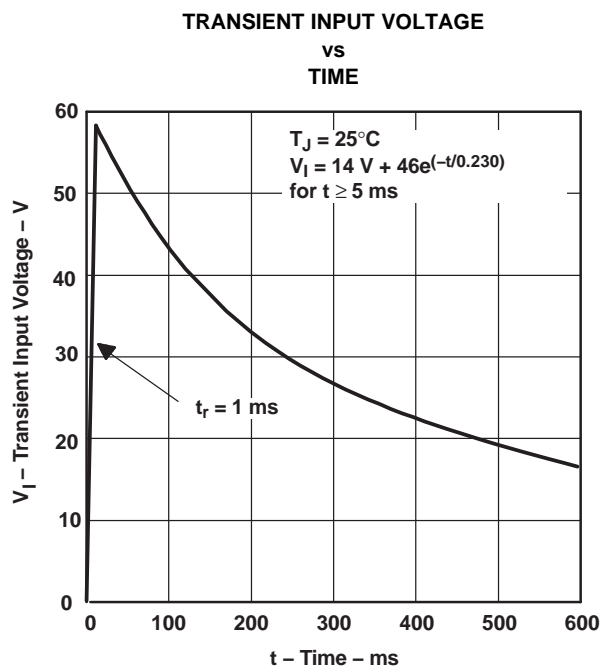


Figure 3.

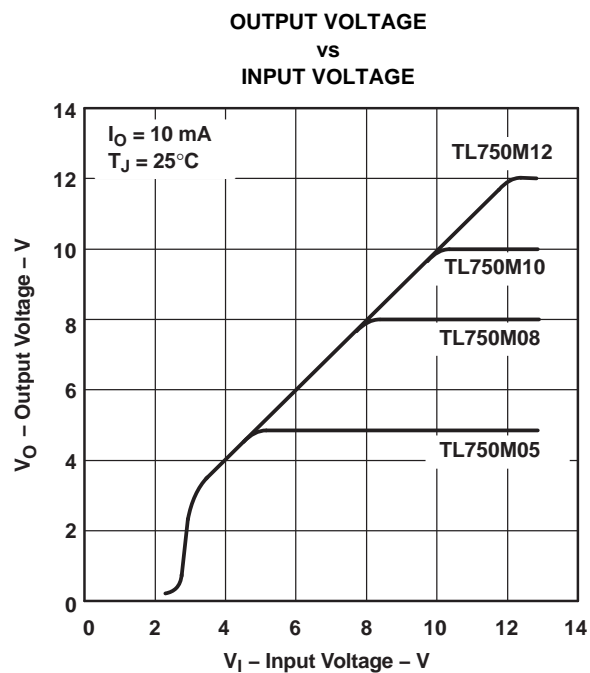


Figure 4.

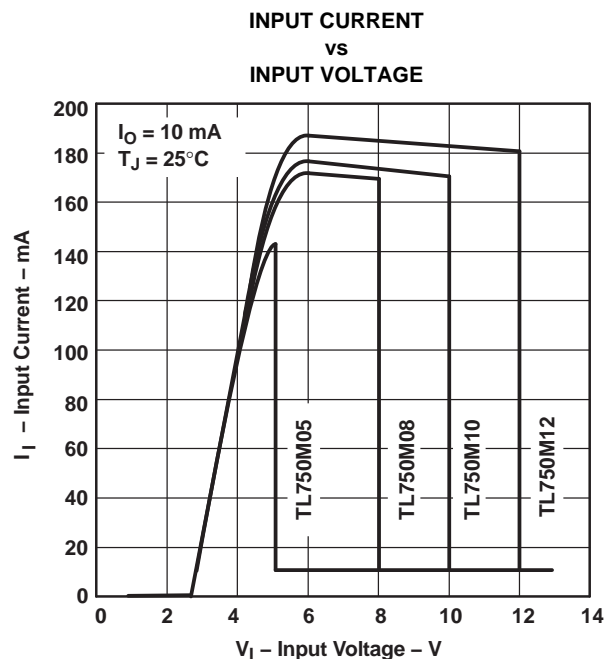


Figure 5.

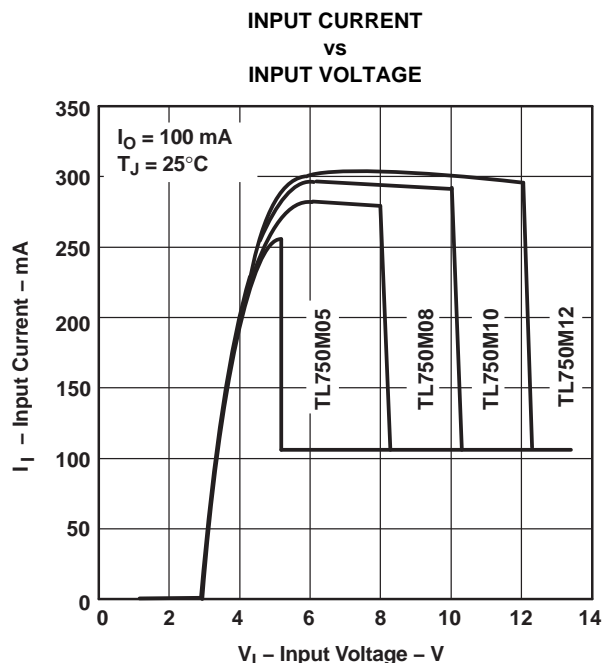


Figure 6.

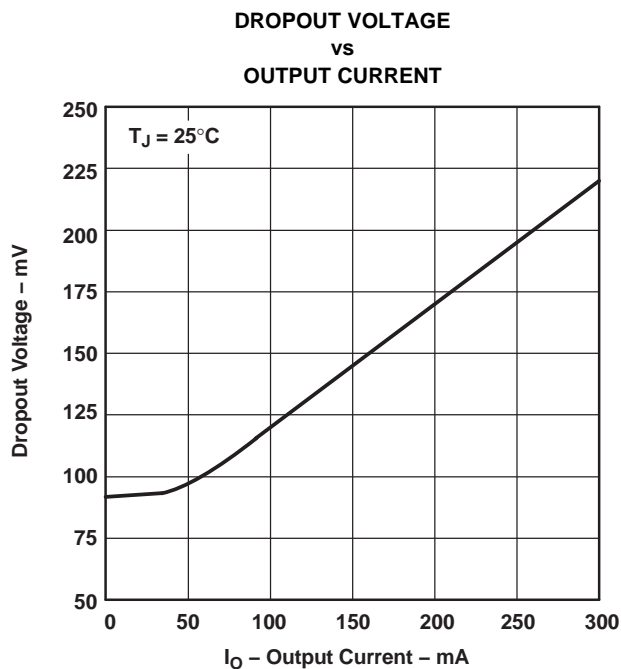


Figure 7.

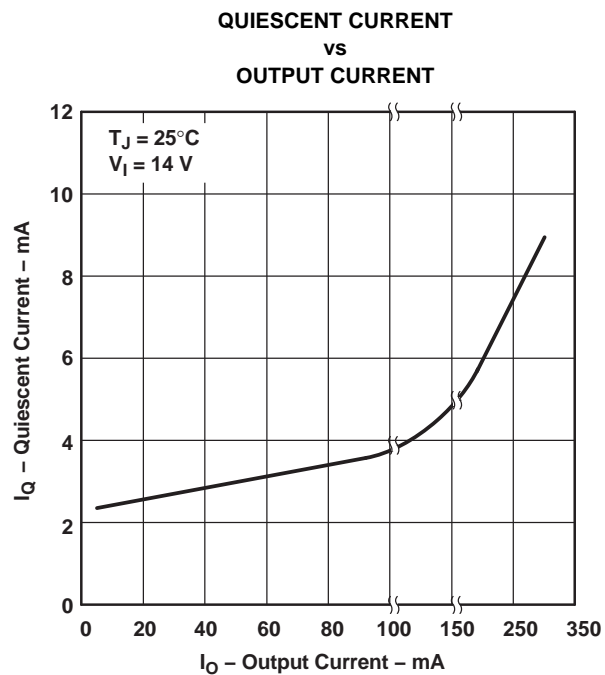


Figure 8.

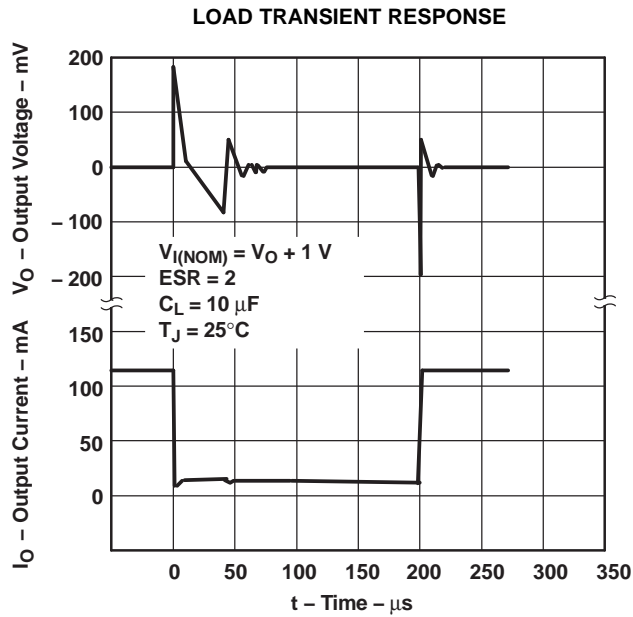


Figure 9.

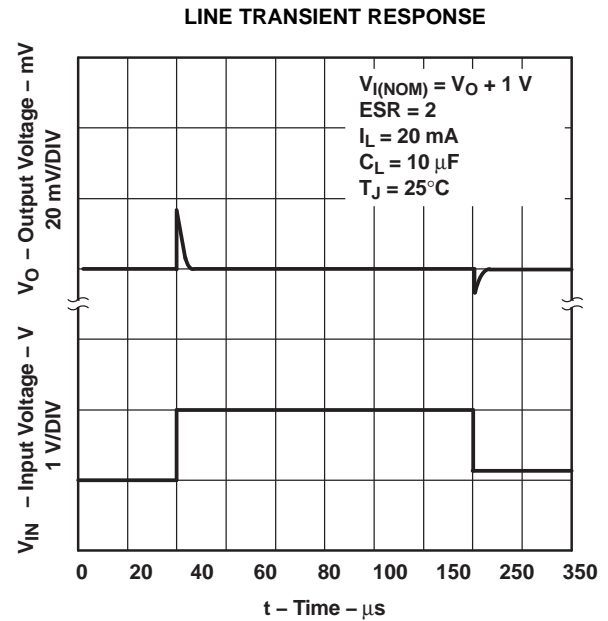


Figure 10.

PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|------------------|--------------------|------|----------------|----------------------------|------------------|----------------------|--------------|-------------------------|-------------------------|
| TL750M05CKC | OBSOLETE | TO-220 | KC | 3 | | TBD | Call TI | Call TI | 0 to 125 | TL750M05C | |
| TL750M05CKCE3 | OBSOLETE | TO-220 | KC | 3 | | TBD | Call TI | Call TI | 0 to 125 | TL750M05C | |
| TL750M05CKCSE3 | ACTIVE | TO-220 | KCS | 3 | 50 | Pb-Free (RoHS) | CU SN | N / A for Pkg Type | 0 to 125 | TL750M05C | Samples |
| TL750M05CKTER | OBSOLETE | PFM | KTE | 3 | | TBD | Call TI | Call TI | 0 to 125 | TL750M05C | |
| TL750M05CKTPR | OBSOLETE | PFM | KTP | 2 | | TBD | Call TI | Call TI | 0 to 125 | 750M05C | |
| TL750M05CKTPRG3 | OBSOLETE | PFM | KTP | 2 | | TBD | Call TI | Call TI | 0 to 125 | | |
| TL750M05CKTTTR | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 500 | Green (RoHS & no Sb/Br) | CU SN | Level-3-245C-168 HR | 0 to 125 | TL750M05C | Samples |
| TL750M05CKTTTRG3 | ACTIVE | DDPAK/ TO-263 | KTT | 3 | 500 | Green (RoHS & no Sb/Br) | CU SN | Level-3-245C-168 HR | 0 to 125 | TL750M05C | Samples |
| TL750M05CKVURG3 | ACTIVE | TO-252 | KVU | 3 | 2500 | Green (RoHS & no Sb/Br) | CU SN | Level-3-260C-168 HR | 0 to 125 | 50M05C | Samples |
| TL750M08CKCE3 | OBSOLETE | TO-220 | KC | 3 | | TBD | Call TI | Call TI | 0 to 125 | TL750M08C | |
| TL750M08CKCSE3 | ACTIVE | TO-220 | KCS | 3 | 50 | Pb-Free (RoHS) | CU SN | N / A for Pkg Type | 0 to 125 | TL750M08C | Samples |
| TL750M08CKTPRG3 | OBSOLETE | PFM | KTP | 2 | | TBD | Call TI | Call TI | 0 to 125 | | |
| TL750M08CKVURG3 | ACTIVE | TO-252 | KVU | 3 | 2500 | Green (RoHS & no Sb/Br) | CU SN | Level-3-260C-168 HR | 0 to 125 | 50M08C | Samples |
| TL750M10CKC | OBSOLETE | TO-220 | KC | 3 | | TBD | Call TI | Call TI | 0 to 125 | TL750M10C | |
| TL750M10CKCE3 | OBSOLETE | TO-220 | KC | 3 | | TBD | Call TI | Call TI | 0 to 125 | TL750M10C | |
| TL750M10CKCSE3 | ACTIVE | TO-220 | KCS | 3 | 50 | Pb-Free (RoHS) | CU SN | N / A for Pkg Type | 0 to 125 | TL750M10C | Samples |
| TL750M10CKTER | OBSOLETE | PFM | KTE | 3 | | TBD | Call TI | Call TI | 0 to 125 | | |
| TL750M10CKTPR | OBSOLETE | PFM | KTP | 2 | | TBD | Call TI | Call TI | 0 to 125 | 750M10C | |
| TL750M10CKTPRG3 | OBSOLETE | PFM | KTP | 2 | | TBD | Call TI | Call TI | 0 to 125 | | |
| TL750M10CKVURG3 | ACTIVE | TO-252 | KVU | 3 | 2500 | Green (RoHS & no Sb/Br) | CU SN | Level-3-260C-168 HR | 0 to 125 | 50M10C | Samples |
| TL750M12CKC | OBSOLETE | TO-220 | KC | 3 | | TBD | Call TI | Call TI | 0 to 125 | TL750M12C | |
| TL750M12CKCE3 | OBSOLETE | TO-220 | KC | 3 | | TBD | Call TI | Call TI | 0 to 125 | TL750M12C | |
| TL750M12CKCSE3 | ACTIVE | TO-220 | KCS | 3 | 50 | Pb-Free (RoHS) | CU SN | N / A for Pkg Type | 0 to 125 | TL750M12C | Samples |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|-----------------|------|-------------|-------------------------|------------------|----------------------|--------------|-------------------------|-------------------------|
| TL750M12CKTPRG3 | OBSOLETE | PFM | KTP | 2 | | TBD | Call TI | Call TI | 0 to 125 | | |
| TL750M12CKVURG3 | ACTIVE | TO-252 | KVU | 3 | 2500 | Green (RoHS & no Sb/Br) | CU SN | Level-3-260C-168 HR | 0 to 125 | 50M12C | Samples |

(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), Pb-Free (RoHS Exempt), 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.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

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.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

OTHER QUALIFIED VERSIONS OF TL750M05, TL750M08, TL750M12 :

- Automotive: [TL750M05-Q1](#), [TL750M08-Q1](#), [TL750M12-Q1](#)

NOTE: Qualified Version Definitions:

- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects

TAPE AND REEL INFORMATION


*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|-----------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| TL750M05CKTTR | DDPAK/TO-263 | KTT | 3 | 500 | 330.0 | 24.4 | 10.6 | 15.8 | 4.9 | 16.0 | 24.0 | Q2 |
| TL750M05CKVURG3 | TO-252 | KVU | 3 | 2500 | 330.0 | 16.4 | 6.9 | 10.5 | 2.7 | 8.0 | 16.0 | Q2 |
| TL750M08CKVURG3 | TO-252 | KVU | 3 | 2500 | 330.0 | 16.4 | 6.9 | 10.5 | 2.7 | 8.0 | 16.0 | Q2 |
| TL750M10CKVURG3 | TO-252 | KVU | 3 | 2500 | 330.0 | 16.4 | 6.9 | 10.5 | 2.7 | 8.0 | 16.0 | Q2 |
| TL750M12CKVURG3 | TO-252 | KVU | 3 | 2500 | 330.0 | 16.4 | 6.9 | 10.5 | 2.7 | 8.0 | 16.0 | Q2 |

TAPE AND REEL BOX DIMENSIONS

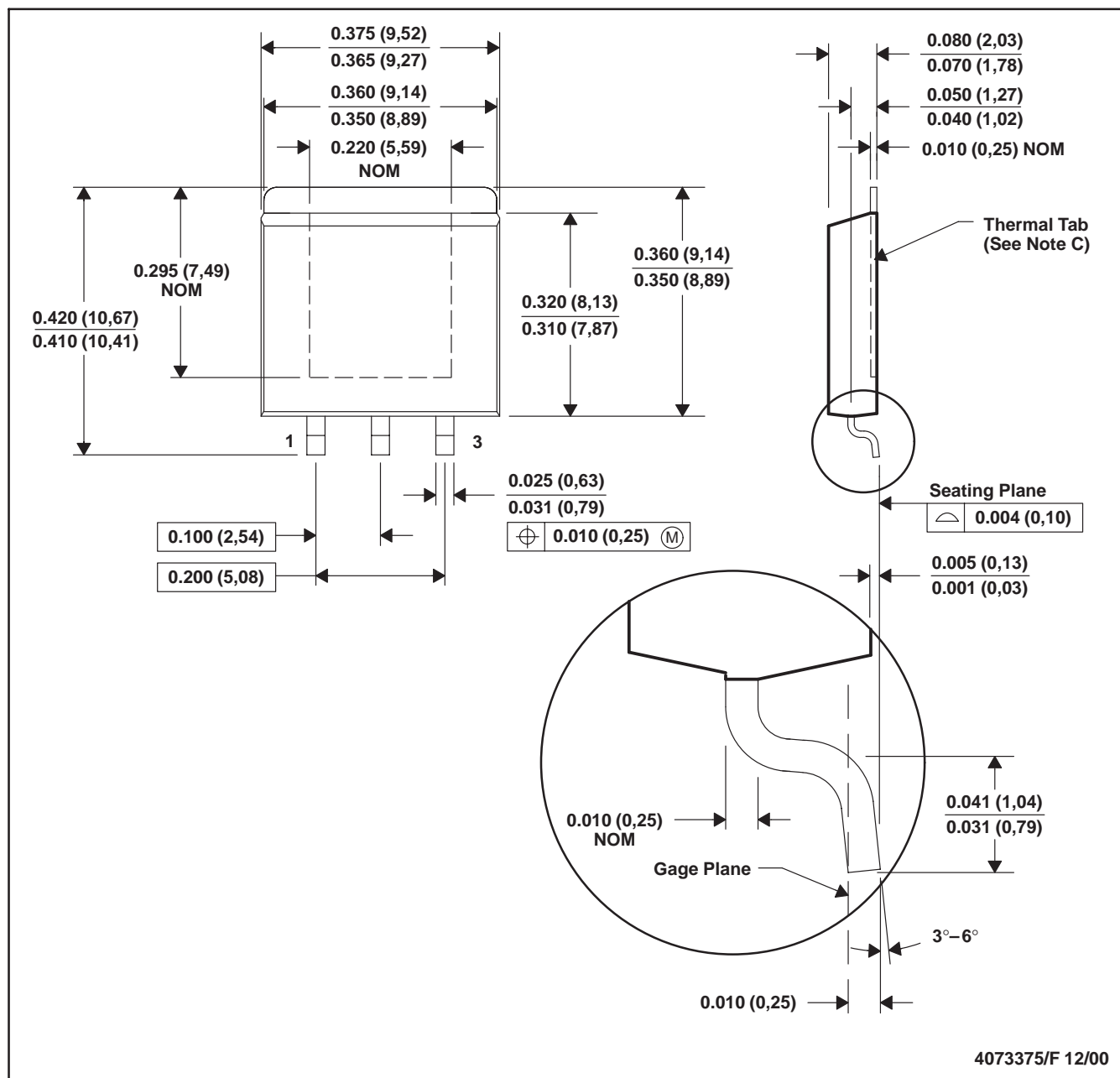


*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|-----------------|--------------|-----------------|------|------|-------------|------------|-------------|
| TL750M05CKTTR | DDPAK/TO-263 | KTT | 3 | 500 | 340.0 | 340.0 | 38.0 |
| TL750M05CKVURG3 | TO-252 | KVU | 3 | 2500 | 340.0 | 340.0 | 38.0 |
| TL750M08CKVURG3 | TO-252 | KVU | 3 | 2500 | 340.0 | 340.0 | 38.0 |
| TL750M10CKVURG3 | TO-252 | KVU | 3 | 2500 | 340.0 | 340.0 | 38.0 |
| TL750M12CKVURG3 | TO-252 | KVU | 3 | 2500 | 340.0 | 340.0 | 38.0 |

KTE (R-PSFM-G3)

PowerFLEX™ PLASTIC FLANGE-MOUNT



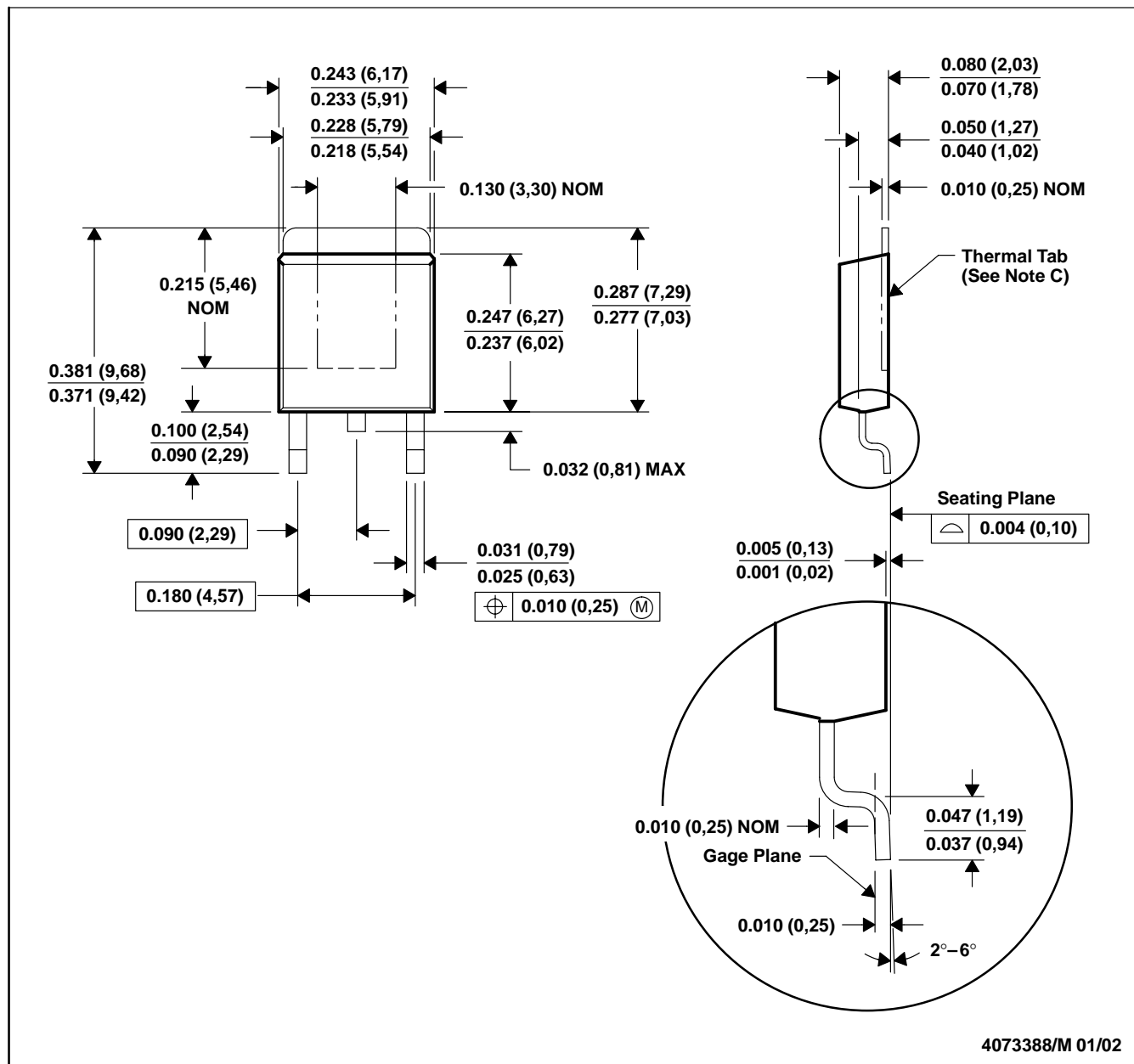
- NOTES:
- All linear dimensions are in inches (millimeters).
 - This drawing is subject to change without notice.
 - The center lead is in electrical contact with the thermal tab.
 - Dimensions do not include mold protrusions, not to exceed 0.006 (0,15).
 - Falls within JEDEC MO-169

PowerFLEX is a trademark of Texas Instruments.



KTP (R-PSFM-G2)

PowerFLEX™ PLASTIC FLANGE-MOUNT PACKAGE

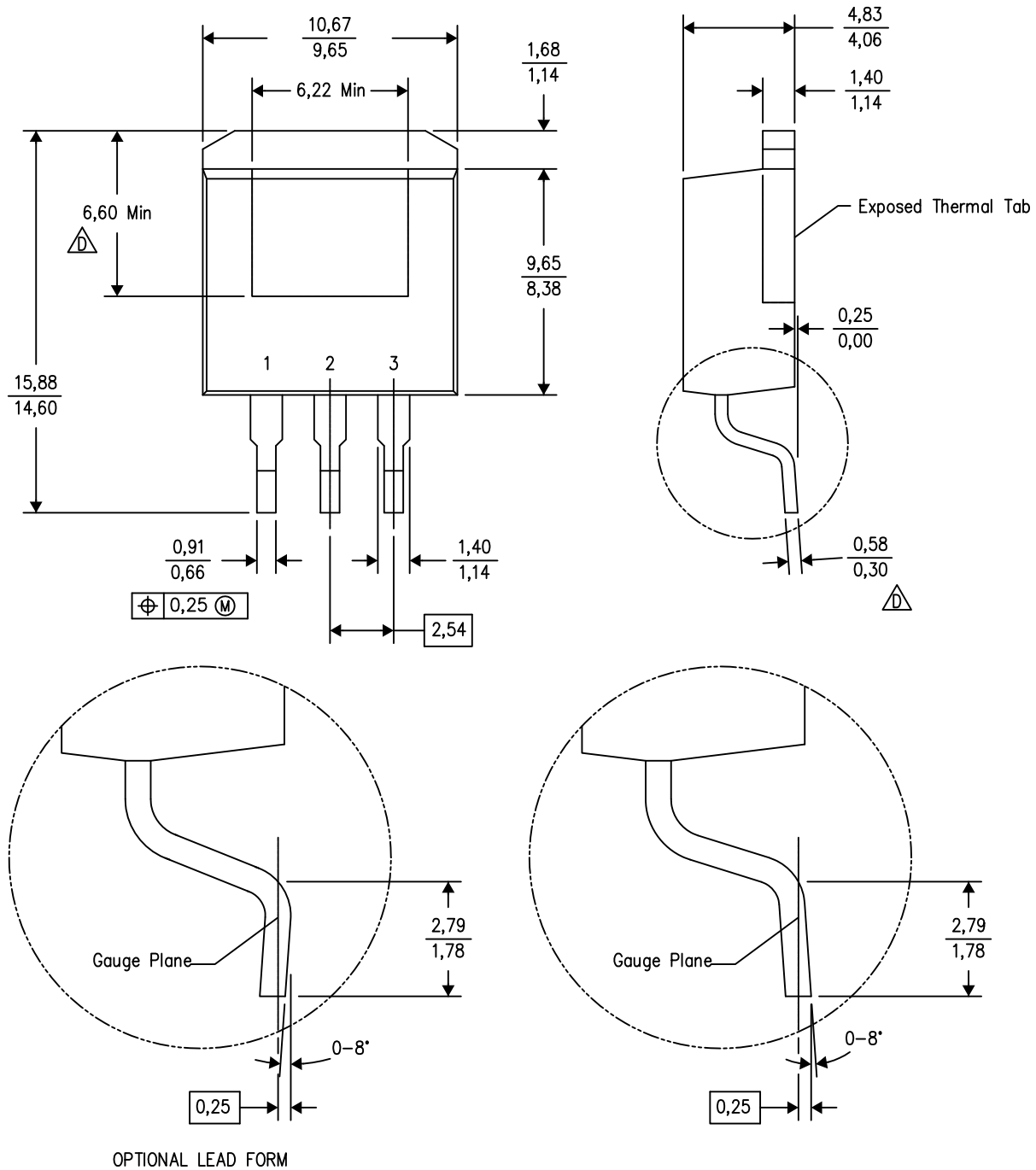


- NOTES:
- All linear dimensions are in inches (millimeters).
 - This drawing is subject to change without notice.
 - The center lead is in electrical contact with the thermal tab.
 - Dimensions do not include mold protrusions, not to exceed 0.006 (0,15).
 - Falls within JEDEC TO-252 variation AC.

PowerFLEX is a trademark of Texas Instruments.

KTT (R-PSFM-G3)

PLASTIC FLANGE-MOUNT PACKAGE

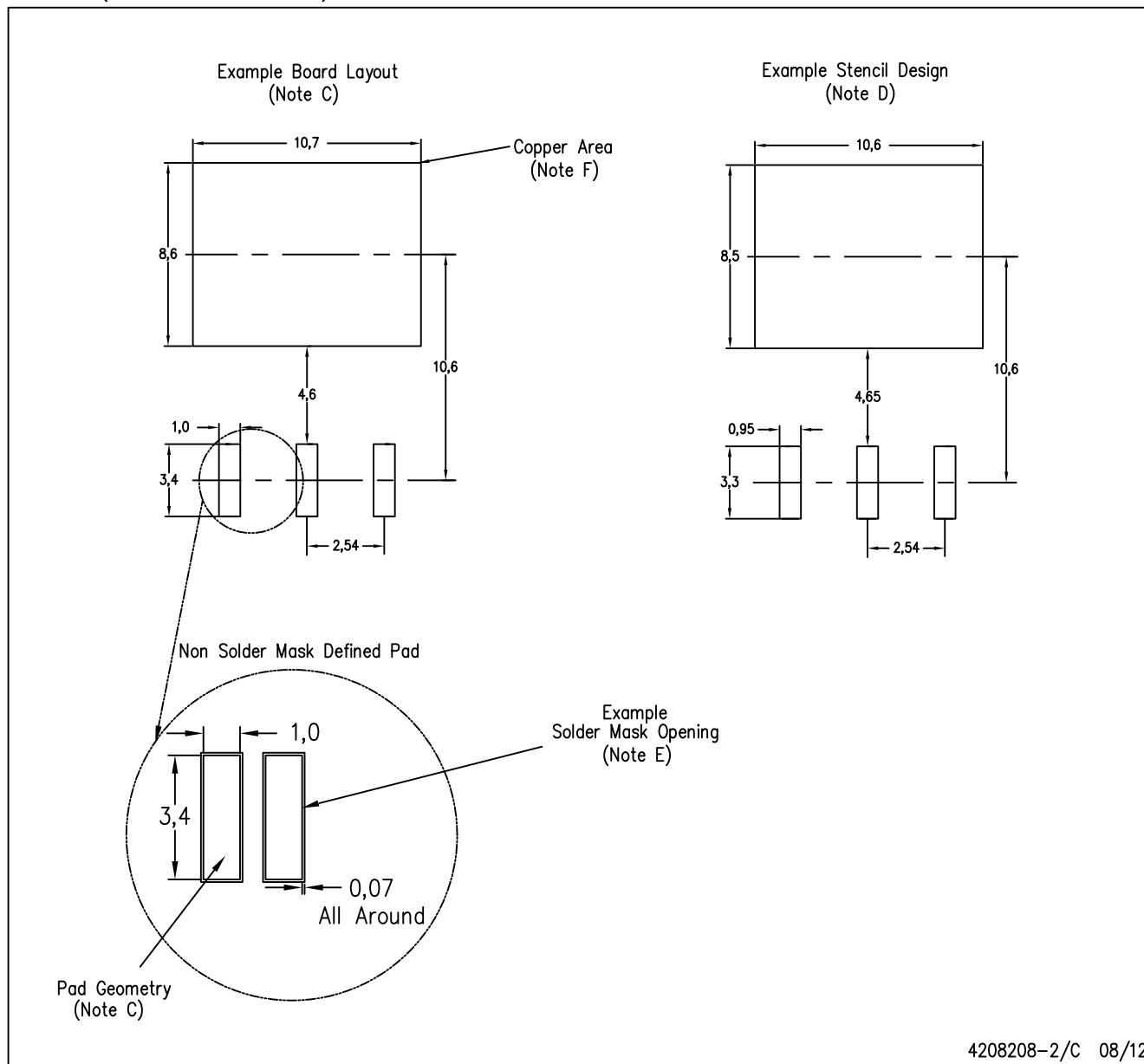


4200577-3/G 01/13

- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Body dimensions do not include mold flash or protrusion. Mold flash or protrusion not to exceed 0.005 (0,13) per side.
- Δ Falls within JEDEC TO-263 variation AA, except minimum lead thickness and minimum exposed pad length.

KTT (R-PSFM-G3)

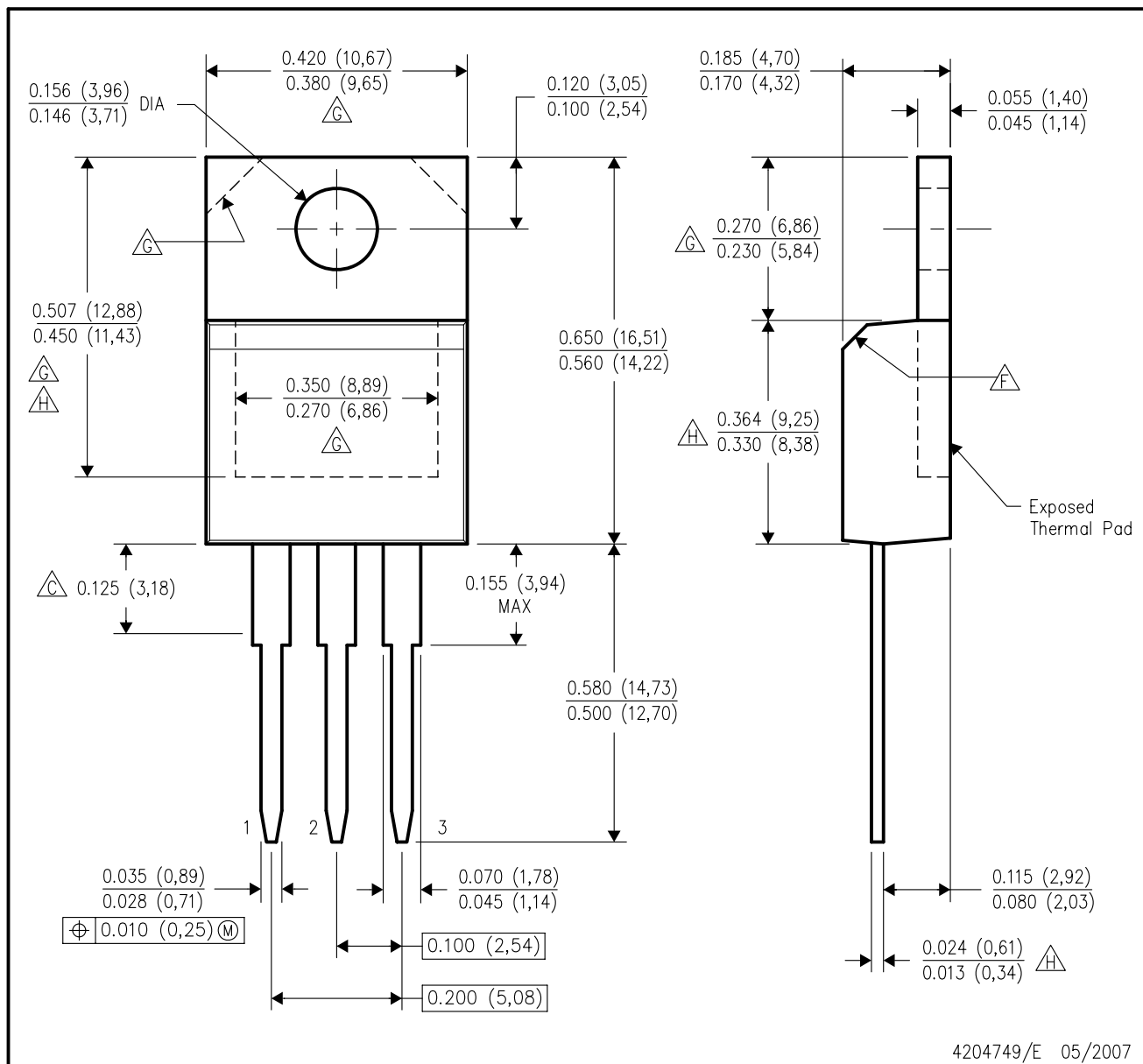
PLASTIC FLANGE-MOUNT PACKAGE



- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Publication IPC-SM-782 is recommended for alternate designs.
 - Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525.
 - Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.
 - This package is designed to be soldered to a thermal pad on the board. Refer to the Product Datasheet for specific thermal information, via requirements, and recommended thermal pad size. For thermal pad sizes larger than shown a solder mask defined pad is recommended in order to maintain the solderable pad geometry while increasing copper area.

KCS (R-PSFM-T3)

PLASTIC FLANGE-MOUNT PACKAGE



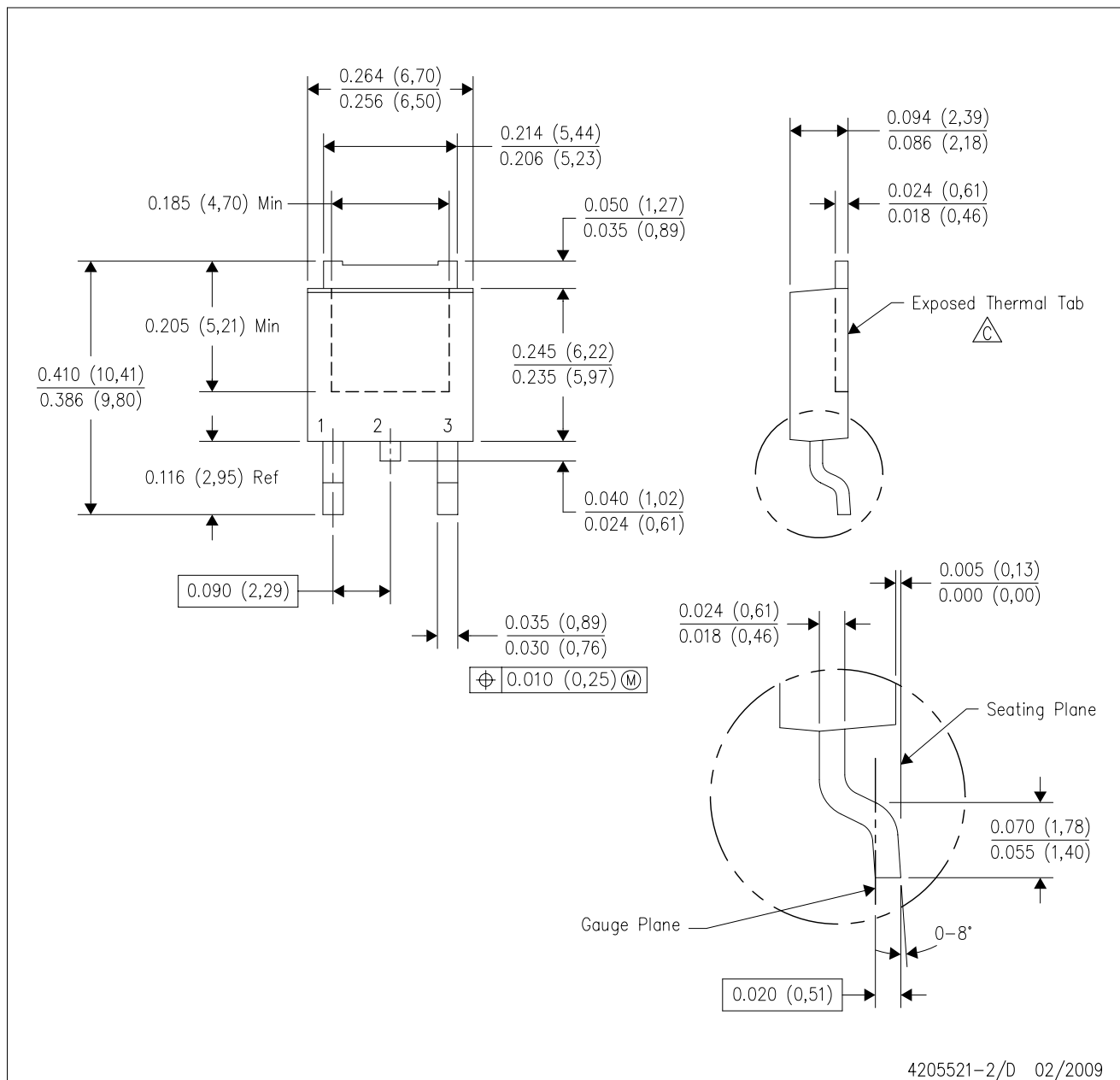
4204749/E 05/2007

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, minimum exposed pad length, and maximum body length.

KVU (R-PSFM-G3)

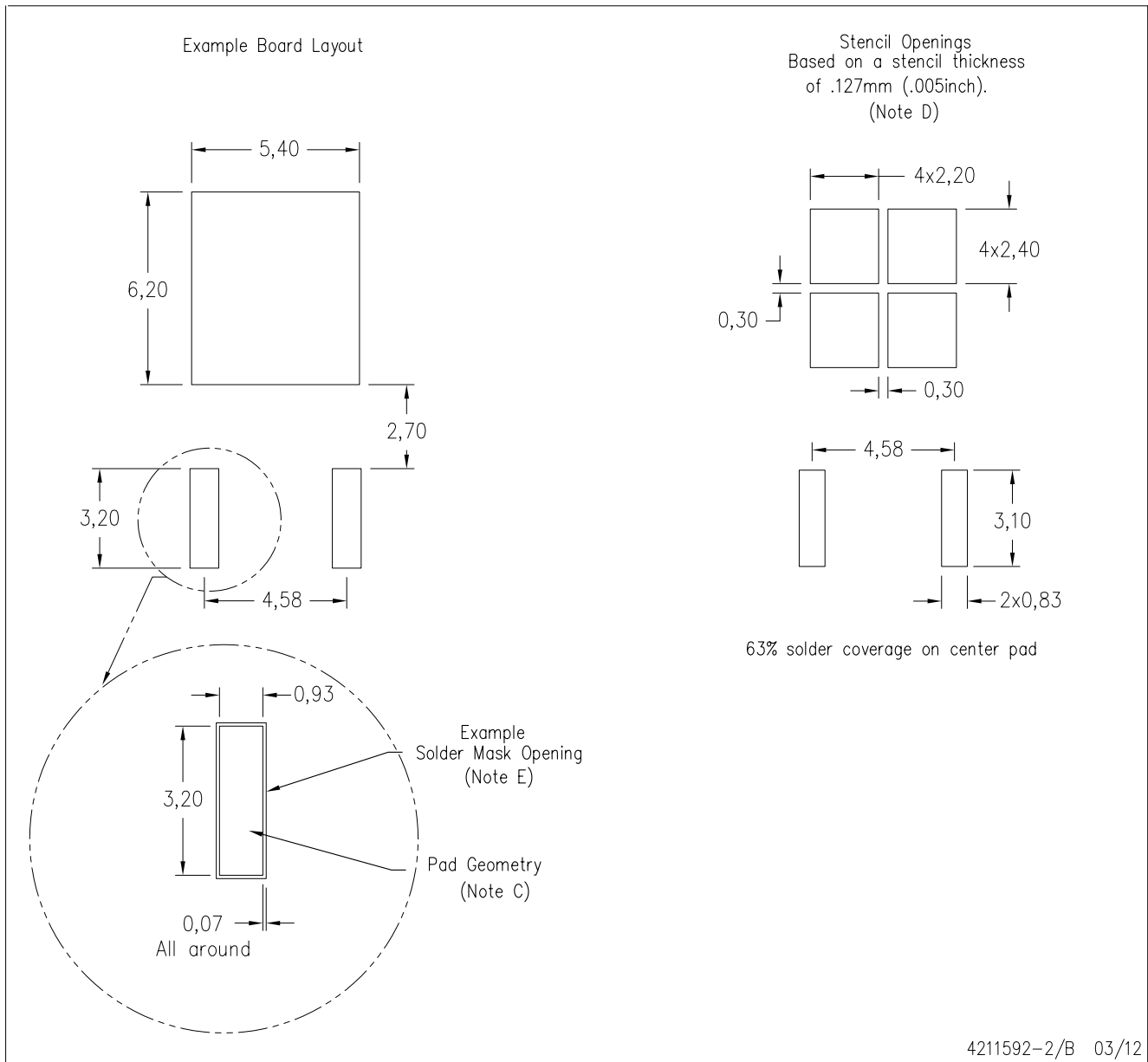
PLASTIC FLANGE-MOUNT PACKAGE



- 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 exposed thermal tab.
 - D. Body Dimensions do not include mold flash or protrusions. Mold flash and protrusion shall not exceed 0.006 (0,15) per side.
 - E. Falls within JEDEC TO-252 variation AA.

KVU (R-PSFM-G3)

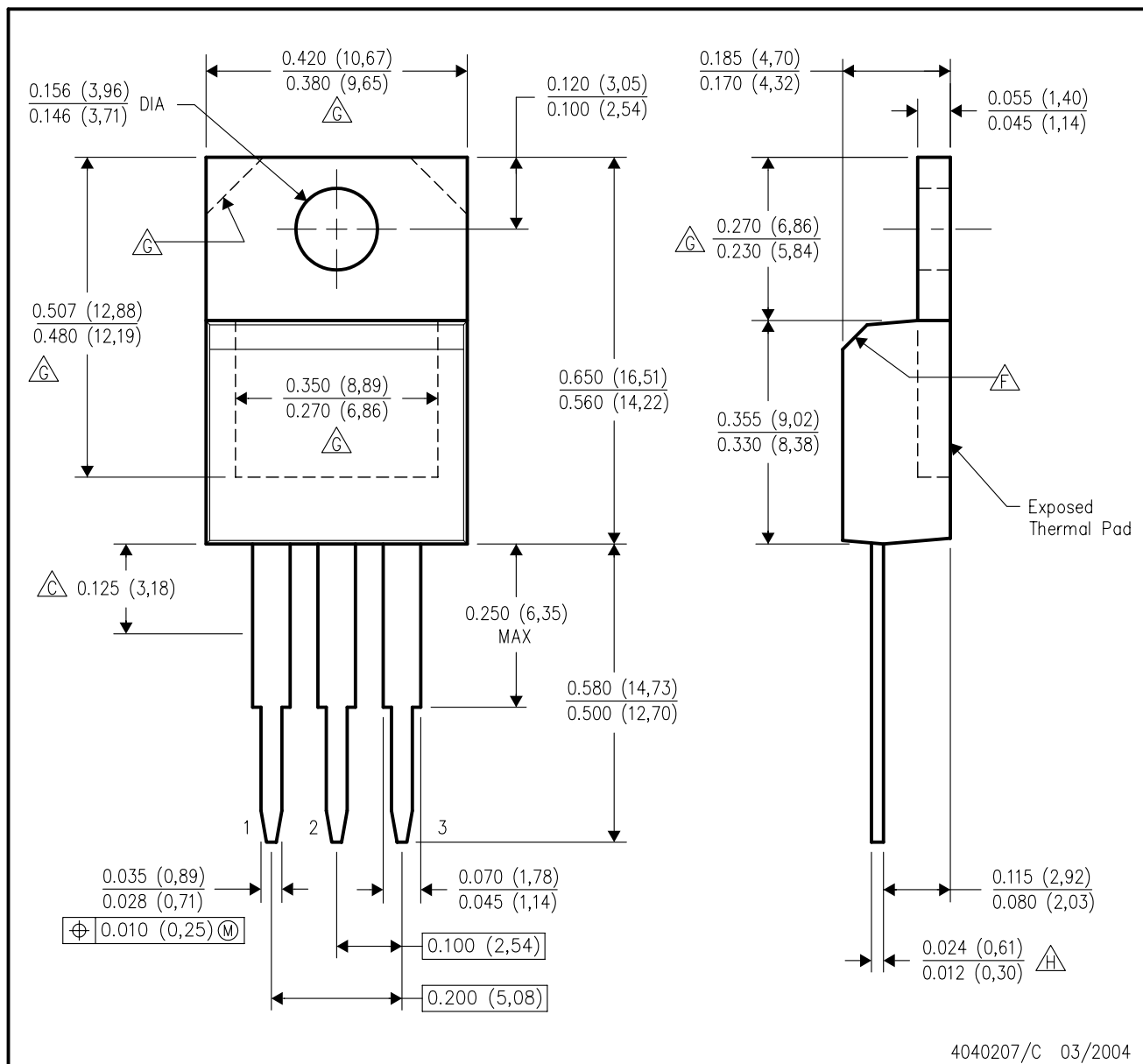
PLASTIC FLANGE MOUNT PACKAGE



- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Publication IPC-SM-782 is an alternate information source for PCB land pattern designs.
 - Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525 for other stencil recommendations.
 - Customers should contact their board fabrication site for recommended solder mask tolerances and via tenting recommendations for vias placed in thermal pad.

KC (R-PSFM-T3)

PLASTIC FLANGE-MOUNT PACKAGE



4040207/C 03/2004

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.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have **not** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

Products

| | |
|------------------------------|--|
| Audio | www.ti.com/audio |
| Amplifiers | amplifier.ti.com |
| Data Converters | dataconverter.ti.com |
| DLP® Products | www.dlp.com |
| DSP | dsp.ti.com |
| Clocks and Timers | www.ti.com/clocks |
| Interface | interface.ti.com |
| Logic | logic.ti.com |
| Power Mgmt | power.ti.com |
| Microcontrollers | microcontroller.ti.com |
| RFID | www.ti-rfid.com |
| OMAP Applications Processors | www.ti.com/omap |
| Wireless Connectivity | www.ti.com/wirelessconnectivity |

Applications

| | |
|-------------------------------|--|
| Automotive and Transportation | www.ti.com/automotive |
| Communications and Telecom | www.ti.com/communications |
| Computers and Peripherals | www.ti.com/computers |
| Consumer Electronics | www.ti.com/consumer-apps |
| Energy and Lighting | www.ti.com/energy |
| Industrial | www.ti.com/industrial |
| Medical | www.ti.com/medical |
| Security | www.ti.com/security |
| Space, Avionics and Defense | www.ti.com/space-avionics-defense |
| Video and Imaging | www.ti.com/video |

TI E2E Community

e2e.ti.com