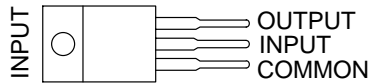


# μA79M00 SERIES NEGATIVE-VOLTAGE REGULATORS

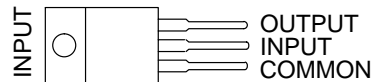
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- 3-Terminal Regulators
- Output Current Up To 500 mA
- No External Components
- High Power-Dissipation Capability
- Internal Short-Circuit Current Limiting
- Output Transistor Safe-Area Compensation

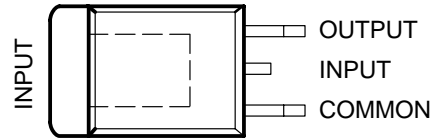
μA79M05 . . . KC (TO-220) PACKAGE  
(TOP VIEW)



μA79M05 . . . KCS (TO-220) PACKAGE  
(TOP VIEW)



μA79M05, μA79M08 . . . KTP PACKAGE  
(TOP VIEW)



## description/ordering information

This series of fixed-negative-voltage integrated-circuit voltage regulators is designed to complement the μA78M00 series in a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. Each of these regulators delivers up to 500 mA of output current. The internal current-limiting and thermal-shutdown features of these regulators essentially make them immune to overload. In addition to use as fixed-voltage regulators, these devices can be used with external components to obtain adjustable output voltages and currents, and also as the power-pass element in precision regulators.

## ORDERING INFORMATION

| $T_J$        | $V_O(NOM)$<br>(V) | PACKAGE†                     |              | ORDERABLE<br>PART NUMBER | TOP-SIDE<br>MARKING |
|--------------|-------------------|------------------------------|--------------|--------------------------|---------------------|
| 0°C to 125°C | –5                | Power Flex (KTP)             | Reel of 3000 | μA79M05CKTPR             | μA79M05C            |
|              |                   | TO-220 (KC)                  | Tube of 50   | μA79M05CKC               | μA79M05C            |
|              |                   | TO-220, short shoulder (KCS) | Tube of 20   | μA79M05CKCS              |                     |
|              | –8                | Power Flex (KTP)             | Reel of 3000 | μA79M08CKTPR             | μA79M08C            |

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at [www.ti.com/sc/package](http://www.ti.com/sc/package).



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**TEXAS  
INSTRUMENTS**

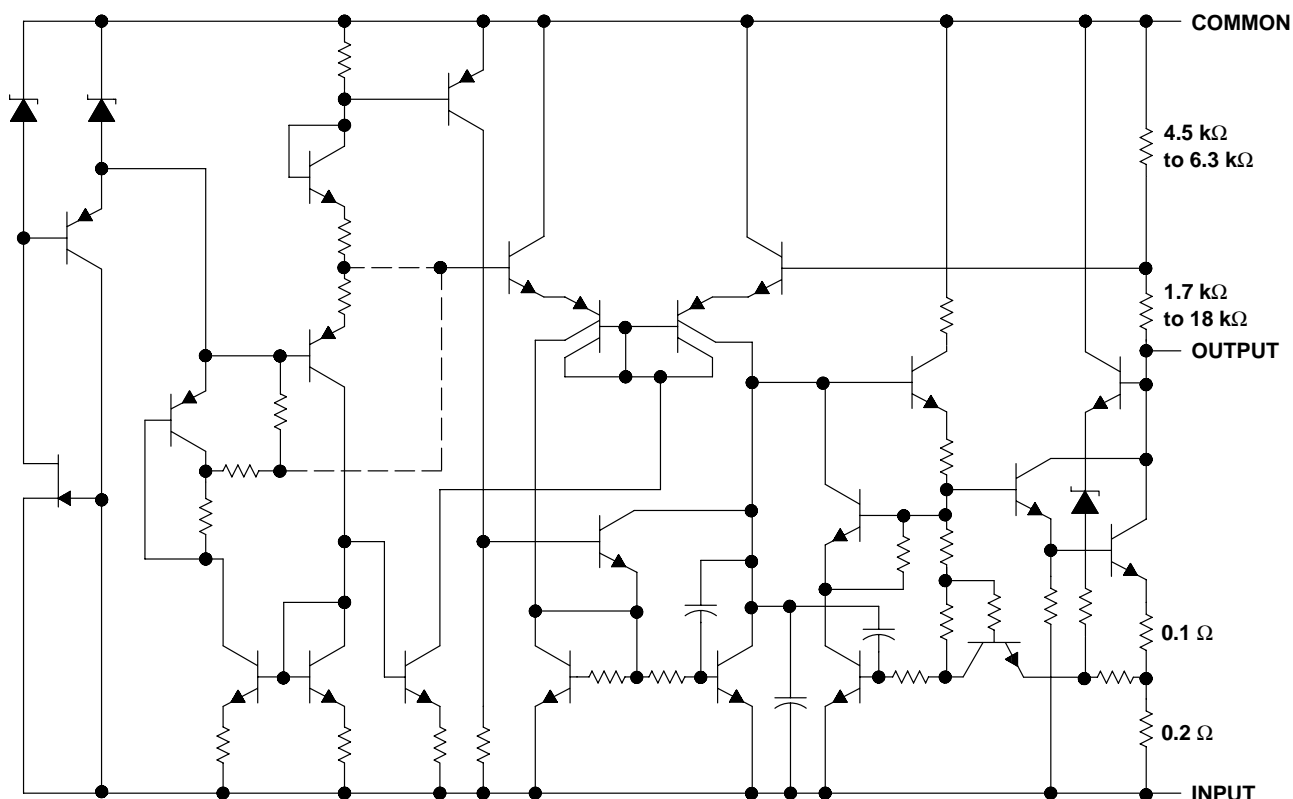
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# μA79M00 SERIES NEGATIVE-VOLTAGE REGULATORS

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## schematic



Resistor values shown are nominal.

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

|  |                |
|--|----------------|
| Input voltage, $V_I$ .....   | 35 V           |
| Operating virtual junction temperature, $T_J$ .....                | 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.

## package thermal data (see Note 1)

| PACKAGE          | BOARD             | $\theta_{JC}$ | $\theta_{JA}$ |
|------------------|-------------------|---------------|---------------|
| POWER-FLEX (KTP) | High K, JESD 51-5 | 19°C/W        | 28°C/W        |
| TO-220 (KC/KCS)  | High K, JESD 51-5 | 3°C/W         | 19°C/W        |

NOTE 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 affect reliability.



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# μA79M00 SERIES NEGATIVE-VOLTAGE REGULATORS

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## recommended operating conditions

|       |  | MIN      | MAX   | UNIT |   |
|-------|--|----------|-------|------|---|
| $V_I$ | Input voltage                          | μA79M05C | -7    | -25  | V |
|       |  | μA79M08C | -10.5 | -25  |   |
| $I_O$ | Output current                         |          | 500   | mA   |   |
| $T_J$ | Operating virtual junction temperature | 0        | 125   | °C   |   |

## electrical characteristics at specified virtual junction temperature, $V_I = -10$ V, $I_O = 350$ mA, $T_J = 25$ °C (unless otherwise noted)

| PARAMETER                                 | TEST CONDITIONS†   | μA79M05C |      |       | UNIT  |
|---|--|----------|------|-------|-------|
|   |  | MIN      | TYP  | MAX   |       |
| Output voltage                            | $V_I = -7$ V to $-25$ V, $I_O = 5$ mA to 350 mA  | -4.8     | -5   | -5.2  | V     |
|   | $T_J = 0$ °C to 125°C  | -4.75    |      | -5.25 |       |
| Input voltage regulation                  | $V_I = -7$ V to $-25$ V  |          | 7    | 50    | mV    |
|   | $V_I = -8$ V to $-18$ V  |          | 3    | 30    |       |
| Ripple rejection                          | $V_I = -8$ V to $-18$ V, $f = 120$ Hz<br>$I_O = 100$ mA, $T_J = 0$ °C to 125°C<br>$I_O = 300$ mA |          | 50   |       | dB    |
|   |  |          | 54   | 60    |       |
| Output voltage regulation                 | $I_O = 5$ mA to 500 mA   |          | 75   | 100   | mV    |
|   | $I_O = 5$ mA to 350 mA   |          | 50   |       |       |
| Temperature coefficient of output voltage | $I_O = 5$ mA, $T_J = 0$ °C to 125°C  |          | -0.4 |       | mV/°C |
| Output noise voltage                      | $f = 10$ Hz to 100 kHz   |          | 125  |       | μV    |
| Dropout voltage                           |  |          | 1.1  |       | V     |
| Bias current                              |  |          | 1    | 2     | mA    |
| Bias current change                       | $V_I = -8$ V to $-18$ V, $T_J = 0$ °C to 125°C   |          |      | 0.4   | mA    |
|   | $I_O = 5$ mA to 350 mA, $T_J = 0$ °C to 125°C  |          |      | 0.4   |       |
| Short-circuit output current              | $V_I = -30$ V  |          | 140  |       | mA    |
| Peak output current                       |  |          | 0.65 |       | A     |

† Pulse-testing techniques maintain  $T_J$  as close to  $T_A$  as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 2-μF capacitor across the input and a 1-μF capacitor across the output.

# μA79M00 SERIES NEGATIVE-VOLTAGE REGULATORS

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electrical characteristics at specified virtual junction temperature,  $V_I = -19\text{ V}$ ,  $I_O = 350\text{ mA}$ ,  $T_J = 25^\circ\text{C}$   
(unless otherwise noted)

| PARAMETER                                 | TEST CONDITIONS†  | μA79M08C   |  |       | UNIT  |
|---|---|--|--|-------|-------|
|   |   | MIN  | TYP  | MAX   |       |
| Output voltage                            | $V_I = -10.5\text{ V to }-25\text{ V}$ , $I_O = 5\text{ mA to }350\text{ mA}$         | -7.7   | -8   | -8.3  | V     |
|   | $T_J = 0^\circ\text{C to }125^\circ\text{C}$  | -7.6   |  | -8.4  |       |
| Input voltage regulation                  | $V_I = -10.5\text{ V to }-25\text{ V}$  |  | 8  | 80    | mV    |
|   | $V_I = -11\text{ V to }-21\text{ V}$  |  | 4  | 50    |       |
| Ripple rejection                          | $V_I = -11.5\text{ V to }-21.5\text{ V}$ ,<br>$f = 120\text{ Hz}$                     | $I_O = 100\text{ mA}$ ,<br>$I_O = 300\text{ mA}$ | $T_J = 0^\circ\text{C to }125^\circ\text{C}$ | 50    | dB    |
|   |   |  |  | 54 59 |       |
| Output voltage regulation                 | $I_O = 5\text{ mA to }500\text{ mA}$  |  | 90   | 160   | mV    |
|   | $I_O = 5\text{ mA to }350\text{ mA}$  |  | 60   |       |       |
| Temperature coefficient of output voltage | $I_O = 5\text{ mA}$ , $T_J = 0^\circ\text{C to }125^\circ\text{C}$                    |  | -0.6   |       | mV/°C |
| Output noise voltage                      | $f = 10\text{ Hz to }100\text{ kHz}$  |  | 200  |       | μV    |
| Dropout voltage                           | $I_O = 5\text{ mA}$   |  | 1.1  |       | V     |
| Bias current                              |   |  | 1  | 2     | mA    |
| Bias current change                       | $V_I = -10.5\text{ V to }-25\text{ V}$ , $T_J = 0^\circ\text{C to }125^\circ\text{C}$ |  |  | 0.4   | mA    |
|   | $I_O = 5\text{ mA to }350\text{ mA}$ , $T_J = 0^\circ\text{C to }125^\circ\text{C}$   |  |  | 0.4   |       |
| Short-circuit output current              | $V_I = -30\text{ V}$  |  | 140  |       | mA    |
| Peak output current                       |   |  | 0.65   |       | A     |

† Pulse-testing techniques maintain  $T_J$  as close to  $T_A$  as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 2-μF capacitor across the input and a 1-μF capacitor across the output.



**PACKAGING INFORMATION**

| Orderable Device | Status <sup>(1)</sup> | Package Type | Package Drawing | Pins | Package Qty | Eco Plan <sup>(2)</sup> | Lead/Ball Finish | MSL Peak Temp <sup>(3)</sup> |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
| 7704001HA        | OBSOLETE              | CFP          | U               | 10   |             | None                    | Call TI          | Call TI                      |
| UA79M05CKC       | ACTIVE                | TO-220       | KC              | 3    | 50          | None                    | Call TI          | Level-1-220C-UNLIM           |
| UA79M05CKCS      | ACTIVE                | TO-220       | KCS             | 3    | 50          | None                    | Call TI          | Level-NC-NC-NC               |
| UA79M05CKTPR     | ACTIVE                | PFM          | KTP             | 2    | 3000        | None                    | Call TI          | Level-1-220C-UNLIM           |
| UA79M05MUB       | OBSOLETE              | CFP          | U               | 10   |             | None                    | Call TI          | Call TI                      |
| UA79M06CKTPR     | OBSOLETE              | PFM          | KTP             | 2    |             | None                    | Call TI          | Call TI                      |
| UA79M08CKC       | OBSOLETE              | TO-220       | KC              | 3    |             | None                    | Call TI          | Call TI                      |
| UA79M08CKTPR     | ACTIVE                | PFM          | KTP             | 2    | 3000        | None                    | Call TI          | Level-1-220C-UNLIM           |
| UA79M12CKC       | OBSOLETE              | TO-220       | KC              | 3    |             | None                    | Call TI          | Call TI                      |
| UA79M12CKTPR     | OBSOLETE              | PFM          | KTP             | 2    |             | None                    | Call TI          | Call TI                      |
| UA79M15CKC       | OBSOLETE              | TO-220       | KC              | 3    |             | None                    | Call TI          | Call TI                      |
| UA79M15CKTPR     | OBSOLETE              | PFM          | KTP             | 2    |             | None                    | Call TI          | Call TI                      |
| UA79M20CKTPR     | OBSOLETE              | PFM          | KTP             | 2    |             | None                    | Call TI          | Call TI                      |
| UA79M24CKTPR     | OBSOLETE              | PFM          | KTP             | 2    |             | None                    | Call TI          | Call TI                      |

<sup>(1)</sup> 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.

<sup>(2)</sup> Eco Plan - May not be currently available - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

**None:** Not yet available Lead (Pb-Free).

**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.

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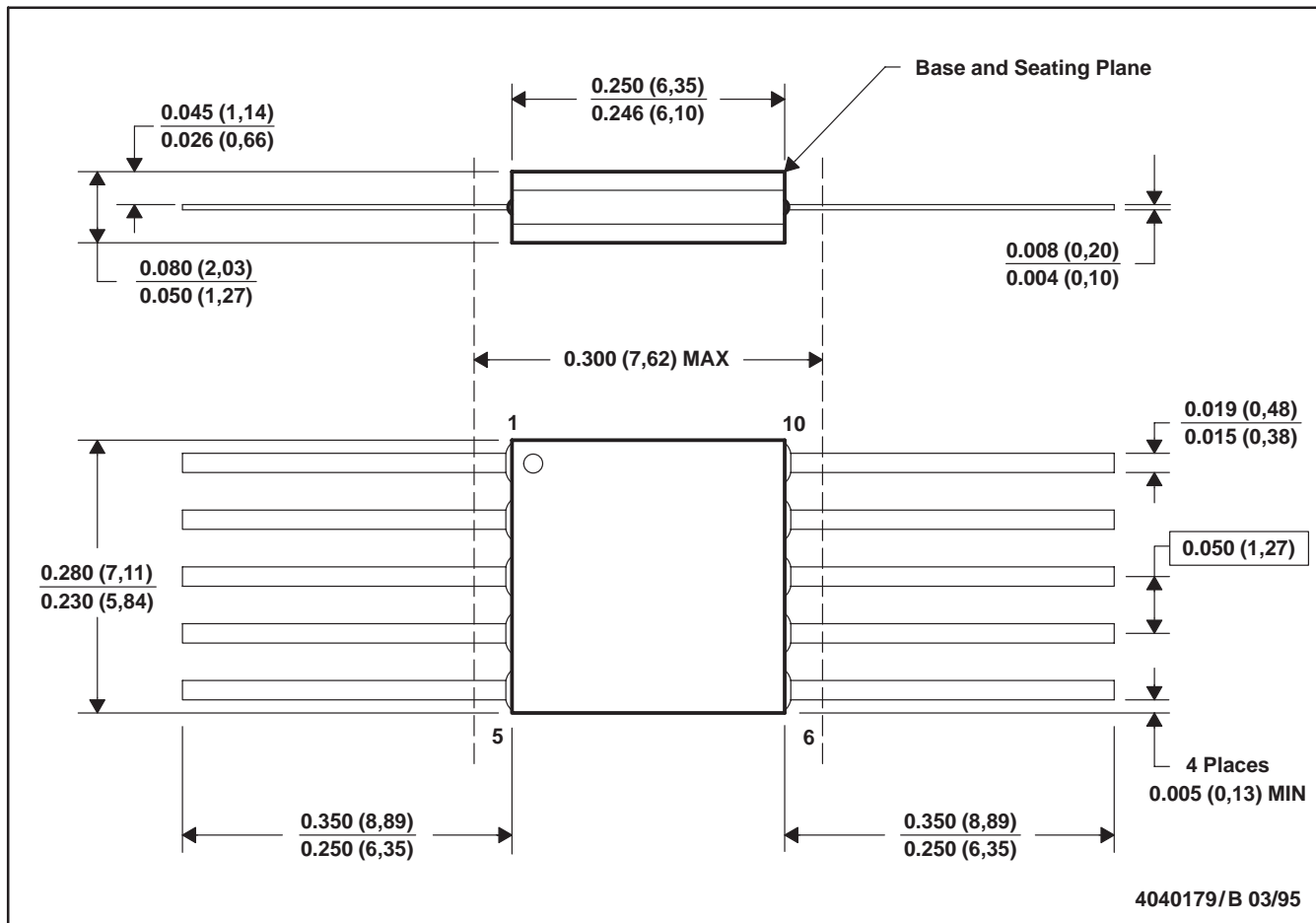
<sup>(3)</sup> MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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U (S-GDFP-F10)

CERAMIC DUAL FLATPACK



- NOTES: A. All linear dimensions are in inches (millimeters).  
 B. This drawing is subject to change without notice.  
 C. This package can be hermetically sealed with a ceramic lid using glass frit.  
 D. Index point is provided on cap for terminal identification only.  
 E. Falls within MIL STD 1835 GDFP1-F10 and JEDEC MO-092AA

KTP (R-PSFM-G2)

PowerFLEX™ PLASTIC FLANGE-MOUNT PACKAGE



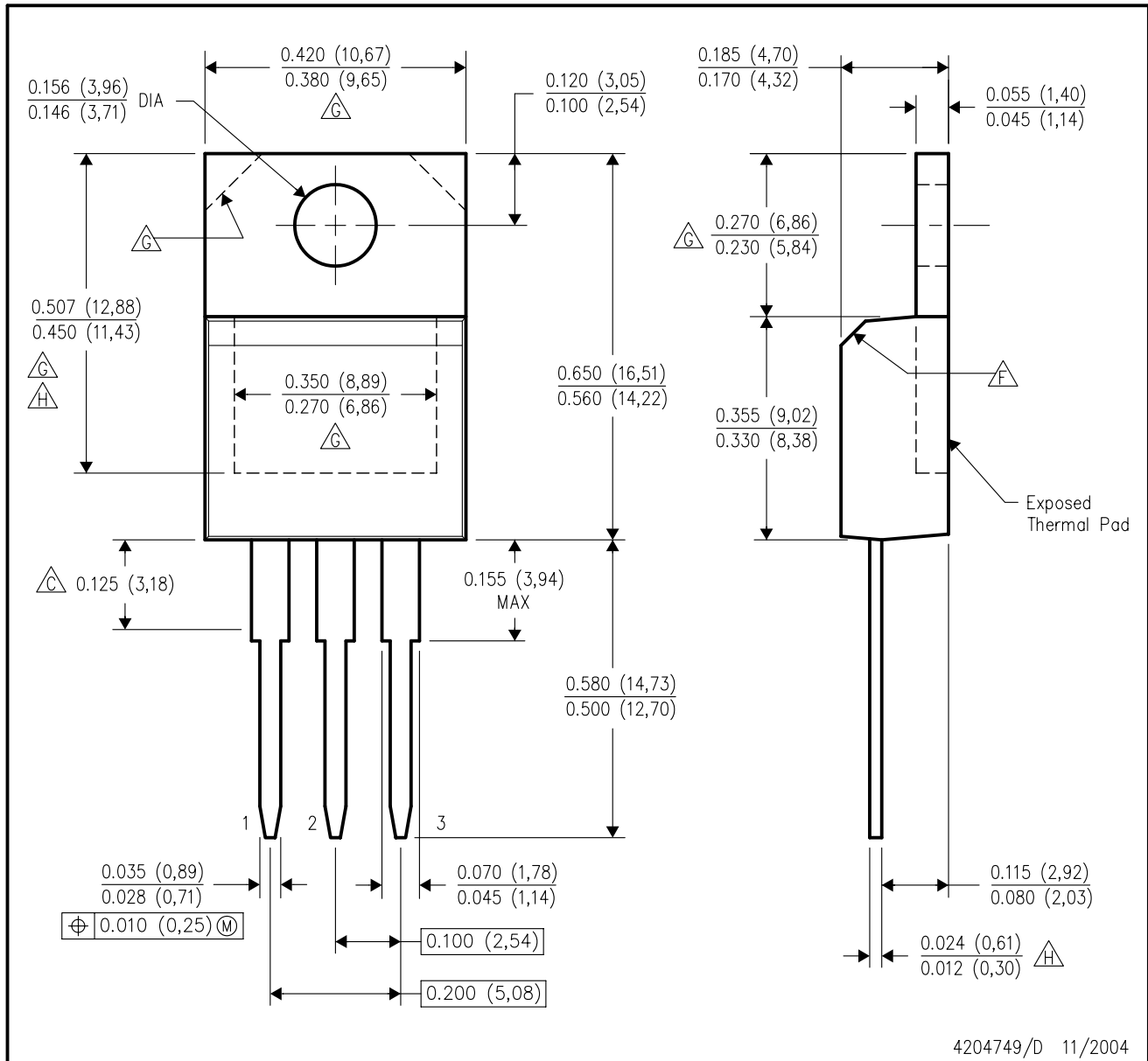
- NOTES: A. All linear dimensions are in inches (millimeters).  
 B. This drawing is subject to change without notice.  
 C. The center lead is in electrical contact with the thermal tab.  
 D. Dimensions do not include mold protrusions, not to exceed 0.006 (0,15).  
 E. Falls within JEDEC TO-252 variation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

PowerFLEX is a trademark of Texas Instruments.



KCS (R-PSFM-T3)

PLASTIC FLANGE-MOUNT PACKAGE

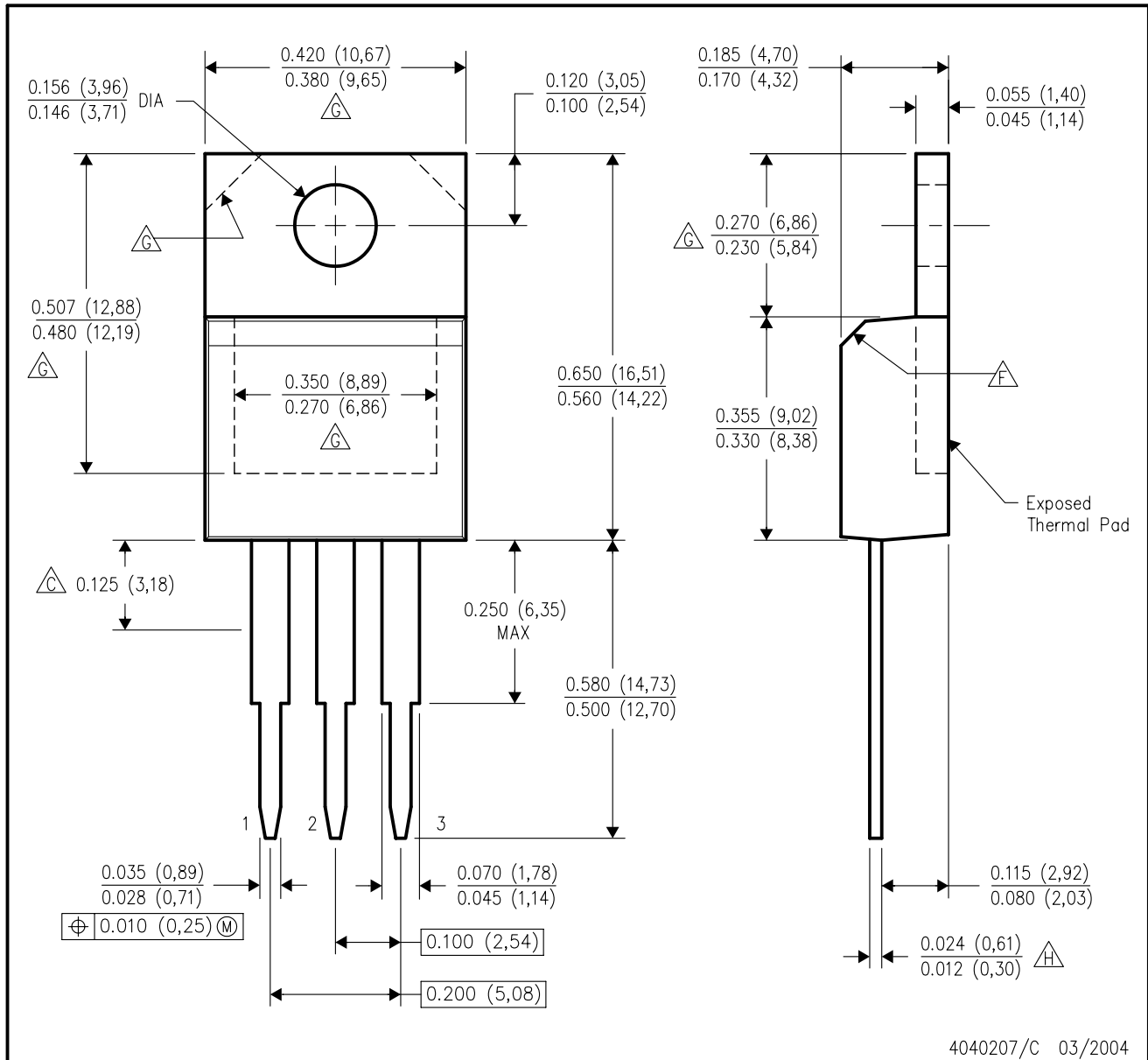


- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. Lead dimensions are not controlled within this area.
  - D. All lead dimensions apply before solder dip.
  - E. The center lead is in electrical contact with the mounting tab.
  - 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 and minimum exposed pad length.



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.
  - $\triangle C$  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.
  - $\triangle F$  The chamfer is optional.
  - $\triangle G$  Thermal pad contour optional within these dimensions.
  - $\triangle H$  Falls within JEDEC TO-220 variation AB, except minimum lead thickness.

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