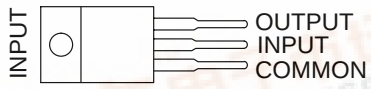
# µA79M00 SERIES NEGATIVE-VOLTAGE REGULATORS

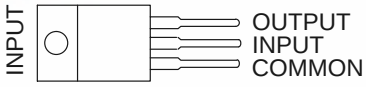
SLVS060J – JUNE 1976 – REVISED MAY 2003

- 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

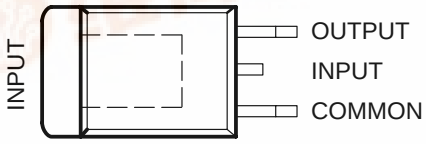
µA79M05 . . . KC (TO-220) PACKAGE
(TOP VIEW)




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




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




## description/ordering information

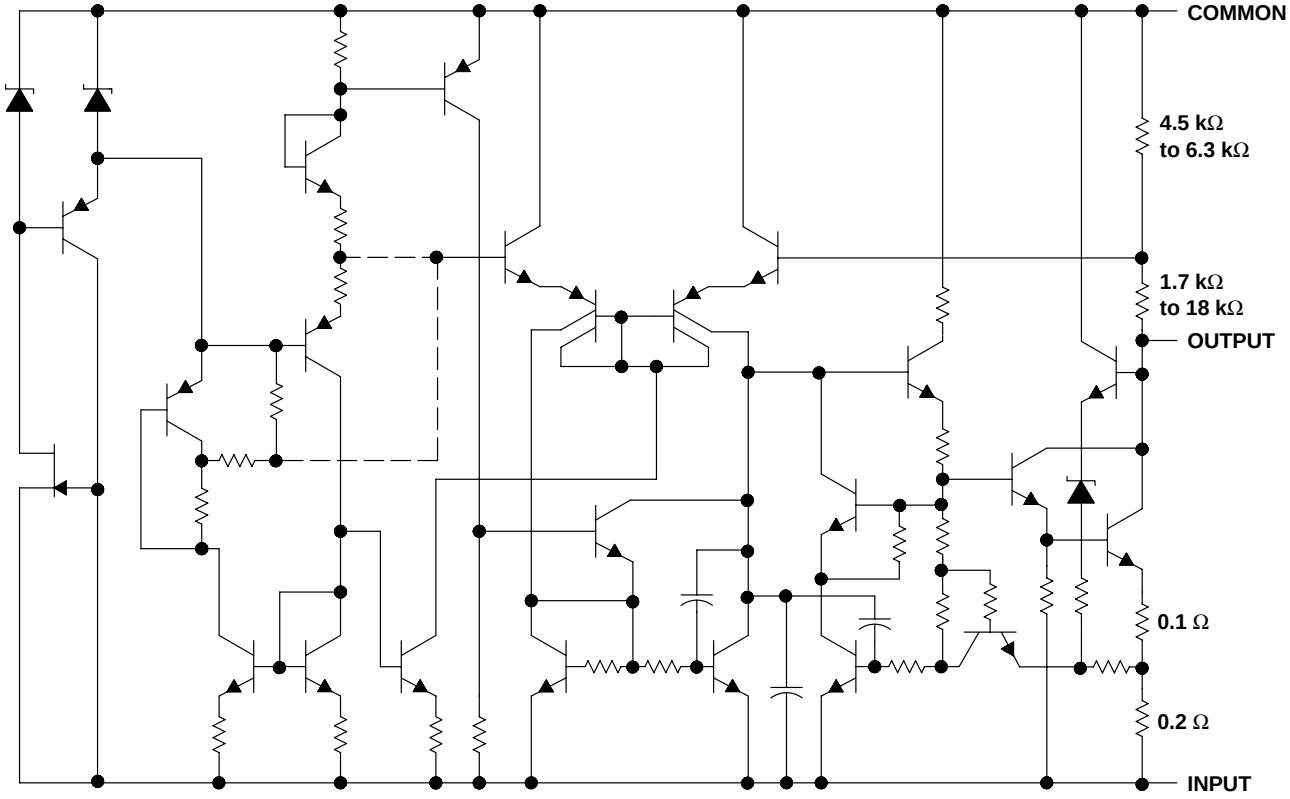
This series of fixed-negative-voltage integrated-circuit voltage regulators is designed to complement the µA78M00 series in a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. Each of these 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) (V) | PACKAGE† | | ORDERABLE PART NUMBER | TOP-SIDE 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.

## 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.

## 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 | $I_O$ = 100 mA, | $T_J$ = 0°C to 125°C | 50 | | | dB |
| | | $I_O$ = 300 mA | | 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.

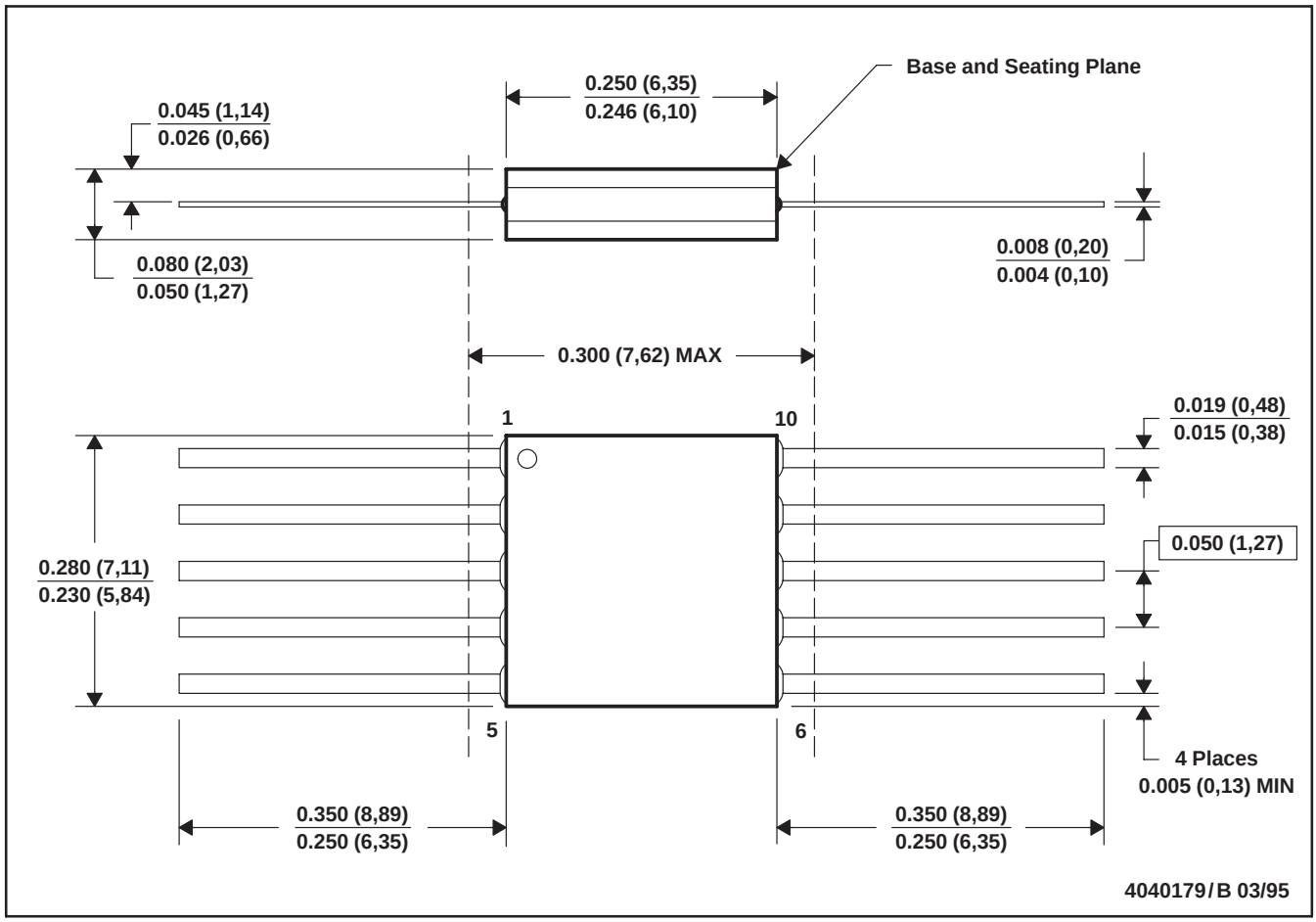
## electrical characteristics at specified virtual junction temperature, $V_I$ = –19 V, $I_O$ = 350 mA, $T_J$ = 25°C (unless otherwise noted)

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

MCFP001A – JANUARY 1995 – REVISED DECEMBER 1995

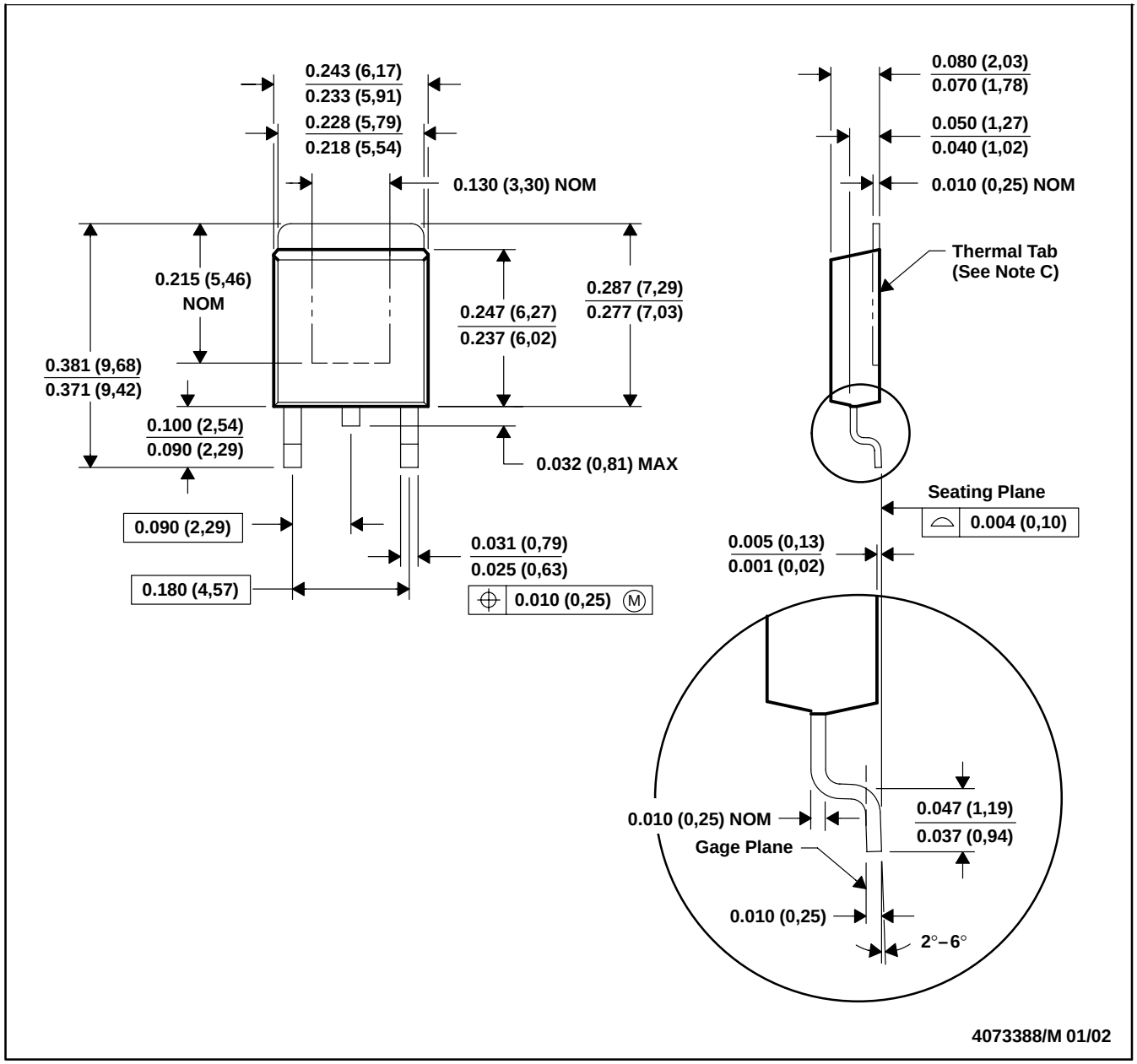
**U (S-GDFP-F10)** **CERAMIC DUAL FLATPACK**




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

MPSF001F – JANUARY 1996 – REVISED JANUARY 2002

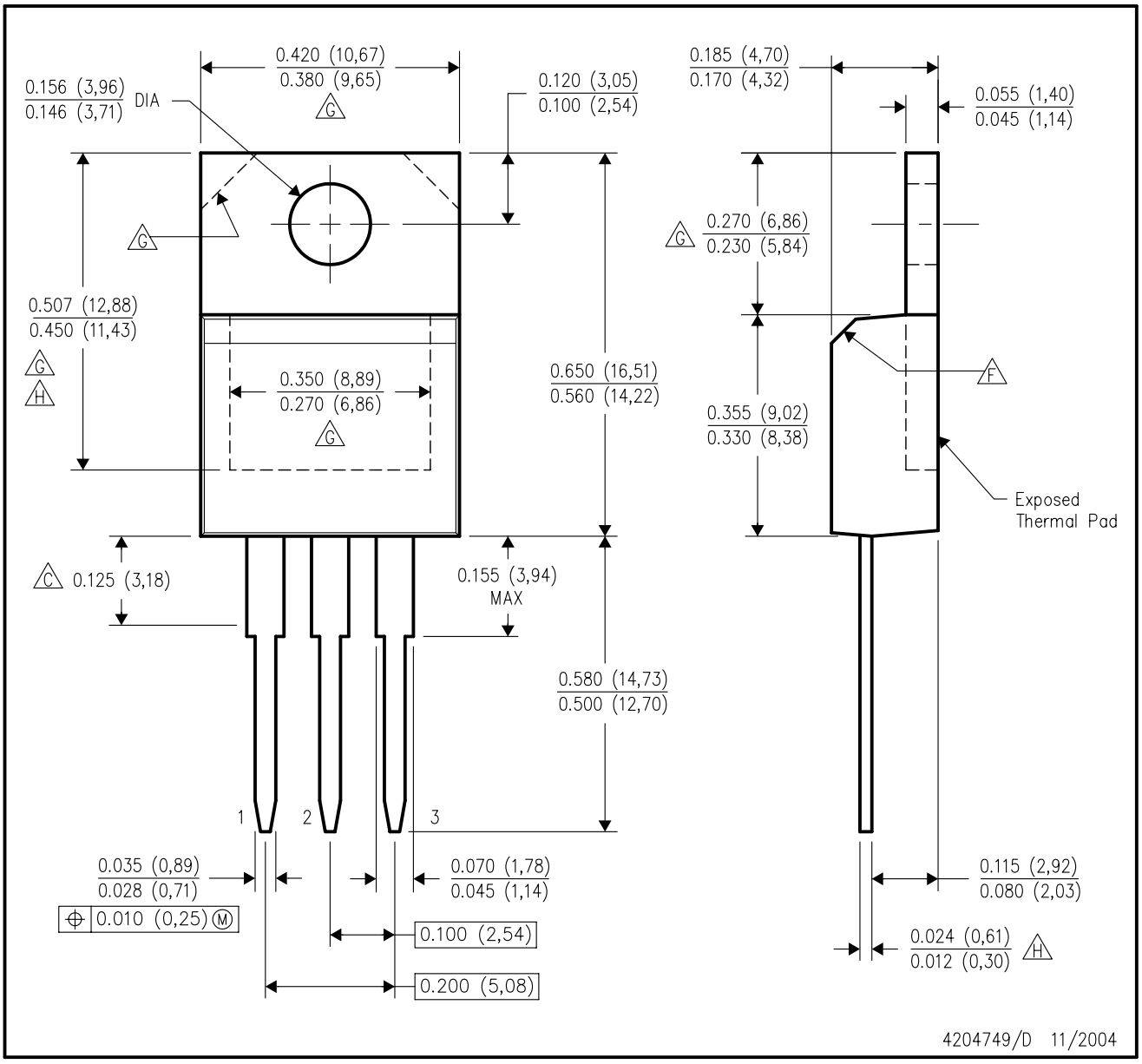
**KTP (R-PSFM-G2)** **PowerFLEX™ PLASTIC FLANGE-MOUNT PACKAGE**




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.

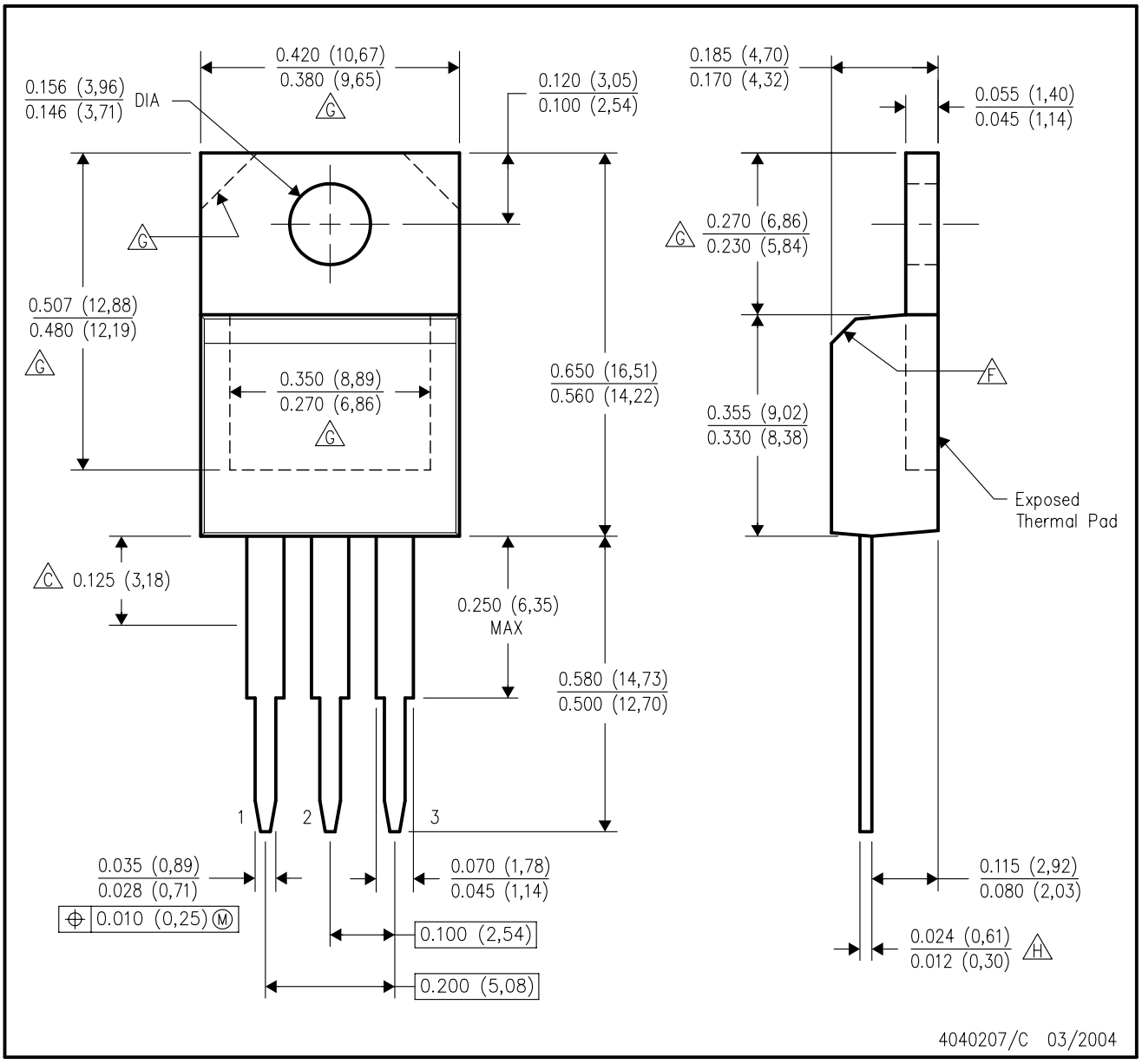
PowerFLEX is a trademark of Texas Instruments.

## 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.
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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