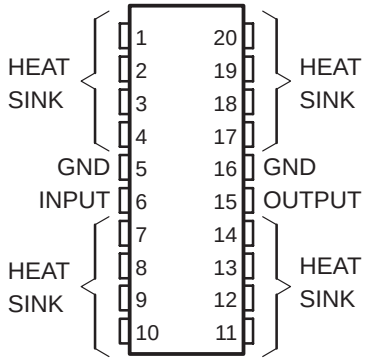
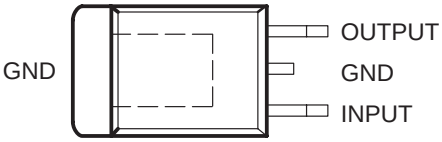
- **Fixed 1.8-V, 2.5-V, and 3.3-V Outputs**
- **±1% Maximum Output Voltage Tolerance at T_J = 25°C**
- **500-mV Maximum Dropout Voltage at 500 mA (3.3-V Option)**
- **±2% Output Voltage Variation Across Load and Temperature**
- **Internal Overcurrent Limiting**
- **Internal Thermal-Overload Protection**
- **Internal Overvoltage Protection**

PW (TSSOP) PACKAGE
(TOP VIEW)



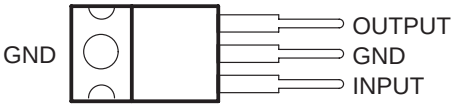
HEAT SINK − These terminals have an internal resistive connection to ground and should be grounded or electrically isolated.

KTP (PowerFLEX™/TO-252*) PACKAGE
(TOP VIEW)

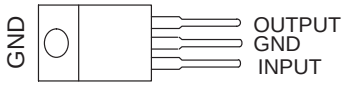


*Complies with JEDEC TO-252, variation AC

KC (TO-220) PACKAGE
(TOP VIEW)



KCS (TO-220) PACKAGE
(TOP VIEW)



description/ordering information

ORDERING INFORMATION

T_J	V_O (NOM)	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
0°C to 125°C	1.8 V	PowerFLEX™/TO-252* (KTP)	Reel of 3000	TLV2217-18KTPR	2217−18
		TO-220 (KCS)	Tube of 50	TLV2217-18KCS	TLV2217−18
	2.5 V	TO-220 (KC)	Tube of 50	TLV2217-25KC	TLV2217−25
		PowerFLEX™/TO-252* (KTP)	Reel of 3000	TLV2217-25KTPR	2217−25
		TSSOP (PW)	Tube of 70	TLV2217-25PW	2217−25
			Reel of 2000	TLV2217-25PWR	
	3.3 V	PowerFLEX™/TO-252* (KTP)	Reel of 3000	TLV2217-33KTPR	2217−33
		TO-220 (KC)	Tube of 50	TLV2217-33KC	TLV2217−33
		TSSOP (PW)	Reel of 2000	TLV2217-33PWR	2217−33

*Complies to TO-252, variation AC.
† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

description/ordering information (continued)

The TLV2217 family of low-dropout regulators offers a variety of fixed-voltage options that offer a maximum continuous input voltage of 16 V, making them more versatile than CMOS regulators. Utilizing a pnp pass element, these regulators are capable of sourcing 500 mA of current, with a specified maximum dropout of 500 mV (3.3-V and 2.5-V options), making these regulators ideal for low-voltage applications. Additionally, the TLV2217 regulators offer very tight output accuracy of ±2% across operating load and temperature ranges. Other convenient features the regulators provide are internal overcurrent limiting, thermal-overload protection, and overvoltage protection. The TLV2217 family of regulators is available in fixed voltages of 1.8 V, 2.5 V, and 3.3 V.

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

Continuous input voltage, V_I . . . . . 16 V
Operating virtual junction temperature, T_J . . . . . 150°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	θ_{JP}‡	θ_{JC}	θ_{JA}
PowerFLEX™/TO-252 (KTP)	High K, JESD 51-5	1.4°C/W	19°C/W	28°C/W
TO-220 (KC/KCS)	High K, JESD 51-5	3°C/W	17°C/W	19°C/W
TSSOP (PW)	High K, JESD 51-7		32°C/W	83°C/W

‡ For packages with exposed thermal pads, such as QFN, PowerPAD, and PowerFLEX, θ_{JP} is defined as the thermal resistance between the die junction and the bottom of the exposed pad.

NOTE 1: Maximum power dissipation is a function of $T_J(max)$, θ_{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	3.0	12	V
I_O	Output current	0	500	mA
T_J	Operating virtual junction temperature range	0	125	°C

§ Minimum V_I is equal to 3.0 V or $V_O(max)$ + 0.6 V, whichever is greater.

electrical characteristics at V_I = 4.5 V, I_O = 500 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		TLV2217-33			UNIT
			MIN	TYP	MAX	
Output voltage	I_O = 20 mA to 500 mA, V_I = 3.8 V to 5.5 V	T_J = 25°C	3.267	3.30	3.333	V
		T_J = 0°C to 125°C	3.234		3.366	
Input voltage regulation	V_I = 3.8 V to 5.5 V			5	15	mV
Ripple rejection	f = 120 Hz, V_{ripple} = 1 V_{PP}	V_I = 4.5 V		−62		dB
Output voltage regulation	I_O = 20 mA to 500 mA			5	30	mV
Output noise voltage	f = 10 Hz to 100 kHz			500		μV
Dropout voltage	I_O = 250 mA				400	mV
	I_O = 500 mA				500	
Bias current	I_O = 0			2	5	mA
	I_O = 500 mA			19	49	

† Pulse-testing techniques are used to maintain the virtual 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 22-μF tantalum capacitor, with equivalent series resistance of 1.5 Ω, on the output.

electrical characteristics at V_I = 3.3 V, I_O = 500 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		TLV2217-25			UNIT
			MIN	TYP	MAX	
Output voltage	I_O = 20 mA to 500 mA, V_I = 3.0 V to 5.5 V	T_J = 25°C	2.475	2.5	2.525	V
		T_J = 0°C to 125°C	2.45		2.55	
Input voltage regulation	V_I = 3.0 V to 5.5 V			4	12	mV
Ripple rejection	f = 120 Hz, V_{ripple} = 1 V_{PP},	V_I = 4.5 V		−62		dB
Output voltage regulation	I_O = 20 mA to 500 mA			4	23	mV
Output noise voltage	f = 10 Hz to 100 kHz			500		μV
Dropout voltage	I_O = 250 mA				400	mV
	I_O = 500 mA				500	
Bias current	I_O = 0			2	5	mA
	I_O = 500 mA			19	49	

† Pulse-testing techniques are used to maintain the virtual 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 22-μF tantalum capacitor, with equivalent series resistance of 1.5 Ω, on the output.

electrical characteristics at V_I = 3.3 V, I_O = 500 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS†		TLV2217-18			UNIT
			MIN	TYP	MAX	
Output voltage	I_O = 20 mA to 500 mA, V_I = 3.0 V to 5.5 V	T_J = 25°C	1.782	1.8	1.818	V
		T_J = 0°C to 125°C	1.764		1.836	
Input voltage regulation	V_I = 3.0 V to 5.5 V			3	9	mV
Ripple rejection	f = 120 Hz, V_{ripple} = 1 V_{PP}, V_I = 4.5 V			−62		dB
Output voltage regulation	I_O = 20 mA to 500 mA			3	17	mV
Output noise voltage	f = 10 Hz to 100 kHz			500		μV
Dropout voltage	I_O = 250 mA			‡		mV
	I_O = 500 mA			‡		
Bias current	I_O = 0			2	5	mA
	I_O = 500 mA			19	49	

† Pulse-testing techniques are used to maintain the virtual 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 22-μF tantalum capacitor, with equivalent series resistance of 1.5 Ω, on the output.

‡ Dropout voltage is limited by the input voltage range, with minimum V_I = 3.0 V.

COMPENSATION-CAPACITOR SELECTION INFORMATION

The TLV2217 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 be used to establish the capacitance value and ESR range for the best regulator performance.

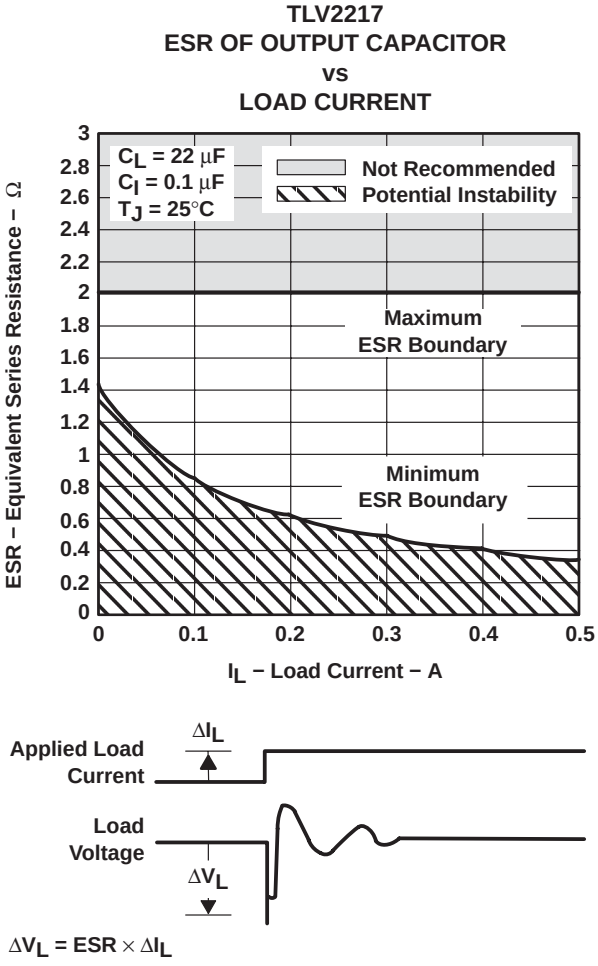


Figure 1

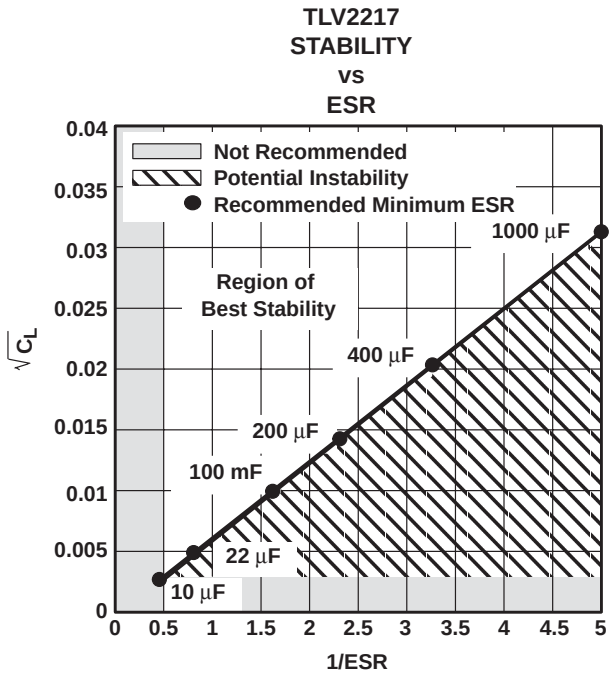


Figure 2

typical application schematic

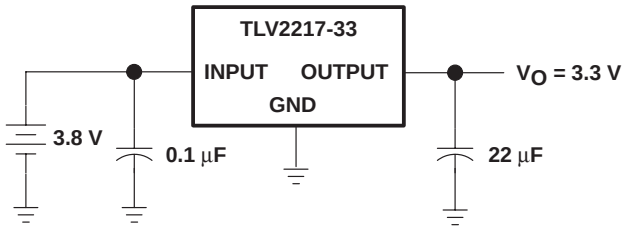


Figure 3

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/ Ball Finish	MSL Peak Temp (3)	Samples (Requires Login)
TLV2217-18KCS	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
TLV2217-18KCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
TLV2217-18KTPR	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	
TLV2217-18KTPRG3	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	
TLV2217-18KVURG3	ACTIVE	PFM	KVU	3	2500	Green (RoHS & no Sb/Br)	CU SN	Level-3-260C-168 HR	
TLV2217-25KC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
TLV2217-25KCE3	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
TLV2217-25KCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
TLV2217-25KTPR	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	
TLV2217-25KTPRG3	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	
TLV2217-25KVURG3	ACTIVE	PFM	KVU	3	2500	Green (RoHS & no Sb/Br)	CU SN	Level-3-260C-168 HR	
TLV2217-25PWR	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPD	Level-1-260C-UNLIM	
TLV2217-25PWRE4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPD	Level-1-260C-UNLIM	
TLV2217-25PWRG4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPD	Level-1-260C-UNLIM	
TLV2217-33KC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
TLV2217-33KCE3	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
TLV2217-33KCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
TLV2217-33KTPR	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	
TLV2217-33KTPRG3	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	
TLV2217-33KVURG3	ACTIVE	PFM	KVU	3	2500	Green (RoHS & no Sb/Br)	CU SN	Level-3-260C-168 HR	
TLV2217-33PWR	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
TLV2217-33PWRE4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	
TLV2217-33PWRG4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	

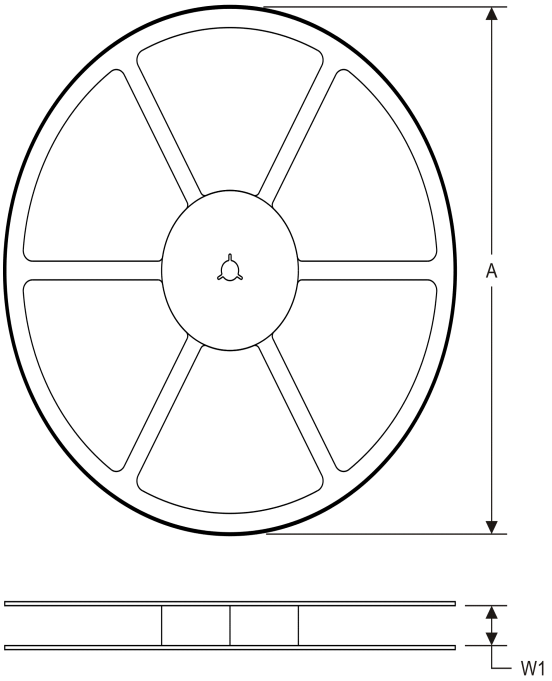
(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, 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), 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)

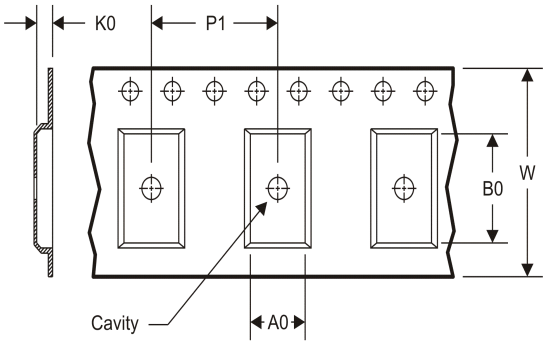
(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



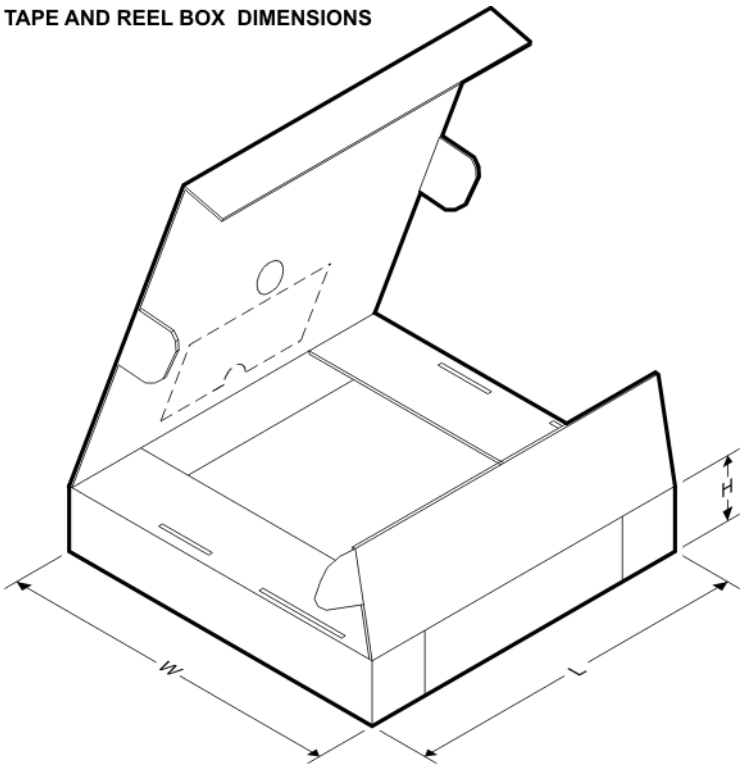
A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

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
TLV2217-18KVURG3	PFM	KVU	3	2500	330.0	16.4	6.9	10.5	2.7	8.0	16.0	Q2
TLV2217-25KVURG3	PFM	KVU	3	2500	330.0	16.4	6.9	10.5	2.7	8.0	16.0	Q2
TLV2217-25PWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1
TLV2217-33KVURG3	PFM	KVU	3	2500	330.0	16.4	6.9	10.5	2.7	8.0	16.0	Q2
TLV2217-33PWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1

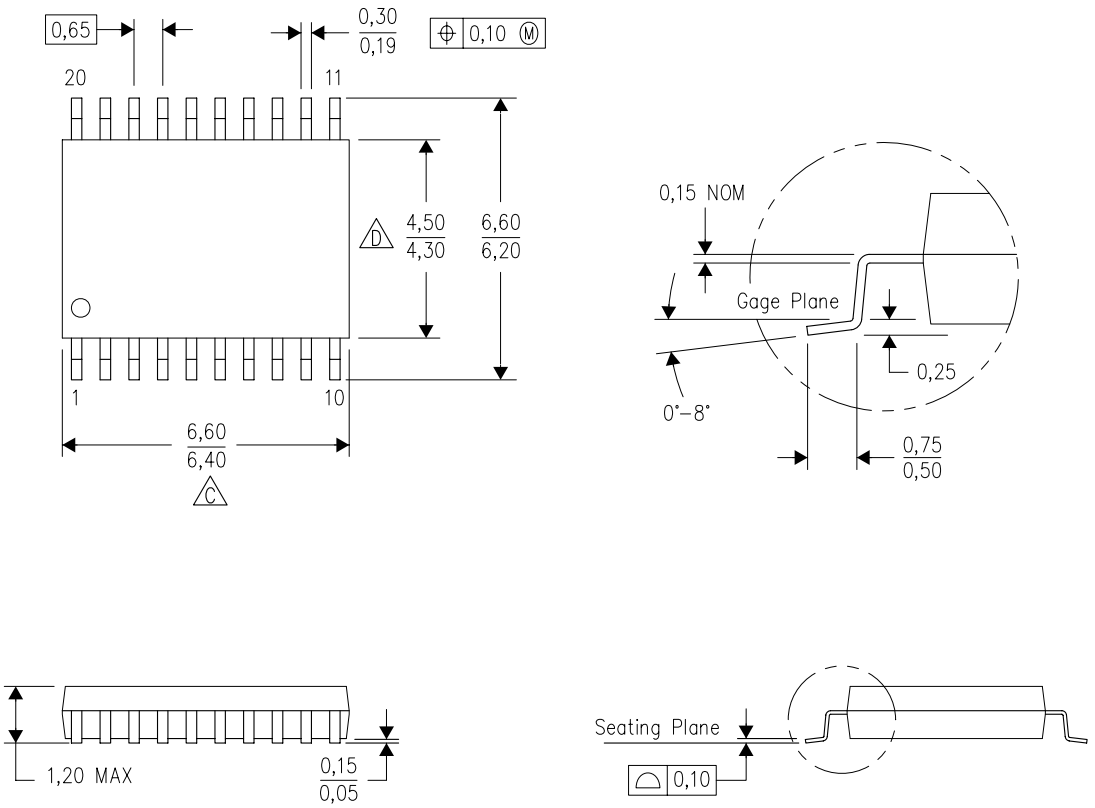
TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TLV2217-18KVURG3	PFM	KVU	3	2500	340.0	340.0	38.0
TLV2217-25KVURG3	PFM	KVU	3	2500	340.0	340.0	38.0
TLV2217-25PWR	TSSOP	PW	20	2000	367.0	367.0	38.0
TLV2217-33KVURG3	PFM	KVU	3	2500	340.0	340.0	38.0
TLV2217-33PWR	TSSOP	PW	20	2000	367.0	367.0	38.0

PW (R–PDSO–G20) PLASTIC SMALL OUTLINE

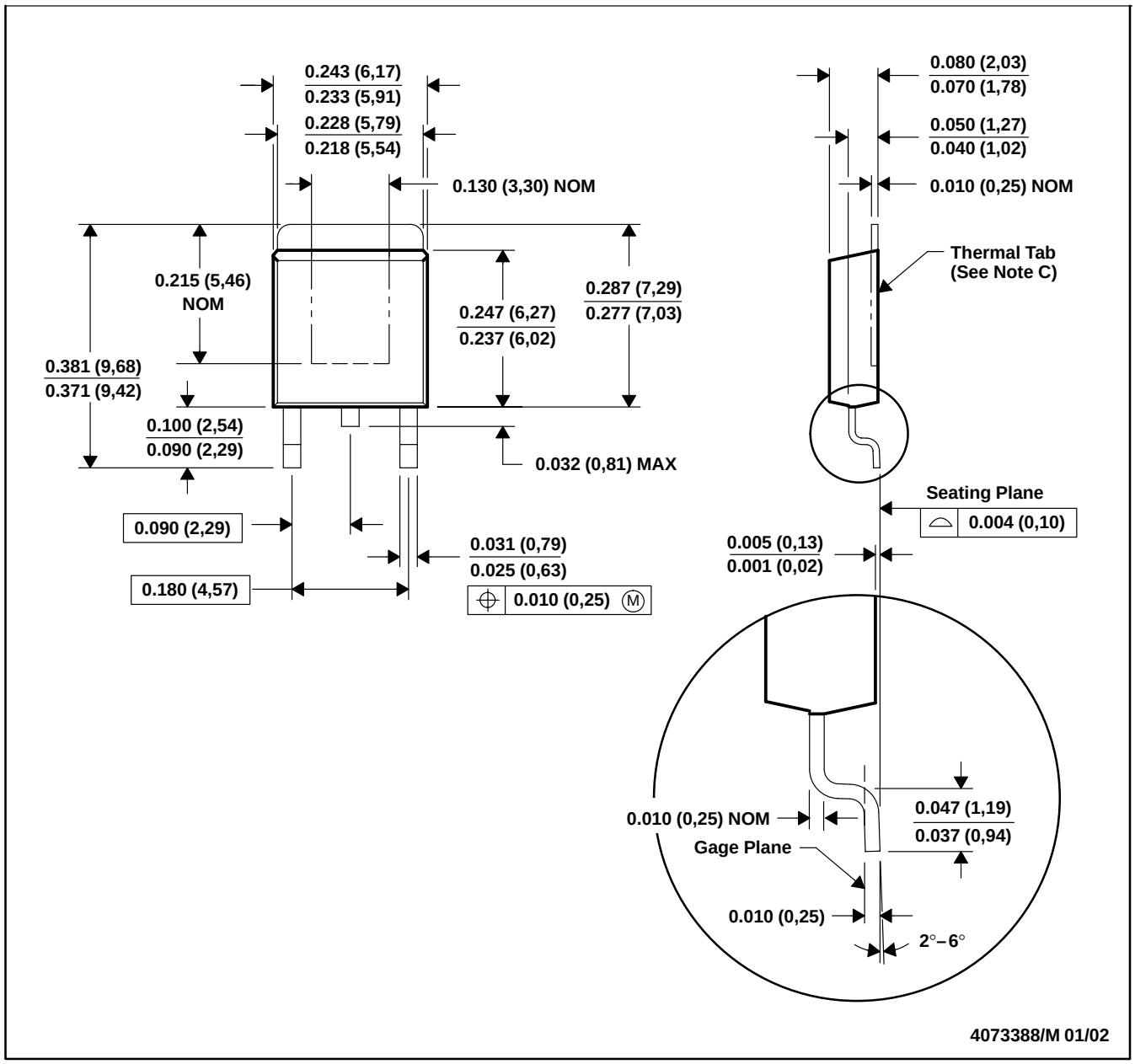


4040064–5/G 02/11

NOTES:
A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M–1994.
B. This drawing is subject to change without notice.
C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.
D. Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.
E. Falls within JEDEC MO–153

MPSF001F – JANUARY 1996 – REVISED JANUARY 2002

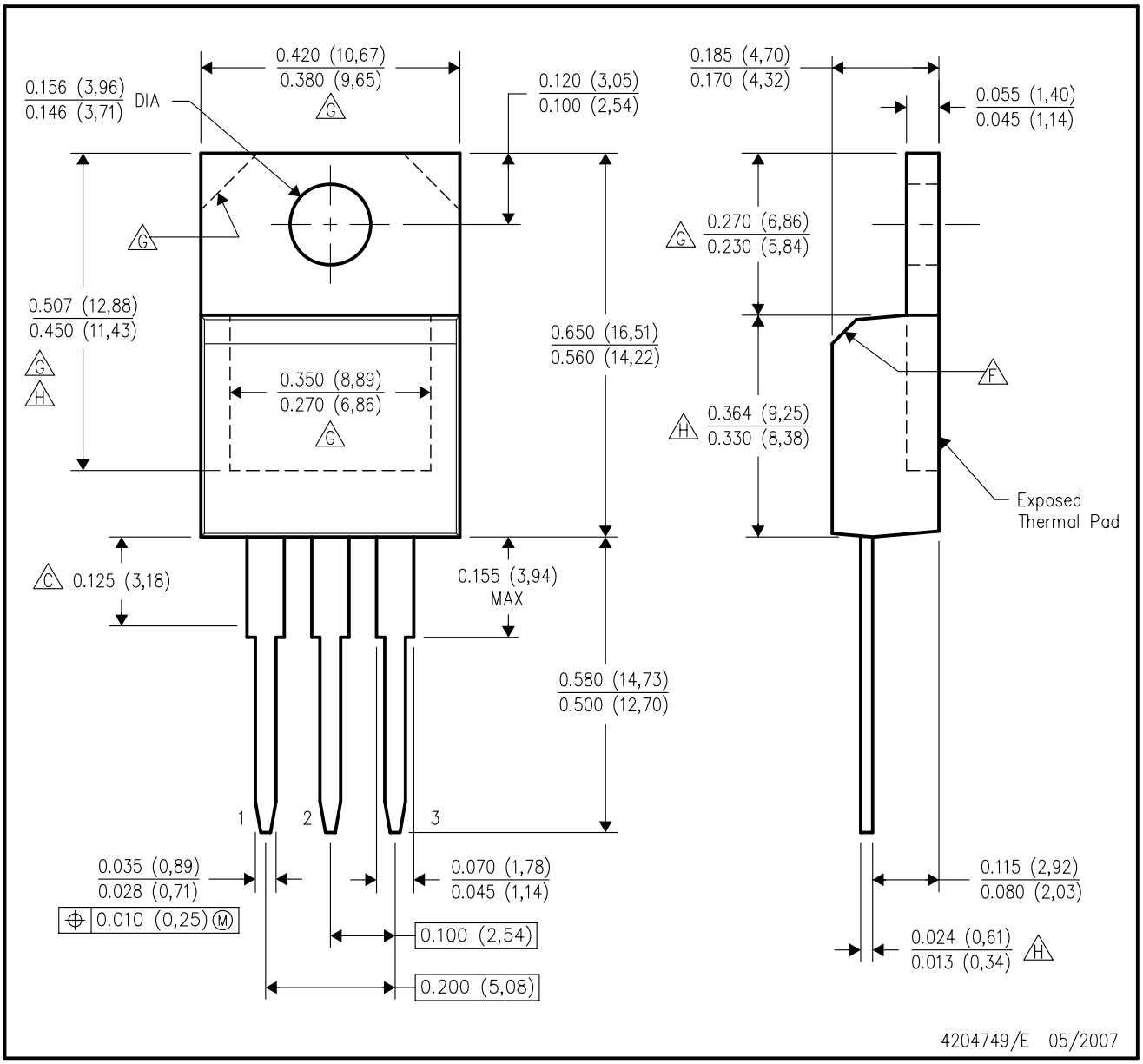
KTP (R-PSFM-G2) **PowerFLEX™ PLASTIC FLANGE-MOUNT PACKAGE**



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.

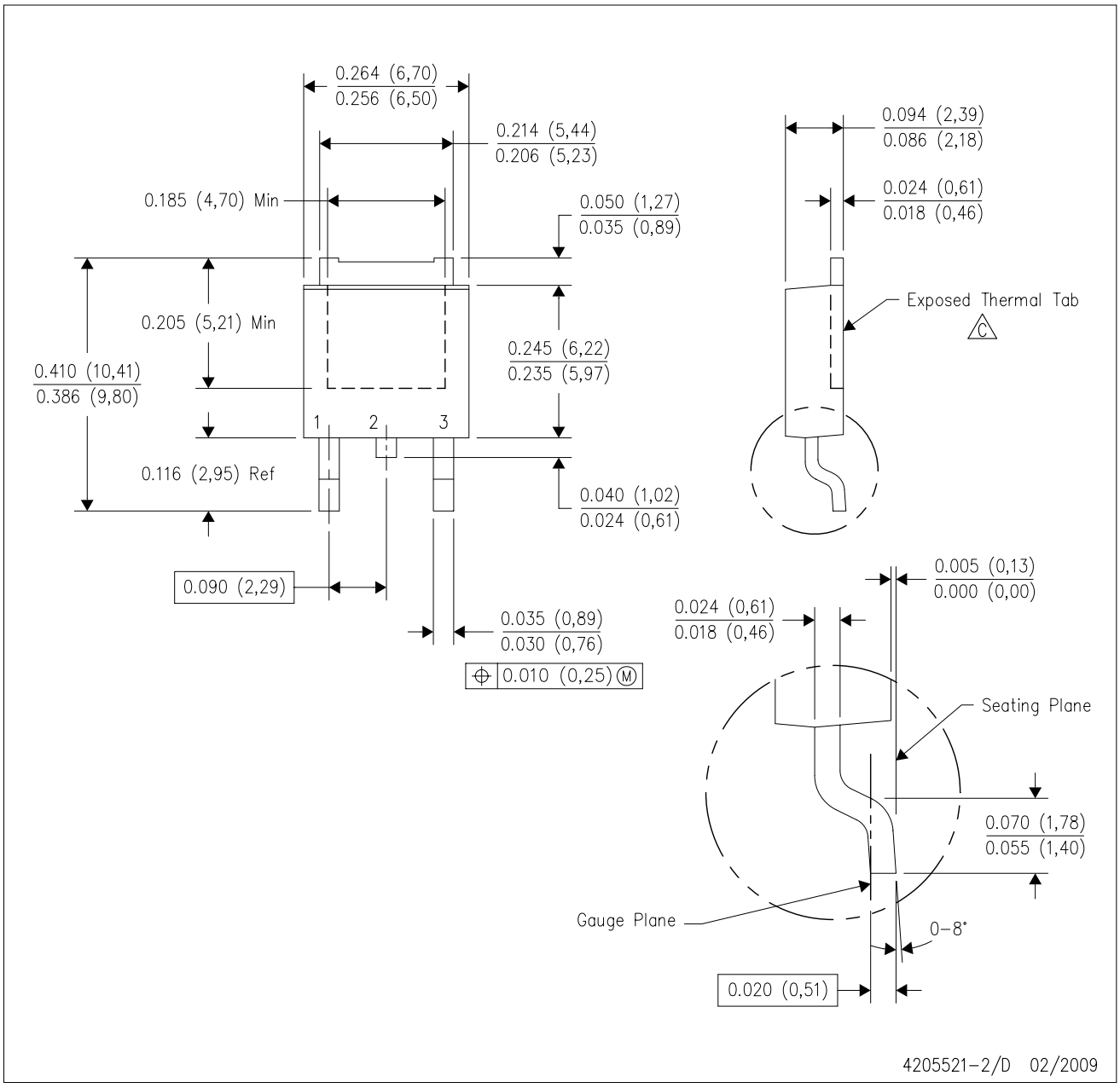
PowerFLEX is a trademark of Texas Instruments.

KCS (R–PSFM–T3) PLASTIC FLANGE–MOUNT PACKAGE



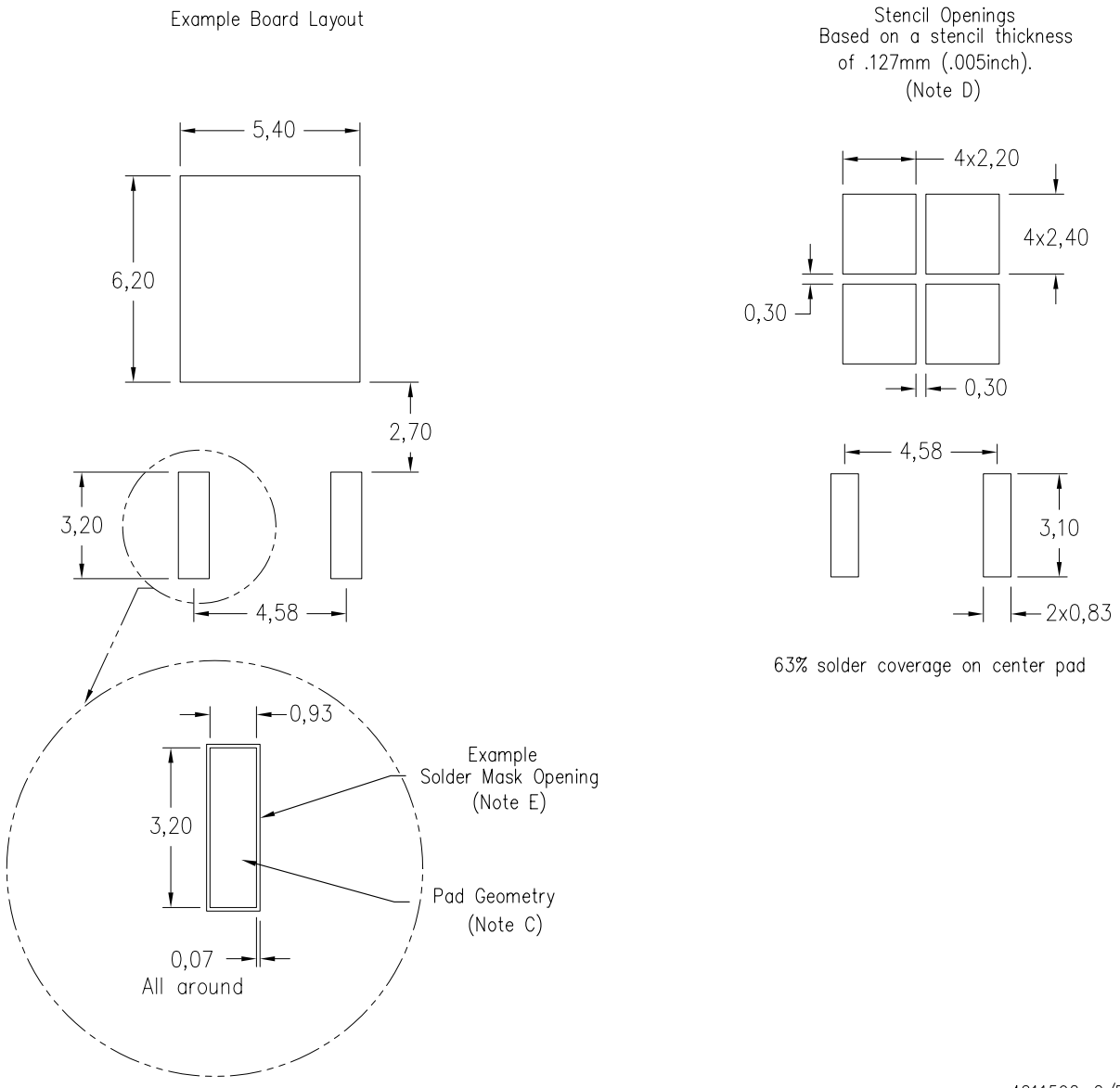
NOTES:
- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. Lead dimensions are not controlled within this area.
- D. All lead dimensions apply before solder dip.
- E. The center lead is in electrical contact with the mounting tab.
- F. The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

KVU (R–PSFM–G3) PLASTIC FLANGE–MOUNT PACKAGE



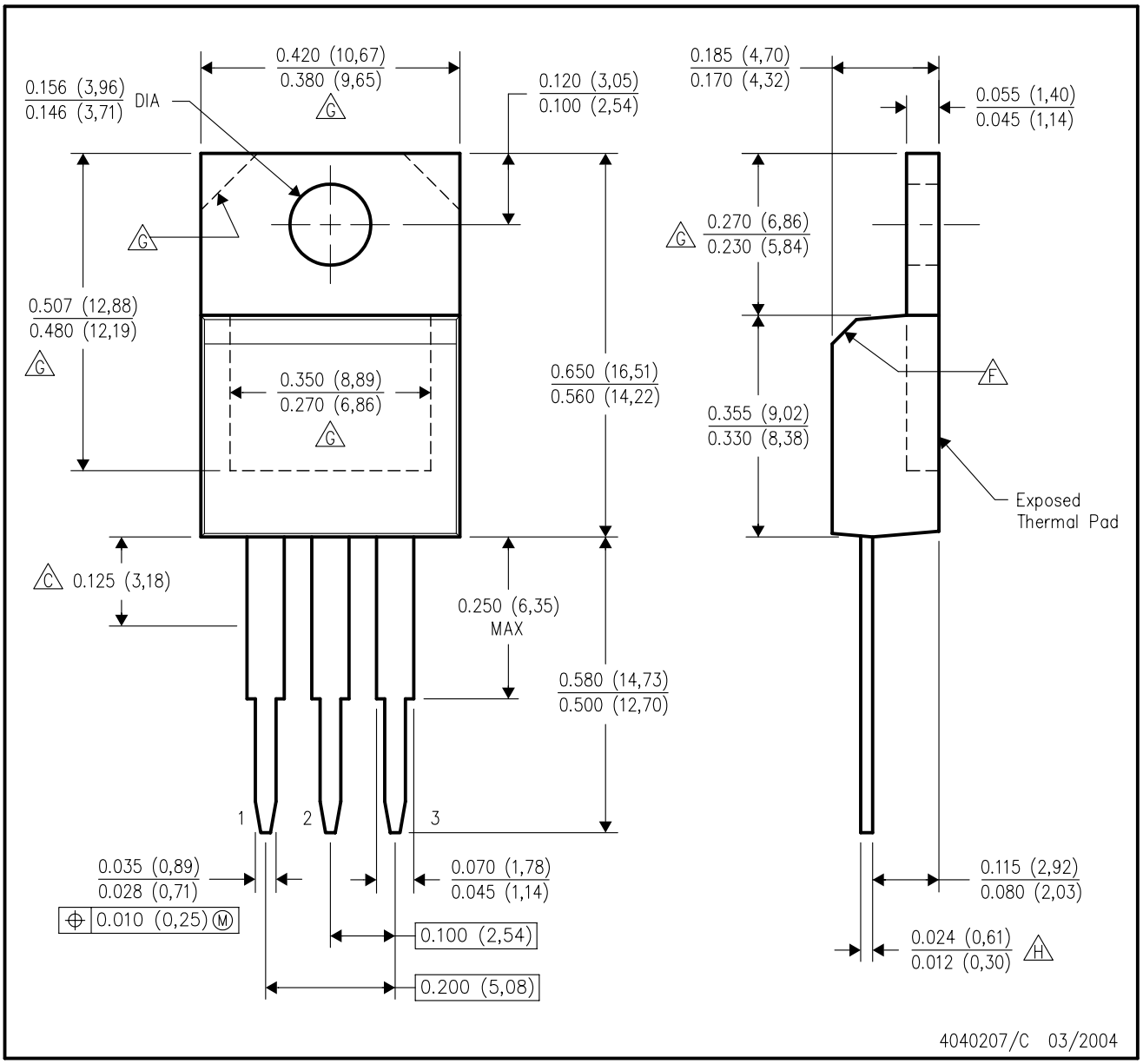
NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. The center lead is in electrical contact with the exposed thermal tab.
D. Body Dimensions do not include mold flash or protrusions. Mold flash and protrusion shall not exceed 0.006 (0,15) per side.
E. Falls within JEDEC TO–252 variation AA.

KVU (R–PSFM–G3) PLASTIC FLANGE MOUNT PACKAGE



NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Publication IPC–SM–782 is an alternate information source for PCB land pattern designs.
D. 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.
E. 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



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 JESD46C and to discontinue any product or service per JESD48B. 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 which meet ISO/TS16949 requirements, mainly for automotive use. Components which have not been so designated are neither designed nor intended for automotive use; and TI will not be responsible for any failure of such components to meet such requirements.

Products		**Applications**	
Audio	www.ti.com/audio	Automotive and Transportation	www.ti.com/automotive
Amplifiers	amplifier.ti.com	Communications and Telecom	www.ti.com/communications
Data Converters	dataconverter.ti.com	Computers and Peripherals	www.ti.com/computers
DLP® Products	www.dlp.com	Consumer Electronics	www.ti.com/consumer-apps
DSP	dsp.ti.com	Energy and Lighting	www.ti.com/energy
Clocks and Timers	www.ti.com/clocks	Industrial	www.ti.com/industrial
Interface	interface.ti.com	Medical	www.ti.com/medical
Logic	logic.ti.com	Security	www.ti.com/security
Power Mgmt	power.ti.com	Space, Avionics and Defense	www.ti.com/space-avionics-defense
Microcontrollers	microcontroller.ti.com	Video and Imaging	www.ti.com/video
RFID	www.ti-rfid.com		
OMAP Mobile Processors	www.ti.com/omap	**TI E2E Community**	e2e.ti.com
Wireless Connectivity	www.ti.com/wirelessconnectivity		

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265