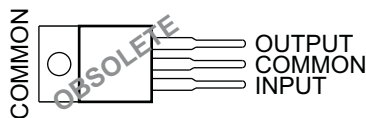
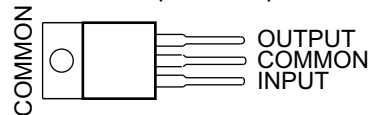
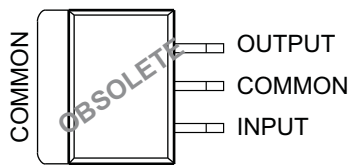
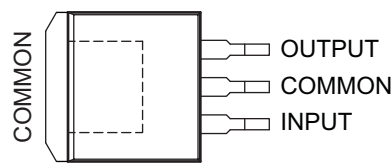


## FIXED POSITIVE VOLTAGE REGULATORS

 Check for Samples: [μA7800 SERIES](#)

### FEATURES

- 3-Terminal Regulators
- Available in fixed 5V/8V/10V/12V/15V/24V options
- Output Current up to 1.5 A
- Internal Thermal-Overload Protection
- High Power-Dissipation Capability
- Internal Short-Circuit Current Limiting
- Output Transistor Safe-Area Compensation

**KC (TO-220) PACKAGE  
(TOP VIEW)**

**KCS OR KCT (TO-220) PACKAGE  
(TOP VIEW)**

**KTE (PowerFLEX™) PACKAGE  
(TOP VIEW)**

**KTT (TO-263) PACKAGE  
(TOP VIEW)**


### DESCRIPTION/ORDERING INFORMATION

This series of fixed-voltage integrated-circuit voltage regulators is designed for 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 can deliver up to 1.5 A 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 can be used as the power-pass element in precision regulators.



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.

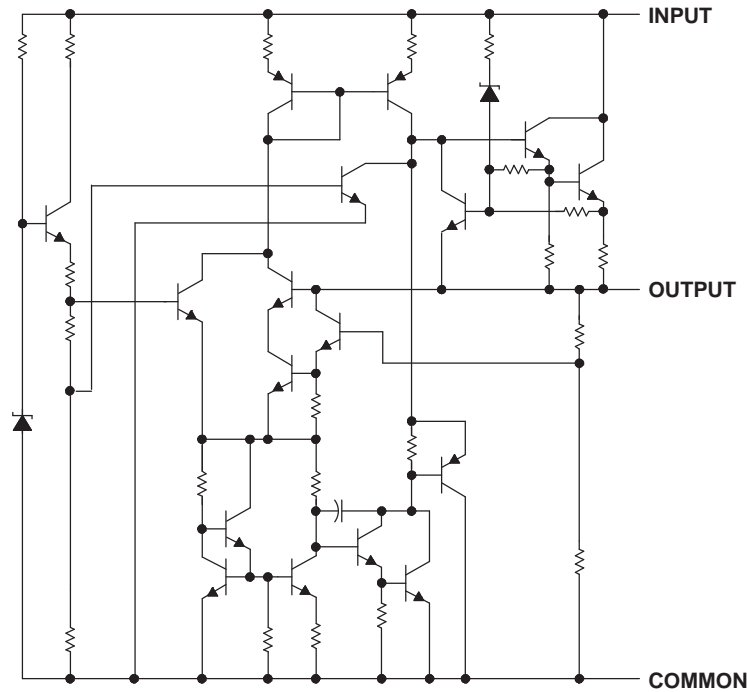
PowerFLEX, PowerPAD are trademarks of Texas Instruments.

**ORDERING INFORMATION<sup>(1)</sup>**

T <sub>J</sub>	V <sub>O(NOM)</sub>	PACKAGE <sup>(2)</sup>		ORDERABLE PART NUMBER	TOP-SIDE MARKING
0°C to 125°C	5 V	TO-220, short shoulder – KCS	Tube of 50	UA7805CKCS	UA7805C
		TO-220, single gauge – KCT	Tube of 50	UA7805CKCT	UA7805C
		TO-263 – KTT	Reel of 500	UA7805CKTTR	UA7805C
		PowerFLEX™ – KTE		OBSOLETE	OBSOLETE
		TO-220 – KC		OBSOLETE	OBSOLETE
	8 V	TO-220, short shoulder – KCS	Tube of 50	UA7808CKCS	UA7808C
		TO-220, single gauge – KCT	Tube of 50	UA7808CKCT	<b>PREVIEW</b>
		TO-263 – KTT	Reel of 500	UA7808CKTTR	UA7808C
		PowerFLEX – KTE		OBSOLETE	OBSOLETE
		TO-220 – KC		OBSOLETE	OBSOLETE
	10 V	TO-220, short shoulder – KCS	Tube of 50	UA7810CKCS	UA7810C
		TO-263 – KTT	Reel of 500	UA7810CKTTR	UA7810C
		PowerFLEX – KTE		OBSOLETE	OBSOLETE
		TO-220 – KC		OBSOLETE	OBSOLETE
	12 V	TO-220, short shoulder – KCS	Tube of 50	UA7812CKCS	UA7812C
		TO-220, single gauge – KCT	Tube of 50	UA7812CKCT	UA7812C
		TO-263 – KTT	Reel of 500	UA7812CKTTR	UA7812C
		PowerFLEX – KTE		OBSOLETE	OBSOLETE
		TO-220 – KC		OBSOLETE	OBSOLETE
	15 V	TO-220, short shoulder – KCS	Tube of 50	UA7815CKCS	UA7815C
		TO-220, single gauge – KCT	Tube of 50	UA7815CKCT	<b>PREVIEW</b>
		TO-263 – KTT	Reel of 500	UA7815CKTTR	UA7815C
		PowerFLEX – KTE		OBSOLETE	OBSOLETE
		TO-220 – KC		OBSOLETE	OBSOLETE
24 V	TO-220, short shoulder – KCS	Tube of 50	UA7824CKCS	UA7824C	
	TO-263 – KTT	Reel of 500	UA7824CKTTR	UA7824C	
	PowerFLEX – KTE		OBSOLETE	OBSOLETE	
	TO-220 – KC		OBSOLETE	OBSOLETE	

- (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](http://www.ti.com).
- (2) Package drawings, thermal data, and symbolization are available at [www.ti.com/packaging](http://www.ti.com/packaging).

Figure 1. SCHEMATIC



**Absolute Maximum Ratings<sup>(1)</sup>**

over virtual junction temperature range (unless otherwise noted)

		MIN	MAX	UNIT
V <sub>I</sub>	Input voltage	μA7824C		V
		All others		
T <sub>J</sub>	Operating virtual junction temperature		150	°C
	Lead temperature	1,6 mm (1/16 in) from case for 10 s		°C
T <sub>stg</sub>	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.

**Package Thermal Data<sup>(1)</sup>**

PACKAGE	BOARD	θ <sub>JA</sub>	θ <sub>JC</sub>	θ <sub>JP</sub> <sup>(2)</sup>
PowerFLEX (KTE) – OBSOLETE	High K, JESD 51-5	23°C/W	3°C/W	2.7°C/W
TO-220 (KCS), (KCT) (KC – OBSOLETE)	High K, JESD 51-5	19°C/W	17°C/W	3°C/W
TO-263 (KTT)	High K, JESD 51-5	25.3°C/W	18°C/W	1.94°C/W

(1) Maximum power dissipation is a function of T<sub>J(max)</sub>, θ<sub>JA</sub>, and T<sub>A</sub>. The maximum allowable power dissipation at any allowable ambient temperature is P<sub>D</sub> = (T<sub>J(max)</sub> – T<sub>A</sub>)/θ<sub>JA</sub>. Operating at the absolute maximum T<sub>J</sub> of 150°C can affect reliability.  
 (2) For packages with exposed thermal pads, such as QFN, PowerPAD™, or PowerFLEX, θ<sub>JP</sub> is defined as the thermal resistance between the die junction and the bottom of the exposed pad.

**Recommended Operating Conditions**

		MIN	MAX	UNIT	
V <sub>I</sub>	Input voltage	μA7805	7	25	V
		μA7808	10.5	25	
		μA7810	12.5	28	
		μA7812	14.5	30	
		μA7815	17.5	30	
		μA7824	27	38	
I <sub>O</sub>	Output current		1.5	A	
T <sub>J</sub>	Operating virtual junction temperature	0	125	°C	

## uA7805 Electrical Characteristics

at specified virtual junction temperature,  $V_I = 10\text{ V}$ ,  $I_O = 500\text{ mA}$  (unless otherwise noted)

PARAMETER	TEST CONDITIONS	$T_J$ (1)	μA7805C			UNIT
			MIN	TYP	MAX	
Output voltage	$I_O = 5\text{ mA to }1\text{ A}$ , $V_I = 7\text{ V to }20\text{ V}$ , $P_D \leq 15\text{ W}$	25°C	4.8	5	5.2	V
		0°C to 125°C	4.75		5.25	
Input voltage regulation	$V_I = 7\text{ V to }25\text{ V}$	25°C		3	100	mV
	$V_I = 8\text{ V to }12\text{ V}$			1	50	
Ripple rejection (2)	$V_I = 8\text{ V to }12\text{ V}$ , $f = 120\text{ Hz}$	0°C to 125°C	62	78		dB
	$V_I = 8\text{ V to }12\text{ V}$ , $f = 120\text{ Hz (KCT)}$			68		
Output voltage regulation	$I_O = 5\text{ mA to }1.5\text{ A}$	25°C		15	100	mV
	$I_O = 250\text{ mA to }750\text{ mA}$			5	50	
Output resistance	$f = 1\text{ kHz}$	0°C to 125°C		0.017		Ω
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$	0°C to 125°C		-1.1		mV/°C
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$	25°C		40		μV
Dropout voltage	$I_O = 1\text{ A}$	25°C		2		V
Bias current		25°C		4.2	8	mA
Bias current change	$V_I = 7\text{ V to }25\text{ V}$	0°C to 125°C			1.3	mA
	$I_O = 5\text{ mA to }1\text{ A}$				0.5	
Short-circuit output current		25°C		750		mA
Peak output current		25°C		2.2		A

(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 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

(2) This parameter is validated by design and verified during product characterization. It is not tested in production.

## uA7808 Electrical Characteristics

at specified virtual junction temperature,  $V_I = 14\text{ V}$ ,  $I_O = 500\text{ mA}$  (unless otherwise noted)

PARAMETER	TEST CONDITIONS	$T_J$ (1)	μA7808C			UNIT
			MIN	TYP	MAX	
Output voltage	$I_O = 5\text{ mA to }1\text{ A}$ , $V_I = 10.5\text{ V to }23\text{ V}$ , $P_D \leq 15\text{ W}$	25°C	7.7	8	8.3	V
		0°C to 125°C	7.6		8.4	
Input voltage regulation	$V_I = 10.5\text{ V to }25\text{ V}$	25°C		6	160	mV
	$V_I = 11\text{ V to }17\text{ V}$			2	80	
Ripple rejection (2)	$V_I = 11.5\text{ V to }21.5\text{ V}$ , $f = 120\text{ Hz}$	0°C to 125°C	55	72		dB
Output voltage regulation	$I_O = 5\text{ mA to }1.5\text{ A}$	25°C		12	160	mV
	$I_O = 250\text{ mA to }750\text{ mA}$			4	80	
Output resistance	$f = 1\text{ kHz}$	0°C to 125°C		0.016		Ω
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$	0°C to 125°C		-0.8		mV/°C
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$	25°C		52		μV
Dropout voltage	$I_O = 1\text{ A}$	25°C		2		V
Bias current		25°C		4.3	8	mA
Bias current change	$V_I = 10.5\text{ V to }25\text{ V}$	0°C to 125°C			1	mA
	$I_O = 5\text{ mA to }1\text{ A}$				0.5	
Short-circuit output current		25°C		450		mA
Peak output current		25°C		2.2		A

(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 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.

(2) This parameter is validated by design and verified during product characterization. It is not tested in production.

### µA7810 Electrical Characteristics

at specified virtual junction temperature,  $V_I = 17\text{ V}$ ,  $I_O = 500\text{ mA}$  (unless otherwise noted)

PARAMETER	TEST CONDITIONS	$T_J$ (1)	µA7810C			UNIT
			MIN	TYP	MAX	
Output voltage	$I_O = 5\text{ mA to }1\text{ A}$ , $V_I = 12.5\text{ V to }25\text{ V}$ , $P_D \leq 15\text{ W}$	25°C	9.6	10	10.4	V
		0°C to 125°C	9.5		10.5	
Input voltage regulation	$V_I = 12.5\text{ V to }28\text{ V}$	25°C		7	200	mV
	$V_I = 14\text{ V to }20\text{ V}$			2	100	
Ripple rejection (2)	$V_I = 13\text{ V to }23\text{ V}$ , $f = 120\text{ Hz}$	0°C to 125°C	55	71		dB
Output voltage regulation	$I_O = 5\text{ mA to }1.5\text{ A}$	25°C		12	200	mV
	$I_O = 250\text{ mA to }750\text{ mA}$			4	100	
Output resistance	$f = 1\text{ kHz}$	0°C to 125°C		0.018		Ω
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$	0°C to 125°C		-1		mV/°C
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$	25°C		70		µV
Dropout voltage	$I_O = 1\text{ A}$	25°C		2		V
Bias current		25°C		4.3	8	mA
Bias current change	$V_I = 12.5\text{ V to }28\text{ V}$	0°C to 125°C			1	mA
	$I_O = 5\text{ mA to }1\text{ A}$				0.5	
Short-circuit output current		25°C		400		mA
Peak output current		25°C		2.2		A

- (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 0.33-µF capacitor across the input and a 0.1-µF capacitor across the output.
- (2) This parameter is validated by design and verified during product characterization. It is not tested in production.

### µA7812 Electrical Characteristics

at specified virtual junction temperature,  $V_I = 19\text{ V}$ ,  $I_O = 500\text{ mA}$  (unless otherwise noted)

PARAMETER	TEST CONDITIONS	$T_J$ (1)	µA7812C			UNIT
			MIN	TYP	MAX	
Output voltage	$I_O = 5\text{ mA to }1\text{ A}$ , $V_I = 14.5\text{ V to }27\text{ V}$ , $P_D \leq 15\text{ W}$	25°C	11.5	12	12.5	V
		0°C to 125°C	11.4		12.6	
Input voltage regulation	$V_I = 14.5\text{ V to }30\text{ V}$	25°C		10	240	mV
	$V_I = 16\text{ V to }22\text{ V}$			3	120	
Ripple rejection (2)	$V_I = 15\text{ V to }25\text{ V}$ , $f = 120\text{ Hz}$	0°C to 125°C	55	71		dB
	$V_I = 15\text{ V to }25\text{ V}$ , $f = 120\text{ Hz (KCT)}$			61		
Output voltage regulation	$I_O = 5\text{ mA to }1.5\text{ A}$	25°C		12	240	mV
	$I_O = 250\text{ mA to }750\text{ mA}$			4	120	
Output resistance	$f = 1\text{ kHz}$	0°C to 125°C		0.018		Ω
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$	0°C to 125°C		-1		mV/°C
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$	25°C		75		µV
Dropout voltage	$I_O = 1\text{ A}$	25°C		2		V
Bias current		25°C		4.3	8	mA
Bias current change	$V_I = 14.5\text{ V to }30\text{ V}$	0°C to 125°C			1	mA
	$I_O = 5\text{ mA to }1\text{ A}$				0.5	
Short-circuit output current		25°C		350		mA
Peak output current		25°C		2.2		A

- (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 0.33-µF capacitor across the input and a 0.1-µF capacitor across the output.
- (2) This parameter is validated by design and verified during product characterization. It is not tested in production.

### uA7815 Electrical Characteristics

at specified virtual junction temperature,  $V_I = 23\text{ V}$ ,  $I_O = 500\text{ mA}$  (unless otherwise noted)

PARAMETER	TEST CONDITIONS	$T_J$ (1)	μA7815C			UNIT
			MIN	TYP	MAX	
Output voltage	$I_O = 5\text{ mA to }1\text{ A}$ , $V_I = 17.5\text{ V to }30\text{ V}$ , $P_D \leq 15\text{ W}$	25°C	14.4	15	15.6	V
		0°C to 125°C	14.25		15.75	
Input voltage regulation	$V_I = 17.5\text{ V to }30\text{ V}$	25°C		11	300	mV
	$V_I = 20\text{ V to }26\text{ V}$			3	150	
Ripple rejection (2)	$V_I = 18.5\text{ V to }28.5\text{ V}$ , $f = 120\text{ Hz}$	0°C to 125°C	54	70		dB
Output voltage regulation	$I_O = 5\text{ mA to }1.5\text{ A}$	25°C		12	300	mV
	$I_O = 250\text{ mA to }750\text{ mA}$			4	150	
Output resistance	$f = 1\text{ kHz}$	0°C to 125°C		0.019		Ω
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$	0°C to 125°C		-1		mV/°C
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$	25°C		90		μV
Dropout voltage	$I_O = 1\text{ A}$	25°C		2		V
Bias current		25°C		4.4	8	mA
Bias current change	$V_I = 17.5\text{ V to }30\text{ V}$	0°C to 125°C			1	mA
	$I_O = 5\text{ mA to }1\text{ A}$				0.5	
Short-circuit output current		25°C		230		mA
Peak output current		25°C		2.1		A

- (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 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.
- (2) This parameter is validated by design and verified during product characterization. It is not tested in production.

### uA7824 Electrical Characteristics

at specified virtual junction temperature,  $V_I = 33\text{ V}$ ,  $I_O = 500\text{ mA}$  (unless otherwise noted)

PARAMETER	TEST CONDITIONS	$T_J$ (1)	μA7824C			UNIT
			MIN	TYP	MAX	
Output voltage	$I_O = 5\text{ mA to }1\text{ A}$ , $V_I = 27\text{ V to }38\text{ V}$ , $P_D \leq 15\text{ W}$	25°C	23	24	25	V
		0°C to 125°C	22.8		25.2	
Input voltage regulation	$V_I = 27\text{ V to }38\text{ V}$	25°C		18	480	mV
	$V_I = 30\text{ V to }36\text{ V}$			6	240	
Ripple rejection (2)	$V_I = 28\text{ V to }38\text{ V}$ , $f = 120\text{ Hz}$	0°C to 125°C	50	66		dB
Output voltage regulation	$I_O = 5\text{ mA to }1.5\text{ A}$	25°C		12	480	mV
	$I_O = 250\text{ mA to }750\text{ mA}$			4	240	
Output resistance	$f = 1\text{ kHz}$	0°C to 125°C		0.028		Ω
Temperature coefficient of output voltage	$I_O = 5\text{ mA}$	0°C to 125°C		-1.5		mV/°C
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$	25°C		170		μV
Dropout voltage	$I_O = 1\text{ A}$	25°C		2		V
Bias current		25°C		4.6	8	mA
Bias current change	$V_I = 27\text{ V to }38\text{ V}$	0°C to 125°C			1	mA
	$I_O = 5\text{ mA to }1\text{ A}$				0.5	
Short-circuit output current		25°C		150		mA
Peak output current		25°C		2.1		A

- (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 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output.
- (2) This parameter is validated by design and verified during product characterization. It is not tested in production.

APPLICATION INFORMATION

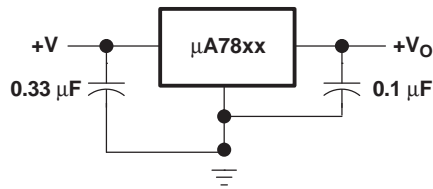


Figure 2. Fixed-Output Regulator

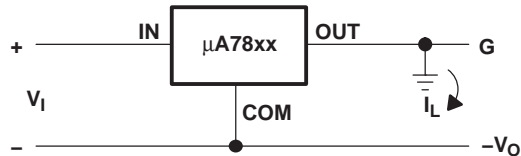
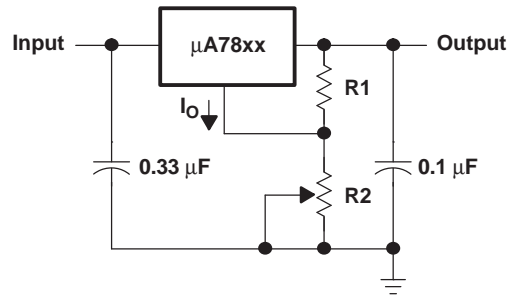


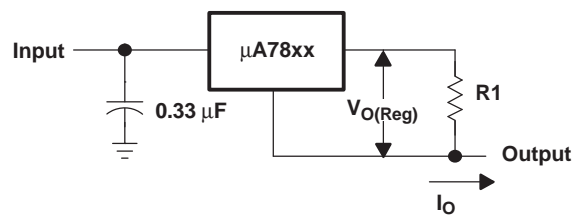
Figure 3. Positive Regulator in Negative Configuration ( $V_I$  Must Float)



A: The following formula is used when  $V_{xx}$  is the nominal output voltage (output to common) of the fixed regulator:

$$V_O = V_{xx} + \left( \frac{V_{xx}}{R1} + I_Q \right) R2$$

Figure 4. Adjustable-Output Regulator



$$I_O = (V_O/R1) + I_O \text{ Bias Current}$$

Figure 5. Current Regulator

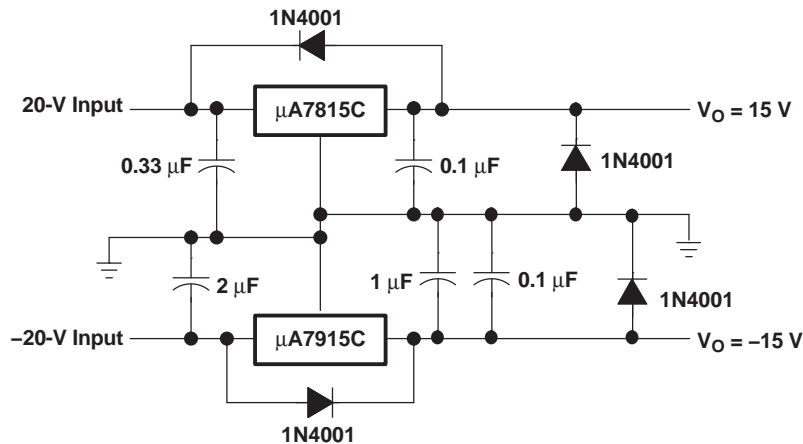


Figure 6. Regulated Dual Supply

### Operation With a Load Common to a Voltage of Opposite Polarity

In many cases, a regulator powers a load that is not connected to ground but, instead, is connected to a voltage source of opposite polarity (e.g., operational amplifiers, level-shifting circuits, etc.). In these cases, a clamp diode should be connected to the regulator output as shown in Figure 7. This protects the regulator from output polarity reversals during startup and short-circuit operation.

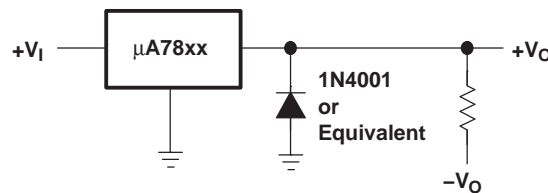


Figure 7. Output Polarity-Reversal-Protection Circuit

### Reverse-Bias Protection

Occasionally, the input voltage to the regulator can collapse faster than the output voltage. This can occur, for example, when the input supply is crowbarred during an output overvoltage condition. If the output voltage is greater than approximately 7 V, the emitter-base junction of the series-pass element (internal or external) could break down and be damaged. To prevent this, a diode shunt can be used as shown in Figure 8.

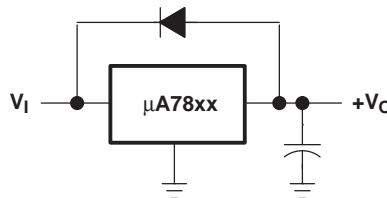


Figure 8. Reverse-Bias-Protection Circuit

---

**REVISION HISTORY**

<b>Changes from Revision M (January 2009) to Revision N</b>	<b>Page</b>
<ul style="list-style-type: none"><li>Added KCT package and orderable part number to the ORDERING INFORMATION table. ....</li></ul>	<a href="#">2</a>

---

**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>	Samples (Requires Login)
UA7805CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
UA7805CKCE3	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
UA7805CKCS	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7805CKCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7805CKCT	ACTIVE	TO-220	KCT	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7805CKTER	OBSOLETE	PFM	KTE	3		TBD	Call TI	Call TI	
UA7805CKTTR	ACTIVE	DDPAK/ TO-263	KTT	3	500	Green (RoHS & no Sb/Br)	CU SN	Level-3-245C-168 HR	
UA7805CKTTRG3	ACTIVE	DDPAK/ TO-263	KTT	3	500	Green (RoHS & no Sb/Br)	CU SN	Level-3-245C-168 HR	
UA7805QKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
UA7805QKTE	OBSOLETE	PFM	KTE	3		TBD	Call TI	Call TI	
UA7808CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
UA7808CKCE3	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
UA7808CKCS	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7808CKCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7808CKCT	PREVIEW	TO-220	KCT	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7808CKTER	OBSOLETE	PFM	KTE	3		TBD	Call TI	Call TI	
UA7808CKTTR	ACTIVE	DDPAK/ TO-263	KTT	3	500	Green (RoHS & no Sb/Br)	CU SN	Level-3-245C-168 HR	
UA7808CKTTRG3	ACTIVE	DDPAK/ TO-263	KTT	3	500	Green (RoHS & no Sb/Br)	CU SN	Level-3-245C-168 HR	
UA7808QKTE	OBSOLETE	PFM	KTE	3		TBD	Call TI	Call TI	
UA7810CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
UA7810CKCE3	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
UA7810CKCS	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7810CKCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7810CKTER	OBSOLETE	PFM	KTE	3		TBD	Call TI	Call TI	
UA7810CKTTR	ACTIVE	DDPAK/ TO-263	KTT	3	500	Green (RoHS & no Sb/Br)	CU SN	Level-3-245C-168 HR	

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>	Samples (Requires Login)
UA7810CKTTRG3	ACTIVE	DDPAK/ TO-263	KTT	3	500	Green (RoHS & no Sb/Br)	CU SN	Level-3-245C-168 HR	
UA7810QKTE	OBSOLETE	PFM	KTE	3		TBD	Call TI	Call TI	
UA7812CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
UA7812CKCE3	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
UA7812CKCS	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7812CKCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7812CKCT	ACTIVE	TO-220	KCT	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7812CKTER	OBSOLETE	PFM	KTE	3		TBD	Call TI	Call TI	
UA7812CKTTR	ACTIVE	DDPAK/ TO-263	KTT	3	500	Green (RoHS & no Sb/Br)	CU SN	Level-3-245C-168 HR	
UA7812CKTTRG3	ACTIVE	DDPAK/ TO-263	KTT	3	500	Green (RoHS & no Sb/Br)	CU SN	Level-3-245C-168 HR	
UA7812QKTE	OBSOLETE	PFM	KTE	3		TBD	Call TI	Call TI	
UA7815CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
UA7815CKCS	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7815CKCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7815CKCT	PREVIEW	TO-220	KCT	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7815CKTER	OBSOLETE	PFM	KTE	3		TBD	Call TI	Call TI	
UA7815CKTTR	ACTIVE	DDPAK/ TO-263	KTT	3	500	Green (RoHS & no Sb/Br)	CU SN	Level-3-245C-168 HR	
UA7815CKTTRG3	ACTIVE	DDPAK/ TO-263	KTT	3	500	Green (RoHS & no Sb/Br)	CU SN	Level-3-245C-168 HR	
UA7815QKTE	OBSOLETE	PFM	KTE	3		TBD	Call TI	Call TI	
UA7824CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
UA7824CKCE3	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
UA7824CKCS	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7824CKCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	
UA7824CKTER	OBSOLETE	PFM	KTE	3		TBD	Call TI	Call TI	
UA7824CKTTR	ACTIVE	DDPAK/ TO-263	KTT	3	500	Green (RoHS & no Sb/Br)	CU SN	Level-3-245C-168 HR	
UA7824CKTTRG3	ACTIVE	DDPAK/ TO-263	KTT	3	500	Green (RoHS & no Sb/Br)	CU SN	Level-3-245C-168 HR	

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>	Samples (Requires Login)
UA7885CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	
UA7885CKTER	OBSOLETE	PFM	KTE	3		TBD	Call TI	Call TI	
UA7885QKTE	OBSOLETE	PFM	KTE	3		TBD	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 - 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.

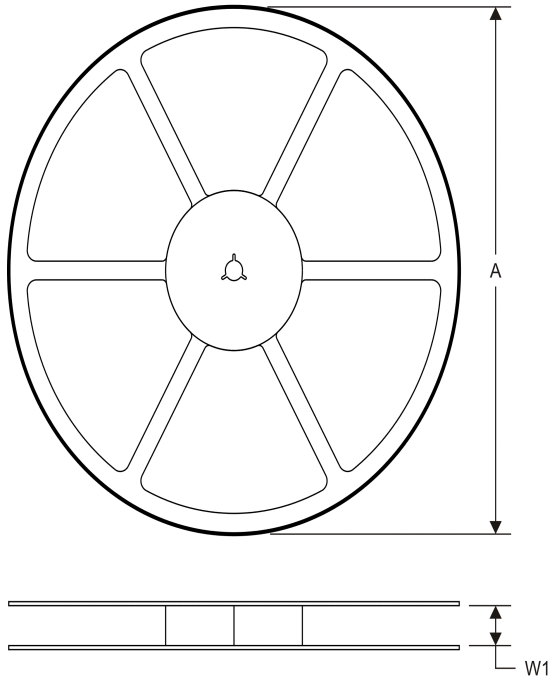
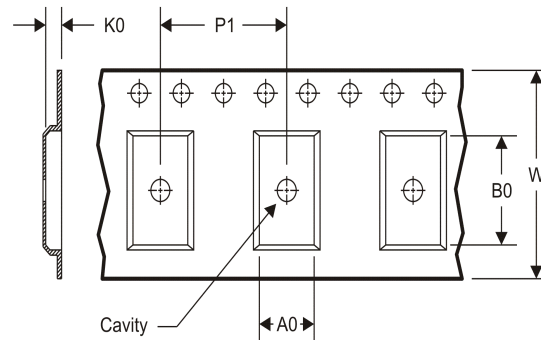
**Pb-Free (RoHS Exempt):** This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

**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)

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

**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.

**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
UA7805CKTTR	DDPAK/TO-263	KTT	3	500	330.0	24.4	10.6	15.8	4.9	16.0	24.0	Q2
UA7808CKTTR	DDPAK/TO-263	KTT	3	500	330.0	24.4	10.6	15.8	4.9	16.0	24.0	Q2
UA7810CKTTR	DDPAK/TO-263	KTT	3	500	330.0	24.4	10.6	15.8	4.9	16.0	24.0	Q2
UA7812CKTTR	DDPAK/TO-263	KTT	3	500	330.0	24.4	10.6	15.8	4.9	16.0	24.0	Q2
UA7815CKTTR	DDPAK/TO-263	KTT	3	500	330.0	24.4	10.6	15.8	4.9	16.0	24.0	Q2
UA7824CKTTR	DDPAK/TO-263	KTT	3	500	330.0	24.4	10.6	15.8	4.9	16.0	24.0	Q2

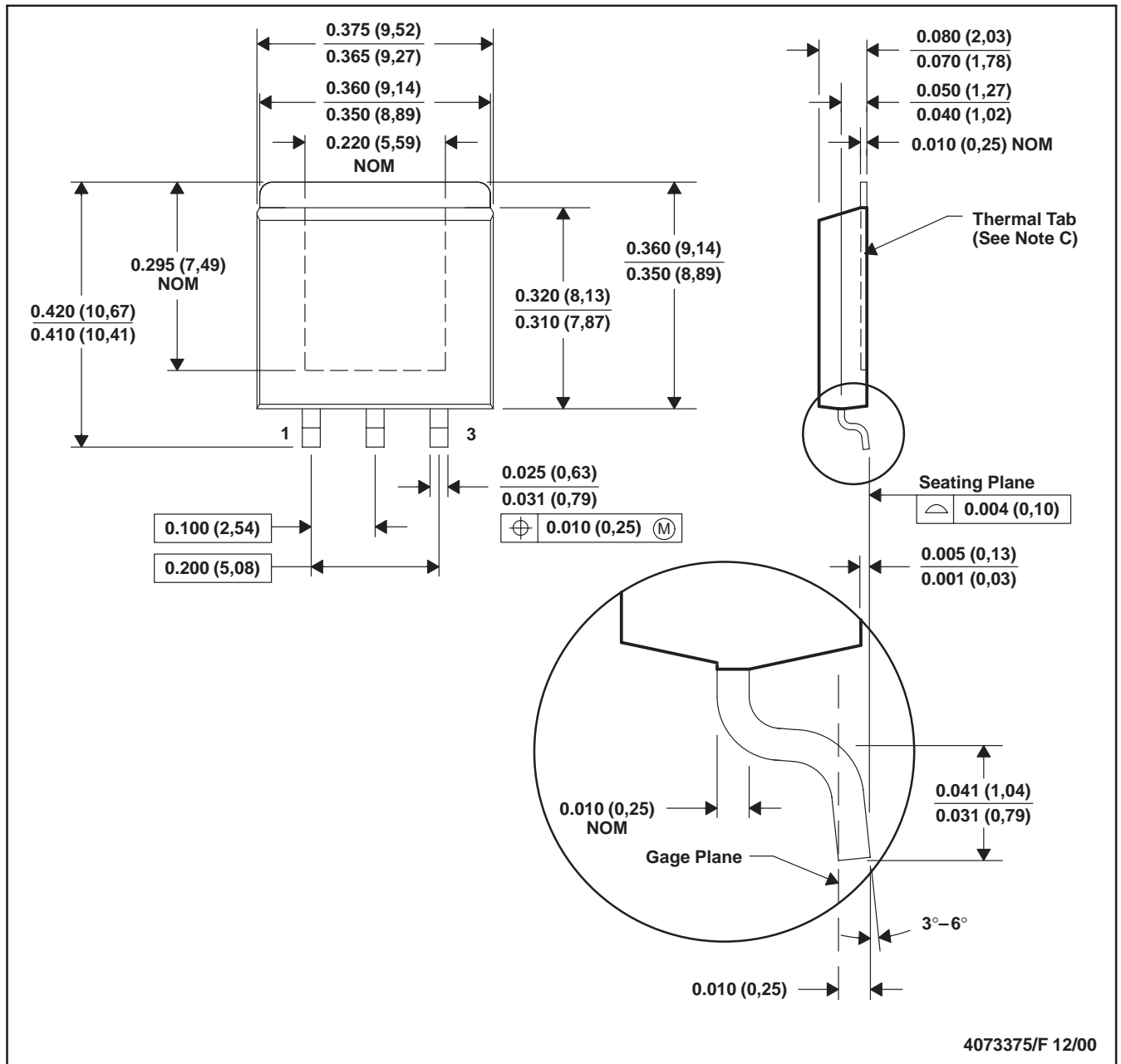
**TAPE AND REEL BOX DIMENSIONS**


\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
UA7805CKTTR	DDPAK/TO-263	KTT	3	500	340.0	340.0	38.0
UA7808CKTTR	DDPAK/TO-263	KTT	3	500	340.0	340.0	38.0
UA7810CKTTR	DDPAK/TO-263	KTT	3	500	340.0	340.0	38.0
UA7812CKTTR	DDPAK/TO-263	KTT	3	500	340.0	340.0	38.0
UA7815CKTTR	DDPAK/TO-263	KTT	3	500	340.0	340.0	38.0
UA7824CKTTR	DDPAK/TO-263	KTT	3	500	340.0	340.0	38.0

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

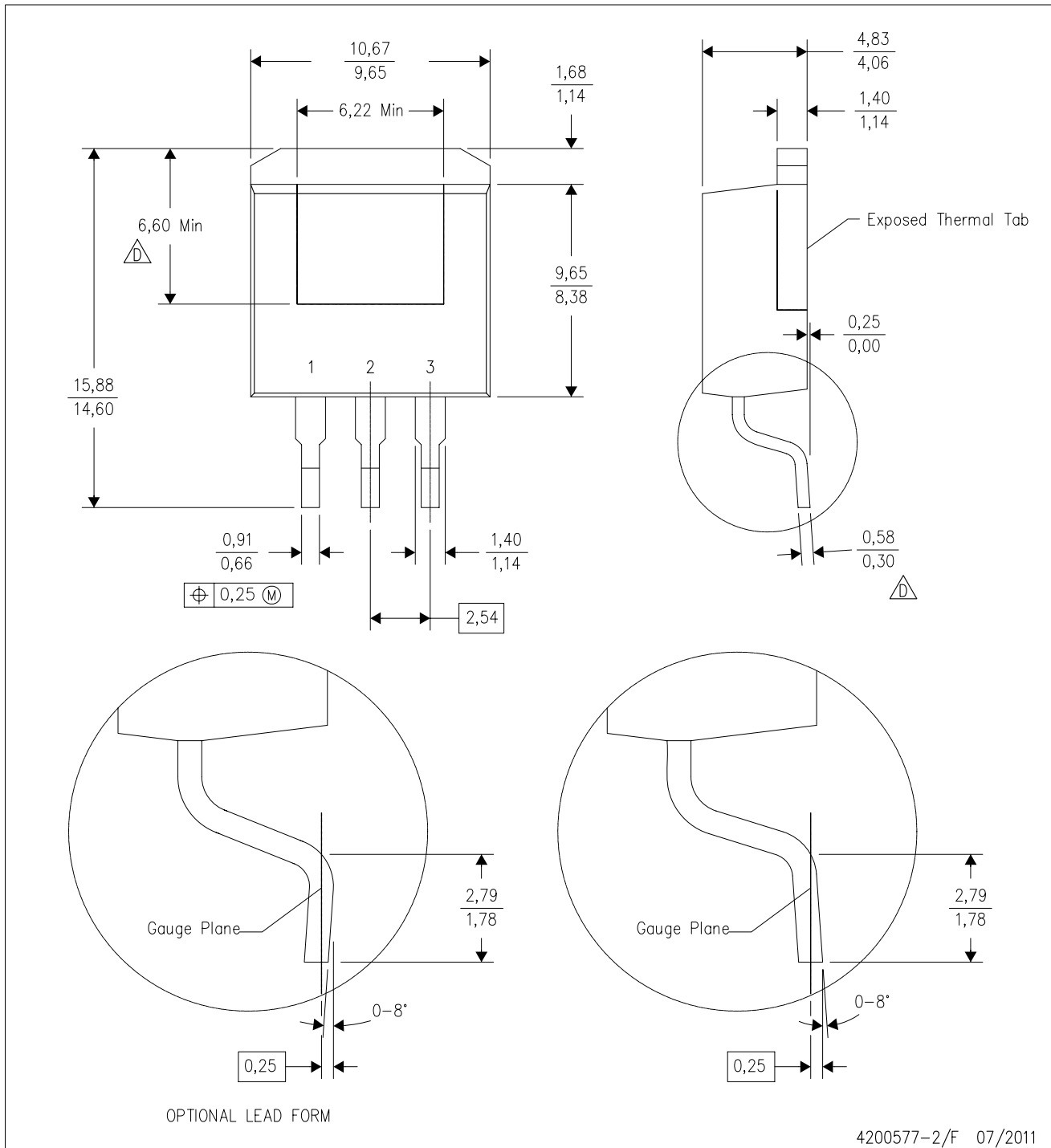
PowerFLEX is a trademark of Texas Instruments.



# MECHANICAL DATA

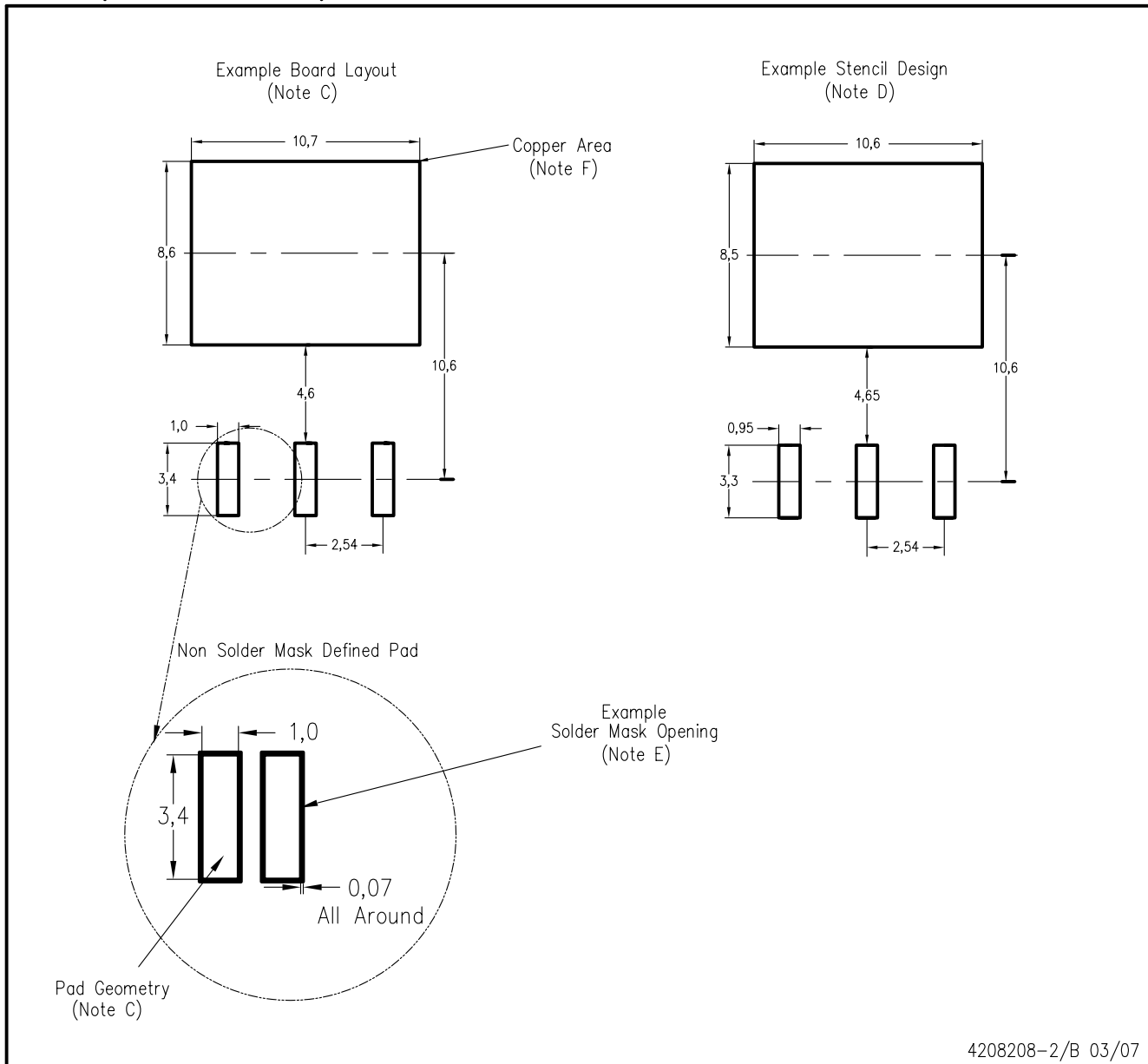
KTT (R-PSFM-G3)

PLASTIC FLANGE-MOUNT PACKAGE



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

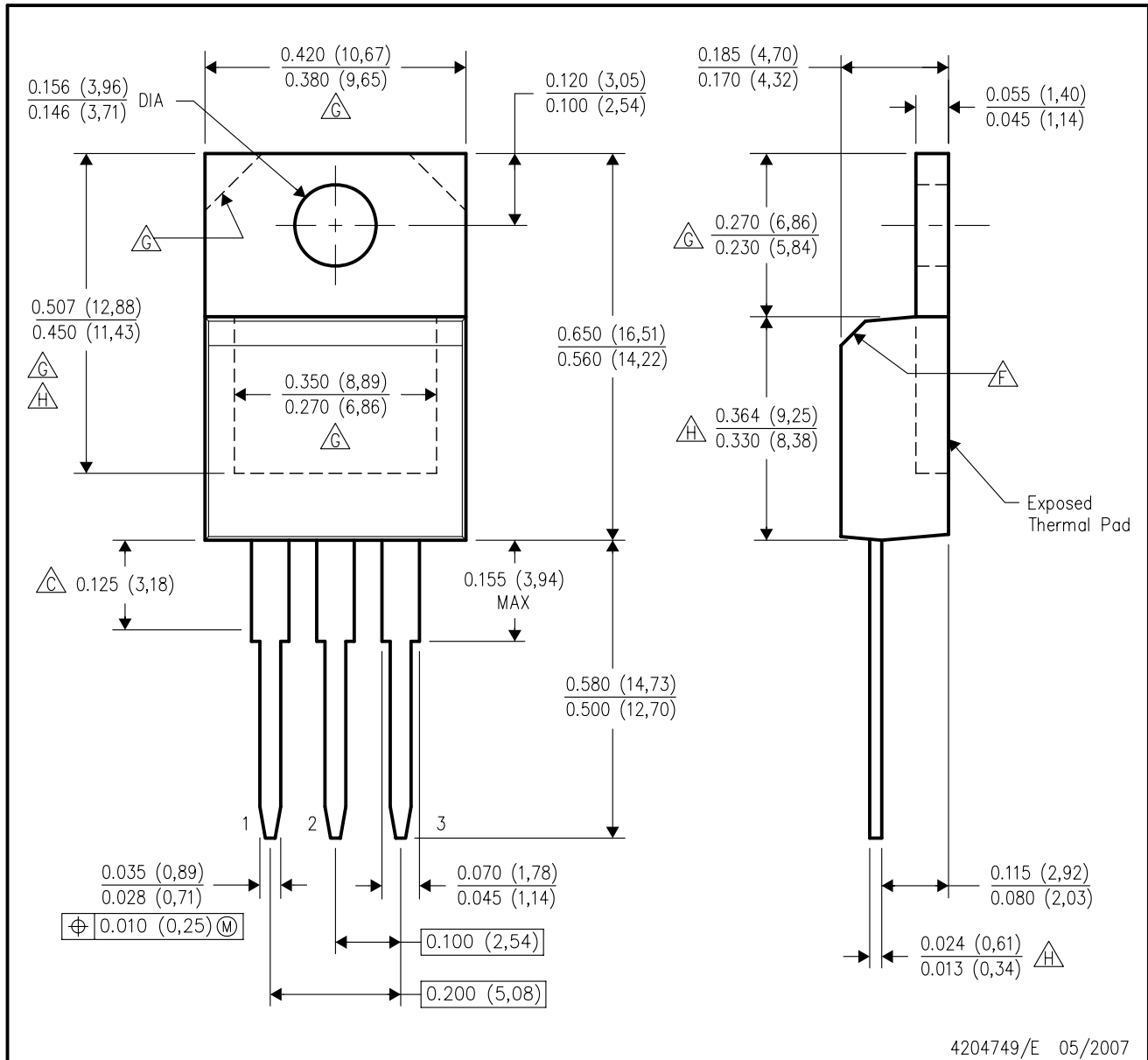
KTT (R-PSFM-G3)



- NOTES:
- A. All linear dimensions are in millimeters.
  - B. This drawing is subject to change without notice.
  - C. Publication IPC-SM-782 is recommended for alternate 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.
  - E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.
  - F. 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)

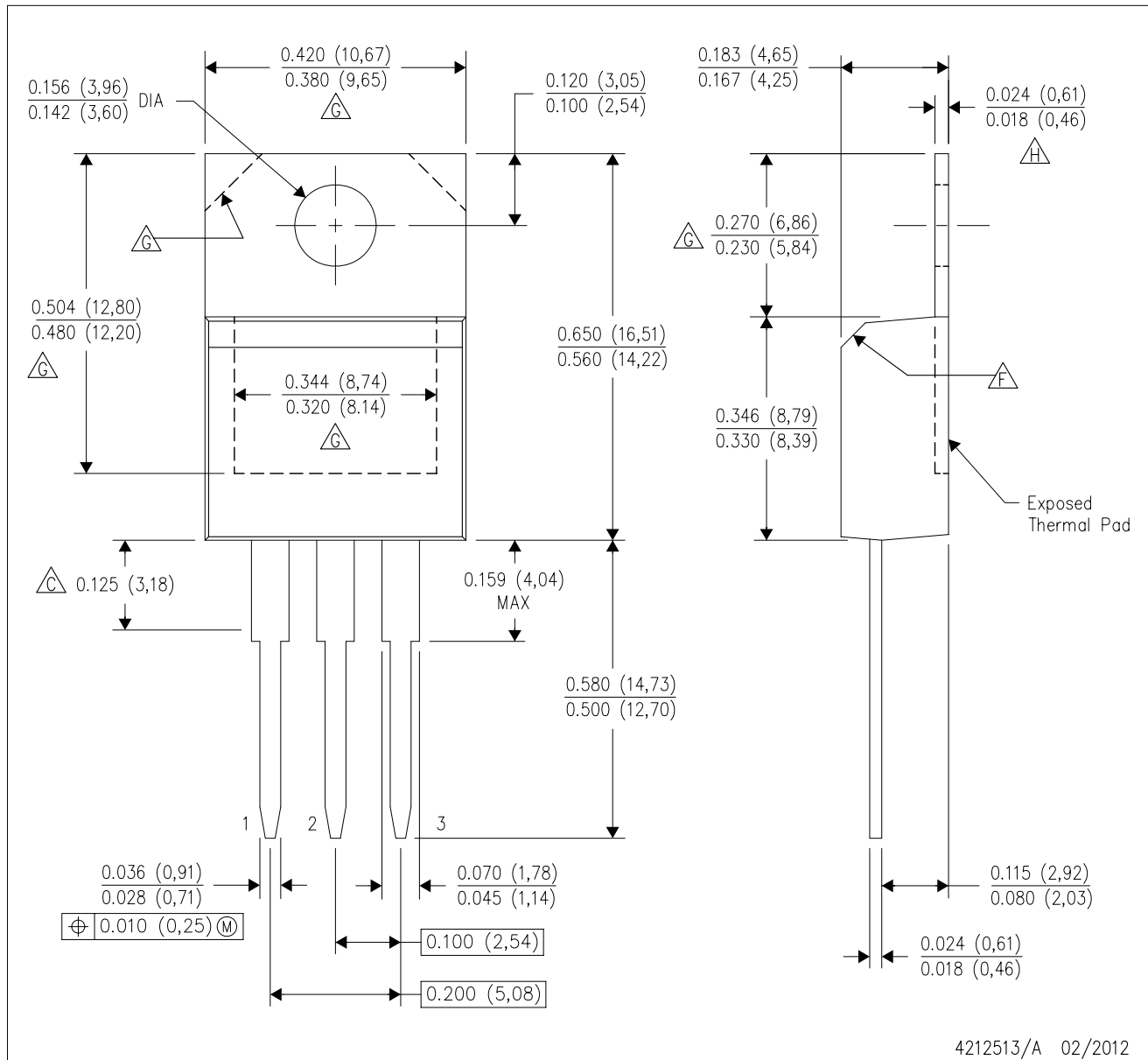
PLASTIC FLANGE-MOUNT PACKAGE



- 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, minimum exposed pad length, and maximum body length.

KCT (R-PSFM-T3)

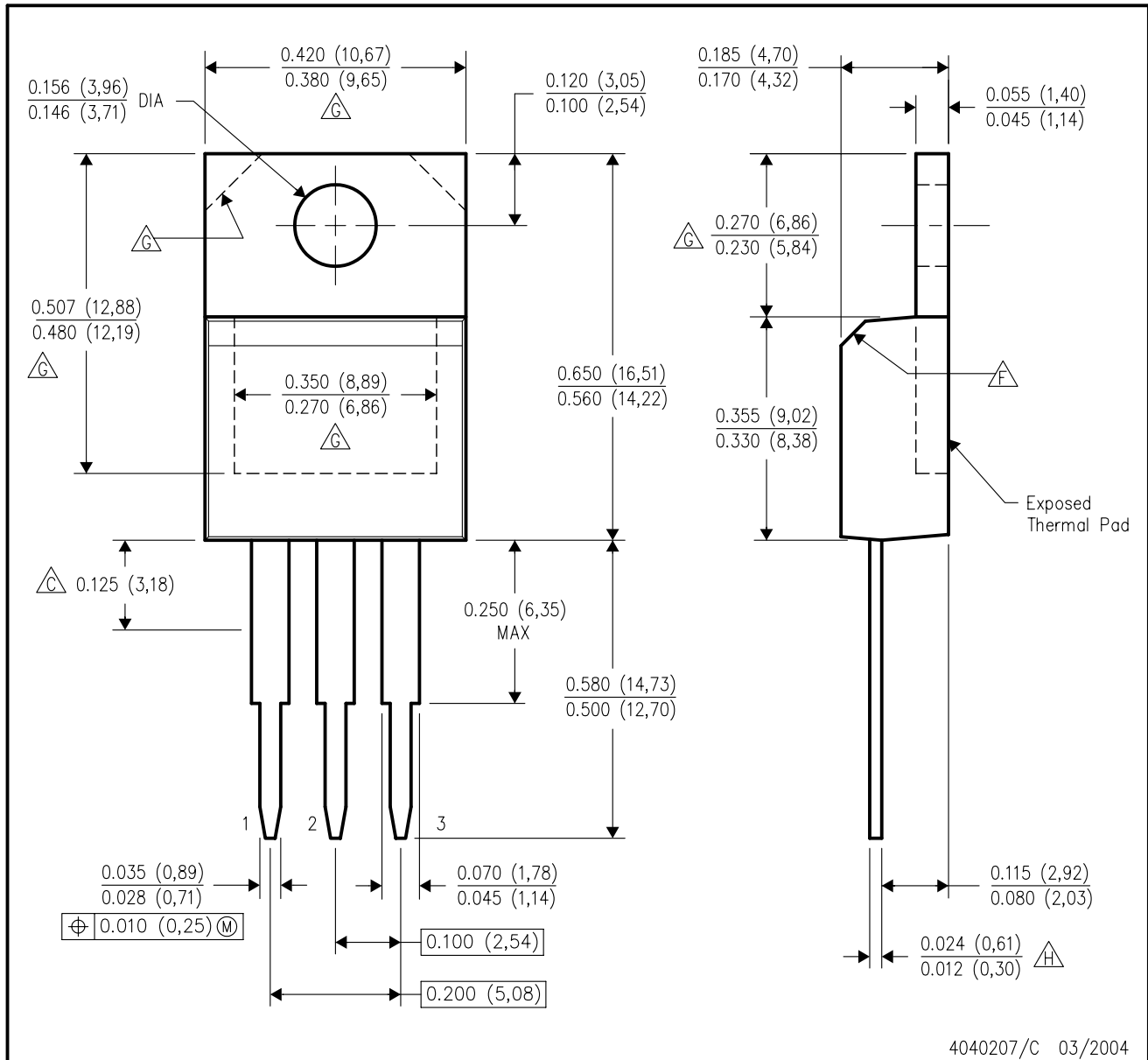
PLASTIC FLANGE-MOUNT PACKAGE



- 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 tab thickness.

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

Audio	<a href="http://www.ti.com/audio">www.ti.com/audio</a>
Amplifiers	<a href="http://amplifier.ti.com">amplifier.ti.com</a>
Data Converters	<a href="http://dataconverter.ti.com">dataconverter.ti.com</a>
DLP® Products	<a href="http://www.dlp.com">www.dlp.com</a>
DSP	<a href="http://dsp.ti.com">dsp.ti.com</a>
Clocks and Timers	<a href="http://www.ti.com/clocks">www.ti.com/clocks</a>
Interface	<a href="http://interface.ti.com">interface.ti.com</a>
Logic	<a href="http://logic.ti.com">logic.ti.com</a>
Power Mgmt	<a href="http://power.ti.com">power.ti.com</a>
Microcontrollers	<a href="http://microcontroller.ti.com">microcontroller.ti.com</a>
RFID	<a href="http://www.ti-rfid.com">www.ti-rfid.com</a>
OMAP Mobile Processors	<a href="http://www.ti.com/omap">www.ti.com/omap</a>
Wireless Connectivity	<a href="http://www.ti.com/wirelessconnectivity">www.ti.com/wirelessconnectivity</a>

### Applications

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

**TI E2E Community** [e2e.ti.com](http://e2e.ti.com)