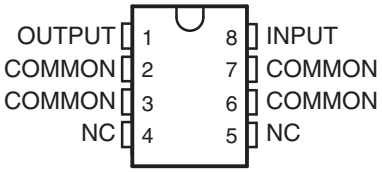
LOW-DROPOUT VOLTAGE REGULATORS

FEATURES

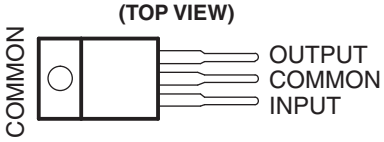
- Very Low Dropout Voltage, Less Than 0.6 V at 150 mA
- Very Low Quiescent Current
- TTL- and CMOS-Compatible Enable on TL751L Series
- 60-V Load-Dump Protection
- Reverse Transient Protection Down to –50 V
- Internal Thermal-Overload Protection
- Overvoltage Protection
- Internal Overcurrent-Limiting Circuitry
- Less Than 500-µA Disable (TL751L Series)

TL750L . . . D PACKAGE
(TOP VIEW)

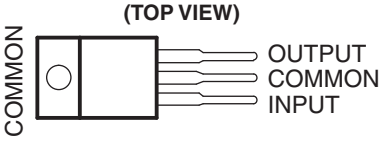


NC – No internal connection

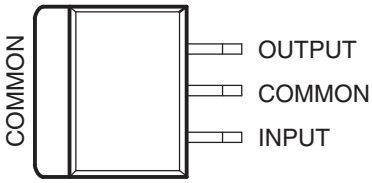
TL750L . . . KC PACKAGE
(TOP VIEW)



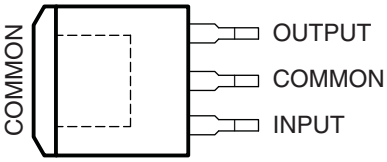
TL750L . . . KCS PACKAGE
(TOP VIEW)



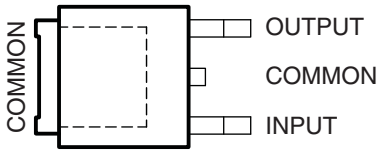
TL750L . . . KTE PACKAGE
(TOP VIEW)



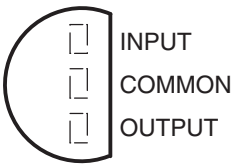
TL750L . . . KTT PACKAGE
(TOP VIEW)



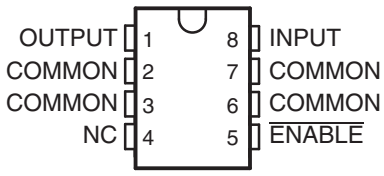
TL750L . . . KVU PACKAGE
(TOP VIEW)



TL750L . . . LP PACKAGE
(TO-92, TO-226AA)
(TOP VIEW)

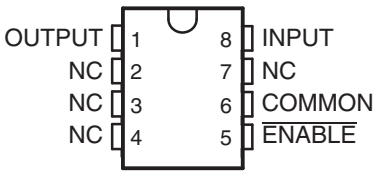


TL751L . . . D PACKAGE
(TOP VIEW)



NC – No internal connection

TL751L . . .P PACKAGE
(TOP VIEW)



NC – No internal connection

DESCRIPTION/ORDERING INFORMATION

The TL750L and TL751L series of fixed-output voltage regulators offer 5-V, 8-V, 10-V, and 12-V options. The TL751L series also has an enable (ENABLE) input. When ENABLE is high, the regulator output is placed in the high-impedance state. This gives the designer complete control over power up, power down, or emergency shutdown.

The TL750L and TL751L series are low-dropout positive-voltage regulators specifically designed for battery-powered systems. These devices incorporate overvoltage and current-limiting protection circuitry, along with internal reverse-battery protection circuitry to protect the devices and the regulated system. The series is fully protected against 60-V load-dump and reverse-battery conditions. Extremely low quiescent current during full-load conditions makes these devices ideal for standby power systems.

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

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

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ORDERING INFORMATION(1)

T_J	V_O TYP AT 25°C	PACKAGE (2)		ORDERABLE PART NUMBER	TOP-SIDE MARKING
0°C to 125°C	5 V	PowerFLEX™ – KTE	Reel of 2000	TL750L05CKTER	TL750L05C
		SOIC – D	Tube of 75	TL750L05CD	50L05C
			Reel of 2500	TL750L05CDR	
			Tube of 75	TL751L05CD	51L05C
			Reel of 2500	TL751L05CDR	
		TO-226/TO-92 – LP	Bulk of 1000	TL750L05CLP	750L05C
			Reel of 2000	TL750L05CLPR	
		TO-220 – KC	Tube of 50	TL750L05CKC	TL750L05C
		TO-220 – KCS	Tube of 50	TL750L05CKCS	TL750L05C
		TO-252 – KVU	Reel of 2500	TL750L05CKVUR	750L05C
		TO-263 – KTT	Reel of 500	TL750L05CKTTR	750L05C
	8 V	SOIC – D	Tube of 75	TL750L08CD	50L08C
			Reel of 2500	TL750L08CDR	
		TO-226/TO-92 – LP	Bulk of 1000	TL750L08CLP	750L08C
	10 V	PDIP – P	Tube of 50	TL751L10CP	TL751L10C
		SOIC – D	Tube of 75	TL750L10CD	50L10C
			Reel of 2500	TL750L10CDR	
			Tube of 75	TL751L10CD	51L10C
			Reel of 2500	TL751L10CDR	
		TO-226/TO-92 – LP	Bulk of 1000	TL750L10CLP	750L10C
			Reel of 2000	TL750L10CLPR	
	12 V	SOIC – D	Tube of 75	TL750L12CD	50L12C
			Reel of 2500	TL750L12CDR	
			Tube of 75	TL751L12CD	51L12C
			Reel of 2500	TL751L12CDR	
		TO-226/TO-92 – LP	Bulk of 1000	TL750L12CLP	750L12C

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

DEVICE COMPONENT COUNT	
Transistors	20
JFETs	2
Diodes	5
Resistors	16

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Absolute Maximum Ratings(1)

over operating junction temperature range (unless otherwise noted)

			MIN	MAX	UNIT
	Continuous input voltage			26	V
	Transient input voltage(2)	T_A = 25°C		60	V
	Continuous reverse input voltage			–15	V
	Transient reverse input voltage	t ≤ 100 ms		–50	V
T_J	Operating virtual junction temperature			150	°C
	Lead temperature	1,6 mm (1/16 in) for 10 s		260	°C
T_{stg}	Storage temperature range		–65	150	°C

(1) Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
(2) The transient input voltage rating applies to the waveform shown in Figure 1.

Package Thermal Data(1)

PACKAGE	BOARD	θ_{JC}	θ_{JA}
PDIP (P)	High K, JESD 51-7	57°C/W	85°C/W
PowerFLEX™ (KTE)	High K, JESD 51-5	3°C/W	23°C/W
SOIC (D)	High K, JESD 51-7	39°C/W	97°C/W
TO-226/TO-92 (LP)	High K, JESD 51-7	55°C/W	140°C/W
TO-220 (KC)	High K, JESD 51-5	3°C/W	19°C/W
TO-220 (KCS)	High K, JESD 51-5	3°C/W	19°C/W
TO-252 (KVU)	High K, JESD 51-5	–	30.3°C/W
TO-263 (KTT)	High K, JESD 51-5	18°C/W	25.3°C/W

(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

over recommended operating junction temperature range (unless otherwise noted)

				MIN	MAX	UNIT
V_I	Input voltage		TL75xL05	6	26	V
			TL75xL08	9	26	
			TL75xL10	11	26	
			TL75xL12	13	26	
V_{IH}	High-level $\overline{\text{ENABLE}}$ input voltage		TL75xLxx	2	15	V
V_{IL} (1)	Low-level $\overline{\text{ENABLE}}$ input voltage	T_J = 25°C	TL75xLxx	–0.3	0.8	V
		T_J = 0°C to 125°C	TL75xLxx	–0.15	0.8	
I_O	Output current		TL75xLxx	0	150	mA
T_J	Operating virtual junction temperature		TL75xLxxC	0	125	°C

(1) The algebraic convention, in which the least positive (most negative) value is designated minimum, is used in this data sheet for $\overline{\text{ENABLE}}$ voltage levels and temperature only.

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TL75xL05 Electrical Characteristics[1]

V_I = 14 V, I_O = 10 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS		TL750L05 TL751L05			UNIT
			MIN	TYP	MAX	
Output voltage	V_I = 6 V to 26 V, I_O = 0 to 150 mA	T_J = 25°C	4.8	5	5.2	V
		T_J = 0°C to 125°C	4.75		5.25	
Input regulation voltage	V_I = 9 V to 16 V			5	10	mV
	V_I = 6 V to 26 V			6	30	
Ripple rejection	V_I = 8 V to 18 V, f = 120 Hz		60	65		dB
Output regulation voltage	I_O = 5 mA to 150 mA			20	50	mV
Dropout voltage	I_O = 10 mA				0.2	V
	I_O = 150 mA				0.6	
Output noise voltage	f = 10 Hz to 100 kHz			500		µV
Quiescent current	I_O = 150 mA			10	12	mA
	V_I = 6 V to 26 V, I_O = 10 mA, T_J = 0°C to 125°C			1	2	
	$\overline{\text{ENABLE}}$ ≥ 2 V				0.5	

(1) Pulse-testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.1-µF capacitor across the input and a 10-µF capacitor, with equivalent series resistance of less than 0.4 Ω, across the output.

TL75xL08 Electrical Characteristics[1]

V_I = 14 V, I_O = 10 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS		TL750L08 TL751L08			UNIT
			MIN	TYP	MAX	
Output voltage	V_I = 9 V to 26 V, I_O = 0 to 150 mA	T_J = 25°C	7.68	8	8.32	V
		T_J = 0°C to 125°C	7.6		8.4	
Input regulation voltage	V_I = 10 V to 17 V			10	20	mV
	V_I = 9 V to 26 V			25	50	
Ripple rejection	V_I = 11 V to 21 V, f = 120 Hz		60	65		dB
Output regulation voltage	I_O = 5 mA to 150 mA			40	80	mV
Dropout voltage	I_O = 10 mA				0.2	V
	I_O = 150 mA				0.6	
Output noise voltage	f = 10 Hz to 100 kHz			500		µV
Quiescent current	I_O = 150 mA			10	12	mA
	V_I = 9 V to 26 V, I_O = 10 mA, T_J = 0°C to 125°C			1	2	
	$\overline{\text{ENABLE}}$ ≥ 2 V				0.5	

(1) Pulse-testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.1-µF capacitor across the input and a 10-µF capacitor, with equivalent series resistance of less than 0.4 Ω, across the output.

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TL75xL10 Electrical Characteristics[1]

V_I = 14 V, I_O = 10 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS		TL750L10 TL751L10			UNIT
			MIN	TYP	MAX	
Output voltage	V_I = 11 V to 26 V, I_O = 0 to 150 mA	T_J = 25°C	9.6	10	10.4	V
		T_J = 0°C to 125°C	9.5		10.5	
Input regulation voltage	V_I = 12 V to 19 V			10	25	mV
	V_I = 11 V to 26 V			30	60	
Ripple rejection	V_I = 12 V to 22 V, f = 120 Hz		60	65		dB
Output regulation voltage	I_O = 5 mA to 150 mA			50	100	mV
Dropout voltage	I_O = 10 mA				0.2	V
	I_O = 150 mA				0.6	
Output noise voltage	f = 10 Hz to 100 kHz			700		μV
Quiescent current	I_O = 150 mA			10	12	mA
	V_I = 11 V to 26 V, I_O = 10 mA, T_J = 0°C to 125°C			1	2	
	$\overline{\text{ENABLE}}$ ≥ 2 V				0.5	

(1) Pulse-testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.1-μF capacitor across the input and a 10-μF capacitor, with equivalent series resistance of less than 0.4 Ω, across the output.

TL75xL12 Electrical Characteristics[1]

V_I = 14 V, I_O = 10 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS		TL750L12 TL751L12			UNIT
			MIN	TYP	MAX	
Output voltage	V_I = 13 V to 26 V, I_O = 0 to 150 mA	T_J = 25°C	11.52	12	12.48	V
		T_J = 0°C to 125°C	11.4		12.6	
Input regulation voltage	V_I = 14 V to 19 V			15	30	mV
	V_I = 13 V to 26 V			20	40	
Ripple rejection	V_I = 13 V to 23 V, f = 120 Hz		50	55		dB
Output regulation voltage	I_O = 5 mA to 150 mA			50	120	mV
Dropout voltage	I_O = 10 mA				0.2	V
	I_O = 150 mA				0.6	
Output noise voltage	f = 10 Hz to 100 kHz			700		μV
Quiescent current	I_O = 150 mA			10	12	mA
	V_I = 13 V to 26 V, I_O = 10 mA, T_J = 0°C to 125°C			1	2	
	$\overline{\text{ENABLE}}$ ≥ 2 V				0.5	

(1) Pulse-testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.1-μF capacitor across the input and a 10-μF capacitor, with equivalent series resistance of less than 0.4 Ω, across the output.

PARAMETER MEASUREMENT INFORMATION

The TL750L, TL751L series are low-dropout regulators. This means that capacitance loading is important to the performance of the regulator because it is a vital part of the control loop. The capacitor value and its equivalent series resistance (ESR) both affect the control loop and must be defined for the load range and temperature range. Figure 1 shows the recommended range of ESR for a given load with a 10-μF capacitor on the output.

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TYPICAL CHARACTERISTICS

TL750L05
EQUIVALENT SERIES RESISTANCE
vs
LOAD CURRENT

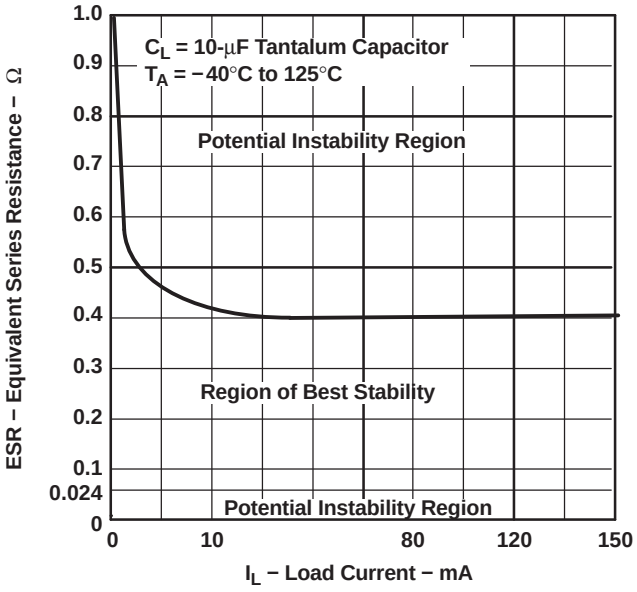

Figure 1.

TRANSIENT INPUT VOLTAGE
vs
TIME

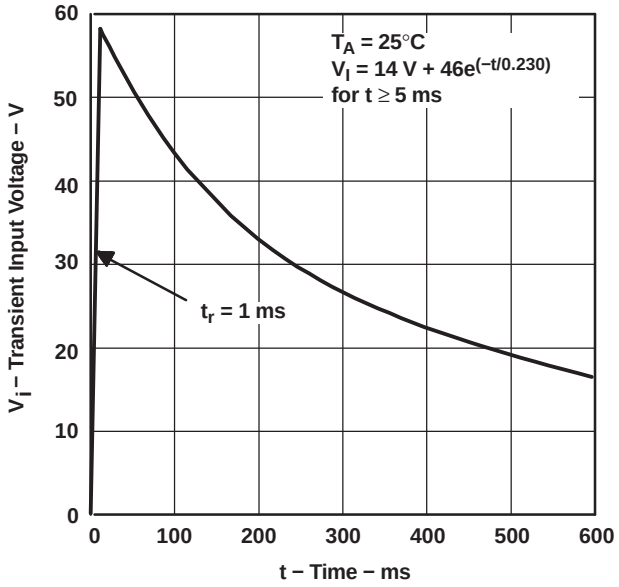

Figure 2.

TL750L05
INPUT CURRENT
vs
INPUT VOLTAGE

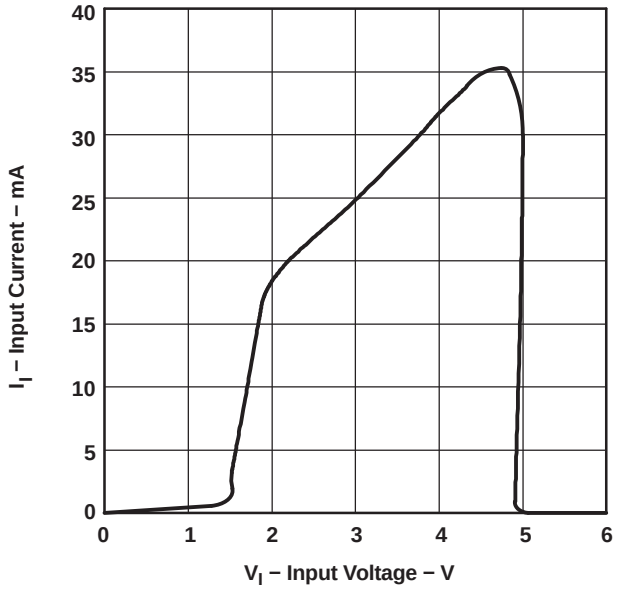

Figure 3.

TL750L12
INPUT CURRENT
vs
INPUT VOLTAGE

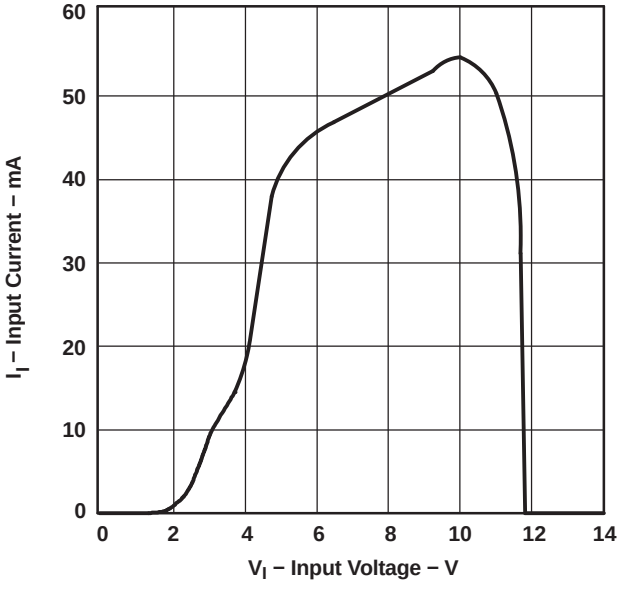

Figure 4.

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PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
5962-9166901Q2A	OBSOLETE	LCCC	FK	20		TBD	Call TI	Call TI	-55 to 125		
5962-9166901QPA	OBSOLETE	CDIP	JG	8		TBD	Call TI	Call TI	-55 to 125		
TL750L05CD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L05C	Samples
TL750L05CDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L05C	Samples
TL750L05CDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L05C	Samples
TL750L05CDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L05C	Samples
TL750L05CDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L05C	Samples
TL750L05CDRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L05C	Samples
TL750L05CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	0 to 125	TL750L05C	
TL750L05CKCE3	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	0 to 125	TL750L05C	
TL750L05CKCS	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	TL750L05C	Samples
TL750L05CKCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	TL750L05C	Samples
TL750L05CKTER	OBSOLETE	PFM	KTE	3		TBD	Call TI	Call TI	0 to 125	TL750L05C	
TL750L05CKTTR	ACTIVE	DDPAK/ TO-263	KTT	3	500	Green (RoHS & no Sb/Br)	CU SN	Level-3-245C-168 HR	0 to 125	TL750L05C	Samples
TL750L05CKTTRG3	ACTIVE	DDPAK/ TO-263	KTT	3	500	Green (RoHS & no Sb/Br)	CU SN	Level-3-245C-168 HR	0 to 125	TL750L05C	Samples
TL750L05CKVURG3	ACTIVE	TO-252	KVU	3	2500	Green (RoHS & no Sb/Br)	CU SN	Level-3-260C-168 HR	0 to 125	750L05C	Samples
TL750L05CLP	ACTIVE	TO-92	LP	3	1000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	750L05C	Samples
TL750L05CLPE3	ACTIVE	TO-92	LP	3	1000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	750L05C	Samples
TL750L05CLPM	OBSOLETE	TO-92	LP	3		TBD	Call TI	Call TI	0 to 125		

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
TL750L05CLPR	ACTIVE	TO-92	LP	3	2000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	750L05C	Samples
TL750L05CLPRE3	ACTIVE	TO-92	LP	3	2000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	750L05C	Samples
TL750L05CP	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI	0 to 125		
TL750L05QD	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI	-40 to 125		
TL750L05QDR	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI	-40 to 125		
TL750L05QKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	-40 to 125		
TL750L05QLP	OBSOLETE	TO-92	LP	3		TBD	Call TI	Call TI	-40 to 125		
TL750L05QP	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI	-40 to 125		
TL750L08CD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 125	50L08C	Samples
TL750L08CDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 125	50L08C	Samples
TL750L08CDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 125	50L08C	Samples
TL750L08CDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 125	50L08C	Samples
TL750L08CDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 125	50L08C	Samples
TL750L08CDRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	0 to 125	50L08C	Samples
TL750L08CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	0 to 125		
TL750L08CLP	ACTIVE	TO-92	LP	3	1000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	750L08C	Samples
TL750L08CLPE3	ACTIVE	TO-92	LP	3	1000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	750L08C	Samples
TL750L08CP	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI	0 to 125		
TL750L08QD	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI	-40 to 125		
TL750L08QDR	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI	-40 to 125		
TL750L08QKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	-40 to 125		
TL750L08QLP	OBSOLETE	TO-92	LP	3		TBD	Call TI	Call TI	-40 to 125		
TL750L10CD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L10C	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
TL750L10CDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L10C	Samples
TL750L10CDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L10C	Samples
TL750L10CDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L10C	Samples
TL750L10CDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L10C	Samples
TL750L10CDRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L10C	Samples
TL750L10CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	0 to 125		
TL750L10CLP	ACTIVE	TO-92	LP	3	1000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	750L10C	Samples
TL750L10CLPE3	ACTIVE	TO-92	LP	3	1000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	750L10C	Samples
TL750L10CLPR	ACTIVE	TO-92	LP	3	2000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	750L10C	Samples
TL750L10CLPRE3	ACTIVE	TO-92	LP	3	2000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	750L10C	Samples
TL750L10CP	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI	0 to 125		
TL750L10QD	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI	-40 to 125		
TL750L10QDR	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI	-40 to 125		
TL750L10QKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	-40 to 125		
TL750L10QLP	OBSOLETE	TO-92	LP	3		TBD	Call TI	Call TI	-40 to 125		
TL750L10QP	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI	-40 to 125		
TL750L12CD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L12C	Samples
TL750L12CDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L12C	Samples
TL750L12CDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L12C	Samples
TL750L12CDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L12C	Samples
TL750L12CDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L12C	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
TL750L12CDRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	50L12C	Samples
TL750L12CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	0 to 125		
TL750L12CLP	ACTIVE	TO-92	LP	3	1000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	750L12C	Samples
TL750L12CLPE3	ACTIVE	TO-92	LP	3	1000	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	750L12C	Samples
TL750L12CP	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI	0 to 125		
TL750L12QD	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI	-40 to 125		
TL750L12QDR	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI	-40 to 125		
TL750L12QKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	-40 to 125		
TL750L12QLP	OBSOLETE	TO-92	LP	3		TBD	Call TI	Call TI	-40 to 125		
TL750L12QP	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI	-40 to 125		
TL751L05CD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L05C	Samples
TL751L05CDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L05C	Samples
TL751L05CDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L05C	Samples
TL751L05CDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L05C	Samples
TL751L05CDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L05C	Samples
TL751L05CDRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L05C	Samples
TL751L05CP	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI	0 to 125		
TL751L05MFKB	OBSOLETE	LCCC	FK	20		TBD	Call TI	Call TI	-55 to 125		
TL751L05MJGB	OBSOLETE	CDIP	JG	8		TBD	Call TI	Call TI	-55 to 125		
TL751L05QD	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI	-40 to 125		
TL751L05QDR	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI	-40 to 125		
TL751L05QP	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI	-40 to 125		
TL751L10CD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L10C	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
TL751L10CDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L10C	Samples
TL751L10CDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L10C	Samples
TL751L10CDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L10C	Samples
TL751L10CDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L10C	Samples
TL751L10CDRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L10C	Samples
TL751L10CP	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 125	TL751L10C	Samples
TL751L10CPE4	ACTIVE	PDIP	P	8	50	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 125	TL751L10C	Samples
TL751L10QD	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI	-40 to 125		
TL751L10QP	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI	-40 to 125		
TL751L12CD	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L12C	Samples
TL751L12CDE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L12C	Samples
TL751L12CDG4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L12C	Samples
TL751L12CDR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L12C	Samples
TL751L12CDRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L12C	Samples
TL751L12CDRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 125	51L12C	Samples
TL751L12CP	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI	0 to 125		
TL751L12MFKB	OBSOLETE	LCCC	FK	20		TBD	Call TI	Call TI	-55 to 125		
TL751L12MJGB	OBSOLETE	CDIP	JG	8		TBD	Call TI	Call TI	-55 to 125		
TL751L12QD	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI	-40 to 125		
TL751L12QDR	OBSOLETE	SOIC	D	8		TBD	Call TI	Call TI	-40 to 125		
TL751L12QP	OBSOLETE	PDIP	P	8		TBD	Call TI	Call TI	-40 to 125		

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

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

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

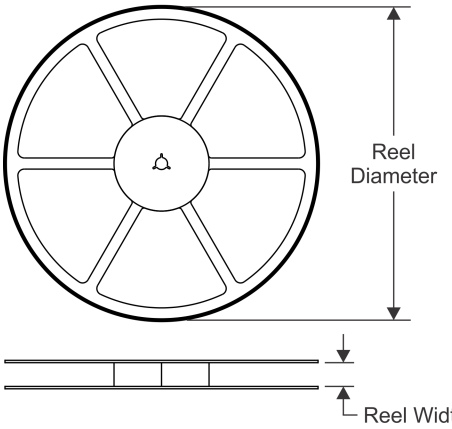
(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

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

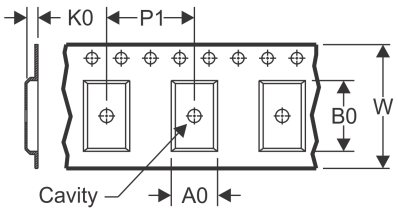
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

TAPE AND REEL INFORMATION

REEL DIMENSIONS

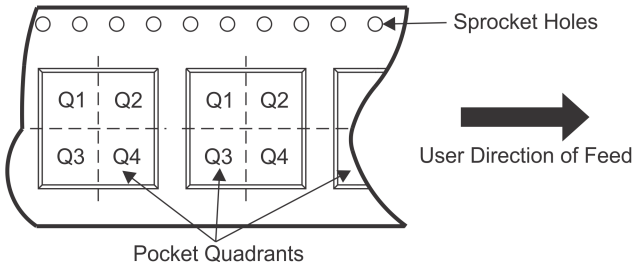


TAPE DIMENSIONS



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

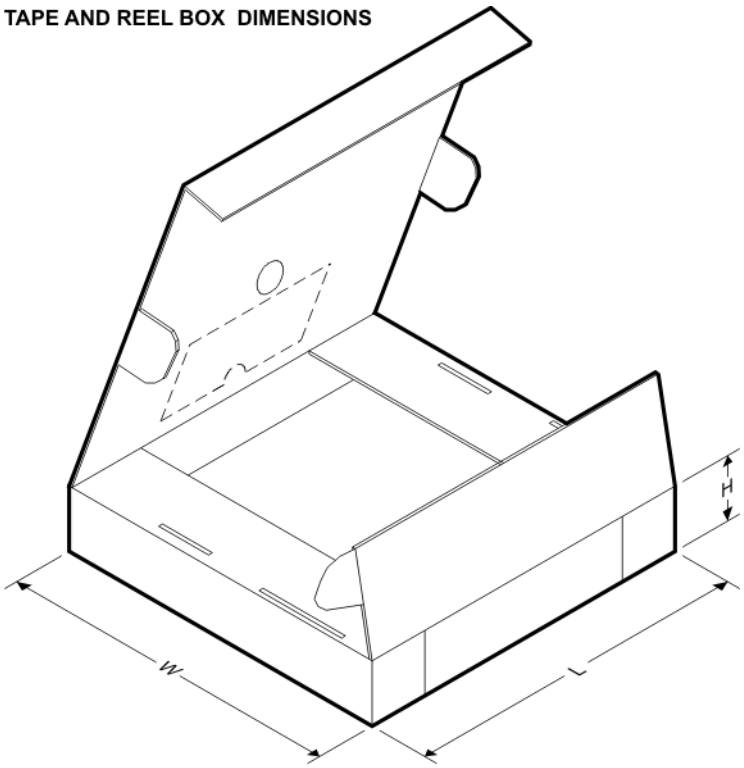
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*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
TL750L05CDR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TL750L05CKTTR	DDPAK/ TO-263	KTT	3	500	330.0	24.4	10.6	15.8	4.9	16.0	24.0	Q2
TL750L05CKVURG3	TO-252	KVU	3	2500	330.0	16.4	6.9	10.5	2.7	8.0	16.0	Q2
TL750L08CDR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TL750L10CDR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TL750L12CDR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TL751L05CDR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TL751L10CDR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
TL751L12CDR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1

TAPE AND REEL BOX DIMENSIONS

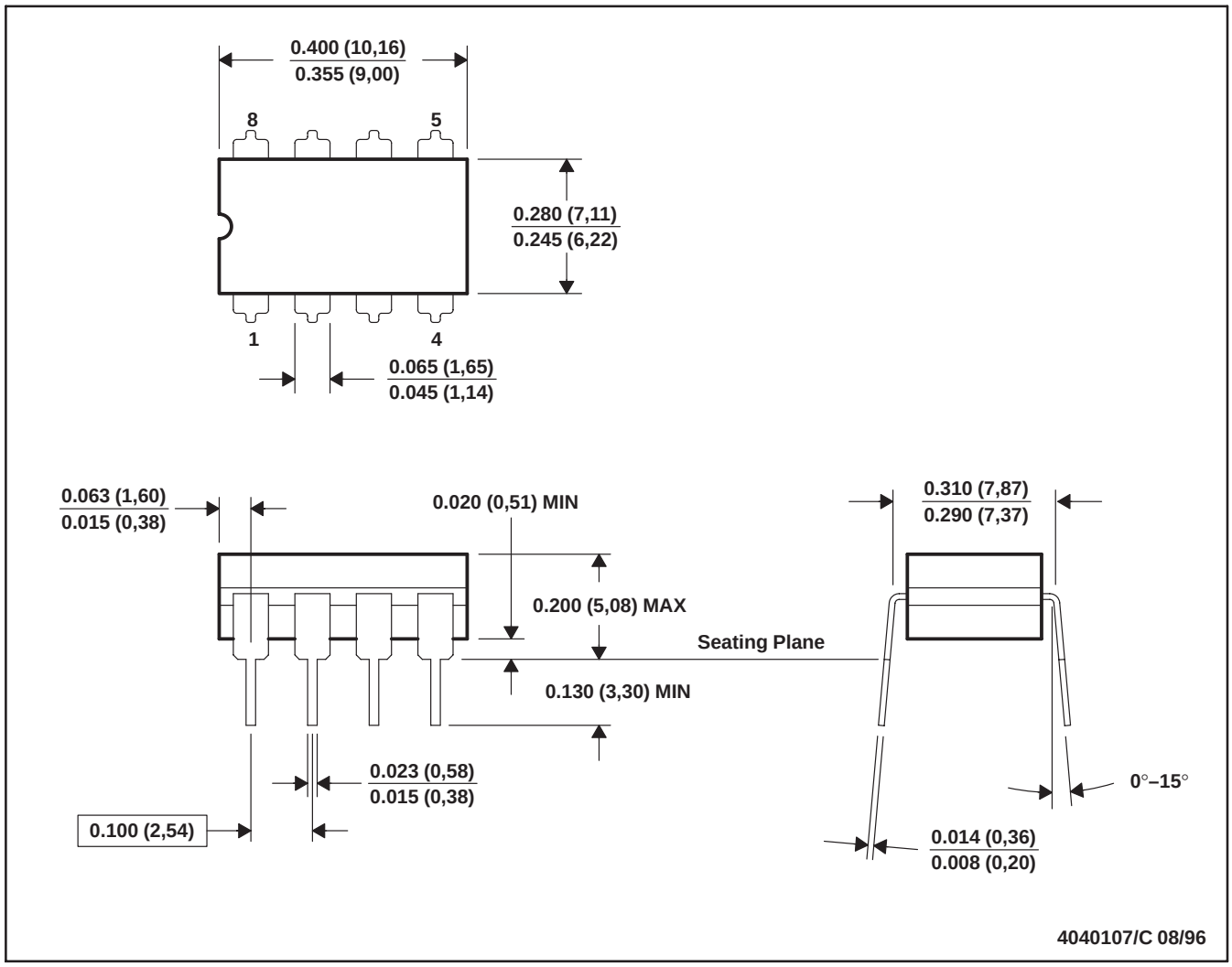


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TL750L05CDR	SOIC	D	8	2500	340.5	338.1	20.6
TL750L05CKTTR	DDPAK/TO-263	KTT	3	500	340.0	340.0	38.0
TL750L05CKVURG3	TO-252	KVU	3	2500	340.0	340.0	38.0
TL750L08CDR	SOIC	D	8	2500	340.5	338.1	20.6
TL750L10CDR	SOIC	D	8	2500	340.5	338.1	20.6
TL750L12CDR	SOIC	D	8	2500	340.5	338.1	20.6
TL751L05CDR	SOIC	D	8	2500	340.5	338.1	20.6
TL751L10CDR	SOIC	D	8	2500	340.5	338.1	20.6
TL751L12CDR	SOIC	D	8	2500	340.5	338.1	20.6

MCER001A – JANUARY 1995 – REVISED JANUARY 1997

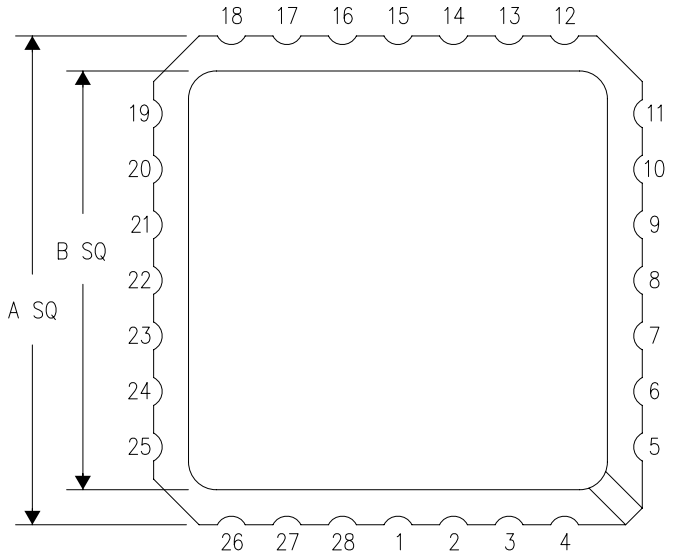
JG (R-GDIP-T8) **CERAMIC DUAL-IN-LINE**



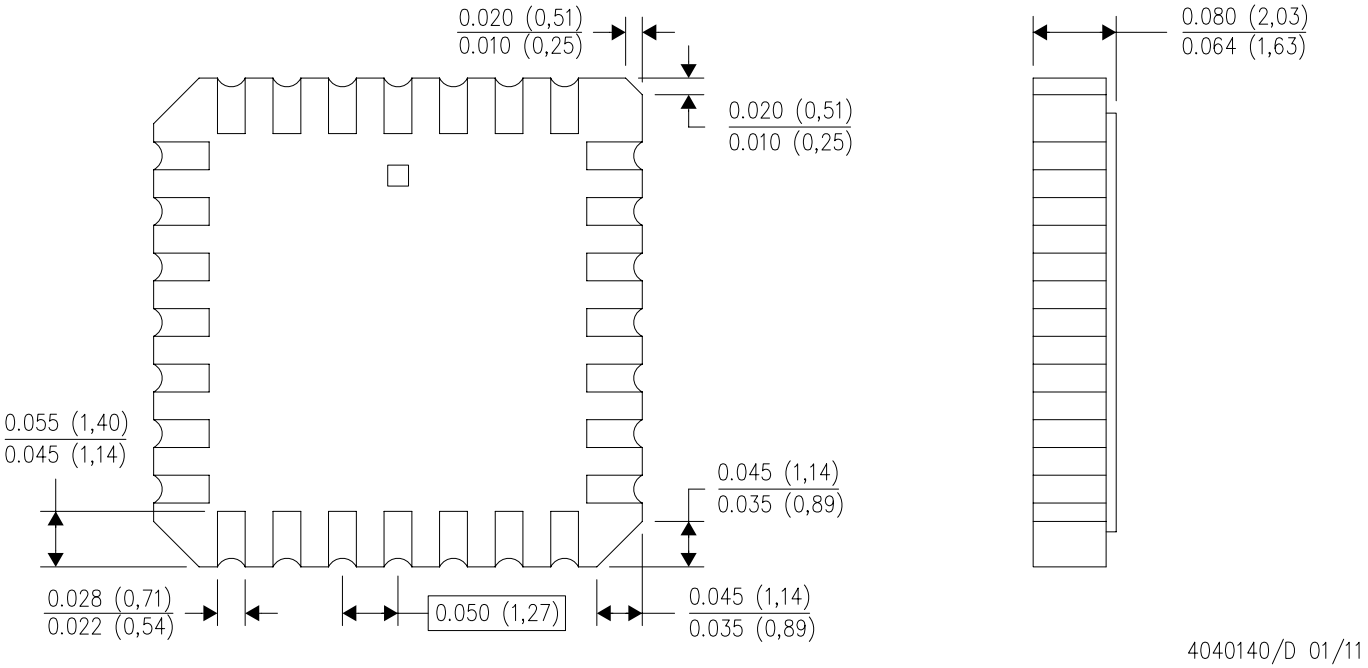
NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. This package can be hermetically sealed with a ceramic lid using glass frit.
D. Index point is provided on cap for terminal identification.
E. Falls within MIL STD 1835 GDIP1-T8

FK (S–CQCC–N**) LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



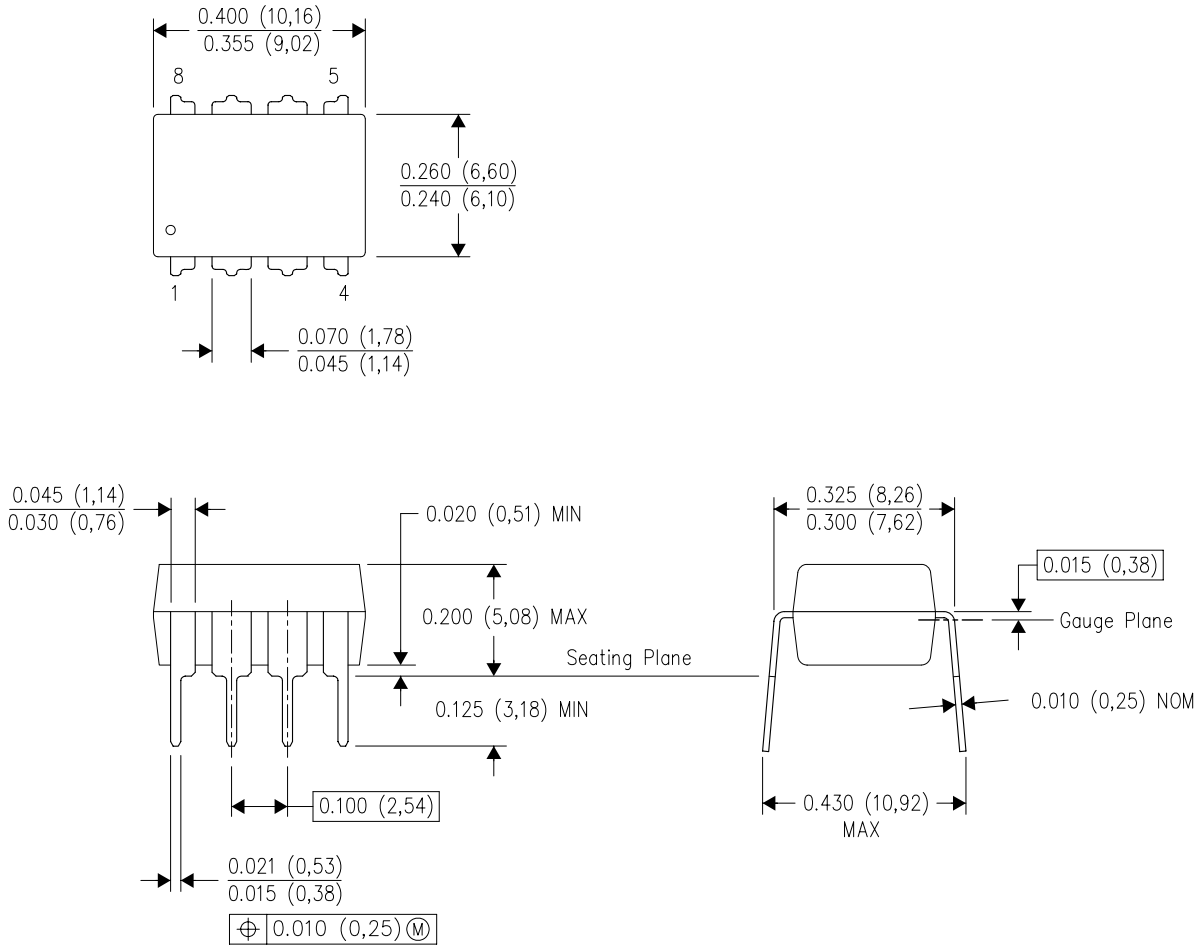
NO. OF TERMINALS **	A		B	
	MIN	MAX	MIN	MAX
20	0.342 (8,69)	0.358 (9,09)	0.307 (7,80)	0.358 (9,09)
28	0.442 (11,23)	0.458 (11,63)	0.406 (10,31)	0.458 (11,63)
44	0.640 (16,26)	0.660 (16,76)	0.495 (12,58)	0.560 (14,22)
52	0.740 (18,78)	0.761 (19,32)	0.495 (12,58)	0.560 (14,22)
68	0.938 (23,83)	0.962 (24,43)	0.850 (21,6)	0.858 (21,8)
84	1.141 (28,99)	1.165 (29,59)	1.047 (26,6)	1.063 (27,0)



4040140/D 01/11

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 metal lid.
D. Falls within JEDEC MS–004

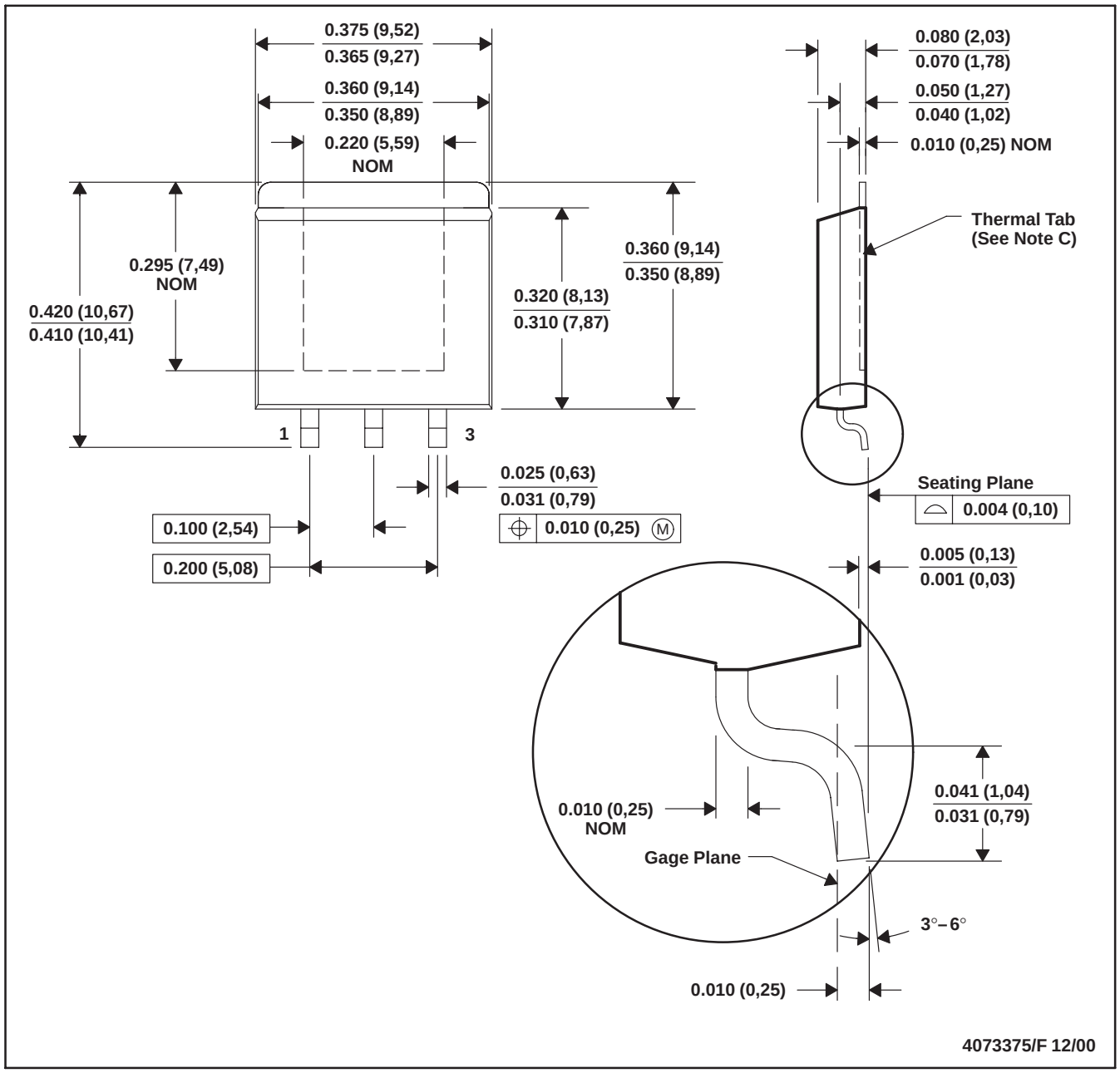
P (R–PDIP–T8) PLASTIC DUAL–IN–LINE PACKAGE



NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Falls within JEDEC MS–001 variation BA.

MPFM001E – OCTOBER 1994 – REVISED JANUARY 2001

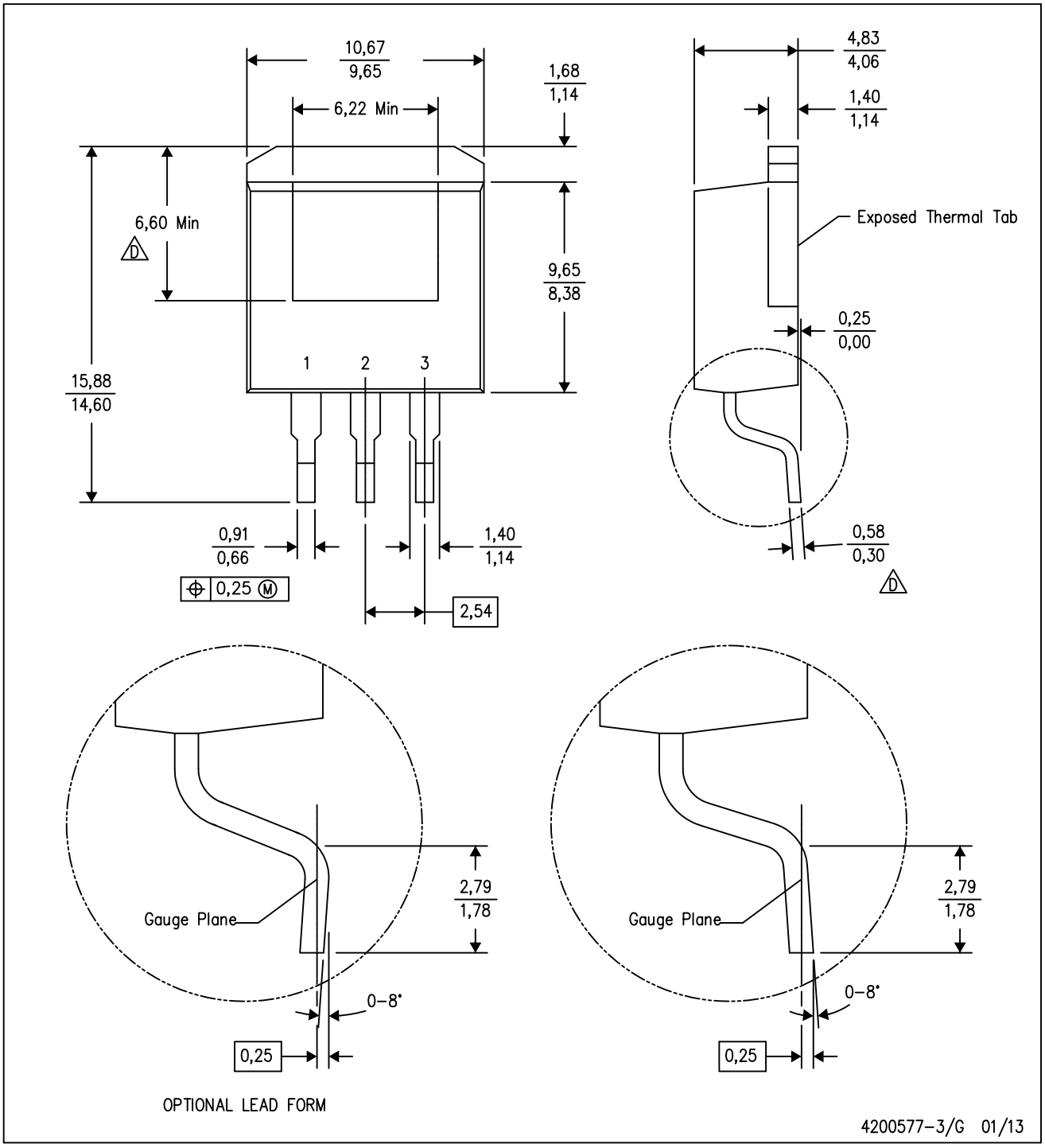
KTE (R-PSFM-G3) **PowerFLEX™ PLASTIC FLANGE-MOUNT**



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

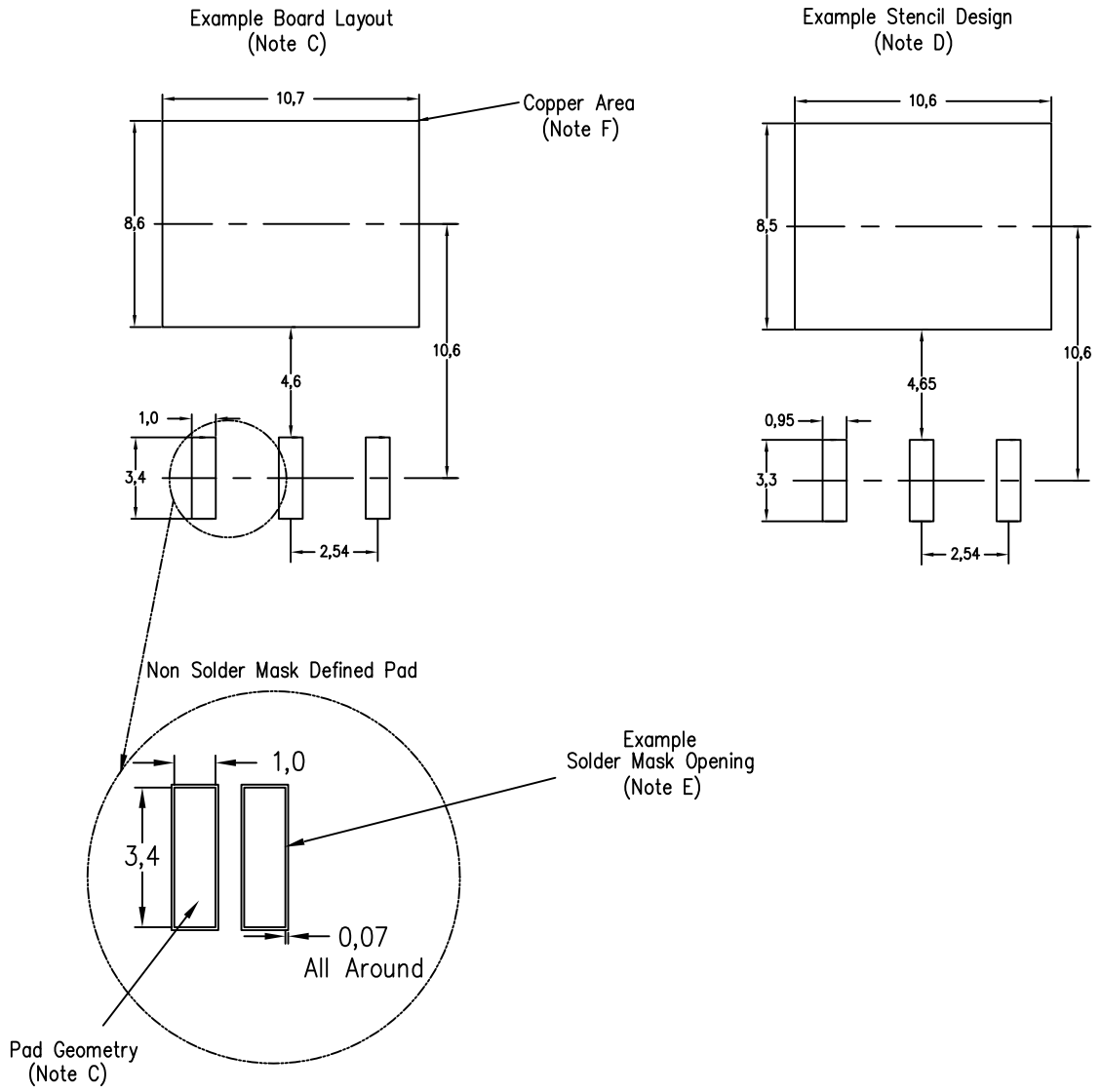
PowerFLEX is a trademark of Texas Instruments.

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



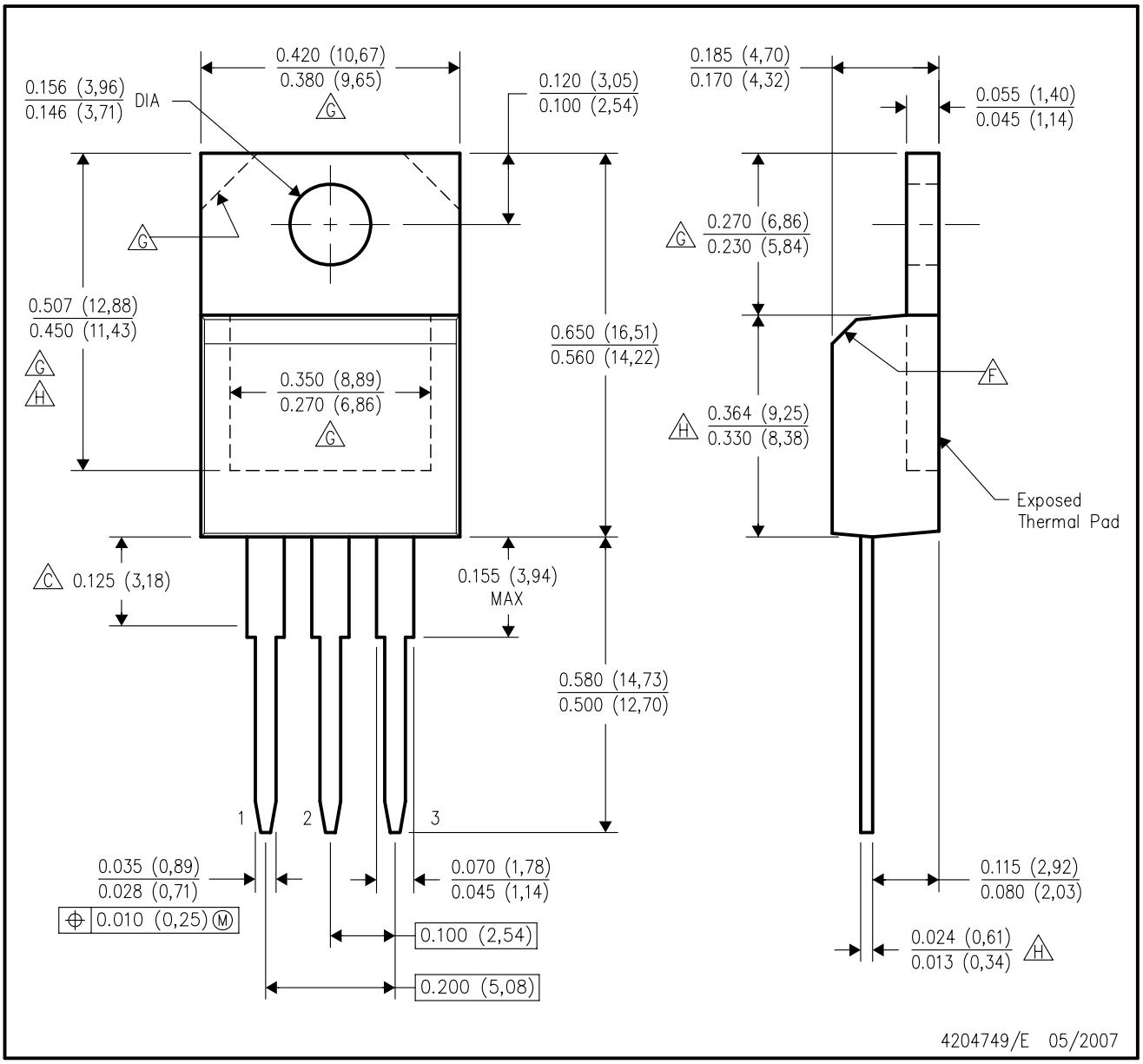
NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion. Mold flash or protrusion not to exceed 0.005 (0,13) per side.
D. Falls within JEDEC TO–263 variation AA, except minimum lead thickness and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

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



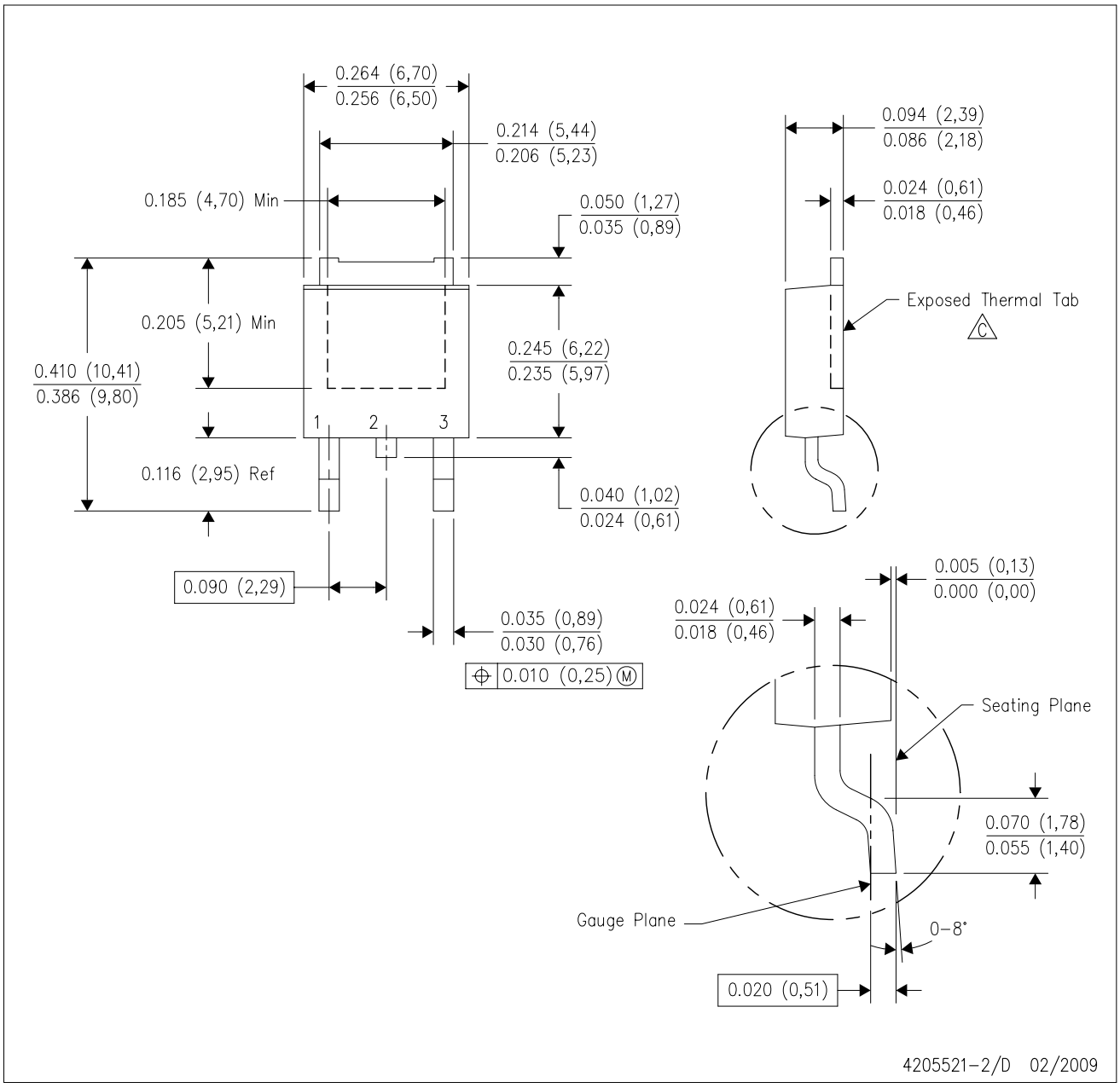
NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Publication IPC–SM–782 is recommended for alternate designs.
D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact 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



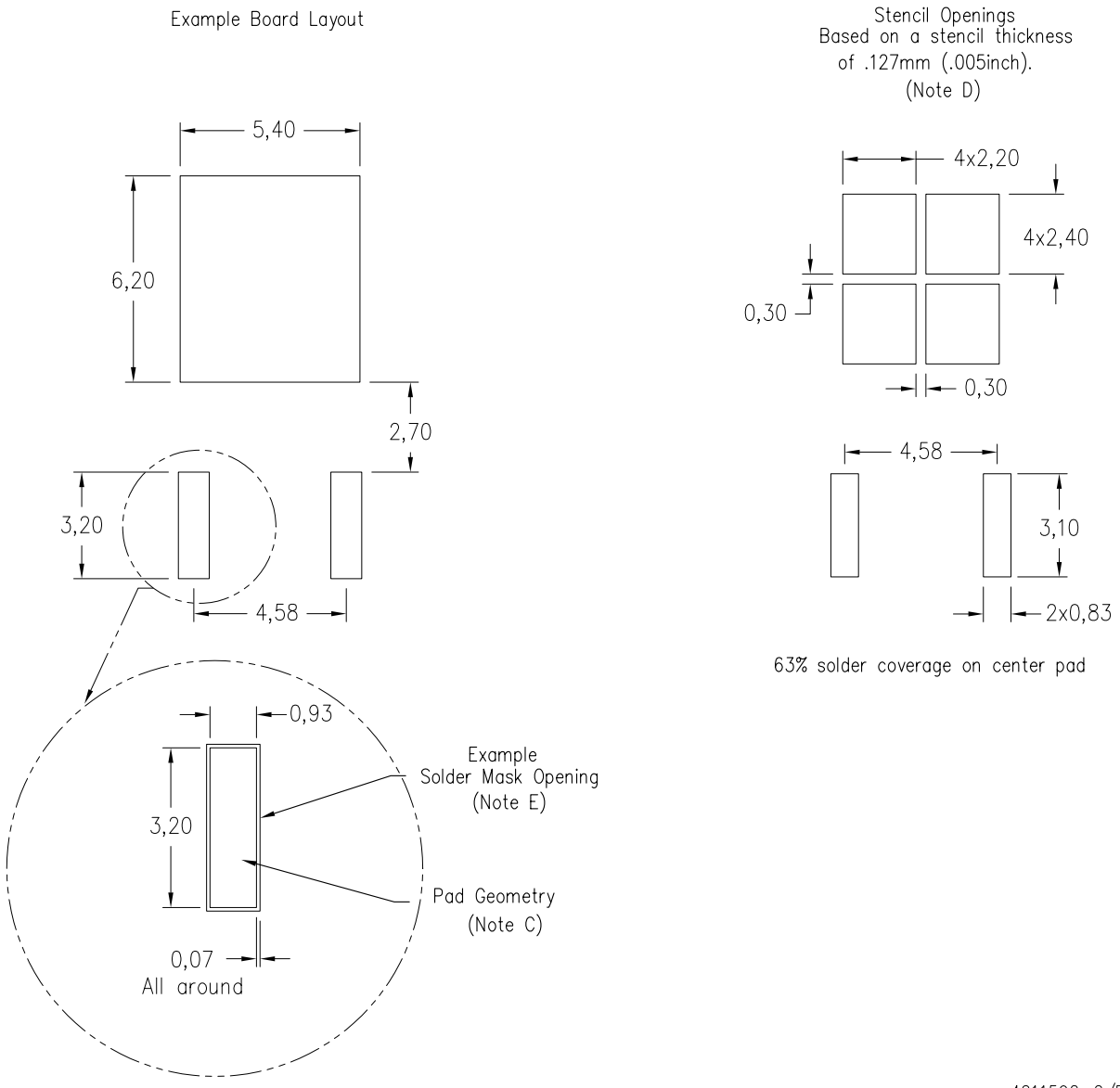
NOTES:
- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. Lead dimensions are not controlled within this area.
- D. All lead dimensions apply before solder dip.
- E. The center lead is in electrical contact with the mounting tab.
- F. The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



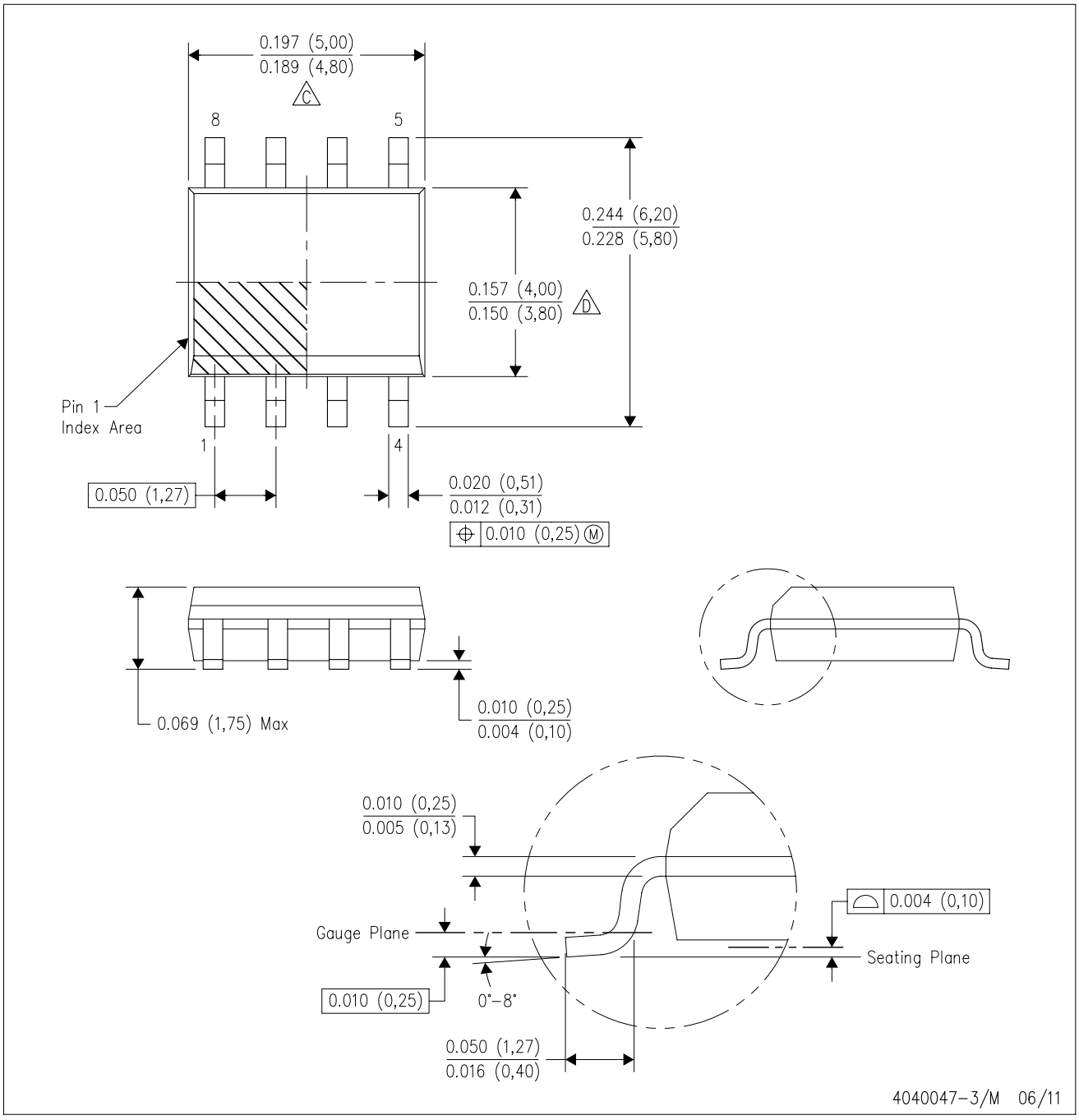
NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. The center lead is in electrical contact with the exposed thermal tab.
D. Body Dimensions do not include mold flash or protrusions. Mold flash and protrusion shall not exceed 0.006 (0,15)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

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



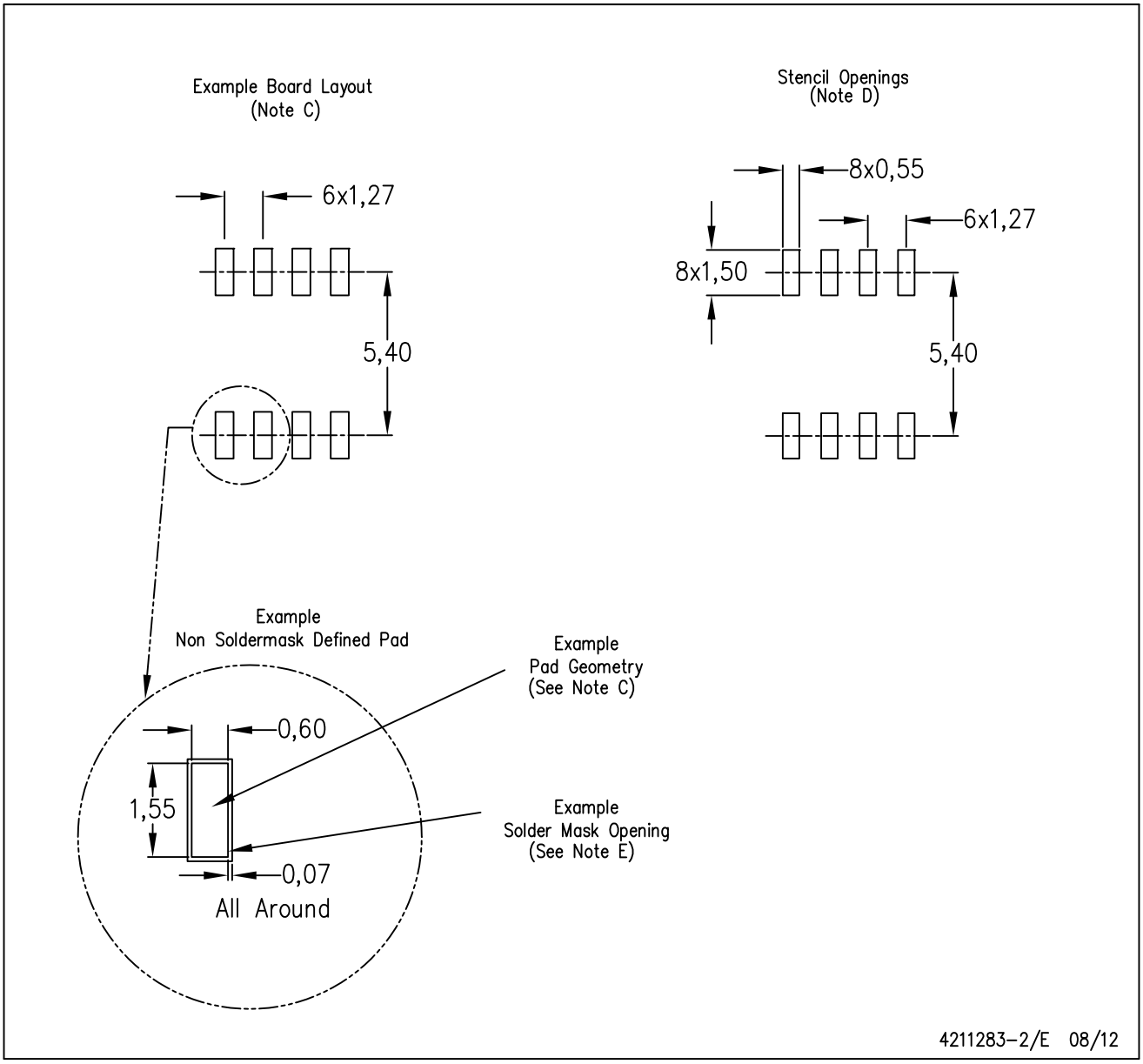
NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Publication IPC–SM–782 is an alternate information source for PCB land pattern designs.
D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. 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.

D (R–PDSO–G8) PLASTIC SMALL OUTLINE



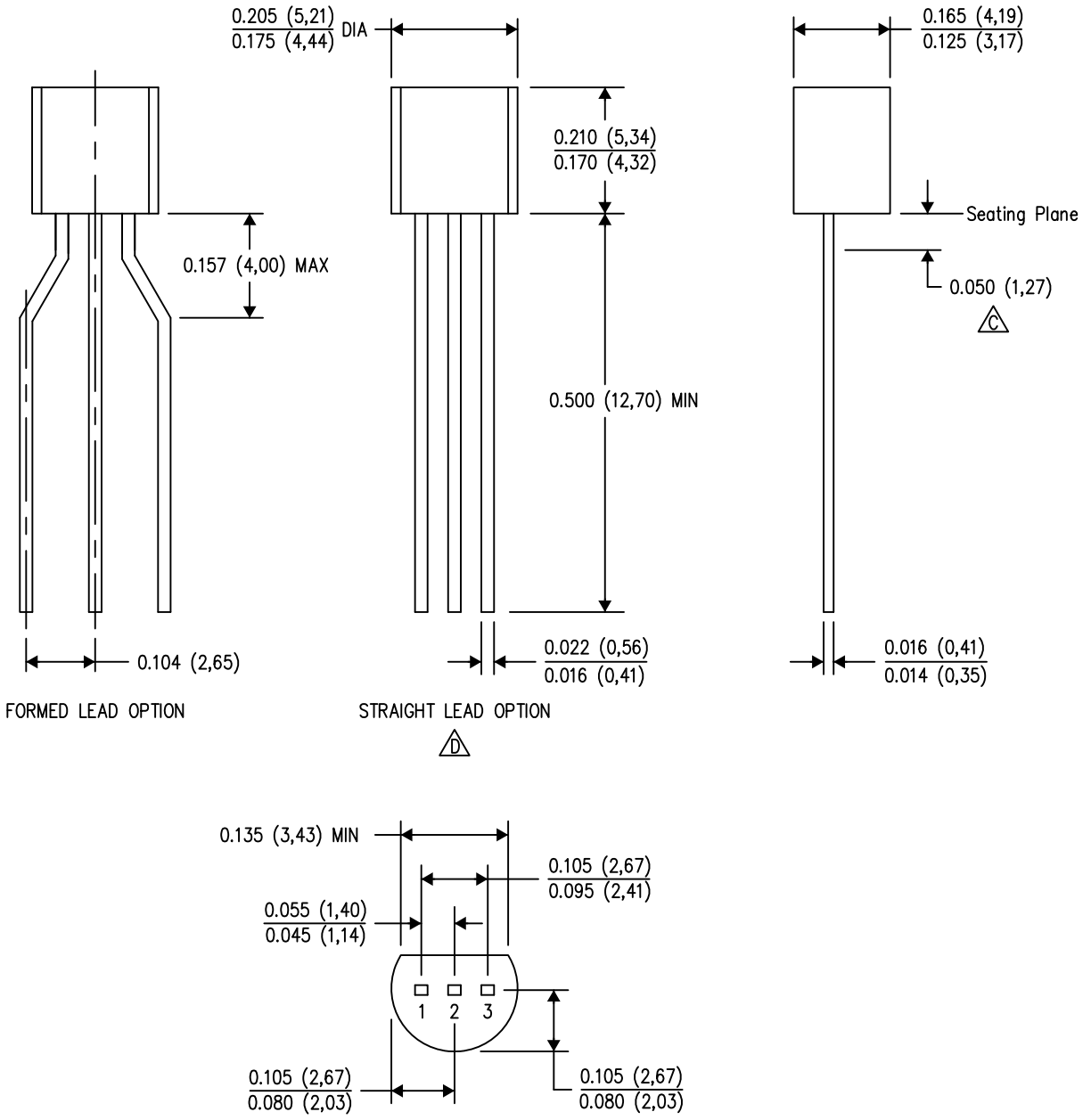
NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
D. Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
E. Reference JEDEC MS–012 variation AA.

D (R–PDSO–G8) PLASTIC SMALL OUTLINE



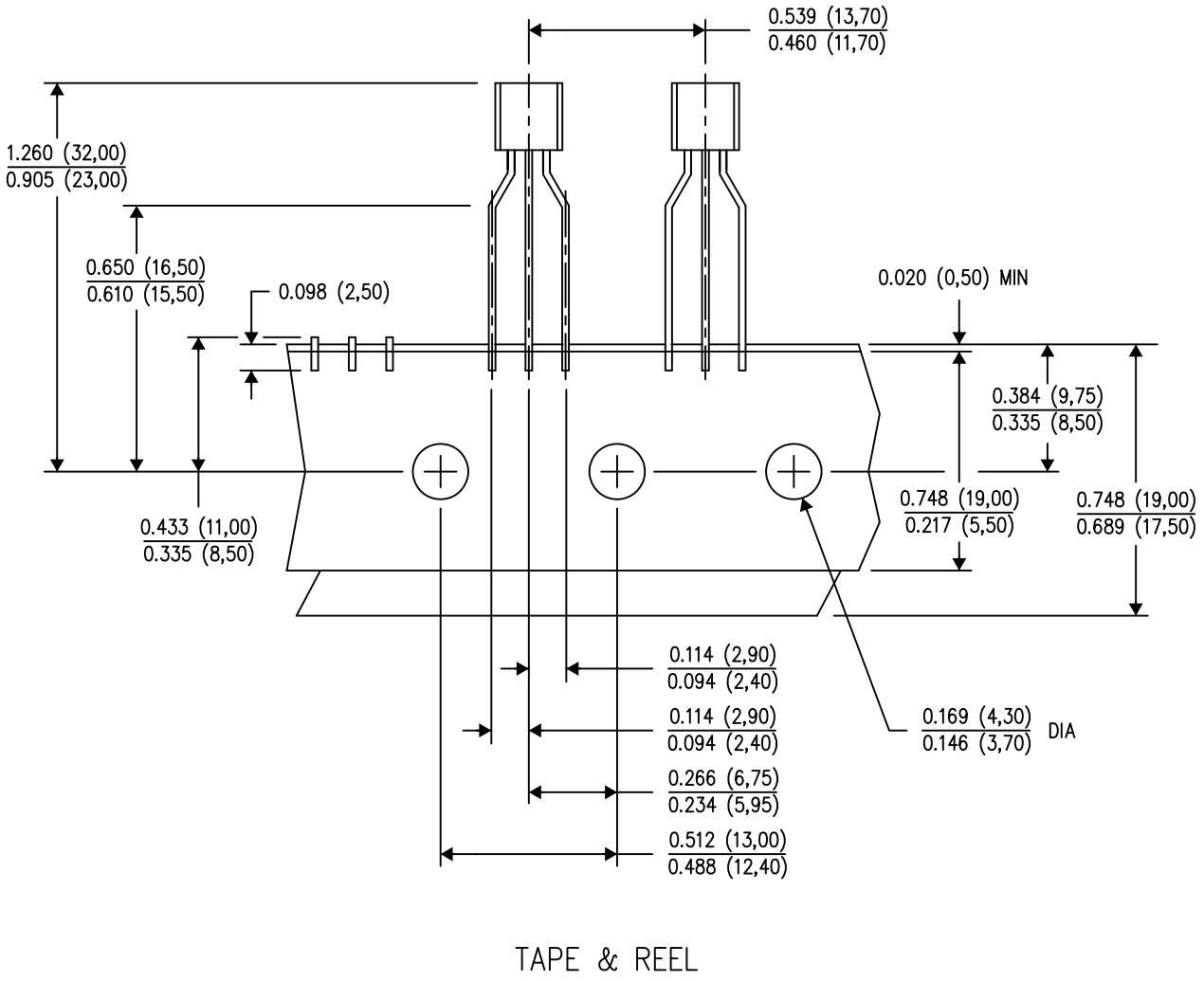
NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Publication IPC–7351 is recommended for alternate designs.
D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC–7525 for other stencil recommendations.
E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.

LP (O–PBCY–W3) PLASTIC CYLINDRICAL PACKAGE



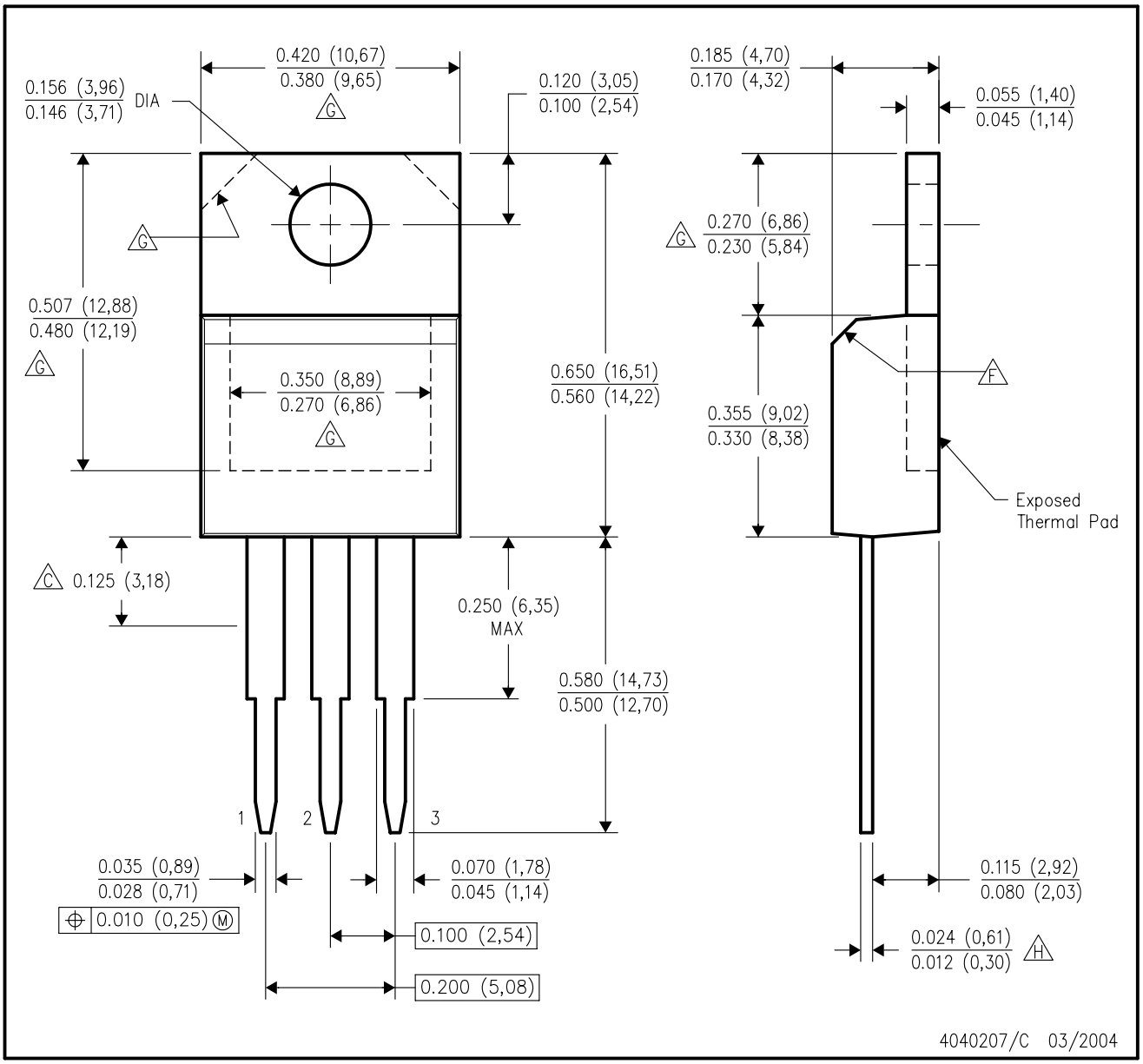
NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Lead dimensions are not controlled within this area.
D. Falls within JEDEC TO–226 Variation AA (TO–226 replaces TO–92).
E. Shipping Method:
Straight lead option available in bulk pack only.
Formed lead option available in tape & reel or ammo pack.
Specific products can be offered in limited combinations of shipping mediums and lead options.
Consult product folder for more information on available options.

LP (O–PBCY–W3) PLASTIC CYLINDRICAL PACKAGE



NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Tape and Reel information for the Formed Lead Option package.

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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