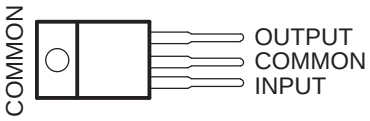
POSITIVE-VOLTAGE REGULATORS

Check for Samples: uA78M00 SERIES

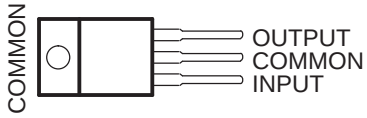
FEATURES

- **3-Terminal Regulators**
- **Output Current up to 500 mA**
- **No External Components**
- **Internal Thermal-Overload Protection**
- **High Power-Dissipation Capability**
- **Internal Short-Circuit Current Limiting**
- **Output Transistor Safe-Area Compensation**

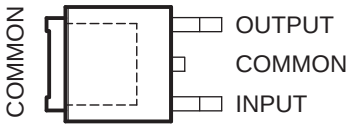
KC (TO-220) PACKAGE
(TOP VIEW)



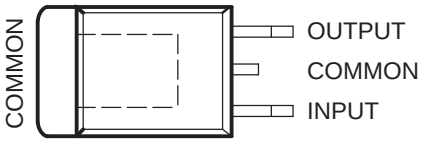
KCS (TO-220) PACKAGE
(TOP VIEW)



KVU (TO-252) PACKAGE
(TOP VIEW)

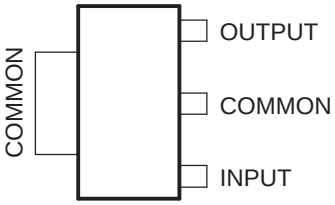


KTP (PowerFLEX /TO-252*) PACKAGE
(TOP VIEW)



* Complies with JEDEC TO-252, variation AC

DCY (SOT-223) PACKAGE
(TOP VIEW)



DESCRIPTION

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 500 mA of output current. The internal current-limiting and thermal-shutdown features of these regulators essentially make them immune to overload. In addition to use as fixed-voltage regulators, these devices can be used with external components to obtain adjustable output voltages and currents and also as the power-pass element in precision regulators.

ORDERING INFORMATION

For package and ordering information, see the Package Option Addendum at the end of this document.

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.

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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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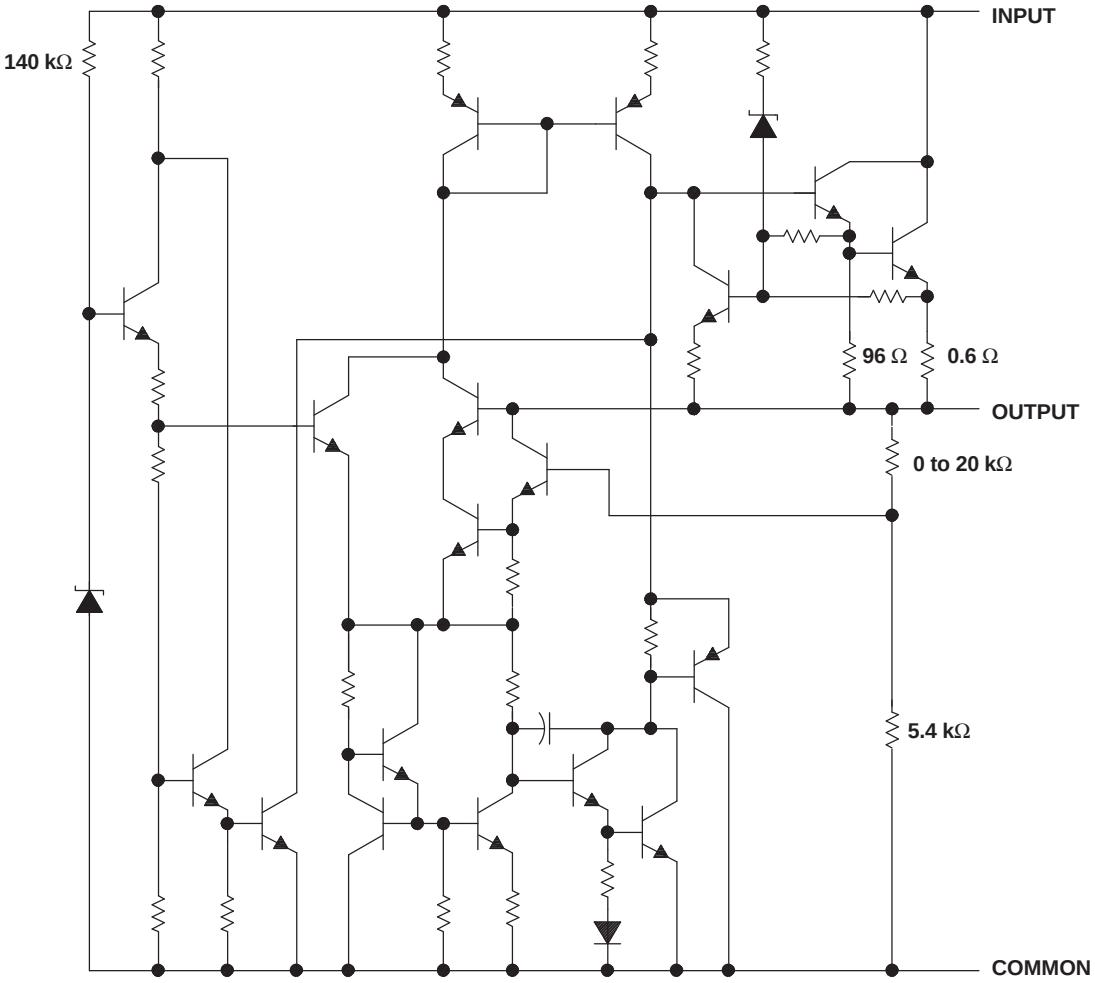
SCHEMATIC



Resistor values shown are nominal.

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Absolute Maximum Ratings(1)

over virtual junction temperature range (unless otherwise noted)

		MIN	MAX	UNIT
V_I	Input voltage		35	V
T_J	Operating virtual junction temperature		150	°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.

Package Thermal Data(1)

PACKAGE	BOARD	θ_{JP} (2)	θ_{JC}	θ_{JA}
PowerFLEX/TO-252 – KTP	High K, JESD 51-5	1.4°C/W	19°C/W	28°C/W
SOT-223 – DCY	High K, JESD 51-7		30.6°C/W	53°C/W
TO-220 – KC	High K, JESD 51-5	3°C/W	17°C/W	19°C/W
TO-220 – KCS	High K, JESD 51-5	3°C/W	17°C/W	19°C/W
TO-252 – KVU	High K, JESD 51-5			30.3°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.
(2) For packages with exposed thermal pads, such as QFN, PowerPAD™, or PowerFLEX, θ_{JP} is defined as the thermal resistance between the die junction and the bottom of the exposed pad.

Recommended Operating Conditions

			MIN	MAX	UNIT
V_I	Input voltage	uA78M33	5.3	25	V
		uA78M05	7	25	
		uA78M06	8	25	
		uA78M08	10.5	25	
		uA78M09	11.5	26	
		uA78M10	12.5	28	
		uA78M12	14.5	30	
		uA78M15	17.5	30	
I_O	Output current			500	mA
T_J	Operating virtual junction temperature	uA78MxxC	0	125	°C
		uA78MxxI	–40	125	

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Electrical Characteristics

at specified virtual junction temperature, V_I = 8 V, I_O = 350 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS(1)		uA78M33C			UNIT
			MIN	TYP	MAX	
Output voltage(2)	I_O = 5 mA to 350 mA, V_I = 8 V to 20 V		3.2	3.3	3.4	V
		T_J = 0°C to 125°C	3.1	3.3	3.5	
Input voltage regulation	I_O = 200 mA	V_I = 5.3 V to 25 V		9	100	mV
		V_I = 8 V to 25 V		3	50	
Ripple rejection	V_I = 8 V to 18 V, f = 120 Hz	I_O = 100 mA, T_J = 0°C to 125°C	62			dB
		I_O = 300 mA	62	80		
Output voltage regulation	V_I = 8 V,	I_O = 5 mA to 500 mA		20	100	mV
Temperature coefficient of output voltage	I_O = 5 mA,	T_J = 0°C to 125°C		–1		mV/°C
Output noise voltage	f = 10 Hz to 100 kHz			40	200	μV
Dropout voltage				2		V
Bias current				4.5	6	mA
Bias current change	I_O = 200 mA, V_I = 8 V to 25 V, T_J = 0°C to 125°C				0.8	mA
	I_O = 5 mA to 350 mA,	T_J = 0°C to 125°C			0.5	
Short-circuit output current	V_I = 35 V			300		mA
Peak output current				700		mA

(1) All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output. Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately.
(2) This specification applies only for dc power dissipation permitted by absolute maximum ratings

Electrical Characteristics

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

PARAMETER	TEST CONDITIONS(1)		uA78M05C			UNIT
			MIN	TYP	MAX	
Output voltage	I_O = 5 mA to 350 mA, V_I = 7 V to 20 V		4.8	5	5.2	V
		T_J = 0°C to 125°C	4.75		5.25	
Input voltage regulation	I_O = 200 mA	V_I = 7 V to 25 V		3	100	mV
		V_I = 8 V to 25 V		1	50	
Ripple rejection	V_I = 8 V to 18 V, f = 120 Hz	I_O = 100 mA, T_J = 0°C to 125°C	62			dB
		I_O = 300 mA	62	80		
Output voltage regulation	I_O = 5 mA to 500 mA			20	100	mV
	I_O = 5 mA to 200 mA			10	50	
Temperature coefficient of output voltage	I_O = 5 mA,	T_J = 0°C to 125°C		–1		mV/°C
Output noise voltage	f = 10 Hz to 100 kHz			40	200	μV
Dropout voltage				2		V
Bias current				4.5	6	mA
Bias current change	I_O = 200 mA, V_I = 8 V to 25 V, T_J = 0°C to 125°C				0.8	mA
	I_O = 5 mA to 350 mA,	T_J = 0°C to 125°C			0.5	
Short-circuit output current	V_I = 35 V			300		mA
Peak output current				0.7		A

(1) All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output. Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately.

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Electrical Characteristics

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

PARAMETER	TEST CONDITIONS(1)		uA78M05I			UNIT
			MIN	TYP	MAX	
Output voltage	I_O = 5 mA to 350 mA, V_I = 7 V to 20 V		4.8	5	5.2	V
		T_J = –40°C to 125°C	4.75		5.25	
Input voltage regulation	I_O = 200 mA	V_I = 7 V to 25 V		3	100	mV
		V_I = 8 V to 25 V		1	50	
Ripple rejection	V_I = 8 V to 18 V, f = 120 Hz	I_O = 100 mA, T_J = –40°C to 125°C	62			dB
		I_O = 300 mA	62	80		
Output voltage regulation	I_O = 5 mA to 500 mA			20	100	mV
	I_O = 5 mA to 200 mA			10	50	
Temperature coefficient of output voltage	I_O = 5 mA, T_J = –40°C to 125°C			–1		mV/°C
Output noise voltage	f = 10 Hz to 100 kHz			40	200	µV
Dropout voltage				2		V
Bias current				4.5	6	mA
Bias current change	I_O = 200 mA, V_I = 8 V to 25 V, T_J = –40°C to 125°C				0.8	mA
	I_O = 5 mA to 350 mA, T_J = –40°C to 125°C				0.5	
Short-circuit output current	V_I = 35 V			300		mA
Peak output current				0.7		A

(1) All characteristics are measured with a 0.33-µF capacitor across the input and a 0.1-µF capacitor across the output. Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately.

Electrical Characteristics

at specified virtual junction temperature, V_I = 11 V, I_O = 350 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS(1)			uA78M06C			UNIT
				MIN	TYP	MAX	
Output voltage	I_O = 5 mA to 350 mA,	V_I = 8 V to 21 V		5.75	6	6.25	V
			T_J = 0°C to 125°C	5.7		6.3	
Input voltage regulation	I_O = 200 mA	V_I = 8 V to 25 V			5	100	mV
		V_I = 9 V to 25 V			1.5	50	
Ripple rejection	V_I = 8 V to 18 V,	f = 120 Hz	I_O = 100 mA, T_J = 0°C to 125°C	59			dB
			I_O = 300 mA	59	80		
Output voltage regulation	I_O = 5 mA to 500 mA				20	120	mV
	I_O = 5 mA to 200 mA				10	60	
Temperature coefficient of output voltage	I_O = 5 mA,	T_J = 0°C to 125°C			–1		mV/°C
Output noise voltage	f = 10 Hz to 100 kHz				45		µV
Dropout voltage					2		V
Bias current					4.5	6	mA
Bias current change	V_I = 9 V to 25 V,	I_O = 200 mA,	T_J = 0°C to 125°C			0.8	mA
	I_O = 5 mA to 350 mA,	T_J = 0°C to 125°C				0.5	
Short-circuit output current	V_I = 35 V				270		mA
Peak output current					0.7		A

(1) All characteristics are measured with a 0.33-µF capacitor across the input and a 0.1-µF capacitor across the output. Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately.

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Electrical Characteristics

at specified virtual junction temperature, V_I = 14 V, I_O = 350 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS(1)			uA78M08C			UNIT
				MIN	TYP	MAX	
Output voltage	V_I = 10.5 V to 23 V,	I_O = 5 mA to 350 mA		7.7	8	8.3	V
			T_J = 0°C to 125°C	7.6		8.4	
Input voltage regulation	I_O = 200 mA	V_I = 10.5 V to 25 V			6	100	mV
		V_I = 11 V to 25 V			2	50	
Ripple rejection	V_I = 11 V to 21.5 V, f = 120 Hz	I_O = 100 mA,	T_J = 0°C to 125°C	56			dB
		I_O = 300 mA		56	80		
Output voltage regulation	I_O = 5 mA to 500 mA				25	160	mV
	I_O = 5 mA to 200 mA				10	80	
Temperature coefficient of output voltage	I_O = 5 mA,	T_J = 0°C to 125°C			–1		mV/°C
Output noise voltage	f = 10 Hz to 100 kHz				52		μV
Dropout voltage					2		V
Bias current					4.6	6	mA
Bias current change	V_I = 10.5 V to 25 V,	I_O = 200 mA,	T_J = 0°C to 125°C			0.8	mA
	I_O = 5 mA to 350 mA,	T_J = 0°C to 125°C				0.5	
Short-circuit output current	V_I = 35 V				250		mA
Peak output current					0.7		A

(1) All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output. Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately.

Electrical Characteristics

at specified virtual junction temperature, V_I = 16 V, I_O = 350 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS(1)			uA78M09C			UNIT
				MIN	TYP	MAX	
Output voltage	V_I = 11.5 V to 24 V,	I_O = 5 mA to 350 mA		8.6	9	9.4	V
			T_J = 0°C to 125°C	8.5		9.5	
Input voltage regulation	I_O = 200 mA	V_I = 11.5 V to 26 V			6	100	mV
		V_I = 12 V to 26 V			2	50	
Ripple rejection	V_I = 13 V to 23 V, f = 120 Hz	I_O = 100 mA,	T_J = 0°C to 125°C	56			dB
		I_O = 300 mA		56	80		
Output voltage regulation	I_O = 5 mA to 500 mA				25	180	mV
	I_O = 5 mA to 200 mA				10	90	
Temperature coefficient of output voltage	I_O = 5 mA,	T_J = 0°C to 125°C			–1		mV/°C
Output noise voltage	f = 10 Hz to 100 kHz				58		μV
Dropout voltage					2		V
Bias current					4.6	6	mA
Bias current change	V_I = 11.5 V to 26 V,	I_O = 200 mA,	T_J = 0°C to 125°C			0.8	mA
	I_O = 5 mA to 350 mA,	T_J = 0°C to 125°C				0.5	
Short-circuit output current	V_I = 35 V				250		mA
Peak output current					0.7		A

(1) All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output. Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately.

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Electrical Characteristics

at specified virtual junction temperature, V_I = 17 V, I_O = 350 mA, T_J = 25°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS[1]			uA78M10C			UNIT
				MIN	TYP	MAX	
Output voltage	V_I = 12.5 V to 25 V,	I_O = 5 mA to 350 mA		9.6	10	10.4	V
			T_J = 0°C to 125°C	9.5		10.5	
Input voltage regulation	I_O = 200 mA	V_I = 12.5 V to 28 V			7	100	mV
		V_I = 14 V to 28 V			2	50	
Ripple rejection	V_I = 15 V to 25 V, f = 120 Hz	I_O = 100 mA,	T_J = 0°C to 125°C	59			dB
		I_O = 300 mA		55	80		
Output voltage regulation	I_O = 5 mA to 500 mA				25	200	mV
	I_O = 5 mA to 200 mA				10	100	
Temperature coefficient of output voltage	I_O = 5 mA,	T_J = 0°C to 125°C			–1		mV/°C
Output noise voltage	f = 10 Hz to 100 kHz				64		μV
Dropout voltage					2		V
Bias current					4.7	6	mA
Bias current change	V_I = 12.5 V to 28 V,	I_O = 200 mA,	T_J = 0°C to 125°C			0.8	mA
	I_O = 5 mA to 350 mA,	T_J = 0°C to 125°C				0.5	
Short-circuit output current	V_I = 35 V				245		mA
Peak output current					0.7		A

(1) All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output. Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately.

Electrical Characteristics

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

PARAMETER	TEST CONDITIONS[1]			uA78M12C			UNIT
				MIN	TYP	MAX	
Output voltage	V_I = 14.5 V to 27 V,	I_O = 5 mA to 350 mA		11.5	12	12.5	V
			T_J = 0°C to 125°C	11.4		12.6	
Input voltage regulation	I_O = 200 mA	V_I = 14.5 V to 30 V			8	100	mV
		V_I = 16 V to 30 V			2	50	
Ripple rejection	V_I = 15 V to 25 V, f = 120 Hz	I_O = 100 mA,	T_J = 0°C to 125°C	55			dB
		I_O = 300 mA		55	80		
Output voltage regulation	I_O = 5 mA to 500 mA				25	240	mV
	I_O = 5 mA to 200 mA				10	120	
Temperature coefficient of output voltage	I_O = 5 mA,	T_J = 0°C to 125°C			–1		mV/°C
Output noise voltage	f = 10 Hz to 100 kHz				75		μV
Dropout voltage					2		V
Bias current					4.8	6	mA
Bias current change	V_I = 14.5 V to 30 V,	I_O = 200 mA,	T_J = 0°C to 125°C			0.8	mA
	I_O = 5 mA to 350 mA,	T_J = 0°C to 125°C				0.5	
Short-circuit output current	V_I = 35 V				240		mA
Peak output current					0.7		A

(1) All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output. Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately.

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REVISION HISTORY

Changes from Revision Q (April 2010) to Revision R	Page
• Removed obsolete part information from document.	1

Changes from Revision R (February 2013) to Revision S	Page
• Removed ordering information table.	1

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PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
UA78M05CDCY	ACTIVE	SOT-223	DCY	4	80	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	0 to 125	C5	Samples
UA78M05CDCYG3	ACTIVE	SOT-223	DCY	4	80	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	0 to 125	C5	Samples
UA78M05CDCYR	ACTIVE	SOT-223	DCY	4	2500	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	0 to 125	C5	Samples
UA78M05CDCYRG3	ACTIVE	SOT-223	DCY	4	2500	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	0 to 125	C5	Samples
UA78M05CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	0 to 125	UA78M05C	
UA78M05CKCS	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	UA78M05C	Samples
UA78M05CKCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	UA78M05C	Samples
UA78M05CKTPR	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125	UA78M05C	
UA78M05CKTPRG3	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125	UA78M05C	
UA78M05CKVURG3	ACTIVE	TO-252	KVU	3	2500	Green (RoHS & no Sb/Br)	CU SN	Level-3-260C-168 HR	0 to 125	78M05C	Samples
UA78M05IDCY	ACTIVE	SOT-223	DCY	4	80	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	-40 to 125	J5	Samples
UA78M05IDCYG3	ACTIVE	SOT-223	DCY	4	80	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	-40 to 125	J5	Samples
UA78M05IDCYR	ACTIVE	SOT-223	DCY	4	2500	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	-40 to 125	J5	Samples
UA78M05IDCYRG3	ACTIVE	SOT-223	DCY	4	2500	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	-40 to 125	J5	Samples
UA78M05IKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	-40 to 125	UA78M05I	
UA78M05IKCE3	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	-40 to 125	UA78M05I	
UA78M05IKCS	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	-40 to 125	UA78M05I	Samples
UA78M05IKCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	-40 to 125	UA78M05I	Samples
UA78M05IKTPR	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	-40 to 125	UA78M05I	
UA78M05IKTPRG3	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	-40 to 125	UA78M05I	

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
UA78M05IKVURG3	ACTIVE	TO-252	KVU	3	2500	Green (RoHS & no Sb/Br)	CU SN	Level-3-260C-168 HR	-40 to 125	78M05I	Samples
UA78M06CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	0 to 125		
UA78M06CKTPR	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125	UA78M06C	
UA78M06CKTPRG3	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125	UA78M06C	
UA78M06CKVURG3	ACTIVE	TO-252	KVU	3	2500	Green (RoHS & no Sb/Br)	CU SN	Level-3-260C-168 HR	0 to 125	78M06C	Samples
UA78M08CDCY	ACTIVE	SOT-223	DCY	4	80	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	0 to 125	C8	Samples
UA78M08CDCYG3	ACTIVE	SOT-223	DCY	4	80	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	0 to 125	C8	Samples
UA78M08CDCYR	ACTIVE	SOT-223	DCY	4	2500	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	0 to 125	C8	Samples
UA78M08CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	0 to 125	UA78M08C	
UA78M08CKCE3	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	0 to 125	UA78M08C	
UA78M08CKCS	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	UA78M08C	Samples
UA78M08CKCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	UA78M08C	Samples
UA78M08CKTPR	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125	UA78M08C	
UA78M08CKTPRG3	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125	UA78M08C	
UA78M08CKVURG3	ACTIVE	TO-252	KVU	3	2500	Green (RoHS & no Sb/Br)	CU SN	Level-3-260C-168 HR	0 to 125	78M08C	Samples
UA78M09CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	0 to 125		
UA78M09CKTP	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125		
UA78M09CKTPR	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125	UA78M09C	
UA78M09CKTPRG3	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125	UA78M09C	
UA78M09CKVURG3	ACTIVE	TO-252	KVU	3	2500	Green (RoHS & no Sb/Br)	CU SN	Level-3-260C-168 HR	0 to 125	78M09C	Samples
UA78M10CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	0 to 125		
UA78M10CKTPR	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125	UA78M10C	
UA78M10CKTPRG3	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125	UA78M10C	
UA78M10CKVURG3	ACTIVE	TO-252	KVU	3	2500	Green (RoHS & no Sb/Br)	CU SN	Level-3-260C-168 HR	0 to 125	78M10C	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
UA78M12CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	0 to 125	UA78M12C	
UA78M12CKCS	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	UA78M12C	Samples
UA78M12CKCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	UA78M12C	Samples
UA78M12CKTPR	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125	UA78M12C	
UA78M12CKTPRG3	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125	UA78M12C	
UA78M12CKVURG3	ACTIVE	TO-252	KVU	3	2500	Green (RoHS & no Sb/Br)	CU SN	Level-3-260C-168 HR	0 to 125	78M12C	Samples
UA78M33CDCY	ACTIVE	SOT-223	DCY	4	80	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	0 to 125	C3	Samples
UA78M33CDCYG3	ACTIVE	SOT-223	DCY	4	80	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	0 to 125	C3	Samples
UA78M33CDCYR	ACTIVE	SOT-223	DCY	4	2500	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	0 to 125	C3	Samples
UA78M33CDCYRG3	ACTIVE	SOT-223	DCY	4	2500	Green (RoHS & no Sb/Br)	CU SN	Level-2-260C-1 YEAR	0 to 125	C3	Samples
UA78M33CKC	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	0 to 125	UA78M33C	
UA78M33CKCE3	OBSOLETE	TO-220	KC	3		TBD	Call TI	Call TI	0 to 125	UA78M33C	
UA78M33CKCS	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	UA78M33C	Samples
UA78M33CKCSE3	ACTIVE	TO-220	KCS	3	50	Pb-Free (RoHS)	CU SN	N / A for Pkg Type	0 to 125	UA78M33C	Samples
UA78M33CKTPR	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125	UA78M33C	
UA78M33CKTPRG3	OBSOLETE	PFM	KTP	2		TBD	Call TI	Call TI	0 to 125	UA78M33C	
UA78M33CKVURG3	ACTIVE	TO-252	KVU	3	2500	Green (RoHS & no Sb/Br)	CU SN	Level-3-260C-168 HR	0 to 125	78M33C	Samples

(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.

(6) Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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OTHER QUALIFIED VERSIONS OF UA78M05, UA78M10, UA78M33 :

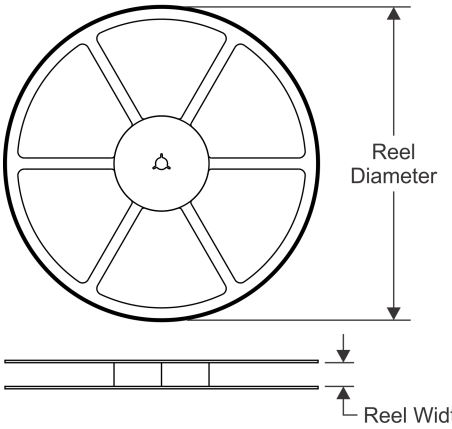
- Automotive: UA78M05-Q1, UA78M10-Q1, UA78M33-Q1

NOTE: Qualified Version Definitions:

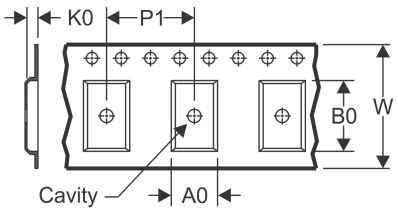
- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects

TAPE AND REEL INFORMATION

REEL DIMENSIONS

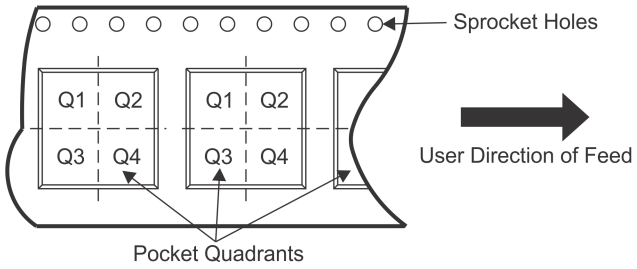


TAPE DIMENSIONS



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

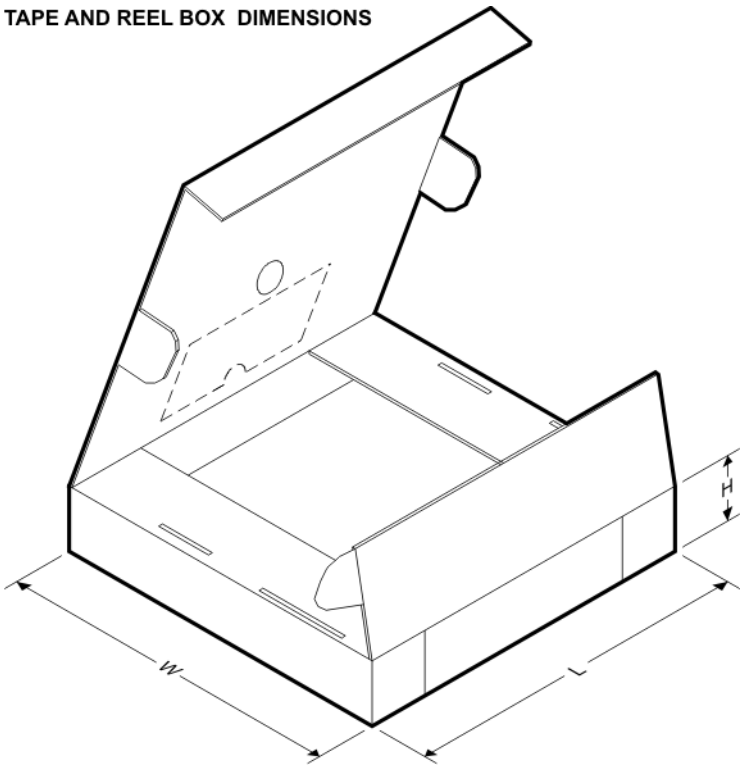
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*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
UA78M05CDCYR	SOT-223	DCY	4	2500	330.0	12.4	7.05	7.4	1.9	8.0	12.0	Q3
UA78M05CKVURG3	TO-252	KVU	3	2500	330.0	16.4	6.9	10.5	2.7	8.0	16.0	Q2
UA78M05IDCYR	SOT-223	DCY	4	2500	330.0	12.4	7.05	7.4	1.9	8.0	12.0	Q3
UA78M05IKVURG3	TO-252	KVU	3	2500	330.0	16.4	6.9	10.5	2.7	8.0	16.0	Q2
UA78M06CKVURG3	TO-252	KVU	3	2500	330.0	16.4	6.9	10.5	2.7	8.0	16.0	Q2
UA78M08CDCYR	SOT-223	DCY	4	2500	330.0	12.4	7.05	7.4	1.9	8.0	12.0	Q3
UA78M08CKVURG3	TO-252	KVU	3	2500	330.0	16.4	6.9	10.5	2.7	8.0	16.0	Q2
UA78M09CKVURG3	TO-252	KVU	3	2500	330.0	16.4	6.9	10.5	2.7	8.0	16.0	Q2
UA78M10CKVURG3	TO-252	KVU	3	2500	330.0	16.4	6.9	10.5	2.7	8.0	16.0	Q2
UA78M12CKVURG3	TO-252	KVU	3	2500	330.0	16.4	6.9	10.5	2.7	8.0	16.0	Q2
UA78M33CDCYR	SOT-223	DCY	4	2500	330.0	12.4	7.05	7.4	1.9	8.0	12.0	Q3
UA78M33CKVURG3	TO-252	KVU	3	2500	330.0	16.4	6.9	10.5	2.7	8.0	16.0	Q2

TAPE AND REEL BOX DIMENSIONS

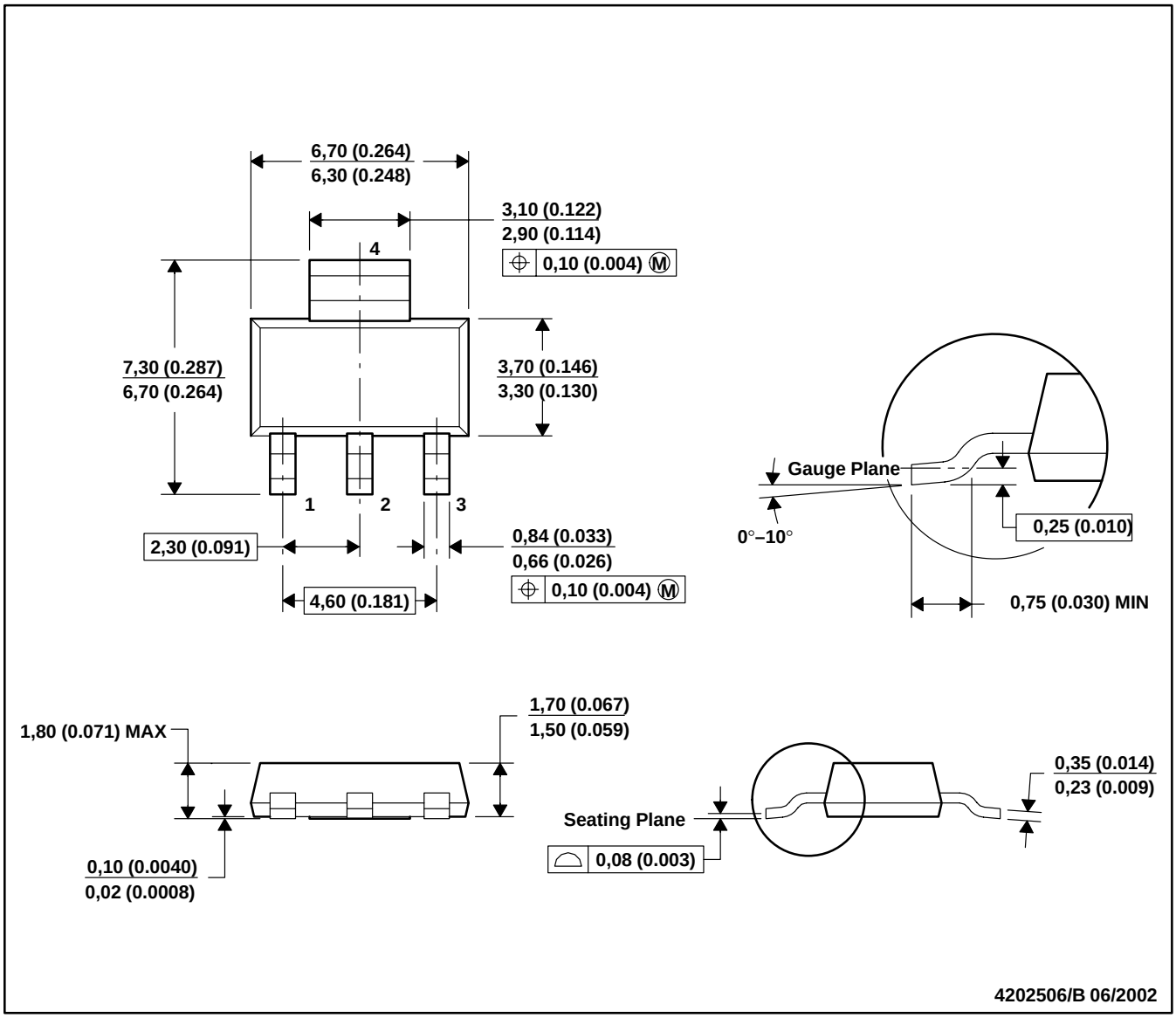


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
UA78M05CDCYR	SOT-223	DCY	4	2500	340.0	340.0	38.0
UA78M05CKVURG3	TO-252	KVU	3	2500	340.0	340.0	38.0
UA78M05IDCYR	SOT-223	DCY	4	2500	340.0	340.0	38.0
UA78M05IKVURG3	TO-252	KVU	3	2500	340.0	340.0	38.0
UA78M06CKVURG3	TO-252	KVU	3	2500	340.0	340.0	38.0
UA78M08CDCYR	SOT-223	DCY	4	2500	340.0	340.0	38.0
UA78M08CKVURG3	TO-252	KVU	3	2500	340.0	340.0	38.0
UA78M09CKVURG3	TO-252	KVU	3	2500	340.0	340.0	38.0
UA78M10CKVURG3	TO-252	KVU	3	2500	340.0	340.0	38.0
UA78M12CKVURG3	TO-252	KVU	3	2500	340.0	340.0	38.0
UA78M33CDCYR	SOT-223	DCY	4	2500	340.0	340.0	38.0
UA78M33CKVURG3	TO-252	KVU	3	2500	340.0	340.0	38.0

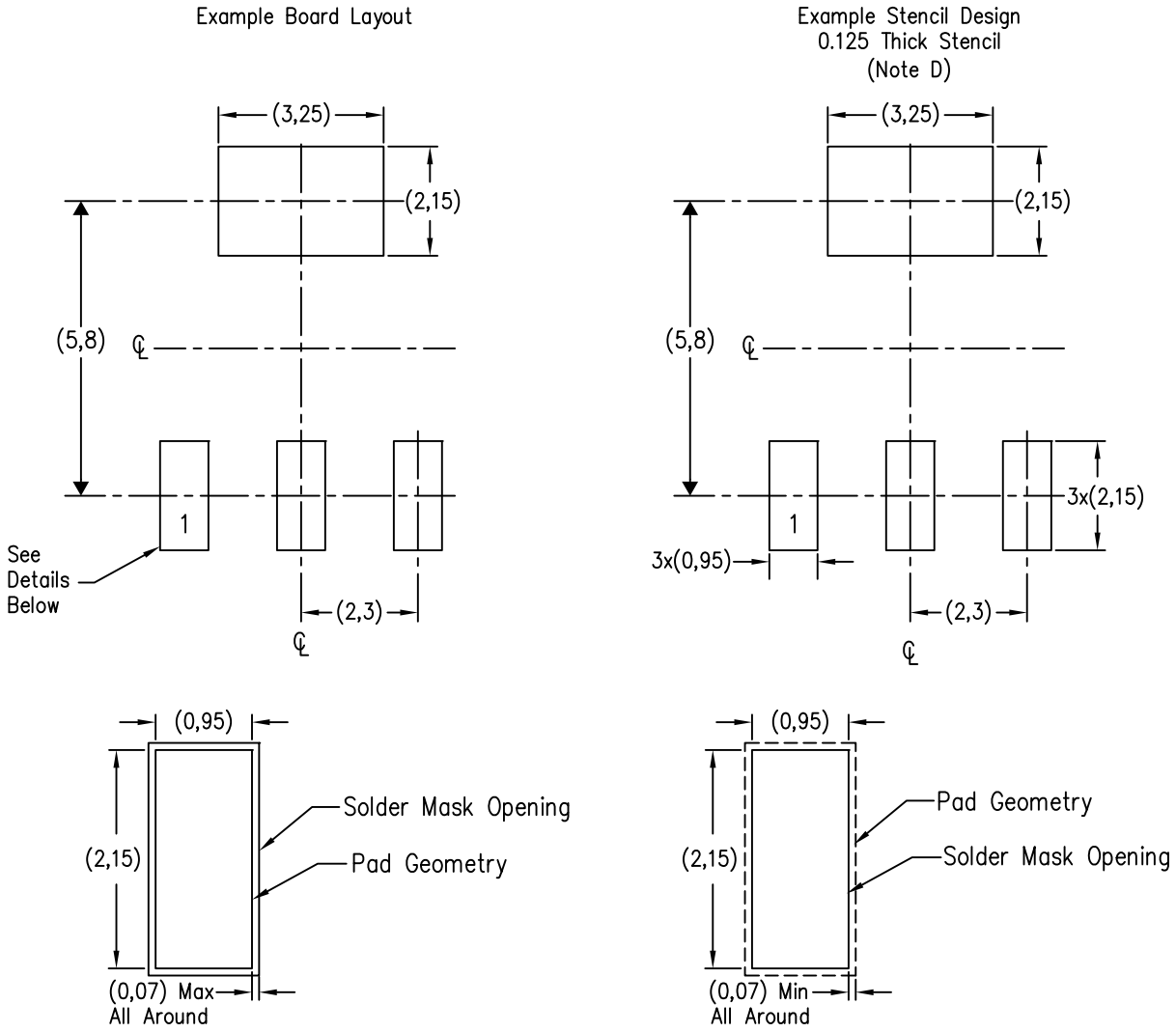
MPDS094A – APRIL 2001 – REVISED JUNE 2002

DCY (R-PDSO-G4) **PLASTIC SMALL-OUTLINE**



NOTES: A. All linear dimensions are in millimeters (inches).
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion.
D. Falls within JEDEC TO-261 Variation AA.

DCY (R–PDSO–G4) PLASTIC SMALL OUTLINE

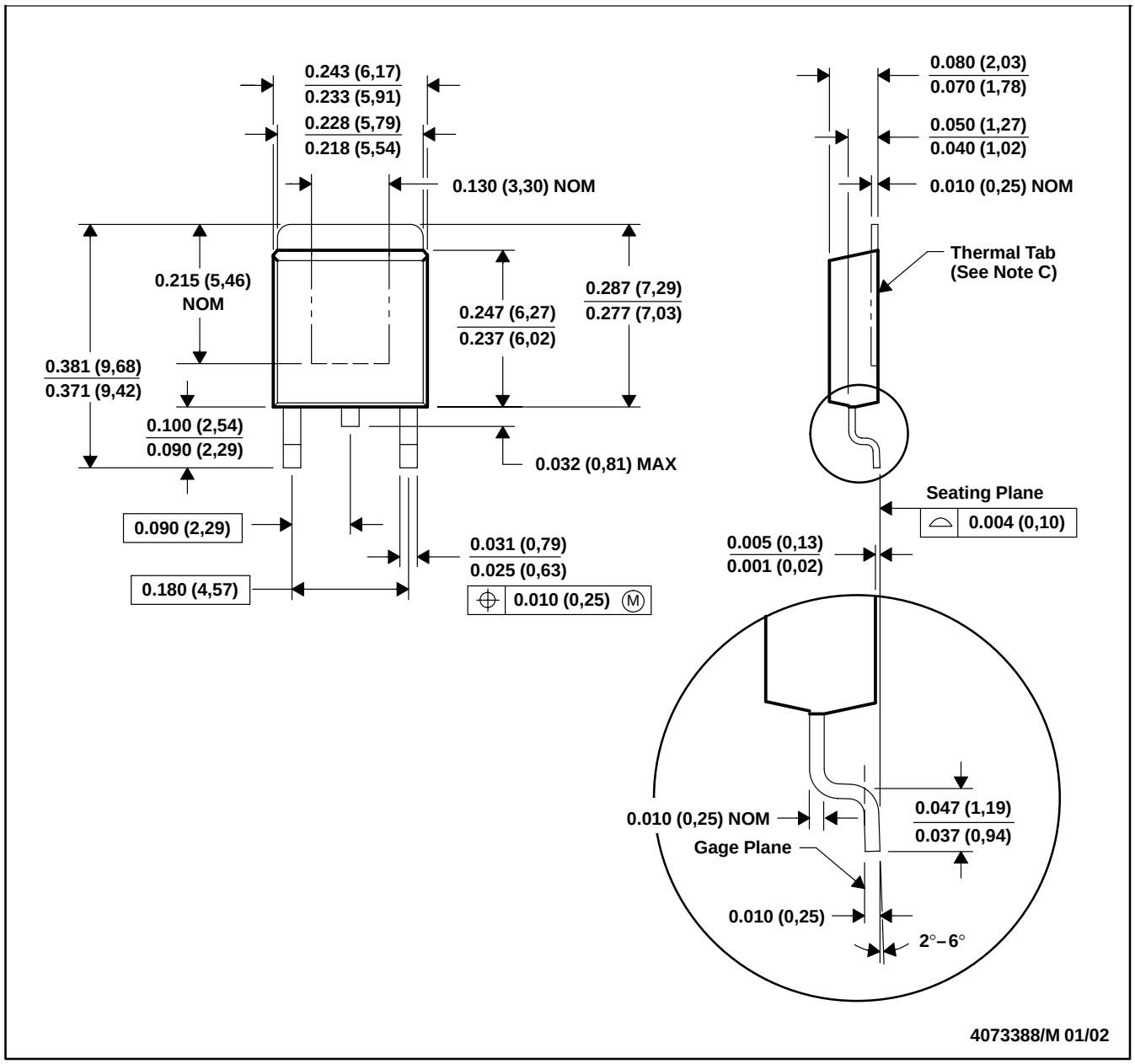


NOTES:

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 recommendations. Refer to IPC 7525 for stencil design considerations.

MPSF001F – JANUARY 1996 – REVISED JANUARY 2002

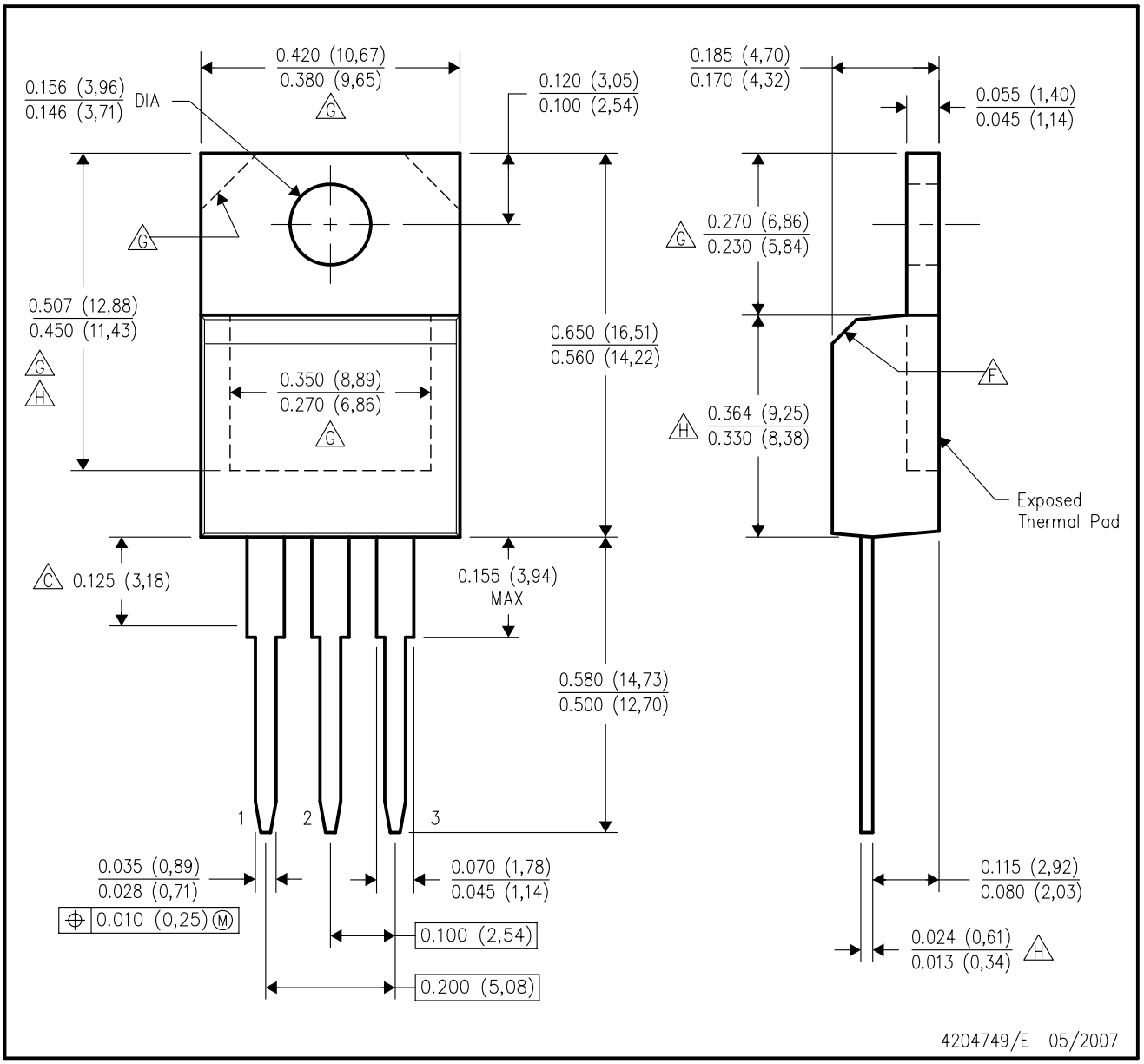
KTP (R-PSFM-G2) **PowerFLEX™ PLASTIC FLANGE-MOUNT PACKAGE**



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.

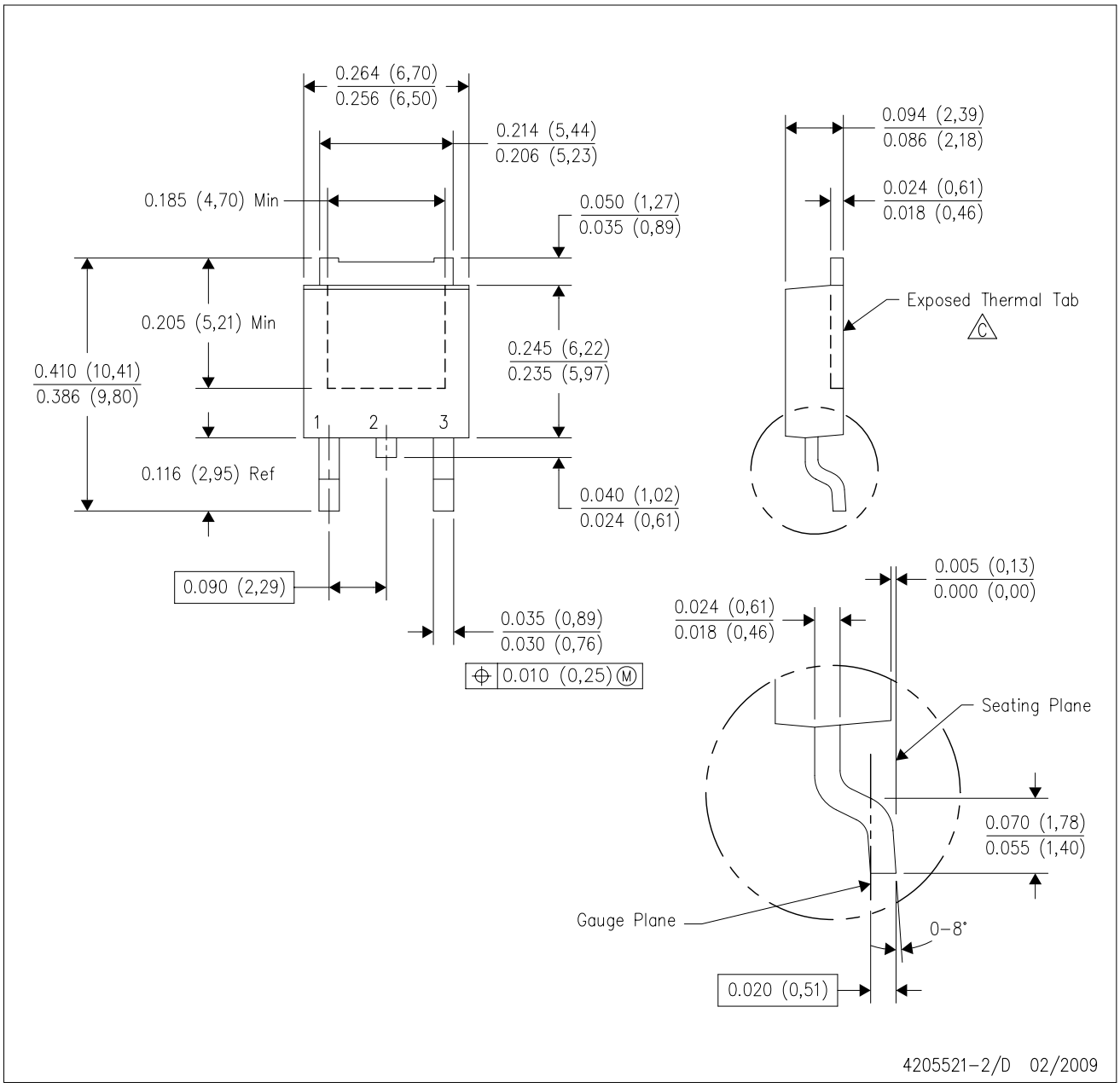
PowerFLEX is a trademark of Texas Instruments.

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



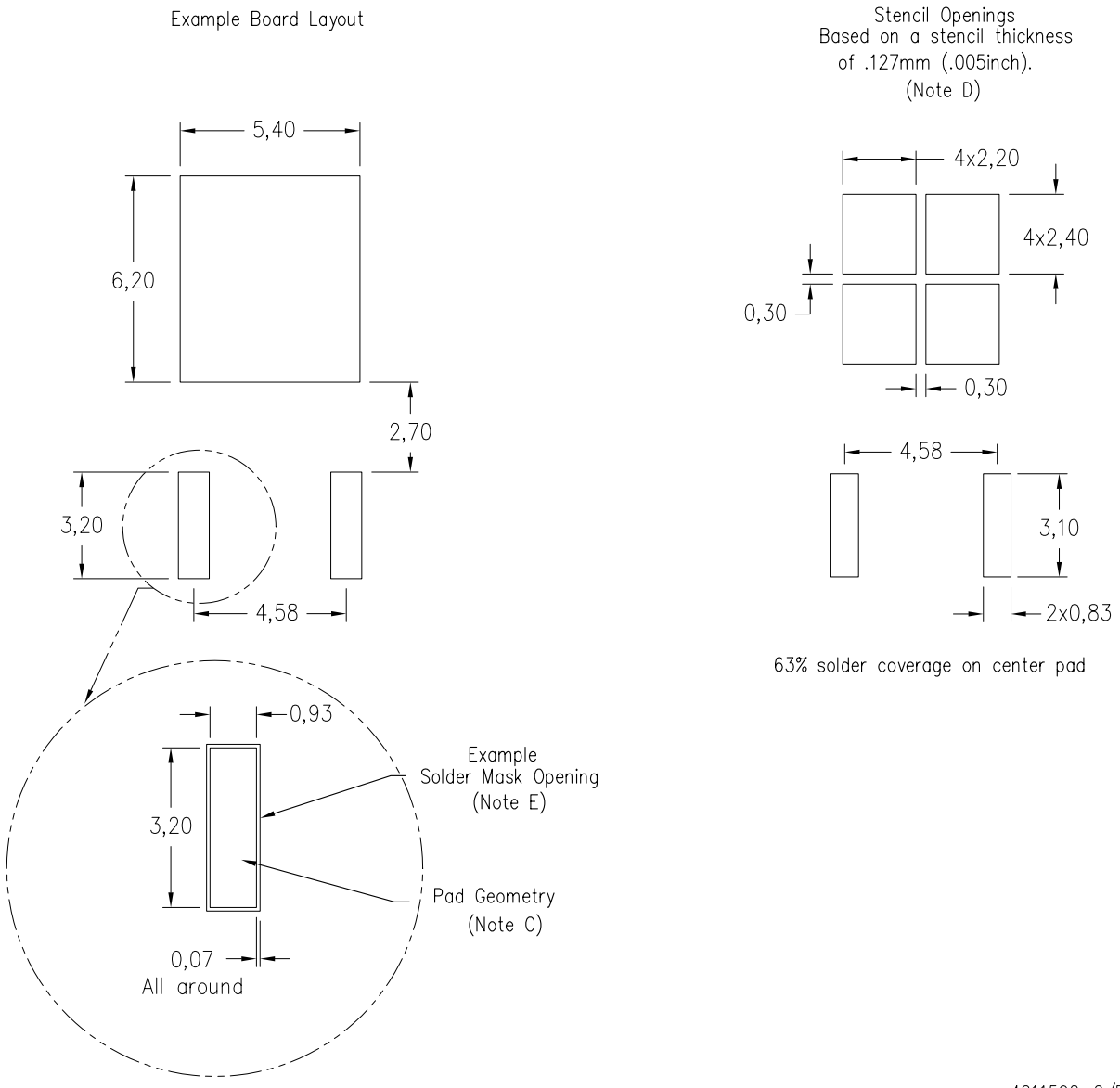
NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Lead dimensions are not controlled within this area.
D. All lead dimensions apply before solder dip.
E. The center lead is in electrical contact with the mounting tab.
F. The chamfer is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



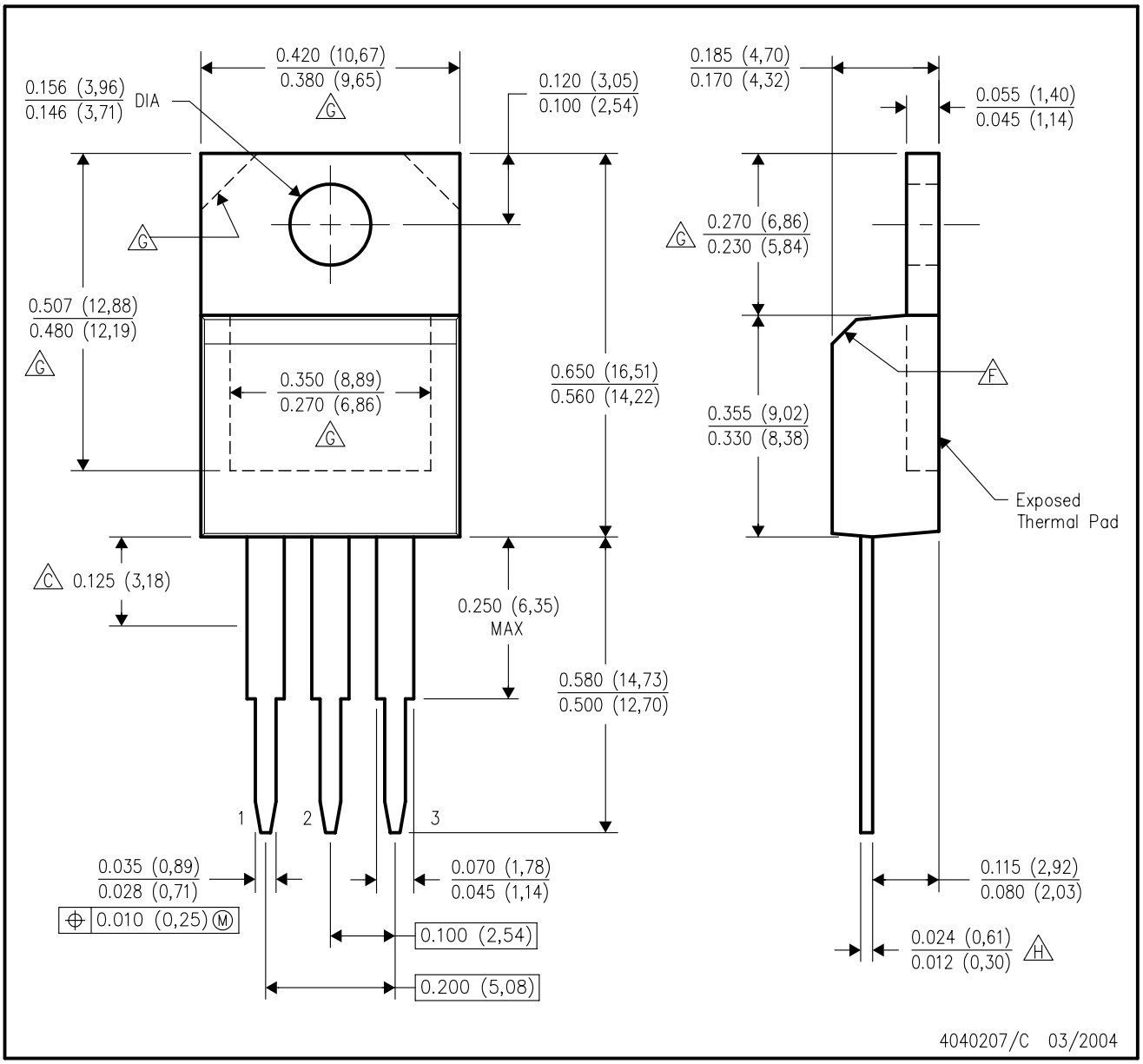
NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. The center lead is in electrical contact with the exposed thermal tab.
D. Body Dimensions do not include mold flash or protrusions. Mold flash and protrusion shall not exceed 0.006 (0,15)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

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