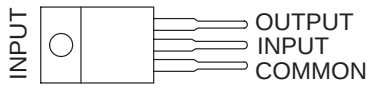
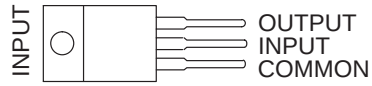
SLVS060K − JUNE 1976 − REVISED APRIL 2005

- **3-Terminal Regulators**
- **Output Current Up To 500 mA**
- **No External Components**
- **High Power-Dissipation Capability**
- **Internal Short-Circuit Current Limiting**
- **Output Transistor Safe-Area Compensation**

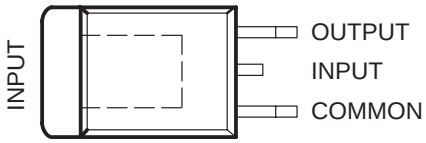
μA79M05 . . . KC (TO-220) PACKAGE
(TOP VIEW)



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



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



description/ordering information

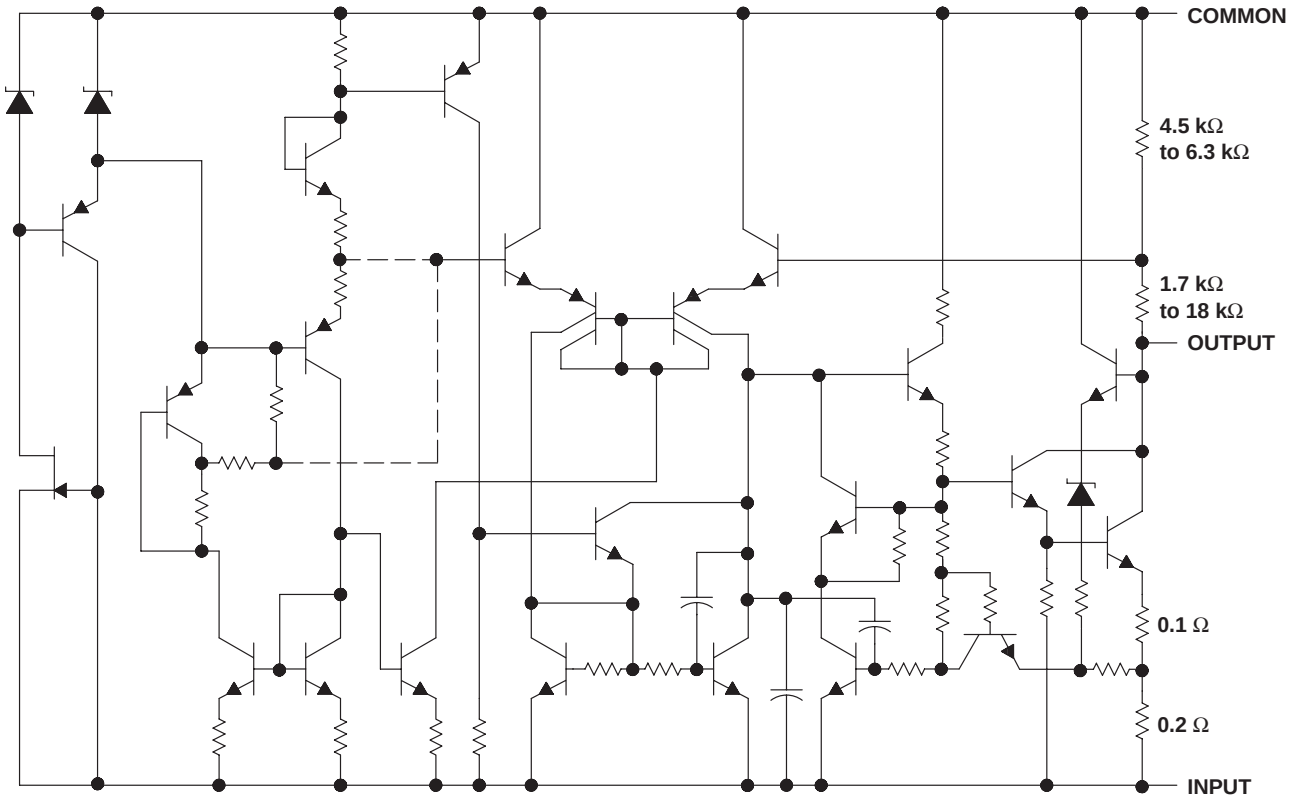
This series of fixed-negative-voltage integrated-circuit voltage regulators is designed to complement the μA78M00 series in a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. Each of these regulators delivers up to 500 mA of output current. The internal current-limiting and thermal-shutdown features of these regulators essentially make them immune to overload. In addition to use as fixed-voltage regulators, these devices can be used with external components to obtain adjustable output voltages and currents, and also as the power-pass element in precision regulators.

ORDERING INFORMATION

T_J	V_O(NOM) (V)	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
0°C to 125°C	−5	PowerFLEX™ (KTP)	Reel of 3000	μA79M05CKTPR	μA79M05C
		TO-220 (KC)	Tube of 50	μA79M05CKC	μA79M05C
		TO-220, short shoulder (KCS)	Tube of 20	μA79M05CKCS	
	−8	PowerFLEX (KTP)	Reel of 3000	μA79M08CKTPR	μA79M08C

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

schematic



Resistor values shown are nominal.

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

Input voltage, V_I	35 V
Operating virtual junction temperature, T_J	150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	260°C
Storage temperature range, T_{stg}	−65°C to 150°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

package thermal data (see Note 1)

PACKAGE	BOARD	θ_{JC}	θ_{JA}	θ_{JP}‡
PowerFLEX (KTP)	High K, JESD 51-5	19°C/W	28°C/W	1.4°C/W
TO-220 (KC/KCS)	High K, JESD 51-5	17°C/W	19°C/W	3°C/W

NOTE 1: Maximum power dissipation is a function of $T_J(max)$, θ_{JA}, and T_A. The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(max) − T_A)/\theta_{JA}$. Operating at the absolute maximum T_J of 150°C can affect reliability.

‡ 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	μA79M05C	−7	−25	V
		μA79M08C	−10.5	−25	
I_O	Output current			500	mA
T_J	Operating virtual junction temperature		0	125	°C

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

PARAMETER	TEST CONDITIONS†			μA79M05C			UNIT
				MIN	TYP	MAX	
Output voltage	V_I = −7 V to −25 V,	I_O = 5 mA to 350 mA		−4.8	−5	−5.2	V
			T_J = 0°C to 125°C	−4.75		−5.25	
Input voltage regulation	V_I = −7 V to −25 V				7	50	mV
	V_I = −8 V to −18 V				3	30	
Ripple rejection	V_I = −8 V to −18 V, f = 120 Hz	I_O = 100 mA,	T_J = 0°C to 125°C	50			dB
		I_O = 300 mA		54	60		
Output voltage regulation	I_O = 5 mA to 500 mA				75	100	mV
	I_O = 5 mA to 350 mA				50		
Temperature coefficient of output voltage	I_O = 5 mA,	T_J = 0°C to 125°C			−0.4		mV/°C
Output noise voltage	f = 10 Hz to 100 kHz				125		μV
Dropout voltage					1.1		V
Bias current					1	2	mA
Bias current change	V_I = −8 V to −18 V,	T_J = 0°C to 125°C				0.4	mA
	I_O = 5 mA to 350 mA,	T_J = 0°C to 125°C				0.4	
Short-circuit output current	V_I = −30 V				140		mA
Peak output current					0.65		A

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 2-μF capacitor across the input and a 1-μF capacitor across the output.

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

PARAMETER	TEST CONDITIONS†			μA79M08C			UNIT
				MIN	TYP	MAX	
Output voltage	V_I = −10.5 V to −25 V,	I_O = 5 mA to 350 mA		−7.7	−8	−8.3	V
			T_J = 0°C to 125°C	−7.6		−8.4	
Input voltage regulation	V_I = −10.5 V to −25 V				8	80	mV
	V_I = −11 V to −21 V				4	50	
Ripple rejection	V_I = −11.5 V to −21.5 V, f = 120 Hz	I_O = 100 mA,	T_J = 0°C to 125°C	50			dB
		I_O = 300 mA		54	59		
Output voltage regulation	I_O = 5 mA to 500 mA				90	160	mV
	I_O = 5 mA to 350 mA				60		
Temperature coefficient of output voltage	I_O = 5 mA,	T_J = 0°C to 125°C			−0.6		mV/°C
Output noise voltage	f = 10 Hz to 100 kHz				200		μV
Dropout voltage	I_O = 5 mA				1.1		V
Bias current					1	2	mA
Bias current change	V_I = −10.5 V to −25 V,	T_J = 0°C to 125°C				0.4	mA
	I_O = 5 mA to 350 mA,	T_J = 0°C to 125°C				0.4	
Short-circuit output current	V_I = −30 V				140		mA
Peak output current					0.65		A

† Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 2-μF capacitor across the input and a 1-μF capacitor across the output.

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package | Pins	Package qty | Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
UA79M05CKCS	Active	Production	TO-220 (KCS) | 3	50 | TUBE	Yes	SN	N/A for Pkg Type	0 to 125	UA79M05C
UA79M05CKCS.A	Active	Production	TO-220 (KCS) | 3	50 | TUBE	Yes	SN	N/A for Pkg Type	0 to 125	UA79M05C
UA79M05CKVURG3	Active	Production	TO-252 (KVU) | 3	2500 | LARGE T&R	Yes	SN	Level-3-260C-168 HR	0 to 125	79M05C
UA79M05CKVURG3.A	Active	Production	TO-252 (KVU) | 3	2500 | LARGE T&R	Yes	SN	Level-3-260C-168 HR	0 to 125	79M05C
UA79M08CKVURG3	Active	Production	TO-252 (KVU) | 3	2500 | LARGE T&R	Yes	SN	Level-3-260C-168 HR	0 to 125	79M08C
UA79M08CKVURG3.A	Active	Production	TO-252 (KVU) | 3	2500 | LARGE T&R	Yes	SN	Level-3-260C-168 HR	0 to 125	79M08C

(1) **Status:** For more details on status, see our product life cycle.

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

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

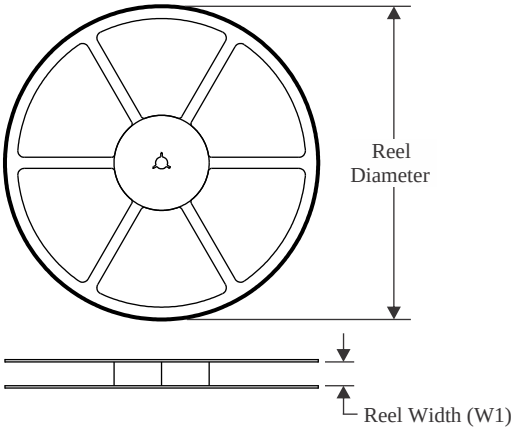
(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

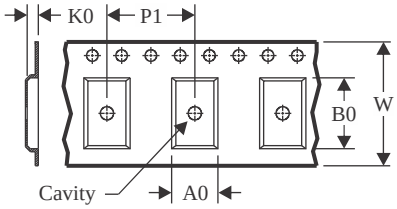
Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

TAPE AND REEL INFORMATION

REEL DIMENSIONS

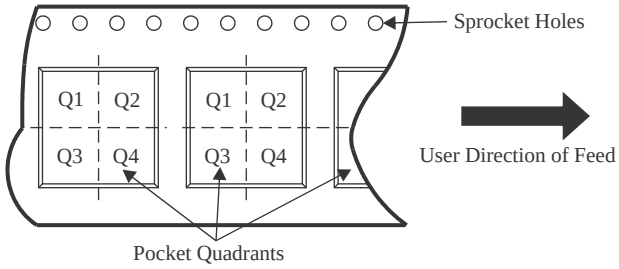


TAPE DIMENSIONS



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

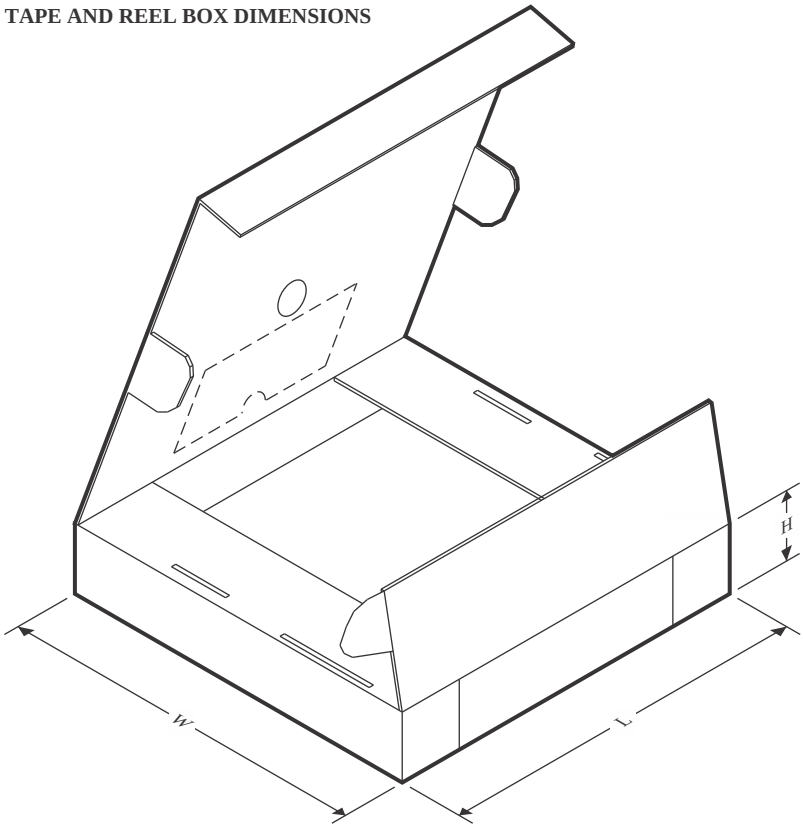
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*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
UA79M05CKVURG3	TO-252	KVU	3	2500	330.0	16.4	6.9	10.5	2.7	8.0	16.0	Q2
UA79M08CKVURG3	TO-252	KVU	3	2500	330.0	16.4	6.9	10.5	2.7	8.0	16.0	Q2

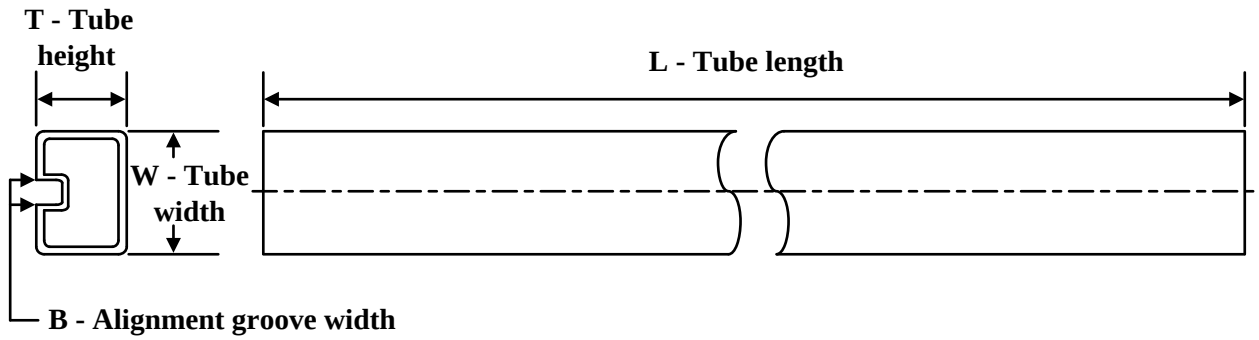
TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
UA79M05CKVURG3	TO-252	KVU	3	2500	340.0	340.0	38.0
UA79M08CKVURG3	TO-252	KVU	3	2500	340.0	340.0	38.0

TUBE



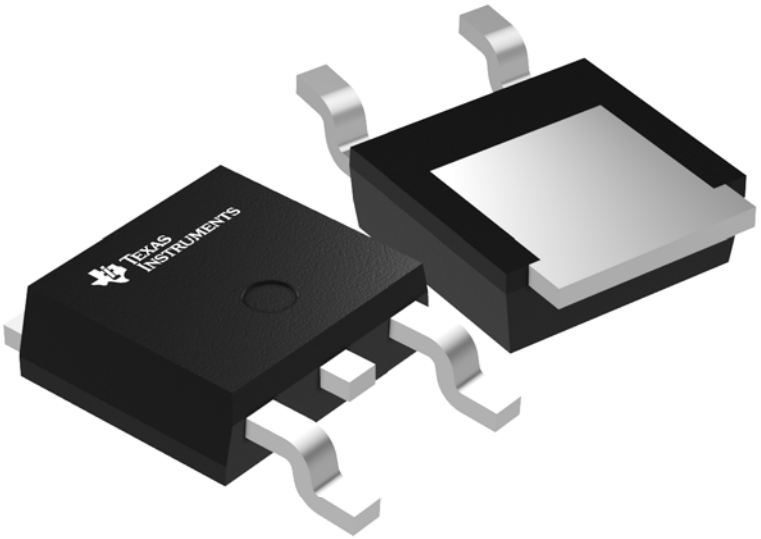
*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
UA79M05CKCS	KCS	TO-220	3	50	532	34.1	700	9.6
UA79M05CKCS.A	KCS	TO-220	3	50	532	34.1	700	9.6

KVU 3

TO-252 - 2.52 mm max height

TRANSISTOR OUTLINE



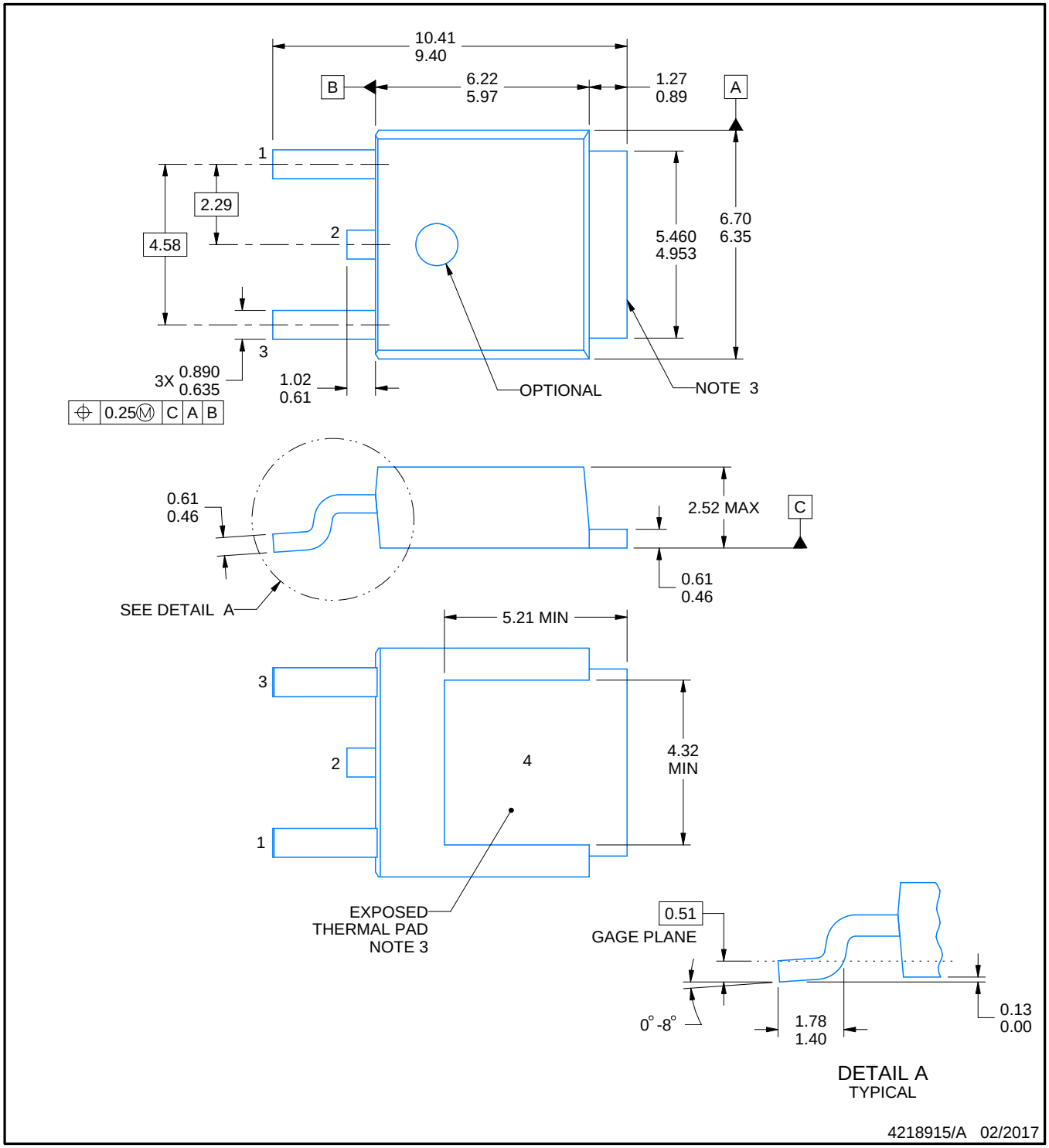
Images above are just a representation of the package family, actual package may vary.
Refer to the product data sheet for package details.

PACKAGE OUTLINE

KVU0003A

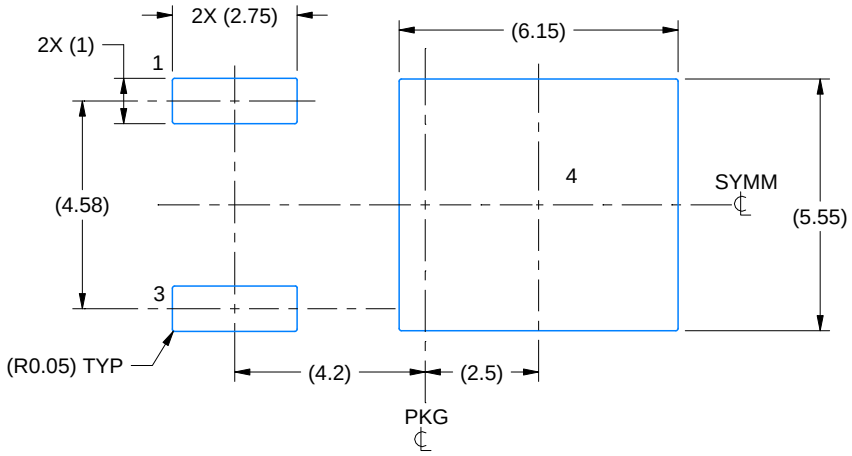
TO-252 - 2.52 mm max height

TO-252

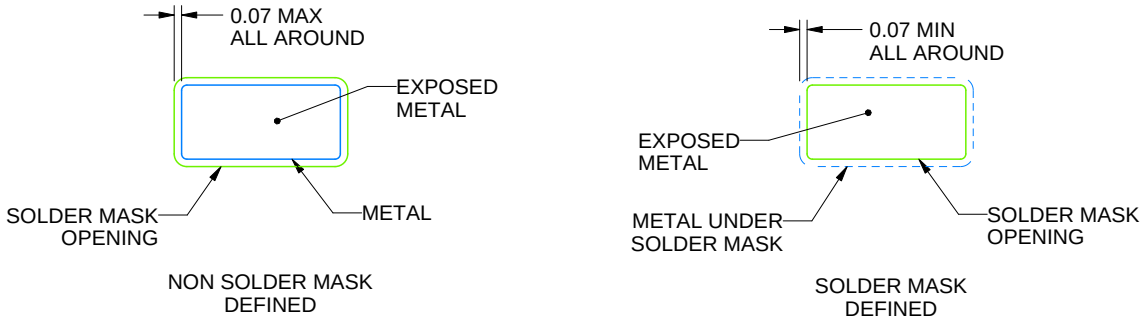


NOTES:

1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. Shape may vary per different assembly sites.
4. Reference JEDEC registration TO-252.



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:6X



SOLDER MASK DETAILS
NOT TO SCALE

4218915/A 02/2017

NOTES: (continued)

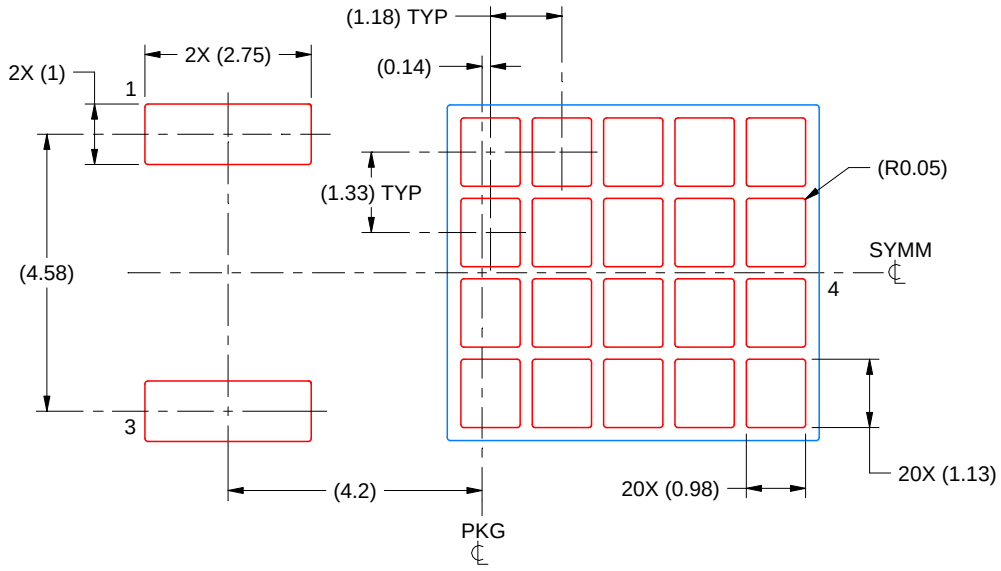
5. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature numbers SLMA002(www.ti.com/lit/slm002) and SLMA004 (www.ti.com/lit/slma004).
6. Vias are optional depending on application, refer to device data sheet. It is recommended that vias under paste be filled, plugged or tented.

EXAMPLE STENCIL DESIGN

KVU0003A

TO-252 - 2.52 mm max height

TO-252



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL

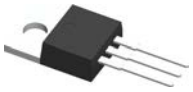
EXPOSED PAD
65% PRINTED SOLDER COVERAGE BY AREA
SCALE:8X

4218915/A 02/2017

NOTES: (continued)

7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. Board assembly site may have different recommendations for stencil design.

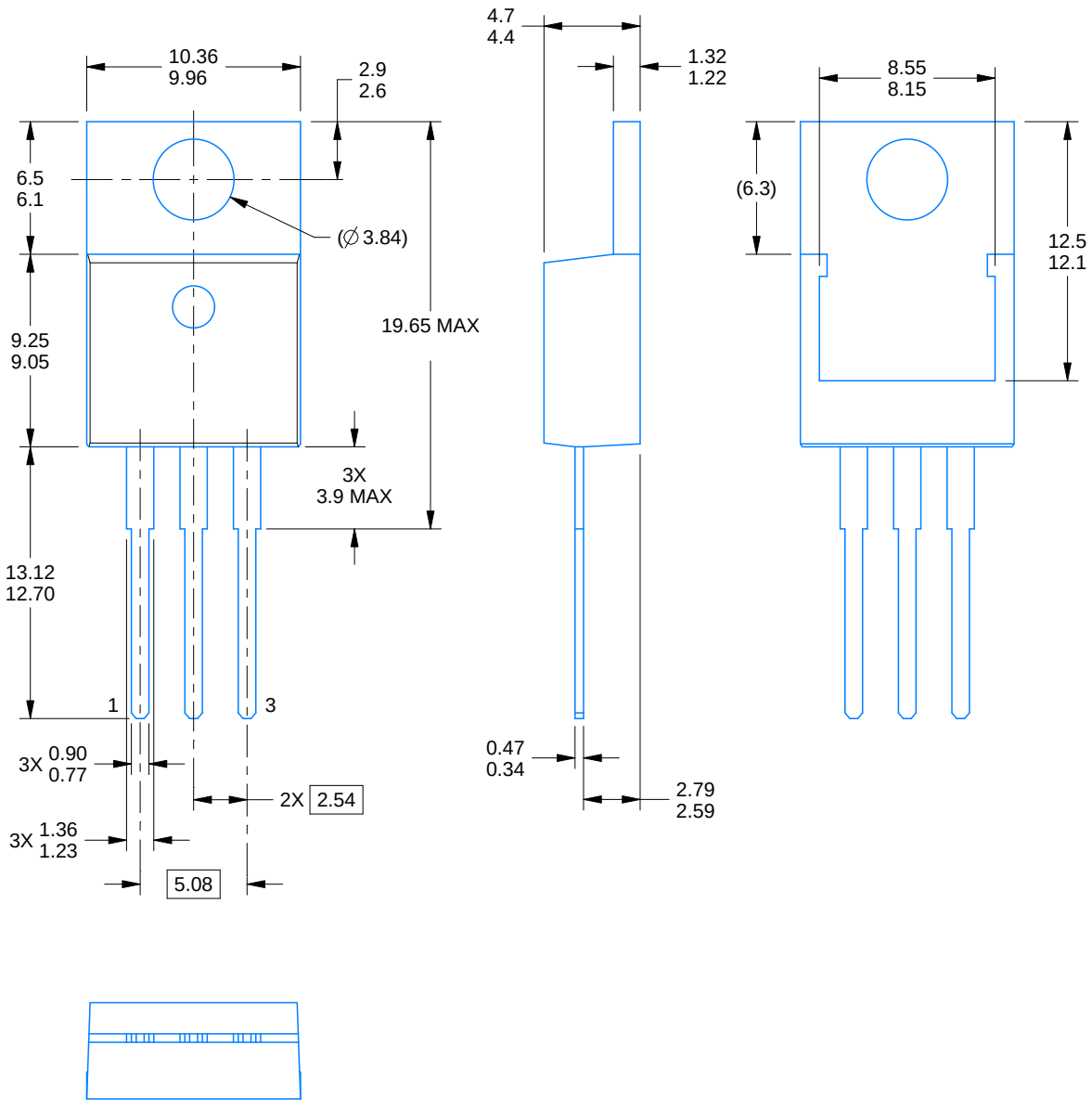
KCS0003B



PACKAGE OUTLINE

TO-220 - 19.65 mm max height

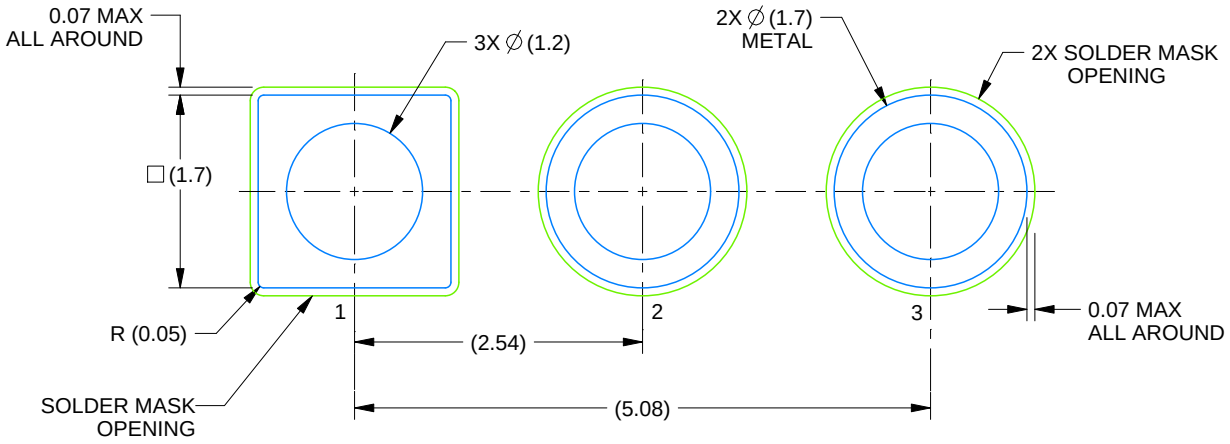
TO-220



4222214/B 08/2018

NOTES:

1. Dimensions are in millimeters. Any dimension in brackets or parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. Reference JEDEC registration TO-220.



LAND PATTERN EXAMPLE
NON-SOLDER MASK DEFINED
SCALE:15X

4222214/B 08/2018

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you fully indemnify TI and its representatives against any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI’s products are provided subject to TI’s Terms of Sale, TI’s General Quality Guidelines, or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI’s provision of these resources does not expand or otherwise alter TI’s applicable warranties or warranty disclaimers for TI products. Unless TI explicitly designates a product as custom or customer-specified, TI products are standard, catalog, general purpose devices.

TI objects to and rejects any additional or different terms you may propose.

Last updated 10/2025