

CSD19536KTT 100V N-Channel NexFET™ Power MOSFET

1 Features

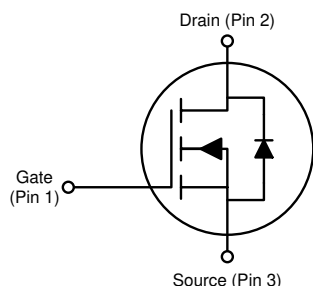
- Ultra-low Q_g and Q_{gd}
- Low thermal resistance
- Avalanche rated
- Lead-free terminal plating
- RoHS compliant
- Halogen free
- D²PAK plastic package

2 Applications

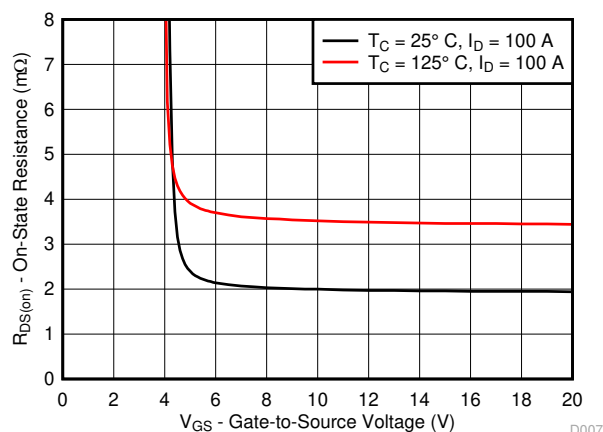
- Secondary side synchronous rectifier
- Hot swap
- Motor control

3 Description

This 100V, 2m Ω , D²PAK (TO-263) NexFET™ power MOSFET is designed to minimize losses in power conversion applications.



Pin Out



$R_{DS(on)}$ vs V_{GS}

Product Summary

$T_A = 25^\circ\text{C}$		TYPICAL VALUE		UNIT
V_{DS}	Drain-to-Source Voltage	100		V
Q_g	Gate Charge Total (10V)	118		nC
Q_{gd}	Gate Charge Gate-to-Drain	17		nC
$R_{DS(on)}$	Drain-to-Source On-Resistance	$V_{GS} = 6\text{V}$	2.2	m Ω
		$V_{GS} = 10\text{V}$	2	
$V_{GS(th)}$	Threshold Voltage	2.5		V

Device Information

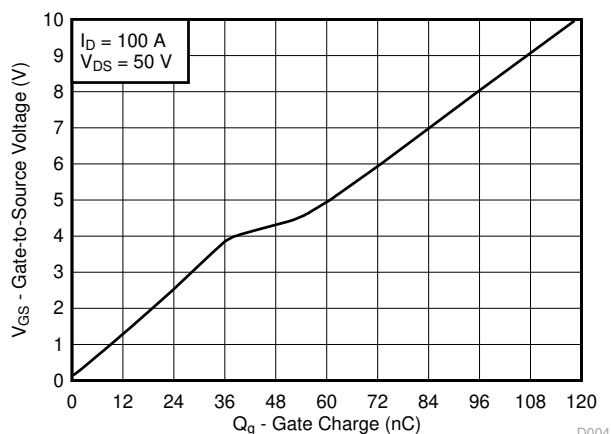
DEVICE ⁽¹⁾	QTY	MEDIA	PACKAGE	SHIP
CSD19536KTT	500	13-Inch Reel	D ² PAK Plastic Package	Tape and Reel
CSD19536KTTT	50			

- (1) For all available packages, see the orderable addendum at the end of the data sheet.

Absolute Maximum Ratings

$T_A = 25^\circ\text{C}$		VALUE	UNIT
V_{DS}	Drain-to-Source Voltage	100	V
V_{GS}	Gate-to-Source Voltage	± 20	V
I_D	Continuous Drain Current (Package Limited)	200	A
	Continuous Drain Current (Silicon Limited), $T_C = 25^\circ\text{C}$	272	
	Continuous Drain Current (Silicon Limited), $T_C = 100^\circ\text{C}$	192	
I_{DM}	Pulsed Drain Current ⁽¹⁾	400	A
P_D	Power Dissipation	375	W
T_J, T_{stg}	Operating Junction, Storage Temperature	-55 to 175	$^\circ\text{C}$
E_{AS}	Avalanche Energy, Single Pulse $I_D = 127\text{A}$, $L = 0.1\text{mH}$, $R_G = 25\Omega$	806	mJ

- (1) Max $R_{\theta JC} = 0.4^\circ\text{C/W}$, Pulse duration $\leq 100\mu\text{s}$, Duty cycle $\leq 1\%$.



Gate Charge



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4 Specifications

4.1 Electrical Characteristics

$T_A = 25^\circ\text{C}$ (unless otherwise stated)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC CHARACTERISTICS						
BV _{DSS}	Drain-to-source voltage	V _{GS} = 0V, I _D = 250μA	100			V
I _{DSS}	Drain-to-source leakage current	V _{GS} = 0V, V _{DS} = 80V	1			μA
I _{GSS}	Gate-to-source leakage current	V _{DS} = 0V, V _{GS} = 20V	100			nA
V _{GS(th)}	Gate-to-source threshold voltage	V _{DS} = V _{GS} , I _D = 250μA	2.1	2.5	3.2	V
R _{DS(on)}	Drain-to-source on-resistance	V _{GS} = 6V, I _D = 100A	2.2			mΩ
		V _{GS} = 10V, I _D = 100A	2			
g _{fs}	Transconductance	V _{DS} = 10V, I _D = 100A	329			S
DYNAMIC CHARACTERISTICS						
C _{iss}	Input capacitance	V _{GS} = 0V, V _{DS} = 50V, f = 1MHz	9250		12000	pF
C _{oss}	Output capacitance		1820		2370	pF
C _{rss}	Reverse transfer capacitance		47		61	pF
R _G	Series gate resistance	V _{DS} = 50V, I _D = 100A	1.4		2.8	Ω
Q _g	Gate charge total (10V)		118		153	nC
Q _{gd}	Gate charge gate-to-drain		17			nC
Q _{gs}	Gate charge gate-to-source		37			nC
Q _{g(th)}	Gate charge at V _{th}		24			nC
Q _{oss}	Output charge	V _{DS} = 50V, V _{GS} = 0V	335			nC
t _{d(on)}	Turnon delay time	V _{DS} = 50V, V _{GS} = 10V, I _{DS} = 100A, R _G = 0Ω	13			ns
t _r	Rise time		8			ns
t _{d(off)}	Turnoff delay time		32			ns
t _f	Fall time		6			ns
DIODE CHARACTERISTICS						
V _{SD}	Diode forward voltage	I _{SD} = 100A, V _{GS} = 0V	0.9		1.1	V
Q _{rr}	Reverse recovery charge	V _{DS} = 50V, I _F = 100A, di/dt = 300A/μs	548			nC
t _{rr}	Reverse recovery time		103			ns

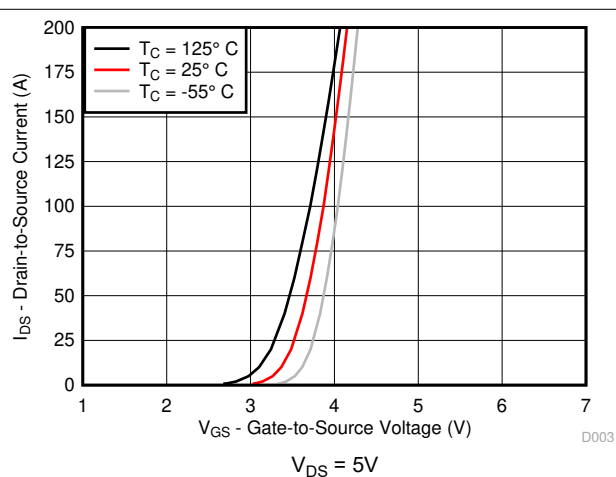
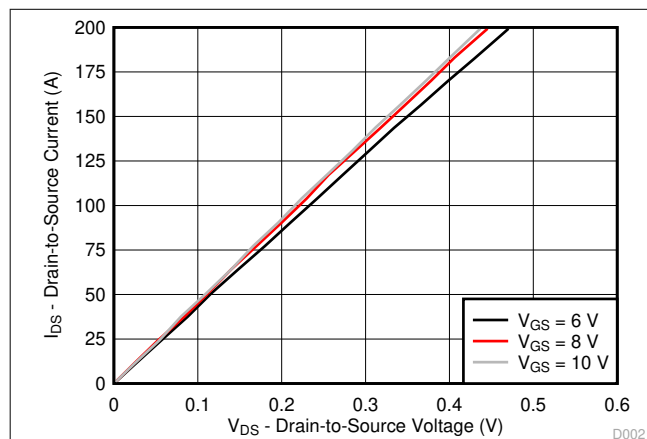
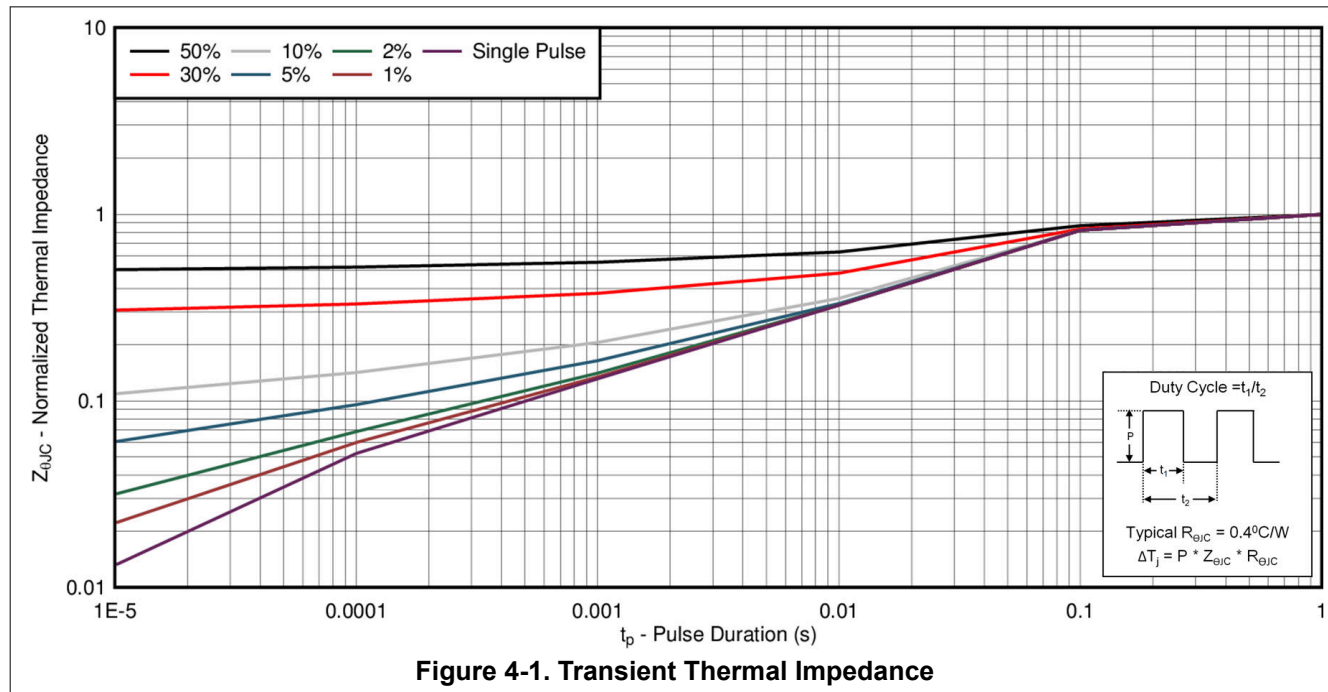
4.2 Thermal Information

$T_A = 25^\circ\text{C}$ (unless otherwise stated)

THERMAL METRIC		MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-case thermal resistance			0.4	$^\circ\text{C/W}$
$R_{\theta JA}$	Junction-to-ambient thermal resistance			62	$^\circ\text{C/W}$

4.3 Typical MOSFET Characteristics

$T_A = 25^\circ\text{C}$ (unless otherwise stated)



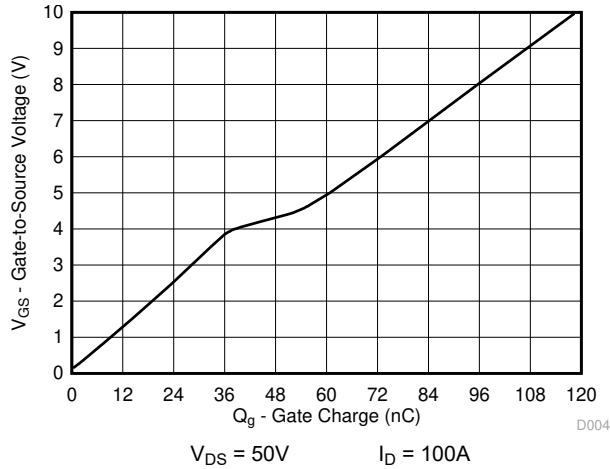


Figure 4-4. Gate Charge

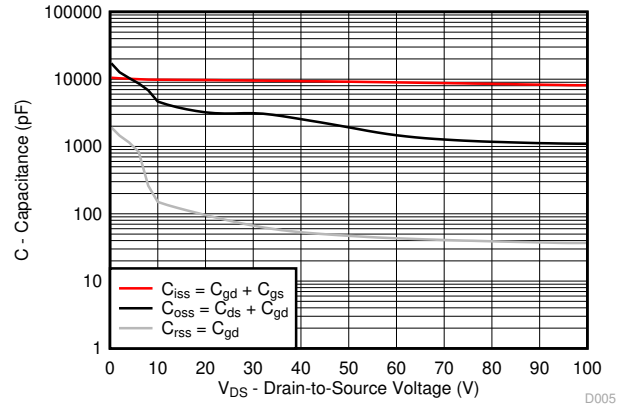


Figure 4-5. Capacitance

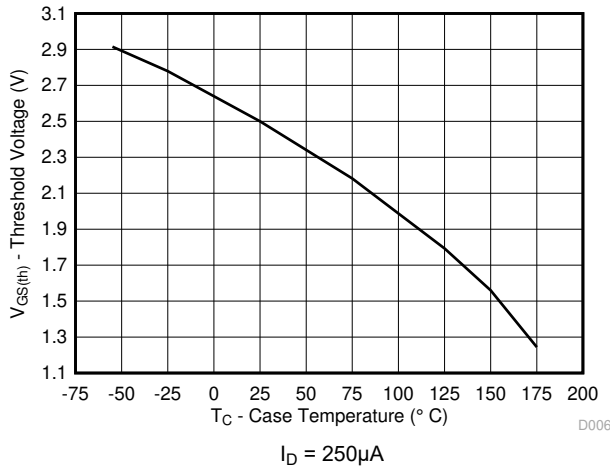


Figure 4-6. Threshold Voltage vs Temperature

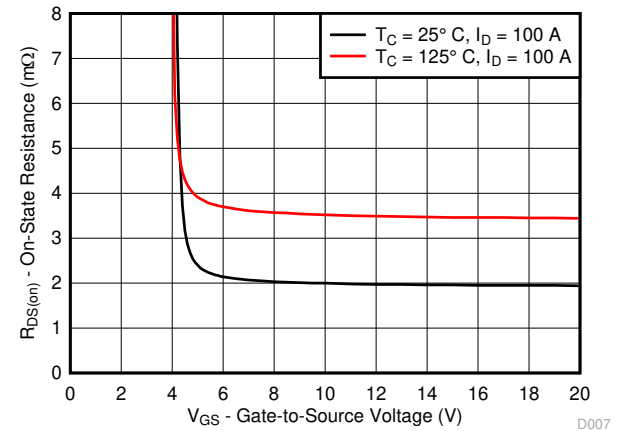


Figure 4-7. On-State Resistance vs Gate-to-Source Voltage

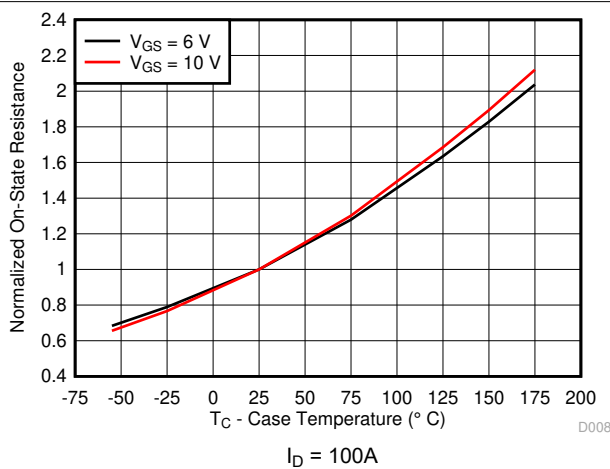


Figure 4-8. Normalized On-State Resistance vs Temperature

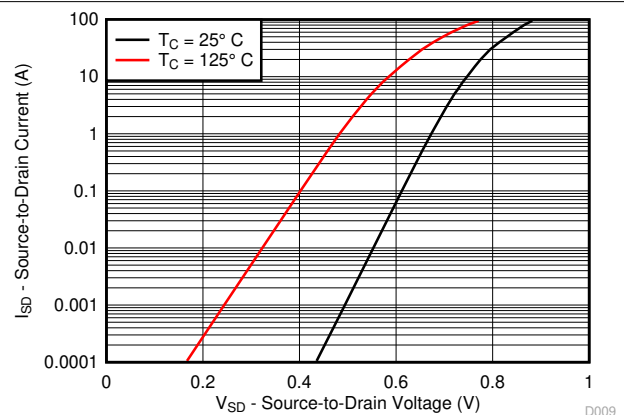


Figure 4-9. Typical Diode Forward Voltage

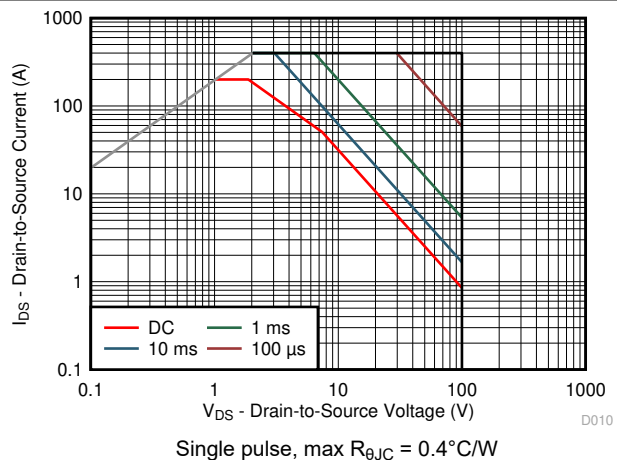


Figure 4-10. Maximum Safe Operating Area

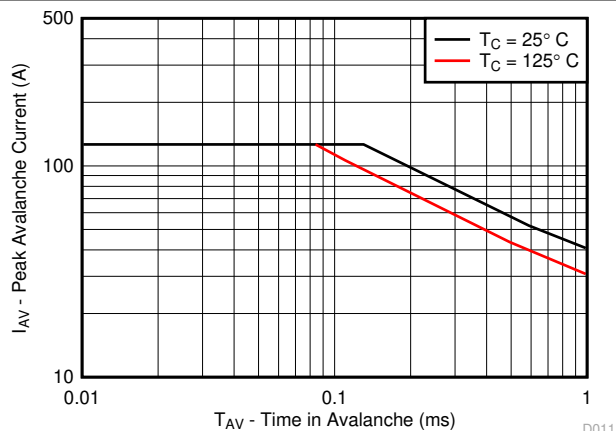


Figure 4-11. Single Pulse Unclamped Inductive Switching

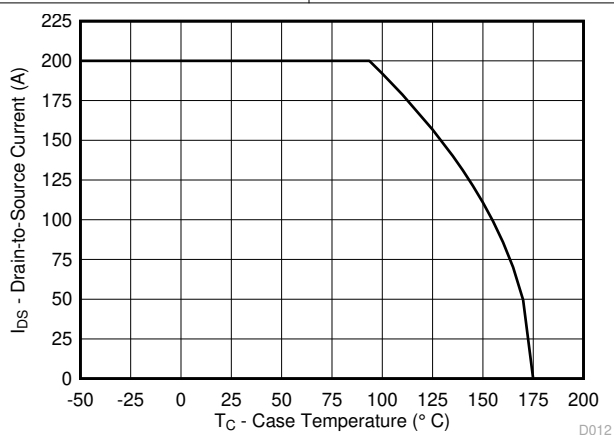


Figure 4-12. Maximum Drain Current vs Temperature

5 Device and Documentation Support

5.1 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. In the upper right corner, click on *Alert me* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

5.2 Community Resources

5.3 Trademarks

NexFET™ is a trademark of Texas Instruments.
All trademarks are the property of their respective owners.

6 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Revision B (May 2015) to Revision C (May 2025)	Page
• Updated the numbering format for tables, figures, and cross-references throughout the document.....	1

Changes from Revision A (May 2015) to Revision B (August 2016)	Page
• Added Section 5.1 section.....	7

Changes from Revision * (March 2015) to Revision A (May 2015)	Page
• Added Section 5.2 section.....	7
• Added PCB and stencil drawings in Section 7	8

7 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

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)
CSD19536KTT	Active	Production	DDPAK/ TO-263 (KTT) 2	500 LARGE T&R	ROHS Exempt	SN	Level-2-260C-1 YEAR	-55 to 175	CSD19536KTT
CSD19536KTT.B	Active	Production	DDPAK/ TO-263 (KTT) 2	500 LARGE T&R	ROHS Exempt	SN	Level-2-260C-1 YEAR	-55 to 175	CSD19536KTT
CSD19536KTTT	Active	Production	DDPAK/ TO-263 (KTT) 2	50 SMALL T&R	ROHS Exempt	SN	Level-2-260C-1 YEAR	-55 to 175	CSD19536KTT
CSD19536KTTT.B	Active	Production	DDPAK/ TO-263 (KTT) 2	50 SMALL T&R	ROHS Exempt	SN	Level-2-260C-1 YEAR	-55 to 175	CSD19536KTT

⁽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.

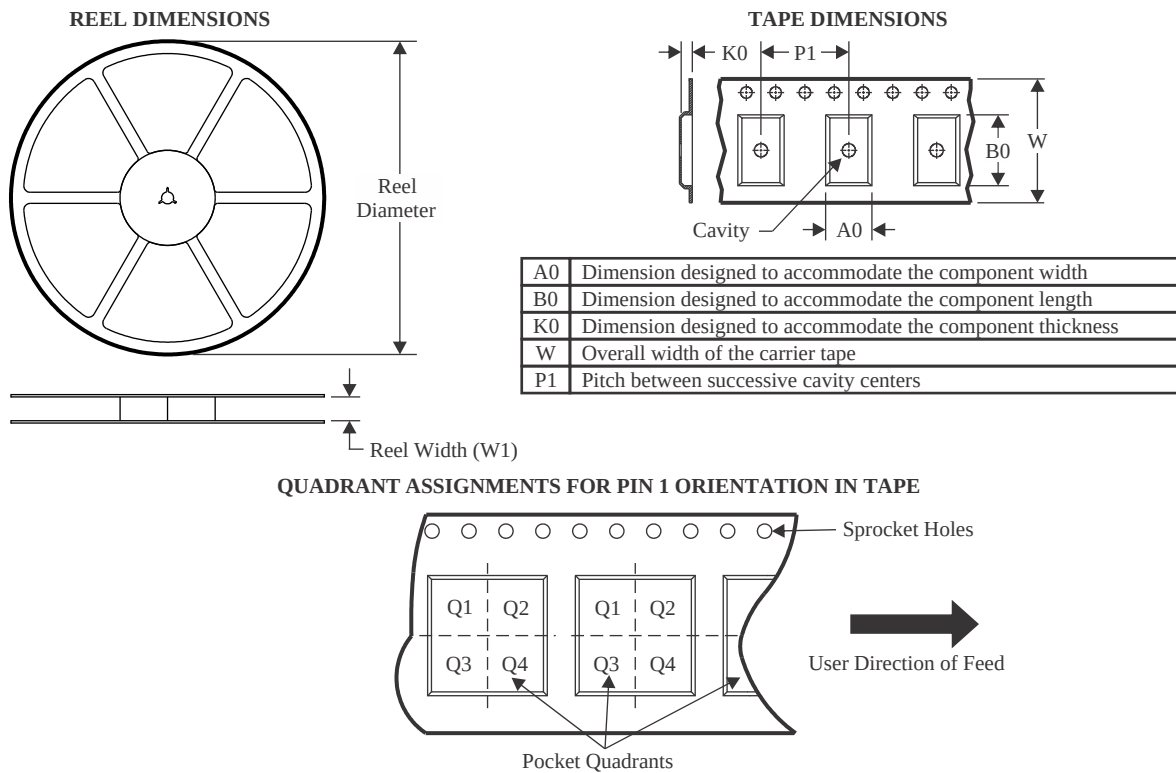
⁽⁶⁾ **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

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.

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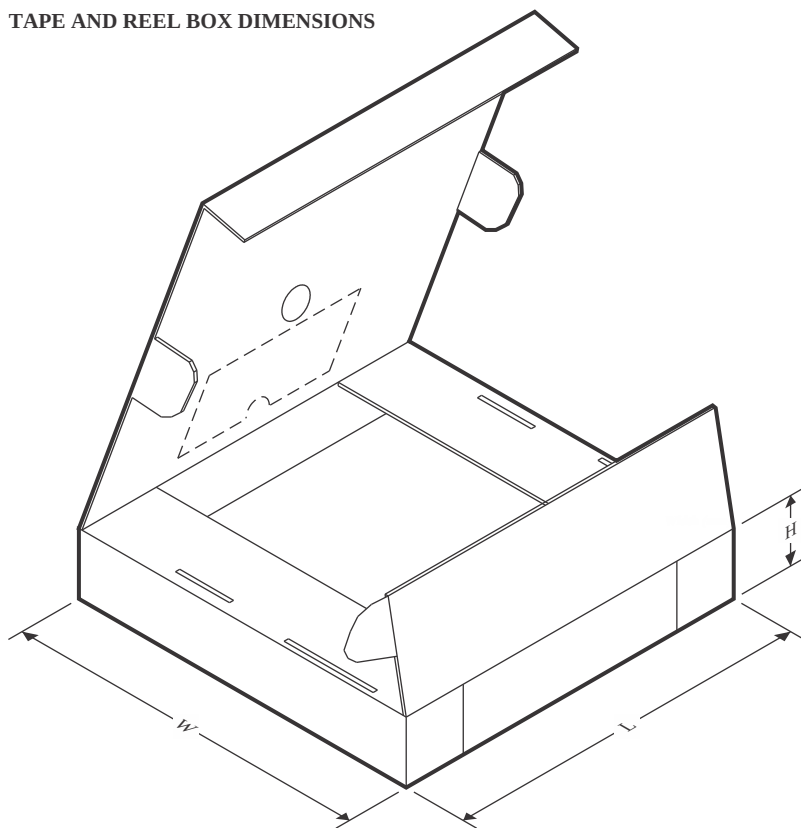
TAPE AND REEL INFORMATION



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
CSD19536KTT	DDPAK/TO-263	KTT	2	500	330.0	24.4	10.8	16.3	5.11	16.0	24.0	Q2
CSD19536KTTT	DDPAK/TO-263	KTT	2	50	330.0	24.4	10.8	16.3	5.11	16.0	24.0	Q2

TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
CSD19536KTT	DDPAK/TO-263	KTT	2	500	340.0	340.0	38.0
CSD19536KTTT	DDPAK/TO-263	KTT	2	50	340.0	340.0	38.0



PACKAGE OUTLINE

TO-263 - 4.7 mm max height

TRANSISTOR OUTLINE



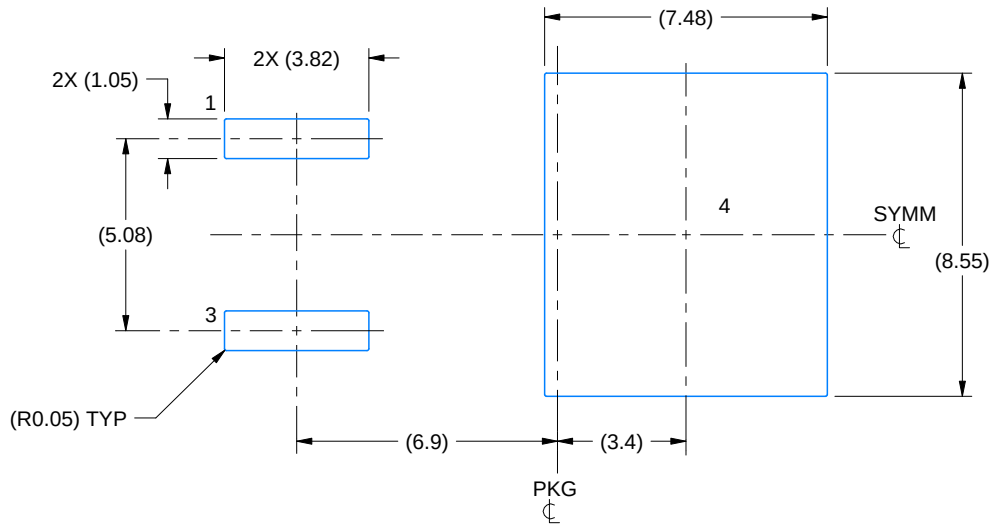
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. Features may not exist and shape may vary per different assembly sites. Pin 2 and Pin 4 connected.
4. Reference JEDEC registration TO-263.

EXAMPLE BOARD LAYOUT

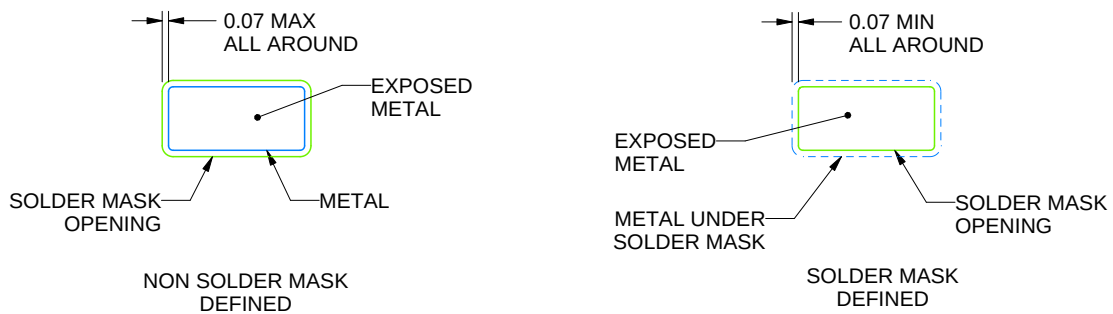
KTT0002A

TO-263 - 4.7 mm max height

TRANSISTOR OUTLINE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:5X



SOLDER MASK DETAILS

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NOTES: (continued)

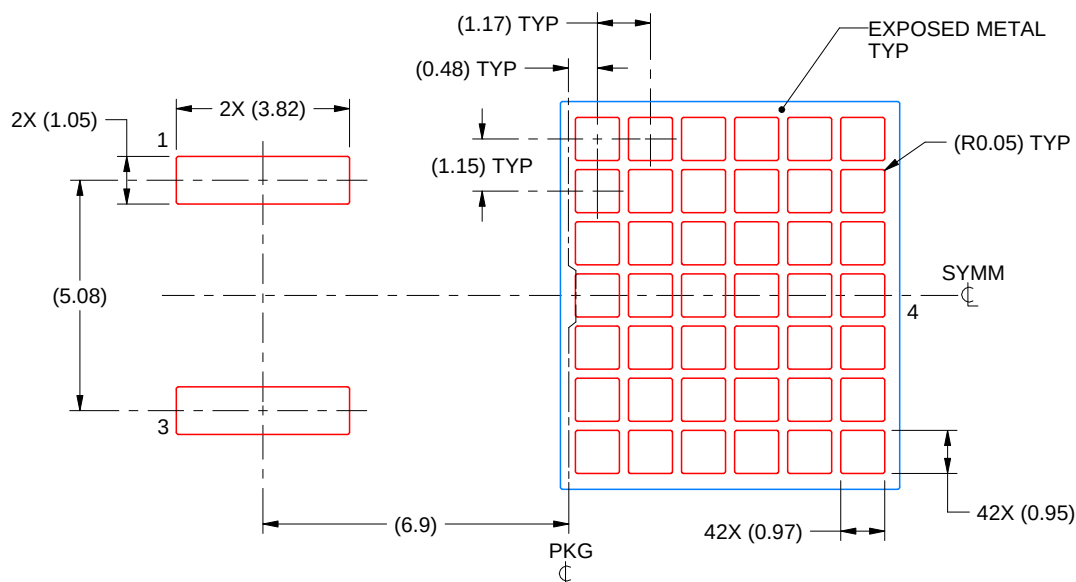
5. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature numbers SLMA002 (www.ti.com/lit/slm002) and SLMA004 (www.ti.com/lit/slma004).
6. Vias are optional depending on application, refer to device data sheet. It is recommended that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

EXAMPLE STENCIL DESIGN

KTT0002A

TO-263 - 4.7 mm max height

TRANSISTOR OUTLINE



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL

EXPOSED PAD
60.5% PRINTED SOLDER COVERAGE BY AREA
SCALE:6X

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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.

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