CSD17579Q3A 30 V N-Channel NexFET™ Power MOSFETs

1 Features

- Low Q_g and Q_{gd}
- Low $R_{DS(on)}$
- Low Thermal Resistance
- Avalanche Rated
- Pb-Free
- RoHS Compliant
- Halogen Free
- SON 3.3 mm × 3.3 mm Plastic Package

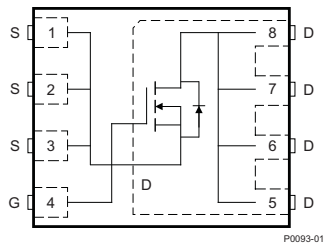
2 Applications

- Point-of-Load Synchronous Buck Converter for Applications in Networking, Telecom, and Computing Systems
- Optimized for Control FET Applications

3 Description

This 30 V, 8.7 mΩ, SON 3.3 mm × 3.3 mm NexFET™ power MOSFET is designed to minimize losses in power conversion applications.

Top View



Product Summary

T_A = 25°C		TYPICAL VALUE		UNIT
V_{DS}	Drain-to-Source Voltage	30		V
Q_g	Gate Charge Total (4.5 V)	5.3		nC
Q_{gd}	Gate Charge Gate-to-Drain	1.2		nC
$R_{DS(on)}$	Drain-to-Source On-Resistance	V_{GS} = 4.5 V	11.8	mΩ
		V_{GS} = 10 V	8.7	mΩ
$V_{GS(th)}$	Threshold Voltage	1.5		V

Ordering Information[1]

DEVICE	MEDIA	QTY	PACKAGE	SHIP
CSD17579Q3A	13-Inch Reel	2500	SON 3.3 × 3.3 mm Plastic Package	Tape and Reel
CSD17579Q3AT	7-Inch Reel	250		

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

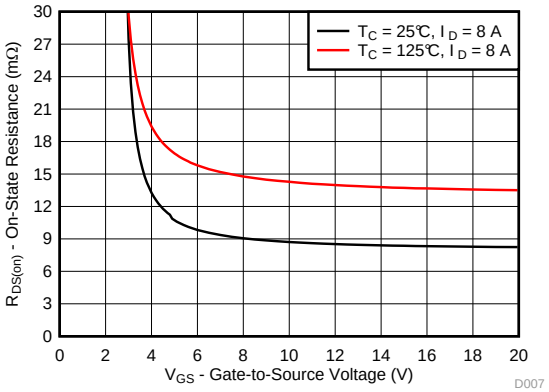
Absolute Maximum Ratings

T_A = 25°C		VALUE	UNIT
V_{DS}	Drain-to-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	±20	V
I_D	Continuous Drain Current (Package limited)	20	A
	Continuous Drain Current (Silicon limited), T_C = 25°C	39	
	Continuous Drain Current[1]	11	
I_{DM}	Pulsed Drain Current[2]	106	A
P_D	Power Dissipation[1]	2.5	W
	Power Dissipation, T_C = 25°C	29	
T_J, T_{stg}	Operating Junction Temperature, Storage Temperature	–55 to 150	°C
E_{AS}	Avalanche Energy, single pulse I_D = 17 A, L = 0.1 mH, R_G = 25 Ω	14	mJ

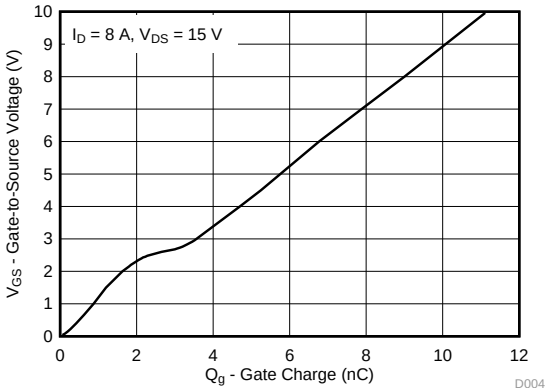
(1) Typical $R_{\theta JA}$ = 50°C/W on a 1 inch², 2 oz. Cu pad on a 0.06 inch thick FR4 PCB.

(2) Max $R_{\theta JC}$ = 5.4 °C/W, pulse duration ≤100 µs, duty cycle ≤1%

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



Gate Charge



An IMPORTANT NOTICE at the end of this data sheet addresses availability, warranty, changes, use in safety-critical applications, intellectual property matters and other important disclaimers. PRODUCTION DATA.

Table of Contents

1 Features ... 1
2 Applications ... 1
3 Description ... 1
4 Revision History ... 2
5 Specifications ... 3
5.1 Electrical Characteristics ... 3
5.2 Thermal Information ... 3
5.3 Typical MOSFET Characteristics ... 4
6 Device and Documentation Support ... 7
6.1 Community Resources ... 7
6.2 Trademarks ... 7
6.3 Electrostatic Discharge Caution ... 7
6.4 Glossary ... 7
7 Mechanical, Packaging, and Orderable Information ... 8
7.1 Q3A Package Dimensions ... 8
7.2 Q3A Recommended PCB Pattern ... 9
7.3 Q3A Recommended Stencil Pattern ... 9
7.4 Q3A Tape and Reel Information ... 10

4 Revision History

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

Changes from Original (September 2014) to Revision A	Page
• Updated Power Dissipation value in *Absolute Maximum Ratings* table.	1
• Added *Community Resources* section	7
• Updated Package Dimensions drawing	8
• Updated PCB drawing.	9
• Updated Stencil Pattern drawing.	9

Copyright © 2014–2016, Texas Instruments Incorporated

5 Specifications

5.1 Electrical Characteristics

(T_A = 25°C unless otherwise stated)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
STATIC CHARACTERISTICS						
BV_{DSS}	Drain-to-source voltage	V_{GS} = 0 V, I_D = 250 µA	30			V
I_{DSS}	Drain-to-source leakage current	V_{GS} = 0 V, V_{DS} = 24 V			1	µA
I_{GSS}	Gate-to-source leakage current	V_{DS} = 0 V, V_{GS} = 20 V			100	nA
$V_{GS(th)}$	Gate-to-source threshold voltage	V_{DS} = V_{GS}, I_D = 250 µA	1.1	1.5	1.9	V
$R_{DS(on)}$	Drain-to-source on-resistance	V_{GS} = 4.5 V, I_D = 8 A		11.8	14.2	mΩ
		V_{GS} = 10 V, I_D = 8 A		8.7	10.2	mΩ
g_{fs}	Transconductance	V_{DS} = 3 V, I_D = 8 A		37		S
DYNAMIC CHARACTERISTICS						
C_{iss}	Input capacitance	V_{GS} = 0 V, V_{DS} = 15 V, f = 1 MHz		768	998	pF
C_{oss}	Output capacitance			93	121	pF
C_{rss}	Reverse transfer capacitance			38	49	pF
R_G	Series gate resistance			1.9	3.8	Ω
Q_g	Gate charge total (4.5 V)	V_{DS} = 15 V, I_D = 8 A		5.3	6.9	nC
Q_g	Gate charge total (10 V)			11.5	15.0	nC
Q_{gd}	Gate charge gate-to-drain			1.2		nC
Q_{gs}	Gate charge gate-to-source			2.2		nC
$Q_{g(th)}$	Gate charge at V_{th}			1.1		nC
Q_{oss}	Output charge	V_{DS} = 15 V, V_{GS} = 0 V		3.0		nC
$t_{d(on)}$	Turn on delay time	V_{DS} = 15 V, V_{GS} = 10 V, I_{DS} = 8 A, R_G = 0 Ω		2		ns
t_r	Rise time			5		ns
$t_{d(off)}$	Turn off delay time			11		ns
t_f	Fall time			1		ns
DIODE CHARACTERISTICS						
V_{SD}	Diode forward voltage	I_{SD} = 8 A, V_{GS} = 0 V		0.8	1.0	V
Q_{rr}	Reverse recovery charge	V_{DS}= 15 V, I_F = 8 A, di/dt = 300 A/µs		3.4		nC
t_{rr}	Reverse recovery time			5		ns

5.2 Thermal Information

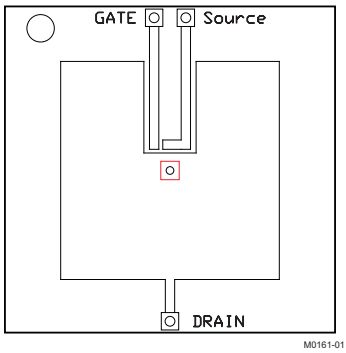
(T_A = 25°C unless otherwise stated)

THERMAL METRIC		MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-case thermal resistance (1)			5.4	°C/W
$R_{\theta JA}$	Junction-to-ambient thermal resistance (1) (2)			60	°C/W

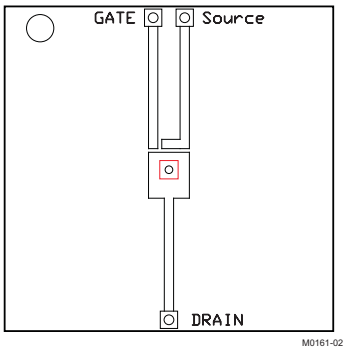
(1) $R_{\theta JC}$ is determined with the device mounted on a 1 inch^2 (6.45 cm^2), 2 oz. (0.071 mm thick) Cu pad on a 1.5 inch × 1.5 inch (3.81 cm × 3.81 cm), 0.06 inch (1.52 mm) thick FR4 PCB. $R_{\theta JC}$ is specified by design, whereas $R_{\theta JA}$ is determined by the user's board design.

(2) Device mounted on FR4 material with 1 inch^2 (6.45 cm^2), 2 oz. (0.071 mm thick) Cu.

Copyright © 2014–2016, Texas Instruments Incorporated



Max $R_{\theta JA}$ = 60°C/W when mounted on 1 inch^2 (6.45 cm^2) of 2 oz. (0.071 mm thick) Cu.



Max $R_{\theta JA}$ = 145°C/W when mounted on a minimum pad area of 2 oz. (0.071 mm thick) Cu.

5.3 Typical MOSFET Characteristics

(T_A = 25°C unless otherwise stated)

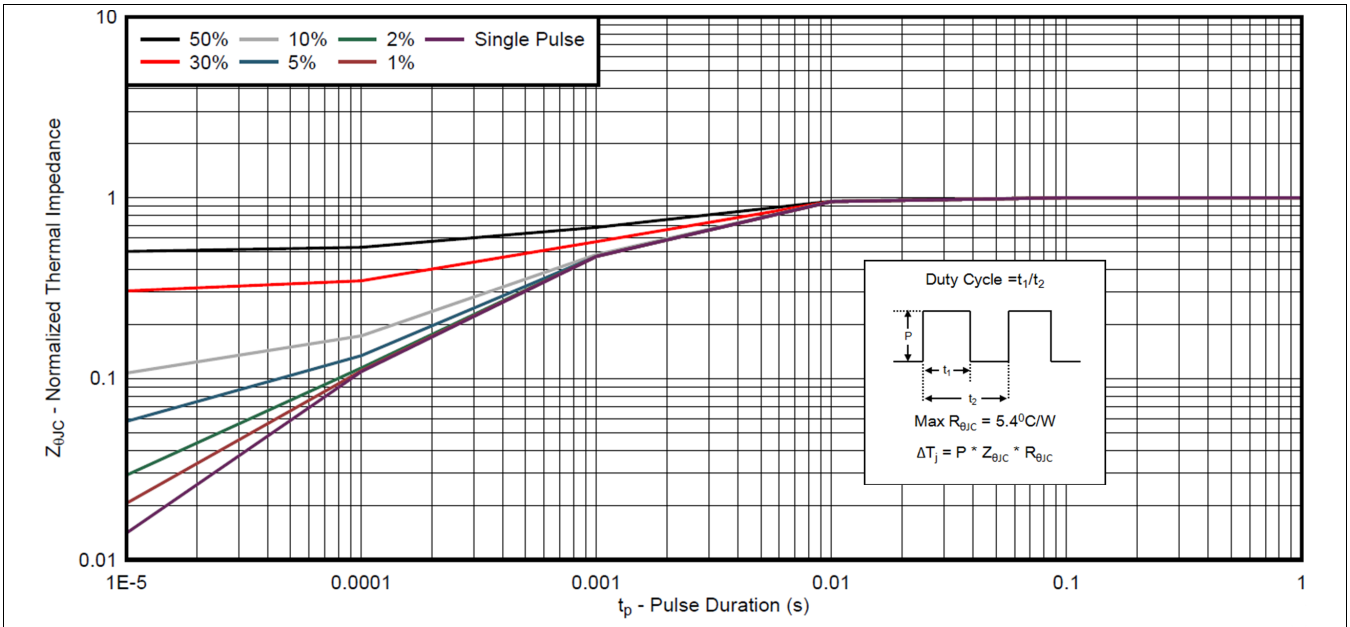


Figure 1. Transient Thermal Impedance

Copyright © 2014–2016, Texas Instruments Incorporated

Typical MOSFET Characteristics (continued)

(T_A = 25°C unless otherwise stated)

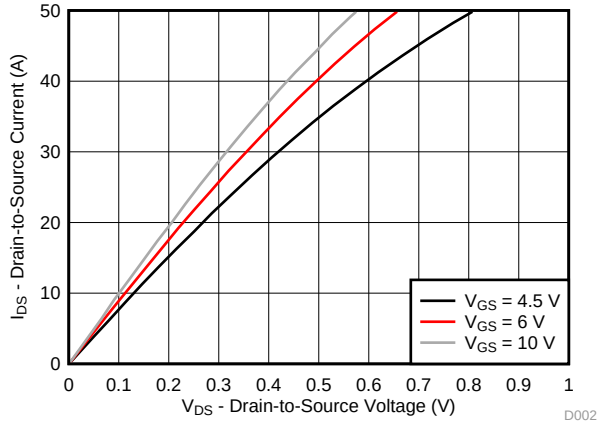


Figure 2. Saturation Characteristics

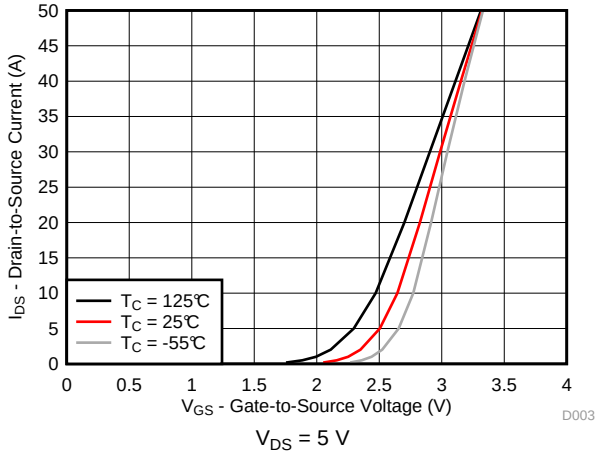


Figure 3. Transfer Characteristics

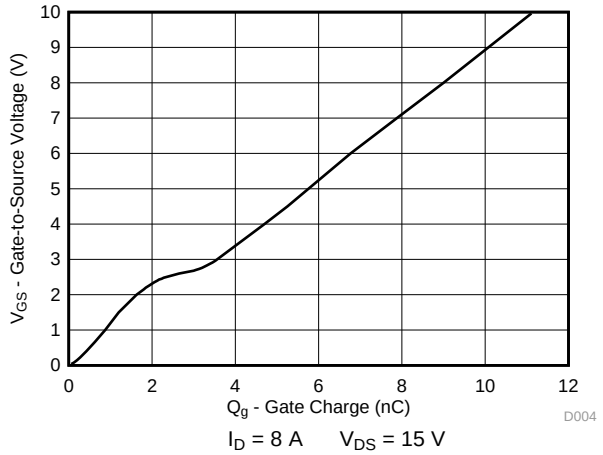


Figure 4. Gate Charge

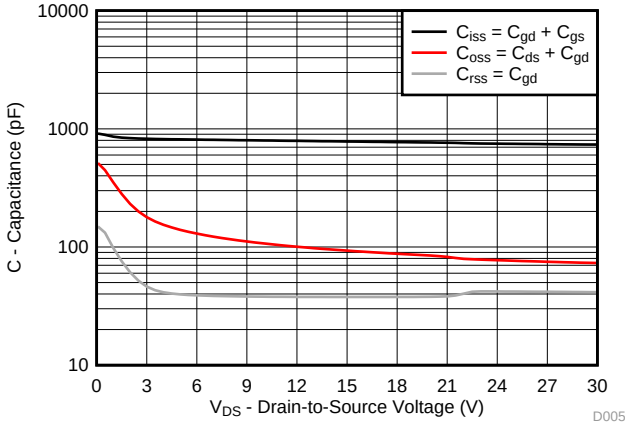


Figure 5. Capacitance

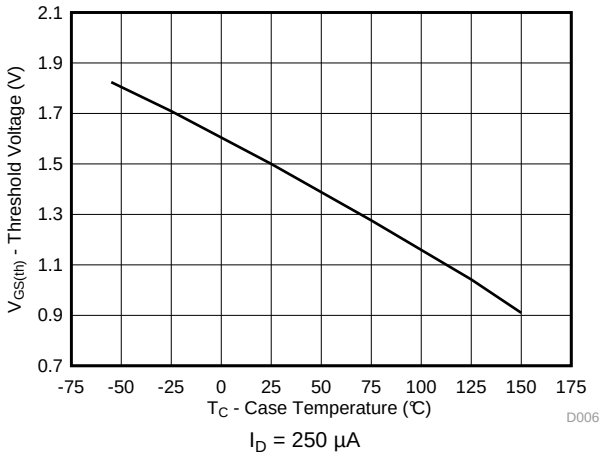


Figure 6. Threshold Voltage vs Temperature

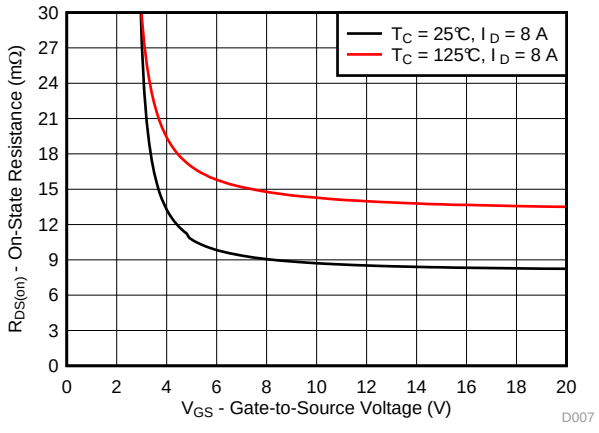


Figure 7. On-State Resistance vs Gate-to-Source Voltage

Copyright © 2014–2016, Texas Instruments Incorporated

Typical MOSFET Characteristics (continued)

(T_A = 25°C unless otherwise stated)

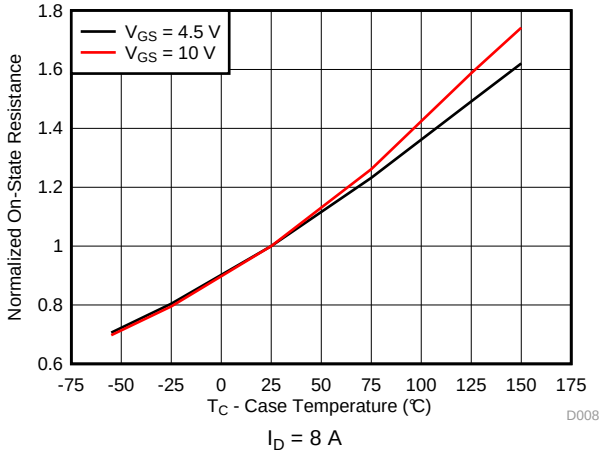


Figure 8. Normalized On-State Resistance vs Temperature

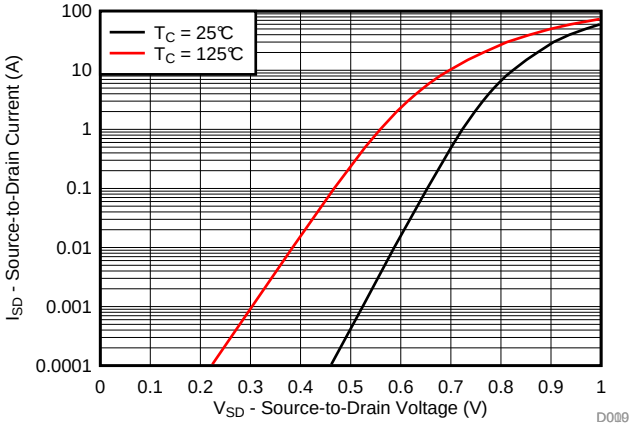


Figure 9. Typical Diode Forward Voltage

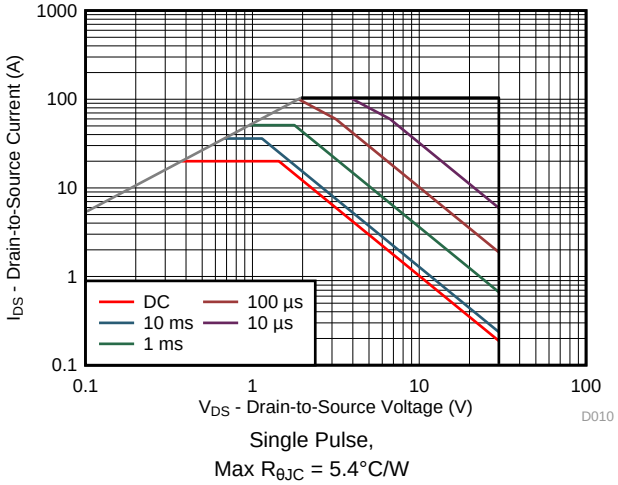


Figure 10. Maximum Safe Operating Area

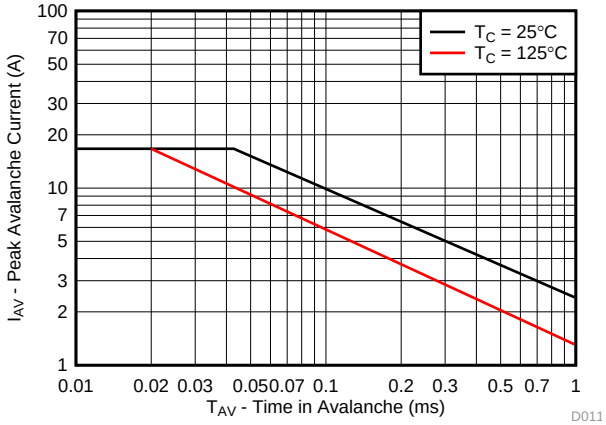


Figure 11. Single Pulse Unclamped Inductive Switching

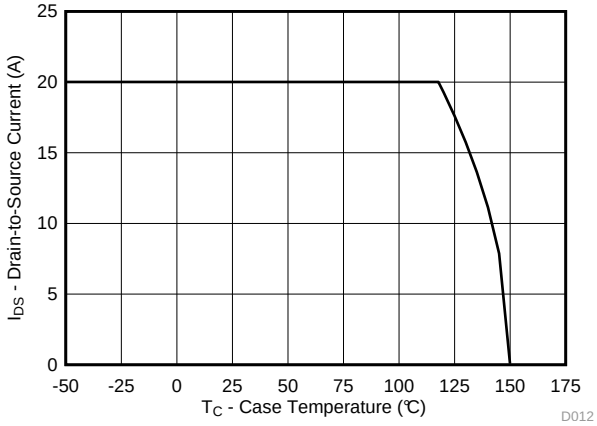


Figure 12. Maximum Drain Current vs Temperature

Copyright © 2014–2016, Texas Instruments Incorporated

6 Device and Documentation Support

6.1 Community Resources

The following links connect to TI community resources. Linked contents are provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's Terms of Use.

TI E2E™ Online Community ***TI's Engineer-to-Engineer (E2E) Community.*** Created to foster collaboration among engineers. At e2e.ti.com, you can ask questions, share knowledge, explore ideas and help solve problems with fellow engineers.

Design Support ***TI's Design Support*** Quickly find helpful E2E forums along with design support tools and contact information for technical support.

6.2 Trademarks

NexFET, E2E are trademarks of Texas Instruments.
All other trademarks are the property of their respective owners.

6.3 Electrostatic Discharge Caution



These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

6.4 Glossary

SLYZ022 — *TI Glossary*.

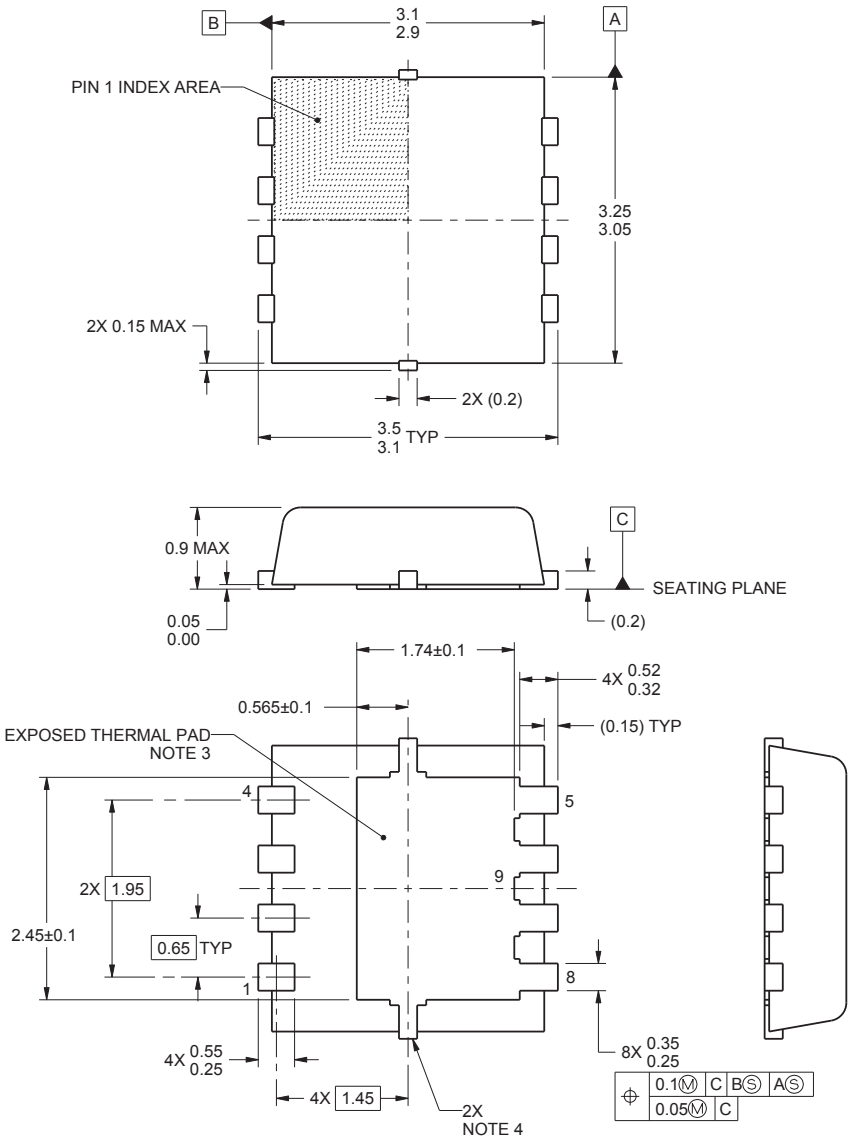
This glossary lists and explains terms, acronyms, and definitions.

Copyright © 2014–2016, Texas Instruments Incorporated

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.

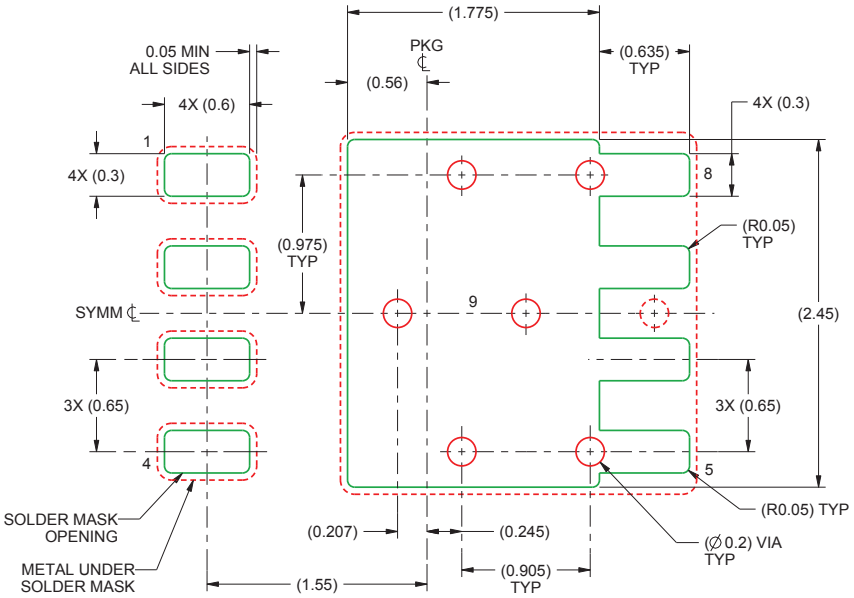
7.1 Q3A Package Dimensions



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. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.
4. Metalized features are supplier options and may not be on the package.
5. All dimensions do not include mold flash or protrusions.

Copyright © 2014–2016, Texas Instruments Incorporated

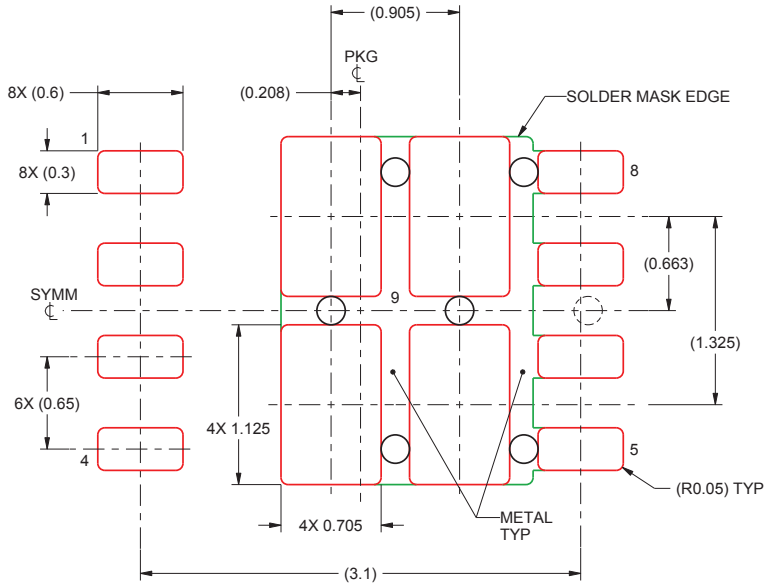
7.2 Q3A Recommended PCB Pattern



1. This package is designed to be soldered to a thermal pad on the board. For more information, see *QFN/SON PCB Attachment* application report, SLUA271.
2. Vias are optional depending on application, refer to device data sheet. If some or all are implemented, recommended via locations are shown.

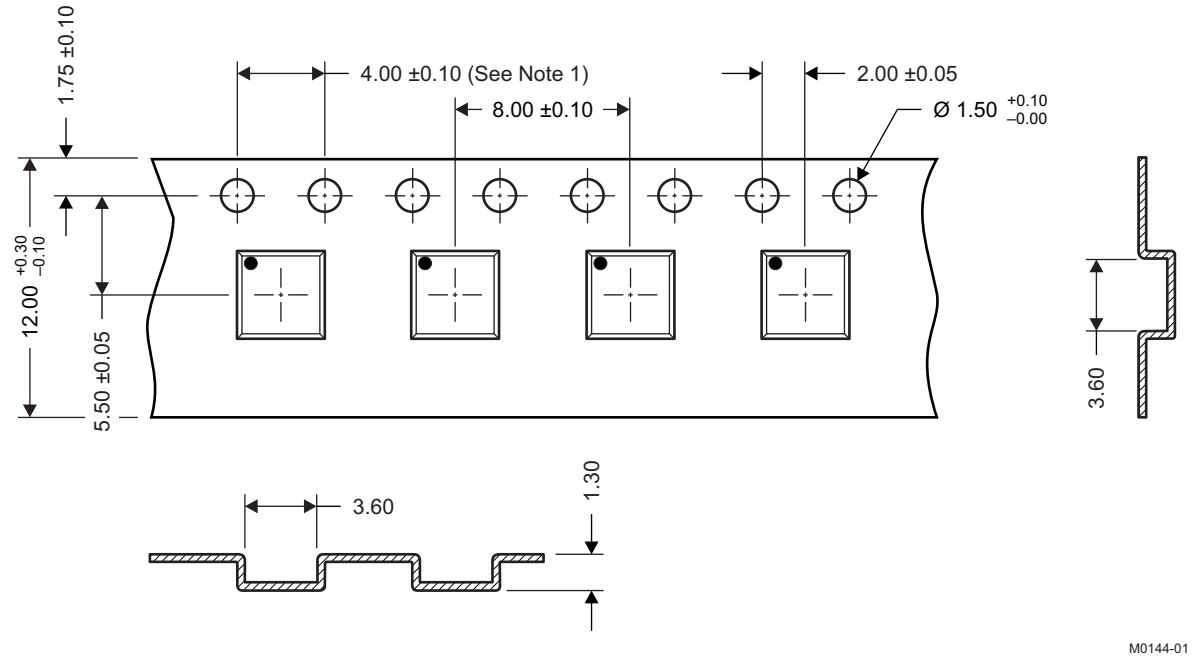
For recommended circuit layout for PCB designs, see application note SLPA005 – *Reducing Ringing Through PCB Layout Techniques*.

7.3 Q3A Recommended Stencil Pattern



1. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

7.4 Q3A Tape and Reel Information



Notes:
1. 10-sprocket hole-pitch cumulative tolerance ±0.2
2. Camber not to exceed 1 mm in 100 mm, noncumulative over 250 mm
3. Material: black static-dissipative polystyrene
4. All dimensions are in mm, unless otherwise specified.
5. Thickness: 0.30 ±0.05 mm
6. MSL1 260°C (IR and convection) PbF-reflow compatible

Copyright © 2014–2016, Texas Instruments Incorporated

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)
CSD17579Q3A	Active	Production	VSONP (DNH) | 8	2500 | LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-	17579
CSD17579Q3A.B	Active	Production	VSONP (DNH) | 8	2500 | LARGE T&R	Yes	SN	Level-1-260C-UNLIM	-55 to 150	17579
CSD17579Q3AT	Active	Production	VSONP (DNH) | 8	250 | SMALL T&R	Yes	SN	Level-1-260C-UNLIM	-55 to 150	17579
CSD17579Q3AT.B	Active	Production	VSONP (DNH) | 8	250 | SMALL T&R	Yes	SN	Level-1-260C-UNLIM	-55 to 150	17579

(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.

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.

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.

Copyright © 2026, Texas Instruments Incorporated

Last updated 10/2025