

30V、N 沟道 NexFET™ 功率 MOSFET

查询样品: [CSD17327Q5A](#)

特性

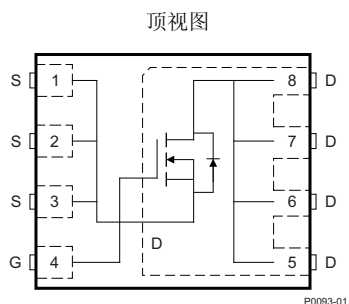
- 超低 Q_g 和 Q_{gd}
- 低热阻
- 雪崩额定
- 无铅终端镀层
- 符合 RoHS 标准
- 无卤素
- SON 5 毫米 × 6 毫米塑料封装

应用

- 网络、电信和计算系统中的负载点同步降压
- 针对控制 FET 应用进行了优化

说明

此 NexFET™ 功率 MOSFET 专为最大限度地减少功率转换应用中的损耗而设计。



产品汇总

V_{DS}	漏极至源极电压	30	V
Q_g	总栅极电荷 (4.5V)	2.8	nC
Q_{gd}	栅极电荷 (栅极至漏极)	0.8	nC
$R_{DS(on)}$	漏极至源极导通电阻	$V_{GS} = 4.5V$	12.5 mΩ
		$V_{GS} = 8V$	9.9 mΩ
$V_{GS(th)}$	门限电压	1.6	V

订购信息

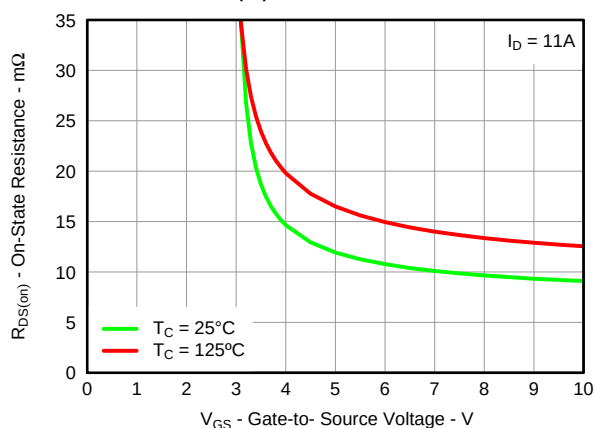
器件	封装	介质	数量	出货
CSD17327Q5A	SON 5-mm × 6-mm 塑料封装	13 英寸卷带	2500	卷带封装

最大绝对额定值

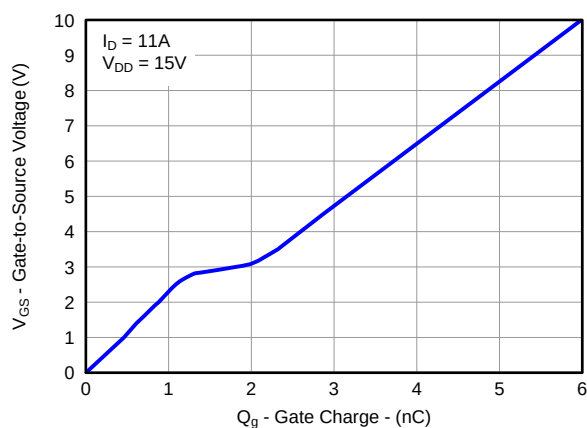
$T_A = 25^\circ\text{C}$, 除非另有说明。		数值	单位
V_{DS}	漏极至源极电压	30	V
V_{GS}	漏极至源极电压	+10 / -10	V
I_D	连续漏极电流, $T_C = 25^\circ\text{C}$	65	A
	连续漏极电流 ⁽¹⁾	13	A
I_{DM}	脉冲漏极电流, $T_A = 25^\circ\text{C}$ ⁽²⁾	85	A
P_D	功耗 ⁽¹⁾	3	W
T_J, T_{STG}	工作结温及存储温度范围	-55 至 150	°C
E_{AS}	雪崩能量, 单脉冲 $I_D = 30A, L = 0.1mH, R_G = 25\Omega$	45	mJ

- (1) 典型 $R_{\theta JA} = 44^\circ\text{C/W}$, 在一块 1 英寸² (6.45-cm²)、2 盎司 (0.071-mm 厚) 铜焊盘上, 该铜焊盘位于一块厚度为 0.06 英寸 (1.52-mm) 的 FR4 PCB 之上。
- (2) 脉冲持续时间 $\leq 300\mu\text{s}$, 占空比 $\leq 2\%$

$R_{DS(on)}$ 与 V_{GS} 的关系曲线



栅极电荷



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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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English Data Sheet: [SLPS332](#)



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.

ELECTRICAL CHARACTERISTICS

(T_A = 25°C unless otherwise stated)

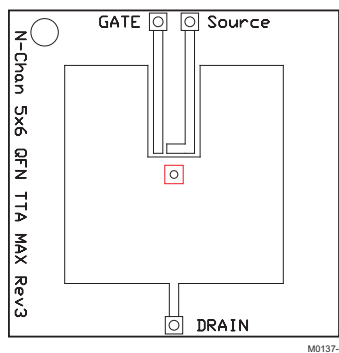
PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
Static Characteristics						
BV _{DSS}	Drain to Source Voltage	V _{GS} = 0V, I _{DS} = 250μA	30			V
I _{DSS}	Drain to Source Leakage Current	V _{GS} = 0V, V _{DS} = 24V			1	μA
I _{GSS}	Gate to Source Leakage Current	V _{DS} = 0V, V _{GS} = +10/-10V			100	nA
V _{GS(th)}	Gate to Source Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = 250μA	1.1	1.6	2.0	V
R _{DS(on)}	Drain to Source On Resistance	V _{GS} = 4.5V, I _{DS} = 11A	12.5		15.5	mΩ
		V _{GS} = 8V, I _{DS} = 11A	9.9		12.2	mΩ
g _{fs}	Transconductance	V _{DS} = 15V, I _{DS} = 11A	44			S
Dynamic Characteristics						
C _{iSS}	Input Capacitance	V _{GS} = 0V, V _{DS} = 15V, f = 1MHz	422		506	pF
C _{oSS}	Output Capacitance		286		343	pF
C _{rSS}	Reverse Transfer Capacitance		26		33	pF
R _G	Series Gate Resistance	V _{DS} = 15V, I _{DS} = 11A	4.7			Ω
Q _g	Gate Charge Total (4.5V)		2.8		3.4	nC
Q _{gd}	Gate Charge Gate to Drain		0.8			nC
Q _{gs}	Gate Charge Gate to Source		1.2			nC
Q _{g(th)}	Gate Charge at V _{th}		0.6			nC
Q _{oSS}	Output Charge	V _{DS} = 13V, V _{GS} = 0V	6.8			nC
t _{d(on)}	Turn On Delay Time	V _{DS} = 15V, V _{GS} = 4.5V, I _{DS} = 11A, R _G = 2Ω	5.6			ns
t _r	Rise Time		8.2			ns
t _{d(off)}	Turn Off Delay Time		9.8			ns
t _f	Fall Time		3.2			ns
Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _{SD} = 11A, V _{GS} = 0V	0.85		1	V
Q _{rr}	Reverse Recovery Charge	V _{DS} = 13V, I _F = 11A, di/dt = 300A/μs	10.5			nC
t _{rr}	Reverse Recovery Time		14.6			ns

THERMAL CHARACTERISTICS

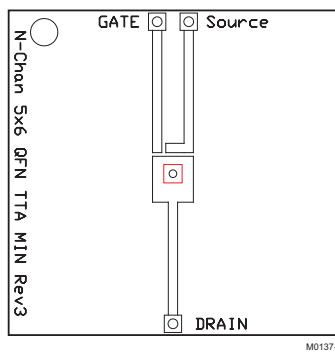
(T_A = 25°C unless otherwise stated)

PARAMETER		MIN	TYP	MAX	UNIT
R _{θJC}	Thermal Resistance Junction to Case ⁽¹⁾			1.9	°C/W
R _{θJA}	Thermal Resistance Junction to Ambient ⁽¹⁾⁽²⁾			51	°C/W

- (1) R_{θJC} is determined with the device mounted on a 1-inch² (6.45-cm²), 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_{θJC} is specified by design, whereas R_{θJA} is determined by the user's board design.
- (2) Device mounted on FR4 material with 1-inch² (6.45-cm²), 2-oz. (0.071-mm thick) Cu.



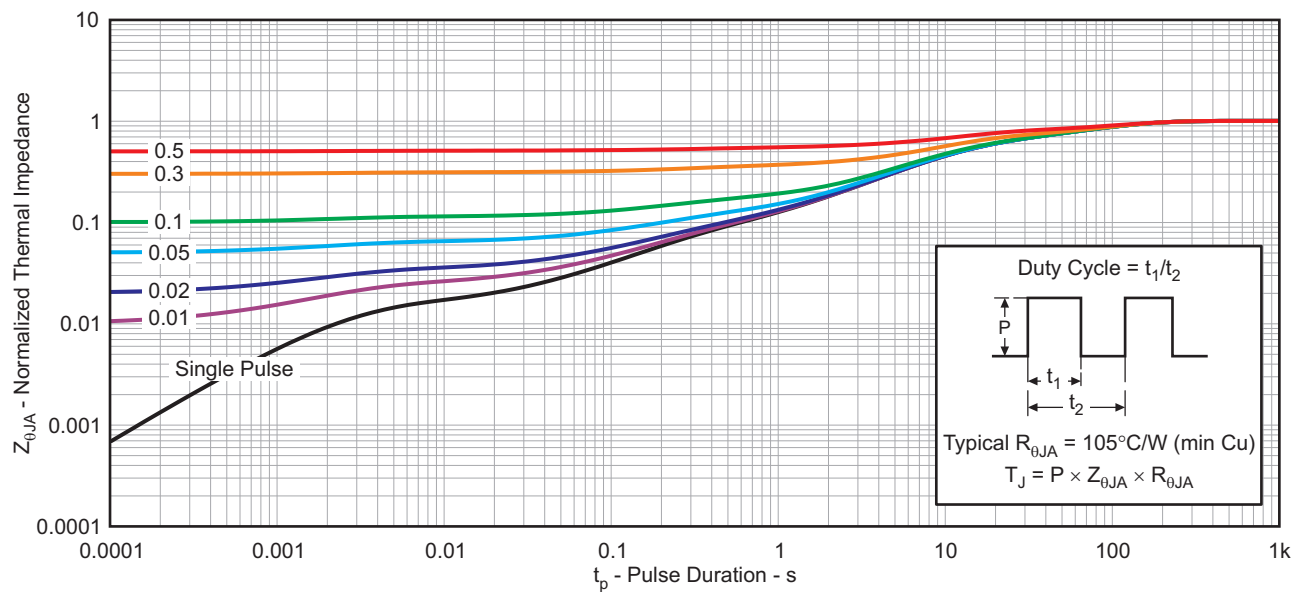
Max $R_{\theta JA} = 51^{\circ}\text{C/W}$
when mounted on
1 inch² (6.45 cm²) of
2-oz. (0.071-mm thick)
Cu.



Max $R_{\theta JA} = 131^{\circ}\text{C/W}$
when mounted on a
minimum pad area of
2-oz. (0.071-mm thick)
Cu.

TYPICAL MOSFET CHARACTERISTICS

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



G012

Figure 1. Transient Thermal Impedance

TYPICAL MOSFET CHARACTERISTICS (continued)

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

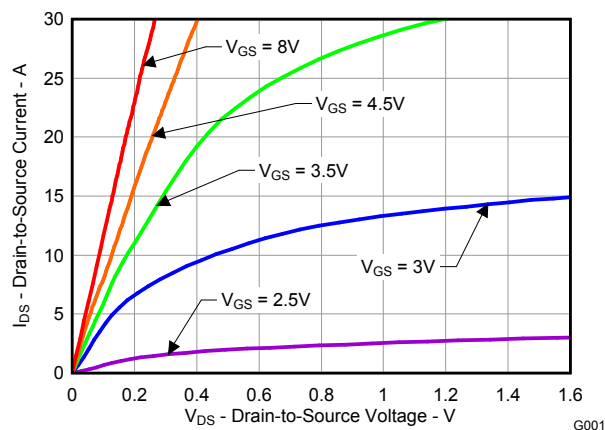


Figure 2. Saturation Characteristics

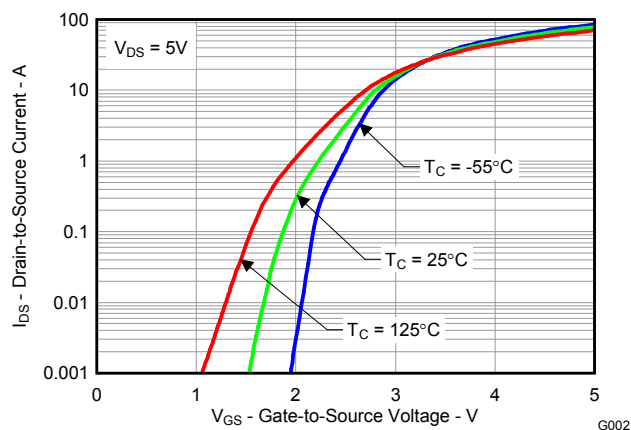


Figure 3. Transfer Characteristics

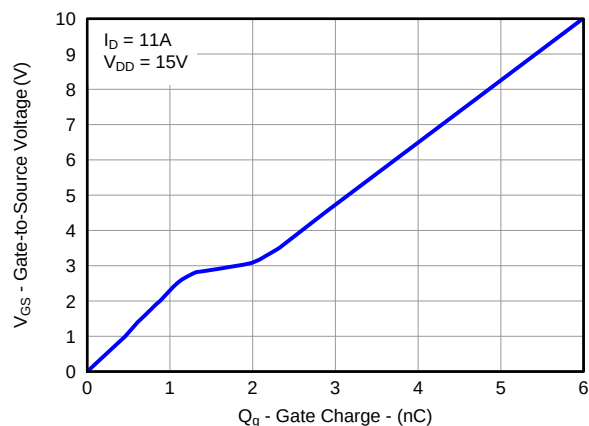


Figure 4. Gate Charge

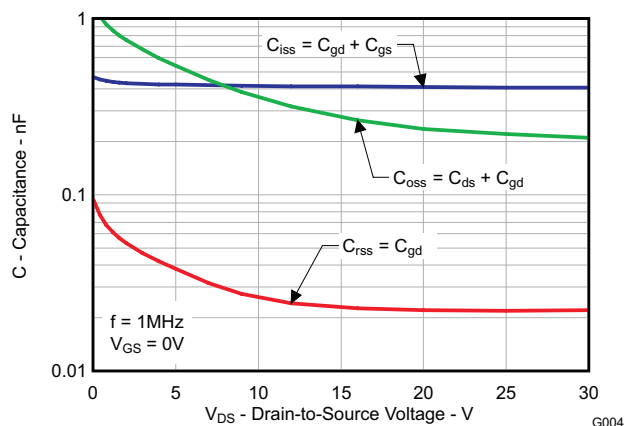


Figure 5. Capacitance

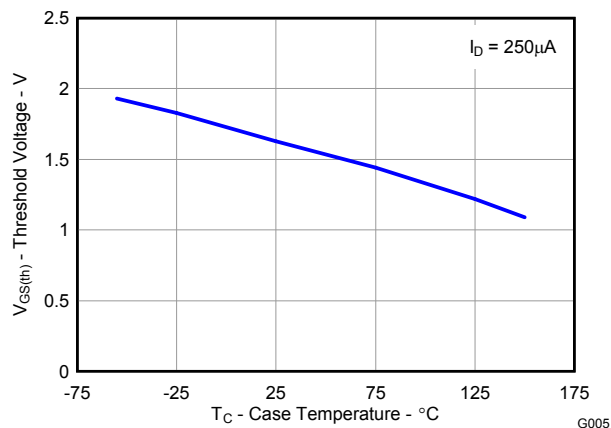


Figure 6. Threshold Voltage vs. Temperature

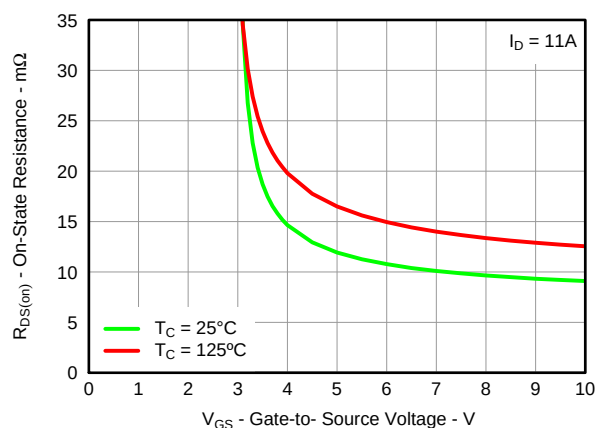


Figure 7. On-State Resistance vs. Gate-to-Source Voltage

TYPICAL MOSFET CHARACTERISTICS (continued)

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

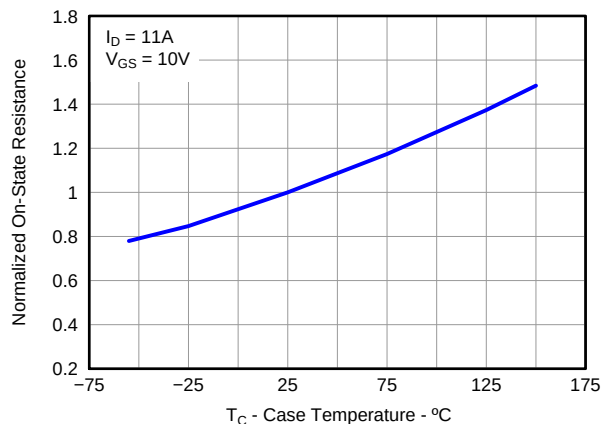


Figure 8. Normalized On-State Resistance vs. Temperature

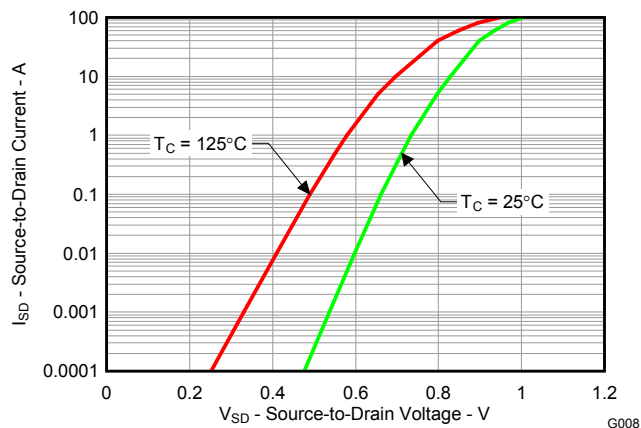


Figure 9. Typical Diode Forward Voltage

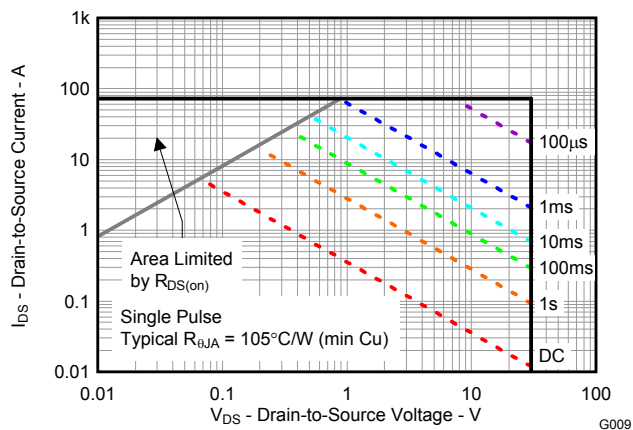


Figure 10. Maximum Safe Operating Area

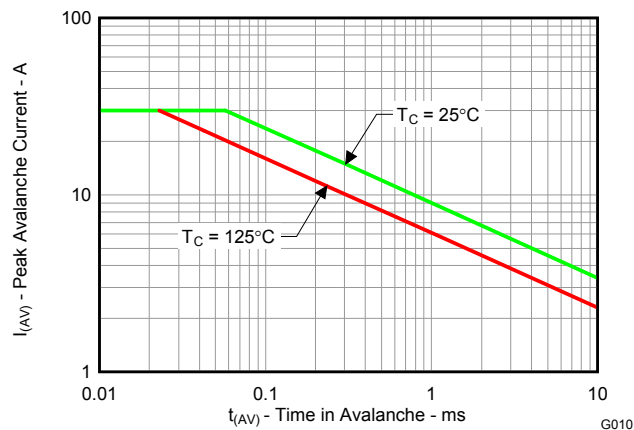


Figure 11. Single Pulse Unclamped Inductive Switching

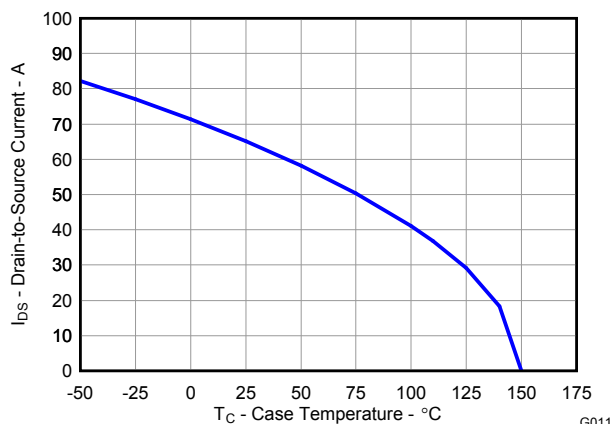
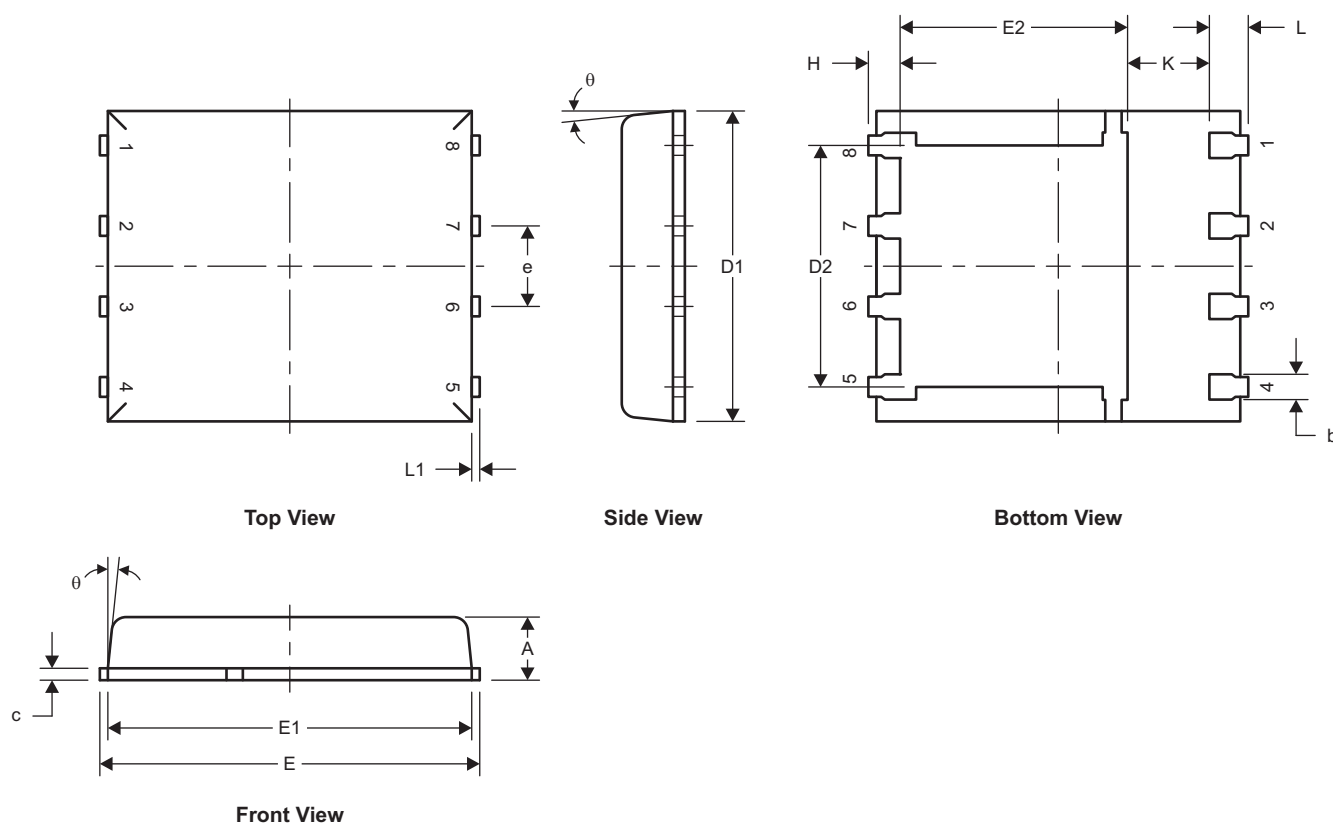


Figure 12. Maximum Drain Current vs. Temperature

MECHANICAL DATA

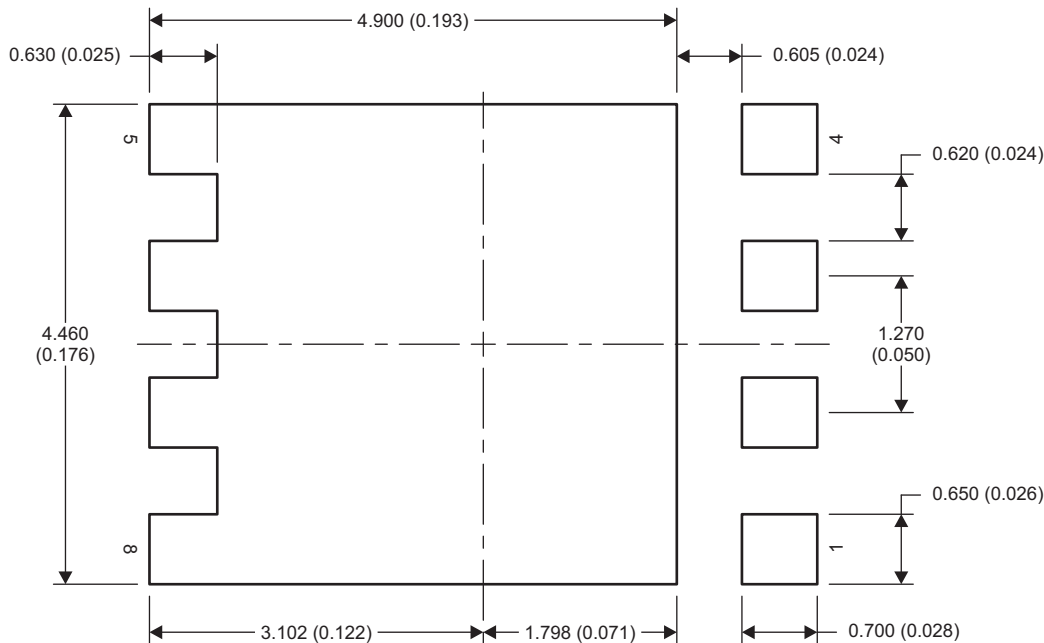
Q5A Package Dimensions



M0135-01

DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.33	0.41	0.51
c	0.20	0.25	0.34
D1	4.80	4.90	5.00
D2	3.61	3.81	4.02
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78
e	1.17	1.27	1.37
H	0.41	0.56	0.71
K	1.10		
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
θ	0°		12°

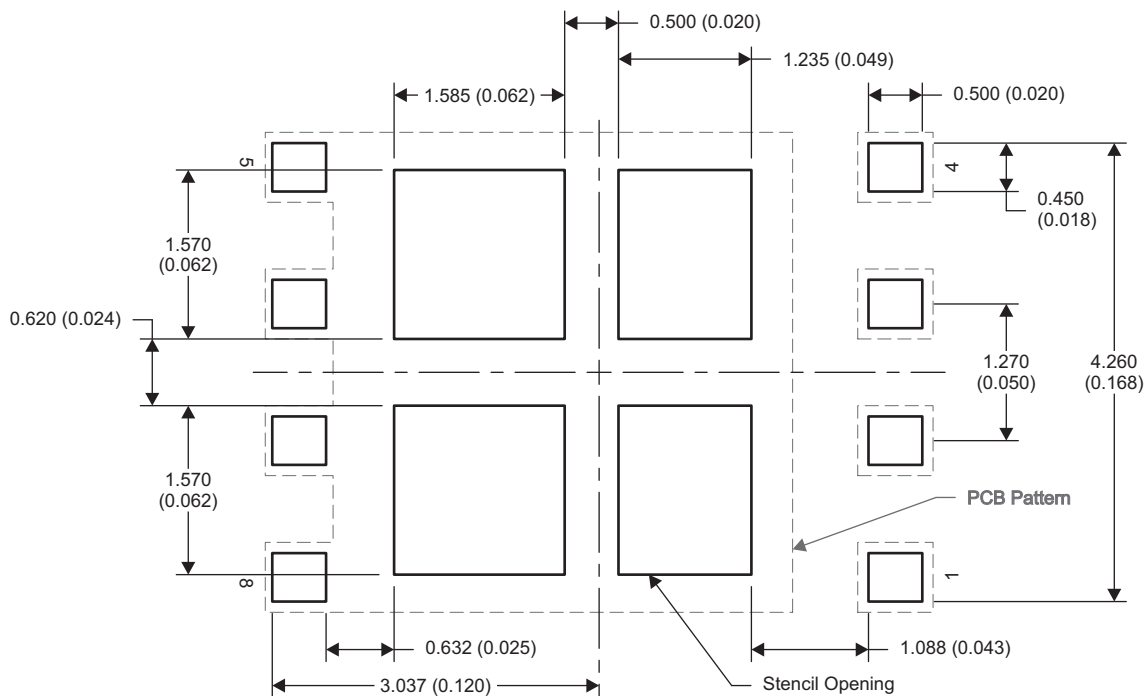
Recommended PCB Pattern



M0139-01

NOTE: Dimensions are in mm (inches).

Stencil Recommendation

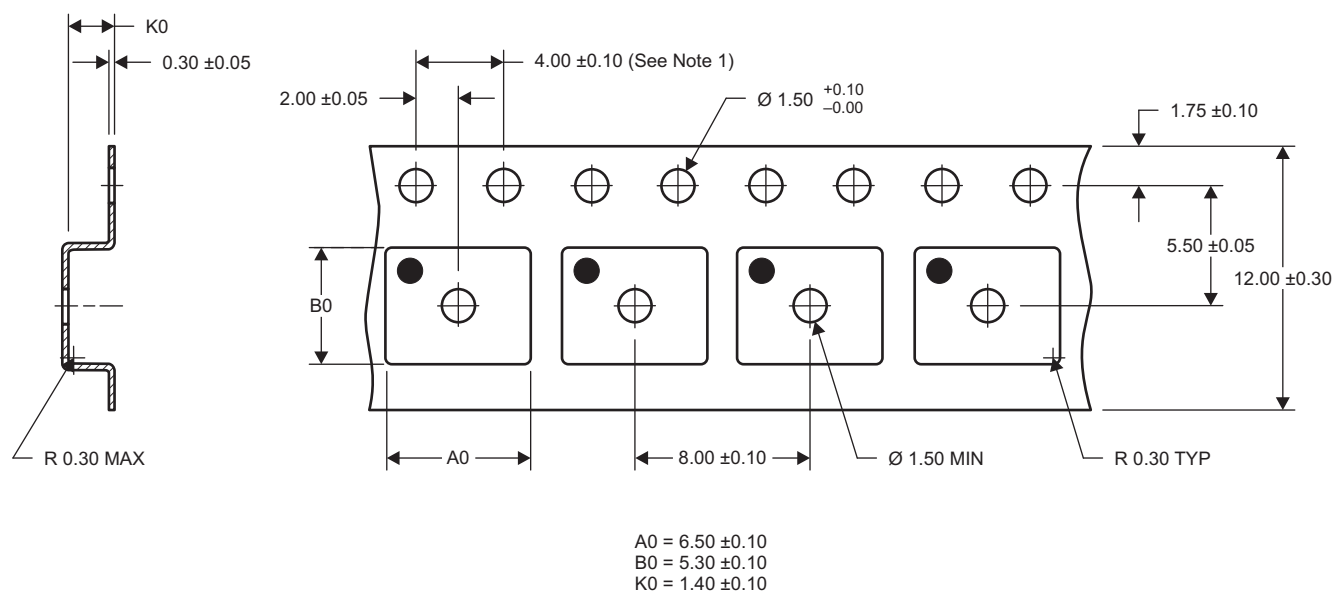


M0209-01

NOTE: Dimensions are in mm (inches).

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

Q5A Tape and Reel Information



M0138-01

- NOTES:
- 10-sprocket hole-pitch cumulative tolerance ± 0.2
 - Camber not to exceed 1mm in 100mm, noncumulative over 250mm
 - Material: black static-dissipative polystyrene
 - All dimensions are in mm (unless otherwise specified)
 - $A0$ and $B0$ measured on a plane 0.3mm above the bottom of the pocket

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)
CSD17327Q5A	Active	Production	VSONP (DQJ) 8	2500 LARGE T&R	ROHS Exempt	SN	Level-1-260C-UNLIM	-55 to 150	CSD17327
CSD17327Q5A.B	Active	Production	VSONP (DQJ) 8	2500 LARGE T&R	ROHS Exempt	SN	Level-1-260C-UNLIM	-55 to 150	CSD17327

⁽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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VSONP - 1.1 mm max height

Top View:

- Overall width: 5.8 mm (0.230 inches)
- Overall height: 5.0 mm (0.197 inches)
- Pin 1 Index Area: Indicated by a shaded square in the top-left corner.
- Width of Pin 1 Index Area: 5.7 mm (0.224 inches)
- Height of Pin 1 Index Area: 4.8 mm (0.189 inches)
- Width of Pin 1 Index Area (Typical): 6.1 mm (0.240 inches)
- Width of Pin 1 Index Area (Note 6): 5.9 mm (0.232 inches)

Side View:

- Seating Plane: Indicated by a dashed line.
- Height of Seating Plane: 1.10 mm (0.043 inches) MAX
- Height of Seating Plane: 0.05 mm (0.002 inches) MIN
- Radius of Seating Plane: 0.08 mm (0.003 inches) C

Detail View:

- Exposed Thermal Pad: Indicated by a dashed line.
- Width of Exposed Thermal Pad: 0.1 mm (0.004 inches) MAX
- Height of Exposed Thermal Pad: 0.71 mm (0.028 inches) MIN
- Width of Exposed Thermal Pad (Typical): 3.78 mm (0.149 inches)
- Width of Exposed Thermal Pad (Note 6): 3.38 mm (0.133 inches)
- Width of Exposed Thermal Pad (Typical): (1.16) mm (0.046 inches)
- Width of Exposed Thermal Pad (Note 6): 0.71 mm (0.028 inches)
- Width of Exposed Thermal Pad (Note 6): 0.41 mm (0.016 inches)
- Width of Exposed Thermal Pad (Note 6): 0.21 mm (0.008 inches)
- Width of Exposed Thermal Pad (Note 6): 0.1 mm (0.004 inches)
- Width of Exposed Thermal Pad (Note 6): 0.05 mm (0.002 inches)
- Width of Exposed Thermal Pad (Note 6): 0.025 mm (0.001 inches)
- Width of Exposed Thermal Pad (Note 6): 0.0125 mm (0.0005 inches)
- Width of Exposed Thermal Pad (Note 6): 0.00625 mm (0.00025 inches)
- Width of Exposed Thermal Pad (Note 6): 0.003125 mm (0.000125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.0015625 mm (0.0000625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.00078125 mm (0.00003125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.000390625 mm (0.000015625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.0001953125 mm (0.0000078125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.00009765625 mm (0.00000390625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.000048828125 mm (0.000001953125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.0000244140625 mm (0.0000009765625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.00001220703125 mm (0.00000048828125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.000006103515625 mm (0.000000244140625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.0000030517578125 mm (0.0000001220703125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.00000152587890625 mm (0.00000006103515625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.000000762939453125 mm (0.000000030517578125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.0000003814697265625 mm (0.0000000152587890625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.00000019073486328125 mm (0.00000000762939453125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.000000095367431640625 mm (0.000000003814697265625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.0000000476837158203125 mm (0.0000000019073486328125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.00000002384185791015625 mm (0.00000000095367431640625 inches)
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- Width of Exposed Thermal Pad (Note 6): 0.0000000059604644775390625 mm (0.0000000002384185791015625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.00000000298023223876953125 mm (0.00000000011920928955078125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.000000001490116119384765625 mm (0.000000000059604644775390625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.0000000007450580596923828125 mm (0.0000000000298023223876953125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.00000000037252902984619140625 mm (0.00000000001490116119384765625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.000000000186264514923095703125 mm (0.000000000007450580596923828125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.0000000000931322574615478515625 mm (0.0000000000037252902984619140625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.00000000004656612873077392578125 mm (0.00000000000186264514923095703125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.000000000023283064365386962890625 mm (0.000000000000931322574615478515625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.0000000000116415321826934814453125 mm (0.0000000000004656612873077392578125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.00000000000582076609134674072265625 mm (0.00000000000023283064365386962890625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.000000000002910383045673370361328125 mm (0.000000000000116415321826934814453125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.0000000000014551915228366851806640625 mm (0.0000000000000582076609134674072265625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.00000000000072759576141834259033203125 mm (0.00000000000002910383045673370361328125 inches)
- Width of Exposed Thermal Pad (Note 6): 0.000000000000363797880709171295166015625 mm (0.000000000000014551915228366851806640625 inches)
- Width of Exposed Thermal Pad (Note 6): 0.0000000000001818989403545856475830078125 mm (0.0000000000000072759576141834259033203125 inches)
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- Width of Exposed Thermal Pad (Note 6): 0.00000000000000142108547152020037174224853515625 mm (0.00000000

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. These dimensions do not include mold flash protrusions or gate burrs.
6. These dimensions include interterminal flash or protrusion. Interterminal flash or protrusion shall not exceed 0.25 mm per side.

PLASTIC SMALL OUTLINE - NO LEAD

LAND PATTERN EXAMPLE
SOLDER MASK DEFINED
SCALE: 15X

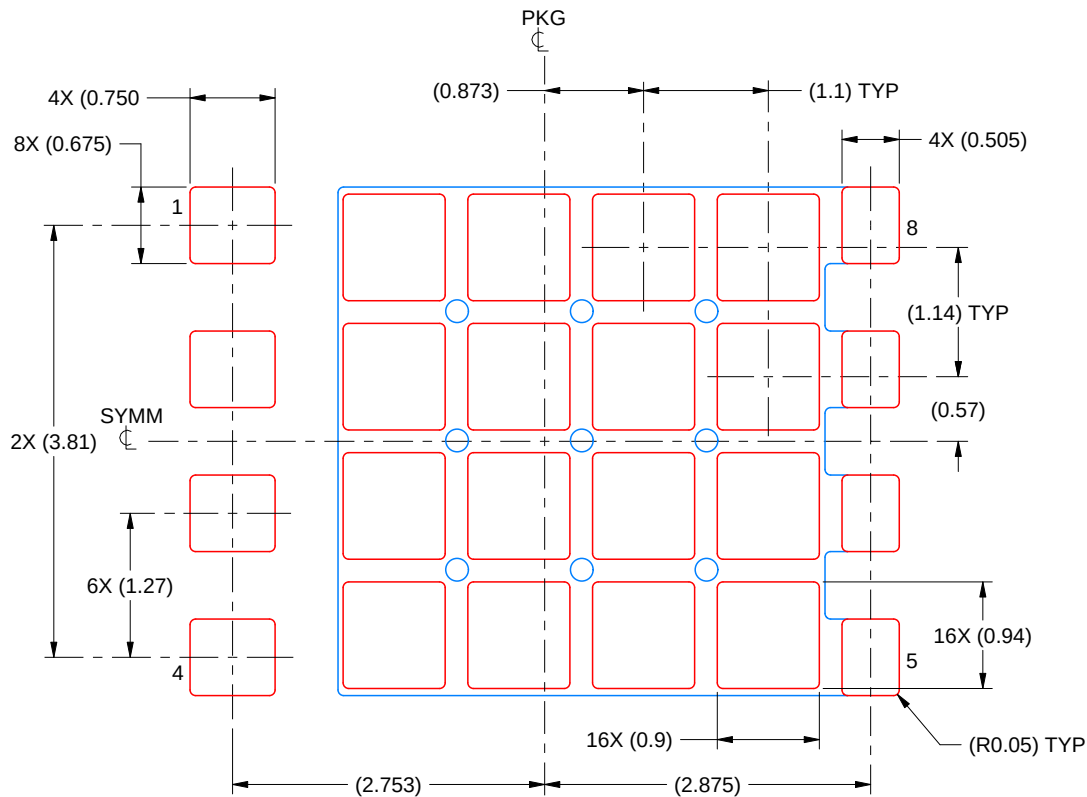
SOLDER MASK DETAILS

EXAMPLE STENCIL DESIGN

DQJ0008A

VSONP - 1.1 mm max height

PLASTIC SMALL OUTLINE - NO LEAD



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL

EXPOSED PAD:
70% PRINTED SOLDER COVERAGE BY AREA UNDER PACKAGE
SCALE: 15X

4218866/C 02/2025

NOTES: (continued)

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

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