

P-Channel 60-V (D-S) MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A) ^a	Q _g (Typ.)
- 60	0.055 at V _{GS} = - 10 V	- 7.0	30 nC
	0.065 at V _{GS} = - 4.5 V	- 6.0	

FEATURES

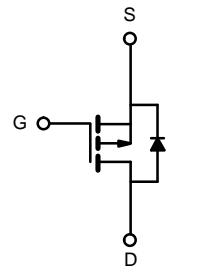
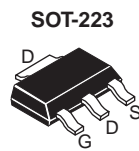
- TrenchFET[®] Power MOSFET
- 100 % UIS Tested

APPLICATIONS

- Load Switch



RoHS
COMPLIANT
HALOGEN
FREE



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C, unless otherwise noted)				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	- 60	V	
Gate-Source Voltage	V _{GS}	± 20		
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C	- 7.0 ^a	A
		T _C = 70 °C	- 5.2	
		T _A = 25 °C	- 4.8 ^b	
		T _A = 70 °C	- 4.1 ^b	
Pulsed Drain Current	I _{DM}	- 25		
Avalanche Current Pulse	L = 0.1 mH	I _{AS}	- 4.5	
Single Pulse Avalanche Energy		E _{AS}	10.1	mJ
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C	6.9 ^a	A
		T _A = 25 °C	3.5 ^b	
Maximum Power Dissipation	P _D	T _C = 25 °C	10.4 ^a	W
		T _C = 70 °C	6.6 ^a	
		T _A = 25 °C	2.1 ^b	
		T _A = 70 °C	1.1 ^b	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^b	Steady State	R _{thJA}	33	40	°C/W
		R _{thJC}	0.98	1.2	

Notes:

a. Based on T_C = 25 °C.

b. Surface mounted on 1" x 1" FR4 board.

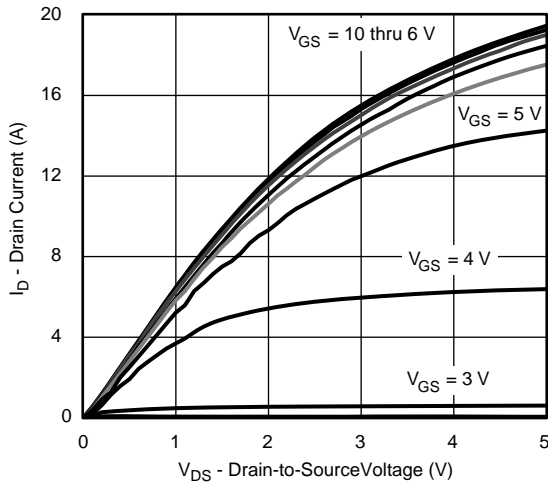
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 250 μA	- 60			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = - 250 μA		68		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			- 5.2		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 1.0		- 2.5	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 60 V, V _{GS} = 0 V			- 1	μA
		V _{DS} = - 60 V, V _{GS} = 0 V, T _J = 55 °C			- 10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = - 5 V, V _{GS} = - 10 V	- 25			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 10 V, I _D = - 3 A		0.055		Ω
		V _{GS} = - 4.5 V, I _D = - 2 A		0.065		
Forward Transconductance ^a	g _{fs}	V _{DS} = - 15 V, I _D = - 5 A	20			S
Dynamic^b						
Input Capacitance	C _{iss}	V _{DS} = - 25 V, V _{GS} = 0 V, f = 1 MHz		1500		pF
Output Capacitance	C _{oss}			200		
Reverse Transfer Capacitance	C _{rss}			150		
Total Gate Charge	Q _g	V _{DS} = - 30 V, V _{GS} = - 10 V, I _D = - 5 A		38	56	nC
				19	30	
Gate-Source Charge	Q _{gs}	V _{DS} = - 30 V, V _{GS} = - 4.5 V, I _D = - 5 A		9		
Gate-Drain Charge	Q _{gd}			10		
Gate Resistance	R _g	f = 1 MHz		5.2		Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 2 V, R _L = 2 Ω I _D = - 5 A, V _{GEN} = - 10 V, R _g = 1 Ω		10	15	ns
Rise Time	t _r			7	15	
Turn-Off Delay Time	t _{d(off)}			70	110	
Fall Time	t _f			40	60	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			- 6.9	A
Pulse Diode Forward Current ^a	I _{SM}				- 15	
Body Diode Voltage	V _{SD}	I _S = - 3 A		- 1	- 1.5	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = - 5 A, di/dt = 10 A/μs, T _J = 25 °C		45	68	ns
Body Diode Reverse Recovery Charge	Q _{rr}			59	120	nC
Reverse Recovery Fall Time	t _a			29		ns
Reverse Recovery Rise Time	t _b			16		

Notes:

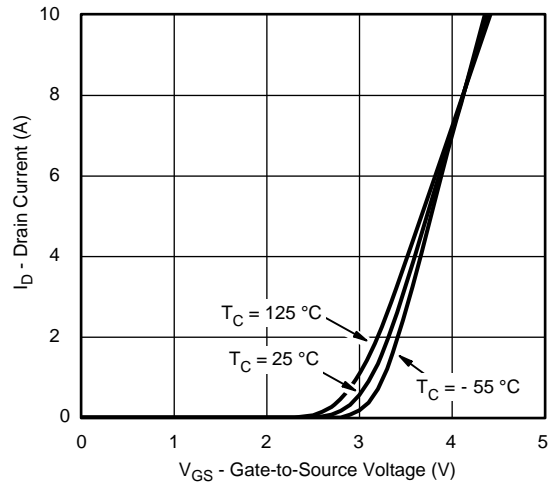
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- b. Guaranteed by design, not subject to production testing.

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 in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

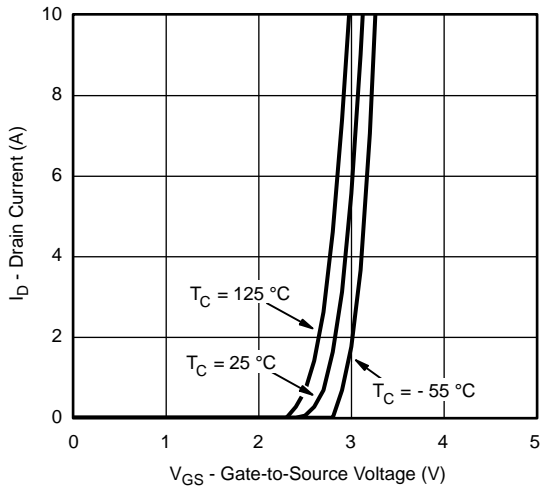
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



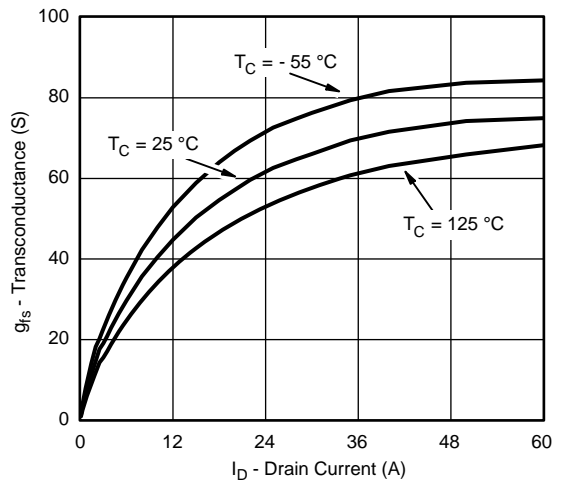
Output Characteristics



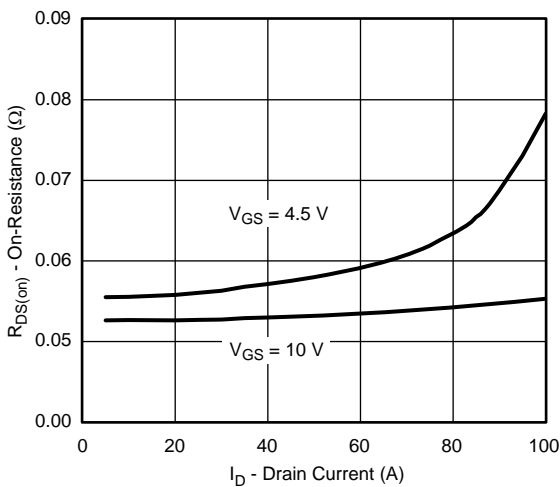
Transfer Characteristics



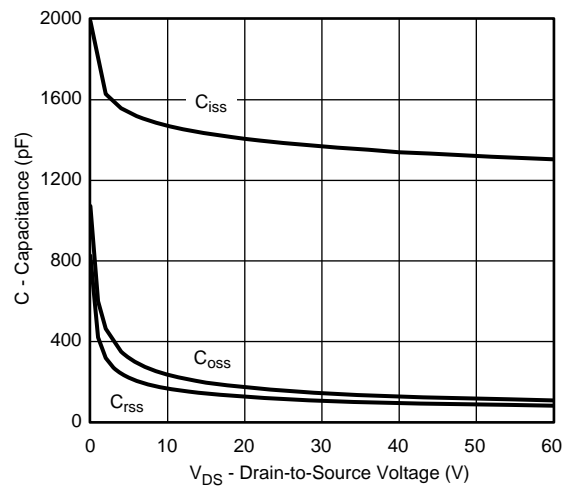
Transfer Characteristics



Transconductance

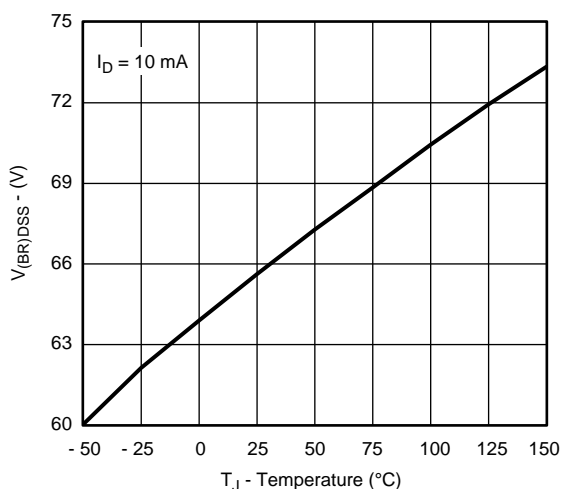
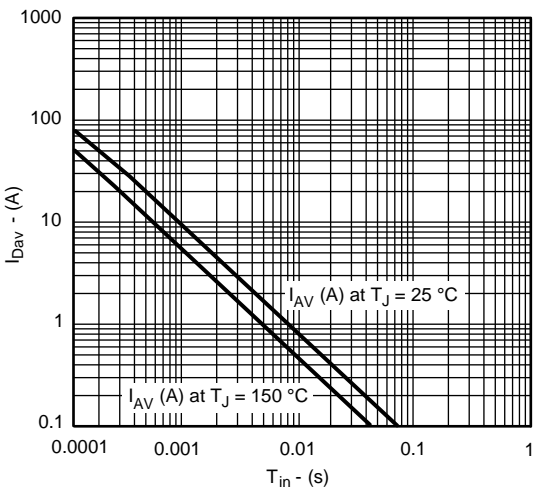
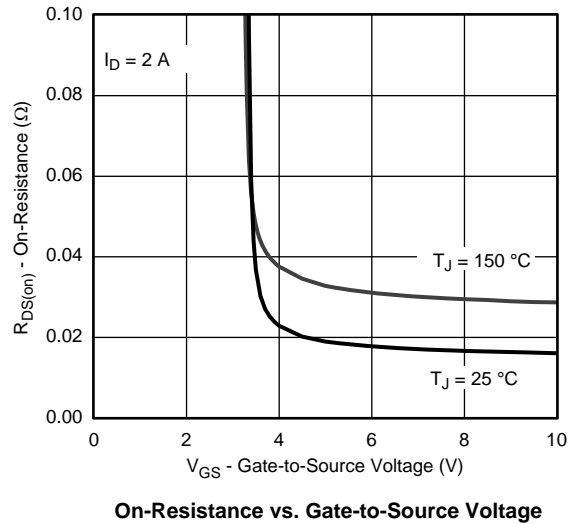
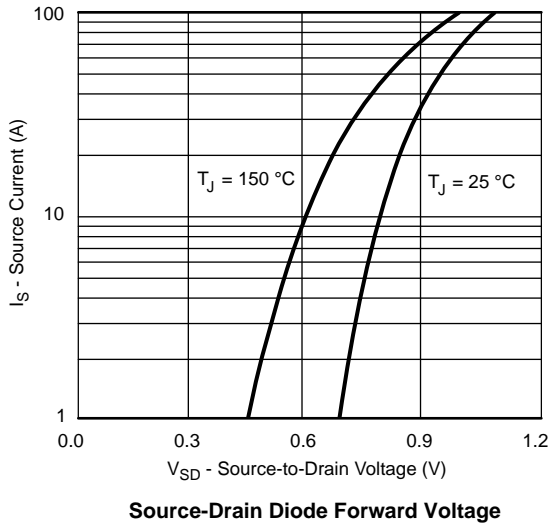
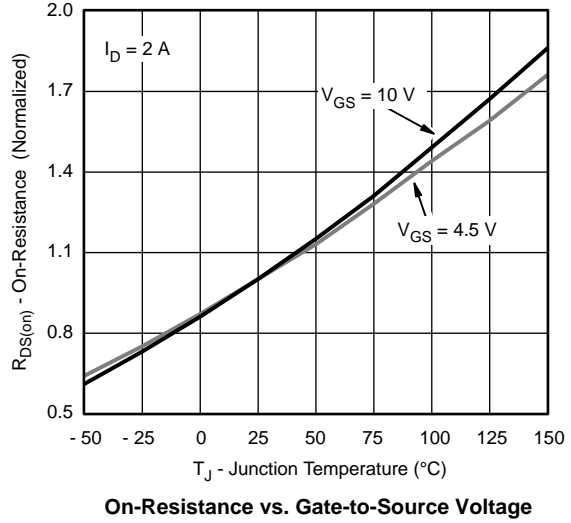
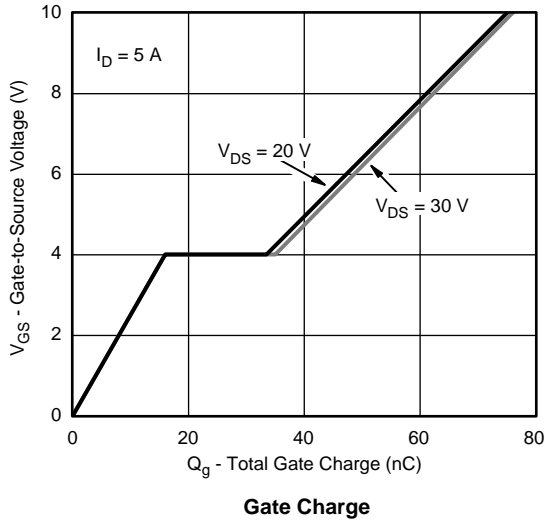


On-Resistance vs. Drain Current



Capacitance

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



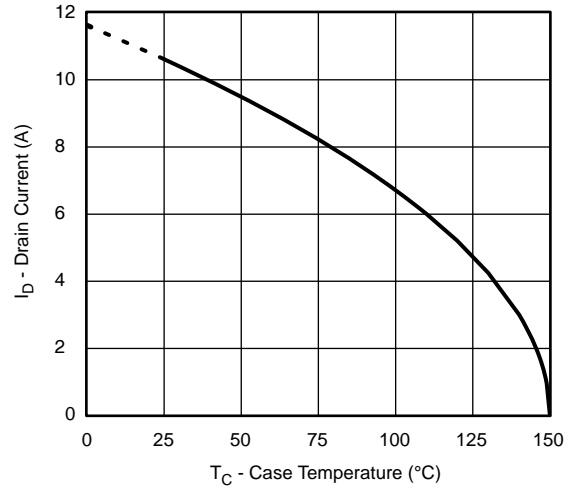
Single Pulse Avalanche Current Capability vs. Time

Drain-Source Breakdown Voltage vs. Junction Temperature

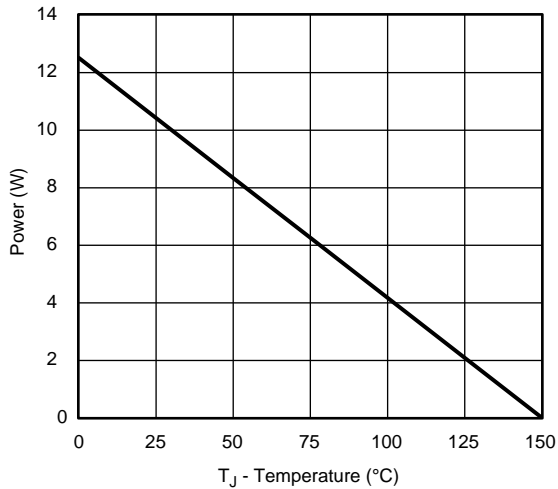
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



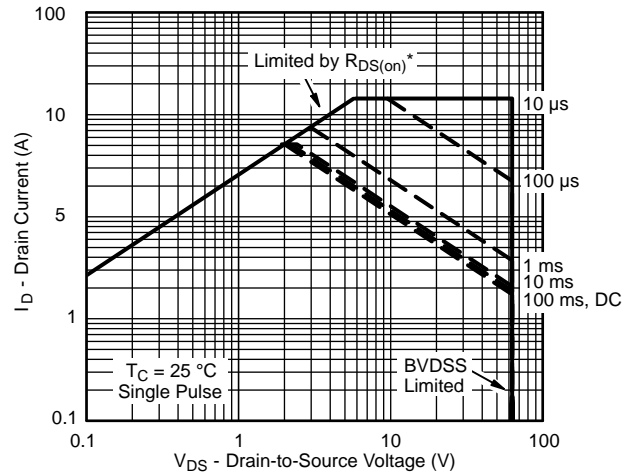
Threshold Voltage



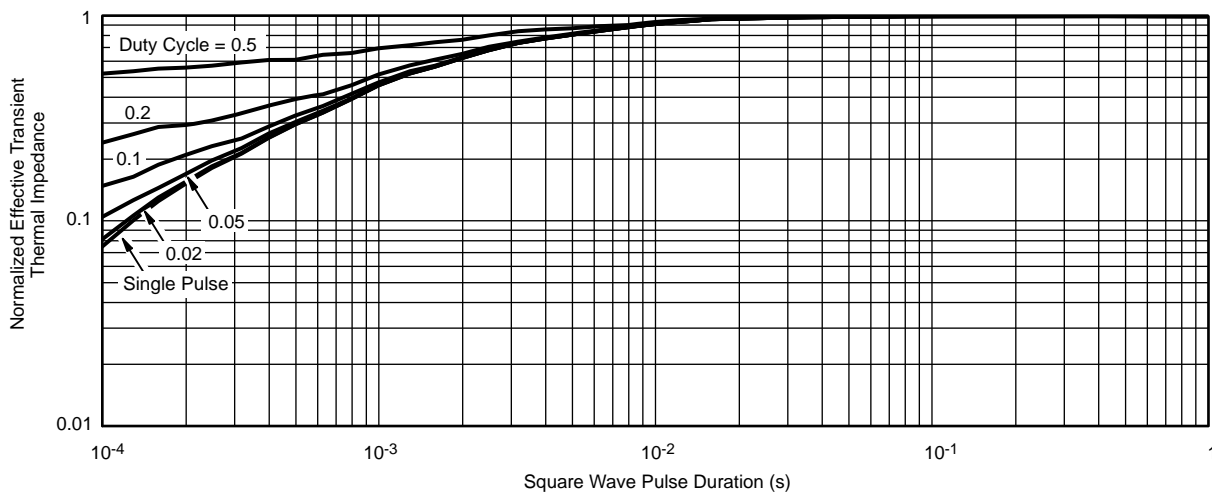
Max. Drain Current vs. Case Temperature



Power Derating, Junction-to-Case

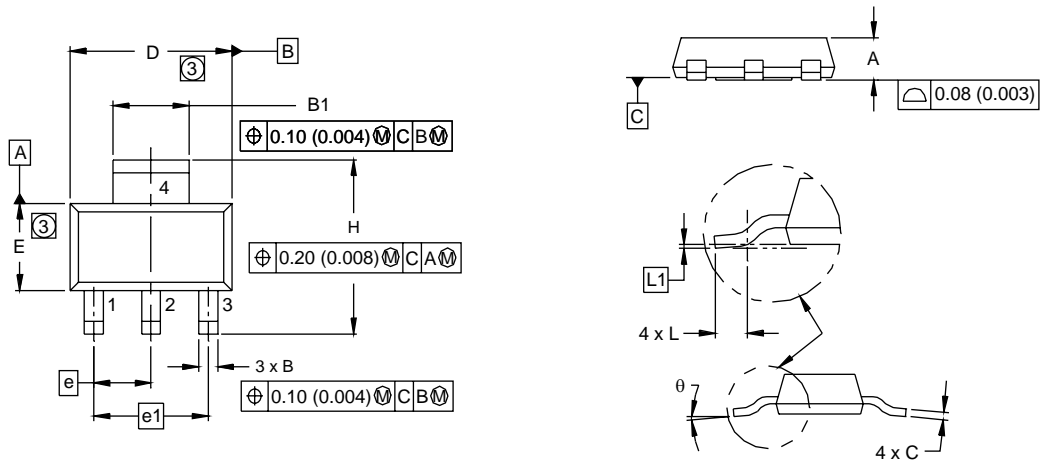


Safe Operating Area, Junction-to-Case



Normalized Thermal Transient Impedance, Junction-to-Case

SOT-223 (HIGH VOLTAGE)



DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	1.55	1.80	0.061	0.071
B	0.65	0.85	0.026	0.033
B1	2.95	3.15	0.116	0.124
C	0.25	0.35	0.010	0.014
D	6.30	6.70	0.248	0.264
E	3.30	3.70	0.130	0.146
e	2.30 BSC		0.0905 BSC	
e1	4.60 BSC		0.181 BSC	
H	6.71	7.29	0.264	0.287
L	0.91	-	0.036	-
L1	0.061 BSC		0.0024 BSC	
θ	-	10°	-	10°

ECN: S-82109-Rev. A, 15-Sep-08
DWG: 5969

Notes

1. Dimensioning and tolerancing per ASME Y14.5M-1994.
2. Dimensions are shown in millimeters (inches).
3. Dimension do not include mold flash.
4. Outline conforms to JEDEC outline TO-261AA.

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