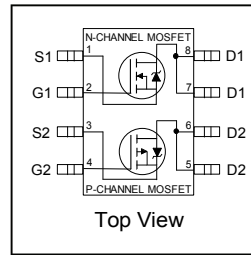


**Features**

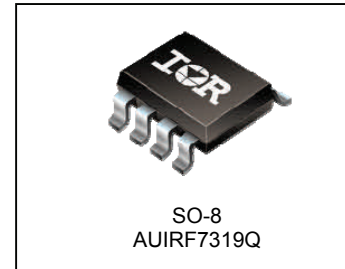
- Advanced Planar Technology
- Low On-Resistance
- Logic Level Gate Drive
- Dual N and P Channel MOSFET
- Surface Mount
- Fully Avalanche Rated
- Lead-Free, RoHS Compliant
- Automotive Qualified \*



	N-CH	P-CH
$V_{DSS}$	30V	-30V
$R_{DS(on)}$ <b>typ.</b>	0.023Ω	0.042Ω
<b>max.</b>	0.029Ω	0.058Ω
$I_D$	6.5A	-4.9A

**Description**

Specifically designed for Automotive applications, these HEXFET® Power MOSFET's in a Dual SO-8 package utilize the latest processing techniques to achieve extremely low on-resistance per silicon area. Additional features of these Automotive qualified HEXFET Power MOSFET's are a 150°C junction operating temperature, fast switching speed and improved repetitive avalanche rating. These benefits combine to make this design an extremely efficient and reliable device for use in Automotive applications and a wide variety of other applications. The efficient SO-8 package provides enhanced thermal characteristics and dual MOSFET die capability making it ideal in a variety of power applications. This dual, surface mount SO-8 can dramatically reduce board space and is also available in Tape & Reel.



G	D	S
Gate	Drain	Source

Base part number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
AUIRF7319Q	SO-8	Tape and Reel	4000	AUIRF7319QTR

**Absolute Maximum Ratings**

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 condition beyond those indicated in the specifications is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions. Ambient temperature (TA) is 25°C, unless otherwise specified.

Symbol	Parameter	Max.		Units
		N-Channel	P-Channel	
$V_{DS}$	Drain-Source Voltage	30	-30	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	6.5	-4.9	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	5.2	-3.9	
$I_{DM}$	Pulsed Drain Current ①	30	-30	
$I_S$	Continuous Source Current (Diode Conduction)	2.5	-2.5	
$P_D @ T_A = 25^\circ C$	Maximum Power Dissipation ⑤	2.0		W
$P_D @ T_A = 70^\circ C$	Maximum Power Dissipation ⑤	1.3		
$E_{AS}$	Single Pulse Avalanche Energy (Thermally Limited) ③	82	140	mJ
$I_{AR}$	Avalanche Current	4.0	-2.8	A
$E_{AR}$	Repetitive Avalanche Energy	0.20		mJ
$V_{GS}$	Gate-to-Source Voltage	± 20		V
dv/dt	Peak Diode Recovery dv/dt ②	5.0	-5.0	V/ns
$T_J$ $T_{STG}$	Operating Junction and Storage Temperature Range	-55 to + 150		°C

**Thermal Resistance**

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient ( PCB Mount, steady state) ⑤	—	62.5	°C/W

HEXFET® is a registered trademark of Infineon.

\*Qualification standards can be found at [www.infineon.com](http://www.infineon.com)

**Static @ T<sub>J</sub> = 25°C (unless otherwise specified)**

	Parameter		Min.	Typ.	Max.	Units	Conditions
V <sub>(BR)DSS</sub>	Drain-to-Source Breakdown Voltage	N-Ch	30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
		P-Ch	-30	—	—		V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA
ΔV <sub>(BR)DSS</sub> /ΔT <sub>J</sub>	Breakdown Voltage Temp. Coefficient	N-Ch	—	0.022	—	V/°C	Reference to 25°C, I <sub>D</sub> = 1mA
		P-Ch	—	-0.022	—		Reference to 25°C, I <sub>D</sub> = -1mA
R <sub>DS(on)</sub>	Static Drain-to-Source On-Resistance	N-Ch	—	0.023	0.029	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 5.8A ④
			—	0.032	0.046		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 4.7A ④
		P-Ch	—	0.042	0.058		V <sub>GS</sub> = -10V, I <sub>D</sub> = -4.9A ⑤
			—	0.076	0.098		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.6A ④
V <sub>GS(th)</sub>	Gate Threshold Voltage	N-Ch	1.0	—	3.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
		P-Ch	-1.0	—	-3.0		V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
g <sub>fs</sub>	Forward Trans conductance	N-Ch	—	14	—	S	V <sub>DS</sub> = 15V, I <sub>D</sub> = 5.8A ④
		P-Ch	—	7.7	—		V <sub>DS</sub> = -15V, I <sub>D</sub> = -4.9A ④
I <sub>DSS</sub>	Drain-to-Source Leakage Current	N-Ch	—	—	1.0	μA	V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V
		P-Ch	—	—	-1.0		V <sub>DS</sub> = -24V, V <sub>GS</sub> = 0V
		N-Ch	—	—	25		V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 55°C
		P-Ch	—	—	-25		V <sub>DS</sub> = -24V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 55°C
I <sub>GSS</sub>	Gate-to-Source Forward Leakage	N-P	—	—	± 100	nA	V <sub>GS</sub> = ± 20V
	Gate-to-Source Reverse Leakage	N-P	—	—	± 100		V <sub>GS</sub> = ± 20V

**Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise specified)**

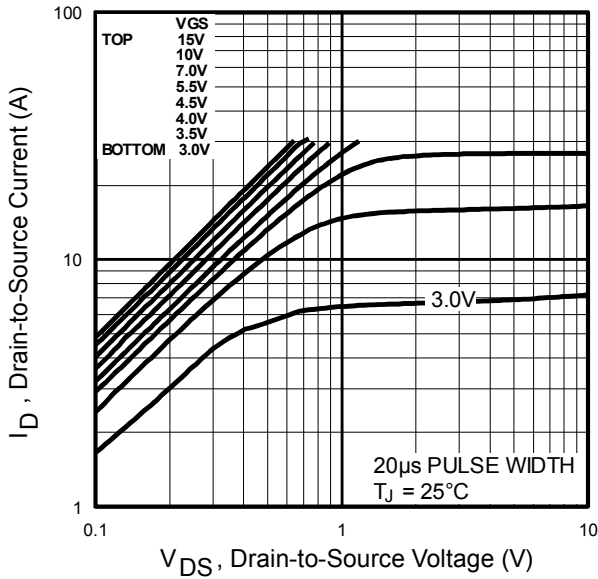
Q <sub>g</sub>	Total Gate Charge	N-Ch	—	22	33	nC	N-Channel I <sub>D</sub> = 5.8A, V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V ④
		P-Ch	—	23	34		
Q <sub>gs</sub>	Gate-to-Source Charge	N-Ch	—	2.6	3.9	nC	P-Channel I <sub>D</sub> = -4.9A, V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V
		P-Ch	—	3.8	5.7		
Q <sub>gd</sub>	Gate-to-Drain Charge	N-Ch	—	6.4	9.6	nC	P-Channel I <sub>D</sub> = -4.9A, V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V
		P-Ch	—	5.9	8.9		
t <sub>d(on)</sub>	Turn-On Delay Time	N-Ch	—	8.1	12	ns	N-Channel V <sub>DD</sub> = 15V, I <sub>D</sub> = 1.0A, R <sub>G</sub> = 6.0Ω, R <sub>D</sub> = 15Ω ④
		P-Ch	—	13	19		
t <sub>r</sub>	Rise Time	N-Ch	—	8.9	13	ns	P-Channel V <sub>DD</sub> = -15V, I <sub>D</sub> = -1.0A, R <sub>G</sub> = 6.0Ω, R <sub>D</sub> = 15Ω ④
		P-Ch	—	13	20		
t <sub>d(off)</sub>	Turn-Off Delay Time	N-Ch	—	26	39	ns	P-Channel V <sub>DD</sub> = -15V, I <sub>D</sub> = -1.0A, R <sub>G</sub> = 6.0Ω, R <sub>D</sub> = 15Ω ④
		P-Ch	—	34	51		
t <sub>f</sub>	Fall Time	N-Ch	—	17	26	ns	P-Channel V <sub>DD</sub> = -15V, I <sub>D</sub> = -1.0A, R <sub>G</sub> = 6.0Ω, R <sub>D</sub> = 15Ω ④
		P-Ch	—	32	48		
C <sub>iss</sub>	Input Capacitance	N-Ch	—	650	—	pF	N-Channel V <sub>GS</sub> = 0V, V <sub>DS</sub> = 25V, f = 1.0MHz
		P-Ch	—	710	—		
C <sub>oss</sub>	Output Capacitance	N-Ch	—	320	—	pF	P-Channel V <sub>GS</sub> = 0V, V <sub>DS</sub> = -25V, f = 1.0MHz
		P-Ch	—	380	—		
C <sub>rss</sub>	Reverse Transfer Capacitance	N-Ch	—	130	—	pF	P-Channel V <sub>GS</sub> = 0V, V <sub>DS</sub> = -25V, f = 1.0MHz
		P-Ch	—	180	—		

**Diode Characteristics**

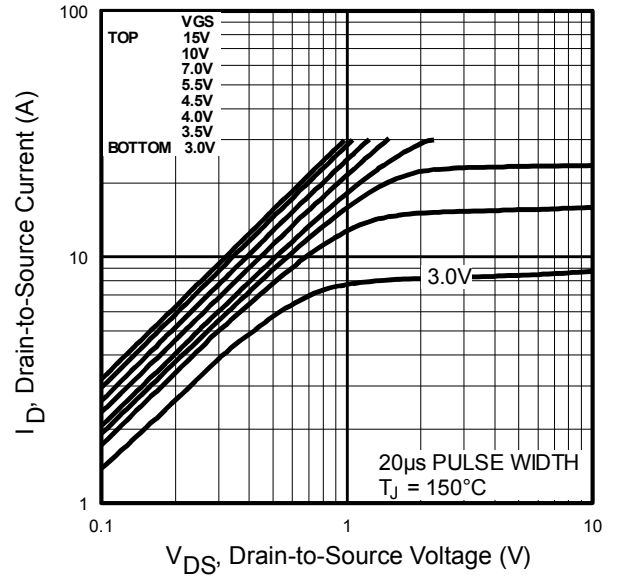
	Parameter		Min.	Typ.	Max.	Units	Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)	N-Ch	—	—	2.5	A	
		P-Ch	—	—	-2.5		
I <sub>SM</sub>	Pulsed Source Current (Body Diode) ①	N-Ch	—	—	30	A	
		P-Ch	—	—	-30		
V <sub>SD</sub>	Diode Forward Voltage	N-Ch	—	0.78	1.0	V	T <sub>J</sub> = 25°C, I <sub>S</sub> = 1.7A, V <sub>GS</sub> = 0V ④
		P-Ch	—	-0.78	-1.0		T <sub>J</sub> = 25°C, I <sub>S</sub> = -1.7A, V <sub>GS</sub> = 0V ④
t <sub>rr</sub>	Reverse Recovery Time	N-Ch	—	45	68	ns	N-Channel T <sub>J</sub> = 25°C, I <sub>F</sub> = 1.7A, di/dt = 100A/μs
		P-Ch	—	44	66		
Q <sub>rr</sub>	Reverse Recovery Charge	N-Ch	—	58	87	nC	P-Channel T <sub>J</sub> = 25°C, I <sub>F</sub> = -1.7A, di/dt = 100A/μs ④
		P-Ch	—	42	63		

**Notes:**

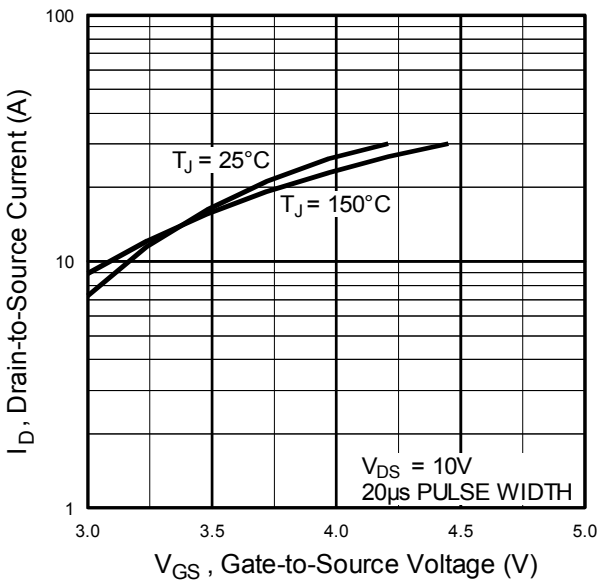
- ① Repetitive rating; pulse width limited by max. junction temperature. (See Fig. 22)
- ② N-Channel I<sub>SD</sub> ≤ 4.0A, di/dt ≤ 74A/μs, V<sub>DD</sub> ≤ V<sub>(BR)DSS</sub>, T<sub>J</sub> ≤ 150°C.  
P-Channel I<sub>SD</sub> ≤ -2.8A, di/dt ≤ 150A/μs, V<sub>DD</sub> ≤ V<sub>(BR)DSS</sub>, T<sub>J</sub> ≤ 150°C
- ③ N-Channel Starting T<sub>J</sub> = 25°C, L = 10mH, R<sub>G</sub> = 25Ω, I<sub>AS</sub> = 4.0A. (See Fig. 12)  
P-Channel Starting T<sub>J</sub> = 25°C, L = 35mH, R<sub>G</sub> = 25Ω, I<sub>AS</sub> = -2.8A.
- ④ Pulse width ≤ 300μs; duty cycle ≤ 2%.
- ⑤ Surface mounted on FR-4 board, t ≤ 10sec.



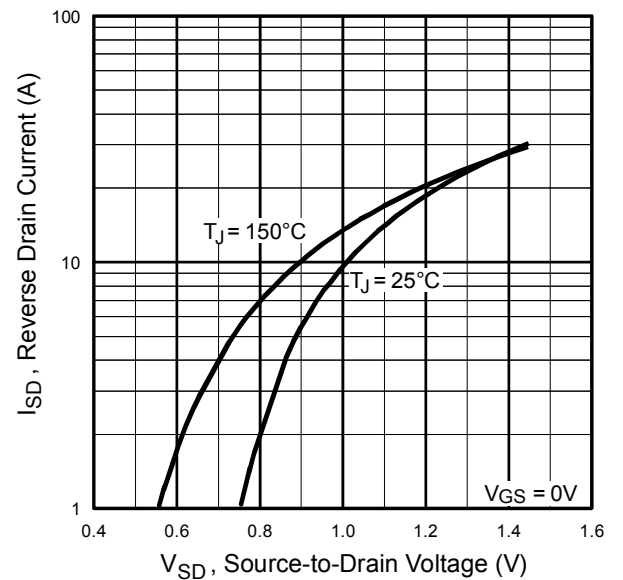
**Fig. 1** Typical Output Characteristics



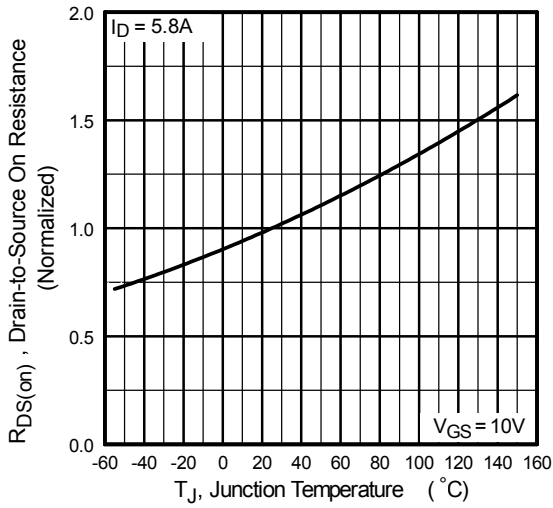
**Fig. 2** Typical Output Characteristics



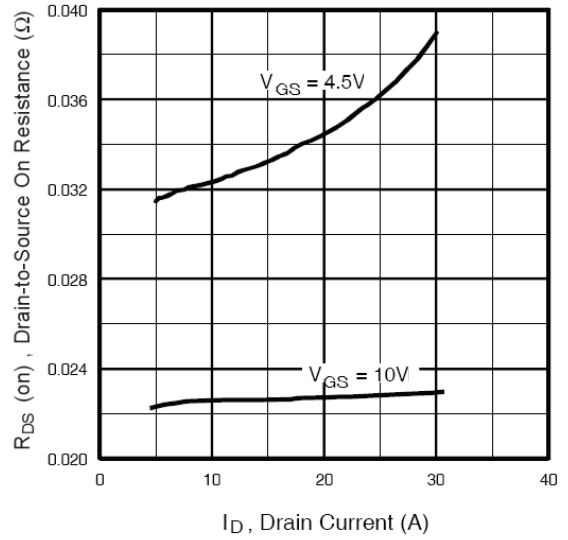
**Fig. 3** Typical Transfer Characteristics



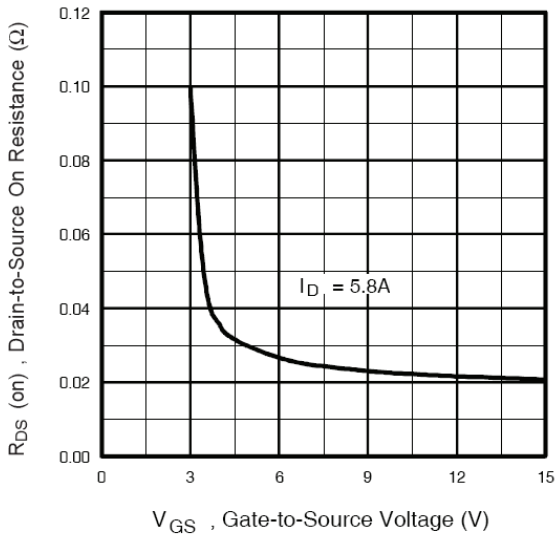
**Fig. 4** Typical Source-Drain Diode Forward Voltage



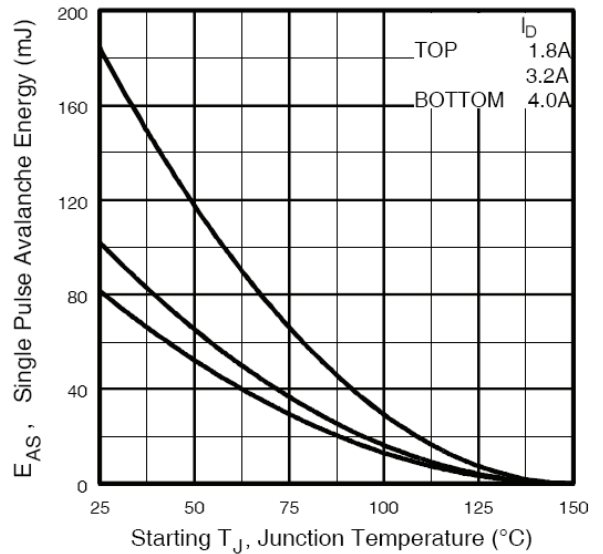
**Fig 5.** Normalized On-Resistance Vs. Temperature



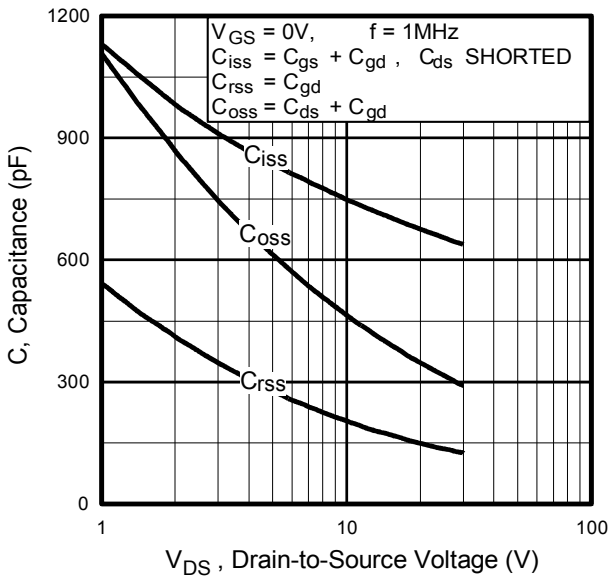
**Fig 6.** Typical On-Resistance Vs. Drain Current



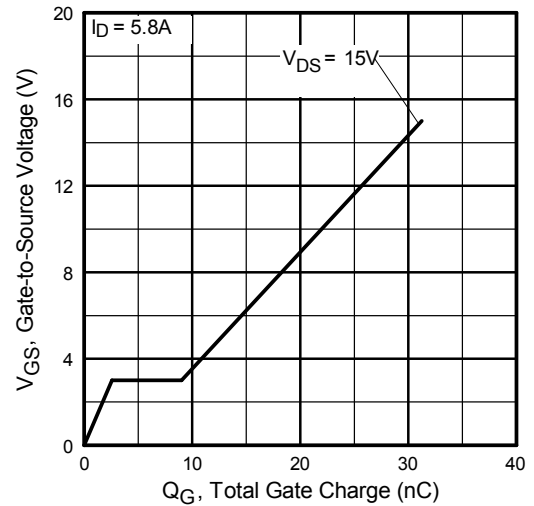
**Fig 7** Typical On-Resistance Vs. Gate Voltage



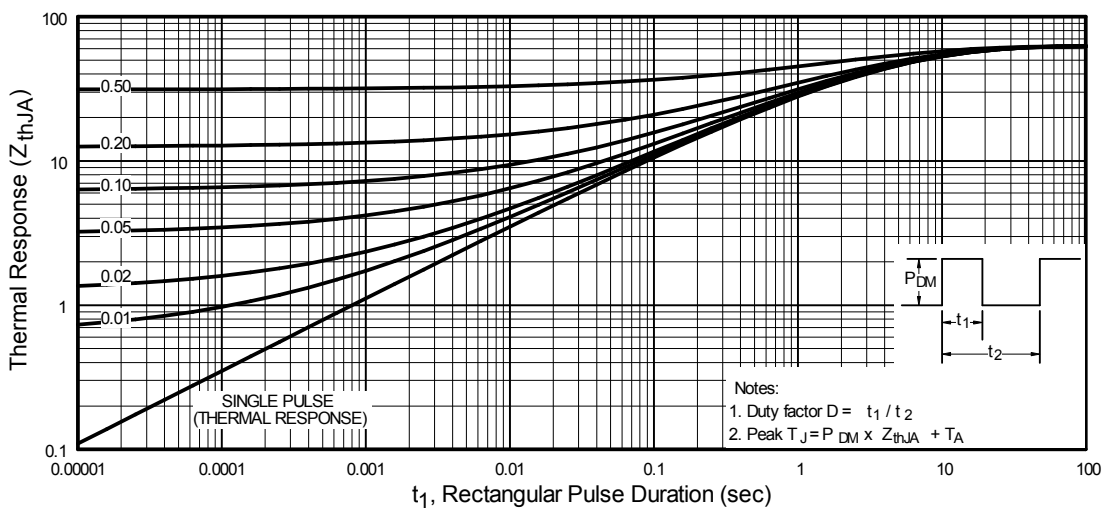
**Fig 8.** Maximum Avalanche Energy Vs. Drain Current



**Fig 9.** Typical Capacitance Vs. Drain-to-Source Voltage



**Fig 10.** Typical Gate Charge Vs. Gate-to-Source Voltage



**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

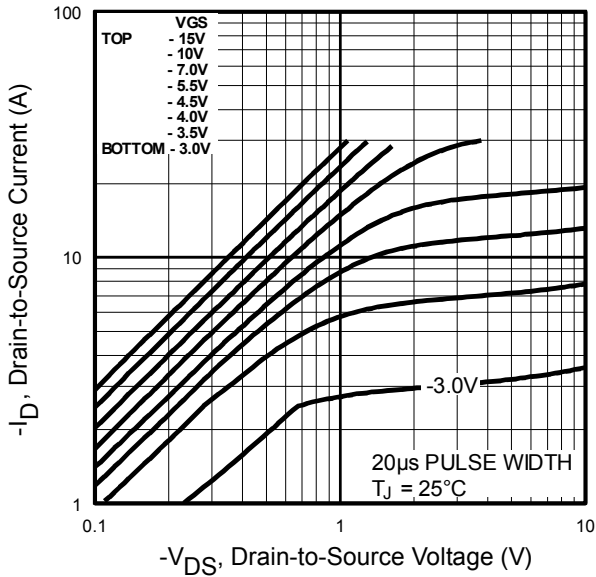


Fig. 12 Typical Output Characteristics

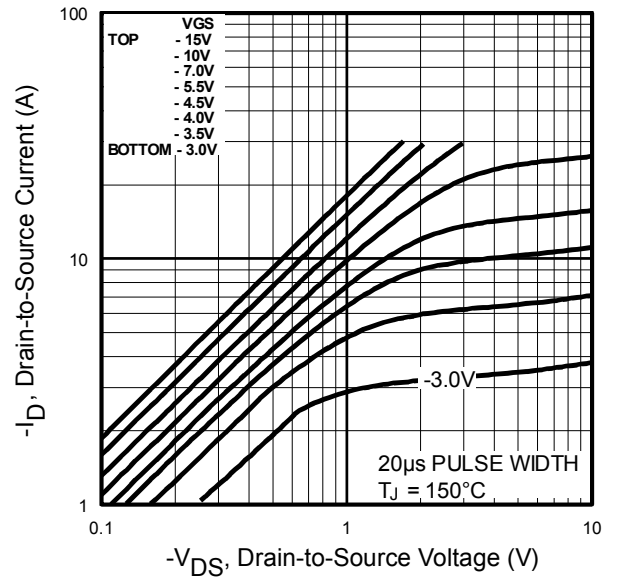


Fig. 13 Typical Output Characteristics

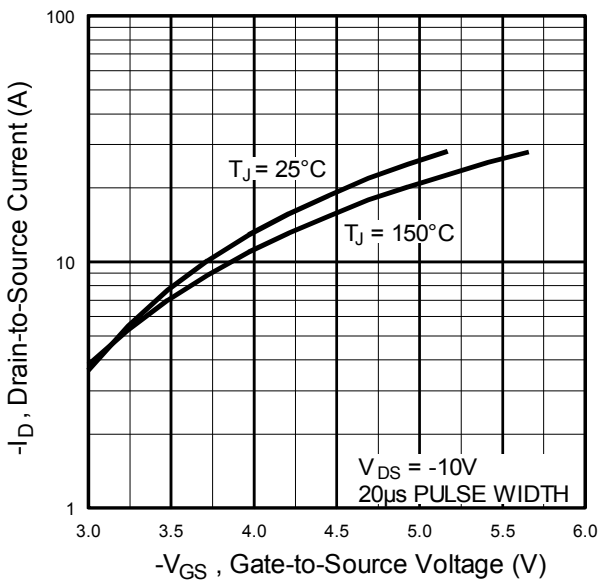


Fig. 14 Typical Transfer Characteristics

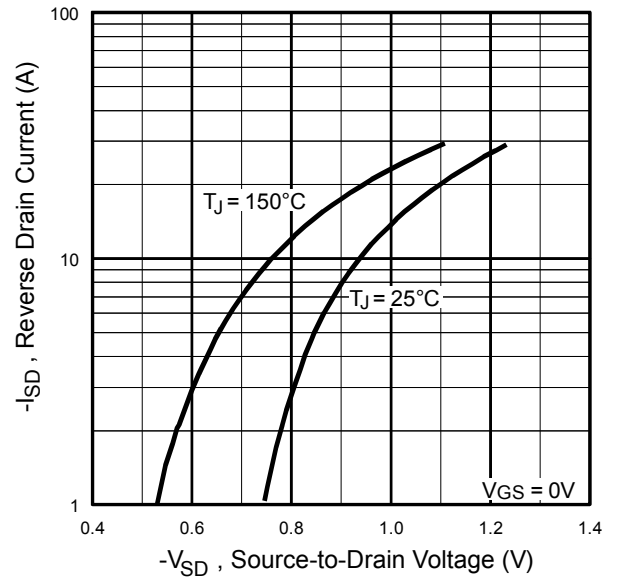
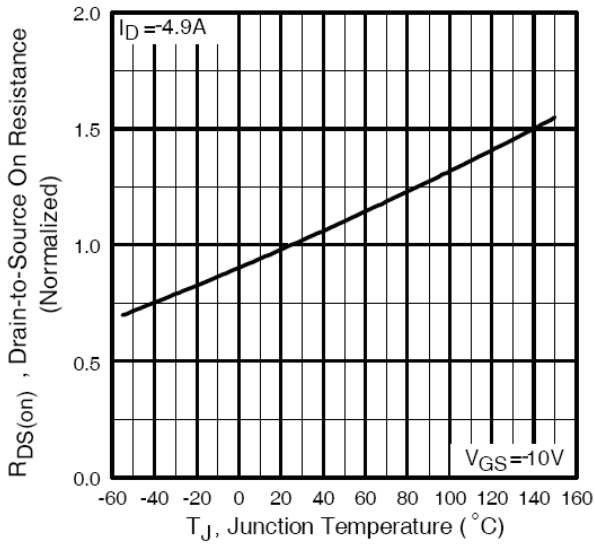
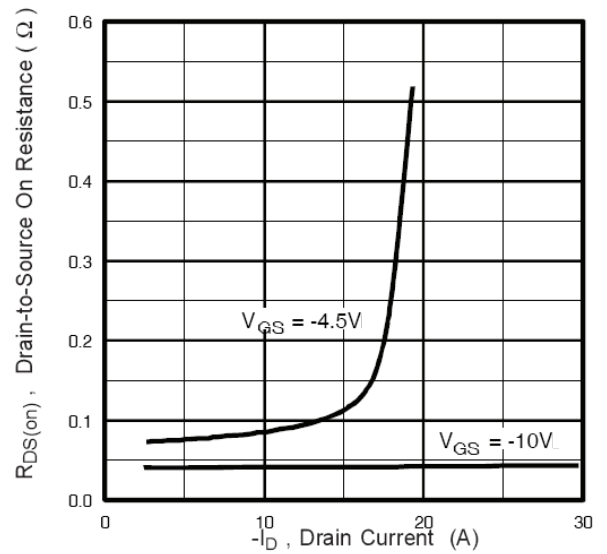


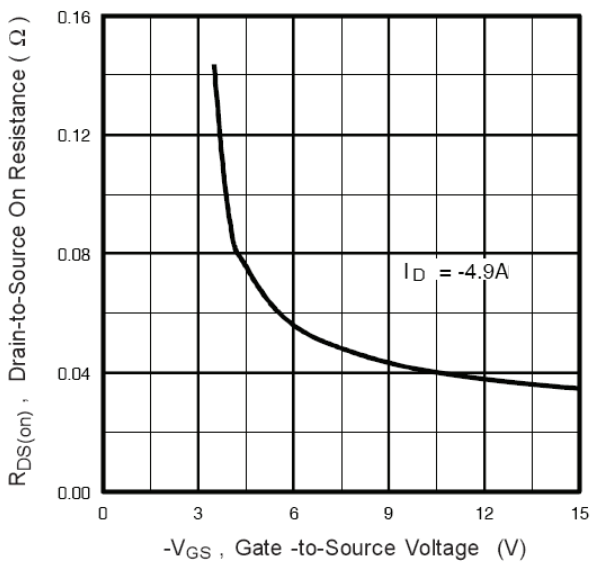
Fig. 15 Typical Source-Drain Diode Forward Voltage



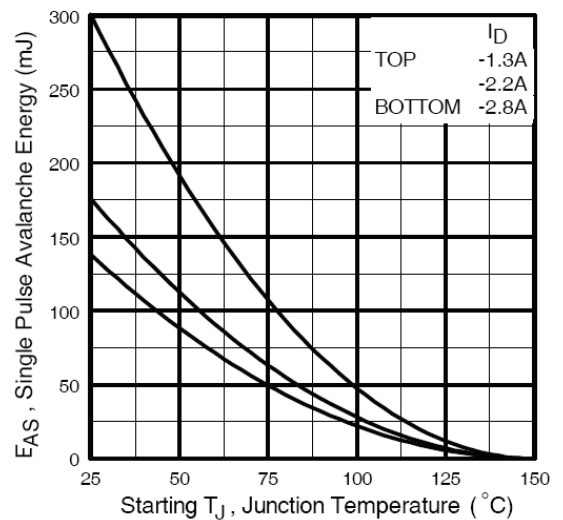
**Fig 16.** Normalized On-Resistance Vs. Temperature



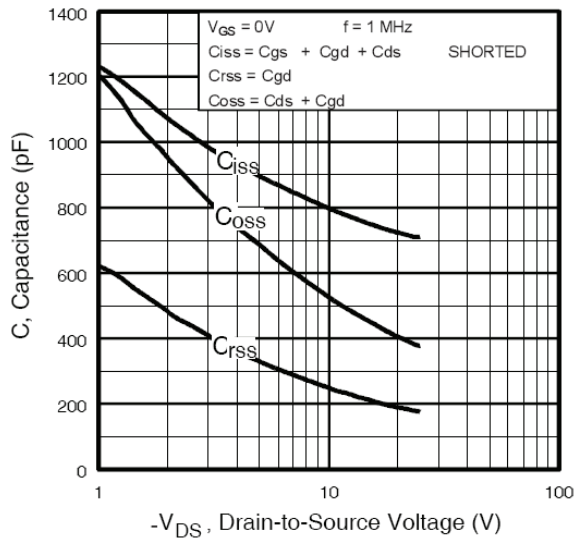
**Fig 17.** Typical On-Resistance Vs. Drain Current



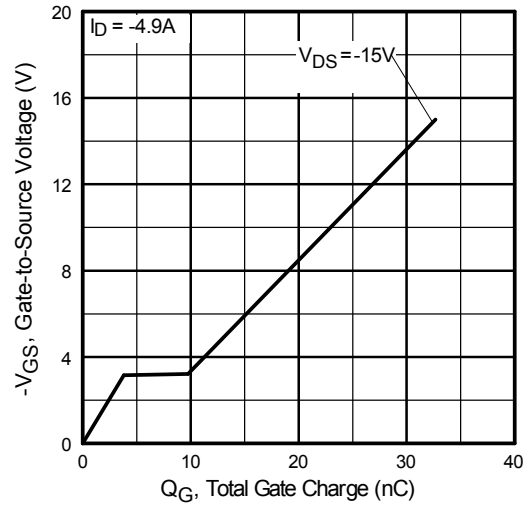
**Fig. 18** Typical On-Resistance Vs. Gate Voltage



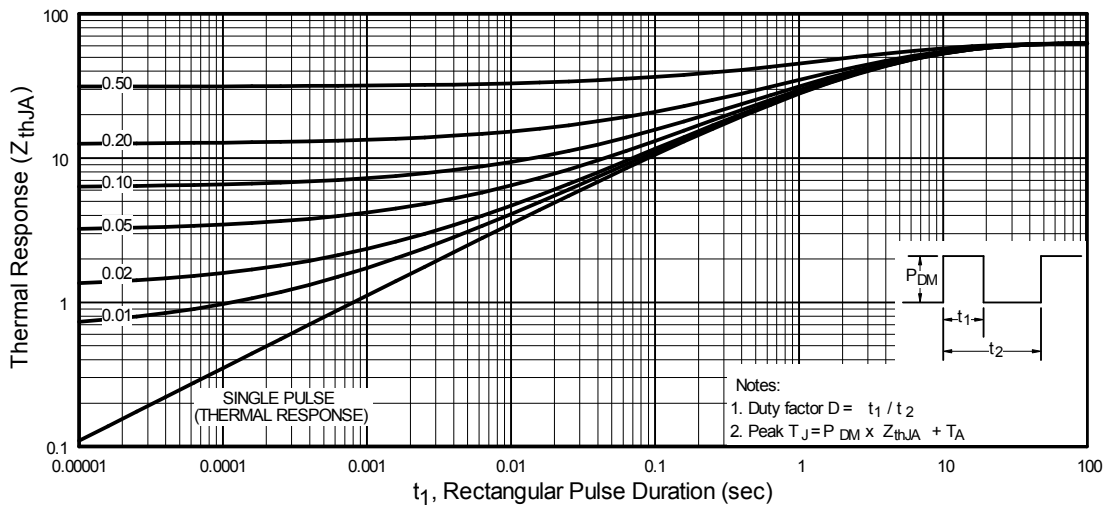
**Fig 19.** Maximum Avalanche Energy Vs. Drain Current



**Fig 20.** Typical Capacitance Vs. Drain-to-Source Voltage



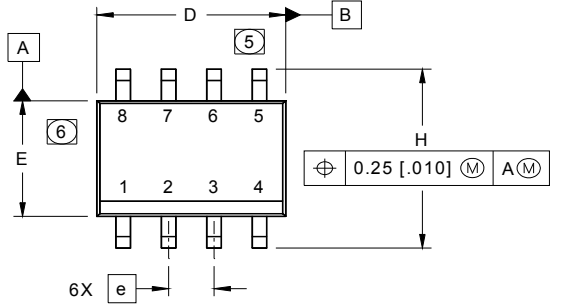
**Fig 21.** Typical Gate Charge Vs. Gate-to-Source Voltage



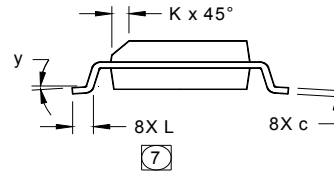
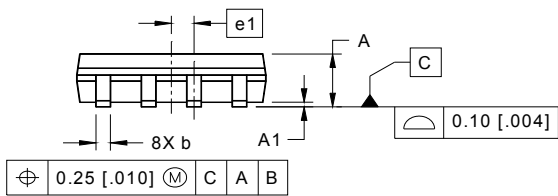
**Fig 22.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



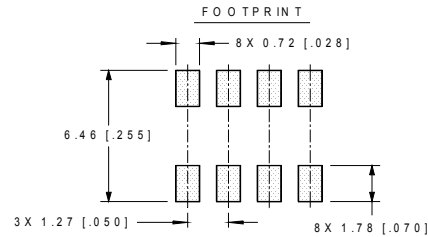
## SO-8 Package Outline (Dimensions are shown in millimeters (inches))



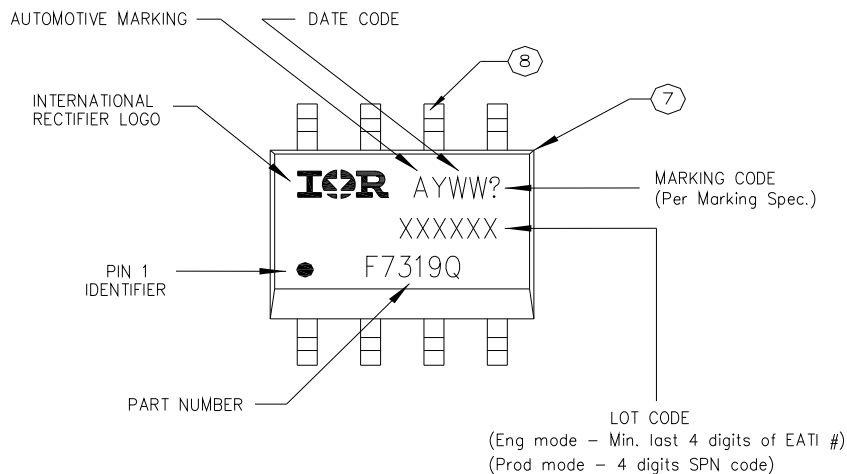
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e 1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40	1.27
y	0°	8°	0°	8°

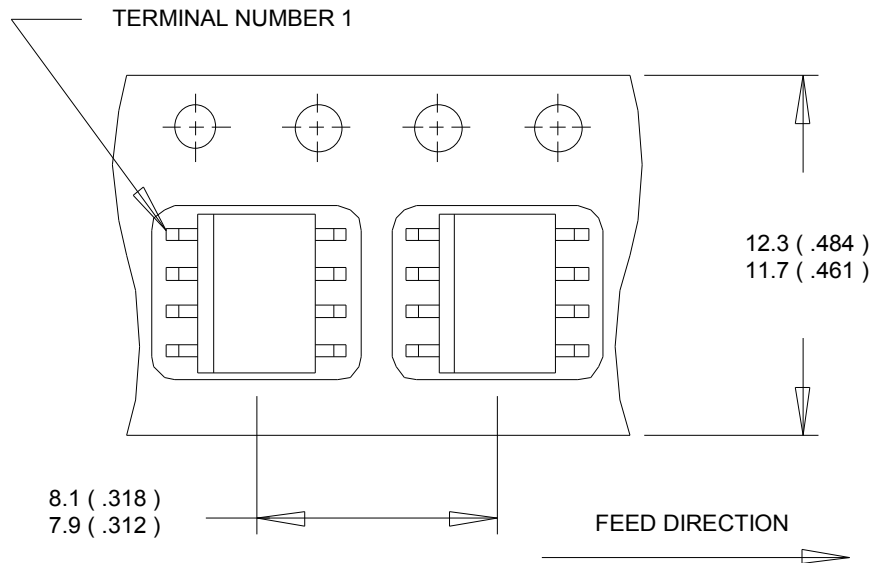


- NOTES:
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M -1994.
  2. CONTROLLING DIMENSION: MILLIMETER
  3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
  4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
  5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [0.006].
  6. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [0.010].
  7. DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.



## SO-8 Part Marking Information



**SO-8 Tape and Reel** (Dimensions are shown in millimeters (inches))

**NOTES:**

1. CONTROLLING DIMENSION : MILLIMETER.
2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS(INCHES).
3. OUTLINE CONFORMS TO EIA-481 & EIA-541.


**NOTES :**

1. CONTROLLING DIMENSION : MILLIMETER.
2. OUTLINE CONFORMS TO EIA-481 & EIA-541.

**Qualification Information**

<b>Qualification Level</b>		Automotive (per AEC-Q101)	
		Comments: This part number(s) passed Automotive qualification. Infineon's Industrial and Consumer qualification level is granted by extension of the higher Automotive level.	
<b>Moisture Sensitivity Level</b>		SO-8	MSL1
<b>ESD</b>	Machine Model	Class M2 (+/- 200V) <sup>†</sup> AEC-Q101-002	
	Human Body Model	Class H1A (+/- 500V) <sup>†</sup> AEC-Q101-001	
	Charged Device Model	Class C5 (+/- 2000V) <sup>†</sup> AEC-Q101-005	
<b>RoHS Compliant</b>		Yes	

† Highest passing voltage.

**Revision History**

Date	Comments
3/4/2014	<ul style="list-style-type: none"> <li>Added "Logic Level Gate Drive" bullet in the features section on page 1</li> <li>Updated data sheet with new IR corporate template</li> </ul>
9/30/2015	<ul style="list-style-type: none"> <li>Updated datasheet with corporate template</li> <li>Corrected ordering table on page 1.</li> </ul>

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