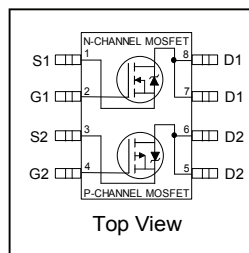


Features

- 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 *

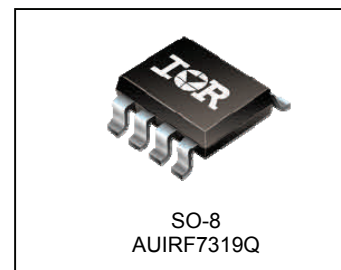


	N-CH	P-CH
V_{DS}	30V	-30V
$R_{DS(on)}$ typ.	0.023Ω	0.042Ω
max.	0.029Ω	0.058Ω
I_D	6.5A	-4.9A

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 (T_A) 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°C	Continuous Drain Current, V _{GS} @ 10V	6.5	-4.9	A
I _D @ T _A = 70°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°C	Maximum Power Dissipation ⑤	2.0		W
P _D @T _A = 70°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

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*Qualification standards can be found at www.infineon.com

Static @ T_J = 25°C (unless otherwise specified)

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

Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

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

Diode Characteristics

	Parameter		Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	N-Ch	—	—	2.5	A	
		P-Ch	—	—	-2.5		
I _{SM}	Pulsed Source Current (Body Diode) ①	N-Ch	—	—	30	A	
		P-Ch	—	—	-30		
V _{SD}	Diode Forward Voltage	N-Ch	—	0.78	1.0	V	T _J = 25°C, I _S = 1.7A, V _{GS} = 0V ④
		P-Ch	—	-0.78	-1.0		T _J = 25°C, I _S = -1.7A, V _{GS} = 0V ④
t _{rr}	Reverse Recovery Time	N-Ch	—	45	68	ns	N-Channel T _J = 25°C, I _F = 1.7A, di/dt = 100A/μs
		P-Ch	—	44	66		
Q _{rr}	Reverse Recovery Charge	N-Ch	—	58	87	nC	P-Channel T _J = 25°C, I _F = -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_{SD} ≤ 4.0A, di/dt ≤ 74A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 150°C.
P-Channel I_{SD} ≤ -2.8A, di/dt ≤ 150A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 150°C
- ③ N-Channel Starting T_J = 25°C, L = 10mH, R_G = 25Ω, I_{AS} = 4.0A. (See Fig. 12)
P-Channel Starting T_J = 25°C, L = 35mH, R_G = 25Ω, I_{AS} = -2.8A.
- ④ Pulse width ≤ 300μs; duty cycle ≤ 2%.
- ⑤ Surface mounted on FR-4 board, t ≤ 10sec.

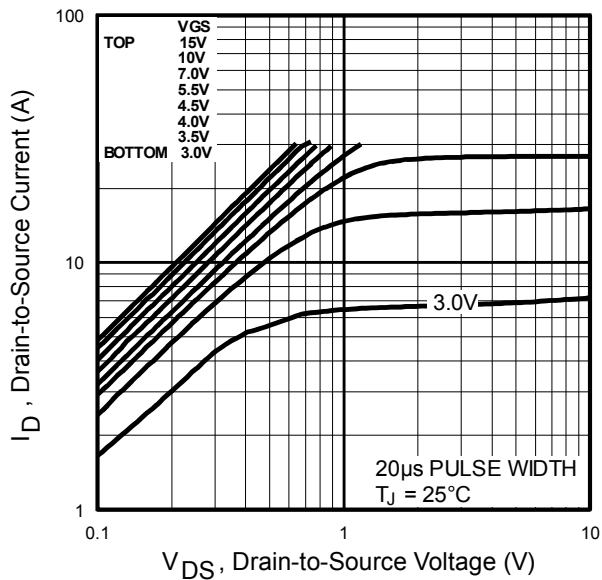


Fig. 1 Typical Output Characteristics

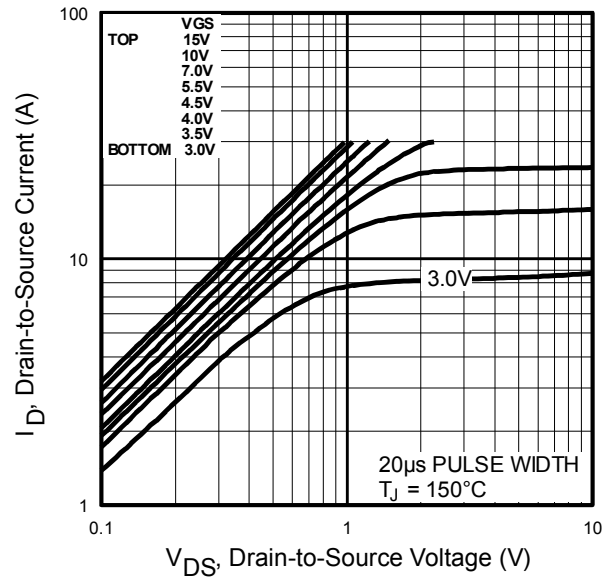


Fig. 2 Typical Output Characteristics

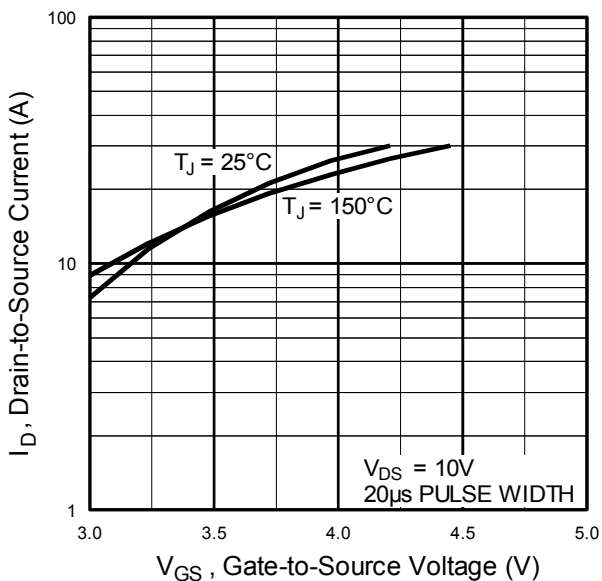


Fig. 3 Typical Transfer Characteristics

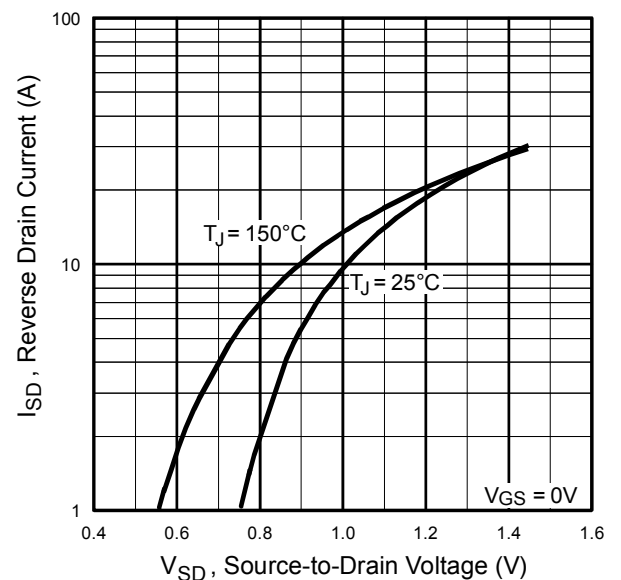


Fig. 4 Typical Source-Drain Diode Forward Voltage

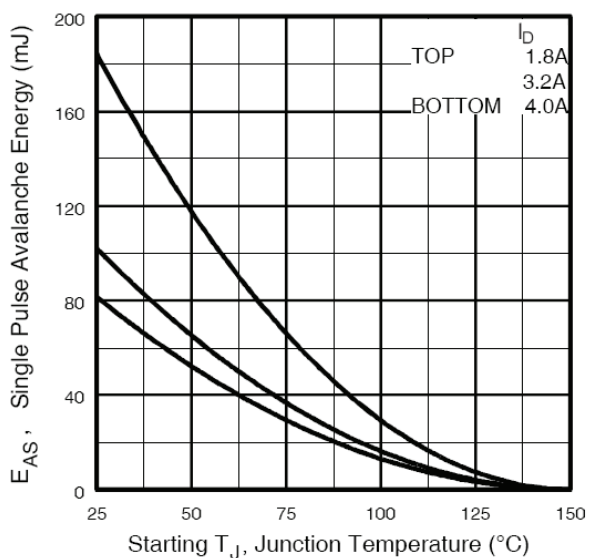
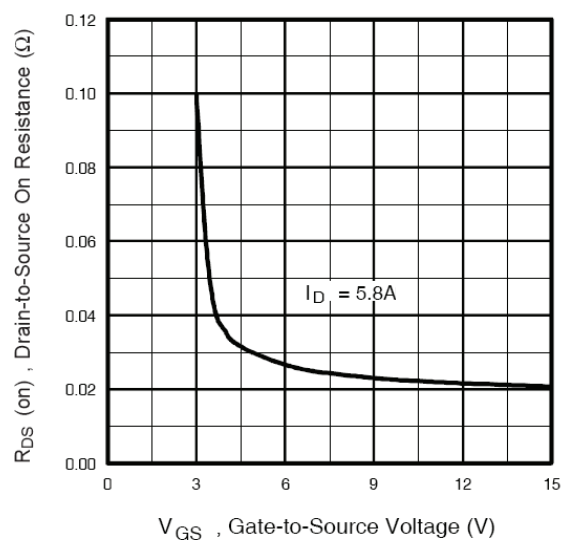
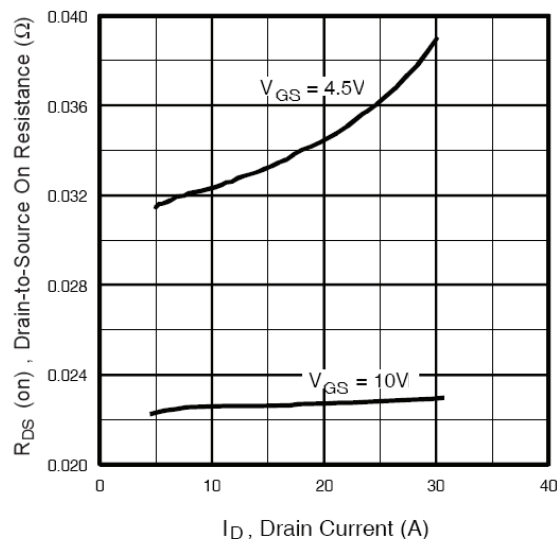
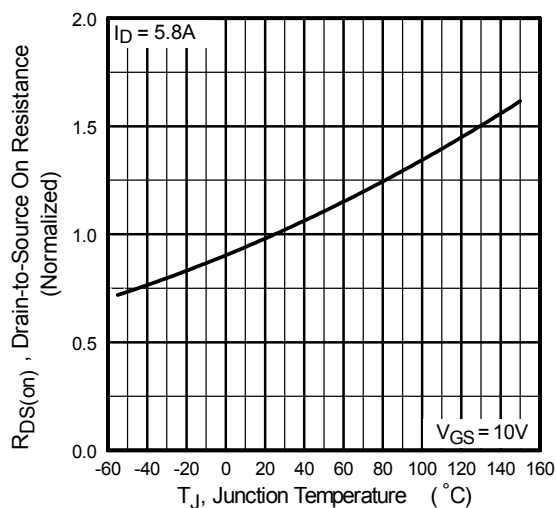


Fig. 7 Typical On-Resistance Vs. Gate Voltage

Fig 8. Maximum Avalanche Energy Vs. Drain Current

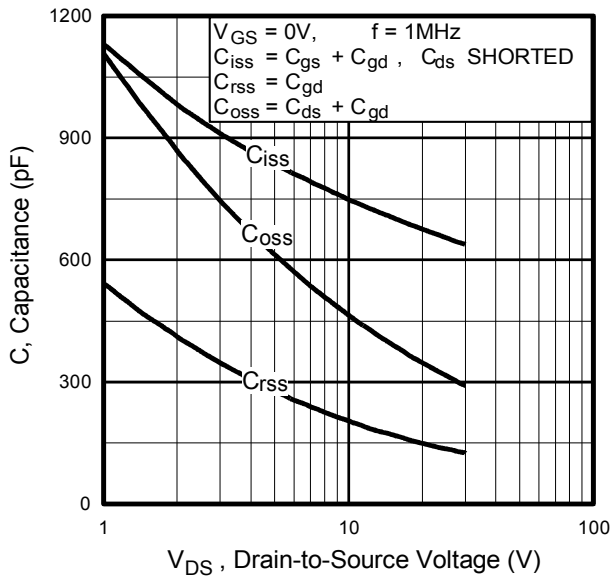


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

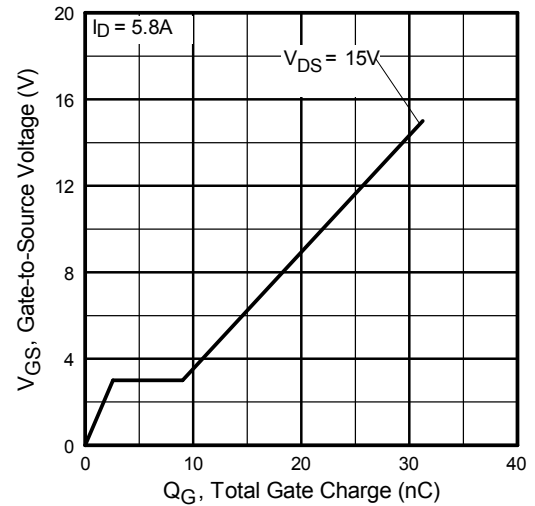


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

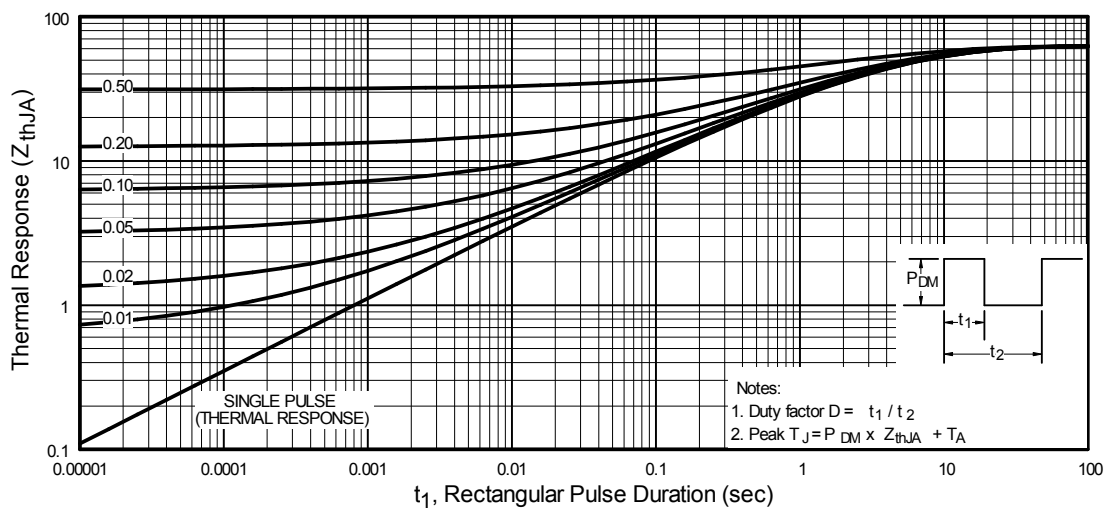
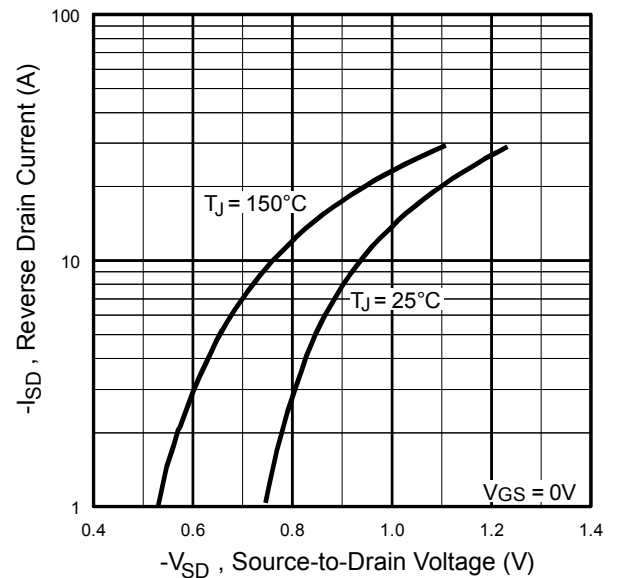
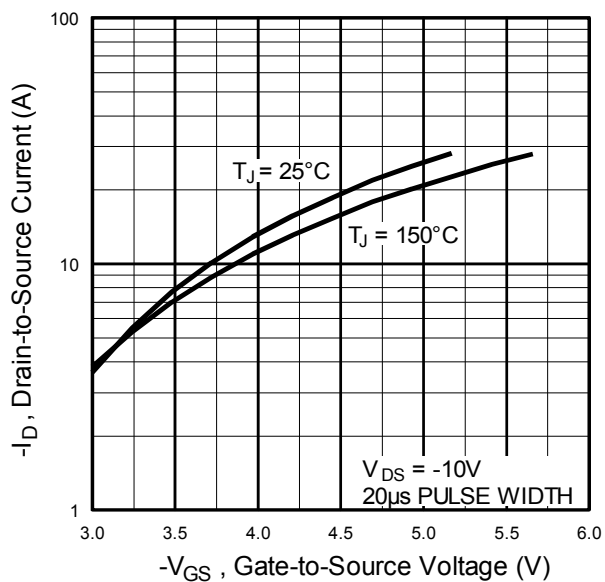
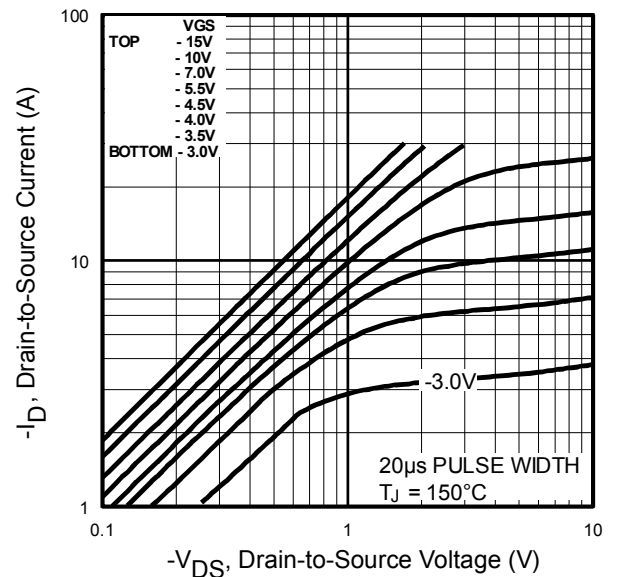
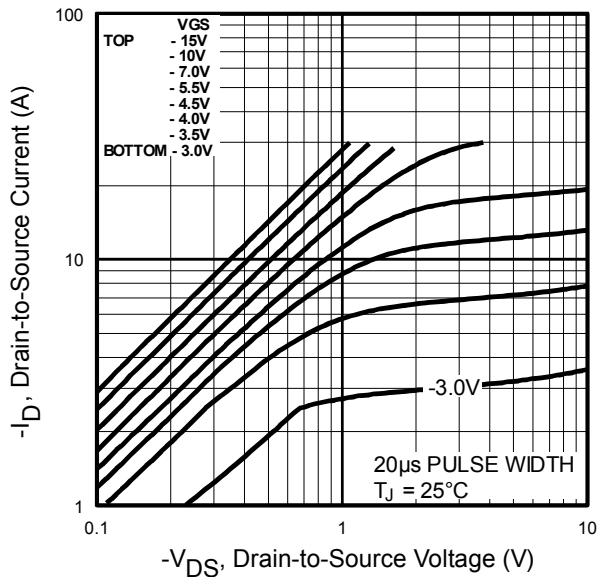


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



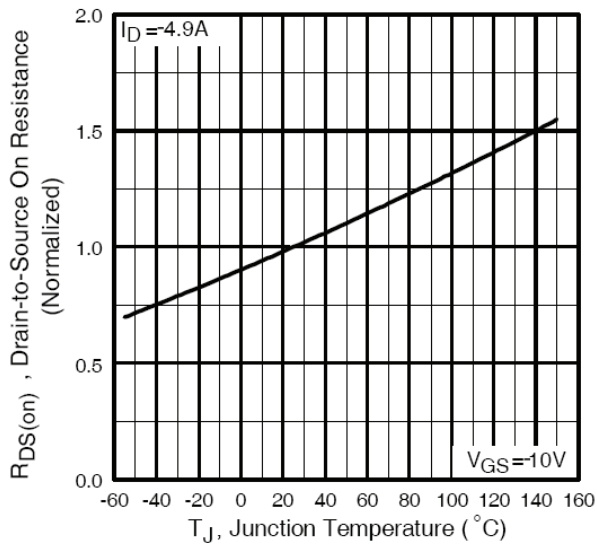


Fig 16. Normalized On-Resistance Vs. Temperature

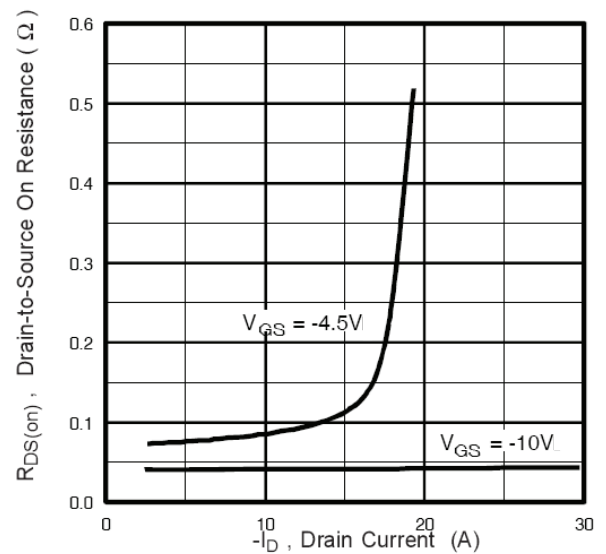


Fig 17. Typical On-Resistance Vs. Drain Current

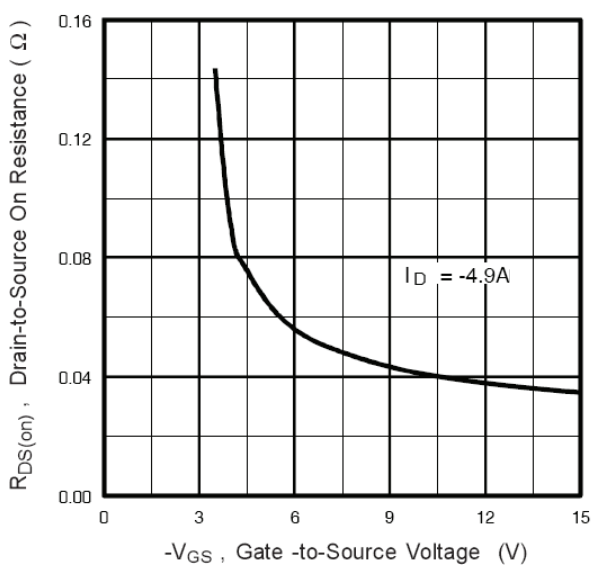


Fig 18 Typical On-Resistance Vs. Gate Voltage

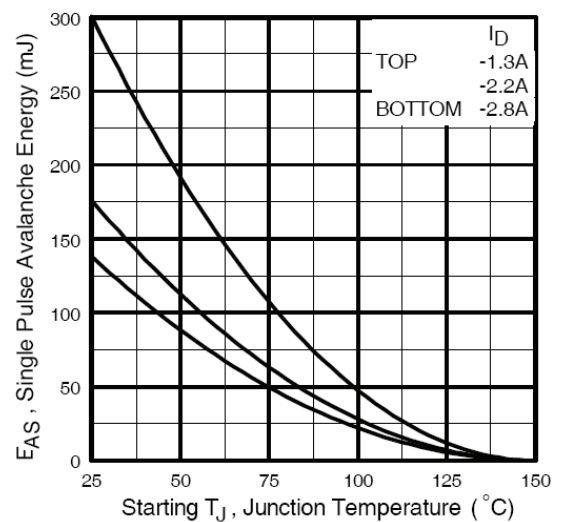


Fig 19. Maximum Avalanche Energy Vs. Drain Current

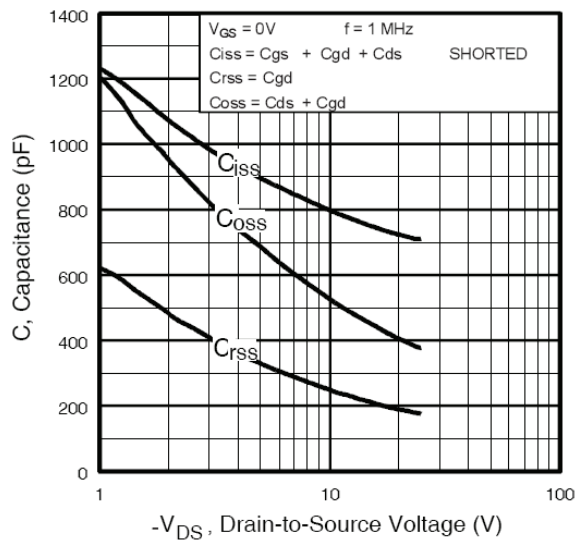


Fig 20. Typical Capacitance Vs. Drain-to-Source Voltage

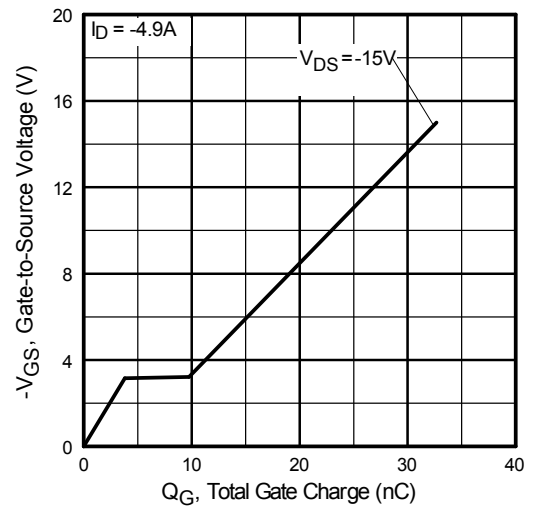


Fig 21. Typical Gate Charge Vs. Gate-to-Source Voltage

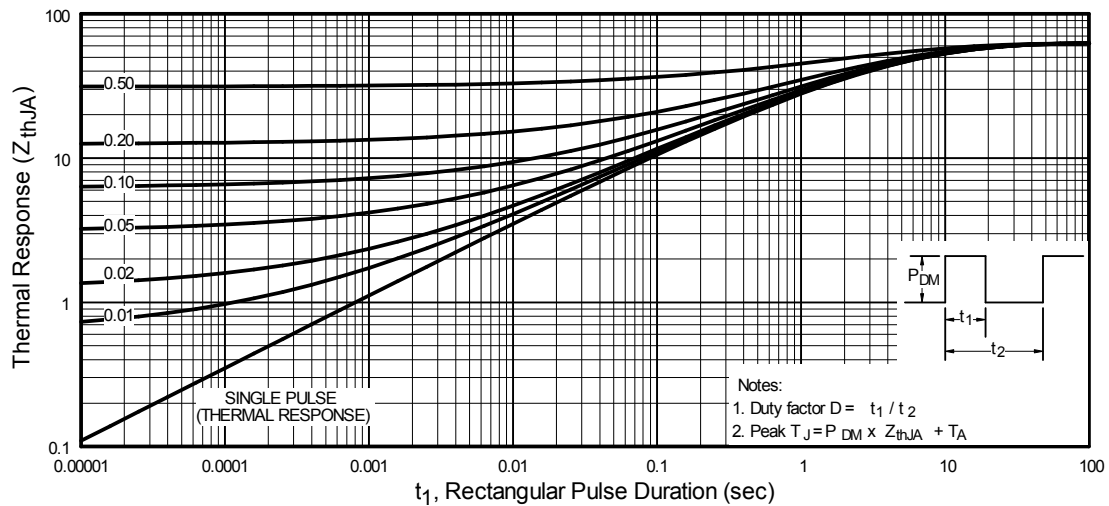
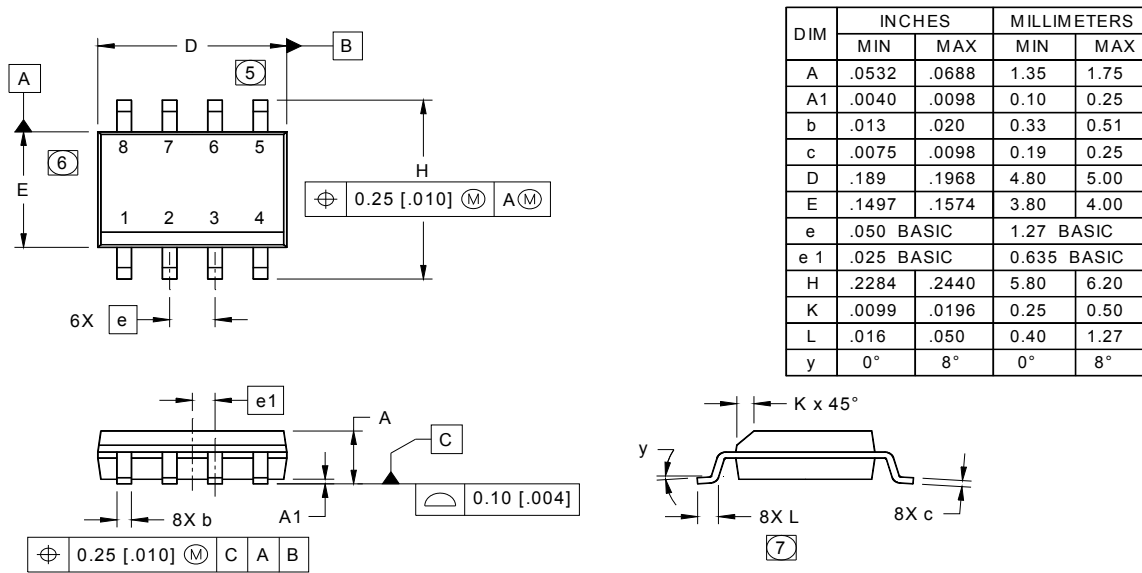
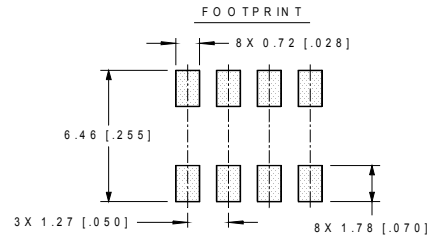


Fig 22. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

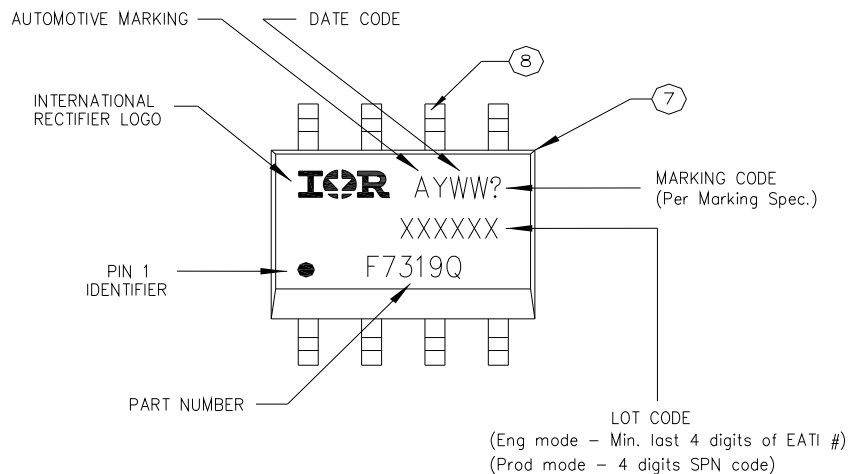
SO-8 Package Outline (Dimensions are shown in millimeters (inches))

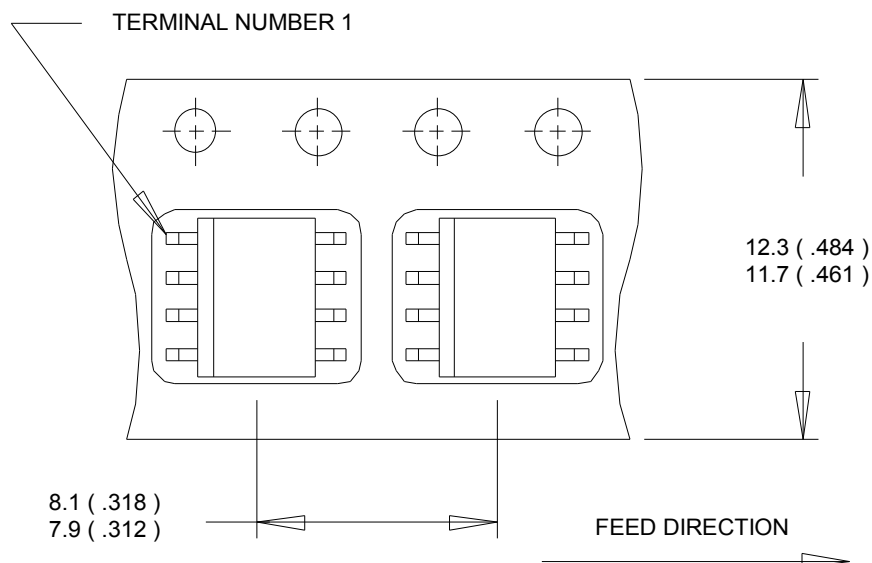


- NOTES:
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M -1994.
 2. CONTROLLING DIMENSION: MILLIMETER
 3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
 4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
 5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [0.006].
 6. DIMENSION 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.

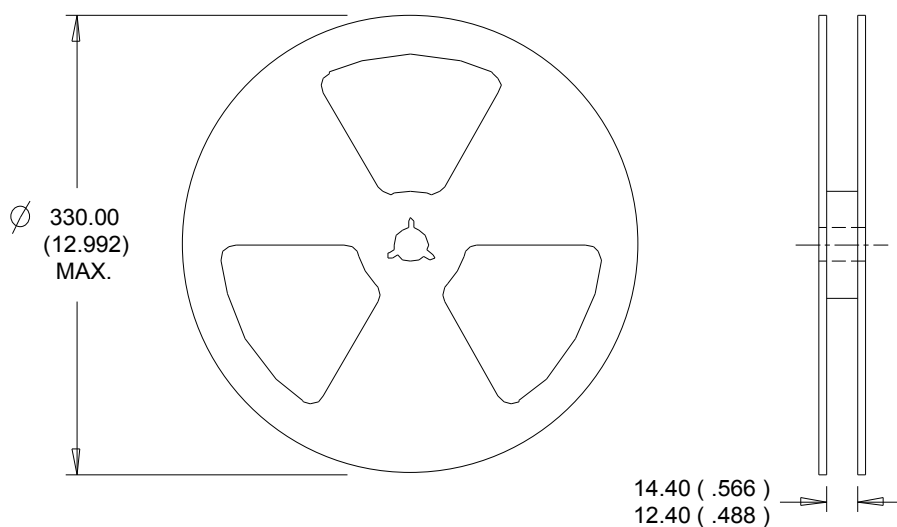


SO-8 Part Marking Information



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

Qualification Level		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.	
Moisture Sensitivity Level		SO-8	MSL1
ESD	Machine Model	Class M2 (+/- 200V) [†] AEC-Q101-002	
	Human Body Model	Class H1A (+/- 500V) [†] AEC-Q101-001	
	Charged Device Model	Class C5 (+/- 2000V) [†] AEC-Q101-005	
RoHS Compliant		Yes	

† Highest passing voltage.

Revision History

Date	Comments
3/4/2014	- Added "Logic Level Gate Drive" bullet in the features section on page 1 - Updated data sheet with new IR corporate template
9/30/2015	- Updated datasheet with corporate template - Corrected ordering table on page 1.

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