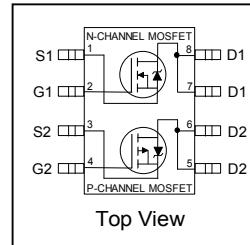


Features

- 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
$R_{DS(on)}$ 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 lastest 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	W	
$P_D @ T_A = 25^\circ C$	Maximum Power Dissipation ⑤	2.0			
$P_D @ T_A = 70^\circ C$	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

Static @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter		Min.	Typ.	Max.	Units	Conditions
$V_{(\text{BR})\text{DSS}}$	Drain-to-Source Breakdown Voltage	N-Ch	30	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
		P-Ch	-30	—	—		$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
$\Delta V_{(\text{BR})\text{DSS}}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	N-Ch	—	0.022	—	V/ $^\circ\text{C}$	Reference to $25^\circ\text{C}, I_D = 1\text{mA}$
		P-Ch	—	-0.022	—		Reference to $25^\circ\text{C}, I_D = -1\text{mA}$
$R_{DS(\text{on})}$	Static Drain-to-Source On-Resistance	N-Ch	—	0.023	0.029	Ω	$V_{GS} = 10\text{V}, I_D = 5.8\text{A}$ ④
		—	—	0.032	0.046		$V_{GS} = 4.5\text{V}, I_D = 4.7\text{A}$ ④
		P-Ch	—	0.042	0.058		$V_{GS} = -10\text{V}, I_D = -4.9\text{A}$ ⑤
		—	—	0.076	0.098		$V_{GS} = -4.5\text{V}, I_D = -3.6\text{A}$ ④
$V_{GS(\text{th})}$	Gate Threshold Voltage	N-Ch	1.0	—	3.0	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
		P-Ch	-1.0	—	-3.0		$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
g_{fs}	Forward Trans conductance	N-Ch	—	14	—	S	$V_{DS} = 15\text{V}, I_D = 5.8\text{A}$ ④
		P-Ch	—	7.7	—		$V_{DS} = -15\text{V}, I_D = -4.9\text{A}$ ④
I_{DSS}	Drain-to-Source Leakage Current	N-Ch	—	—	1.0	μA	$V_{DS} = 24\text{V}, V_{GS} = 0\text{V}$
		P-Ch	—	—	-1.0		$V_{DS} = -24\text{V}, V_{GS} = 0\text{V}$
		N-Ch	—	—	25		$V_{DS} = 24\text{V}, V_{GS} = 0\text{V}, T_J = 55^\circ\text{C}$
		P-Ch	—	—	-25		$V_{DS} = -24\text{V}, V_{GS} = 0\text{V}, T_J = 55^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	N-P	—	—	± 100	nA	$V_{GS} = \pm 20\text{V}$
	Gate-to-Source Reverse Leakage	N-P	—	—	± 100		$V_{GS} = \pm 20\text{V}$

Dynamic Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

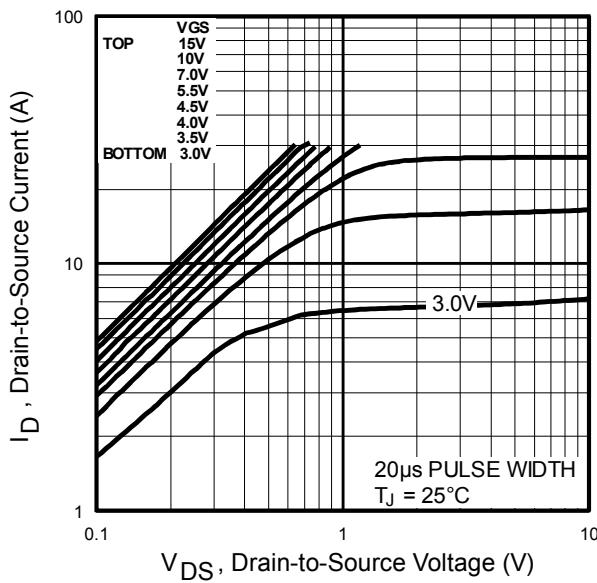
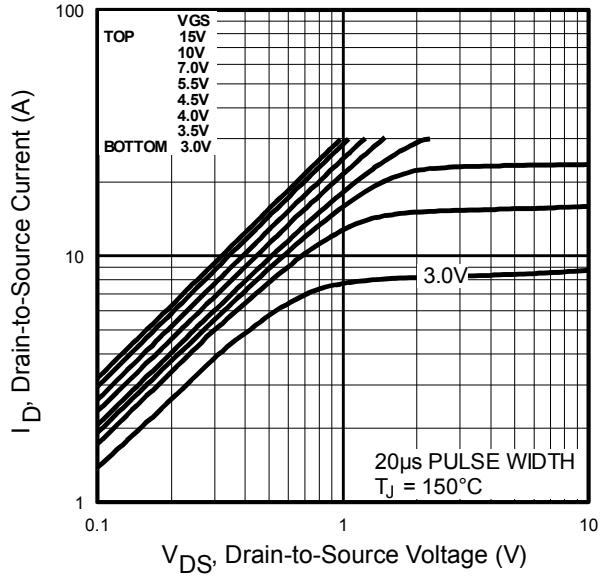
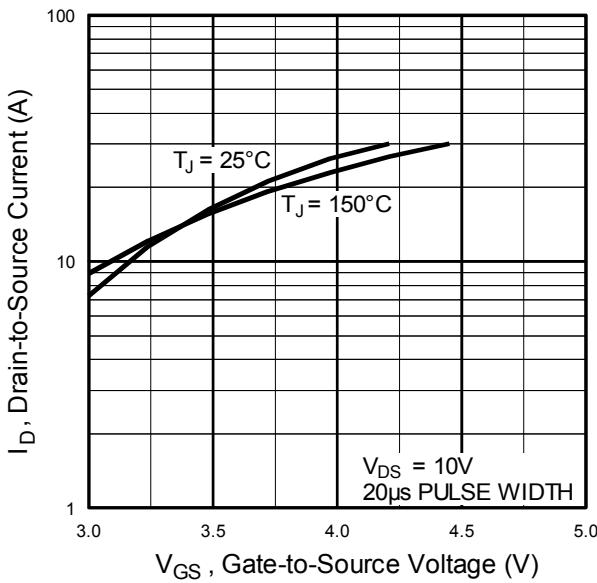
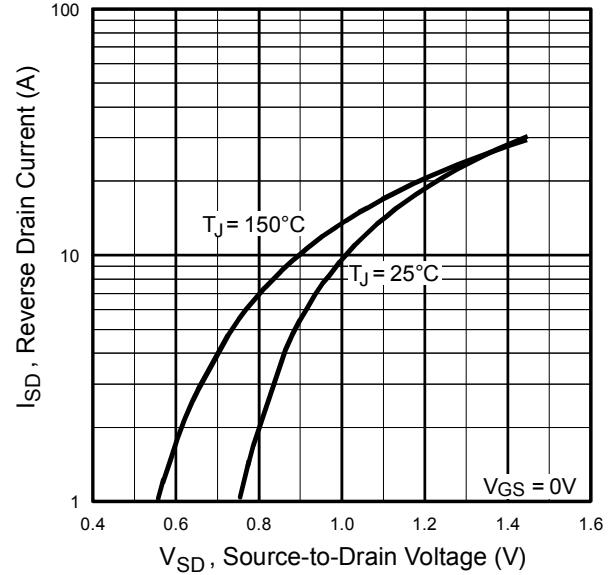
Q_g	Total Gate Charge	N-Ch	—	22	33	nC	N-Channel $I_D = 5.8\text{A}, V_{DS} = 15\text{V}, V_{GS} = 10\text{V}$ ④
		P-Ch	—	23	34		P-Channel $I_D = -4.9\text{A}, V_{DS} = -15\text{V}, V_{GS} = -10\text{V}$
Q_{gs}	Gate-to-Source Charge	N-Ch	—	2.6	3.9		
		P-Ch	—	3.8	5.7		
Q_{gd}	Gate-to-Drain Charge	N-Ch	—	6.4	9.6		
		P-Ch	—	5.9	8.9		
$t_{d(on)}$	Turn-On Delay Time	N-Ch	—	8.1	12	ns	N-Channel $V_{DD} = 15\text{V}, I_D = 1.0\text{A}, R_G = 6.0\Omega, R_D = 15\Omega$
		P-Ch	—	13	19		
t_r	Rise Time	N-Ch	—	8.9	13		
		P-Ch	—	13	20		
$t_{d(off)}$	Turn-Off Delay Time	N-Ch	—	26	39		P-Channel $V_{DD} = -15\text{V}, I_D = -1.0\text{A}, R_G = 6.0\Omega, R_D = 15\Omega$
		P-Ch	—	34	51		
t_f	Fall Time	N-Ch	—	17	26		
		P-Ch	—	32	48		
C_{iss}	Input Capacitance	N-Ch	—	650	—	pF	N-Channel $V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1.0\text{MHz}$
		P-Ch	—	710	—		
C_{oss}	Output Capacitance	N-Ch	—	320	—		P-Channel $V_{GS} = 0\text{V}, V_{DS} = -25\text{V}, f = 1.0\text{MHz}$
		P-Ch	—	380	—		
C_{rss}	Reverse Transfer Capacitance	N-Ch	—	130	—		
		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		
		P-Ch	—	—	-30		
V_{SD}	Diode Forward Voltage	N-Ch	—	0.78	1.0	V	$T_J = 25^\circ\text{C}, I_S = 1.7\text{A}, V_{GS} = 0\text{V}$ ④
		P-Ch	—	-0.78	-1.0		$T_J = 25^\circ\text{C}, I_S = -1.7\text{A}, V_{GS} = 0\text{V}$ ④
t_{rr}	Reverse Recovery Time	N-Ch	—	45	68	ns	N-Channel $T_J = 25^\circ\text{C}, I_F = 1.7\text{A}, di/dt = 100\text{A}/\mu\text{s}$
		P-Ch	—	44	66		P-Channel $T_J = 25^\circ\text{C}, I_F = -1.7\text{A}, di/dt = 100\text{A}/\mu\text{s}$ ④
Q_{rr}	Reverse Recovery Charge	N-Ch	—	58	87	nC	
		P-Ch	—	42	63		

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See Fig. 22)
- ② N-Channel $I_{SD} \leq 4.0\text{A}$, $di/dt \leq 74\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(\text{BR})\text{DSS}}$, $T_J \leq 150^\circ\text{C}$.
P-Channel $I_{SD} \leq -2.8\text{A}$, $di/dt \leq 150\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(\text{BR})\text{DSS}}$, $T_J \leq 150^\circ\text{C}$
- ③ N-Channel Starting $T_J = 25^\circ\text{C}$, $L = 10\text{mH}$, $R_G = 25\Omega$, $I_{AS} = 4.0\text{A}$. (See Fig. 12)
P-Channel Starting $T_J = 25^\circ\text{C}$, $L = 35\text{mH}$, $R_G = 25\Omega$, $I_{AS} = -2.8\text{A}$.
- ④ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.
- ⑤ Surface mounted on FR-4 board, $t \leq 10\text{sec}$.

**Fig. 1** Typical Output Characteristics**Fig. 2** Typical Output Characteristics**Fig. 3** Typical Transfer Characteristics**Fig. 4** Typical Source-Drain Diode Forward Voltage

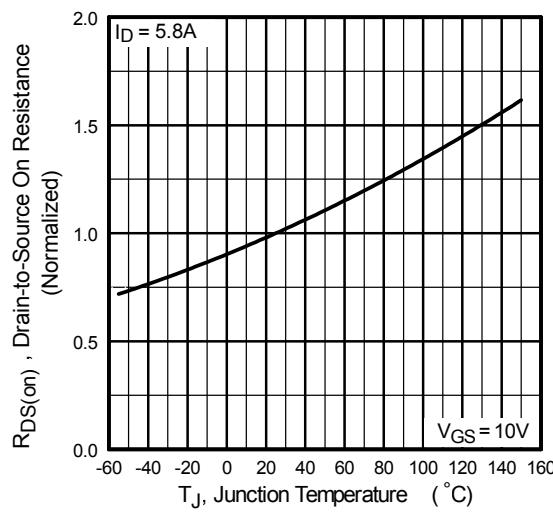


Fig 5. Normalized On-Resistance Vs. Temperature

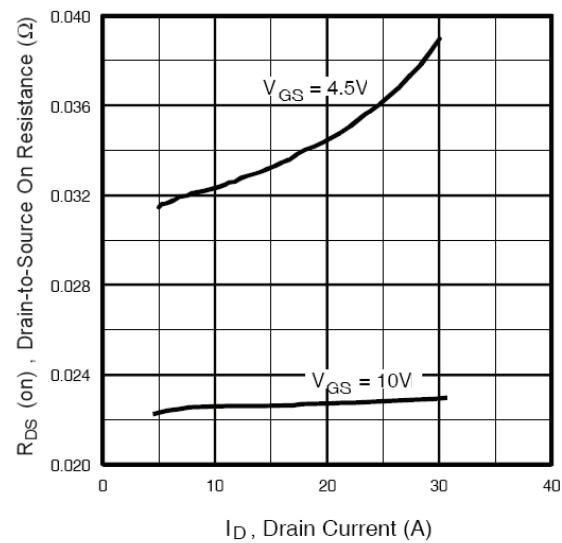


Fig 6. Typical On-Resistance Vs. Drain Current

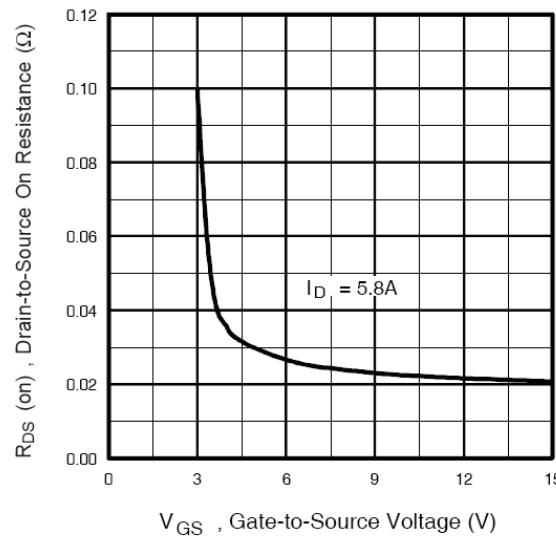


Fig 7 Typical On-Resistance Vs. Gate Voltage

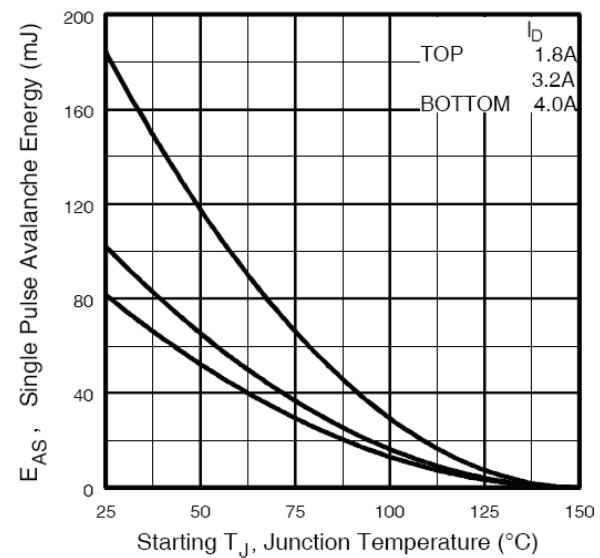


Fig 8. Maximum Avalanche Energy Vs. Drain Current

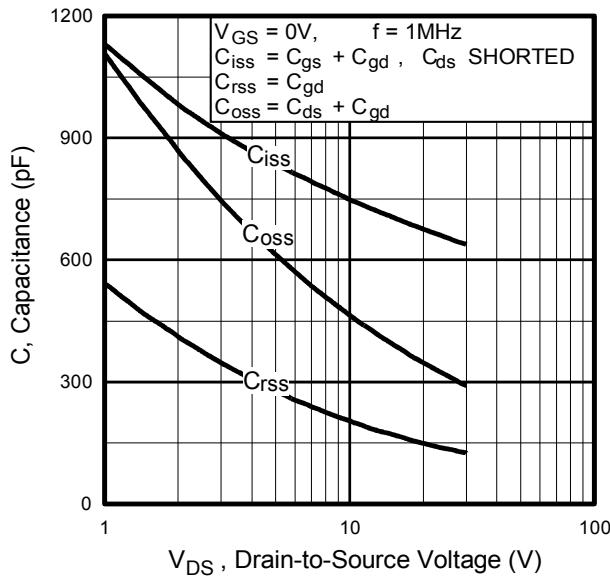


Fig 9. Typical Capacitance Vs.
Drain-to-Source Voltage

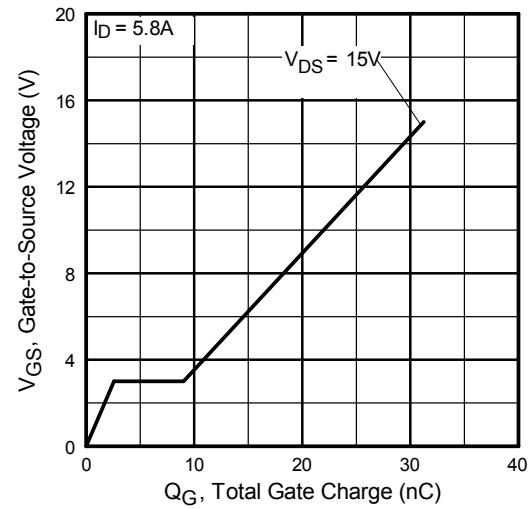


Fig 10. Typical Gate Charge Vs.
Gate-to-Source Voltage

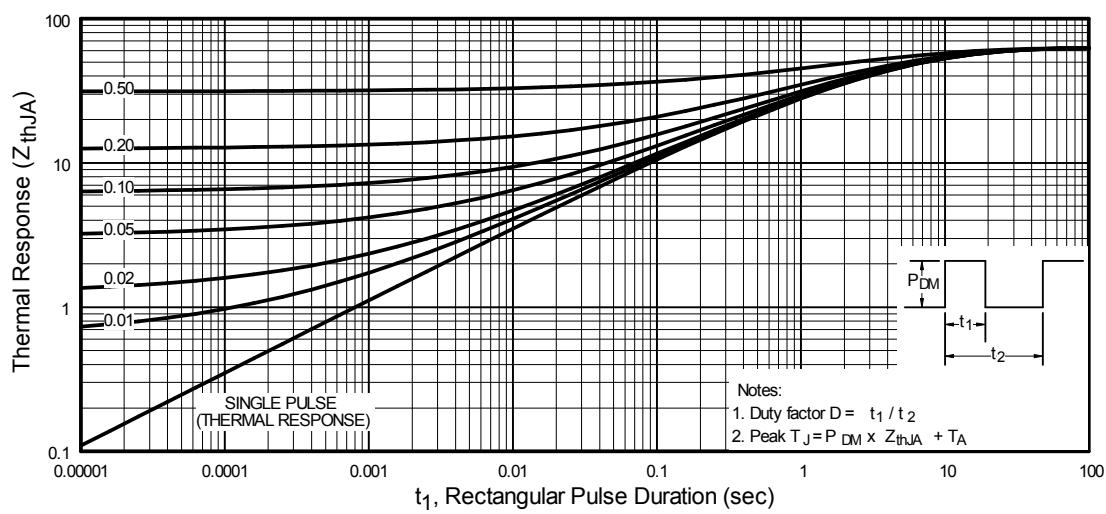


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

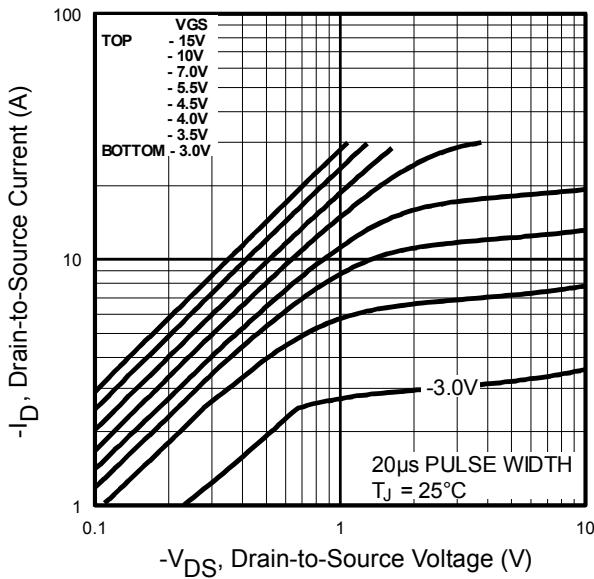


Fig. 12 Typical Output Characteristics

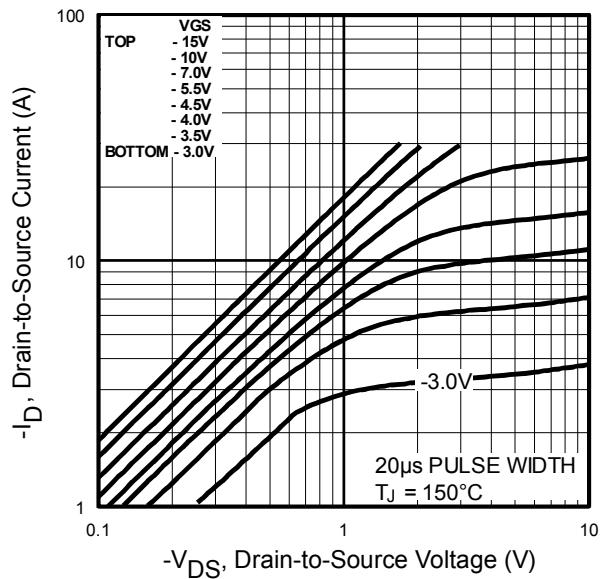


Fig. 13 Typical Output Characteristics

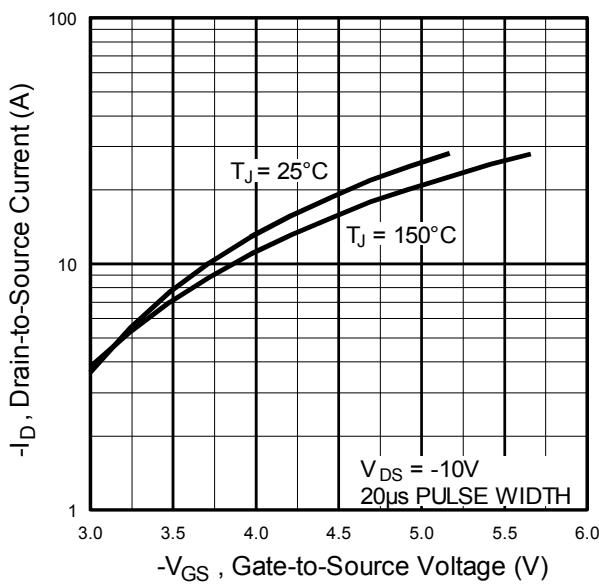


Fig. 14 Typical Transfer Characteristics

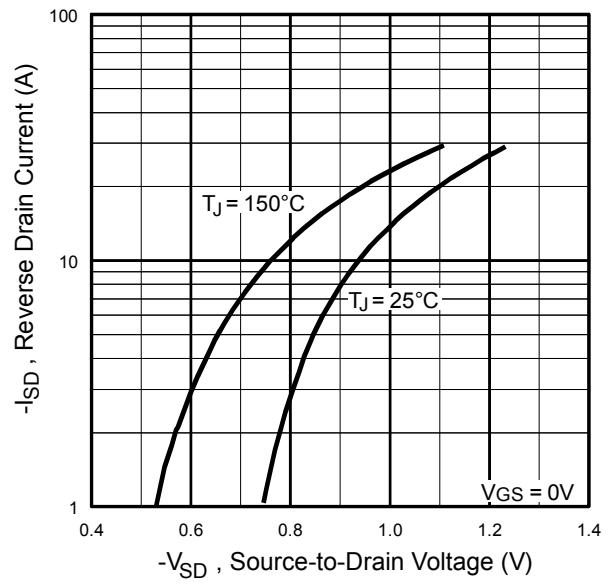


Fig. 15 Typical Source-Drain Diode Forward Voltage

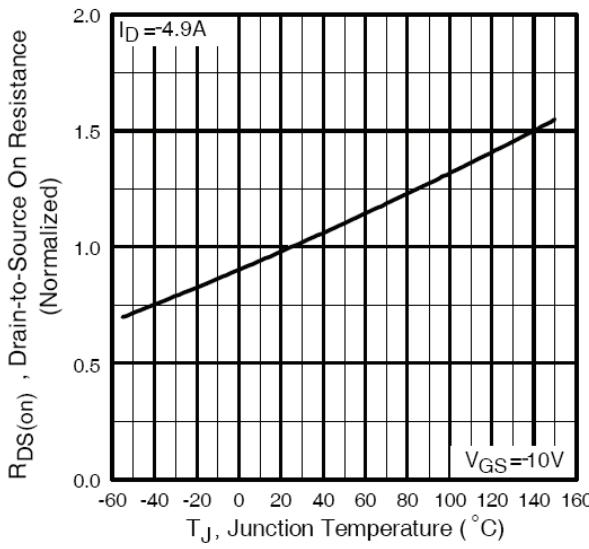


Fig 16. Normalized On-Resistance Vs. Temperature

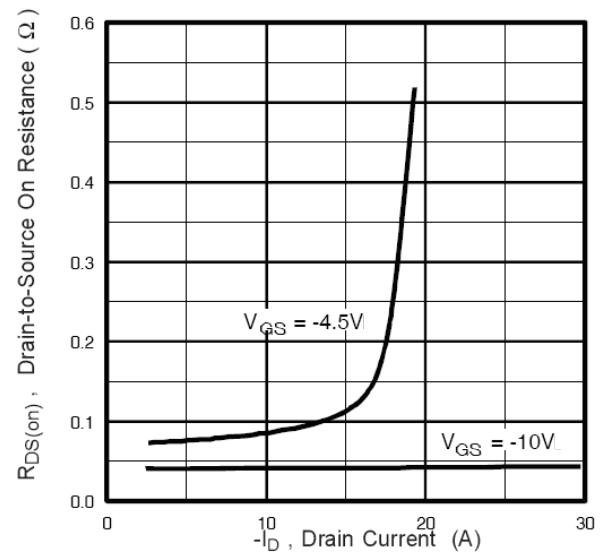


Fig 17. Typical On-Resistance Vs. Drain Current

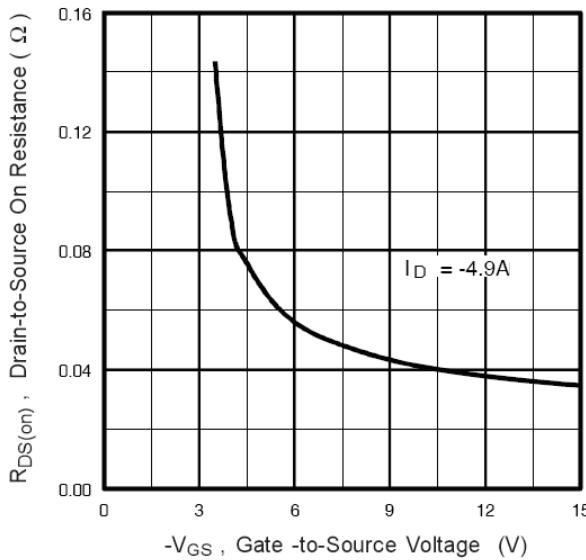


Fig. 18 Typical On-Resistance Vs. Gate Voltage

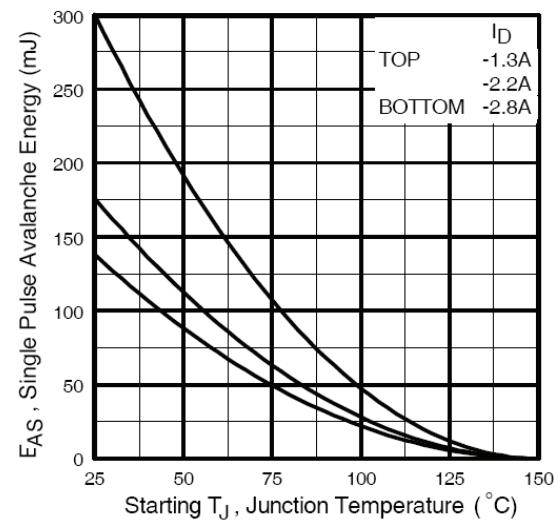


Fig 19. Maximum Avalanche Energy Vs. Drain Current

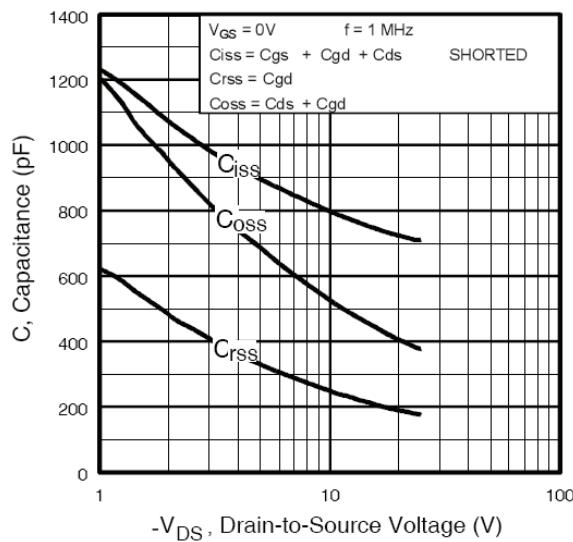


Fig 20. Typical Capacitance Vs.
Drain-to-Source Voltage

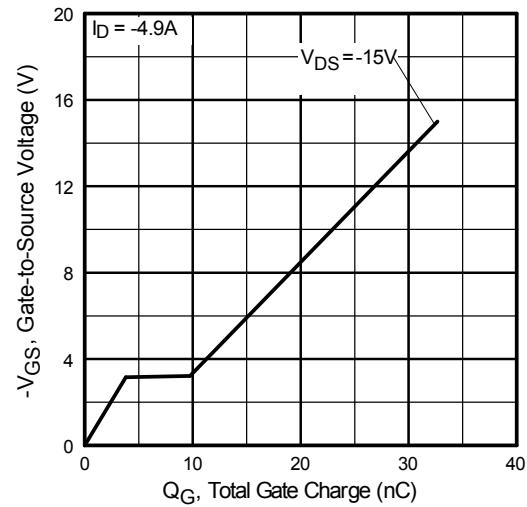


Fig 21. Typical Gate Charge Vs.
Gate-to-Source Voltage

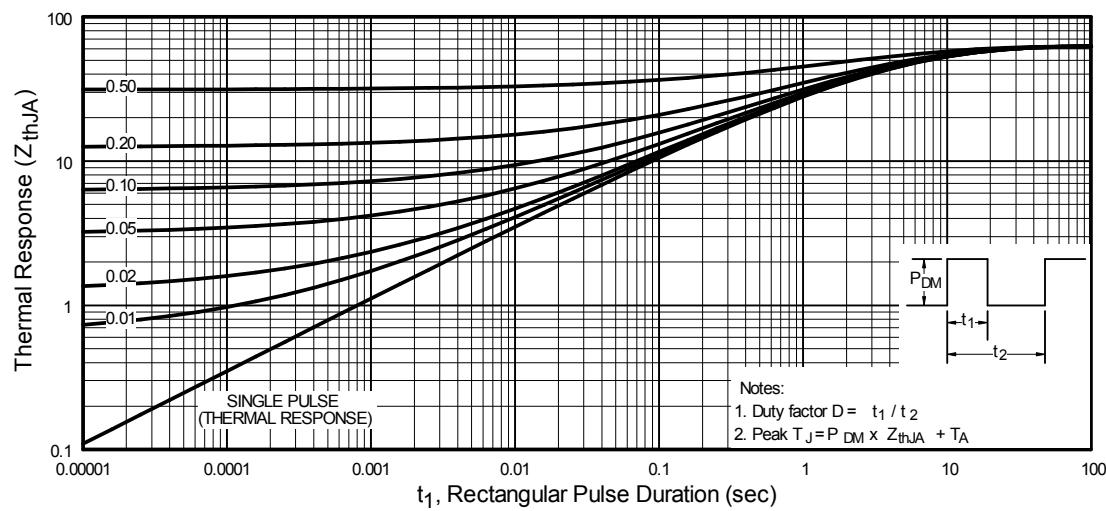
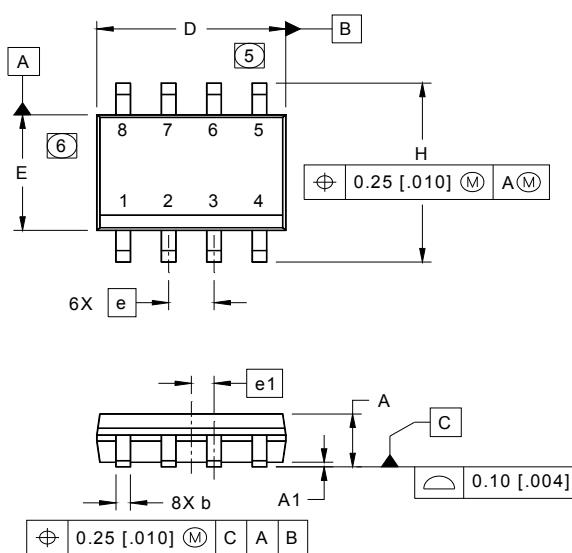
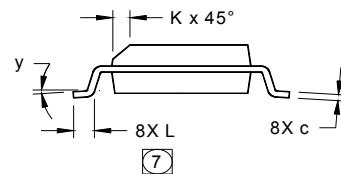


Fig 22. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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

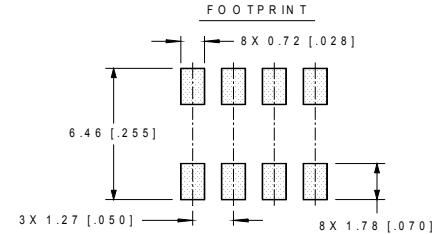


DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050	BASIC	1.27	BASIC
e 1	.025	BASIC	0.635	BASIC
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40	1.27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

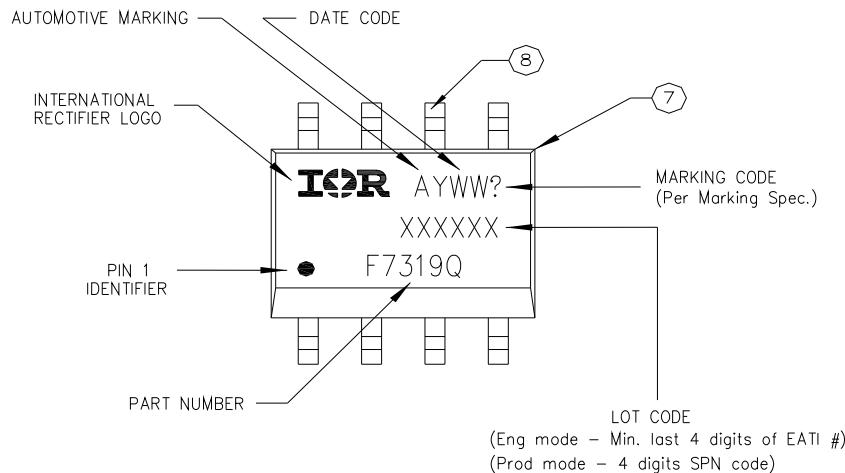


NOTES:

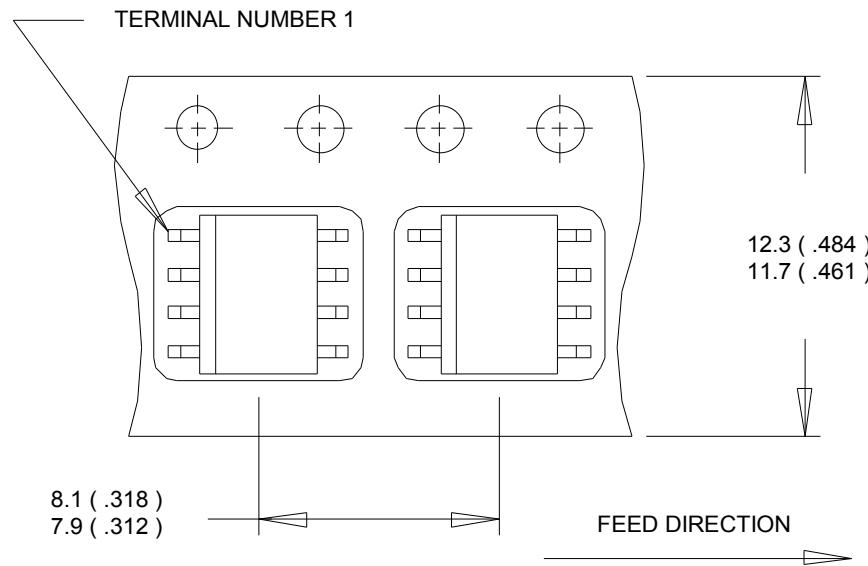
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M -1994.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE EIA-MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [.006].
6. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [.010].
7. DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.



SO-8 Part Marking Information

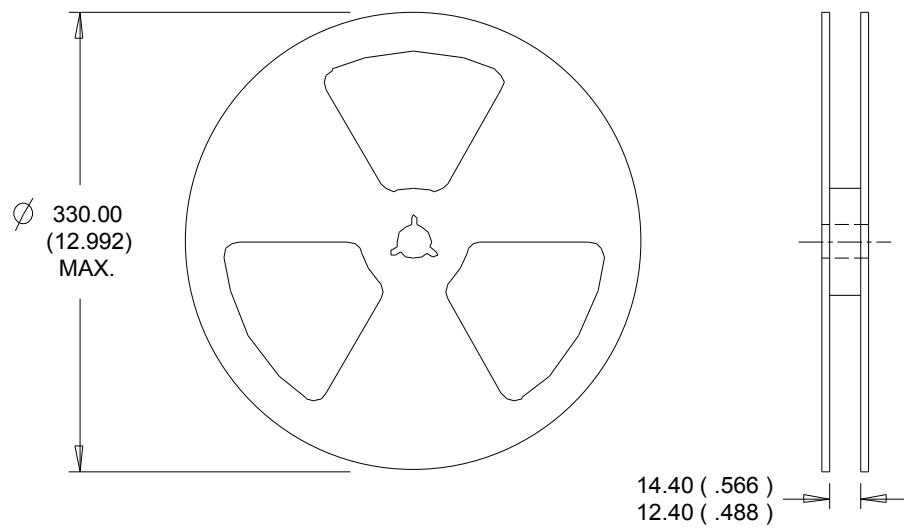


SO-8 Tape and Reel (Dimensions are shown in millimeters (inches))



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

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- Поставка более 17-ти миллионов наименований электронных компонентов;
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- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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