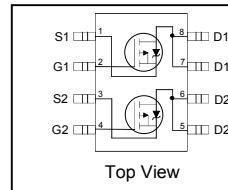


Features

- Advanced Planar Technology
- Low On-Resistance
- Dual P Channel MOSFET
- Dynamic dv/dt Rating
- Logic Level
- 150°C Operating Temperature
- Fast Switching
- Lead-Free, RoHS Compliant
- Automotive Qualified *

Description

Specifically designed for Automotive applications, this cellular design of HEXFET® Power MOSFETs utilizes the latest processing techniques to achieve low on-resistance per silicon area. This benefit combined with the fast switching speed and ruggedized device design that HEXFET power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in Automotive and a wide variety of other applications.



HEXFET® Power MOSFET

V_{DSS}	-20V
R_{DS(on)} max.	0.090Ω
I_D	-4.3A



G	D	S
Gate	Drain	Source

Base part number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
AUIRF7304Q	SO-8	Tape and Reel	4000	AUIRF7304QTR

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
I _D @ T _A = 25°C	Continuous Drain Current, V _{GS} @ -4.5V	-4.7	A
I _D @ T _A = 25°C	Continuous Drain Current, V _{GS} @ -4.5V	-4.3	
I _D @ T _A = 70°C	Continuous Drain Current, V _{GS} @ -4.5V	-3.4	
I _{DM}	Pulsed Drain Current ①	-17	
P _D @ T _A = 25°C	Maximum Power Dissipation ③	2.0	W
	Linear Derating Factor	0.016	W°C
V _{GS}	Gate-to-Source Voltage	± 12	V
dv/dt	Peak Diode Recovery dv/dt ②	-5.0	V/ns
T _J	Operating Junction and	-55 to + 150	°C
T _{STG}	Storage Temperature Range		

Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
R _{θJA}	Junction-to-Ambient ④	—	62.5	°C/W

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 *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	-20	—	—	V	$V_{GS} = 0V, I_D = -250\mu\text{A}$
$\Delta V_{(\text{BR})\text{DSS}}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	-0.012	—	V/ $^\circ\text{C}$	Reference to 25°C , $I_D = -1\text{mA}$
$R_{\text{DS}(\text{on})}$	Static Drain-to-Source On-Resistance	—	—	0.090	Ω	$V_{GS} = -4.5V, I_D = -2.2\text{A}$ ③
		—	—	0.140		$V_{GS} = -2.7V, I_D = -1.8\text{A}$ ③
$V_{GS(\text{th})}$	Gate Threshold Voltage	-0.70	—	-1.5	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
g_{fs}	Forward Trans conductance	4.0	—	—	S	$V_{DS} = -16V, I_D = -2.2\text{A}$
I_{DSS}	Drain-to-Source Leakage Current	—	—	-1.0	μA	$V_{DS} = -16V, V_{GS} = 0V$
		—	—	-25		$V_{DS} = -16V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	-100	nA	$V_{GS} = -12V$
	Gate-to-Source Reverse Leakage	—	—	100		$V_{GS} = 12V$

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

Q_g	Total Gate Charge	—	—	22	nC	$I_D = -2.2\text{A}$ $V_{DS} = -16V$ $V_{GS} = -4.5V$, See Fig.6 & 12 ③
Q_{gs}	Gate-to-Source Charge	—	—	3.3		
Q_{qd}	Gate-to-Drain Charge	—	—	9.0		
$t_{d(\text{on})}$	Turn-On Delay Time	—	8.4	—	ns	$V_{DD} = -10V$ $I_D = -2.2\text{A}$ $R_G = 6.0\Omega$ $R_D = 4.5\Omega$, See Fig.10 ③
t_r	Rise Time	—	26	—		
$t_{d(\text{off})}$	Turn-Off Delay Time	—	51	—		
t_f	Fall Time	—	33	—		
L_D	Internal Drain Inductance	—	4.0	—	nH	Between lead, 6mm (0.25in.) from package and center of die contact
L_s	Internal Source Inductance	—	6.0	—		
C_{iss}	Input Capacitance	—	610	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	310	—		$V_{DS} = -15V$
C_{rss}	Reverse Transfer Capacitance	—	170	—		$f = 1.0\text{MHz}$, See Fig.5

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_s	Continuous Source Current (Body Diode)	—	—	-2.5	A	MOSFET symbol showing the integral reverse p-n junction diode.
	Pulsed Source Current (Body Diode) ①	—	—	-17		
V_{SD}	Diode Forward Voltage	—	—	-1.0	V	$T_J = 25^\circ\text{C}, I_s = -1.8\text{A}, V_{GS} = 0V$ ③
t_{rr}	Reverse Recovery Time	—	56	84	ns	$T_J = 25^\circ\text{C}, I_F = -2.2\text{A},$ $di/dt = 100\text{A}/\mu\text{s}$ ③
Q_{rr}	Reverse Recovery Charge	—	71	110	nC	
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by $L_s + L_D$)				

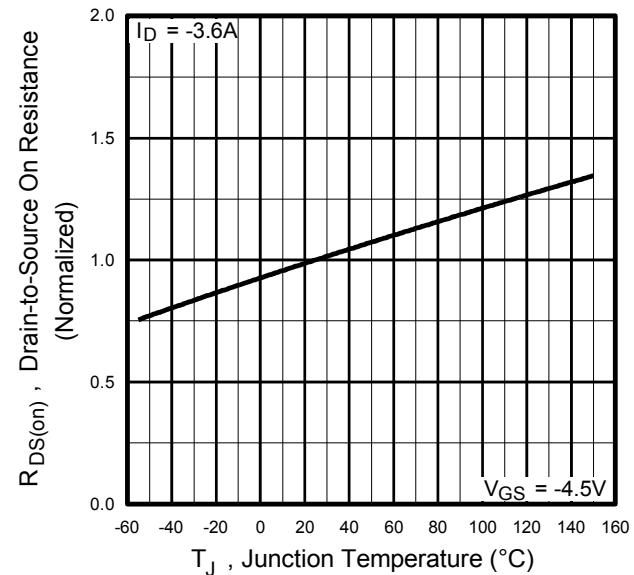
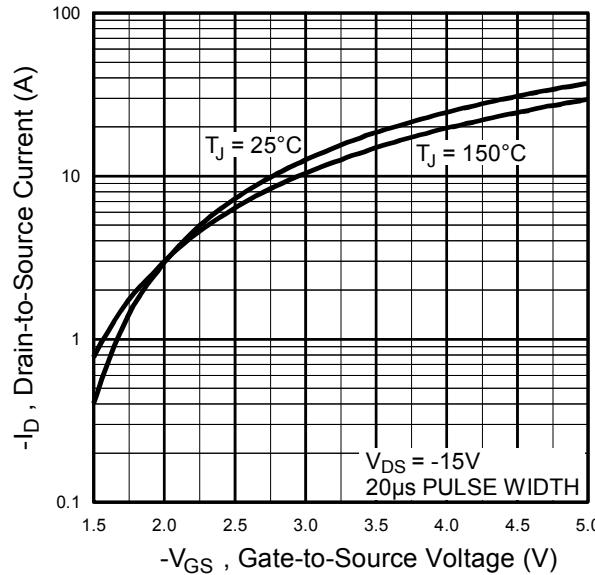
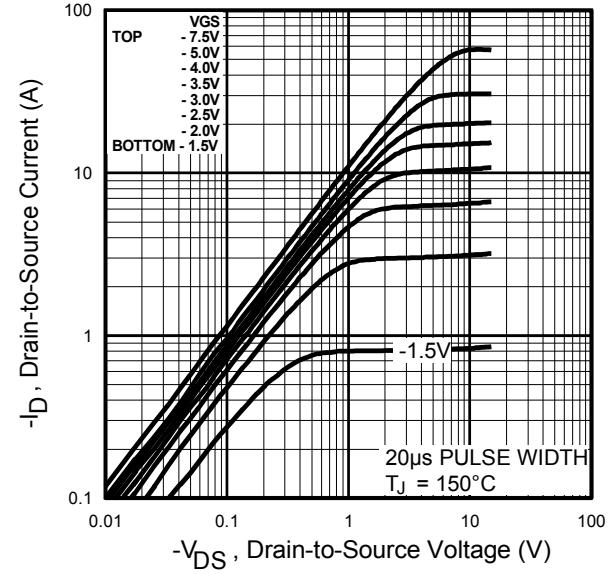
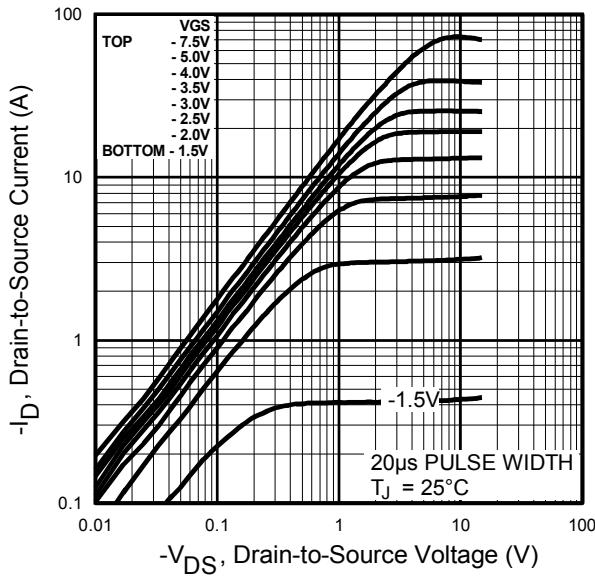
Notes:

① Repetitive rating; pulse width limited by max. junction temperature. (See Fig. 11)

② $I_{SD} \leq -2.2\text{A}$, $di/dt \leq 50\text{A}/\mu\text{s}$, $V_{DD} \leq V_{(\text{BR})\text{DSS}}$, $T_J \leq 150^\circ\text{C}$.

③ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

④ When mounted on 1 inch square copper board, $t \leq 10\text{sec}$.



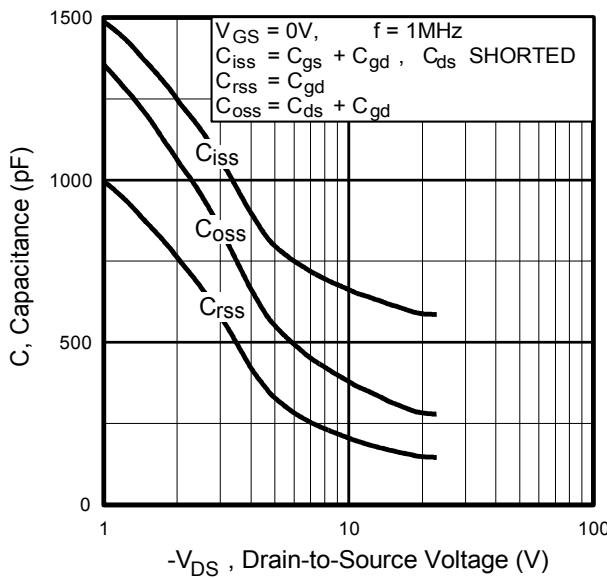


Fig 5. Typical Capacitance Vs.
Drain-to-Source Voltage

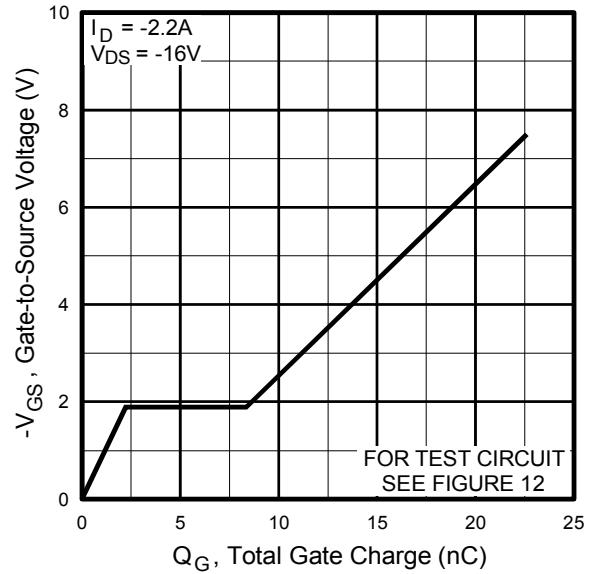


Fig 6. Typical Gate Charge Vs.
Gate-to-Source Voltage

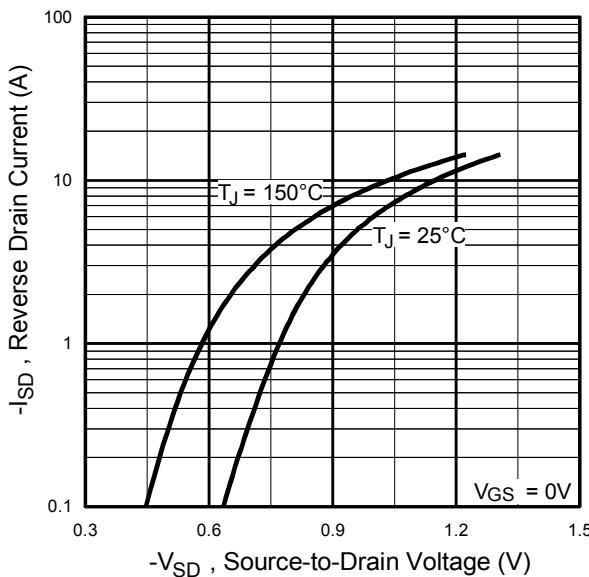


Fig. 7 Typical Source-Drain Diode
Forward Voltage

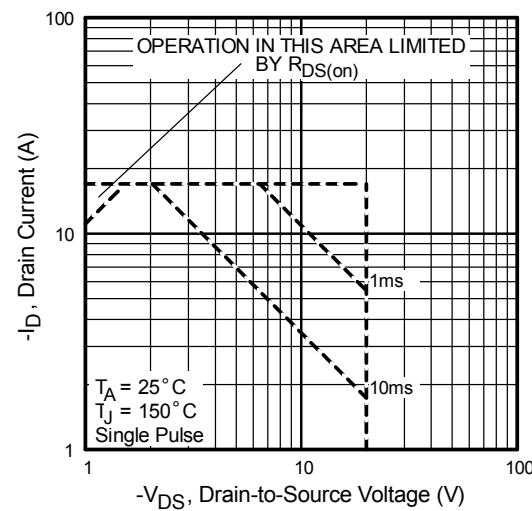


Fig 8. Maximum Safe Operating Area

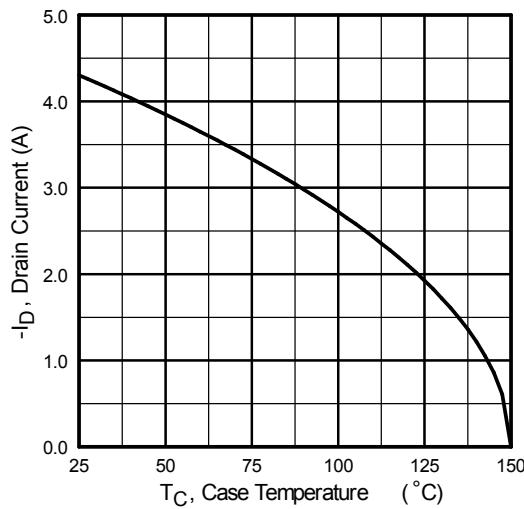


Fig 9. Maximum Drain Current Vs. Ambient Temperature

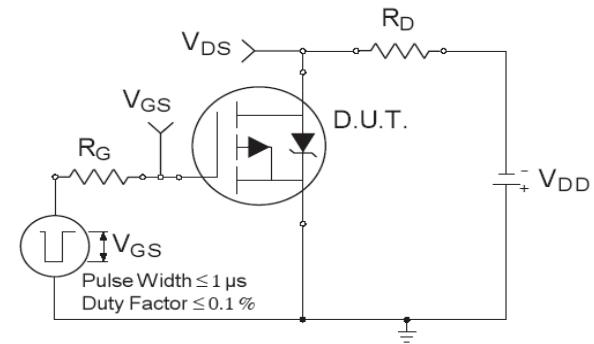


Fig 10a. Switching Time Test Circuit

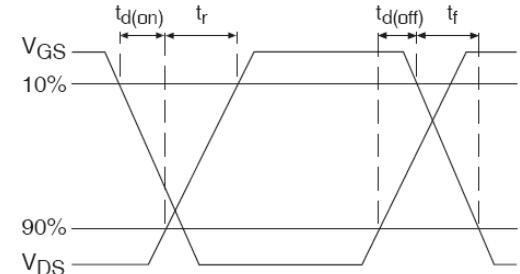


Fig 10b. Switching Time Waveforms

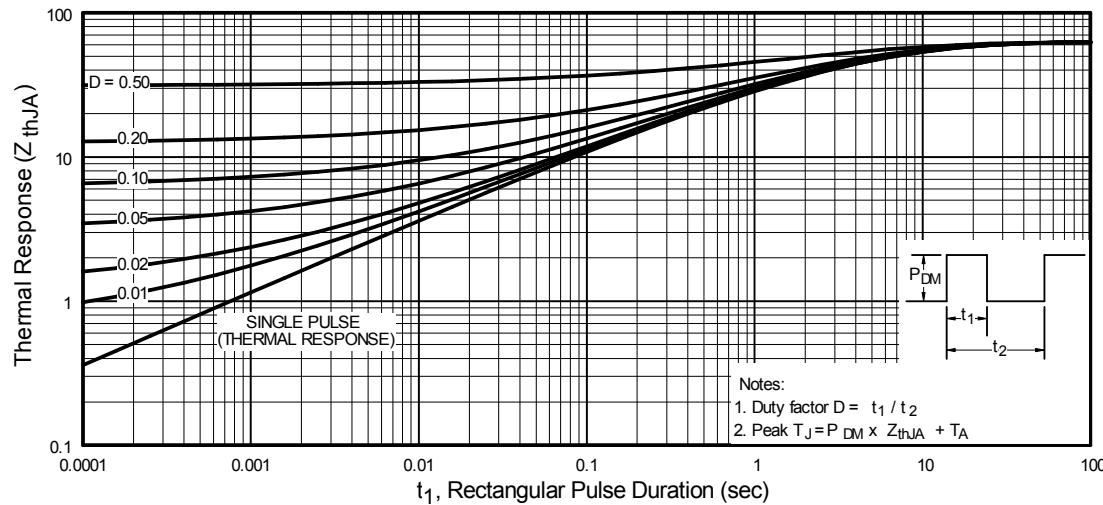


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

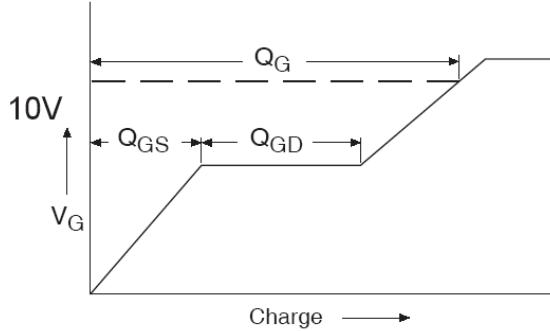


Fig 12a. Basic Gate Charge Waveform

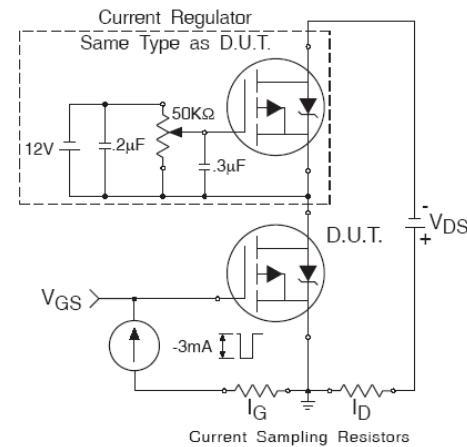


Fig 12b. Gate Charge Test Circuit

Peak Diode Recovery dv/dt Test Circuit

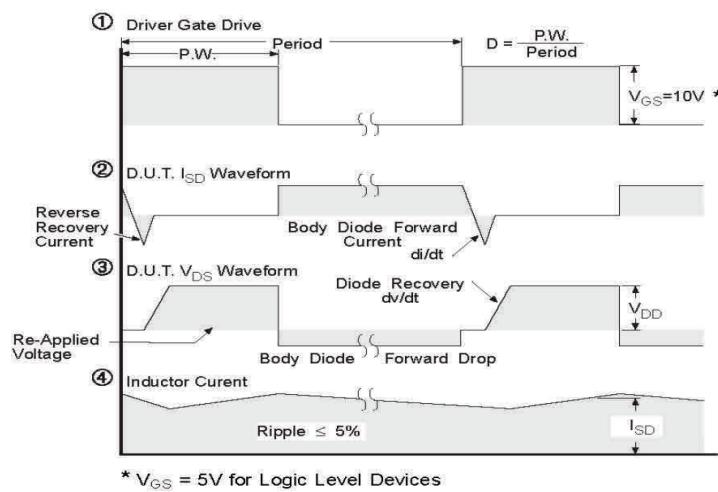
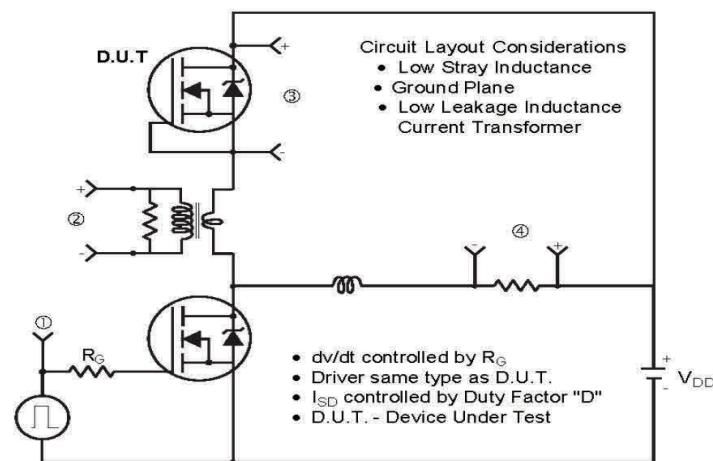
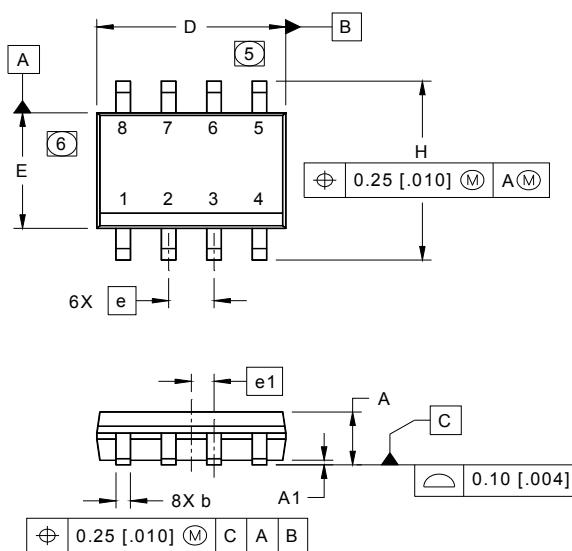
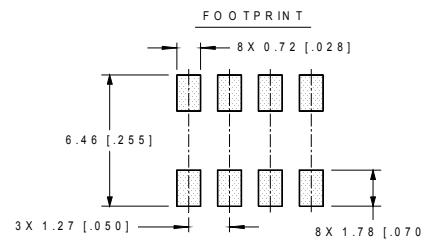
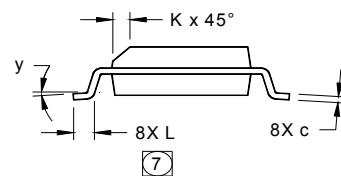


Fig 13. Peak Diode Recovery dv/dt Test Circuit for P-Channel HEXFET® Power MOSFETs

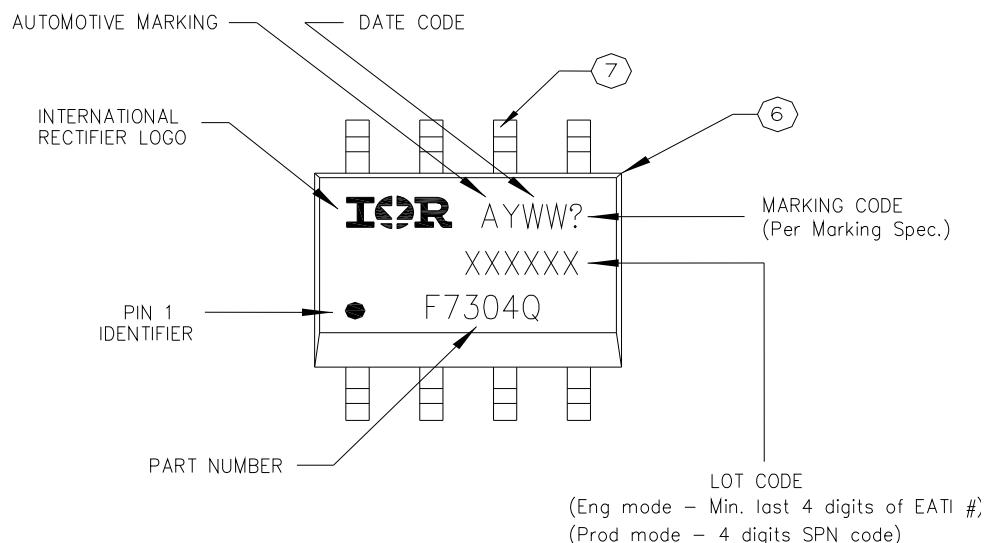
SO-8 Package Outline (Dimensions are shown in millimeters (inches))



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°

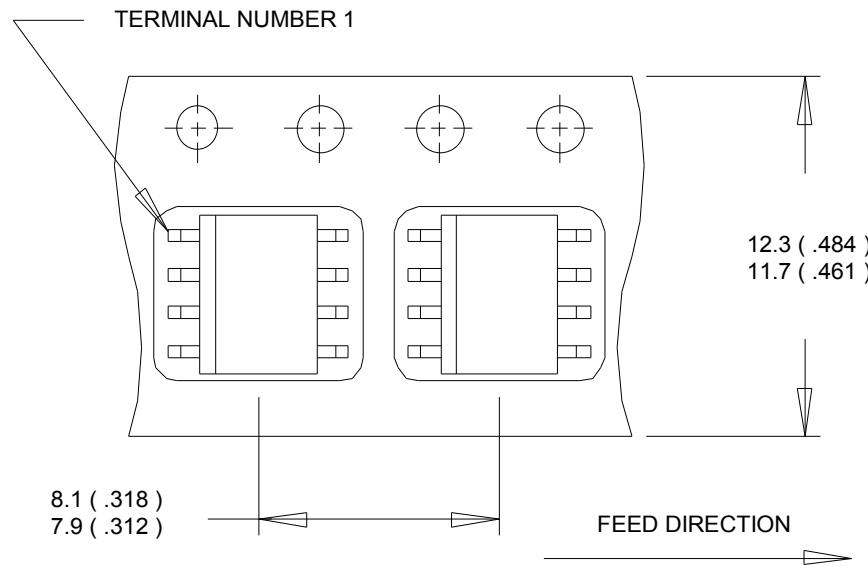


SO-8 Part Marking Information



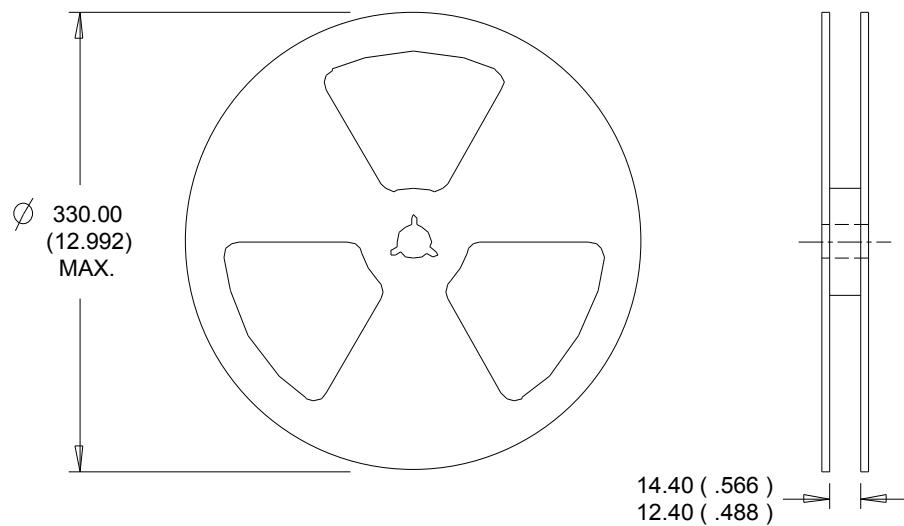
Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

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.

Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

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 M1B (+/- 100V) [†] AEC-Q101-002	
	Human Body Model	Class H0 (+/- 250V) [†] AEC-Q101-001	
	Charged Device Model	Class C5 (+/- 2000V) [†] AEC-Q101-005	
RoHS Compliant		Yes	

† Highest passing voltage.

Revision History

Date	Comments
11/16/2015	<ul style="list-style-type: none"> • Updated datasheet with corporate template • Corrected ordering table on page 1.

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