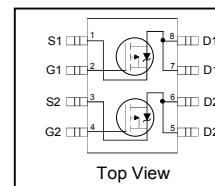


**Features**

- Advanced Planar Technology
- Low On-Resistance
- Logic Level Gate Drive
- Dual P Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- 150°C Operating Temperature
- Lead-Free, RoHS Compliant
- Automotive Qualified \*



$V_{DSS}$	-30V
$R_{DS(on)}$ typ.	0.042Ω
	0.058Ω
$I_D$	-4.9A



G	D	S
Gate	Drain	Source

**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.

Base part number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
AUIRF7316Q	SO-8	Tape and Reel	4000	AUIRF7316QTR

**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
$V_{DS}$	Drain-Source Voltage	-30	V
$I_D$ @ $T_A = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS}$ @ 10V ⑤	-4.9	A
$I_D$ @ $T_A = 70^\circ\text{C}$	Continuous Drain Current, $V_{GS}$ @ 10V ⑤	-3.9	
$I_{DM}$	Pulsed Drain Current ①	-30	
$I_S$	Continuous Source Current (Diode Conduction)	-2.5	
$P_D$ @ $T_A = 25^\circ\text{C}$	Maximum Power Dissipation ⑤	2.0	W
$P_D$ @ $T_A = 70^\circ\text{C}$	Maximum Power Dissipation ⑤	1.3	
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$E_{AS}$	Single Pulse Avalanche Energy (Thermally Limited)	140	mJ
$I_{AR}$	Avalanche Current	-2.8	A
$E_{AR}$	Repetitive Avalanche Energy	0.20	mJ
$dv/dt$	Peak Diode Recovery $dv/dt$ ③	-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
$R_{\theta JA}$	Junction-to-Ambient ⑤	—	62.5	°C/W

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\*Qualification standards can be found at [www.infineon.com](http://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	-30	—	—	V	$V_{GS} = 0V, I_D = -250\mu\text{A}$
$\Delta V_{(\text{BR})\text{DSS}}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.022	—	V/ $^\circ\text{C}$	Reference to $25^\circ\text{C}$ , $I_D = -1\text{mA}$
$R_{\text{DS}(\text{on})}$	Static Drain-to-Source On-Resistance	—	0.042	0.058	$\Omega$	$V_{GS} = -10V, I_D = -4.9\text{A}$ ④
		—	0.076	0.098		$V_{GS} = -4.5V, I_D = -3.6\text{A}$ ④
$V_{GS(\text{th})}$	Gate Threshold Voltage	-1.0	—	-3.0	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
$g_{fs}$	Forward Trans conductance	—	7.7	—	S	$V_{DS} = -15V, I_D = -4.9\text{A}$
$I_{\text{DSS}}$	Drain-to-Source Leakage Current	—	—	-1.0	$\mu\text{A}$	$V_{DS} = -24V, V_{GS} = 0V$
		—	—	-25		$V_{DS} = -24V, V_{GS} = 0V, T_J = 55^\circ\text{C}$
$I_{\text{GSS}}$	Gate-to-Source Forward Leakage	—	—	-100	nA	$V_{GS} = -20V$
	Gate-to-Source Reverse Leakage	—	—	100		$V_{GS} = 20V$

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

$Q_g$	Total Gate Charge	—	23	34	nC	$I_D = -4.9\text{A}$ $V_{DS} = -15V$ $V_{GS} = -10V$ , See Fig.10 ④
$Q_{gs}$	Gate-to-Source Charge	—	3.8	5.7		
$Q_{qd}$	Gate-to-Drain Charge	—	5.9	8.9		
$t_{d(\text{on})}$	Turn-On Delay Time	—	13	19	ns	$V_{DD} = -15V$ $I_D = -1.0\text{A}$ $R_G = 6.0\Omega$ $R_D = 15\Omega$ ④
$t_r$	Rise Time	—	13	20		
$t_{d(\text{off})}$	Turn-Off Delay Time	—	34	51		
$t_f$	Fall Time	—	32	48		
$C_{iss}$	Input Capacitance	—	710	—	pF	$V_{GS} = 0V$ $V_{DS} = -25V$ $f = 1.0\text{MHz}$ , See Fig.5
$C_{oss}$	Output Capacitance	—	380	—		
$C_{rss}$	Reverse Transfer Capacitance	—	180	—		

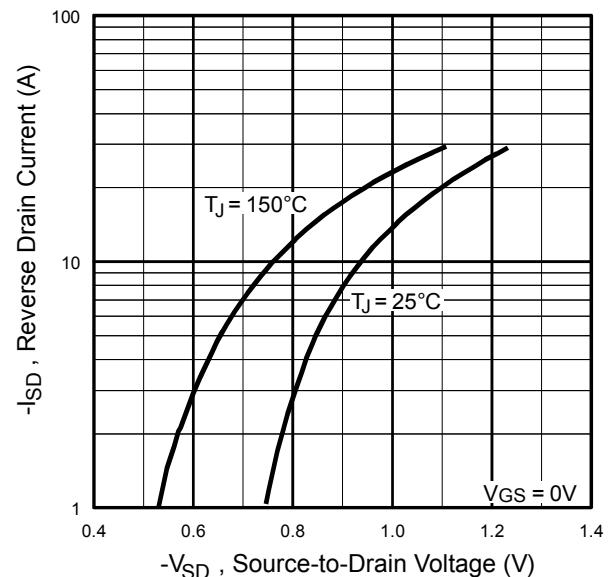
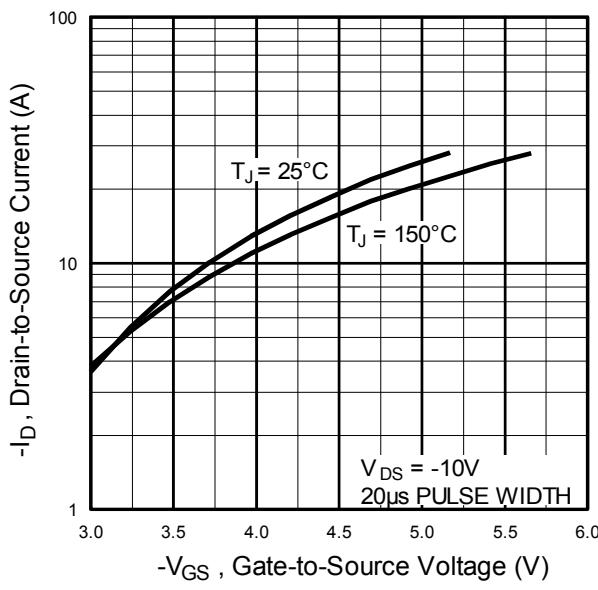
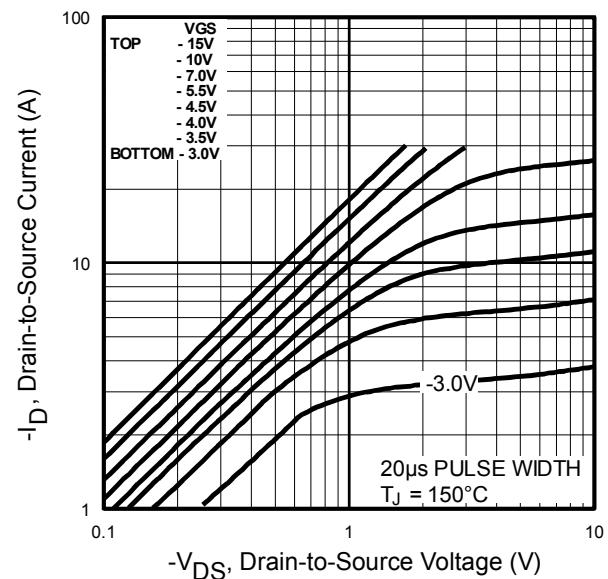
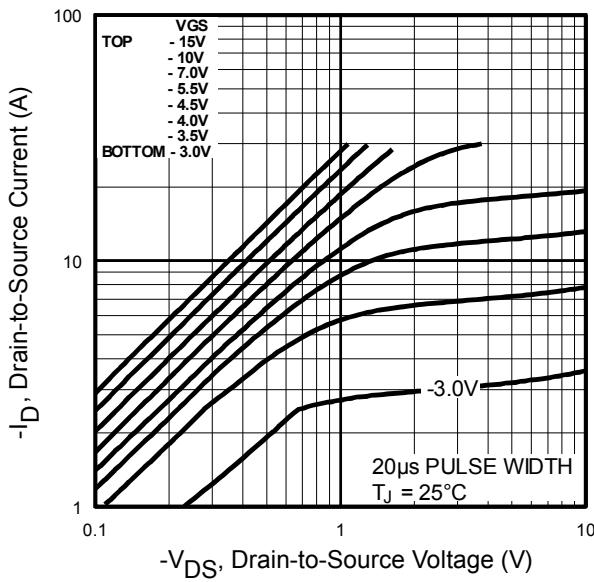
**Diode Characteristics**

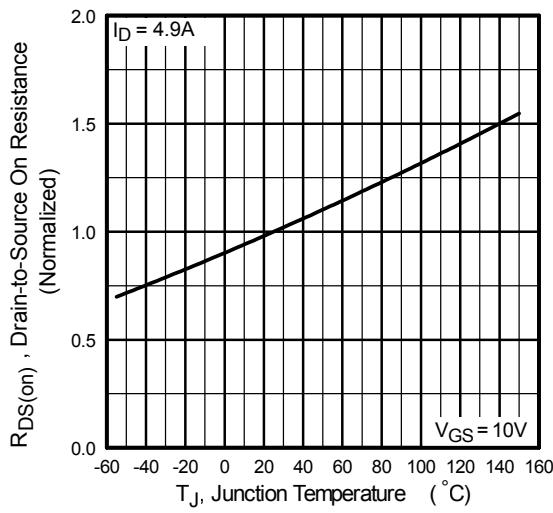
	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_s$	Continuous Source Current (Body Diode)	—	—	-2.5	A	MOSFET symbol showing the integral reverse p-n junction diode.
$I_{sM}$	Pulsed Source Current (Body Diode) ①	—	—	-30		
$V_{SD}$	Diode Forward Voltage	—	-0.78	-1.0	V	$T_J = 25^\circ\text{C}, I_s = -1.7\text{A}, V_{GS} = 0V$ ④
$t_{rr}$	Reverse Recovery Time	—	44	66	ns	$T_J = 25^\circ\text{C}, I_F = -1.7\text{A},$ $di/dt = 100\text{A}/\mu\text{s}$ ④
	Reverse Recovery Charge	—	42	63		

**Notes:**

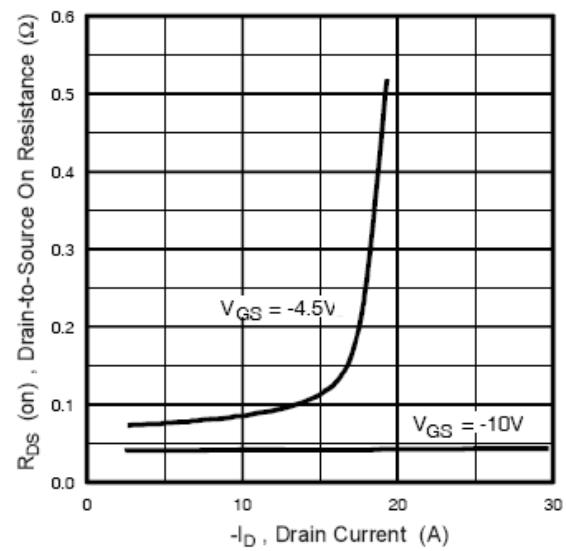
- ① Repetitive rating; pulse width limited by max. junction temperature. (See Fig. 11)
- ② Starting  $T_J = 25^\circ\text{C}$ ,  $L = 35\text{mH}$ ,  $R_G = 25\Omega$ ,  $I_{AS} = -2.8\text{A}$ .
- ③  $I_{SD} \leq -2.8\text{A}$ ,  $di/dt \leq 150\text{A}/\mu\text{s}$ ,  $V_{DD} \leq V_{(\text{BR})\text{DSS}}$ ,  $T_J \leq 150^\circ\text{C}$ .
- ④ Pulse width  $\leq 300\mu\text{s}$ ; duty cycle  $\leq 2\%$ .
- ⑤ Surface mounted on FR-4 board,  $t \leq 10\text{sec}$ .



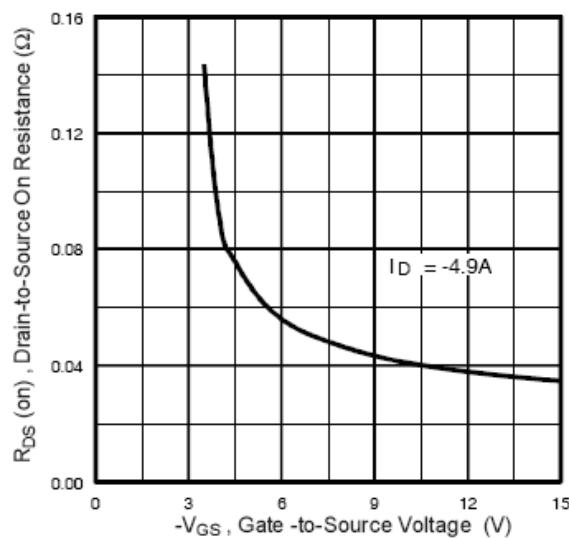




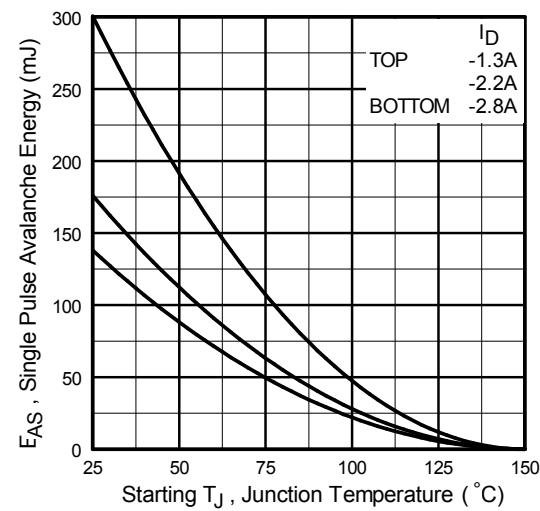
**Fig 5.** Normalized On-Resistance Vs. Temperature



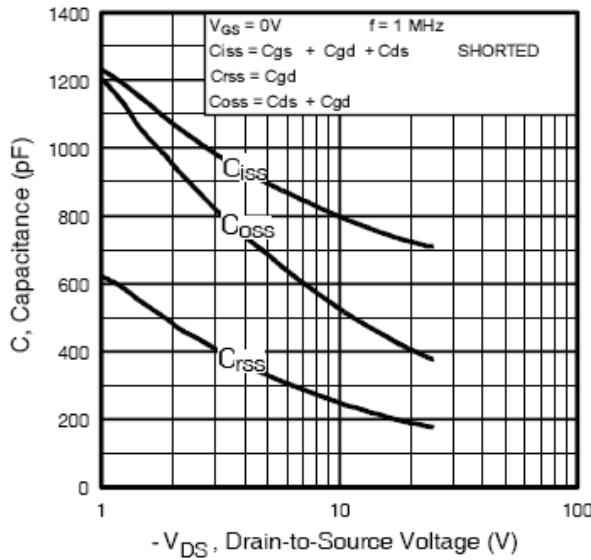
**Fig 6.** Typical On-Resistance Vs. Drain Current



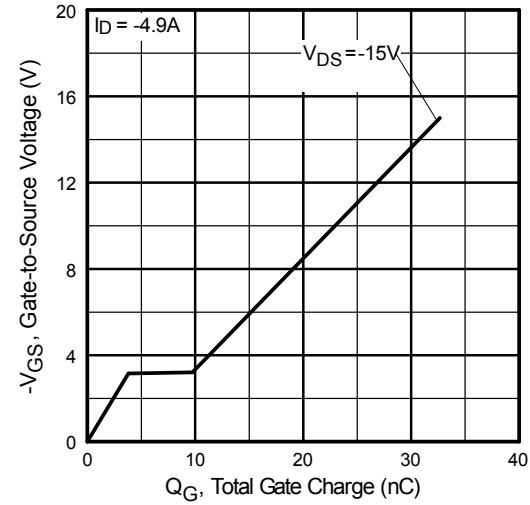
**Fig. 7** Typical On-Resistance Vs. Gate Voltage



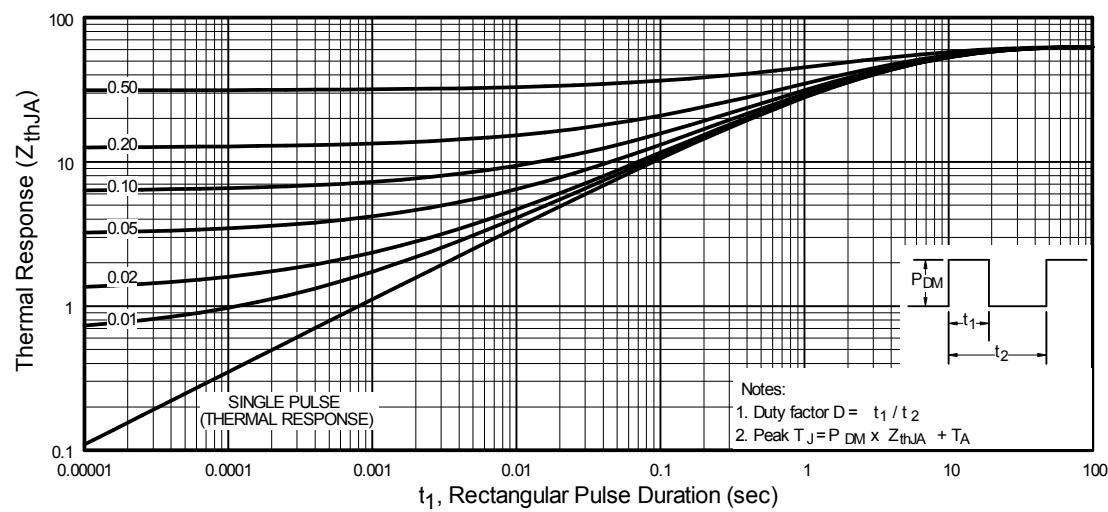
**Fig 8.** Maximum Avalanche Energy Vs. Drain Current



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

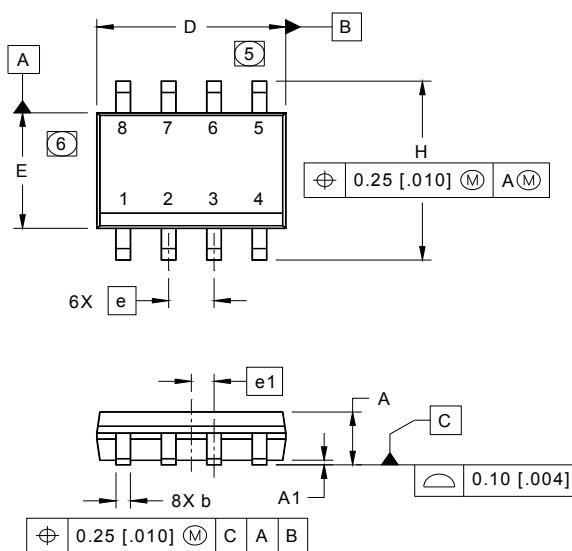


**Fig 10.** Typical Gate Charge Vs.  
Gate-to-Source Voltage

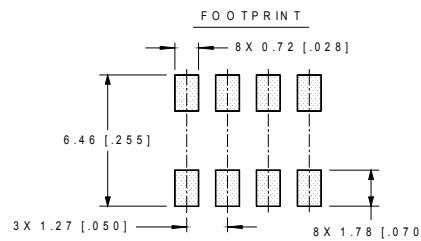
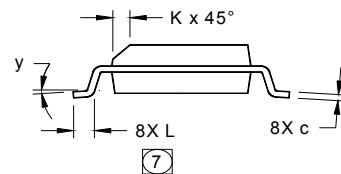


**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

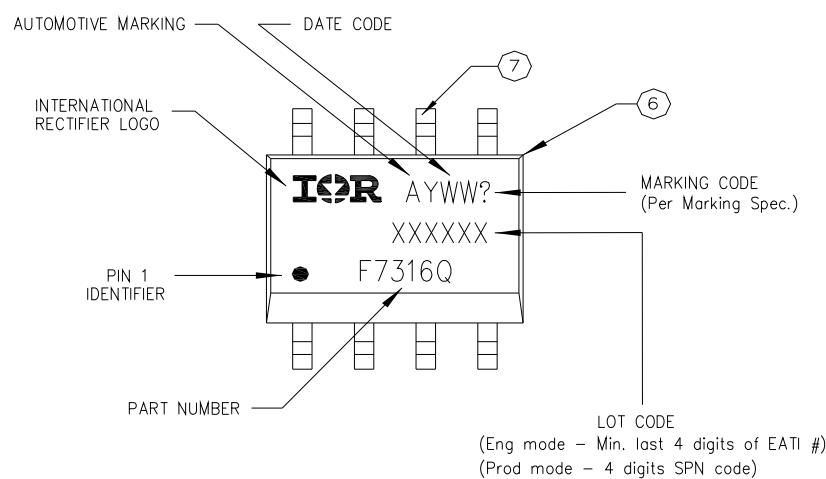
## SO-8 Package Outline (Dimensions are shown in millimeters (inches))



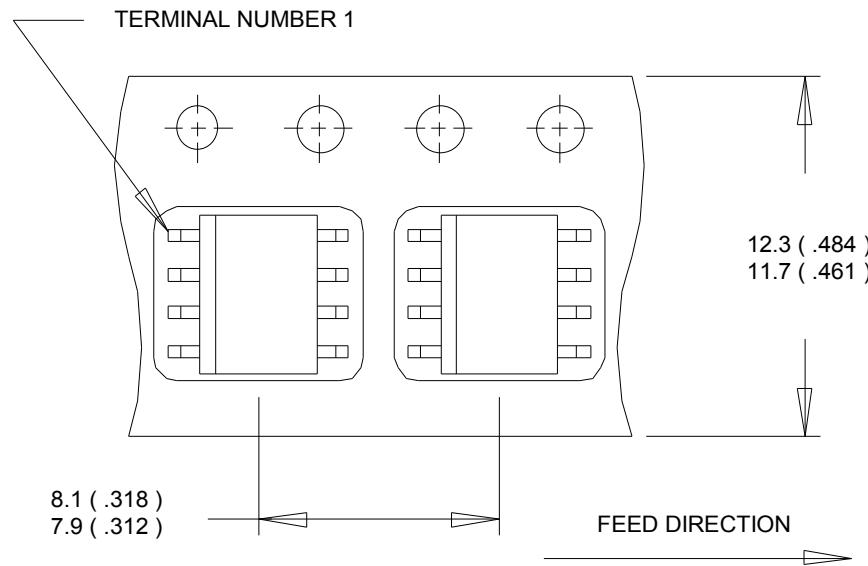
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050	BASIC	1.27	BASIC
e 1	.025	BASIC	0.635	BASIC
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40	1.27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



## SO-8 Part Marking Information

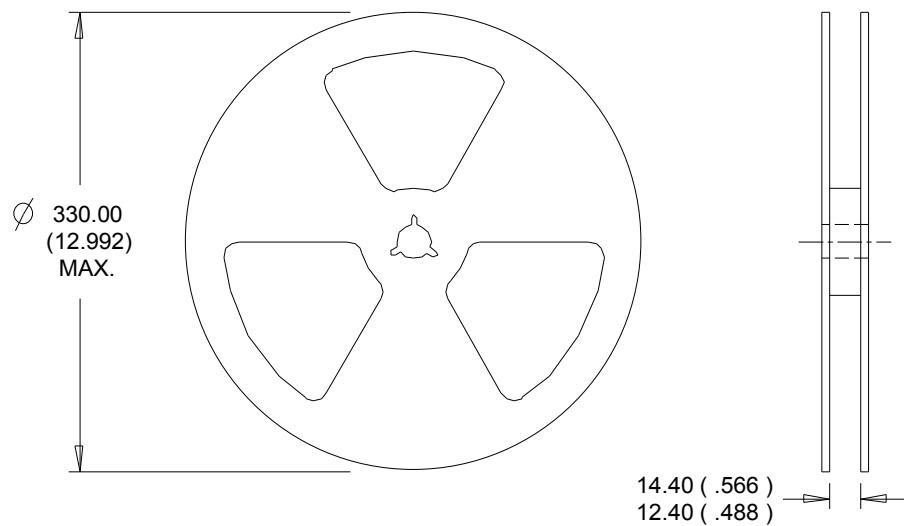


**SO-8 Tape and Reel** (Dimensions are shown in millimeters (inches))



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	

<sup>†</sup> Highest passing voltage.

## Revision History

Date	Comments
4/3/2014	<ul style="list-style-type: none"> <li>Added "Logic Level Gate Drive" bullet in the features section on page 1</li> <li>Updated part marking on page 6.</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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