

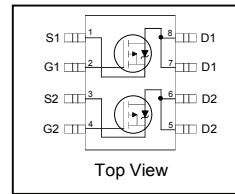
**Features**

- 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 \*

**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.



$V_{DS}$		<b>-30V</b>
$R_{DS(on)}$	typ.	<b>0.042Ω</b>
	max.	<b>0.058Ω</b>
$I_D$		<b>-4.9A</b>



<b>G</b>	<b>D</b>	<b>S</b>
Gate	Drain	Source

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
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ ⑤	-4.9	A
$I_D @ T_A = 70^\circ C$	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	
$P_D @ T_A = 25^\circ C$	Maximum Power Dissipation ⑤	2.0	W
$P_D @ T_A = 70^\circ C$	Maximum Power Dissipation ⑤	1.3	
$V_{GS}$	Gate-to-Source Voltage	± 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
$T_J$ $T_{STG}$	Operating Junction and Storage Temperature Range	-55 to + 150	°C

**Thermal Resistance**

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient ⑥	—	62.5	°C/W

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\*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	-30	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA
ΔV <sub>(BR)DSS</sub> /ΔT <sub>J</sub>	Breakdown Voltage Temp. Coefficient	—	0.022	—	V/°C	Reference to 25°C, I <sub>D</sub> = -1mA
R <sub>DS(on)</sub>	Static Drain-to-Source On-Resistance	—	0.042	0.058	Ω	V <sub>GS</sub> = -10V, I <sub>D</sub> = -4.9A ④
		—	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	-1.0	—	-3.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
g <sub>fs</sub>	Forward Trans conductance	—	7.7	—	S	V <sub>DS</sub> = -15V, I <sub>D</sub> = -4.9A
I <sub>DSS</sub>	Drain-to-Source Leakage Current	—	—	-1.0	μA	V <sub>DS</sub> = -24V, V <sub>GS</sub> = 0V
		—	—	-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	—	—	-100	nA	V <sub>GS</sub> = -20V
	Gate-to-Source Reverse Leakage	—	—	100		V <sub>GS</sub> = 20V

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

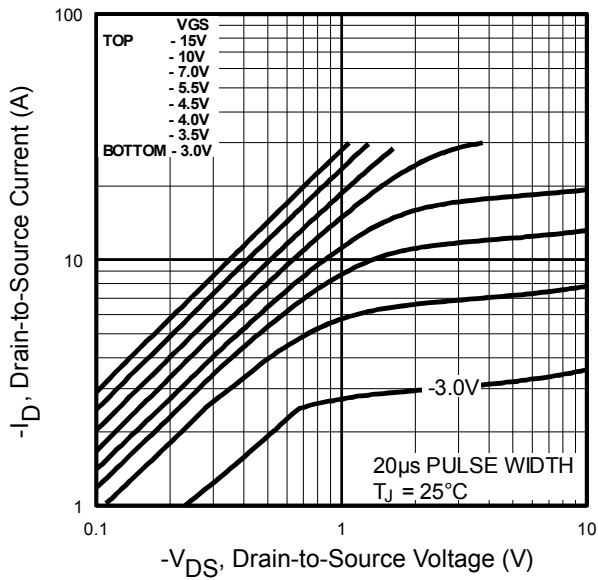
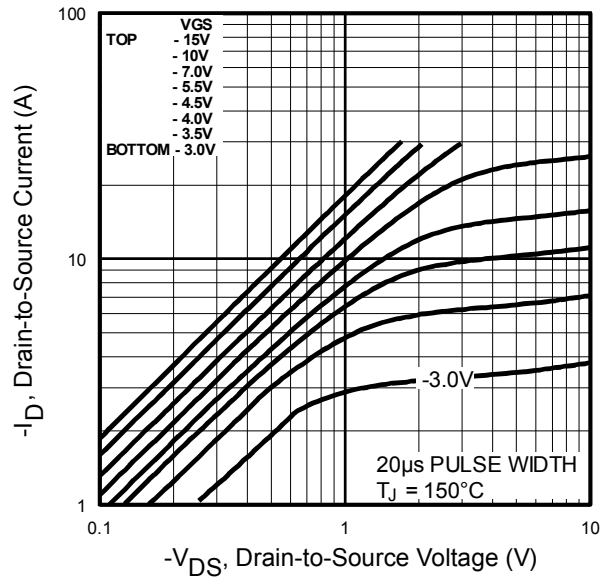
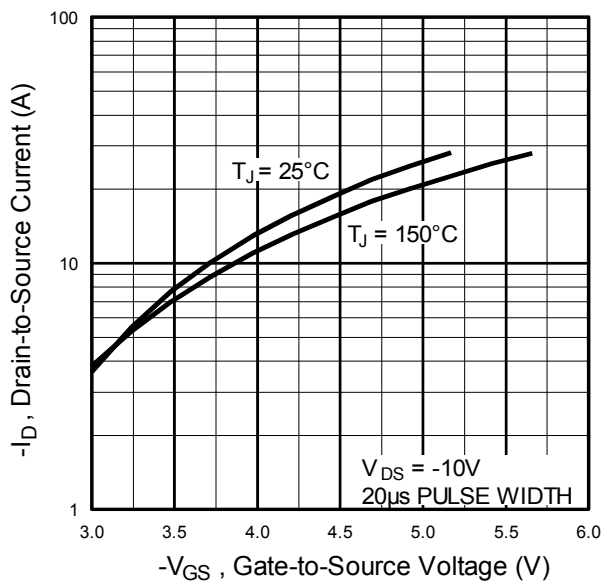
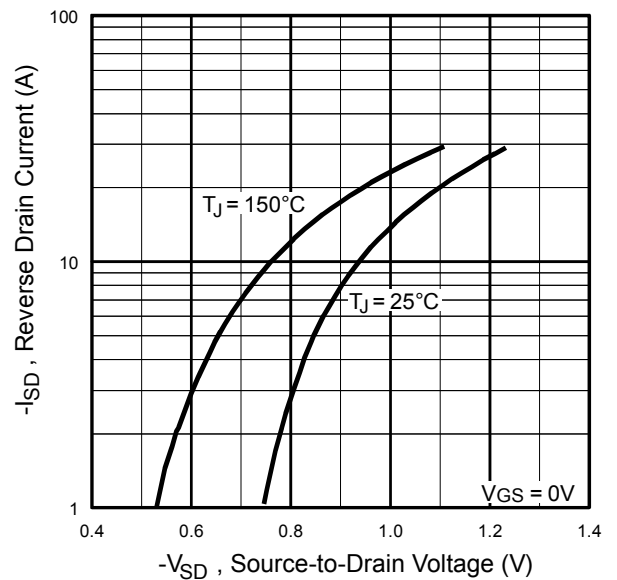
Q <sub>g</sub>	Total Gate Charge	—	23	34	nC	I <sub>D</sub> = -4.9A
Q <sub>gs</sub>	Gate-to-Source Charge	—	3.8	5.7		V <sub>DS</sub> = -15V
Q <sub>gd</sub>	Gate-to-Drain Charge	—	5.9	8.9		V <sub>GS</sub> = -10V, See Fig.10 ④
t <sub>d(on)</sub>	Turn-On Delay Time	—	13	19	ns	V <sub>DD</sub> = -15V
t <sub>r</sub>	Rise Time	—	13	20		I <sub>D</sub> = -1.0A
t <sub>d(off)</sub>	Turn-Off Delay Time	—	34	51		R <sub>G</sub> = 6.0Ω
t <sub>f</sub>	Fall Time	—	32	48		R <sub>D</sub> = 15Ω ④
C <sub>iss</sub>	Input Capacitance	—	710	—	pF	V <sub>GS</sub> = 0V
C <sub>oss</sub>	Output Capacitance	—	380	—		V <sub>DS</sub> = -25V
C <sub>rss</sub>	Reverse Transfer Capacitance	—	180	—		f = 1.0MHz, See Fig.5

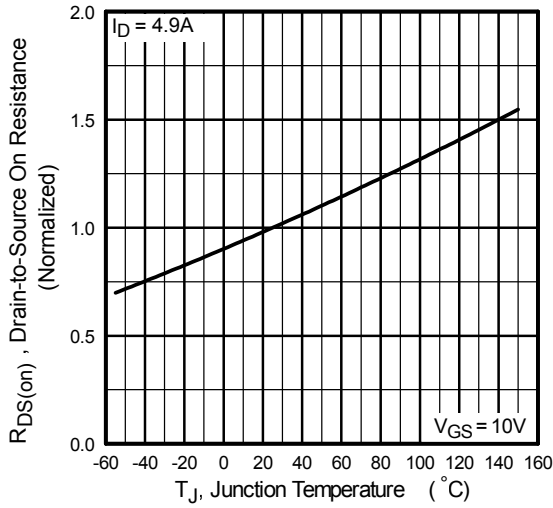
**Diode Characteristics**

	Parameter	Min.	Typ.	Max.	Units	Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)	—	—	-2.5	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I <sub>SM</sub>	Pulsed Source Current (Body Diode) ①	—	—	-30		
V <sub>SD</sub>	Diode Forward Voltage	—	-0.78	-1.0	V	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	—	44	66	ns	T <sub>J</sub> = 25°C, I <sub>F</sub> = -1.7A,
Q <sub>rr</sub>	Reverse Recovery Charge	—	42	63	nC	di/dt = 100A/μs ④

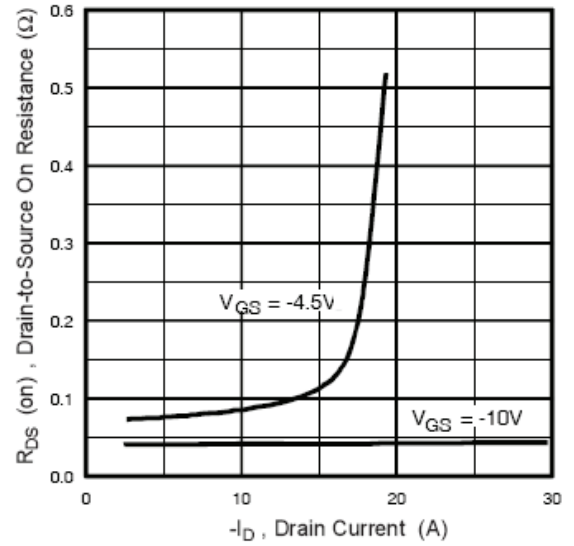
**Notes:**

- ① Repetitive rating; pulse width limited by max. junction temperature. (See Fig. 11)
- ② Starting T<sub>J</sub> = 25°C, L = 35mH, R<sub>G</sub> = 25Ω, I<sub>AS</sub> = -2.8A.
- ③ 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.
- ④ Pulse width ≤ 300μs; duty cycle ≤ 2%.
- ⑤ Surface mounted on FR-4 board, t ≤ 10sec.

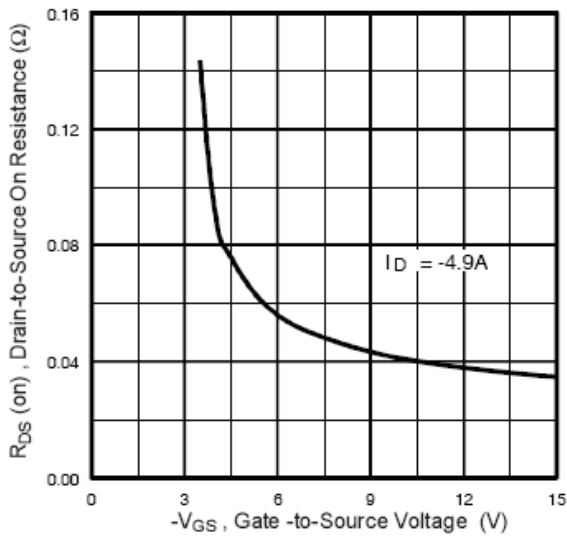

**Fig. 1** Typical Output Characteristics

**Fig. 2** Typical Output Characteristics

**Fig. 3** Typical Transfer Characteristics

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



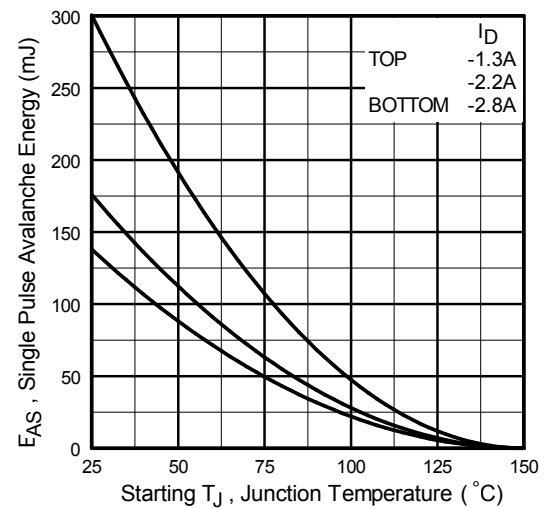
**Fig 5.** Normalized On-Resistance Vs. Temperature



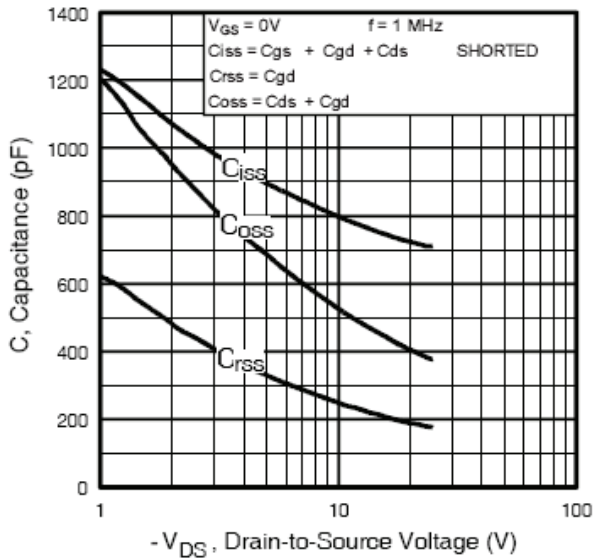
**Fig 6.** Typical On-Resistance Vs. Drain Current



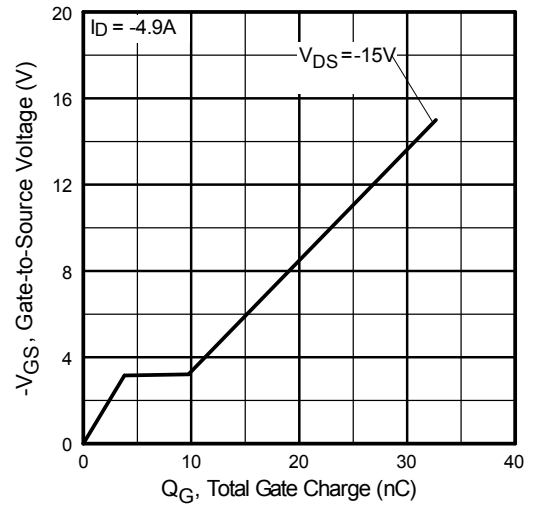
**Fig. 7** Typical On-Resistance Vs. Gate Voltage



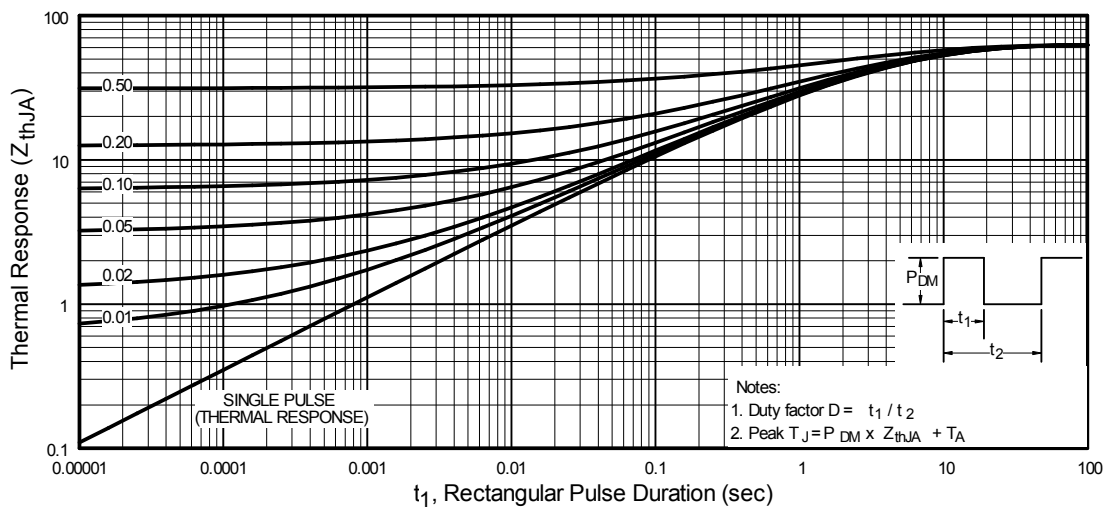
**Fig 8.** Maximum Avalanche Energy Vs. Drain Current



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

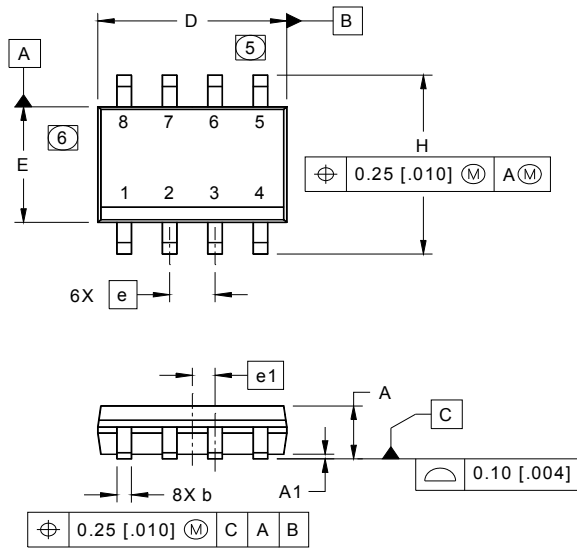


**Fig 10.** Typical Gate Charge Vs. Gate-to-Source Voltage



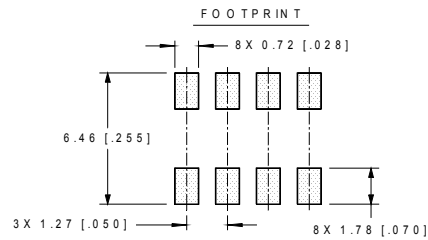
**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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

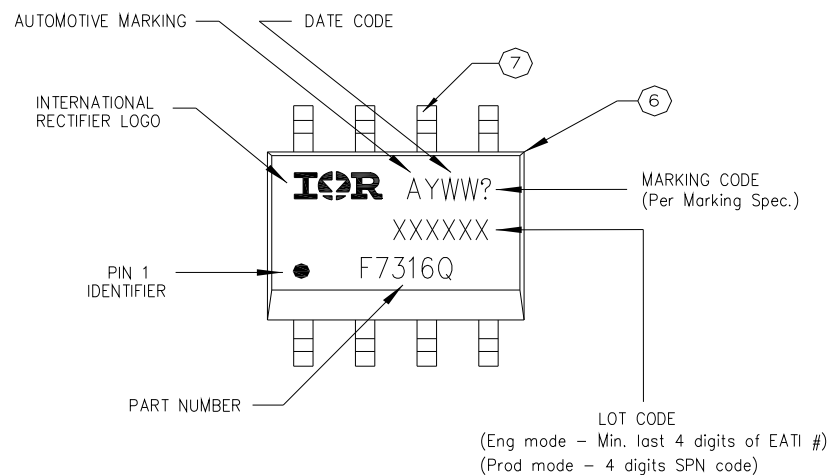


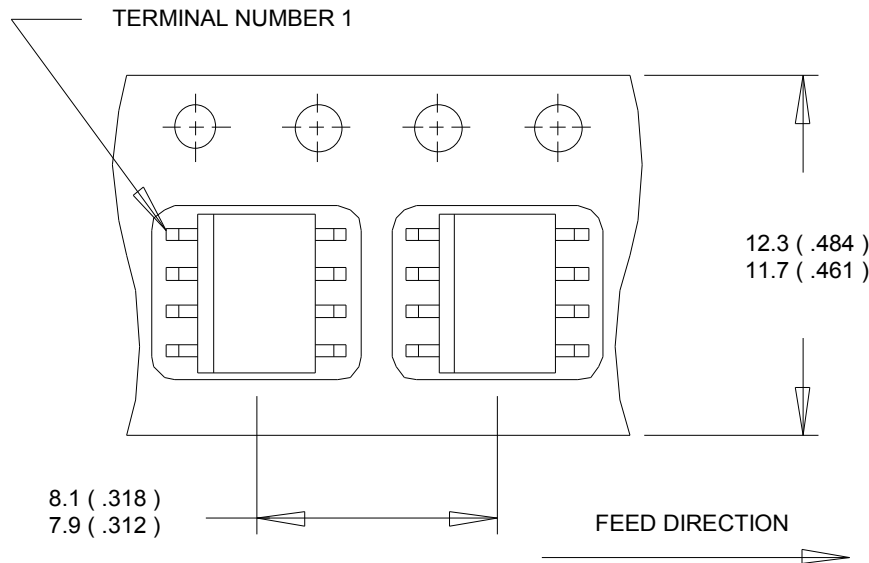
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e 1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40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

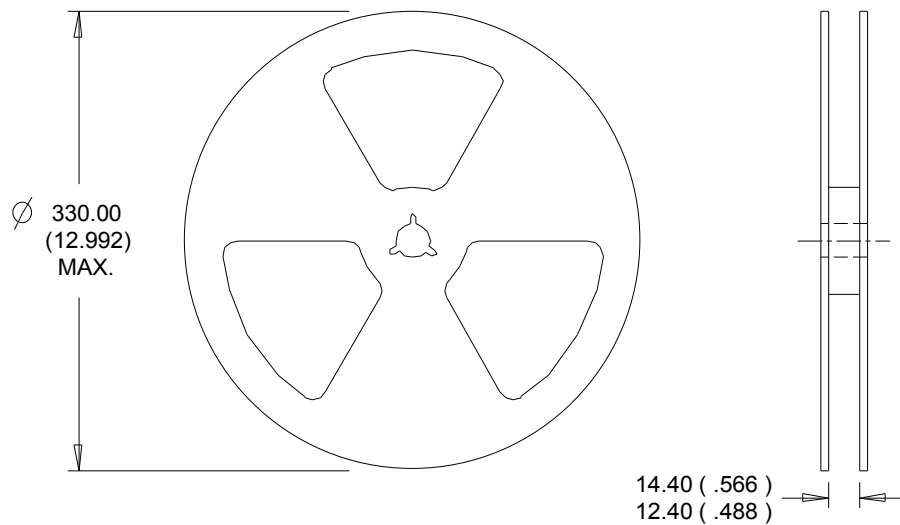


## SO-8 Part Marking Information



**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**

<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
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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