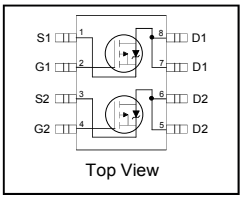
Features

- 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
max.	0.058Ω
I_D	-4.9A

SO-8
AUIRF7316Q

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°C	Continuous Drain Current, V_{GS} @ 10V ⑤	-4.9	A
I_D @ T_A = 70°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°C	Maximum Power Dissipation ⑤	2.0	W
P_D @T_A = 70°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 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	-30	—	—	V	V_{GS} = 0V, I_D = -250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.022	—	V/°C	Reference to 25°C, I_D = -1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	0.042	0.058	Ω	V_{GS} = -10V, I_D = -4.9A ④
		—	0.076	0.098		V_{GS} = -4.5V, I_D = -3.6A ④
$V_{GS(th)}$	Gate Threshold Voltage	-1.0	—	-3.0	V	V_{DS} = V_{GS}, I_D = -250µA
gfs	Forward Trans conductance	—	7.7	—	S	V_{DS} = -15V, I_D = -4.9A
I_{DSS}	Drain-to-Source Leakage Current	—	—	-1.0	µA	V_{DS} = -24V, V_{GS} = 0V
		—	—	-25		V_{DS} = -24V,V_{GS} = 0V,T_J =55°C
I_{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°C (unless otherwise specified)

Q_g	Total Gate Charge	—	23	34	nC	I_D = -4.9A
Q_{gs}	Gate-to-Source Charge	—	3.8	5.7		V_{DS} = -15V
Q_{gd}	Gate-to-Drain Charge	—	5.9	8.9		V_{GS} = -10V, See Fig.10 ④
$t_{d(on)}$	Turn-On Delay Time	—	13	19	ns	V_{DD} = -15V
t_r	Rise Time	—	13	20		I_D = -1.0A
$t_{d(off)}$	Turn-Off Delay Time	—	34	51		R_G = 6.0Ω
t_f	Fall Time	—	32	48		R_D = 15Ω ④
C_{iss}	Input Capacitance	—	710	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	380	—		V_{DS} = -25V
C_{rss}	Reverse Transfer Capacitance	—	180	—		f = 1.0MHz, 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. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	-30		
V_{SD}	Diode Forward Voltage	—	-0.78	-1.0	V	T_J = 25°C,I_S = -1.7A,V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time	—	44	66	ns	T_J = 25°C ,I_F = -1.7A,
Q_{rr}	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_J = 25°C, L = 35mH, R_G = 25Ω, I_{AS} = -2.8A.

③ I_{SD} ≤ -2.8A, di/dt ≤ 150A/µs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C.

④ Pulse width ≤ 300µs; duty cycle ≤ 2%.

⑤ Surface mounted on FR-4 board , t ≤ 10sec.

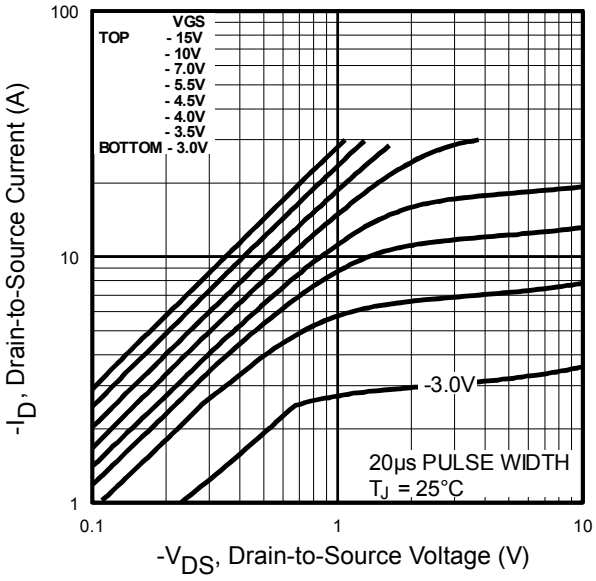


Fig. 1 Typical Output Characteristics

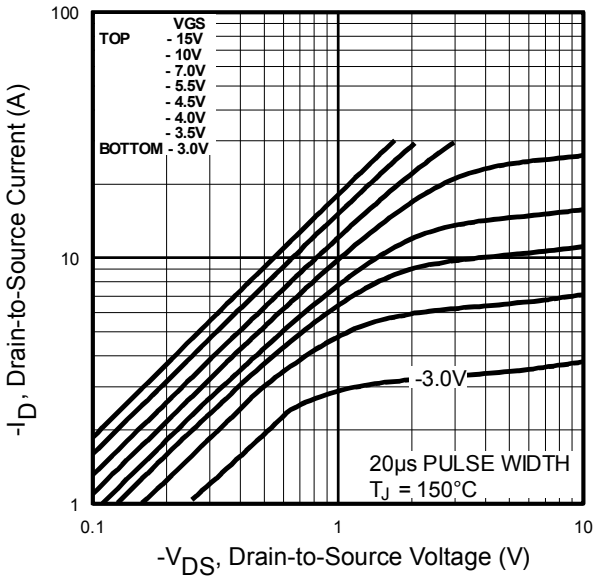


Fig. 2 Typical Output Characteristics

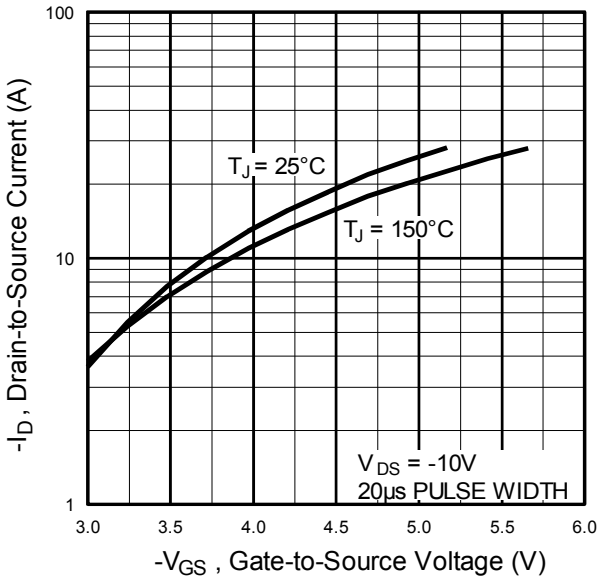


Fig. 3 Typical Transfer Characteristics

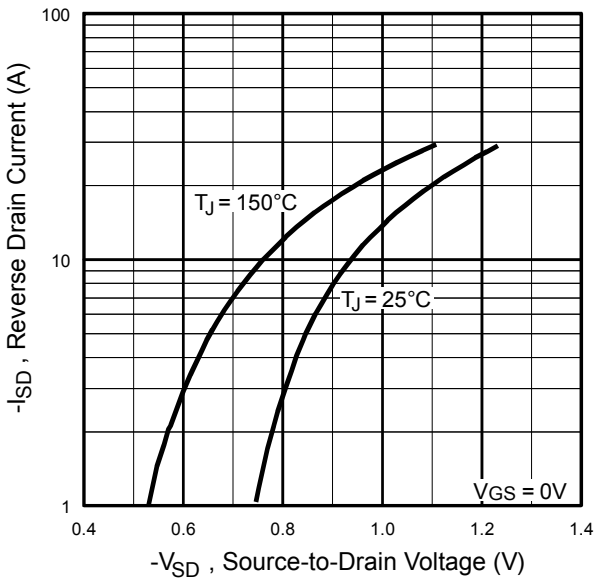


Fig. 4 Typical Source-Drain Diode Forward Voltage

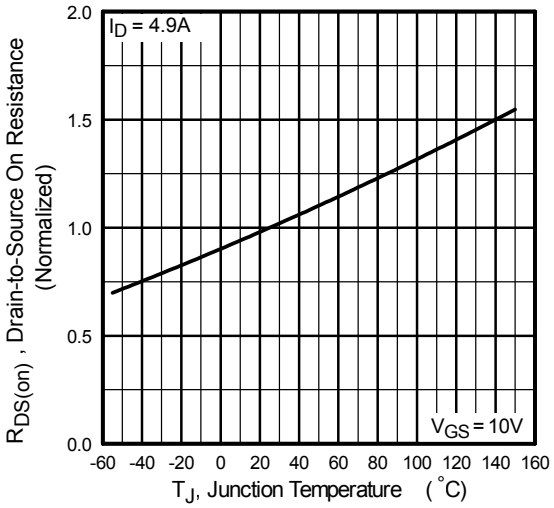


Fig 5. Normalized On-Resistance Vs. Temperature

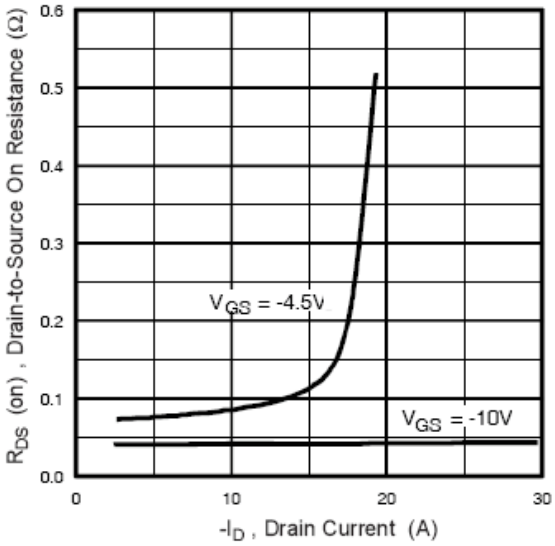


Fig 6. Typical On-Resistance Vs. Drain Current

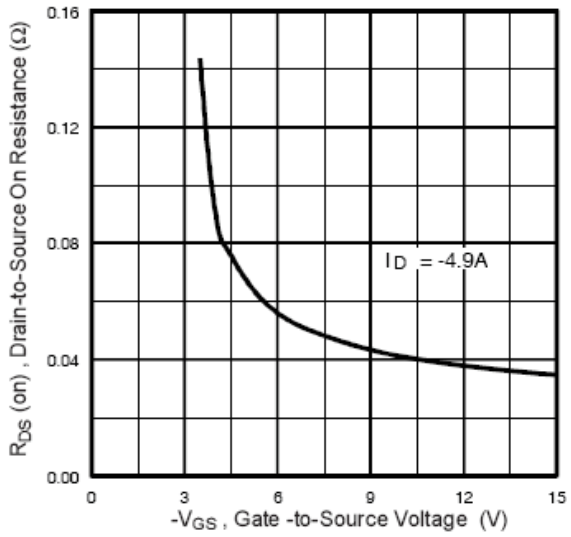


Fig. 7 Typical On-Resistance Vs. Gate Voltage

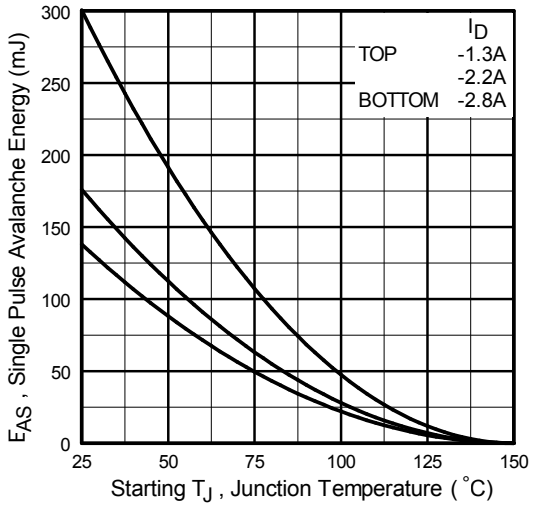


Fig 8. Maximum Avalanche Energy Vs. Drain Current

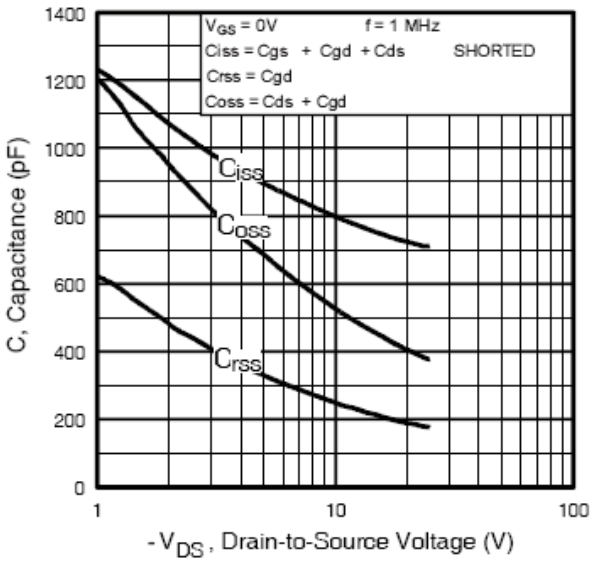


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

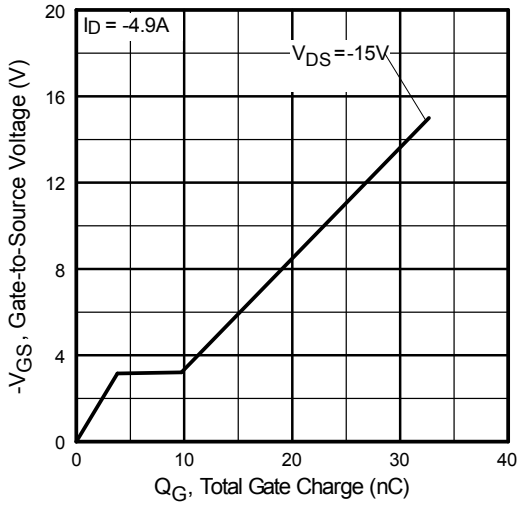


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

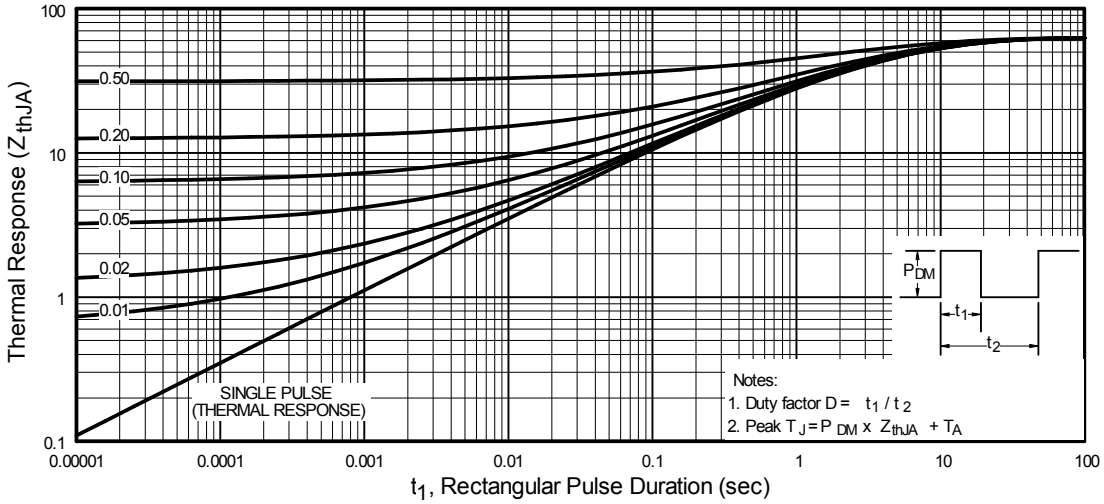
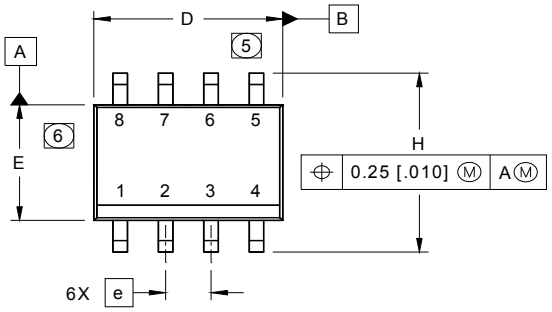
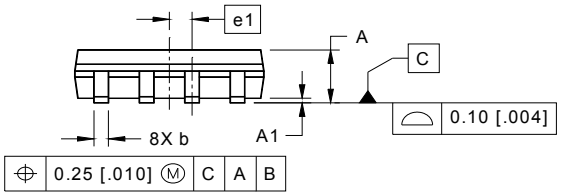


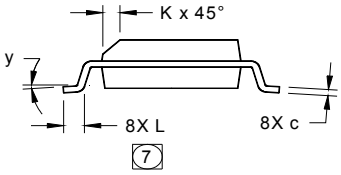
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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

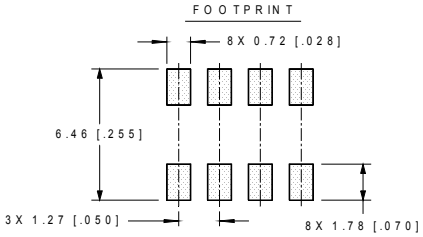


DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e 1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40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

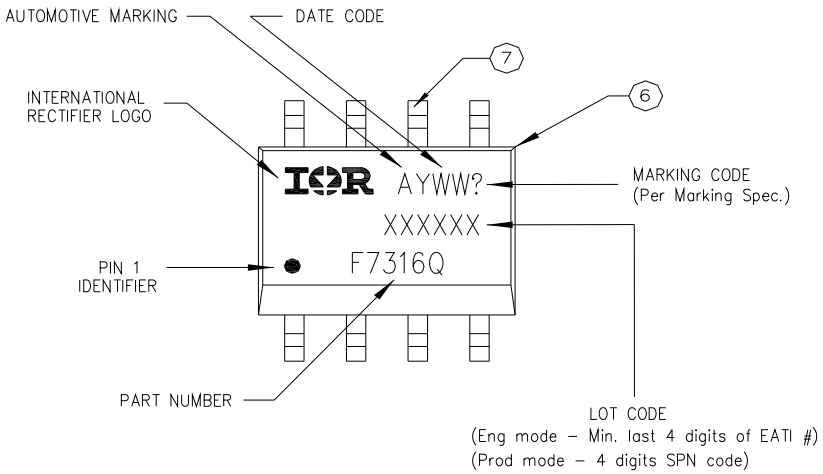




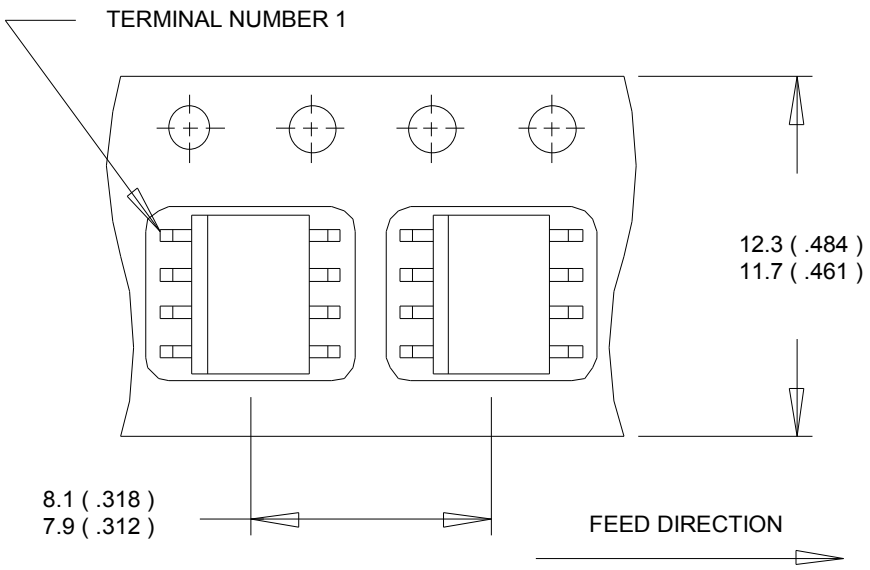
NOTES:
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [.006].
6. DIMENSION DOES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



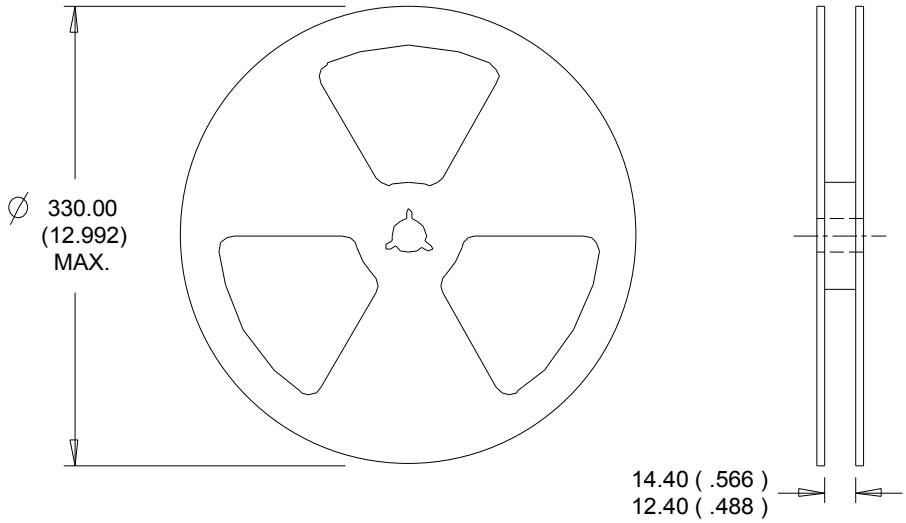
SO-8 Part Marking Information



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

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
4/3/2014	• Added "Logic Level Gate Drive" bullet in the features section on page 1 • Updated part marking on page 6. • 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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