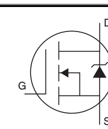
Static Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	60	——	——	V	V_{GS} = 0V, I_D = 250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	——	0.065	——	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	——	20	26	mΩ	V_{GS} = 10V, I_D = 4.2A ③
		——	23	30		V_{GS} = 4.5V, I_D = 3.5A ③
$V_{GS(th)}$	Gate Threshold Voltage	1.0	——	3.0	V	V_{DS} = V_{GS}, I_D = 250μA
gfs	Forward Transconductance	17	——	——	S	V_{DS} = 50V, I_D = 4.2A
I_{DSS}	Drain-to-Source Leakage Current	——	——	20	μA	V_{DS} = 48V, V_{GS} = 0V
		——	——	100		V_{DS} = 48V, V_{GS} = 0V, T_J = 125°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)

	Parameter	Min.	Typ.	Max.	Units	Conditions
Q_g	Total Gate Charge	——	21	31	nC	I_D = 4.2A
Q_{gs}	Gate-to-Source Charge	——	4.3	——		V_{DS} = 48V
Q_{gd}	Gate-to-Drain ("Miller") Charge	——	9.6	——		V_{GS} = 4.5V
$t_{d(on)}$	Turn-On Delay Time	——	7.7	——	ns	V_{DD} = 30V
t_r	Rise Time	——	2.6	——		I_D = 4.2A
$t_{d(off)}$	Turn-Off Delay Time	——	44	——		R_G = 6.2Ω
t_f	Fall Time	——	13	——		V_{GS} = 10V ③
C_{iss}	Input Capacitance	——	1740	——	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	——	300	——		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	——	37	——		f = 1.0MHz
C_{oss}	Output Capacitance	——	1590	——		V_{GS} = 0V, V_{DS} = 1.0V, f =1.0MHz
C_{oss}	Output Capacitance	——	220	——		V_{GS} = 0V, V_{DS} = 48V, f =1.0MHz
C_{oss}	Output Capacitance	——	410	——		V_{GS} = 0V, V_{DS} = 0V to 48V ⑤

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	——	——	2.3	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	——	——	56		
V_{SD}	Diode Forward Voltage	——	——	1.3	V	T_J = 25°C, I_S = 4.2A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	——	52	78	ns	T_J = 25°C, I_F = 4.2A
Q_{rr}	Reverse Recovery Charge	——	100	150	nC	di/dt = 100A/μs ③

Notes:

① Repetitive rating; pulse width limited by max. junction temperature.

② Starting T_J = 25°C, L = 16mH R_G = 25Ω, I_{AS} = 4.2A.

③ Pulse width ≤ 400μs; duty cycle ≤ 2%.

④ When mounted on 1 inch square copper board

⑤ C_{oss} eff. is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to 80% V_{DSS}

⑥ I_{SD} ≤ 4.2A, di/dt ≤ 160A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C

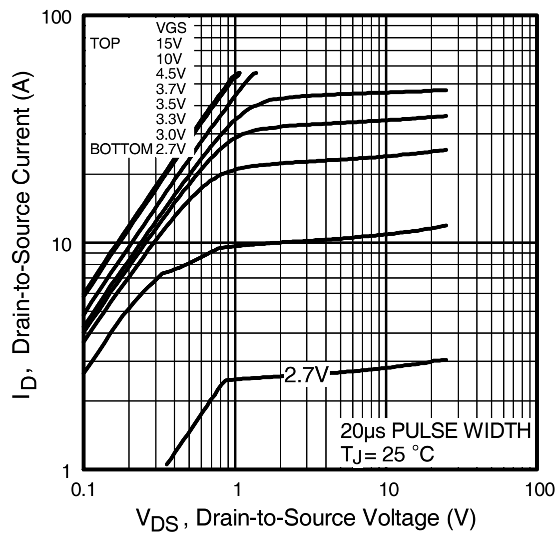


Fig 1. Typical Output Characteristics

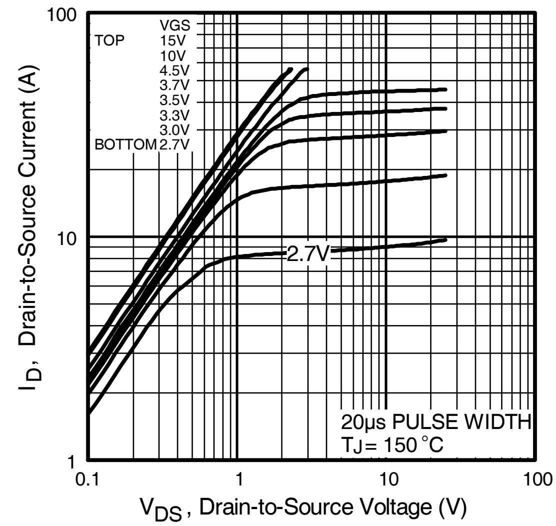


Fig 2. Typical Output Characteristics

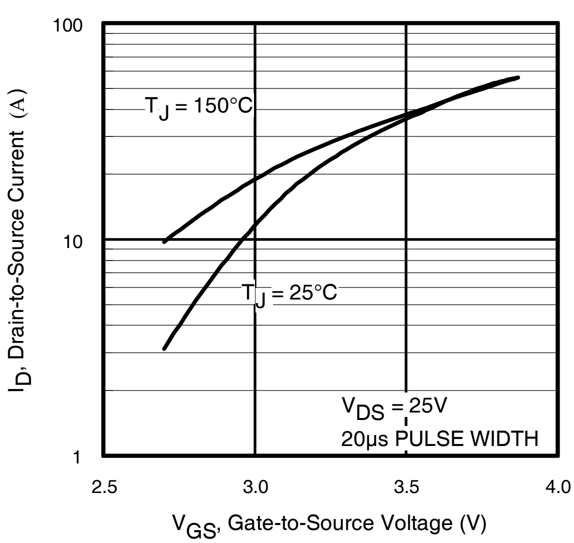


Fig 3. Typical Transfer Characteristics

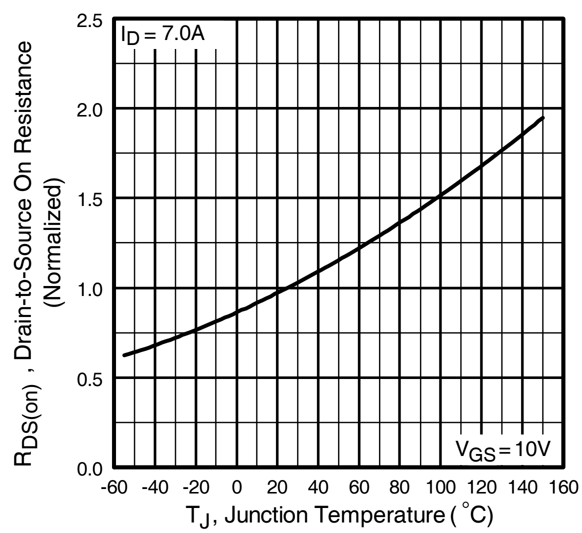


Fig 4. Normalized On-Resistance Vs. Temperature

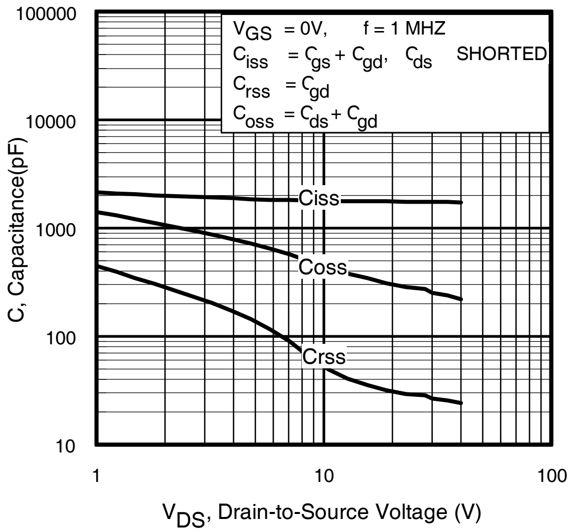


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

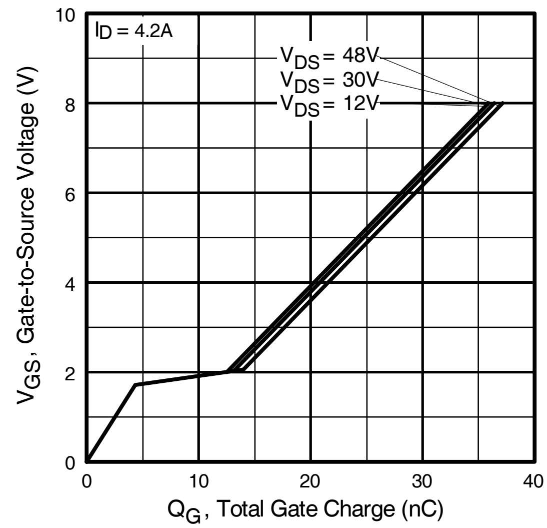


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

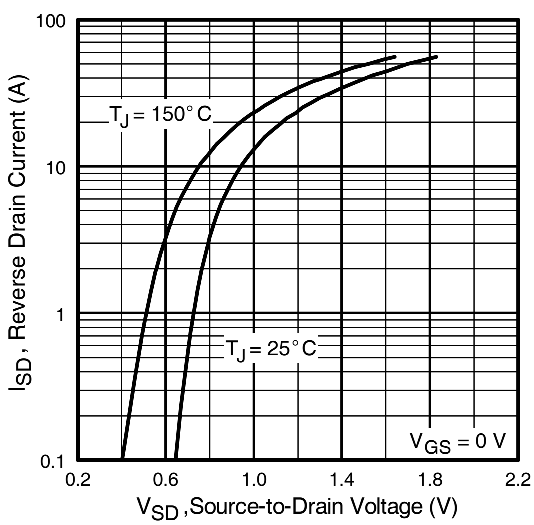


Fig 7. Typical Source-Drain Diode Forward Voltage

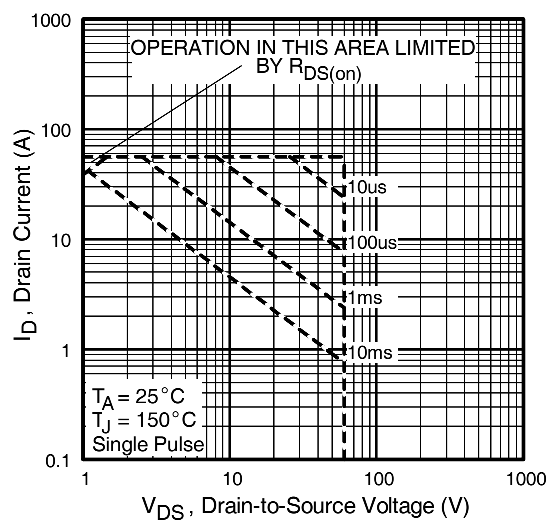


Fig 8. Maximum Safe Operating Area

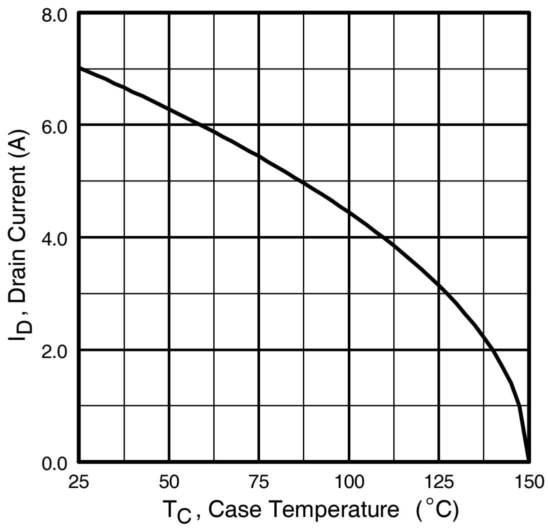


Fig 9. Maximum Drain Current Vs. Ambient Temperature

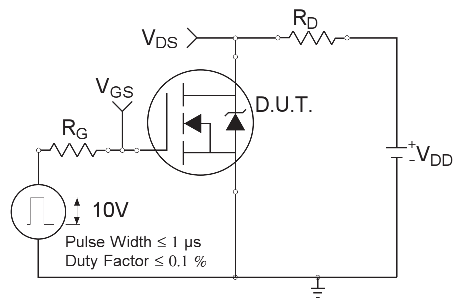


Fig 10a. Switching Time Test Circuit

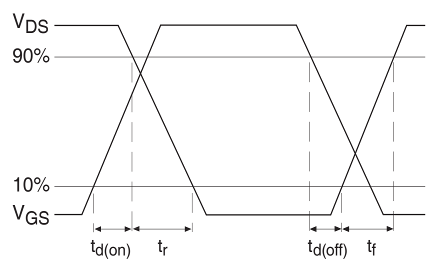


Fig 10b. Switching Time Waveforms

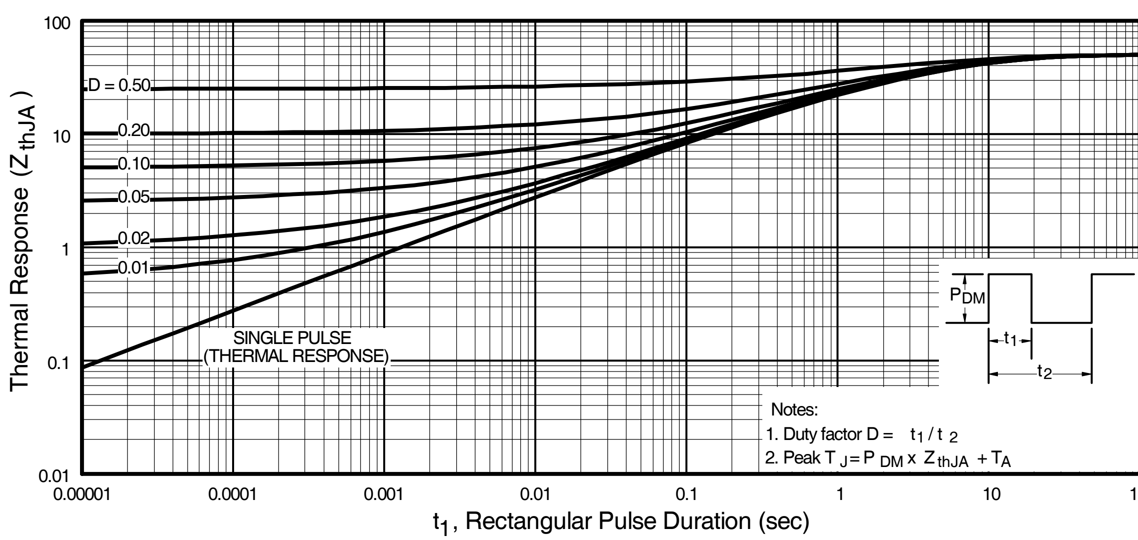


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

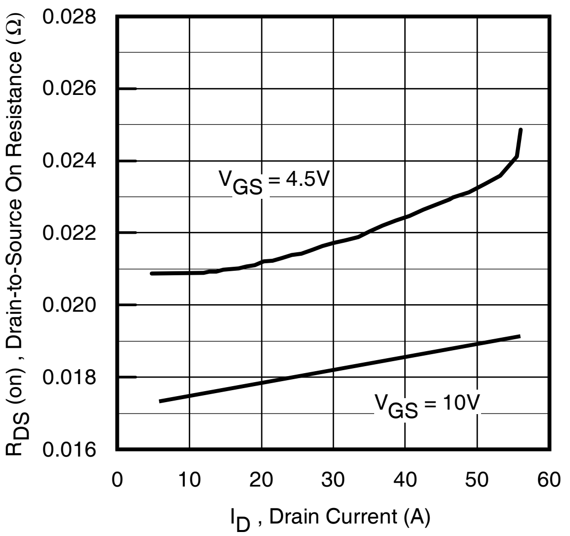


Fig 12. On-Resistance Vs. Drain Current

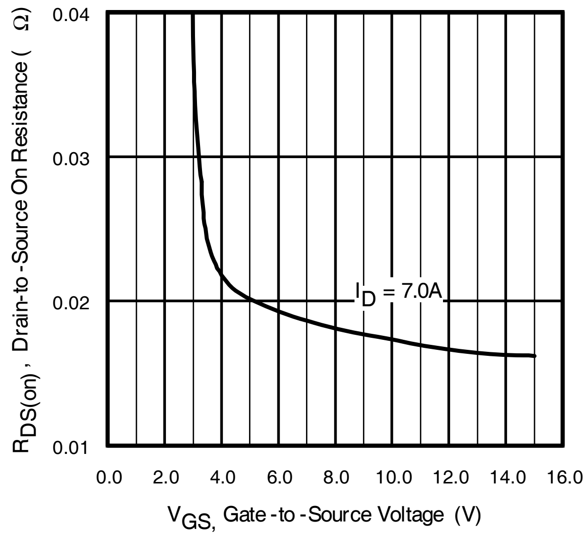


Fig 13. On-Resistance Vs. Gate Voltage

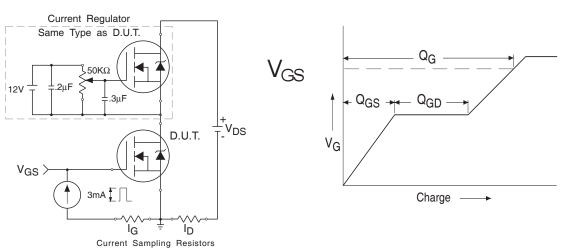


Fig 14a&b. Basic Gate Charge Test Circuit and Waveform

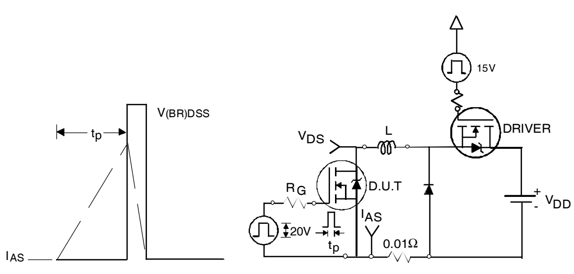


Fig 15a&b. Unclamped Inductive Test circuit and Waveforms

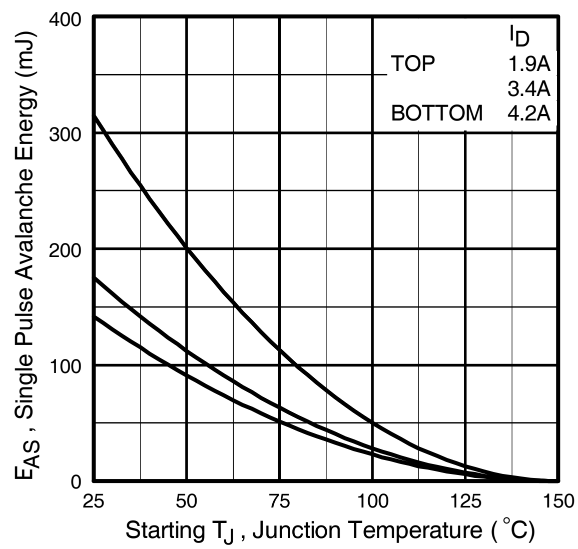
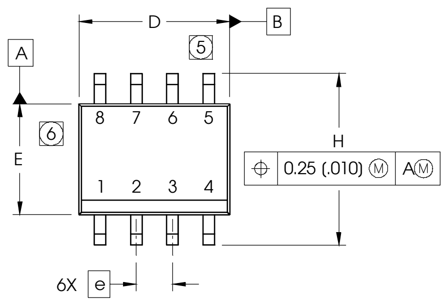


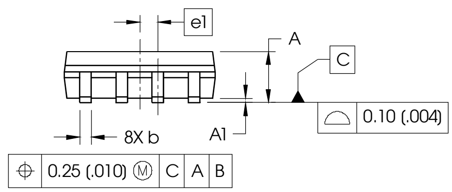
Fig 15c. Maximum Avalanche Energy Vs. Drain Current

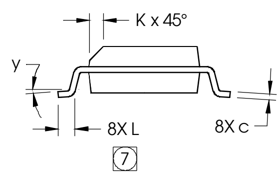
SO-8 Package Outline

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	
e1	.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°

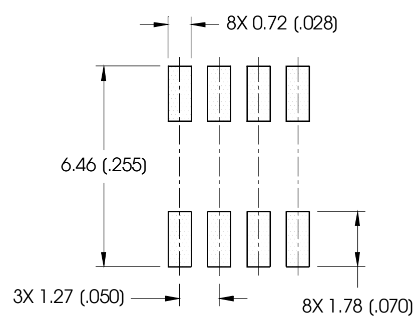




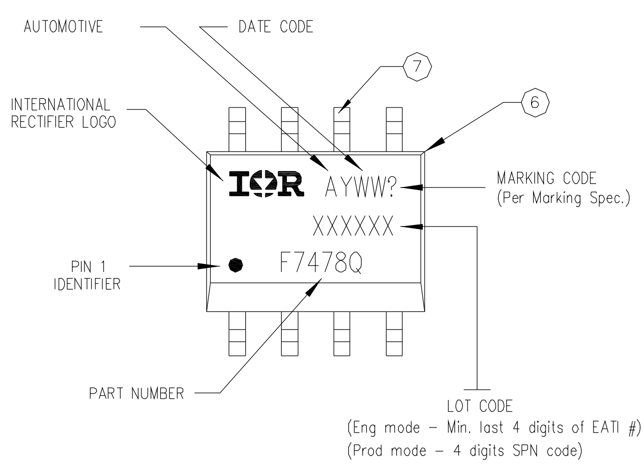
NOTES:

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.

FOOTPRINT



SO-8 Part Marking

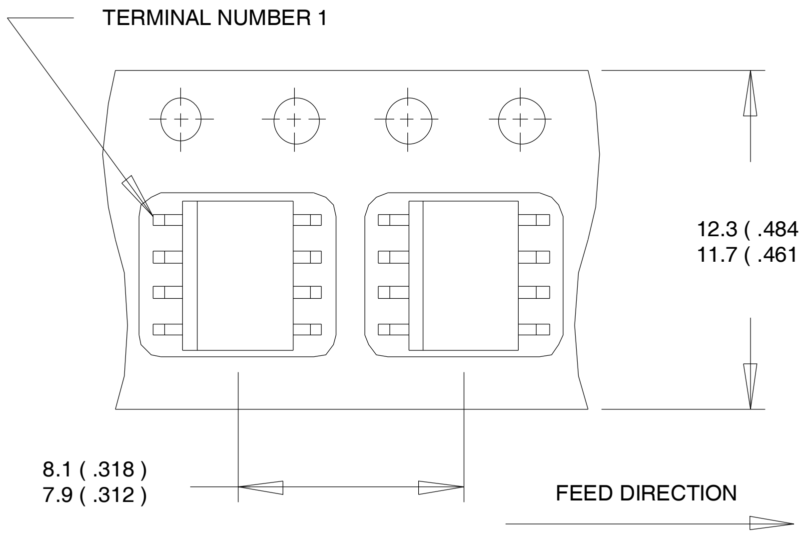


TOP MARKING (LASER)

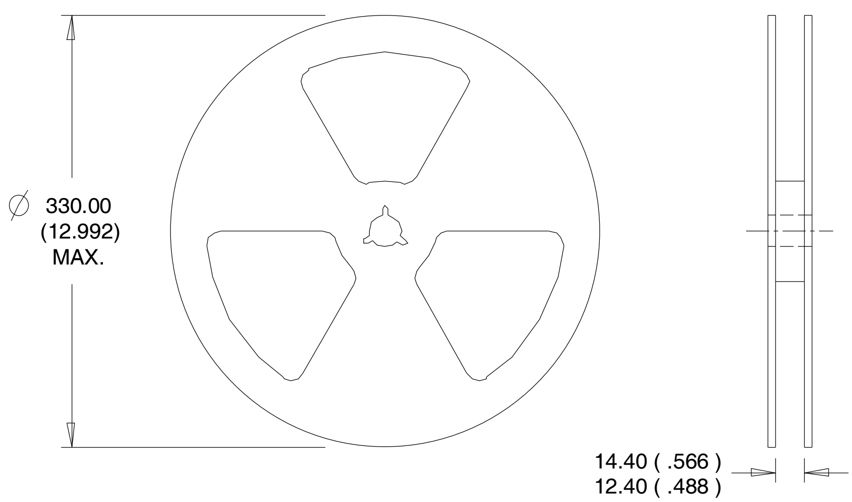
Note: For the most current drawing please refer to IR website at http://www.irf.com/package/

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. IR'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 M3(+/- 300V)[†††] (per AEC-Q101-002)	
	Human Body Model	Class H1C(+/- 2000V)[†††] (per AEC-Q101-001)	
	Charged Device Model	Class C5(+/- 2000V)[†††] (per AEC-Q101-005)	
RoHS Compliant		Yes	

† Qualification standards can be found at International Rectifier's web site: http//www.irf.com/

†† Exceptions (if any) to AEC-Q101 requirements are noted in the qualification report.

††† Highest passing voltage

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http://www.irf.com/technical-info/

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Tel: (310) 252-7105

Revision History

Date	Comments
3/11/2014	• Added "Logic Level Gate Drive" bullet in the features section on page 1 • Updated data sheet with new IR corporate template