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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	55	—	—	V	V_{GS} = 0V, I_D = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.061	—	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.040	Ω	V_{GS} = 10V, I_D = 3.8A ④
		—	—	0.051		V_{GS} = 5.0V, I_D = 3.8A ④
		—	—	0.065		V_{GS} = 4.0V, I_D = 1.9A ④
$V_{GS(th)}$	Gate Threshold Voltage	1.0	—	2.0	V	V_{DS} = V_{GS}, I_D = 250µA
gfs	Forward Transconductance	5.1	—	—	S	V_{DS} = 25V, I_D = 1.9A
I_{DSS}	Drain-to-Source Leakage Current	—	—	25	µA	V_{DS} = 55V, V_{GS} = 0V
		—	—	250		V_{DS} = 44V, V_{GS} = 0V, T_J = 150°C
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V_{GS} = 16V
	Gate-to-Source Reverse Leakage	—	—	-100		V_{GS} = -16V

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
Q_g	Total Gate Charge	—	32	48	nC	I_D = 3.8A
Q_{gs}	Gate-to-Source Charge	—	3.5	5.3		V_{DS} = 44V
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	9.7	14		V_{GS} = 10V, See Fig. 6 and 9 ④
$t_{d(on)}$	Turn-On Delay Time	—	6.2	—	ns	V_{DD} = 28V
t_r	Rise Time	—	12	—		I_D = 3.8A
$t_{d(off)}$	Turn-Off Delay Time	—	35	—		R_G = 6.2Ω
t_f	Fall Time	—	22	—		R_D = 7.1Ω, See Fig. 10 ④
C_{iss}	Input Capacitance	—	870	—	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	—	220	—		V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance	—	92	—		f = 1.0MHz, See Fig. 5

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	0.91	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	—	—	1.3	V	T_J = 25°C, I_S = 3.8A, V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time	—	58	88	ns	T_J = 25°C, I_F = 3.8A
Q_{rr}	Reverse Recovery Charge	—	140	210	nC	di/dt = 100A/µs ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

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

② V_{DD} = 25V, starting T_J = 25°C, L = 15mH R_G = 25Ω, I_{AS} = 3.8A. (See Figure 12)

③ I_{SD} ≤ 3.8A, di/dt ≤ 220A/µs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C .

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

⑤ When mounted on FR-4 board using minimum recommended footprint.

⑥ When mounted on 1 inch square copper board, for comparison with other SMD devices.

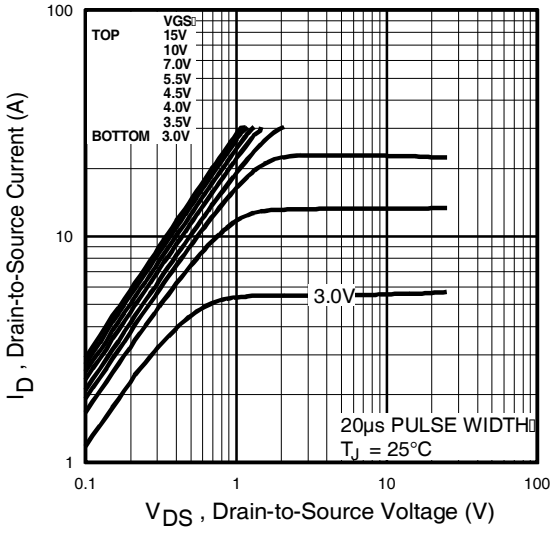


Fig 1. Typical Output Characteristics

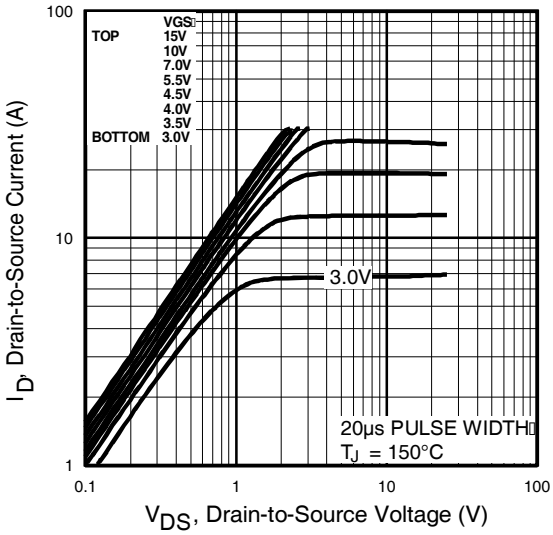


Fig 2. Typical Output Characteristics

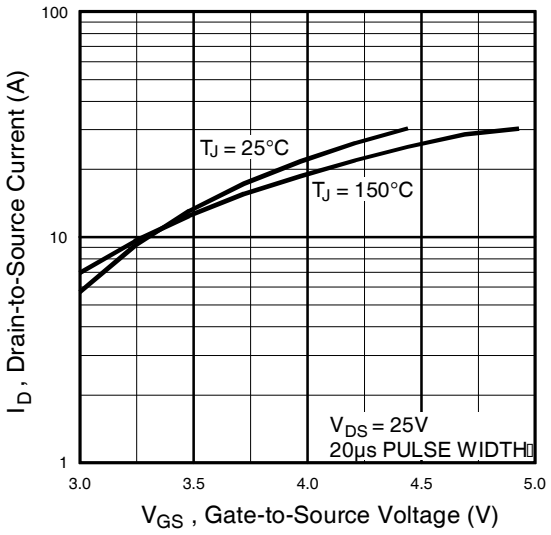


Fig 3. Typical Transfer Characteristics

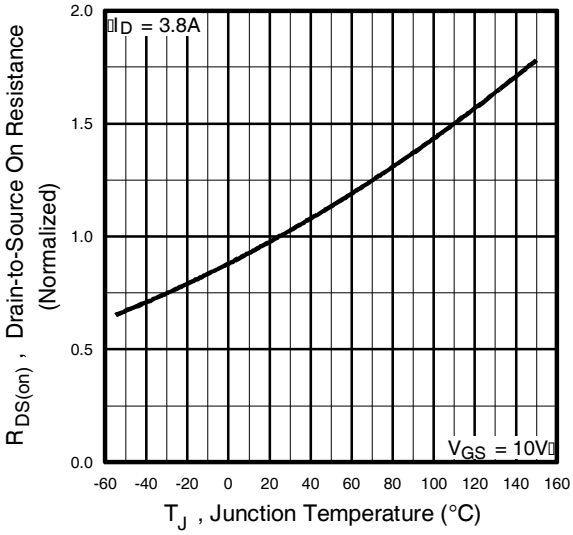


Fig 4. Normalized On-Resistance Vs. Temperature

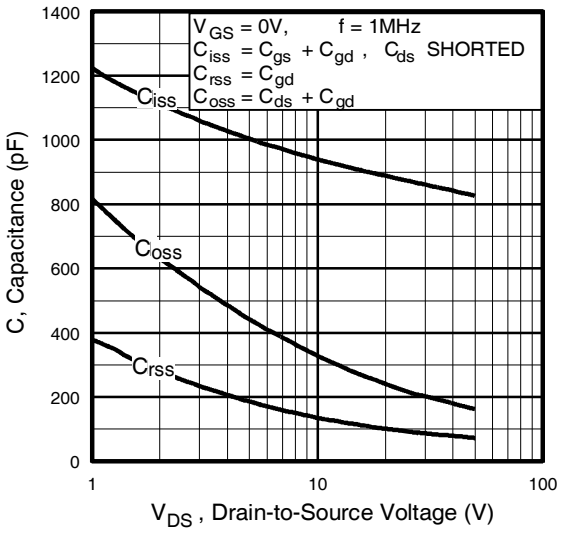


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

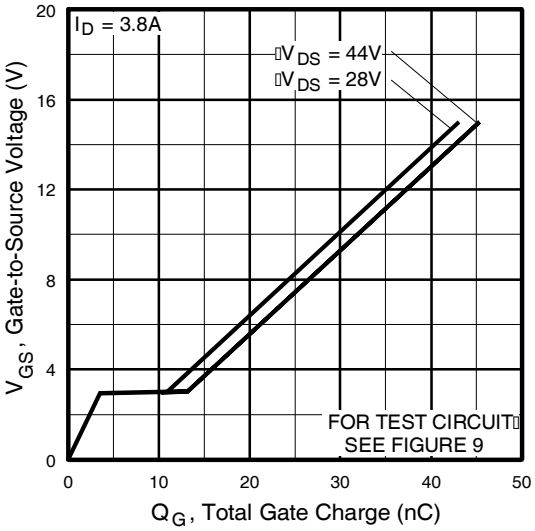


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

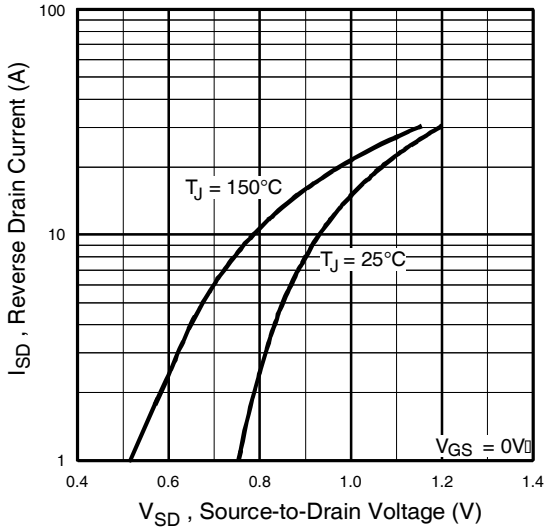


Fig 7. Typical Source-Drain Diode Forward Voltage

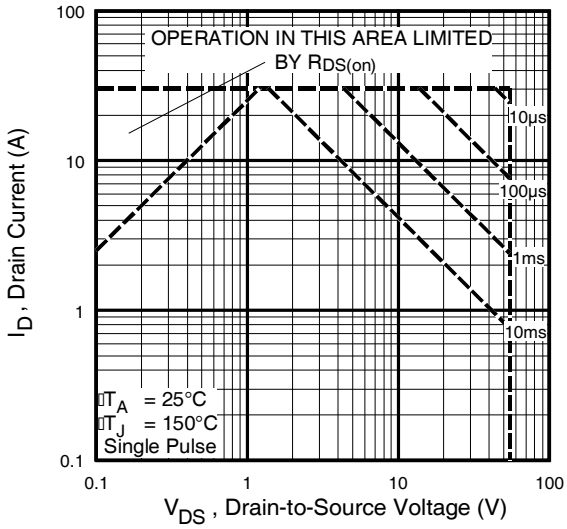


Fig 8. Maximum Safe Operating Area

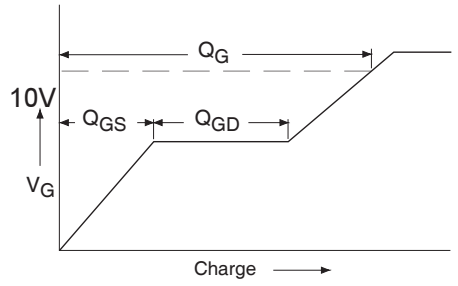


Fig 9a. Basic Gate Charge Waveform

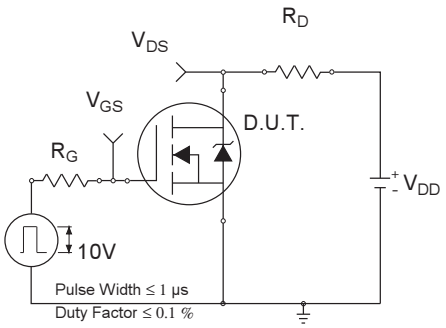


Fig 10a. Switching Time Test Circuit

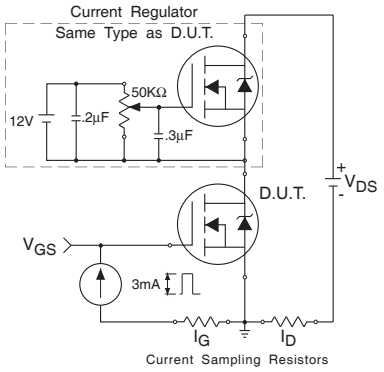


Fig 9b. Gate Charge Test Circuit

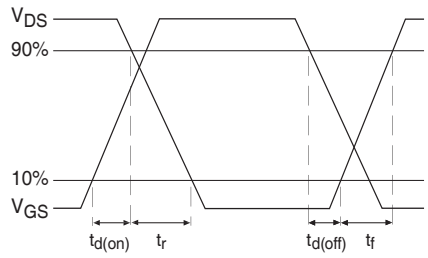


Fig 10b. Switching Time Waveforms

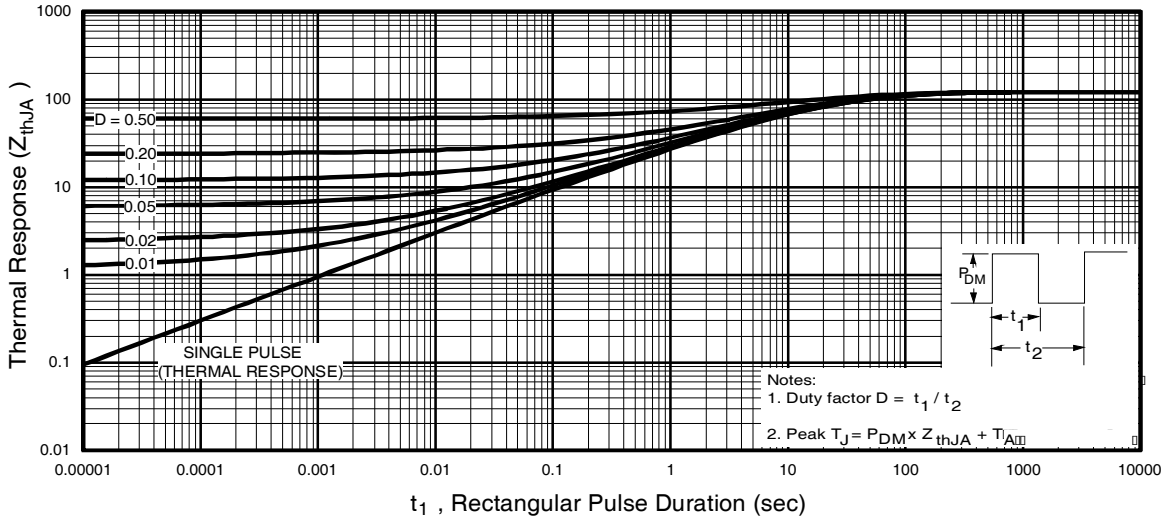


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

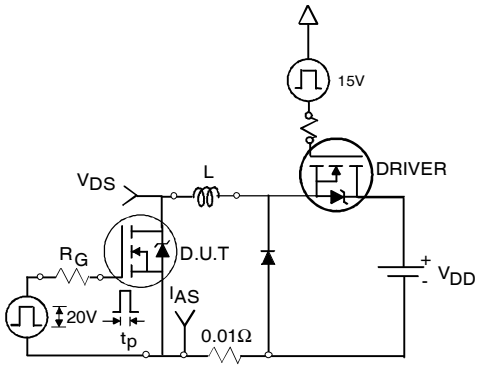


Fig 12a. Unclamped Inductive Test Circuit

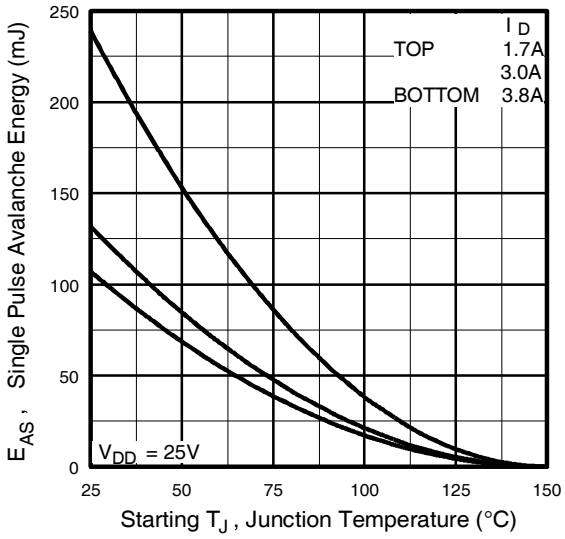


Fig 12c. Maximum Avalanche Energy Vs. Drain Current

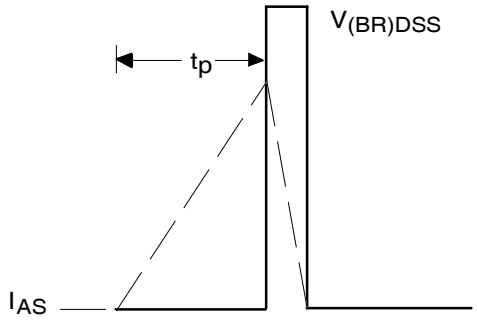
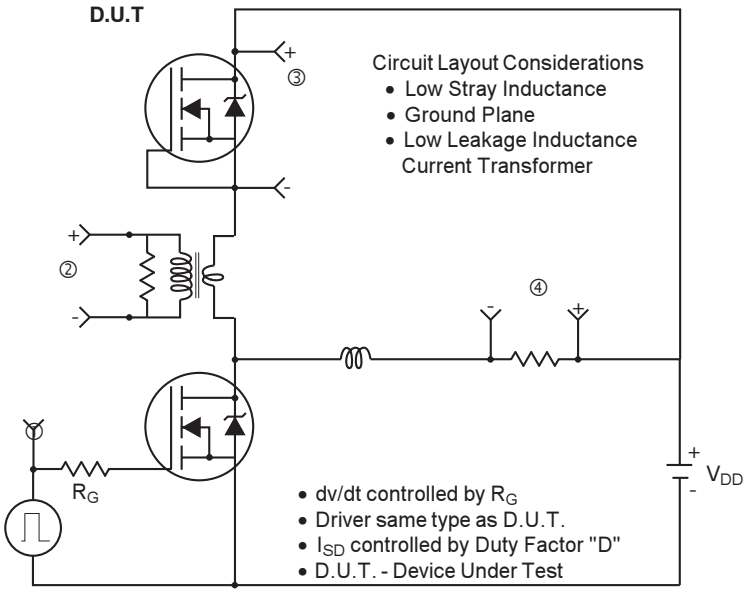


Fig 12b. Unclamped Inductive Waveforms

Peak Diode Recovery dv/dt Test Circuit



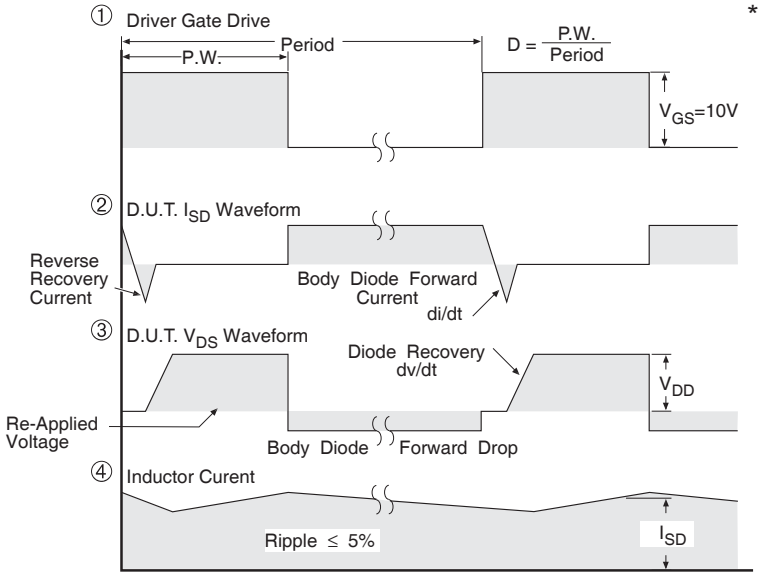
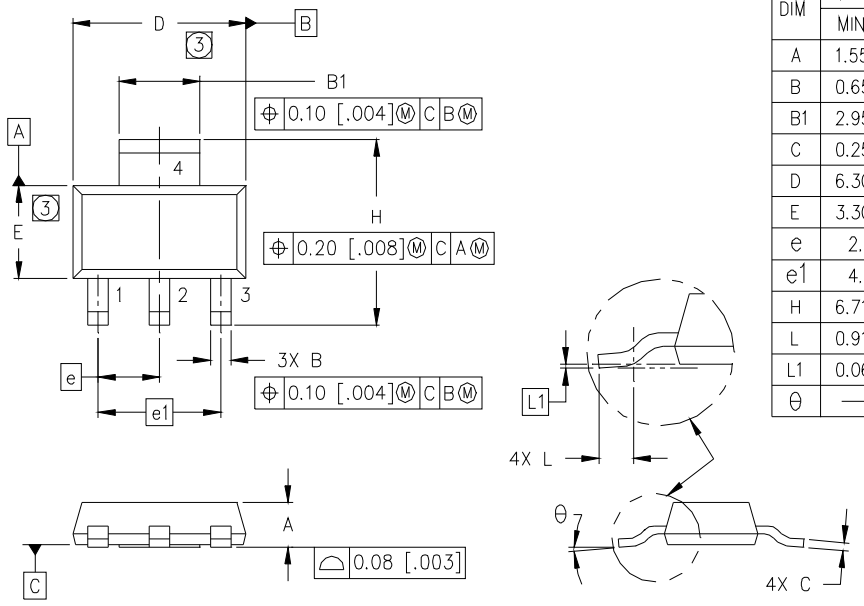


Fig 13. For N-Channel HEXFETS

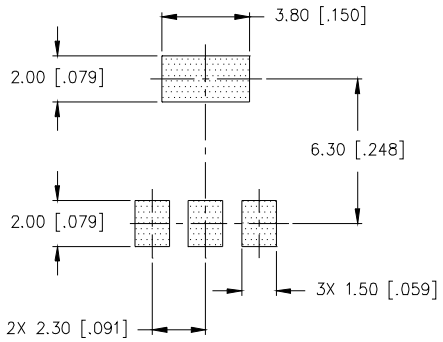
SOT-223 (TO-261AA) Package Outline

Dimensions are shown in milimeters (inches)



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.55	1.80	.061	.071
B	0.65	0.85	.026	.033
B1	2.95	3.15	.116	.124
C	0.25	0.35	.010	.014
D	6.30	6.70	.248	.264
E	3.30	3.70	.130	.146
e	2.30 BSC		.0905 BSC	
e1	4.60 BSC		.181 BSC	
H	6.71	7.29	.264	.287
L	0.91	—	.036	—
L1	0.061 BSC		.0024 BSC	
θ	—	10°	—	10°

MINIMUM RECOMMENDED FOOTPRINT



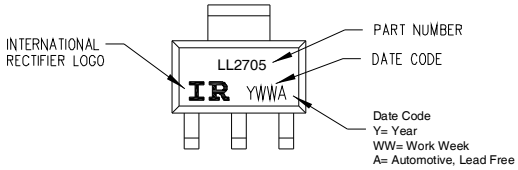
LEAD ASSIGNMENTS

1 = GATE
2 = DRAIN
3 = SOURCE
4 = DRAIN

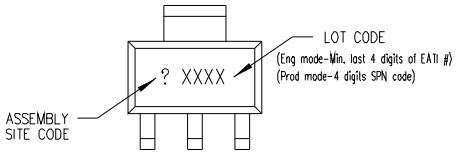
NOTES:

1. DIMENSIONING & TOLERANCING PER ASME Y14.5M–1994.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSIONS DO NOT INCLUDE MOLD FLASH.
4. OUTLINE CONFORMS TO JEDEC OUTLINE TO–261AA.
5. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].

SOT-223 (TO-261AA) Part Marking Information



TOP MARKING

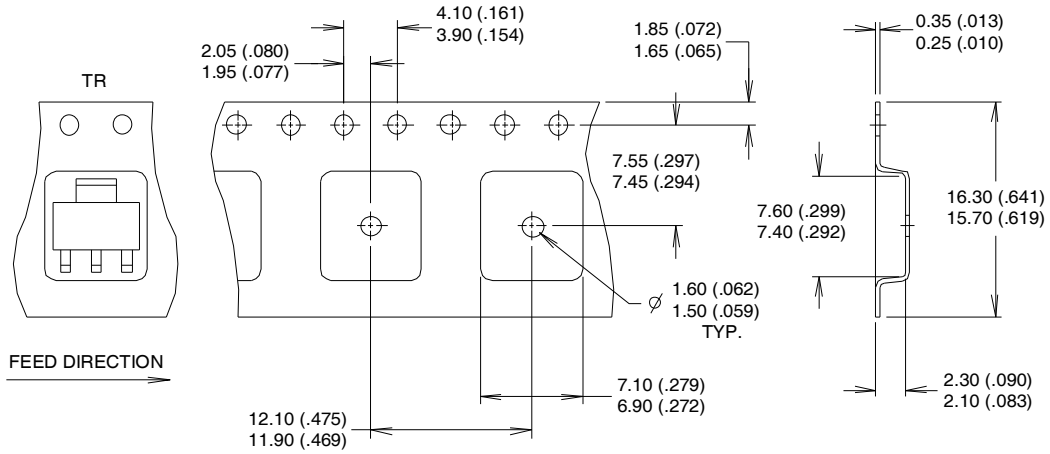


BOTTOM MARKING

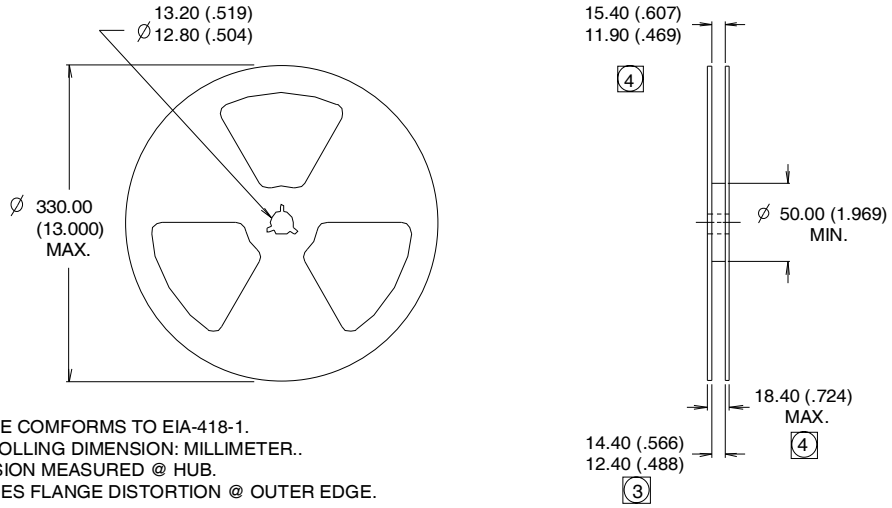
Note: For the most current drawing please refer to IR website at http://www.irf.com/package/

SOT-223 (TO-261AA) Tape & Reel Information

Dimensions are shown in milimeters (inches)



NOTES :
1. CONTROLLING DIMENSION: MILLIMETER.
2. OUTLINE CONFORMS TO EIA-481 & EIA-541.
3. EACH Ø330.00 (13.00) REEL CONTAINS 2,500 DEVICES.



NOTES :
1. OUTLINE COMFORMS TO EIA-418-1.
2. CONTROLLING DIMENSION: MILLIMETER..
3. DIMENSION MEASURED @ HUB.
4. INCLUDES FLANGE DISTORTION @ OUTER EDGE.

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		SOT-223	MSL1
ESD	Machine Model	Class M2 (+/- 200V)††† AEC-Q101-002	
	Human Body Model	Class H1B (+/- 750V)††† AEC-Q101-001	
	Charged Device Model	Class C5 (+/- 1125V)††† 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
3/26/2014	• Added "Logic Level Gate Drive" bullet in the features section on page 1 • Updated part marking on page 8 • Updated data sheet with new IR corporate template