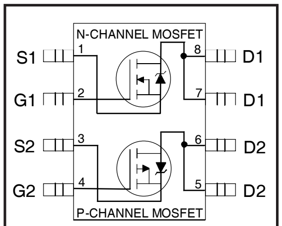
PD - 96110

International
IOR Rectifier

IRF7343QPBF

HEXFET® Power MOSFET

- Advanced Process Technology
- Ultra Low On-Resistance
- Dual N and P Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- 150°C Operating Temperature
- Automotive [Q101] Qualified
- Lead-Free



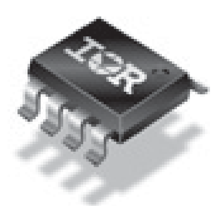
Top View

	N-Ch	P-Ch
V_{DSS}	55V	-55V
$R_{DS(on)}$	0.050Ω	0.105Ω

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.



SO-8

Absolute Maximum Ratings

	Parameter	Max. N-Channel	Max. P-Channel	Units
V_{DS}	Drain-Source Voltage	55	-55	V
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	4.7	-3.4	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	3.8	-2.7	A
I_{DM}	Pulsed Drain Current ①	38	-27	A
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		W
E_{AS}	Single Pulse Avalanche Energy③	72	114	mJ
I_{AR}	Avalanche Current	4.7	-3.4	A
E_{AR}	Repetitive Avalanche Energy	0.20		mJ
V_{GS}	Gate-to-Source Voltage	± 20		V
dv/dt	Peak Diode Recovery dv/dt ②	5.0	-5.0	V/ns
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150		°C

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ⑤	–––	62.5	°C/W

07/23/07

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

	Parameter		Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	N-Ch	55	—	—	V	V_{GS} = 0V, I_D = 250μA
		P-Ch	-55	—	—		V_{GS} = 0V, I_D = -250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	N-Ch	—	0.059	—	V/°C	Reference to 25°C, I_D = 1mA
		P-Ch	—	0.054	—		Reference to 25°C, I_D = -1mA
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	N-Ch	—	0.043	0.050	Ω	V_{GS} = 10V, I_D = 4.7A ④
			—	0.056	0.065		V_{GS} = 4.5V, I_D = 3.8A ④
		P-Ch	—	0.095	0.105		V_{GS} = -10V, I_D = -3.4A ④
			—	0.150	0.170		V_{GS} = -4.5V, I_D = -2.7A ④
$V_{GS(th)}$	Gate Threshold Voltage	N-Ch	1.0	—	—	V	V_{DS} = V_{GS}, I_D = 250μA
		P-Ch	-1.0	—	—		V_{DS} = V_{GS}, I_D = -250μA
g_{fs}	Forward Transconductance	N-Ch	7.9	—	—	S	V_{DS} = 10V, I_D = 4.5A ④
		P-Ch	3.3	—	—		V_{DS} = -10V, I_D = -3.1A ④
I_{DSS}	Drain-to-Source Leakage Current	N-Ch	—	—	2.0	μA	V_{DS} = 55V, V_{GS} = 0V
		P-Ch	—	—	-2.0		V_{DS} = -55V, V_{GS} = 0V
		N-Ch	—	—	25		V_{DS} = 55V, V_{GS} = 0V, T_J = 55°C
		P-Ch	—	—	-25		V_{DS} = -55V, V_{GS} = 0V, T_J = 55°C
I_{GSS}	Gate-to-Source Forward Leakage	N-P	—	—	±100	nA	V_{GS} = ±20V
Q_g	Total Gate Charge	N-Ch	—	24	36	nC	N-Channel I_D = 4.5A, V_{DS} = 44V, V_{GS} = 10V ④ P-Channel I_D = -3.1A, V_{DS} = -44V, V_{GS} = -10V
		P-Ch	—	26	38		
Q_{gs}	Gate-to-Source Charge	N-Ch	—	2.3	3.4		
		P-Ch	—	3.0	4.5		
Q_{gd}	Gate-to-Drain ("Miller") Charge	N-Ch	—	7.0	10		
		P-Ch	—	8.4	13		
$t_{d(on)}$	Turn-On Delay Time	N-Ch	—	8.3	12	ns	N-Channel V_{DD} = 28V, I_D = 1.0A, R_G = 6.0Ω, R_D = 28Ω ④ P-Channel V_{DD} = -28V, I_D = -1.0A, R_G = 6.0Ω, R_D = 28Ω
		P-Ch	—	14	22		
t_r	Rise Time	N-Ch	—	3.2	4.8		
		P-Ch	—	10	15		
$t_{d(off)}$	Turn-Off Delay Time	N-Ch	—	32	48		
		P-Ch	—	43	64		
t_f	Fall Time	N-Ch	—	13	20		
		P-Ch	—	22	32		
C_{iss}	Input Capacitance	N-Ch	—	740	—	pF	N-Channel V_{GS} = 0V, V_{DS} = 25V, ƒ = 1.0MHz P-Channel V_{GS} = 0V, V_{DS} = -25V, ƒ = 1.0MHz
		P-Ch	—	690	—		
C_{oss}	Output Capacitance	N-Ch	—	190	—		
		P-Ch	—	210	—		
C_{rss}	Reverse Transfer Capacitance	N-Ch	—	71	—		
		P-Ch	—	86	—		

Source-Drain Ratings and Characteristics

	Parameter		Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	N-Ch	—	—	2.0	A	
		P-Ch	—	—	-2.0		
I_{SM}	Pulsed Source Current (Body Diode) ①	N-Ch	—	—	38		
		P-Ch	—	—	-27		
V_{SD}	Diode Forward Voltage	N-Ch	—	0.70	1.2	V	T_J = 25°C, I_S = 2.0A, V_{GS} = 0V ③
		P-Ch	—	-0.80	-1.2		T_J = 25°C, I_S = -2.0A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	N-Ch	—	60	90	ns	N-Channel T_J = 25°C, I_F = 2.0A, di/dt = 100A/μs P-Channel ④ T_J = 25°C, I_F = -2.0A, di/dt = 100A/μs
		P-Ch	—	54	80		
Q_{rr}	Reverse Recovery Charge	N-Ch	—	120	170	nC	
		P-Ch	—	85	130		

Notes:

① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 22)

② N-Channel I_{SD} ≤ 4.7A, di/dt ≤ 220A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C
P-Channel I_{SD} ≤ -3.4A, di/dt ≤ -150A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C

③ N-Channel Starting T_J = 25°C, L = 6.5mH R_G = 25Ω, I_{AS} = 4.7A.
P-Channel Starting T_J = 25°C, L = 20mH R_G = 25Ω, I_{AS} = -3.4A.

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

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

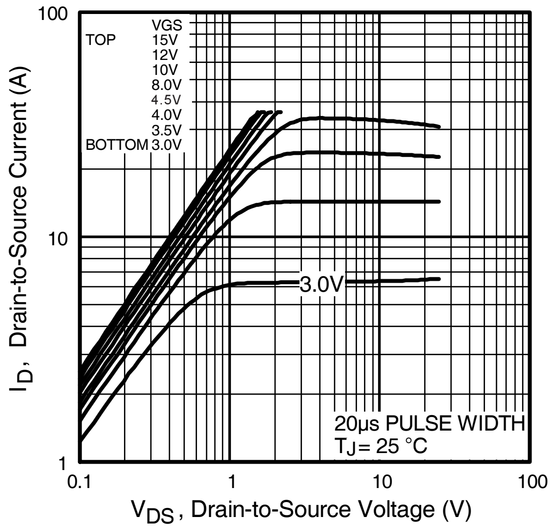


Fig 1. Typical Output Characteristics

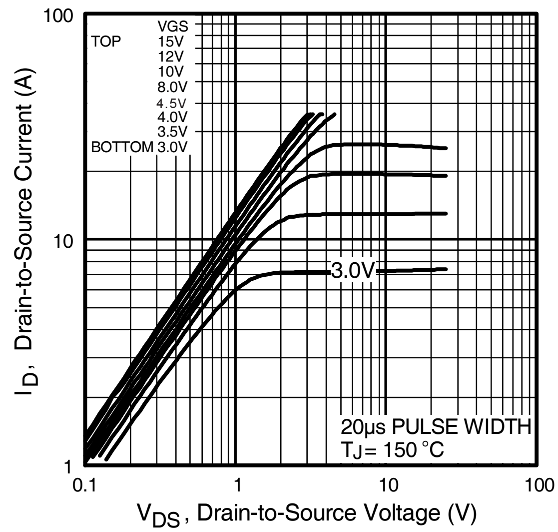


Fig 2. Typical Output Characteristics

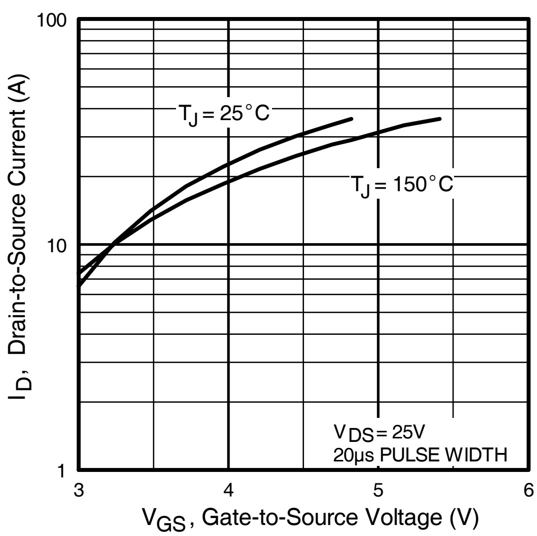


Fig 3. Typical Transfer Characteristics

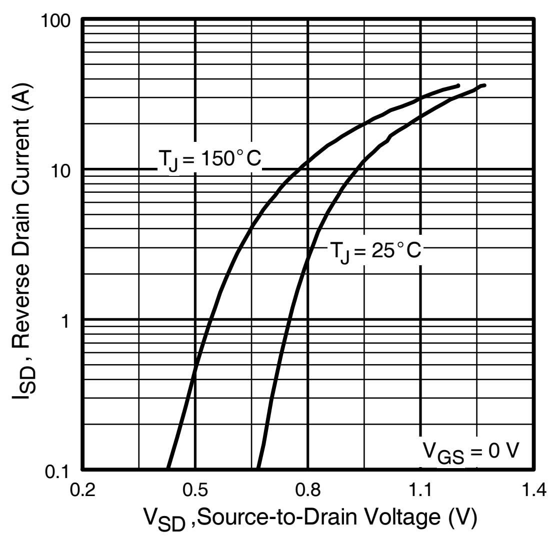


Fig 4. Typical Source-Drain Diode Forward Voltage

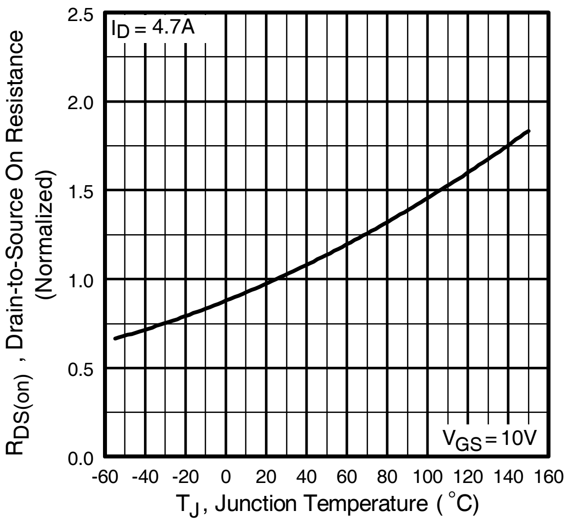


Fig 5. Normalized On-Resistance Vs. Temperature

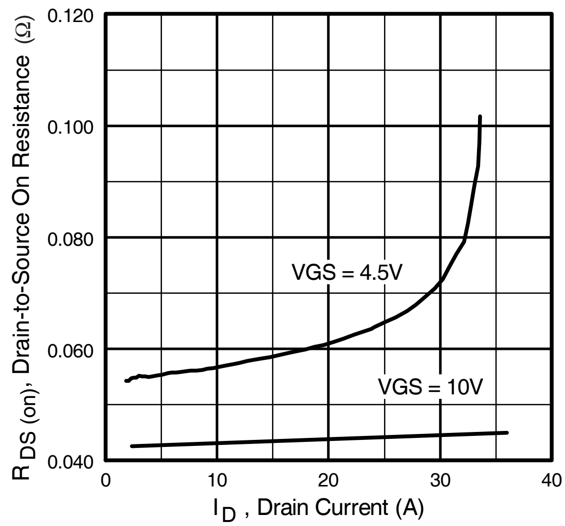


Fig 6. Typical On-Resistance Vs. Drain Current

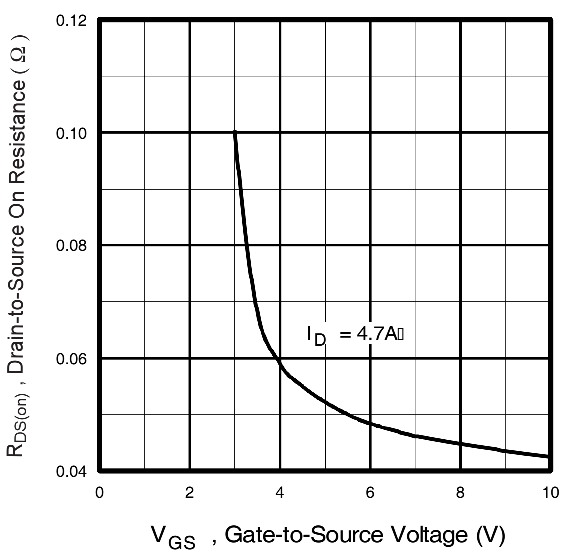


Fig 7. Typical On-Resistance Vs. Gate Voltage

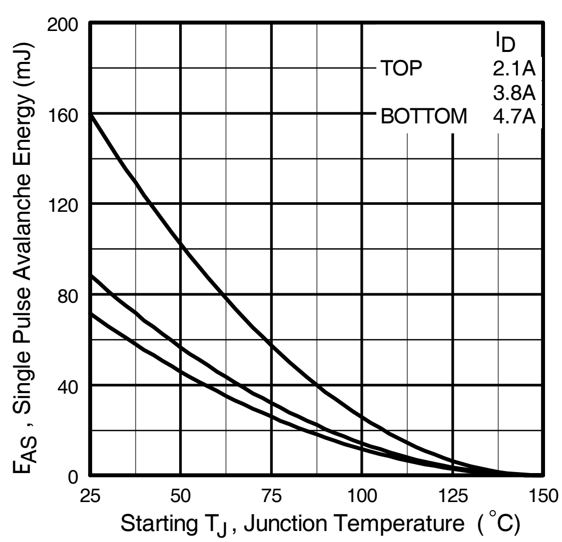


Fig 8. Maximum Avalanche Energy Vs. Drain Current

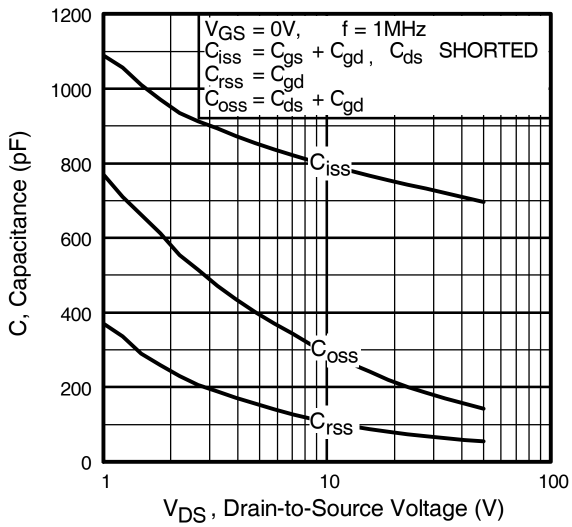


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

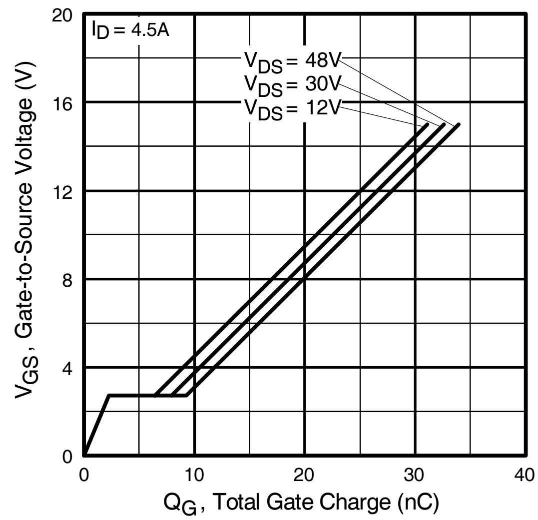


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

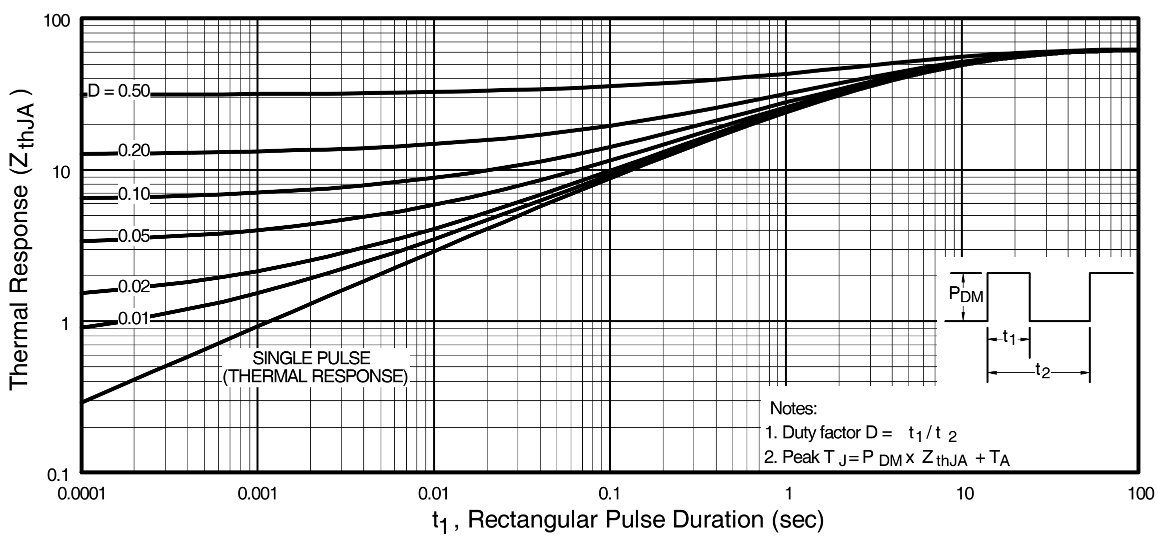


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

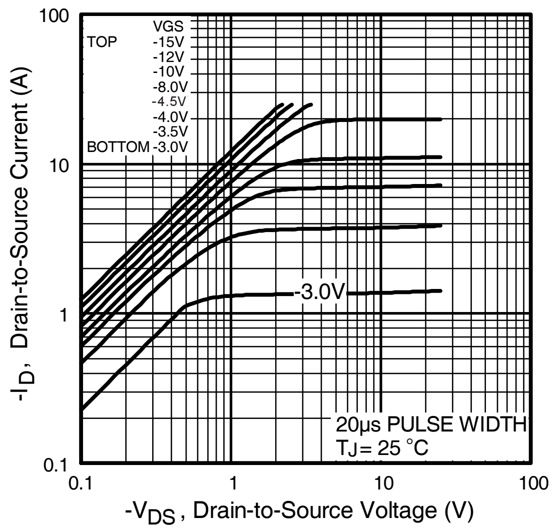


Fig 12. Typical Output Characteristics

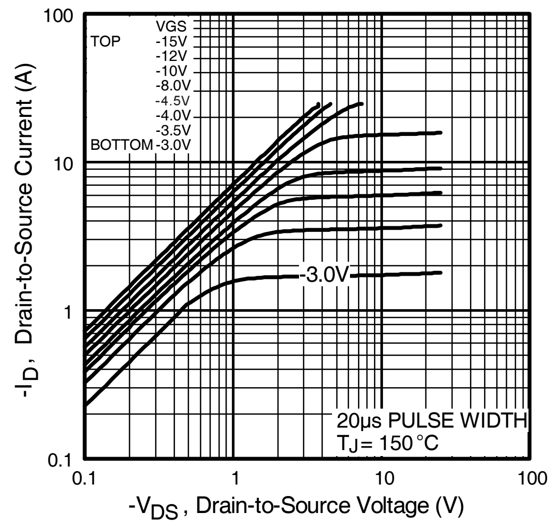


Fig 13. Typical Output Characteristics

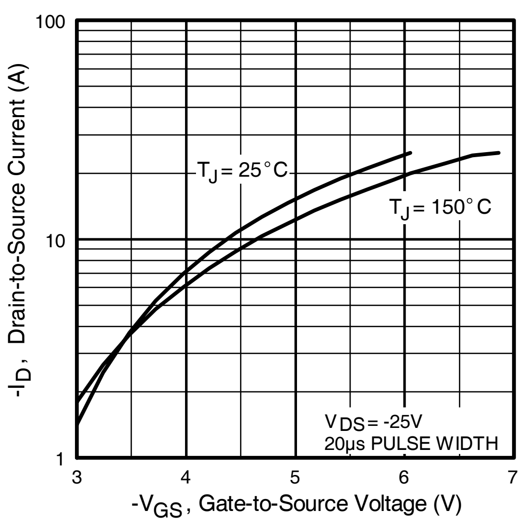


Fig 14. Typical Transfer Characteristics

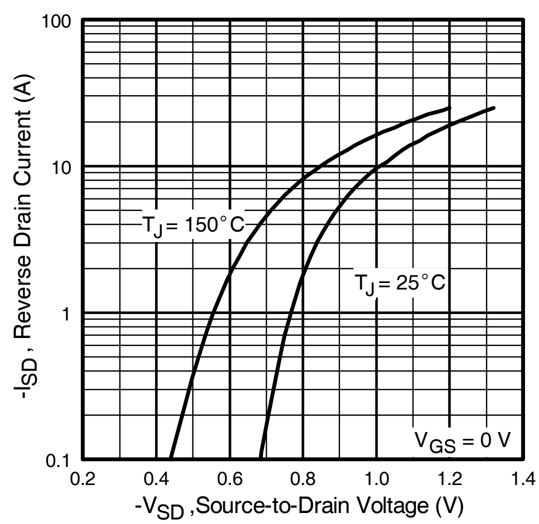


Fig 15. Typical Source-Drain Diode Forward Voltage

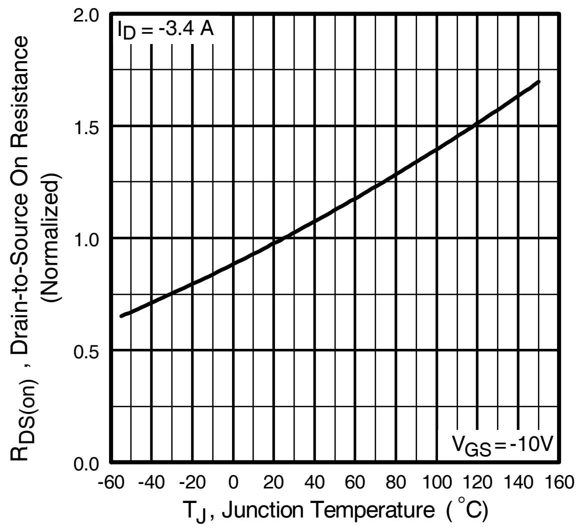


Fig 16. Normalized On-Resistance Vs. Temperature

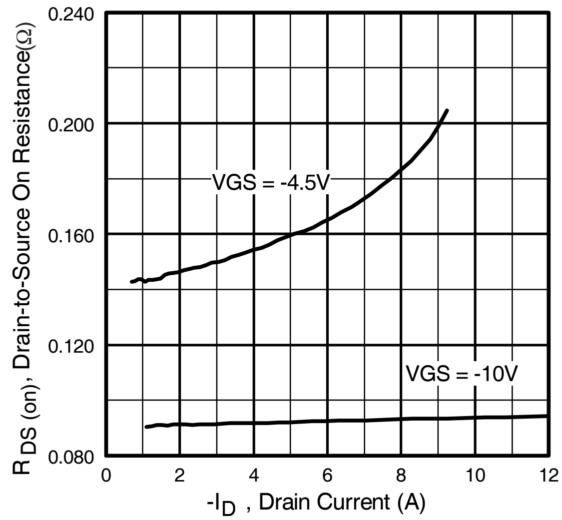


Fig 17. Typical On-Resistance Vs. Drain Current

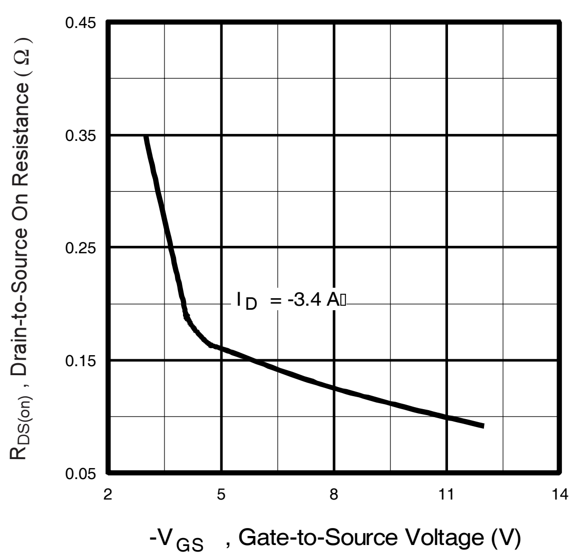


Fig 18. Typical On-Resistance Vs. Gate Voltage

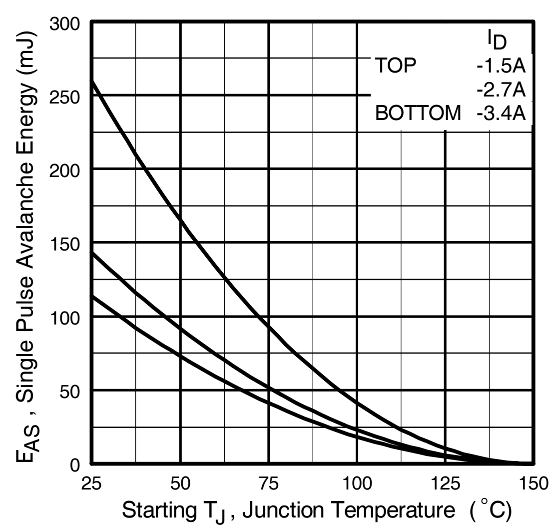


Fig 19. Maximum Avalanche Energy Vs. Drain Current

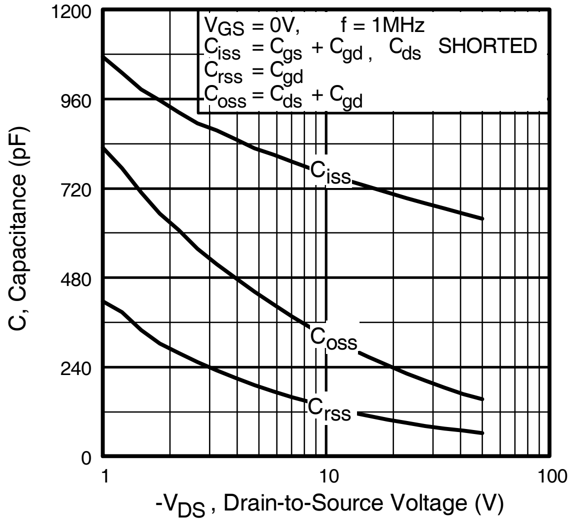


Fig 20. Typical Capacitance Vs. Drain-to-Source Voltage

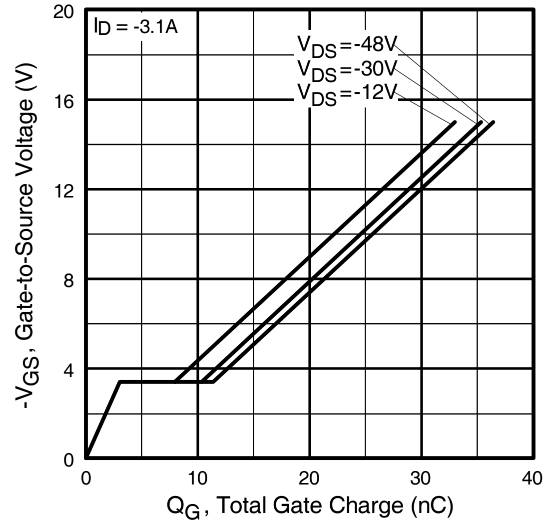


Fig 21. Typical Gate Charge Vs. Gate-to-Source Voltage

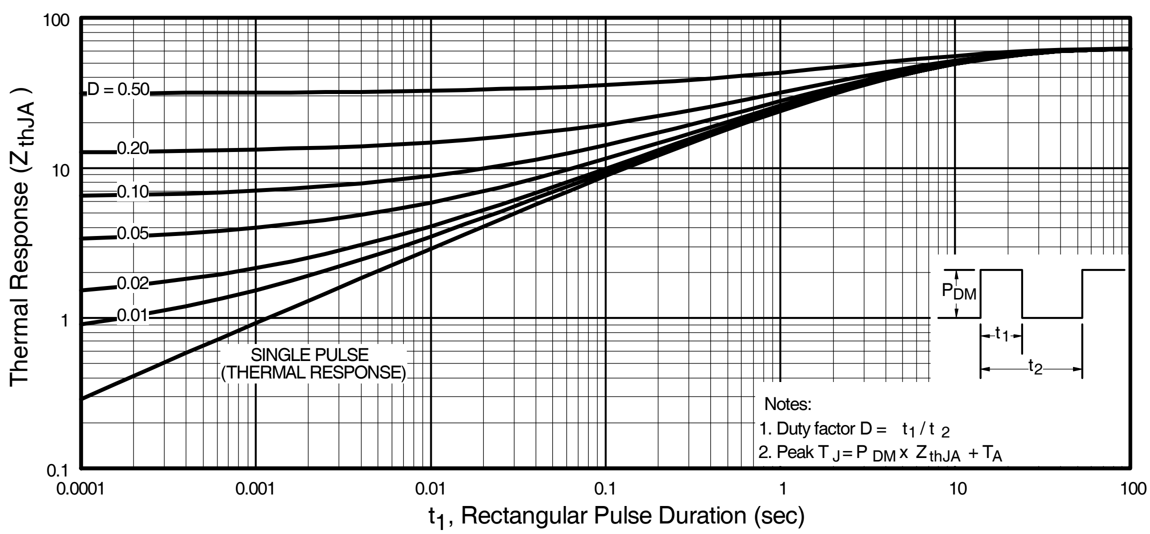
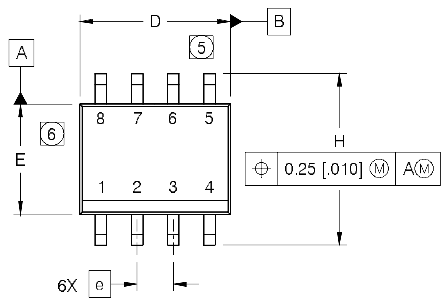


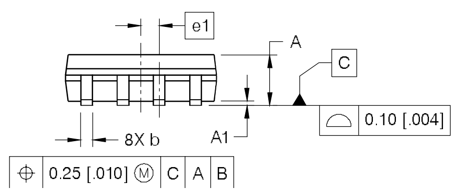
Fig 22. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

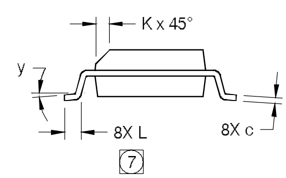
SO-8 Package Outline

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°

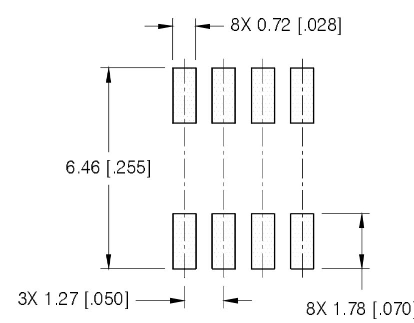




NOTES:

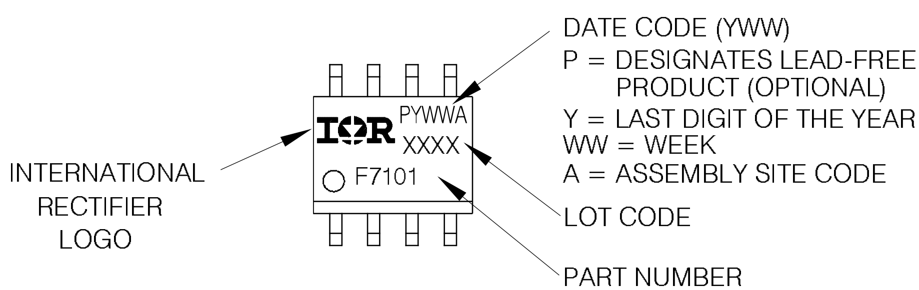
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [.006].
6. DIMENSION DOES NOT INCLUDE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

FOOTPRINT



SO-8 Part Marking

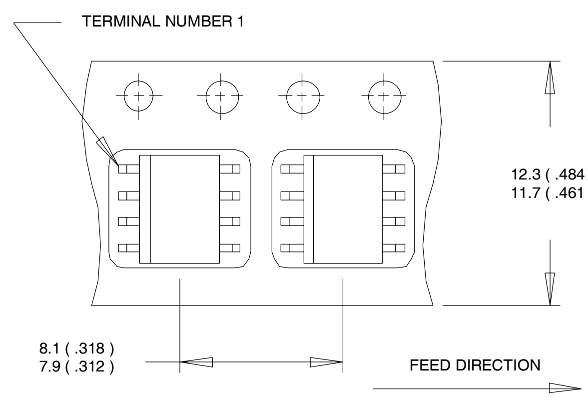
EXAMPLE: THIS IS AN IRF7101 (MOSFET)



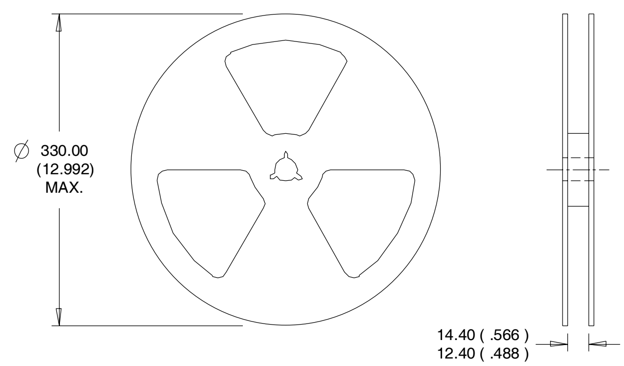
Note: For the most current drawing please refer to IR website at http://www.irf.com/package/

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.

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Data and specifications subject to change without notice.
This product has been designed and qualified for the Automotive [Q101] market.
Qualification Standards can be found on IR's Web site.

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