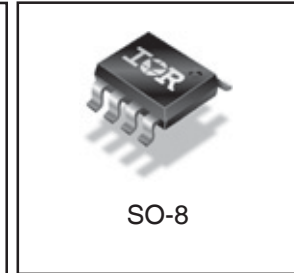
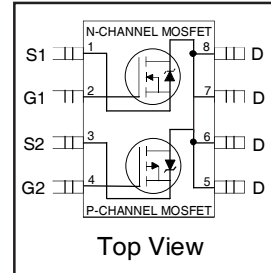


HEXFET® Power MOSFET

	N-CH	P-CH	
V_{DS}	30	-30	V
$R_{DS(on) max}$ (@ $V_{GS} = 10V$)	0.029	0.058	Ω
Q_g (typical)	22	23	nC
I_D (@ $T_A = 25^\circ C$)	7.3	-5.3	A



Features

Industry-standard pinout SO-8 Package
Compatible with Existing Surface Mount Techniques
RoHS Compliant, Halogen-Free
MSL1, Industrial qualification



Benefits

Multi-Vendor Compatibility
Easier Manufacturing
Environmentally Friendlier
Increased Reliability

Base Part Number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRF7389PbF-1	SO-8	Tube/Bulk	95	IRF7389PbF-1
		Tape and Reel	4000	IRF7389TRPbF-1

Absolute Maximum Ratings ($T_A = 25^\circ C$ Unless Otherwise Noted)

	Symbol	Maximum		Units	
		N-Channel	P-Channel		
Drain-Source Voltage	V_{DS}	30	-30	V	
Gate-Source Voltage	V_{GS}	± 20			
Continuous Drain Current [Ⓢ]	I_D	$T_A = 25^\circ C$	7.3	-5.3	A
		$T_A = 70^\circ C$	5.9	-4.2	
Pulsed Drain Current	I_{DM}	30	-30		
Continuous Source Current (Diode Conduction)	I_S	2.5	-2.5		
Maximum Power Dissipation [Ⓢ]	P_D	$T_A = 25^\circ C$	2.5		W
		$T_A = 70^\circ C$	1.6		
Single Pulse Avalanche Energy	E_{AS}	82	140	mJ	
Avalanche Current	I_{AR}	4.0	-2.8	A	
Repetitive Avalanche Energy	E_{AR}	0.20		mJ	
Peak Diode Recovery dv/dt [Ⓢ]	dv/dt	3.8	-2.2	V/ ns	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to + 150 °C			

Thermal Resistance Ratings

Parameter	Symbol	Limit	Units
Maximum Junction-to-Ambient [Ⓢ]	$R_{\theta JA}$	50	$^\circ C/W$



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

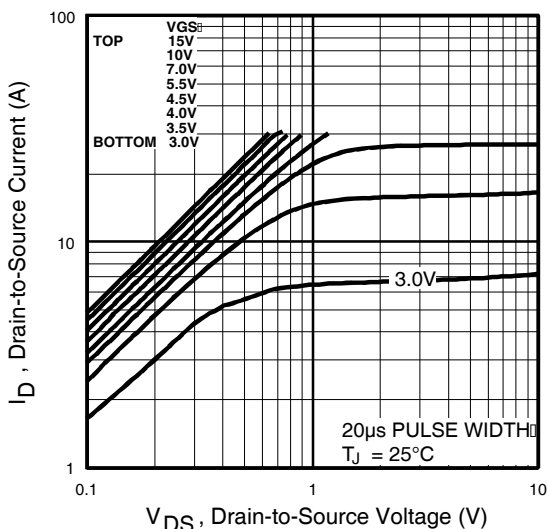
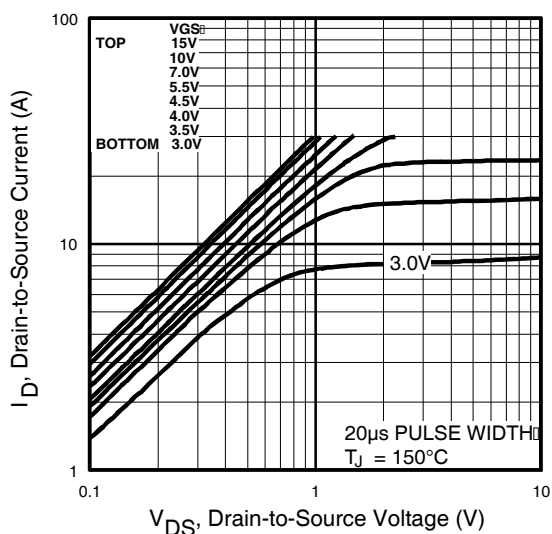
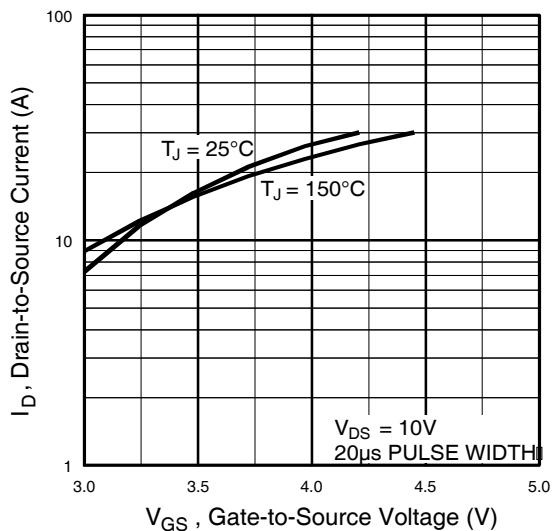
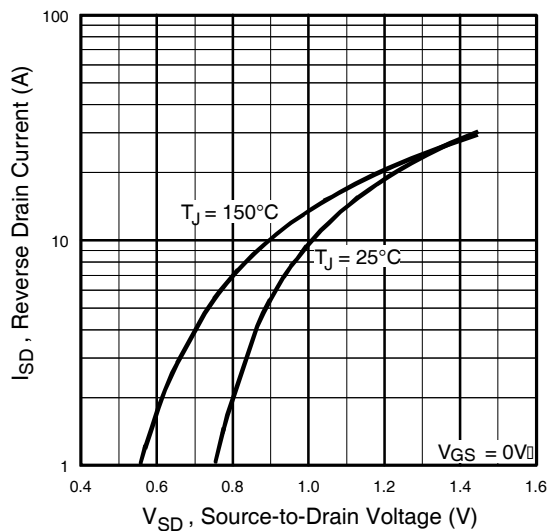
Parameter	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	30	—	—	V	V _{GS} = 0V, I _D = 250μA
		-30	—	—		V _{GS} = 0V, I _D = -250μA
ΔV _{(BR)DSS/ΔT_J}	Breakdown Voltage Temp. Coefficient	—	0.022	—	V/°C	Reference to 25°C, I _D = 1mA
		—	0.022	—		Reference to 25°C, I _D = -1mA
R _{DS(ON)}	Static Drain-to-Source On-Resistance	—	0.023	0.029	Ω	V _{GS} = 10V, I _D = 5.8A ④
		—	0.032	0.046		V _{GS} = 4.5V, I _D = 4.7A ④
		—	0.042	0.058		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	—	—	V	V _{DS} = V _{GS} , I _D = 250μA
		-1.0	—	—		V _{DS} = V _{GS} , I _D = -250μA
g _{fs}	Forward Transconductance	—	14	—	S	V _{DS} = 15V, I _D = 5.8A ④
		—	7.7	—		V _{DS} = -15V, I _D = -4.9A ④
I _{DSS}	Drain-to-Source Leakage Current	—	—	1.0	μA	V _{DS} = 24V, V _{GS} = 0V
		—	—	-1.0		V _{DS} = -24V, V _{GS} = 0V
		—	—	25		V _{DS} = 24V, V _{GS} = 0V, T _J = 55°C
		—	—	-25		V _{DS} = -24V, V _{GS} = 0V, T _J = 55°C
I _{GSS}	Gate-to-Source Forward Leakage	—	—	±100	nA	V _{GS} = ±20V
Q _g	Total Gate Charge	—	22	33	nC	N-Channel
		—	23	34		I _D = 5.8A, V _{DS} = 15V, V _{GS} = 10V ④
Q _{gs}	Gate-to-Source Charge	—	2.6	3.9		
		—	3.8	5.7		
Q _{gd}	Gate-to-Drain ("Miller") Charge	—	6.4	9.6		P-Channel
		—	5.9	8.9		I _D = -4.9A, V _{DS} = -15V, V _{GS} = -10V
t _{d(on)}	Turn-On Delay Time	—	8.1	12	ns	N-Channel
		—	13	19		V _{DD} = 15V, I _D = 1.0A, R _G = 6.0Ω, R _D = 15Ω ④
t _r	Rise Time	—	8.9	13		
		—	13	20		
t _{d(off)}	Turn-Off Delay Time	—	26	39		P-Channel
		—	34	51		V _{DD} = -15V, I _D = -1.0A, R _G = 6.0Ω, R _D = 15Ω
t _f	Fall Time	—	17	26		
		—	32	48		
C _{iss}	Input Capacitance	—	650	—	pF	N-Channel
		—	710	—		V _{GS} = 0V, V _{DS} = 25V, f = 1.0MHz
C _{oss}	Output Capacitance	—	320	—		
		—	380	—		P-Channel
C _{rss}	Reverse Transfer Capacitance	—	130	—		V _{GS} = 0V, V _{DS} = -25V, f = 1.0MHz
		—	180	—		

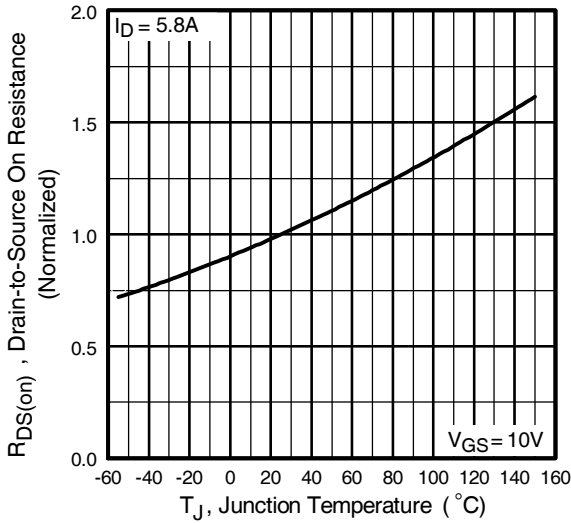
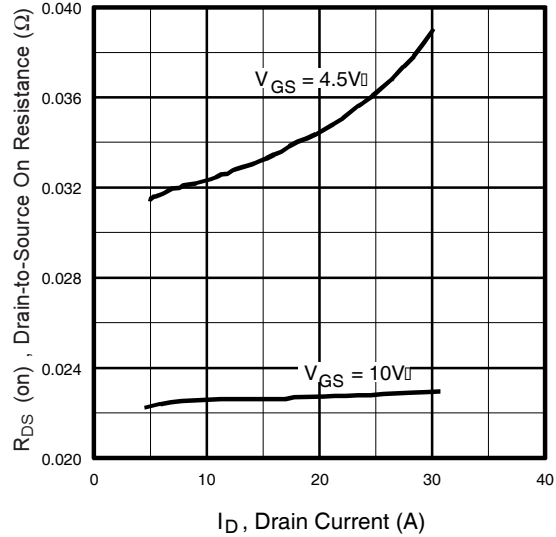
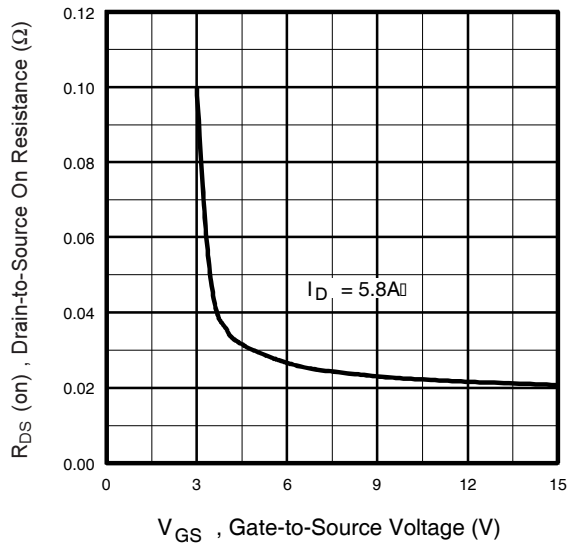
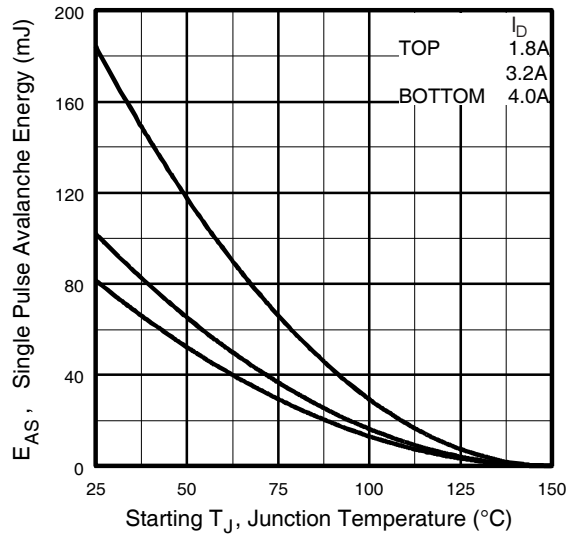
Source-Drain Ratings and Characteristics

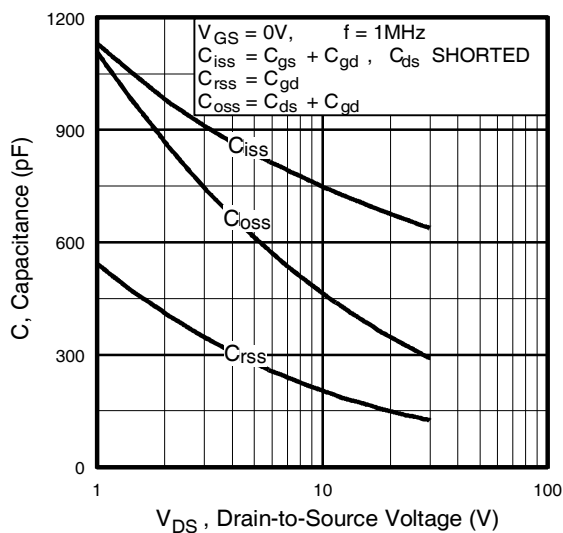
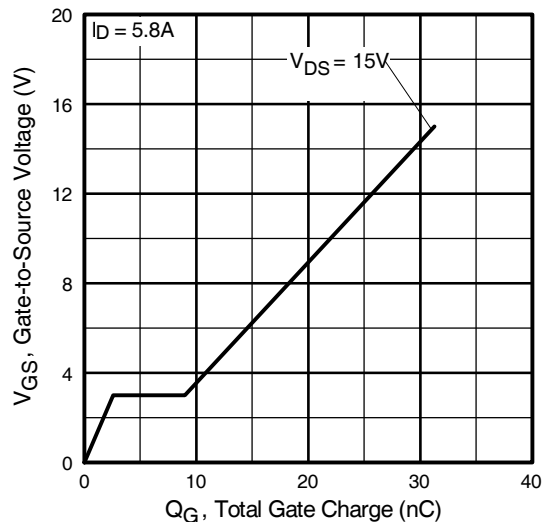
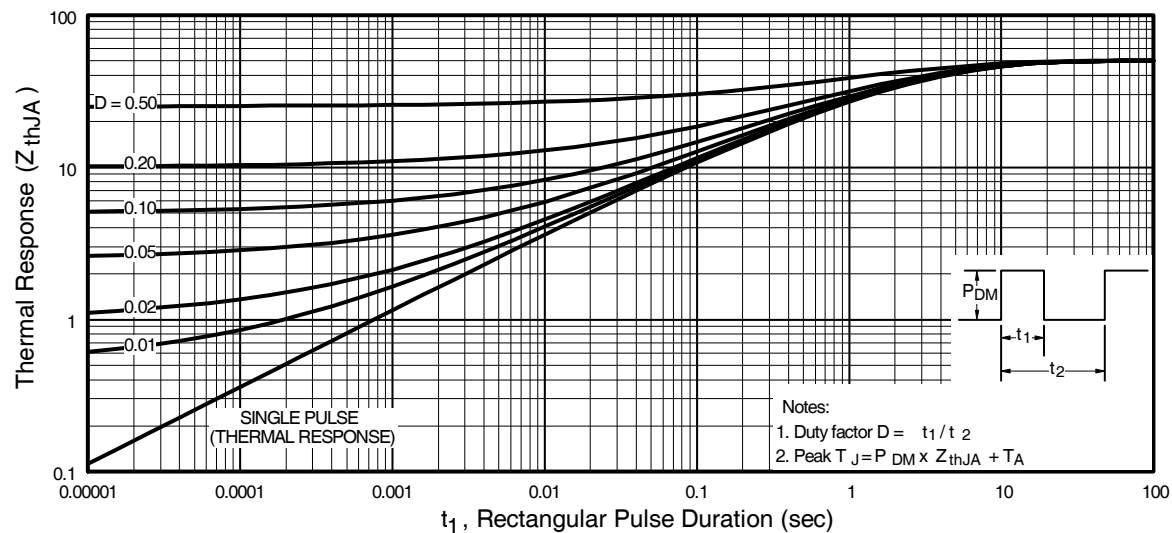
Parameter	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	—	—	2.5	A	
		—	—	-2.5		
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	30		
		—	—	-30		
V _{SD}	Diode Forward Voltage	—	0.78	1.0	V	T _J = 25°C, I _S = 1.7A, V _{GS} = 0V ③
		—	-0.78	-1.0		T _J = 25°C, I _S = -1.7A, V _{GS} = 0V ③
t _{rr}	Reverse Recovery Time	—	45	68	ns	N-Channel
		—	44	66		T _J = 25°C, I _F = 1.7A, di/dt = 100A/μs ④
Q _{rr}	Reverse Recovery Charge	—	58	87	nC	P-Channel
		—	42	63		T _J = 25°C, I _F = -1.7A, di/dt = 100A/μs

Notes:

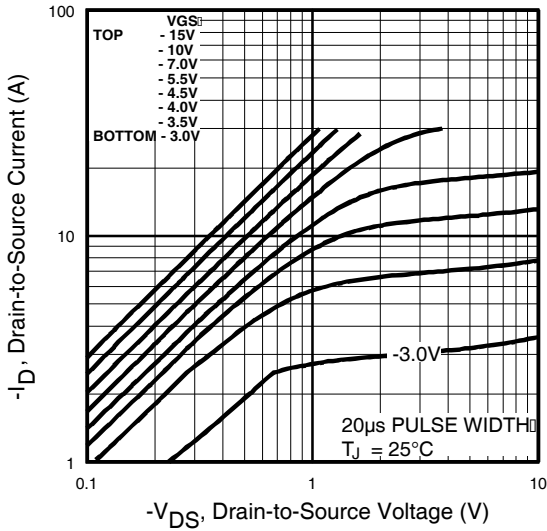
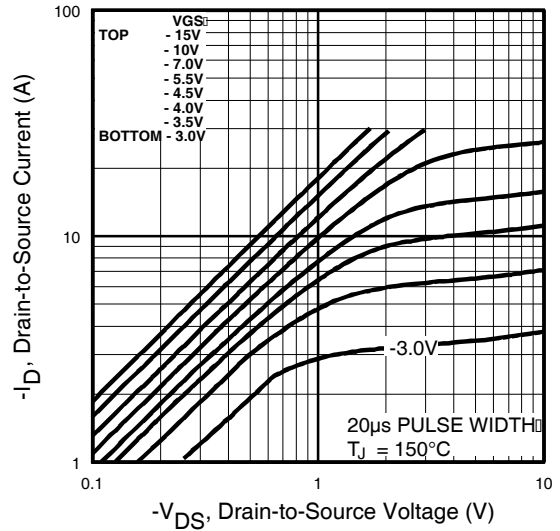
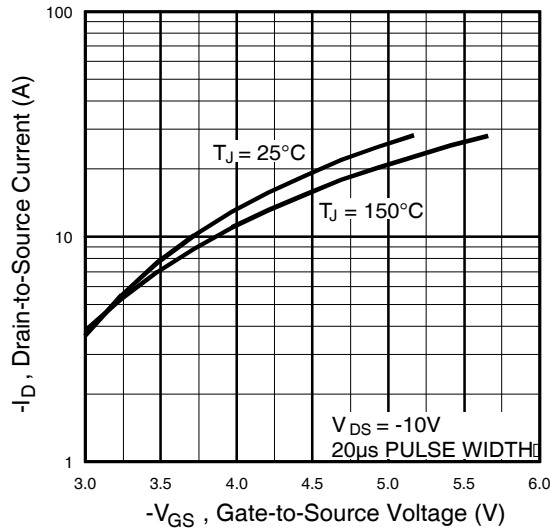
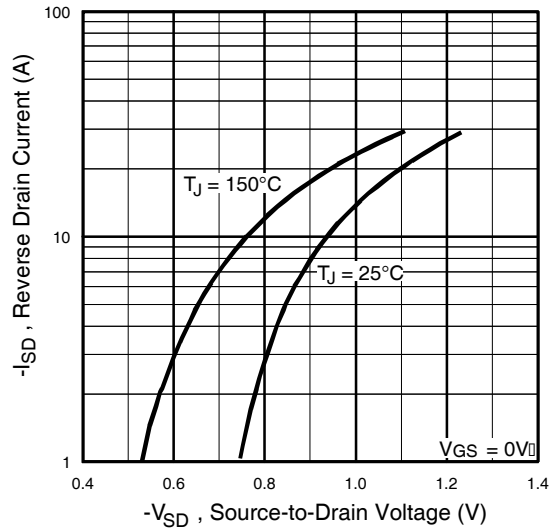
- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 22)
- ② N-Channel I_{SD} ≤ 4.0A, di/dt ≤ 74A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 150°C
- ③ N-Channel Starting T_J = 25°C, L = 10mH R_G = 25Ω, I_{AS} = 4.0A. (See Figure 12)
- ④ Pulse width ≤ 300μs; duty cycle ≤ 2%.
- ⑤ Surface mounted on FR-4 board, t ≤ 10sec.
- P-Channel I_{SD} ≤ -2.8A, di/dt ≤ 150A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 150°C
- P-Channel Starting T_J = 25°C, L = 35mH R_G = 25Ω, I_{AS} = -2.8A.

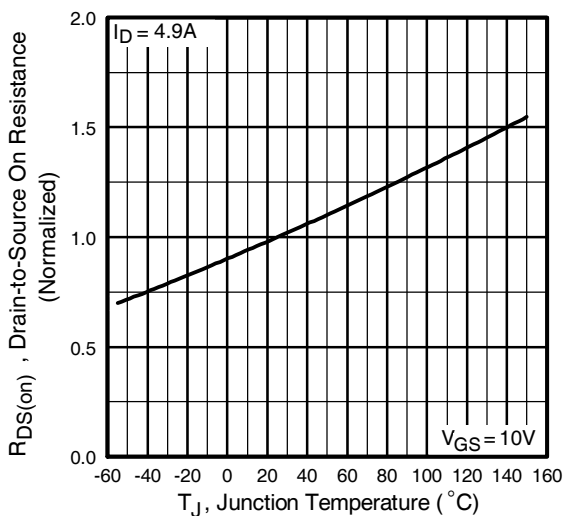
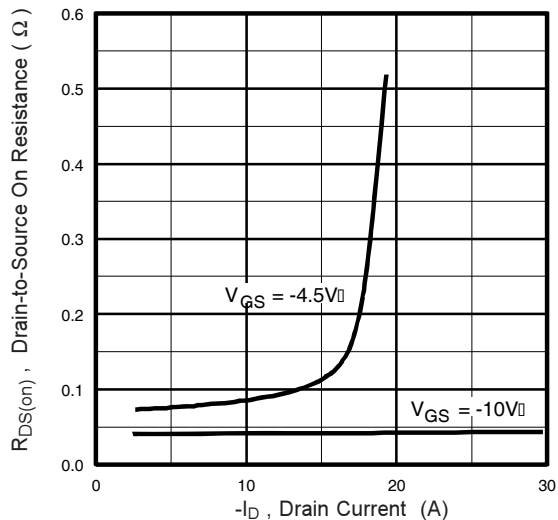
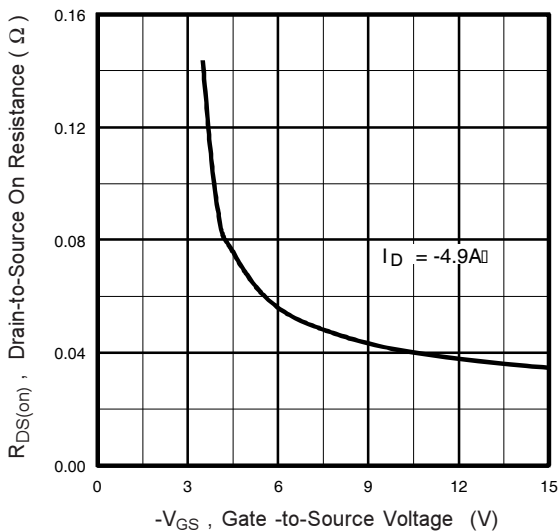
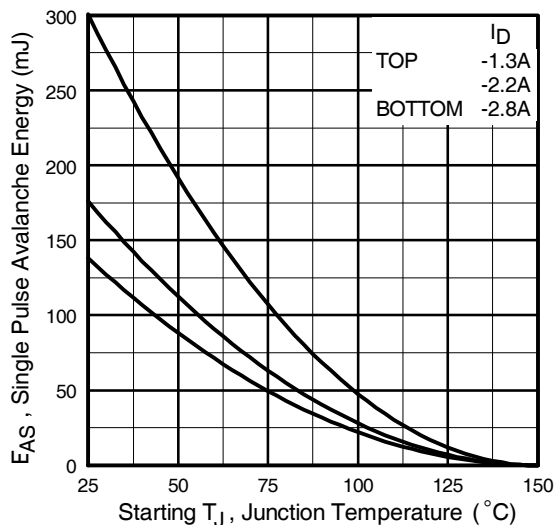
N-Channel

Fig 1. Typical Output Characteristics

Fig 2. Typical Output Characteristics

Fig 3. Typical Transfer Characteristics

Fig 4. Typical Source-Drain Diode Forward Voltage

N-Channel

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

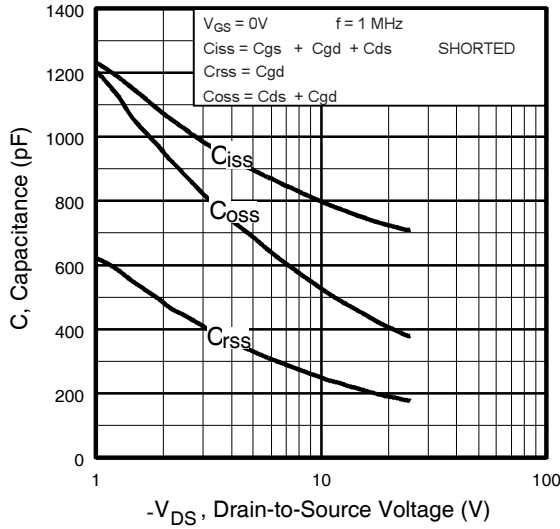
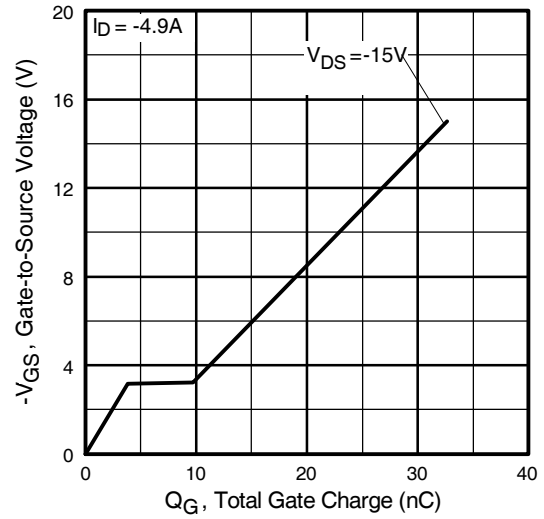
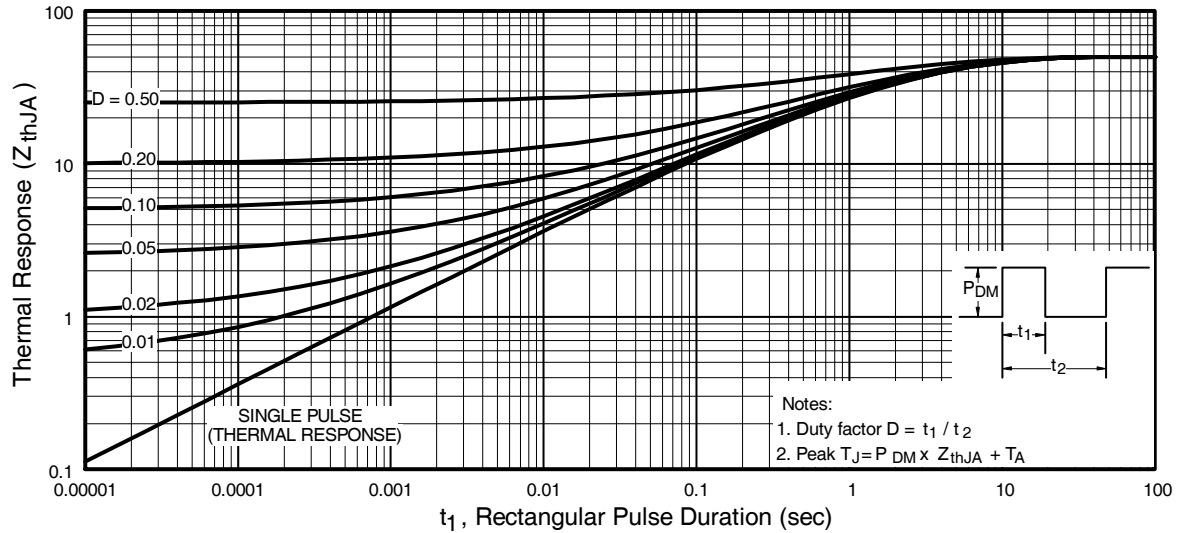
N-Channel

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

P-Channel


Fig 12. Typical Output Characteristics

Fig 13. Typical Output Characteristics

Fig 14. Typical Transfer Characteristics

Fig 15. Typical Source-Drain Diode Forward Voltage

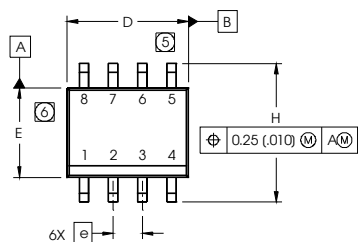
P-Channel

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

P-Channel

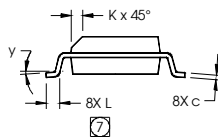
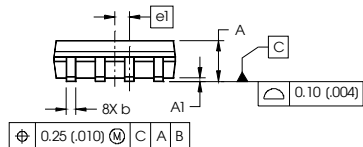

Fig 20. Typical Capacitance Vs. Drain-to-Source Voltage

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)



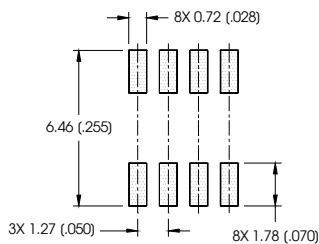
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40	1.27
y	0°	8°	0°	8°



NOTES:

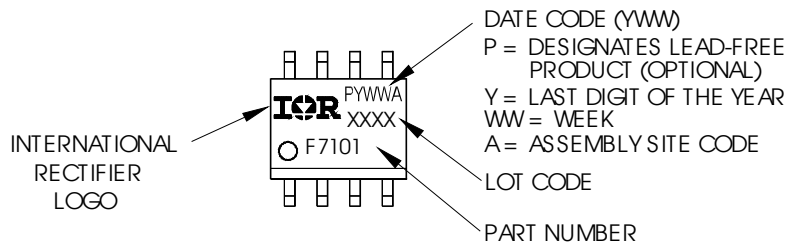
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
- ⑤ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 (.006).
- ⑥ DIMENSION DOES NOT 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 Information (Lead-Free)

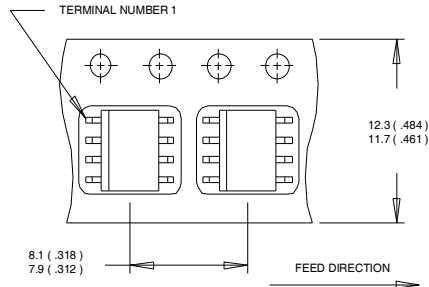
EXAMPLE: THIS IS AN IRF7101 (MOSFET)



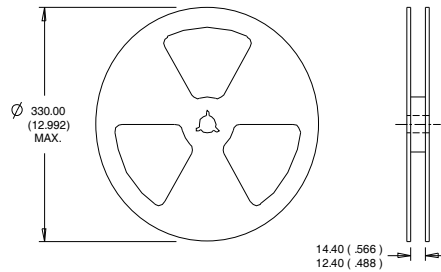
Note: For the most current drawing please refer to IR website at <http://www.irf.com/package/>

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.

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

Qualification information[†]

Qualification level	Industriid (per JEDEC JESD47F ^{††} guidelines)	
Moisture Sensitivity Level	SO-8	MSL1 (per JEDEC J-STD-020D ^{††})
RoHS compliant	Yes	

[†] Qualification standards can be found at International Rectifier's web site: <http://www.irf.com/product-info/reliability>

^{††} Applicable version of JEDEC standard at the time of product release

International
 Rectifier

IR WORLD HEADQUARTERS: 101 N. Sepulveda Blvd., El Segundo, California 90245, USA

To contact International Rectifier, please visit <http://www.irf.com/whoto-call/>