

IRF7379IPbF

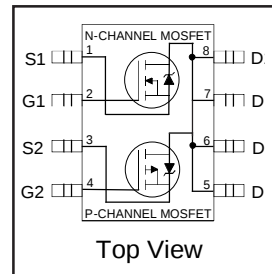
HEXFET® Power MOSFET

- Generation V Technology
- Ultra Low On-Resistance
- Complimentary Half Bridge
- Surface Mount
- Fully Avalanche Rated
- Lead-Free

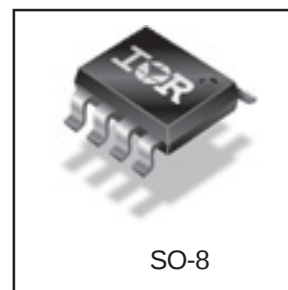
Description

Fifth Generation HEXFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET Power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The SO-8 has been modified through a customized leadframe for enhanced thermal characteristics and multiple-die capability making it ideal in a variety of power applications. With these improvements, multiple devices can be used in an application with dramatically reduced board space. The package is designed for vapor phase, infra red, or wave soldering techniques.



	N-Ch	P-Ch
V_{DS}	30V	-30V
$R_{DS(on)}$	0.045Ω	0.090Ω



Absolute Maximum Ratings

	Parameter	Max.		Units
		N-Channel	P-Channel	
V_{SD}	Drain-to-Source Voltage	30	-30	A
$I_D @ T_A = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$	5.8	-4.3	
$I_D @ T_A = 70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$	4.6	-3.4	
I_{DM}	Pulsed Drain Current ①	46	-34	
$P_D @ T_A = 25^\circ\text{C}$	Power Dissipation	2.5		W
	Linear Derating Factor	0.02		W/°C
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 Ratings

	Parameter	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient③	50	°C/W

Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter		Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	N-Ch	30	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
		P-Ch	-30	—	—		$V_{GS} = 0V, I_D = -250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	N-Ch	—	0.032	—	$V/^\circ\text{C}$	Reference to $25^\circ\text{C}, I_D = 1\text{mA}$
		P-Ch	—	-0.037	—		Reference to $25^\circ\text{C}, I_D = -1\text{mA}$
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	N-Ch	—	0.038	0.045	Ω	$V_{GS} = 10V, I_D = 5.8A$ ③
			—	0.055	0.075		$V_{GS} = 4.5V, I_D = 4.9A$ ③
			—	0.070	0.090		$V_{GS} = -10V, I_D = -4.3A$ ③
		P-Ch	—	0.130	0.180		$V_{GS} = -4.5V, I_D = -3.7A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	N-Ch	1.0	—	—	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
		P-Ch	-1.0	—	—		$V_{DS} = V_{GS}, I_D = -250\mu A$
g_{fs}	Forward Transconductance	N-Ch	5.2	—	—	S	$V_{DS} = 15V, I_D = 2.4A$ ③
		P-Ch	2.5	—	—		$V_{DS} = -24V, I_D = -1.8A$ ③
I_{DSS}	Drain-to-Source Leakage Current	N-Ch	—	—	1.0	μA	$V_{DS} = 24V, V_{GS} = 0V$
		P-Ch	—	—	-1.0		$V_{DS} = -24V, V_{GS} = 0V$
		N-Ch	—	—	25		$V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
		P-Ch	—	—	-25		$V_{DS} = -24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	N-P	—	—	± 100		$V_{GS} = \pm 20V$
Q_g	Total Gate Charge	N-Ch	—	—	25	nC	N-Channel $I_D = 2.4A, V_{DS} = 24V, V_{GS} = 10V$ ③
		P-Ch	—	—	25		
Q_{gs}	Gate-to-Source Charge	N-Ch	—	—	2.9		P-Channel $I_D = -1.8A, V_{DS} = -24V, V_{GS} = -10V$
		P-Ch	—	—	2.9		
Q_{gd}	Gate-to-Drain ("Miller") Charge	N-Ch	—	—	7.9		
		P-Ch	—	—	9.0		
$t_{d(on)}$	Turn-On Delay Time	N-Ch	—	6.8	—	ns	N-Channel $V_{DD} = 15V, I_D = 2.4A, R_G = 6.0\Omega, R_D = 6.2\Omega$ ③
		P-Ch	—	11	—		
t_r	Rise Time	N-Ch	—	21	—		P-Channel $V_{DD} = -15V, I_D = -1.8A, R_G = 6.0\Omega, R_D = 8.2\Omega$ ③
		P-Ch	—	17	—		
$t_{d(off)}$	Turn-Off Delay Time	N-Ch	—	22	—		
		P-Ch	—	25	—		
t_f	Fall Time	N-Ch	—	7.7	—		
		P-Ch	—	18	—		
L_D	Internal Drain Inductance	N-P	—	4.0	—	nH	Between lead, 6mm (0.25in.) from package and center of die contact
L_S	Internal Source Inductance	N-P	—	6.0	—		
C_{iss}	Input Capacitance	N-Ch	—	520	—	pF	N-Channel $V_{GS} = 0V, V_{DS} = 25V, f = 1.0\text{MHz}$ ③
		P-Ch	—	440	—		
C_{oss}	Output Capacitance	N-Ch	—	180	—		P-Channel $V_{GS} = 0V, V_{DS} = -25V, f = 1.0\text{MHz}$
		P-Ch	—	200	—		
C_{rss}	Reverse Transfer Capacitance	N-Ch	—	72	—		
		P-Ch	—	93	—		

Source-Drain Ratings and Characteristics

	Parameter		Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	N-Ch	—	—	3.1	A	
		P-Ch	—	—	-3.1		
I_{SM}	Pulsed Source Current (Body Diode) ①	N-Ch	—	—	46		
		P-Ch	—	—	-34		
V_{SD}	Diode Forward Voltage	N-Ch	—	—	1.0	V	$T_J = 25^\circ\text{C}, I_S = 1.8A, V_{GS} = 0V$ ③
		P-Ch	—	—	-1.0		$T_J = 25^\circ\text{C}, I_S = -1.8A, V_{GS} = 0V$ ③
t_{rr}	Reverse Recovery Time	N-Ch	—	47	71	ns	N-Channel $T_J = 25^\circ\text{C}, I_F = 2.4A, di/dt = 100A/\mu s$ ③
		P-Ch	—	53	80		
Q_{rr}	Reverse Recovery Charge	N-Ch	—	56	84	nC	P-Channel $T_J = 25^\circ\text{C}, I_F = -1.8A, di/dt = -100A/\mu s$ ③
		P-Ch	—	66	99		

Notes:

① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 10)

③ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

② N-Channel $I_{SD} \leq 2.4A, di/dt \leq 73A/\mu s, V_{DD} \leq V_{(BR)DSS}, T_J \leq 150^\circ\text{C}$
P-Channel $I_{SD} \leq -1.8A, di/dt \leq 90A/\mu s, V_{DD} \leq V_{(BR)DSS}, T_J \leq 150^\circ\text{C}$

④ Surface mounted on FR-4 board, $t \leq 10\text{sec}$.

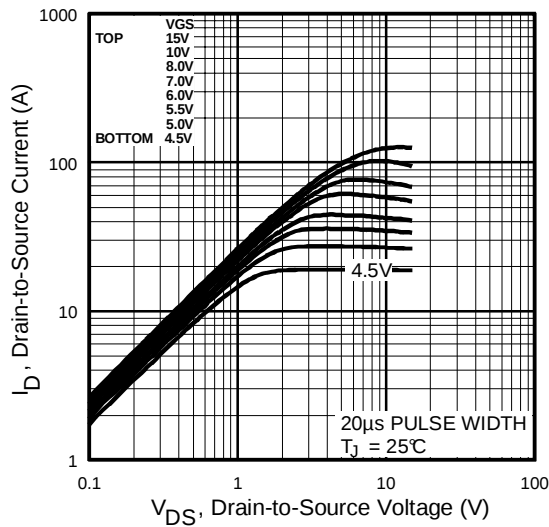


Fig 1. Typical Output Characteristics

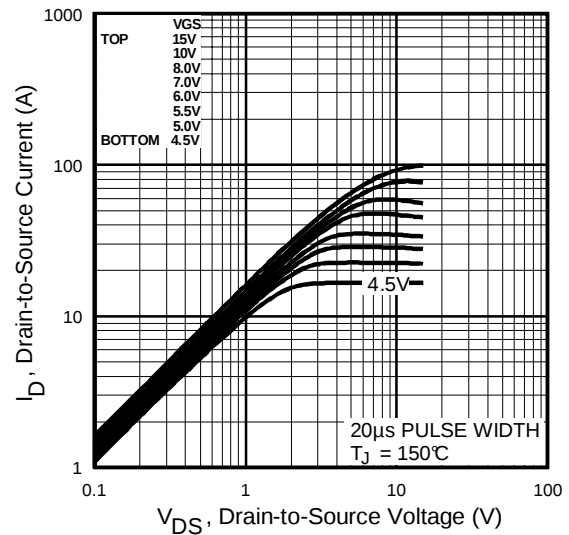


Fig 2. Typical Output Characteristics

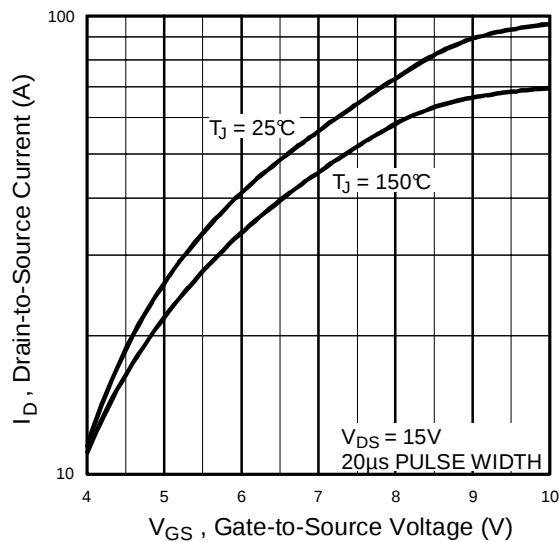


Fig 3. Typical Transfer Characteristics

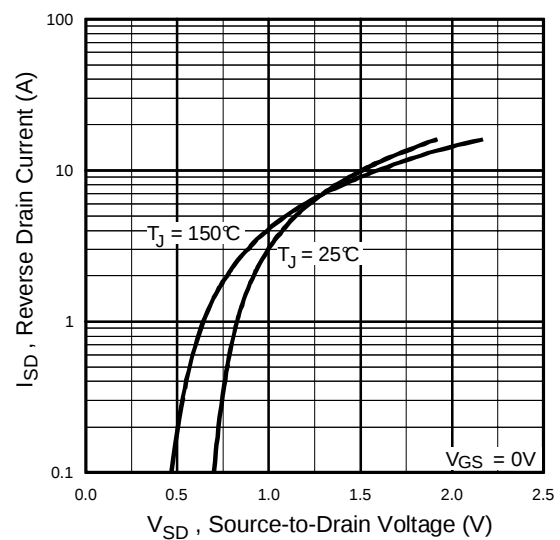


Fig 4. Typical Source-Drain Diode Forward Voltage

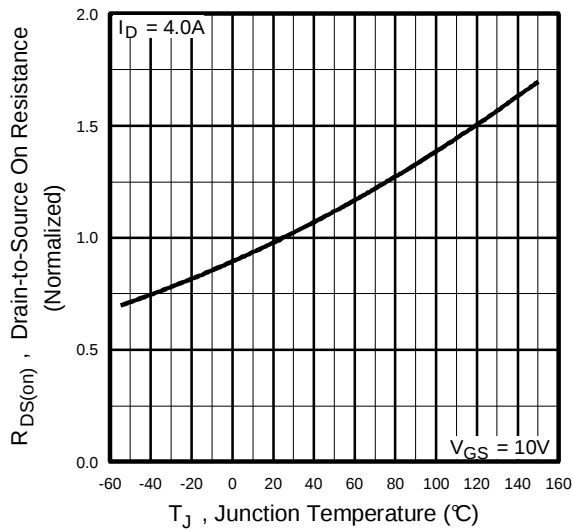


Fig 5. Normalized On-Resistance Vs. Temperature

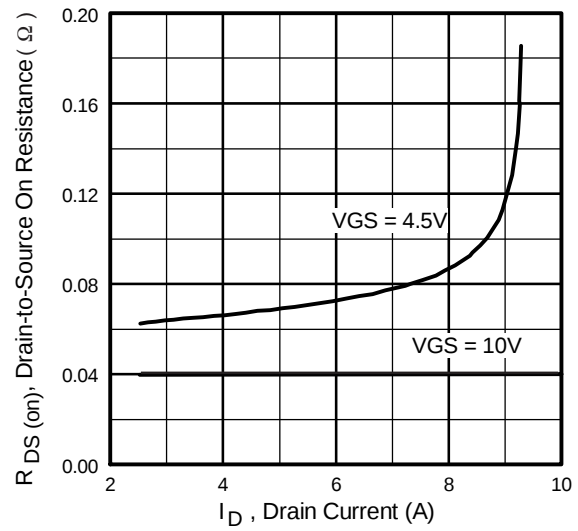


Fig 6. Typical On-Resistance Vs. Drain Current

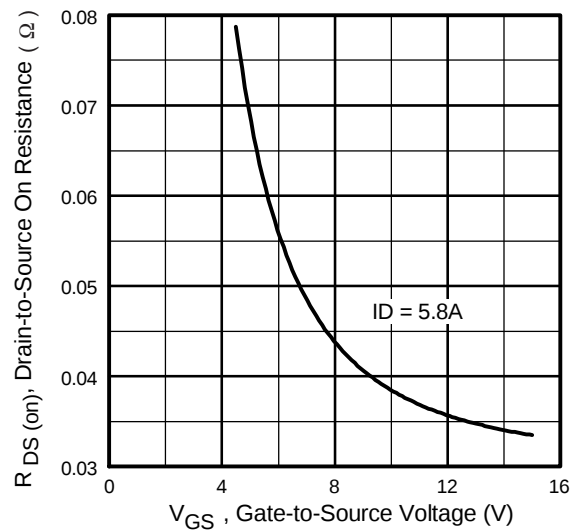
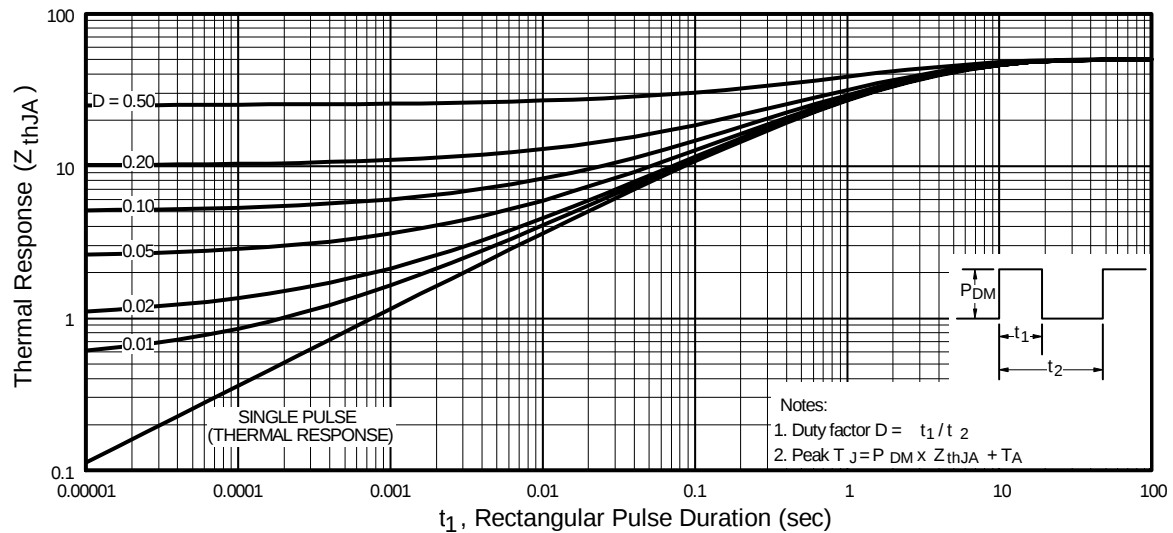
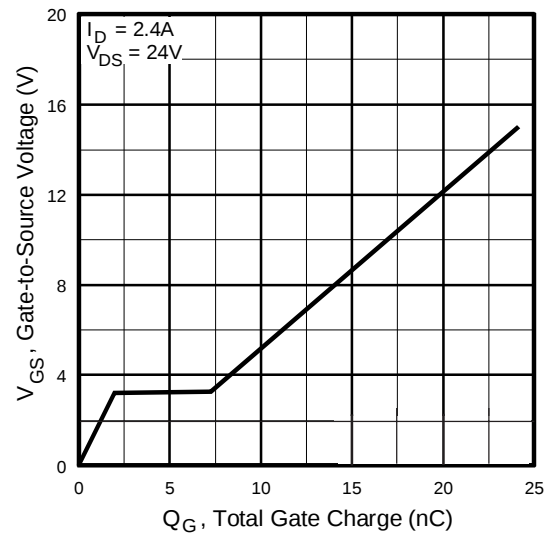
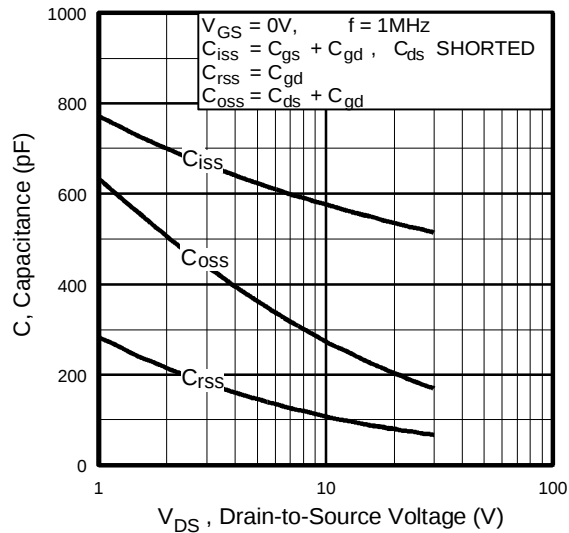


Fig 7. Typical On-Resistance Vs. Gate Voltage



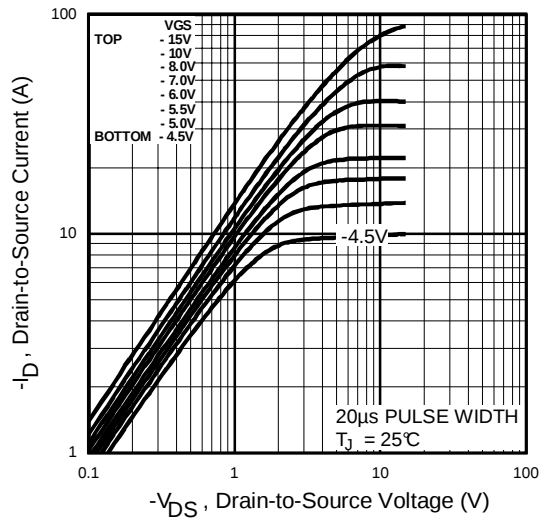


Fig 11. Typical Output Characteristics

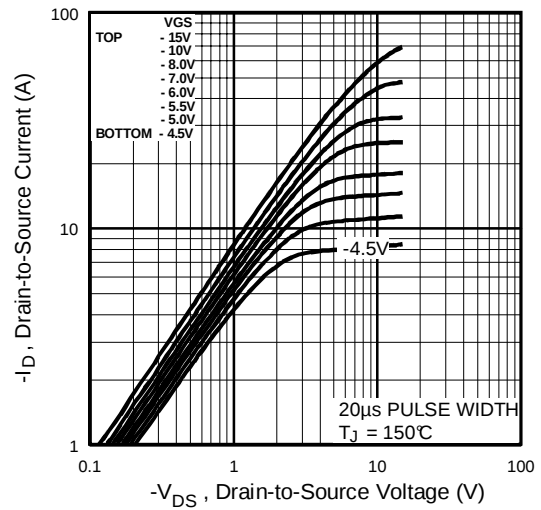


Fig 12. Typical Output Characteristics

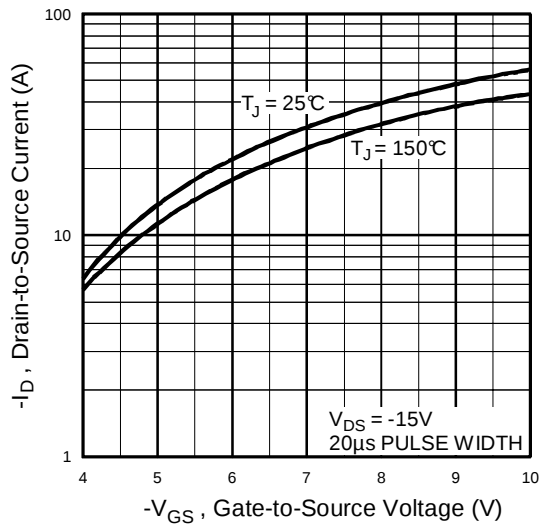


Fig 13. Typical Transfer Characteristics

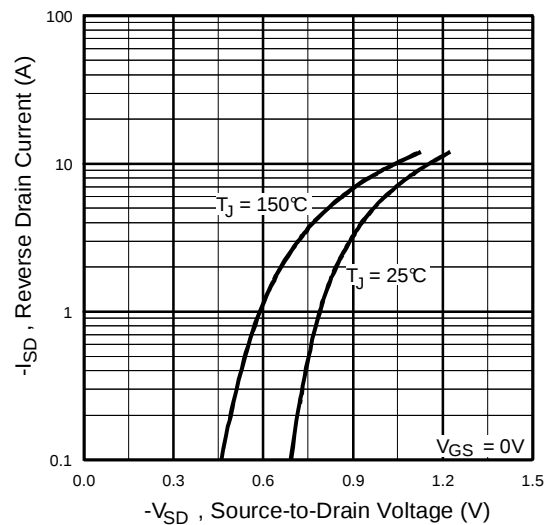


Fig 14. Typical Source-Drain Diode Forward Voltage

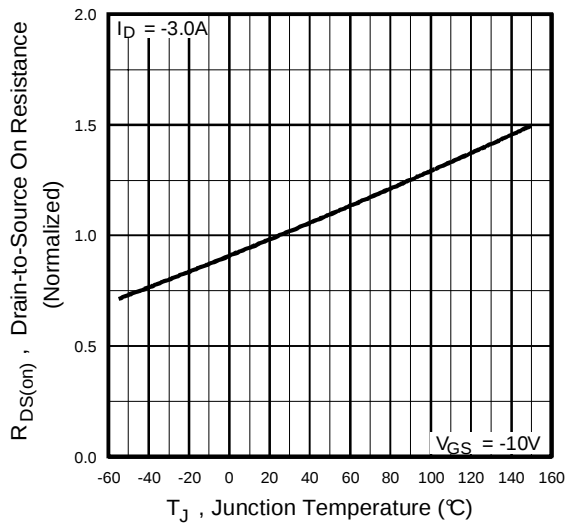


Fig 15. Normalized On-Resistance Vs. Temperature

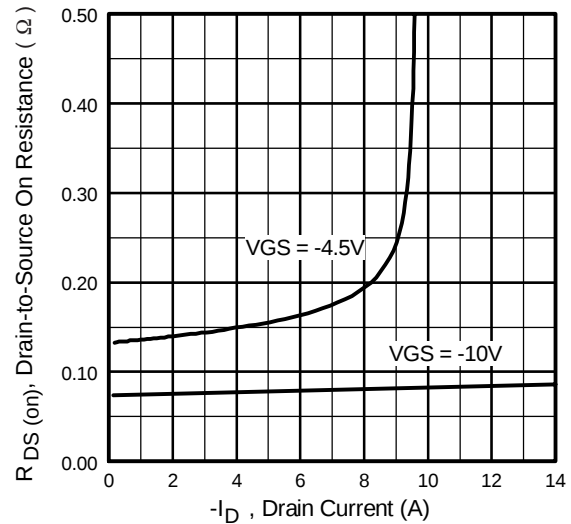


Fig 16. Typical On-Resistance Vs. Drain Current

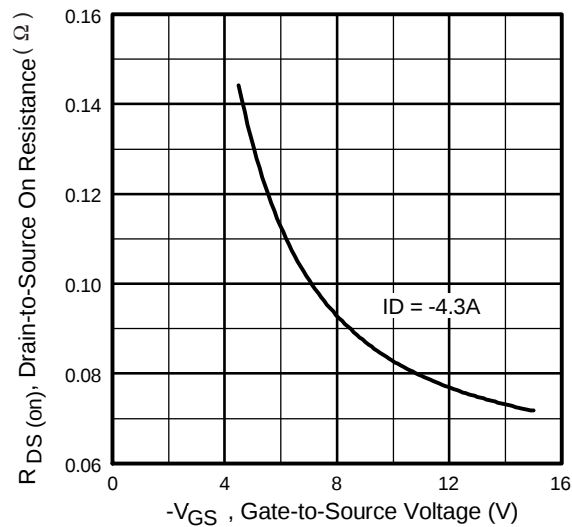


Fig 17. Typical On-Resistance Vs. Gate Voltage

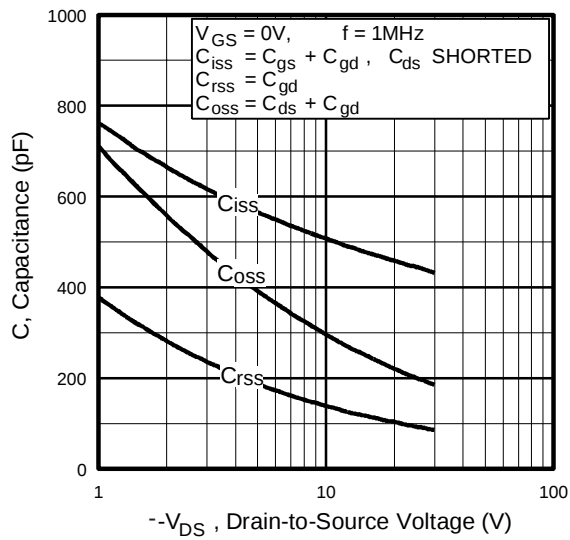


Fig 18. Typical Capacitance Vs. Drain-to-Source Voltage

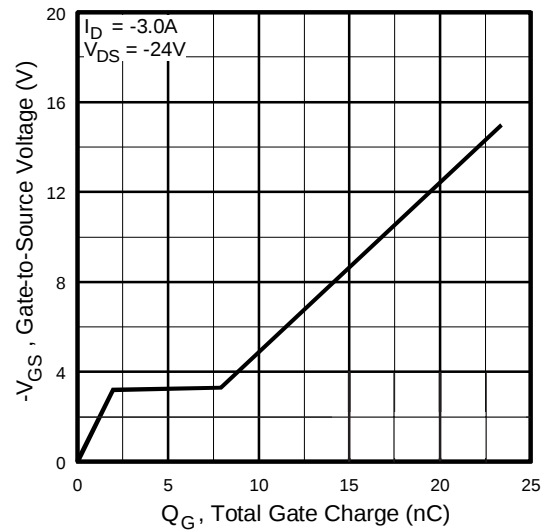


Fig 19. Typical Gate Charge Vs. Gate-to-Source Voltage

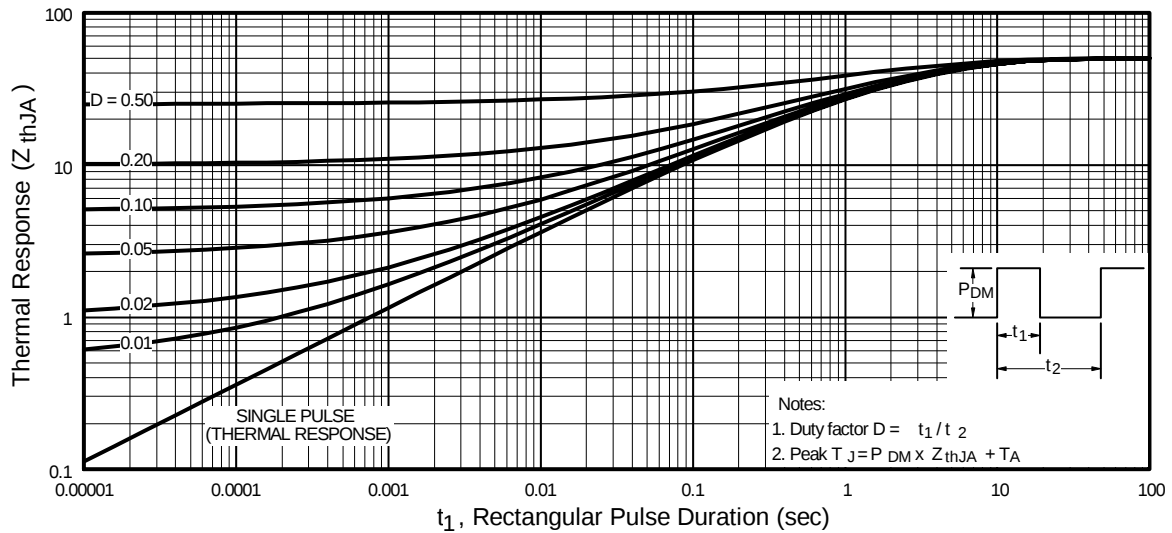
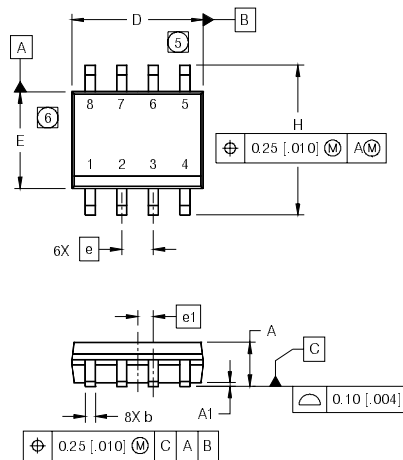


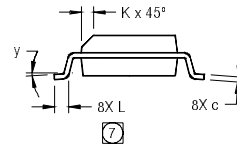
Fig 20. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

SO-8 Package Outline

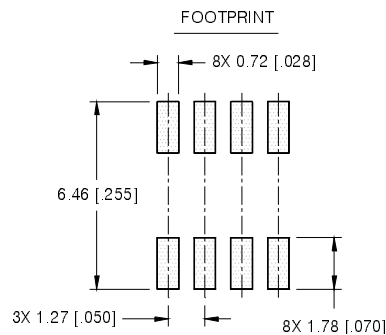
Dimensions are shown in millimeters (inches)



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°

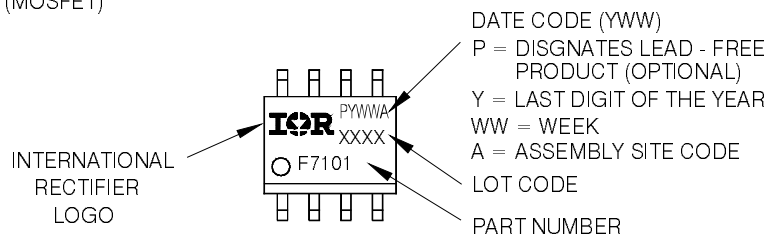


- NOTES:
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
 2. CONTROLLING DIMENSION: MILLIMETER
 3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
 4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-01 2AA.
 5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [0.006].
 6. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [0.010].
 7. DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.



SO-8 Part Marking Information

EXAMPLE: THIS IS AN IRF7101 (MOSFET)

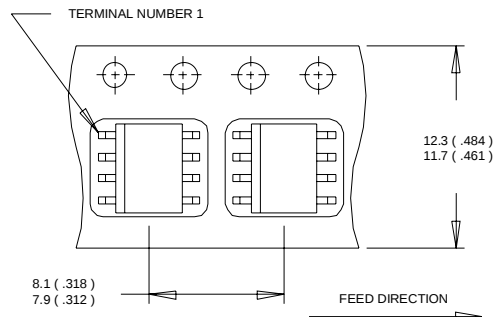


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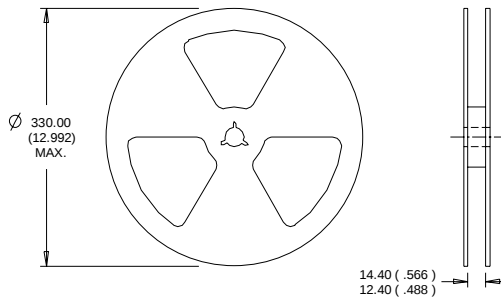
International
IOR Rectifier

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.

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

International
IOR Rectifier

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