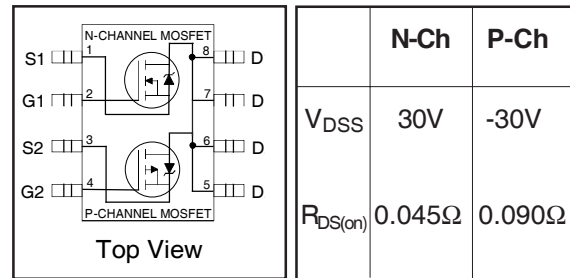**International IƏR Rectifier**

IRF7379QPbF

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

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

Top View

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
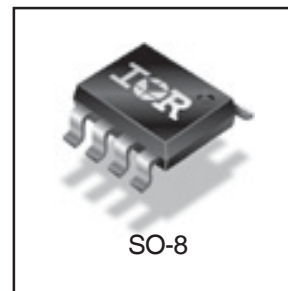
Absolute Maximum Ratings

	Parameter	Max.		Units
		N-Channel	P-Channel	
V_{SD}	Drain-to-Source Voltage	30	-30	A
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	5.8	-4.3	
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	4.6	-3.4	
I_{DM}	Pulsed Drain Current ①	46	-34	
P_D @ T_A = 25°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-Ambient④	50	°C/W

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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	30	—	—	V	V_{GS} = 0V, I_D = 250µA
		P-Ch	-30	—	—		V_{GS} = 0V, I_D = -250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	N-Ch	—	0.032	—	V/°C	Reference to 25°C, I_D = 1mA
		P-Ch	—	-0.037	—		Reference to 25°C, I_D = -1mA
$R_{DS(ON)}$	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
		P-Ch	—	0.070	0.090		V_{GS} = -10V, I_D =- 4.3A ③
			—	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 = 250µA
		P-Ch	-1.0	—	—		$V_{DS} = V_{GS}$, I_D = -250µA
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} = 24 V, V_{GS} = 0V
		P-Ch	—	—	-1.0		V_{DS} = -24V, V_{GS} = 0V
		N-Ch	—	—	25		V_{DS} = 24 V, V_{GS} = 0V, T_J = 125°C
		P-Ch	—	—	-25		V_{DS} = -24V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate-to-Source Forward Leakage	N-P	—	—	±100		V_{GS} = ± 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-Ch	—	—	2.9		
Q_{gd}	Gate-to-Drain ("Miller") Charge	N-Ch	—	—	7.9		P-Channel I_D = -1.8A, V_{DS} = -24V, V_{GS} = -10V
		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 = 6.0Ω, R_D = 6.2Ω ③
		P-Ch	—	11	—		
t_r	Rise Time	N-Ch	—	21	—		
		P-Ch	—	17	—		
$t_{d(off)}$	Turn-Off Delay Time	N-Ch	—	22	—		P-Channel V_{DD} = -15V, I_D = -1.8A, R_G = 6.0Ω, R_D = 8.2Ω
		P-Ch	—	25	—		
t_f	Fall Time	N-Ch	—	7.7	—		
		P-Ch	—	18	—		
L_D	Internal Drain Inductace	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 = 1.0MHz ③
		P-Ch	—	440	—		
C_{oss}	Output Capacitance	N-Ch	—	180	—		
		P-Ch	—	200	—		P-Channel V_{GS} = 0V, V_{DS} = -25V, f = 1.0MHz
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°C, I_S = 1.8A, V_{GS} = 0V ③
		P-Ch	—	—	-1.0		T_J = 25°C, I_S = -1.8A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	N-Ch	—	47	71	ns	N-Channel T_J = 25°C, I_F = 2.4A, di/dt = 100A/µs
		P-Ch	—	53	80		
Q_{rr}	Reverse Recovery Charge	N-Ch	—	56	84	nC	P-Channel ③ T_J = 25°C, I_F = -1.8A, di/dt = -100A/µs
		P-Ch	—	66	99		

Notes:

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

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

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

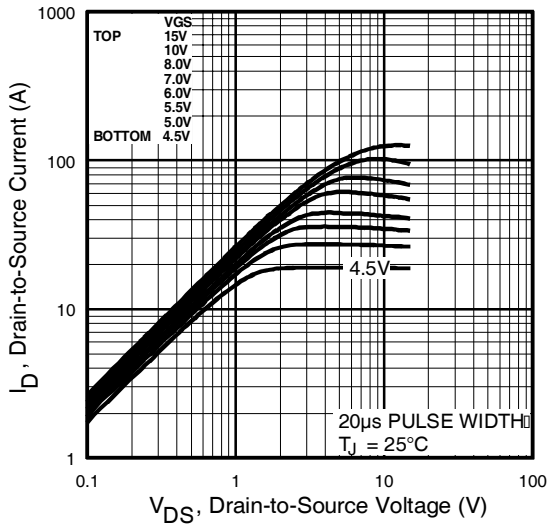④ Surface mounted on FR-4 board, t $\leq$ 10sec.
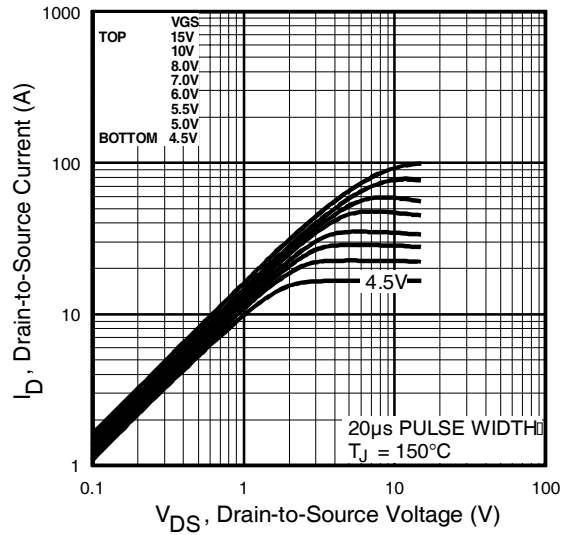
Fig 1. Typical Output Characteristics

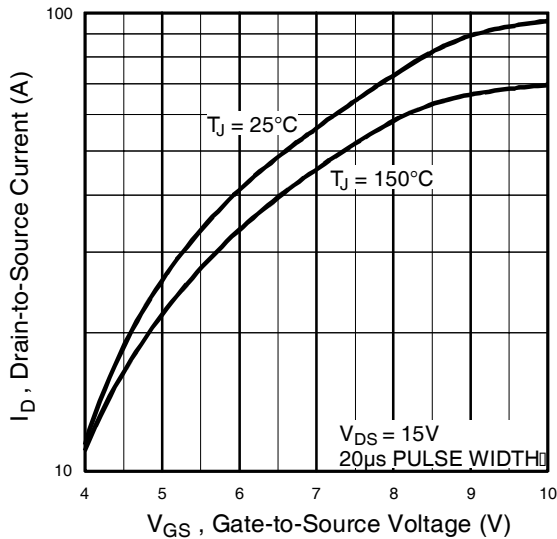**Fig 2.** Typical Output Characteristics

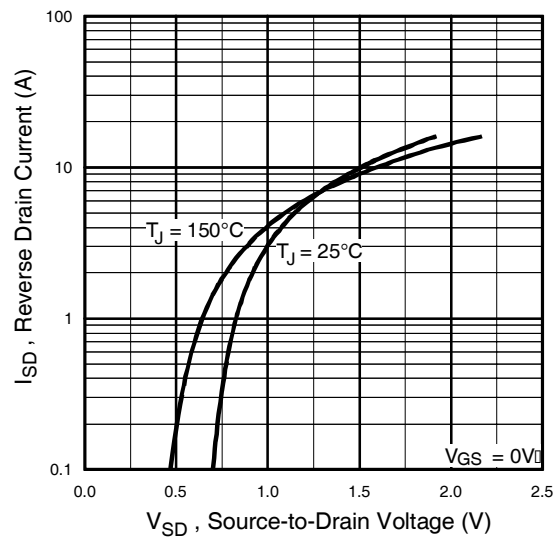**Fig 3.** Typical Transfer Characteristics

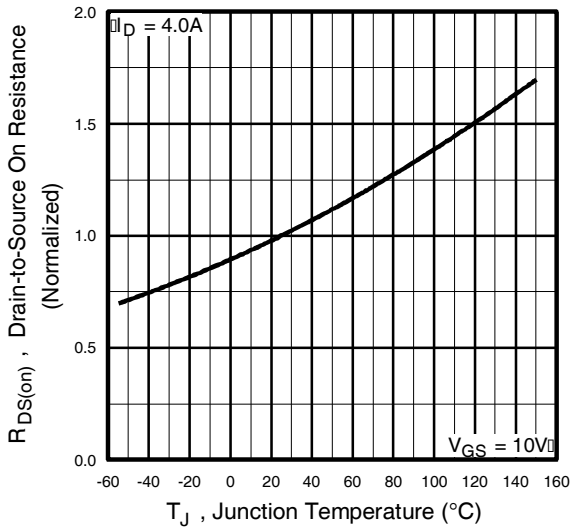**Fig 4.** Typical Source-Drain Diode Forward Voltage
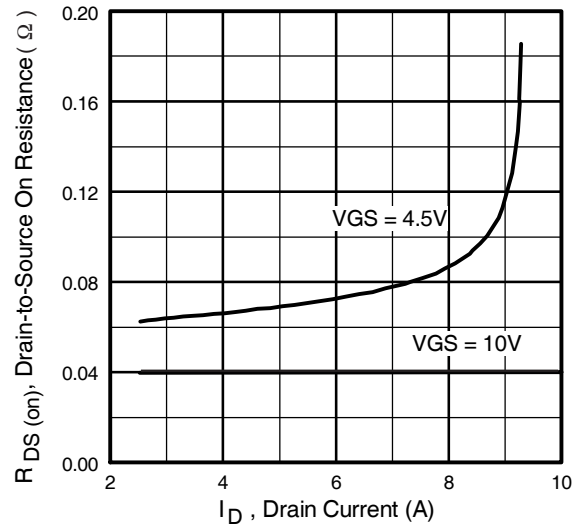
Fig 5. Normalized On-Resistance
Vs. Temperature
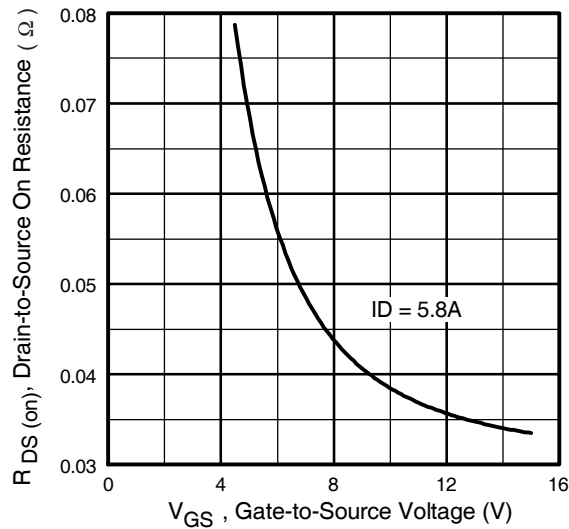

Fig 6. Typical On-Resistance Vs. Drain
Current

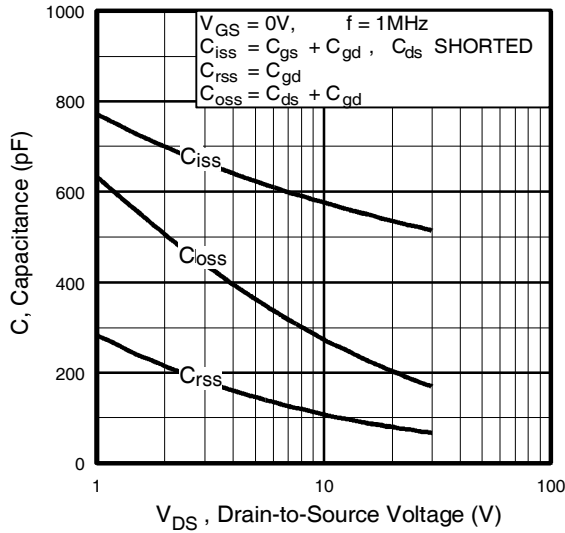**Fig 7.** Typical On-Resistance Vs. Gate
Voltage

N-Channel   IRF7379QPbF
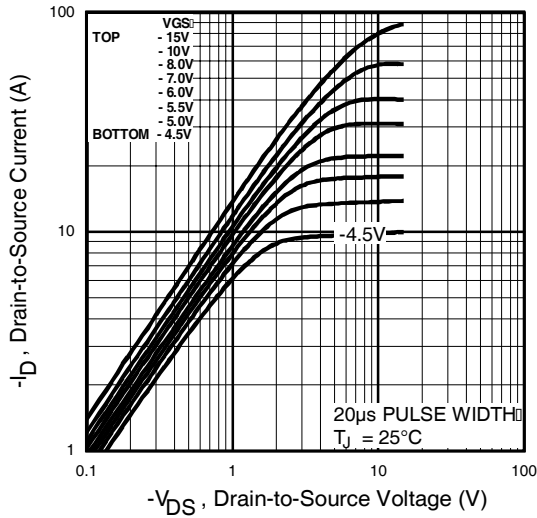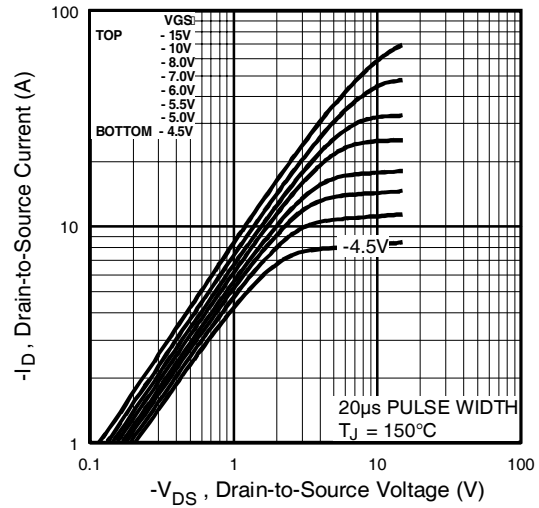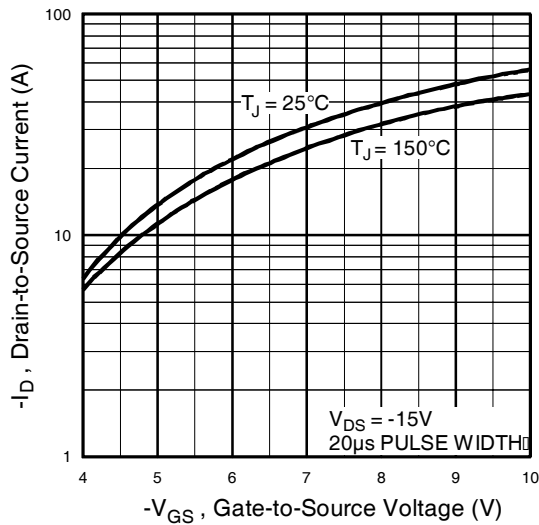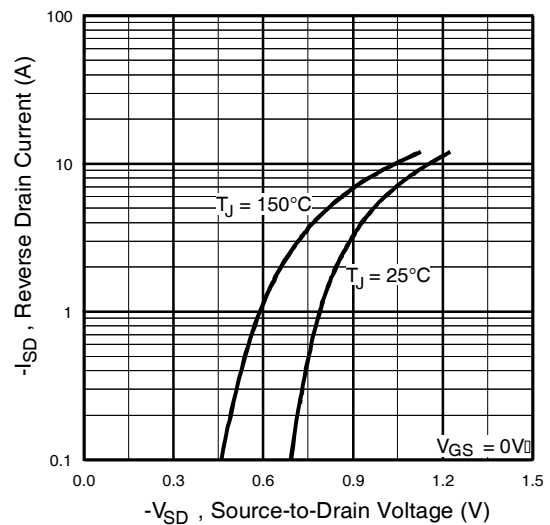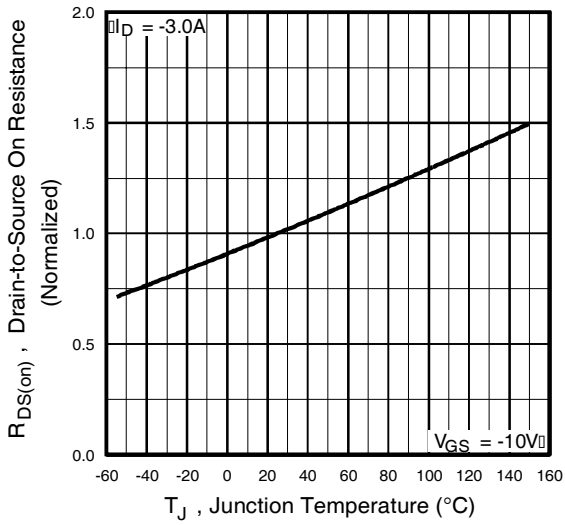

Fig 8. Typical Capacitance Vs.
Drain-to-Source Voltage
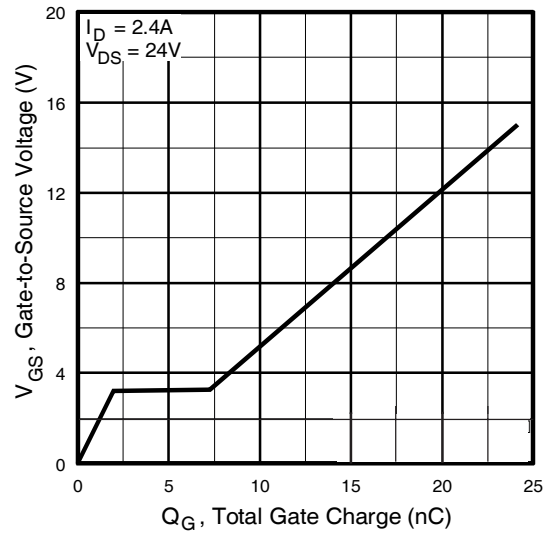
Fig 9. Typical Gate Charge Vs.
Gate-to-Source Voltage
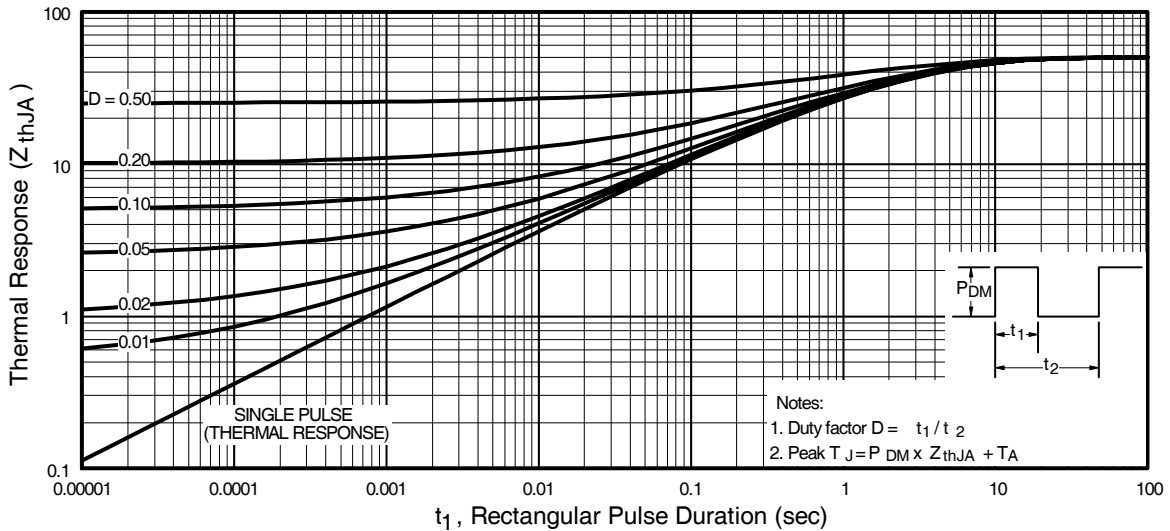
Fig 10. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

IRF7379QPbF

P-Channel

International
IOR Rectifier

Fig 11. Typical Output Characteristics

Fig 12. Typical Output Characteristics

Fig 13. Typical Transfer Characteristics

Fig 14. Typical Source-Drain Diode
Forward Voltage

6

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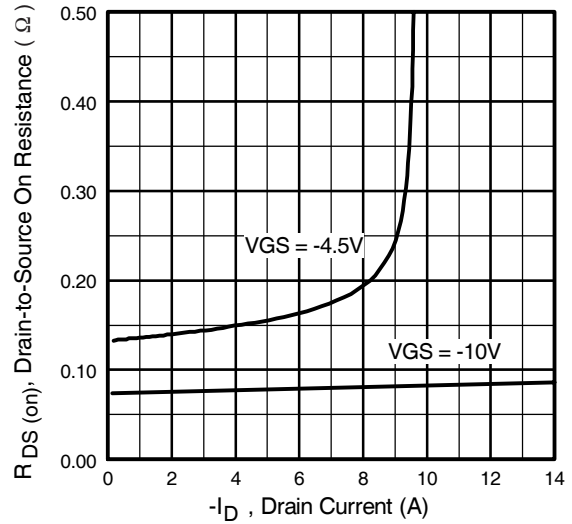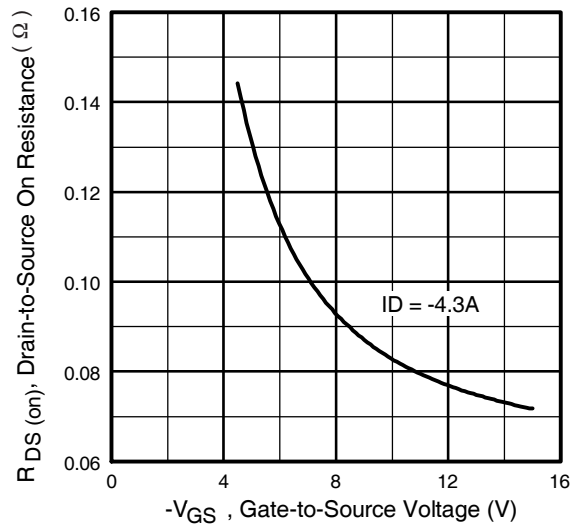**Fig 15.** Normalized On-Resistance Vs. Temperature

Fig 16. Typical On-Resistance Vs. Drain Current

Fig 17. Typical On-Resistance Vs. Gate Voltage

IRF7379QPbF
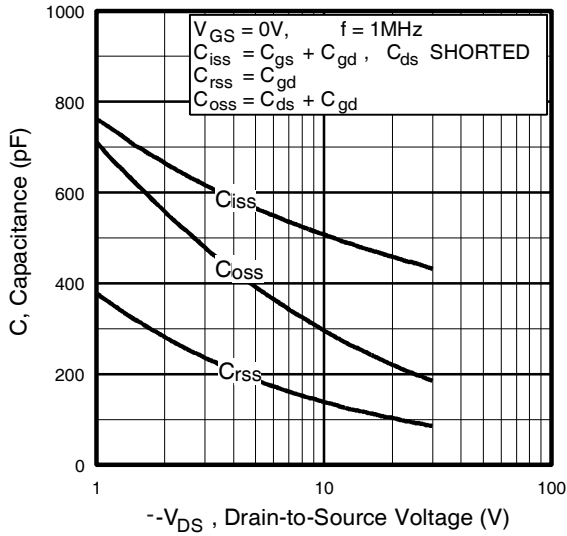
P-Channel

International IOR Rectifier

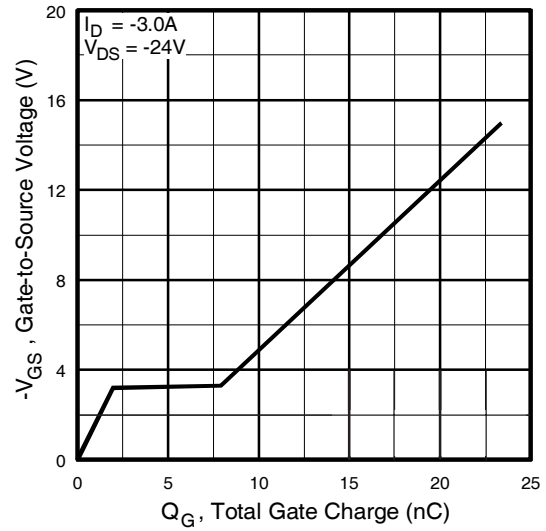**Fig 18.** Typical Capacitance Vs. Drain-to-Source Voltage

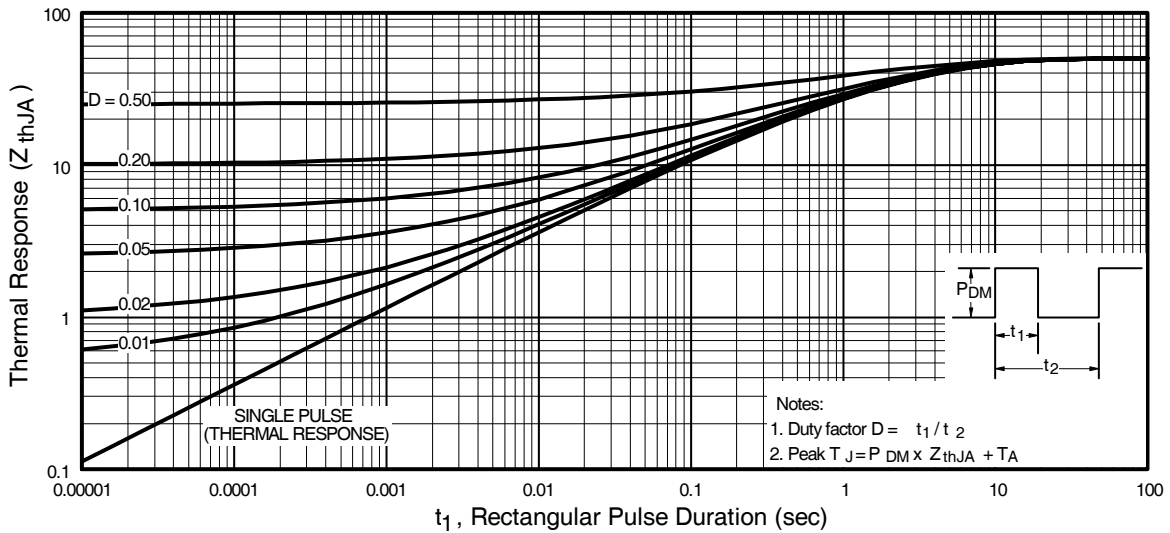**Fig 19.** Typical Gate Charge Vs. Gate-to-Source Voltage

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

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SO-8 Package Outline

Dimensions are shown in millimeters (inches)
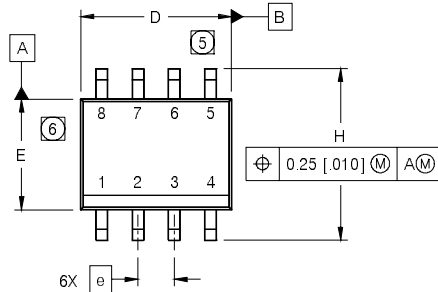
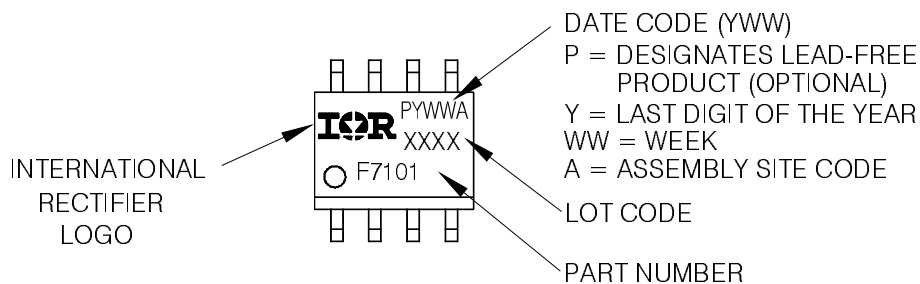| DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e 1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40	1.27
y	0°	8°	0°	8°
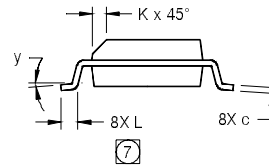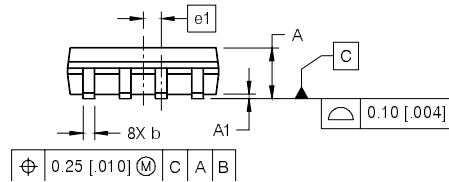
NOTES:

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
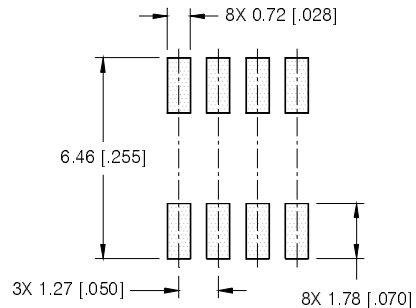
SO-8 Part Marking

EXAMPLE: THIS IS AN IRF7101 (MOSFET)

DATE CODE (YWW)
P = DESIGNATES LEAD-FREE PRODUCT (OPTIONAL)
Y = LAST DIGIT OF THE YEAR
WW = WEEK
A = ASSEMBLY SITE CODE

INTERNATIONAL RECTIFIER LOGO

LOT CODE

PART NUMBER

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

IRF7379QPbF

SO-8 Tape and Reel

Dimensions are shown in millimeters (inches)

TERMINAL NUMBER 1

12.3 (.484)
11.7 (.461)

8.1 (.318)
7.9 (.312)

FEED DIRECTION
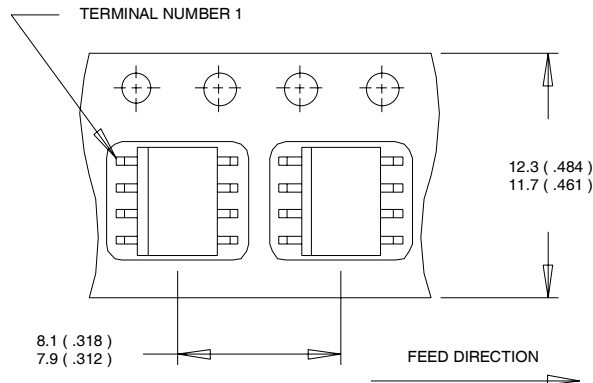
NOTES:
1. CONTROLLING DIMENSION : MILLIMETER.
2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS(INCHES).
3. OUTLINE CONFORMS TO EIA-481 & EIA-541.

∅ 330.00
(12.992)
MAX.

14.40 (.566)
12.40 (.488)
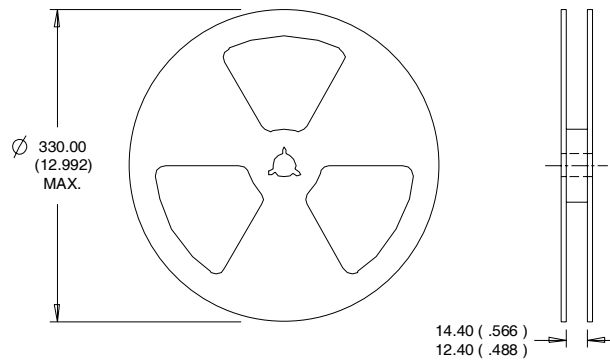
NOTES :
1. CONTROLLING DIMENSION : MILLIMETER.
2. OUTLINE CONFORMS TO EIA-481 & EIA-541.

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

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.

International **IR** Rectifier

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