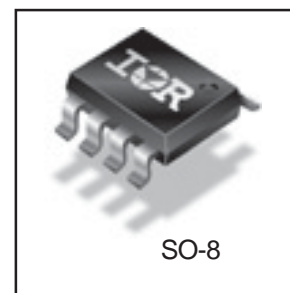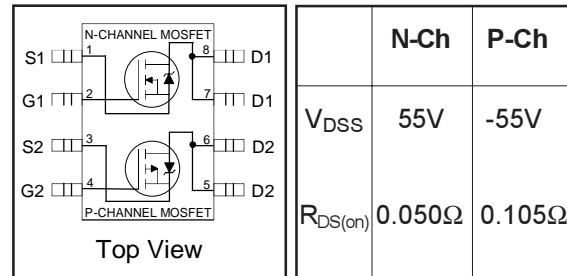# International IƆR Rectifier

IRF7343IPbF

HEXFET® Power MOSFET

- Generation V Technology
- Ultra Low On-Resistance
- Dual N and P Channel MOSFET
- 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-CHANNEL MOSFET

S1	1			8	D1
G1	2			7	D1
S2	3			6	D2
G2	4			5	D2

P-CHANNEL MOSFET

Top View

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

SO-8

Absolute Maximum Ratings

	Parameter	Max.		Units
		N-Channel	P-Channel	
V_{DS}	Drain-Source Voltage	55	-55	V
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	4.7	-3.4	
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	
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
$R_{θJA}$	Maximum Junction-to-Ambient ⑤	——	62.5	°C/W

International IOR Rectifier

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	—	—	-50		V_{DS} = -55V, V_{GS} = 0V
		N-Ch	—	—	25		V_{DS} = 55V, V_{GS} = 0V, T$_J$ = 55°C
		P-Ch	—	—	-250		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
		P-Ch	—	26	38		I_D = 4.5A, V_{DS} = 44V, V_{GS} = 10V ④
Q_{gs}	Gate-to-Source Charge	N-Ch	—	2.3	3.4		
		P-Ch	—	3.0	4.5		P-Channel
Q_{gd}	Gate-to-Drain ("Miller") Charge	N-Ch	—	7.0	10		I_D = -3.1A, V_{DS} = -44V, V_{GS} = -10V
		P-Ch	—	8.4	13		
$t_{d(on)}$	Turn-On Delay Time	N-Ch	—	8.3	12	ns	N-Channel
		P-Ch	—	14	22		V_{DD} = 28V, I_D = 1.0A, R_G = 6.0Ω,
t_r	Rise Time	N-Ch	—	3.2	4.8		R_D = 16Ω ④
		P-Ch	—	10	15		
$t_{d(off)}$	Turn-Off Delay Time	N-Ch	—	32	48		P-Channel
		P-Ch	—	43	64		V_{DD} = -28V, I_D = -1.0A, R_G = 6.0Ω,
t_f	Fall Time	N-Ch	—	13	20		R_D = 16Ω
		P-Ch	—	22	32		
C_{iss}	Input Capacitance	N-Ch	—	740	—	pF	N-Channel
		P-Ch	—	690	—		V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz
C_{oss}	Output Capacitance	N-Ch	—	190	—		
		P-Ch	—	210	—		P-Channel
C_{rss}	Reverse Transfer Capacitance	N-Ch	—	71	—		V_{GS} = 0V, V_{DS} = -25V, f = 1.0MHz
		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
		P-Ch	—	54	80		T$_J$ = 25°C, I_F = 2.0A, di/dt = 100A/μs
Q_{rr}	Reverse Recovery Charge	N-Ch	—	120	170	nC	P-Channel
		P-Ch	—	85	130		T$_J$ = 25°C, I_F = -2.0A, di/dt = 100A/μs ④

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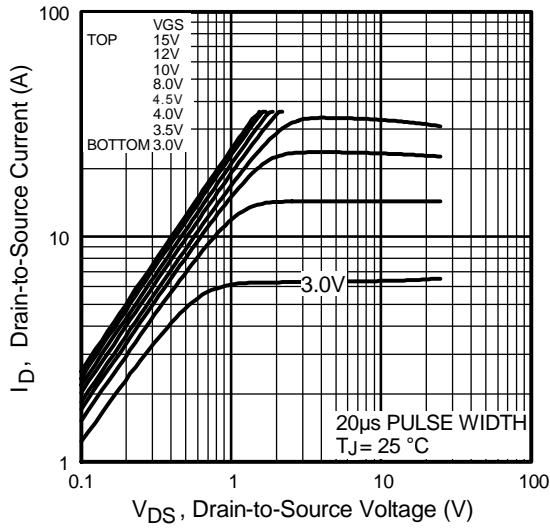
⑤ Surface mounted on FR-4 board, t ≤ 10sec.

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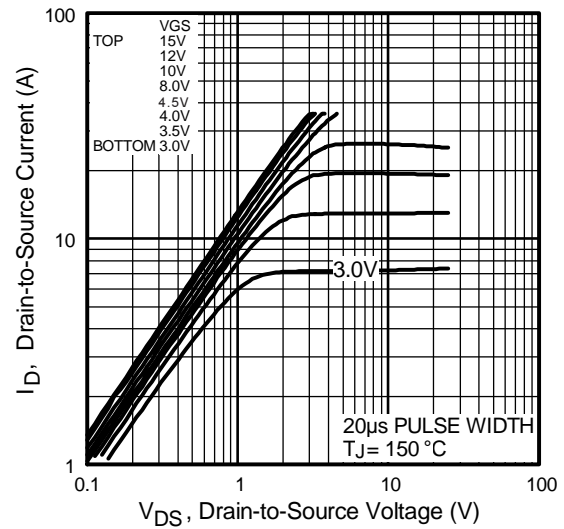**Fig 1.** Typical Output Characteristics
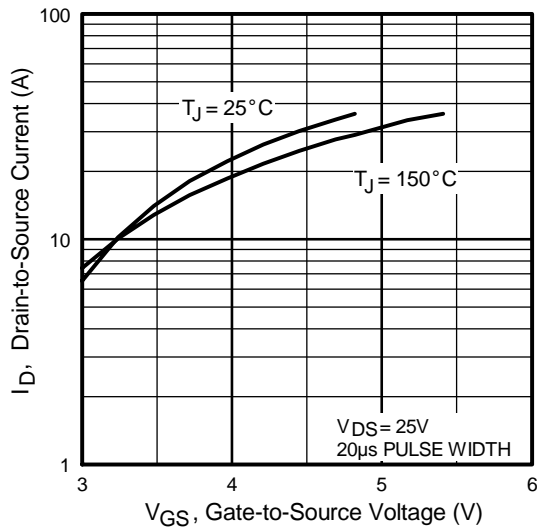
Fig 2. Typical Output Characteristics

Fig 3. Typical Transfer Characteristics
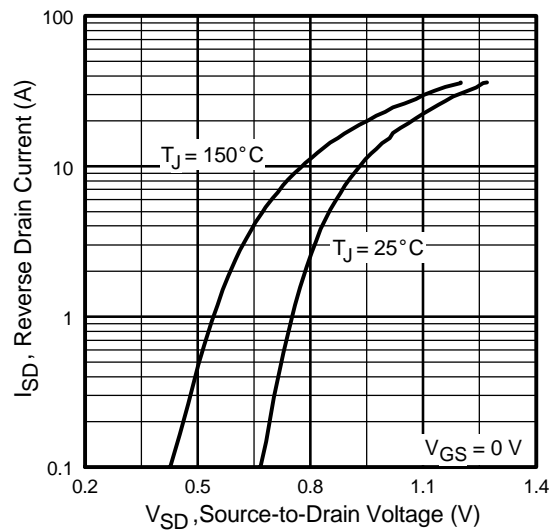
Fig 4. Typical Source-Drain Diode
Forward Voltage
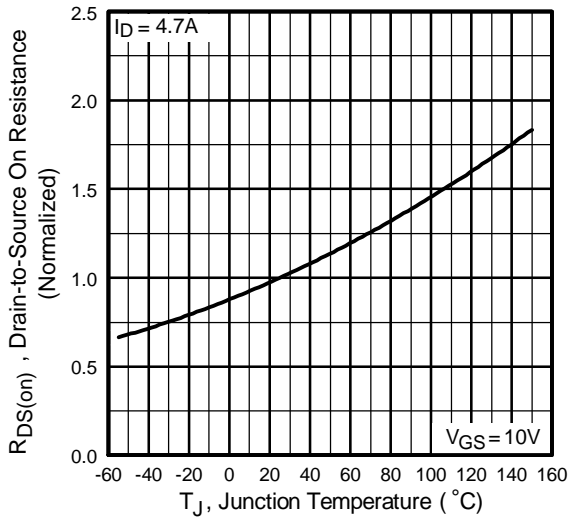
IRF7343IPbF

N-Channel

Fig 5. Normalized On-Resistance
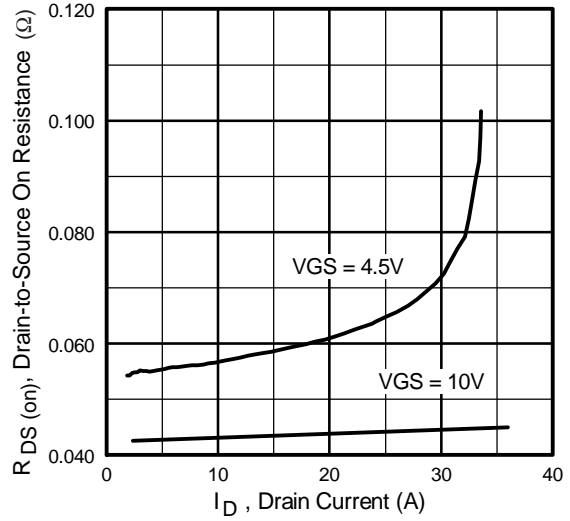Vs. Temperature

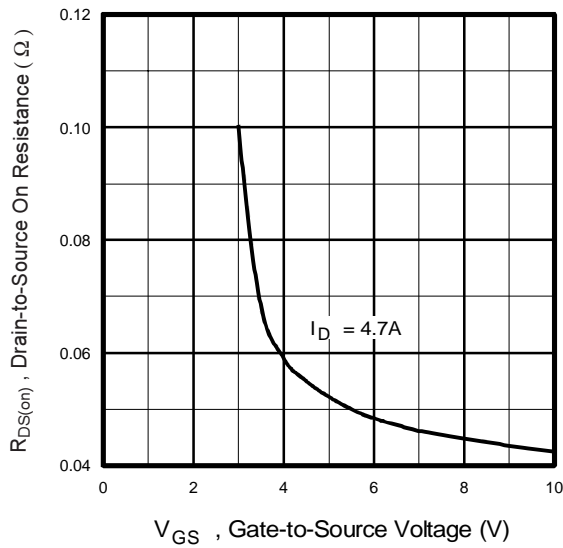**Fig 6.** Typical On-Resistance Vs. Drain
Current

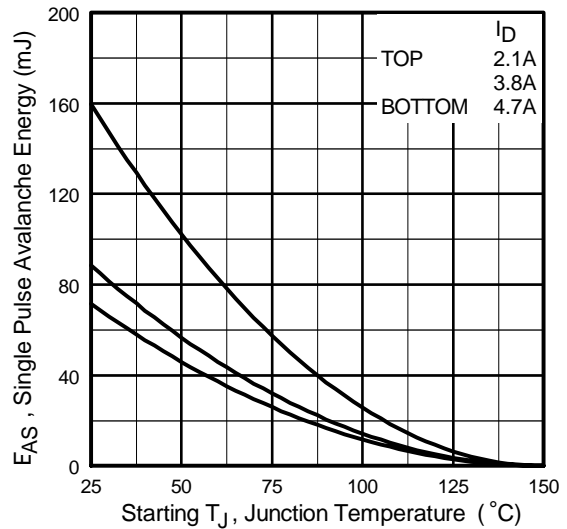**Fig 7.** Typical On-Resistance Vs. Gate
Voltage

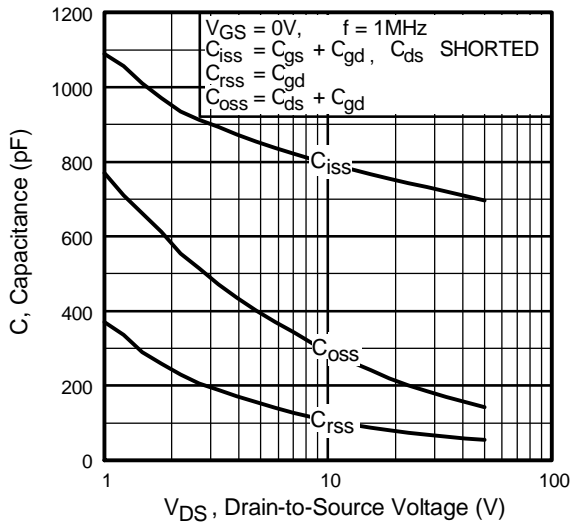**Fig 8.** Maximum Avalanche Energy
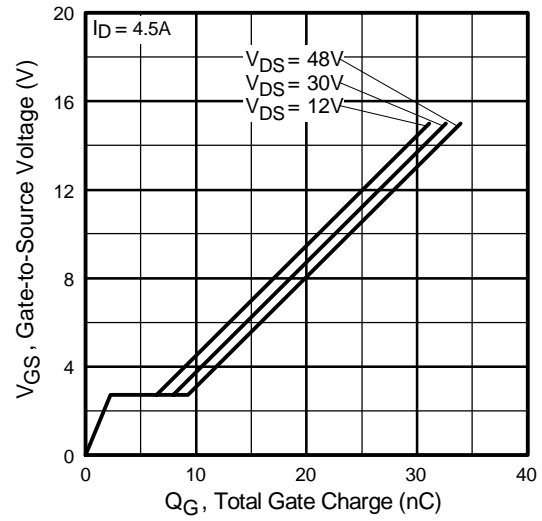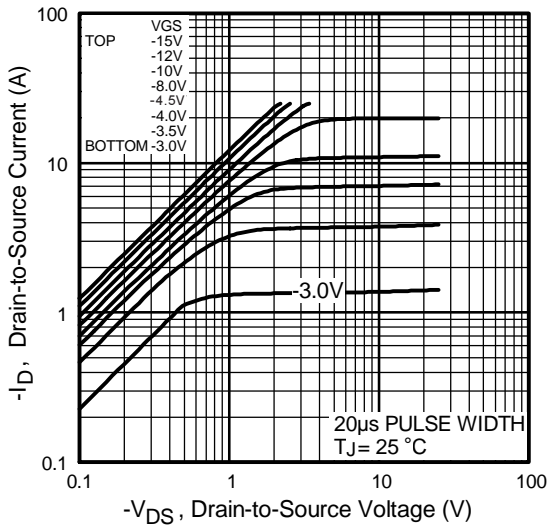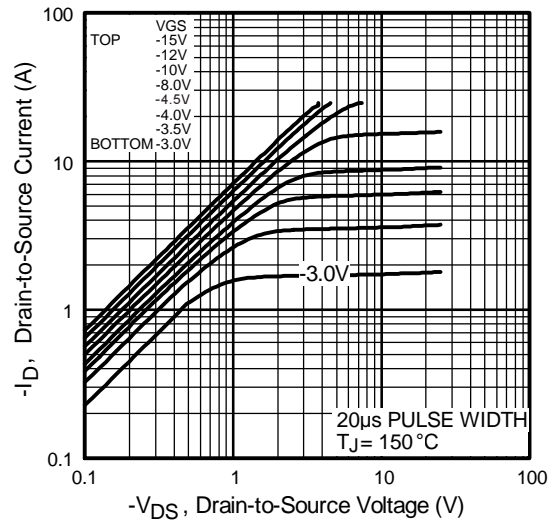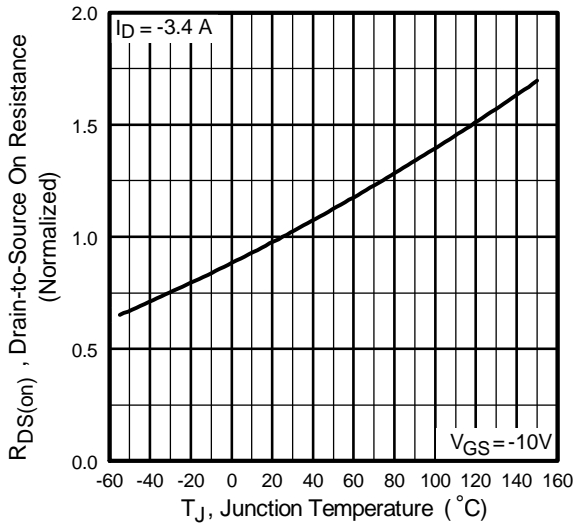Vs. Drain Current

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

Fig 10. Typical Gate Charge Vs.
Gate-to-Source Voltage
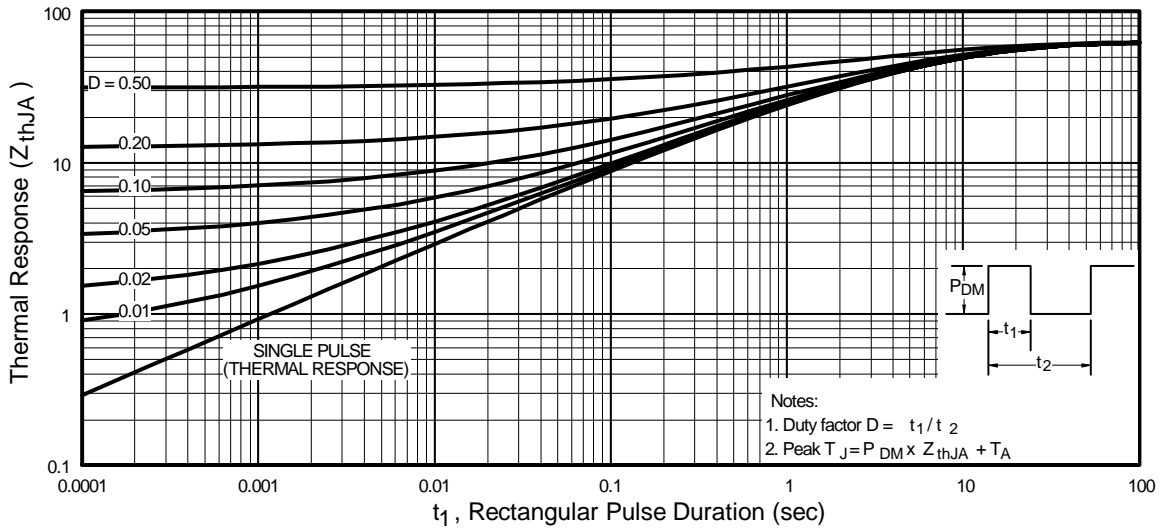
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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P-Channel

Fig 12. Typical Output Characteristics

Fig 13. Typical Output Characteristics
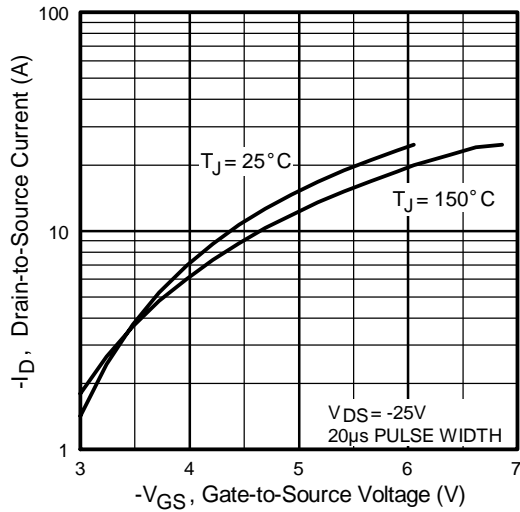
Fig 14. Typical Transfer Characteristics
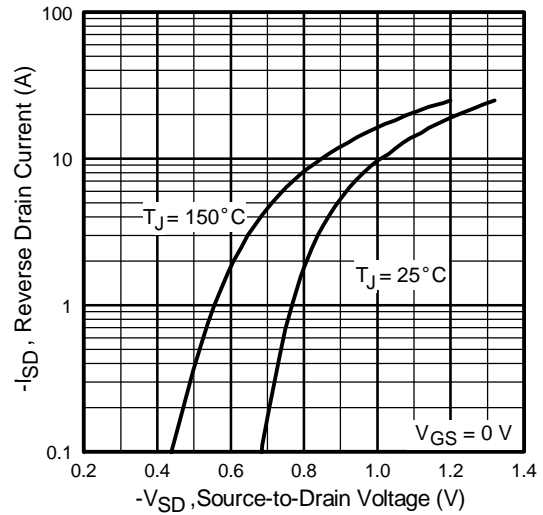
Fig 15. Typical Source-Drain Diode
Forward Voltage
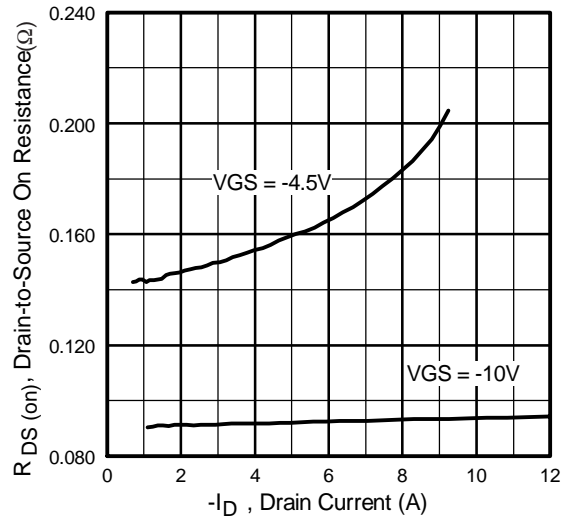
6

Fig 16. Normalized On-Resistance
Vs. Temperature

Fig 17. Typical On-Resistance Vs. Drain
Current
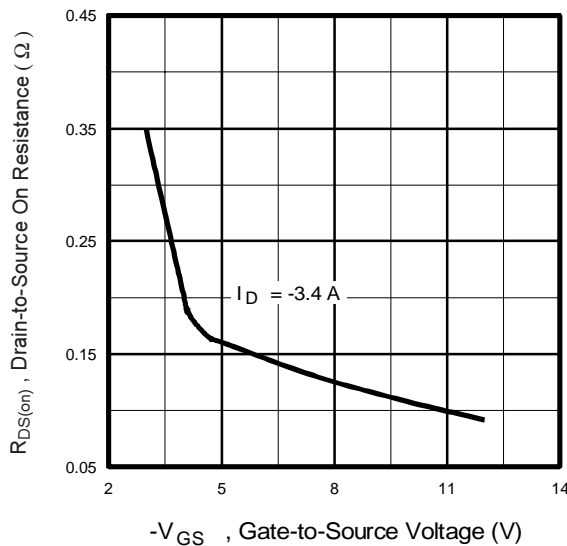
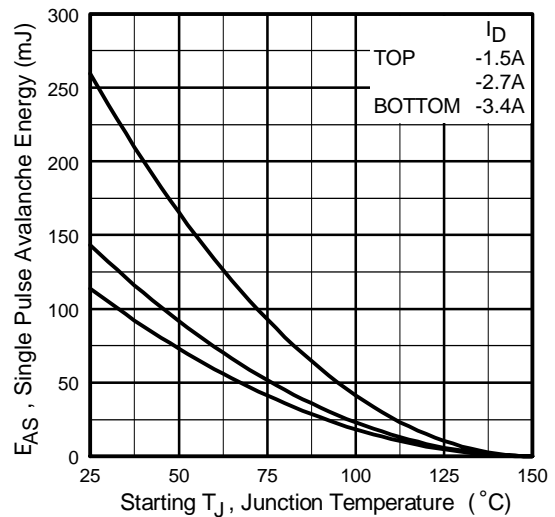**Fig 18.** Typical On-Resistance Vs. Gate
Voltage

Fig 19. Maximum Avalanche Energy
Vs. Drain Current

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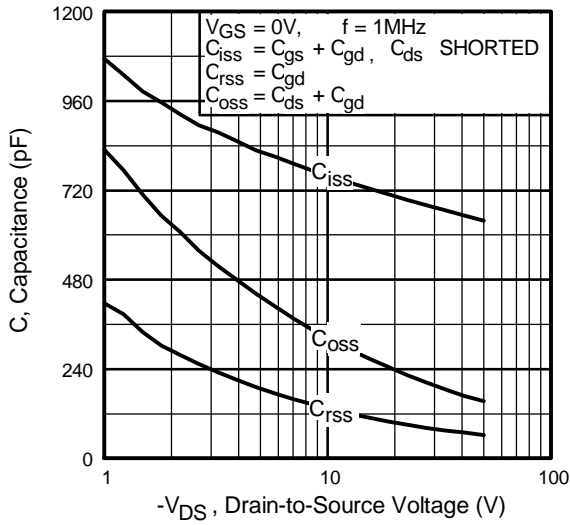## P-Channel

International **IꝎR** Rectifier

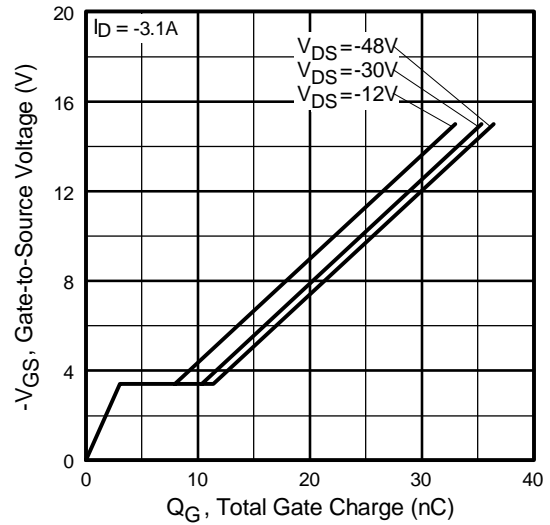**Fig 20.** Typical Capacitance Vs.
Drain-to-Source Voltage

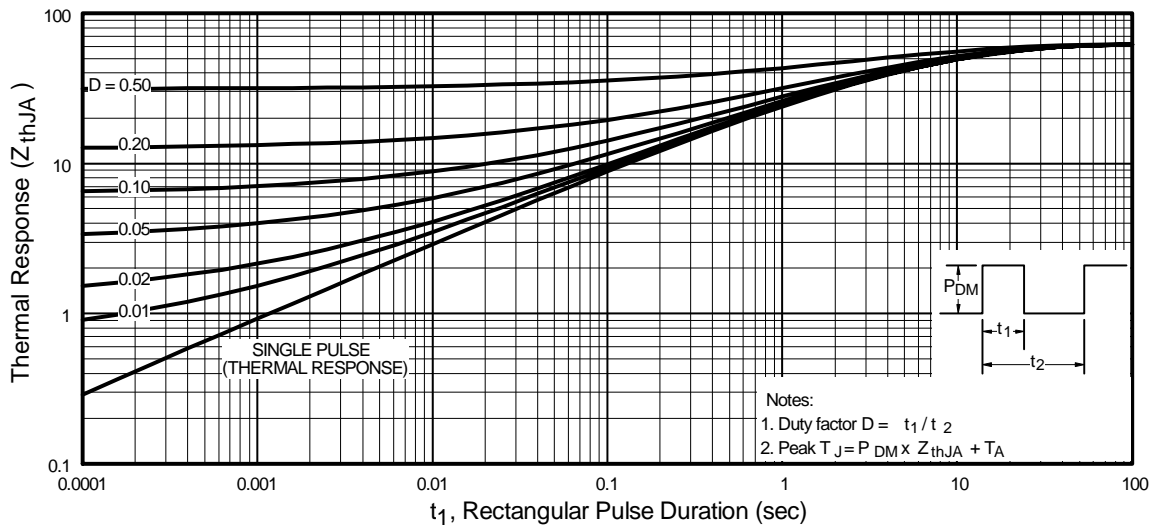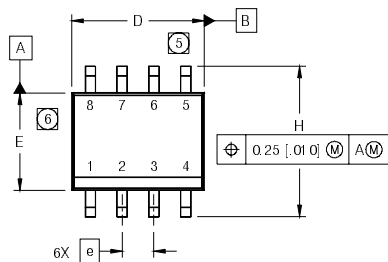**Fig 21.** Typical Gate Charge Vs.
Gate-to-Source Voltage

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

SO-8 Package Outline
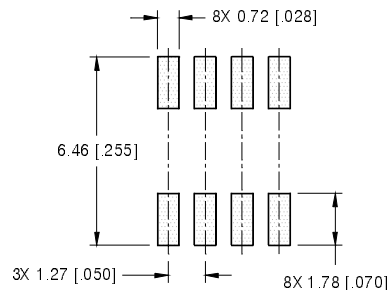
Dimensions are shown in milimeters (inches)

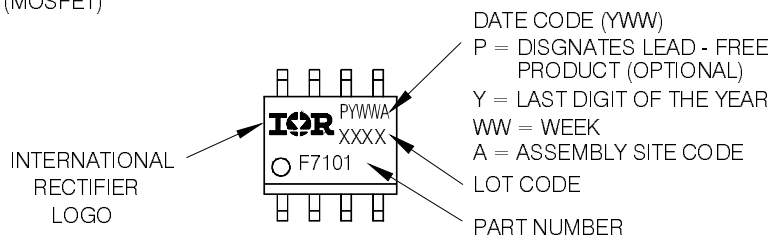| DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e 1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40	1.27
y	0°	8°	0°	8°
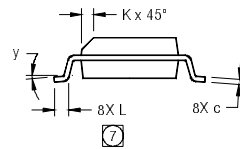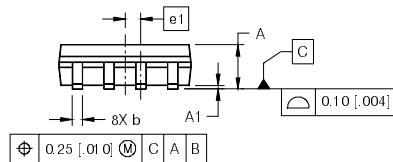
NOTES:
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5️⃣ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [.006].
6️⃣ DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [.010].
7️⃣ DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

FOOTPRINT

8X 0.72 [.028]

6.46 [.255]

3X 1.27 [.050]

8X 1.78 [.070]

SO-8 Part Marking Information

EXAMPLE: THIS IS AN IRF7101 (MOSFET)

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

INTERNATIONAL RECTIFIER LOGO

IOR PYWWA
XXXX
F7101

LOT CODE

PART NUMBER

IRF7343IPbF

SO-8 Tape and Reel

Dimensions are shown in milimeters (inches)

TERMINAL NUMBER 1

12.3 (.484)
11.7 (.461)

8.1 (.318)
7.9 (.312)

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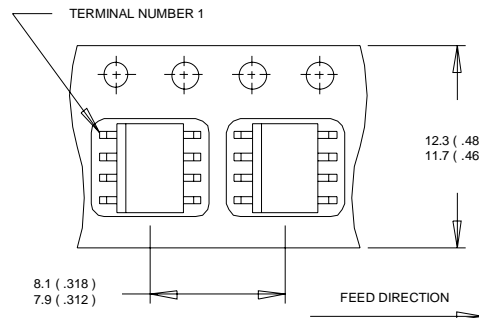
NOTES:
1. CONTROLLING DIMENSION : MILLIMETER.
2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS(INCHES).
3. OUTLINE CONFORMS TO EIA-481 & EIA-541.

∅ 330.00
(12.992)
MAX.

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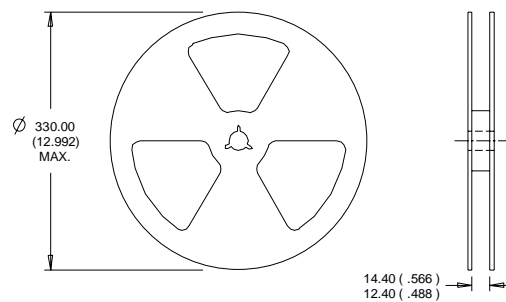
NOTES :
1. CONTROLLING DIMENSION : MILLIMETER.
2. OUTLINE CONFORMS TO EIA-481 & EIA-541.

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

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7903
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