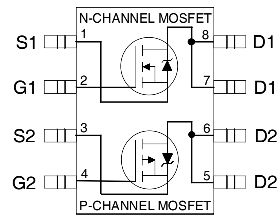
HEXFET® Power MOSFET

Features

- Advanced Planar Technology
- Ultra Low On-Resistance
- Logic Level Gate Drive
- Dual N and P Channel MOSFET
- Surface Mount
- Available in Tape & Reel
- 150°C Operating Temperature
- Automotive [Q101] Qualified*
- Lead-Free, RoHS Compliant



Top View

		N-Ch	P-Ch
$V_{(BR)DSS}$		55V	-55V
$R_{DS(on)}$	typ.	0.043Ω	0.095Ω
	max.	0.050Ω	0.105Ω
I_D		4.7A	-3.4A


SO-8

G	D	S
Gate	Drain	Source

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.

Base Part Number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
AUIRF7343Q	SO-8	Tube	95	AUIRF7343Q
		Tape and Reel	4000	AUIRF7343QTR

Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only; and functional operation of the device at these or any other condition beyond those indicated in the specifications is not implied.Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions. Ambient temperature (T_A) is 25°C, unless otherwise specified.

	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	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	3.8	-2.7	
I_{DM}	Pulsed Drain Current ①	38	-27	
P_D @T_A = 25°C	Power Dissipation⑤	2.0		W
P_D @T_A = 70°C	Power Dissipation⑤	1.3		
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}	Operating Junction and Storage Temperature Range	-55 to + 150		°C

Thermal Resistance

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

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*Qualification standards can be found at http://www.irf.com/

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

	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
gfs	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		——	——	± 100	nA	V_{GS} = ± 20V

Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)

	Parameter		Min.	Typ.	Max.	Units	Conditions
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
Q_{gs}	Gate-to-Source Charge	N-Ch	——	2.3	3.4		
		P-Ch	——	3.0	4.5		P-Channel ④
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, ID=1.0A, RG = 6.0Ω
t_r	Rise Time	N-Ch	——	3.2	4.8		R_D = 28Ω
		P-Ch	——	10	15		P-Channel ④
$t_{d(off)}$	Turn-Off Delay Time	N-Ch	——	32	48		V_{DD} = -28V, ID=-1.0A, RG = 6.0Ω
		P-Ch	——	43	64		R_D = 28Ω
t_f	Fall Time	N-Ch	——	13	20		
		P-Ch	——	22	32		
C_{iss}	Input Capacitance	N-Ch	——	740	——	pF	N-Channel
		P-Ch	——	690			VGS = 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	——		VGS = 0V, V_{DS} = -25V, f =1.0Mhz
		P-Ch	——	86			

Diode Characteristics

	Parameter		Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current	N-Ch	——	——	2.0	A	
	(Body Diode)	P-Ch	——	——	-2.0		
I_{SM}	Pulsed Source Current	N-Ch	——	——	38		
	(Body Diode) ①	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 ƒ
Q_{rr}	Reverse Recovery Charge	N-Ch	——	120	170	nC	P-Channel ④
		P-Ch	——	85	130		T_J = 25°C, I_F = -2.0A di/dt = 100A/μs ƒ

Notes:

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

② N-Channel $I_{SD} \le$ 4.7A, di/dt $\le$ 220A/μs, $V_{DD} \le V_{(BR)DSS}$, $T_J \le$ 150°C
P-Channel $I_{SD} \le$ -3.4A, di/dt $\le$ -150A/μs, $V_{DD} \le V_{(BR)DSS}$, $T_J \le$ 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 $\le$ 300μs; duty cycle $\le$ 2%.

⑤ Surface mounted on FR-4 board, t $\le$ 10sec.

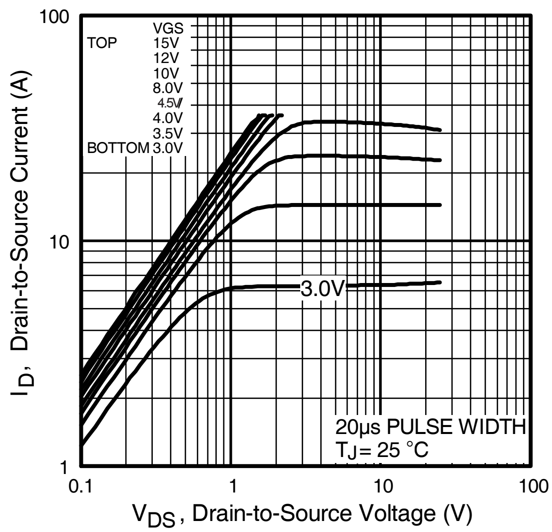


Fig 1. Typical Output Characteristics

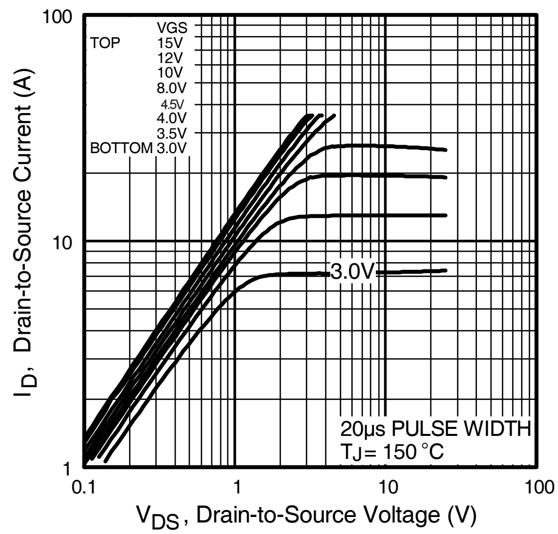


Fig 2. Typical Output Characteristics

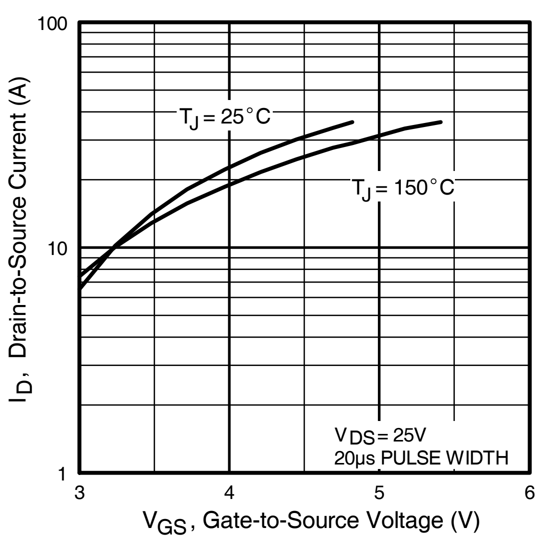


Fig 3. Typical Transfer Characteristics

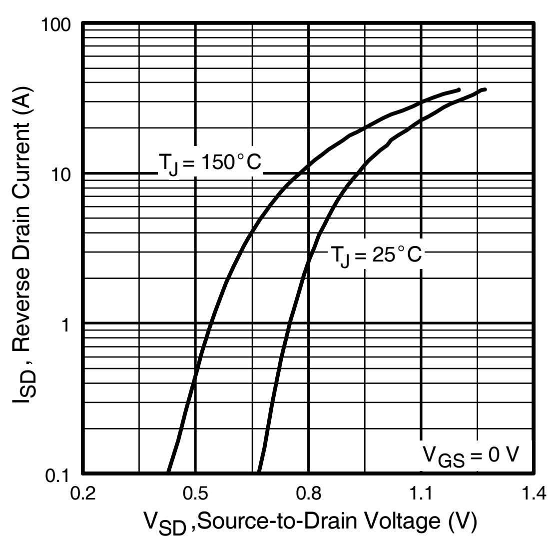


Fig 4. Typical Source-Drain Diode Forward Voltage

N-Channel

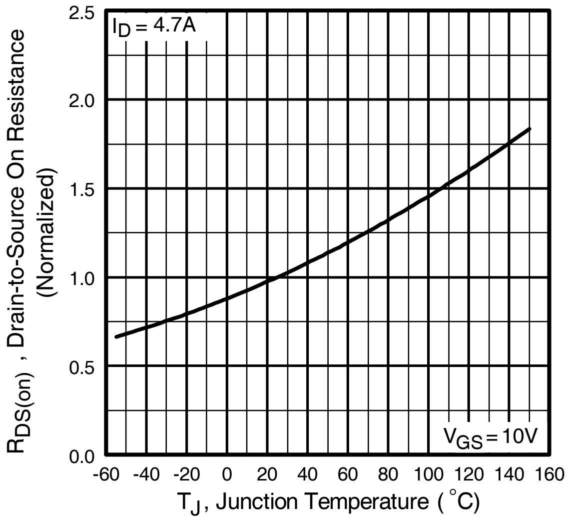


Fig 5. Normalized On-Resistance Vs. Temperature

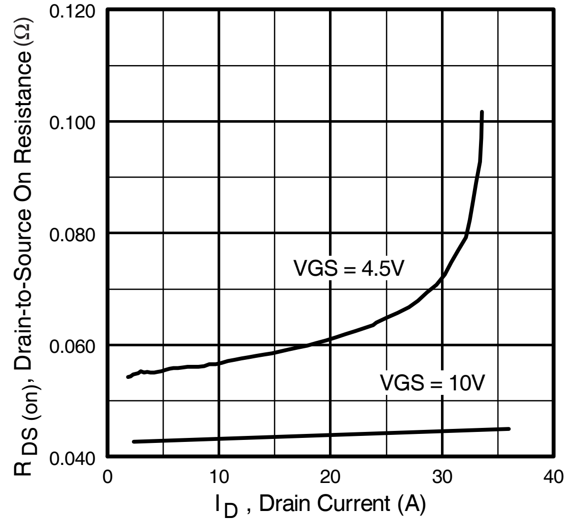


Fig 6. Typical On-Resistance Vs. Drain Current

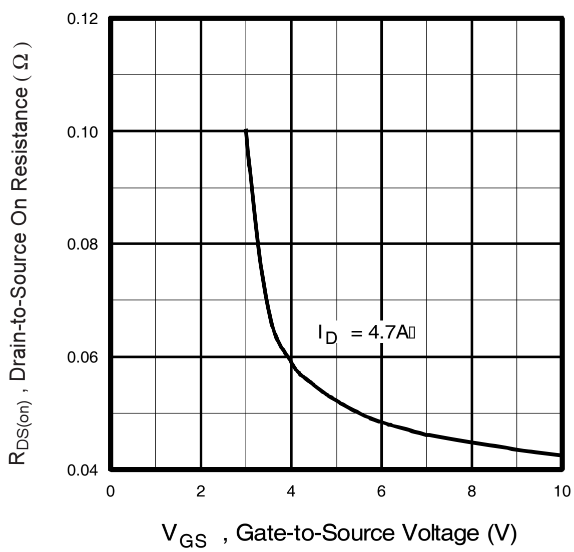


Fig 7. Typical On-Resistance Vs. Gate Voltage

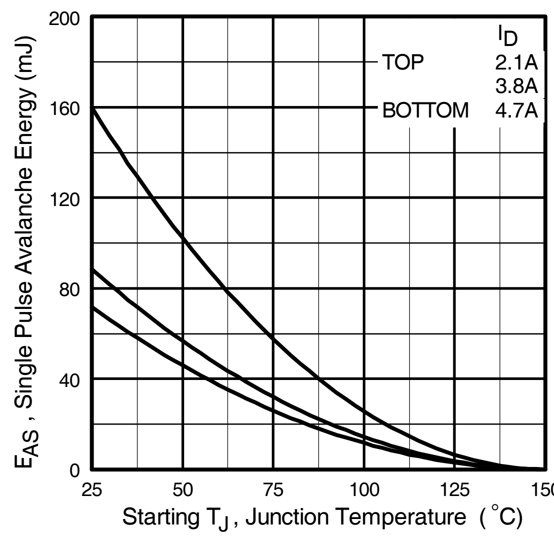


Fig 8. Maximum Avalanche Energy Vs. Drain Current

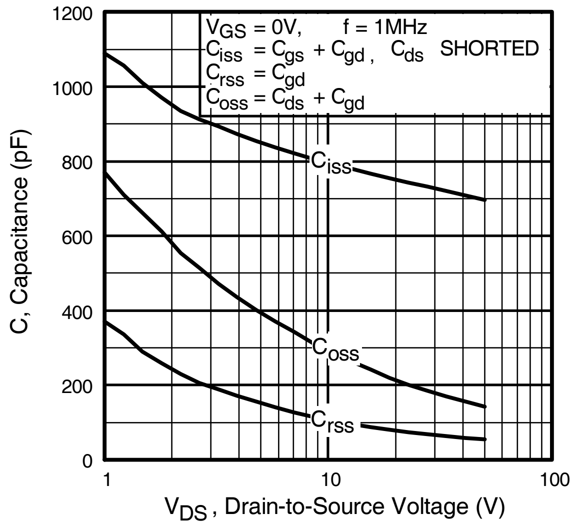


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

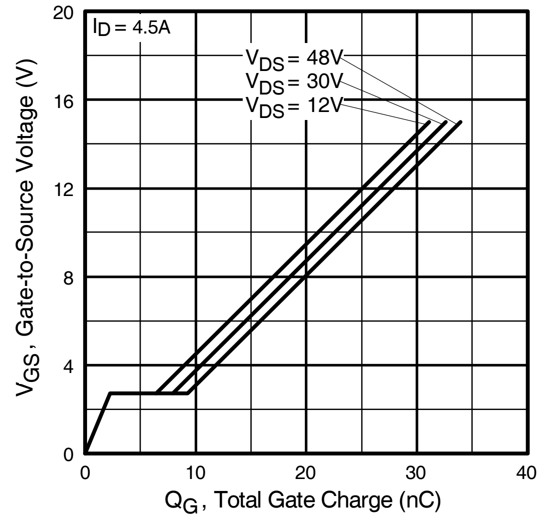


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

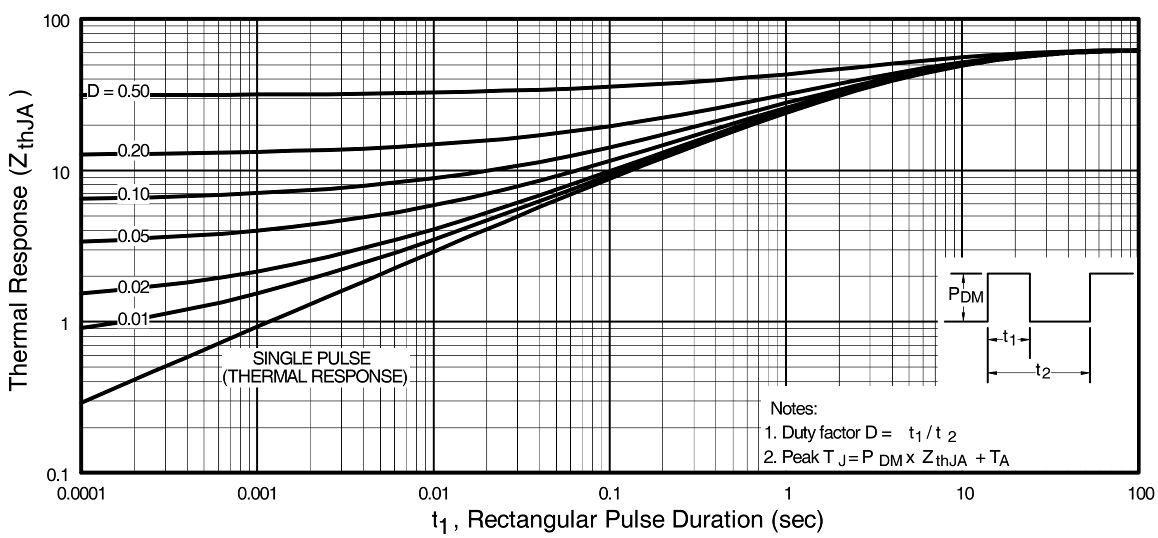


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

P-Channel

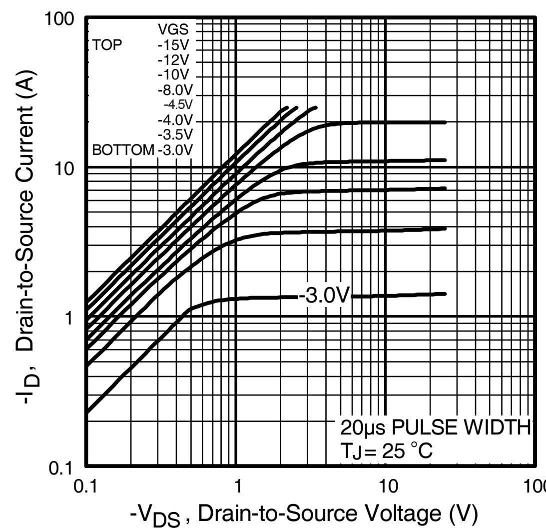


Fig 12. Typical Output Characteristics

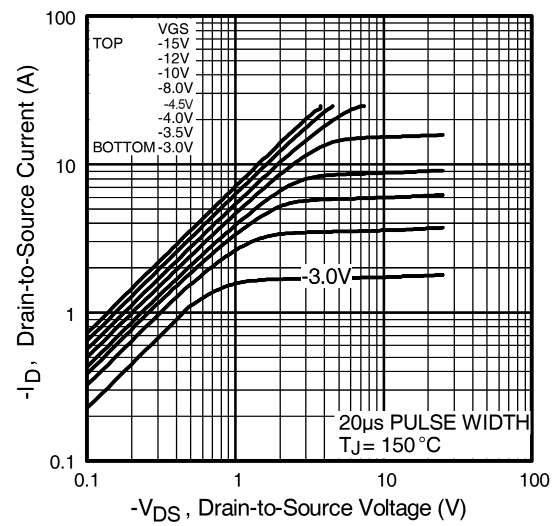


Fig 13. Typical Output Characteristics

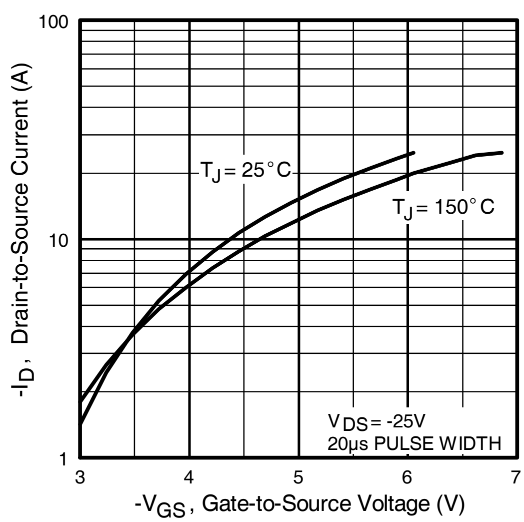


Fig 14. Typical Transfer Characteristics

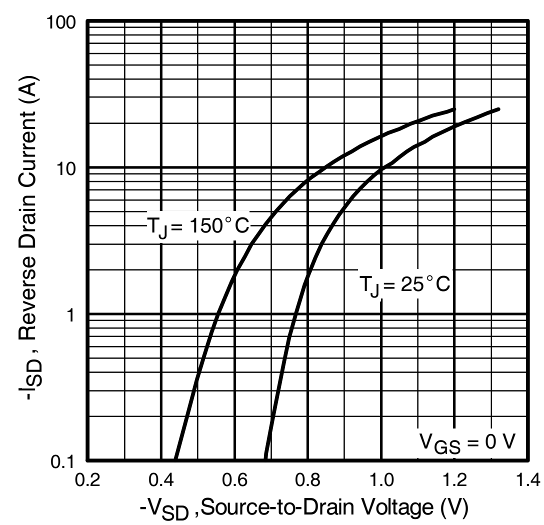


Fig 15. Typical Source-Drain Diode Forward Voltage

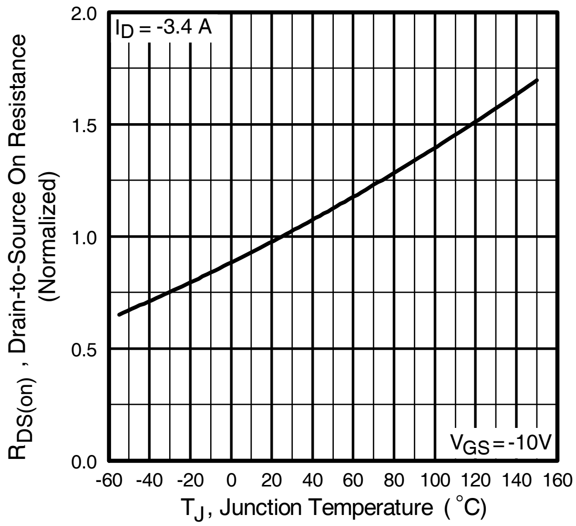


Fig 16. Normalized On-Resistance Vs. Temperature

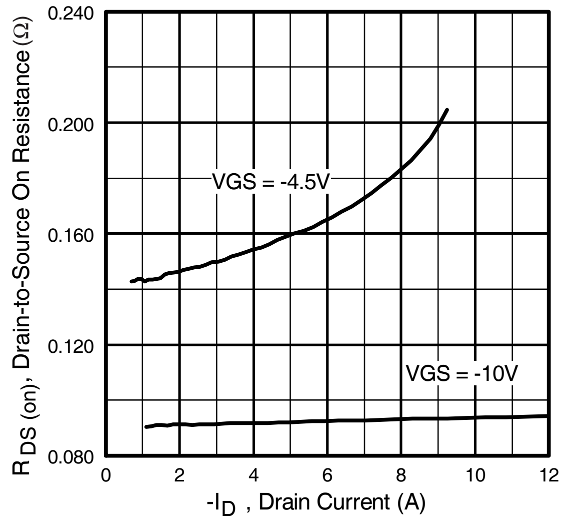


Fig 17. Typical On-Resistance Vs. Drain Current

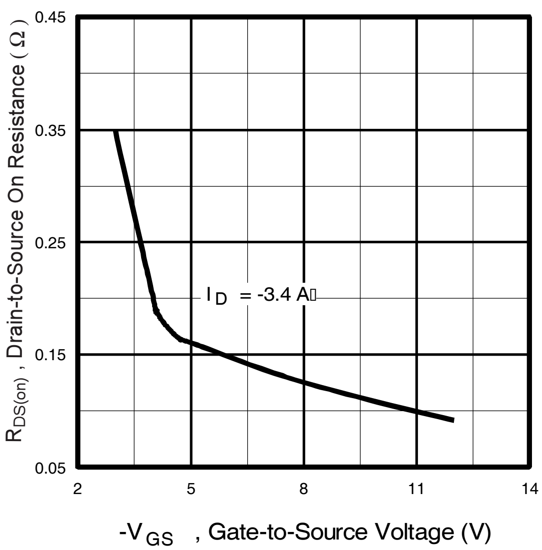


Fig 18. Typical On-Resistance Vs. Gate Voltage

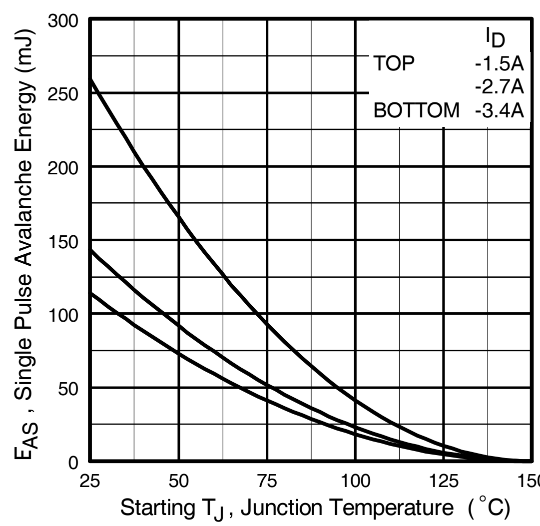


Fig 19. Maximum Avalanche Energy Vs. Drain Current

P-Channel

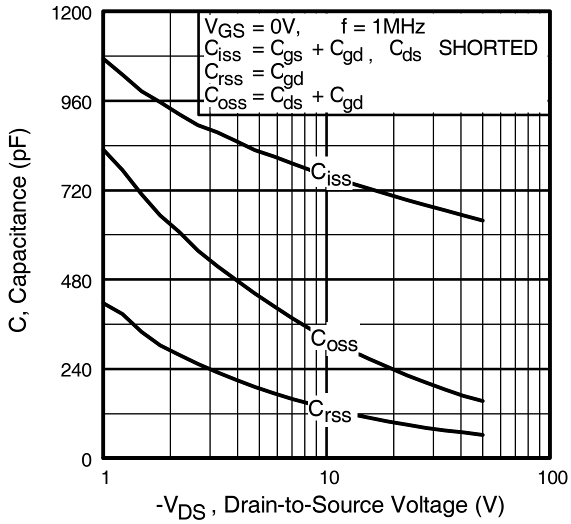


Fig 20. Typical Capacitance Vs. Drain-to-Source Voltage

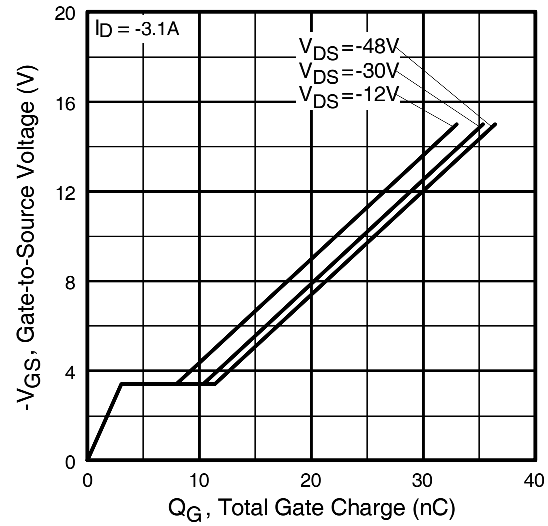


Fig 21. Typical Gate Charge Vs. Gate-to-Source Voltage

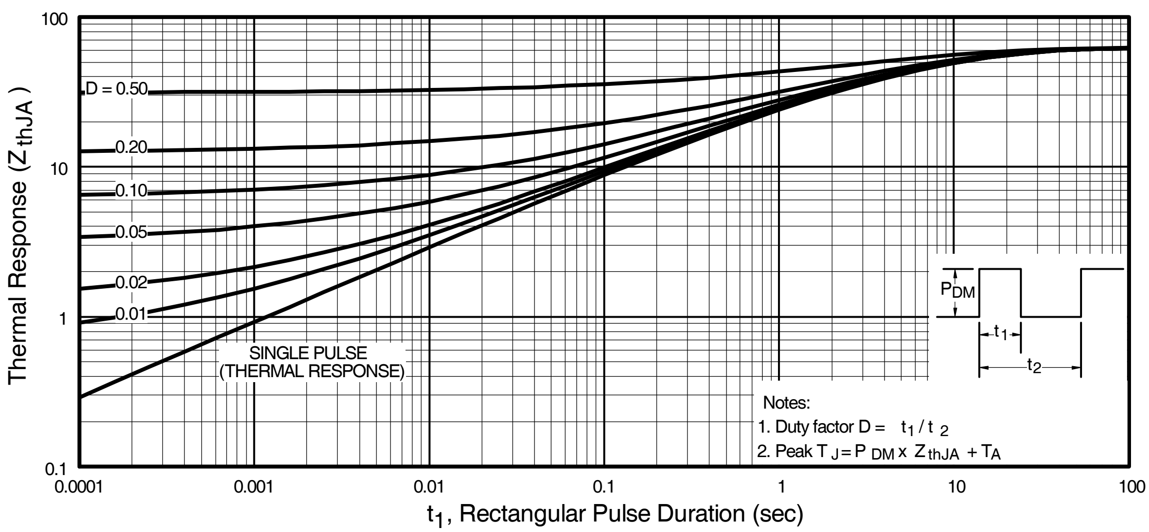
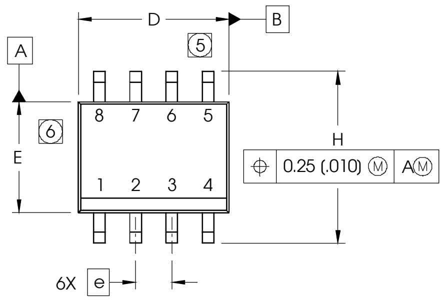


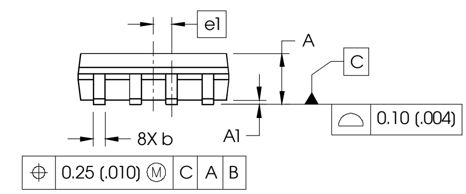
Fig 22. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

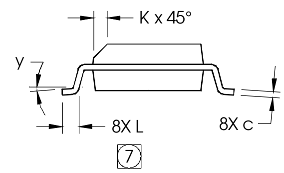
SO-8 Package Outline

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	
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:

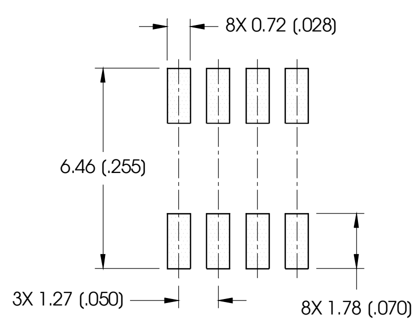
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.

5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [.006].

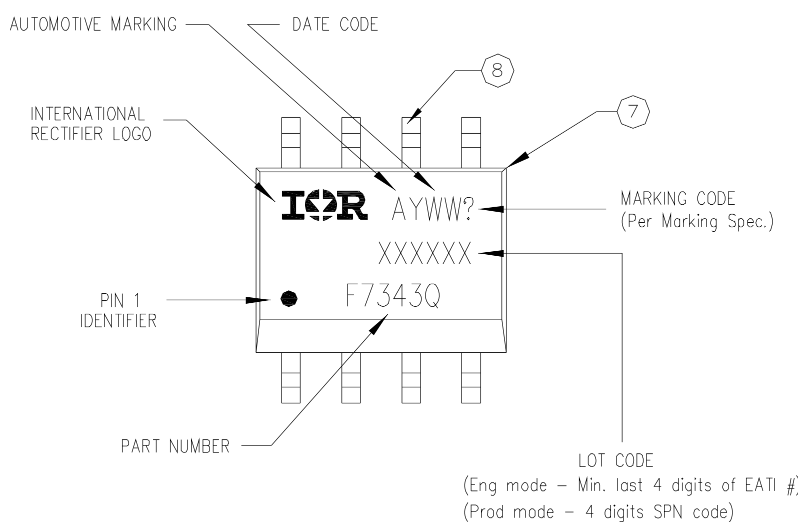
6. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [.010].

7. DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

FOOTPRINT



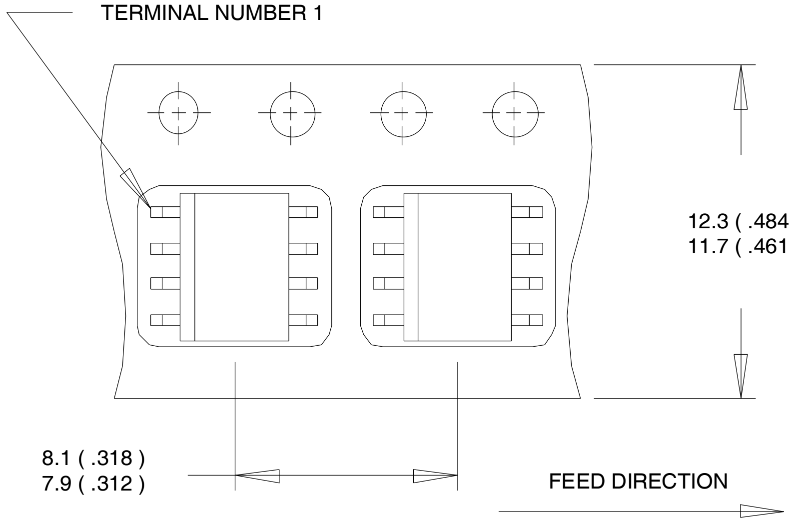
SO-8 Part Marking



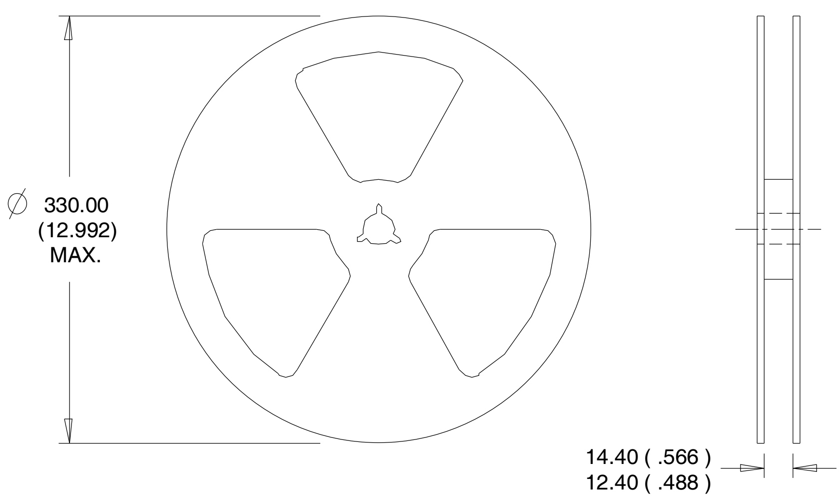
Note: For the most current drawing please refer to IR website at http://www.irf.com/package/

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		Automotive (per AEC-Q101) ††	
		Comments: This part number(s) passed Automotive qualification. IR's Industrial and Consumer qualification level is granted by extension of the higher Automotive level.	
Moisture Sensitivity Level		SO-8	MSL1
ESD	Machine Model	Class M2 (200V)††† (per AEC-Q101-002)	
	Human Body Model	Class H1A (500V)††† (per AEC-Q101-001)	
	Charged Device Model	Class C5 (1125V)††† (per AEC-Q101-005)	
RoHS Compliant		Yes	

† Qualification standards can be found at International Rectifier's web site: http//www.irf.com/

†† Exceptions (if any) to AEC-Q101 requirements are noted in the qualification report.

††† Highest passing voltage

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For technical support, please contact IR's Technical Assistance Center
http://www.irf.com/technical-info/

WORLD HEADQUARTERS:
101 N. Sepulveda Blvd., El Segundo, California 90245
Tel: (310) 252-7105

Revision History

Date	Comments
3/10/2014	• Added "Logic Level Gate Drive" bullet in the features section on page 1 • Updated data sheet with new IR corporate template