International
IOR Rectifier

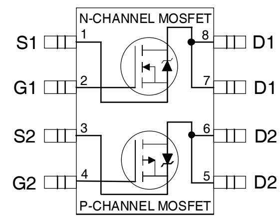
AUTOMOTIVE MOSFET

AUIRF7343Q

HEXFET® Power MOSFET

Features

- Advanced Planar 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, RoHS Compliant

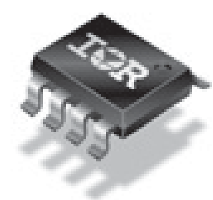


Top View

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

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

G	D	S
Gate	Drain	Source

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
$R_{θJA}$	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 $I_{SD} \leq$ 4.7A, di/dt ≤ 220A/μs, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq$ 150°C
P-Channel $I_{SD} \leq$ -3.4A, di/dt ≤ -150A/μs, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq$ 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.

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 to AEC-Q101 requirements are noted in the qualification report.

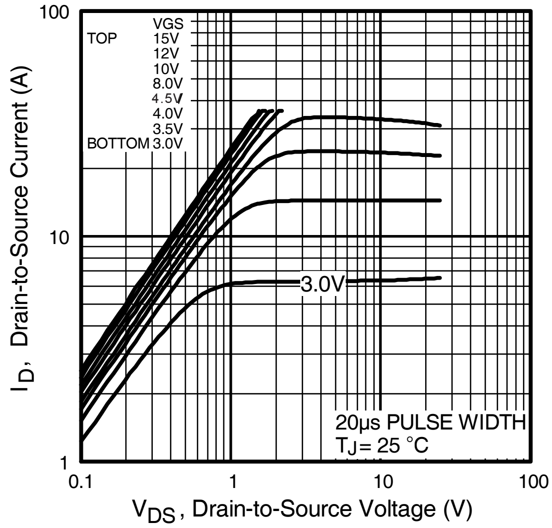


Fig 1. Typical Output Characteristics

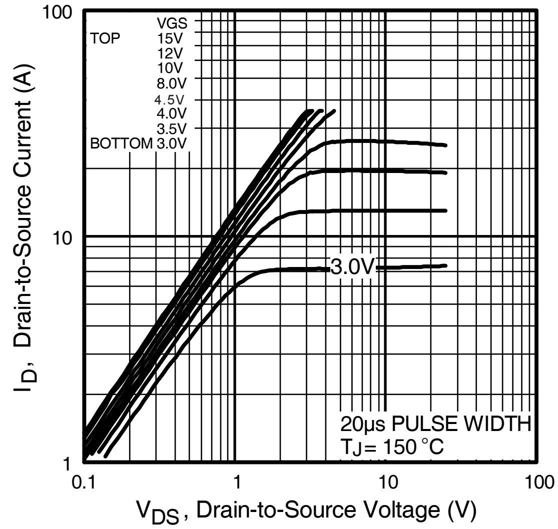


Fig 2. Typical Output Characteristics

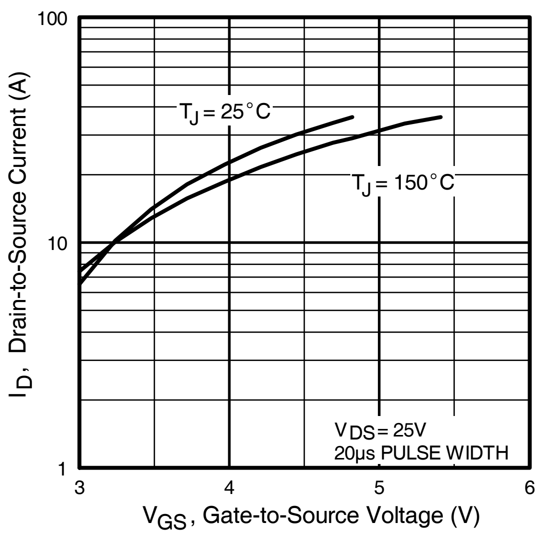


Fig 3. Typical Transfer Characteristics

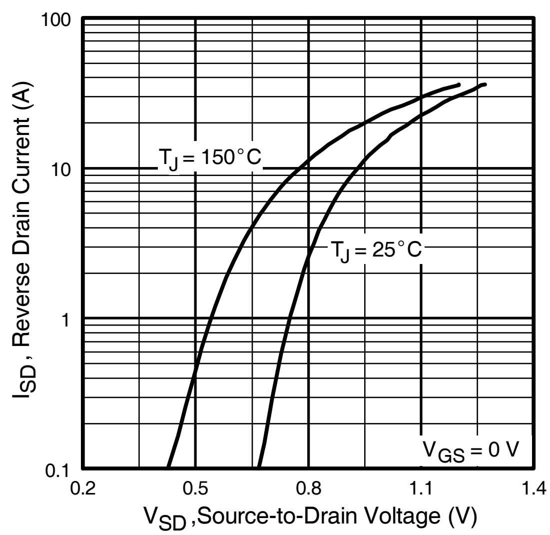


Fig 4. Typical Source-Drain Diode Forward Voltage

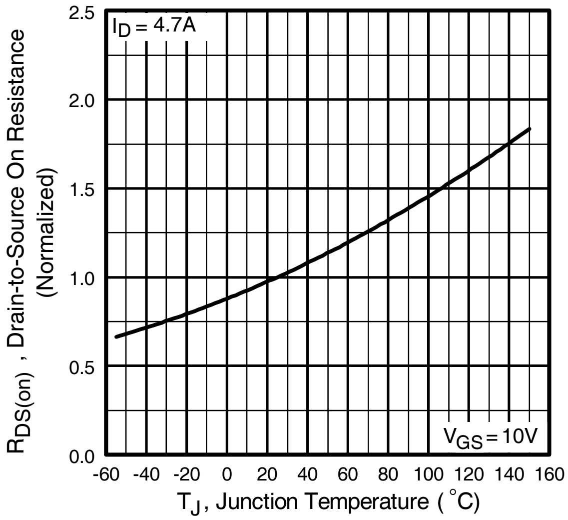


Fig 5. Normalized On-Resistance Vs. Temperature

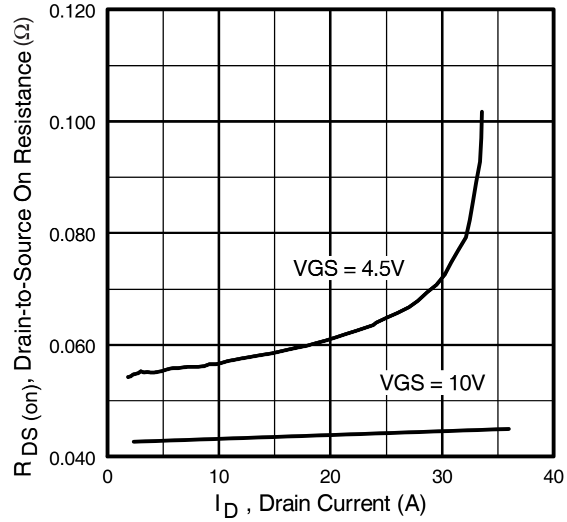


Fig 6. Typical On-Resistance Vs. Drain Current

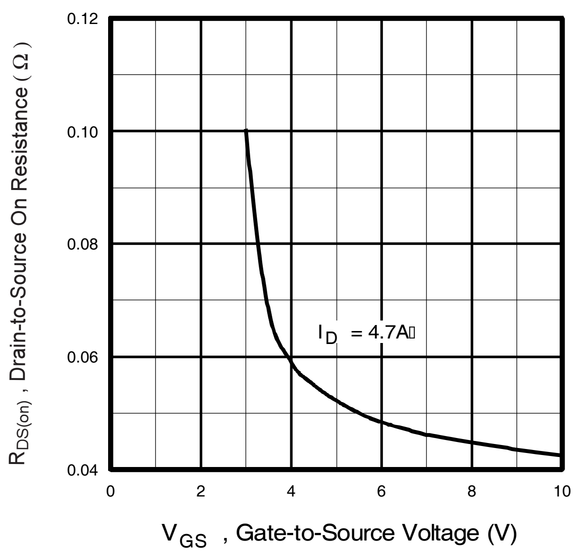


Fig 7. Typical On-Resistance Vs. Gate Voltage

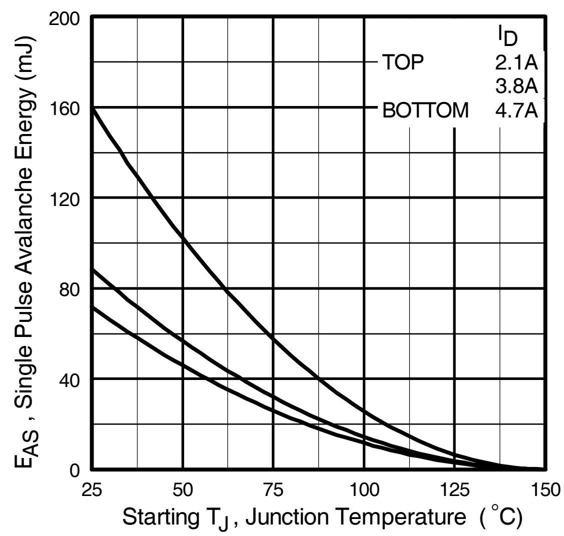


Fig 8. Maximum Avalanche Energy Vs. Drain Current

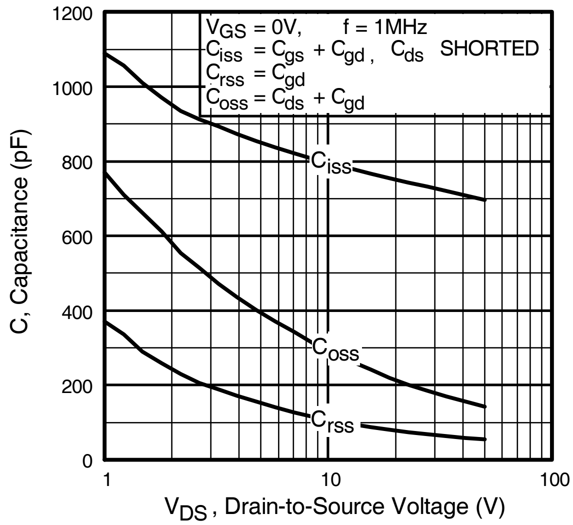


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

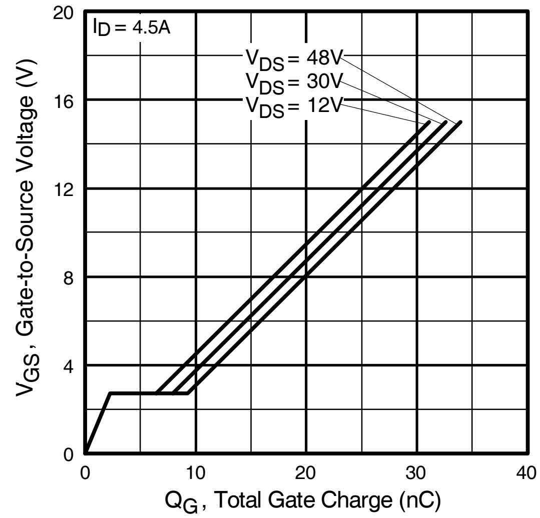


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

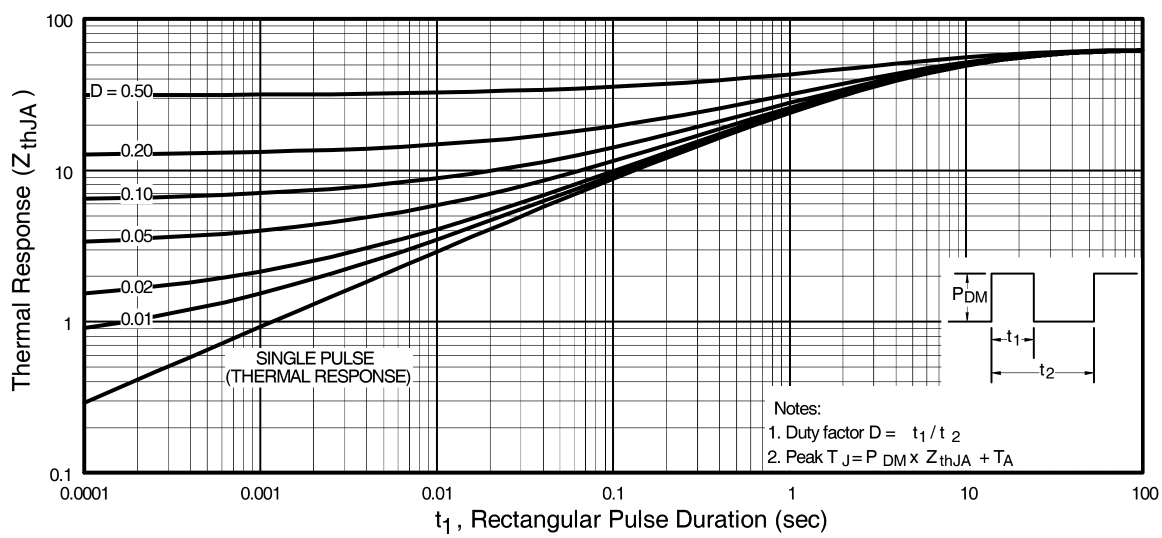


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

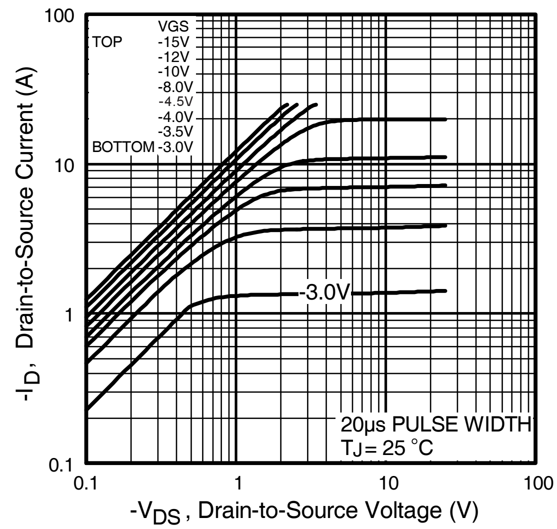


Fig 12. Typical Output Characteristics

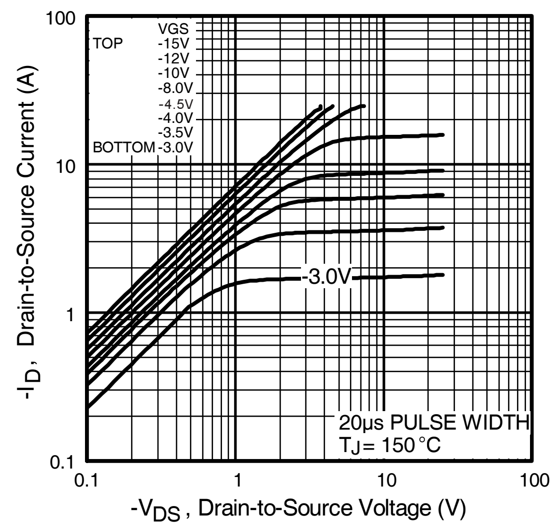


Fig 13. Typical Output Characteristics

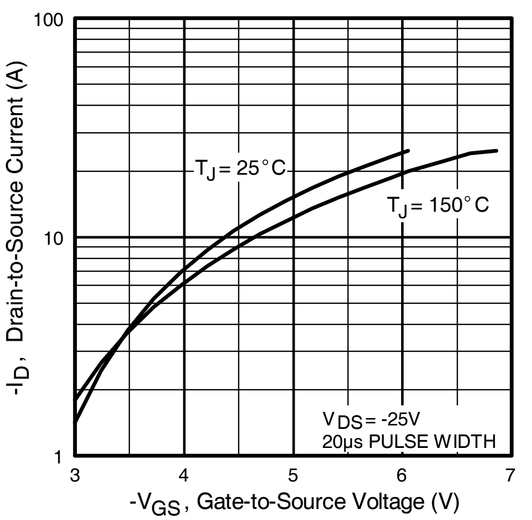


Fig 14. Typical Transfer Characteristics

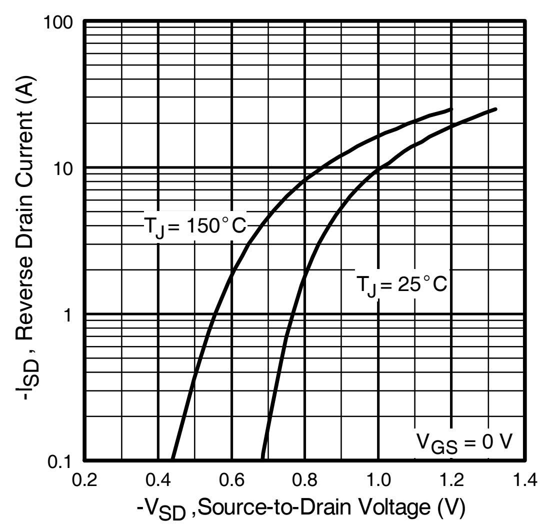


Fig 15. Typical Source-Drain Diode Forward Voltage

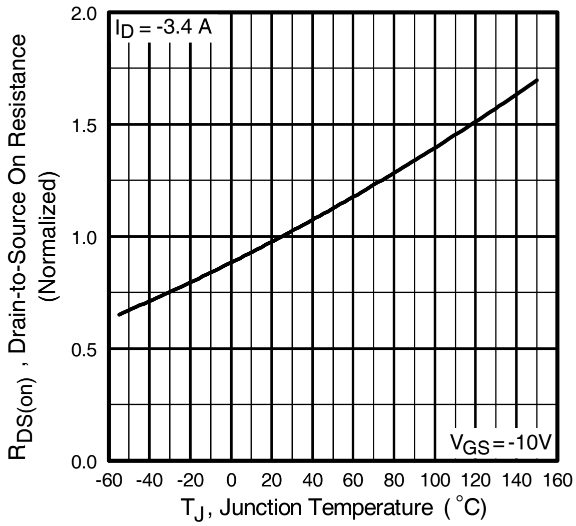


Fig 16. Normalized On-Resistance Vs. Temperature

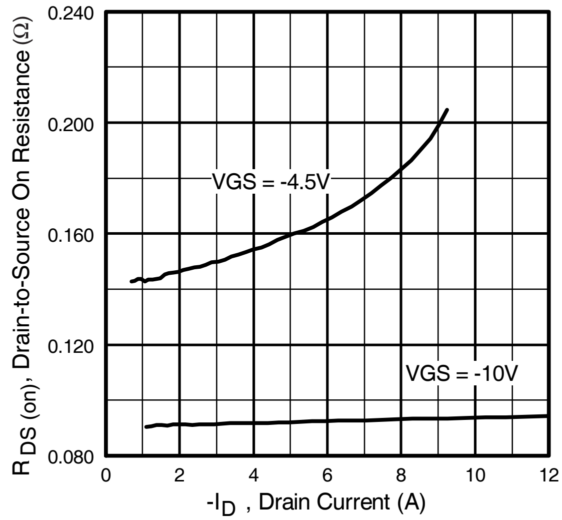


Fig 17. Typical On-Resistance Vs. Drain Current

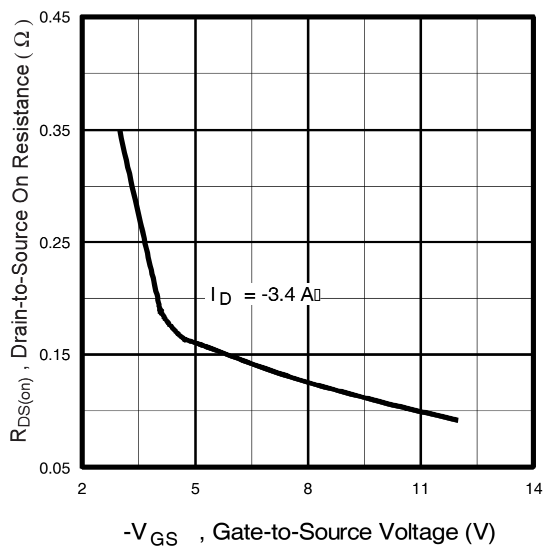


Fig 18. Typical On-Resistance Vs. Gate Voltage

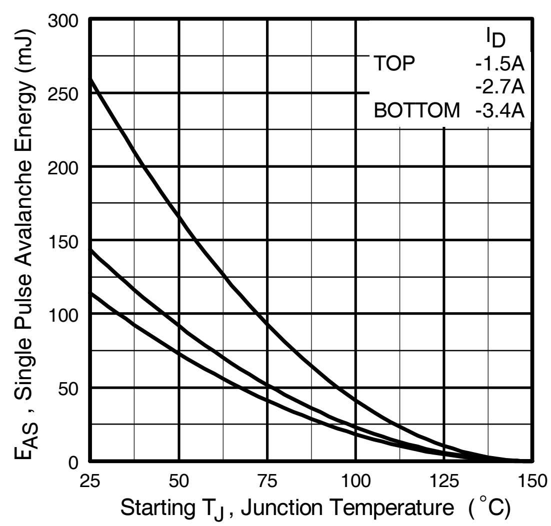


Fig 19. Maximum Avalanche Energy Vs. Drain Current

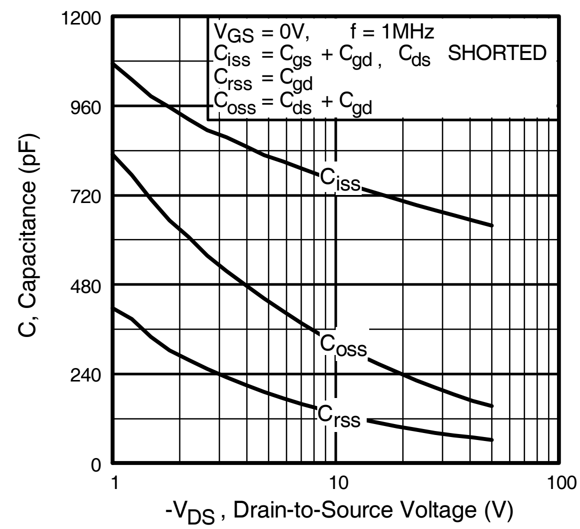


Fig 20. Typical Capacitance Vs. Drain-to-Source Voltage

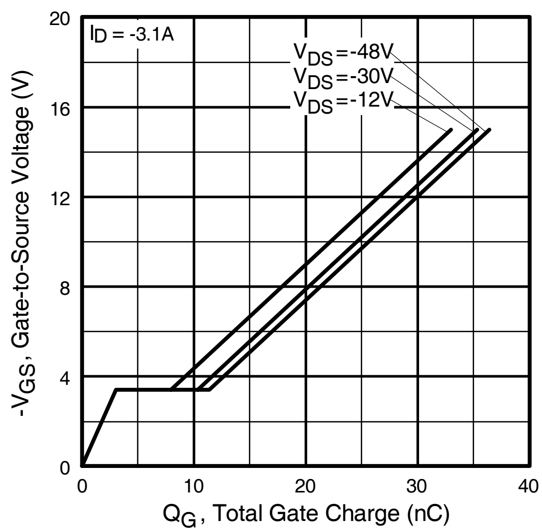


Fig 21. Typical Gate Charge Vs. Gate-to-Source Voltage

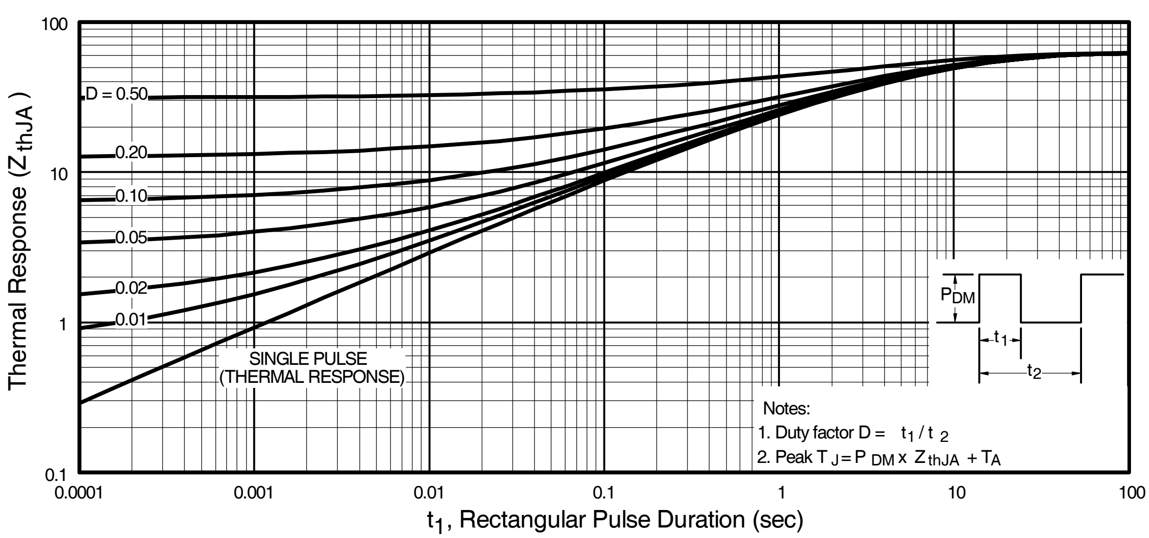
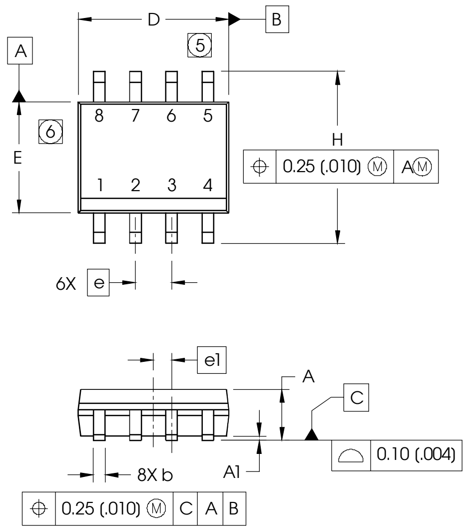


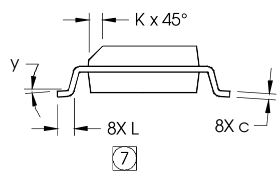
Fig 22. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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:

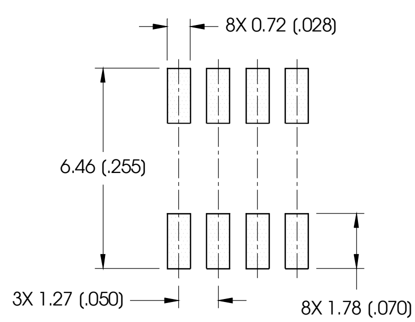
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.

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

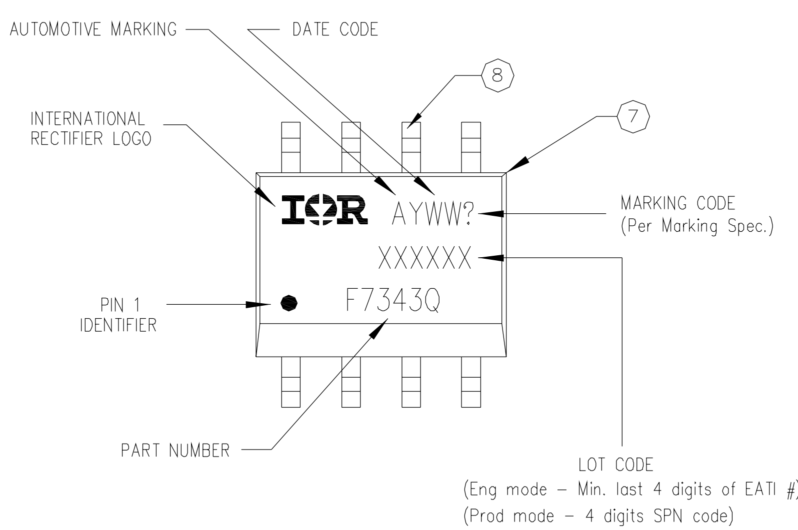
6. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [.010].

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

FOOTPRINT



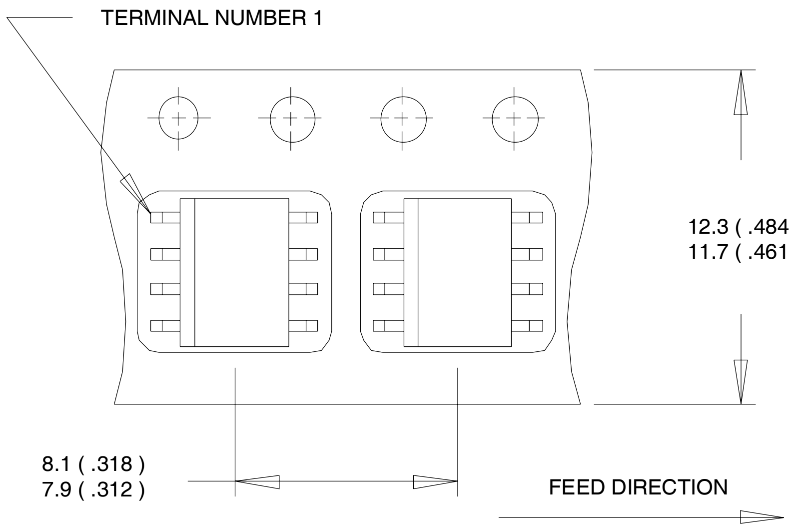
SO-8 Part Marking



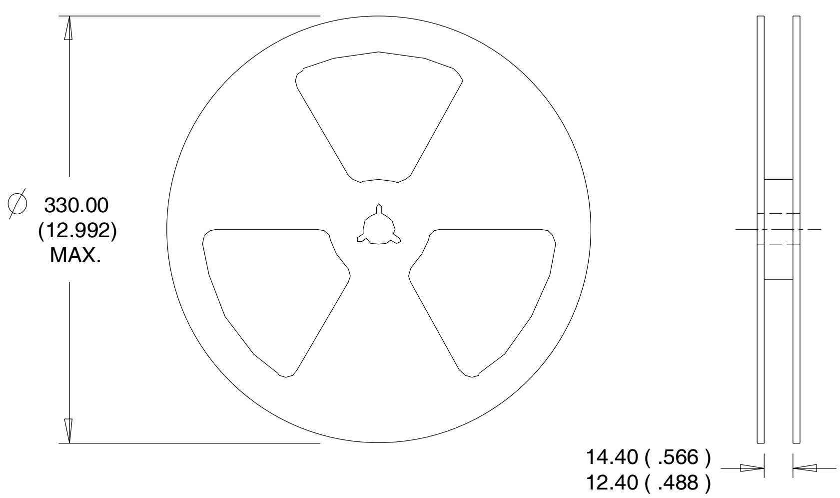
Note: For the most current drawing please refer to IR website at http://www.irf.com/package/

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.

Ordering Information

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

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

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