

AUIRF7343Q

HEXFET® Power MOSFET

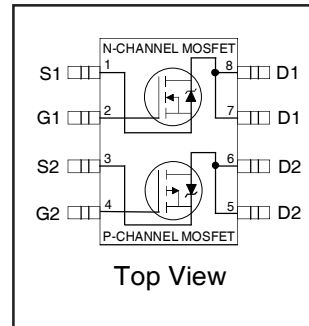
Features

- 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

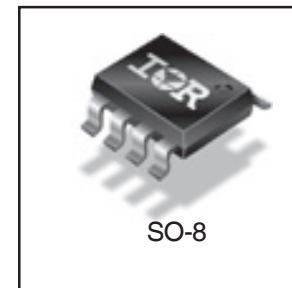
Description

Specifically designed for Automotive applications, these HEXFET® Power MOSFET's in a Dual SO-8 package utilize the latest 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.



	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



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	Operating Junction and	-55 to + 150		°C
T _{STG}	Storage Temperature Range			

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient ③	—	62.5	$^\circ\text{C/W}$

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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
ΔV _{(BR)DSS} /ΔT _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	—	—	-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 @ T_J = 25°C (unless otherwise stated)

	Parameter		Min.	Typ.	Max.	Units	Conditions
Q _g	Total Gate Charge	N-Ch	—	24	36	nC	N-Channel I _D = 4.5A V _{DS} = 44V, V _{GS} = 10V
		P-Ch	—	26	38		
Q _{gs}	Gate-to-Source Charge	N-Ch	—	2.3	3.4		P-Channel ④
		P-Ch	—	3.0	4.5		
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 V _{DD} = 28V, I _D = 1.0A, R _G = 6.0Ω R _D = 28Ω P-Channel ④ V _{DD} = -28V, I _D = -1.0A, R _G = 6.0Ω R _D = 28Ω
		P-Ch	—	14	22		
t _r	Rise Time	N-Ch	—	3.2	4.8		
		P-Ch	—	10	15		
t _{d(off)}	Turn-Off Delay Time	N-Ch	—	32	48		
		P-Ch	—	43	64		
t _f	Fall Time	N-Ch	—	13	20		
		P-Ch	—	22	32		
C _{iss}	Input Capacitance	N-Ch	—	740	—	pF	N-Channel V _{GS} = 0V, V _{DS} = 25V, f = 1.0Mhz
		P-Ch	—	690	—		
C _{oss}	Output Capacitance	N-Ch	—	190	—		P-Channel V _{GS} = 0V, V _{DS} = -25V, f = 1.0Mhz
		P-Ch	—	210	—		
C _{rss}	Reverse Transfer Capacitance	N-Ch	—	71	—		
		P-Ch	—	86	—		

Diode 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 T _J = 25°C, I _F = 2.0A di/dt = 100A/μs f
		P-Ch	—	54	80		
Q _{rr}	Reverse Recovery Charge	N-Ch	—	120	170	nC	P-Channel ④ T _J = 25°C, I _F = -2.0A di/dt = 100A/μs f
		P-Ch	—	85	130		

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.

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

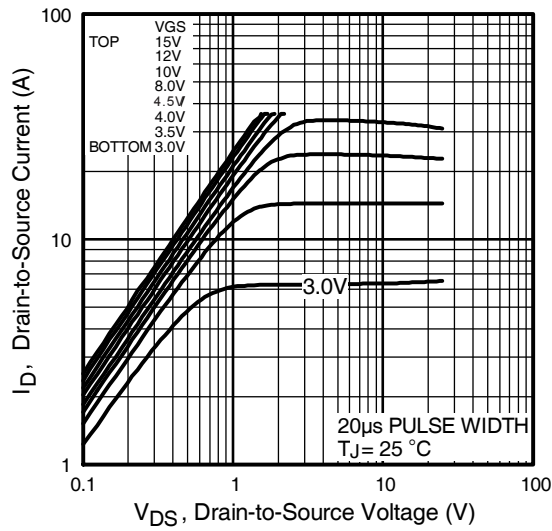


Fig 1. Typical Output Characteristics

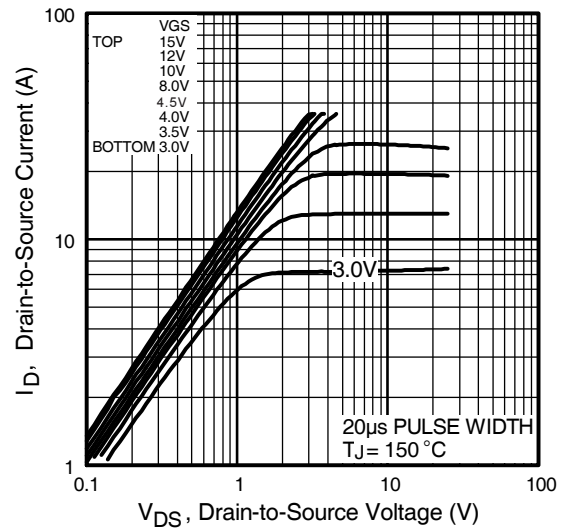


Fig 2. Typical Output Characteristics

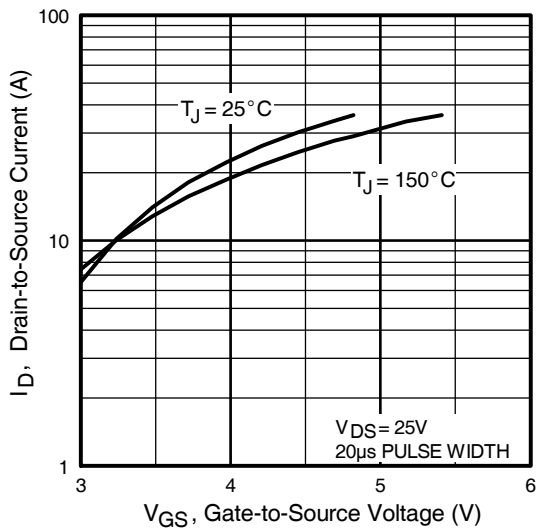


Fig 3. Typical Transfer Characteristics

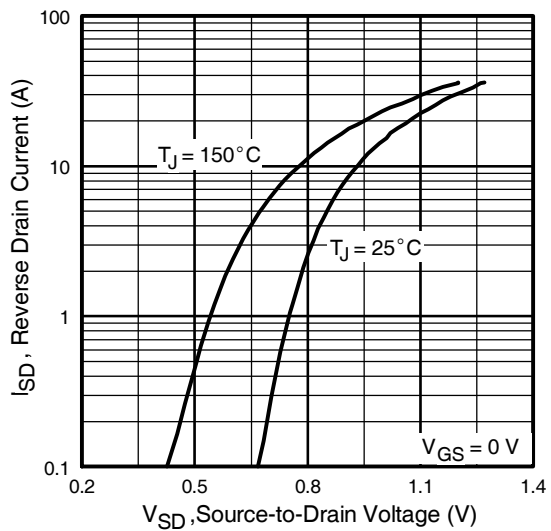


Fig 4. Typical Source-Drain Diode Forward Voltage

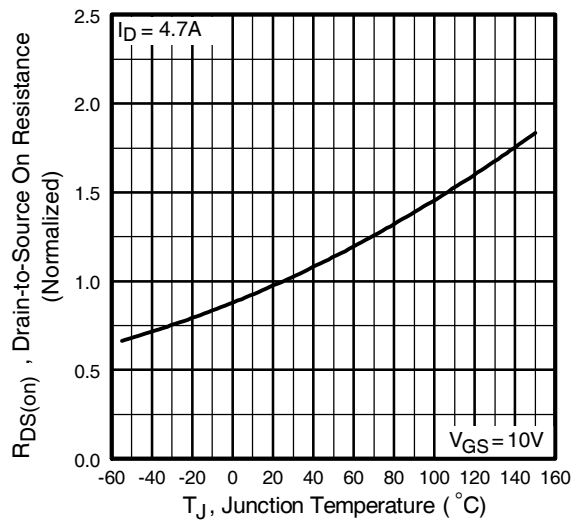


Fig 5. Normalized On-Resistance Vs. Temperature

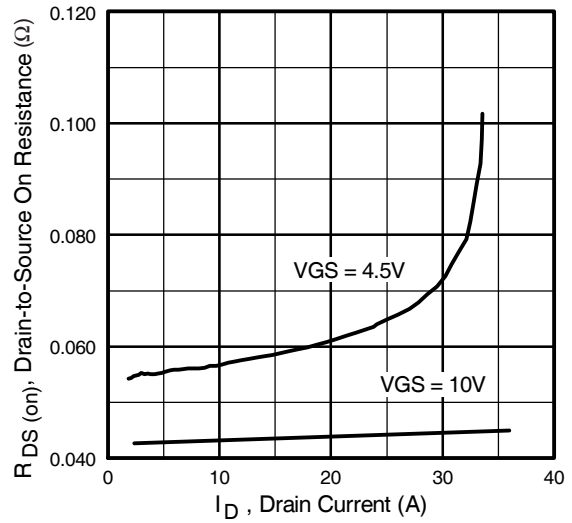


Fig 6. Typical On-Resistance Vs. Drain Current

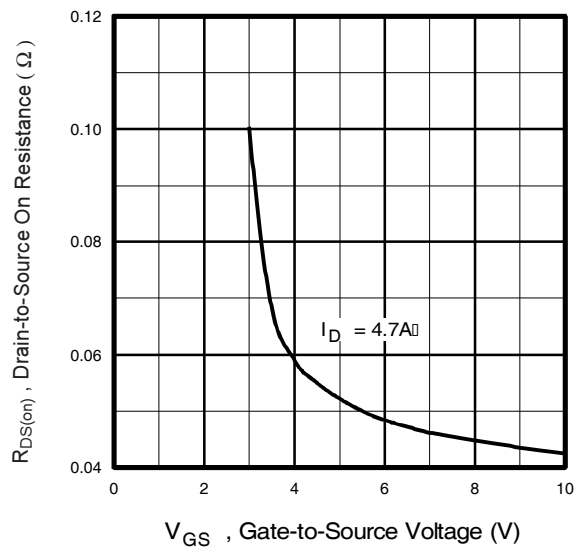


Fig 7. Typical On-Resistance Vs. Gate Voltage

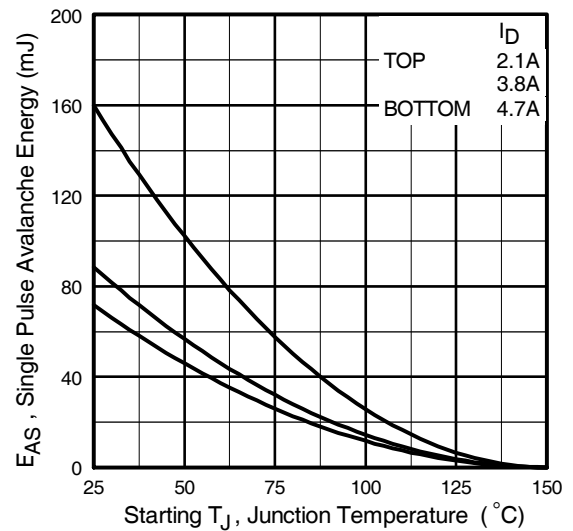


Fig 8. Maximum Avalanche Energy Vs. Drain Current

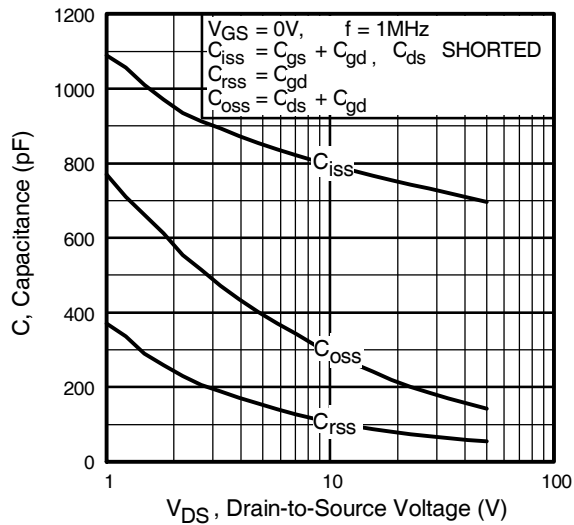


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

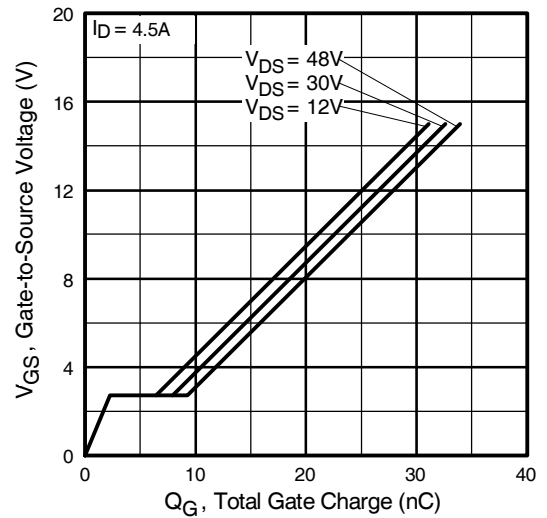


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

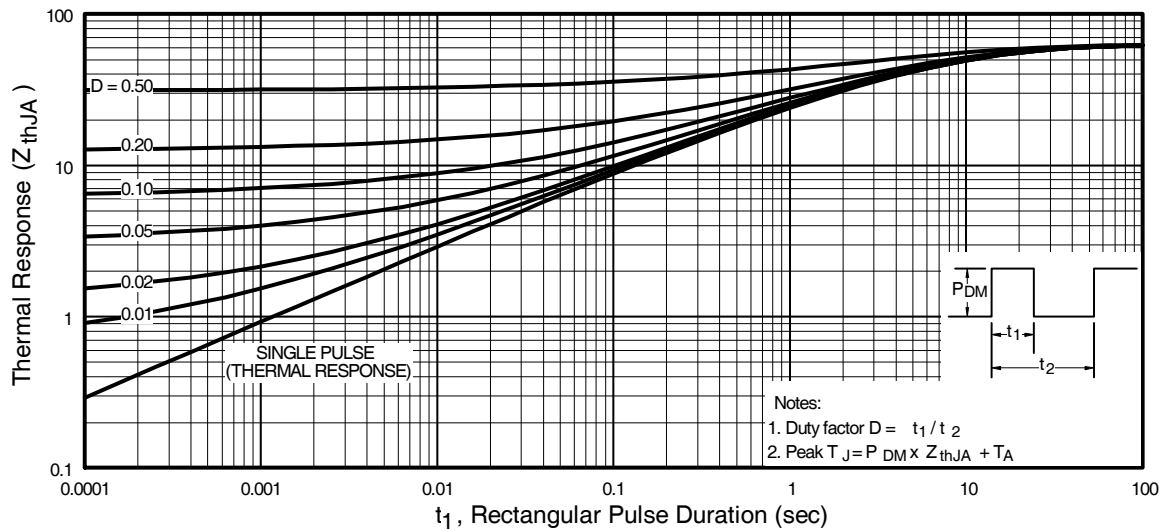


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

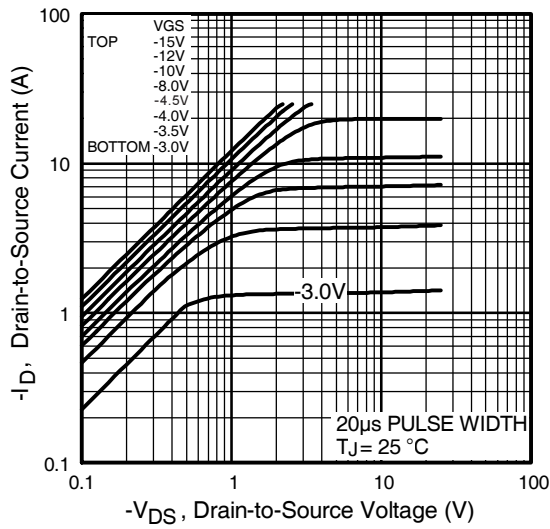


Fig 12. Typical Output Characteristics

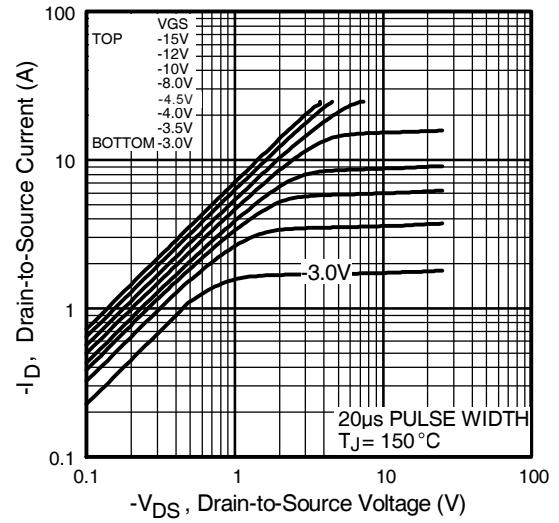


Fig 13. Typical Output Characteristics

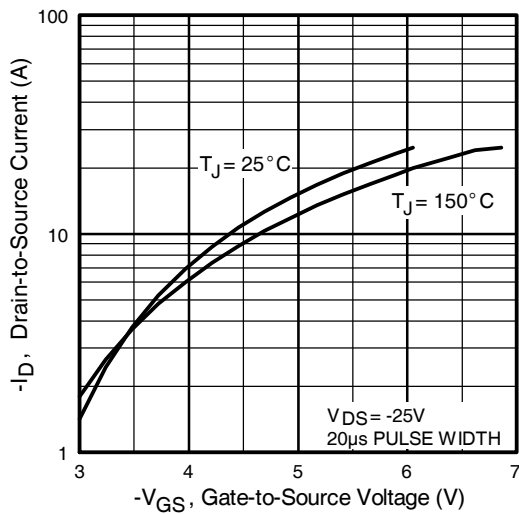


Fig 14. Typical Transfer Characteristics

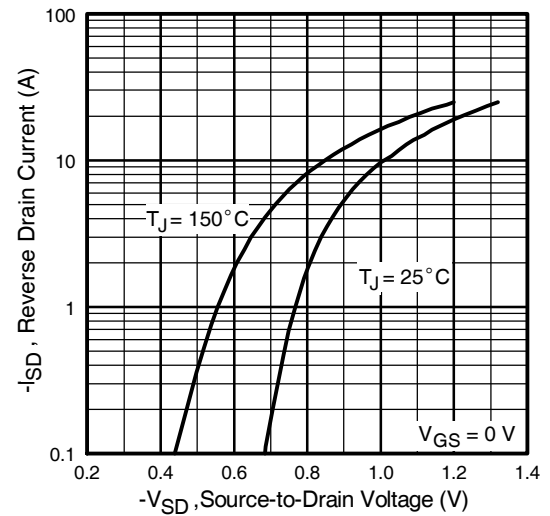


Fig 15. Typical Source-Drain Diode Forward Voltage

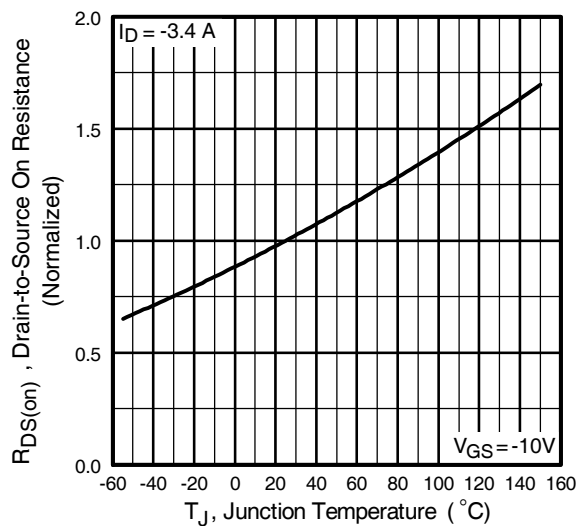


Fig 16. Normalized On-Resistance Vs. Temperature

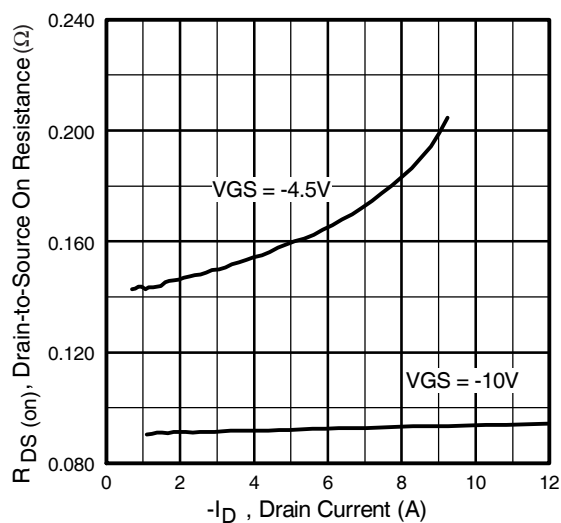


Fig 17. Typical On-Resistance Vs. Drain Current

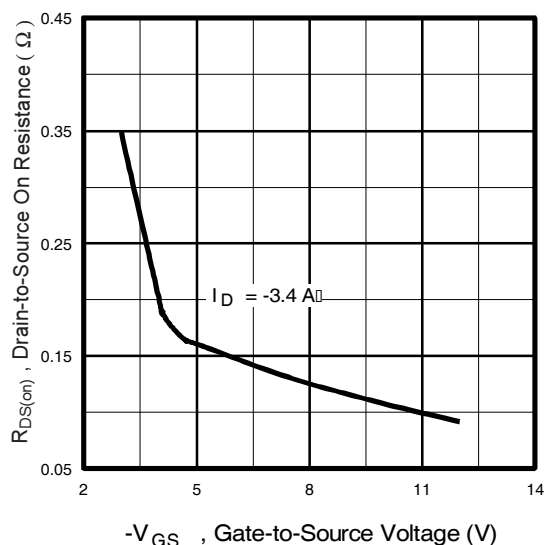


Fig 18. Typical On-Resistance Vs. Gate Voltage

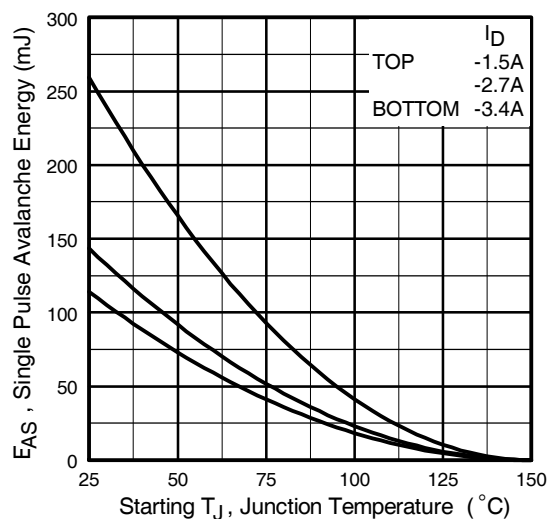
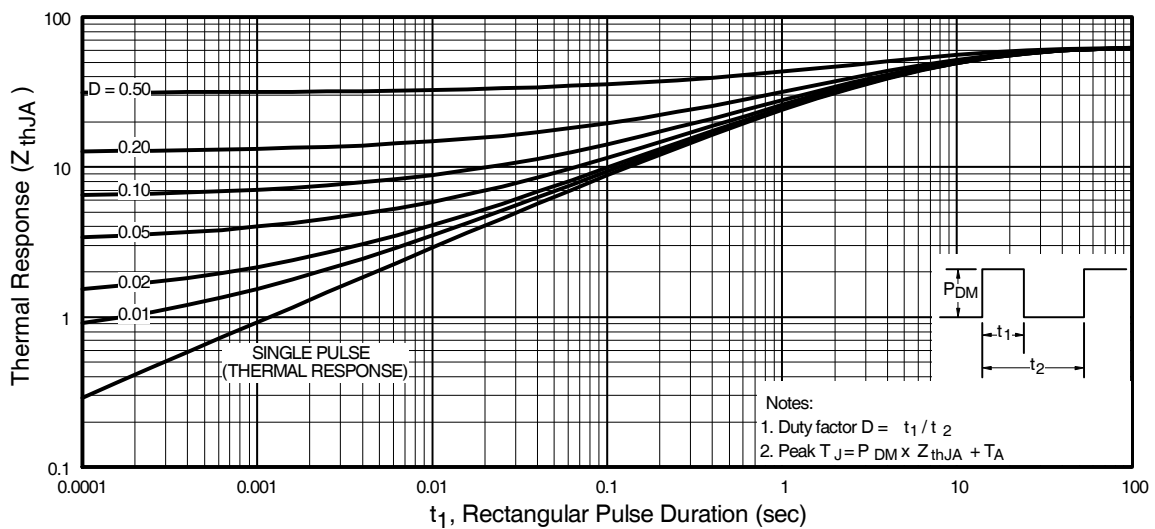
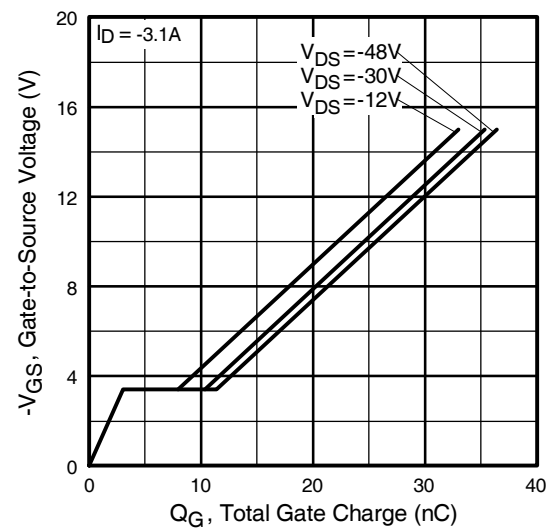
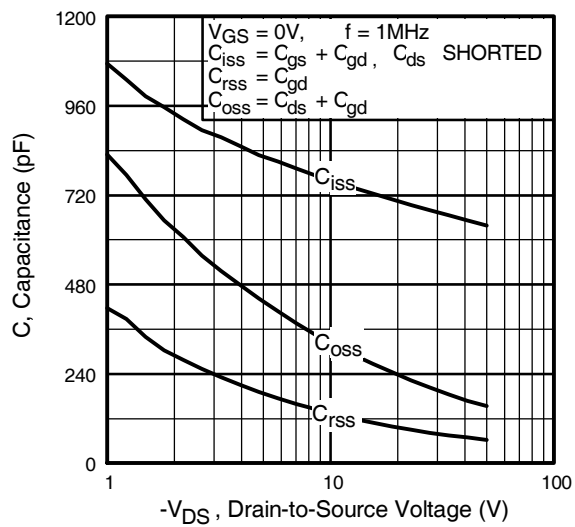
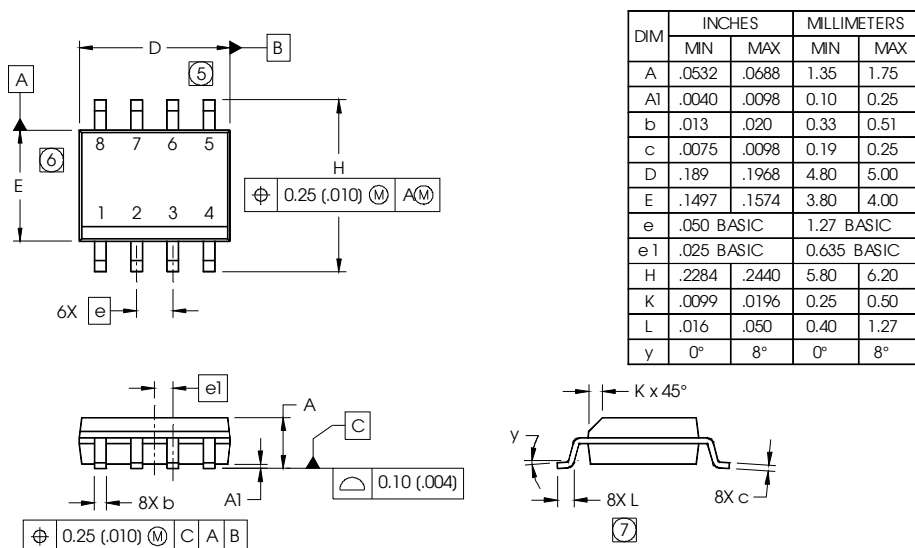


Fig 19. Maximum Avalanche Energy Vs. Drain Current



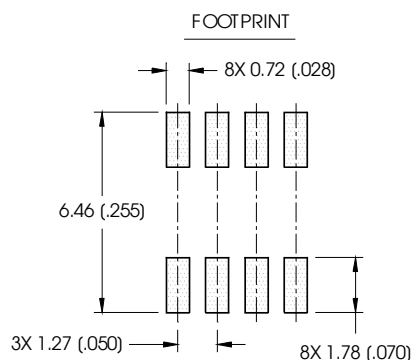
SO-8 Package Outline

Dimensions are shown in millimeters (inches)

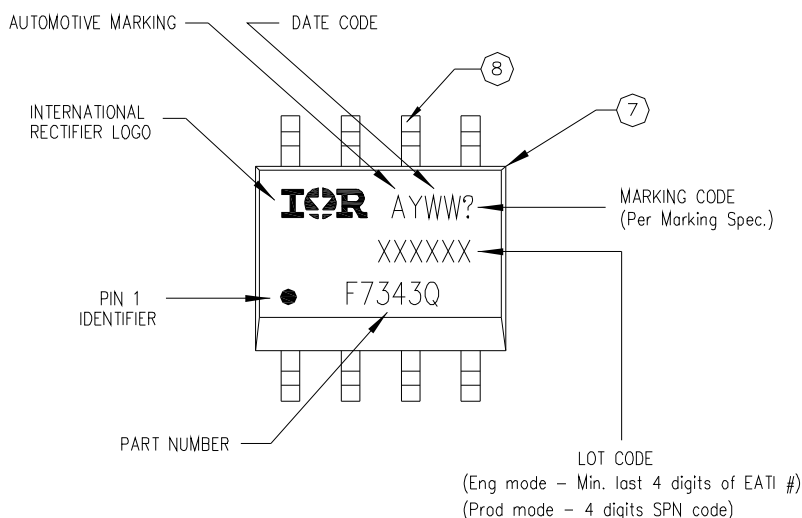


NOTES:

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.



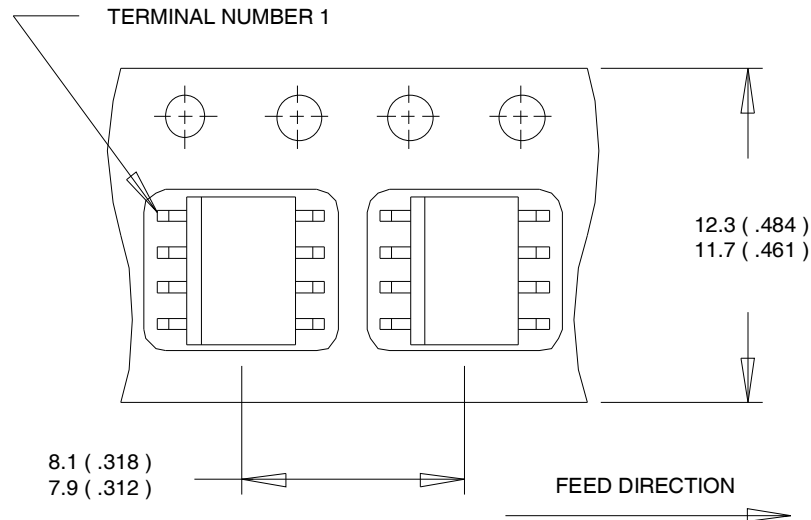
SO-8 Part Marking



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

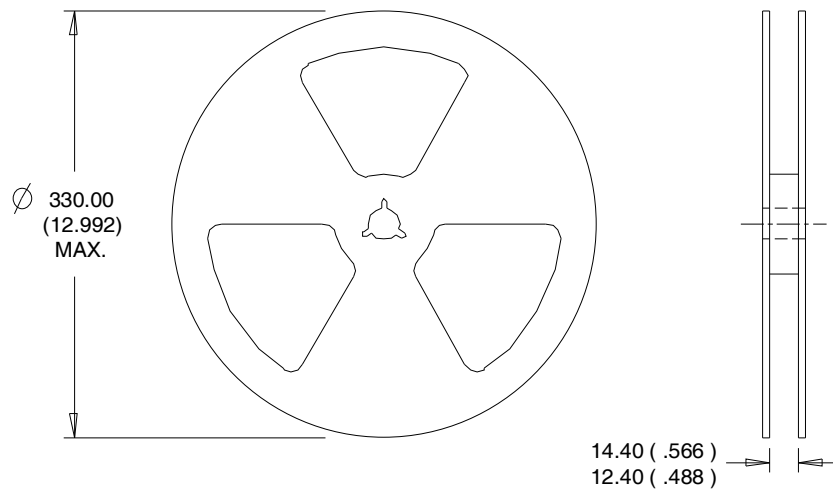
SO-8 Tape and Reel

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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