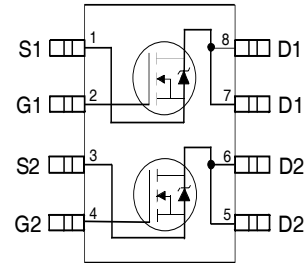


Features

- V_{DS} (V)=30V
- R_{DS(ON)} < 29m Ω (V_{GS} = 10V)
- R_{DS(ON)} < 46 m Ω (V_{GS} = 4.5V)
- Generation V Technology
- Ultra Low On-Resistance
- Surface Mount
- Fully Avalanche Rated
- Lead-Free



Top View

Description

The SOP-8 has been modified through a customized eadframe for enhanced thermal characteristics and multiple-die capability making it ideal in a variety of powerapplications. With theseimprovements,multiple devices can be usedinapplication with dramatica v reduced board space. The package is designed for vapor phase, infra red, or wave sodering techniques.

Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

	Symbol	Maximum	Units
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current ^①	T _A = 25°C	6.5	A
	T _A = 70°C	5.2	
Pulsed Drain Current	I _{DM}	30	
Continuous Source Current (Diode Conduction)	I _S	2.5	W
Maximum Power Dissipation ^②	T _A = 25°C	2.0	
	T _A = 70°C	1.3	
Single Pulse Avalanche Energy ^②	E _{AS}	82	mJ
Avalanche Current	I _{AR}	4.0	A
Repetitive Avalanche Energy	E _{AR}	0.20	mJ
Peak Diode Recovery dv/dt ^③	dv/dt	5.8	V/ ns
Junction and Storage Temperature Range	T _J , T _{STG}	-55 to + 150	°C

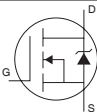
Thermal Resistance Ratings

Parameter	Symbol	Limit	Units
Maximum Junction-to-Ambient ^①	R _{θJA}	62.5	°C/W

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	30			V	V _{GS} = 0V, I _D = 250μA
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient		0.022		V/°C	Reference to 25°C, I _D = 1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance		23	29	mΩ	V _{GS} = 10V, I _D = 5.8A ④
			32	46		V _{GS} = 4.5V, I _D = 4.7A ④
V _{GS(th)}	Gate Threshold Voltage	1.0			V	V _{DS} = V _{GS} , I _D = 250μA
g _{fs}	Forward Transconductance		14		S	V _{DS} = 15V, I _D = 5.8A
I _{DSS}	Drain-to-Source Leakage Current			1.0	μA	V _{DS} = 24V, V _{GS} = 0V
				25		V _{DS} = 24V, V _{GS} = 0V, T _J = 55°C
I _{GSS}	Gate-to-Source Forward Leakage			100	nA	V _{GS} = 20V
	Gate-to-Source Reverse Leakage			-100		V _{GS} = -20V
Q _g	Total Gate Charge		22	33	nC	I _D = 5.8A
Q _{gs}	Gate-to-Source Charge		2.6	3.9		V _{DS} = 15V
Q _{gd}	Gate-to-Drain ("Miller") Charge		6.4	9.6		V _{GS} = 10V, See Fig. 10 ④
t _{d(on)}	Turn-On Delay Time		8.1	12	ns	V _{DD} = 15V
t _r	Rise Time		8.9	13		I _D = 1.0A
t _{d(off)}	Turn-Off Delay Time		26	39		R _G = 6.0Ω
t _f	Fall Time		17	26		R _D = 15Ω ④
C _{iss}	Input Capacitance		650		pF	V _{GS} = 0V
C _{oss}	Output Capacitance		320			V _{DS} = 25V
C _{rss}	Reverse Transfer Capacitance		130			f = 1.0MHz, See Fig. 9

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)			2.5	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode) ①			30		
V _{SD}	Diode Forward Voltage		0.78	1.0	V	T _J = 25°C, I _S = 1.7A, V _{GS} = 0V ③
t _{rr}	Reverse Recovery Time		45	68	ns	T _J = 25°C, I _F = 1.7A
Q _{rr}	Reverse Recovery Charge		58	87	nC	di/dt = 100A/μs ③

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)
- ② Starting T_J = 25°C, L = 10mH
R_G = 25Ω, I_{AS} = 4.0A.
- ③ I_{SD} ≤ 4.0A, di/dt ≤ 74A/μs, V_{DD} ≤ V_{(BR)DSS},
T_J ≤ 150°C
- ④ Pulse width ≤ 300μs; duty cycle ≤ 2%.
- ⑤ Surface mounted on FR-4 board, t ≤ 10sec.

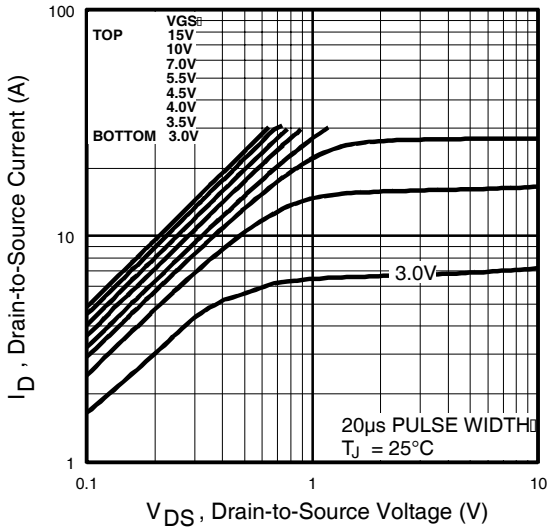


Fig 1. Typical Output Characteristics

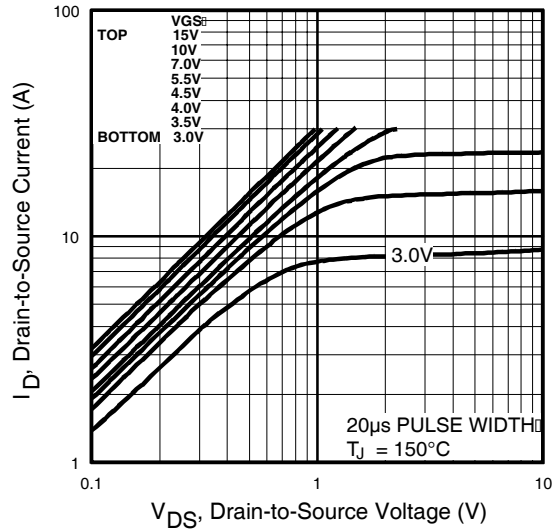


Fig 2. Typical Output Characteristics

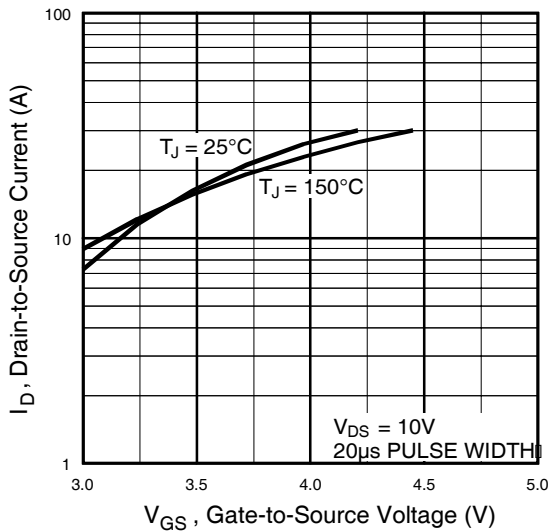


Fig 3. Typical Transfer Characteristics

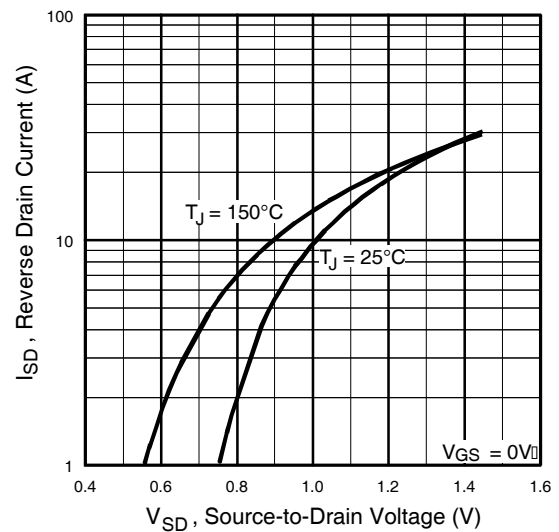


Fig 4. Typical Source-Drain Diode Forward Voltage

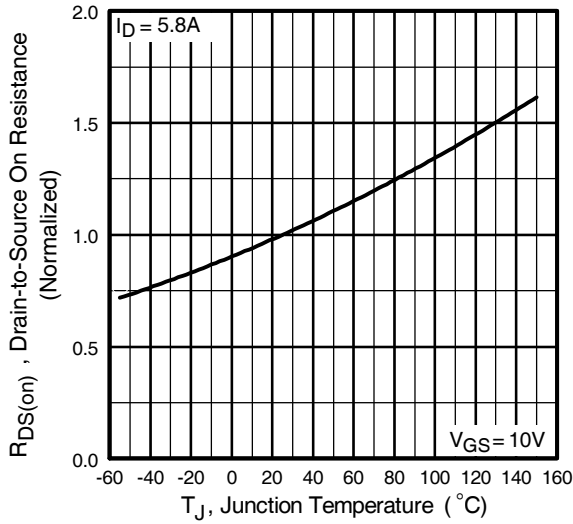


Fig 5. Normalized On-Resistance Vs. Temperature

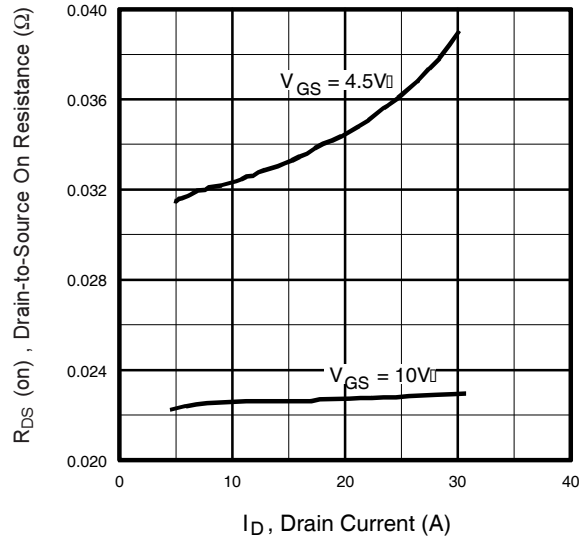


Fig 6. Typical On-Resistance Vs. Drain Current

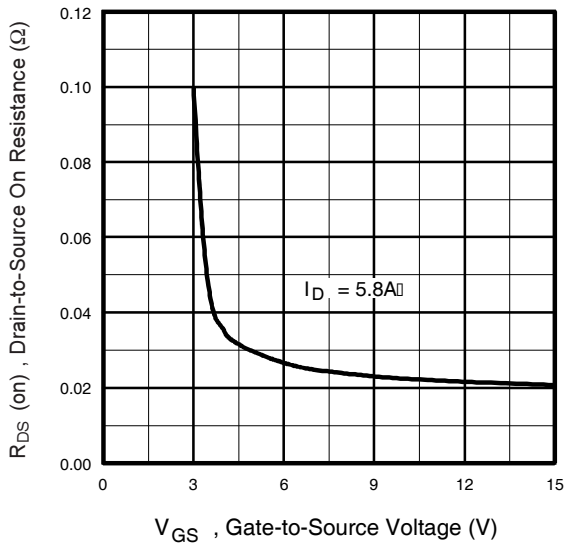


Fig 7. Typical On-Resistance Vs. Gate Voltage

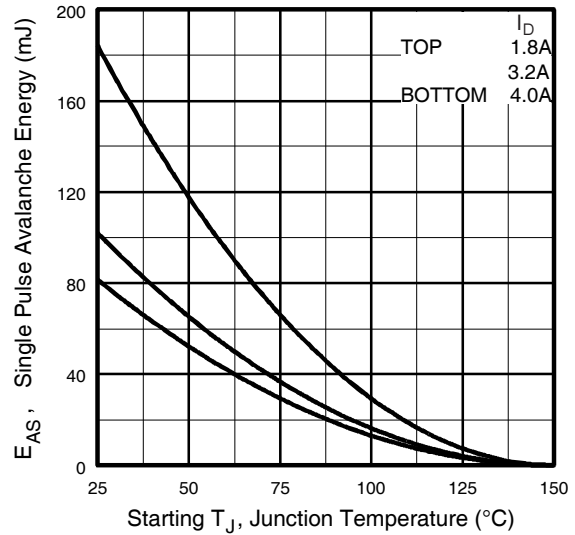


Fig 8. Maximum Avalanche Energy Vs. Drain Current

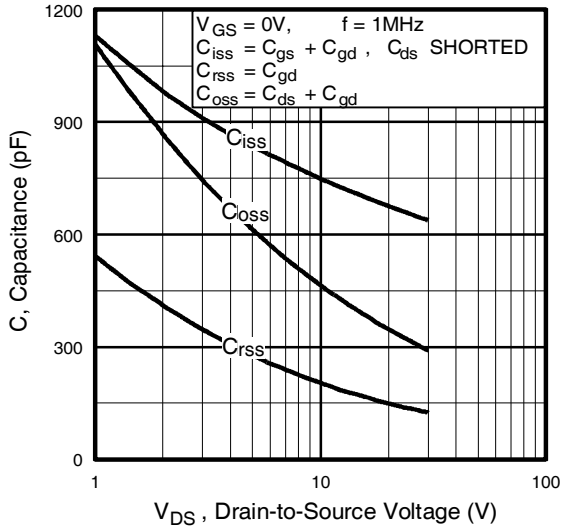


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

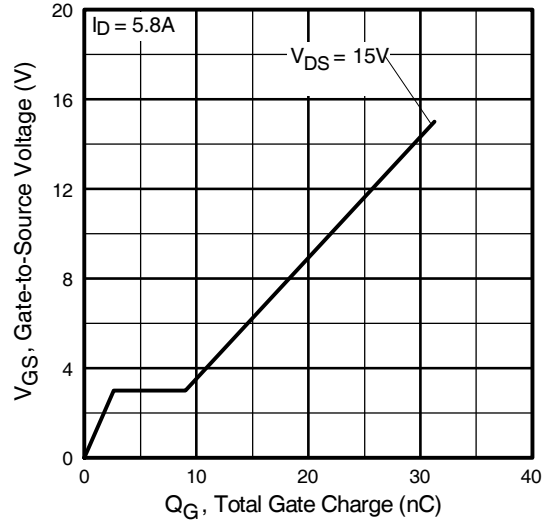


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

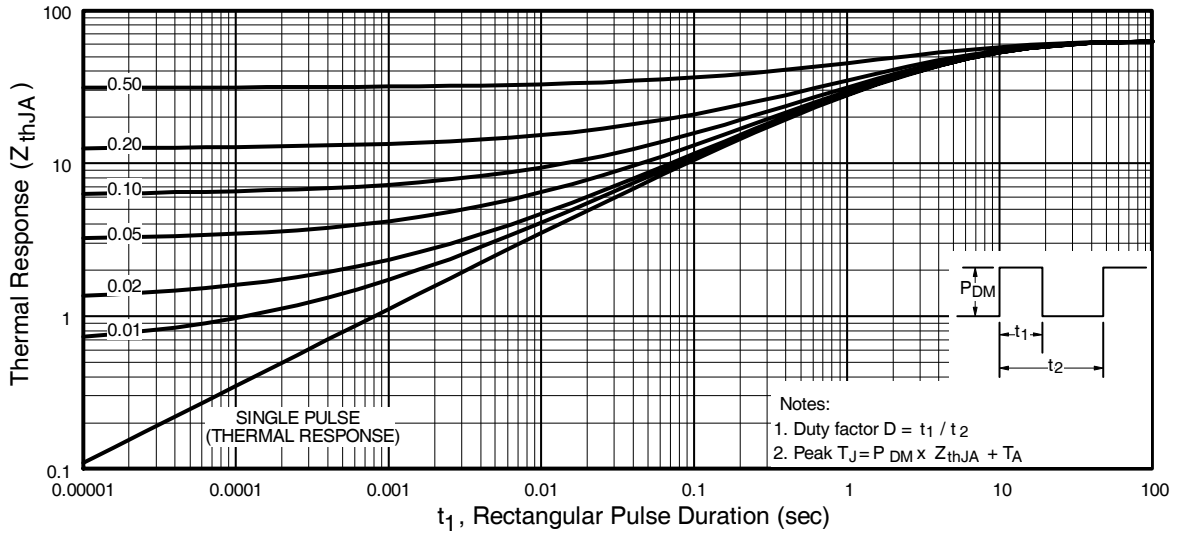
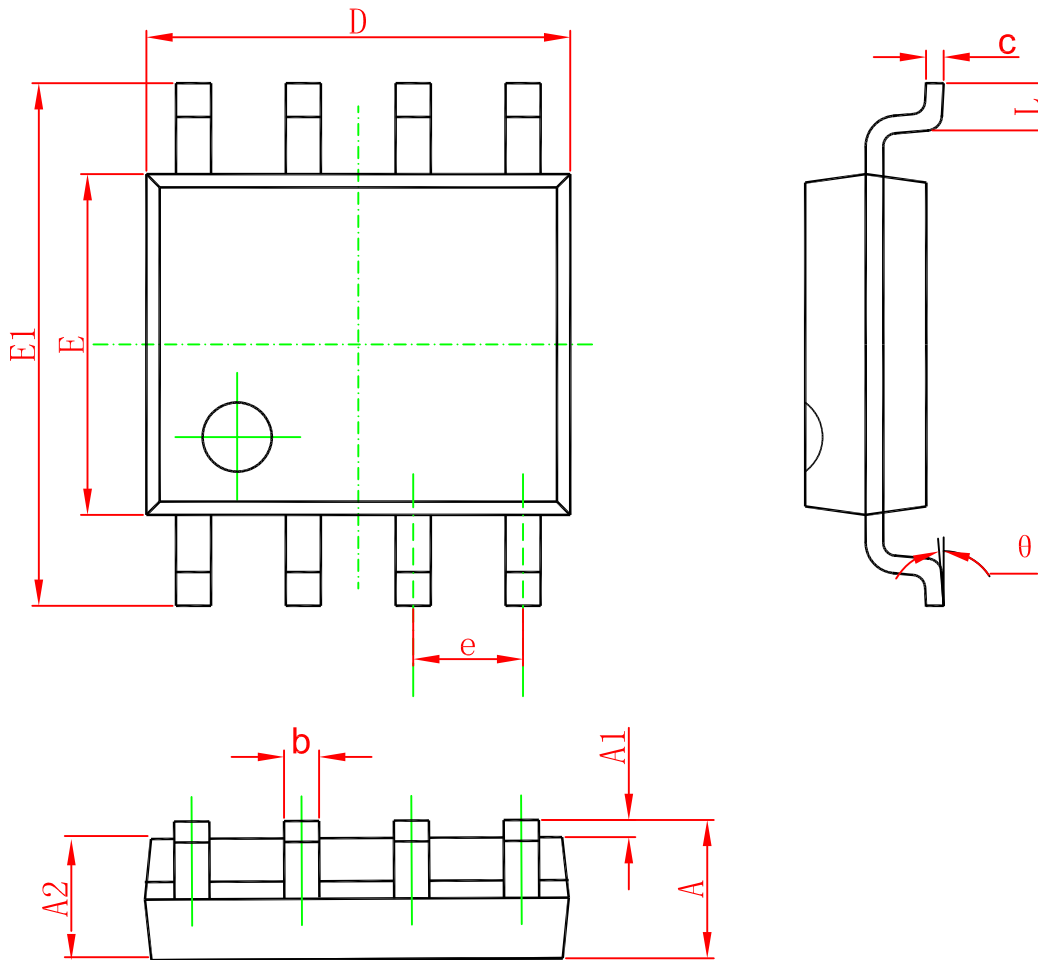


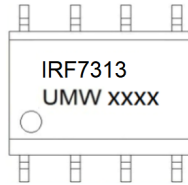
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW IRF7313TR	SOP-8	3000	Tape and reel