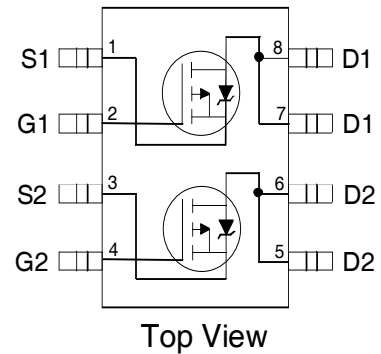


### Features

- $V_{DS} (V) = -20V$
- $R_{DS(ON)} < 60\ m\Omega$  ( $V_{GS} = -4.5V$ )
- $R_{DS(ON)} < 95\ m\Omega$  ( $V_{GS} = -2.7V$ )
- Generation V Technology
- Ultra Low On-Resistance
- Surface Mount
- Fully Avalanche Rated
- Lead-Free



### Absolute Maximum Ratings ( $T_A = 25^\circ C$ Unless Otherwise Noted)

	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	
Continuous Drain Current <sup>①</sup>	$I_D$	$T_A = 25^\circ C$	-5.3
		$T_A = 70^\circ C$	-4.3
Pulsed Drain Current	$I_{DM}$	-21	A
Continuous Source Current (Diode Conduction)	$I_S$	-2.5	
Maximum Power Dissipation <sup>②</sup>	$P_D$	$T_A = 25^\circ C$	2.0
		$T_A = 70^\circ C$	1.3
Single Pulse Avalanche Energy	$E_{AS}$	150	mJ
Avalanche Current	$I_{AR}$	-2.9	A
Repetitive Avalanche Energy	$E_{AR}$	0.20	mJ
Peak Diode Recovery $dv/dt$ <sup>③</sup>	$dv/dt$	-5.0	V/ ns
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to + 150	$^\circ C$

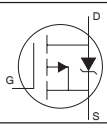
### Thermal Resistance Ratings

Parameter	Symbol	Limit	Units
Maximum Junction-to-Ambient <sup>④</sup>	$R_{\theta JA}$	62.5	$^\circ C/W$

### Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
V <sub>(BR)DSS</sub>	Drain-to-Source Breakdown Voltage	-20			V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA
ΔV <sub>(BR)DSS</sub> /ΔT <sub>J</sub>	Breakdown Voltage Temp. Coefficient		0.031		V/°C	Reference to 25°C, I <sub>D</sub> = -1mA
R <sub>DS(on)</sub>	Static Drain-to-Source On-Resistance		49	60	mΩ	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -2.9A ④
			82	95		V <sub>GS</sub> = -2.7V, I <sub>D</sub> = -1.5A ④
V <sub>GS(th)</sub>	Gate Threshold Voltage	-0.70			V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
g <sub>fs</sub>	Forward Transconductance		5.9		S	V <sub>DS</sub> = -10V, I <sub>D</sub> = -1.5A
I <sub>DSS</sub>	Drain-to-Source Leakage Current			-1.0	μA	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V
				-25		V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 55°C
I <sub>GSS</sub>	Gate-to-Source Forward Leakage			100	nA	V <sub>GS</sub> = -12V
	Gate-to-Source Reverse Leakage			-100		V <sub>GS</sub> = 12V
Q <sub>g</sub>	Total Gate Charge		19	29	nC	I <sub>D</sub> = -2.9A
Q <sub>gs</sub>	Gate-to-Source Charge		4.0	6.1		V <sub>DS</sub> = -16V
Q <sub>gd</sub>	Gate-to-Drain ("Miller") Charge		7.7	12		V <sub>GS</sub> = -4.5V, See Fig. 10 ④
t <sub>d(on)</sub>	Turn-On Delay Time		15	22	ns	V <sub>DD</sub> = -10V
t <sub>r</sub>	Rise Time		40	60		I <sub>D</sub> = -2.9A
t <sub>d(off)</sub>	Turn-Off Delay Time		42	63		R <sub>G</sub> = 6.0Ω
t <sub>f</sub>	Fall Time		49	73		R <sub>D</sub> = 3.4Ω ④
C <sub>iss</sub>	Input Capacitance		780		pF	V <sub>GS</sub> = 0V
C <sub>oss</sub>	Output Capacitance		470			V <sub>DS</sub> = -15V
C <sub>rss</sub>	Reverse Transfer Capacitance		240			f = 1.0MHz, See Fig. 5

### Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)			-2.5	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I <sub>SM</sub>	Pulsed Source Current (Body Diode) ①			-21		
V <sub>SD</sub>	Diode Forward Voltage	-0.78	-1.0		V	T <sub>J</sub> = 25°C, I <sub>S</sub> = -2.9A, V <sub>GS</sub> = 0V ③
t <sub>rr</sub>	Reverse Recovery Time	47	71		ns	T <sub>J</sub> = 25°C, I <sub>F</sub> = -2.9A
Q <sub>rr</sub>	Reverse Recovery Charge	49	73		nC	di/dt = 100A/μs ③

#### Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. ( See fig. 11 )
- ② Starting T<sub>J</sub> = 25°C, L = 35mH  
R<sub>G</sub> = 25Ω, I<sub>AS</sub> = -2.9A.
- ③ I<sub>SD</sub> ≤ -2.9A, di/dt ≤ -77A/μs, V<sub>DD</sub> ≤ V<sub>(BR)DSS</sub>, T<sub>J</sub> ≤ 150°C
- ④ Pulse width ≤ 300μs; duty cycle ≤ 2%.
- ⑤ Surface mounted on FR-4 board, t ≤ 10sec.

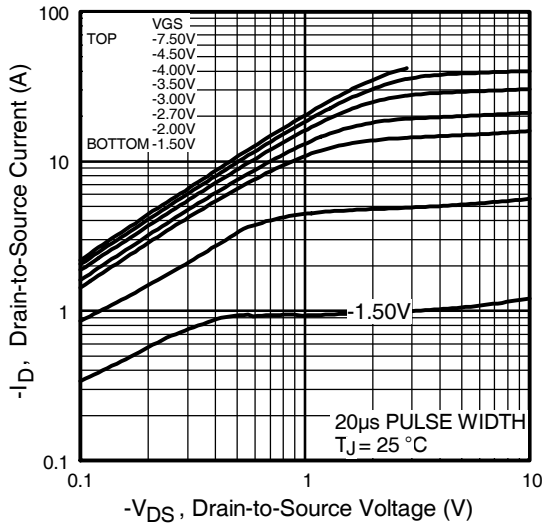


Fig 1. Typical Output Characteristics

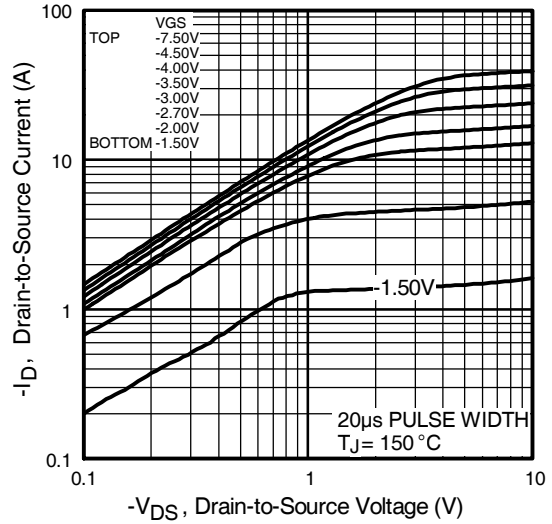


Fig 2. Typical Output Characteristics

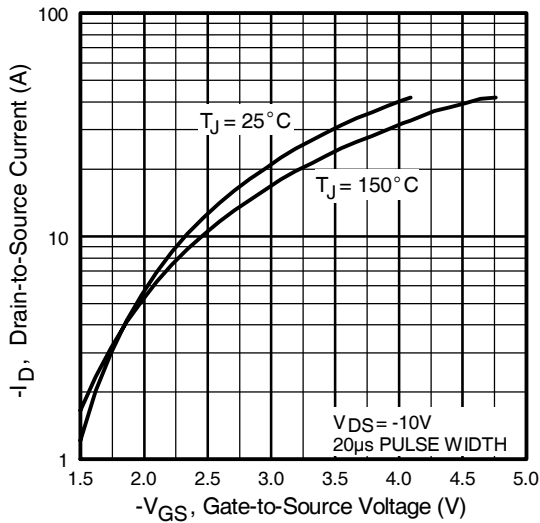


Fig 3. Typical Transfer Characteristics

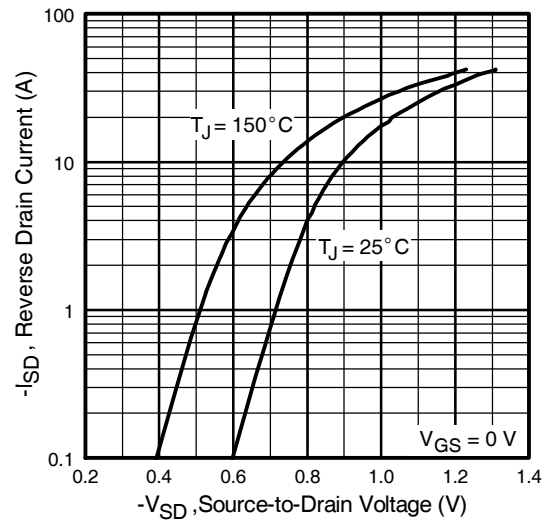
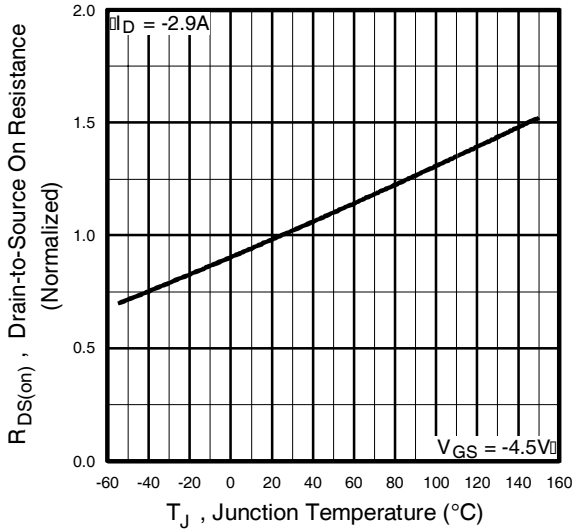
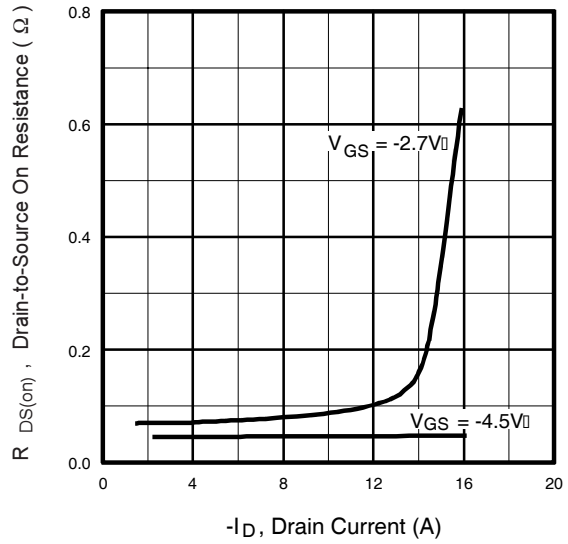


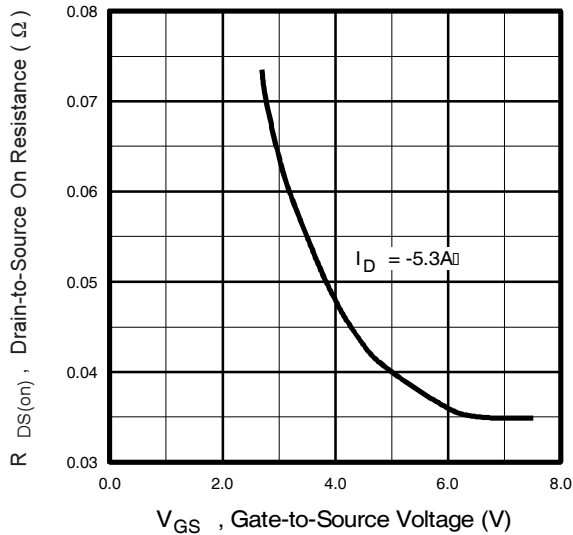
Fig 4. Typical Source-Drain Diode Forward Voltage



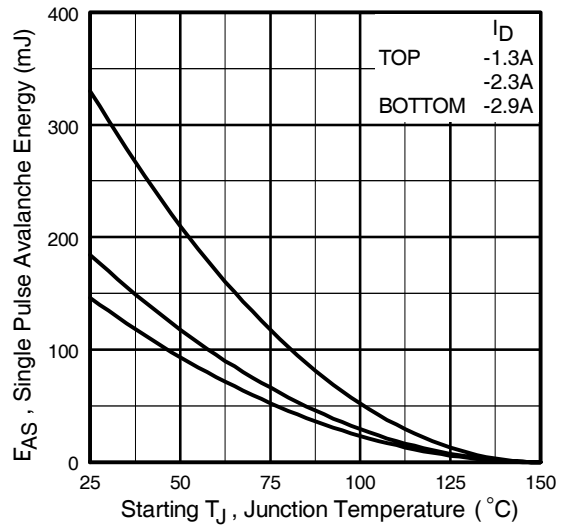
**Fig 5.** Normalized On-Resistance Vs. Temperature



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



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



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

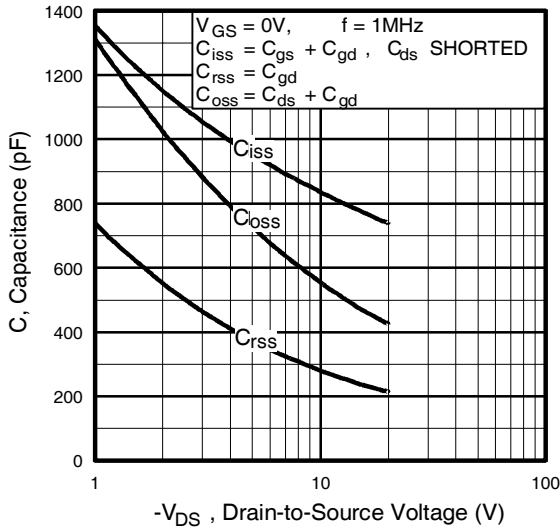


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

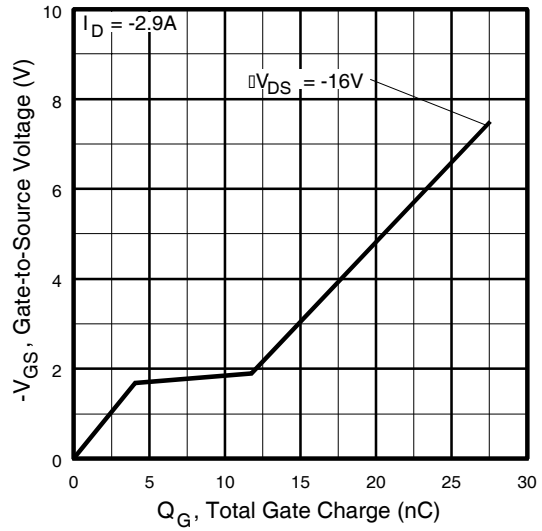


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

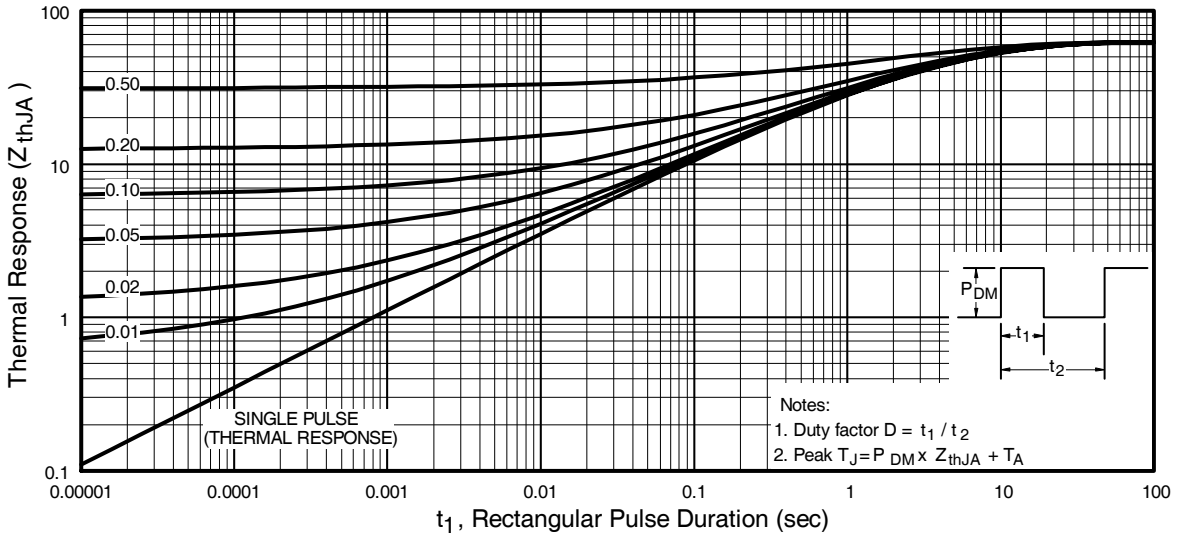
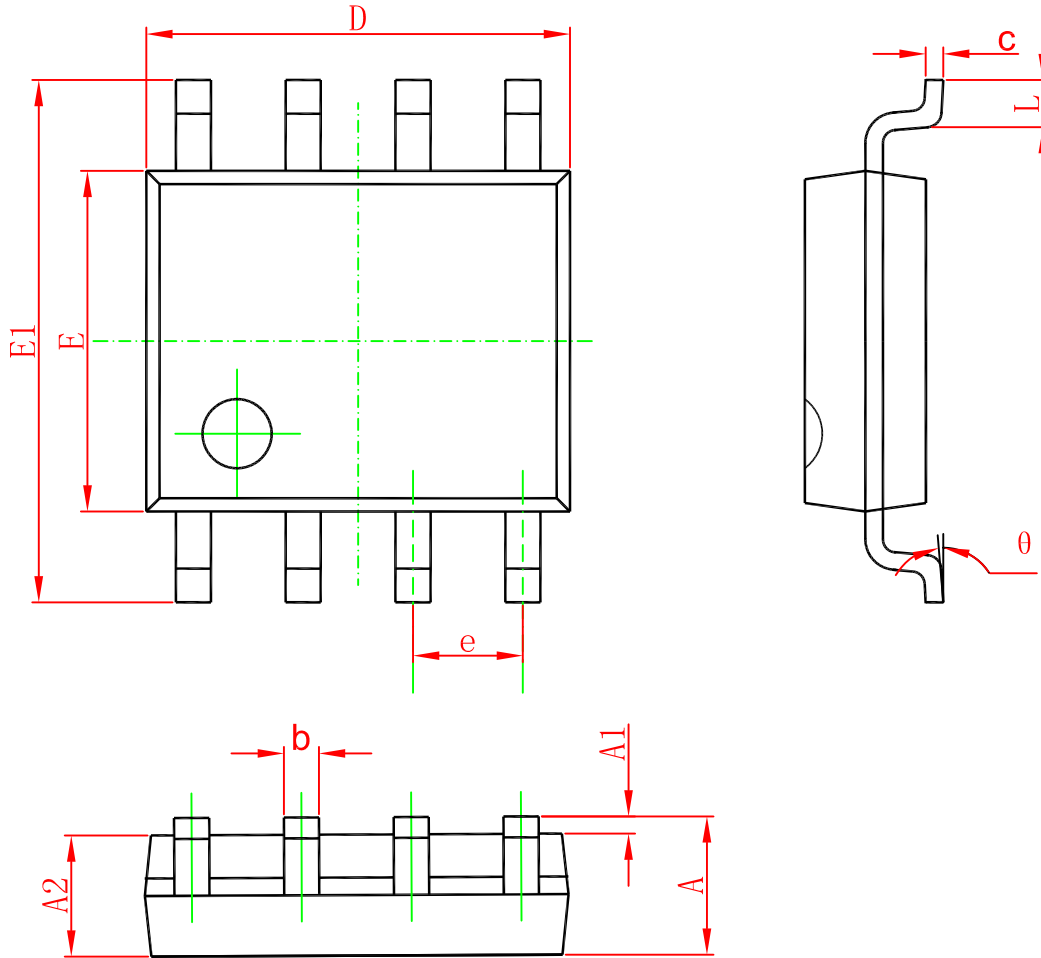


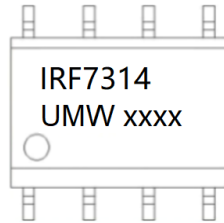
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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 IRF7314TR	SOP-8	3000	Tape and reel