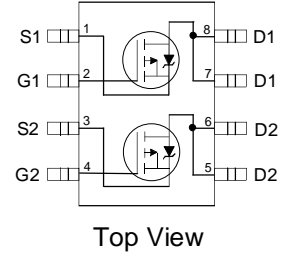


Benefits

- $V_{DS(V)} = -30V$
- $I_D = -2.3A$
- $R_{DS(ON)} < 250m\Omega (V_{GS}=-10V)$
- $R_{DS(ON)} < 400m\Omega (V_{GS}=-4.5V)$
- Ultra Low On-resistance
- Fast Switching
- Lead-free



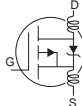
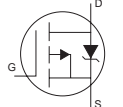
Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	-2.3	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	-1.8	
I_{DM}	Pulsed Drain Current ①	-10	
$P_D @ T_C = 25^\circ C$	Power Dissipation	2.0	W
	Linear Derating Factor	0.016	W/°C
V_{GS}	Gate-to-Source Voltage	± 12	V
dv/dt	Peak Diode Recovery dv/dt ②	-3.0	V/nS
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance Ratings

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ④			62.5	°C/W

Electrical Characteristics T_A = 25°C unless otherwise noted

	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	---	-0.015	---	V/°C	Reference to 25°C, I _D = -1mA
R _{DS(ON)}	Static Drain-to-Source On-Resistance		190	250	mΩ	V _{GS} = -10V, I _D = -1.0A ③
			300	400		V _{GS} = -4.5V, I _D = -0.50A ③
V _{GS(th)}	Gate Threshold Voltage	-1.0	---	-3.0	V	V _{DS} = V _{GS} , I _D = -250μA
g _{fs}	Forward Transconductance	---	2.5	---	S	V _{DS} = -15V, I _D = -2.3A ③
I _{DSS}	Drain-to-Source Leakage Current		---	-2.0	μA	V _{DS} = -16V, V _{GS} = 0V
			---	-25		V _{DS} = -16V, V _{GS} = 0V, T _J = 55 °C
I _{GSS}	Gate-to-Source Forward Leakage	---	---	-100	nA	V _{GS} = -12V
	Gate-to-Source Reverse Leakage	---	---	100		V _{GS} = 12V
Q _g	Total Gate Charge	---	9.3	25	nC	I _D = -2.3A
Q _{gs}	Gate-to-Source Charge	---	1.6	---		V _{DS} = -10V
Q _{gd}	Gate-to-Drain ("Miller") Charge	---	3.0	---		V _{GS} = -10V ③
t _{d(on)}	Turn-On Delay Time	---	12	40	ns	V _{DD} = -10V
t _r	Rise Time	---	16	40		I _D = -1.0A
t _{d(off)}	Turn-Off Delay Time	---	42	90		R _G = 6.0Ω
t _f	Fall Time	---	30	50		R _D = 10Ω ③
L _D	Internal Drain Inductance	---	4.0	---	nH	Between lead, 6mm (0.25in.) from package and center of die contact 
L _S	Internal Source Inductance	---	6.0	---		
C _{iss}	Input Capacitance	---	290	---	pF	V _{GS} = 0V
C _{oss}	Output Capacitance	---	210	---		V _{DS} = -15V
C _{rss}	Reverse Transfer Capacitance	---	67	---		f = 1.0MHz
I _S	Continuous Source Current (Body Diode)	---	---	-2.0	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode) ①	---	---	-9.2		
V _{SD}	Diode Forward Voltage	---	---	-1.2	V	T _J = 25°C, I _S = -1.25A, V _{GS} = 0V ③
t _{rr}	Reverse Recovery Time	---	69	100	ns	T _J = 25°C, I _F = -1.25A
Q _{rr}	Reverse Recovery Charge	---	90	140	nC	di/dt = 100A/μs ③
t _{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L _S +L _D)				

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② I_{SD} ≤ -2.3A, di/dt ≤ 100A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 150°C
- ③ Pulse width ≤ 300μs; duty cycle ≤ 2%.
- ④ Surface mounted on FR-4 board, t ≤ 10sec.

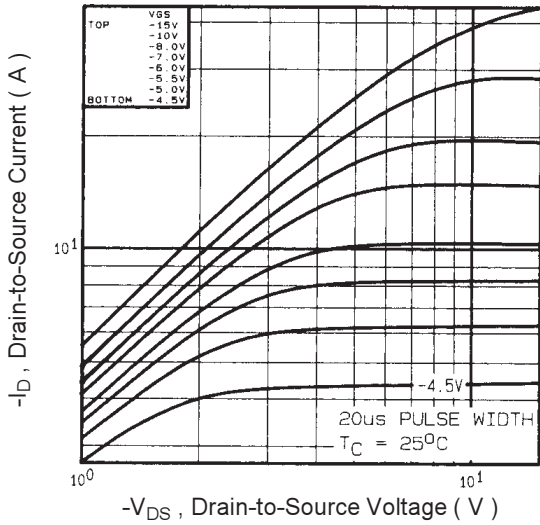


Fig 1. Typical Output Characteristics

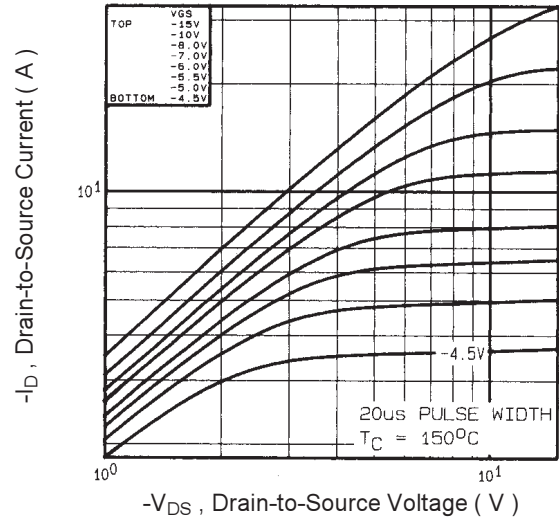


Fig 2. Typical Output Characteristics

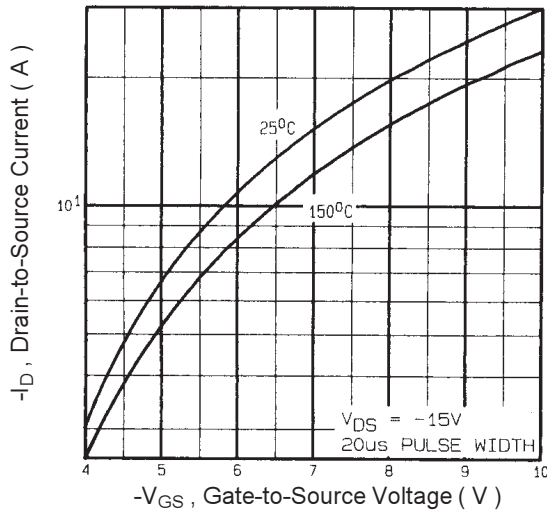


Fig 3. Typical Transfer Characteristics

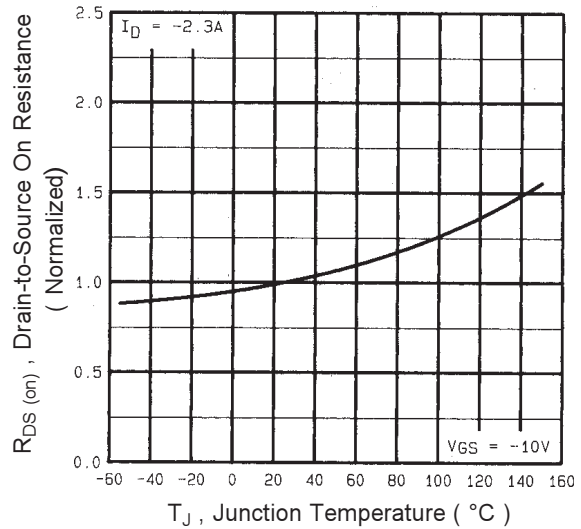


Fig 4. Normalized On-Resistance Vs. Temperature

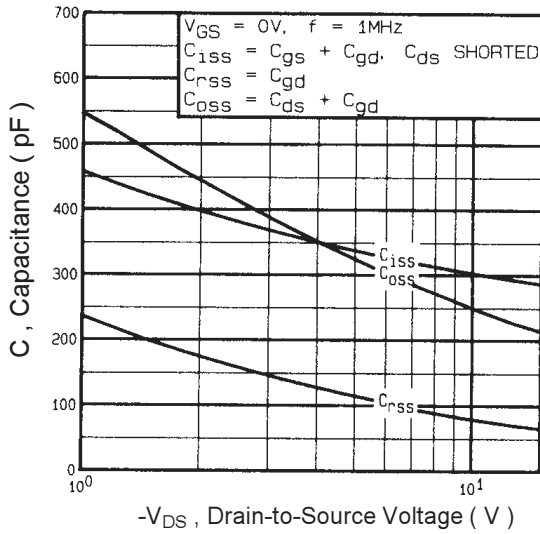


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

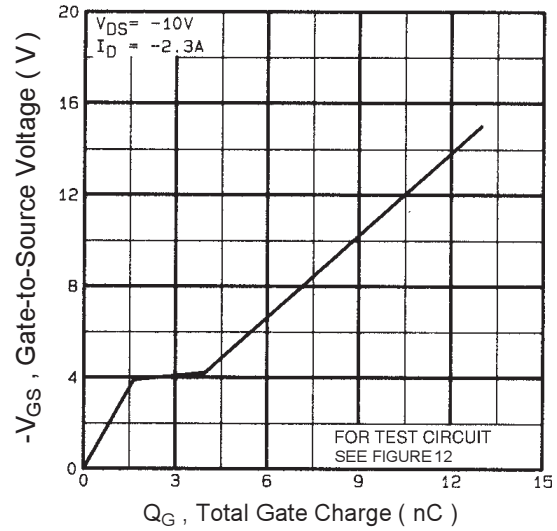


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

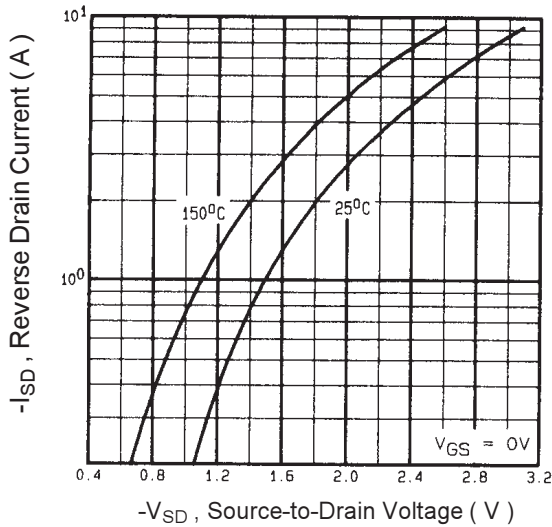


Fig 7. Typical Source-Drain Diode Forward Voltage

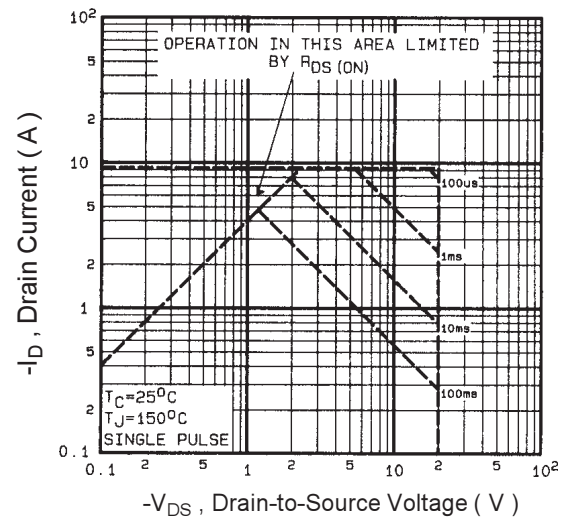


Fig 8. Maximum Safe Operating Area

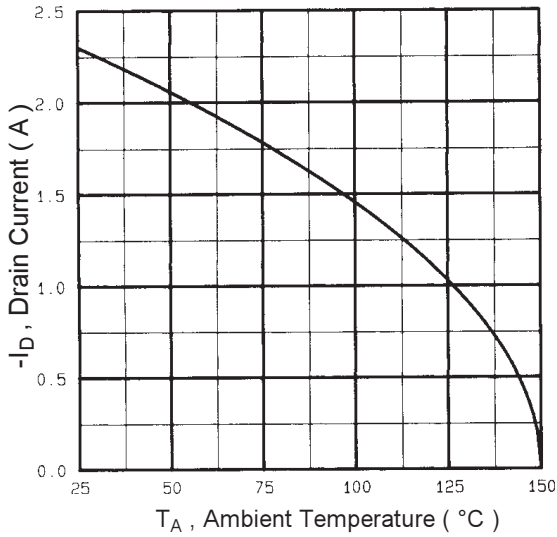


Fig 9. Maximum Drain Current Vs. Ambient Temperature

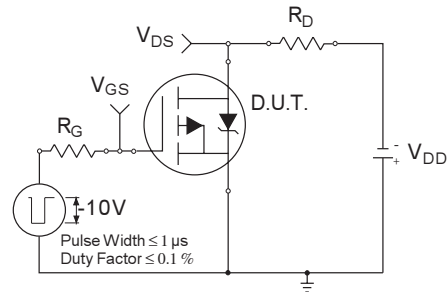


Fig 10a. Switching Time Test Circuit

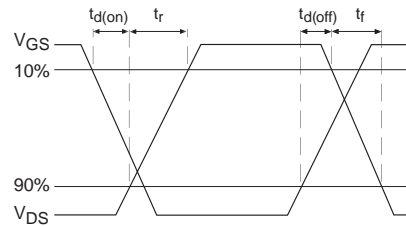


Fig 10b. Switching Time Waveforms

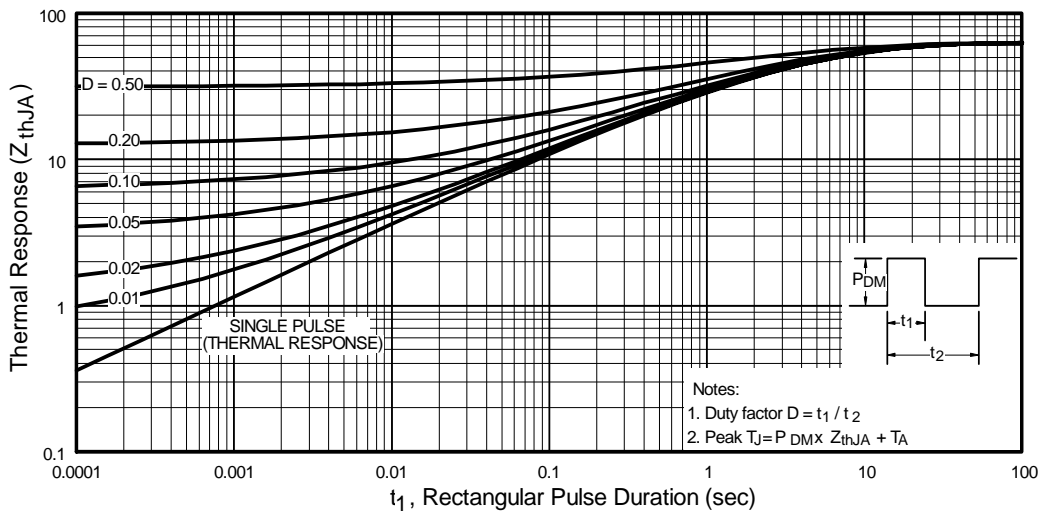
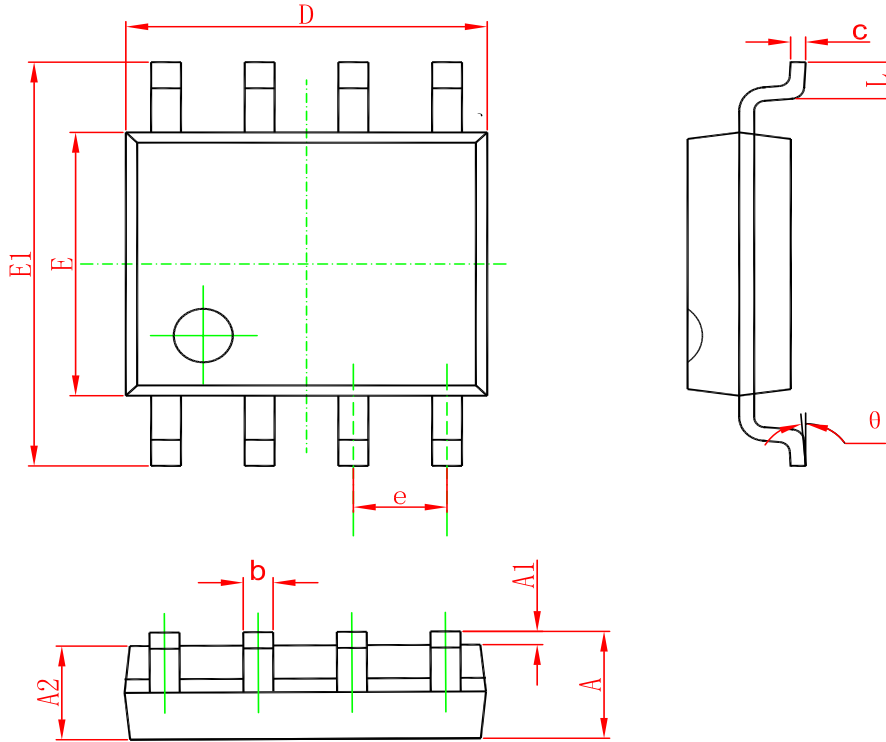


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

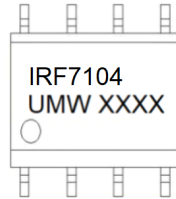
PACKAGE OUTLINE DIMENSIONS

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 IRF7104TR	SOP-8	3000	Tape and reel