UMW IRF7104TR

Dual P Channel MOSFET

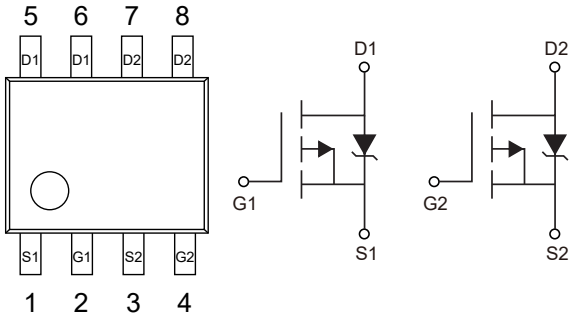
1.Features

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

3.Pinning information

Pin	Symbol	Description
2,4	G	GATE
1,3	S	SOURCE
5,6,7,8	D	DRAIN

SOP-8



3.Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter		Symbol	Rating	Units
Continuous Drain Current, V_{GS}=10V	T_A=25°C	I_D	-2.3	A
Continuous Drain Current, V_{GS}=10V	T_A=100°C		-1.8	A
Pulsed Drain Current ①		I_{DM}	-10	A
Power Dissipation	T_C=25°C	P_D	2	W
Linear Derating Factor			0.016	W/°C
Gate-to-Source Voltage		V_{GS}	±12	V
Peak Diode Recovery dv/dt ②		dv/dt	-3	V/nS
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

4.Thermal resistance rating

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

5.Electrical Characteristics T_A=25°C

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=-250μA, V_{GS}=0V	-30			V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DSS}/T_J$	I_D=-1mA,Reference to 25°C		0.015		V/°C
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-1A ③		190	250	mΩ
		V_{GS}=-4.5V, I_D=-0.5A ③		300	400	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1		-3	V
Forward Transconductance	g_{FS}	V_{DS}=-15V, I_D=-2.3A ③		2.5		S
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V			-2	μA
		V_{DS}=-16V,V_{GS}=0V,T_J=55°C			-25	
Gate-to-Source Forward Leakage	I_{GSS}	V_{GS}=-12V			-100	nA
Gate-to-Source Reverse Leakage		V_{GS}=12V			100	
Total Gate Charge	Q_g	I_D=-2.3A		9.3	25	nC
Gate-to-Source Charge	Q_{gs}	V_{DS}=-10V		1.6		
Gate-to-Drain ("Miller") Charge	Q_{gd}	V_{GS}=-10V ③		3		
Turn-On Delay Time	$t_{D(on)}$	V_{DD}=-10V		12	40	ns
Rise Time	t_r	I_D=-1A		16	40	ns
Turn-Off Delay Time	$t_{D(off)}$	R_G=6Ω		42	90	ns
Fall Time	t_f	R_D=10Ω ③		30	50	ns
Internal Drain inductance	L_D	Between lead,6mm (0.25in.) from package and centerof die contact		4		nH
Internal Source inductance	L_S			6		
Input Capacitance	C_{iss}	V_{GS}=0V		290		pF
Output Capacitance	C_{oss}	V_{DS}=-15V		210		pF
Reverse Transfer Capacitance	C_{rss}	f=1.0MHz		67		pF

Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			-2	A
Pulsed Source Current (Body Diode) ①	I_{SM}				-9.2	
Diode Forward Voltage	V_{SD}	T_J=25°C,I_S=-1.25A,V_{GS}=0V③			-1.2	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=-1.25A		69	100	ns
Reverse Recovery Charge	Q_{rr}	dI/dt=100A/μs ③		90	140	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

Notes:

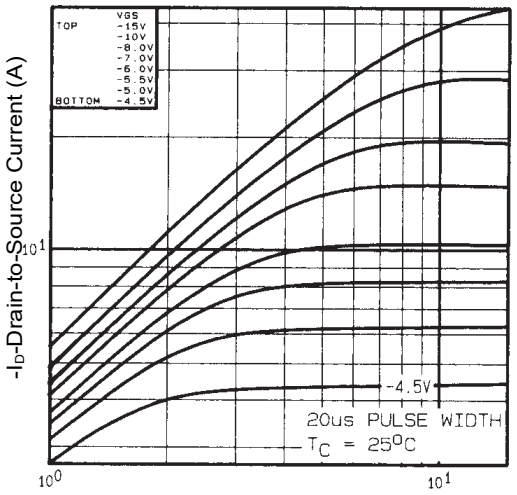
① Repetitive rating; pulse width limited bymax.junction temperature.

② I_{SD}≤-2.3A, di/dt ≤100A/μS, V_{DD}≤ $V_{(BR)DSS}$,T_J≤ 150°C.

③ Pulse width ≤ 300us; duty cycle ≤ 2%.

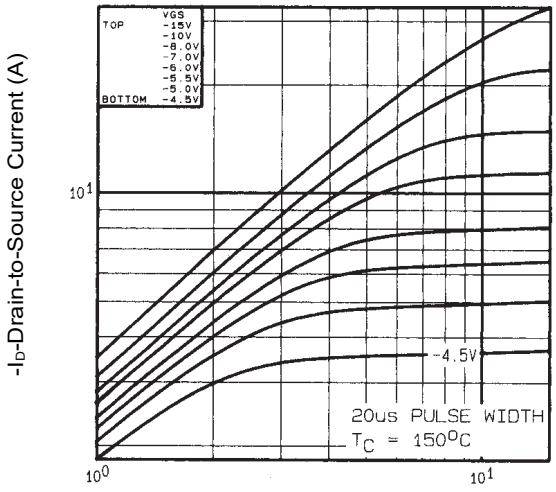
④ Surface mounted on FR-4 board, t ≤ 10sec.

6.1Typical Characterisitics



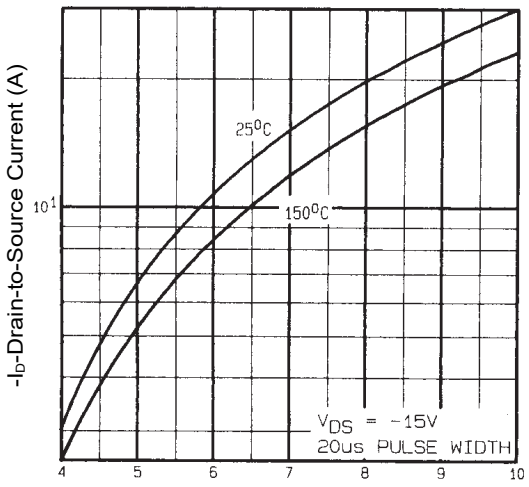
-V_{DS} - Drain-to-Source Voltage (V)

Fig 1. Typical Output Characteristics



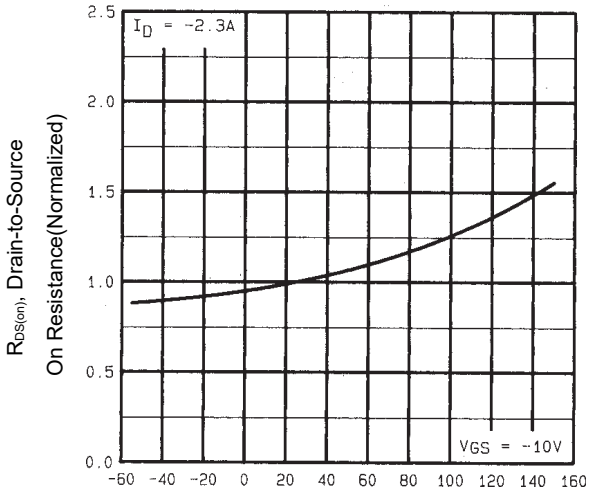
-V_{DS} - Drain-to-Source Voltage (V)

Fig 2. Typical Output Characteristics



-V_{GS}, Gate-to-Source Voltage (V)

Fig 3. Typical Transfer Characteristics



T_J, Junction Temperature (°C)

Fig 4. Nomalized On-ResistanceVs. Temperature

6.2Typical Characterisitics

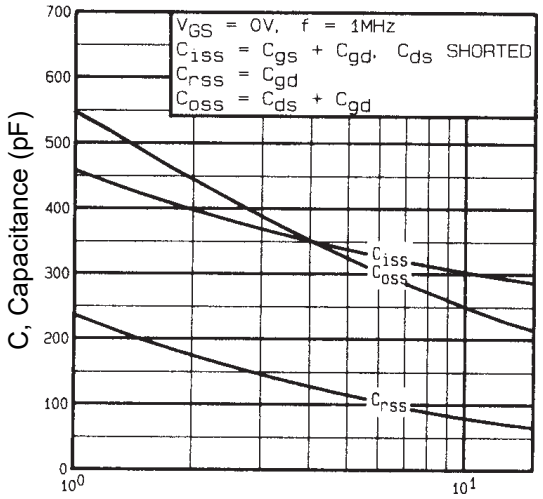


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

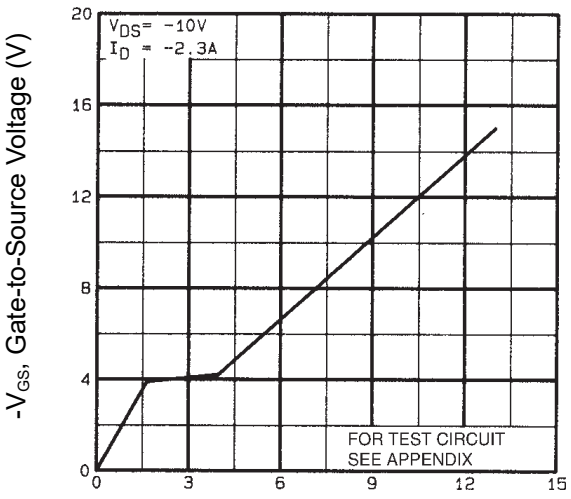


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

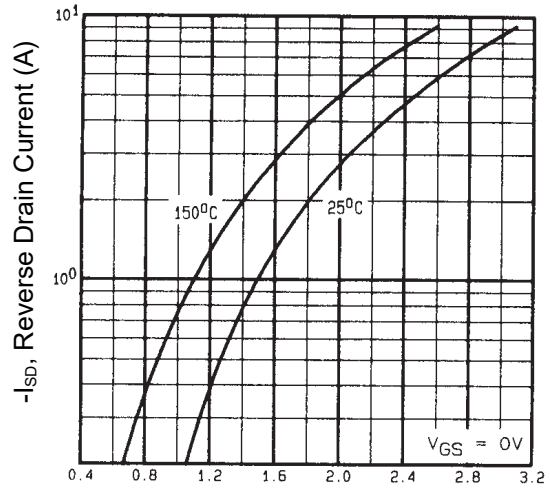


Fig 7. Typical Source-Drain Diode Forward Voltage

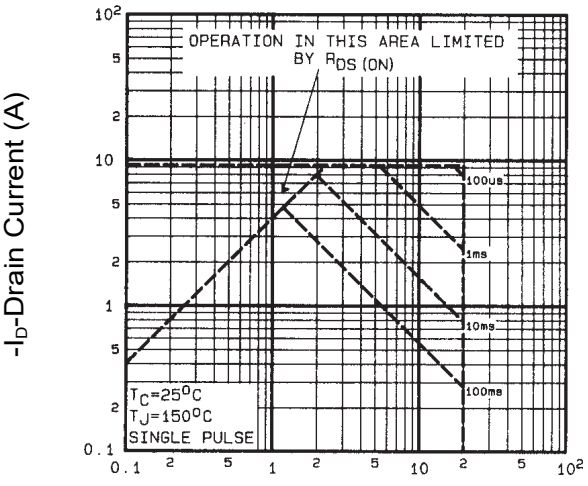


Fig 8. Maximum Safe Operating Area

6.3Typical Characterisitics

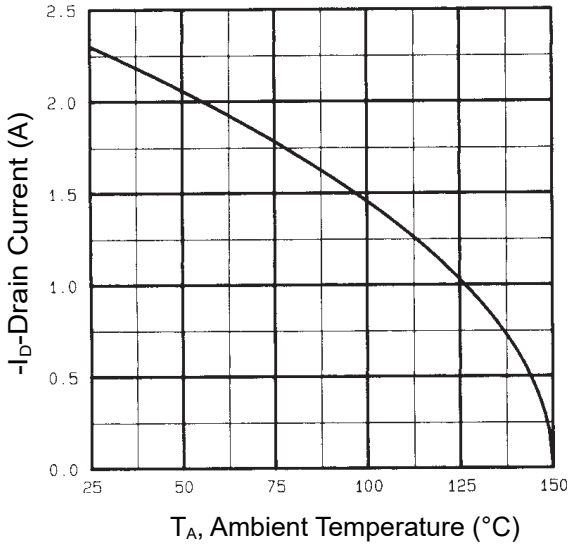


Fig 9. Maximum Drain Current Vs.AmbientTemperature

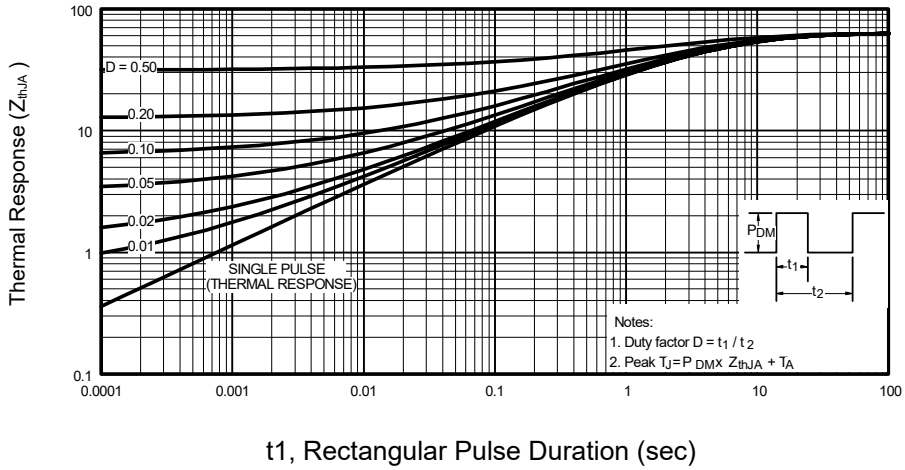


Fig 10. Maximum Effective Transient Themal Impedance, Junction-to-Ambient

6.4Typical Characterisitics

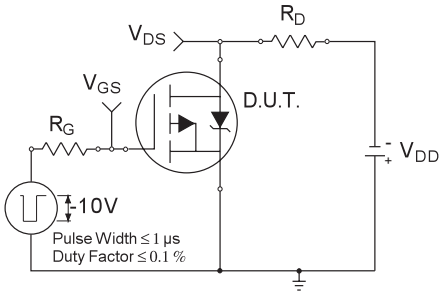


Fig 11a. Switching Time Test Circuit

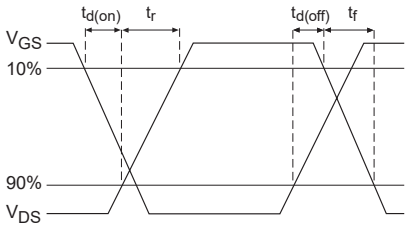
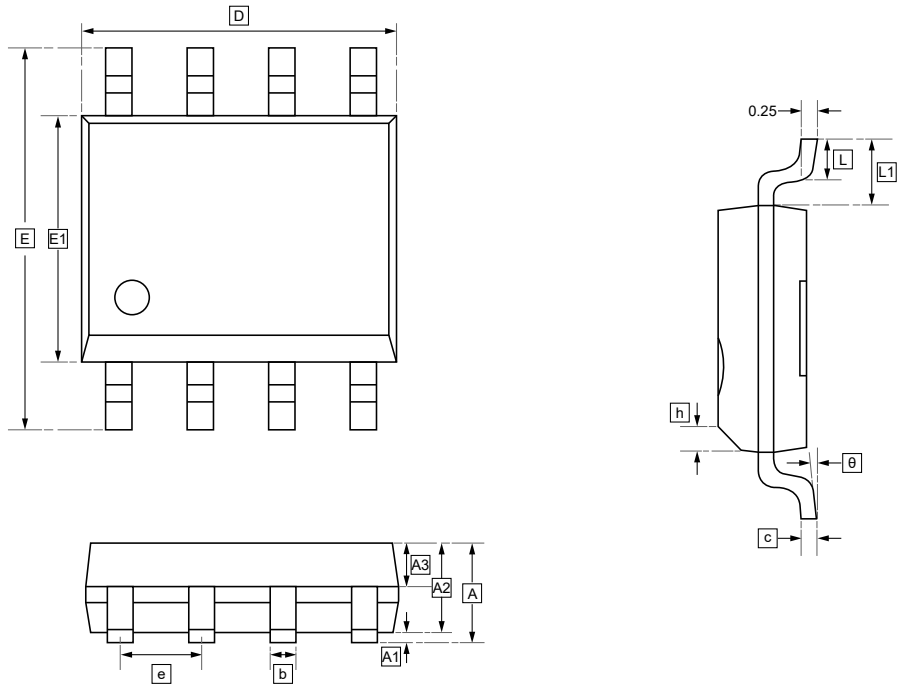


Fig 11b. Switching Time Waveforms

7.SOP-8 Package Outline Dimensions

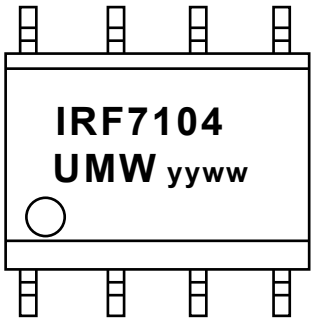


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	b	c	D	E	E1	e	h	L
Min	-	0.05	1.30	0.60	0.39	0.20	4.80	5.80	3.80	1.24	0.30	0.50
Max	1.75	0.20	1.50	0.70	0.47	0.24	5.00	6.20	4.00	1.30	0.50	0.80

Symbol	L1	θ
Min	1.00	0°
Max	1.10	8°

8.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRF7104TR	SOP-8	3000	Tape and reel

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