UMW IRF7240TR

-40V P-Channel MOSFET

1.Description

The SOP-8 has been modified through a customized leadframe for enhanced thermal characteristics and multiple-die capability making it ideal in a variety of power applications. With these improvements, multiple devices can be used in an application with dramatically reduced board space. The package is designed for vapor phase, infrared, or wave soldering techniques.

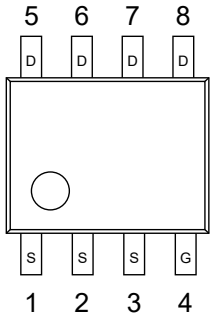
2.Features

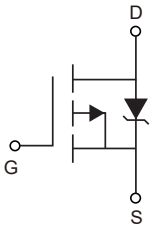
- $V_{DS\ (V)}$=-40V
- I_D=-10.5A
- $R_{DS(ON)}$<16mΩ(V_{GS}=-10V)
- $R_{DS(ON)}$<27mΩ(V_{GS}=-4.5V)
- Ultra Low On-Resistance
- Surface Mount
- Lead-Free

3.Pinning information

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

SOP-8





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

Parameter		Symbol	Rating	Units
Drain- Source Voltage	T_A=25°C	V_{DS}	-40	V
Continuous Drain Current, V_{GS}=-10V	T_A=70°C	I_D	-10.5	A
Continuous Drain Current, V_{GS}=-10V			-8.6	A
Pulsed Drain Current ①	T_A=25°C	I_{DM}	-43	A
Power Dissipation ③	T_A=70°C	P_D	2.5	W
Power Dissipation ③			1.6	W
Linear Derating Factor			20	mW/°C
Gate-to-Source Voltage		V_{GS}	±20	V
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

5.Thermal resistance rating

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ③	$R_{\theta JA}$		50	°C/W

6.Electrical Characteristics T_J=25°C

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=-250μA, V_{GS}=0V	-40			V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DSS}/T_J$	I_D=-1mA,Reference to 25°C		-0.025		V/°C
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-10.5A ②			16	mΩ
		V_{GS}=-4.5V, I_D=-8.4A ②			27	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1		-3	V
Forward Transconductance	g_{FS}	V_{GS}=-10V, I_D=-10.5A	17			S
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=-32V, V_{GS}=0V			-15	μA
		V_{DS}=-32V,V_{GS}=0V,T_J=70°C			-25	
Gate-to-Source Forward Leakage	I_{GSS}	V_{GS}=-20V			-100	nA
Gate-to-Source Reverse Leakage		V_{GS}=20V			100	
Total Gate Charge	Q_g	I_D=-10.5A		73	110	nC
Gate-to-Source Charge	Q_{gs}	V_{DS}=-20V		31	47	
Gate-to-Drain ("Miller") Charge	Q_{gd}	V_{GS}=-10V		17	26	
Turn-On Delay Time	$t_{D(on)}$	V_{DD}=-20V ②		52		ns
Rise Time	t_r	I_D=-1A		490		
Turn-Off Delay Time	$t_{D(off)}$	R_G=6Ω		210		
Fall Time	t_f	V_{GS}=-10V		97		
Input Capacitance	C_{iss}	V_{GS}=0V		9250		pF
Output Capacitance	C_{oss}	V_{DS}=-25V		580		
Reverse Transfer Capacitance	C_{rss}	f=1.0kHz		520		

Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			-2.5	A
Pulsed Source Current (Body Diode) ①	I_{SM}				-43	
Diode Forward Voltage	V_{SD}	T_J=25°C,I_S=-2.5A,V_{GS}=0V ②			-1.2	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=-2.5A		43	65	ns
Reverse Recovery Charge	Q_{rr}	dI/dt=-100A/μs ②		75	110	nC

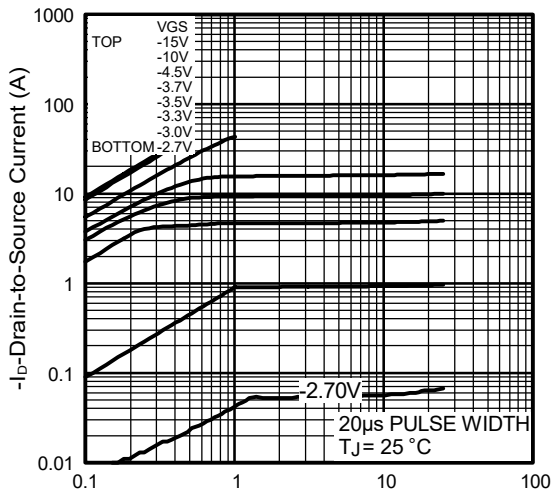
Notes:

① Repetitive rating; pulse width limited by max. junction temperature.

② Pulse width ≤ 400μs; duty cycle ≤ 2%.

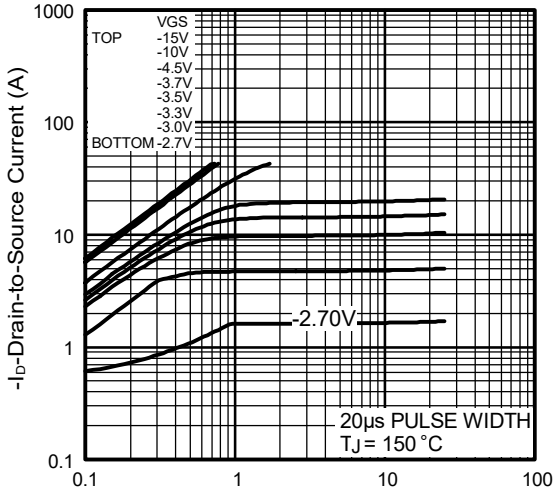
③ Surface mounted on 1 in square Cu board, t ≤ 5sec.

7.1Typical Characterisitics



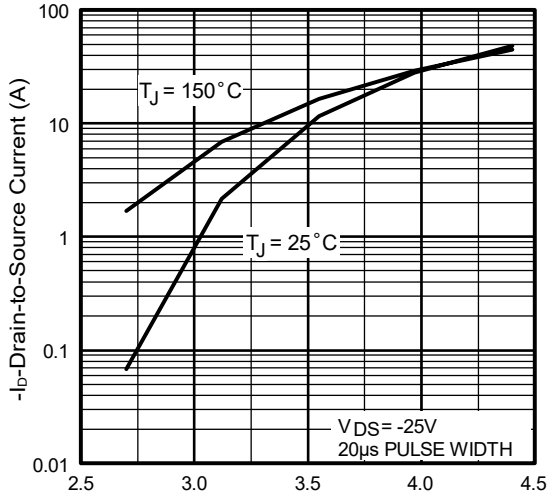
$-V_{DS}$ - Drain-to-Source Voltage (V)

Fig 1. Typical Output Characteristics



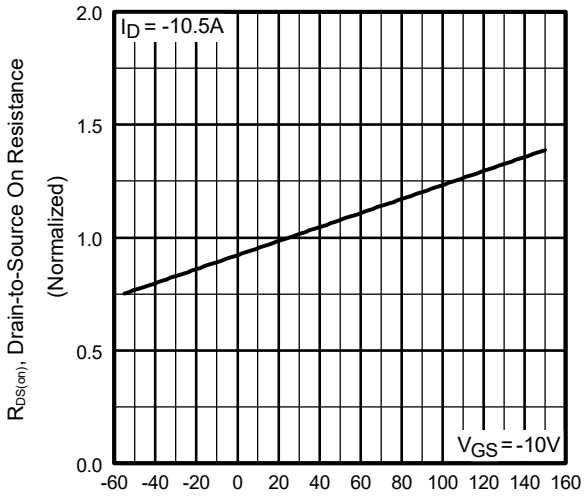
$-V_{DS}$ - Drain-to-Source Voltage (V)

Fig 2. Typical Output Characteristics



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

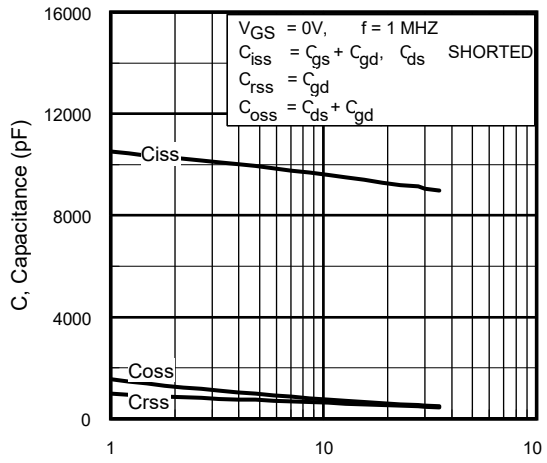
Fig 3. Typical Transfer Characteristics



T_J, Junction Temperature (°C)

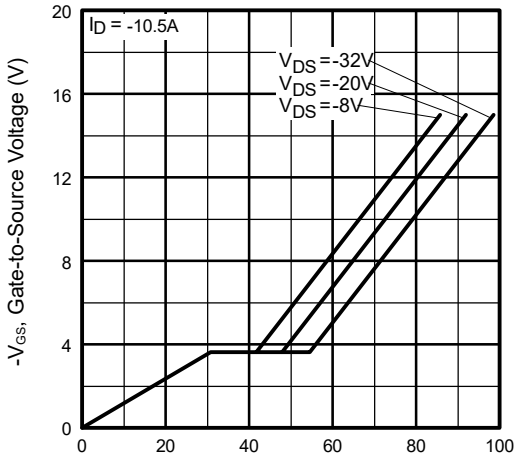
Fig 4. Nomalized On-ResistanceVs. Temperature

7.2Typical Characterisitics



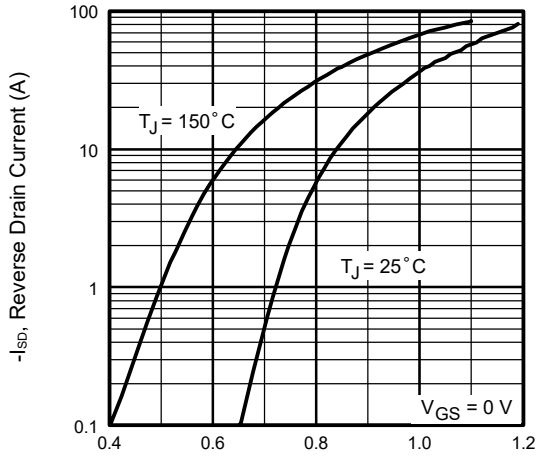
-V_{DS} ,Drain-to-Source Voltage (V)

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



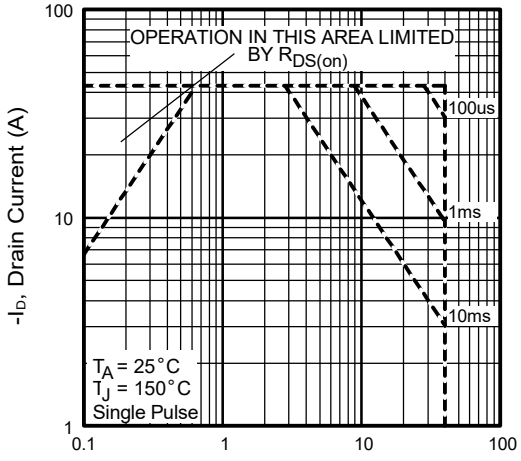
Q_G, Total Gate Charge (nC)

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



-V_{SD}, Source-to-Drain Voltage (V)

Fig 7. Typical Source-Drain Diode Forward Voltage



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

Fig 8. Maximum Safe Operating Area

7.3Typical Characterisitics

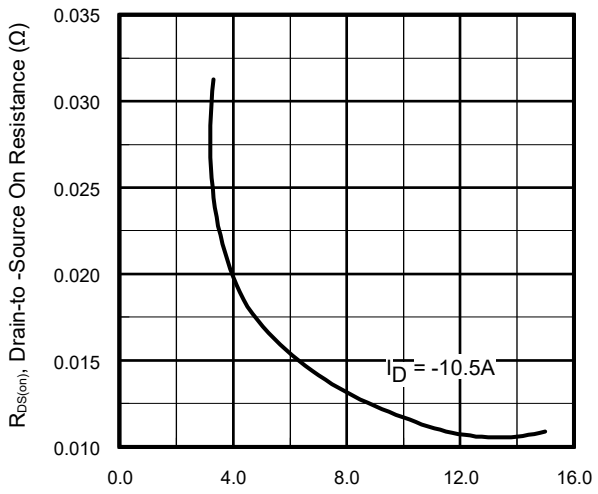


Fig 9. Typical On-Resistance vs. Gate Voltage

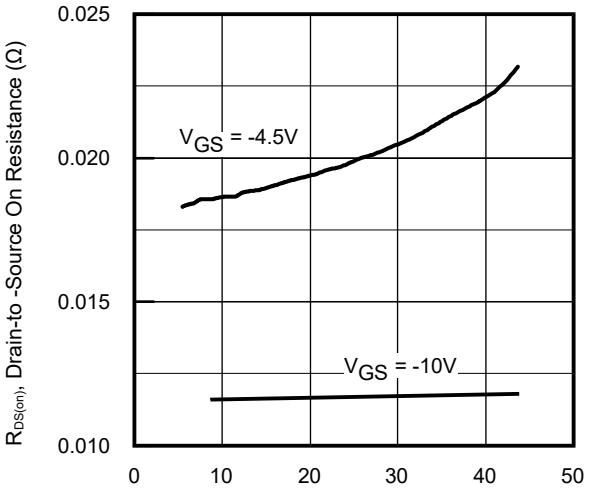


Fig 10. Typical On-Resistance vs. Drain Current

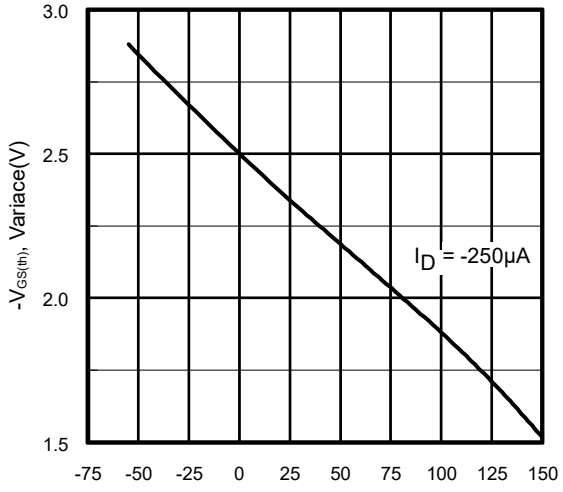


Fig 11. Typical Threshold Voltage vs. Junction Temperature

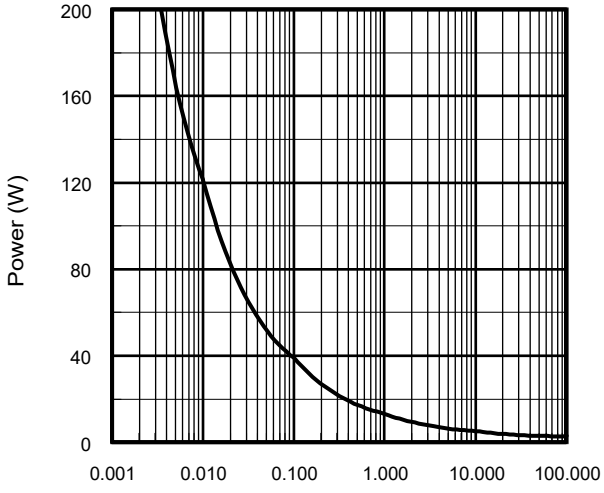


Fig 12. Typical Power vs. Time

7.4Typical Characterisitics

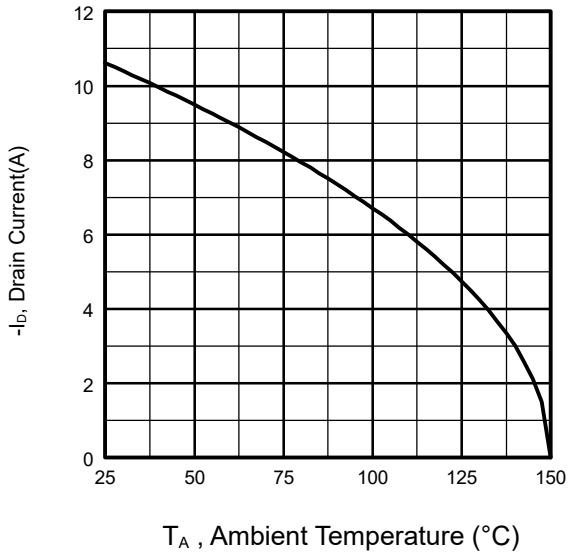


Fig 13. Maximum Drain Current vs. Ambient Temperature

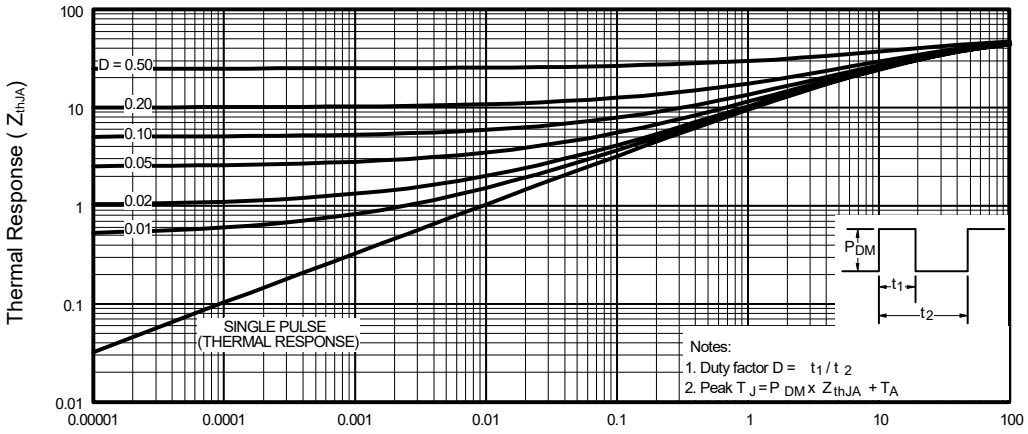


Fig 14. Typical Effective Transient Thermal Impedance, Junction-to-Ambient

7.5Typical Characterisitics

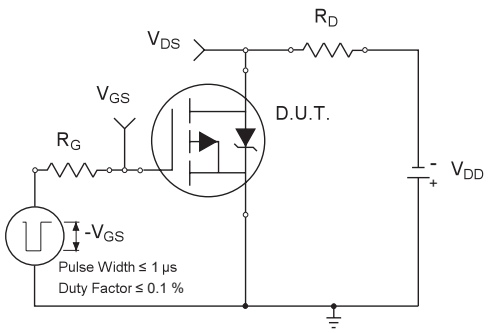


Fig 15a. Switching Time Test Circuit

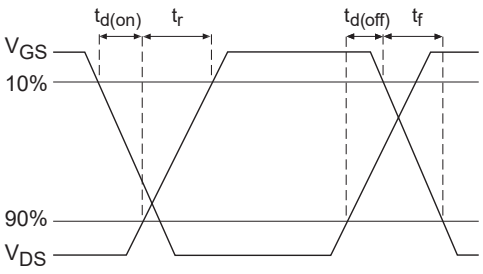


Fig 15b. Switching Time Waveforms

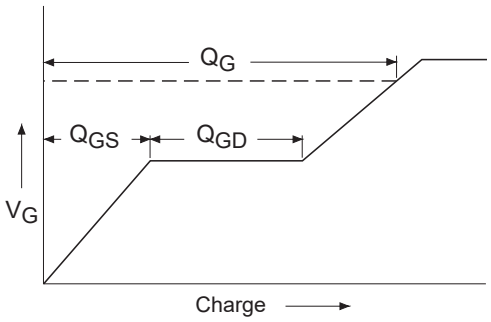


Fig 16a. Basic Gate Charge Waveform

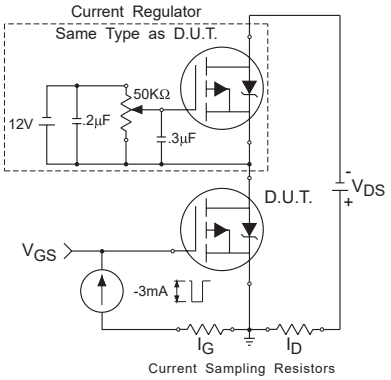
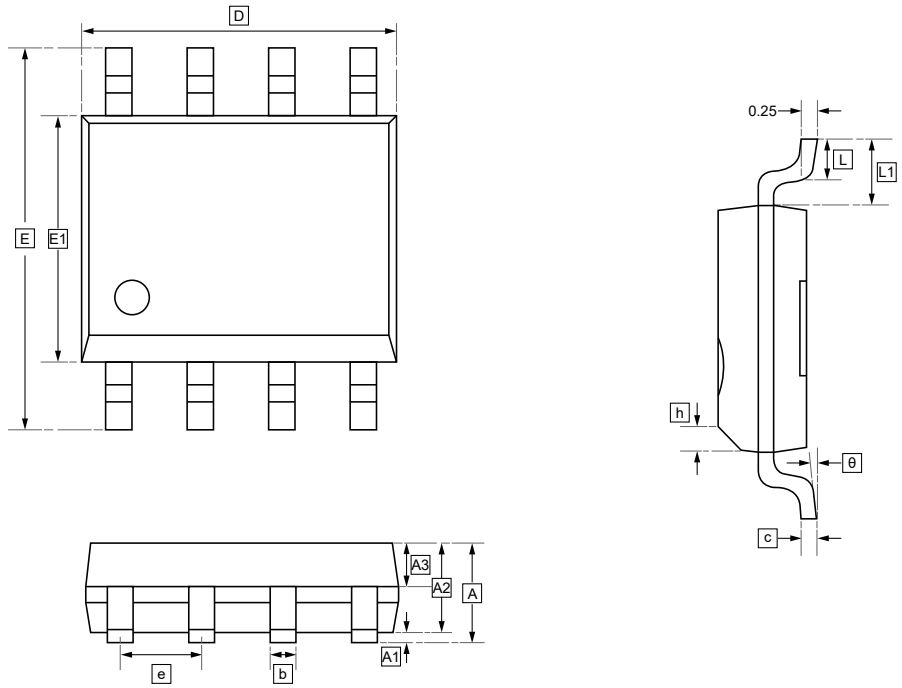


Fig 16b. Gate Charge Test Circuit

8.SOP-8 Package Outline Dimensions

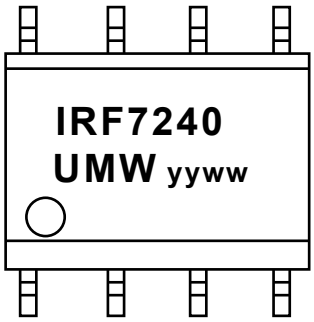


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	b	c	D	E	E1	e	h	L
Min	-	0.05	1.30	0.60	0.39	0.20	4.70	5.80	3.80	1.24	0.30	0.50
Max	1.75	0.20	1.50	0.70	0.47	0.24	5.10	6.20	4.00	1.30	0.50	0.80

Symbol	L1	θ
Min	1.00	0°
Max	1.10	8°

9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRF7240TR	SOP-8	3000	Tape and reel

10.Disclaimer

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