UMW IRF7201TR

30V N-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.

2.1Features

- $V_{DS\ (V)}$=30V
- I_D=7.3A(V_{GS}=10V)
- $R_{DS(ON)}$<30mΩ(V_{GS}=-10V)
- $R_{DS(ON)}$<50mΩ(V_{GS}=-4.5V)

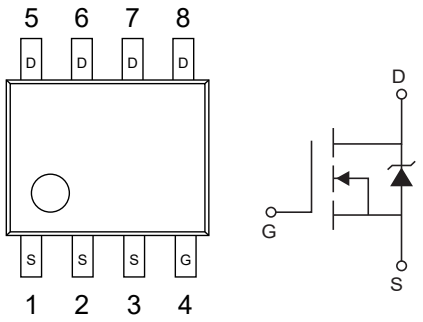
2.2Features

- Generation V Technology
- Ultra Low On-Resistance
- Surface Mount
- Dynamic dv/dt Rating
- Fast Switching
- 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}	30	V
Continuous Drain Current, V_{GS}=10V	T_A=70°C	I_D	7.3	A
Continuous Drain Current, V_{GS}=10V			5.8	A
Pulsed Drain Current ①	T_A=25°C	I_{DM}	58	A
Power Dissipation	T_A=70°C	P_D	2.5	W
Power Dissipation			1.6	W

Linear Derating Factor		0.02	W/°C
Gate-to-Source Voltage	V_{GS}	±20	V
Gate-to-Source Voltage Single Pulse tp<10μs	V_{GSM}	30	V
Single Pulse Avalanche Energy ②	E_{AS}	70	mJ
Peak Diode Recovery dv/dt ③	dv/dt	5	V/ns
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 ⑤	$R_{\theta JA}$		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	30			V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DSS}/\Delta T_J$	I_D=1mA,Reference to 25°C		0.024		V/°C
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=7.3A ④			30	mΩ
		V_{GS}=4.5V, I_D=3.7A ④			50	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1			V
Forward Transconductance	g_{FS}	V_{GS}=15V, I_D=2.3A	5.8			S
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V			1	μA
		V_{DS}=24V,V_{GS}=0V,T_J=125°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=4.6A		19	28	nC
Gate-to-Source Charge	Q_{gs}	V_{DS}=24V		2.3	3.5	
Gate-to-Drain ("Miller") Charge	Q_{gd}	V_{GS}=10V, See Fig. 10 ④		6.3	9.5	
Turn-On Delay Time	$t_{D(on)}$	V_{DD}=15V ④		7		ns
Rise Time	t_r	I_D=4.6A		35		
Turn-Off Delay Time	$t_{D(off)}$	R_G=6.2Ω		21		
Fall Time	t_f	R_D=3.2Ω ④		19		
Input Capacitance	C_{iss}	V_{GS}=0V		550		pF
Output Capacitance	C_{oss}	V_{DS}=-25V		260		
Reverse Transfer Capacitance	C_{rss}	f=1MHz, See Fig. 9		100		

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}				58	
Diode Forward Voltage	V_{SD}	T_J=25°C,I_S=4.6A,V_{GS}=0V ③			1.2	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=4.6A		48	73	ns
Reverse Recovery Charge	Q_{rr}	dI/dt=-100A/μs ③		73	110	nC

Notes:

① Repetitive rating; pulse width limited by max. junction temperature.(See fig. 11)

② V_{DD}=15V, starting T_J=25°C, L=6.6mH, R_G=25Ω, I_{AS}=4.6A. (See Figure 8)

③ I_{SD}≤ 4.6A, di/dt ≤120A/μs, V_{DD}≤ $V_{(BR)DSS}$,T_J≤ 150°C.

④ Pulse width ≤ 300μs; duty cycle ≤ 2%.

⑤ When mounted on 1 inch square copper board, t<10 sec.

7.1Typical Characterisitics

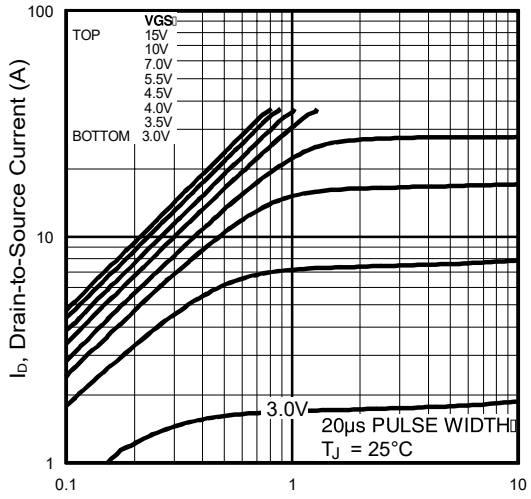


Fig 1. Typical Output Characteristics

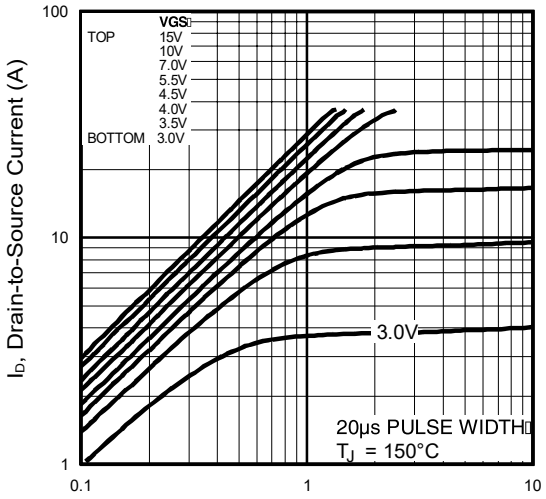


Fig 2. Typical Output Characteristics

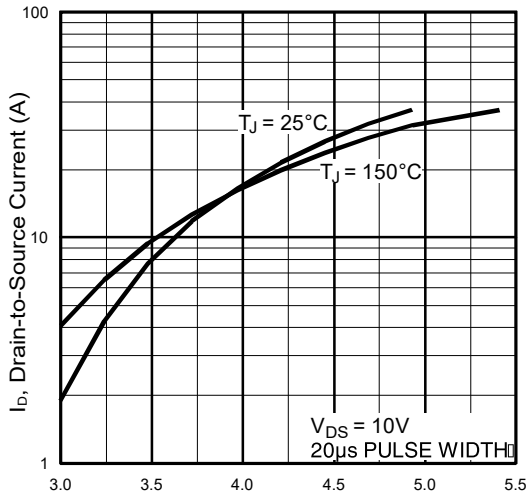


Fig 3. Typical Transfer Characteristics

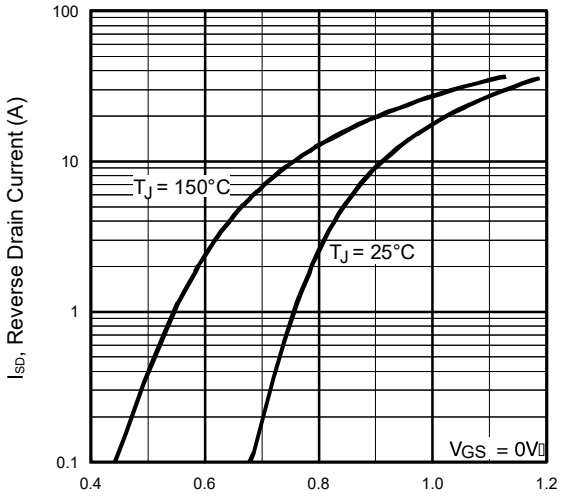
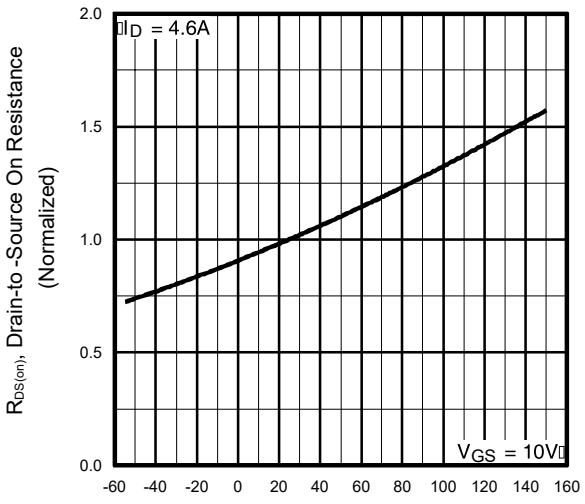


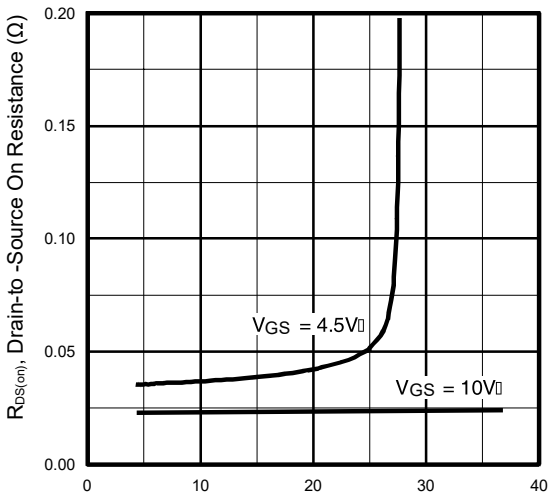
Fig 4. Typical Source-Drain Diode Forward Voltage

7.2Typical Characterisitics



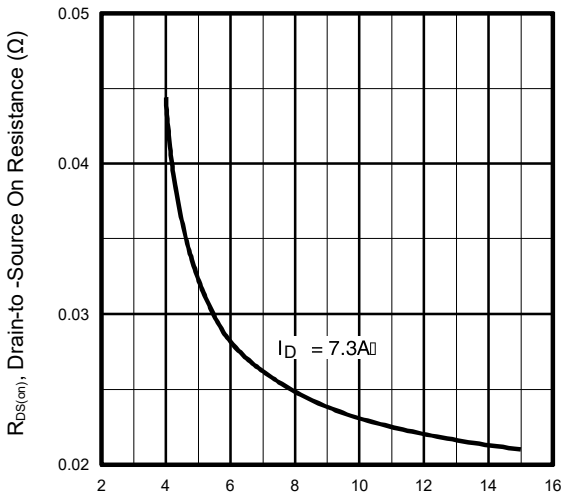
-V_{DS} ,Drain-to-Source Voltage (V)

Fig 5. Normalized On-Resistance Vs. Temperature



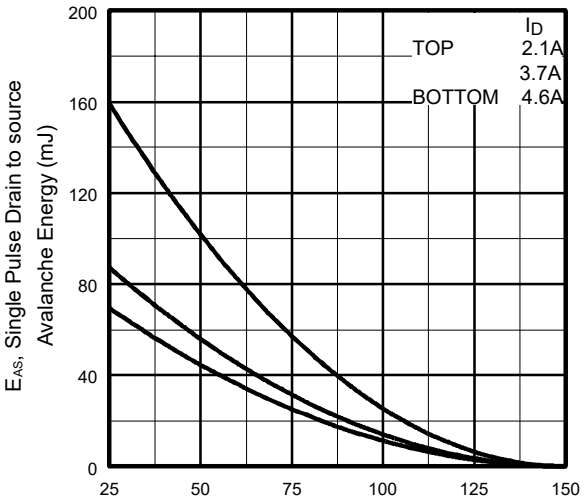
I_D, Drain Current (A)

Fig 6. On-Resistance Vs. Drain Current



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

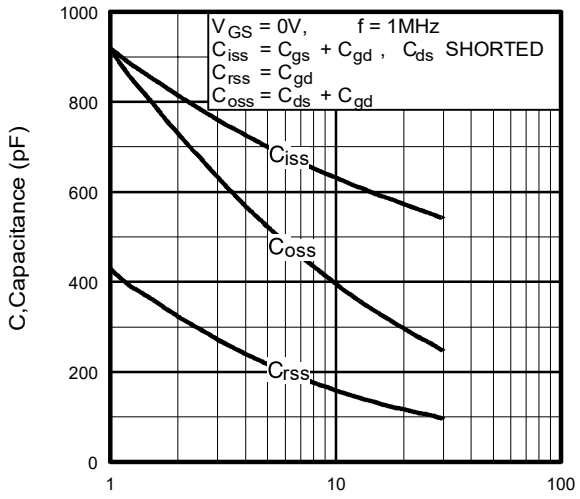
Fig 7. On-Resistance Vs. Gate Voltage



Starting T_J, Junction Temperature (°C)

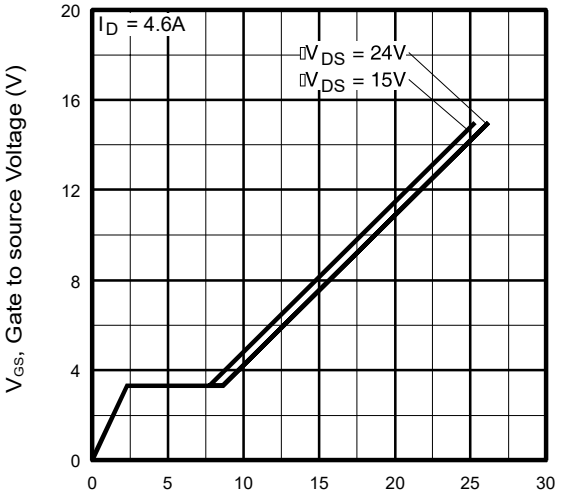
Fig 8. Maximum Avalanche Energy Vs. Drain Current

7.3Typical Characterisitics



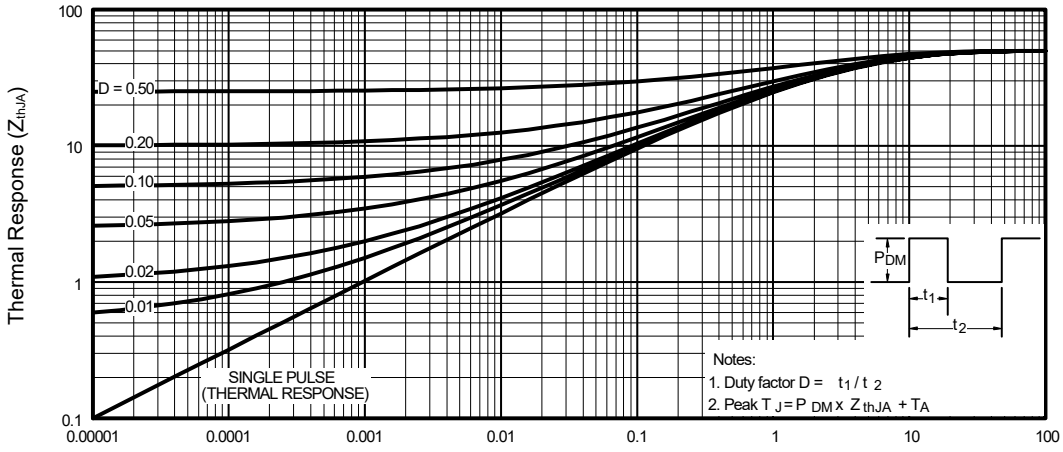
V_{DS},Drain to Source Voltage (V)

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



Q_G, Total Gate Charge (nC)

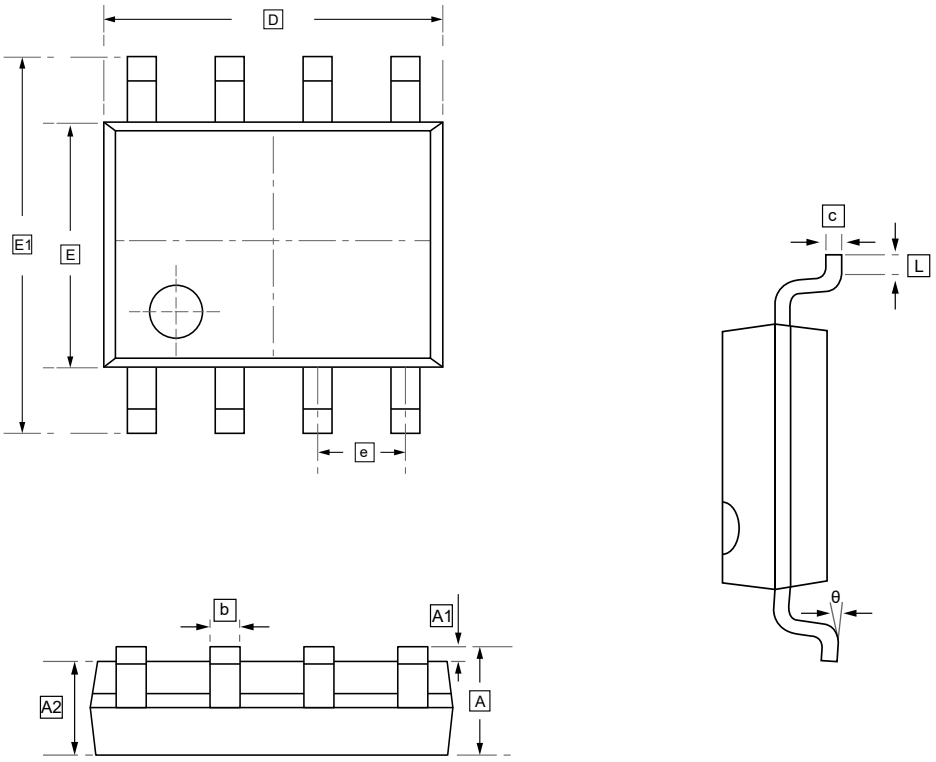
Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage



t_1, Rectangular Pulse Duration (sec)

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

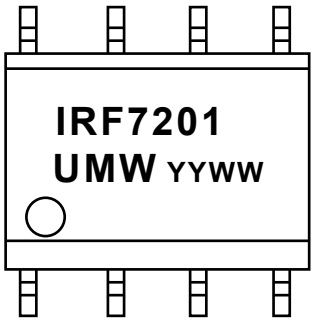
8.SOP-8 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	L	θ
Min	1.350	0.000	1.350	0.330	0.170	4.700	3.800	5.800	1.270	0.400	0°
Max	1.750	0.100	1.550	0.510	0.250	5.100	4.000	6.200	BSC	1.270	8°

9.Ordering information



YY: Year Code
WW: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRF7201TR	SOP-8	3000	Tape and reel

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