UMW IRF9956TR

30V 2N-Channel MOSFET

1.Description

The SOP-8 has been modified through a customized eadframe for enhanced thermalcharacteristics and multiple-die capabilitymaking it ideal in a variety of powerapplications.With these improvements.multiple devices can be used in an appication with dramatically reduced board space. The package is designed for vapor phase, infrared, or wave sodering technique.

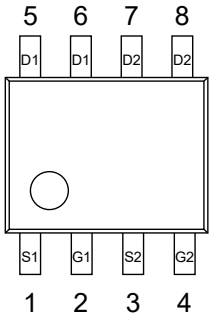
2.Features

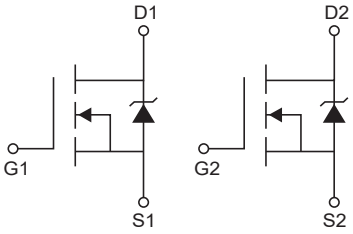
- $V_{DS\ (V)}$=30V, I_D=3.5A
- $R_{DS(ON)}$<80mΩ(V_{GS}=-10V)
- $R_{DS(ON)}$<150mΩ(V_{GS}=-4.5V)
- Generation V Technolog
- Ultra Low On-Resistance
- Surface Mount
- Fully Avalanche Rated
- Lead-Free

3.Pinning information

Pin	Symbol	Description
2,4	G1,G2	GATE
1,3	S1,S2	SOURCE
5,6,7,8	D1,D2	DRAIN

SOP-8





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

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current ⑤	T_A=25°C	I_D	3.5	A
	T_A=70°C		2.8	
Pulsed Drain Current		I_{DM}	16	
Continuous Source Current (Diode Conduction)		I_S	1.7	
Maximum Power Dissipation ⑤	T_A=25°C	P_D	2	W
	T_A=70°C		1.3	W
Single Pulse Avalanche Energy②		E_{AS}	44	mJ
Avalanche Current		I_{AR}	2	A

Repetitive Avalanche Energy	E_{AR}	0.2	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	$R_{\theta JA}$		62.5	°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		0.015		V/°C
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=2.2A ④		50	80	mΩ
		V_{GS}=4.5V, I_D=1A ④		70	150	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1			V
Forward Transconductance	g_{FS}	V_{DS}=15V, I_D=3.5A		12		S
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V			2	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=1.8A		6.9	14	nC
Gate-to-Source Charge	Q_{gs}	V_{DS}=10V, V_{GS}=10V		1	2	
Gate-to-Drain ("Miller") Charge	Q_{gd}	See Fig. 10 ④		1.8	3.5	
Turn-On Delay Time	$t_{D(on)}$	V_{DD}=10V		6.2	12	ns
Rise Time	t_r	I_D=1A		8.8	18	ns
Turn-Off Delay Time	$t_{D(off)}$	R_G=6Ω		13	26	ns
Fall Time	t_f	R_D=10Ω ④		3	6	ns
Input Capacitance	C_{iss}	V_{GS}=0V		190		pF
Output Capacitance	C_{oss}	V_{DS}=15V		120		pF
Reverse Transfer Capacitance	C_{rss}	f=1.0MHz, See Fig. 9		61		pF

Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			1.7	A
Pulsed Source Current (Body Diode) ①	I_{SM}				16	
Diode Forward Voltage	V_{SD}	T_J=25°C,I_S=1.25A,V_{GS}=0V③		0.82	1.2	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=1.25A		27	53	ns
Reverse Recovery Charge	Q_{rr}	dI/dt=100A/μs ③		28	57	nC

Notes:

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

②Starting T_J= 25°C,L=22mH, R_G= 25Ω, I_{AS}= 2A.

③ I_{SD}≤ 2.0A, didt ≤100A/μs, V_{DD}≤ $V_{(BR)DSS}$,T_J≤ 150°C

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

⑤ Surface mounted on FR-4 board, t ≤ 10sec.

7.1Typical Characterisitics

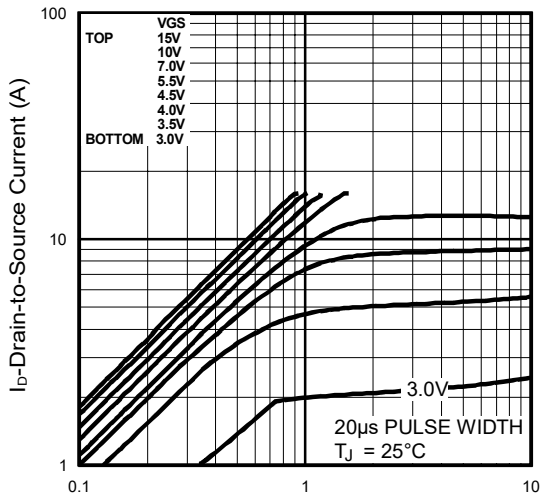


Fig 1. Typical Output Characteristics

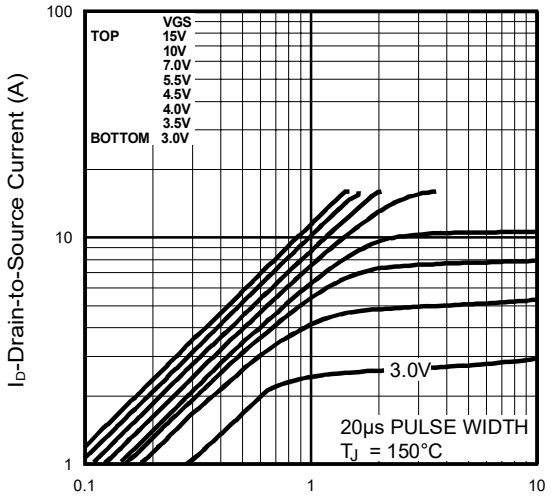


Fig 2. Typical Output Characteristics

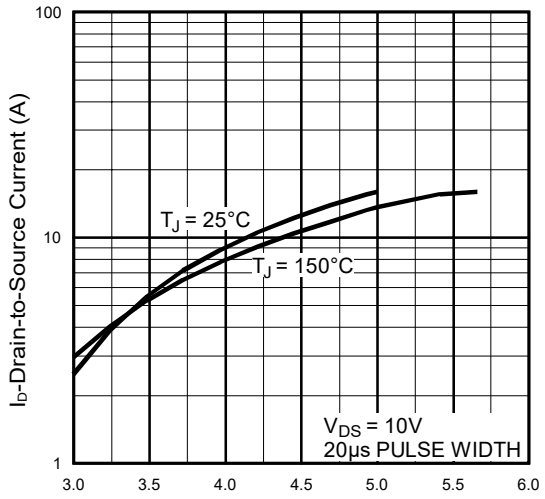


Fig 3. Typical Transfer Characteristics

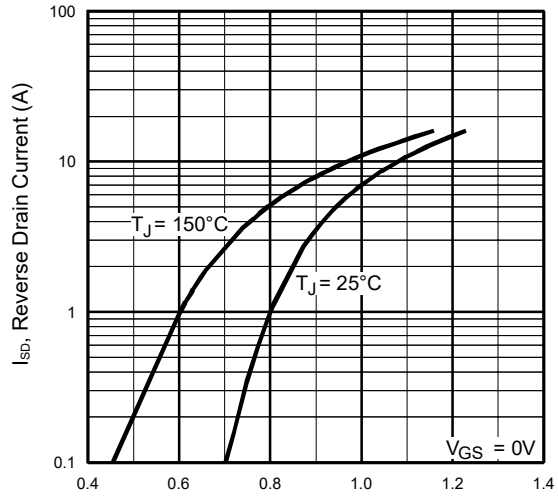
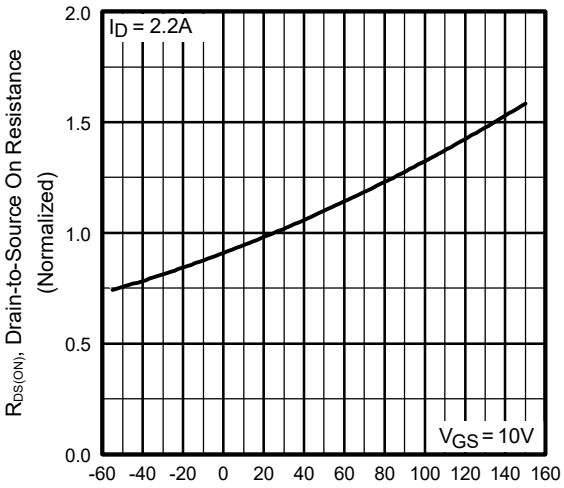


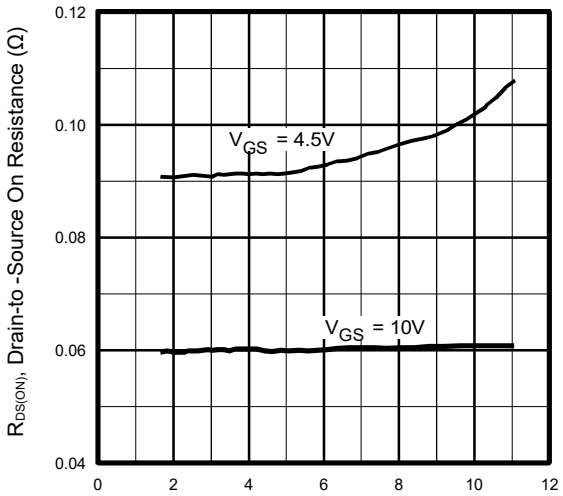
Fig 7. Typical Source-Drain Diode Forward Voltage

7.2Typical Characterisitics



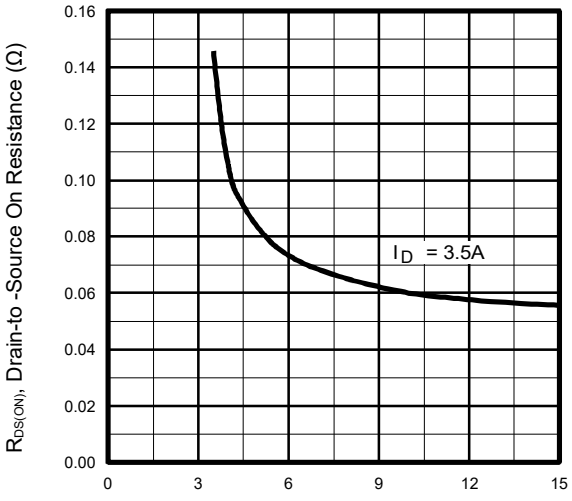
V_{GS}, Gate-to-Source Voltage (V)

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



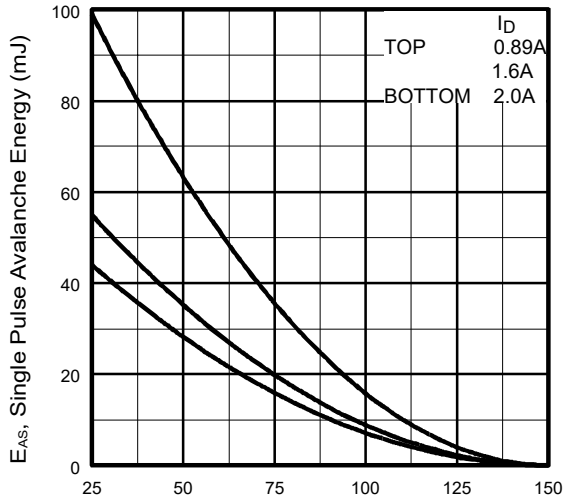
I_D, Drain Current (A)

Fig 6. Typical On-Resistance Vs. Drain Current



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

Fig 11. Typical On-Resistance Vs. Gate Voltage



Starting T_J, Junction Temperature (°C)

Fig 12. Maximum Avalanche Energy Vs. Drain Current

7.3Typical Characterisitics

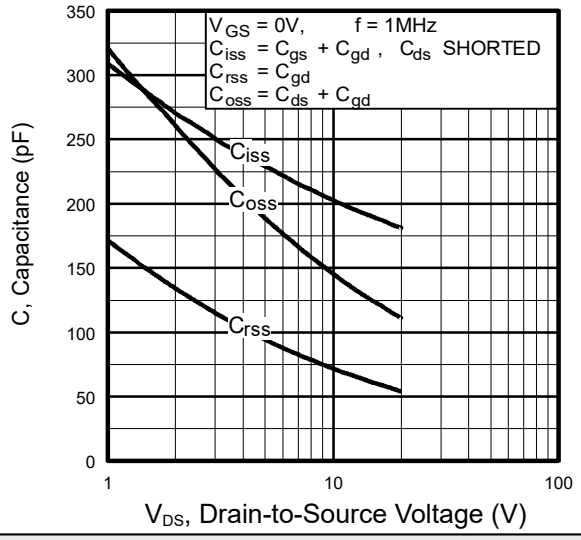


Fig 9. Typical capacitance Vs.Drain-to-Source Voltage

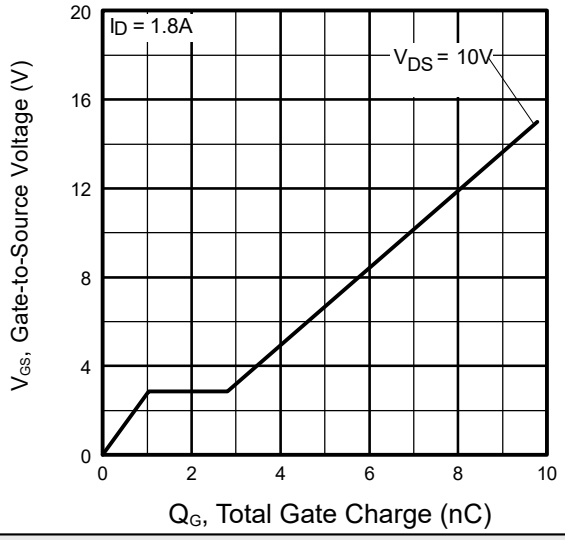


Fig 10. Typical Gate Charge Vs.Gate-to-Source Voltage

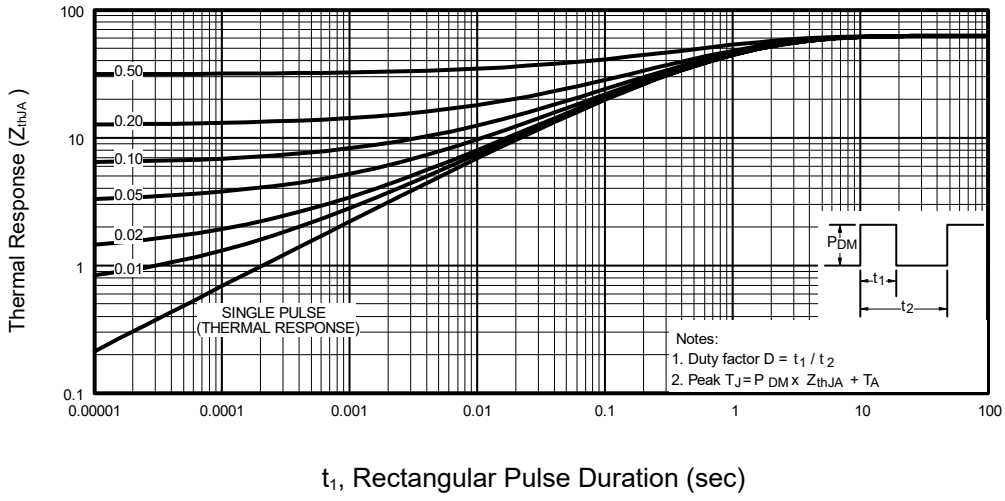
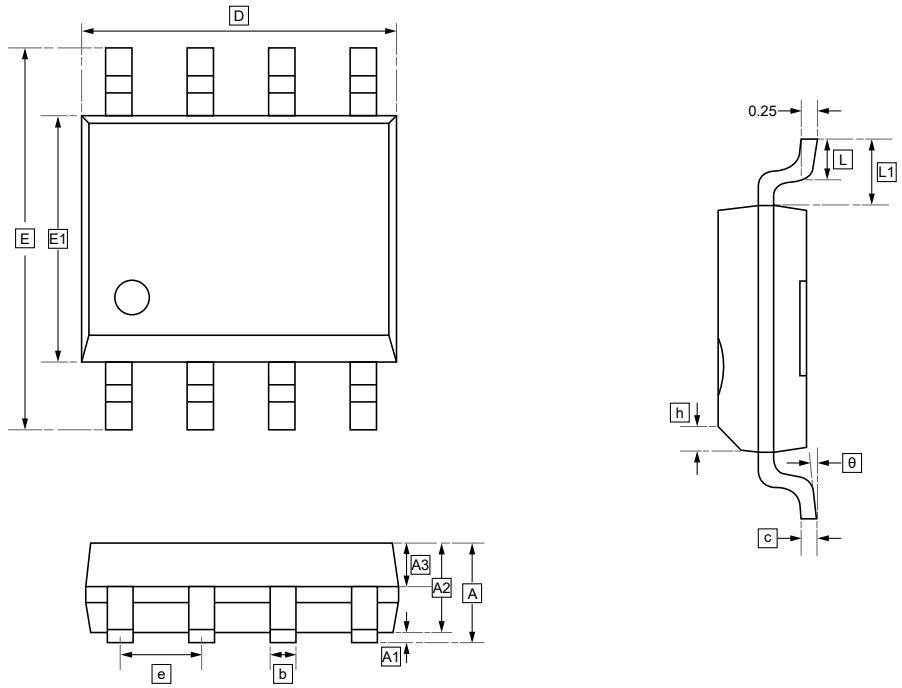


Fig 11. Maximum Effective Transient Themal Impedance, Junction-to-Ambient

8.SOP-8 Package Outline Dimensions

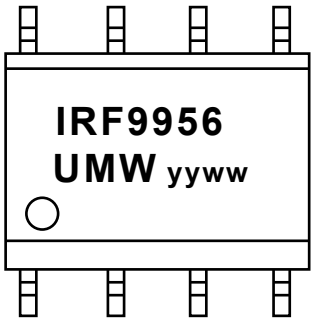


DIMENSIONS (mm are the original dimensions)

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 IRF9956TR	SOP-8	3000	Tape and reel

10.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

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