UMW IRF7319TR

30V N-Channel MOSFET
-30V 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.

2.Features

- GenerationV Technology
- Ultra Low On-Resistance
- Dual N and P Channel MOSFET
- Surface Mount
- Fully Avalanche Rated
- Lead-Free

N-Ch:

- $V_{DS\ (V)}$=30V
- I_D=6.5A
- $R_{DS(ON)}$=23mΩ

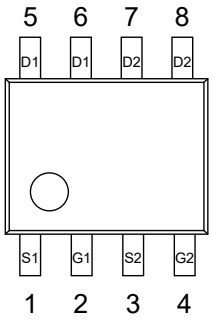
P-Ch:

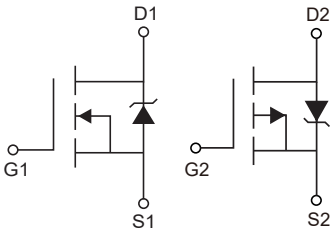
- $V_{DS\ (V)}$=-30V
- I_D=-4.9A
- $R_{DS(ON)}$=42mΩ

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

Parameter		Symbol	N-Channel	P-Channel	Units
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±20	±20	V
Continuous Drain Current ⑤	T_A= 25°C	I_D	6.5	-4.9	A
	T_A=70°C		5.2	-3.9	A
Pulsed Drain Current		I_{DM}	30	-30	A
Continuous Source Current (Diode Conduction)		I_S	2.5	-2.5	A
Maximum Power Dissipation ⑤	T_A= 25°C	P_D	2		W
	T_A=70°C		1.3		W
Single Pulse Avalanche Energy		E_{AS}	82	140	mJ
Avalanche Current		I_{AR}	4	-2.8	A
Repetitive Avalanche Energy		E_{AR}	0.2		mJ
Peak Diode Recovery dv/dt ②		dv/dt	5	-5	V/ns
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150		°C

5.Thermal Characteristics

Parameter	Symbol	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-to-Source Breakdown Voltage	$V_{(BR)DSS}$	N-Ch	I_D=250μA, V_{GS}=0V	30			V
		P-Ch	I_D=-250μA, V_{GS}=0V	-30			V
Breakdown Voltage Temp Coefficient Current	$\frac{\Delta V_{(BR)DSS}}{\Delta T_J}$	N-Ch	I_D=1mA,Reference to 25°C		0.022		V/°C
		P-Ch	I_D=-1mA,Reference to 25°C		-0.022		V/°C
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	N-Ch	V_{GS}=10V, I_D=5.8A ④		23	31	mΩ
		N-Ch	V_{GS}=4.5V, I_D=4.7A ④		32	48	mΩ
		P-Ch	V_{GS}=-10V, I_D=-4.9A ④		42	60	mΩ
		P-Ch	V_{GS}=-4.5V, I_D=-3.6A ④		76	100	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	N-Ch	V_{DS}=V_{GS}, I_D=250μA	1			V
		P-Ch	V_{DS}=V_{GS}, I_D=-250μA	-1			V
Forward Transconductance	g_{fs}	N-Ch	V_{DS}=15V, I_D=5.8A ④		14		S
		P-Ch	V_{DS}=-15V, I_D=-4.9A ④		7.7		S
Drain-to-Source Leakage Current	I_{DSS}	N-Ch	V_{DS}=24V, V_{GS}=0V			1	μA
			V_{DS}=-24V, V_{GS}=0V			-1	μA
		P-Ch	V_{DS}=24V, V_{GS}=0V, T_J=55°C			25	μA
			V_{DS}=-24V, V_{GS}=0V, T_J=55°C			-25	μA
Gate-to-Source ForwardLeakage	I_{GSS}	N-P	V_{GS}=±20V			±100	nA
Total Gate Charge	Q_g	N-Ch	N-Ch: ④ I_D=5.8A, V_{DS}=15V, V_{GS}=10V P-Ch: I_D=-4.9A,V_{DS}=-15V,V_{GS}=-10V		22	33	nC
		P-Ch			23	34	nC
Gate-to-Source Charge	Q_{gs}	N-Ch			2.6	3.9	nC
		P-Ch			3.8	5.7	nC
Gate-to-Drain ("Miller") Charge	Q_{gd}	N-Ch			6.4	9.6	nC
		P-Ch			5.9	8.9	nC
Turn-On Delay Time	$t_{D(on)}$	N-Ch	N-Ch: ④ V_{DD}=15A, I_D=1A R_G=6Ω, R_D=15Ω		8.1	12	ns
		P-Ch			13	19	ns
Rise Time	t_r	N-Ch			8.9	13	ns
		P-Ch			13	20	ns

Tum-Off Delay Time	$t_{D(off)}$	N-Ch	P-Ch: ④ V_{DD}=-15A, I_D=-1A R_G=6Ω, R_D=15Ω		26	39	ns
		P-Ch			34	51	ns
Fall Time	t_f	N-Ch			17	26	ns
		P-Ch			32	48	ns
Input Capacitance	C_{iss}	N-P	N-Ch: V_{GS}=0V, V_{DS}=25V, f=1MHz P-Ch: V_{GS}=0V, V_{DS}=-25V, f=1MHz		650		pF
		N-P			710		pF
Output Capacitance	C_{oss}	N-Ch			320		pF
		P-Ch			380		pF
ReverseTransferCapacitance	C_{rss}	N-Ch			130		pF
		P-Ch			180		pF
Continuous Source Current (Body Diode)	I_S	N-Ch				2.5	A
		P-Ch				-2.5	A
Pulsed Source Current (Body Diode) ①	I_{SM}	N-Ch				30	A
		P-Ch				-30	A
Diode Forward Voltage	V_{SD}	N-Ch	T_J=25°C, I_S=1.7A,V_{GS}=0V ③		0.78	1	V
		P-Ch	T_J=25°C, I_S=-1.7A,V_{GS}=0V ③		-0.78	-1	V
Reverse Recovery Time	t_{rr}	N-Ch	N-Ch: T_J=25°C I_F=1.7A, di/dt =100A/μs P-Ch: T_J=25°C I_F=-1.7A, di/dt=100A/μs ④		45	68	ns
		P-Ch			44	66	ns
Reverse Recovery Charge	Q_{rr}	N-Ch			58	87	nC
		P-Ch			42	63	nC

Notes:

① Repetitive rating; pulse width limited bymax.junction temperature.(See fig. 22)

② N-Channel I_{SD}≤4A, di/dt ≤74A/μs, V_{DD}≤$V_{(BR)DSS}$, T_J≤ 150°C.

P-Channel I_{SD}≤ -2.8A, di/dt ≤ 150Aμs, V_{DD}≤$V_{(BR)DSS}$, T_J≤ 150°C.

③ N-Channel Starting T_J=25°C, L=10mH, R_G=25Ω, I_{AS}= 4.0A.(See Figure 12)

P-Channel Starting T_J= 25°C, L=35mH, R_G=25Ω, I_{AS}= -2.8A.

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

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

7.1Typical Characterisitics (N-Channel)

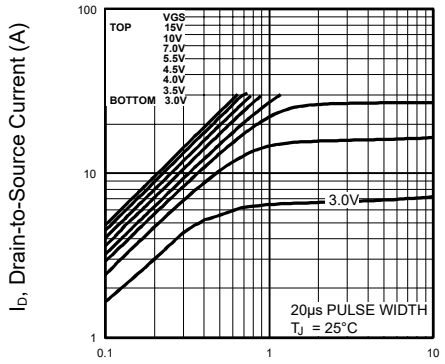


Figure 1: Typical Output Characteristics

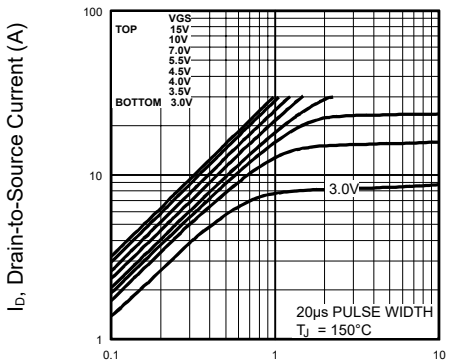


Figure 2: Typical Output Characteristics

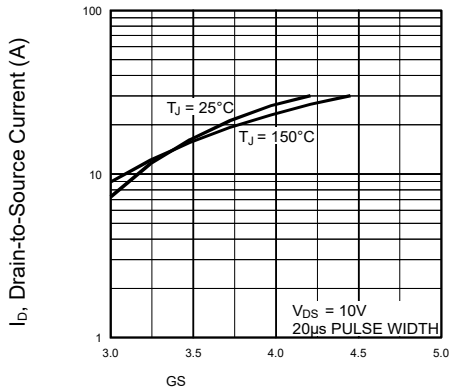


Figure 3: Typical Output Characteristics

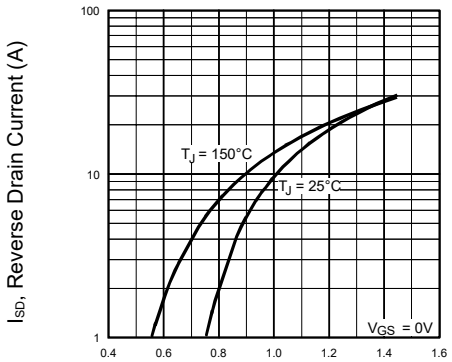


Figure 4: Typical Source-Drain Diode Forward Voltage

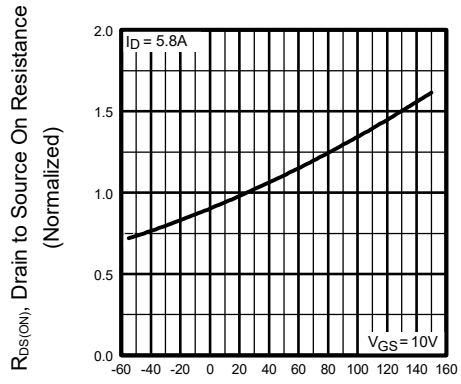


Figure 5: Normalized On-Resistance VS. Temperature

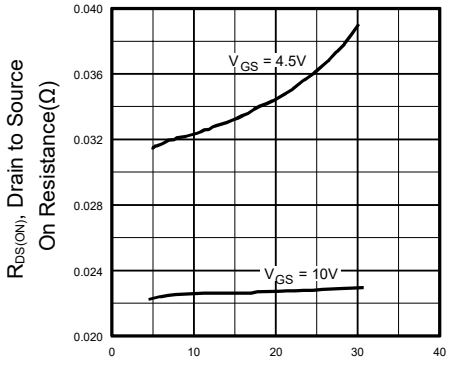


Figure 6: Typical On-Resistance Vs. DrainCurrent

7.2Typical Characterisitics (N-Channel)

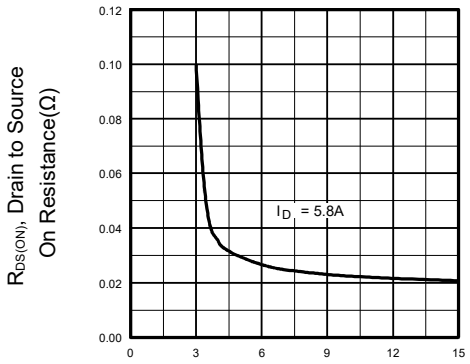


Figure 7: Typical On-Resistance Vs. GateVoltage

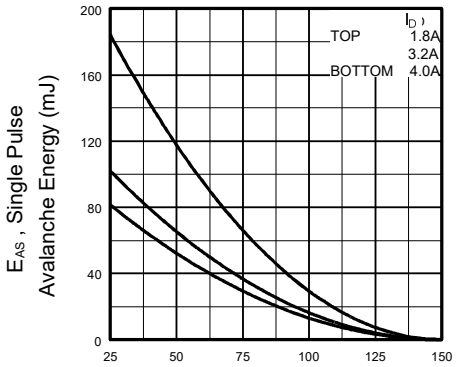


Figure 8: Maximum Avalanche EnergyVs. Drain Curent

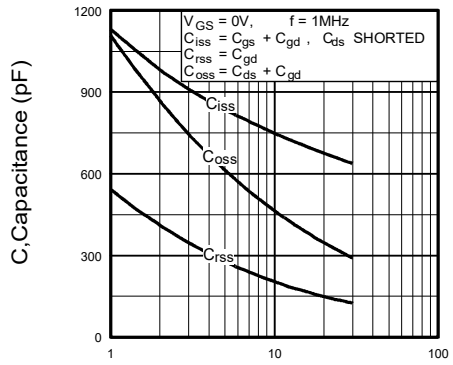


Figure 9: Typical Capacitance Vs. Drain-to-Source Voltage

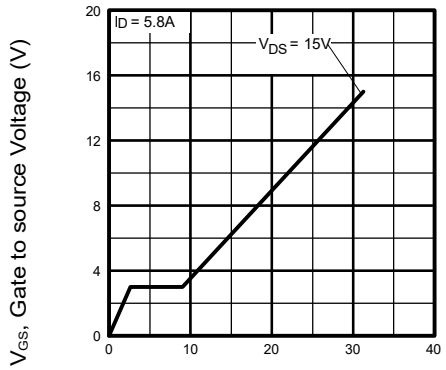


Figure 10: Typical Gate Charge Vs. Gate-to-Source Voltage

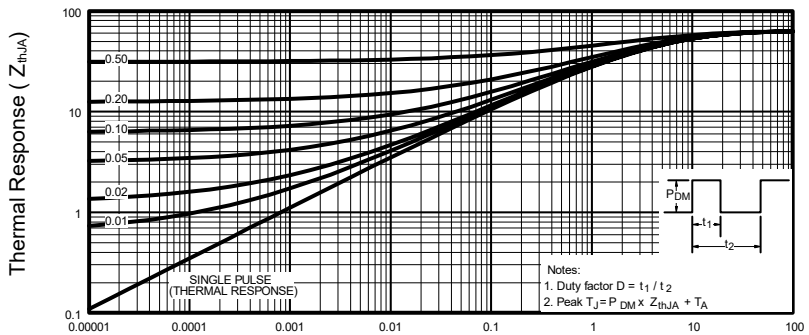
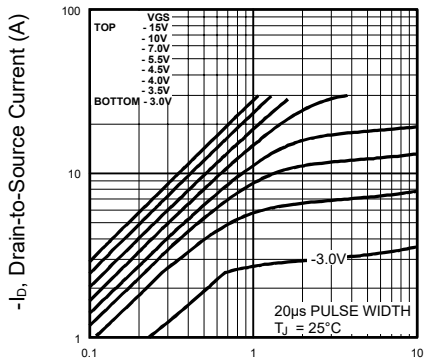


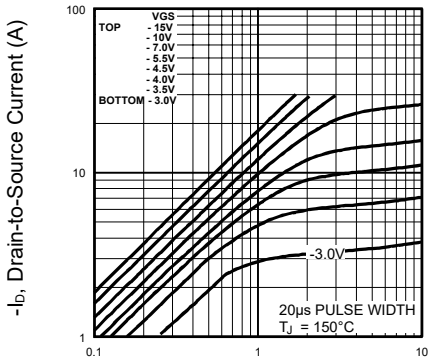
Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

7.3Typical Characterisitics (P-Channel)



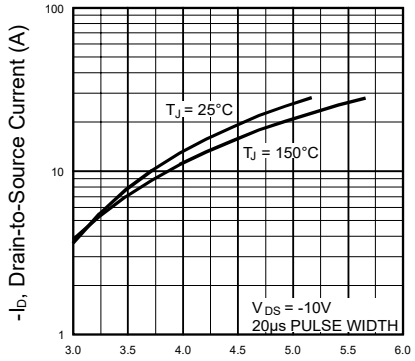
$-V_{DS}$,Drain-to-Source Voltage (V)

Figure 12: Typical Output Characteristics



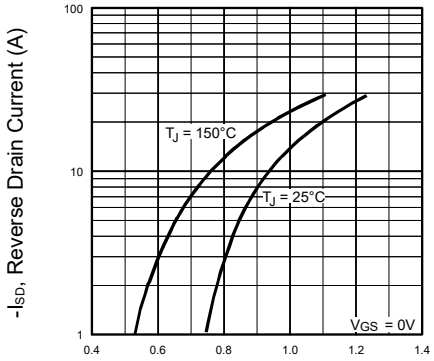
$-V_{DS}$,Drain-to-Source Voltage (V)

Figure 13: Typical Output Characteristics



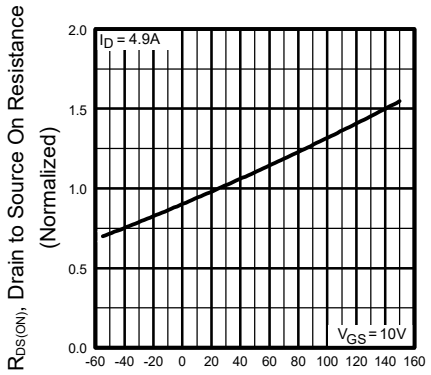
$-V_{GS}$,Gate-to-Source Voltage (V)

Figure 14: Typical Output Characteristics



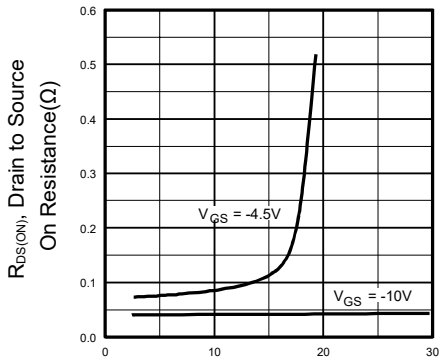
$-V_{SD}$,Source to Drain Voltage (V)

Figure 15: Typical Source-Drain Diode Forward Voltage



T_J,Junction Temperature (°C)

Figure 16: Normalized On-Resistance VS. Temperature



$-I_D$,Drain Current (A)

Figure 17: Typical On-Resistance Vs. DrainCurrent

7.4Typical Characterisitics (P-Channel)

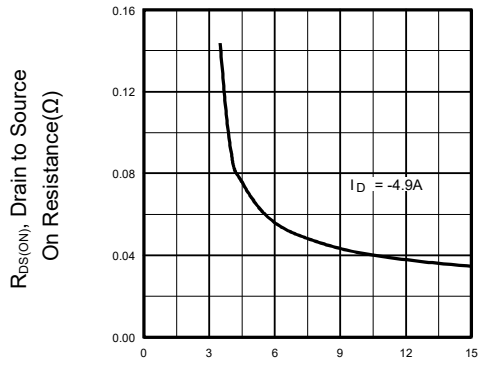


Figure 18: Typical On-Resistance Vs. GateVoltage

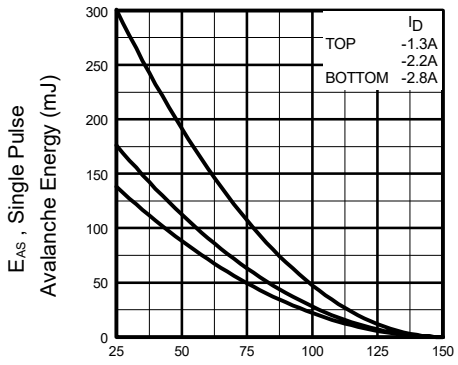


Figure 19: Maximum Avalanche EnergyVs. Drain Curent

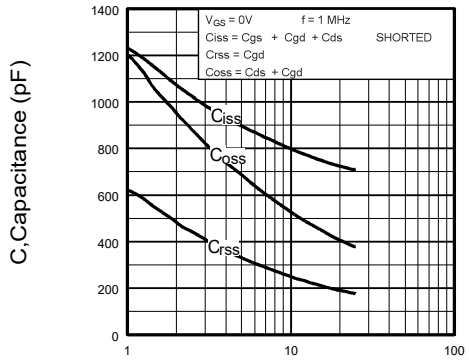


Figure 20: Typical Capacitance Vs. Drain-to-Source Voltage

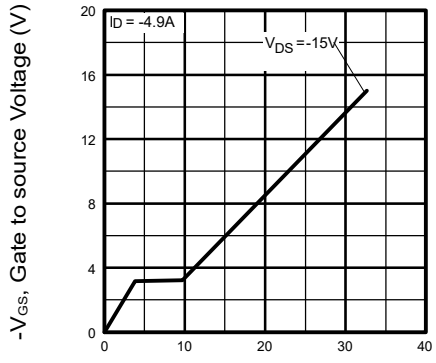


Figure 21: Typical Gate Charge Vs. Gate-to-Source Voltage

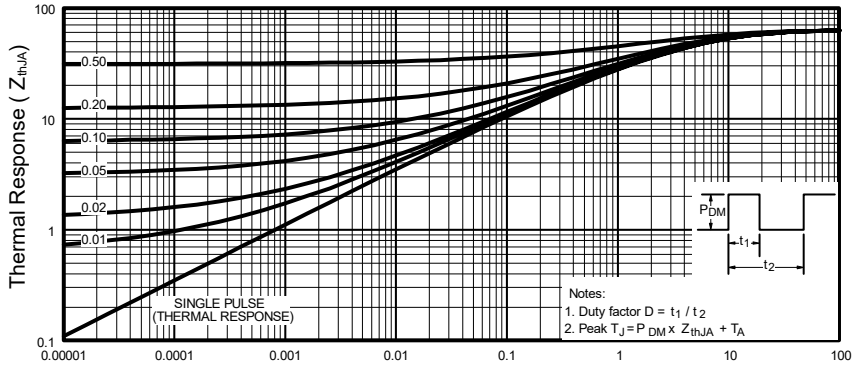
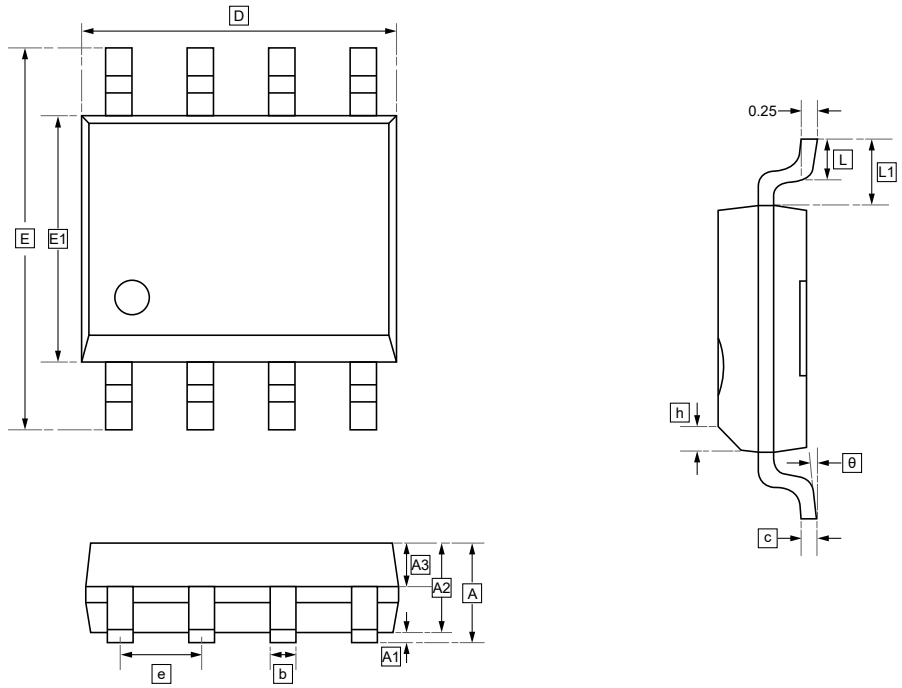


Figure 22: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

8.SOP-8 Package Outline Dimensions

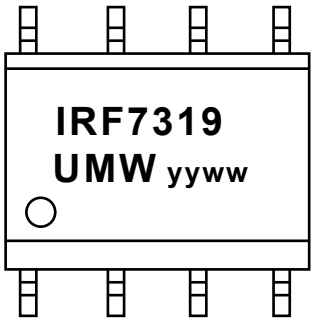


DIMENSIONS (mm are the original dimensions)

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 IRF7319TR	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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