

1.Description

These devices are well suited for low voltage and battery powered applications where low in-line power loss and fast switching are required.

2.2Features

- High power and current handling capability
- High performance trench technology for extremely low $R_{DS(ON)}$

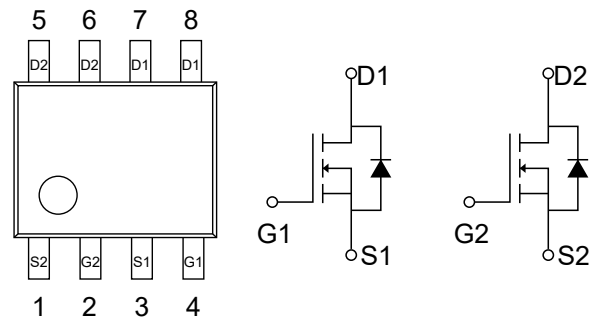
2.1Features

- $V_{DS(V)}=30V$
- $I_D=6A$
- $R_{DS(ON)}<28m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<35m\Omega(V_{GS}=4.5V)$
- Fast switching speed
- Low gate charge

3.Pinning information

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

SOP-8



4.Absolute Maximum Ratings $T_A=25^{\circ}C$ unless otherwise noted

Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current – Continuous	I_D	6	A
– Pulsed (Note 1a)		20	
Power Dissipation for Single Operation (Note 1a)	P_D	1.6	W
		1	
		0.9	
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}C$



5. Thermal Characteristics

Parameter	Symbol	Rating	Units
Thermal Resistance, Junction-to-Ambient (Note 1a)	$R_{\theta JA}$	78	°C/W
Thermal Resistance, Junction-to-Case (Note 1)	$R_{\theta JC}$	40	°C/W



6. Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

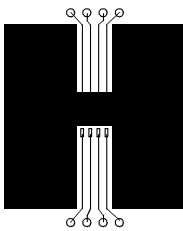
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	30			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	$I_D=250\mu\text{A}$ Referenced to 25°C		25		mV/ $^\circ\text{C}$
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24\text{V}$, $V_{GS}=0\text{V}$			1	μA
		$V_{DS}=24\text{V}$, $V_{GS}=0\text{V}$, $T_J=55^\circ\text{C}$			10	μA
Gate-Body Leakage	I_{GSS}	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1	1.9	3	V
Gate Threshold Voltage Temperature Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	$I_D=250\mu\text{A}$ Referenced to 25°C		-4.5		mV/ $^\circ\text{C}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=6\text{A}$		19	28	m Ω
		$V_{GS}=4.5\text{V}$, $I_D=5\text{A}$		24	35	m Ω
On-State Drain Current	$I_{D(ON)}$	$V_{GS}=10\text{V}$, $V_{DS}=5\text{V}$	20			A
Forward Transconductance	g_{FS}	$V_{DS}=10\text{V}$, $I_D=6\text{A}$		25		S
Input Capacitance	C_{iss}	$V_{DS}=15\text{V}$		575		pF
Output Capacitance	C_{oss}	$V_{GS}=0\text{V}$		145		pF
Reverse Transfer Capacitance	C_{rss}	$f=1\text{MHz}$		65		pF
Gate Resistance	R_G	$V_{GS}=15\text{mV}$, $f=1\text{MHz}$		2.1		Ω
Turn-On Delay Time	$t_{D(on)}$	$V_{DD}=15\text{V}$, $I_D=1\text{A}$ $V_{GS}=10\text{V}$, $R_{GEN}=6\Omega$		8	16	ns
Turn-On Rise Time	t_r			5	10	ns
Turn-Off Delay Time	$t_{D(off)}$			23	37	ns
Turn-Off Fall Time	t_f			3	6	ns
Total Gate Charge	Q_g	$V_{DS}=15\text{V}$, $I_D=6\text{A}$ $V_{GS}=5\text{V}$		5.8	8.1	nC
Gate-Source Charge	Q_{gs}			1.7		nC
Gate-Drain Charge	Q_{gd}			2.1		nC
Maximum Continuous Drain-Source Diode Forward Current	I_S				1.3	A



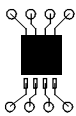
Drain–Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1.3A$ (Note 2)		0.75	1.2	V
Diode Reverse Recovery Time	T_{rr}	$I_F=6A, dI_F/dt=100A/\mu s$		20		nS
Diode Reverse Recovery Charge	Q_{rr}			10		nC

Notes:

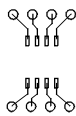
1. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.



a) 78° C/W when
mounted on a 0.5 in²
pad of 2 oz. copper.



b) 125° C/W when
mounted on a 0.02 in²
pad of 2 oz. copper.



c) 135° C/W when
mounted on a minimum
pad.

Scale 1 : 1 on letter size paper

2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%



7.1 Typical characteristic

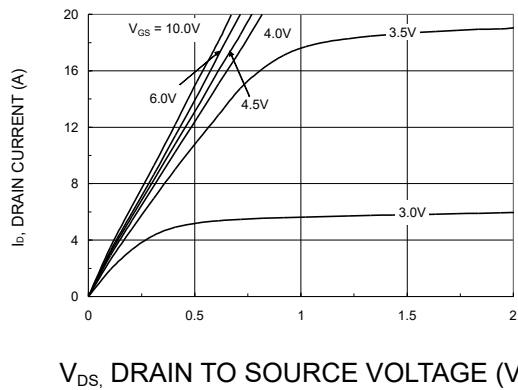


Fig 1: On-Region Characteristics.

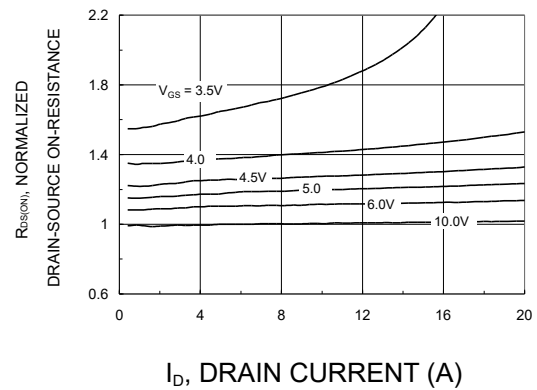


Figure 2: On-Resistance Variation with Drain Current and Gate Voltage.

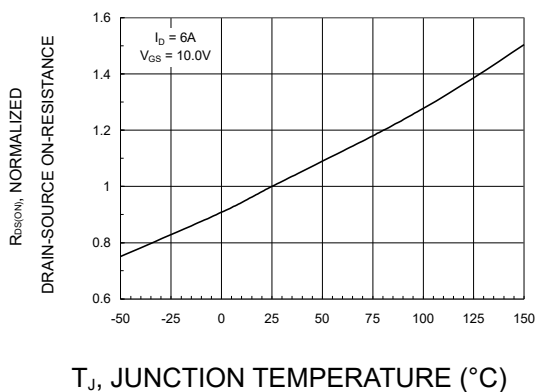


Figure 3: On-Resistance Variation with Temperature.

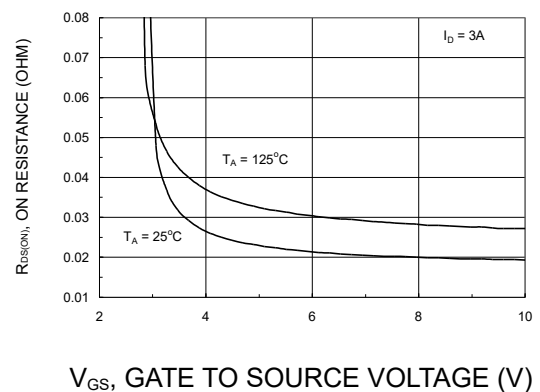


Figure 4: On-Resistance Variation with Gate-to-Source Voltage.

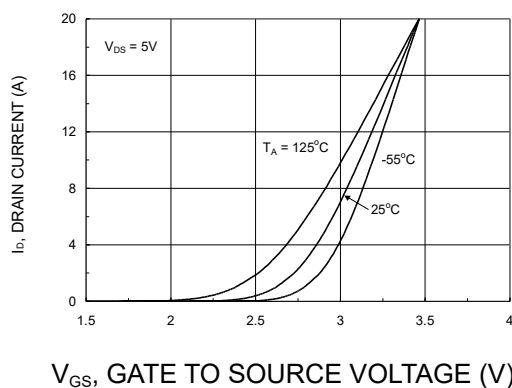


Figure 5: Transfer Characteristics.

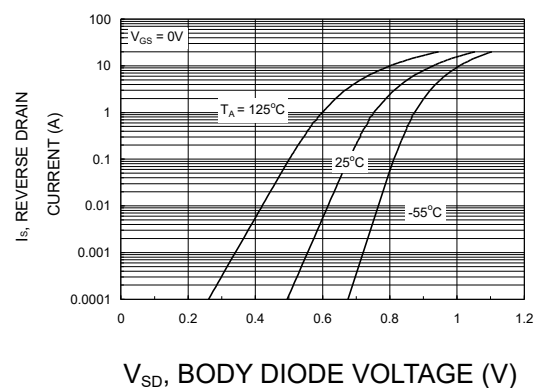


Figure 6: . Body Diode Forward Voltage Variation with Source Current and Temperature.



7.2 Typical characteristic

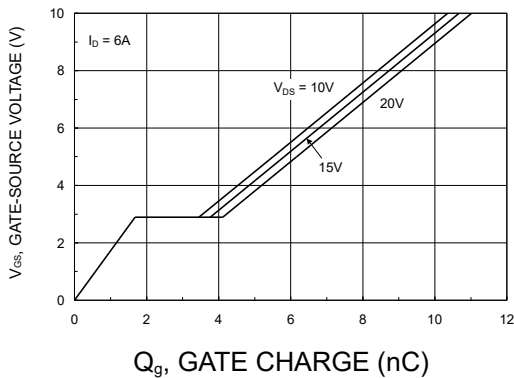


Figure 7: Gate-Charge Characteristics.

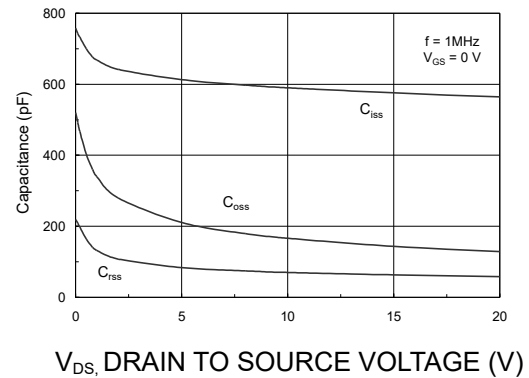


Figure 8: Capacitance Characteristics.

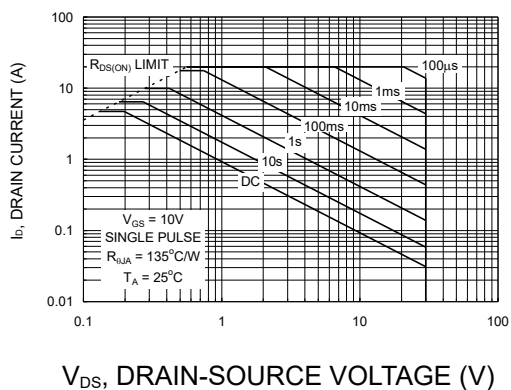


Figure 9: Maximum Safe Operating Area.

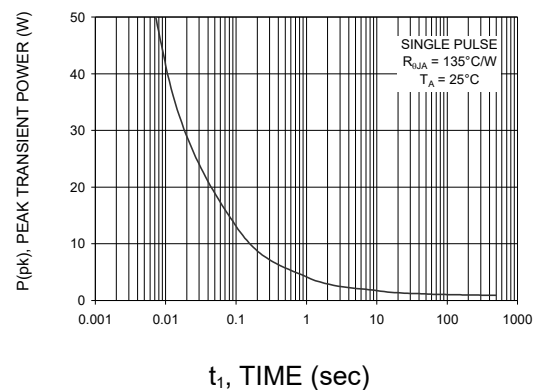


Figure 10: Single Pulse Maximum Power Dissipation.

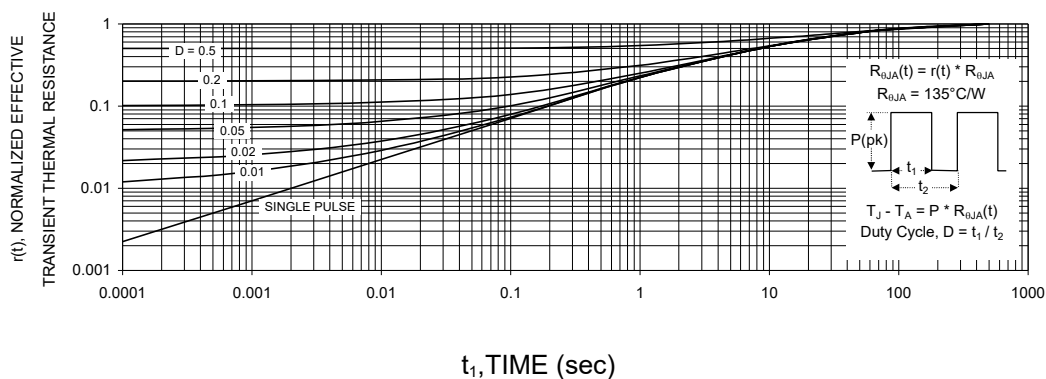
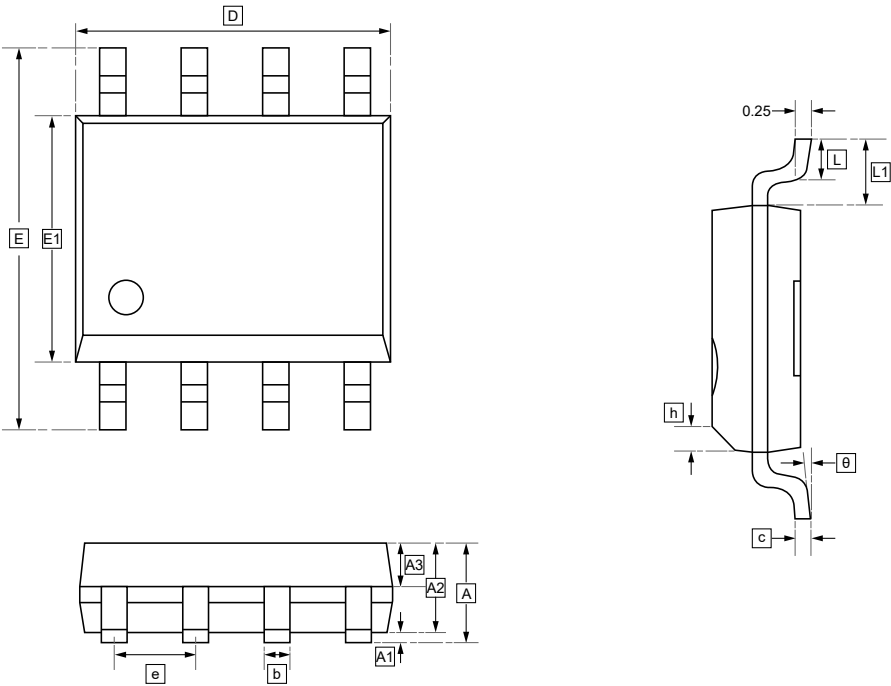


Figure 11: Transient Thermal Response Curve.



8.SOP-8 Package Outline Dimensions



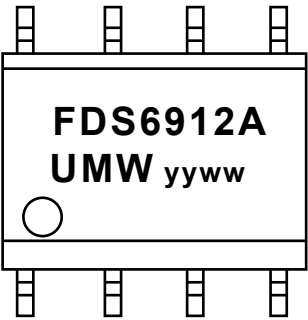
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	b	c	D	E	E1	e	h	L
Min	-	0.05	1.30	0.60	0.39	0.20	4.80	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°



9.Ordering Information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDS6912A	SOP-8	3000	Tape and reel



10.Disclaimer

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