

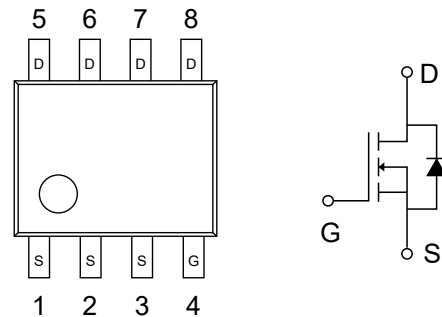
1.Features

- $V_{DS}=30V$
- $I_D=8.4A$
- $R_{DS(ON)}<22m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<30m\Omega(V_{GS}=4.5V)$
- Fast switching speed
- Low gate charge
- High power and current handling capability
- High performance trench technology
for extremely low $R_{DS(ON)}$

3.Pinning information

Pin	Symbol	Description
4	G	GATE
1,2,3	S	SOURCE
5,6,7,8	D	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	8.4	A
– Pulsed (Note 1a)		40	
Power Dissipation for Single Operation (Note 1a)	P_D	2.5	W
(Note 1b)		1	
Single Pulse Avalanche Energy (Note 3)	E_{AS}	24	mJ
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)	$R_{\theta JA}$	50	°C/W
Thermal Resistance, Junction-to-Case (Note 1b)	$R_{\theta JA}$	125	°C/W
Thermal Resistance, Junction-to-Case (Note 1)	$R_{\theta JC}$	25	°C/W



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

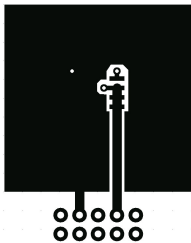
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	30			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	$I_D=250\mu\text{A}$ Referenced to 25°C		26		mV/ $^\circ\text{C}$
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24\text{V}$, $V_{GS}=0\text{V}$			1	μA
		$V_{DS}=24\text{V}$, $V_{GS}=0\text{V}$, $T_J=55^\circ\text{C}$			100	μA
Gate-Body Leakage, Forward	I_{GSS}	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$			± 100	nA
Gate-Body Leakage, Reverse	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	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		-4.4		mV/ $^\circ\text{C}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10\text{V}$, $I_D=8.4\text{A}$		19	22	m Ω
		$V_{GS}=4.5\text{V}$, $I_D=7.2\text{A}$		24	30	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}	$V_{DS}=15\text{V}$, $I_D=8.4\text{A}$		30		S
Input Capacitance	C_{iss}	$V_{DS}=15\text{V}$		560		pF
Output Capacitance	C_{oss}	$V_{GS}=0\text{V}$		140		pF
Reverse Transfer Capacitance	C_{rss}	$f=1\text{MHz}$		55		pF
Gate Resistance	R_G	$V_{DS}=15\text{mV}$, $f=1\text{MHz}$		2.5		Ω
Turn-On DelayTime	$t_{D(on)}$	$V_{DD}=15\text{V}$, $I_D=1\text{A}$ $V_{GS}=10\text{V}$, $R_{GEN}=6\Omega$		7	14	ns
Turn-On Rise Time	t_r			5	10	ns
Turn-Off DelayTime	$t_{D(off)}$			22	35	ns
Turn-Off Fall Time	t_f			3	6	ns
Total Gate Charge	Q_g	$V_{DS}=15\text{V}$		5.4	7.6	nC
Gate-Source Charge	Q_{gs}	$I_D=8.4\text{A}$		1.7		nC
Gate-Drain Charge	Q_{gd}	$V_{GS}=5\text{V}$		1.9		nC



Maximum Continuous Drain–Source Diode Forward Current	I_S				2.1	A
Drain–Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=2.1A(\text{Note } 2)$		0.77	1.2	V
Diode Reverse Recovery Time	T_{rr}	$I_F=8.4A, d_{IF}/d_t=100A/\mu s$		19		nS
Diode Reverse Recovery Charge	Q_{rr}			9		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 $R_{\theta JA}$ is determined by the user's board design.



a) 50°C/W when mounted
on a 1in² pad of 2 oz
copper



b) 125°C/W when mounted
on a minimum pad
Scale 1 : 1 on letter size paper

- 2 Test: Pulse Width < 300μs, Duty Cycle < 2.0%
- 3 Starting $T_J=25^{\circ}C$, $L=1mH$, $I_A=7A$, $V_{DD}=27V$, $V_{GS}=10V$

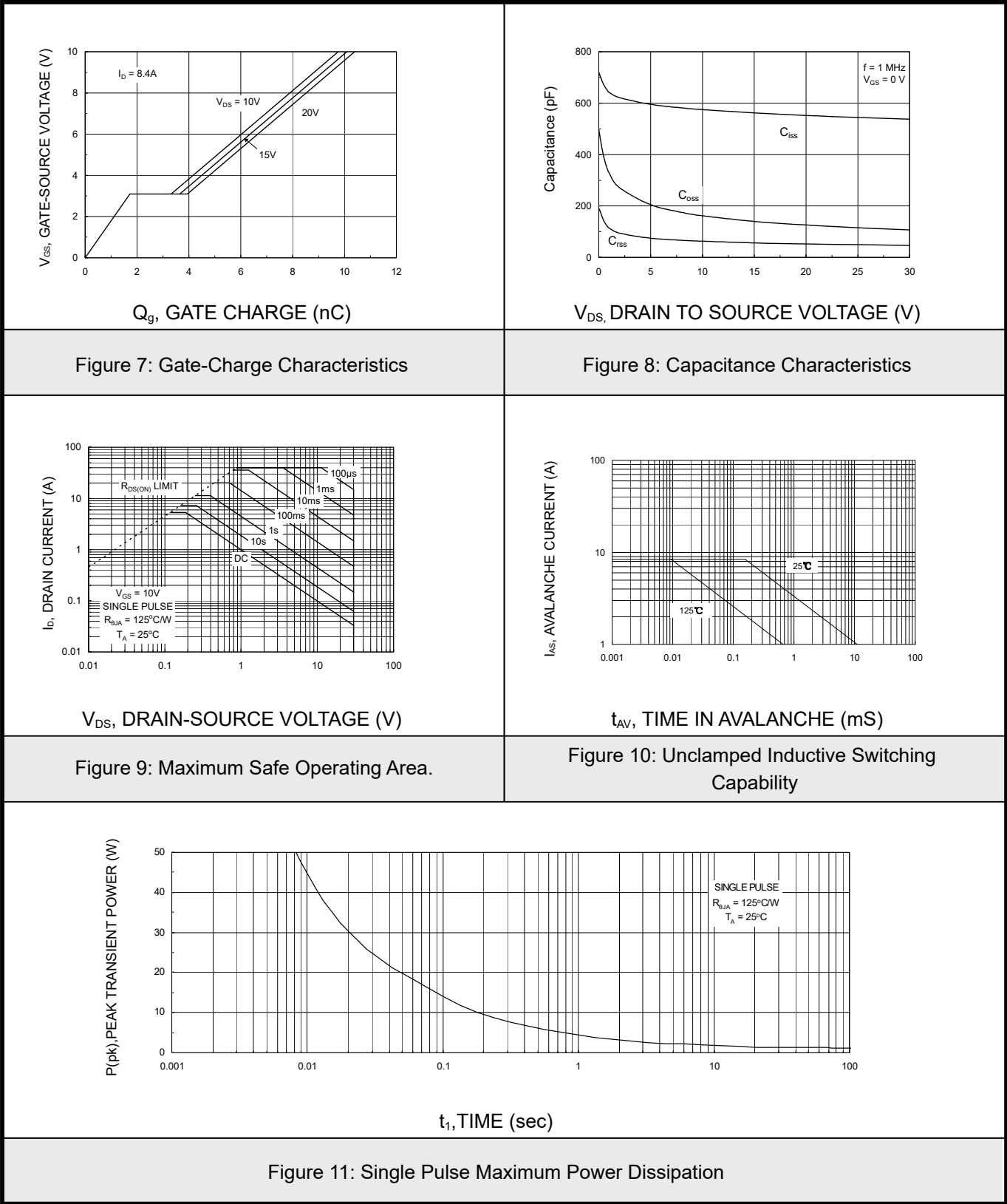


7.1 TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

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 ELECTRICAL AND THERMAL CHARACTERISTICS





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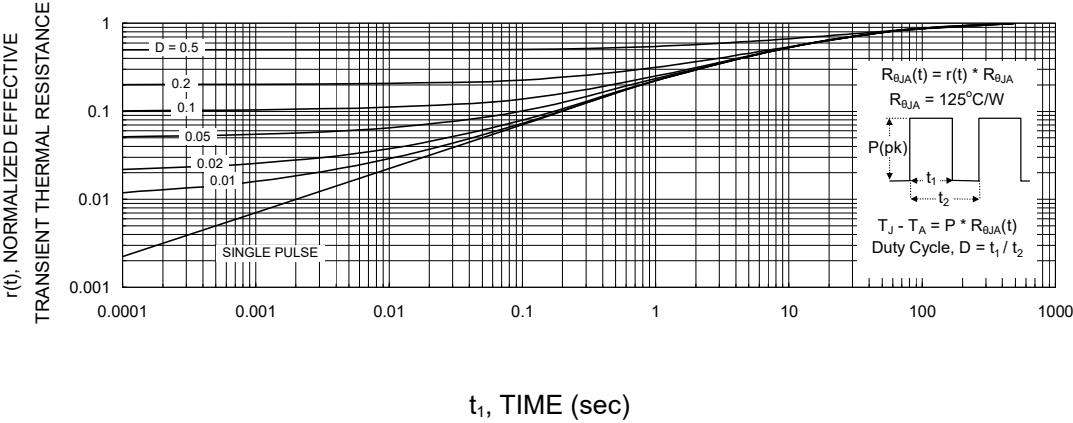
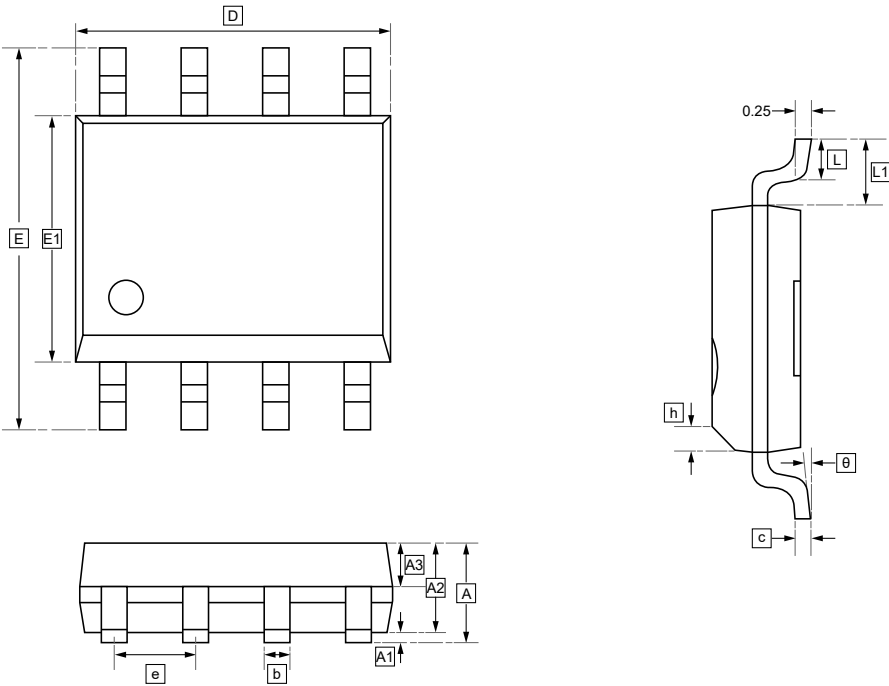


Figure 12: Transient Thermal Response Curve.



8.SOP-8 Package Outline Dimensions



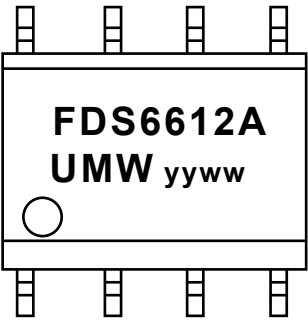
DIMENSIONS (mm are the original dimensions)

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 FDS6612A	SOP-8	3000	Tape and reel



10.Disclaimer

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