

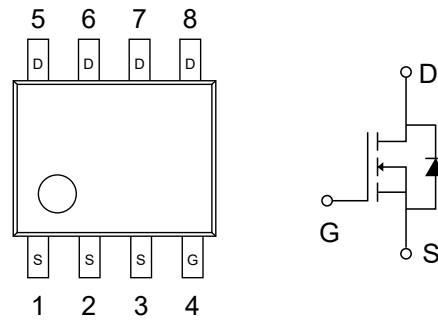
1.Features

- $V_{DS(V)}=30V$
- $I_D=8.4A(V_{GS}=10V)$
- $R_{DS(ON)}<22m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<30m\Omega(V_{GS}=4.5V)$
- 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
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	$^{\circ}C/W$
Thermal Resistance, Junction-to-Case (Note 1b)	$R_{\theta JA}$	125	$^{\circ}C/W$
Thermal Resistance, Junction-to-Case (Note 1)	$R_{\theta JC}$	25	$^{\circ}C/W$



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	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	$I_D=250\mu\text{A}$		26		mV/°C
		Referenced to 25°C			1	mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24\text{V}$, $V_{GS}=0\text{V}$			10	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}	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$			3	nA
Gate-Body Leakage, Reverse	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1	1.9		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/°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 Delay Time	$t_{D(on)}$	$V_{DD}=15\text{V}$, $I_D=1\text{A}$ $V_{GS}=10\text{V}$, $R_{GEN}=6\Omega$		7	14	ns
Turn-On Rise Time	t_r			5	10	ns
Turn-Off Delay Time	$t_{D(off)}$			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}	$V_{GS}=0V, I_S=2.1A$ (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 $T_J=25^\circ C$, $L=1mH$, $I_A=7A$, $V_{DD}=27V$, $V_{GS}=10V$

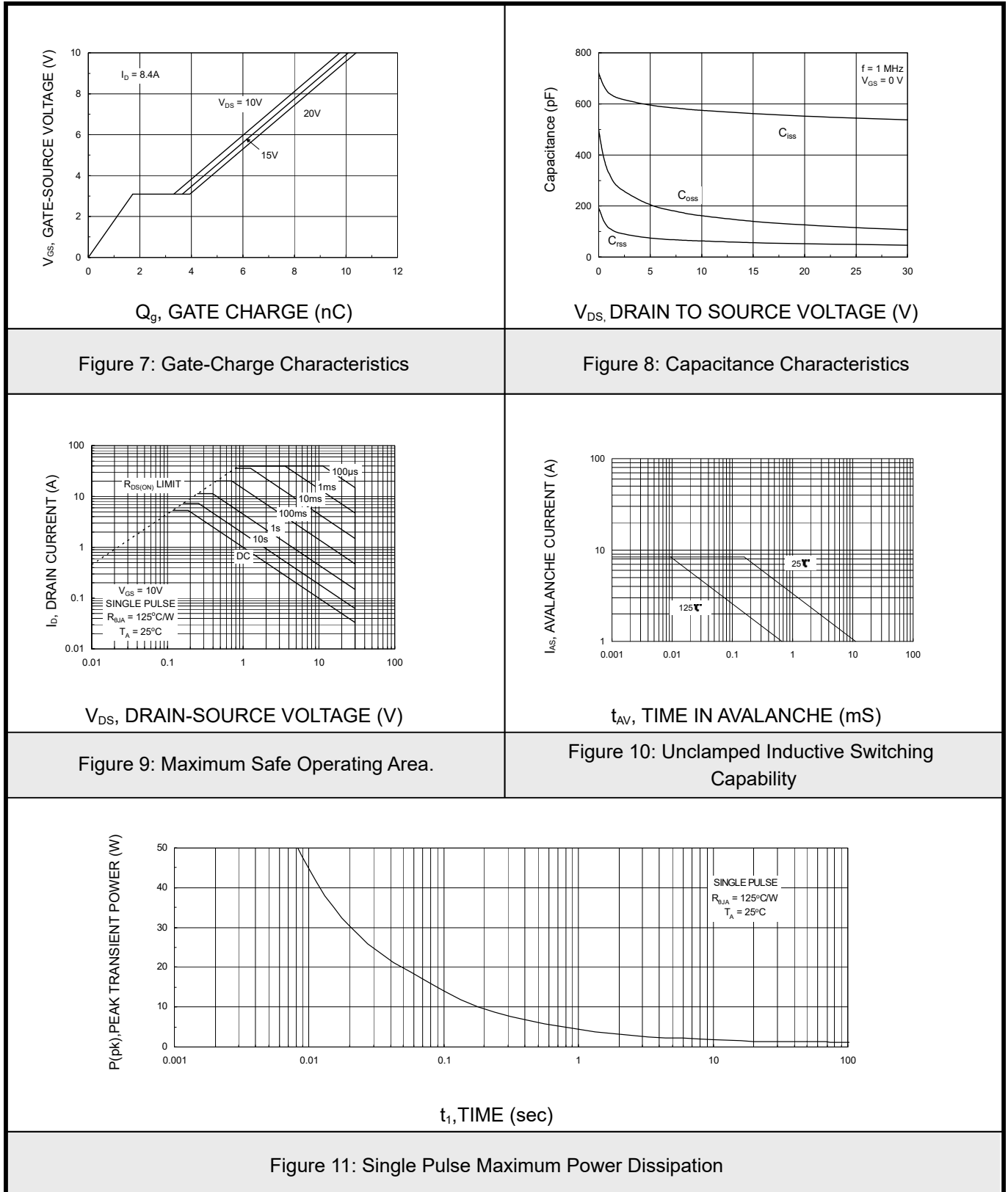


7.1 TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

<p>I_D, DRAIN CURRENT (A)</p> <p>V_{GS}, GATE TO SOURCE VOLTAGE (V)</p>	<p>$R_{DS(on)}$, NORMALIZED DRAIN-SOURCE ON-RESISTANCE</p> <p>I_D, DRAIN CURRENT (A)</p>
<p>Fig 1: On-Region Characteristics.</p>	<p>Figure 2: On-Resistance Variation with Drain Current and Gate Voltage.</p>
<p>$R_{DS(on)}$, NORMALIZED DRAIN-SOURCE ON-RESISTANCE</p> <p>T_J, JUNCTION TEMPERATURE ($^{\circ}C$)</p>	<p>$R_{DS(on)}$, ON RESISTANCE (OHM)</p> <p>V_{GS}, GATE TO SOURCE VOLTAGE (V)</p>
<p>Figure 3: On-Resistance Variation with Temperature.</p>	<p>Figure 4: On-Resistance Variation with Gate-to-Source Voltage.</p>
<p>I_D, DRAIN CURRENT (A)</p> <p>V_{GS}, GATE TO SOURCE VOLTAGE (V)</p>	<p>I_S, REVERSE DRAIN CURRENT (A)</p> <p>V_{SD}, BODY DIODE VOLTAGE (V)</p>
<p>Figure 5: Transfer Characteristics.</p>	<p>Figure 6: . Body Diode Forward Voltage Variation with Source Current and Temperature.</p>

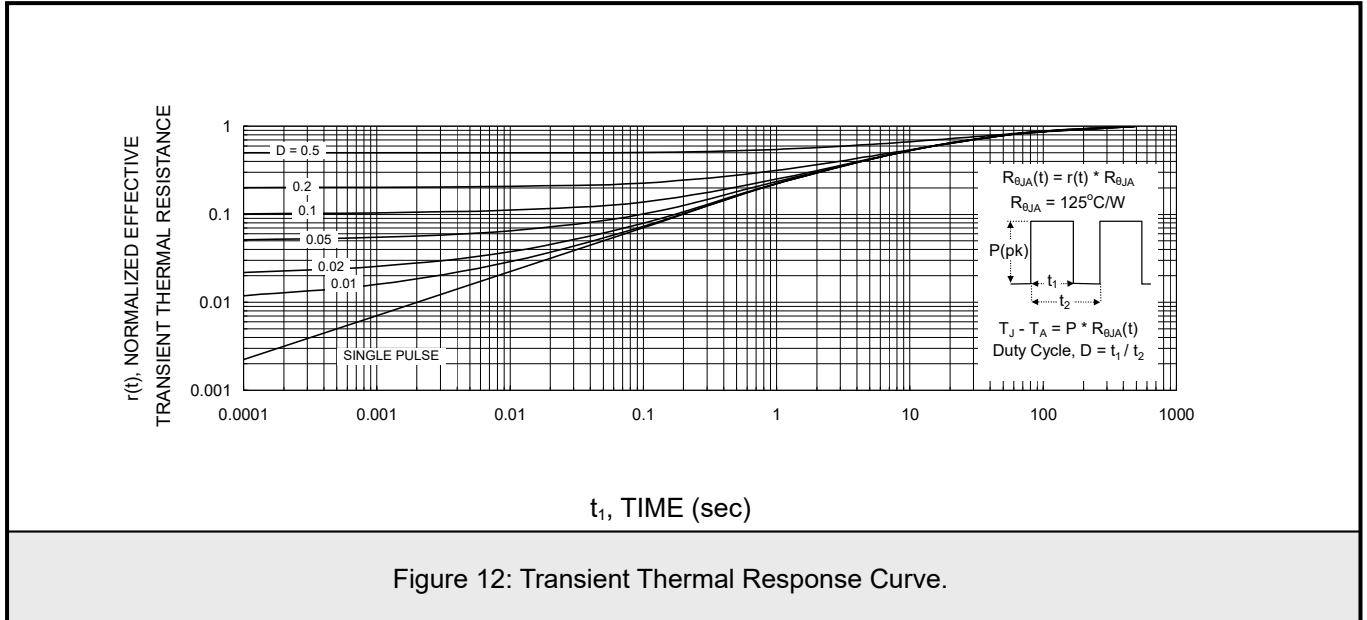


7.2 TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



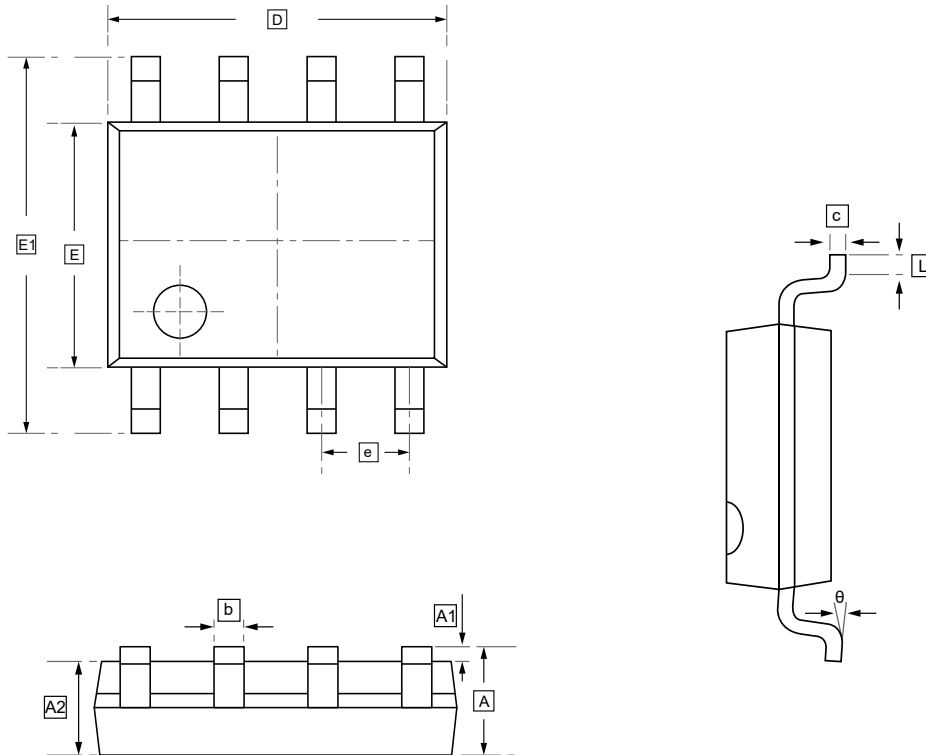


7.2 TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS





8.SOP-8 Package Outline Dimensions

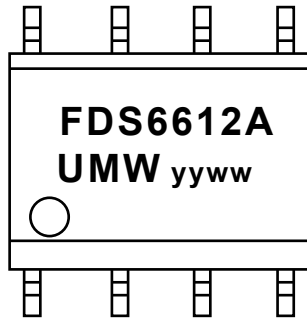


DIMENSIONS (mm are the original dimensions)

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 FDS6612A	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.

When applying our products, please do not exceed the maximum rated values, as this may affect the reliability of the entire system. Under certain conditions, any semiconductor product may experience faults or failures. Buyers are responsible for adhering to safety standards and implementing safety measures during system design, prototyping, and manufacturing when using our products to prevent potential failure risks that could lead to personal injury or property damage.

Unless explicitly stated in writing, UMW products are not intended for use in medical, life-saving, or life-sustaining applications, nor for any other applications where product failure could result in personal injury or death. If customers use or sell the product for such applications without explicit authorization, they assume all associated risks.

When reselling, applying, or exporting, please comply with export control laws and regulations of China, the United States, the United Kingdom, the European Union, and other relevant countries, regions, and international organizations.

This document and any actions by UMW do not grant any intellectual property rights, whether express or implied, by estoppel or otherwise. The product names and marks mentioned herein may be trademarks of their respective owners.