

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.

2.2 Features

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

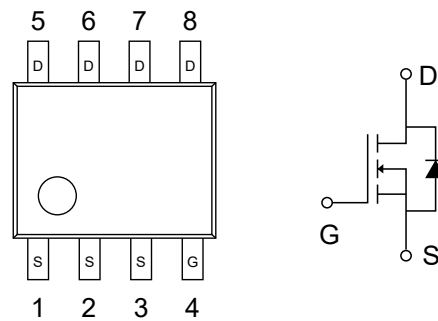
2.1 Features

- $V_{DS(V)}=30V$
- $I_D=15A(V_{GS}=4.5V)$
- $R_{DS(ON)}<7.5m\Omega(V_{GS}=2.5V)$
- $R_{DS(ON)}<10m\Omega(V_{GS}=4.5V)$

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}	± 8	V
Drain Current – Continuous – Pulsed	I_D	15	A
		(Note 1a) 50	
Power Dissipation for Single Operation	P_D	(Note 1a) 2.5	W
		(Note 1b) 1.2	
		(Note 1c) 1	
Junction and Storage 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 1)	$R_{\theta JC}$	25	°C/W



6. Electrical Characteristics (T_A=25°C unless otherwise noted)

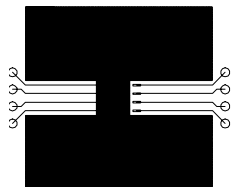
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	30			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	I _D =250μA Referenced to 25°C		29		mV/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} =0V			1	μA
Gate-Body Leakage, Forward	I _{GSSF}	V _{DS} =0V, V _{GS} =8V			100	nA
Gate-Body Leakage, Reverse	I _{GSSR}	V _{DS} =0V, V _{GS} =-8V			-100	nA
On Characteristics (Note 2)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.2	1.4	V
Gate Threshold Voltage Temperature Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	I _D =250μA Referenced to 25°C		-4		mV/°C
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =15A		6	7.5	mΩ
		V _{GS} =2.5V, I _D =12A		8	10	
On-State Drain Current	I _{D(on)}	V _{GS} =4.5V, V _{DS} =5V	25			A
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =15A		70		S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHz		4700		pF
Output Capacitance	C _{oss}			850		pF
Reverse Transfer Capacitance	C _{rss}			310		pF
SWITCHING PARAMETERS (Note 2)						
Turn-On Delay Time	t _{D(on)}	V _{DD} =10V, I _D =1A V _{GS} =4.5V, R _{GEN} =6Ω		20	32	ns
Turn-On Rise Time	t _r			27	44	ns
Turn-Off Delay Time	t _{D(off)}			95	133	ns
Turn-Off Fall Time	t _f			35	56	ns
Total Gate Charge	Q _g	V _{DS} =10V, I _D =15A V _{GS} =5V		47	66	nC
Gate-Source Charge	Q _{gs}			7		nC
Gate-Drain Charge	Q _{gd}			10.5		nC



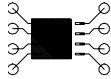
Drain-Source Diode Characteristics						
Maximum Continuous Drain-Source Diode Forward Current	I_S				2.1	A
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=2.1A$ (Note 2)		0.65	1.2	V

Notes:

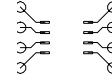
1. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta JA}$ is determined by the user's board design.



a) 50° C/W when mounted on a 0.5 in² pad of 2 oz. copper.



b) 105° C/W when mounted on a 0.02 in² pad of 2 oz. copper.



c) 125° C/W when mounted on a 0.003 in² pad of 2 oz. copper.

Scale 1 : 1 on letter size paper

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

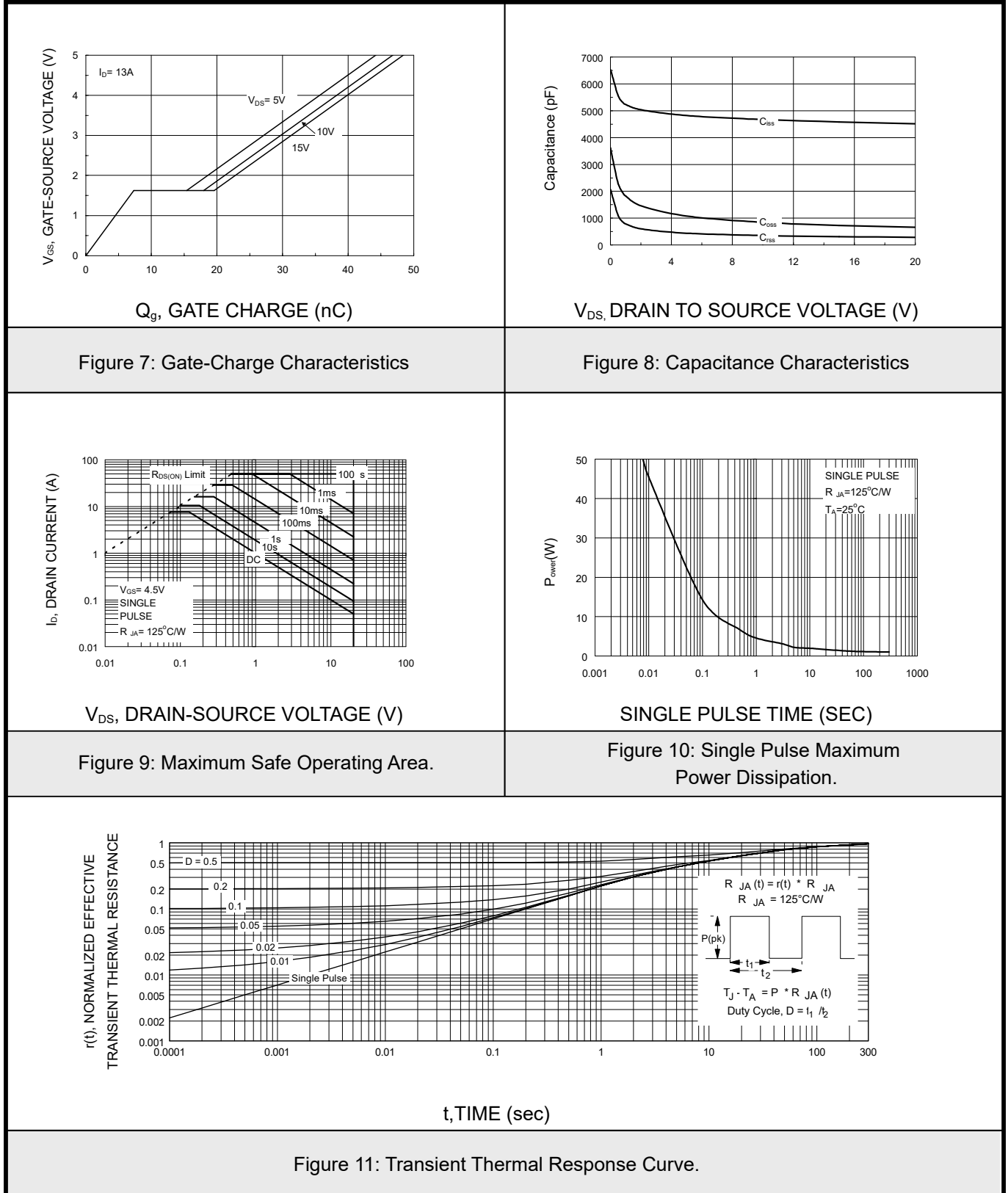


7.1 TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

<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>

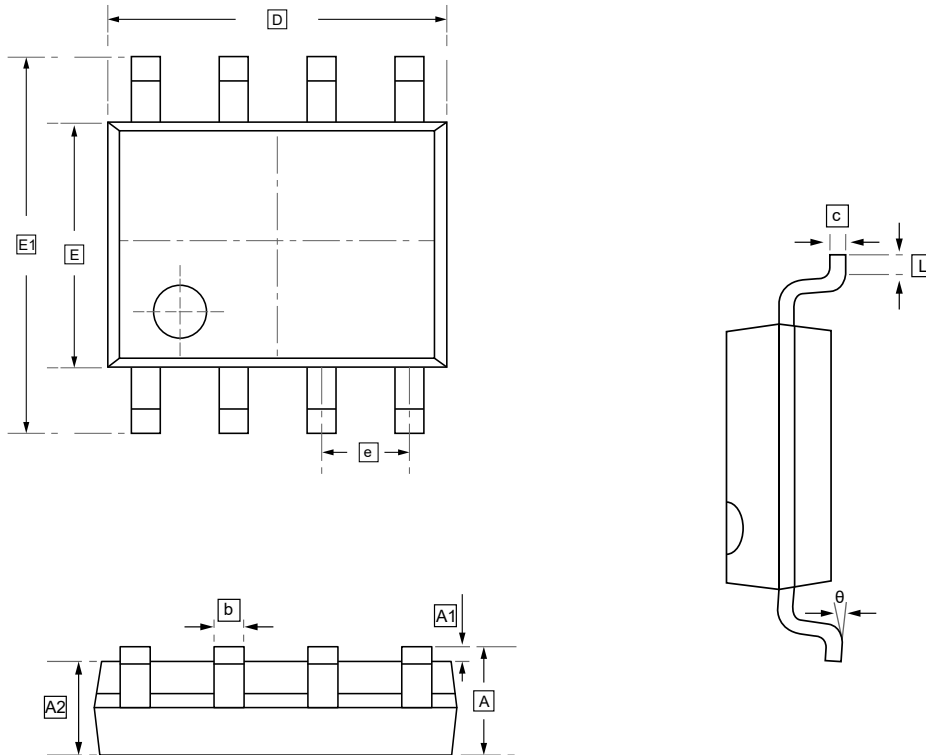


7.2 TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS





8.SOP-8 Package Outline Dimensions

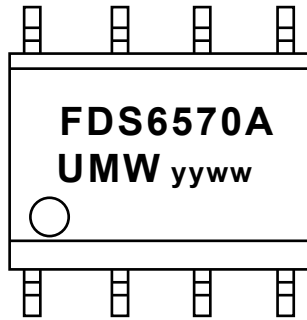


DIMENSIONS (mm are the original dimensions)

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 FDS6570A	SOP-8	3000	Tape and reel



10. Disclaimer

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