

1.Description

This device is well suited for Power Management and load switching applications common in Notebook Computers and Portable Battery Packs.

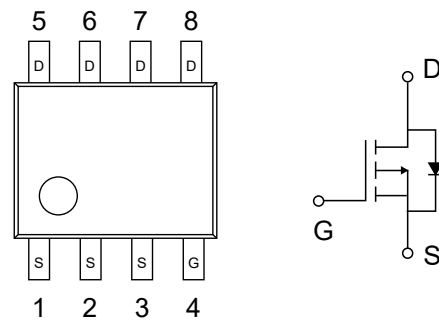
2.Features

- $V_{DS(V)} = -30V$
- $I_D = -8.8A$
- $R_{DS(ON)} < 20m\Omega (V_{GS} = -10V)$
- $R_{DS(ON)} < 35m\Omega (V_{GS} = -4.5V)$

3.Pinning Information

Pin	Symbol	Description
1,2,3	S	SOURCE
4	G	GATE
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_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 25	V
Drain Current – Continuous $T_A = 25^\circ C$ (Note 1a)	I_D	-9	A
Drain Current – Pulsed		-50	
Power Dissipation $T_A = 25^\circ C$ (Note 1a)	P_D	2.5	W
Power Dissipation $T_A = 25^\circ C$ (Note 1b)		1	
Single Pulse Avalanche Energy (Note 4)	E_{AS}	24	mJ
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$
Thermal Resistance, Junction to Case	$R_{\theta JA}$	25	$^\circ C/W$
Thermal Resistance, Junction to Ambient (Note 1a)	$R_{\theta JC}$	50	$^\circ C/W$



5. Electrical Characteristics ($T_J=25^\circ\text{C}$ 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		-21		mV/ $^\circ\text{C}$
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 25\text{V}$, $V_{DS}=0\text{V}$			± 10	μA
Gate to Source Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	-1	-2.1	-3	V
Gate to Source Threshold Voltage Temperature Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	$I_D=-250\mu\text{A}$ Referenced to 25°C		6		mV/ $^\circ\text{C}$
Static Drain to Source On Resistance	$R_{DS(on)}$	$V_{GS}=-10\text{V}$, $I_D=-8.8\text{A}$		15		m Ω
		$V_{GS}=-4.5\text{V}$, $I_D=-6.7\text{A}$		25		m Ω
Forward Transconductance	g_{FS}	$V_{GS}=-5\text{V}$, $I_D=-8.8\text{A}$		24		S
Input Capacitance	C_{iss}	$V_{DS}=-15\text{V}$, $V_{GS}=0\text{V}$		1380	1800	pF
Output Capacitance	C_{oss}	$f=1\text{MHz}$		275		pF
Reverse Transfer Capacitance	C_{rss}			230		pF
Gate Resistance	R_G			4.5		Ω
Turn-On Delay Time	$t_{D(on)}$			10	20	ns
Rise Time	t_r	$V_{DD}=-15\text{V}$, $I_D=-8.8\text{A}$		6	12	ns
Turn-Off Delay Time	$t_{D(off)}$	$V_{GS}=-10\text{V}$, $R_{GEN}=6\Omega$		30	48	ns
Fall Time	t_f	$V_{DD}=-15\text{V}$ $I_D=-8.8\text{A}$		12	20	ns
Total Gate Charge	Q_g		$V_{GS}=0\text{V}$ to -10V	28	40	nC
Total Gate Charge	Q_g		$V_{GS}=0\text{V}$ to -5V	16	23	nC
Gate to Source Charge	Q_{gs}			5.2		nC
Gate to Drain "Miller" Charge	Q_{gd}	$V_{GS}=0\text{V}$, $I_S=-8.8\text{A}$ (Note 2)		7		nC
Source to Drain Diode Forward Voltage	V_{SD}			-0.9	-1.2	V
Reverse Recovery Time	t_{rr}			29	44	ns
Reverse Recovery Charge	Q_{rr}		$I_F=-8.8\text{A}$, $di/dt=100\text{A}/\mu\text{s}$	23	35	nC



6.1 Typical Characteristics

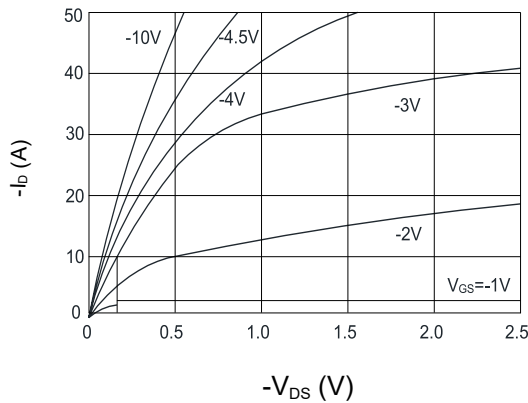


Figure 1: Output Characteristics

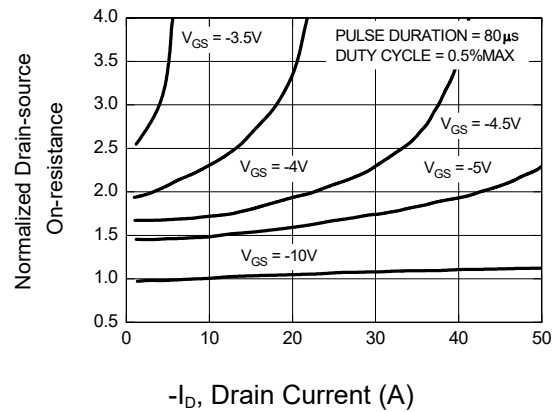


Figure 2: Normalized On-Resistance vs Drain Current and Gate Voltage

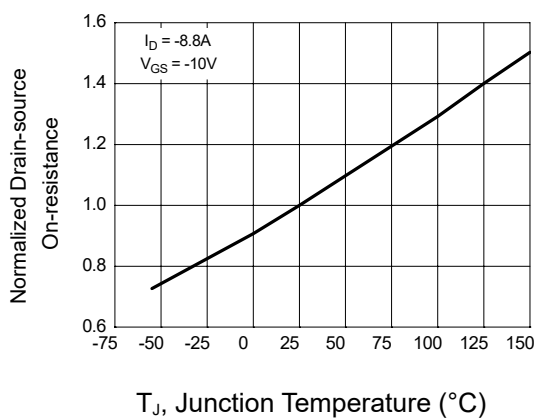


Figure 3: Normalized On-Resistance vs Drain Current and Gate Voltage

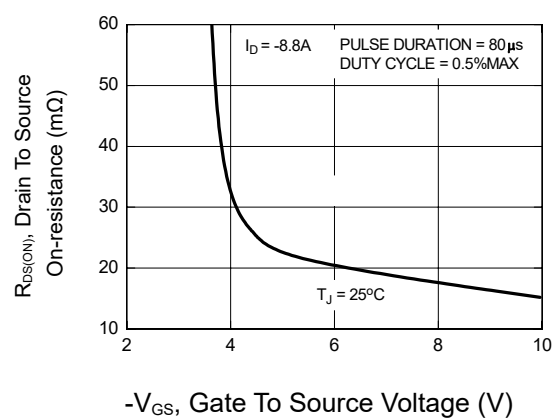


Figure 4: On-Resistance Variation with Gate-to-Source Voltage

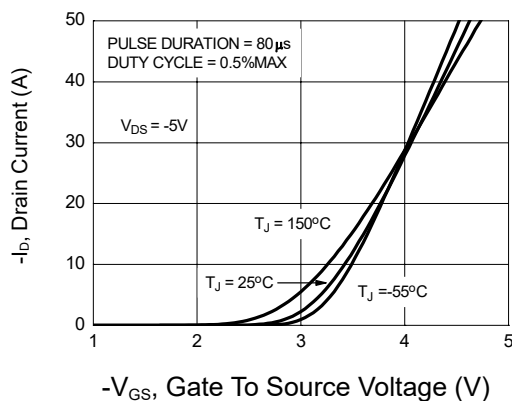


Figure 5: Transfer Characteristics.

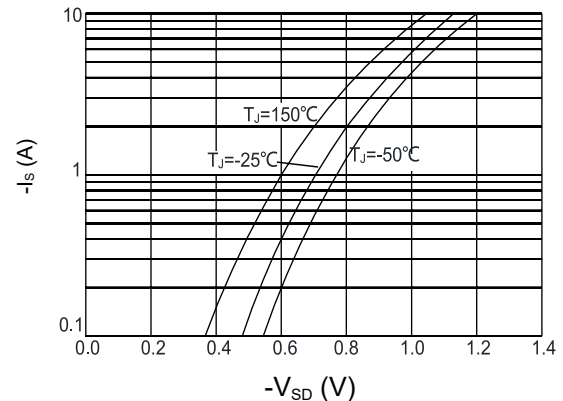


Figure 6: Body Diode Characteristics



6.2 Typical Characteristics

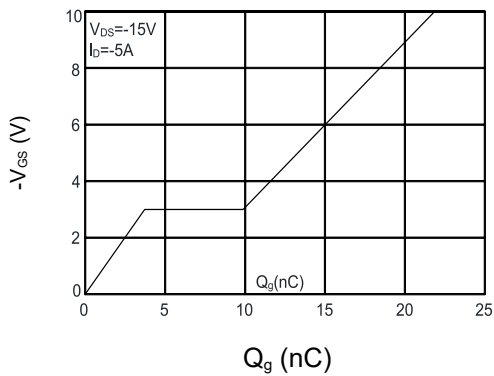


Figure 7: Gate Charge Characteristics

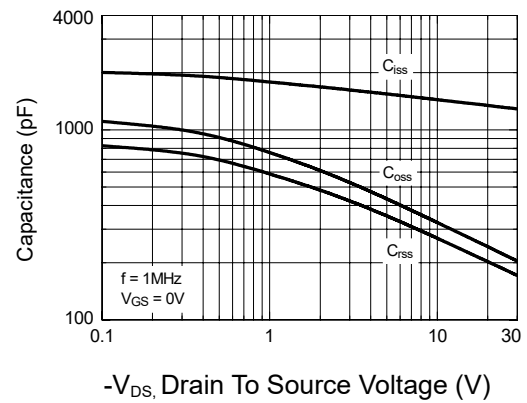


Figure 8: Capacitance vs Drain to Source Voltage

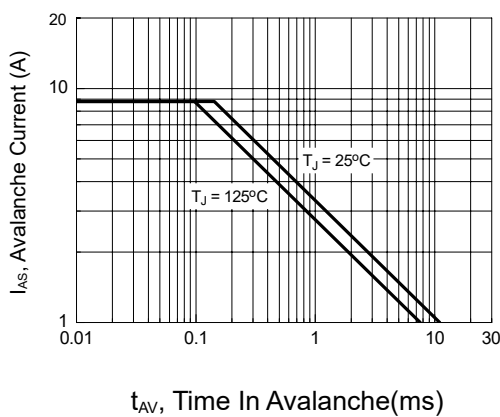


Figure 9: Unclamped Inductive Switching Capability

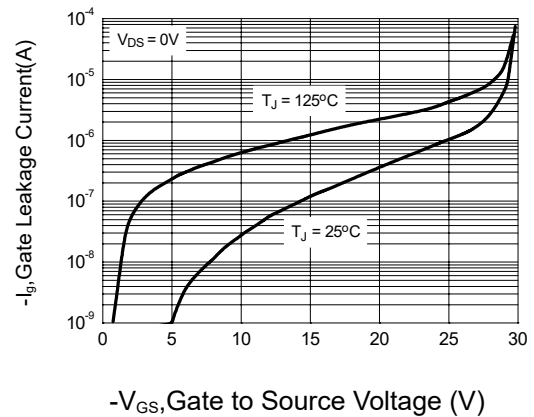


Figure 10: Gate Leakage Current vs Gate to Source Voltage

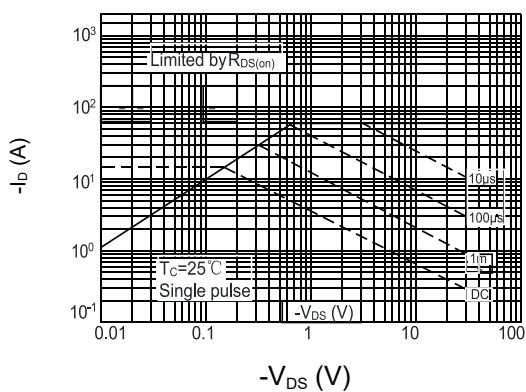


Figure 11: Maximum Safe Operating Area

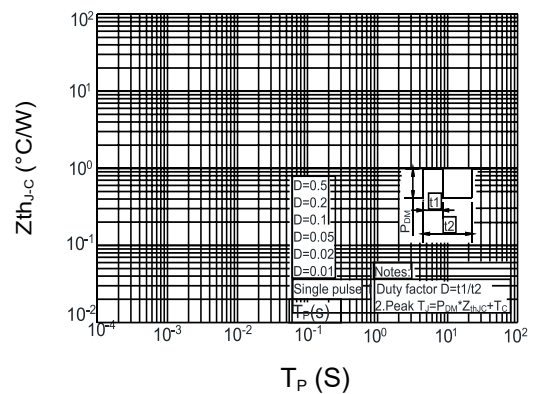
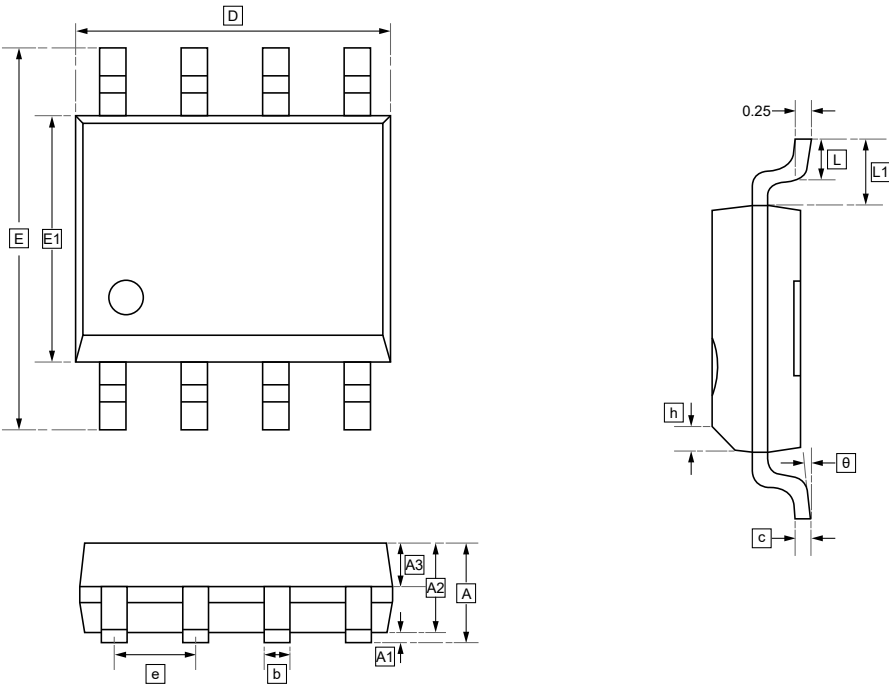


Figure 12: Maximum Effective Transient Thermal Impedance, Junction-to-Case



7.SOP-8 Package Outline Dimensions



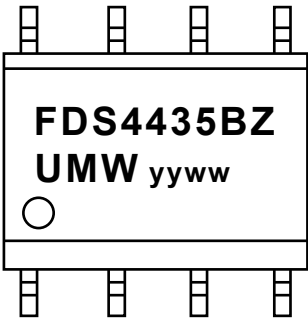
DIMENSIONS (mm are the original dimensions)

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°



8.Ordering Information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDS4435BZ	SOP-8	3000	Tape and reel



9.Disclaimer

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