

1.Features

- $V_{DS(V)} = -30V$
- $Q_g = 27nC$
- $I_D = -18A$
- $R_{DS(ON)} < 5m\Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 8m\Omega (V_{GS} = 4.5V)$

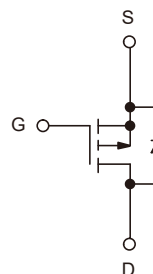
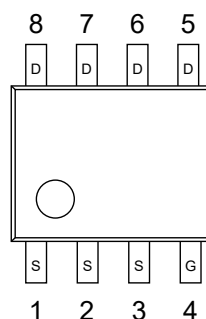
2.Applications

- Battery management in mobile devices
- Adapter and charger switch
- Battery switch
- Load switch

3.Pinning information

Pin	Symbol	Description
1,2,3	S	SOURCE
4	G	GATE
5,6,7,8	D	DRAIN

SOP-8



4.Maximum ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 150^\circ C$)	$T_C = 25^\circ C$	I_D	-18	A
	$T_C = 70^\circ C$		-13	
	$T_A = 25^\circ C$		-11	
	$T_A = 70^\circ C$		-8	
Pulsed Drain Current ($t = 100\mu s$)		I_{DM}	-145	
Continuous Source-Drain Diode Current	$T_C = 25^\circ C$	I_S	-5	
	$T_A = 25^\circ C$		$-2.8^{b,c}$	



Single pulse avalanche current	L = 0.1 mH	I_{AS}	-25	A
Single pulse avalanche energy		E_{AS}	31.2	mJ
Maximum Power Dissipation	$T_C=25^{\circ}\text{C}$	I_P	5.6	W
	$T_C=70^{\circ}\text{C}$		3.6	
	$T_A=25^{\circ}\text{C}$		3.1 ^{b,c}	
	$T_A=70^{\circ}\text{C}$		2 ^{b,c}	
Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$
Soldering recommendations (peak temperature) ^c			260	$^{\circ}\text{C}$

5. Thermal resistance rating

Parameter		Symbol	Typ	Max	Units
Maximum junction-to-ambient ^b	$t \leq 10\text{s}$	R_{thJA}	34	40	$^{\circ}\text{C/W}$
Maximum junction-to-case (drain)	Steady-State	R_{thJF}	18	22	$^{\circ}\text{C/W}$

Notes:

- a. Package limited
- b. Surface mounted on 1" x 1" FR4 board
- c. $t=10\text{ s}$
- d. The SOP-8 is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection
- e. Rework conditions: manual soldering with a soldering iron is not recommended for leadless components
- f. Maximum under steady state conditions is 85 $^{\circ}\text{C/W}$
- g. $T_C=25^{\circ}\text{C}$



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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS}=0\text{V}$, $I_D=-250\mu\text{A}$	-30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D=-10\text{mA}$		-17		mV/ $^{\circ}\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	$I_D=-250\mu\text{A}$		5.5		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	-1		-2.2	V
Gate-Source Leakage	I_{GSS}	$V_{DS}=0\text{V}$, $V_{GS}=\pm 20\text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-30\text{V}$, $V_{GS}=0\text{V}$			-1	μA
		$V_{DS}=-30\text{V}$, $V_{GS}=0\text{V}$, $T_J=70^{\circ}\text{C}$			-15	
On-State Drain Current ^a	$I_{D(ON)}$	$V_{DS}\geq -10\text{V}$, $V_{GS}=-10\text{V}$	-40			A
Drain-Source On-State Resistance ^a	$R_{DS(ON)}$	$V_{GS}=-10\text{V}$, $I_D=-15\text{A}$		5		m Ω
		$V_{GS}=-4.5\text{V}$, $I_D=-10\text{A}$		8		
Forward Transconductance ^a	g_{FS}	$V_{DS}=-15\text{V}$, $I_D=-15\text{A}$		81		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS}=-15\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$		3490		pF
Output Capacitance	C_{oss}			1420		
Reverse Transfer Capacitance	C_{rss}			70		
Total Gate Charge	Q_g	$V_{DS}=-15\text{V}$, $V_{GS}=-10\text{V}$ $I_D=-10\text{A}$		56	84	nC
				27	41	
Gate Source Charge	Q_{gs}	$V_{DS}=-15\text{V}$, $V_{GS}=-4.5\text{V}$		9.4		
Gate Drain Charge	Q_{gd}			8.2		
Gate Resistance	R_g	$f=1\text{MHz}$	1.5	3.5	6	Ω
Turn-On Delay Time	$t_{D(on)}$	$V_{DD}=-15\text{V}$, $R_L=1.5\Omega$ $I_D\leq -10\text{A}$, $V_{GEN}=-10\text{V}$ $R_g=1\Omega$		15	30	ns
Rise Time	t_r			6	12	
Turn-Off Delay Time	$t_{D(off)}$			39	78	
Fall Time	t_f			10	20	



Turn-On Delay Time	$t_{D(on)}$	$V_{DD}=-15V, R_L=1.5\Omega$ $I_D\leq -10V, V_{GEN}=-4.5V$ $R_g=1\Omega$		34	68	ns
Rise Time	t_r			86	172	ns
Turn-Off Delay Time	$t_{D(off)}$			31	62	ns
Fall Time	t_f			22	44	ns
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C=25^{\circ}C$			-5	A
Pulse Diode Forward Current	I_{SM}				-150	A
Body Diode Voltage	V_{SD}	$I_S=-5A, V_{GS}=0V$		-0.73	-1.1	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F=-10A, dI/dt=100A/\mu s$ $T_J=25^{\circ}C$		44	88	ns
Body Diode Reverse Recovery Charge	Q_{rr}			41	82	nC
Reverse Recovery Fall Time	t_a			19		ns
Reverse Recovery Rise Time	t_b			25		ns

Notes:

- a. Pulse test; pulse width $\leq 300 \mu s$, duty cycle $\leq 2 \%$.
- b. Guaranteed by design, not subject to production testing.



7.1 Typical Characteristics

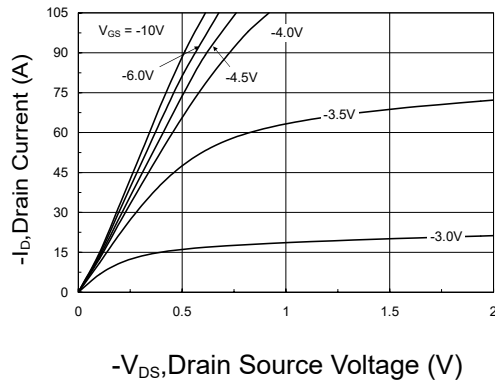


Figure 1: On-Region Characteristics

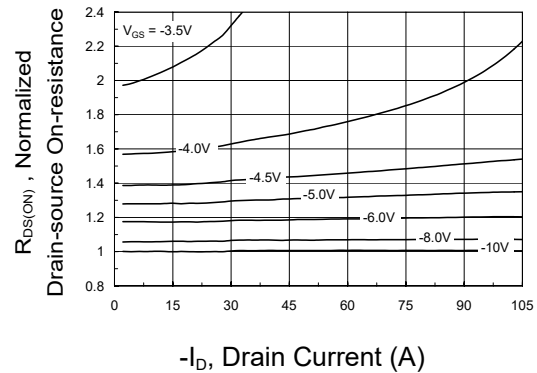


Figure 2: On-Resistance Variation with Drain Current and Gate Voltage

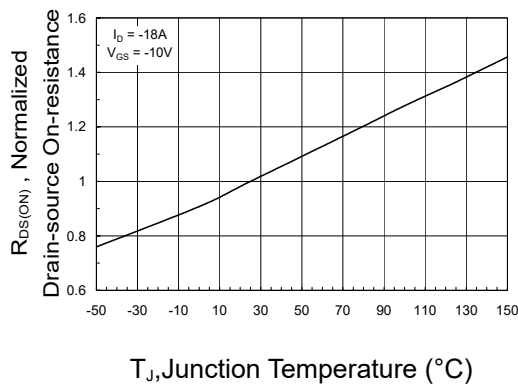


Figure 3: On-Resistance Variation with Temperature

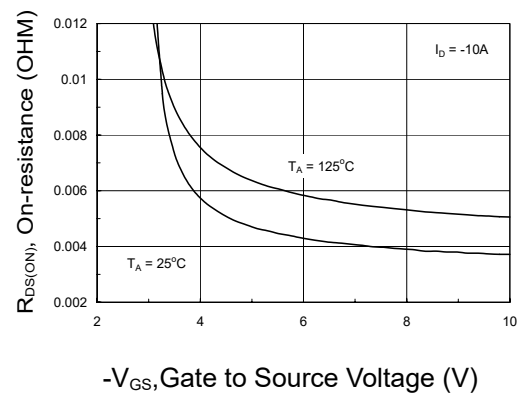


Figure 4: On-Resistance Variation with Gate-to-Source Voltage

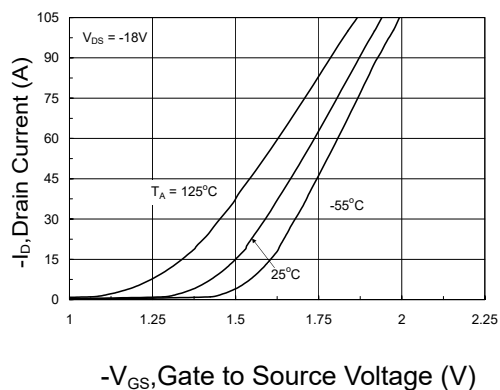


Figure 5: Transfer Characteristics

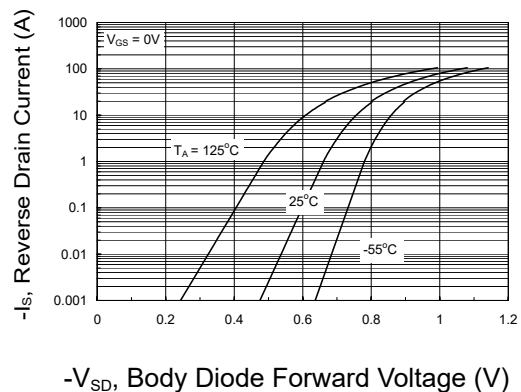


Figure 6: Body Diode Forward Voltage Variation with Source Current and Temperature



7.2 Typical Characteristics

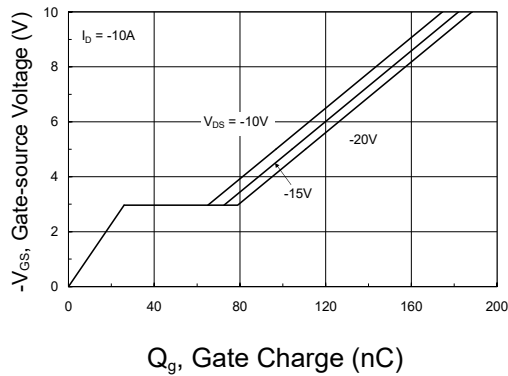


Figure 7: Gate Charge Characteristics

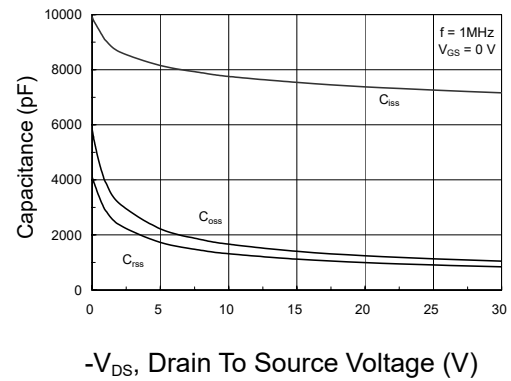


Figure 8: Capacitance Characteristics

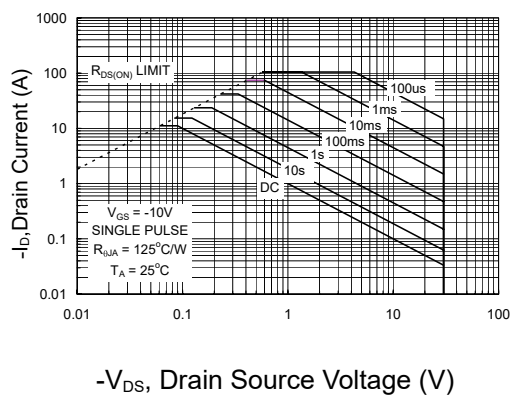


Figure 9: Maximum Safe Operating Area

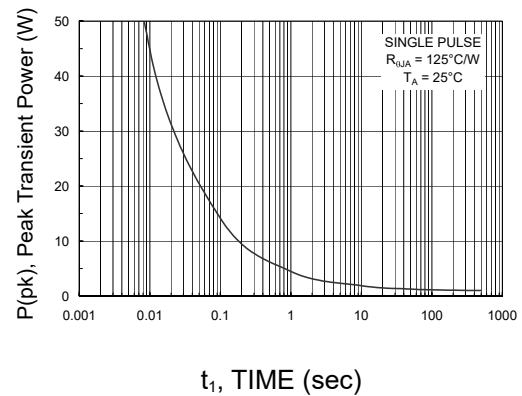


Figure 10: Single Pulse Maximum Power Dissipation

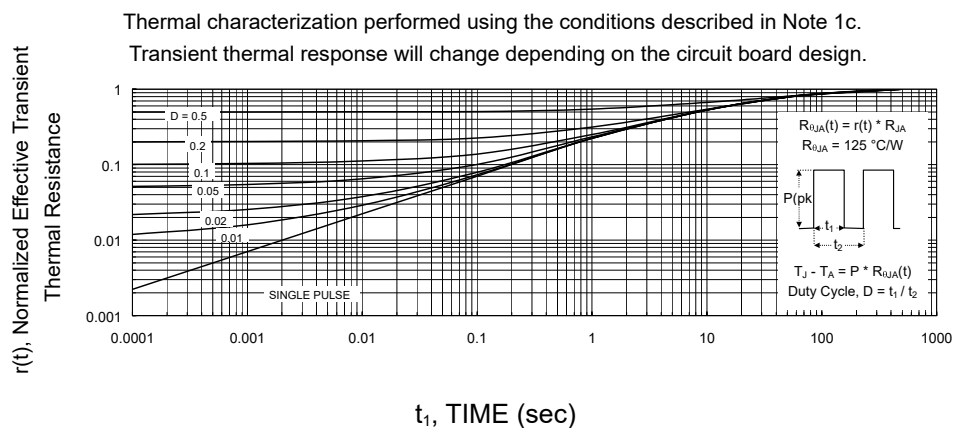
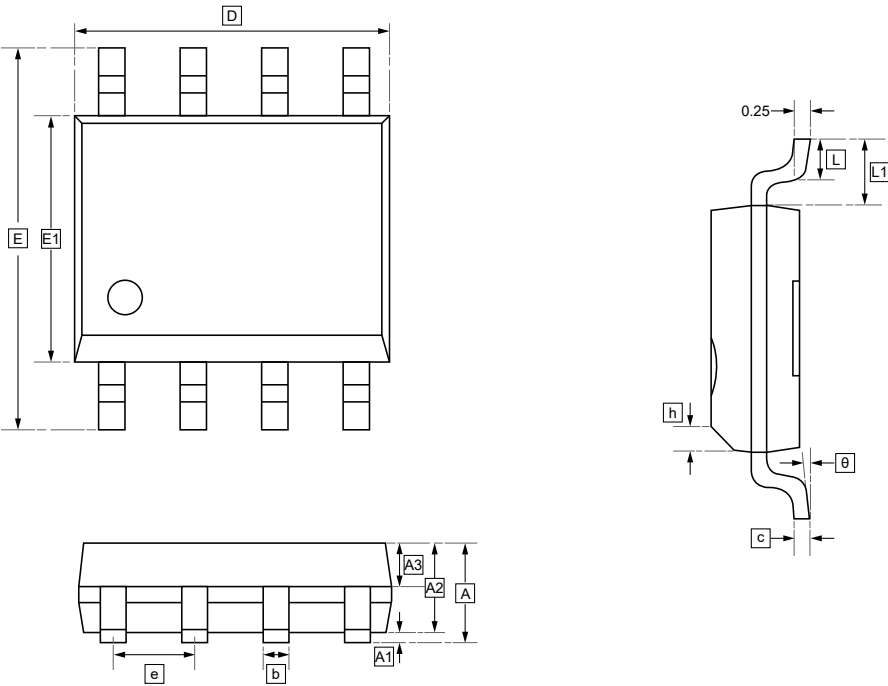


Figure 11: Transient Thermal Response Curve



8.SOP-8 Package Outline Dimensions



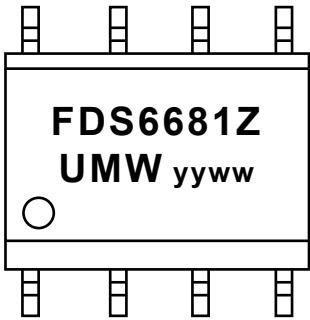
DIMENSIONS (mm are the original dimensions)

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 FDS6681Z	SOP-8	3000	Tape and reel



10.Disclaimer

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