

SOT-23 Plastic-Encapsulate MOSFETS

FDN308P P-Channel Enhancement Mode MOSFET

SOT-23



$V_{DS} = -20V$ $I_D = -2.9A$

$R_{DS(ON)}$ TYP=65mΩ@ $V_{GS} = -4.5V$

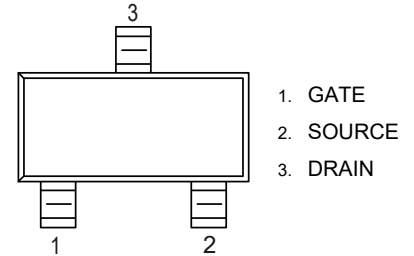
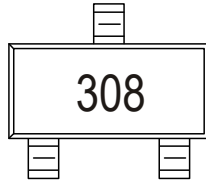
Features

- Improved dv/dt capability
- Fast switching
- Green Device Available

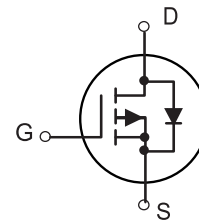
Application

- Notebook
- Load Switch
- Battery Protection
- Hand-held Instruments

MARKING



Equivalent circuit



Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current	$T_A = 25^\circ C$	I_D	-2.9	A
	$T_A = 100^\circ C$		-2.2	A
Drain Current-Pulsed (Note1)		I_{DM}	-12	A
Maximum Power Dissipation		P_D	1.4	W
Operating Junction Temperature Range		T_J	-55 to 150	°C
Storage Temperature Range		T_{stg}	-55 to 150	°C
Thermal Resistance From Junction To Ambient		$R_{\theta JA}$	80	°C/W

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V, T_J=25^{\circ}C$	-	-	-1	μA
		$V_{DS}=-16V, V_{GS}=0V, T_J=125^{\circ}C$	-	-	-10	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 10	μA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.6	-1.0	-1.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	-	3	-	mV/ $^{\circ}C$
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-3A$	-	65	85	m Ω
		$V_{GS}=-2.5V, I_D=-2A$	-	80	100	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_S=-1.0A$	-	2.2	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V,$ $F=1.0MHz$	-	550	-	pF
Output Capacitance	C_{oss}		-	65	-	pF
Reverse Transfer Capacitance	C_{rss}		-	55	-	pF
Switching Characteristics						
Turn-on Delay Time ^(Note2, 3)	$t_{d(on)}$	$V_{DD}=-10V, I_D=-1A$ $V_{GS}=-4.5V, R_G=25\Omega$	-	3.5	-	nS
Turn-on Rise Time ^(Note2, 3)	t_r		-	12.6	-	nS
Turn-Off Delay Time ^(Note2,3)	$t_{d(off)}$		-	32.6	-	nS
Turn-Off Fall Time ^(Note2,3)	t_f		-	8.4	-	nS
Total Gate Charge ^(Note2,3)	Q_g	$V_{DS}=-10V, I_D=3A,$ $V_{GS}=-4.5V$	-	4.8	-	nC
Gate-Source Charge ^(Note2,3)	Q_{gs}		-	0.5	-	nC
Gate-Drain Charge ^(Note2,3)	Q_{gd}		-	1.9	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V_{SD}	$V_{GS}=0V, I_S=-1.0A$	-	-	-1.2	V
Diode continous forward current	I_S	$V_G=V_D=0V$, Force Current	-	-	-2.9	A
Diode pulse current	I_{SM}		-	-	-6.0	A

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
3. Switching characteristics are independent of operating junction temperatures
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

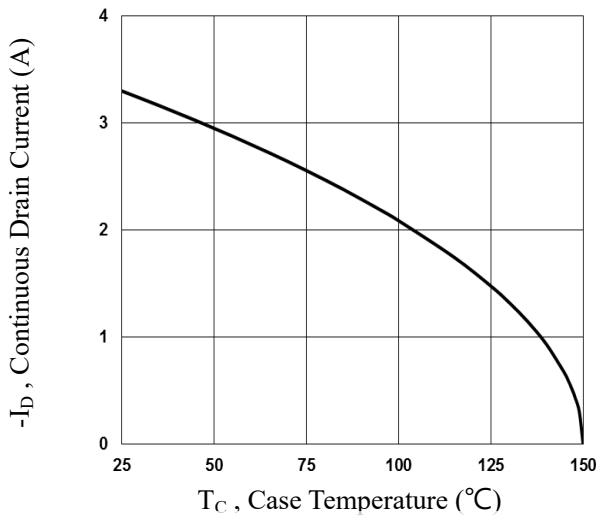


Fig.1 Continuous Drain Current vs. T_C

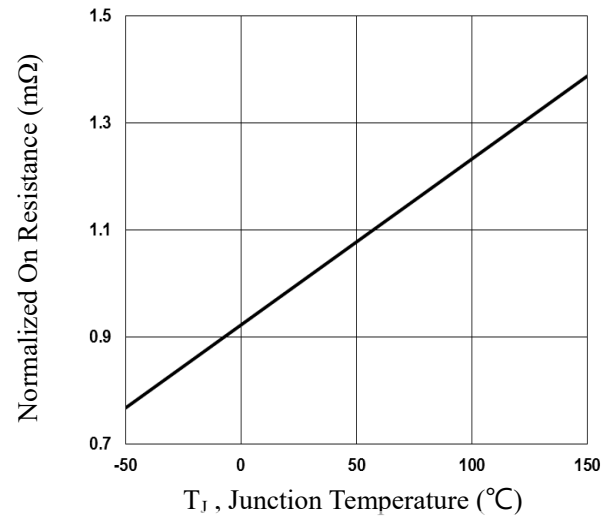


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

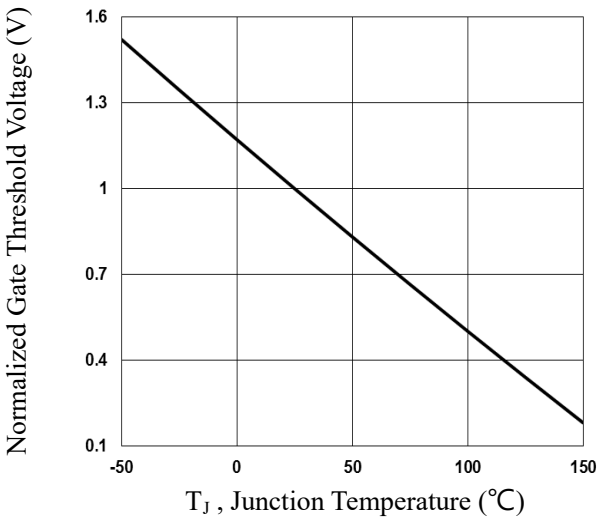


Fig.3 Normalized V_{th} vs. T_J

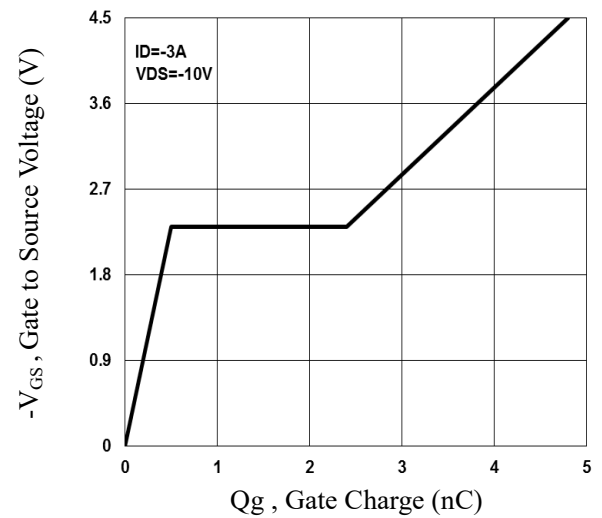


Fig.4 Gate Charge Waveform

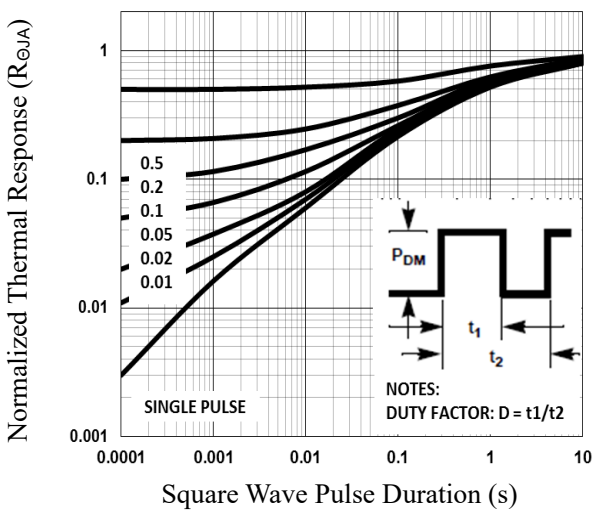


Fig.5 Normalized Transient Response

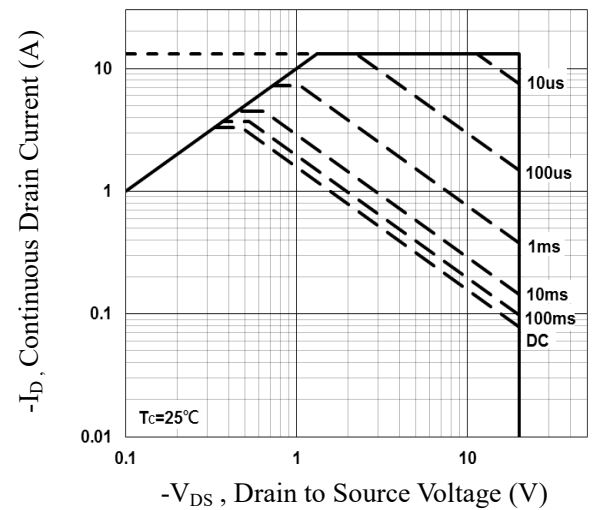


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristics

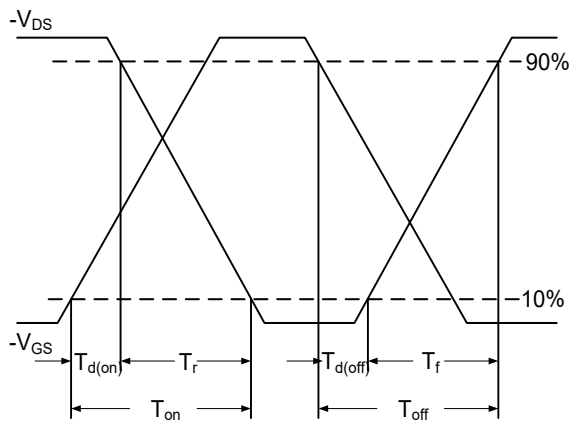


Fig.7 Switching Time Waveform

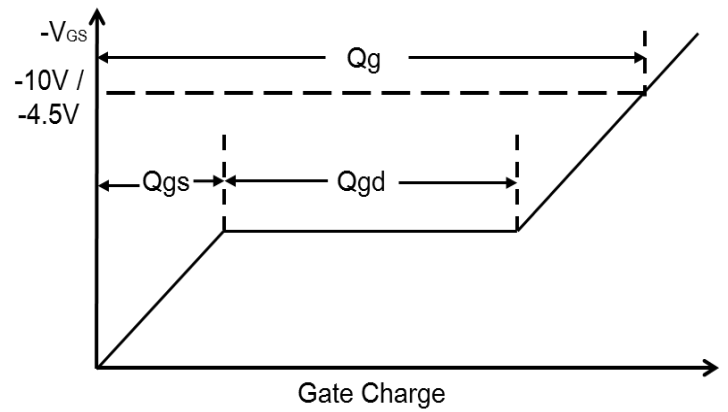
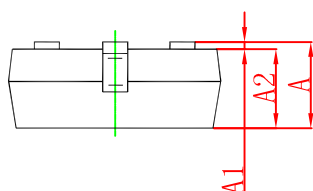
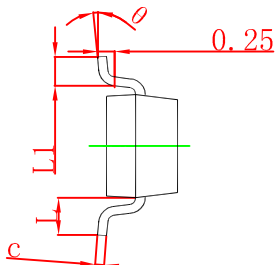
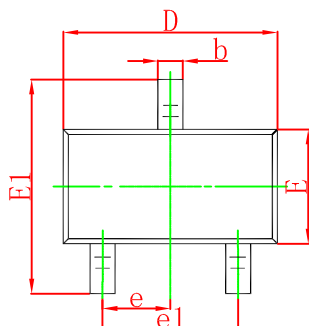


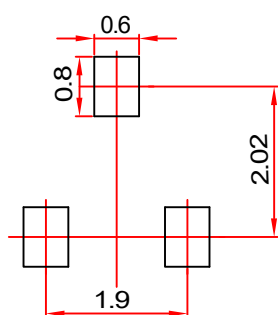
Fig.8 Gate Charge Waveform

SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.400	0.035	0.055
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:

1. Controlling dimension: in/millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

Package and Ordering Information

Package	Outline	Reel Size	Reel DIA. (mm)	Q'TY/Reel (pcs)
SOT-23	TAPING	7"	330	3000