

FH0210

100V/1.8A N Channel Advanced Power MOSFET

Features

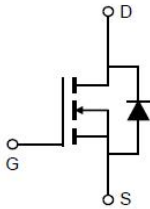
- Low $R_{DS(on)}$ @ $V_{GS}=10V$
- 5V Logic Level Control
- N Channel SOT-23 Package
- Pb -Free, RoHS Compliant

Applications

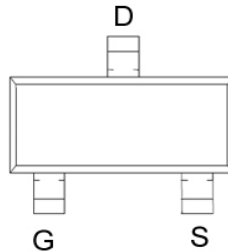
- LED backlighting
- Industrial power supplies
- Load Switch
- Hand-Held Instruments
- DC/DC Converters

General Features

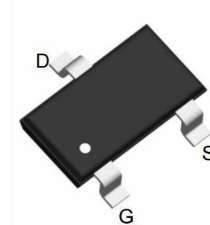
- $V_{DS} : 100V, I_D = 1.8A$
 $R_{DS(ON)} : 310m\Omega @ V_{GS}=10V$
 $R_{DS(ON)} : 330m\Omega @ V_{GS}=4.5V$



Schematic diagram



Marking and Pin Assignment



SOT-23 top view

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_A=25^\circ C$ Unless Otherwise Noted)			
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
T_J	Maximum Junction Temperature	150	$^\circ C$
T_{STG}	Storage Temperature Range	-50 to 150	$^\circ C$
Mounted on Large Heat Sink			
I_{DM}	Pulse Drain Current Tested ^①	$T_A = 25^\circ C$	7.2 A
I_D	Continuous Drain Current	$T_A = 25^\circ C$	1.8 A
		$T_A = 70^\circ C$	1.4 A
P_D	Maximum Power Dissipation	$T_A = 25^\circ C$	1.56 W
		$T_A = 70^\circ C$	1.2 W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	80	$^\circ C/W$

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	100	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current(T _A =25°C)	V _{DS} =100V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T _A =125°C)	V _{DS} =80V, V _{GS} =0V	--	--	100	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.8	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance②	V _{GS} =10V, I _D =1.5A	--	310	380	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance②	V _{GS} =4.5V, I _D =1A	--	330	420	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	--	362	--	pF
C _{oss}	Output Capacitance		--	10.5	--	pF
C _{rss}	Reverse Transfer Capacitance		--	6.8	--	pF
Q _g	Total Gate Charge	V _{DS} =50V I _D =1A, V _{GS} =10V	--	3.5	--	nC
Q _{gs}	Gate Source Charge		--	0.5	--	nC
Q _{gd}	Gate Drain Charge		--	0.7	--	nC
Switching Characteristics @ T_J = 25°C (unless otherwise stated)						
t _{d(on)}	Turn on Delay Time	V _{DD} =50V, I _D =1A, R _G =3.3Ω, V _{GS} =10V	--	4.5	--	ns
t _r	Turn on Rise Time		--	3.4	--	ns
t _{d(off)}	Turn Off Delay Time		-	16	--	ns
t _f	Turn Off Fall Time		--	3	--	ns
Source Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
I _{SD}	Source drain current(Body Diode)	T _A =25°C	--	--	1.2	A
V _{SD}	Forward on voltage②	T _J =25°C, I _{SD} =1A, V _{GS} =0V	--	0.8	1.2	V

Notes: ① Pulse width limited by maximum allowable junction temperature

② Pulse test ; Pulse width≤300μs, duty cycle≤2%.

Typical Characteristics

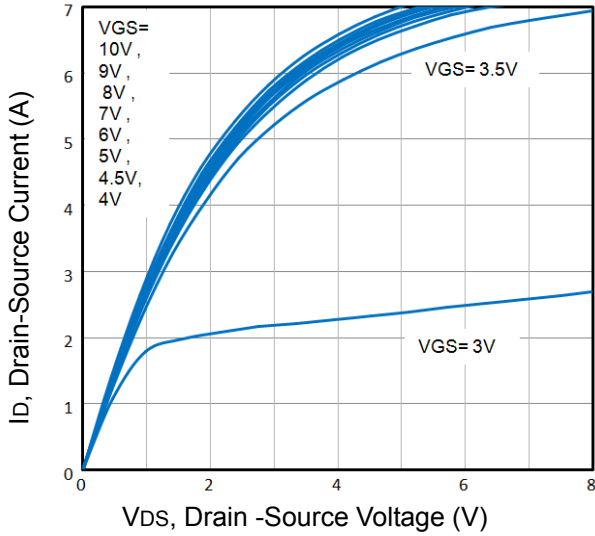


Fig1. Typical Output Characteristics

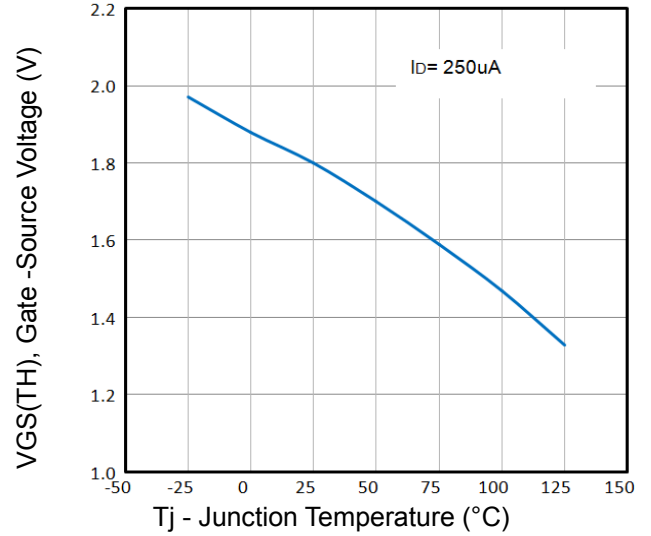


Fig2. VGS(TH) Voltage Vs. Temperature

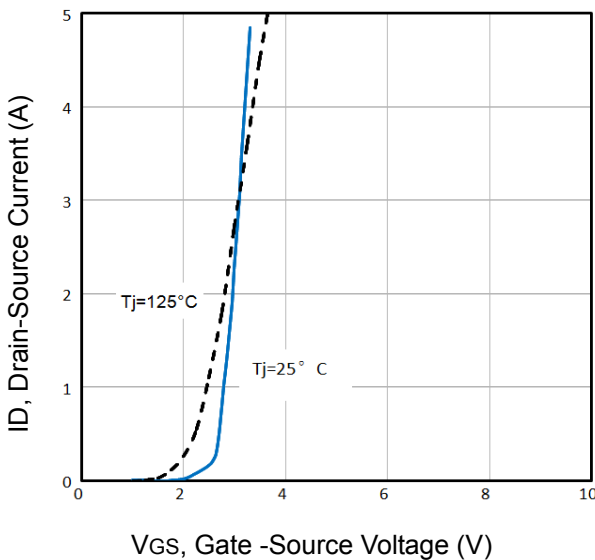


Fig3. Typical Transfer Characteristics

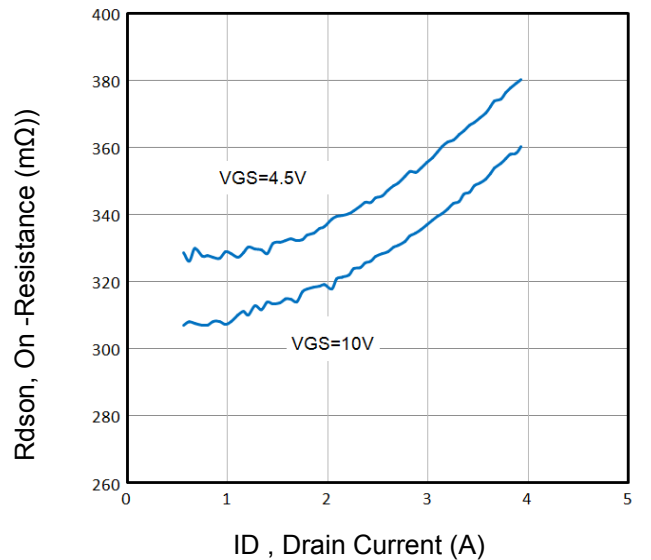


Fig4. On-Resistance vs. Drain Current and Gate

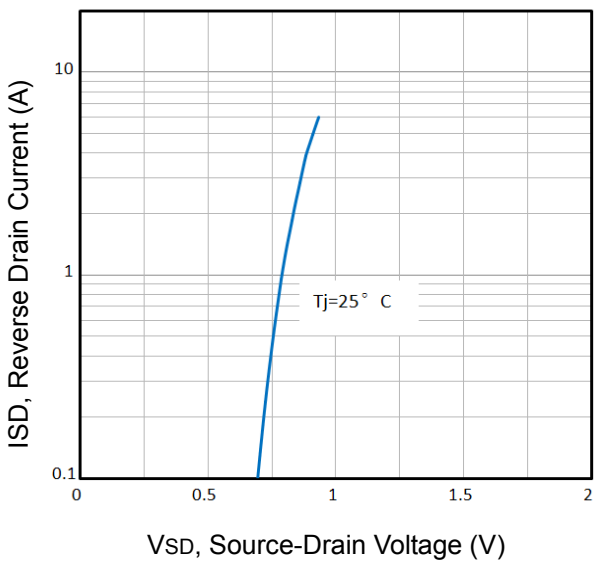


Fig5. Typical Source-Drain Diode Forward Voltage

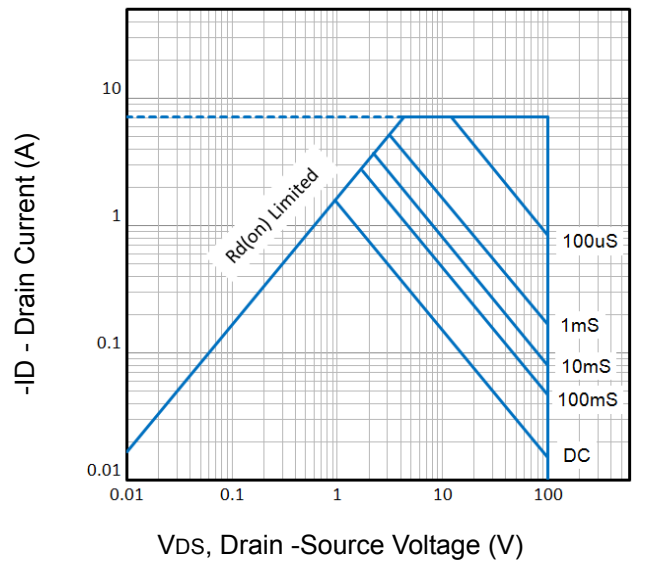


Fig6. Maximum Safe Operating Area

Typical Characteristics

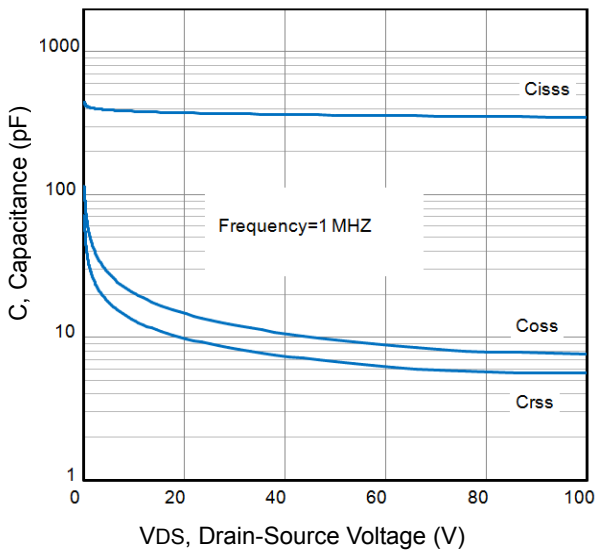


Fig7. Typical Capacitance Vs. Drain-Source Voltage

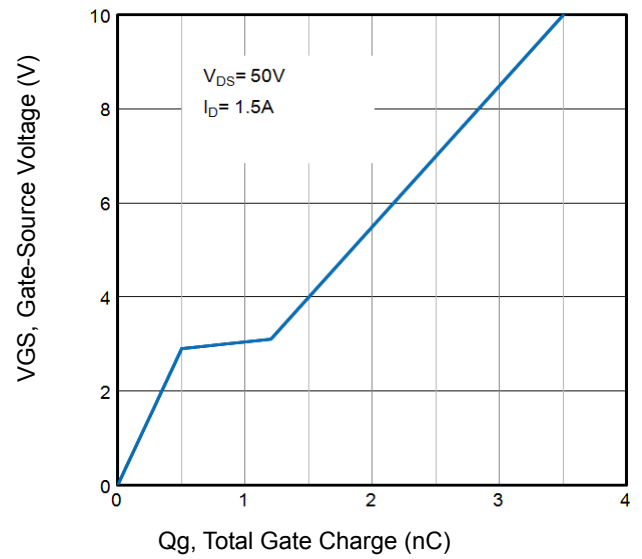


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

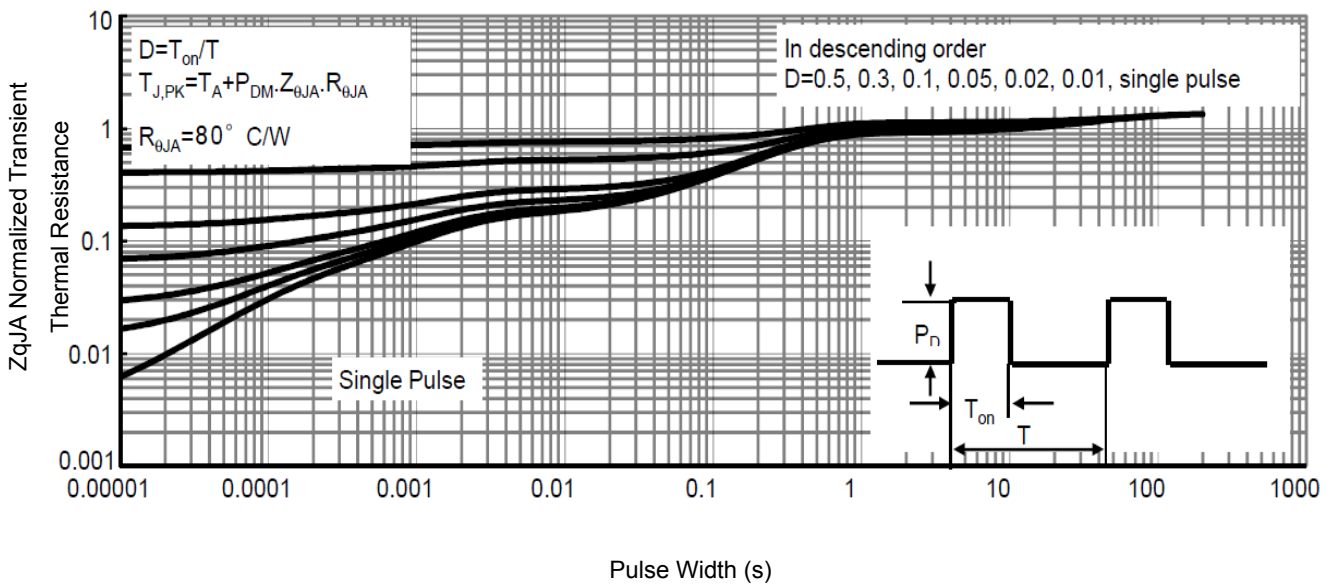


Fig9. Normalized Maximum Transient Thermal Impedance

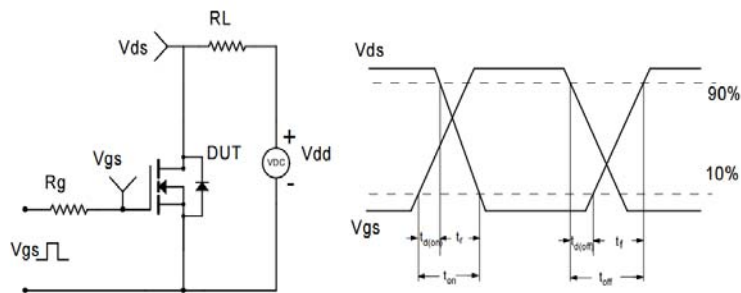
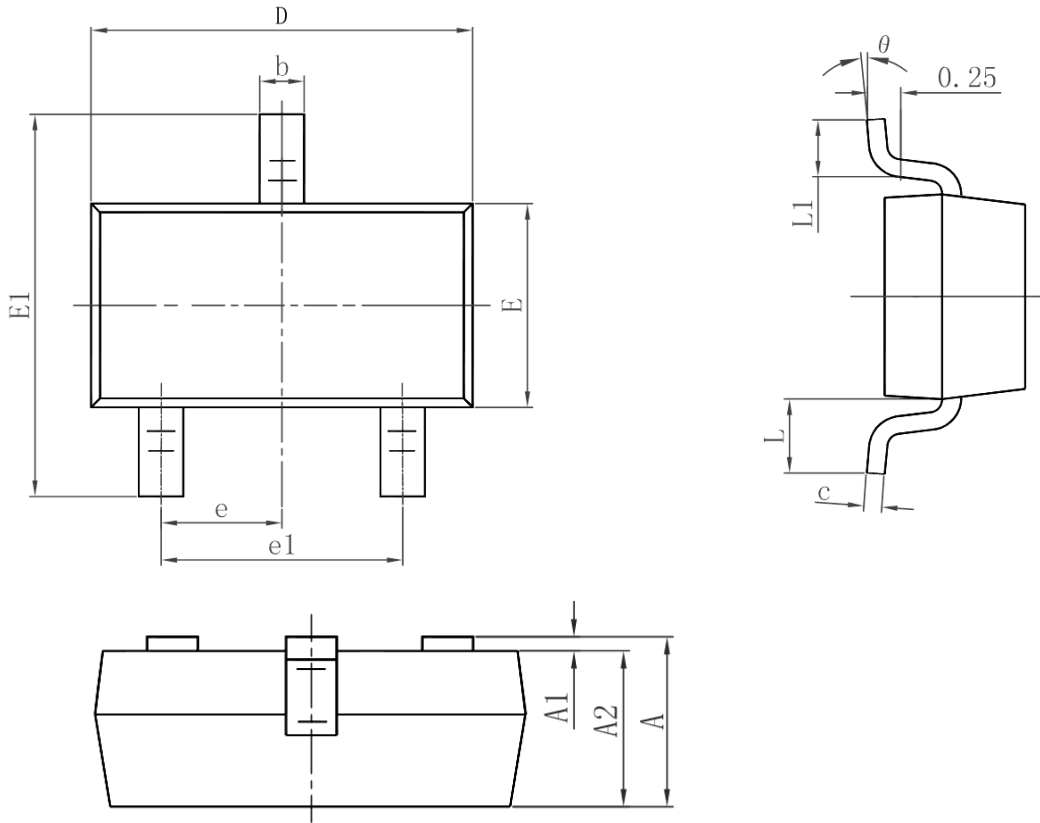


Fig10. Switching Time Test Circuit and waveforms

Package Dimensions : SOT-23



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
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°