Yixin

Advanced Power MOSFET SFR/U9310

FEATURES

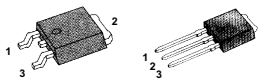
- Avalanche Rugged Technology
- Rugged Gate Oxide Technology
- Lower Input Capacitance
- Improved Gate Charge
- Extended Safe Operating Area
- Lower Leakage Current : -10 μA (Max.) @ V_{DS} = -400V
- Low $R_{DS(ON)}$: 6.000 Ω (Typ.)

BV_{DSS} = -400 V

$R_{DS(on)}$ = 8.0 Ω

I_D = -1.5 A

D-PAK I-PAK



1. Gate 2. Drain 3. Source

Absolute Maximum Ratings

Symbol	Characteristic	Value	Units
V_{DSS}	Drain-to-Source Voltage	-400	V
I_D	Continuous Drain Current (T_C=25℃)	-1.5	A
	Continuous Drain Current (T_C=100℃)	-0.95	
I_{DM}	Drain Current-Pulsed ①	-5	A
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS}	Single Pulsed Avalanche Energy ②	115	mJ
I_{AR}	Avalanche Current ①	-1.5	A
E_{AR}	Repetitive Avalanche Energy ①	3.6	mJ
dv/dt	Peak Diode Recovery dv/dt ③	-4.0	V/ns
P_D	Total Power Dissipation (T_A=25℃) *	2.5	W
	Total Power Dissipation (T_C=25℃)	36	W
	Linear Derating Factor	0.29	W/℃
T_J , T_{STG}	Operating Junction and Storage Temperature Range	- 55 to +150	℃
T_L	Maximum Lead Temp. for Soldering Purposes, 1/8? from case for 5-seconds	300	

Thermal Resistance

Symbol	Characteristic	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	--	3.5	℃/W
$R_{\theta JA}$	Junction-to-Ambient *	--	50	
$R_{\theta JA}$	Junction-to-Ambient	--	110	

* When mounted on the minimum pad size recommended (PCB Mount).

Electrical Characteristics (T_C=25℃ unless otherwise specified)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
BV_{DSS}	Drain-Source Breakdown Voltage	-400	--	--	V	V_{GS}=0V,I_D=-250μA
$\Delta BV/\Delta T_J$	Breakdown Voltage Temp. Coeff.	--	0.34	--	V/℃	I_D=-250μA ***See Fig 7***
$V_{GS(th)}$	Gate Threshold Voltage	-2.0	--	-4.0	V	V_{DS}=-5V,I_D=-250μA
I_{GSS}	Gate-Source Leakage , Forward	--	--	-100	nA	V_{GS}=-30V
	Gate-Source Leakage , Reverse	--	--	100		V_{GS}=30V
I_{DSS}	Drain-to-Source Leakage Current	--	--	-10	μA	V_{DS}=-400V
		--	--	-100		V_{DS}=-320V,T_C=125℃
$R_{DS(on)}$	Static Drain-Source On-State Resistance	--	--	8.0	Ω	V_{GS}=-10V,I_D=-0.75A ④ ê
g_{fs}	Forward Transconductance	--	0.73	--	℧	V_{DS}=-50V,I_D=-0.75A ④
C_{iss}	Input Capacitance	--	300	390	pF	V_{GS}=0V,V_{DS}=-25V,f =1MHz ***See Fig 5***
C_{oss}	Output Capacitance	--	45	55		
C_{rss}	Reverse Transfer Capacitance	--	21	25		
$t_{d(on)}$	Turn-On Delay Time	--	8	25	ns	V_{DD}=-200V,I_D=-1.5A, R_G=18Ω ***See Fig 13*** ④ ⑤
t_r	Rise Time	--	16	40		
$t_{d(off)}$	Turn-Off Delay Time	--	45	100		
t_f	Fall Time	--	17	45		
Q_g	Total Gate Charge	--	17	21	nC	V_{DS}=-320V,V_{GS}=-10V, I_D=-1.5A ***See Fig 6 & Fig 12*** ④ ⑤
Q_{gs}	Gate-Source Charge	--	3.9	--		
Q_{gd}	Gate-Drain(밪iller? Charge	--	7.4	--		

Source-Drain Diode Ratings and Characteristics

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
I_S	Continuous Source Current	--	--	-1.5	A	Integral reverse pn-diode in the MOSFET
I_{SM}	Pulsed-Source Current ①	--	--	-5		
V_{SD}	Diode Forward Voltage ④	--	--	-3.0	V	T_J=25℃,I_S=-1.5A,V_{GS}=0V
t_{rr}	Reverse Recovery Time	--		--	ns	T_J=25℃,I_F=-1.5A di_F/dt=100A/μs ④
Q_{rr}	Reverse Recovery Charge	--		--	μC	

Notes ;

① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
② L=90mH, I_{AS}=-1.5A, V_{DD}=-50V, R_G=27Ω, Starting T_J=25℃
③ I_{SD}≤-1.5A, di/dt≤80A/μs, V_{DD}≤BV_{DSS}, Starting T_J=25℃
④ Pulse Test : Pulse Width = 250μs, Duty Cycle ≤ 2%
⑤ Essentially Independent of Operating Temperature

Fig 1. Output Characteristics

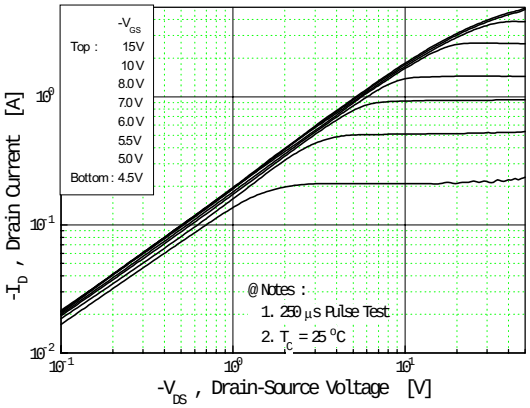


Fig 2. Transfer Characteristics

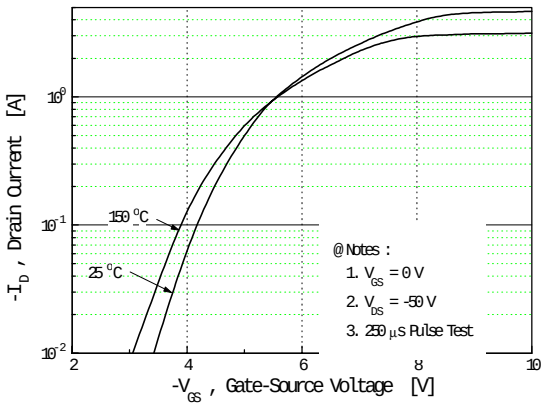


Fig 3. On-Resistance vs. Drain Current

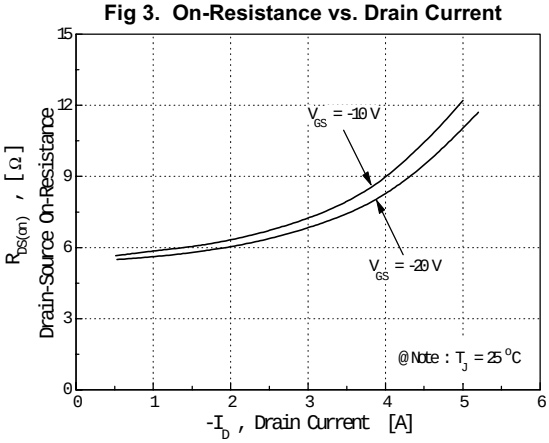


Fig 4. Source-Drain Diode Forward Voltage

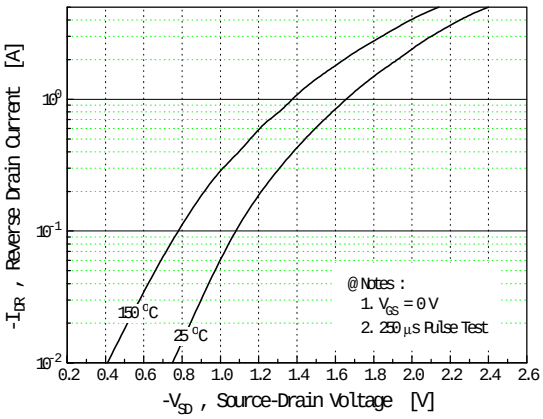


Fig 5. Capacitance vs. Drain-Source Voltage

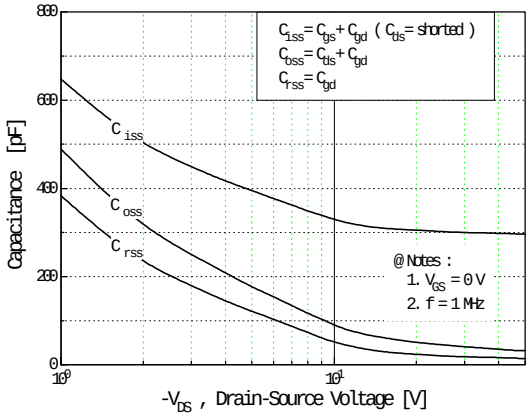
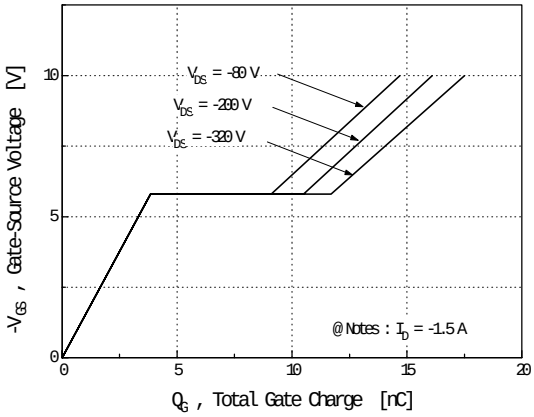



Fig 6. Gate Charge vs. Gate-Source Voltage