

N-Channel Enhancement Mode Field Effect Transistor

Product Summary

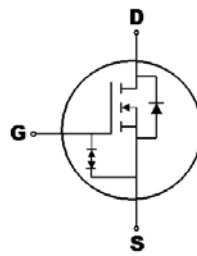
- V_{DS} 20V
- I_D 6.8A
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) < 18 mohm
- $R_{DS(ON)}$ (at $V_{GS}=2.5V$) < 22 mohm
- $R_{DS(ON)}$ (at $V_{GS}=1.8V$) < 39 mohm

General Description

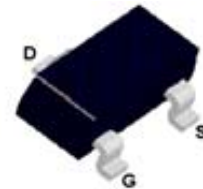
- Trench Power LV MOSFET technology
- High Power and current handing capability
- ESD protect: $\pm 2700V$
- Marking:K12

Applications

- PWM application
- Load switch



Symbol



SOT-23

■ Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	20	V
Gate-source Voltage	V_{GS}	± 10	V
Drain Current	I_D	$T_A=25^\circ C$ @ Steady State	6.8
		$T_A=70^\circ C$ @ Steady State	5.4
Pulsed Drain Current ^A	I_{DM}	17	A
Total Power Dissipation @ $T_A=25^\circ C$	P_D	1.2	W
Thermal Resistance Junction-to-Ambient @ Steady State ^B	$R_{\theta JA}$	104	$^\circ C/W$
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature Range	T_{STG}	-55~+150	$^\circ C$

■ Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V, T _C =25°C			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±10V, V _{DS} =0V			±10	μA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	0.45	0.62	1.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 4.5V, I _D =6.8A		13.5	18	mΩ
		V _{GS} = 2.5V, I _D =3.0A		17	22	
		V _{GS} = 1.8V, I _D =2.5A		22	39	
Diode Forward Voltage	V _{SD}	I _S =6.8A, V _{GS} =0V			1.2	V
Maximum Body-Diode Continuous Current	I _S				6.8	A
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHZ		900		pF
Output Capacitance	C _{oss}			165		
Reverse Transfer Capacitance	C _{rss}			75		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =4.5V, V _{DS} =10V, I _D =6.8A		9.2		nC
Gate Source Charge	Q _{gs}			1.7		
Gate Drain Charge	Q _{gd}			2.9		
Turn-on Delay Time	t _{D(on)}	V _{GS} =4.5V, V _{DD} =10V, R _L =1.5Ω, R _{GEN} =3Ω		12		ns
Turn-on Rise Time	t _r			52		
Turn-off Delay Time	t _{D(off)}			17		
Turn-off Fall Time	t _f			10		

A. Pulse Test: Pulse Width ≤ 300μs, Duty cycle ≤ 2%.

B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Performance Characteristics

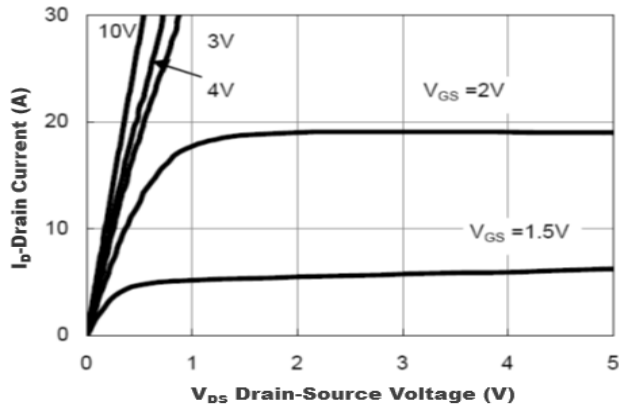


Figure1. Output Characteristics

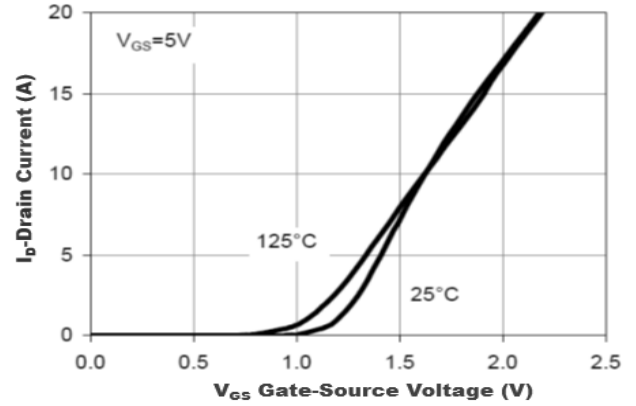


Figure2. Transfer Characteristics

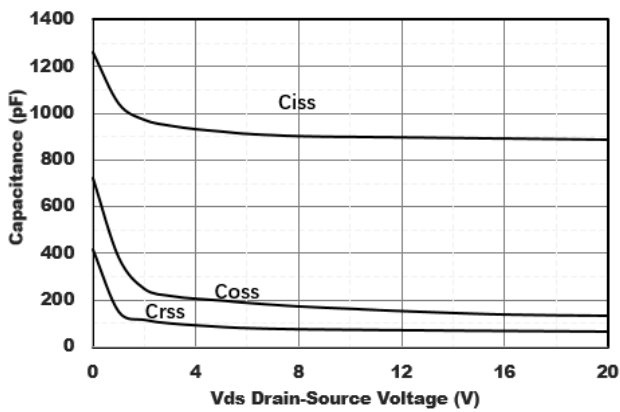


Figure3. Capacitance Characteristics

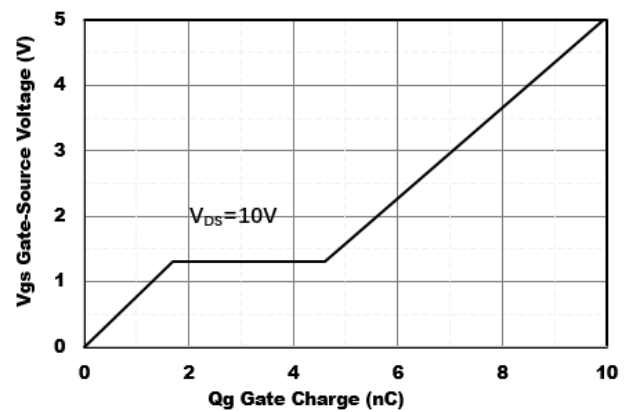


Figure4. Gate Charge

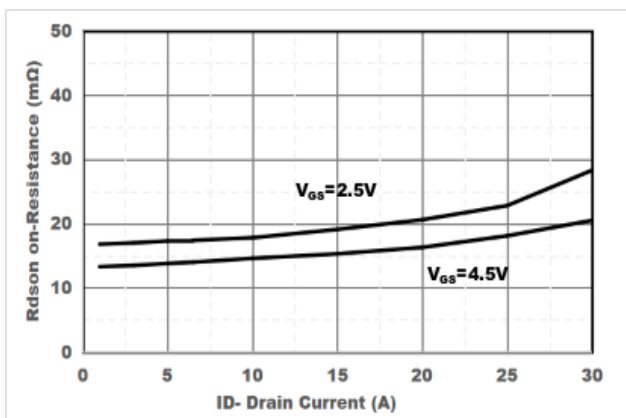


Figure5. Drain-Source on Resistance

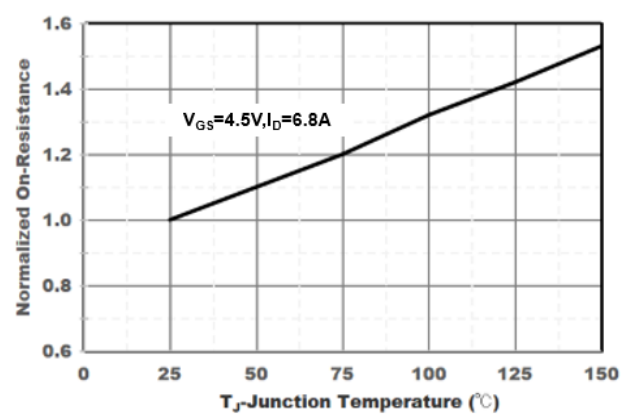


Figure6. Drain-Source on Resistance

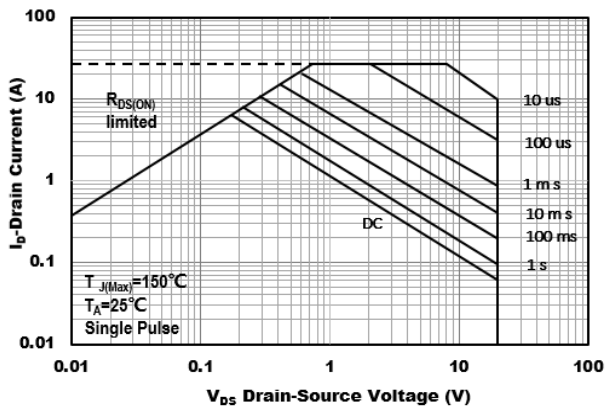


Figure7. Safe Operation Area

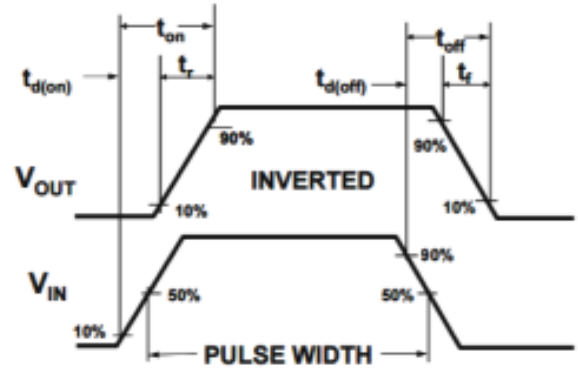
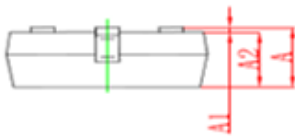
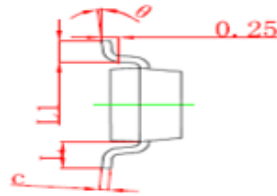
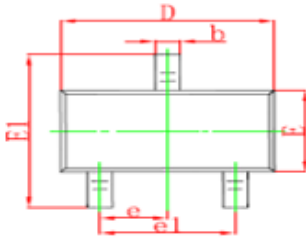


Figure8. Switching wave

■SOT-23 Package information



Symbol	Dimentions in Millimeter		Dimentions 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	0.100	0.200	0.004	0.008
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	0.950Type		0.037Type	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.220REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

■SOT-23 Suggested Pad Layout

