

N-Channel Power MOSFET

Product Summary

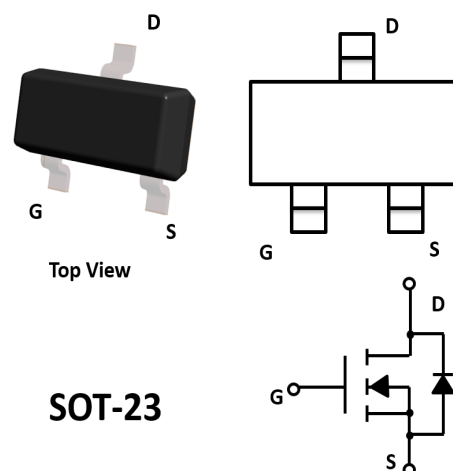
- V_{DS} 30V
- I_D 5.6A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) <29 mohm
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) <40 mohm

General Description

- Trench Power LV MOSFET technology
- High density cell design for low $R_{DS(ON)}$
- High Speed switching

Applications

- Battery protection
- Load switch
- Power management



SOT-23

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

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	30	V
Gate-source Voltage	V_{GS}	± 20	V
Drain Current	I_D	$T_A=25^{\circ}C$ @ Steady State	5.6
		$T_A=70^{\circ}C$ @ Steady State	4.5
Pulsed Drain Current ^A	I_{DM}	30	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 and Storage Temperature Range	T_J, T_{STG}	-55~+150	$^{\circ}C$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	2.2	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5.6A$		21	29	m Ω
		$V_{GS}=4.5V, I_D=5.0A$		27	40	
Diode Forward Voltage	V_{SD}	$I_S=5.6A, V_{GS}=0V$		0.8	1.2	V
Maximum Body-Diode Continuous Current	I_S				5.6	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHZ}$		490		pF
Output Capacitance	C_{oss}			92		
Reverse Transfer Capacitance	C_{rss}			68		
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=15V, I_D=5.6A$		5.2		nC
Gate Source Charge	Q_{gs}			0.9		
Gate Drain Charge	Q_{gd}			1.3		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=4.5V, V_{DD}=15V, I_D=1A, R_{GEN}=2.8\Omega$		4.5		ns
Turn-on Rise Time	t_r			2.5		
Turn-off Delay Time	$t_{D(off)}$			14.5		
Turn-off Fall Time	t_f			3.5		

A. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

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

■ Typical Performance Characteristics

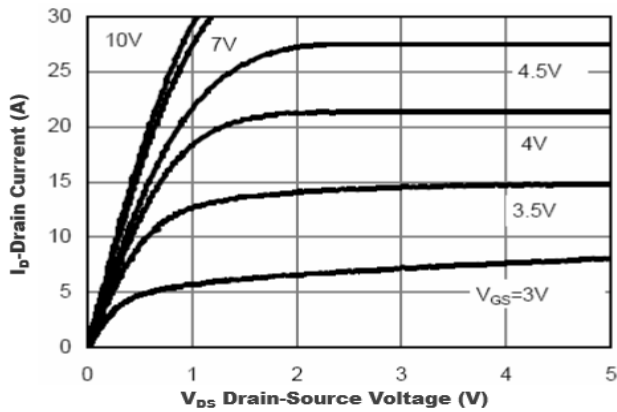


Figure1. Output Characteristics

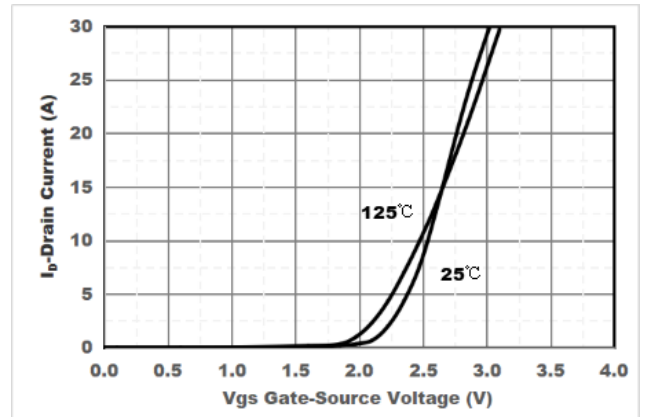


Figure2. Transfer Characteristics

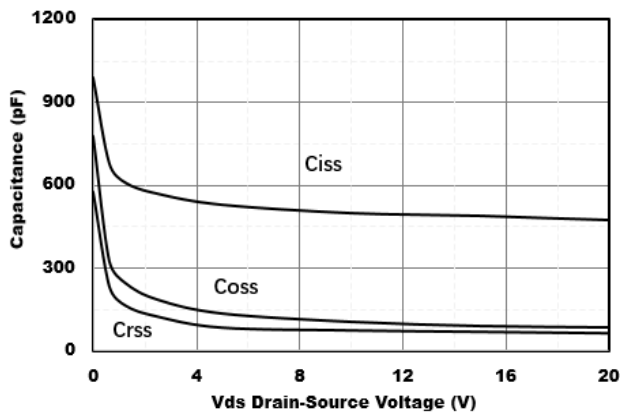


Figure3. Capacitance Characteristics

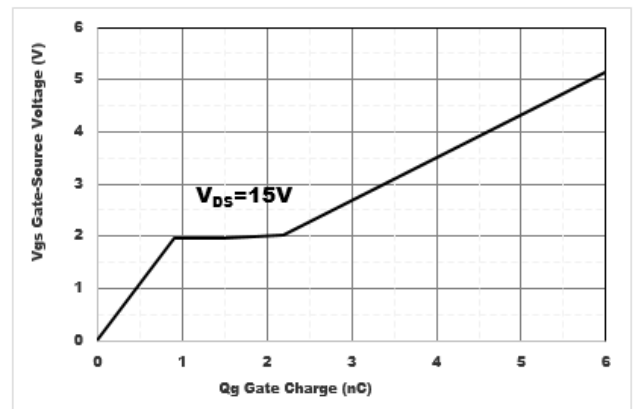


Figure4. Gate Charge

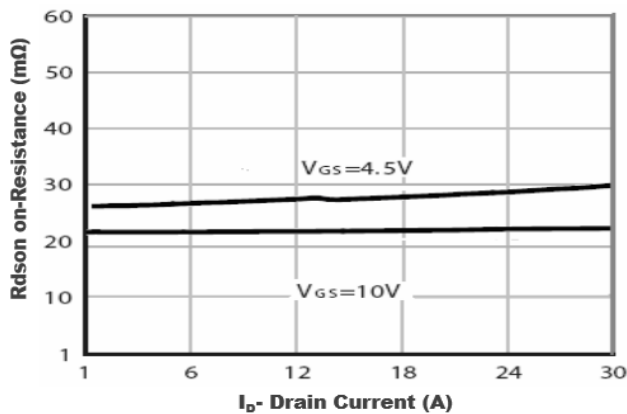


Figure5. Drain-Source on Resistance

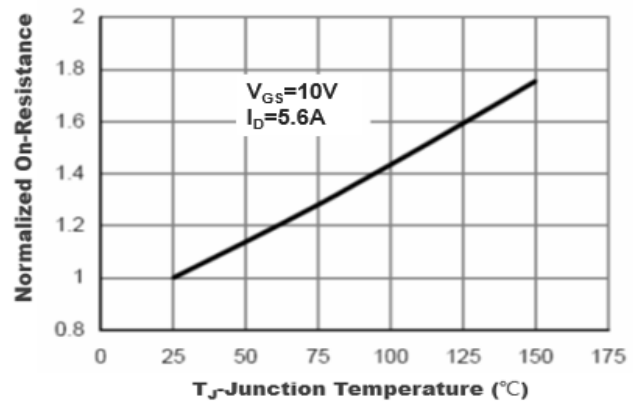


Figure6. Drain-Source on Resistance

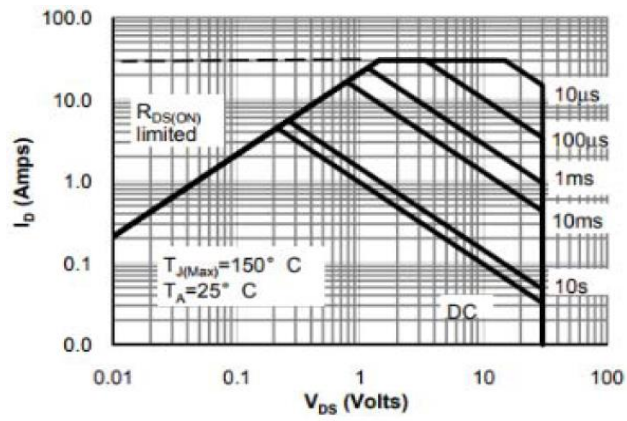


Figure7. Safe Operation Area

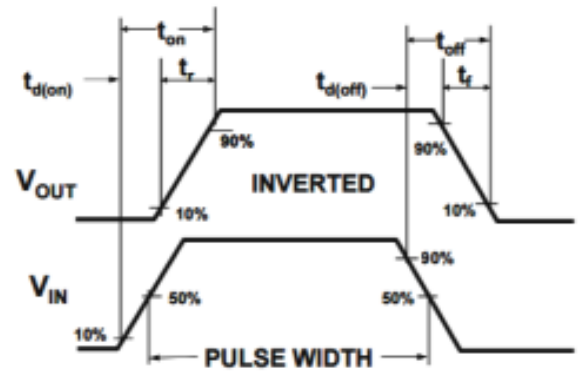
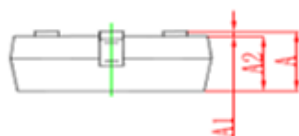
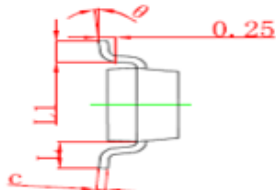
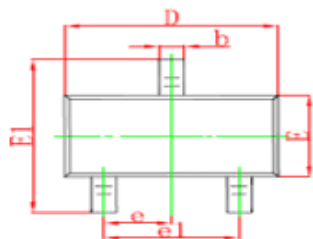


Figure8. Switching wave

■ 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°