

# N-Channel Power MOSFET

## Product Summary

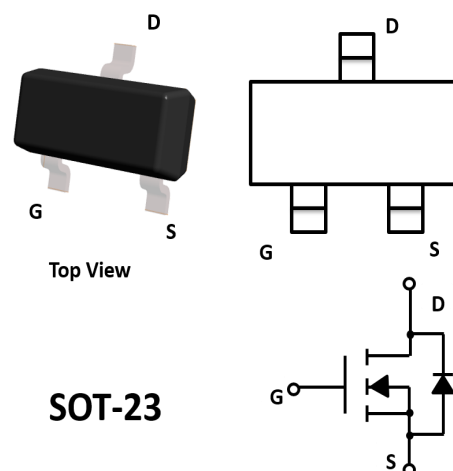
- $V_{DS}$  30V
- $I_D$  5.6A
- $R_{DS(ON)}$ ( at  $V_{GS}=10V$ ) <29 mohm
- $R_{DS(ON)}$ ( at  $V_{GS}=4.5V$ ) <40 mohm

## 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	$V_{GS}$	$\pm 20$	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 <sup>A</sup>	$I_{DM}$	30	A
Total Power Dissipation @ $T_A=25^{\circ}C$	$P_D$	1.2	W
Thermal Resistance Junction-to-Ambient @ Steady State <sup>B</sup>	$R_{\theta JA}$	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
<b>Static Parameter</b>						
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	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	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 $\Omega$
		$V_{GS}=4.5V, I_D=5.0A$		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
<b>Dynamic Parameters</b>						
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		
<b>Switching Parameters</b>						
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

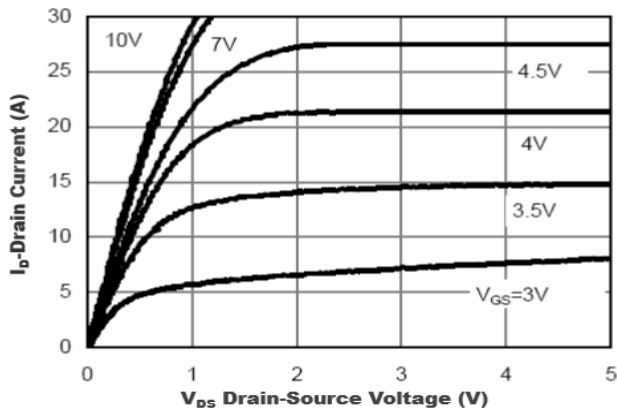


Figure1. Output Characteristics

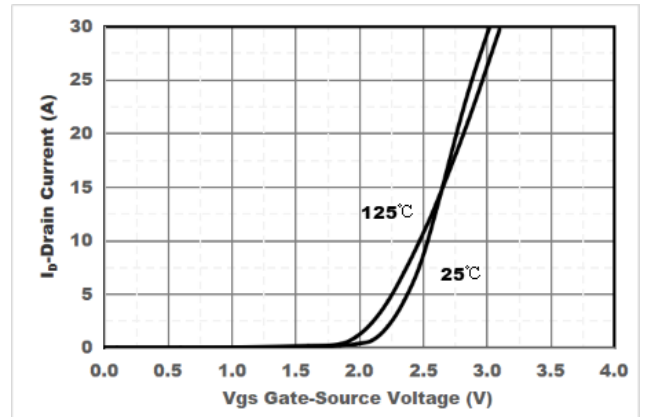


Figure2. Transfer Characteristics

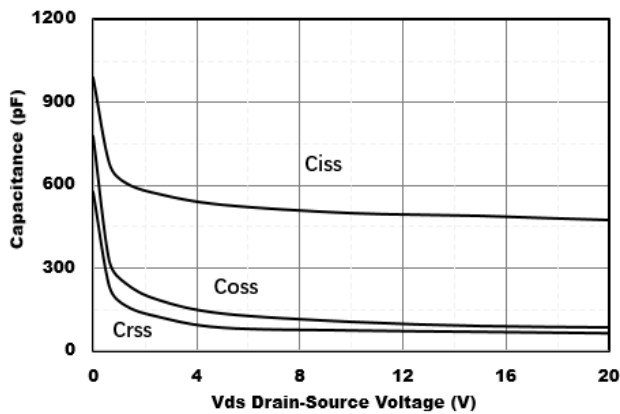


Figure3. Capacitance Characteristics

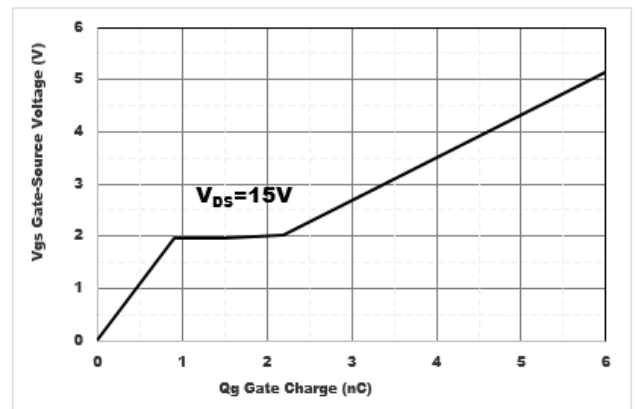


Figure4. Gate Charge

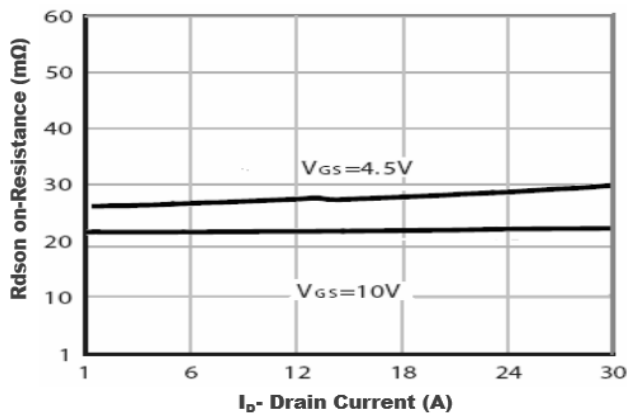


Figure5. Drain-Source on Resistance

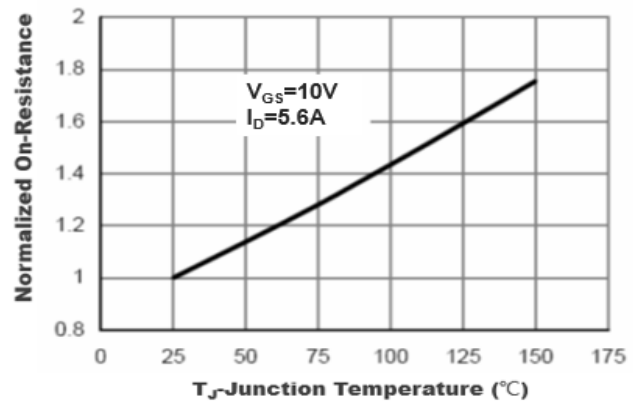


Figure6. Drain-Source on Resistance

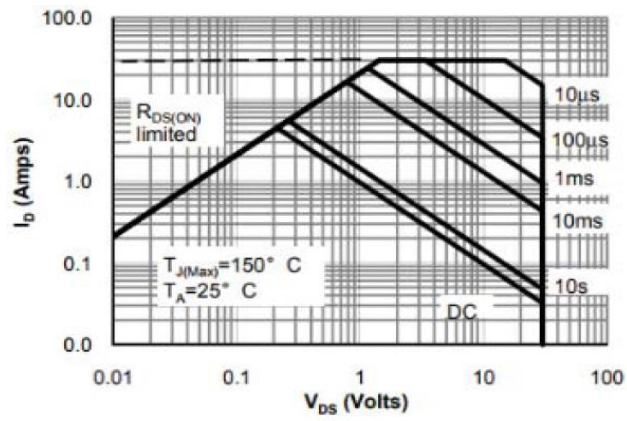


Figure7. Safe Operation Area

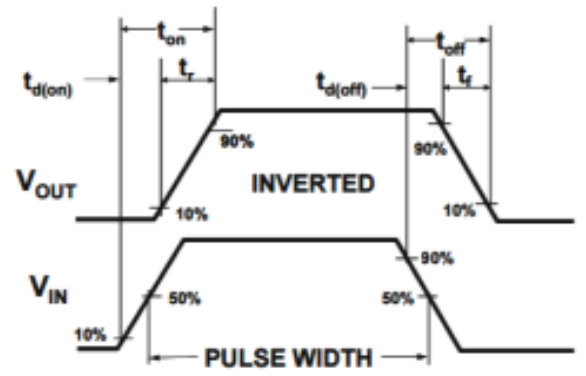
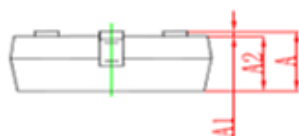
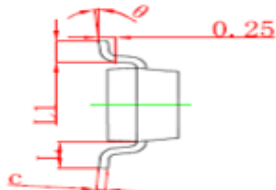
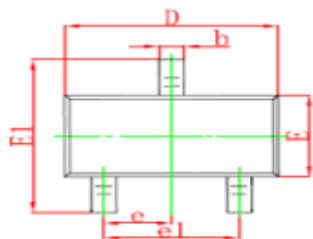


Figure8. Switching wave

**■ 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
$\theta$	0°	8°	0°	8°

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