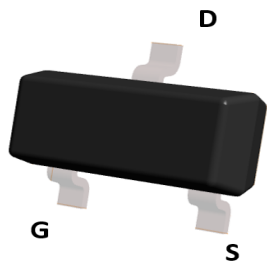
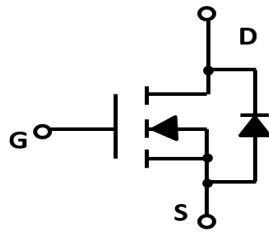
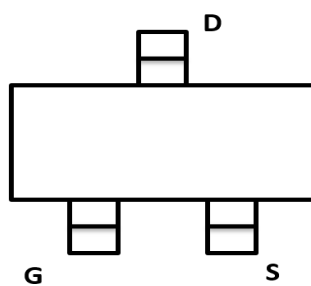


## N-Channel Enhancement Mode Field Effect Transistor



Top View

SOT-23



### Product Summary

- $V_{DS}$  100V
- $I_D$  5.0A
- $R_{DS(ON)}$  (at  $V_{GS}=10V$ ) < 180 mohm
- $R_{DS(ON)}$  (at  $V_{GS}=4.5V$ ) < 300 mohm

### General Description

- Low  $R_{DS(on)}$  & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery

### Applications

- Consumer electronic power supply
- Motor control
- Synchronous-rectification
- Isolated DC/DC convertor
- Invertors

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

Parameter		Symbol	Maximum	Unit
Drain-source Voltage		$V_{DS}$	100	V
Gate-source Voltage		$V_{GS}$	$\pm 20$	V
Drain Current	$T_A=25^\circ C$ @ Steady State	$I_D$	5.0	A
	$T_A=70^\circ C$ @ Steady State		4.0	
Pulsed Drain Current <sup>A</sup>		$I_{DM}$	21	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<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	100			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V			1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.8	3.0	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> =3.0A		110	180	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> =2.0A		160	300	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =5.0A, V <sub>GS</sub> =0V		0.8	1.2	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>				5.0	A
<b>Dynamic Parameters</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, f=1MHZ		206		pF
Output Capacitance	C <sub>oss</sub>			29		
Reverse Transfer Capacitance	C <sub>rss</sub>			1.4		
<b>Switching Parameters</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, I <sub>D</sub> =5.0A		4.3		nC
Gate Source Charge	Q <sub>gs</sub>			1.5		
Gate Drain Charge	Q <sub>gd</sub>			1.1		
Reverse Recovery Charge	Q <sub>rr</sub>	I <sub>F</sub> =2A, di/dt=500A/us		39		
Reverse Recovery Time	t <sub>rr</sub>			32		
Turn-on Delay Time	t <sub>D(on)</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =30V, I <sub>D</sub> =2A, R <sub>L</sub> =1Ω R <sub>GEN</sub> =3Ω		14.7		ns
Turn-on Rise Time	t <sub>r</sub>			3.5		
Turn-off Delay Time	t <sub>D(off)</sub>			20.9		
Turn-off Fall Time	t <sub>f</sub>			2.7		

- A. Repetitive Rating: Pulse width limited by maximum junction temperature.  
 B. Surface Mounted on FR4 Board, t ≤ 10 sec.

## ■ Typical Performance Characteristics

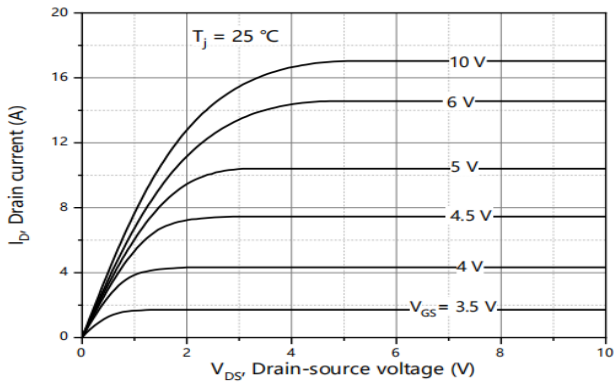


Figure1. Output Characteristics

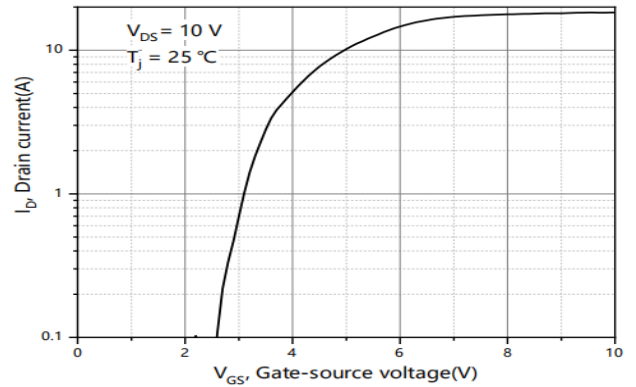


Figure2. Transfer Characteristics

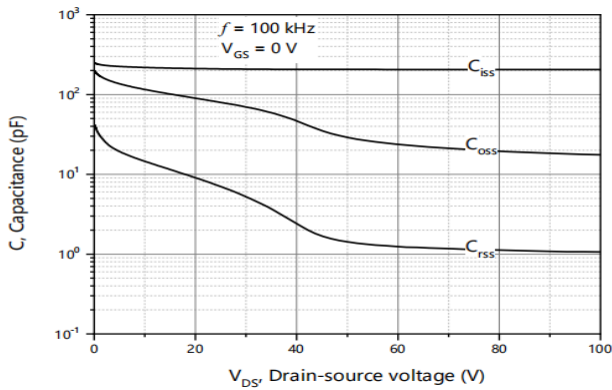


Figure3. Capacitance Characteristics

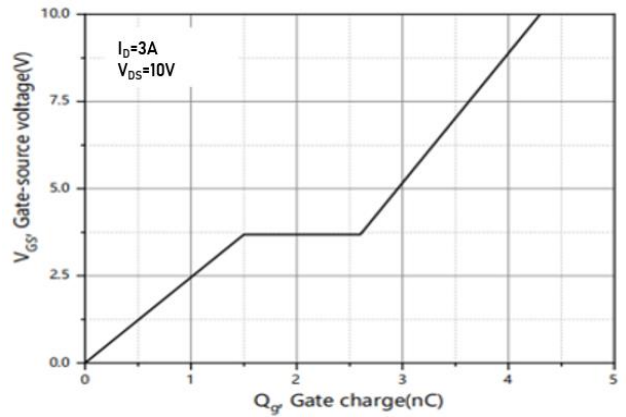


Figure4. Gate Charge

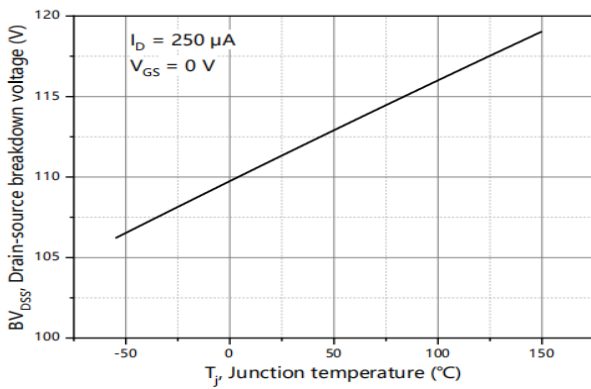


Figure5. Drain-Source breakdown voltage

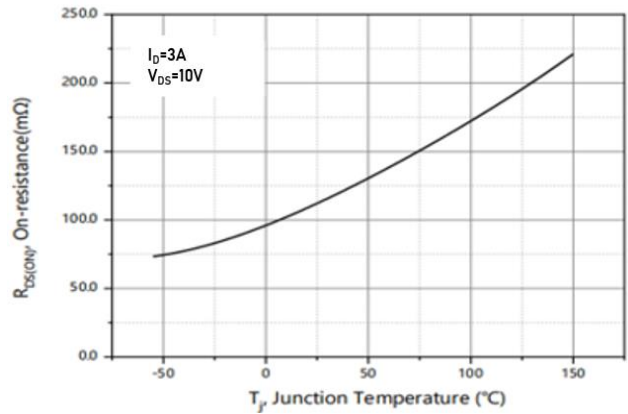


Figure6. Drain-Source on Resistance

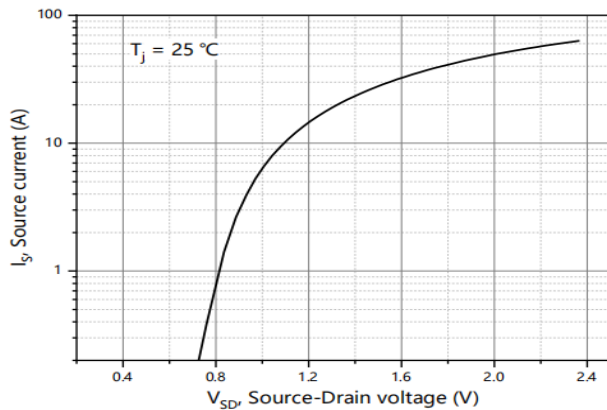


Figure7. Forward characteristic of body diode

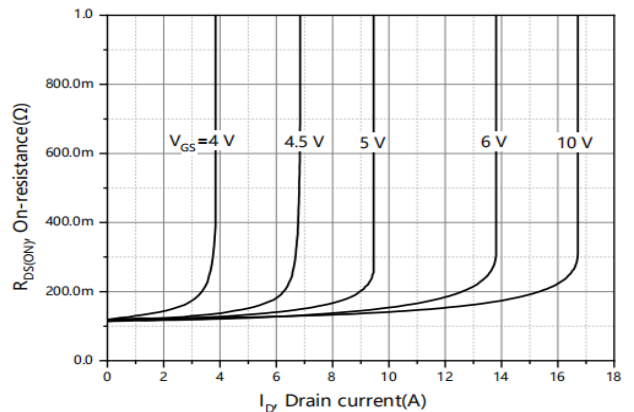


Figure8. Drain-source on-state resistance

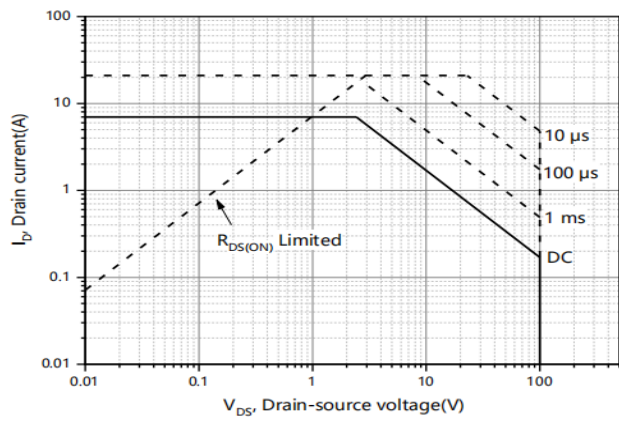


Figure9. Safe Operation Area  $T_A=25\text{ }^\circ\text{C}$

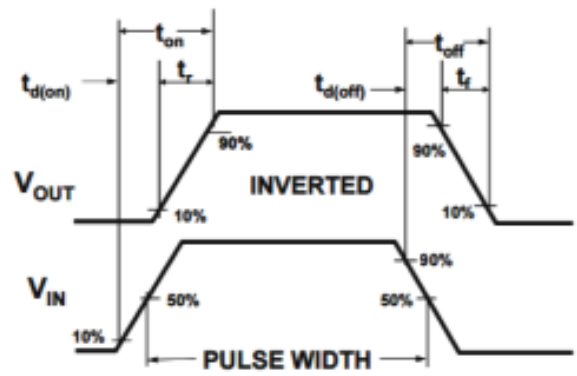
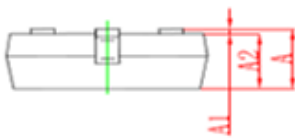
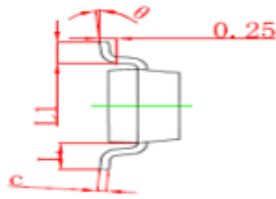
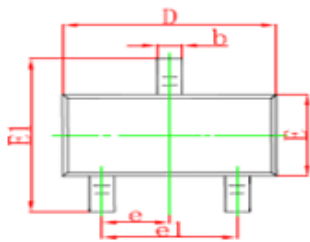


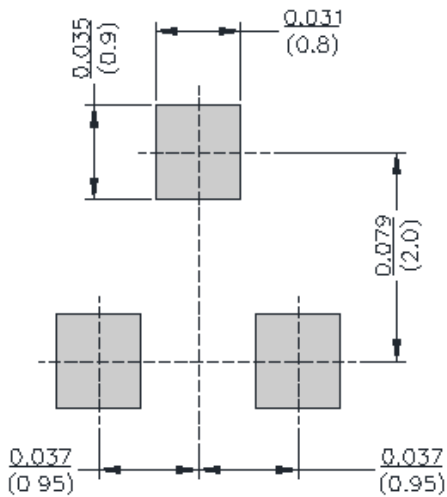
Figure10. Switching wave

## ■ SOT-23 Package information



Symbol	Dimensions in Millimeter		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	0.100	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°

## ■ SOT-23 Suggested Pad Layout



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