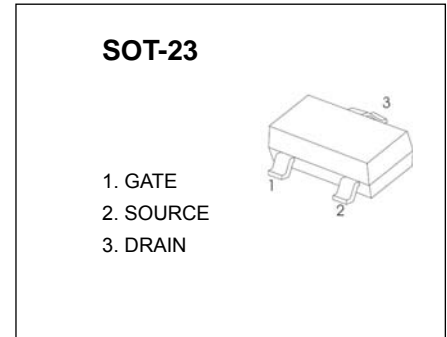


N-Channel 50-V(D-S) MOSFET

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
50V	3.5Ω@10V	220mA
	6Ω@4.5V	



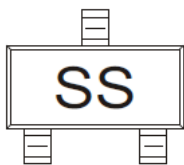
### FEATURE

- High density cell design for extremely low  $R_{DS(on)}$
- Rugged and Reliable

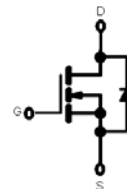
### APPLICATION

- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers; Display, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays

### MARKING



### Equivalent Circuit



### Maximum ratings ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	50	V
Continuous Gate-Source Voltage	$V_{GSS}$	±20	
Continuous Drain Current	$I_D$	0.22	A
Power Dissipation	$P_D$	0.35	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357	$^\circ\text{C}/\text{W}$
Operating Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 ~ +150	

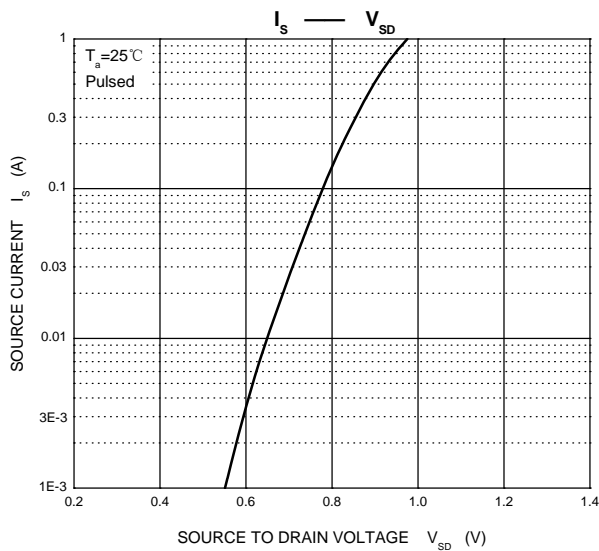
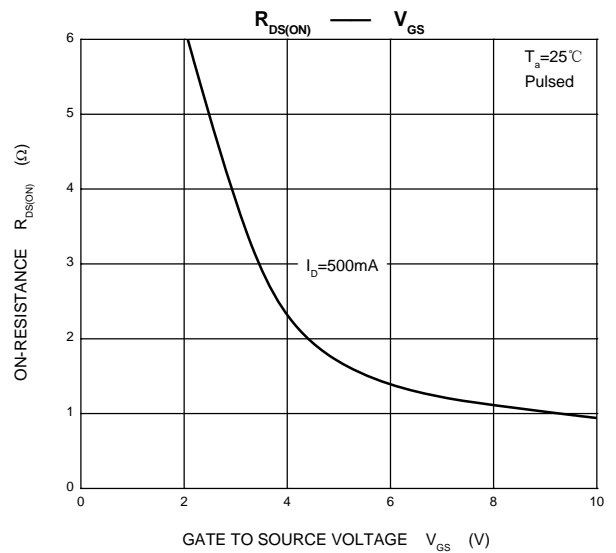
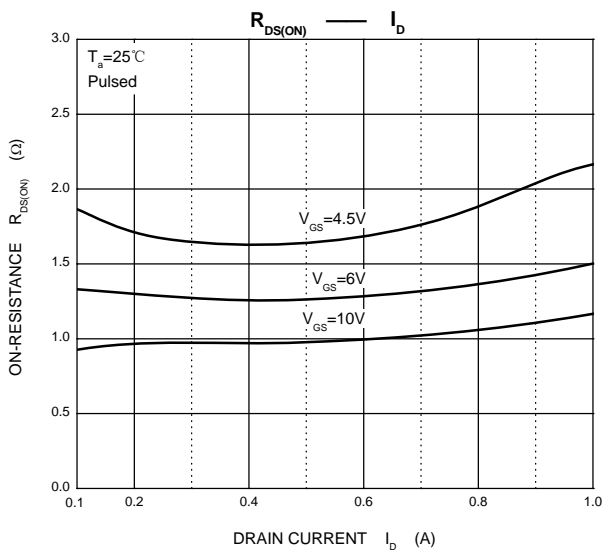
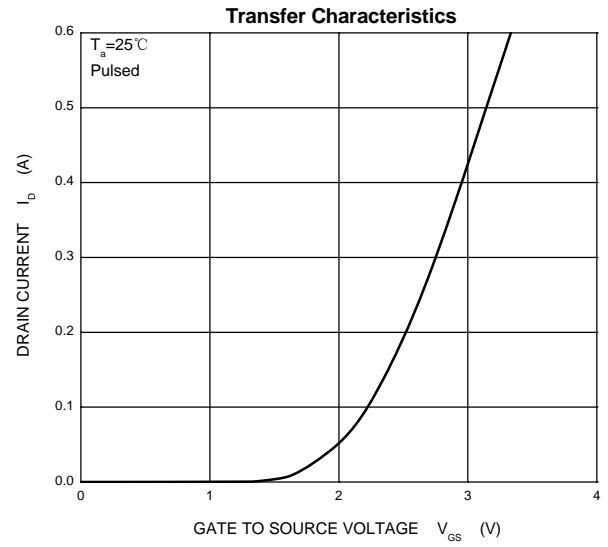
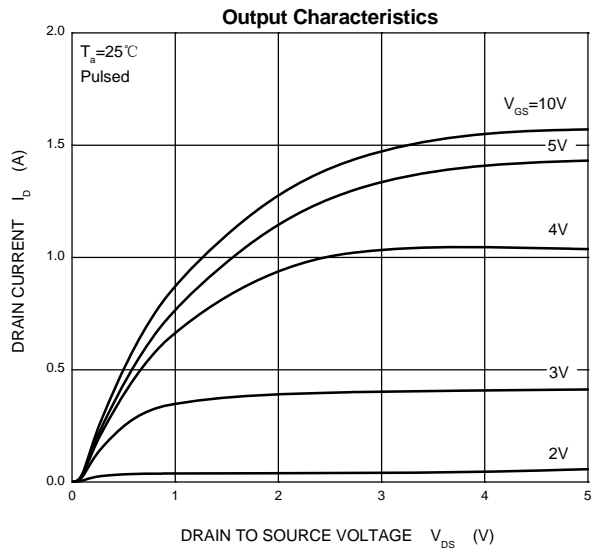
**T<sub>a</sub>=25 °C unless otherwise specified**

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
<b>Off characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	50			V
Gate-body leakage	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V			0.5	μA
		V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			100	nA
<b>On characteristics</b>						
Gate-threshold voltage (note 1)	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =1mA	0.80		1.50	V
Static drain-source on-resistance (note 1)	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =0.22A			3.50	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.22A			6	
Forward transconductance (note 1)	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =0.22A	0.12			S
<b>Dynamic characteristics (note 2)</b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz		27		pF
Output capacitance	C <sub>oss</sub>			13		
Reverse transfer capacitance	C <sub>rss</sub>			6		
<b>Switching characteristics</b>						
Turn-on delay time (note 1,2)	t <sub>d(on)</sub>	V <sub>DD</sub> =30V, V <sub>DS</sub> =10V, I <sub>D</sub> =0.29A, R <sub>GEN</sub> =6Ω			5	ns
Rise time (note 1,2)	t <sub>r</sub>				18	
Turn-off delay time (note 1,2)	t <sub>d(off)</sub>				36	
Fall time (note 1,2)	t <sub>f</sub>				14	
<b>Drain-source body diode characteristics</b>						
Body diode forward voltage (note 1)	V <sub>SD</sub>	I <sub>S</sub> =0.44A, V <sub>GS</sub> = 0V			1.4	V

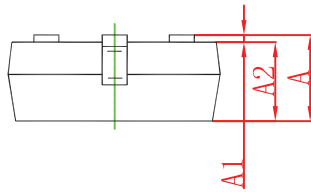
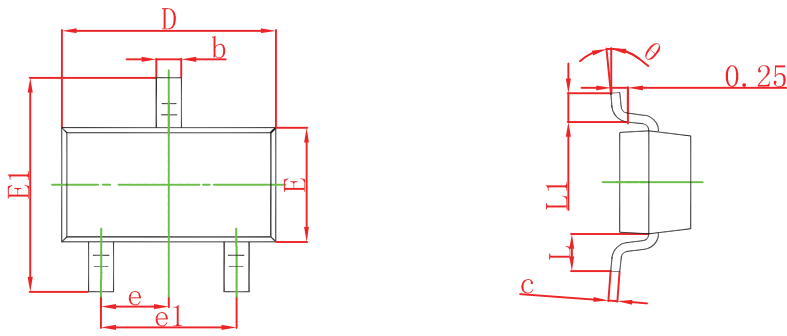
**Notes:**

1. Pulse Test ; Pulse Width ≤300μs, Duty Cycle ≤2%.
2. These parameters have no way to verify.

## Typical Characteristics

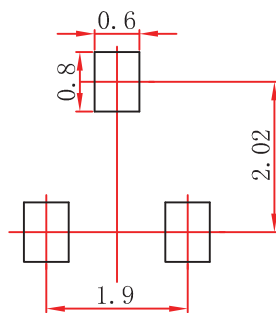


## SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		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	0.080	0.150	0.003	0.006
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	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	6°

## SOT-23 Suggested Pad Layout



**Note:**

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.