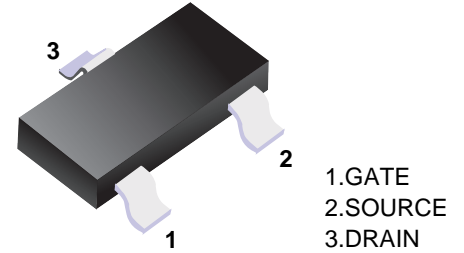


## 2N7002

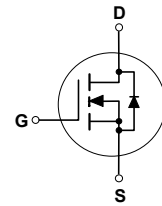
### N-Channel MOSFET

#### ■ Features

- High density cell design for low  $R_{DS(on)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability



#### ■ Simplified outline(SOT-23)



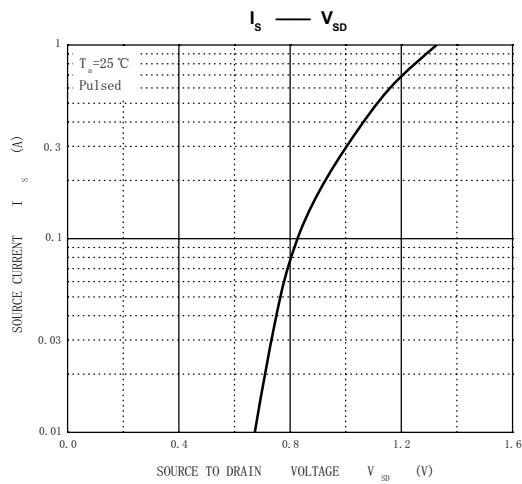
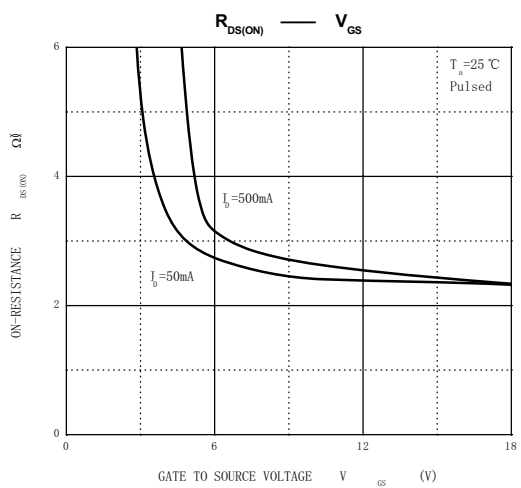
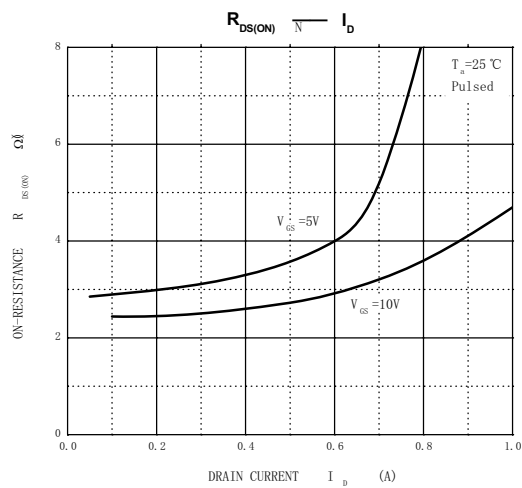
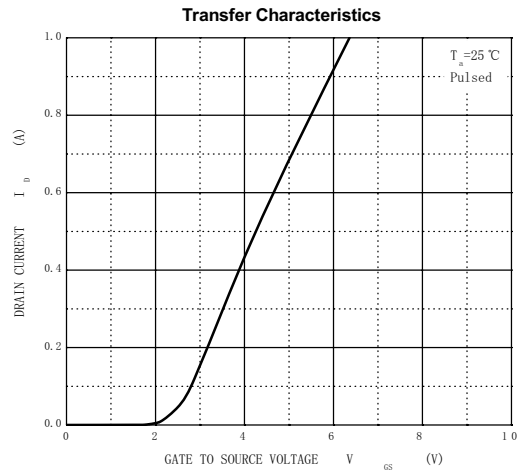
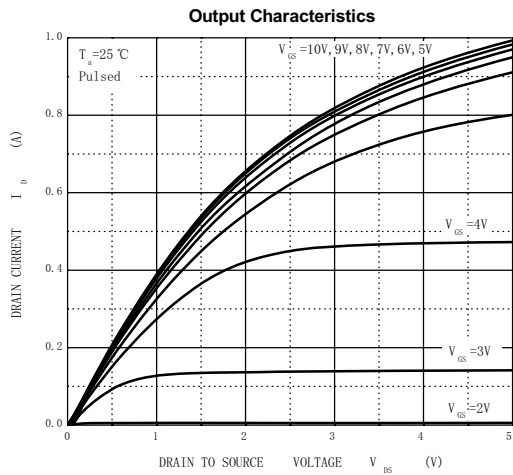
#### ■ Absolute Maximum Ratings $T_a=25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Drain-Source voltage	$V_{DS}$	60	V
Drain Current	$I_D$	115	mA
Power Dissipation	$P_D$	225	mW
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 to 150	$^\circ\text{C}$

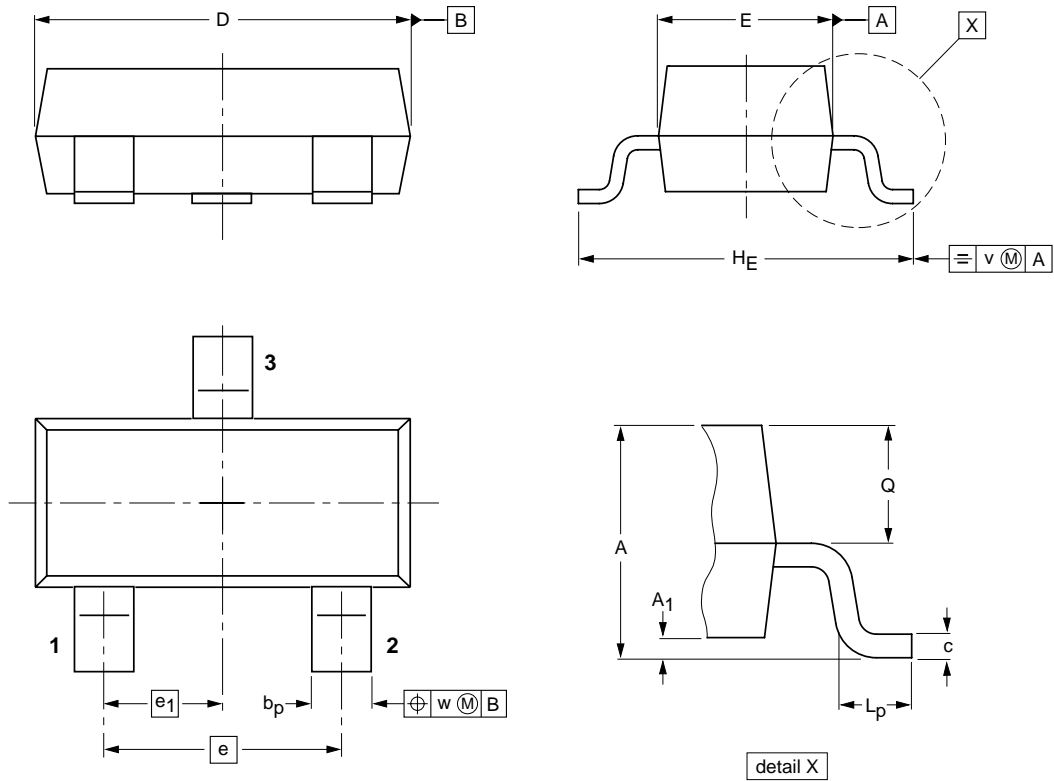
#### ■ Electrical Characteristics $T_a = 25^\circ\text{C}$

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	$V_{DSS}$	$V_{GS}=0\text{ V}, I_D=10\text{ }\mu\text{A}$	60			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=60\text{ V}, V_{GS}=0\text{ V}$			80	nA
Gate-body leakage	$I_{GSS}$	$V_{DS}=0\text{ V}, V_{GS}=\pm 25\text{ V}$			$\pm 80$	nA
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\text{ }\mu\text{A}$	1		2.5	V
Drain-source on-resistance	$r_{DS(on)}$	$V_{GS}=10\text{ V}, I_D=500\text{ mA}$			7.5	$\Omega$
		$V_{GS}=5\text{ V}, I_D=50\text{ mA}$			7.5	
On-state drain current	$I_{D(on)}$	$V_{GS}=10\text{ V}, V_{DS}=7\text{ V}$	500			mA
Forward tran conductance	$g_{fs}$	$V_{DS}=10\text{ V}, I_D=200\text{ mA}$	80			ms
Input capacitance	$C_{iss}$	$V_{DS}=25\text{ V}, V_{GS}=0\text{ V}, f=1\text{ MHz}$			50	pF
Output capacitance	$C_{oss}$				25	
Reverse transfer capacitance	$C_{rSS}$				5	
Turn-on Time	$t_{d(on)}$	$V_{DD}=25\text{ V}, R_L=50\text{ }\Omega$ $I_D=500\text{ mA}, V_{GEN}=10\text{ V}$			20	ns
Turn-off Time	$t_{d(off)}$		$R_G=25\text{ }\Omega$			
Drain-source on-voltage	$V_{DS(on)}$	$V_{GS}=10\text{ V}, I_D=500\text{ mA}$			3.75	V
		$V_{GS}=5\text{ V}, I_D=50\text{ mA}$			0.375	V
Diode forward voltage	$V_{SD}$	$I_S=115\text{ mA}, V_{GS}=0\text{ V}$	0.55		1.2	V

### ■ Typical Characteristics



■ SOT-23



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max.	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1