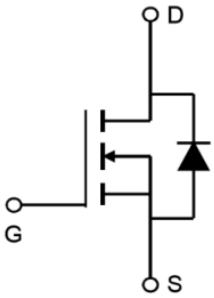
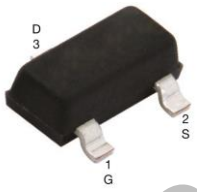
2N7002
60V N-Channel Enhancement Mode MOSFET

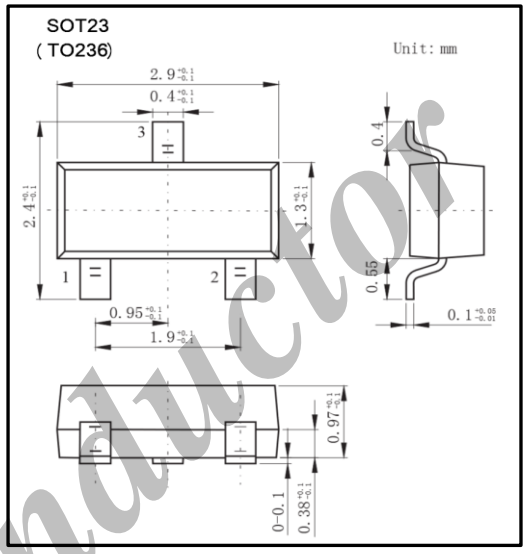
- **General Description**

2N7002 combines advanced MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is most suitable to load-switch or PWM applications.



Top View





- **Applications**

- DC/DC converter for portable devices
- Load switch

- **Product Summary**

V_{DS}	= 60V
I_D	= 115mA
$R_{DS(ON)}$ (at V_{GS} =10V)	< 7.5Ω
$R_{DS(ON)}$ (at V_{GS} = 5V)	< 7.5Ω

Pb-Free

RoHS COMPLIANT

- **Absolute Maximum Ratings (T_a = 25°C, unless noted)**

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	°C
Storage Temperature Range	T_{STG}	-55 to 150	

- **Electrical Characteristics (T_a=25℃, unless noted)**

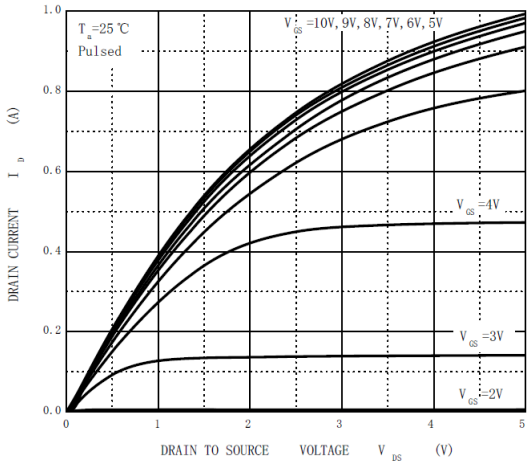
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=100μA, V_{GS}=0V	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			80	nA
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±25V			±80	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1		2.5	V
On-state Drain Current	$I_{D(ON)}$	V_{DS}=7V, V_{GS}=10V	500			mA
Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=500mA			7.5	Ω
		V_{GS}=5V, I_D=50mA			7.5	
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=200mA	80			mS
Diode Forward Voltage	V_{SD}	I_S=115mA, V_{GS}=0V	0.55		1.2	V
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz			50	pF
Output Capacitance	C_{oss}				25	
Reverse Transfer Capacitance	C_{rss}				5	
Turn-On Delay Time	$t_{D(on)}$	V_{DD}=25V, R_L=50Ω, I_D=500mA, V_{GEN}=10V, R_g=25Ω			20	ns
Turn-Off Delay Time	$t_{D(off)}$				40	
Drain-Source On-Voltage	$V_{DS(ON)}$	V_{GS}=10V, I_D=500mA			3.75	V
		V_{GS}=5V, I_D=50mA			0.375	

- **Ordering Information**

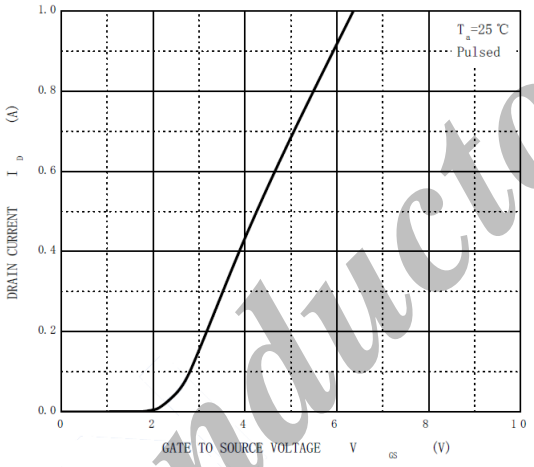
Ordering Part Number	Package	MOQ
2N7002	SOT23 (TO236)	3,000 pcs / reel

- **Typical Characteristics**

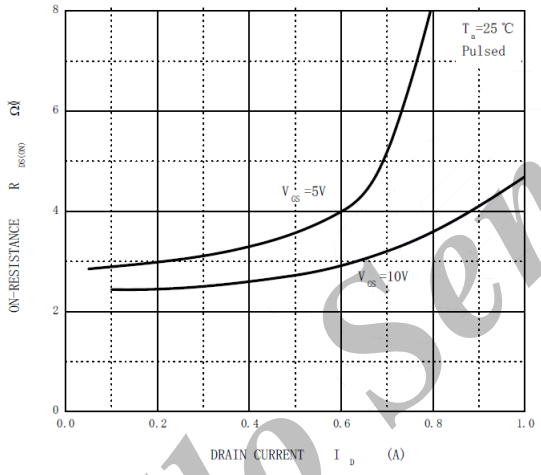
Output Characteristics



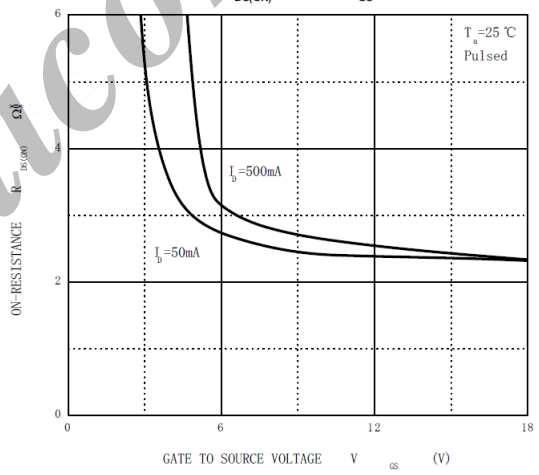
Transfer Characteristics



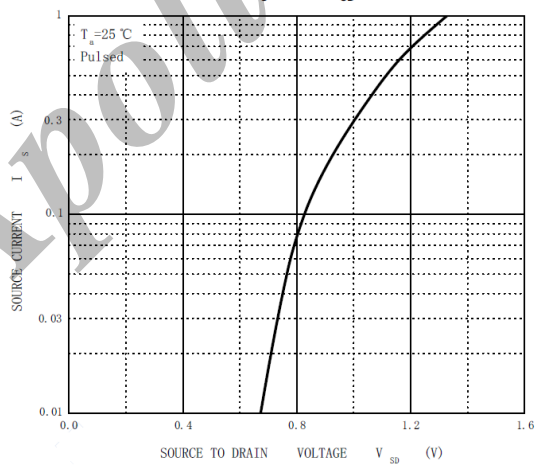
$R_{DS(ON)}$ — I_D



$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



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