



SOT-23 Plastic-Encapsulate Mosfets

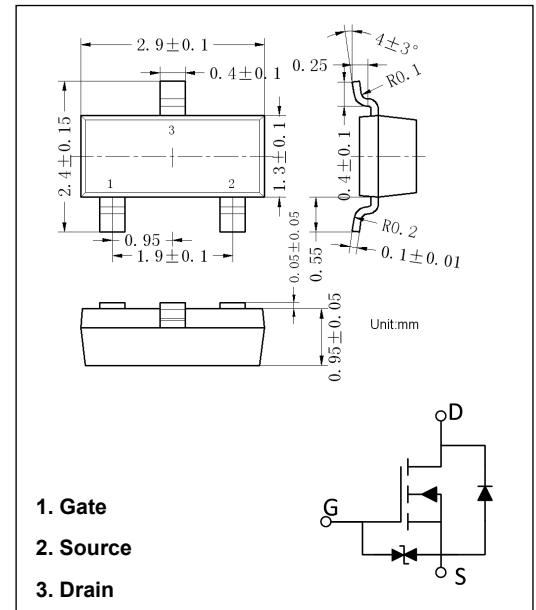
2N7002K

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
- ESD protected up to 2KV

Marking: 702



Maximum Ratings ($T_a=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current	340	mA
P_D	Power Dissipation	350	mW
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	357	$^\circ\text{C}/\text{W}$
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature	-55 to +150	$^\circ\text{C}$

Electrical Characteristics (T_a=25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	60			V
V _{GS(th)}	Gate-Threshold Voltage*	V _{DS} = V _{GS} , I _D = 250μA	1	1.3	2.5	V
I _{GSS}	Gate –Source leakage current	V _{DS} = 0V, V _{GS} = ±20V			±10	μA
		V _{DS} = 0V, V _{GS} = ±10V			±200	nA
		V _{DS} = 0V, V _{GS} = ±5V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 48V, V _{GS} = 0V			1	μA
R _{DS(on)}	Drain-Source On-Resistance*	V _{GS} = 4.5V, I _D = 200mA		2.1	5.3	Ω
		V _{GS} = 10V, I _D = 500mA		1.7	5	
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0V, I _S = 300mA			1.5	V
Q _r	Recovered charge	V _{GS} = 0V, I _S = 300mA, V _R = 25V, dI _S /dt = -100A/μS		30		nC
Dynamic Characteristics**						
C _{iSS}	Input Capacitance*	V _{GS} = 0V V _{DS} = 10V f = 1.0MHz			40	pF
C _{oSS}	Output Capacitance*				30	
C _{rSS}	Reverse Transfer Capacitance*				10	
Switching Characteristics**						
t _{d(on)}	Turn-On Time	V _{GS} =10V, V _{DD} =50V, R _G =50Ω, R _{GS} =50Ω, R _L =250Ω			10	ns
t _{d(off)}	Turn-Off Time				15	
t _{rr}	Reverse recovery Time	V _{GS} =0V, I _S =300mA, V _R =25V, dI _S /dt=-100A/μS		30		
BV _{GSO}	Gate-Source Breakdown Voltage	I _{GS} = ±1mA (Open Drain)	±21.5		±30	V

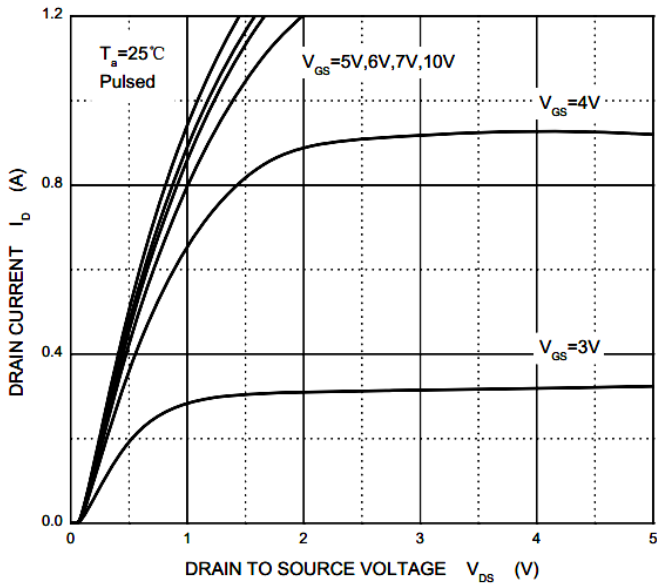
Notes:

*Pulse Test: Pulse Width ≤300μs, Duty Cycle ≤2%.

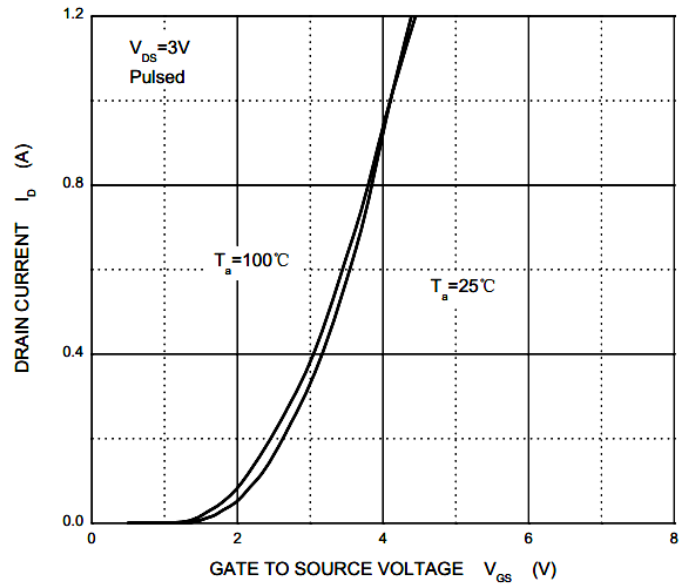
**These parameters have no way to verify.

Typical Characteristics

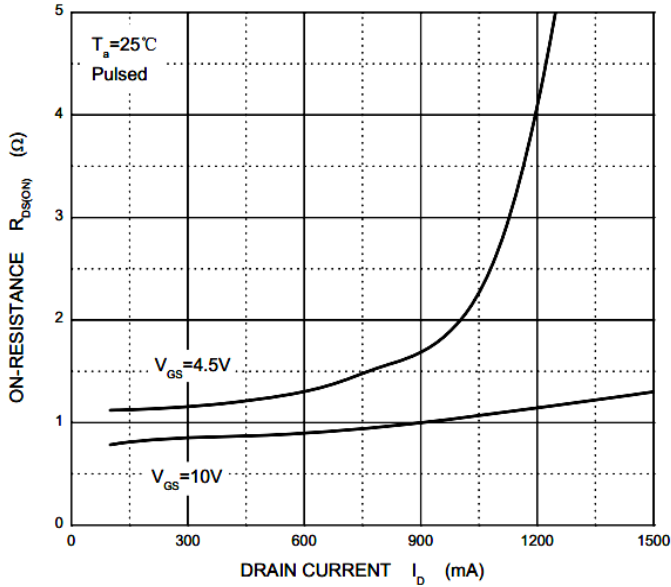
Output Characteristics



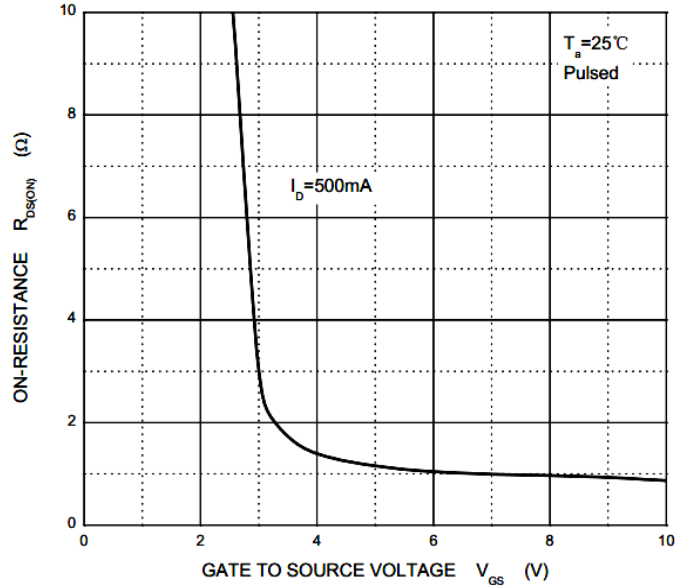
Transfer Characteristics



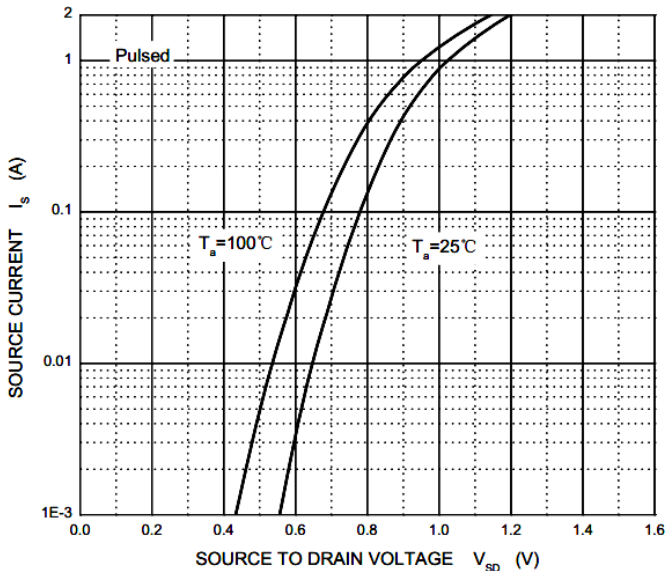
$R_{DS(ON)}$ — I_D



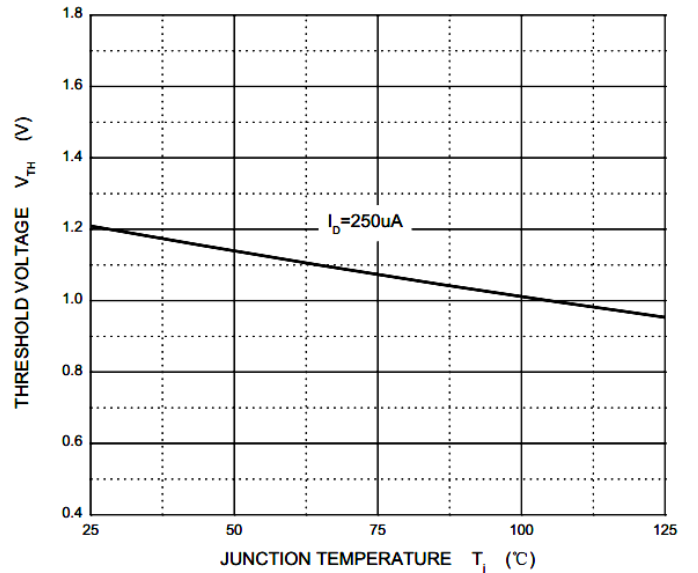
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



Threshold Voltage



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