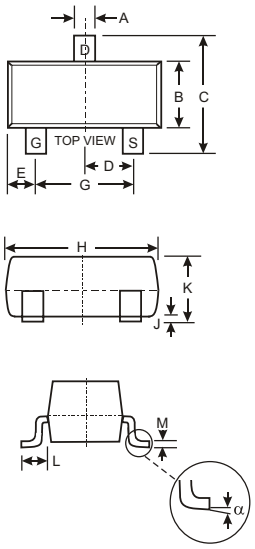
2N7002K

N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

Features

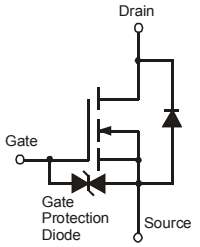
- High density cell design for Low $R_{DS(on)}$.
- Voltage controlled small signal switch.
- Rugged and reliable.
- High saturation current capability.
- ESD protected.
- Marking Code:7002



SOT-23		
Dim	Min	Max
A	0.37	0.51
B	1.20	1.40
C	2.30	2.50
D	0.89	1.03
E	0.45	0.60
G	1.78	2.05
H	2.80	3.00
J	0.013	0.10
K	0.903	1.10
L	0.45	0.61
M	0.085	0.180
α	0°	8°
All Dimensions in mm		

Maximum Ratings @ T_A = 25°C unless otherwise specified

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	60	V
Gate-source Voltage	V_{GS}	±20	V
Drain Current	I_D	300	mA
Pulsed Drain Current [A]	I_{DM}	1.5	A
Total Power Dissipation @ T_A=25℃	P_D	350	mW
Thermal Resistance Junction-to-Ambient @ Steady State [B]	$R_{\theta JA}$	357	℃/ W
Junction and Storage Temperature Range	T_J ,T_{STG}	-55～+150	℃



EQUIVALENT CIRCUIT

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.
B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Electrical Characteristics @ T_A = 25°C unless otherwise specified

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V			±10	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	0.8	1.5	3.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=450mA		2.0	3.5	Ω
		V_{GS}= 4.5V, I_D=200mA		2.8	4.5	
Diode Forward Voltage	V_{SD}	I_S=450mA,V_{GS}=0V			1.2	V
Maximum Body-Diode Continuous Current	I_S				300	mA
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=60V,V_{GS}=0V ,f=1MHZ		18		pF
Output Capacitance	C_{oss}			12		
Reverse Transfer Capacitance	C_{rss}			7		
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=60V, I_D=0.3A		1.7	2.4	nC
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DD}=30V, I_D=300mA, R_{GEN}=6Ω		5		ns
Turn-off Delay Time	$t_{D(off)}$			17		
Reverse recovery Time	t_{rr}	V_{GS}=0V,I_S=300mA, V_R=25V, dI_S/dt=- 100A/μs		30		ns

TYPICAL TRANSIENT CHARACTERISTICS

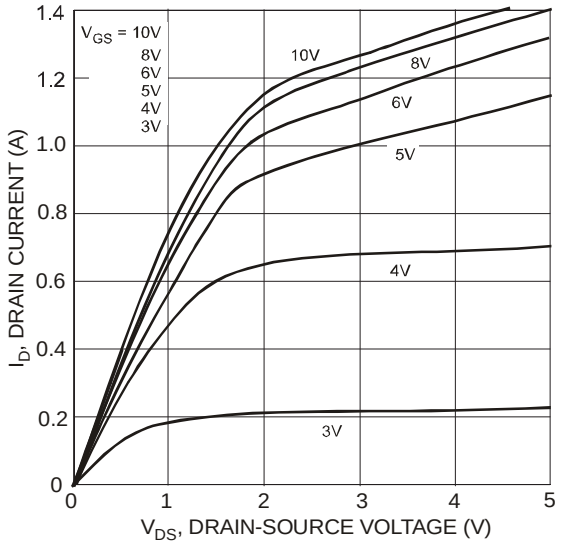


Fig. 1 Typical Output Characteristics

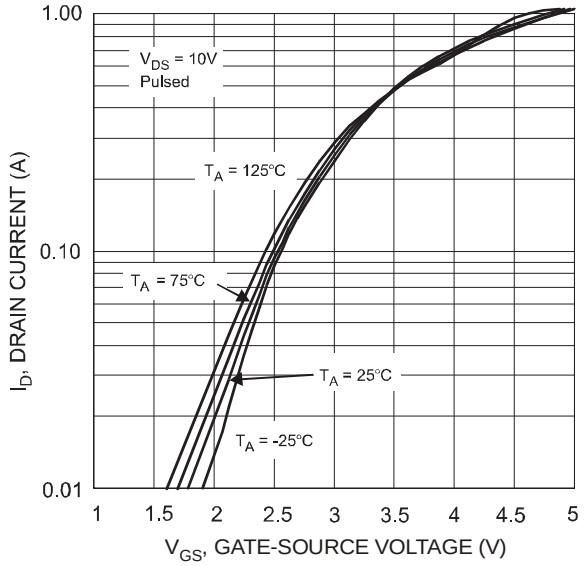


Fig. 2 Typical Transfer Characteristics

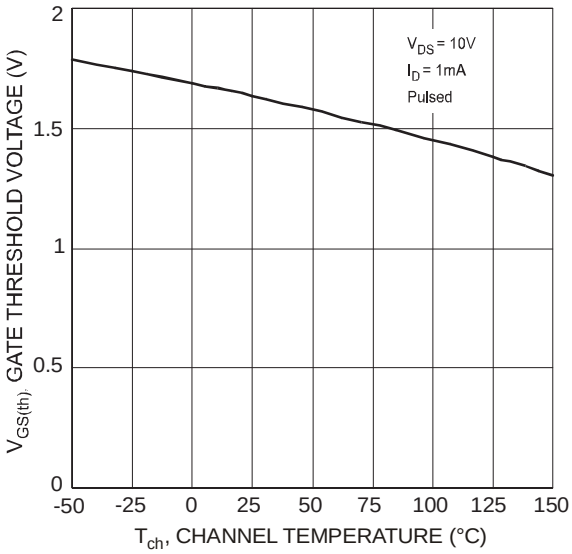


Fig. 3 Gate Threshold Voltage vs. Channel Temperature

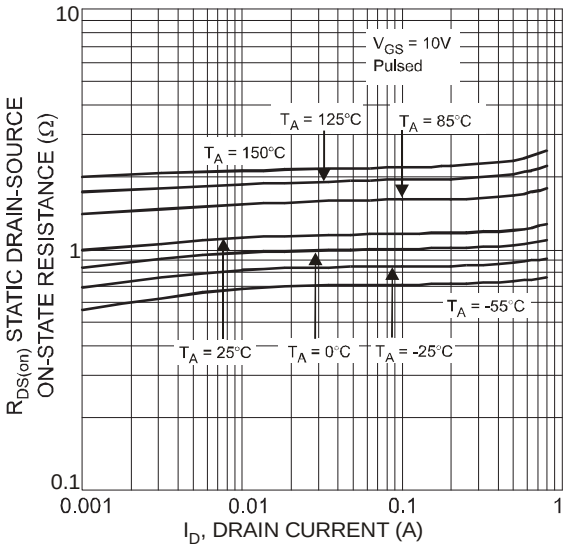


Fig. 4 Static Drain-Source On-Resistance vs. Drain Current

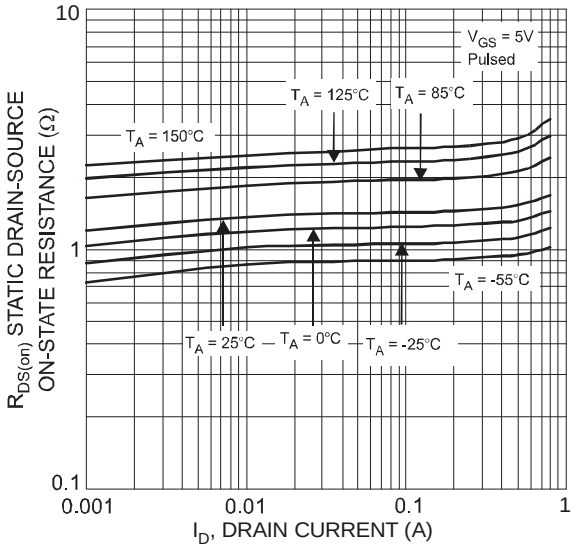


Fig. 5 Static Drain-Source On-Resistance vs. Drain Current

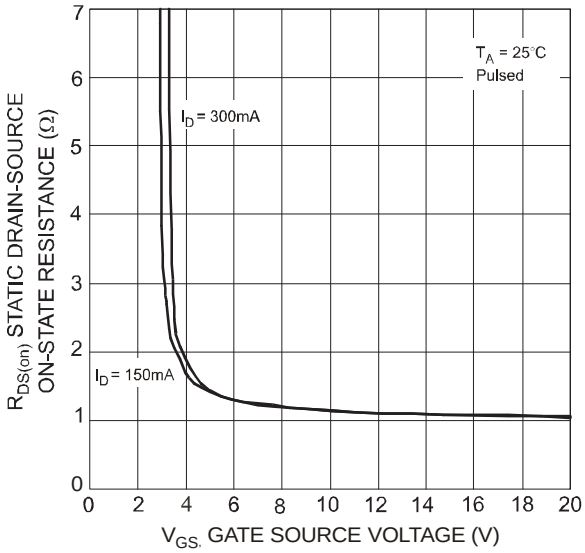


Fig. 6 Static Drain-Source On-Resistance vs. Gate-Source Voltage

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