Elektronische Bauelemente

2N7002K

0.3A , 60V , $R_{DS(ON)}$ 4 Ω

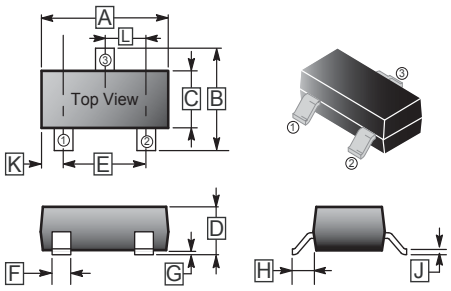
N-Ch Small Signal MOSFET with ESD Protection

RoHS Compliant Product
A suffix of "-C" specifies halogen & lead-free

FEATURES

- $R_{DS(ON)}$, V_{GS}@10V, I_{DS}@500mA=3Ω
- $R_{DS(ON)}$, V_{GS}@4.5V, I_{DS}@200mA=4Ω
- Advanced Trench Process Technology
- High Density Cell Design For Ultra Low On-Resistance
- Very Low Leakage Current In Off Condition
- Specially Designed for Battery Operated Systems, Solid-State Relays Drivers：Relays, Displays, Lamps, Solenoids, Memories, etc.
- ESD Protected 2KV HBM
- In compliance with EU RoHS 2002/95/EC directives

SOT-23



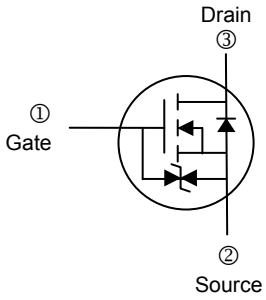
MECHANICAL DATA

- Case: SOT-23 Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.008 gram

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.80	3.04	G	0.09	0.18
B	2.10	2.55	H	0.45	0.60
C	1.20	1.40	J	0.08	0.177
D	0.89	1.15	K	0.6 REF.	
E	1.78	2.04	L	0.89	1.02
F	0.30	0.50			

MARKING

K72



PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7' inch

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise specified)

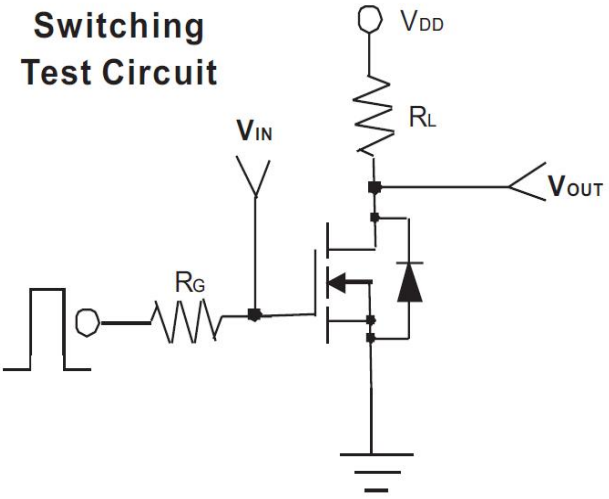
Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current		I_D	300	mA
Pulsed Drain Current [1]		I_{DM}	2000	mA
Maximum Power Dissipation	T_A=25°C	P_D	0.35	W
	T_A=75°C		0.21	
Thermal Resistance Junction-Ambient (PCB mounted) [2]		$R_{\theta JA}$	357	°C/W
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 ~ +150	°C

Notes:
1. Maximum DC current limited by the package.
2. Surface mounted on FR4 board, t < 5sec.

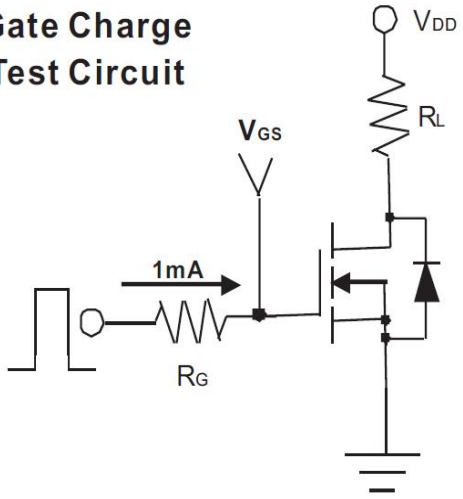
ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	60	-	-	V	V_{GS} =0, I_D =10μA
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	2.5	V	V_{DS} = V_{GS}, I_D =250μA
Drain-Source On-Resistance	$r_{DS(ON)}$	-	-	4	Ω	V_{GS} =4.5V, I_D =200mA
		-	-	3		V_{GS} =10V, I_D =500mA
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	V_{DS} =60V, V_{GS} =0
Gate-Body Leakage Current	I_{GSS}	-	-	±10	μA	V_{DS} = 0, V_{GS} = ±20V
Forward Transconductance	g_{fs}	100	-	-	mS	V_{DS} = 15V, I_D =250 mA
Dynamic						
Total Gate Charge	Q_g	-	-	0.8	nC	V_{DS}=15V, V_{GS}=5V, I_D=200mA
Turn-On Time	$t_{(on)}$	-	-	20	nS	V_{DD}=30V, R_L=150Ω, I_D=200mA, V_{GEN}=10V, R_G=10Ω
Turn-Off Time	$t_{(off)}$	-	-	40		
Input Capacitance	C_{iss}	-	-	35	pF	V_{DS}=25V, V_{GS}=0, f=1MHz
Output Capacitance	C_{oss}	-	-	10		
Reverse Transfer Capacitance	C_{rss}	-	-	5		
Source-Drain Diode						
Diode Forward Voltage	V_{SD}	-	0.82	1.3	V	I_S=200mA, V_{GS}=0
Continuous Diode Forward Current	I_S	-	-	300	mA	
Pulse Diode Forward Current	I_{SM}	-	-	2000	mA	

Switching Test Circuit



Gate Charge Test Circuit



CHARACTERISTIC CURVE

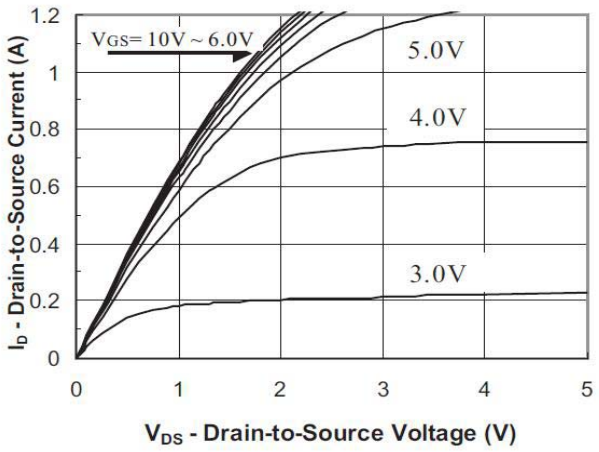


FIG.1-Ouput Characteristic

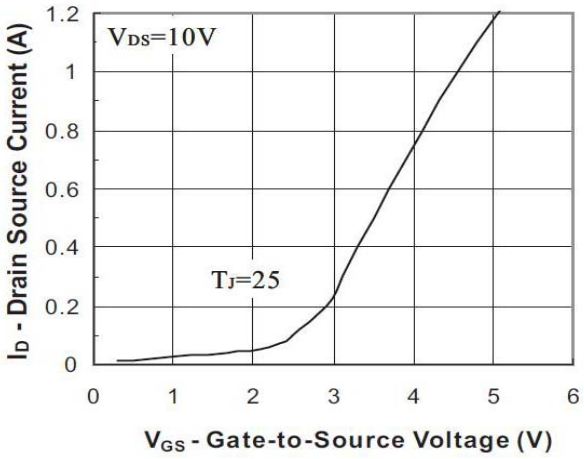


FIG.2-Transfer Characteristic

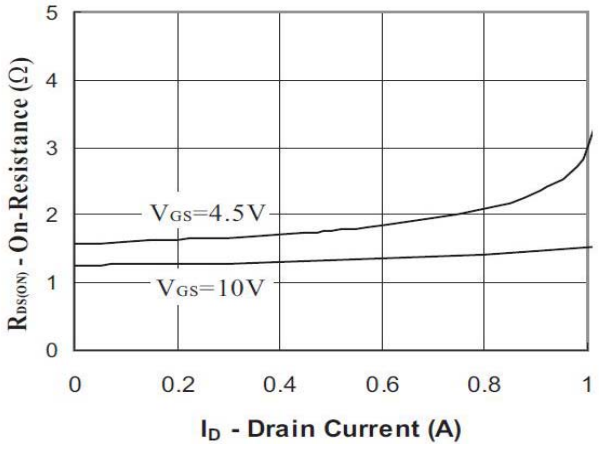


FIG.3-On Resistance vs Drain Current

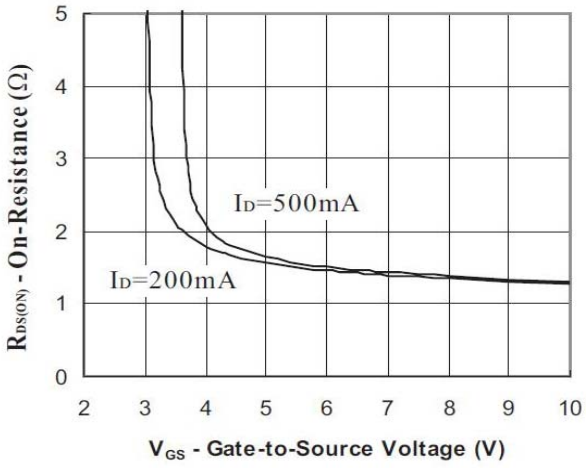


FIG.4- On Resistance vs Gate to Source Voltage

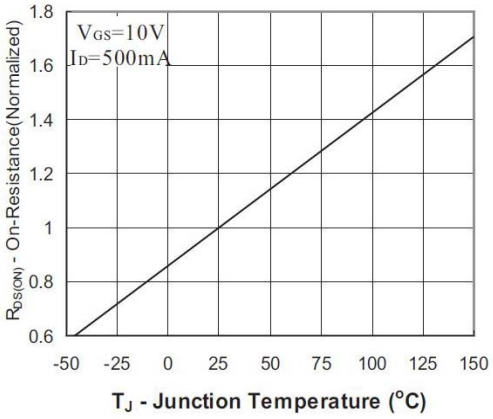


FIG.5-On Resistance vs Junction Temperature

CHARACTERISTIC CURVE

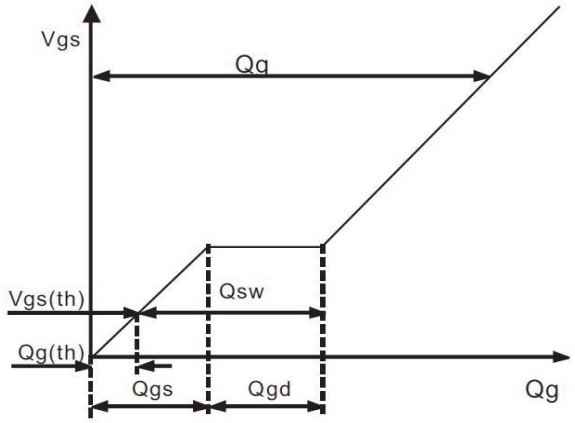


FIG.6-Gate Charge Waveform

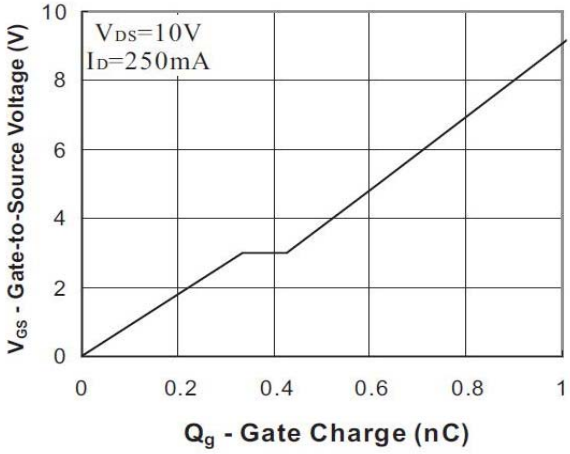


FIG.7-Gate Charge

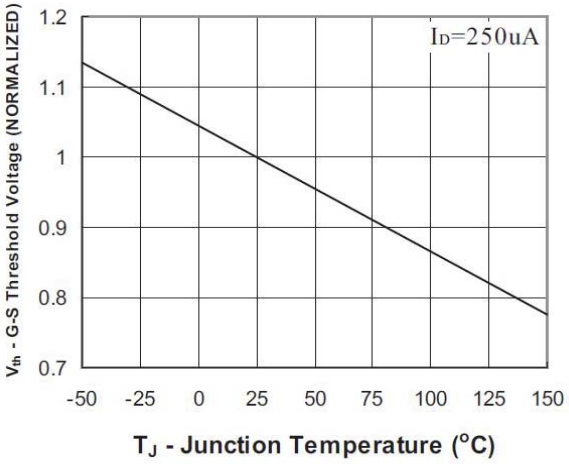


FIG.8-Threshold Voltage vs Temperature

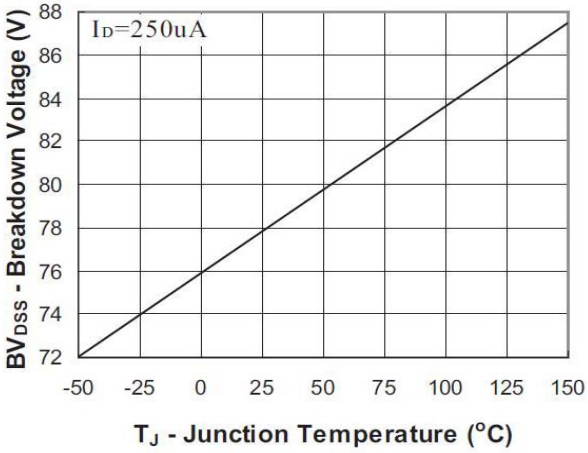


FIG.9-Breakdown Voltage vs Junction Temperature

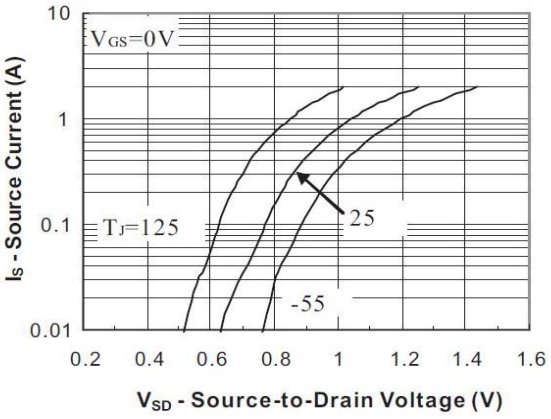


FIG.10-Source-Drain Diode Forward Voltage