Elektronische Bauelemente

2N7002KG

190 mA, 60 V, $R_{DS(ON)}$ = 2 Ω

N-Ch Small Signal MOSFET with Gate Protection

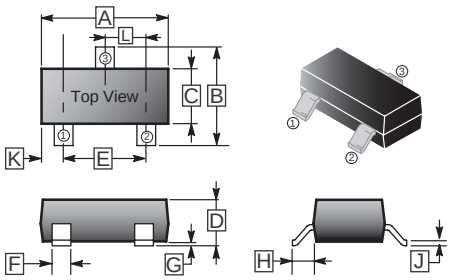
RoHS Compliant Product

A suffix of "-C" specifies halogen & lead-free

FEATURES

- 2 kV ESD Protection
- Lower On-resistance: 2 Ω
- Low Threshold: 2 V (Typ.)
- Low Input Capacitance: 25 pF
- Fast Switching Performance: 25 nS
- Low Input and Output Leakage

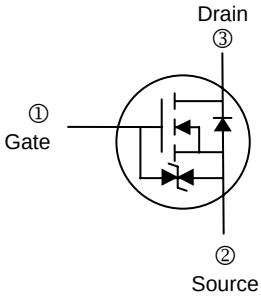
SOT-23



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			

APPLICATIONS

- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers, Display, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays



PACKAGE INFORMATION

Weight: 0.07800g (Approximately)

MARKING CODE

K7K

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings N-Ch	Unit	Test Conditions
Drain-Source Voltage	V_{DS}	60	V	
Gate-Source Voltage	V_{GS}	±20		
Continuous Drain Current[2]	I_D	300	mA	@T_A=25°C
Continuous Drain Current[2]		190		@T_A=100°C
Pulsed Drain Current[1]	I_{DM}	800		
Power Dissipation[2]	P_D	0.35	W	@T_A=25°C
		0.14		@T_A=100°C
Thermal Resistance Junction-Ambient Max.	$R_{\theta JA}$	350	°C/W	
Operating Junction and Storage Temperature	T_J, T_{STG}	-55 ~ +150	°C	

Notes:
1. Pulse width limited by maximum junction temperature.
2. Surface mounted on FR4 board.

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

Parameter	Symbol	Min.	Typ.[2]	Max.	Unit	Test Conditions
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	60	-	-	V	V_{GS} = 0, I_D = 10uA
Gate-Threshold Voltage	$V_{GS(th)}$	1.0	-	2.5		V_{DS} = V_{GS}, I_D = 250uA
Forward Transconductance[2]	g_{fs}	100	-	-	mS	V_{DS} = 10V, I_D = 200 mA
Gate-Body Leakage Current	I_{GSS}	-	-	±10	μA	V_{DS} = 0, V_{GS} = ±20V
		-	-	±150	nA	V_{DS} = 0, V_{GS} = ±10V
		-	-	±1000		V_{DS}=0,V_{GS}=±10V,T_J=85°C
		-	-	±100		V_{DS} = 0, V_{GS} = ±5V
Zero Gate Voltage Drain Current	I_{DSS}	-	-	10		V_{DS} = 50, V_{GS} = 0
		-	-	100		V_{DS} = 50V, V_{GS}=0, T_J=85°C
		-	-	1	μA	V_{DS} = 60V, V_{GS} = 0
		-	-	500		V_{DS}=60V, V_{GS}=0, T_J=125°C
On-State Drain Current[2]	$I_{D(ON)}$	800	-	-	mA	V_{GS} = 10V, V_{DS} = 7.5V
		500	-	-		V_{GS} = 4.5V, V_{DS} = 10V
Drain-Source On-Resistance[2]	$r_{DS(ON)}$	-	-	2	Ω	V_{GS} = 10V, I_{DS} = 500mA
		-	-	4		V_{GS} = 4.5V, I_{DS} = 200mA
Diode Forward Voltage	$V_{DS(ON)}$	-	-	1.3	V	I_S = 200mA, V_{GS} = 0
Dynamic[2]						
Total Gate Charge	Qg	-	0.4	0.6	nC	V_{DS}=10V,V_{GS}=4.5V,I_D=250mA
Input Capacitance	Ciss	-	30	-	pF	V_{DS}=25V, V_{GS}=0V, f=1MHz
Output Capacitance	Coss	-	6	-		
Reverse Transfer Capacitance	Crss	-	2.5	-		
Switching[2,3]						
Turn-On Time	$t_{(ON)}$	-	-	25	nS	V_{DD}=30V,R_L=150Ω,I_D= 200mA,V_{GEN}=10V,R_G=10Ω
Turn-Off Time	$t_{(OFF)}$	-	-	35		

Notes:
1. T_A = 25°C unless otherwise noted.
2. For DESIGN AID ONLY, not subject to production testing.
3. Pulse test: PW ≦ 300μs duty cycle ≦ 2%
4. Switching time is essentially independent of operating temperature.

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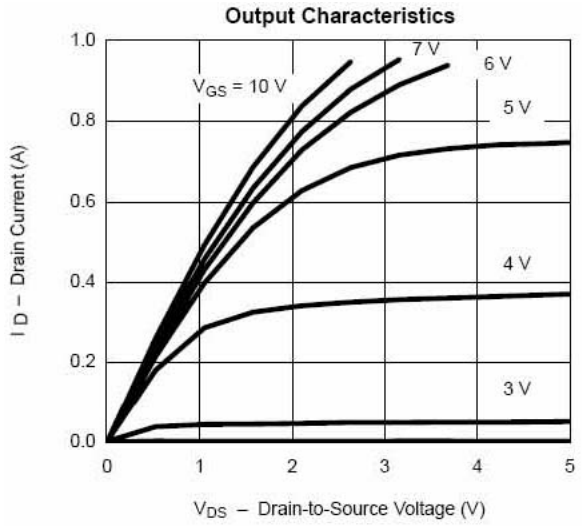
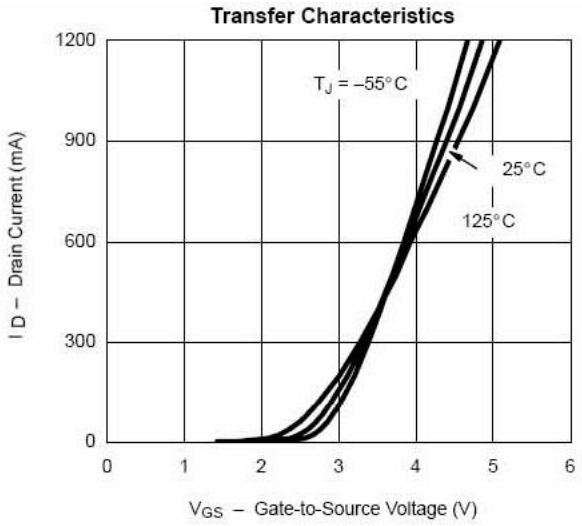
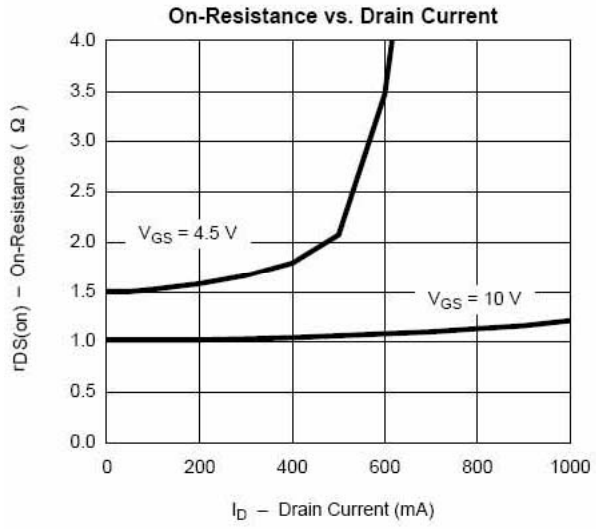
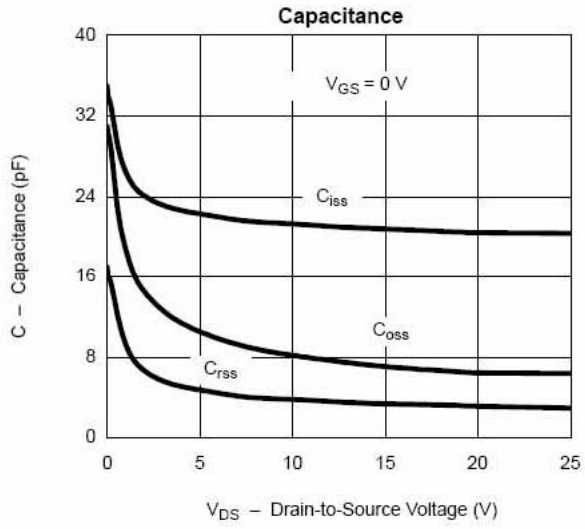
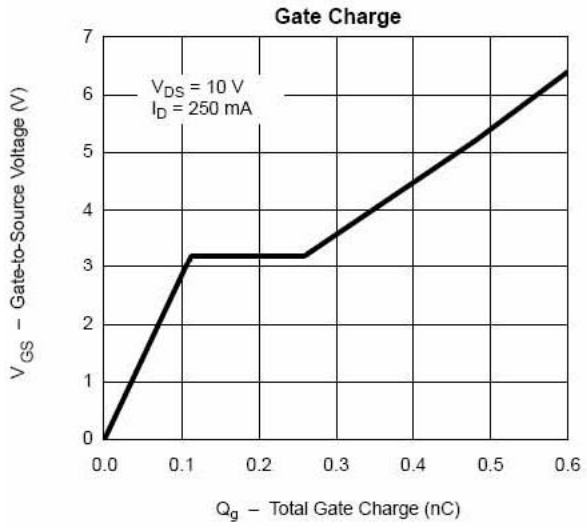
CHARACTERISTIC CURVE

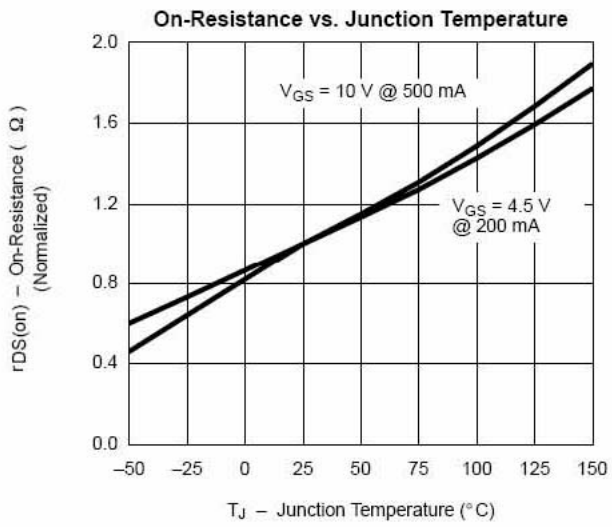






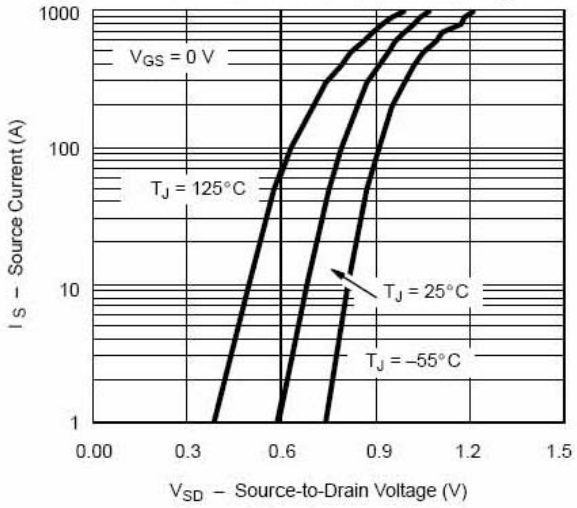




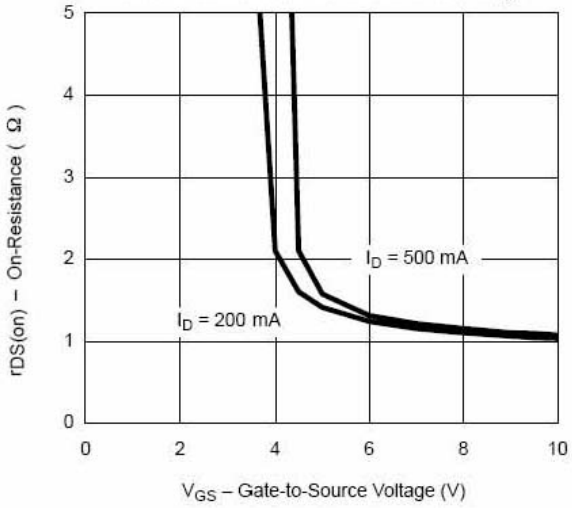


CHARACTERISTIC CURVE (N-Ch, cont'd)

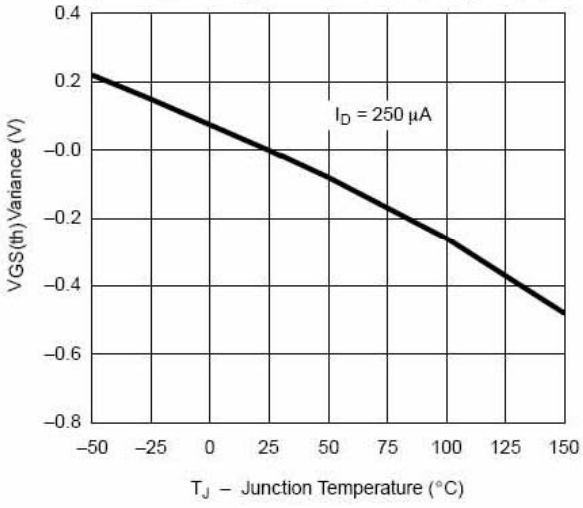
Source-Drain Diode Forward Voltage



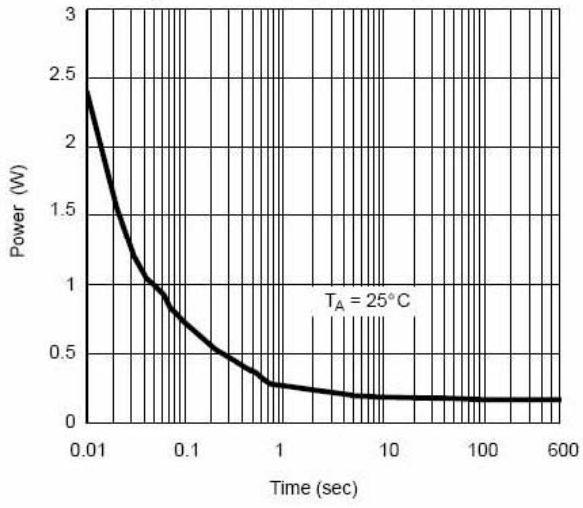
On-Resistance vs. Gate-Source Voltage



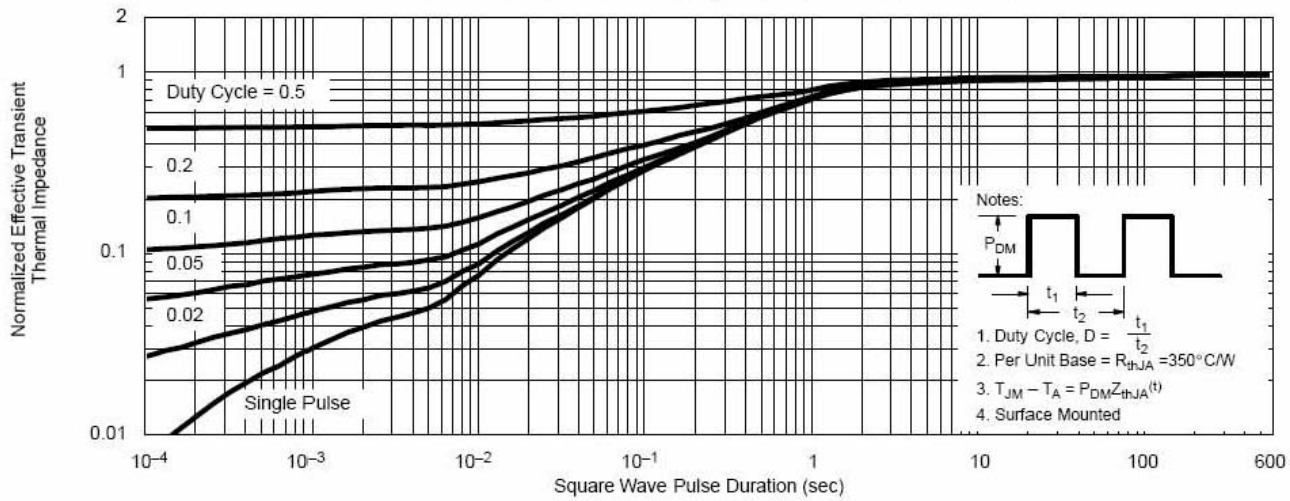
Threshold Voltage Variance Over Temperature



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



CHARACTERISTIC CURVE (N-Ch, cont'd)