



# 2N7002KA

## N-Channel MOSFET

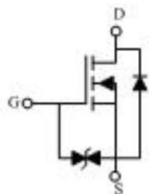
### Features

- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- High density cell design for low  $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- ESD Protected up to 2.5KV (HBM)
- Halogen free available upon request by adding suffix "-HF"

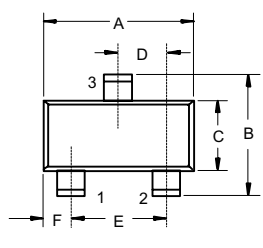
### Maximum Ratings @ 25°C Unless Otherwise Specified

Symbol	Rating	Rating	Unit
$V_{DS}$	Drain-source Voltage	60	V
$V_{GS}$	Gate-source Voltage	$\pm 20$	V
$I_D$	Drain Current	340	mA
$P_D$	Total Power Dissipation	350	mW
$T_J$	Operating Junction Temperature	-55 to +150	°C
$T_{STG}$	Storage Temperature	-55 to +150	°C
$R_{thJA}$	Thermal Resistance from Junction to Ambient	357	°C/W

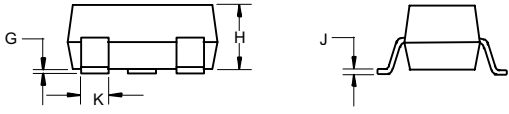
### Equivalent circuit



### SOT-23

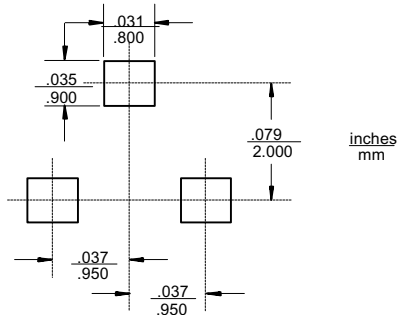


1. GATE  
2. SOURCE  
3. DRAIN



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.110	.120	2.80	3.04	
B	.083	.104	2.10	2.64	
C	.047	.055	1.20	1.40	
D	.035	.041	.89	1.03	
E	.070	.081	1.78	2.05	
F	.018	.024	.45	.60	
G	.0005	.0039	.013	.100	
H	.035	.044	.89	1.12	
J	.003	.007	.085	.180	
K	.015	.020	.37	.51	

### Suggested Solder Pad Layout



inches  
mm

**ELECTRICAL CHARACTERISTICS**( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

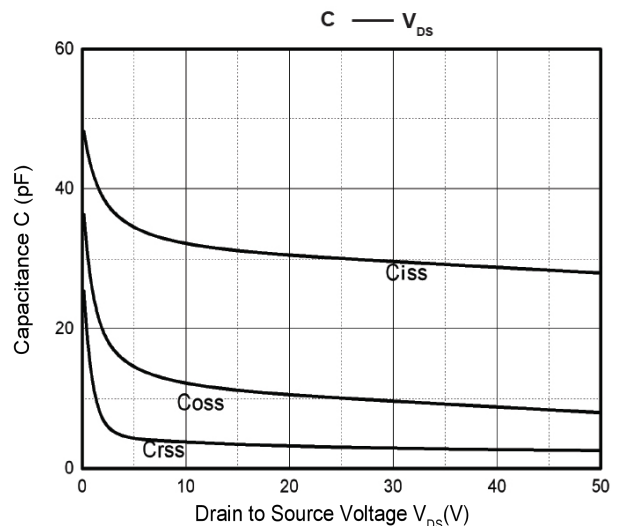
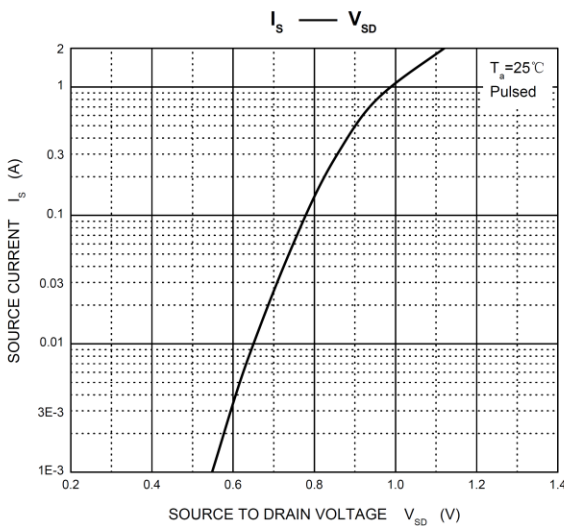
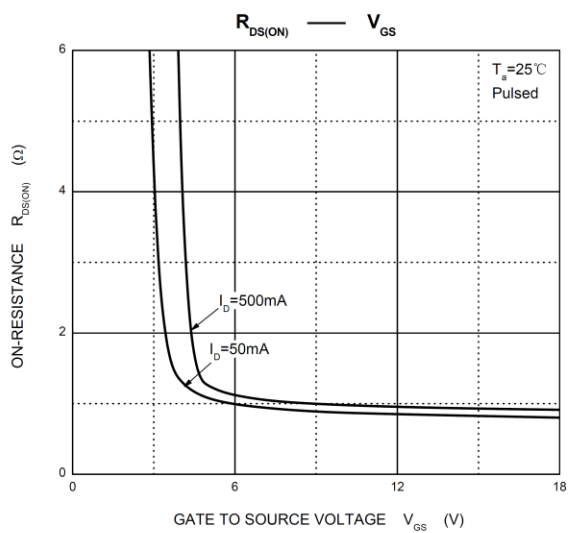
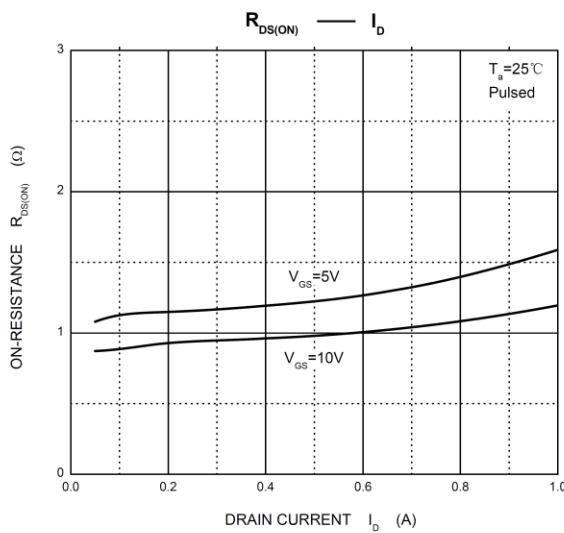
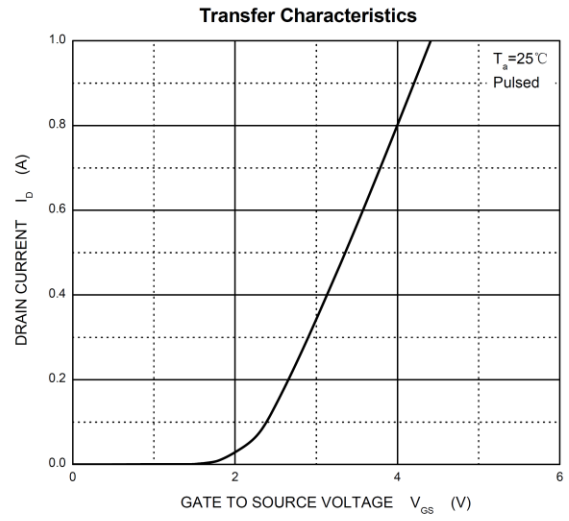
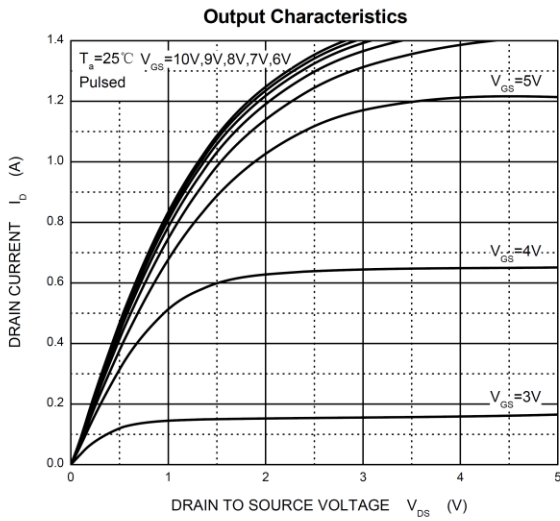
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 48V, V_{GS} = 0V$			1	$\mu A$
Gate-body leakage current	$I_{GSS1}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 10$	$\mu A$
	$I_{GSS2}$	$V_{GS} = \pm 10V, V_{DS} = 0V$			$\pm 200$	nA
	$I_{GSS2}$	$V_{GS} = \pm 5V, V_{DS} = 0V$			$\pm 100$	nA
Gate threshold voltage*	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.4	2.5	V
Drain-source on-resistance*	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 500mA$		1.2	5	$\Omega$
		$V_{GS} = 4.5V, I_D = 200mA$		1.3	5.3	
Recovered charge	$Q_r$	$V_{GS}=0V, I_S=300mA, V_R=25V,$ $di_S/dt=-100A/\mu S$		30		nC
<b>Dynamic characteristics**</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		35		pF
Output Capacitance	$C_{oss}$			13		
Reverse Transfer Capacitance	$C_{rss}$			8		
<b>Switching Characteristics**</b>						
Turn-on delay time	$t_{d(on)}$	$V_{GS}=10V, V_{DD}=50V, R_G=50\Omega$			10	ns
Turn-off delay time	$t_{d(off)}$	$R_{GS}=50\Omega, R_L=250\Omega$			15	
Reverse recovery Time	$t_{rr}$	$V_{GS}=0V, I_S=300mA, V_R=25V,$ $di_S/dt=-100A/\mu S$		30		
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage	$V_{SD}$	$V_{GS} = 0V, I_S = 200mA$		0.82	1.3	V
<b>GATE-SOURCE ZENER DIODE</b>						
Gate-Source Breakdown Voltage	$BV_{GSO}$	$I_{GS} = \pm 1mA$ (Open Drain)	$\pm 21.5$		$\pm 30$	V

**Notes:**

\*Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

\*\*These parameters have no way to verify.

**Typical Characteristics**





Micro Commercial Components

Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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