

## 2N7002KA

## N-Channel MOSFET

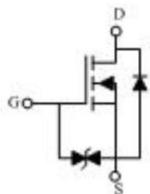
### Features

- 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"

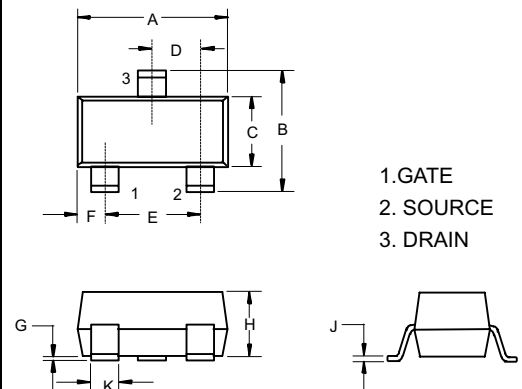
### Maximum Ratings @ 25°C Unless Otherwise Specified

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

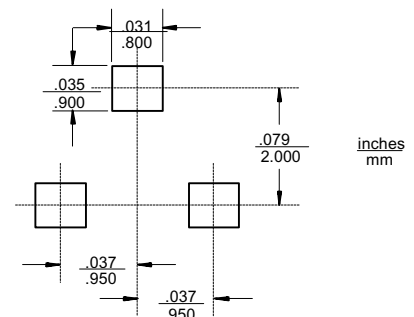


### SOT-23



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



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

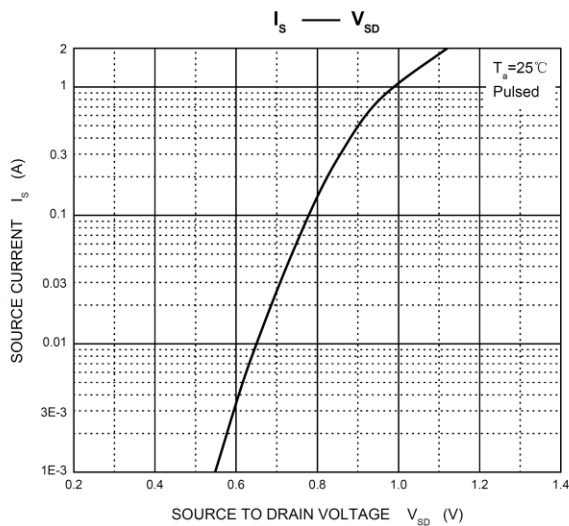
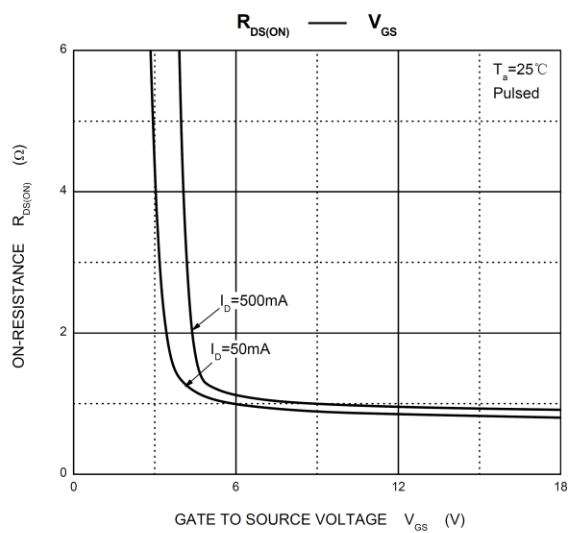
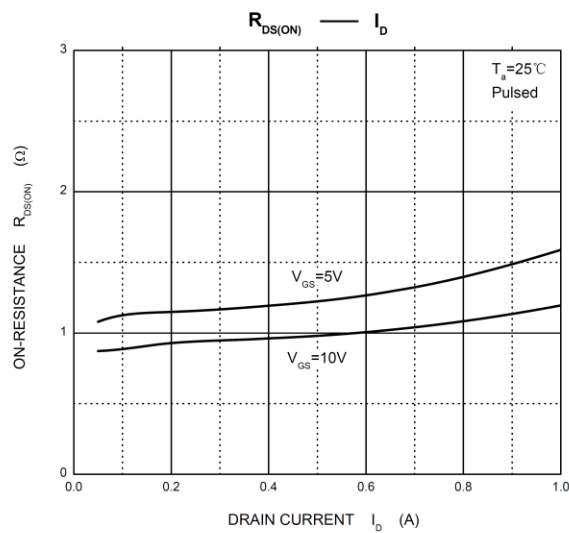
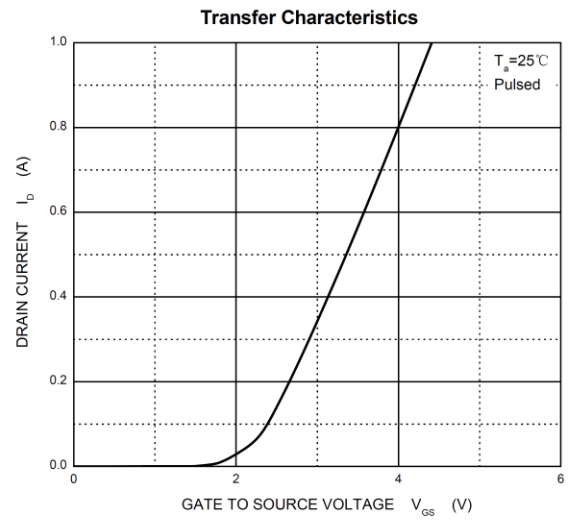
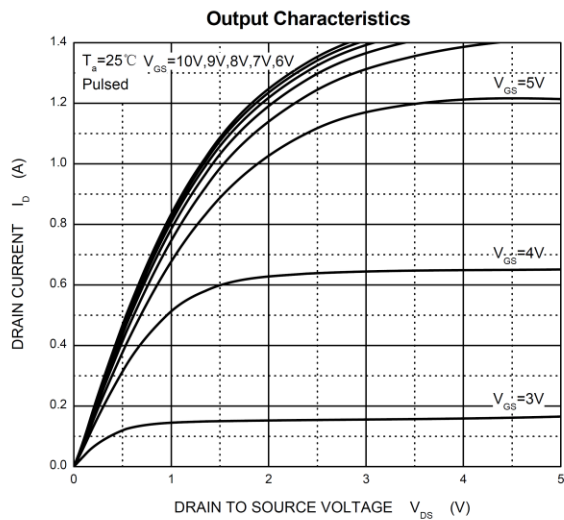
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	60			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =48V,V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS1</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V			±10	μA
	I <sub>GSS2</sub>	V <sub>GS</sub> =±10V, V <sub>DS</sub> = 0V			±200	nA
	I <sub>GSS2</sub>	V <sub>GS</sub> =±5V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage*	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.4	2.5	V
Drain-source on-resistance*	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =500mA		1.2	5	Ω
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =200mA		1.3	5.3	
Recovered charge	Q <sub>r</sub>	V <sub>GS</sub> =0V,I <sub>S</sub> =300mA,V <sub>R</sub> =25V, dI <sub>S</sub> /d <sub>t</sub> =-100A/μS		30		nC
Dynamic characteristics**						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =10V,V <sub>GS</sub> =0V,f=1MHz			40	pF
Output Capacitance	C <sub>oss</sub>				30	
Reverse Transfer Capacitance	C <sub>rss</sub>				10	
Switching Characteristics**						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>GS</sub> =10 V, V <sub>DD</sub> =50V, R <sub>G</sub> =50Ω			10	ns
Turn-off delay time	t <sub>d(off)</sub>	R <sub>GS</sub> =50Ω,R <sub>L</sub> =250Ω			15	
Reverse recovery Time	t <sub>rr</sub>	V <sub>GS</sub> =0V,I <sub>S</sub> =300mA,V <sub>R</sub> =25V, dI <sub>S</sub> /d <sub>t</sub> =-100A/μS		30		
Source-Drain Diode characteristics						
Diode Forward voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =300mA			1.5	V
GATE-SOURCE ZENER DIODE						
Gate-Source Breakdown Voltage	BV <sub>GSO</sub>	IGS=±1mA(Open Drain)	±21.5		±30	V

**Notes:**

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

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

## Typical Characteristics



## 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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