

N-Ch MOSFET ESD Protected 2000V 2N7002KA

FEATURES

- ESD Protected 2000V
- High density cell design for low $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability
- Suffix U : Qualified to AEC-Q101
ex) 2N7002KA-RTK/HU

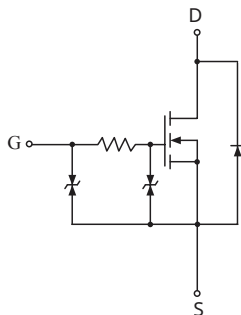
MAXIMUM RATINGS ($T_A=25^{\circ}C$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	Continuous	I_D	300
	Pulsed (Note 1)	I_{DP}	1200
Drain Power Dissipation (Note 2)	P_D	350	mW
Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature Range	T_{STG}	-55~150	$^{\circ}C$
Thermal Characteristics			
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{th(j-A)}$	357	$^{\circ}C/W$

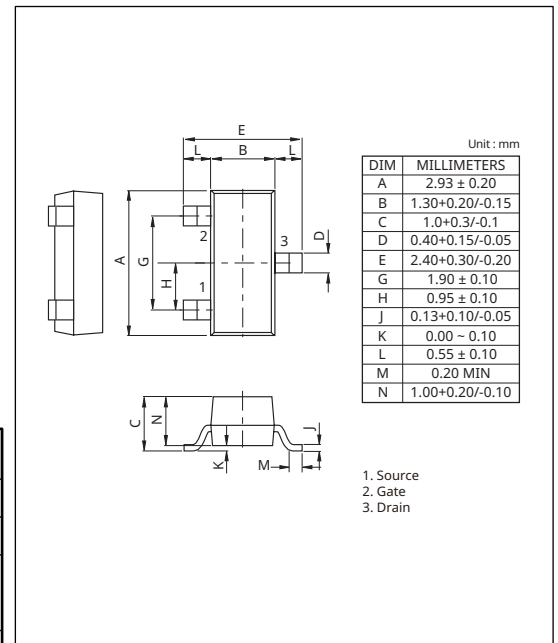
Note 1) Pulse Width $\leq 10\mu s$, Duty Cycle $\leq 1\%$

Note 2) Package mounted on 99% Alumina 10X8X0.6mm

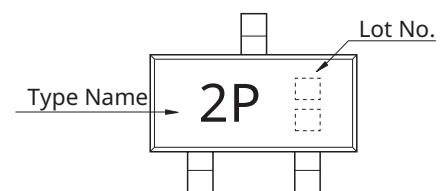
EQUIVALENT CIRCUIT



PACKAGE DIMENSION(SOT-23)



Marking



ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}C$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=10\mu A$	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage, Forward	I_{GSSF}	$V_{GS}=20V, V_{DS}=0V$	-	-	10	μA
Gate-Body Leakage, Reverse	I_{GSSR}	$V_{GS}=20V, V_{DS}=0V$	-	-	-10	μA
ESD-Capability*	-	C=100pF, R=1.5k Ω Both forward and reverse direction 3 pulse	2000	-	-	V

*Failure criterion : $I_{DSS} > 1\mu A$ at $V_{DS}=60V$, $I_{GSSF} > -10\mu A$ at $V_{GS}=20V$, $I_{GSSR} > -10\mu A$ at $V_{GS}=-20V$

PRODUCT DATASHEET

N-Ch MOSFET ESD Protected 2000V - 2N700KA

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$) ON CHARACTERISTICS (NOTE 3)

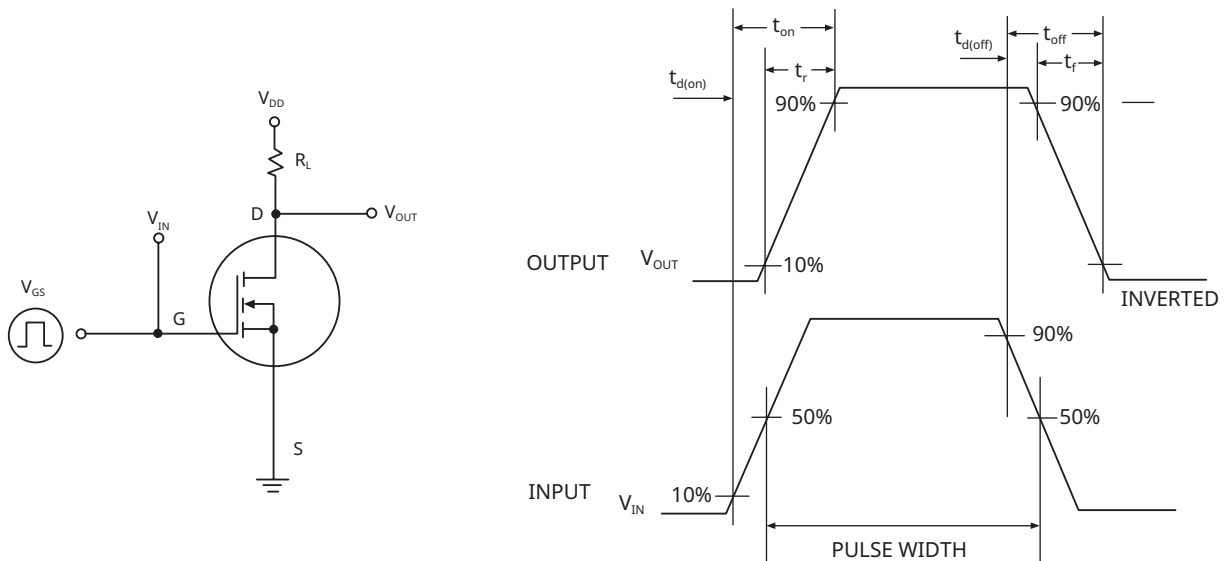
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Threshold Voltage	V_{th}	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.1	-	2.35	V
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=500\text{mA}$	-	-	2.3	Ω
		$V_{GS}=5\text{V}, I_D=50\text{mA}$	-	1.7	2.7	
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0\text{V}, I_S=200\text{mA}$ (Note 1)	-	-	1.15	V

Note 3) Pulse Test : Pulse Width $\leq 80\mu\text{s}$, Duty Cycle $\leq 1\%$

DYNAMIC CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Input Capacitance	C_{iss}	$V_{DS}=25\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$	-	18.0	-	pF	
Reverse Transfer Capacitance	C_{rss}		-	3.0	-		
Output Capacitance	C_{oss}		-	7.0	-		
Switching Time	Turn-On Time	t_{on}	$V_{DD}=30\text{V}, R_L=155\Omega, I_D=190\text{mA}$ $V_{GS}=10\text{V}$	-	15	-	ns
	Turn-Off Time	t_{off}		-	40	-	

SWITCHING TIME TEST CIRCUIT



PRODUCT DATASHEET

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Fig 1. $I_D - V_{DS}$

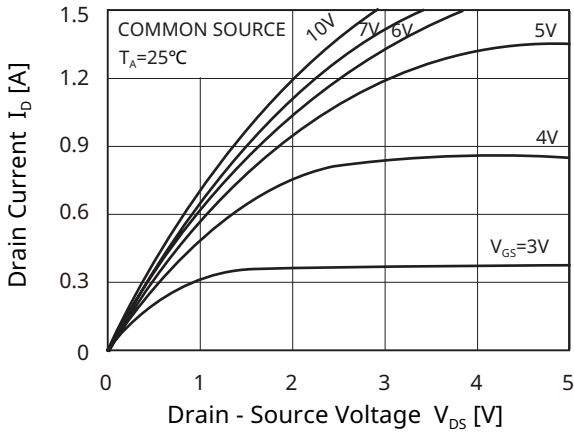


Fig 2. $R_{DS(ON)} - I_D$

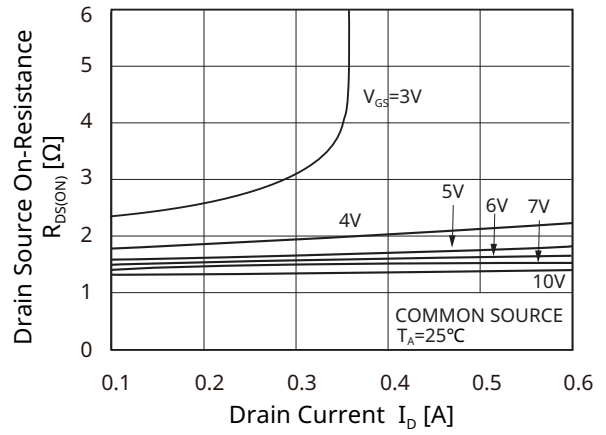


Fig 3. $V_{th} - T_J$

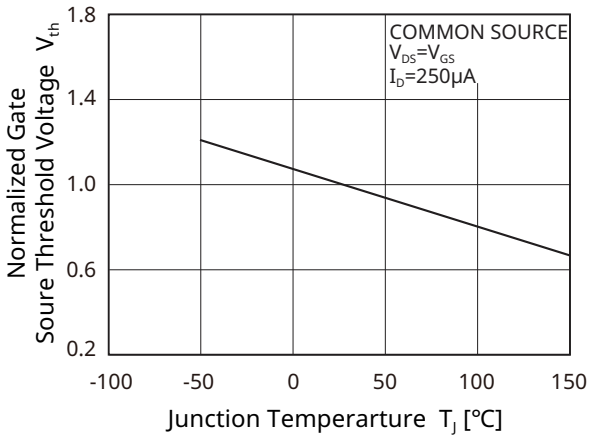


Fig 4. $C - V_{DS}$

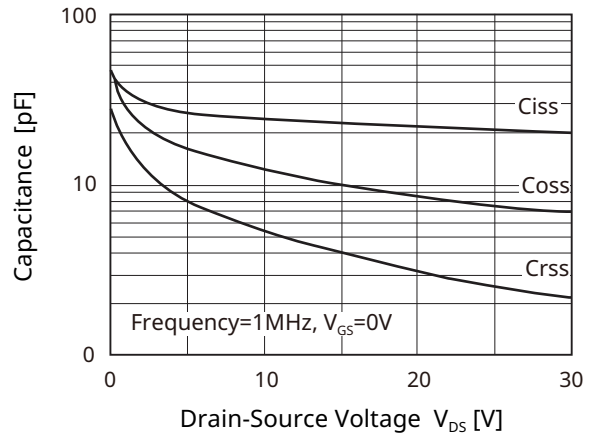


Fig 5. $P_D - T_A$

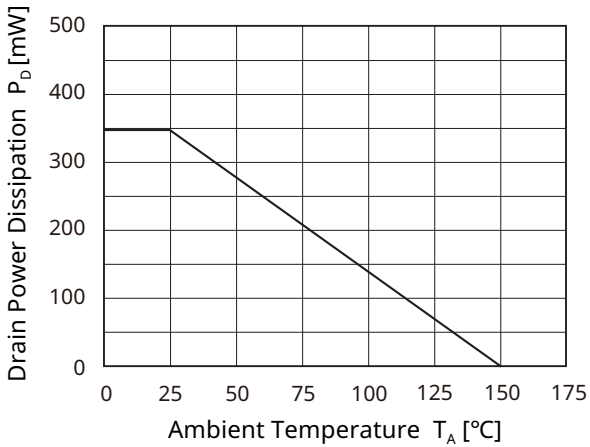
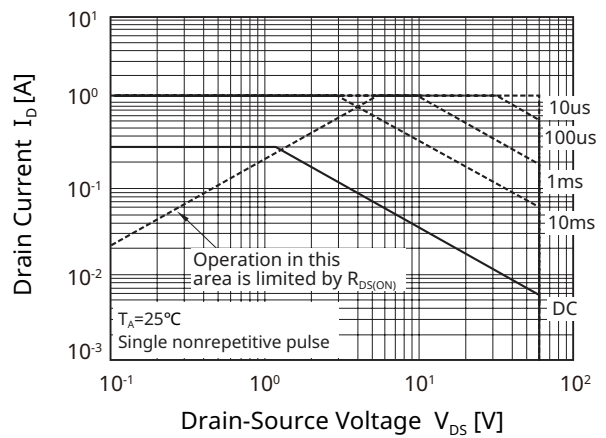


Fig 6. Safe Operation Area



PRODUCT DATASHEET
N-Ch MOSFET ESD Protected 2000V - 2N700KA

ORDERING INFORMATION

Part Number	Status	Compliance			Packing Type	Packing Qty
		AEC-Q	Pb-Free	Halogen Free		
2N7002KA-RTK/P	Active	-	Y	-	Reel	3,000pcs
2N7002KA-RTK/H	Active	-	Y	Y	Reel	3,000pcs
2N7002KA-RTK/HU	Active	Y	Y	Y	Reel	3,000pcs

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1. The products described in this data are intended to be used in general-purpose electronic equipment. (Office equipment, telecommunication equipment, measuring equipment, home appliances)
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3. On designing your application, please use product within the ranges guaranteed by KEC for maximum rating, operating supply voltage range, heat radiation characteristics and other characteristics. User shall be responsible for failure or damage when used beyond the guaranteed ranges.
4. The technical information described in this data is limited to showing representative characteristics and applied circuit examples of the products and it does not constitute the warranting of industrial property, the granting of relative rights, or the granting of any license.
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