

### INTERFACE AND SWITCHING APPLICATION.

### FEATURES

- ESD Protected 2000V.(Human Body Model)
- High density cell design for low  $R_{DS(ON)}$ .
- Voltage controlled small signal switch.

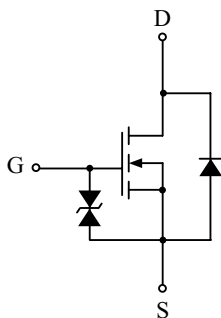
### MAXIMUM RATING (Ta=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		$V_{DSS}$	60	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	Continuous	$I_D$	300	mA
	Pulsed (Note 1)	$I_{DP}$	1000	
Drain Power Dissipation (Note 2)		$P_D$	270	mW
Junction Temperature		$T_j$	150	°C
Storage Temperature Range		$T_{stg}$	-55 ~ 150	°C
Thermal Resistance, Junction to Ambient (Note 2)		$R_{thJA}$	460	°C/W

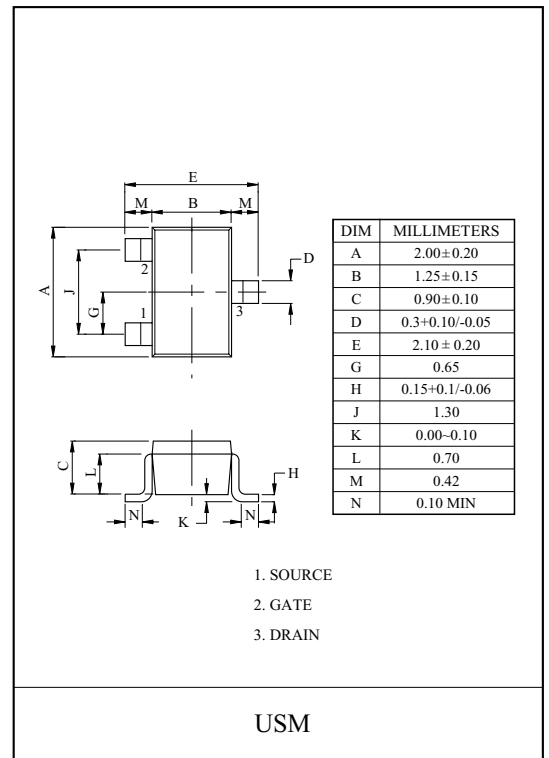
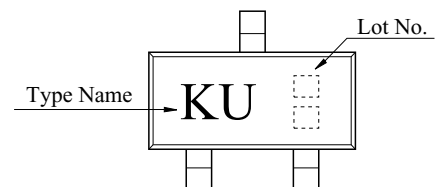
Note 1) Pulse Width  $\leq 10\mu s$ , Duty Cycle  $\leq 1\%$

Note 2) Surface Mounted on  $2 \times 2$  FR4 Board

### EQUIVALENT CIRCUIT



### Marking



# 2N7002KU

## ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT.	
<b>Static</b>							
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	$\mu A$	
Gate-Body Leakage, Forward	$I_{GSSF}$	$V_{GS}=20V, V_{DS}=0V$	-	-	10	$\mu A$	
Gate-Body Leakage, Reverse	$I_{GSSR}$	$V_{GS}=-20V, V_{DS}=0V$	-	-	-10	$\mu A$	
Gate Threshold Voltage	$V_{th}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	-	2.0	V	
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=300mA$ (Note 3)	-	1.2	1.5	$\Omega$	
		$V_{GS}=4.5V, I_D=250mA$ (Note 3)	-	1.45	1.9		
Forward Transconductance	$g_{FS}$	$V_{DS}=10V, I_D=300mA$	250	-	-	mS	
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=300mA$	-	0.9	1.2	V	
<b>Dynamic</b>							
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	-	20	-	pF	
Reverse Transfer Capacitance	$C_{rss}$						
Output Capacitance	$C_{oss}$						
Switching Time	Turn-On Time	$t_{on}$	$V_{DD}=30V, I_D=300mA, V_{GS}=10V$ (Note 3)		-	9	ns
	Turn-Off Time	$t_{off}$	-	43	-		

Note 3) Pulse Test : Pulse Width  $\square 80\mu s$ , Duty Cycle  $\square 1\%$

## SWITCHING TIME TEST CIRCUIT

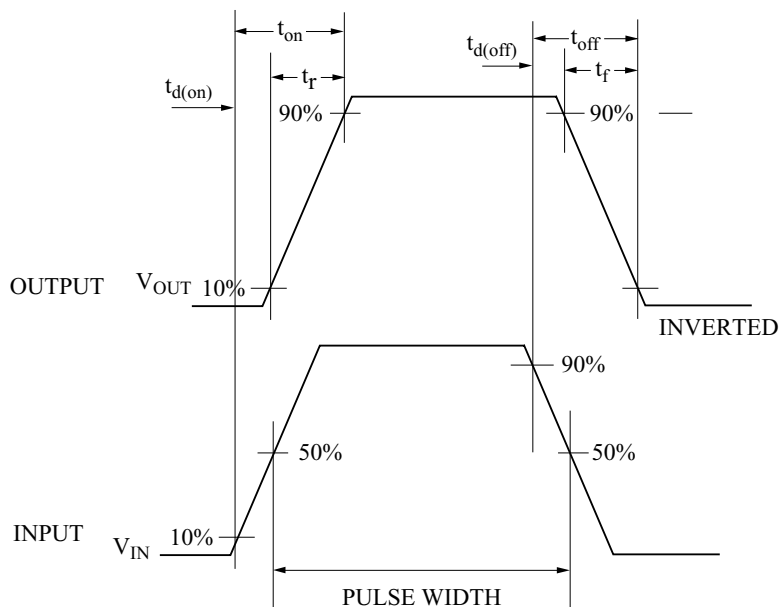
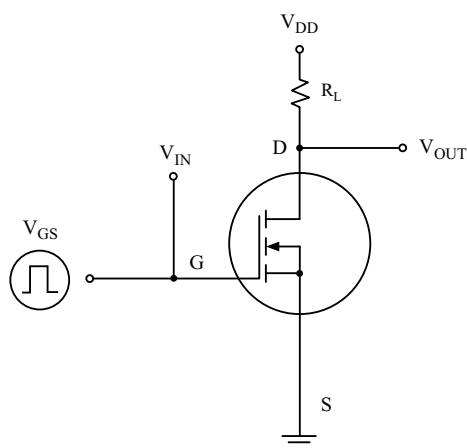


Fig 1.  $I_D - V_{DS}$

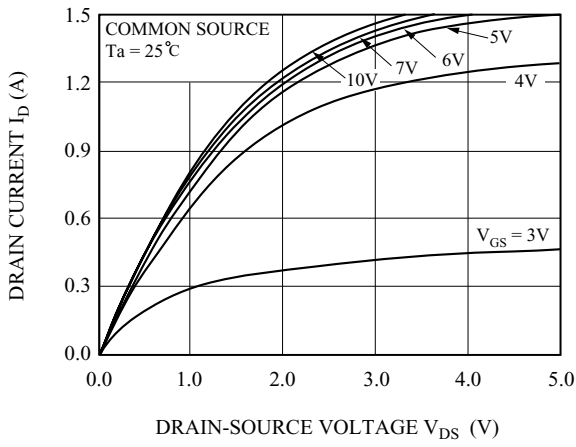


Fig 2.  $R_{DS(ON)} - I_D$

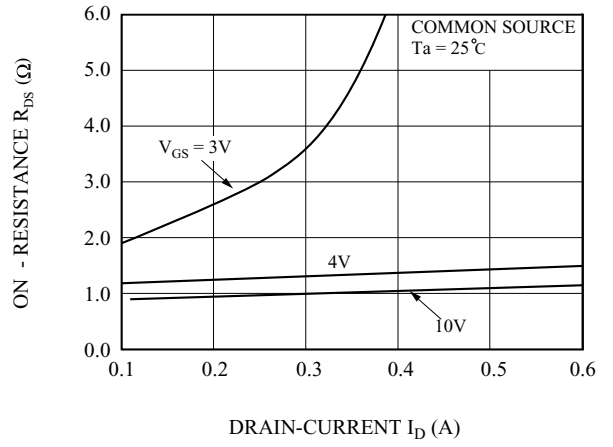


Fig 3.  $R_{DS(ON)} - T_j$

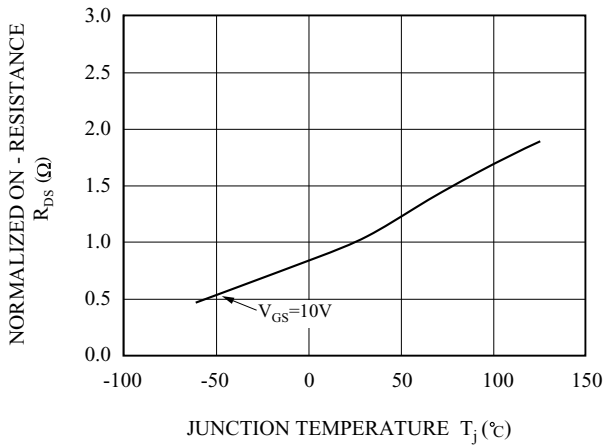


Fig 4.  $V_{th} - T_j$

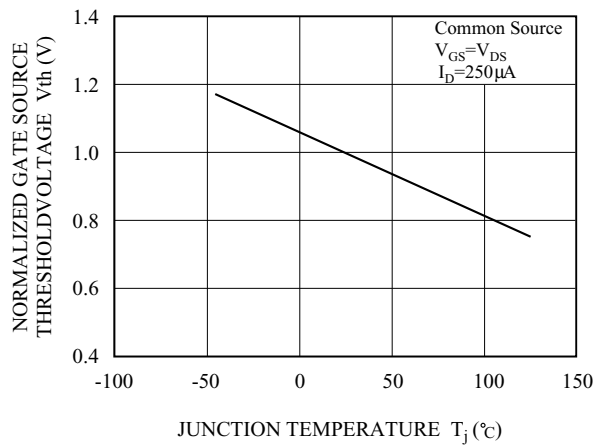


Fig 5.  $I_D - V_{GS}$

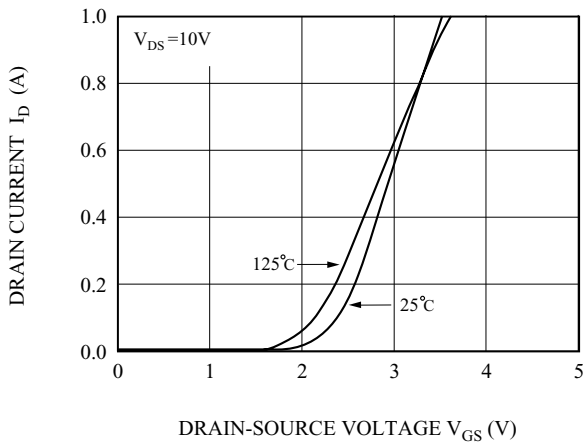
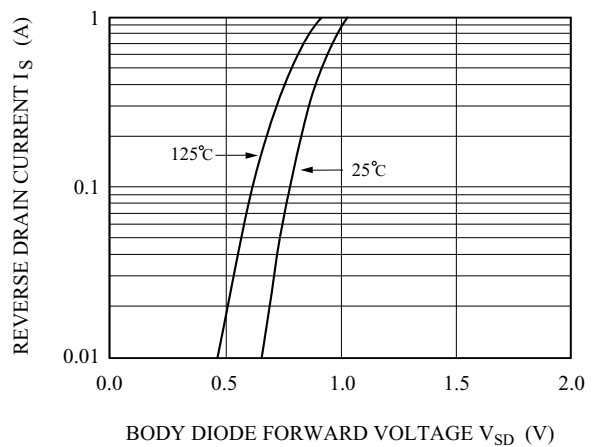


Fig 6.  $I_S - V_{SD}$



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Fig 7. C -  $V_{DS}$

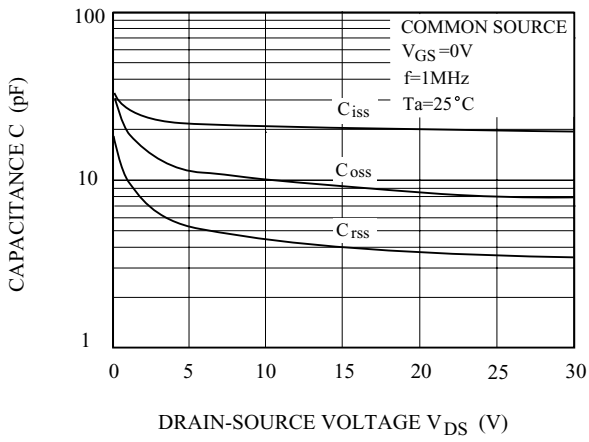


Fig 8. Safe Operation Area

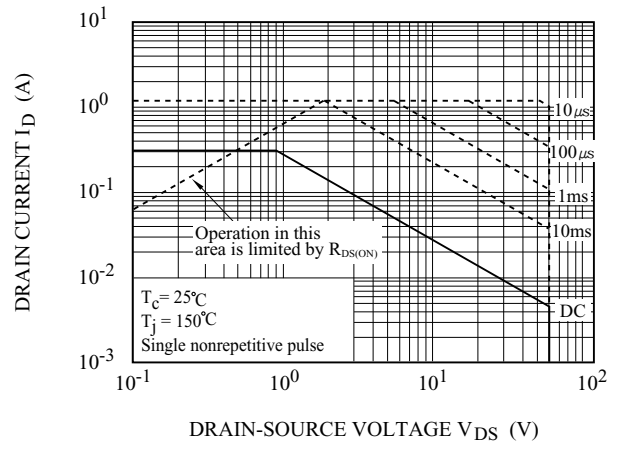


Fig 9.  $P_D$  -  $T_a$

