

N-Ch Small Signal Trench MOSFET

2N7002KB

This Small Signal Trench MOSFET has low on resistance, low gate charge and ESD Protected characteristics. It is mainly suitable for Battery Operated Systems and Direct logic-level Interface applications.

FEATURES

- $V_{DSS}=60V, I_D=0.3A$
- Drain-Source ON Resistance :
 $R_{DS(ON)}(Max)=2.2\Omega @V_{GS}=10V$
- ESD Protected: 2KV

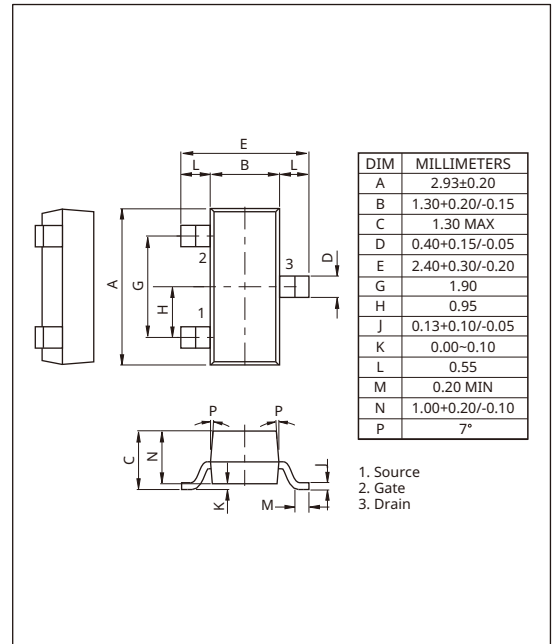
APPLICATION

- Battery Operated Systems
- Direct logic-level Interface
- Voltage controlled small signal switch

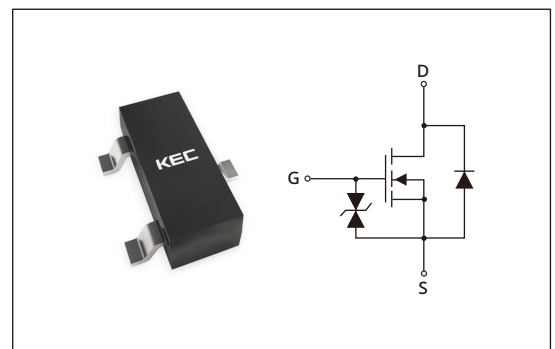
ORDERING INFORMATION

PART NUMBER	QTY PER BOX	BOX SIZE
2N7002KB-RTK/HP	9,000pcs	185X185X40mm

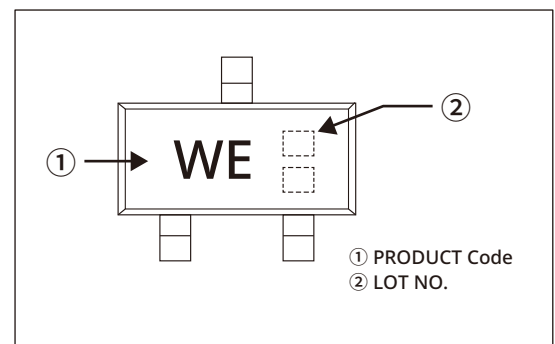
PACKAGE DIMENSION(SOT-23)



PIN CONFIGURATION



MARKING CODE



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MAXIMUM RATING ($T_J=25^{\circ}\text{C}$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	@ $T_A = 25^{\circ}\text{C}$ (Note 1, 2)	I_D	0.3*	A
	Pulsed (Note 1, 3)	I_{DP}	1.0*	
Drain Power Dissipation	@ $T_A = 25^{\circ}\text{C}$ (Note 2)	P_D	400	mW
Maximum Junction Temperature		T_J	150	$^{\circ}\text{C}$
Operation and Storage Temperature Range		T_{opr}, T_{stg}	-55~150	$^{\circ}\text{C}$
Thermal Characteristics				
Thermal Resistance, Junction-to-Ambient	@ $T_A = 25^{\circ}\text{C}$ (Note 2)	R_{thJA}	310	$^{\circ}\text{C}/\text{W}$

* : Drain current limited by maximum junction temperature

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ELECTRICAL CHARACTERISTICS(T_J= 25 °C)

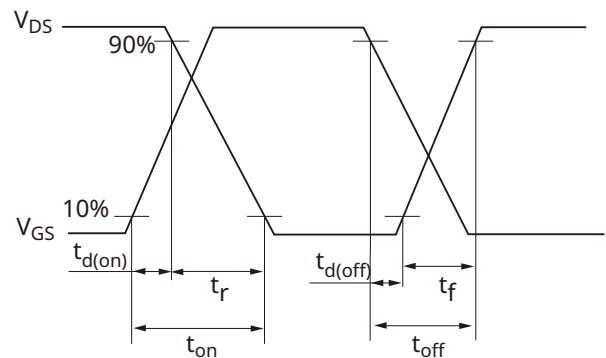
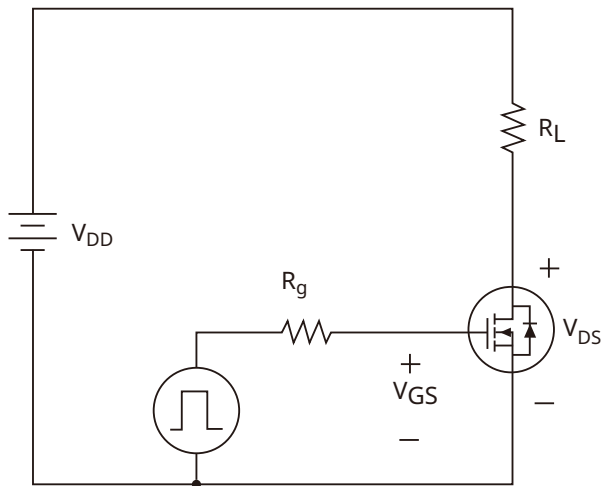
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	60	-	-	V
Drain Cut-off Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V	-	-	10	μA
Gate Threshold Voltage	V _{th}	V _{DS} =V _{GS} , I _D =250μA	1.0	-	2.5	V
Gate Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±10	μA
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =0.3A	-	1.7	2.2	Ω
		V _{GS} =4.5V, I _D =0.2A	-	2.1	2.9	Ω
Dynamic						
Turn-on Delay time	t _{d(on)}	V _{DD} =30V, I _D =0.2A V _{GS} =10V, R _G =25Ω (Note 3)	-	5	-	ns
Turn-on Rise time	t _r		-	5	-	
Turn-off Delay time	t _{d(off)}		-	40	-	
Turn-off Fall time	t _f		-	6	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	15	-	pF
Output Capacitance	C _{oss}		-	3.2	-	
Reverse Transfer Capacitance	C _{rss}		-	1.2	-	
Source-Drain Diode Ratings						
Continuous Source Current	I _S	V _{GS} < V _{th}	-	-	0.25	A
Diode Forward Voltage	V _{SD}	I _S =0.25A, V _{GS} =0V	-	-	1.2	V

Note 1) Max. current is limited by junction temperature

Note 2) Surface mounted on 1 in² FR-4 board with 1oz

Note 3) Pulse Test (Pulse width ≤ 300μs, Duty Cycle ≤ 2%)

SWITCHING TIME TEST CIRCUIT



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Fig1. $I_D - V_{DS}$

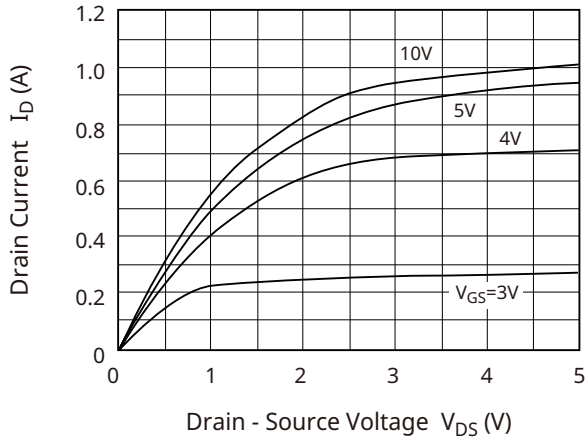


Fig2. $I_D - V_{GS}$

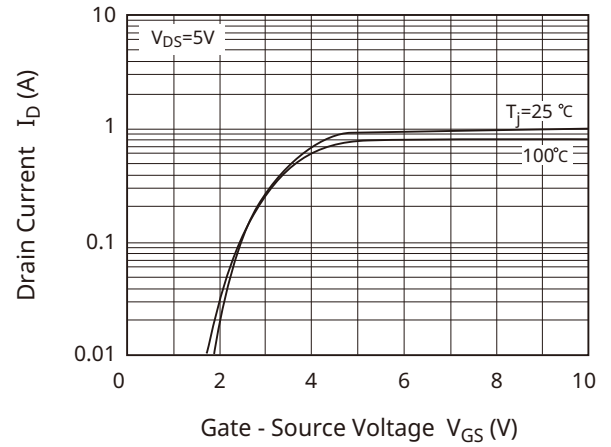


Fig3. $R_{DS(ON)} - I_D$

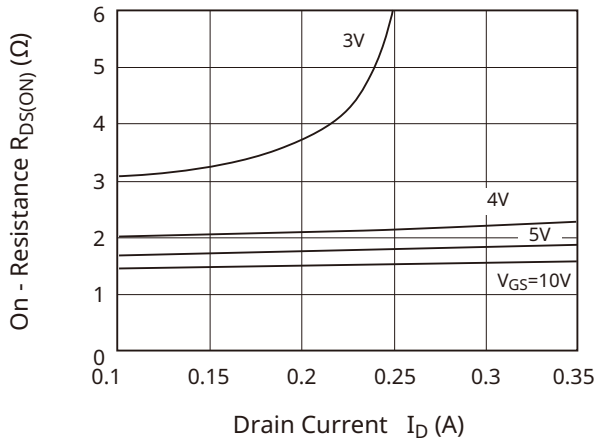


Fig4. $R_{DS(ON)} - V_{GS}$

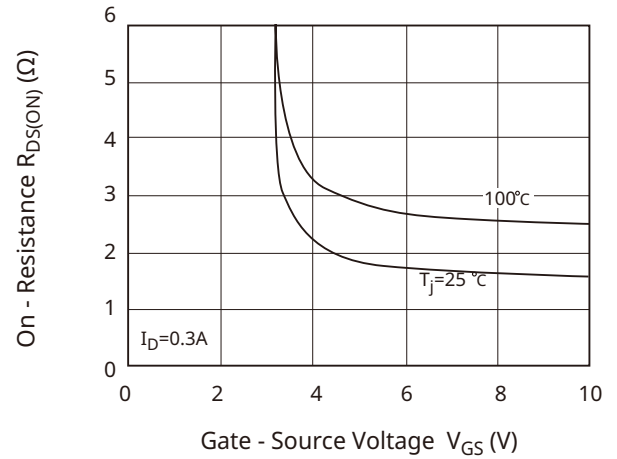


Fig5. $R_{DS(ON)} - T_j$

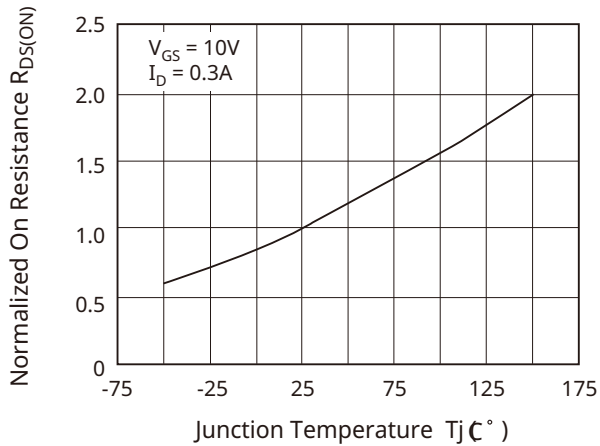
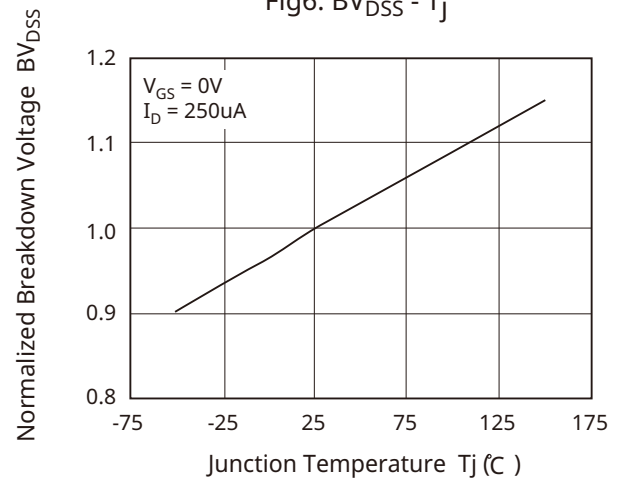


Fig6. $BV_{DSS} - T_j$



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Fig7. $V_{th} - T_j$

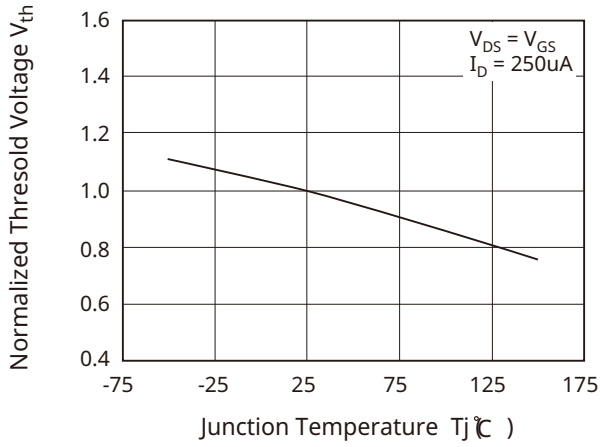


Fig8. $I_S - V_{SD}$

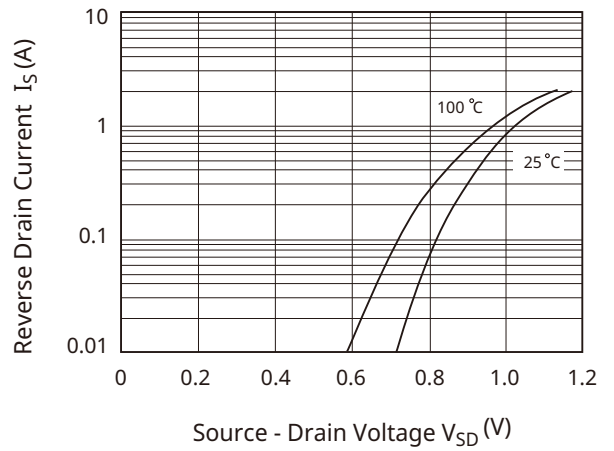


Fig9. C - V_{DS}

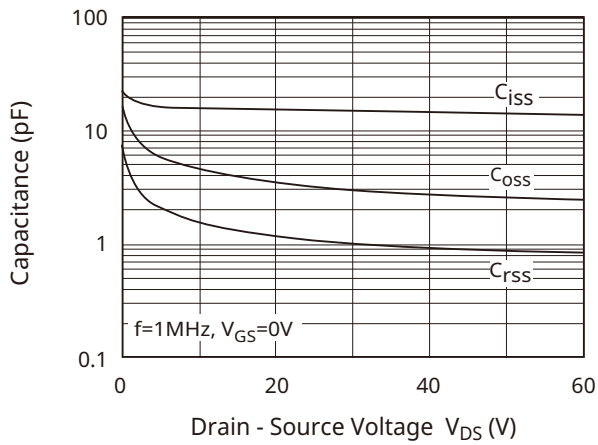
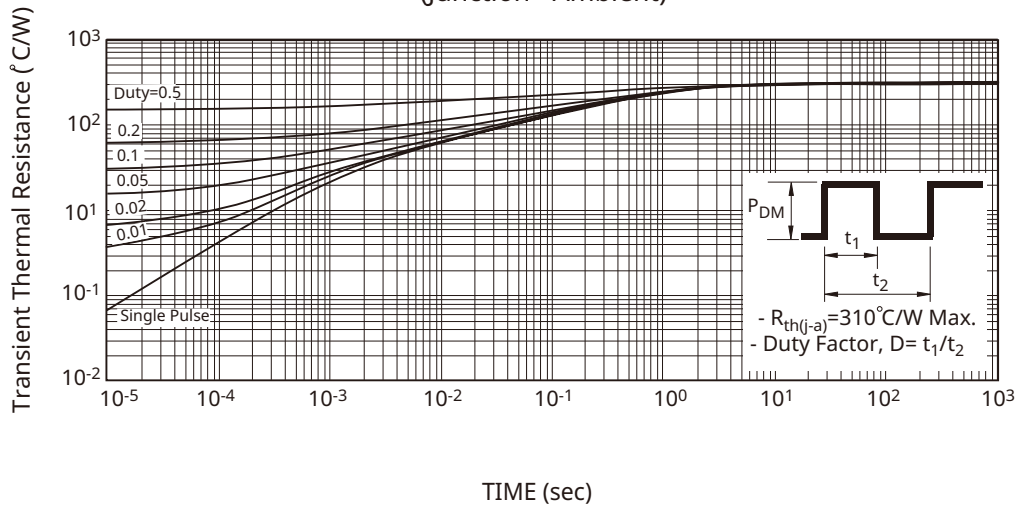
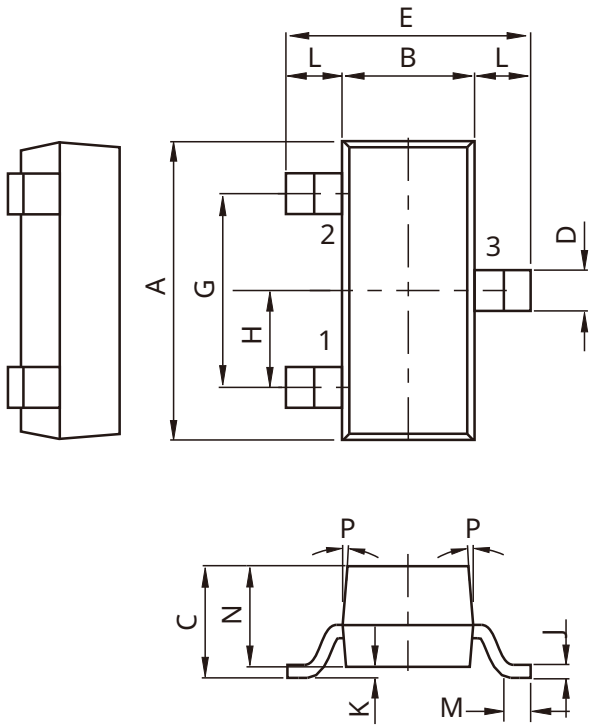


Fig10. Transient Thermal Response Curve
(Junction - Ambient)



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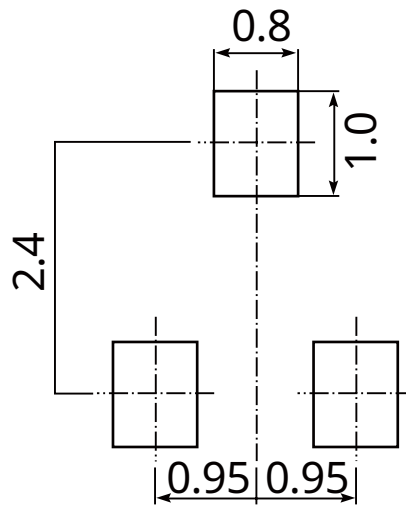


DIM	MILLIMETERS
A	2.93±0.20
B	1.30+0.20/-0.15
C	1.30 MAX
D	0.40+0.15/-0.05
E	2.40+0.30/-0.20
G	1.90
H	0.95
J	0.13+0.10/-0.05
K	0.00~0.10
L	0.55
M	0.20 MIN
N	1.00+0.20/-0.10
P	7°

- 1. Source
- 2. Gate
- 3. Drain

RECOMMENDED PAD DIMENSION

(Unit:mm)



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2. When you intend to use these products with equipment or device which require an extremely high of reliability and special applications (such as automobile, air travel aerospace, transportation equipment, life support, system and safety devices) in which special quality and reliability and the failure or malfunction of products may directly jeopardize or harm the human body or damage to property and any application other than the standard application intended, please be sure to consult with our sales representative in advance.
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