MEI
Lead Free RoHS Compliant

2N7002K

SOT-23 Plastic-Encapsulate MOSFETs

N-channel MOSFET

| $V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D
60 V	2Ω@ 10V	300 mA
	2.8 Ω@ 4.5V	

SOT-23

1. GATE
2. SOURCE
3. DRAIN
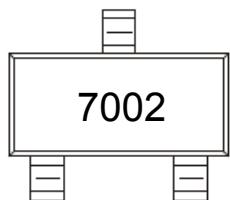
FEATURE

- High density cell design for Low $R_{DS（on）}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability
- ESD protected
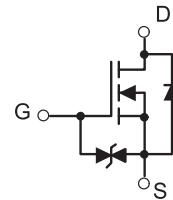
APPLICATION

- Load Switch for Portable Devices
- DC/DC Converter

MARKING

7002

Equivalent circuit

MOSFET MAXIMUM RATINGS (T_a = 25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source voltage	60	V
V_{GS}	Gate-Source voltage	±20	V
I_D	Drain Current	300	mA
P_D	Power Dissipation	0.35	W
T_J	Junction Temperature	150	℃
T_{stg}	Storage Temperature	-55~+150	℃
$R_{θJA}$	Thermal Resistance from Junction to Ambient	357	℃ /W

MOSFET ELECTRICAL CHARACTERISTICS

T_a=25 ℃ unless otherwise specified

| Para meter	Symbol	Test Condition	Min	Typ	Max	Units
Static Ch ara cteristics						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0V, I_D =250µA	60			V
Gate Threshold Voltage*	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =1mA	1.1	1.6	2.1	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =48V,V_{GS} = 0V			1	µA
Gate –Source leakage current	I_{GSS1}	V_{GS} =±20V, V_{DS} = 0V			±10	µA
	I_{GSS2}	V_{GS} =±10V, V_{DS} = 0V			±200	nA
	I_{GSS3}	V_{GS} =±5V, V_{DS} = 0V			±100	nA
Drain-Source On-Resistance*	$R_{DS(on)}$	V_{GS} = 4.5V, I_D =250mA		2	2.8	Ω
		V_{GS} =10V,I_D =250mA		1.6	2	Ω
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=100mA			1.2	V
Recovered charge	Q_r	V_{GS}=0V,I_S=300mA,V_R=25V, dI_s/dt=-100A/µS		30		nC
Dy namic Characteristics**						
Input Capacitance	C_{iss}	V_{DS} =10V,V_{GS} =0V,f =1MHz			40	pF
Output Capacitance	C_{oss}				30	pF
Reverse Transfer Capacitance	C_{rss}				10	pF
Sw itching Characteristics**						
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V,V_{DD}=50V,R_G=50Ω, R_{GS}=50Ω, R_L=250Ω			10	ns
Turn-Off Delay Time	$t_{d(off)}$				15	ns
Reverse recovery Time	t_{rr}	V_{GS}=0V,I_S=300mA,V_R=25V, dI_s/dt=-100A/µS		30		ns
G ATE-SOURCE ZENER DIODE						
Gate-Source Breakdown Voltage	BV_{GSO}	I_{gs}=±1mA (Open Drain)	±21.5		±30	V
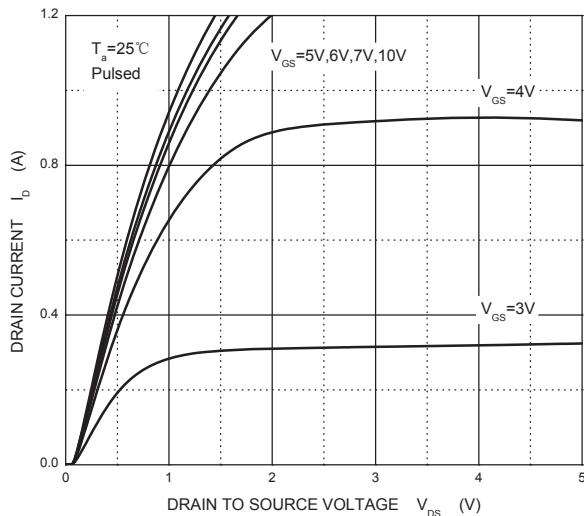
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*Pulse Test : Pulse Width ≤300µs, Duty Cycle ≤2%.
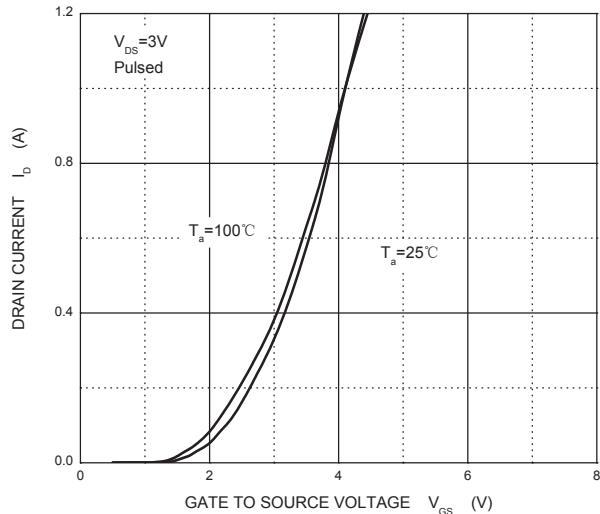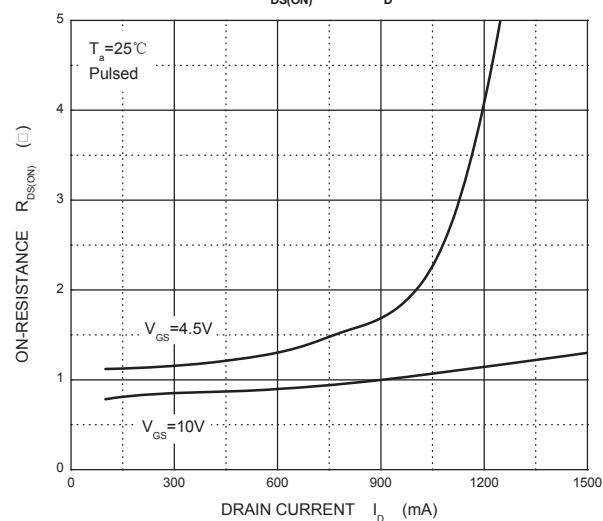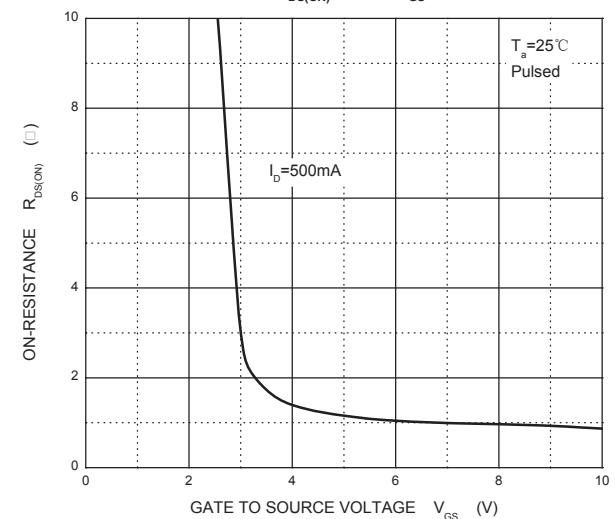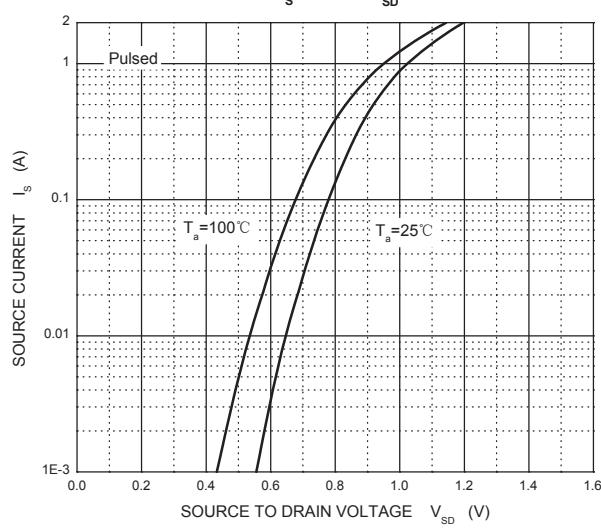
**These parameters have no way to verify.

Typical Characteristics
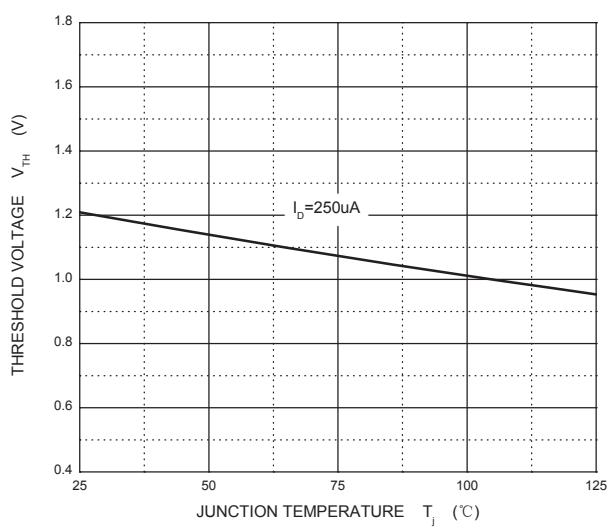
Output Characteristics

T_a=25℃ Pulsed
V_{GS}=5V,6V,7V,10V
V_{GS}=4V
V_{GS}=3V

DRAIN CURRENT I_D (A)
DRAIN TO SOURCE VOLTAGE V_{DS} (V)
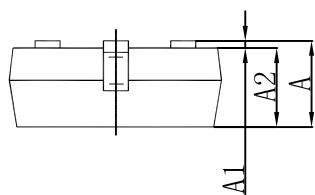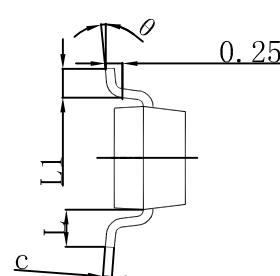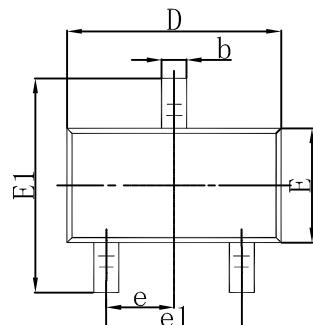
Transfer Characteristics

V_{DS}=3V Pulsed
T_a=100℃
T_a=25℃

DRAIN CURRENT I_D (A)
GATE TO SOURCE VOLTAGE V_{GS} (V)

$R_{DS(ON)}$ — I_D

T_a=25℃ Pulsed
V_{GS}=4.5V
V_{GS}=10V

ON-RESISTANCE $R_{DS(ON)}$ (□)
DRAIN CURRENT I_D (mA)

$R_{DS(ON)}$ — V_{GS}

T_a=25℃ Pulsed
I_D=500mA

ON-RESISTANCE $R_{DS(ON)}$ (□)
GATE TO SOURCE VOLTAGE V_{GS} (V)

I_S — V_{SD}

Pulsed
T_a=100℃
T_a=25℃

SOURCE CURRENT I_S (A)
SOURCE TO DRAIN VOLTAGE V_{SD} (V)

Threshold Voltage

I_D=250uA

THRESHOLD VOLTAGE V_{TH} (V)
JUNCTION TEMPERATURE T_j (℃)
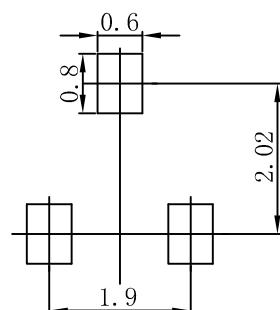
SO T-23 Package Outline Dimensions

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8 °

SO T-23 Suggested Pad Layout

Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.