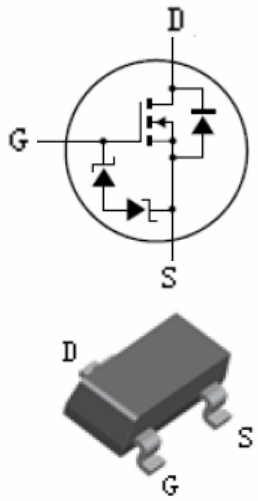
N-Channel MOSFET



SOT-23

FEATURE

- ●Epoxy meets UL 94 V-0 flammability rating
- ●Moisture Sensitivity Level1
- ●High density cell design for low $R_{DS(ON)}$
- ●Voltage controlled small signal switch
- ●Rugged and reliable
- ●ESD Protected up to 2.5KV(HBM)

■MAXIMUM RATINGS (Ta=25℃ 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	340	mA
P_D	Total Power Dissipation	350	mW
R_{thJA}	Thermal Resistance From Junction To Ambient	357	℃/W
T_J	Operation Junction Temperature	-55～+150	℃
T_{STG}	Storage Temperature	-55～+150	℃

■Ordering Information (Example)

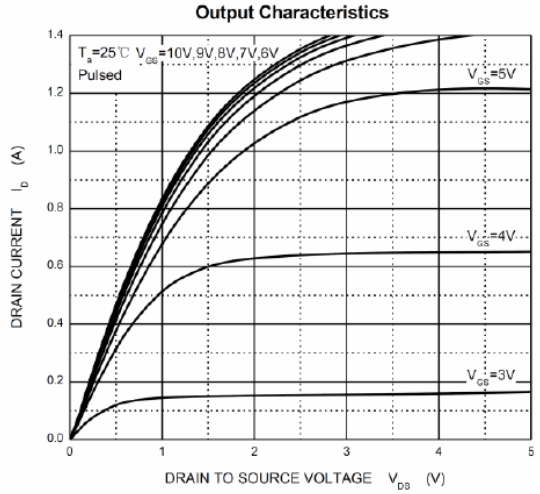
PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
2N7002K	F2	72K	3000	30000	120000	7” reel

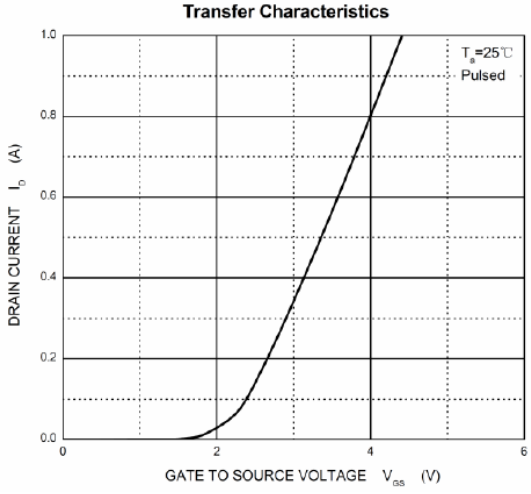
■ELECTRICAL CHARACTERISTICS (Ta=25℃ unless otherwise specified)

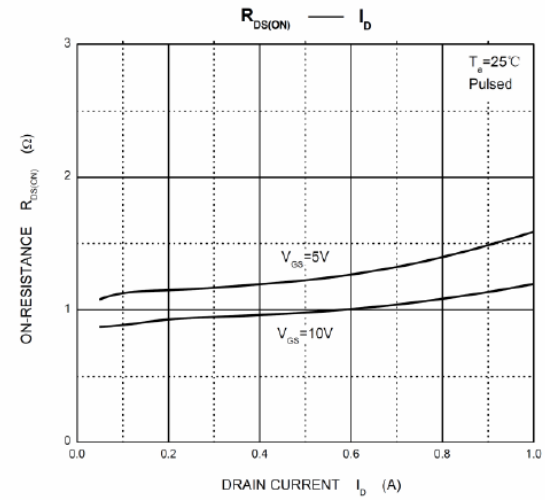
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Static Characterics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}= 0V, I_D=250μA	60			V
Zero gate voltage drain current	I_{DSS}	V_{DS}=48V,V_{GS}=0V			1	μA
Gate-body leakage current	I_{GSS1}	V_{GS}= ±20V, V_{DS}=0V			±10	μA
	I_{GSS2}	V_{GS}= ±10V, V_{DS}=0V			±200	nA
	I_{GSS3}	V_{GS}= ±5V, V_{DS}=0V			±100	nA
Gate threshold voltage*	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	1	1.4	2.5	V
Drain-source on-resistance*	$R_{DS(ON)}$	V_{GS}= 10V, I_D=500mA			5	Ω
		V_{GS}= 4.5V, I_D=200mA			5.3	
Recovered charge	Q_r	V_{GS}= 0V, I_D=300mA,V_R=25V,dI_S/dt=-100A/μs		30		nC
Dynamic characterics**						
Input Capacitance	C_{iss}	VDS=10V,VGS=0V,f=1MHZ			40	pF
Output Capacitance	C_{oss}				30	
Reverse Transfer Capacitance	C_{rss}				10	
Switching 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	
Reverse recovery Time	t_{rr}	VGS=0V,IS=300mA,VR=25V, dI_S/dt=-100A/μs		30		
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	V_{GS}=0V,I_S=300mA			1.5	V
Gate-Source Zener Diode						
Gate-Source Breakdown Voltage	BV_{GSO}	IGS=±1Ma(Open Drain)	±21.5		±30	V

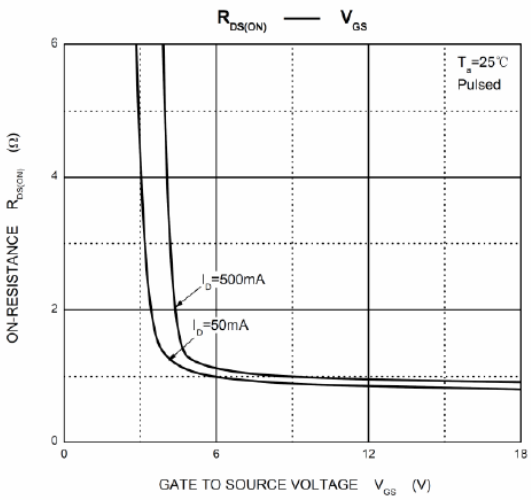
Notes:
***Pulse Test:Pulse Width≤300μA, Duty Cycle≤2%.**
****These parameters have no way to verify.**

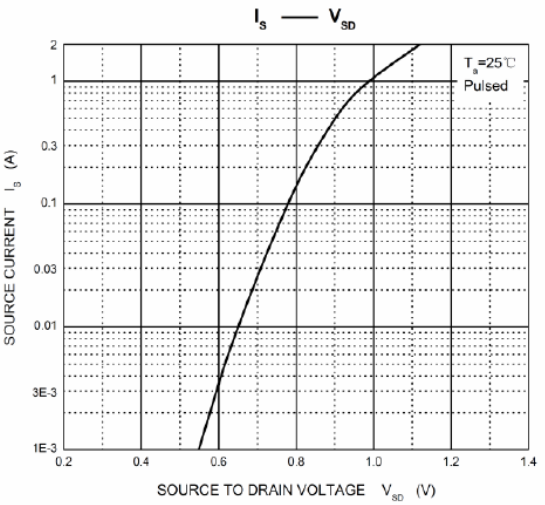
■ Characteristics(Typical)



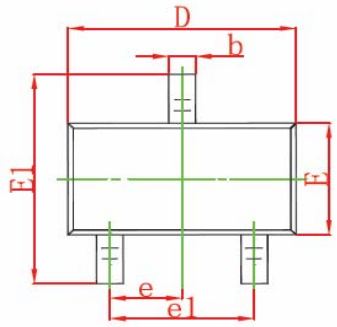


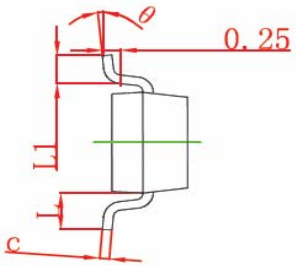


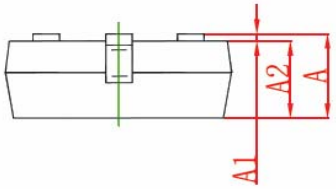




■SOT-23 Package Outline Dimensions

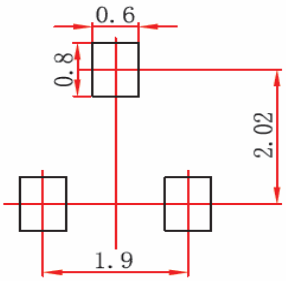






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 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°

■SOT-23Suggested Pad Layout



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

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