SEMICONDUCTOR

2N7002K

N-Channel 60V 340mA MOSFET

FEATURES

- Trench Power MV MOSFET technology
- Voltage controlled small signal switch
- Low input Capacitance
- ESD Protected Up to 2.5KV(HBM)

Pb-Free
RoHS COMPLIANT

Product Summary			
V_{DS}	$R_{DS(on)}$ (Ω) Typ	I_D (mA)	Qg (Typ)
60V	1.3 @ 10V	300	1.7nc
	1.4 @ 4.5V	200	

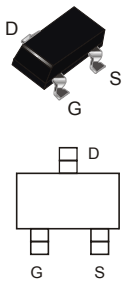
APPLICATIONS

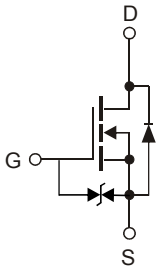
- Battery operated systems
- Solid-state relays
- Direct logic-level interface:TTL/CMOS

MECHANICAL DATA

- Case:SOT-23(TO-236)
- Terminals:Plated solderable per MIL-STD-750,method 2026
- Mounting Position: Any

SOT-23





N-channel MOSFET

Absolute Maximum Ratings (T_A=25℃ unless otherwise noted)

Parameters		Symbol	Value	Unit
Drain-Source voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current(T_J =150℃)	T_A=25℃	I_D	340	mA
	T_A=70℃		272	
Pulsed Drain Current [1]		I_{DM}	1.5	A
Maximum Power Dissipation @T_A=25℃		P_D	350	mW
Junction and Storge Temperature Range		T_J,T_{STG}	-55 to +150	℃

Thermal Resistance Ratings

Parameters	Symbol	Typ	Max	Unit
Junction to Ambient，Steady State [2]	$R_{\theta JA}$	-	104	℃/W

RATINGS AND CHARACTERISTIC OF 2N7002K

Electrical Characteristics (T_J=25℃ unless otherwise noted)

Parameters	Symbol	Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V,T_C=25℃	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}= ±5V, V_{DS}=0V	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA	1	1.4	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=300mA	-	1.3	2.5	Ω
		V_{GS}= 4.5V, I_D=200mA	-	1.4	3.0	
Dynamic						
Input Capacitance	C_{iss}	V_{DS}=30V,V_{GS}=0V,f=1MHz	-	18	-	pF
Output Capacitance	C_{oss}		-	12	-	
Reverse Transfer Capacitance	C_{rss}		-	7	-	
Total Gate Charge	Qg	V_{DS}=30V,V_{GS}=10V,I_D=0.3A	-	1.7	2.4	nc
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DD}=30V, I_D=300mA, R_{GEN}=6Ω	-	5	-	ns
Turn-off Delay Time	$t_{D(off)}$		-	17	-	
Reverse recovery Time	trr	V_{GS}=0V,V_R=25V, I_S=300mA, dIs/dt=100A/μs	-	30	-	
Drain-Source Body Diode Characteristics						
Maximum Body-Diode Continuous Current	I_S		-	-	340	mA
Diode Forward Voltage	V_{SD}	I_S=300mA,V_{GS}=0V	-	-	1.2	V

Notes: 1. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.
2.Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

RATINGS AND CHARACTERISTIC OF 2N7002K

Typical Performance Characteristics

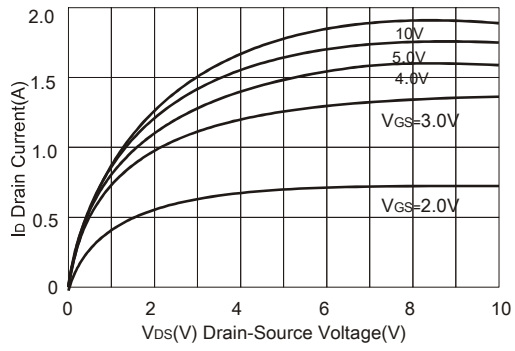


Fig1. Output Characteristics

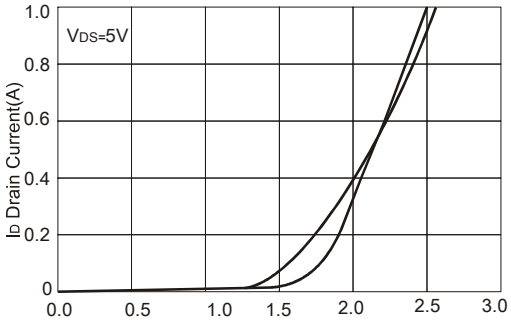


Fig2. Transfer Characteristics

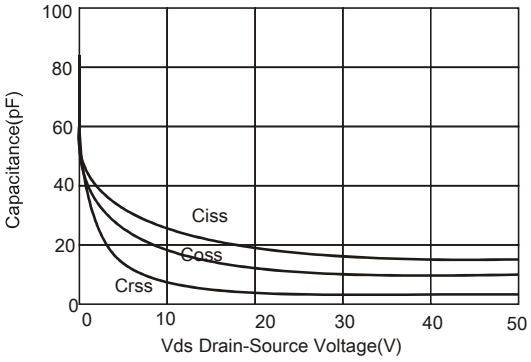


Fig3. Capacitance Characteristics

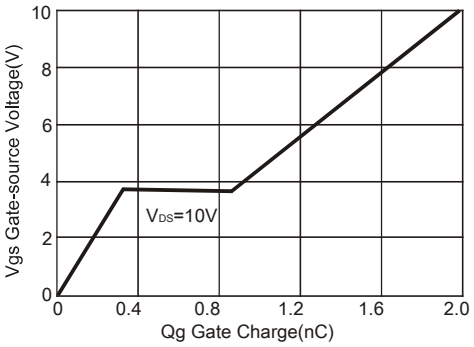


Fig4. Gate Charge

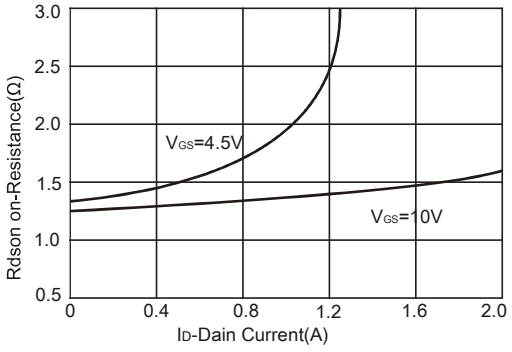


Fig5. Drain-Source on Resistance

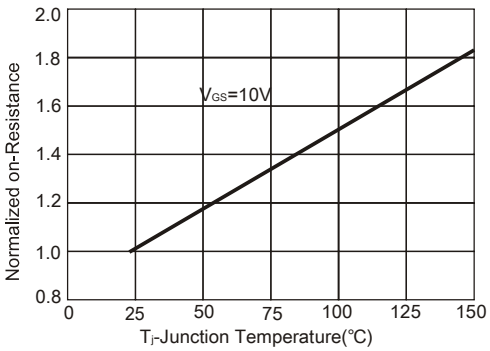


Fig6. Drain-Source on Resistance

RATINGS AND CHARACTERISTIC OF 2N7002K

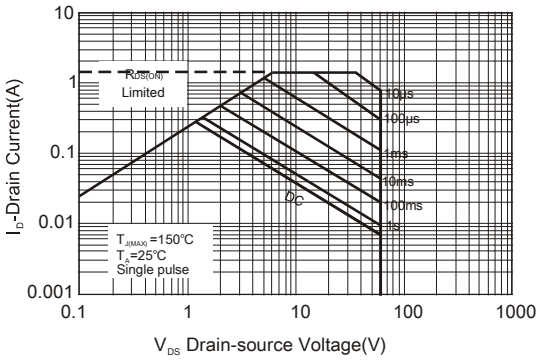


Fig7. Safe Operation Area

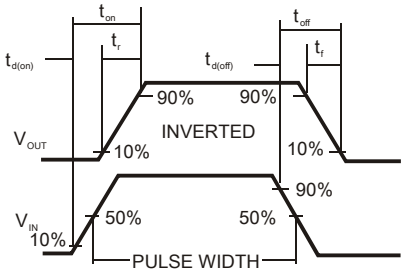
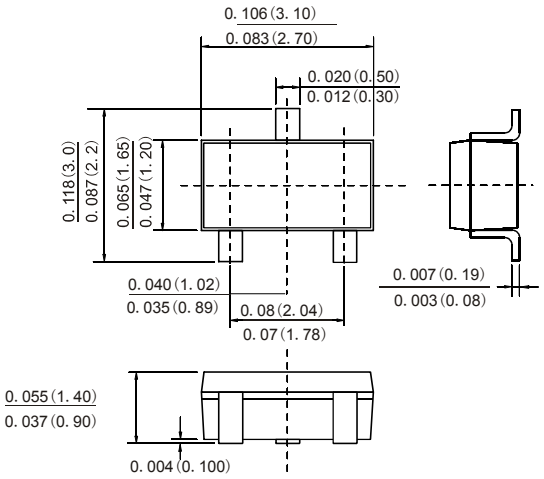


Fig8. Switching wave

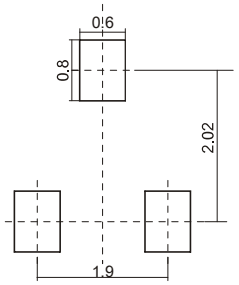
PACKAGE OUTLINE DIMENSIONS

SOT-23



Dimensions in inches and (millimetrers)

Suggested Pad Layout



Dimensions in millimetrers