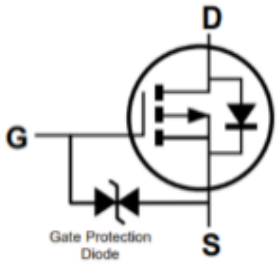
P-Channel Enhancement Mode MOSFET

2N7001K

Features

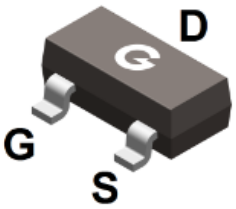
HF

- Low on-resistance
- High-speed switching
- Drive circuits can be simple
- Parallel use is easy
- ESD protected gate up to 1kV HBM



Typical Applications

- P-channel enhancement mode effect transistor
- Switching application



SOT-23

Mechanical Data

- Case: SOT-23
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
2N7001K	SOT-23	3000 pcs / Tape & Reel	7001K

Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	-60	V
Gate -Source Voltage	V_{GSS}	±20	V
Continuous Drain Current (T_C = 25°C)	I_D	-0.3	A
Continuous Drain Current (T_A = 25°C) *1		-0.2	A
Continuous Drain Current (T_A = 25°C) *1		-0.16	A
Pulsed Drain Current (t_p = 10μs, T_A = 25°C)	I_{DM}	-1	A
Single Pulse Avalanche Energy *3	E_{AS}	0.3	mJ
Power Dissipation (T_A = 25°C) *1	P_D	0.36	W
Operating Junction Temperature Range	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Air *1	$R_{\theta JA}$	-	330	347	°C/W
Thermal Resistance Junction-to-Case *1	$R_{\theta JC}$	-	185	208	°C/W
Thermal Resistance Junction-to-Lead *1	$R_{\theta JL}$	-	145	175	°C/W

Electrical Characteristics (@ T_A = 25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = -250μA	-60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -60V, V_{GS} = 0V	-	-	-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS} = ±20V, V_{DS} = 0V	-	-	±10	μA
On Characteristics						
$R_{DS(ON)}$	Drain-Source On-resistance *2	V_{GS} = -10V, I_D = -0.1A	-	1.8	4	Ω
		V_{GS} = -4.5V, I_D = -0.1A	-	2.3	5	
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-1	-1.5	-2	V
Dynamic Characteristics						
g_{fs}	Transconductance	V_{DS} = -10V, I_D = -0.2A	-	0.5	-	S
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = -20V f = 1.0MHz	-	39	-	pF
C_{OSS}	Output Capacitance		-	12	-	
C_{RSS}	Reverse Transfer Capacitance		-	2	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time *4	V_{DS} = -15V R_L = -50Ω I_D = -2.5A	-	2.5	-	ns
t_r	Turn-on Rise Time *4		-	1	-	
$t_{d(OFF)}$	Turn-Off Delay Time *4		-	16	-	
t_f	Turn-Off Fall Time *4		-	8	-	
Q_G	Total Gate-Charge	V_{DS} = -25V V_{GS} = -4.5V I_D = -0.2A	-	2	-	nC
Q_{GS}	Gate to Source Charge		-	0.7	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	0.5	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *2	I_S = -0.2A, V_{GS} = 0 V	-	-0.87	-1.4	V

Notes:

1. The data tested by surface mounted on a minimum recommended pad
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
3. The E_{AS} data shows Max. rating. The test condition is V_{DD} = -30V, V_{GS} = -10V, L = 0.1mH
4. Guaranteed by design, not subject to production

Ratings and Characteristics Curves (@ T_A = 25°C unless otherwise specified)

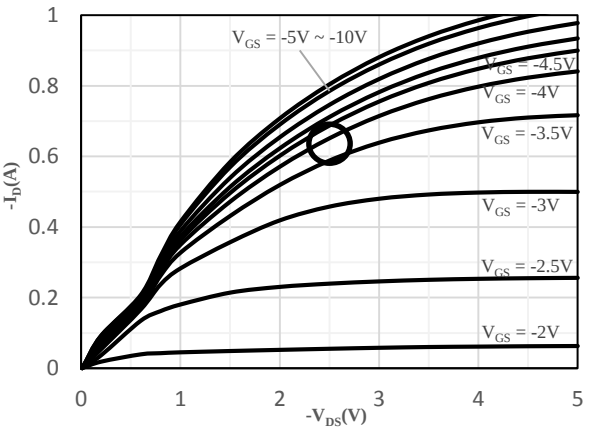


Fig 1 Typical Output Characteristics

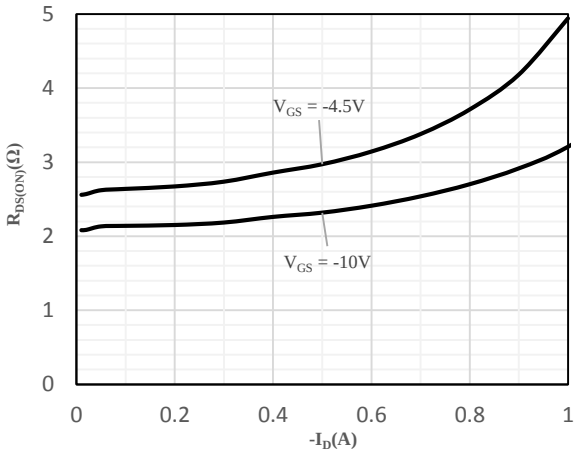


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

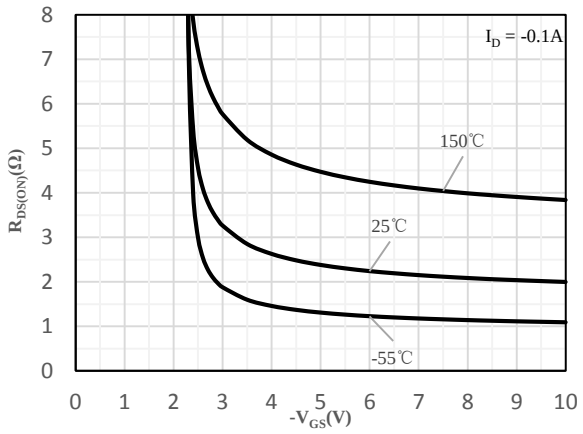


Fig 3 On-Resistance vs. Gate-Source Voltage

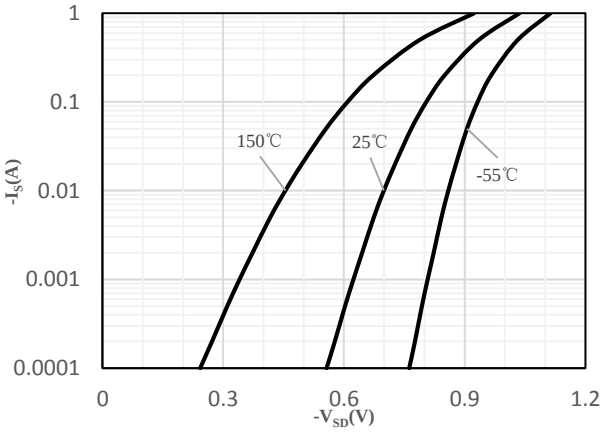


Fig 4 Body-Diode Characteristics

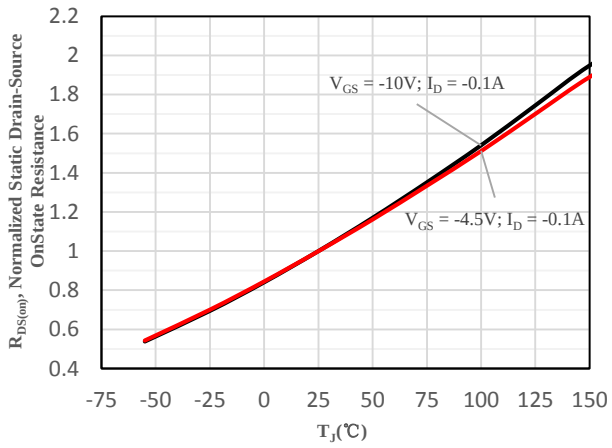


Fig 5 Normalized On-Resistance vs. Junction Temperature

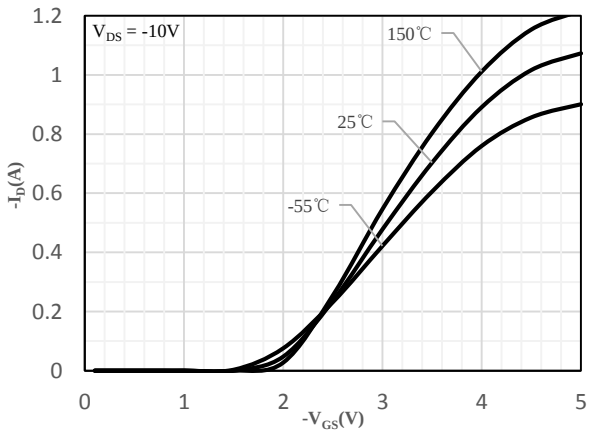


Fig 6 Transfer Characteristics

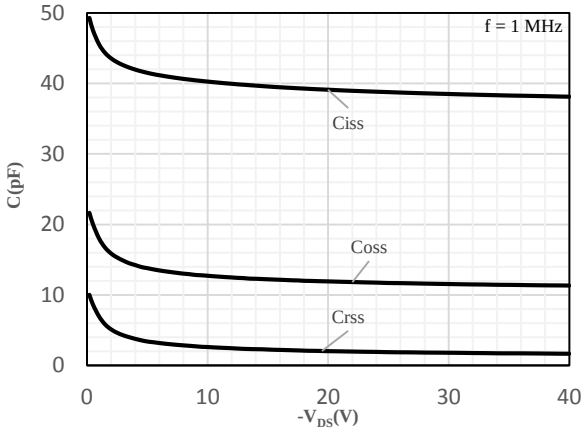


Fig 7 Capacitance Characteristics

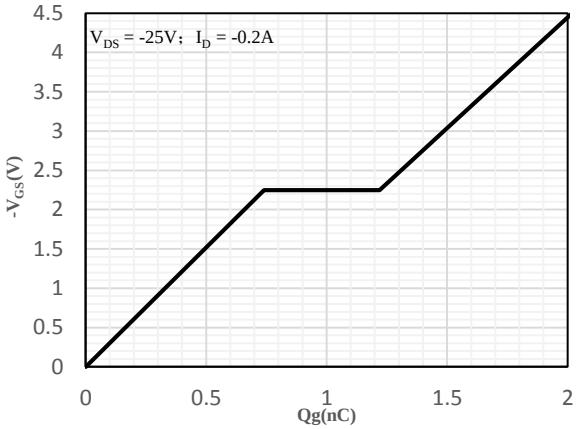


Fig 8 Gate-Charge Characteristics

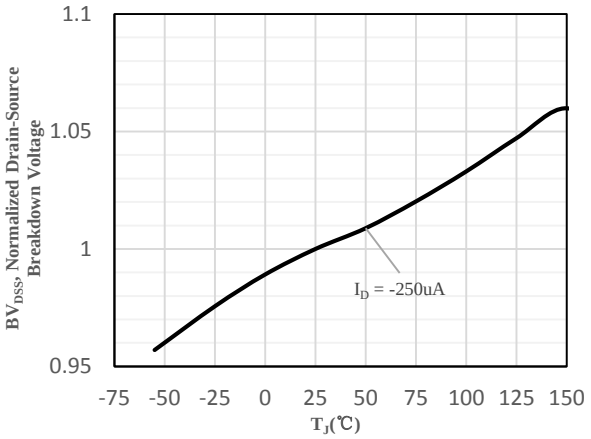


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

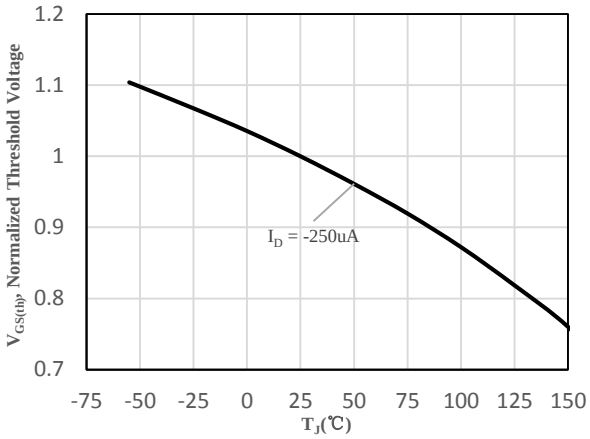


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

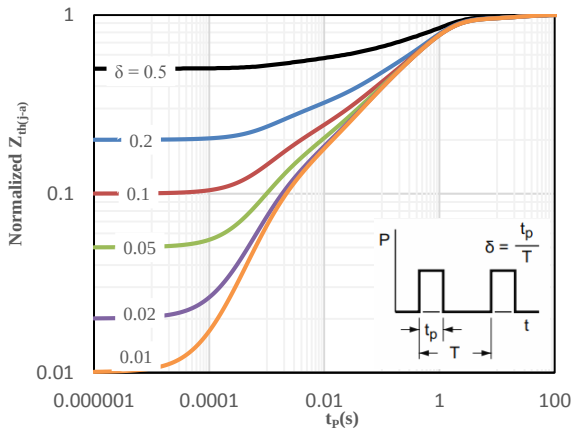
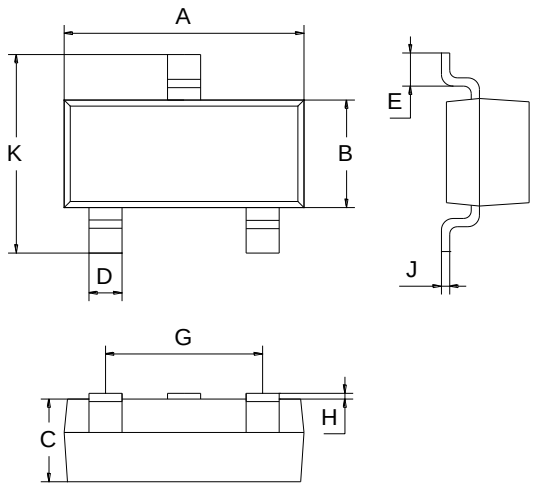


Fig 11 Normalized Maximum transient thermal impedance

Package Outline Dimensions (Unit: mm)

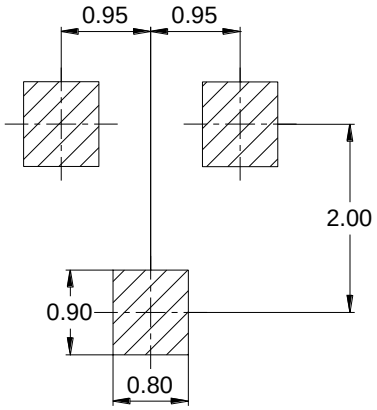
SOT-23



SOT-23		
Dimension	**Min.**	**Max.**
A	2.70	3.10
B	1.10	1.50
C	0.90	1.10
D	0.30	0.50
E	0.35	0.48
G	1.80	2.00
H	0.02	0.10
J	0.05	0.15
K	2.20	2.60

Mounting Pad Layout (Unit: mm)

SOT-23



IMPORTANT NOTICE

Changzhou Galaxy Century Microelectronics (GME) reserves the right to make changes without further notice to any product information (copyrighted) herein to make corrections, modifications, improvements, or other changes. GME does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others.