BORN SEMICONDUCTOR

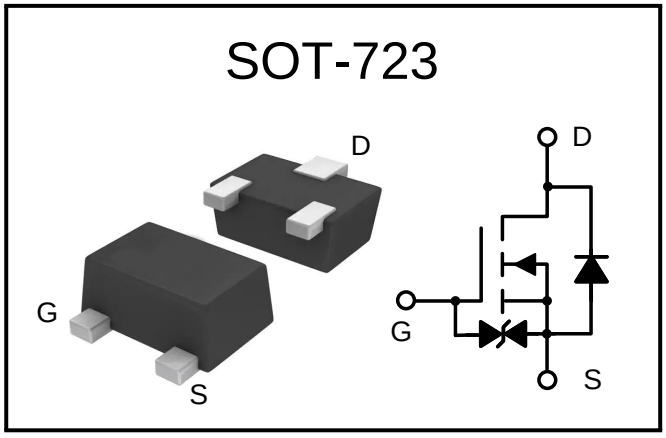
2N7002KM

N-Channel MOSFET

Features

- V_{DS}=60V
- I_D=0.34A
- $R_{DS(ON)}$ @V_{GS}=10V, MAX=2.5Ω
- $R_{DS(ON)}$ @V_{GS}=4.5V, MAX=3.0Ω

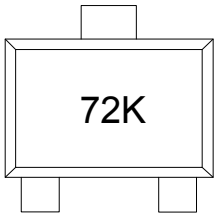
Package



Description

- Super High dense cell design for extremely low RDS(ON)
- Reliable and Rugged
- SOT-723 for Surface Mount Package
- ESD protected

Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
2N7002KM	SOT-723	72K	8K	Tape and reel

Absolute 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	Continuous Drain Current[1,5]	0.34	A
I_{DM}	Pulsed Drain Current[2]	1.0	A
P_D	Maximum Power Dissipation[4,5]	0.2	W
T_J	Junction Temperature	150	°C
T_{stg}	Storage Temperature	-55 to + 150	°C
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance[5]	625	°C/W

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Electrical Characteristics @T_A=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
OFF Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D =250uA	60	–	–	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 60V, V_{GS} = 0V	–	–	1	uA
I_{GSS}	Gate-body leakage	V_{GS} = ±20V, V_{DS} = 0V	–	–	±10	uA
On Characteristics[3]						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250uA	1	1.5	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS} = 10V, I_D = 0.3A	–	0.9	2.5	Ω
		V_{GS} = 4.5V, I_D = 0.2A	–	1.1	3.0	
g_{fs}	Forward transconductance	V_{DS} = 30V, I_D = 0.2A	–	159	–	ms
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 30V,	–	23.7	–	pF
C_{oss}	Output Capacitance	V_{GS} = 0V,	–	5.3	–	
C_{rss}	Reverse Transfer Capacitance	f = 1.0MHZ	–	2.5	–	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 30V, V_{GS} = 10V,	–	3.5	–	ns
t_r	Rise time	I_D = 0.3A,	–	3.2	–	
$t_{d(off)}$	Turn-off delay time	R_G = 3Ω,	–	12	–	
t_f	Fall time	R_L = 100Ω	–	10	–	
Q_g	Total Gate Charge	V_{DS} = 30V	–	0.29	–	nC
Q_{gs}	Gate-Source Charge	I_D = 0.3A,	–	0.23	–	
Q_{gd}	Gate-Drain Charge	V_{GS} = 10V	–	0.12	–	
DRAIN-SOURCE DIODE CHARACTERISTICS						
V_{SD}	Diode forward voltage[3]	V_{GS} = 0V,I_S = 0.3A	–	–	-1.2	V

Notes:

1.The maximum current rating is limited by package.

2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.

3.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

4.The power dissipation PD is limited by TJ(MAX) = 150° C.

5.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

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Typical Performance Characteristics(T_J = 25 °C, unless otherwise noted)

Figure 1 :Output Characteristics

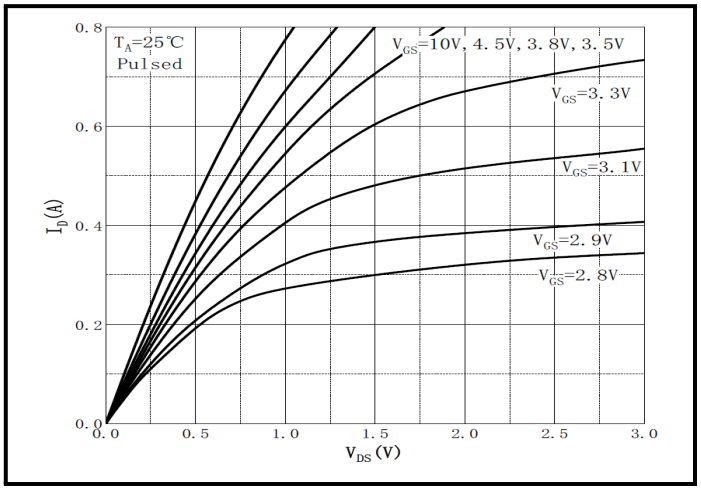

Figure 2 :Transfer Characteristics

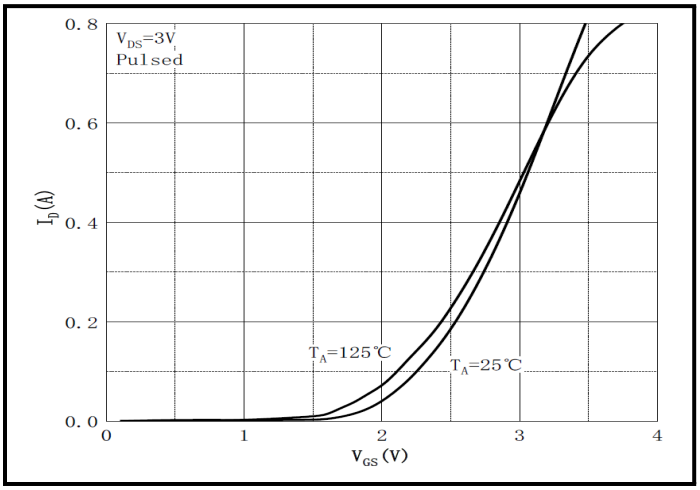

Figure 3 :$R_{DS(ON)}$ VS I_D

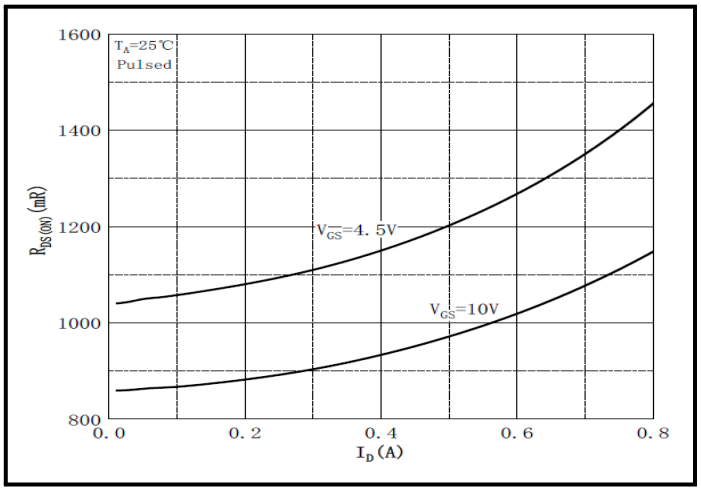

Figure 4 :$R_{DS(ON)}$ VS V_{GS}

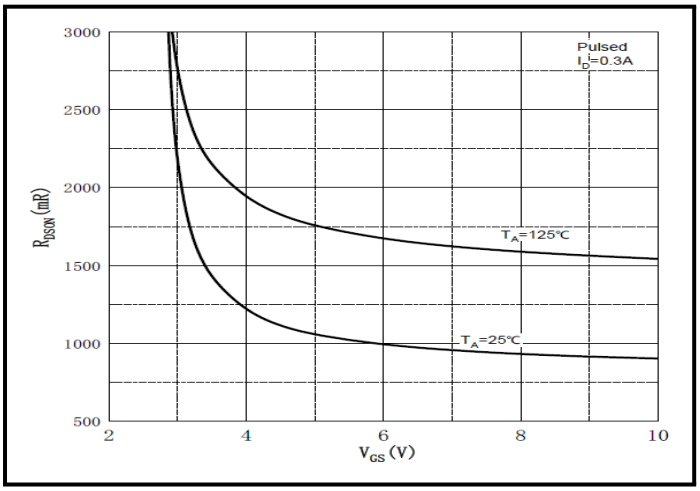

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Figure 5 :I_S VS V_{SD}

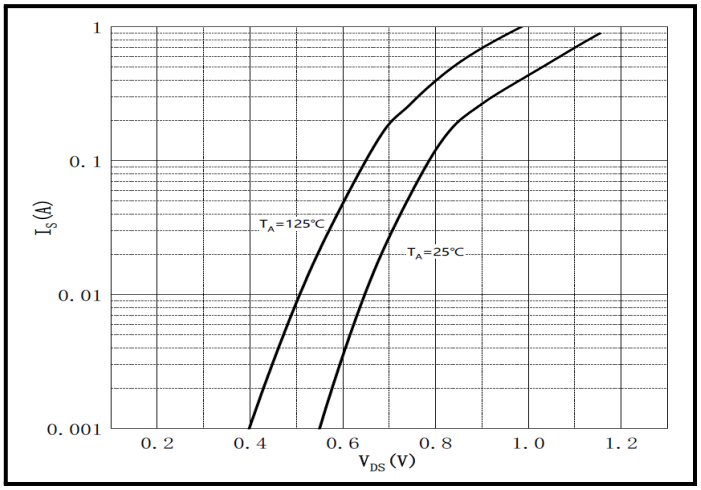
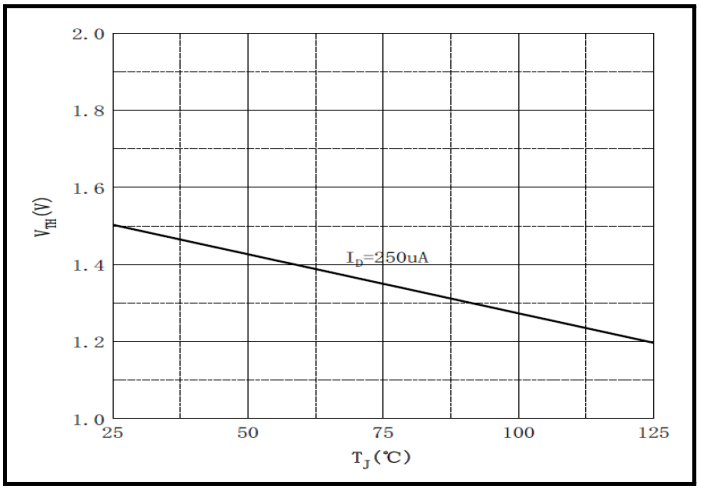


Figure 6 : Threshold Voltage



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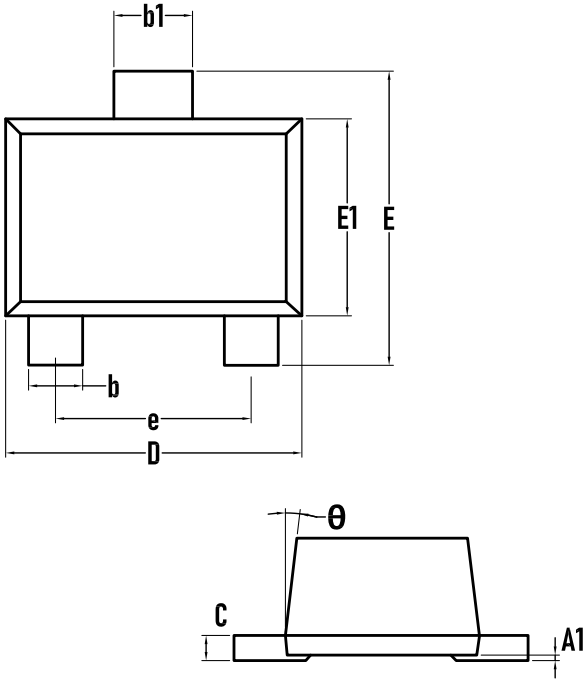
Outline Drawing - SOT-723



SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.350	–	0.490
A1	0.000	–	0.100
b	0.170	0.220	0.270
b1	0.225	–	0.370
C	0.080	–	0.150
D	1.150	–	1.250
E	1.150	–	1.250
E1	0.750	–	0.850
e	0.800TYP.		
θ	0°	–	7°