HM7002KJR

N-Channel Enhancement Mode MOSFET with ESD Protection

➢ Features

VDS	VGS	RDSON Typ.	ID	ESD
60V	±20V	1R@10V	0.3A	500V
		1.25R@4V5		

➢ Description

This device is a N-Channel enhancement mode MOSFET, with low on-resistance, fast switching speed and low threshold voltage, it is ideal for portable equipment.

➢ Applications

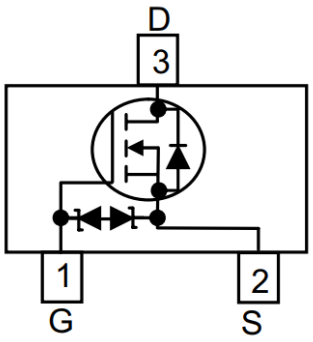
- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers
- Display, Memories, Transistors, etc.
- Battery Operated System
- Solid-State Relays

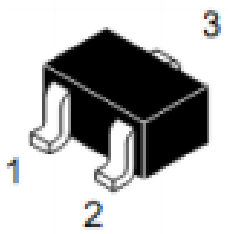
➢ Ordering Information

Device	Package	Shipping
HM7002KJR	SOT723	8000/Reel

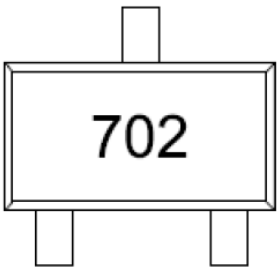
➢ Pin configuration

Top view





SOT723



Marking

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

Symbol	Parameter	Ratings	Unit
V_{DSS}	Drain-to-Source Voltage	60	V
V_{GSS}	Gate-to-Source Voltage	±20	V
I_D	Continuous Drain Current [a]	0.3	A
I_{DM}	Pulsed Drain Current [b]	0.8	A
P_D	Power Dissipation [c]	0.5	W
P_{DSM}	Power Dissipation [a]	0.25	W
T_J	Operation junction temperature	-55 to 150	℃
T_{STG}	Storage temperature range	-55 to 150	℃

➢ Thermal Resistance Ratings(T_A=25℃ unless otherwise noted)

Symbol	Parameter	Typical	Maximum	Unit
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance [a]		510	℃/W
$R_{\theta JC}$	Junction-to-Case Thermal Resistance		255	

Note:

a. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR-4 board with 2oz.copper,in a still air environment with T_A=25℃.The value in any given application depends on the user is specific board design. The current rating is based on the t≤ 10s thermal resistance rating.

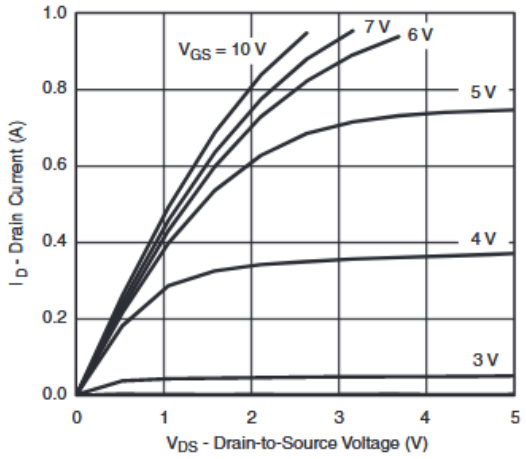
b. Repetitive rating, pulse width limited by junction temperature.

c. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.

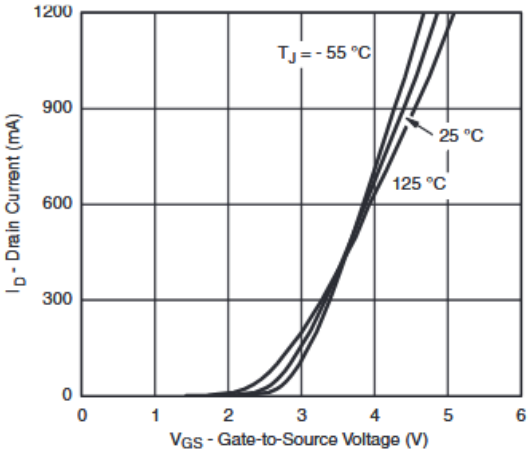
➢ **Electronics Characteristics**(T_A=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	VGS=0V,ID=10uA	60			V
$V_{GS\ (th)}$	Gate Threshold Voltage	VDS=VGS,ID=250uA	0.75	1	1.25	V
$R_{DS(on)}$	Drain-Source On-Resistance	VGS=10V,ID=0.5A		1	2.5	R
		VGS=4.5V,ID=0.5A		1.25	3.5	
		VGS=2.5V,ID=0.2A		1.7	4	
I_{DSS}	Zero Gate Voltage Drain Current	VDS=60V,VGS=0V			1	uA
I_{GSS}	Gate-Source leak current	VGS=±15V,VDS=0V			±10	uA
G_{FS}	Transconductance	VDS=10V,ID=0.2A		0.1		S
V_{SD}	Forward Voltage	VGS=0V,IS=0.2A			1.3	V
Ciss	Input Capacitance	VDS=25V, VGS=0V, f=1MHz		30		pF
Coss	Output Capacitance			6		
Crss	Reverse Transfer Capacitance			2.9		
$T_{D(ON)}$	Turn-on delay time	VGS=10V, VDS=10V, ID=100mA		25		ns
Tr	Rise Time			10		
$T_{D(OFF)}$	Turn-off delay time			35		
Tf	Fall Time			20		
Q_G	Total Gate Charge	VGS=10V, VDS=15V, ID=0.2A		0.4		nC
Q_{GS}	Gate Source Charge			0.1		
Q_{GD}	Gate Drain Charge			0.11		

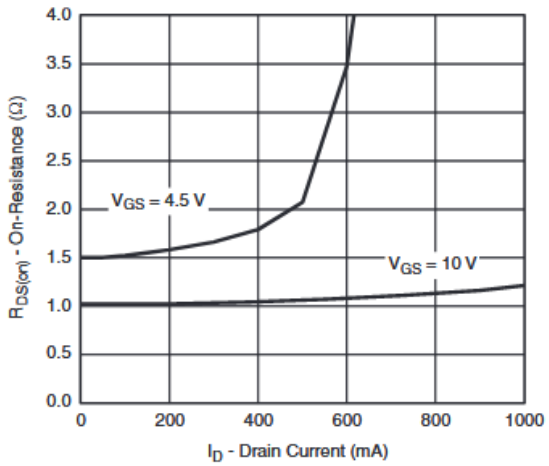
➢ **Typical Characteristics**(T_A=25℃ unless otherwise noted)



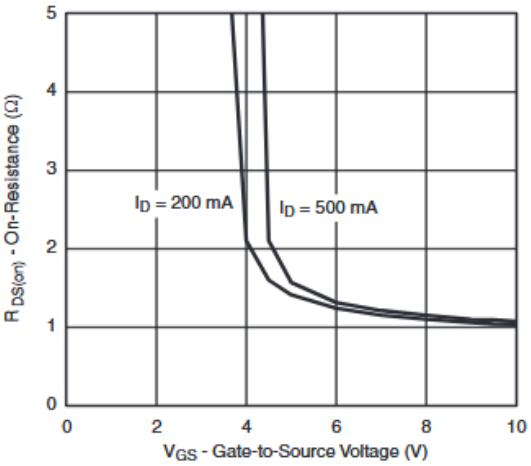
Output Characteristics



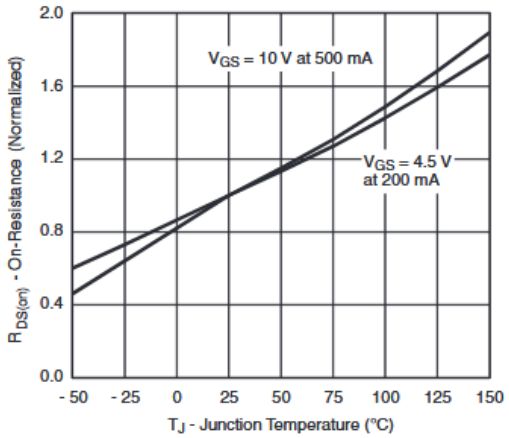
Transfer Characteristics



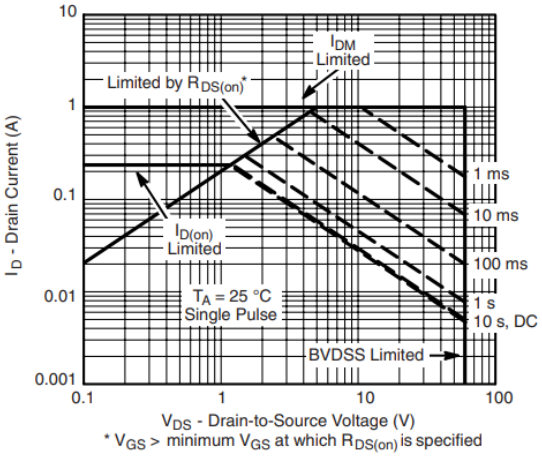
On-Resistance vs. Drain Current



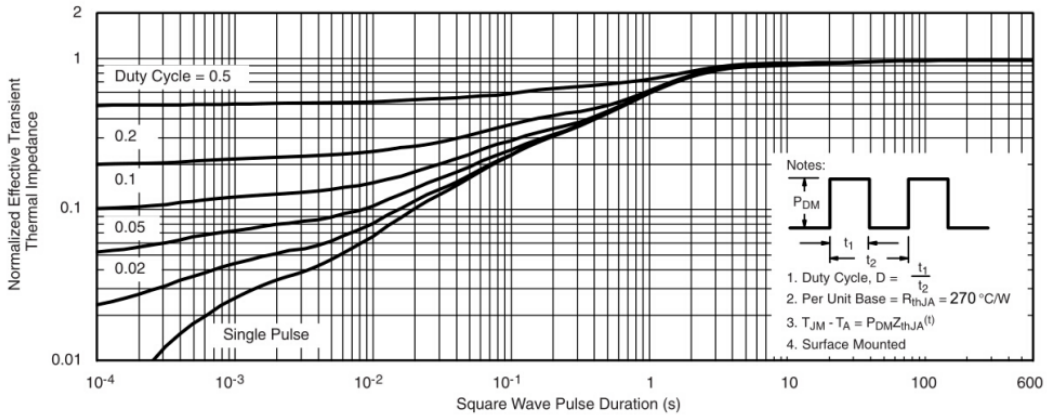
On-Resistance vs. Gate-Source Voltage



On-Resistance vs. Junction Temperature

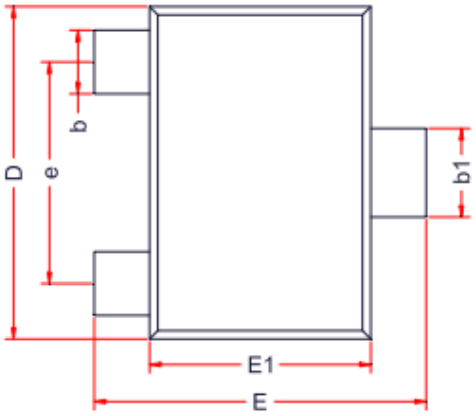


Safe Operating Area

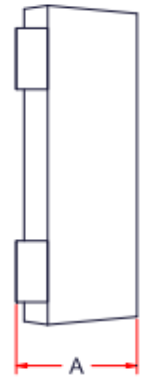

Normalized Effective Transient Thermal Impedance
2
1
0.1
0.01
Duty Cycle = 0.5
0.2
0.1
0.05
0.02
Single Pulse
Notes:
P_{DM}
t_1
t_2
1. Duty Cycle, D = $\frac{t_1}{t_2}$
2. Per Unit Base = R_{thJA} = 270 °C/W
3. $T_{JM} - T_A = P_{DM}Z_{thJA}(t)$
4. Surface Mounted
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
10
100
600
Square Wave Pulse Duration (s)

➢ Package Information

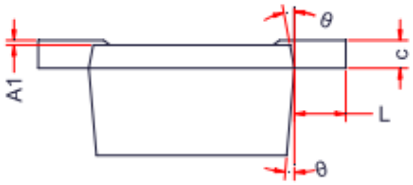
SOT-723



TOP VIEW



SIDE VIEW



SIDE VIEW

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.43	-	0.55
A1	0.00	-	0.05
c	0.08	0.13	0.18
b1	0.27	-	0.37
b	0.17	-	0.27
L1	0.15	0.20	0.25
D	1.15	1.20	1.25
E	1.15	1.20	1.25
E1	0.75	0.80	0.85
e	0.80 Ref.		
θ	7 ° Ref.		