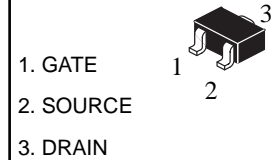


### N-Channel ENHANCEMENT MODE POWER MOSFET

 Lead(Pb)-Free



**SOT-523(SC-75)**

#### FEATURES:

- \* Fast Switching Speed
- \* Low On-Resistance
- \* Low Voltage Driver

#### APPLICATIONS:

- \* Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- \* Battery Operated Systems
- \* Power Supply Converter Circuits
- \* Load/Power Switching Cell Phones, Pagers

#### Maximum Ratings ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

Characteristic	Symbol	Values	Unit
Drain-Source Voltage	$V_{DSS}$	60	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current	$I_D$	115	mA
Total Power Dissipation	$P_D$	150	mW
Junction temperature Range	$T_j$	150	$^{\circ}\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +150	$^{\circ}\text{C}$

#### Device Marking

2N7002T = K72

ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage V <sub>GS</sub> =0V, I <sub>D</sub> =10μA	V <sub>(BR)DSS</sub>	60	-	-	V
Gate-Threshold Voltage V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	V <sub>th(GS)</sub>	1	-	2	V
Gate-body Leakage* V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	I <sub>GSS</sub>	-	-	±10	nA
Zero Gate Voltage Drain Current V <sub>GS</sub> =0V, V <sub>DS</sub> =60V	I <sub>DSS</sub>	-	-	1	μA
On-state Drain Current V <sub>GS</sub> =10V, V <sub>DS</sub> =7.5V	I <sub>D(ON)</sub>	500	1000	-	mA
Drain-Source On-Resistance V <sub>GS</sub> =5V, I <sub>D</sub> =50mA V <sub>GS</sub> =10V, I <sub>D</sub> =500mA	R <sub>DS(on)</sub>	-	2.0 4.4	7.5 13.5	Ω
Forward Transconductance V <sub>DS</sub> =10V, I <sub>D</sub> =200mA	g <sub>fs</sub>	80	-	-	ms
Input Capacitance V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz	C <sub>iss</sub>	-	22	50	pF
Output Capacitance V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz	C <sub>oss</sub>	-	11	25	
Reverse Transfer Capacitance V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz	C <sub>rss</sub>	-	2	5	

## SWITCHING

Turn-on Time V <sub>DD</sub> =30V, R <sub>L</sub> =150Ω, I <sub>D</sub> =200mA, V <sub>GEN</sub> =10V, R <sub>GEN</sub> =25Ω	T <sub>D(on)</sub>	-	7	20	ns
Turn-off Time V <sub>DD</sub> =30V, R <sub>L</sub> =150Ω, I <sub>D</sub> =200mA, V <sub>GEN</sub> =10V, R <sub>GEN</sub> =25Ω	T <sub>D(off)</sub>	-	11	20	

## Typical Characteristics

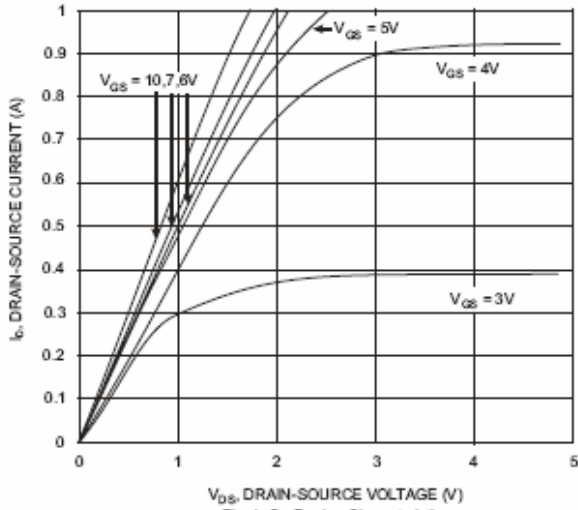


Fig. 1 On-Region Characteristics

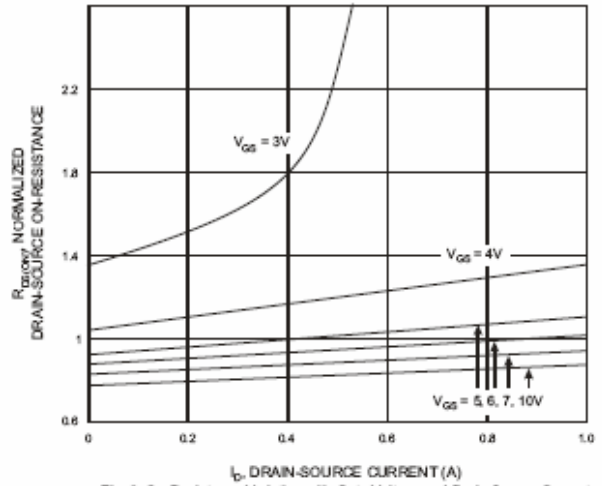


Fig. 2 On-Resistance Variation with Gate Voltage and Drain-Source Current

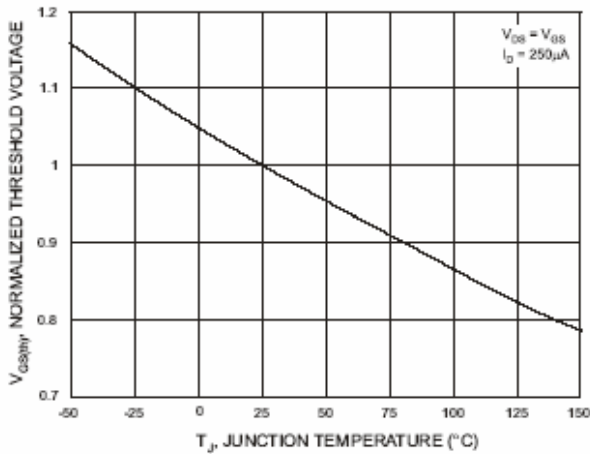


Fig. 3 Gate Threshold Variation with Temperature

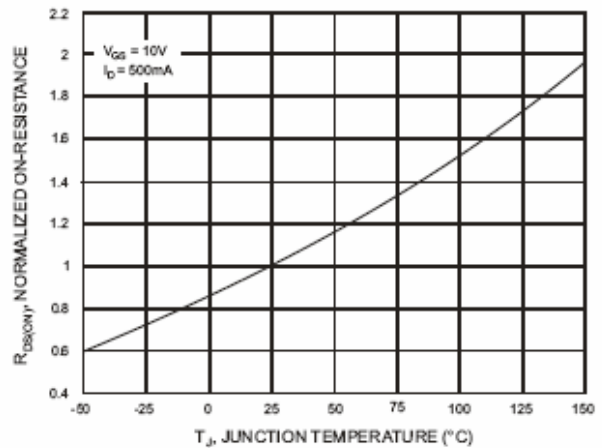


Fig. 4 On-Resistance Variation with Temperature

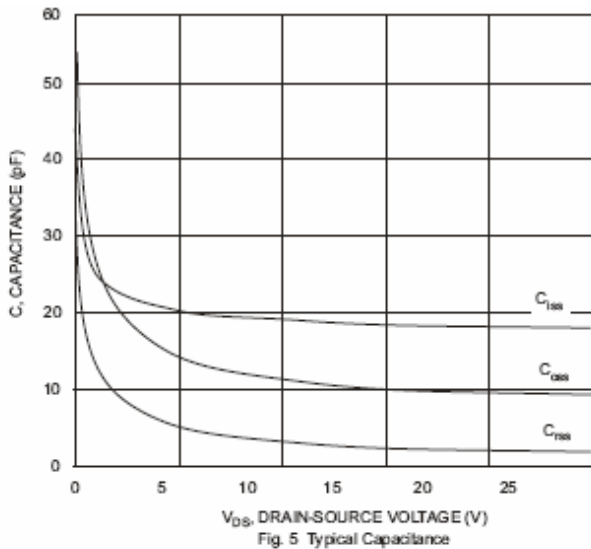


Fig. 5 Typical Capacitance

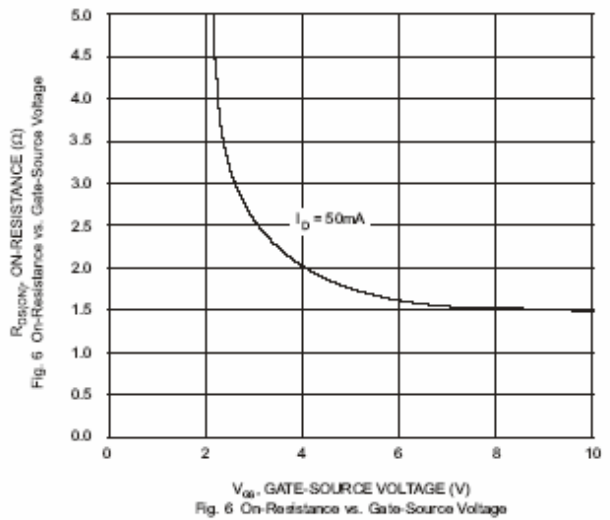
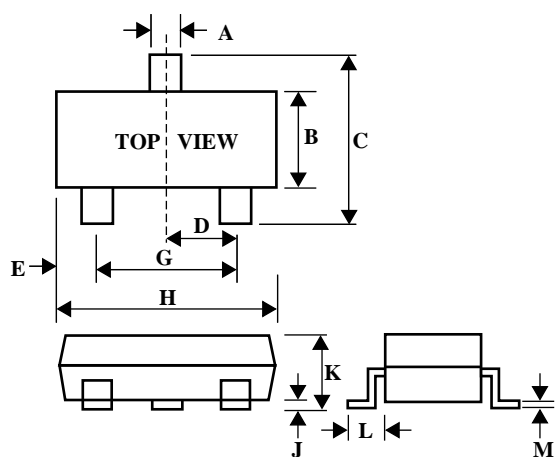


Fig. 6 On-Resistance vs. Gate-Source Voltage

**SOT-523 Outline Dimensions**

Unit:mm



SOT-523		
Dim	Min	Max
A	0.30	0.50
B	0.70	0.90
C	1.45	1.75
D	-	0.50
E	0.15	0.40
G	0.80	1.00
H	1.40	1.80
J	0.00	0.10
K	0.70	1.00
L	0.37	0.48
M	0.10	0.25