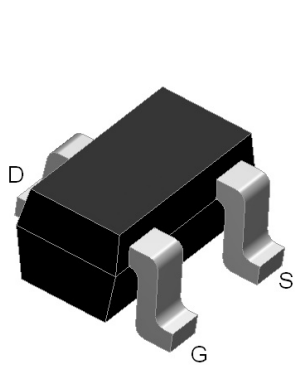
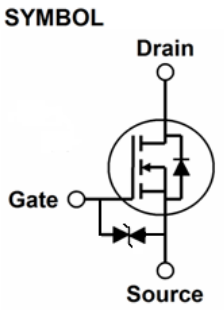
N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR





FEATURES

- N-channel Enhancement Mode Field Effect Transistor, Designed For High Speed Pulse Amplifier And Drive Application, Which Is Manufactured By The N-Channel DMOS Process.
- ESD MIL-STD 833, ±2.5KV Contact Discharge Compliant Protection

MECHANICAL DATA

- Available in SOT-523 Package
- Solderability：MIL-STD-202, Method 208
- Full RoHS Compliance

ORDERING INFORMATION

PART NUMBER	PACKAGE	SHIPPING	MARKING CODE
2N7002T□-5T3R	SOT-523	Tape Reel	K72

Notes:

1. □: none is for Lead Free package;
   "G" is for Halogen Free package.

THERMAL DATA

PARAMETER	SYMBOL	VALUES	UNIT
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	625	°C/W

Notes:

2. The value of $R_{\theta JA}$ is measured with device mounted on 1 in^2 FR-4 board with 2 oz copper.

ABSOLUTE MAXIMUM RATINGS

T_A = 25°C, unless otherwise noted. (Note 3)

PARAMETER	SYMBOL	VALUE	UNIT
Drain-Source Voltage	V_{DSS}	60	V
Drain-Gate Voltage	V_{DGR}	60	V
Gate-Source Voltage	V_{GSS}	±20	V
Drain Current (Continuous)	I_D	250	mA
Maximum Drain Currnet-Continue	P_D	200	mW
Maximum Junction Temperature	T_J	-55 to +150	°C
Storage Junction Temperature	T_{stg}	-55 to +150	°C

Notes:

3. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
4. Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS

T_C = 25°C, unless otherwise noted.

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 10μA	60			V
		V_{GS} = 0V, I_D = 3.0mA	60			
Drain-Source Leakage Current	I_{DSS}	V_{GS} = 0V, V_{DS} = 60V, T_J = 25°C			1	μA
		V_{GS} = 0V, V_{DS} = 60V, T_J = 125°C			500	
Gate- Source Leakage Current	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±10	μA
ON CHARACTERISTICS(Note 5)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.5	2.5	V
Static Drain-Source On Resistance	$R_{DS(ON)}$	V_{GS} =10V, I_D =500mA, T_J = 25°C		1.5	7.5	Ω
		V_{GS} =5V, I_D =50mA, T_J = 25°C		2.0	7.5	
Drain-Source On Voltage	$V_{DS(ON)}$	V_{GS} =10V, I_D =500mA			3.75	V
		V_{GS} =5V, I_D =50mA			1.5	
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz		25	50	pF
Output Capacitance	C_{oss}			6	25	
Reverse Transfer Capacitance	C_{rss}			1.2	5	
SWITCHING CHARACTERISTICS						
Turn-On Time	$T_{(on)}$	V_{DD} = 25V, I_D = 500mA, R_L=50Ω, V_{GEN}=10V, R_G=25Ω		7.5	20	nS
Turn-Off Time	$t_{(off)}$			7.5	20	
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-source Diode Forward Voltage	V_{SD}	V_{GS} = 0V, I_S = 115mA		0.85	1.2	V
On-State Drain Current	$I_{D(ON)}$	V_{DS} = 7V, V_{GS} = 10V	500			mA
Forward Tran Conductance	G_{TS}	V_{DS} =10V, I_D =200mA	80	300		mS

Notes:

5. Pulse test：Pulse width ≦300 μS, Duty cycle ≦2%

TYPICAL PERFORMANCE CHARACTERISTICS

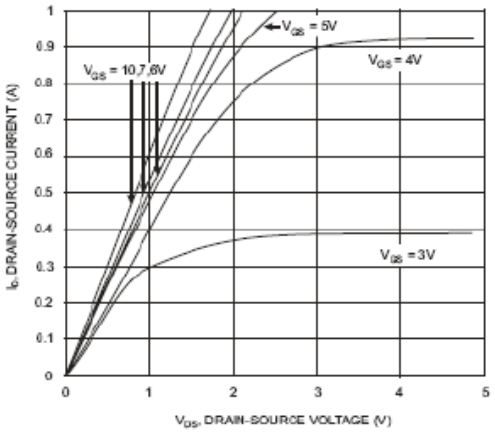


Fig. 1 On-Region Characteristics

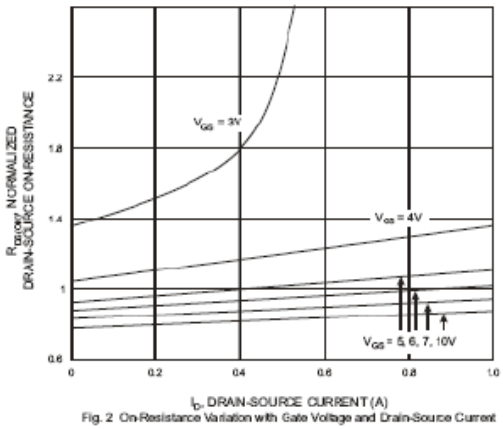


Fig. 2 On-Resistance Variation with Gate Voltage and Drain-Source Current

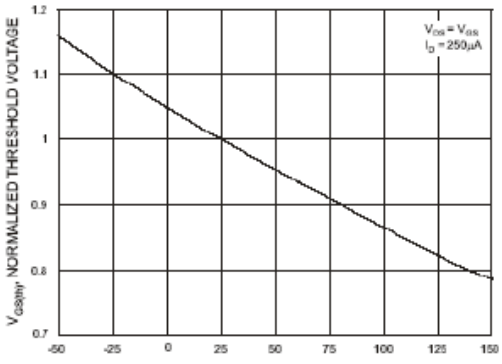


Fig. 3 Gate Threshold Variation with Temperature

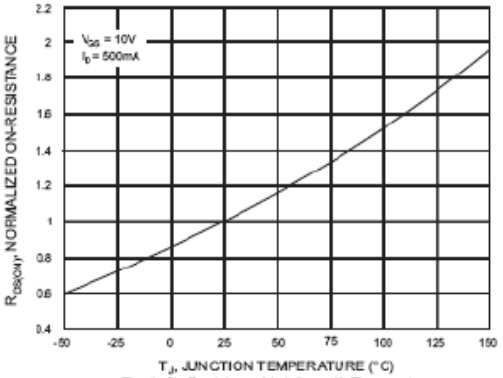


Fig. 4 On-Resistance Variation with Temperature

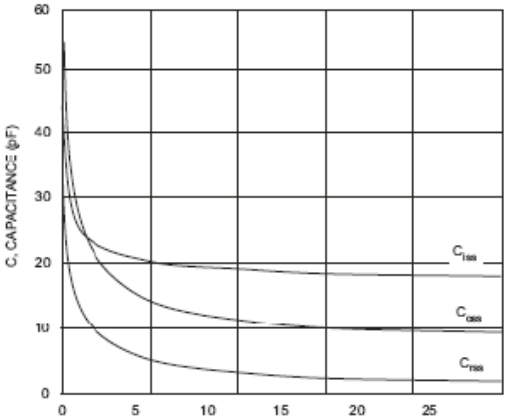


Fig. 5 Typical Capacitance

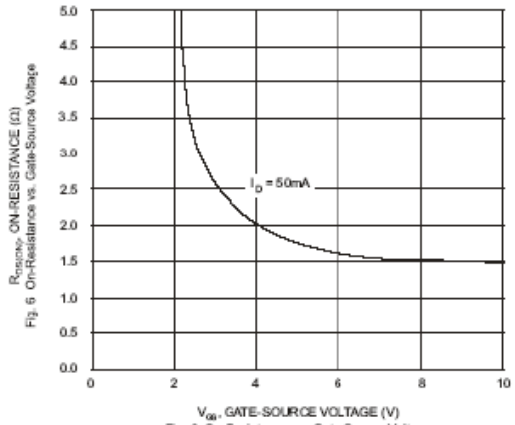


Fig. 6 On-Resistance vs. Gate-Source Voltage

PHYSICAL DIMENSION

Unit：Inch (Millimeter)

SOT-523