



Micro Commercial Components

Micro Commercial Components  
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# 2N7002

## N-Channel MOSFET

### Features

- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0 and MSL Rating 1
- Advanced Trench Process Technology
- High Input Impedance
- High Speed Switching
- CMOS Logic Compatible Input
- Marking : 7002/S72

### Maximum Ratings @ 25°C Unless Otherwise Specified

Symbol	Rating	Rating	Unit
$V_{DS}$	Drain-source Voltage	60	V
$I_D$	Drain Current	115	mA
$P_D$	Total Power Dissipation	200	mW
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	625	°C/W
$T_J$	Operating Junction Temperature	-55 to +150	°C
$T_{STG}$	Storage Temperature	-55 to +150	°C

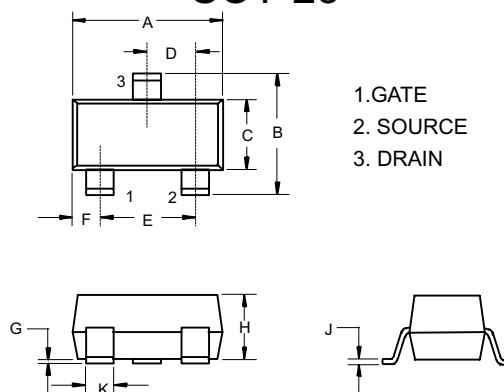
### Electrical Characteristics @ 25°C Unless Otherwise Specified

Symbol	Parameter	Min	Typ	Max	Units
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage ( $V_{GS}=0V_{dc}$ , $I_D=10\mu A_{dc}$ )	60	---	---	Vdc
$V_{th(GS)}$	Gate-Threshold Voltage ( $V_{DS}=V_{GS}$ , $I_D=250\mu A_{dc}$ )	1.0	---	2.5	Vdc
$I_{GSS}$	Gate-body Leakage ( $V_{DS}=0V_{dc}$ , $V_{GS}=\pm 20V_{dc}$ )	---	---	$\pm 100$	nAdc
$I_{DSS}$	Zero Gate Voltage Drain Current ( $V_{DS}=60V_{dc}$ , $V_{GS}=0V_{dc}$ ) ( $V_{DS}=60V_{dc}$ , $V_{GS}=0V_{dc}$ , $T_J=125^\circ C$ )	---	---	1 500	$\mu A_{dc}$
$I_{D(ON)}$	On-state Drain Current ( $V_{DS}=7.5V_{dc}$ , $V_{GS}=10V_{dc}$ )	500	2700	---	mA
$r_{DS(on)}$	Drain-Source On-Resistance ( $V_{GS}=10V_{dc}$ , $I_D=500mA_{dc}$ ) ( $V_{GS}=5V_{dc}$ , $I_D=50mA_{dc}$ )	---	1.2 1.7	7.5 7.5	$\Omega$
$V_{DS(on)}$	Drain-Source On-Voltage ( $V_{GS}=10V_{dc}$ , $I_D=500mA_{dc}$ ) ( $V_{GS}=5V_{dc}$ , $I_D=50mA_{dc}$ )	---	---	3.75 1.5	Vdc
$G_{FS}$	Forward Transconductance ( $V_{DS}=10V_{dc}$ , $I_D=200mA_{dc}$ )	80	---	---	ms
$V_{SD}$	Diode Forward Voltage ( $V_{GS}=0V_{dc}$ , $I_S=115mA_{dc}$ )	---	---	1.5	Vdc
$I_S$	Maximum Continuous Drain-Source Diode Forward Current	-	---	115	mA
$C_{iss}$	Input Capacitance	---	---	50	pF
$C_{oss}$	Output Capacitance	---	---	25	
$C_{rss}$	Reverse Transfer Capacitance	---	---	5	

### Switching

$t_{d(on)}$	Turn-on Time	$V_{DD}=30V_{dc}$ , $V_{GEN}=10V_{dc}$	---	---	20	ns
$t_{d(off)}$	Turn-off Time	$R_L=150\Omega$ , $I_D=200mA$ , $R_{GEN}=25\Omega$	---	---	20	

### SOT-23



#### DIMENSIONS

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.110	.120	2.80	3.04	
B	.083	.098	2.10	2.64	
C	.047	.055	1.20	1.40	
D	.035	.041	.89	1.03	
E	.070	.081	1.78	2.05	
F	.018	.024	.45	.60	
G	.0005	.0039	.013	.100	
H	.035	.044	.89	1.12	
J	.003	.007	.085	.180	
K	.015	.020	.37	.51	

### Suggested Solder Pad Layout

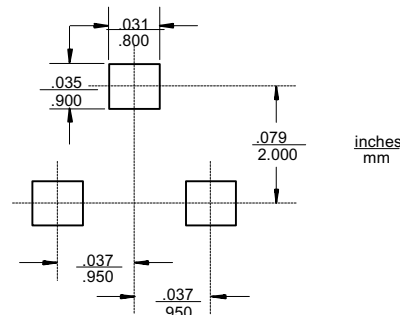


Fig. 1 – On-Resistance vs. Gate-to-Source Voltage

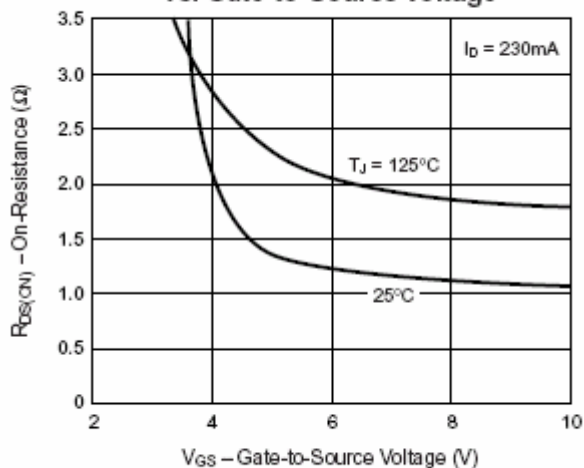


Fig. 2 – Source-Drain Diode Forward Voltage

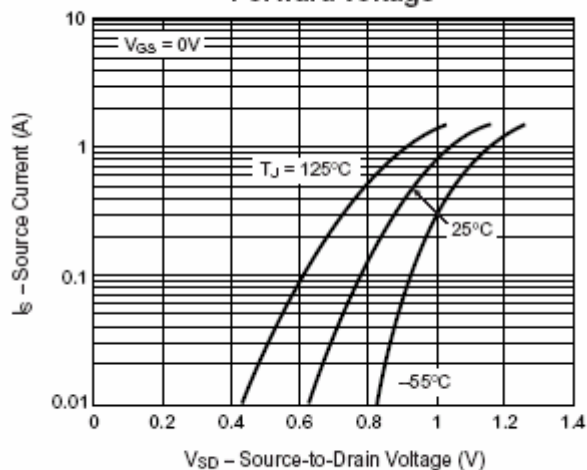


Fig. 3 – Output Characteristics

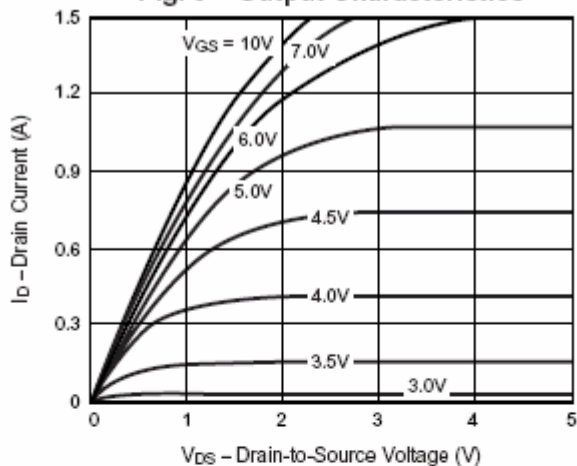


Fig. 4 – Transfer Characteristics

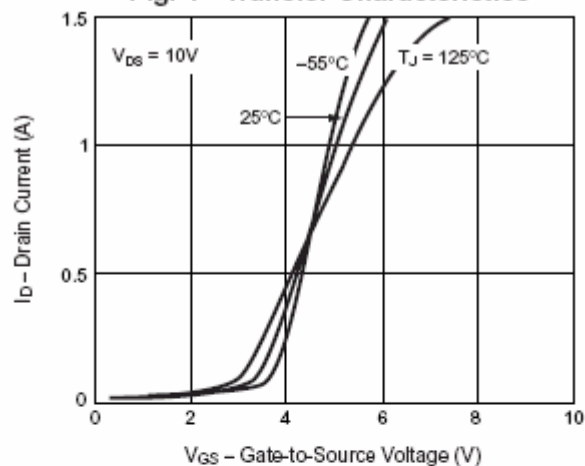


Fig. 5 – Capacitance

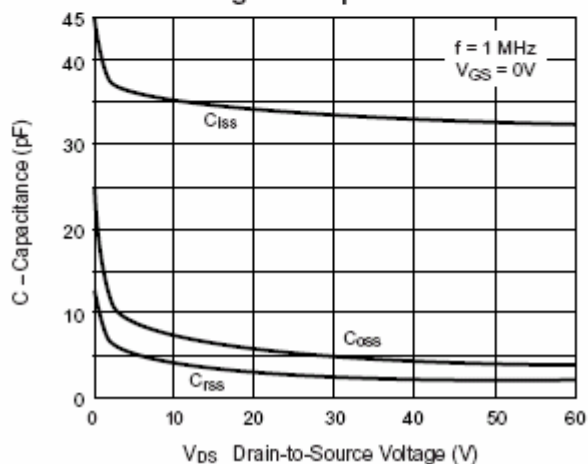


Fig. 6 – On-Resistance vs. Drain Current

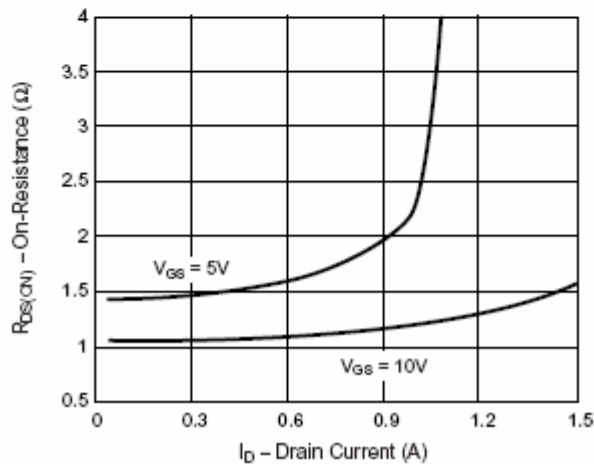


Fig. 7 – Gate Charge

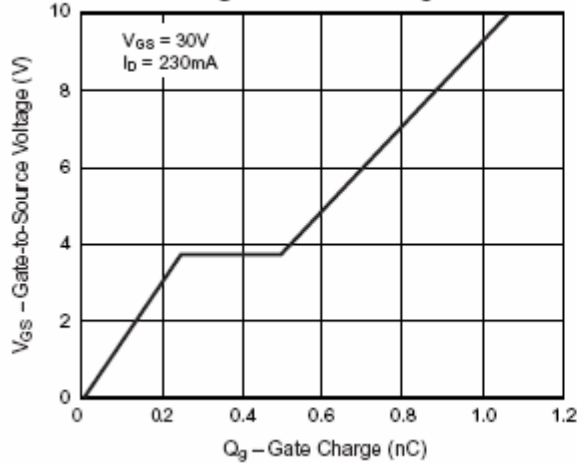


Fig. 8 – Breakdown Voltage vs. Junction Temperature

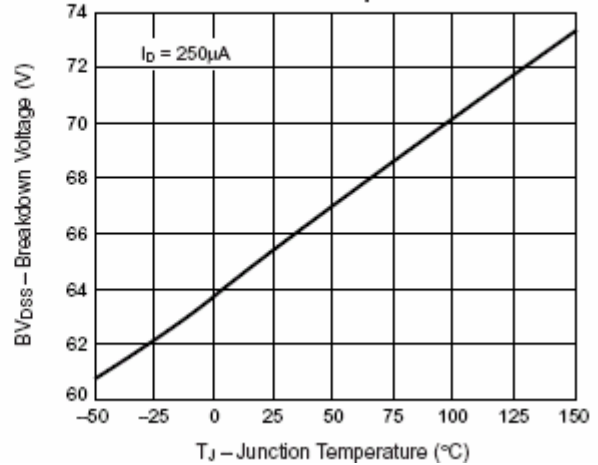


Fig. 9 – Threshold Voltage

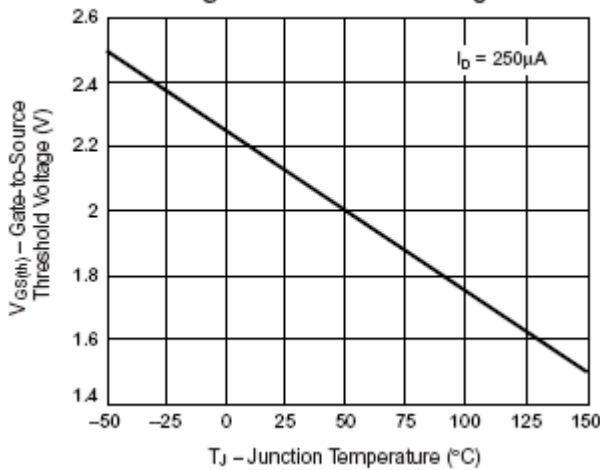


Fig. 10 – On-Resistance vs. Junction Temperature

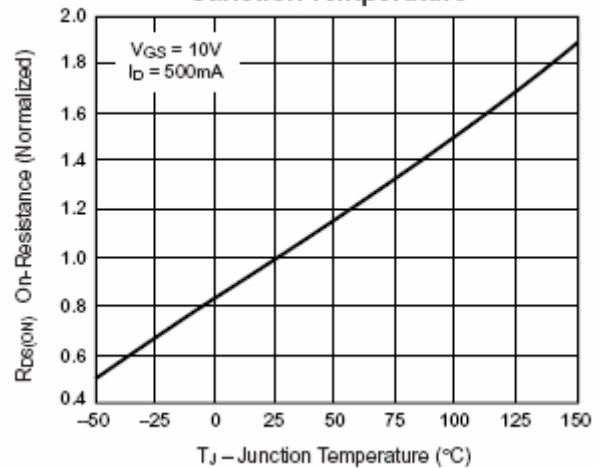


Fig. 11 – Thermal Impedance

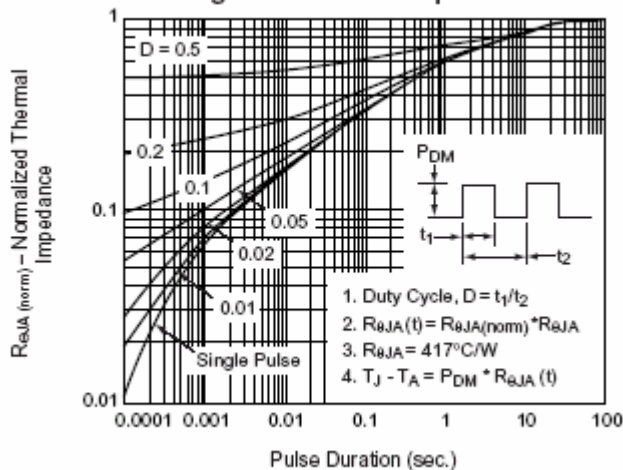
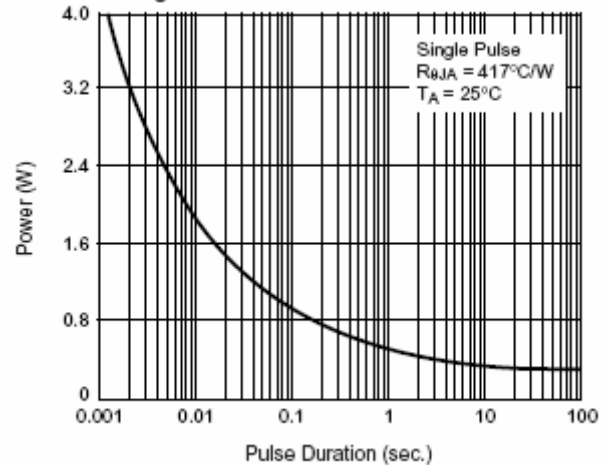
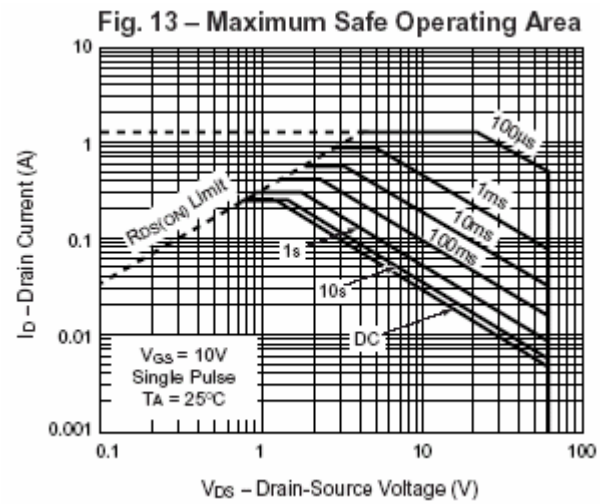


Fig. 12 – Power vs. Pulse Duration





## Ordering Information

Device	Packing
(Part Number)-TP	Tape&Reel;3Kpcs/Reel

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