

N-Channel ENHANCEMENT MODE POWER MOSFET

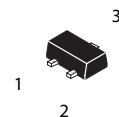
(Pb) Lead(Pb)-Free

FEATURES:

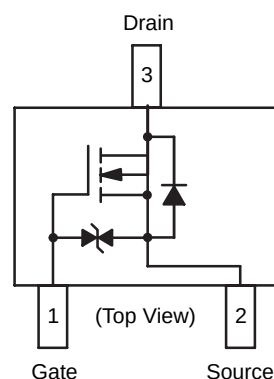
- * Gate-Source ESD Protected: 1500 V
- * Fast Switching Speed
- * Low On-Resistance
- * Low Voltage Driver

APPLICATIONS:

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



SC-89



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

Characteristic	Symbol	Values	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current	I_D	115	mA
	I_{DP}^1	800	mA
Reverse drain current	I_D	115	mA
	I_{DRP}^1	800	mA
Total Power Dissipation	P_D^2	225	mW
Junction temperature Range	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$

Note 1. $P_w \leq 10\mu\text{s}$, Duty cycle $\leq 1\%$

2. When mounted on a 1 x 0.75 x 0.062 inch glass epoxy board

Device Marking

2N7002KT = RS

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified, per element)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS(Note2)

Drain-Source Breakdown Voltage $V_{GS}=0V, I_D=10\mu A$	$V_{(BR)DSS}$	60	-	-	V
Zero Gate Voltage Drain Current $V_{DS}=60V, V_{GS}=0V$	I_{DSS}	-	-	1.0	μA
Gate-source Leakage $V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	± 10	μA

ON CHARACTERISTICS(Note2)

Gate Threshold Voltage $V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	1.5	2.0	V
Static Drain-Source On-Resistance $V_{GS}=10V, I_D=0.5A$ $V_{GS}=5V, I_D=0.05A$	$R_{DS(ON)}$	-	-	7.5 7.5	Ω
Forward transfer admittance $V_{DS}=10V, I_D=0.2A$	g_{fs}^*	80	-	-	mS

DYNAMIC CHARACTERISTICS

Input Capacitance $V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	C_{iss}	-	25	50	pF
Output Capacitance $V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	C_{oss}	-	10	25	
Reverse Transfer Capacitance $V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	C_{rss}	-	3.0	5.0	

SWITCHING CHARACTERISTICS

Turn-On Delay Time $I_D=0.2A, V_{DD}=30V$ $V_{GS}=10V, R_L=150\Omega, R_G=10\Omega$	$T_{D(ON)}^*$	-	12	20	nS
Turn-Off Delay Time $I_D=0.2A, V_{DD}=30V$ $V_{GS}=10V, R_L=150\Omega, R_G=10\Omega$	$T_{D(OFF)}^*$	-	20	30	

* $P_w \leq 300\mu s$, Duty cycle $\leq 1\%$

Characteristics Curve

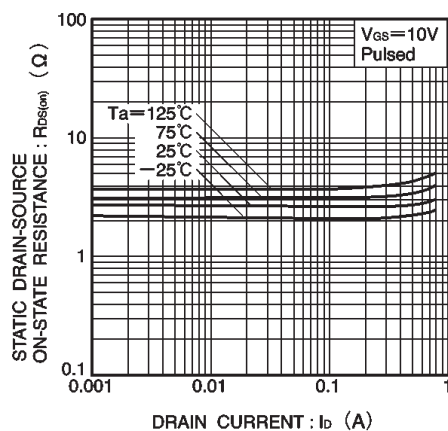


Fig.4 Static drain-source on-state resistance vs. drain current (I)

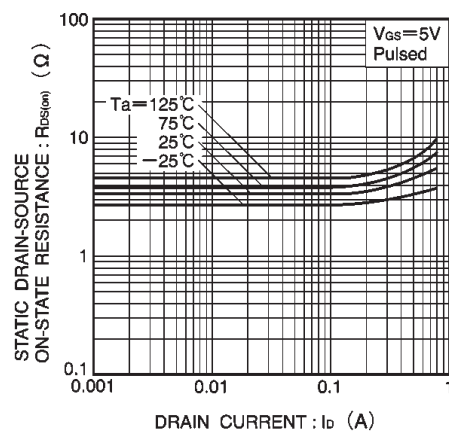


Fig.5 Static drain-source on-state resistance vs. drain current (II)

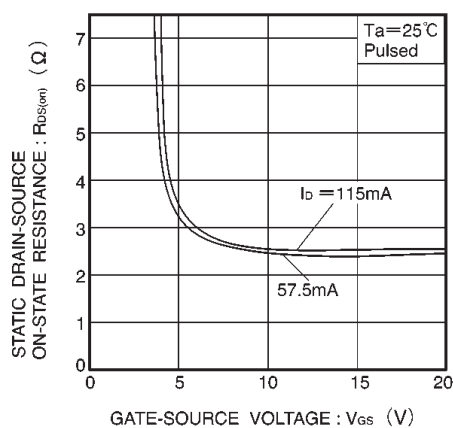


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

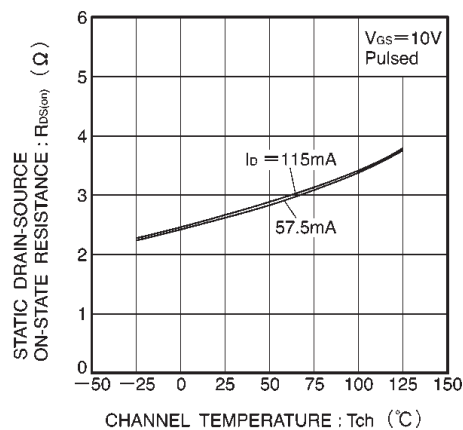


Fig.7 Static drain-source on-state resistance vs. channel temperature

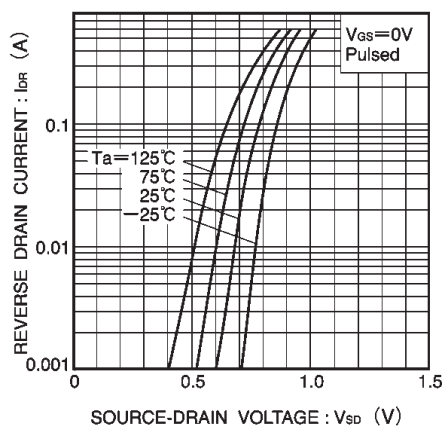


Fig.8 Reverse drain current vs. source-drain voltage (I)

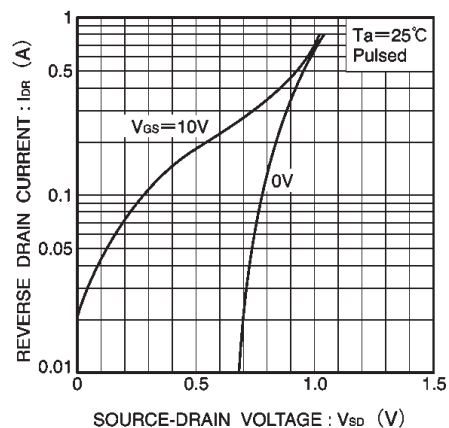


Fig.9 Reverse drain current vs. source-drain voltage (II)

Characteristics Curve

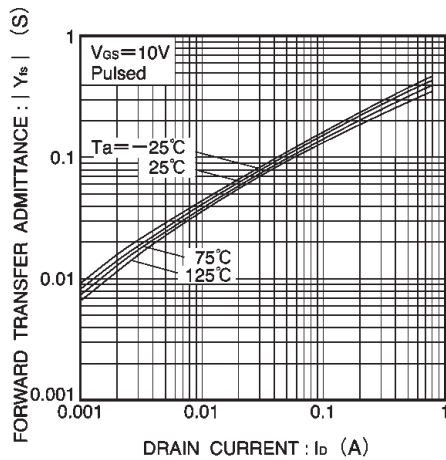


Fig.10 Forward transfer admittance vs. drain current

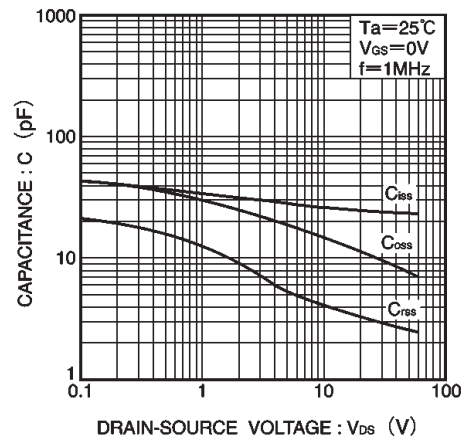


Fig.11 Typical capacitance vs. drain-source voltage

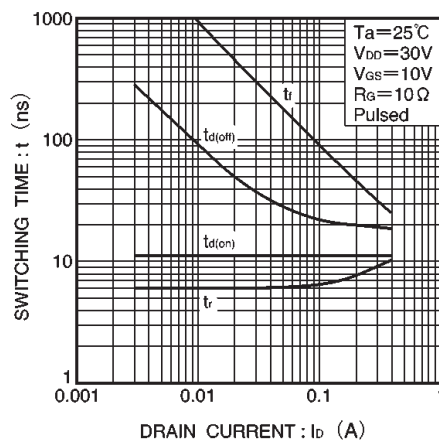
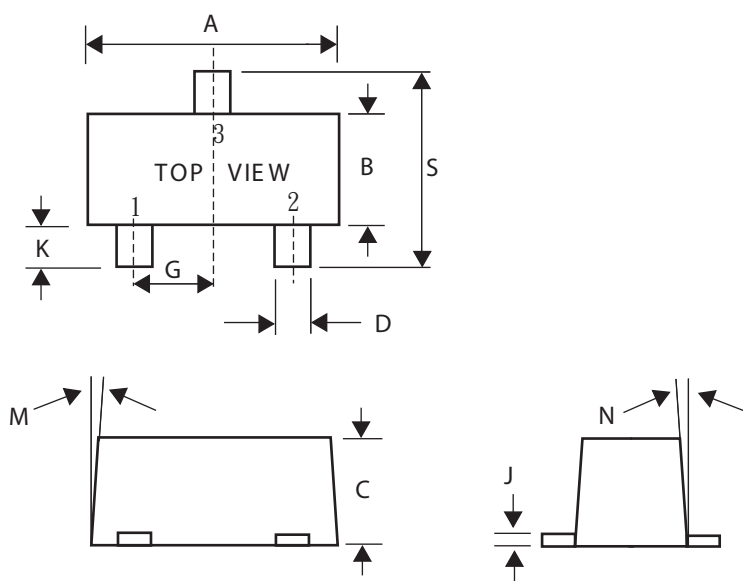


Fig.12 Switching characteristics
(See Figures 13 and 14 for the measurement circuit and resultant waveforms)

SC-89 Outline Demensions

Unit:mm



SC-89			
Dim	Min	Nom	Max
A	1.50	1.60	1.70
B	0.75	0.85	0.95
C	0.60	0.70	0.80
D	0.23	0.28	0.33
G	0.50BSC		
J	0.10	0.15	0.20
K	0.30	0.40	0.50
M	---	---	10°
N	---	---	10°
S	1.50	1.60	1.70