

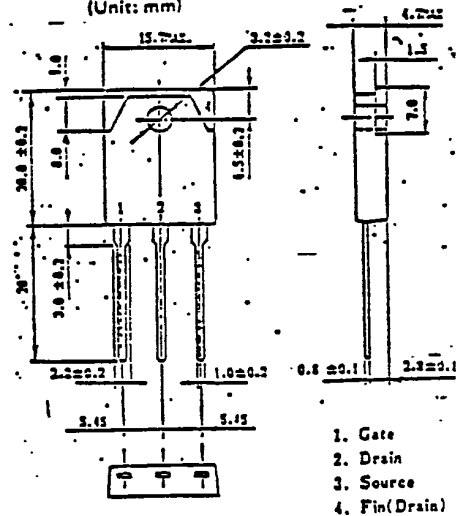
NEC
ELECTRON DEVICE

MOS FIELD EFFECT TRANSISTOR

2SK821

FAST SWITCHING
N-CHANNEL SILICON POWER MOS FET

PACKAGE DIMENSIONS
(Unit: mm)



Features

Suitable for switching power supplies,
actuator controls and pulse circuits
Low $R_{DS(on)}$

Absolute Maximum Ratings ($T_a=25^\circ\text{C}$)

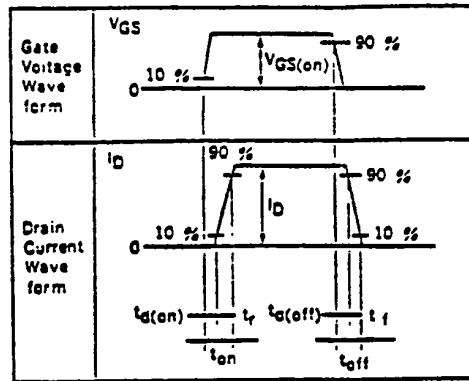
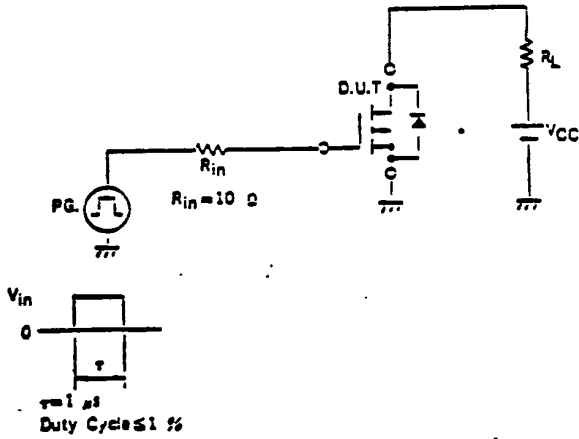
Drain to Source Voltage	V_{DS}	250V
Gate to Source Voltage	V_{GS}	$\pm 20V$
Continuous Drain Current	$I_D(DC)$	$\pm 20A$
Pulse Drain Current	$I_D(\text{pulse})$	$* \pm 80A$
Total Power Dissipation	P_T	3.0W
Total Power Dissipation	P_{T**}	120W
Channel Temperature	T_{ch}	150 $^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150 $^\circ\text{C}$

* $PW \leq 100 \mu\text{s}$, Duty Cycle $\leq 2\%$
** $T_c=25^\circ\text{C}$

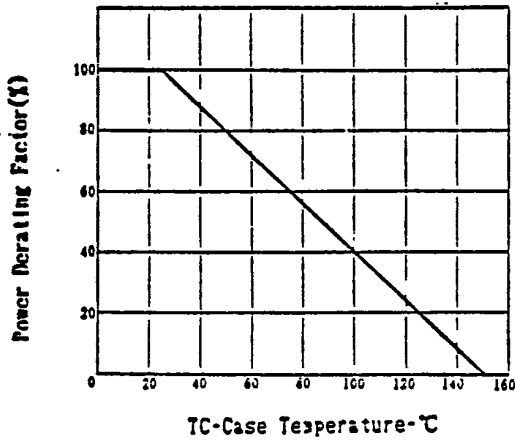
Electrical Characteristics ($T_a=25^\circ\text{C}$)

Characteristics	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain Leakage Current	I_{DSS}			100	μA	$V_{DS}=250V, V_{GS}=0$
Gate to Source Leakage Current	I_{GSS}			± 100	nA	$V_{GS}=\pm 20V, V_{DS}=0$
Gate to Source Cutoff Voltage	$V_{GS(off)}$	1.5		3.5	V	$V_{DS}=10V, I_D=1.0mA$
Forward Transfer Admittance	y_{fs}	5.0			S	$V_{DS}=10V, I_D=10A$
Drain to Source On-State Resistance	$R_{DS(on)}$		0.18	0.23	Ω	$V_{GS}=10V, I_D=10A$
Input Capacitance	C_{iss}		1900		pF	$V_{DS}=10V,$
Output Capacitance	C_{oss}		680		pF	$V_{GS}=0,$
Reverse Transfer Capacitance	C_{rss}		320		pF	$f=1.0MHz$
Turn-On Delay Time	$t_d(on)$		30		ns	$I_D=10A$
Rise Time	t_r		45		ns	$V_{GS(on)}=10V,$
Turn-Off Delay Time	$t_d(off)$		120		ns	$V_{CC}=150V,$
Fall Time	t_f		40		ns	$R_L=15 \Omega$

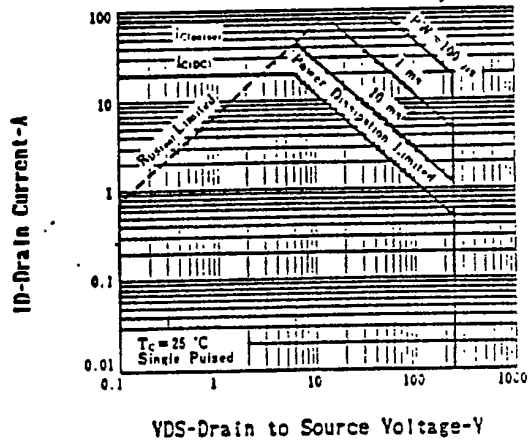
TURN-ON AND TURN-OFF TIME TEST CIRCUIT



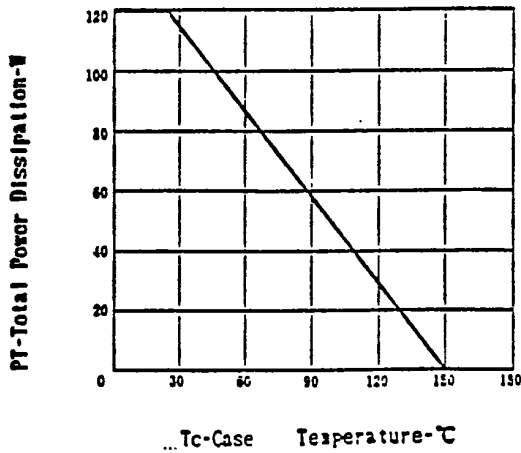
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



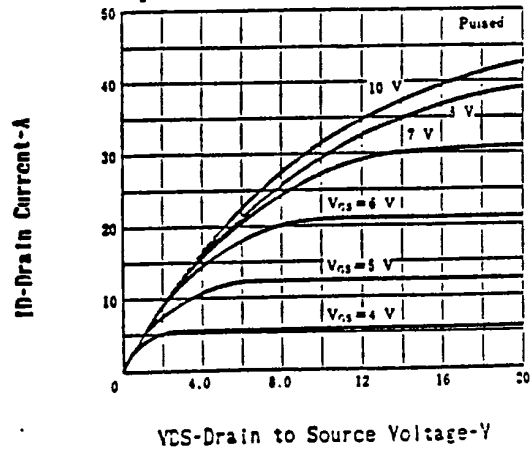
FORWARD BIAS SAFE OPERATING AREA



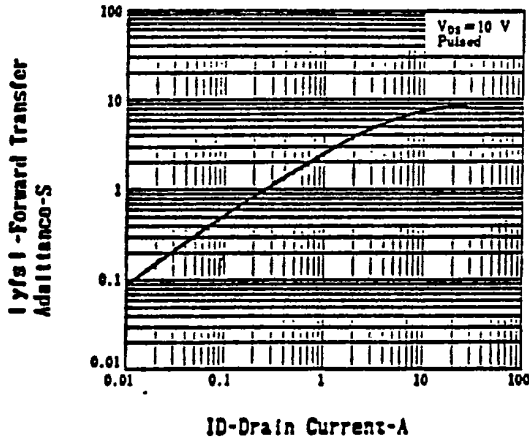
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



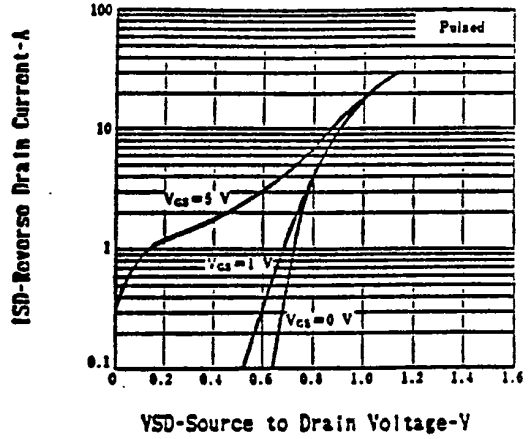
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



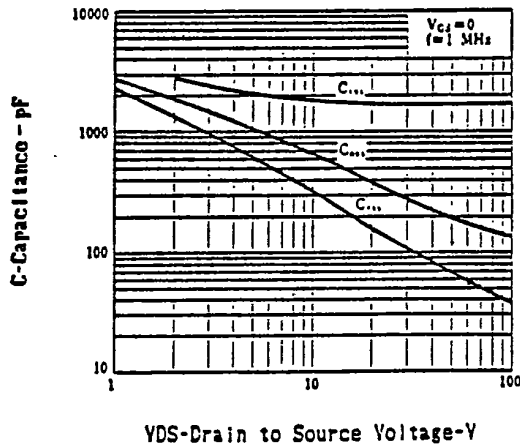
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



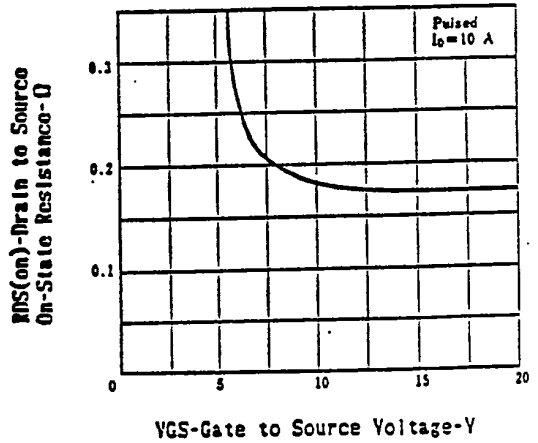
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



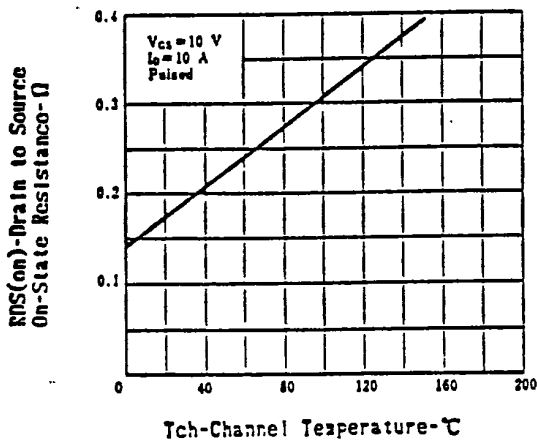
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



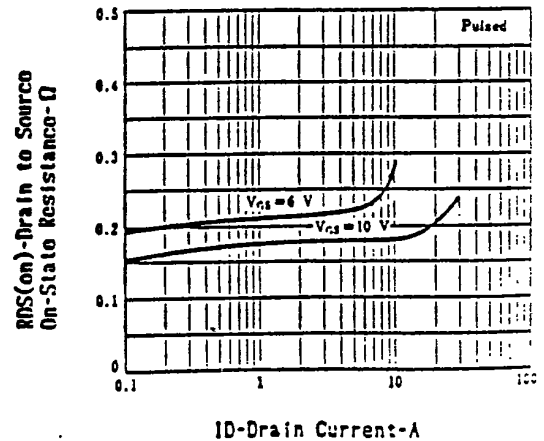
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



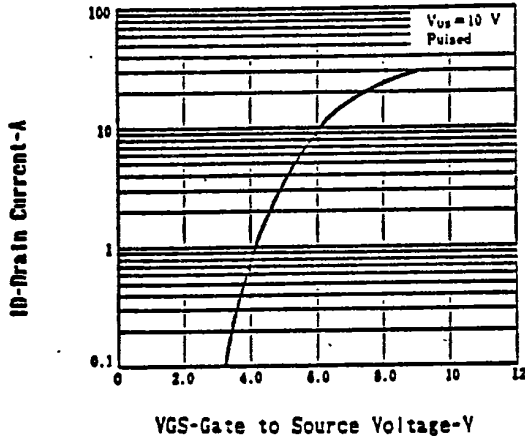
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



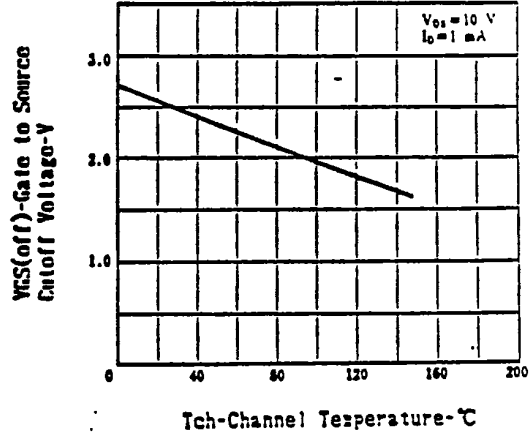
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



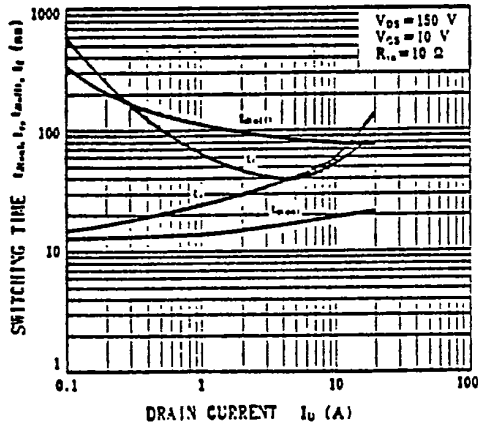
TRANSFER CHARACTERISTICS



GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE



SWITCHING CHARACTERISTICS



NEC Corporation

INTERNATIONAL ELECTRON DEVICES DIV.
 NEC Building, 33-1, Shiba Gochome
 Minato-ku, Tokyo 108, Japan
 Tel: Tokyo 454-1111
 Telex Address: NECTCK J22586
 Cable Address: MICROPHONE TOKYO

Printed in Japan