

# 2SK551

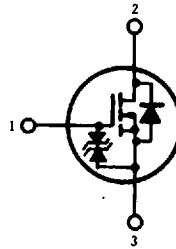
HITACHI/(OPTOELECTRONICS) 61E D

## SILICON N-CHANNEL MOS FET

### HIGH SPEED POWER SWITCHING

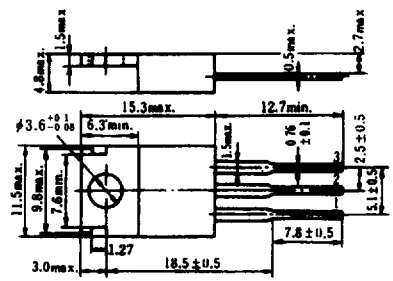
#### FEATURES

- Low On-Resistance
- High Speed Switching
- Low Drive Current
- No Secondary Breakdown
- Suitable for Switching Regulator, DC-DC Converter and Motor Driver



1. Gate  
2. Drain  
(Flange)  
3. Source

(Dimensions in mm)



(JEDEC TO-220AB)

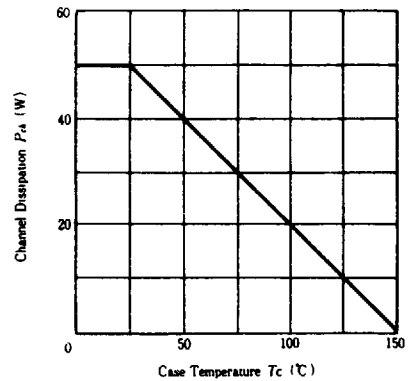
#### ABSOLUTE MAXIMUM RATINGS ( $T_c=25^\circ\text{C}$ )

Item	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	120	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current	$I_D$	10	A
Drain Peak Current	$I_{D(\text{pulse})}^*$	40	A
Body-Drain Diode Reverse Drain Current	$I_{DR}$	10	A
Channel Dissipation	$P_{ch}^{**}$	50	W
Channel Temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	$-55 \sim +150$	$^\circ\text{C}$

\* $PW \leq 10\mu\text{s}$ , duty cycle  $\leq 1\%$

\*\*Value at  $T_c=25^\circ\text{C}$

#### POWER VS. TEMPERATURE DERATING

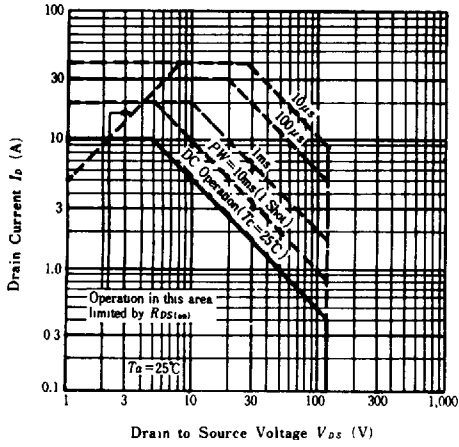


#### ELECTRICAL CHARACTERISTICS ( $T_c=25^\circ\text{C}$ )

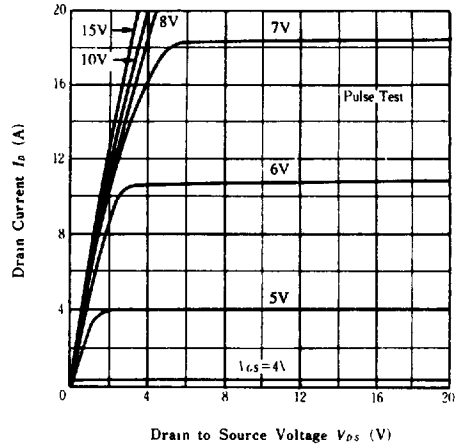
Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DS}$	$I_D=10\text{mA}$ , $V_{GS}=0$	120	—	—	V
Gate-Source Breakdown Voltage	$V_{(BR)GS}$	$I_G=\pm 100\mu\text{A}$ , $V_{DS}=0$	$\pm 20$	—	—	V
Gate-Source Leak Current	$I_{GSS}$	$V_{GS}=\pm 16\text{V}$ , $V_{DS}=0$	—	—	$\pm 10$	$\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=100\text{V}$ , $V_{GS}=0$	—	—	250	$\mu\text{A}$
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$I_D=1\text{mA}$ , $V_{DS}=10\text{V}$	2.0	—	4.0	V
Static Drain-Source On State Resistance	$R_{DS(on)}$	$I_D=5\text{A}$ , $V_{GS}=10\text{V}^*$	—	0.15	0.2	$\Omega$
Forward Transfer Admittance	$ y_{fs} $	$I_D=5\text{A}$ , $V_{DS}=10\text{V}^*$	3.0	5.0	—	S
Input Capacitance	$C_{iss}$	$V_{DS}=10\text{V}$ , $V_{GS}=0$ , $f=1\text{MHz}$	—	730	—	pF
Output Capacitance	$C_{oss}$		—	330	—	pF
Reverse Transfer Capacitance	$C_{ris}$		—	40	—	pF
Turn-on Delay Time	$t_{don}$	$I_D=5\text{A}$ , $V_{GS}=10\text{V}$ , $R_L=6\Omega$	—	15	—	ns
Rise Time	$t_r$		—	40	—	ns
Turn-off Delay Time	$t_{doff}$		—	70	—	ns
Fall Time	$t_f$		—	45	—	ns
Body-Drain Diode Forward Voltage	$V_{DF}$	$I_F=10\text{A}$ , $V_{GS}=0$	—	1.2	—	V
Body-Drain Diode Reverse Recovery Time	$t_r$	$I_F=10\text{A}$ , $V_{GS}=0$ $di_F/dt=50\text{A}/\mu\text{s}$	—	200	—	ns

\*Pulse Test

AREA OF SAFE OPERATION

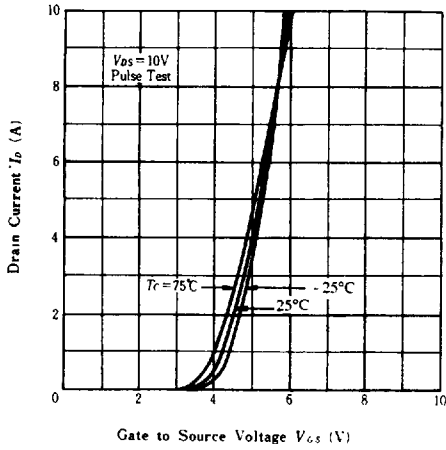


TYPICAL OUTPUT CHARACTERISTICS

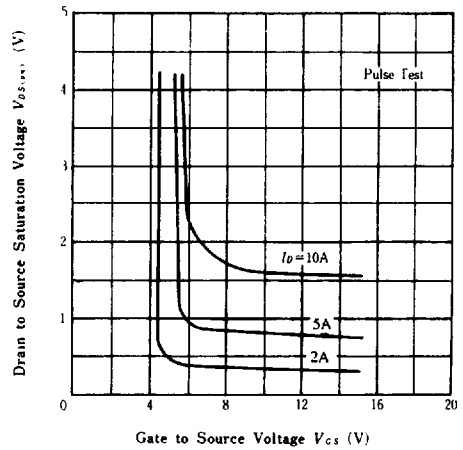


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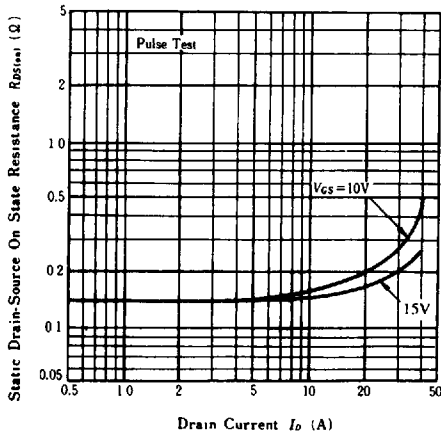
TYPICAL TRANSFER CHARACTERISTICS



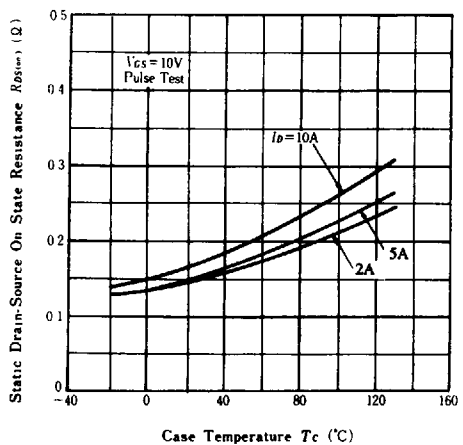
DRAIN TO SOURCE SATURATION VOLTAGE VS. GATE TO SOURCE VOLTAGE



STATIC DRAIN TO SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT

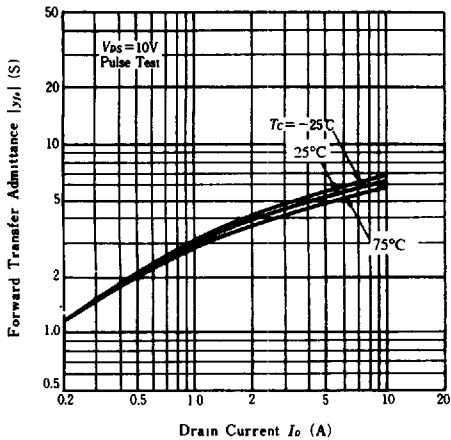


STATIC DRAIN TO SOURCE ON STATE RESISTANCE VS. CASE TEMPERATURE

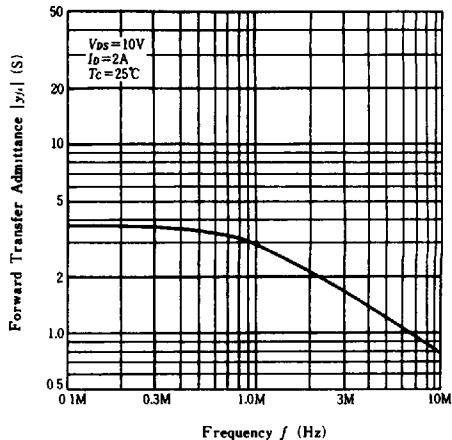


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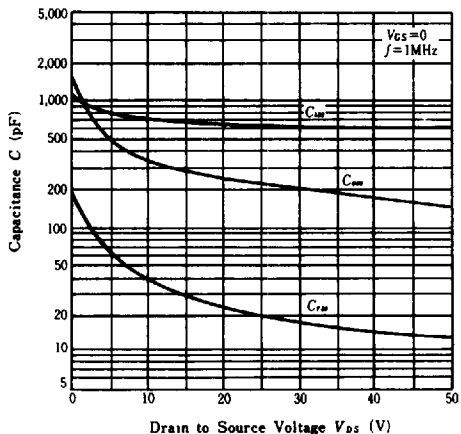
**FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT**



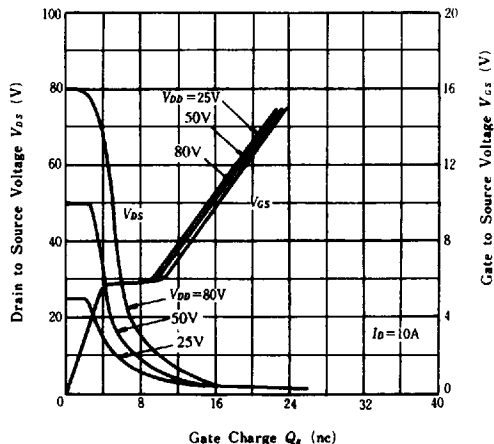
**FORWARD TRANSFER ADMITTANCE VS. FREQUENCY**



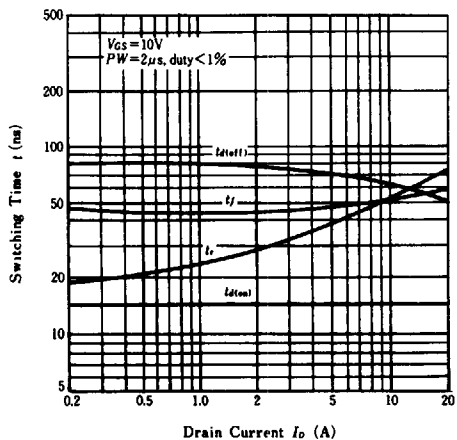
**CAPACITANCE VS. DRAIN TO SOURCE VOLTAGE**



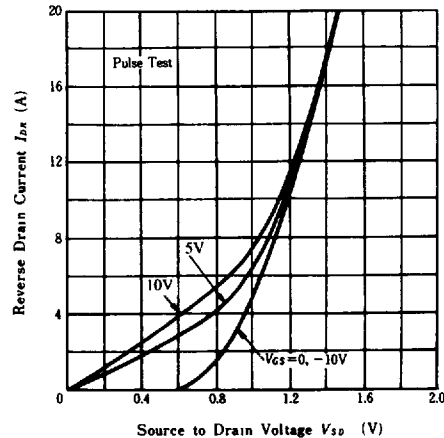
**DYNAMIC INPUT CHARACTERISTICS**



**SWITCHING TIME VS. DRAIN CURRENT**

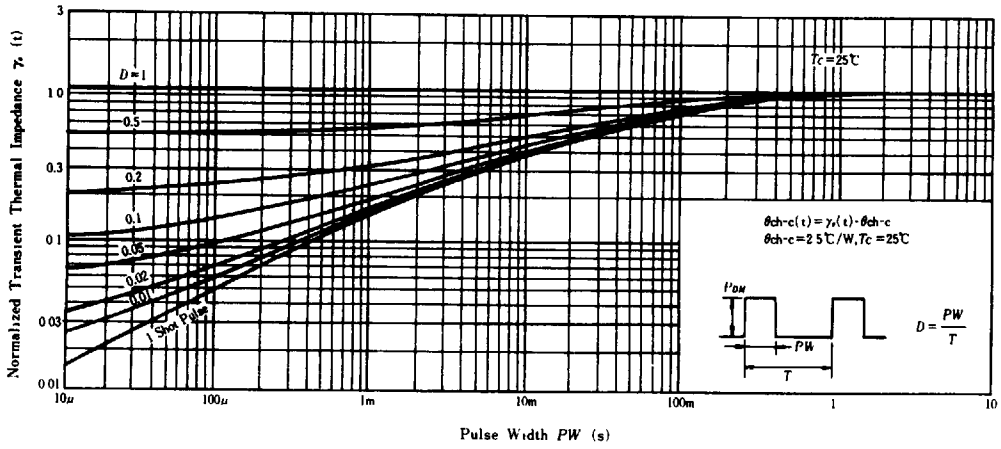


**REVERSE DRAIN CURRENT VS. SOURCE TO DRAIN VOLTAGE**

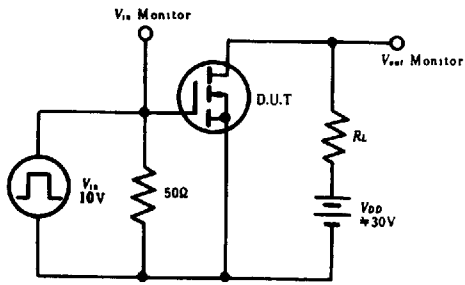


HITACHI/(OPTOELECTRONICS)

NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH



SWITCHING TIME TEST CIRCUIT



WAVEFORM

