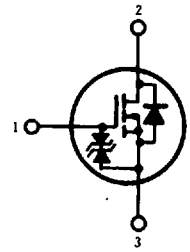
2SK551

SILICON N-CHANNEL MOS FET

HIGH SPEED POWER SWITCHING

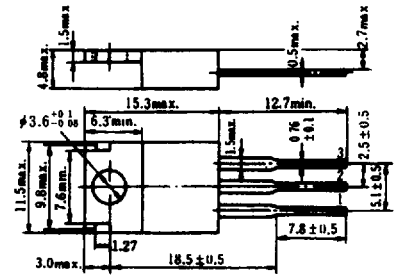
■ FEATURES

- 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)



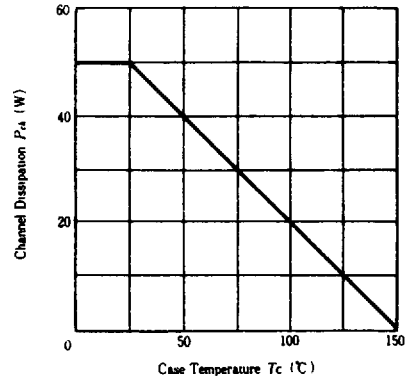
(JEDEC TO-220AB)

■ ABSOLUTE MAXIMUM RATINGS (T_a=25 °C)

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	120	V
Gate-Source Voltage	V_{GSS}	±20	V
Drain Current	I_D	10	A
Drain Peak Current	$I_{D(pulse)}$*	40	A
Body-Drain Diode Reverse Drain Current	I_{DR}	10	A
Channel Dissipation	P_{ch}**	50	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	−55 ~ +150	°C

*PW≤10μs, duty cycle≤1%
**Value at T_c=25 °C

POWER VS. TEMPERATURE DERATING

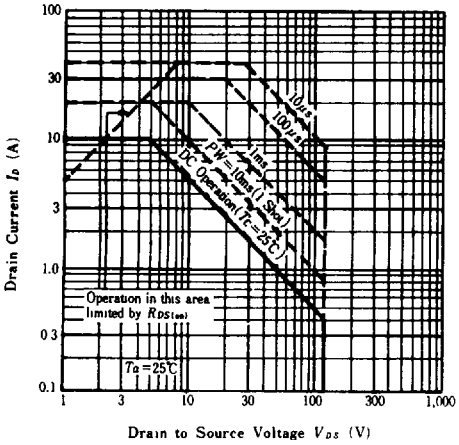


■ ELECTRICAL CHARACTERISTICS (T_a=25 °C)

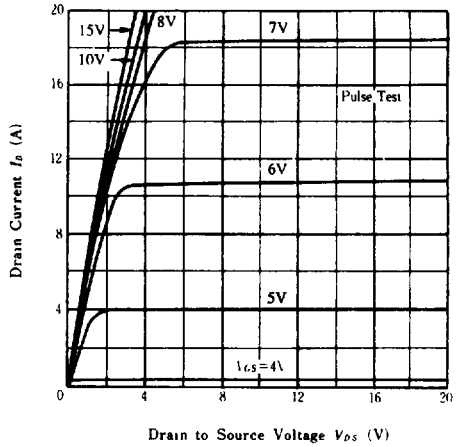
Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=10mA, V_{GS}=0	120	—	—	V
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	I_G=±100μA, V_{DS}=0	±20	—	—	V
Gate-Source Leak Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0	—	—	±10	μA
Zero Gate Voltage Drain Current	I_{DSS}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

*Pulse Test

AREA OF SAFE OPERATION

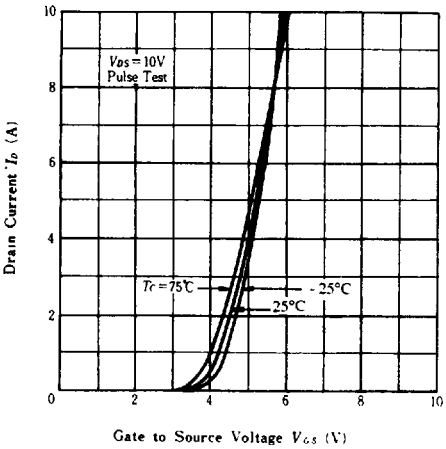


TYPICAL OUTPUT CHARACTERISTICS

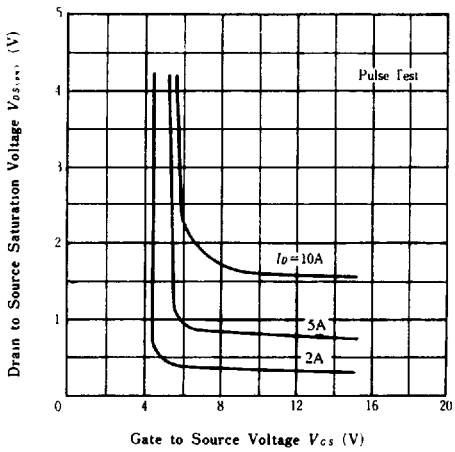


HITACHI/(OPTOELECTRONICS)

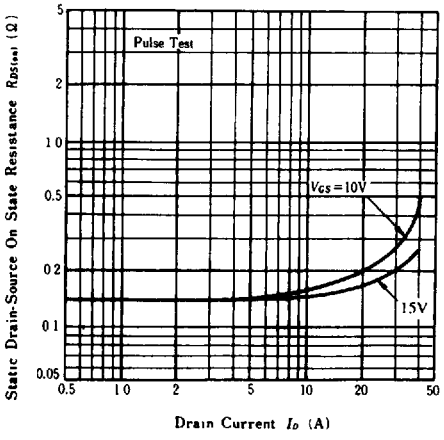
TYPICAL TRANSFER CHARACTERISTICS



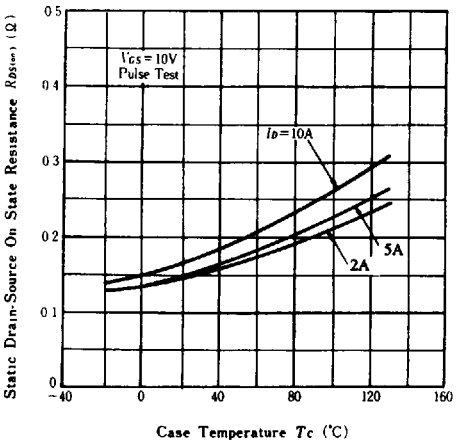
DRAIN TO SOURCE SATURATION VOLTAGE VS. GATE TO SOURCE VOLTAGE



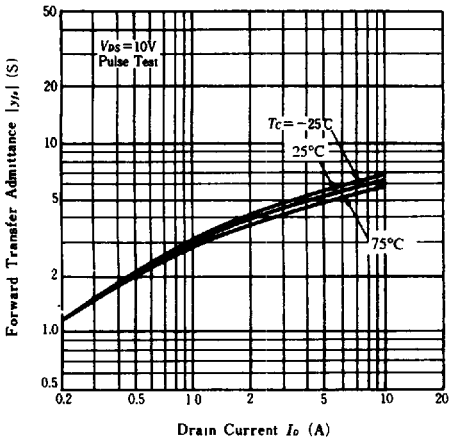
STATIC DRAIN TO SOURCE ON STATE RESISTANCE VS. DAIN CURRENT



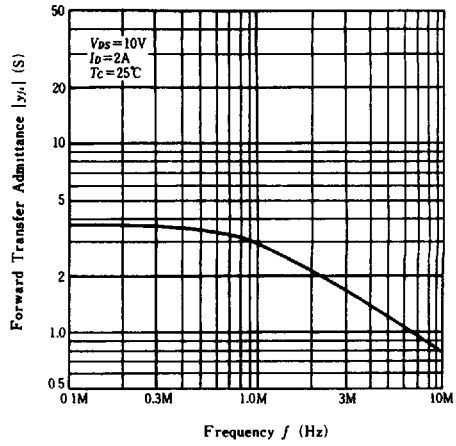
STATIC DRAIN TO SOURCE ON STATE RESISTANCE VS. CASE TEMPERATURE



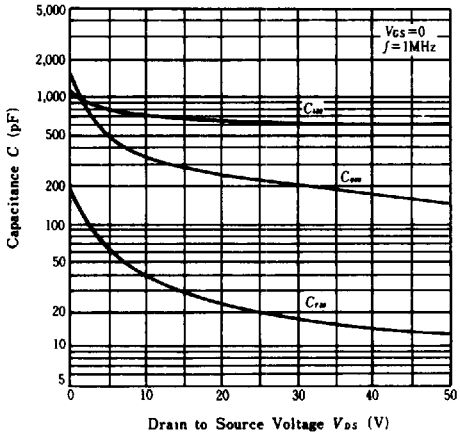
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT



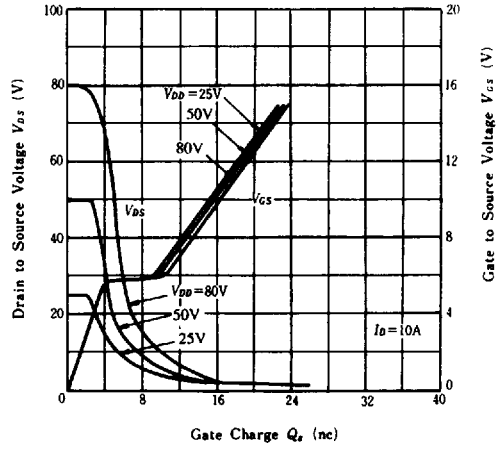
FORWARD TRANSFER ADMITTANCE VS. FREQUENCY



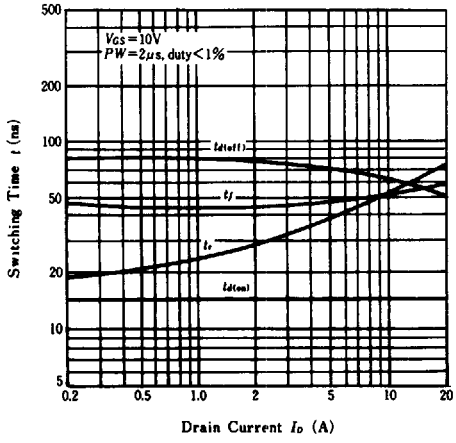
CAPACITANCE VS. DRAIN TO SOURCE VOLTAGE



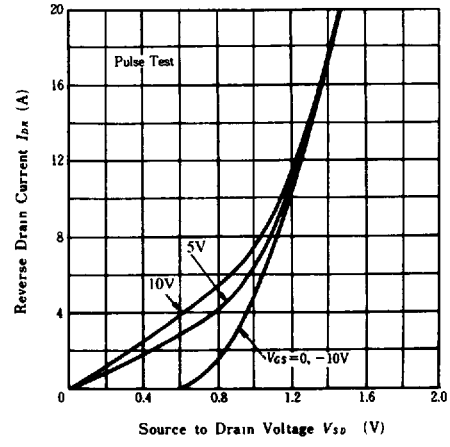
DYNAMIC INPUT CHARACTERISTICS



SWITCHING TIME VS. DRAIN CURRENT

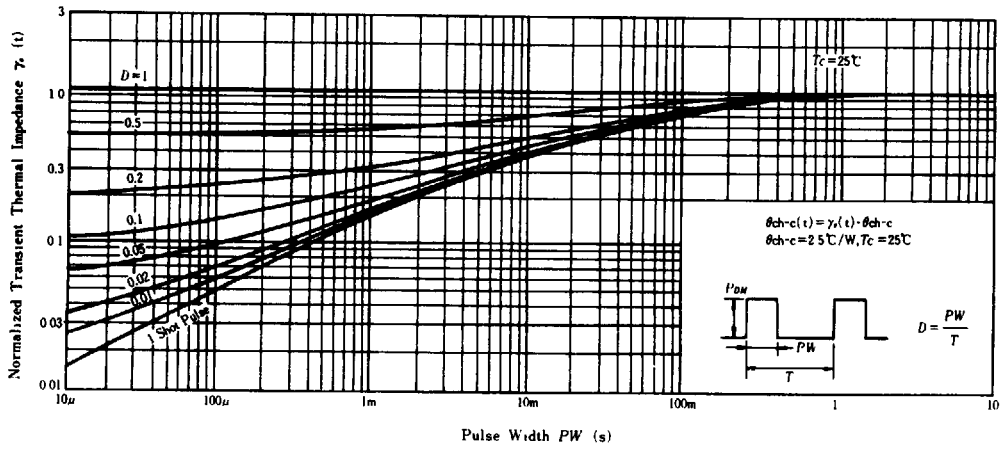


REVERSE DRAIN CURRENT VS. SOURCE TO DRAIN VOLTAGE

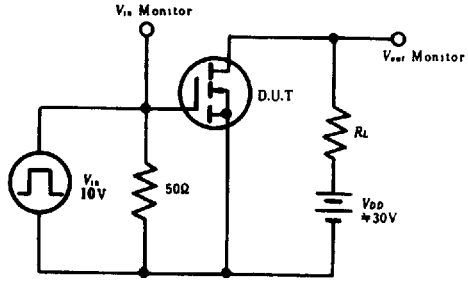


HITACHI/(OPTOELECTRONICS)

NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH



SWITCHING TIME TEST CIRCUIT



WAVEFORM