

2SK552, 2SK553

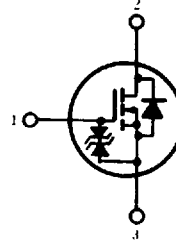
HITACHI/(OPTOELECTRONICS)

SILICON N-CHANNEL MOS FET

HIGH SPEED POWER SWITCHING

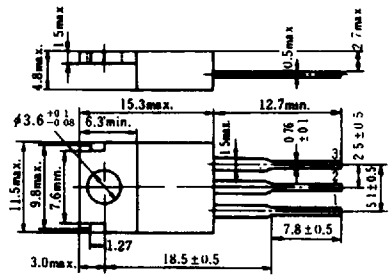
■ FEATURES

- Low On-Resistance.
- High Speed Switching.
- Low Drive Current.
- No Secondary Breakdown.
- Suitable for Switching Regulator, DC-DC Converter, Motor Controls, and Ultrasonic Power Oscillators.



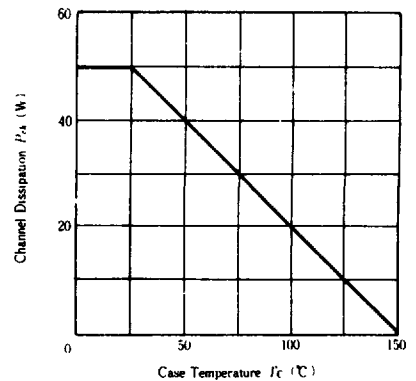
1. Gate
2. Drain (Flange)
3. Source

(Dimensions in mm)



(JEDEC TO-220AB)

POWER VS. TEMPERATURE DERATING



■ ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$)

Item	Symbol	2SK552	2SK553	Unit
Drain-Source Voltage	V_{DS}	450	500	V
Gate-Source Voltage	V_{GS}	± 20		V
Drain Current	I_D	5		A
Drain Peak Current	$I_{D(pulse)}$ *	20		A
Body-Drain Diode Reverse Drain Current	I_{DR}	5		A
Channel Dissipation	P_{ch} **	50		W
Channel Temperature	T_{ch}	150		°C
Storage Temperature	T_{stg}	$-55 \sim +150$		°C

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

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

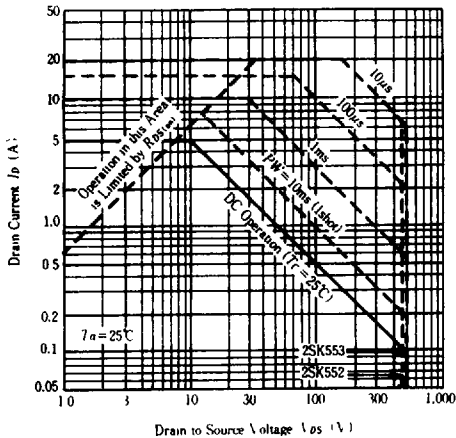
■ ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$)

Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	2SK552	$I_D=10\text{mA}$, $V_{GS}=0$	450	—	—	V
	2SK553		500	—	—	
Gate-Source Breakdown Voltage	$V_{(BR)GS}$	$I_G=\pm 100\mu A$, $V_{DS}=0$	± 20	—	—	V
Gate-Source Leak Current	I_{GS}	$V_{GS}=\pm 16\text{V}$, $V_{DS}=0$	—	—	± 10	μA
Zero Gate Voltage Drain Current	2SK552	$V_{DS}=360\text{V}$, $V_{GS}=0$	—	—	250	μA
	2SK553	$V_{DS}=400\text{V}$, $V_{GS}=0$	—	—	—	
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	$R_{DS(on)}$	$I_D=2.5\text{A}$, $V_{GS}=10\text{V}$ *	—	1.0	1.4	Ω
			—	1.2	1.5	
Forward Transfer Admittance	$ y_{fs} $	$I_D=2.5\text{A}$, $V_{DS}=10\text{V}$ *	2.5	4.0	—	S
Input Capacitance	C_{iss}	$V_{DS}=10\text{V}$, $V_{GS}=0$, $f=1\text{MHz}$	—	820	—	pF
Output Capacitance	C_{oss}		—	300	—	pF
Reverse Transfer Capacitance	C_{rss}		—	45	—	pF
Turn-on Delay Time	t_{don}	$I_D=2.5\text{A}$, $V_{GS}=10\text{V}$, $R_L=12\Omega$	—	10	—	ns
Rise Time	t_r		—	35	—	ns
Turn-off Delay Time	t_{doff}		—	70	—	ns
Fall Time	t_f		—	45	—	ns
Body-Drain Diode Forward Voltage	V_{DF}	$I_F=5\text{A}$, $V_{GS}=0$	—	1.0	—	V
Body-Drain Diode Reverse Recovery Time	t_r	$I_F=5\text{A}$, $V_{GS}=0$, $di_F/dt=100\text{A}/\mu s$	—	300	—	ns

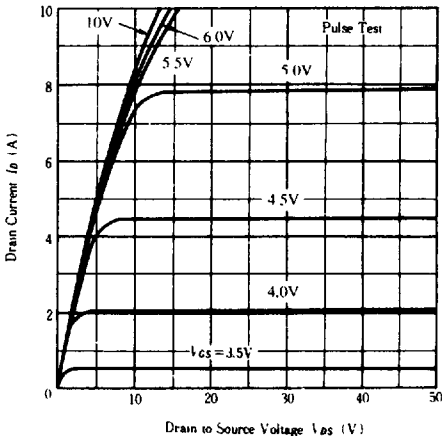
*Pulse Test

HITACHI/(OPTOELECTRONICS)

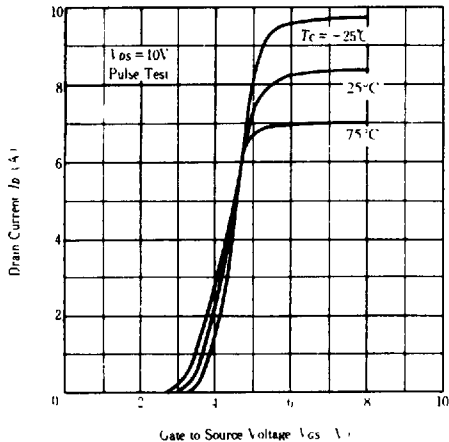
MAXIMUM SAFE OPERATION AREA



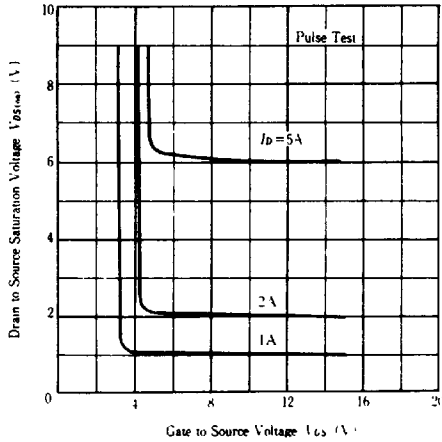
TYPICAL OUTPUT CHARACTERISTICS



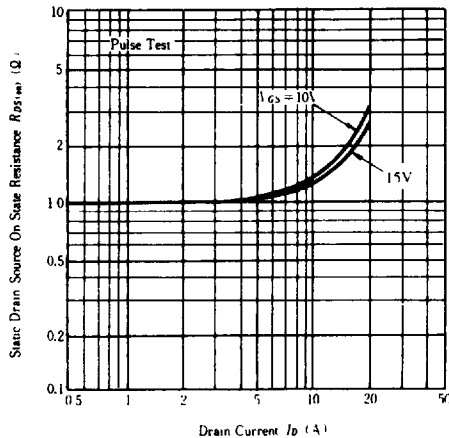
TYPICAL TRANSFER CHARACTERISTICS



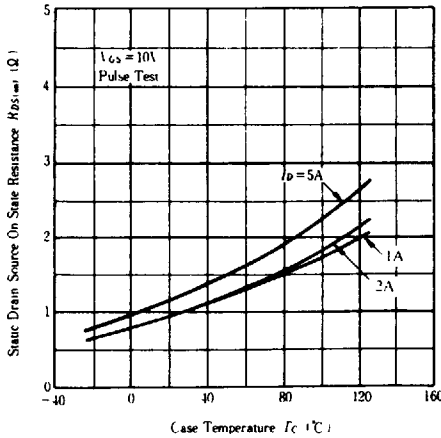
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



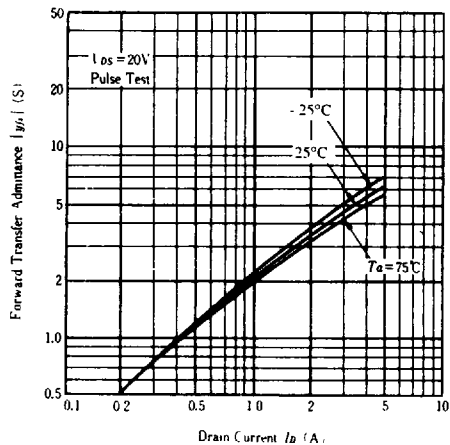
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT



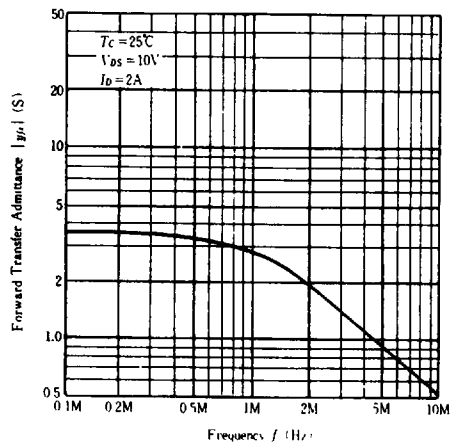
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



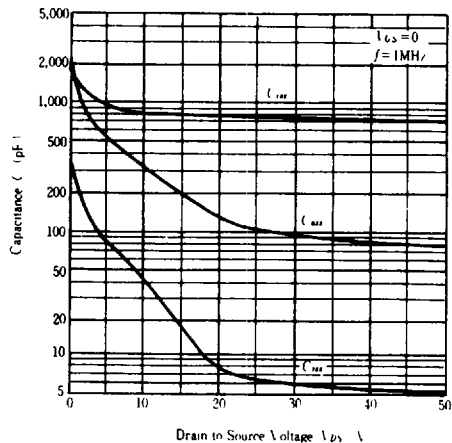
**FORWARD TRANSFER ADMITTANCE
VS. DRAIN CURRENT**



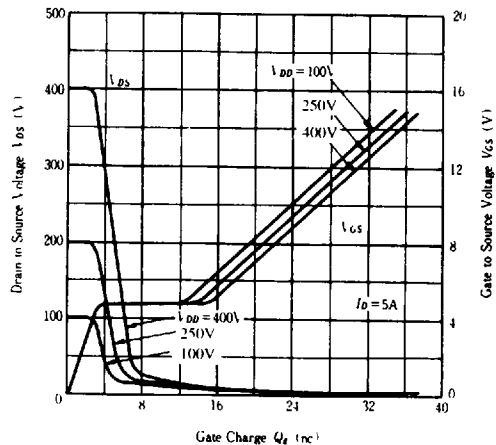
**FORWARD TRANSFER ADMITTANCE
VS. FREQUENCY**



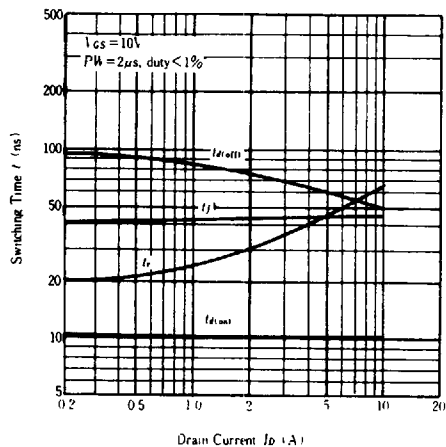
**TYPICAL CAPACITANCE VS.
DRAIN-SOURCE VOLTAGE**



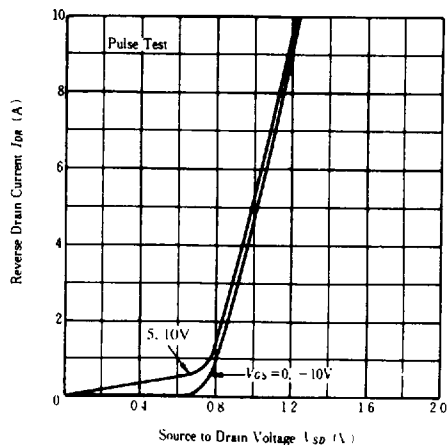
DYNAMIC INPUT CHARACTERISTICS



SWITCHING CHARACTERISTICS



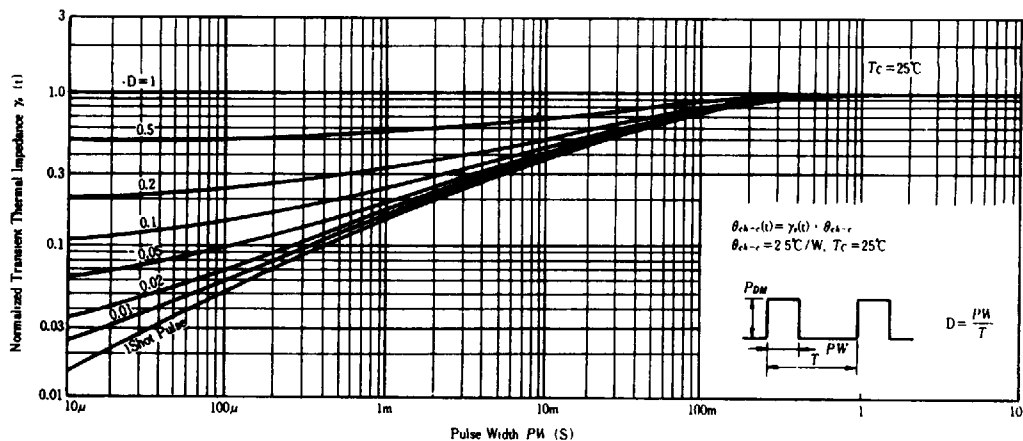
**REVERSE DRAIN CURRENT VS.
SOURCE - DRAIN VOLTAGE**



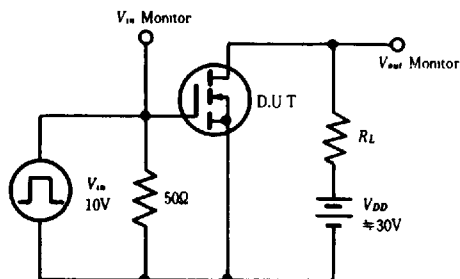
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HITACHI/(OPTOELECTRONICS)

NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH



SWITCHING TIME TEST CIRCUIT



WAVEFORMS

