

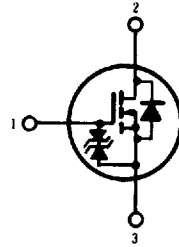
# 2SK559, 2SK560

SILICON N-CHANNEL MOS FET

HIGH SPEED POWER SWITCHING

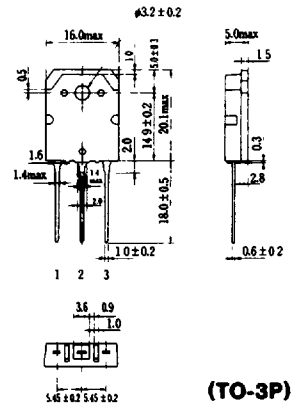
■ FEATURES

- 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)



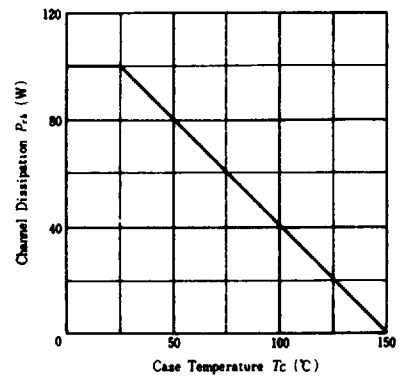
(TO-3P)

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

Item	Symbol	2SK559	2SK560	Unit
Drain-Source Voltage	$V_{DS}$	450	500	V
Gate-Source Voltage	$V_{GS}$	±20		V
Drain Current	$I_D$	15		A
Drain Peak Current	$I_{D(max)}$ *	60		A
Body-Drain Diode Reverse Drain Current	$I_{DR}$	15		A
Channel Dissipation	$P_{ch}$ *	100		W
Channel Temperature	$T_{ch}$	150		°C
Storage Temperature	$T_{stg}$	-55 ~ +150		°C

\* $PW \leq 10\mu\text{s}$ , duty cycle  $\leq 1\%$   
 \*\*Value at  $T_c = 25^\circ\text{C}$

POWER VS. TEMPERATURE DERATING

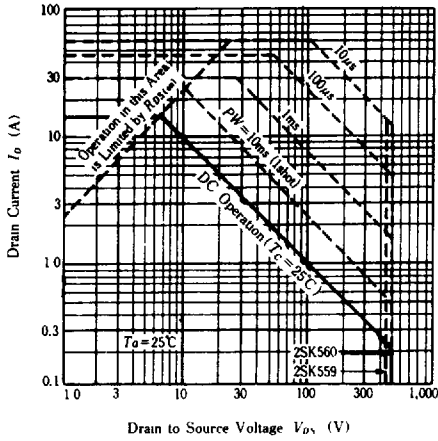


■ ELECTRICAL CHARACTERISTICS ( $T_c=25^\circ\text{C}$ )

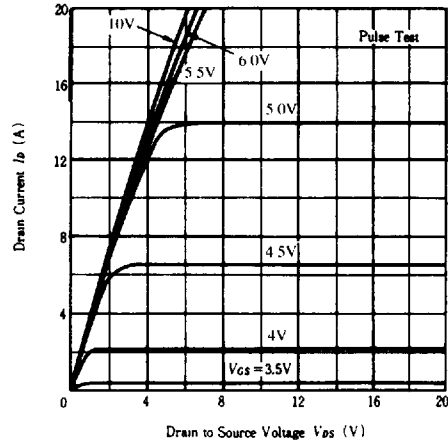
Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	2SK559	$I_D=10\text{mA}$ , $V_{GS}=0$	450	—	—	V
	2SK560		500	—	—	
Gate-Source Breakdown Voltage	$V_{GSOSS}$	$I_G=\pm 100\mu\text{A}$ , $V_{DS}=0$	±20	—	—	V
Gate-Source Leak Current	$I_{OSS}$	$V_{GS}=\pm 16\text{V}$ , $V_{DS}=0$	—	—	±10	μA
Zero Gate Voltage Drain Current	2SK559	$V_{DS}=360\text{V}$ , $V_{GS}=0$	—	—	250	μA
	2SK560		$V_{DS}=400\text{V}$ , $V_{GS}=0$	—	—	
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	2SK559	$I_D=8\text{A}$ , $V_{GS}=10\text{V}$ *	—	0.25	0.36	Ω
	2SK560		—	0.3	0.4	
Forward Transfer Admittance	$ y_f $	$I_D=8\text{A}$ , $V_{DS}=10\text{V}$ *	8	13	—	S
Input Capacitance	$C_{in}$	$V_{DS}=10\text{V}$ , $V_{GS}=0$ , $f=1\text{MHz}$	—	2950	—	pF
Output Capacitance	$C_{out}$		—	1100	—	pF
Reverse Transfer Capacitance	$C_{rc}$		—	140	—	pF
Turn-on Delay Time	$t_{don}$		—	30	—	ns
Rise Tim	$t_r$	$I_D=8\text{A}$ , $V_{GS}=10\text{V}$ , $R_L=3.75\Omega$	—	115	—	ns
Turn-off Delay Time	$t_{doff}$		—	200	—	ns
Fall Time	$t_f$		—	120	—	ns
Body-Drain Diode Forward Voltage	$V_{DF}$	$I_F=15\text{A}$ , $V_{GS}=0$	—	1.2	—	V
Body-Drain Diode Reverse Recovery Time	$t_r$	$I_F=15\text{A}$ , $V_{GS}=0$ , $di_F/dt=100\text{A}/\mu\text{s}$	—	500	—	ns

\*Pulse Test

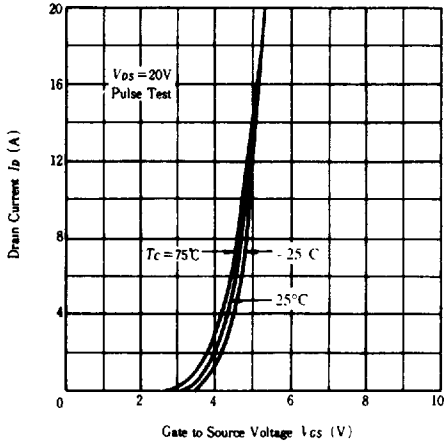
**AREA OF SAFE OPERATION**



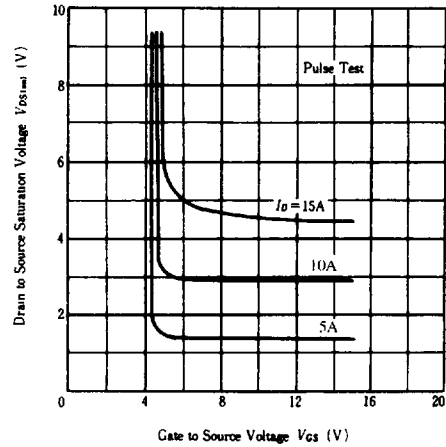
**TYPICAL OUTPUT CHARACTERISTICS**



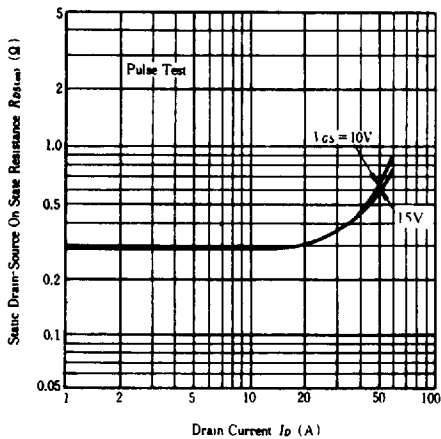
**TYPICAL TRANSFER CHARACTERISTICS**



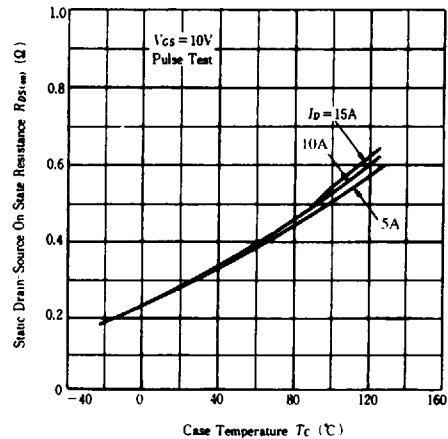
**DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE**



**STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT**

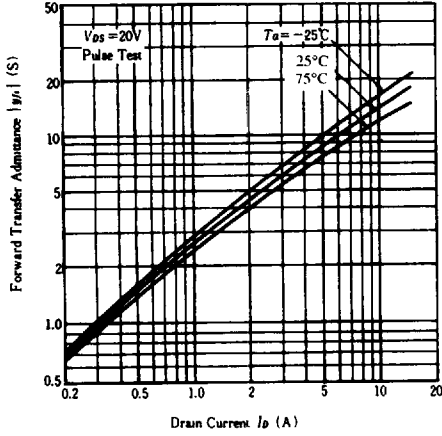


**STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE**

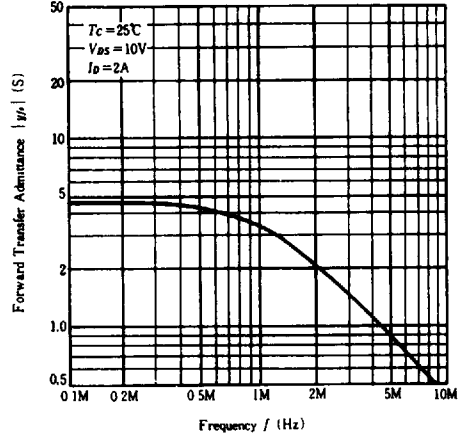


HITACHI/(OPTOELECTRONICS)

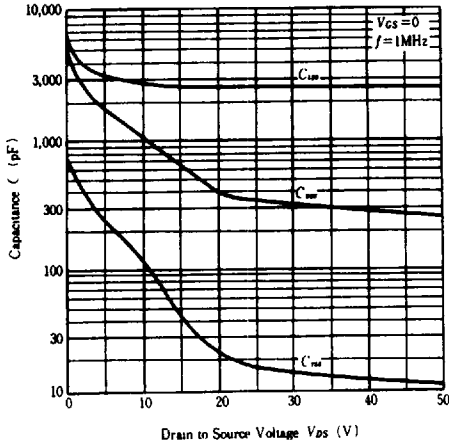
**FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT**



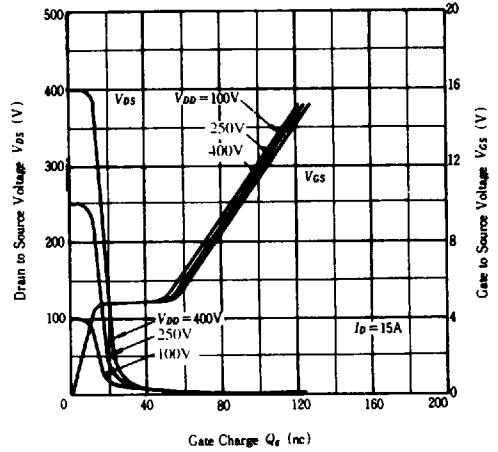
**FORWARD TRANSFER ADMITTANCE VS. FREQUENCY**



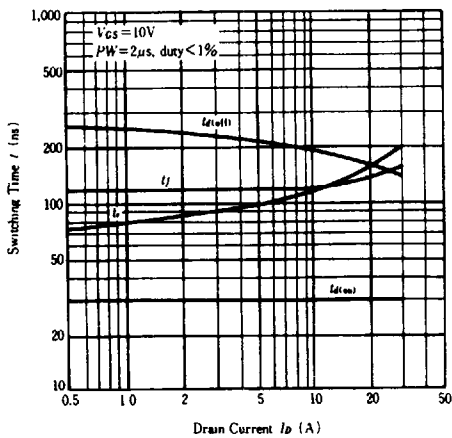
**TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE**



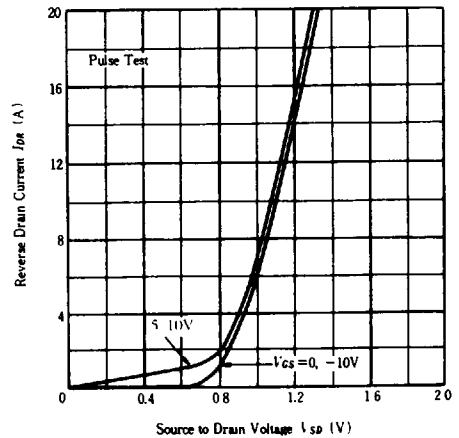
**DYNAMIC INPUT CHARACTERISTICS**



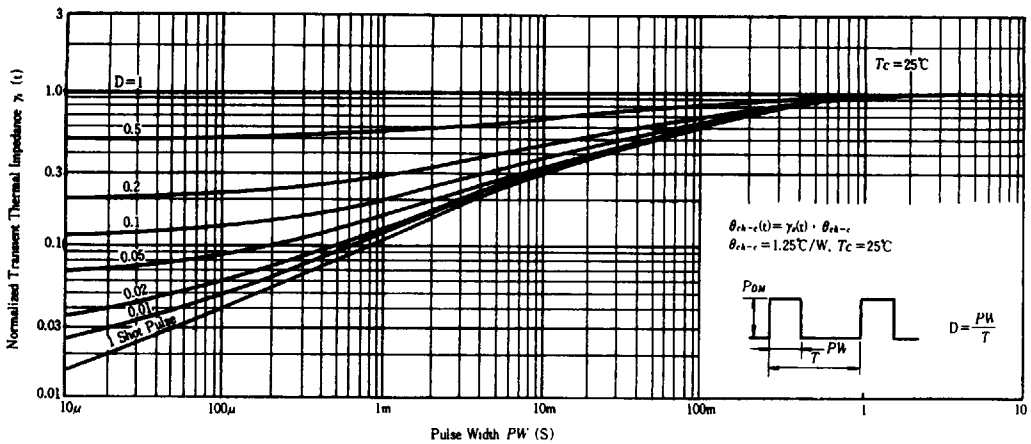
**SWITCHING CHARACTERISTICS**



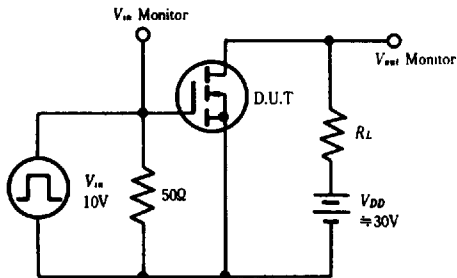
**REVERSE DRAIN CURRENT VS. SOURCE - DRAIN VOLTAGE**



**NORMALIZED TRANSIENT THERMAL  
 IMPEDANCE VS. PULSE WIDTH**



**SWITCHING TIME TEST CIRCUIT**



**WAVEFORMS**

