

2SK559, 2SK560

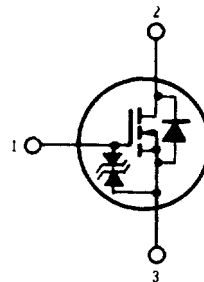
355-987

SILICON N-CHANNEL MOS FET

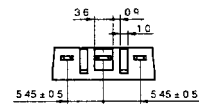
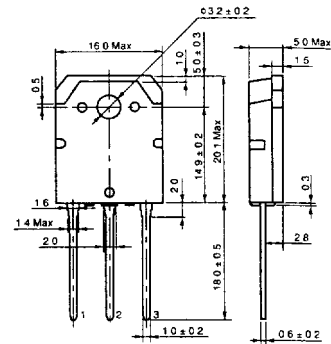
HIGH SPEED POWER SWITCHING

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



(TO-3P)

(Dimensions in mm)

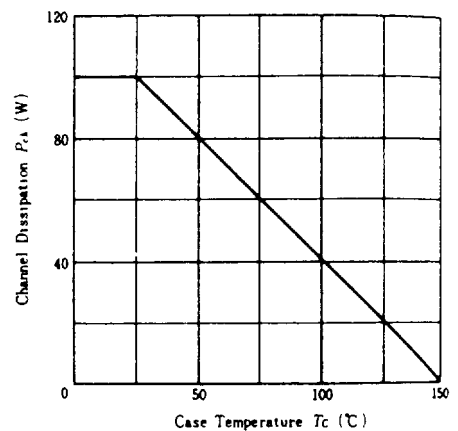
ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$)

Item	Symbol	2SK559	2SK560	Unit
Drain-Source Voltage	V_{DSS}	450	500	V
Gate-Source Voltage	V_{GSS}	±20		V
Drain Current	I_D	15		A
Drain Peak Current	$I_{D(pulse)}$ *	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

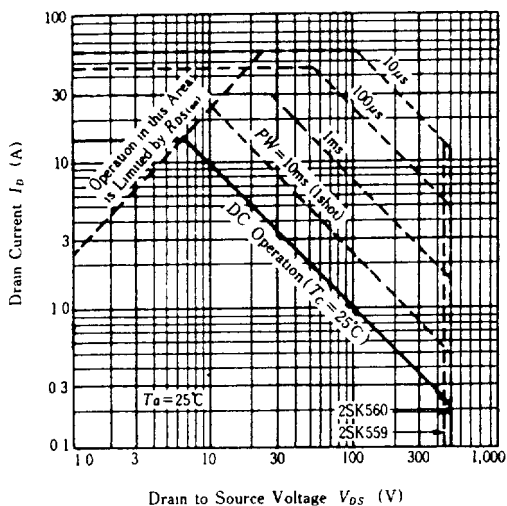


ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$)

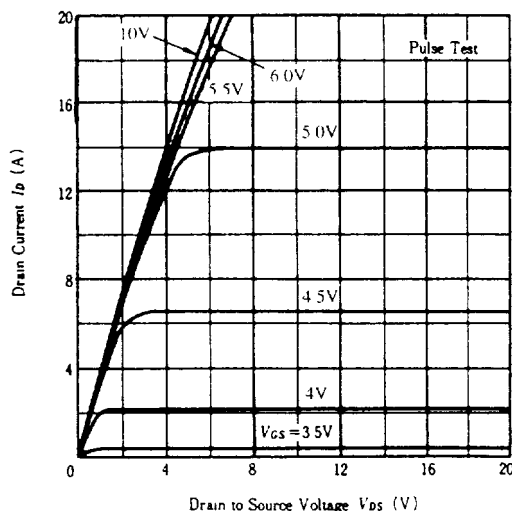
Item	Symbol	Test Condition	min	typ	max	Unit
Drain-Source Breakdown Voltage	2SK559	$I_D=10\text{mA}, V_{GS}=0$	450	—	—	V
	2SK560		500	—	—	V
Gate-Source Breakdown Voltage	$V_{GBR(GSS)}$	$I_G=\pm 100\mu\text{A}, V_{DS}=0$	±20	—	—	V
Gate-Source Leak Current	I_{GSS}	$V_{GS}=\pm 16\text{V}, V_{DS}=0$	—	—	±10	μA
Zero Gate Voltage Drain Current	2SK559	$V_{DS}=360\text{V}, V_{GS}=0$	—	—	250	μA
	2SK560		$V_{DS}=400\text{V}, V_{GS}=0$	—	—	250
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$I_D=1\text{mA}, V_{DS}=10\text{V}$	2 (1)	—	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	Ω
Forward Transfer Admittance	$ y_{fs} $	$I_D=8\text{A}, V_{DS}=10\text{V}^*$	8	13	—	S
Input Capacitance	C_{iss}	$V_{DS}=10\text{V}, V_{GS}=0, f=1\text{MHz}$	—	2950	—	pF
Output Capacitance	C_{oss}		—	1100	—	pF
Reverse Transfer Capacitance	C_{rss}		—	140	—	pF
Turn-on Delay Time	t_{don}	$I_D=8\text{A}, V_{GS}=10\text{V}, R_t=3.75\Omega$	—	30	—	ns
Rise Time	t_r		—	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

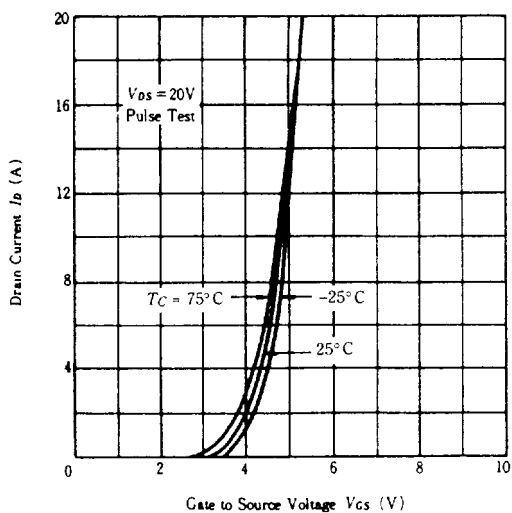
AREA OF SAFE OPERATION



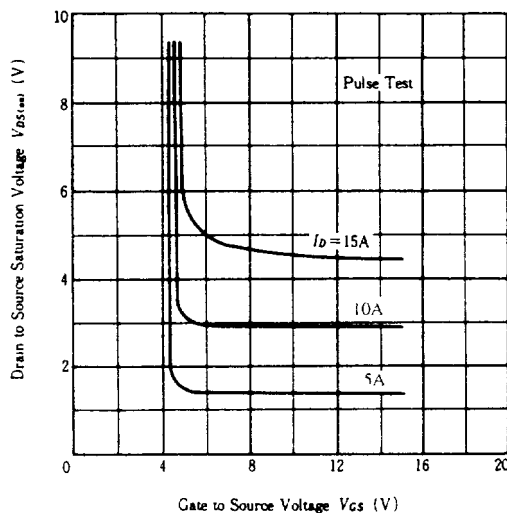
TYPICAL OUTPUT CHARACTERISTICS



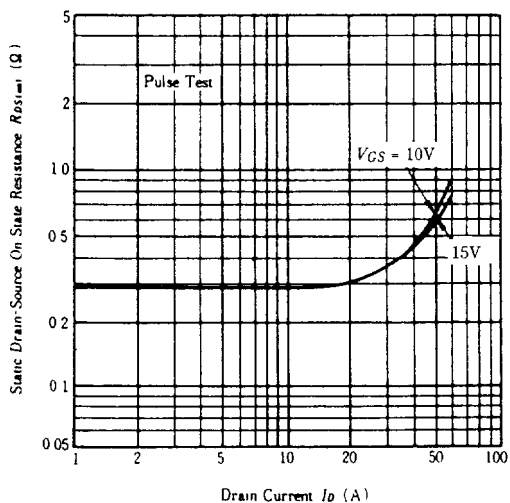
TYPICAL TRANSFER CHARACTERISTICS



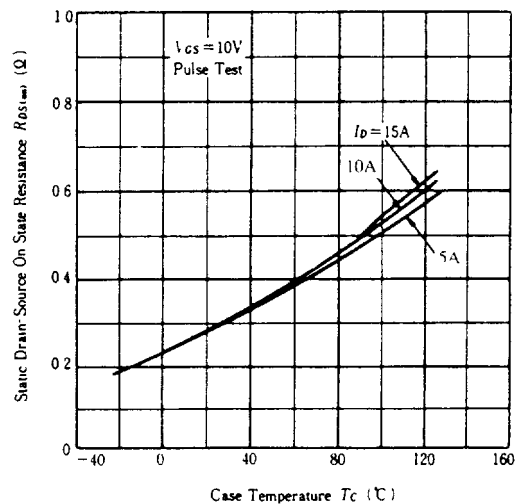
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



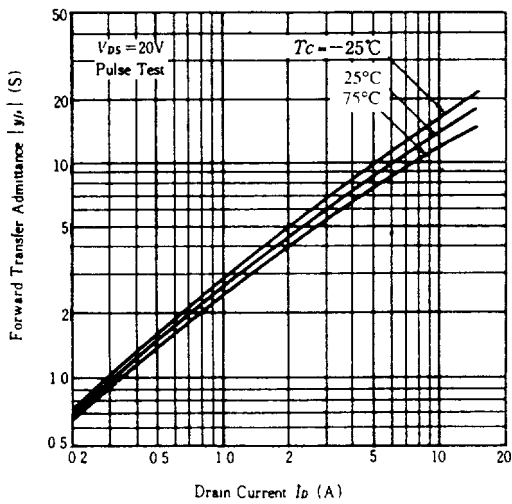
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT



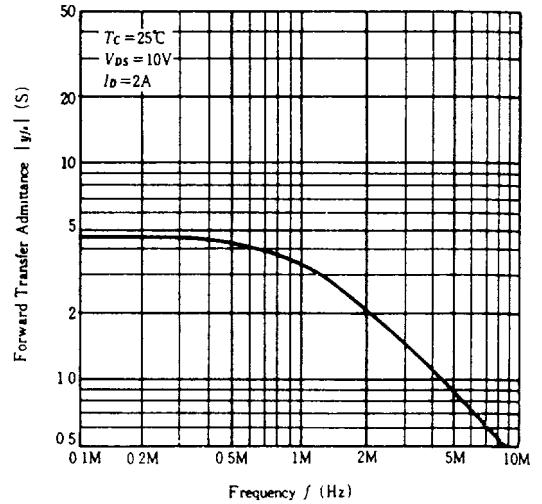
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



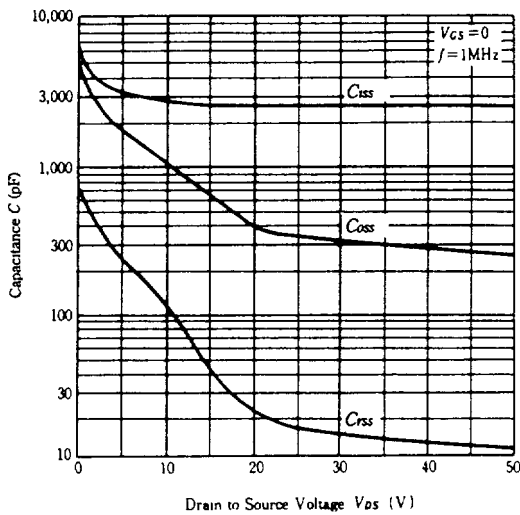
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT



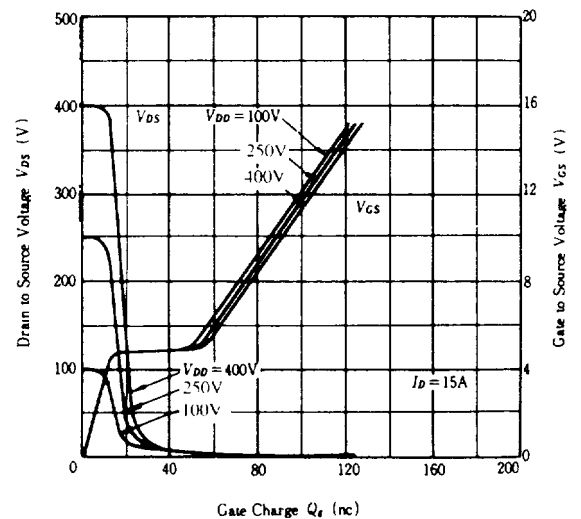
FORWARD TRANSFER ADMITTANCE VS. FREQUENCY



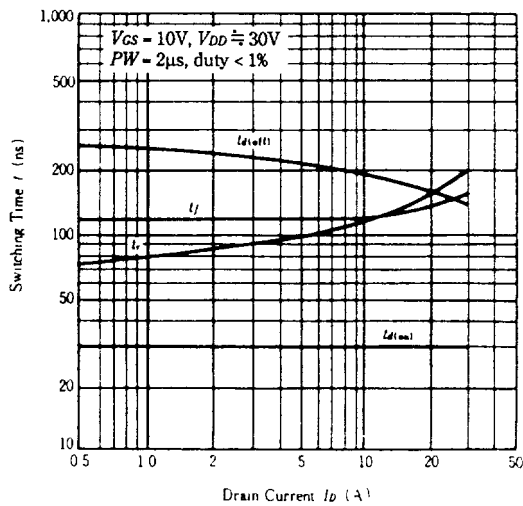
TYPICAL CAPACITANCE VS DRAIN-SOURCE VOLTAGE



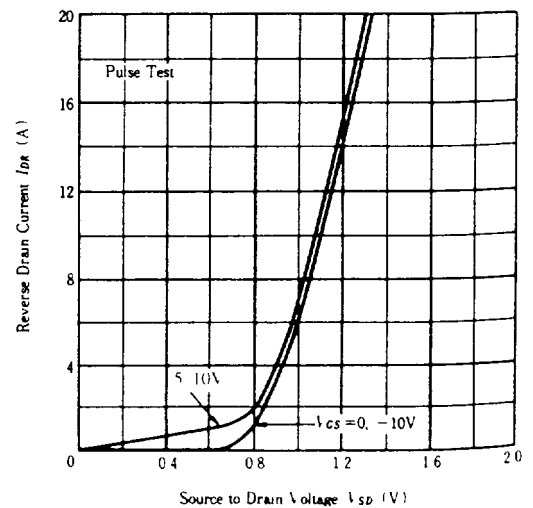
DYNAMIC INPUT CHARACTERISTICS



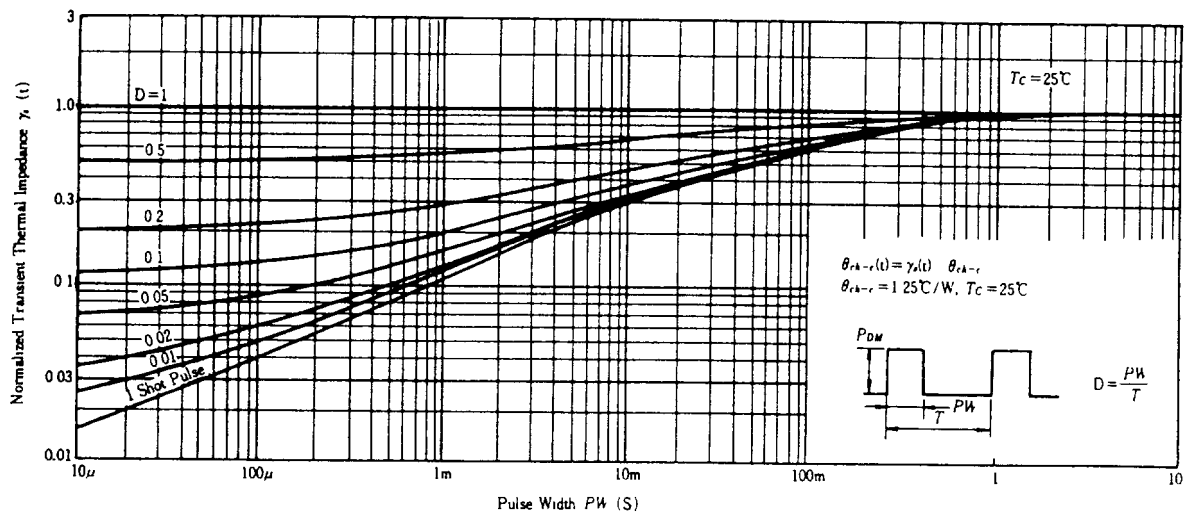
SWITCHING CHARACTERISTICS



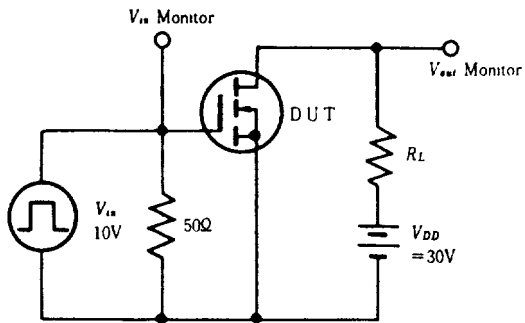
REVERSE DRAIN CURRENT VS. SOURCE - DRAIN VOLTAGE



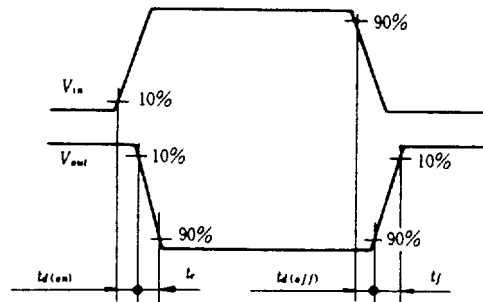
NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH



SWITCHING TIME TEST CIRCUIT



WAVEFORMS



Gate to Source Voltage V_{GS} (V)