

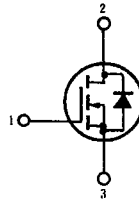
# 2SK319, 2SK320

SILICON N-CHANNEL MOS FET

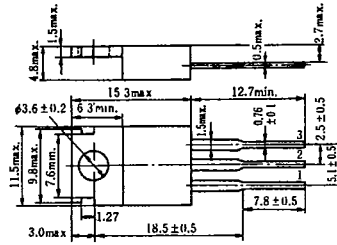
HIGH SPEED POWER SWITCHING,  
HIGH FREQUENCY POWER AMPLIFIER

■ FEATURES

- Low On-Resistance.
- High Speed Switching.
- High Cutoff Frequency.
- No Secondary Breakdown.
- Suitable for Switching Regulator, DC-DC Converter, RF Amplifiers, and Ultrasonic Power Oscillators.



1. Gate  
2. Drain (Flange)  
3. Source  
(Dimensions in mm)



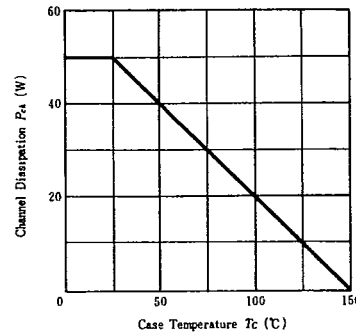
(JEDEC TO-220AB)

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

Item	Symbol	Rating		Unit
		2SK319	2SK320	
Drain-Source Voltage	$V_{DS}$	400	450	V
Gate-Source Voltage	$V_{GS}$	±20		V
Drain Current	$I_D$	5		A
Drain Peak Current	$I_{D(pk)}$	10		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 ~ +150		°C

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

POWER VS. TEMPERATURE DERATING

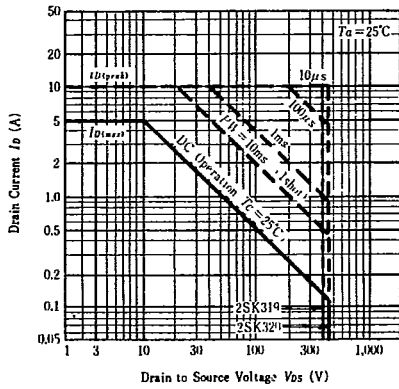


■ ELECTRICAL CHARACTERISTICS ( $T_c=25^\circ\text{C}$ )

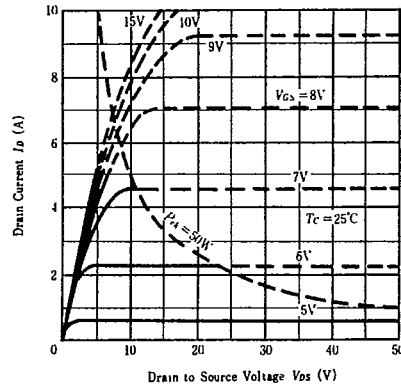
Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DS}$	$I_D=10\text{mA}, V_{GS}=0$	400	—	—	V
			450	—	—	V
Gate-Source Leak Current	$I_{GSS}$	$V_{GS}=\pm 20\text{V}, V_{DS}=0$	—	—	±1	μA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=320\text{V}, V_{GS}=0$	—	—	-1	mA
			—	—	-1	mA
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$I_D=1\text{mA}, V_{DS}=10\text{V}$	1.0	—	5.0	V
Static Drain-Source On State Resistance	$R_{D(on)}$	$I_D=3\text{A}, V_{GS}=-15\text{V}^*$	—	1.1	1.83	Ω
Drain-Source Saturation Voltage	$V_{D(on)}$	$I_D=3\text{A}, V_{GS}=15\text{V}^*$	—	3.3	5.5	V
Forward Transfer Admittance	$ y_f $	$I_D=3\text{A}, V_{DS}=10\text{V}^*$	1.0	1.5	—	S
Input Capacitance	$C_{iss}$	$V_{DS}=10\text{V}, V_{GS}=0$ $f=1\text{MHz}$	—	800	—	pF
Output Capacitance	$C_{oss}$		—	180	—	pF
Reverse Transfer Capacitance	$C_{rss}$		—	20	—	pF
Turn-on Delay Time	$t_{d(on)}$	$I_D=2\text{A}, V_{GS}=15\text{V}$ $R_L=15\Omega$	—	15	—	ns
Rise Time	$t_r$		—	35	—	ns
Turn-off Delay Time	$t_{d(off)}$		—	85	—	ns
Fall Time	$t_f$		—	35	—	ns
Body-Drain Diode Forward Voltage	$V_{DF}$	$I_f=3\text{A}, V_{GS}=0$	—	0.85	—	V
Body-Drain Diode Reverse Recovery Time	$t_{rr}$	$I_f=3\text{A}, V_{GS}=0$ $di_f/dt=100\text{A}/\mu\text{s}$	—	350	—	ns

\*Pulse Test

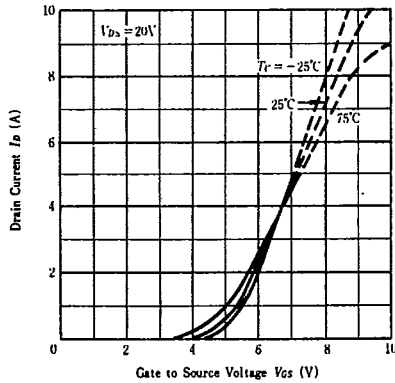
MAXIMUM SAFE OPERATION AREA



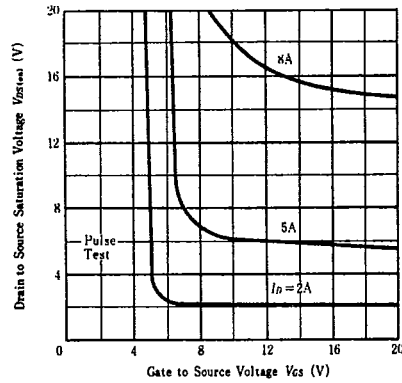
TYPICAL OUTPUT CHARACTERISTICS



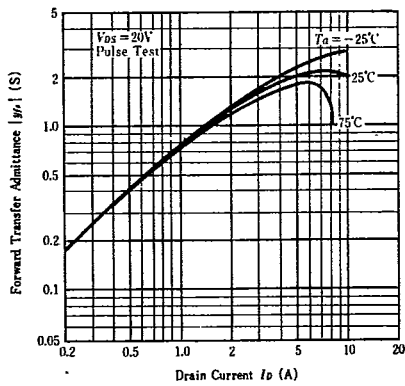
TYPICAL TRANSFER CHARACTERISTICS



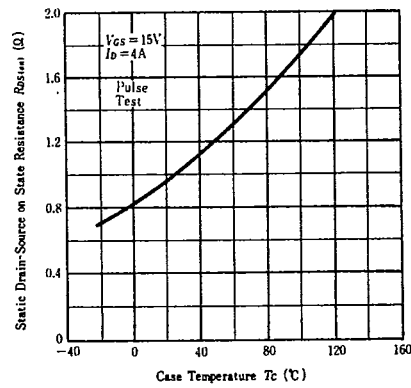
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT

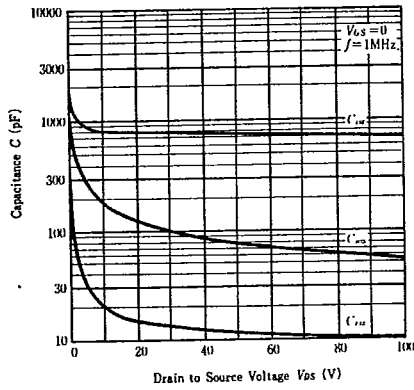


STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE

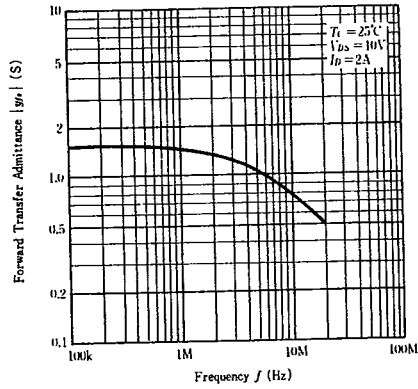


2SK319, 2SK320

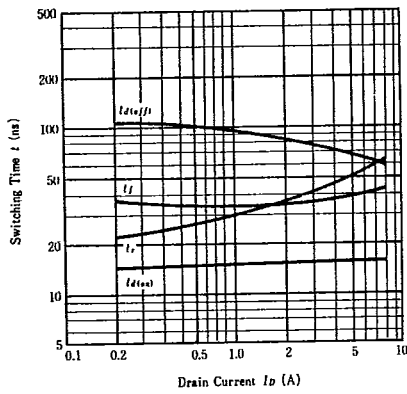
**TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE**



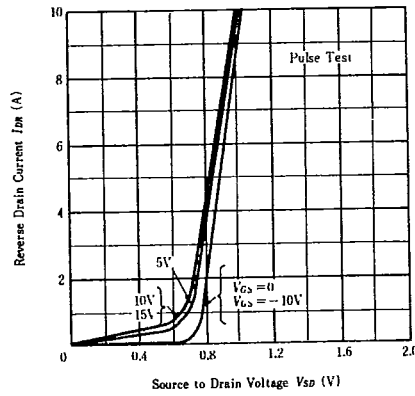
**FORWARD TRANSFER ADMITTANCE VS. FREQUENCY**



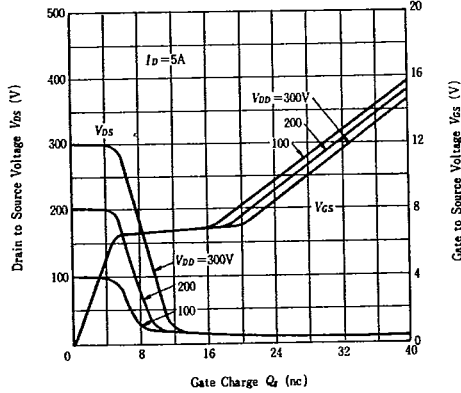
**SWITCHING CHARACTERISTICS**



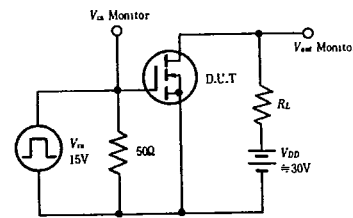
**MAXIMUM BODY-DRAIN DIODE FORWARD VOLTAGE**



**DYNAMIC INPUT CHARACTERISTICS**



**SWITCHING TIME TEST CIRCUIT**



**WAVEFORMS**

