

2SK413, 2SK414 333-431/962

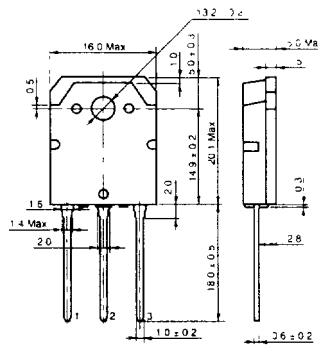
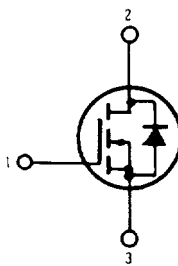
SILICON N-CHANNEL MOS FET

**HIGH SPEED POWER SWITCHING,
HIGH FREQUENCY POWER AMPLIFIER**

complementary pair with 2SJ118, 119

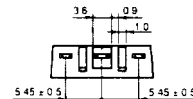
■ FEATURES

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



- 1 Gate
2 Drain
(Flange)
3 Source

(Dimensions in mm)



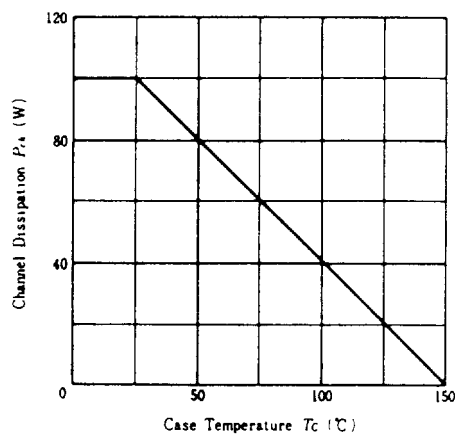
(TO-3P)

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

Item	Symbol	Rating		Unit
		2SK413	2SK414	
rain Source Voltage	V_{DSS}	140	160	V
ate Source Voltage	V_{GSS}	± 20		V
rain Current	I_D	8		A
rain Peak Current	$I_{D(peak)}$	12		A
udy Drain Diode	I_{DR}	8		A
verse Drain Current				
hannel Dissipation	P_{ch}^*	100		W
hannel Temperature	T_{ch}	150		°C
orage Temperature	T_{sig}	-55 ~ +150		°C

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

POWER VS TEMPERATURE DERATING

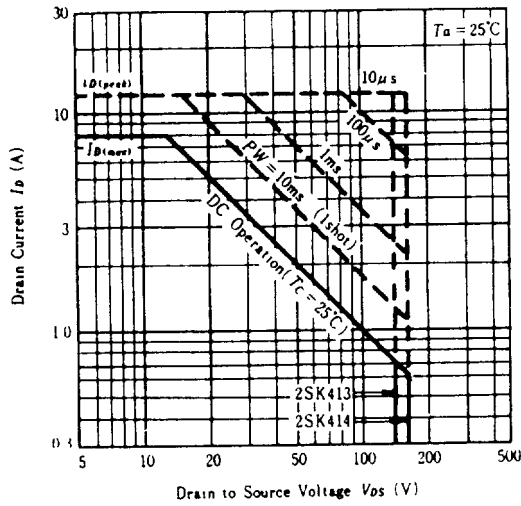


■ ELECTRICAL CHARACTERISTICS ($T_a=25\text{ }^{\circ}\text{C}$)

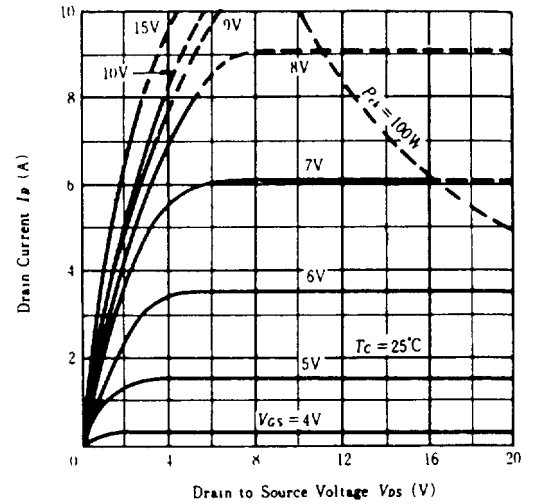
Item		Symbol	Test Condition	min.	typ	max	Unit
Drain-Source Breakdown Voltage	2SK413	$V_{DS(on)}$	$I_D=10\text{mA}, V_{GS}=0$	140	—	—	V
	2SK414			160	—	—	V
Gate-Source Leak Current		I_{GSS}	$V_{GS}=\pm 20\text{V}, V_{DS}=0$	—	—	± 1	μA
Zero Gate Voltage Drain Current	2SK413	I_{DSS}	$V_{DS}=120\text{V}, V_{GS}=0$	—	—	1	mA
	2SK414		$V_{DS}=140\text{V}, V_{GS}=0$				
Gate-Source Cutoff Voltage		$V_{GS(off)}$	$I_D=1\text{mA}, V_{DS}=10\text{V}$	2.0	—	5.0	V
Static Drain-Source On State Resistance		$R_{DS(on)}$	$I_D=4\text{A}, V_{GS}=15\text{V}^*$	—	0.4	0.5	Ω
Drain-Source Saturation Voltage		$V_{DS(on)}$	$I_D=4\text{A}, V_{GS}=15\text{V}^*$	—	1.6	2.0	V
Forward Transfer Admittance		$ y_f $	$I_D=4\text{A}, V_{DS}=10\text{V}^*$	1.0	2.0	—	S
Input Capacitance		C_{iss}	$V_{DS}=10\text{V}, V_{GS}=0$ $f=1\text{MHz}$	—	800	—	pF
Output Capacitance		C_{oss}		—	330	—	pF
Reverse Transfer Capacitance		C_{riss}		—	60	—	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		$t_{d(off)}$		—	60	—	ns
Fall Time		t_f		—	50	—	ns
Body-Drain Diode Forward Voltage		V_{DF}	$I_F=4\text{A}, V_{GS}=0$	—	0.9	—	V
Body-Drain Diode Reverse Recovery Time		t_{rr}	$I_F=4\text{A}, V_{GS}=0$ $di_F/dt=50\text{A}/\mu\text{s}$	—	250	—	ns

False Test

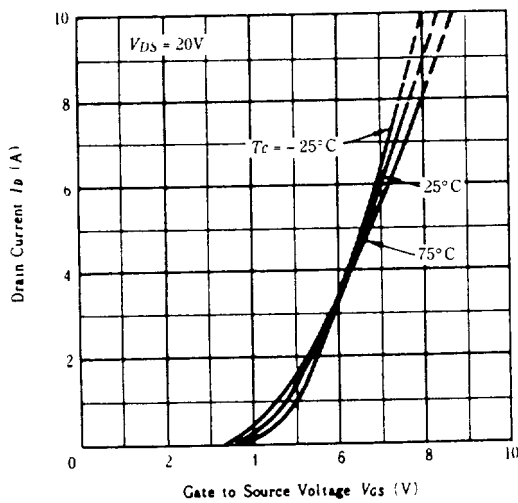
MAXIMUM SAFE OPERATION AREA



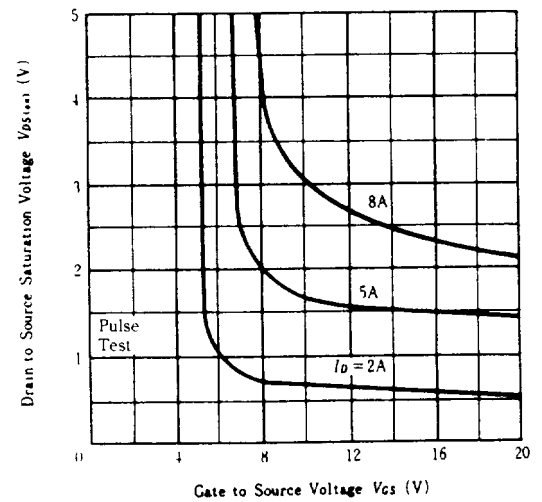
TYPICAL OUTPUT CHARACTERISTICS



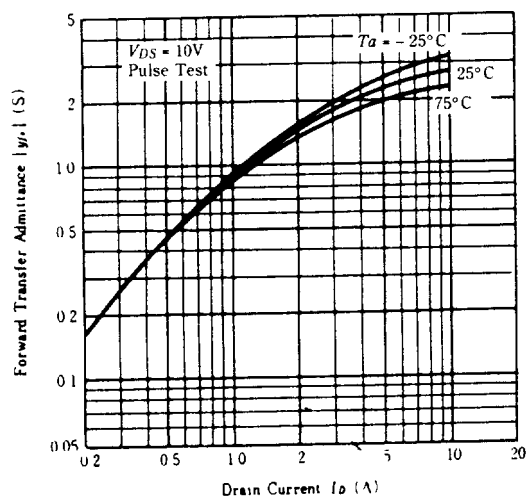
TYPICAL TRANSFER CHARACTERISTICS



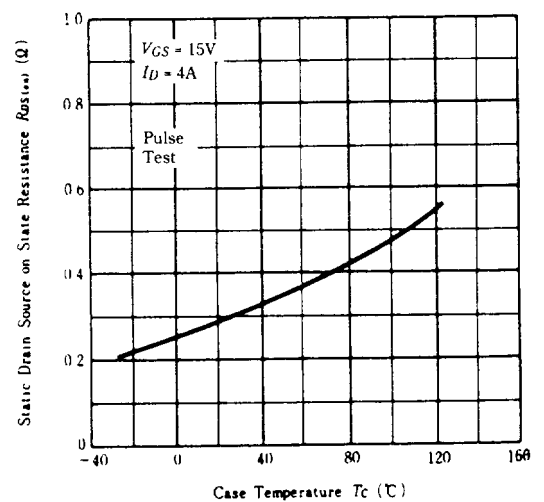
DRAIN-SOURCE SATURATION VOLTAGE VS GATE-SOURCE VOLTAGE



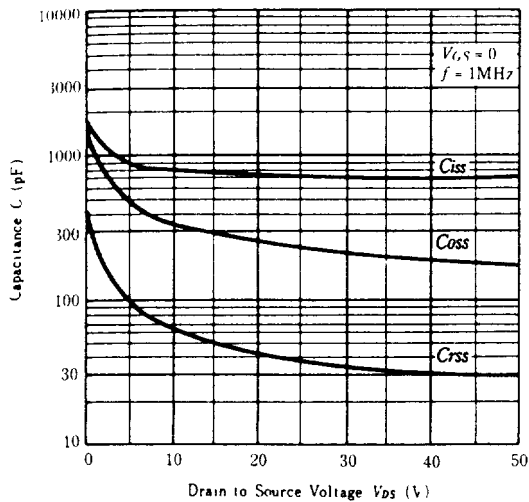
FORWARD TRANSFER ADMITTANCE VS DRAIN CURRENT



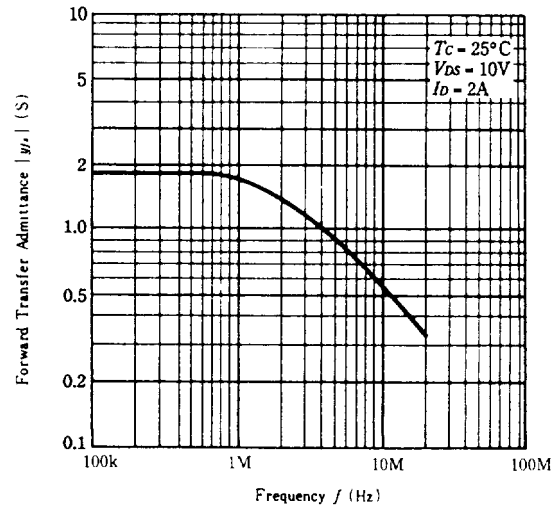
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS TEMPERATURE



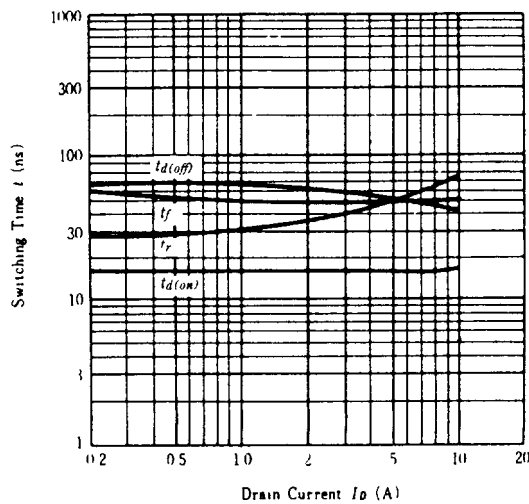
**TYPICAL CAPACITANCE VS.
DRAIN-SOURCE VOLTAGE**



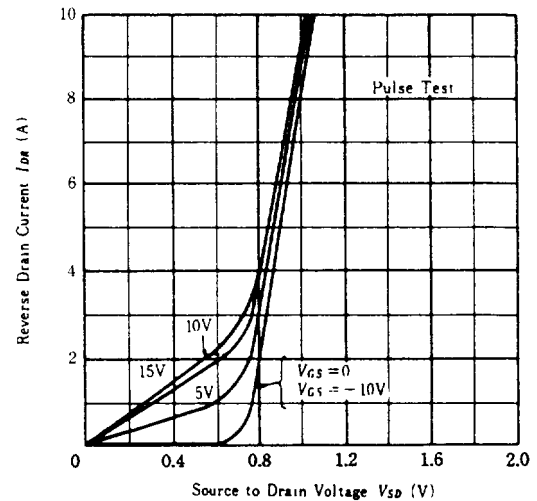
**FORWARD TRANSFER ADMITTANCE
VS FREQUENCY**



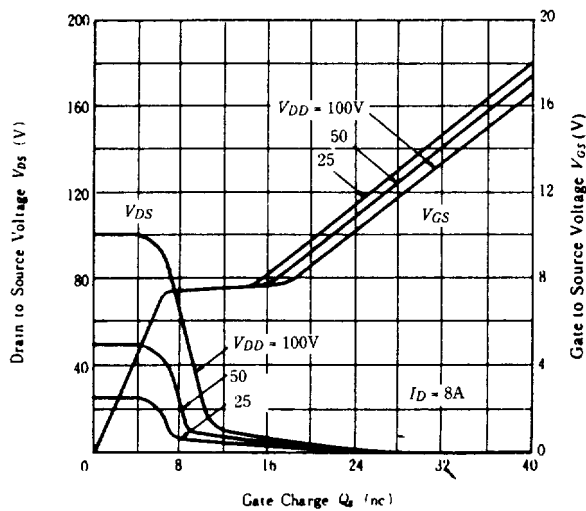
SWITCHING CHARACTERISTICS



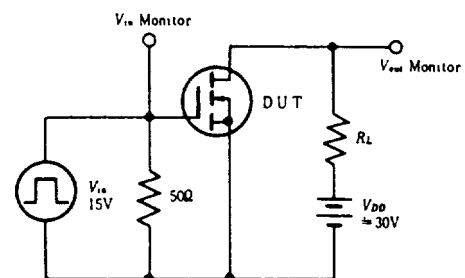
**MAXIMUM BODY-DRAIN DIODE
FORWARD VOLTAGE**



DYNAMIC INPUT CHARACTERISTICS



SWITCHING TIME TEST CIRCUIT



WAVEFORMS

