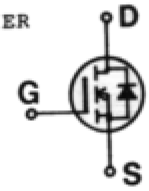
2SK312 , 2SK313

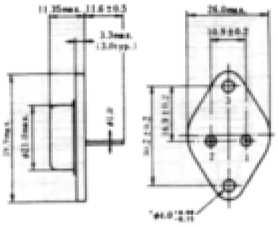
SILICON N-CHANNEL MOS FET

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, Motor Control, and Ultrasonic Power Oscillators.





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

(Dimensions in mm)

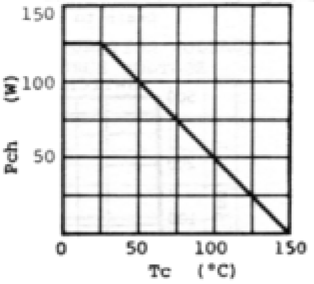
(JEDEC TO-3)

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Item	Symbol	K312	K313	Unit
Drain-Source Voltage	V_{DSS}	400	450	V
Gate-Source Voltage	V_{GSS}	±20		V
Drain Current	I_D	12		A
Drain Peak Current	$I_{D(peak)}$	18		A
Body-Drain Diode Reverse Drain Current	I_{DR}	12		A
Channel Dissipation	Pch*	125		W
Channel Temperature	Tch	150		°C
Storage Temperature	Tstg	-55 ~+150		°C

*Value at Tc=25°C

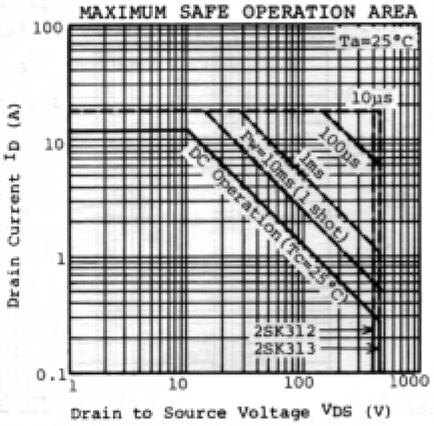
POWER VS. TEMPERATURE DERATING

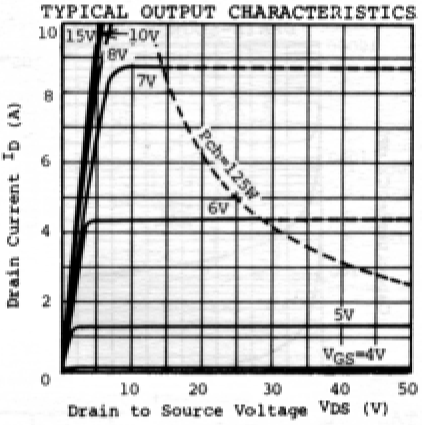


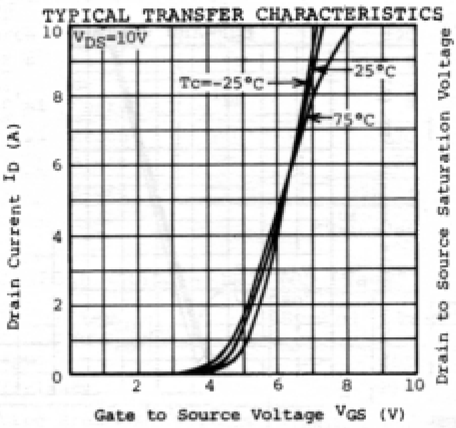
■ ELECTRICAL CHARACTERISTICS (Ta=25°C)

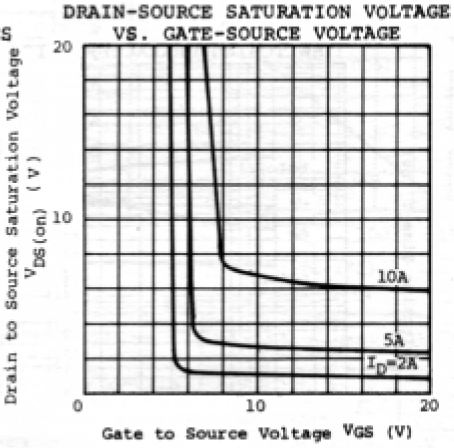
Item		Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	K312	$V_{(BR)DSS}$	I_D=10mA , V_{GS}=0	400	-	-	V
	K313			450	-	-	V
Gate-Source Leak Current		I_{GSS}	V_{GS}=±20V, V_{DS}=0	-	-	±1	μA
Zero Gate Voltage Drain Current	K312	I_{DSS}	V_{DS}=320V, V_{GS}=0	-	-	1	mA
	K313		V_{DS}=360V, V_{GS}=0				
Gate-Source Cutoff Voltage		$V_{GS(off)}$	I_D=1mA , V_{DS}=10V	1.0	-	5.0	V
Static Drain-Source On State Resistance		$R_{DS(on)}$	I_D=6A , V_{GS}=15V *	-	0.67	0.9	Ω
Drain-Source Saturation Voltage		$V_{DS(on)}$	I_D=6A , V_{GS}=15V *	-	4.0	5.4	V
Forward Transfer Admittance		$\|y_{fs}\|$	I_D=6A , V_{DS}=10V *	1.5	2.5	-	S
Input Capacitance		Ciss	V_{DS}=10 V, V_{GS}=0 f=1MHz	-	1500	-	pF
Output Capacitance		Coss		-	330	-	pF
Reverse Transfer Capacitance		Crss		-	35	-	pF
Turn-On Delay Time		$t_{d(on)}$	I_D=2A , V_{GS}=15V R_L=15Ω	-	20	-	ns
Rise Time		t_r		-	50	-	ns
Turn-Off Delay Time		$t_{d(off)}$		-	140	-	ns
Fall Time		t_f		-	60	-	ns
Body-Drain Diode Forward Voltage		V_{DF}	I_F=6A , V_{GS}=0	-	0.9	-	V
Body-Drain Diode Reverse Recovery Time		t_{rr}	I_F=6A , V_{GS}=0	-	800	-	ns

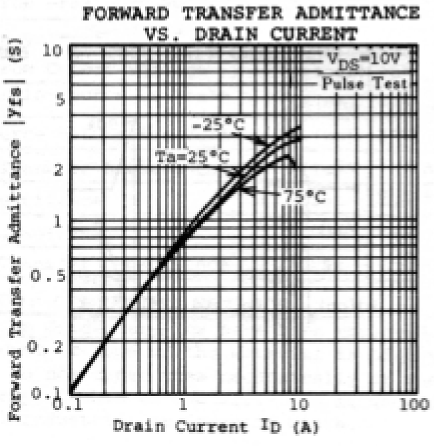
*Pulse Test

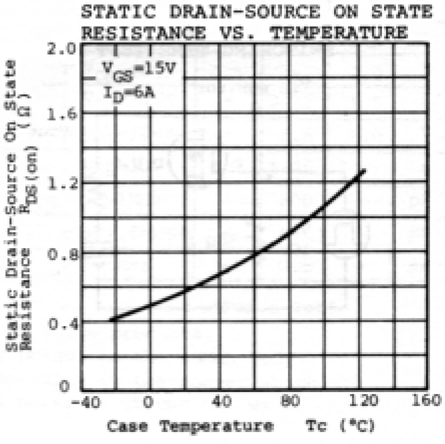

MAXIMUM SAFE OPERATION AREA

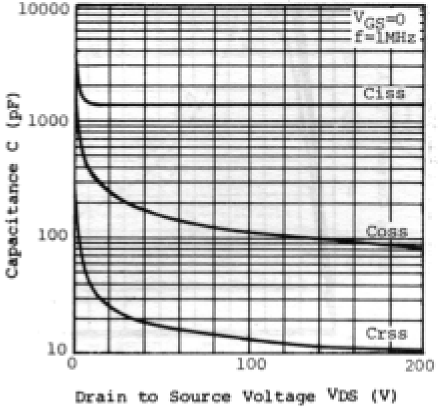

TYPICAL OUTPUT CHARACTERISTICS


TYPICAL TRANSFER CHARACTERISTICS

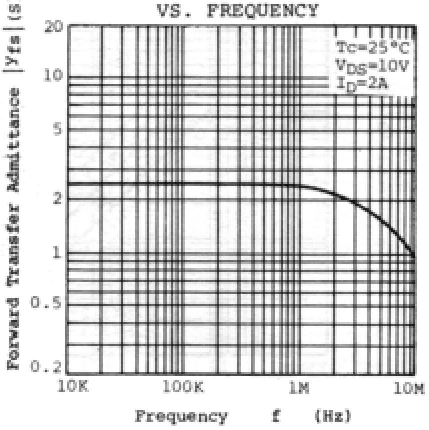

DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE


FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT

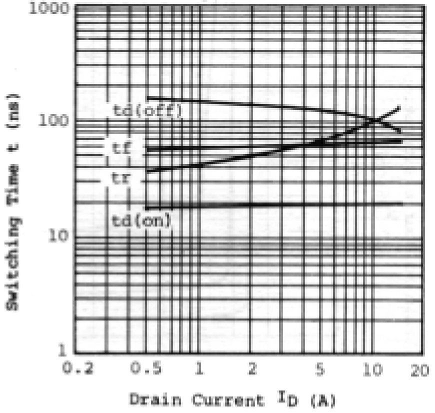

STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



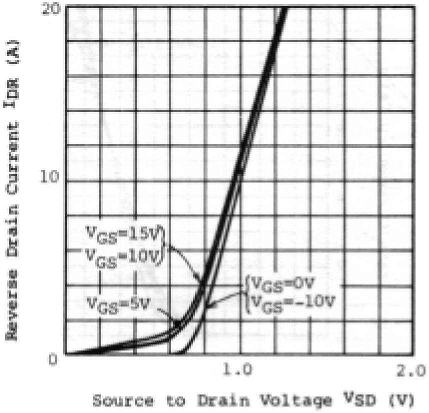
TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE



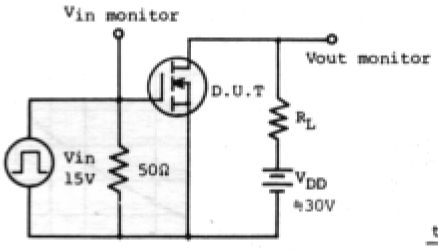
FORWARD TRANSFER ADMITTANCE VS. FREQUENCY



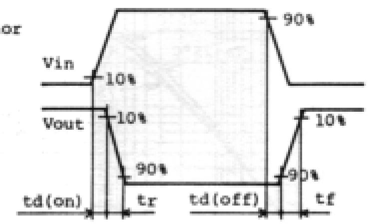
SWITCHING CHARACTERISTICS



MAXIMUM BODY-DRAIN DIODE FORWARD VOLTAGE



SWITCHING TIME TEST CIRCUIT



SWITCHING TIME TEST WAVEFORMS