

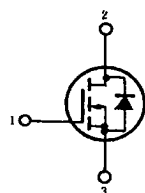
2SK412

SILICON N-CHANNEL MOS FET

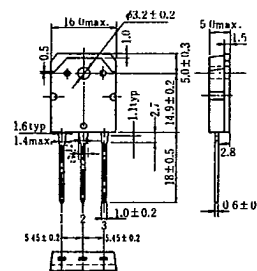
HIGH SPEED POWER SWITCHING, HIGH FREQUENCY POWER AMPLIFIER

■ 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. Drain
(Flange)
3. Source
(Dimensions in mm)



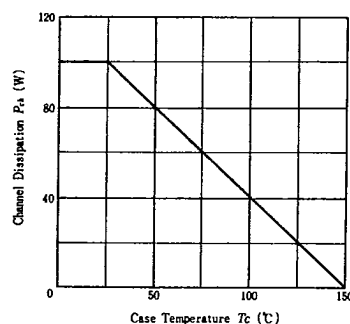
(TO-3P)

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

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	250	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current	I_D	10	A
Drain Peak Current	$I_{D(\text{peak})}$	15	A
Body-Drain Diode Reverse Drain Current	I_{DR}	10	A
Channel Dissipation	P_{ch}	100	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	$-55 \sim +150$	$^\circ\text{C}$

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

POWER VS. TEMPERATURE DERATING



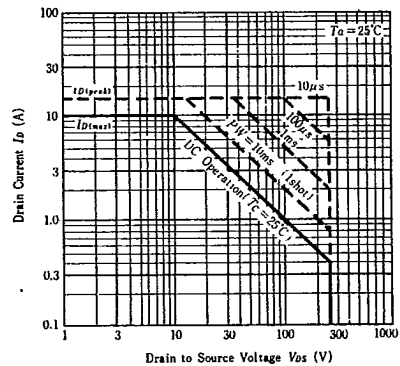
■ ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$)

Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DS}$	$I_D=10\text{mA}$, $V_{GS}=0$	250	—	—	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}	$V_{DS}=200\text{V}$, $V_{GS}=0$	—	—	1	mA
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	$R_{DS(on)}$	$I_D=5\text{A}$, $V_{GS}=15\text{V}^*$	—	0.3	0.4	Ω
Drain-Source Saturation Voltage	$V_{DS(on)}$	$I_D=5\text{A}$, $V_{GS}=15\text{V}^*$	—	1.5	2.0	V
Forward Transfer Admittance	$ y_{fs} $	$I_D=5\text{A}$, $V_{DS}=10\text{V}^*$	1.6	2.5	—	S
Input Capacitance	C_{iss}	$V_{DS}=10\text{V}$, $V_{GS}=0$ $f=1\text{MHz}$	—	1400	—	pF
Output Capacitance	C_{oss}		—	500	—	pF
Reverse Transfer Capacitance	C_{rss}		—	35	—	pF
Turn-on Delay Time	$t_{d(on)}$	$I_D=2\text{A}$, $V_{GS}=15\text{V}$ $R_L=15\Omega$	—	13	—	ns
Rise Time	t_r		—	52	—	ns
Turn-off Delay Time	$t_{d(off)}$		—	120	—	ns
Fall Time	t_f		—	60	—	ns
Body-Drain Diode Forward Voltage	V_{DF}	$I_F=5\text{A}$, $V_{GS}=0$	—	0.9	—	V
Body-Drain Diode Reverse Recovery Time	t_{rr}	$I_F=5\text{A}$, $V_{GS}=0$ $di_F/dt=100\text{A}/\mu\text{s}$	—	400	—	ns

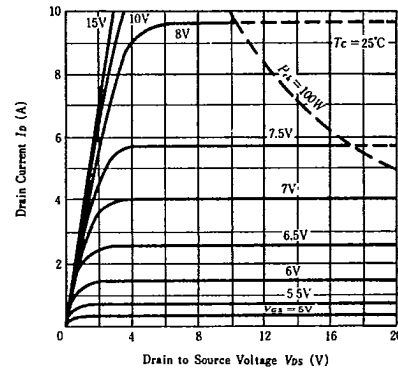
*Pulse Test

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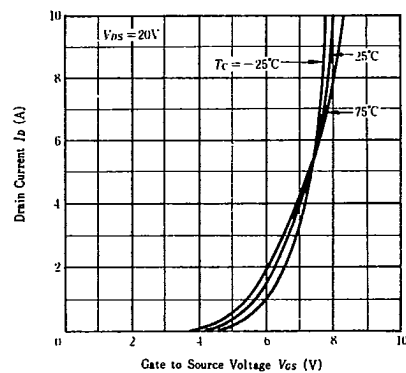
MAXIMUM SAFE OPERATION AREA



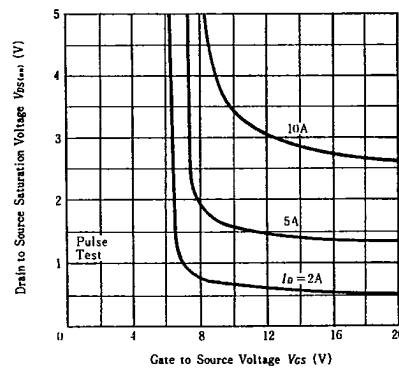
TYPICAL OUTPUT CHARACTERISTICS



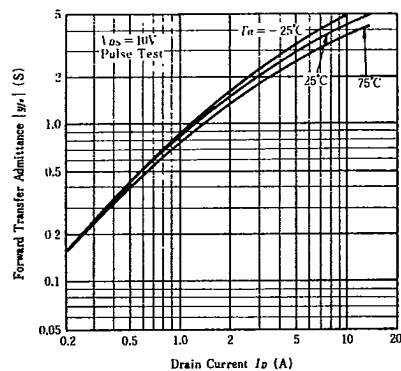
TYPICAL TRANSFER CHARACTERISTICS



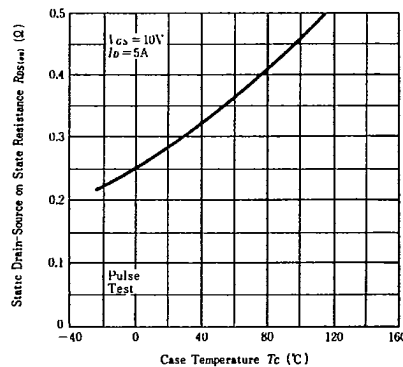
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE

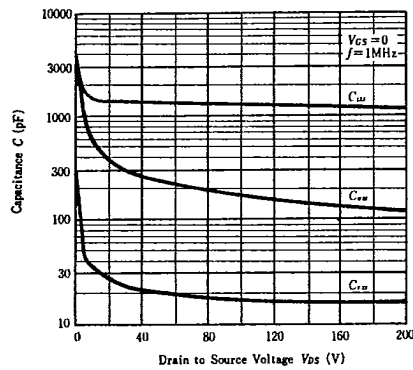
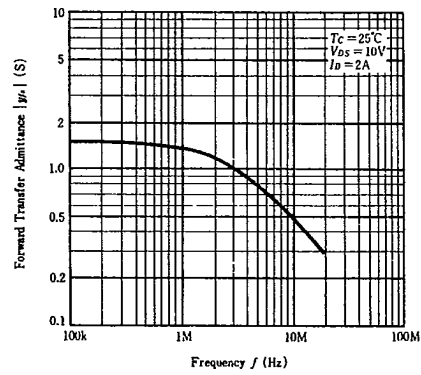


FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT

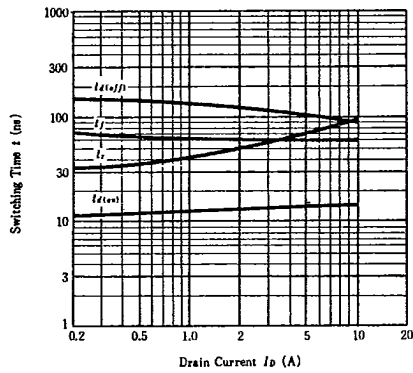
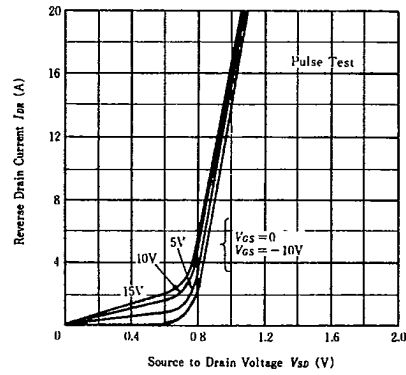


STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE

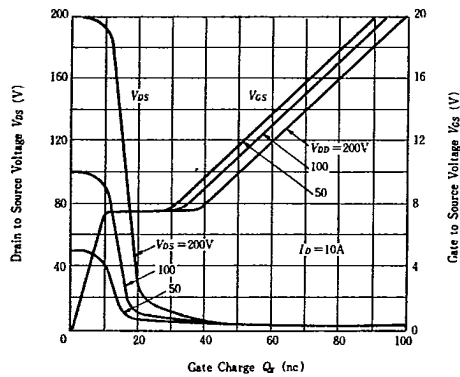


TYPICAL CAPACITANCE VS.
DRAIN-SOURCE VOLTAGEFORWARD TRANSFER ADMITTANCE
VS. FREQUENCY

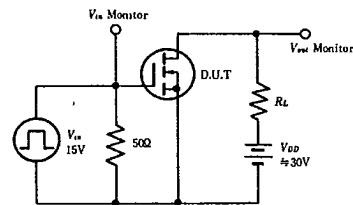
SWITCHING CHARACTERISTICS

MAXIMUM BODY-DRAIN DIODE
FORWARD VOLTAGE

DYNAMIC INPUT CHARACTERISTICS



SWITCHING TIME TEST CIRCUIT



WAVEFORMS

