

MOS FIELD EFFECT POWER TRANSISTOR

2SK612-Z

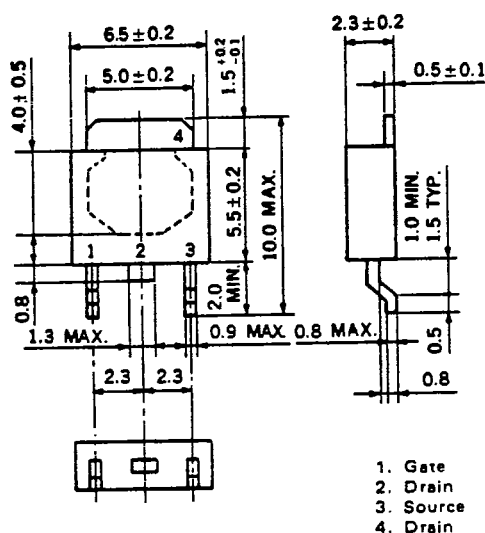
FAST SWITCHING

N-CHANNEL SILICON POWER MOS FET

INDUSTRIAL USE

PACKAGE DIMENSIONS

in millimeters



FEATURES

- Suitable for switching power supplies, actuator controls, and pulse circuits.
- Low $R_{DS(on)}$
- No second breakdown
- 4 V Gate Drive — Logic level —
- Designed for Hybrid Integrated Circuits

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

Drain to Source Voltage	V_{DS}	100	V
Gate to Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_{D(DC)}$	± 2	A
Peak Drain Current	$I_{D(pulse)}$ *	± 8	A
Total Power Dissipation	P_T **	20	W
Total Power Dissipation at 25°C Ambient Temperature	P_T ***	2.0	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

* $PW \leq 10$ ms, Duty Cycle $\leq 50\%$

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

*** Mounted on ceramic substrate of $2.5\text{ cm}^2 \times 0.7\text{ mm}$

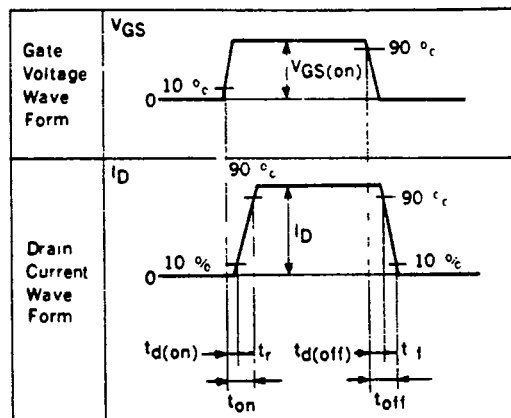
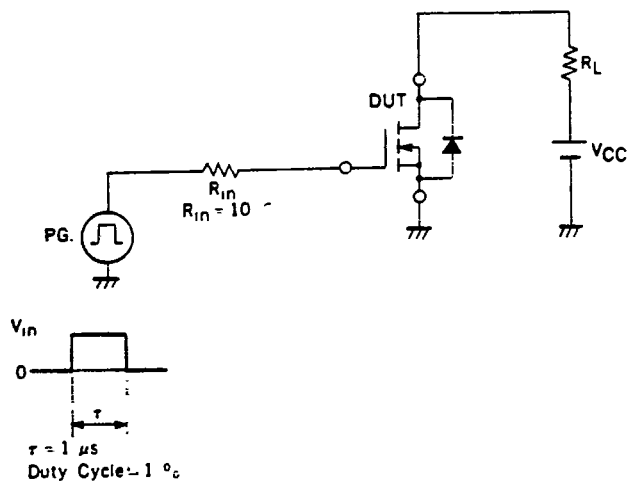
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain Leakage Current	I_{DSS}			10	μA	$V_{DS} = 80\text{ V}, V_{GS} = 0$
Gate to Source Leakage Current	I_{GSS}			± 100	nA	$V_{GS} = \pm 15\text{ V}, V_{DS} = 0$
Gate to Source Cutoff Voltage	$V_{GS(off)}$	0.8		3.0	V	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$
Forward Transfer Admittance	$ y_{fs} $	1.0			S	$V_{DS} = 10\text{ V}, I_D = 1\text{ A}$
Drain to Source On-State Resistance	$R_{DS(on)}$		0.3	0.45	Ω	$V_{GS} = 10\text{ V}, I_D = 1\text{ A}$
Drain to Source On-State Resistance	$R_{DS(on)}$		0.35	0.6	Ω	$V_{GS} = 4\text{ V}, I_D = 0.8\text{ A}$
Input Capacitance	C_{iss}		500		pF	$V_{DS} = 10\text{ V}, V_{GS} = 0$ $f = 1\text{ MHz}$
Output Capacitance	C_{oss}		120		pF	
Reverse Transfer Capacitance	C_{rss}		30		pF	
Turn-On Delay Time	$t_{d(on)}$		10		ns	$I_D = 1\text{ A}, V_{CC} = 50\text{ V}$ $V_{GS(on)} = 10\text{ V}$ $R_L = 50\text{ }\Omega$ $R_{in} = 10\text{ }\Omega$
Rise Time	t_r		20		ns	
Turn-Off Delay Time	$t_{d(off)}$		80		ns	
Fall Time	t_f		20		ns	

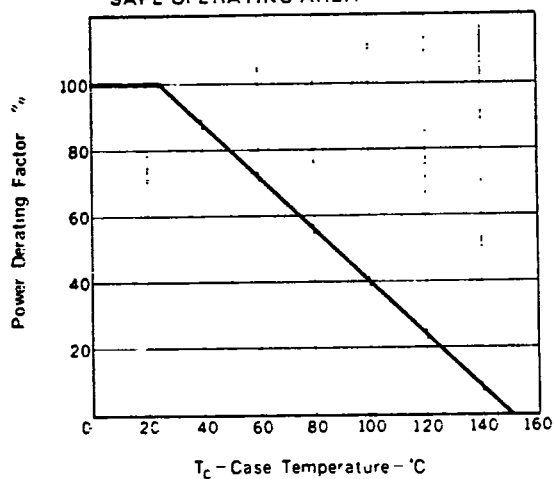
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N-channel MOSFET

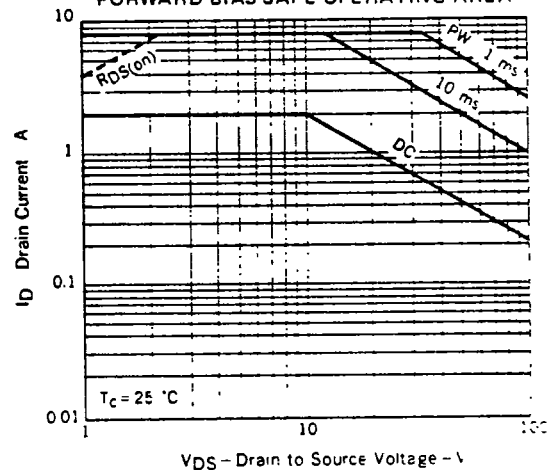
TURN-ON AND TURN-OFF TIME TEST CIRCUIT



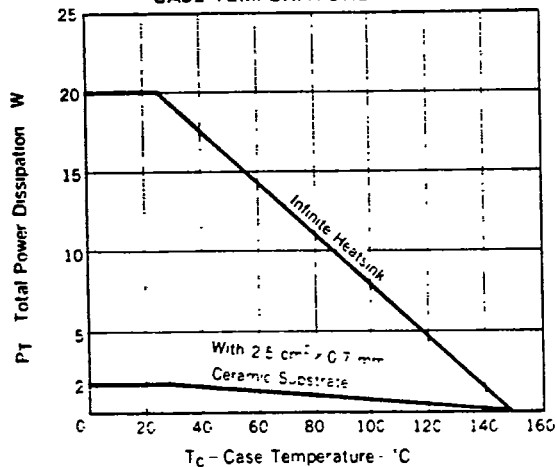
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



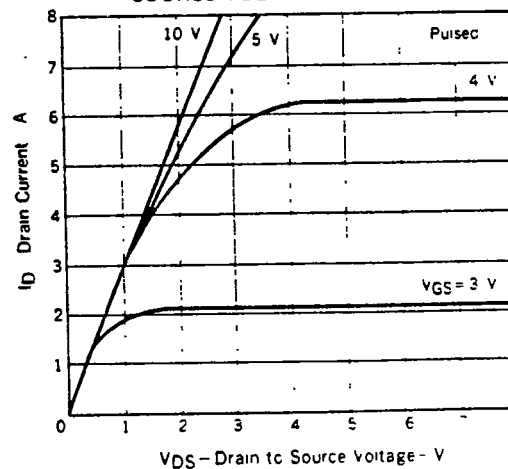
FORWARD BIAS SAFE OPERATING AREA

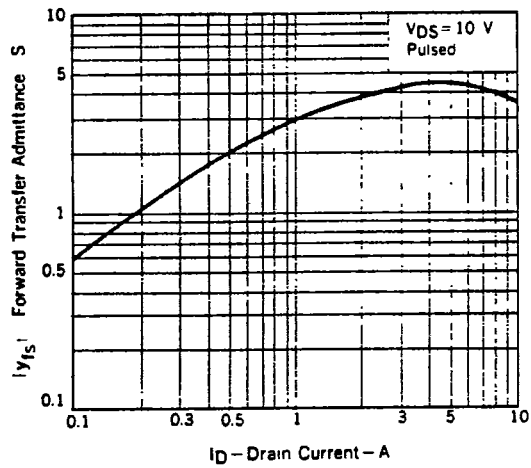
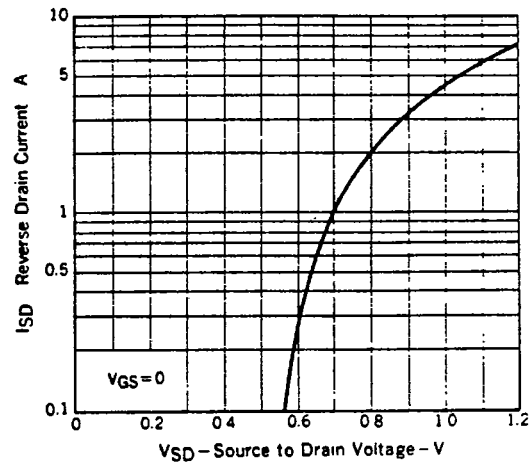
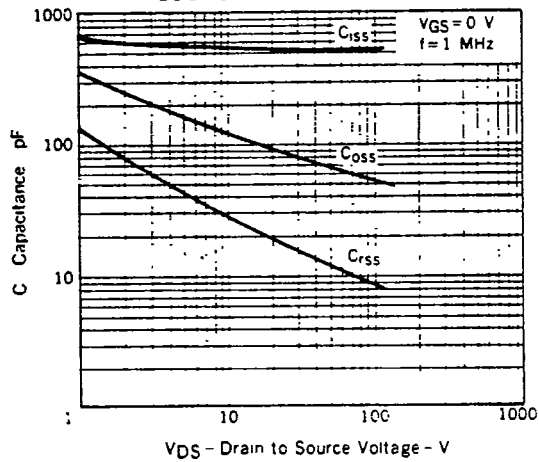
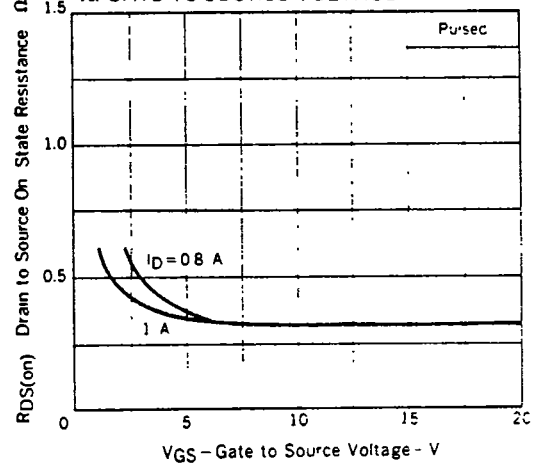
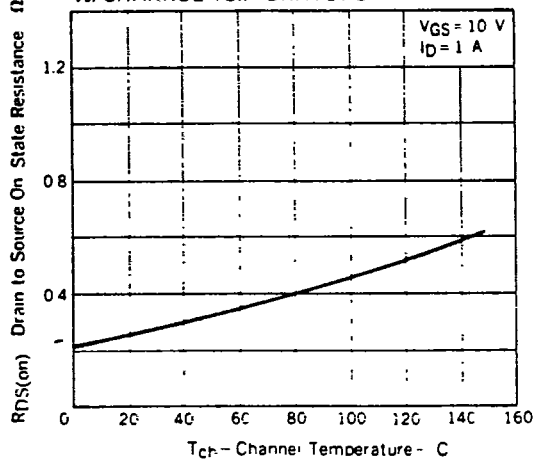
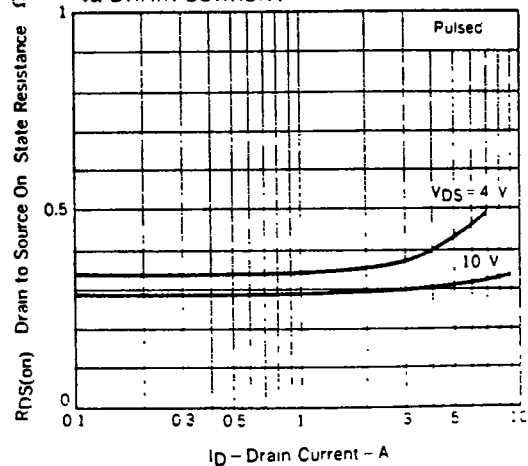


TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



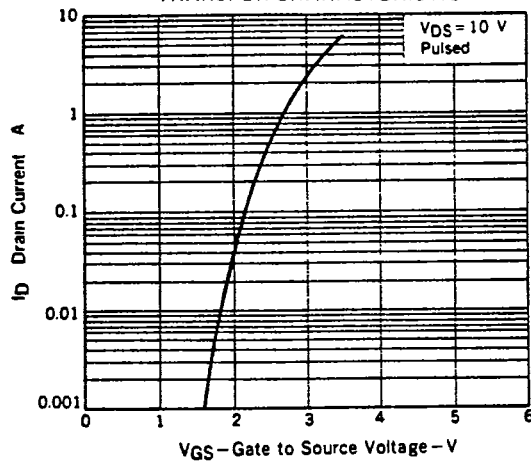
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



FORWARD TRANSFER ADMITTANCE
vs. DRAIN CURRENTSOURCE TO DRAIN DIODE
FORWARD VOLTAGECAPACITANCE vs. DRAIN TO
SOURCE VOLTAGEDRAIN TO SOURCE ON-STATE RESISTANCE
vs. GATE TO SOURCE VOLTAGEDRAIN TO SOURCE ON-STATE RESISTANCE
vs. CHANNEL TEMPERATUREDRAIN TO SOURCE ON-STATE RESISTANCE
vs. DRAIN CURRENT

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TRANSFER CHARACTERISTIC

GATE TO SOURCE CUTOFF VOLTAGE
vs. CHANNEL TEMPERATURE