



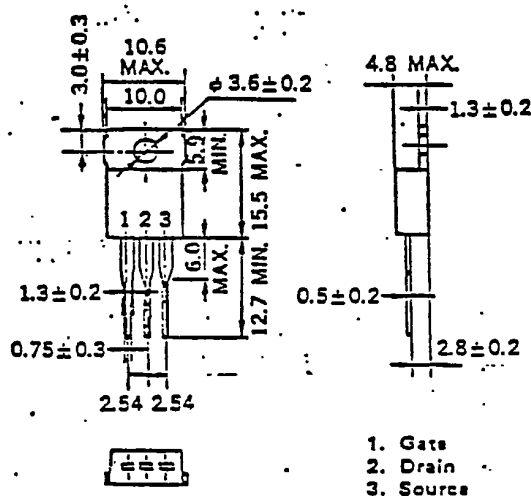
MOS FIELD EFFECT TRANSISTOR

2SJ138

FAST SWITCHING P-CHANNEL SILICON POWER MOS FET

PACKAGE DIMENSIONS

(Unit: mm)

**Features**

Suitable for switching power supplies,
actuator controls and pulse circuits
4V Gate Drive — Logic Level —
Large current switching : $I_{D(DC)}=12A$
Low $R_{DS(on)}$
No Secondary Breakdown

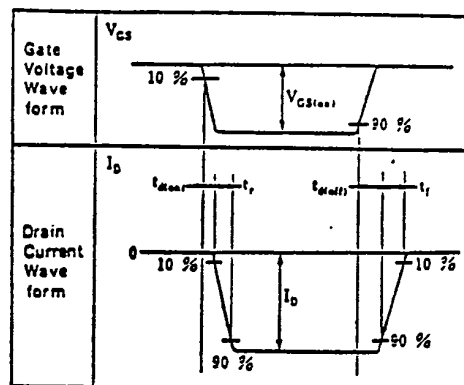
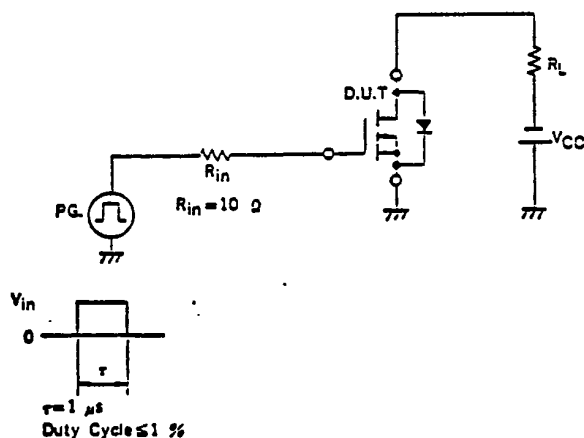
Absolute Maximum Ratings ($T_a=25^\circ C$)

Drain to Source Voltage	V_{DS}	-100V
Gate to Source Voltage	V_{GS}	$\pm 20V$
Continuous Drain Current	$I_{D(DC)}$	$\pm 12A$
Pulse Drain Current	$I_{D(pulse)}$	$\pm 48A$
Total Power Dissipation	P_T	1.5W
Total Power Dissipation	P_{T*}	60%
Channel Temperature	T_{ch}	150 °C
Storage Temperature	T_{stg}	-55 to +150 °C
* $T_{ch} \leq 150^\circ C$		
** $T_c=25^\circ C$		

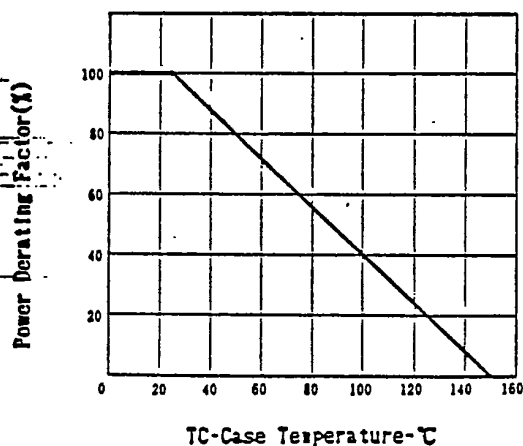
Electrical Characteristics ($T_a=25^\circ C$)

Characteristics	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain Leakage Current	I_{DSS}			- 10	μA	$V_{DS}=-100V, V_{GS}=0$
Gate to Source Leakage Current	I_{GSS}			100	nA	$V_{GS}=20V, V_{DS}=0$
Gate to Source Cutoff Voltage	$V_{GS(off)}$	-1.0		-3.0	V	$V_{DS}=-10V, I_D=-1.0mA$
Forward Transfer Admittance	$ y_{fs} $	2.0			S	$V_{DS}=-10V, I_D=-6.5A$
Drain to Source On-State Resistance	$R_{DS(on)}$			0.3	Ω	$V_{GS}=-10V, I_D=-6.5A$
Drain to Source On-State Resistance	$R_{DS(on)}$			0.45	Ω	$V_{GS}=-10V, I_D=-6.5A$
Input Capacitance	C_{iss}		2700		pF	$V_{DS}=-10V, V_{GS}=0$
Output Capacitance	C_{oss}		600		pF	$V_{GS}=0, f=1.0MHz$
Reverse Transfer Capacitance	C_{rss}		110		pF	$I_D=-6.5A, V_{GS}(on)=-10V$
Turn-On Delay Time	$t_{d(on)}$		15		ns	$V_{CC}=-50V, R_L=8\Omega$
Rise Time	t_r		70		ns	
Turn-Off Delay Time	$t_{d(off)}$		85		ns	
Fall Time	t_f		70		ns	

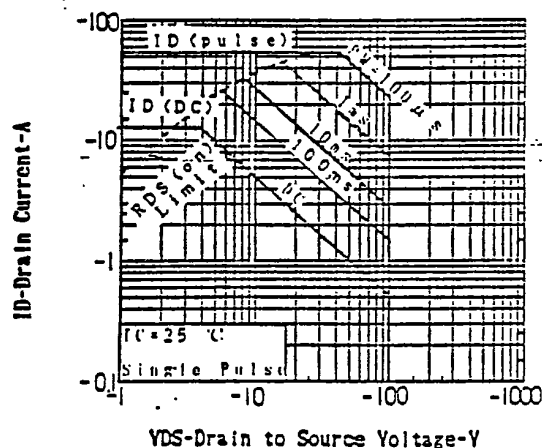
TURN-ON AND TURN-OFF TIME TEST CIRCUIT



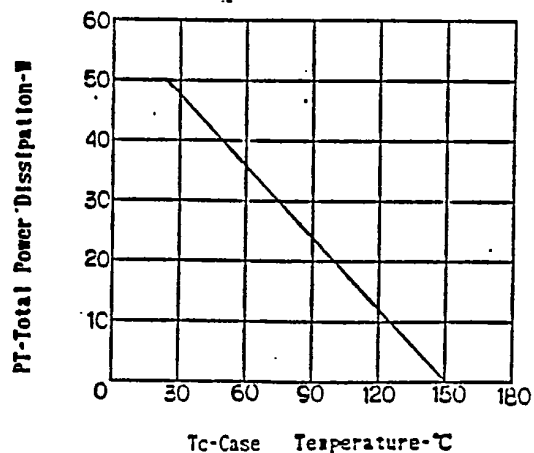
DERATING FACTOR OF FORWARD BIAS
SAFE OPERATING AREA



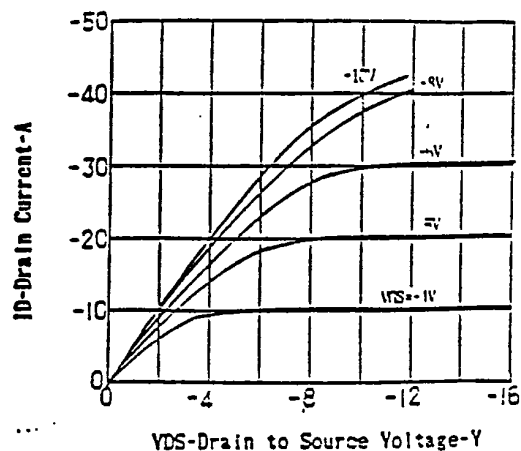
FORWARD BIAS SAFE OPERATING AREA

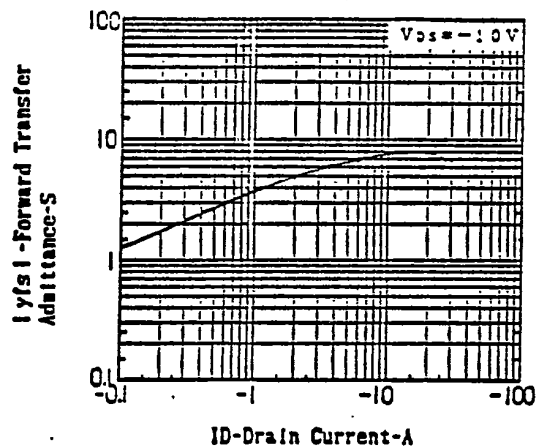
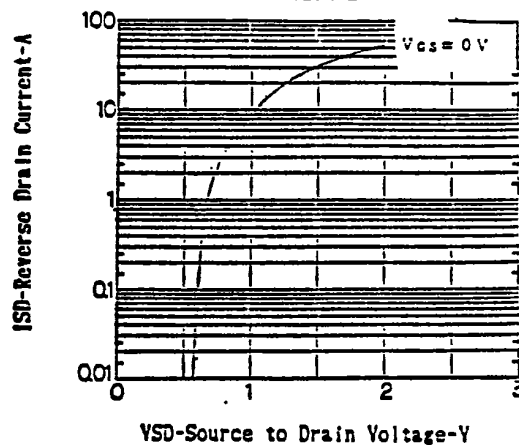
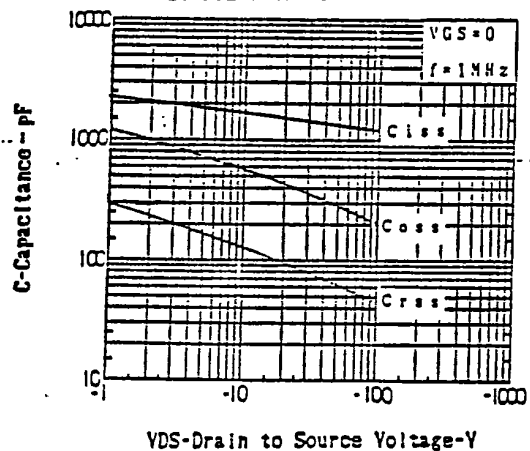
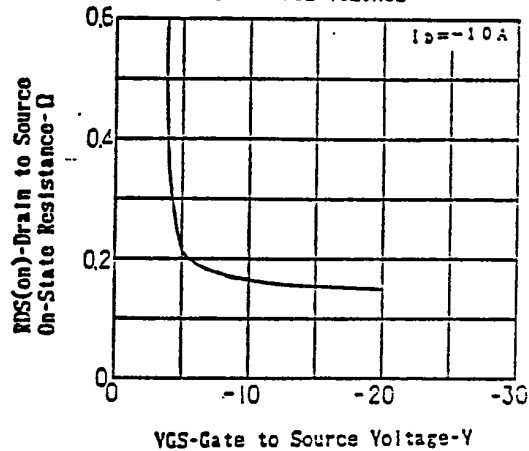
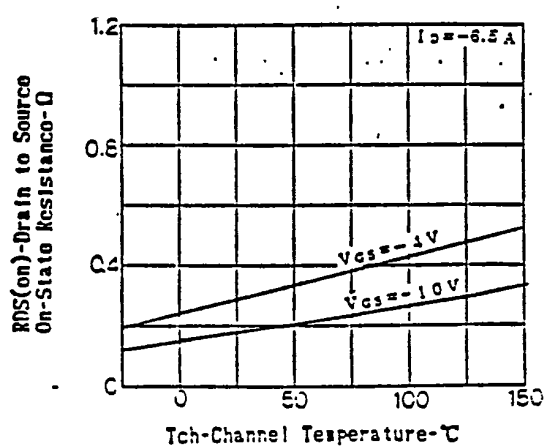
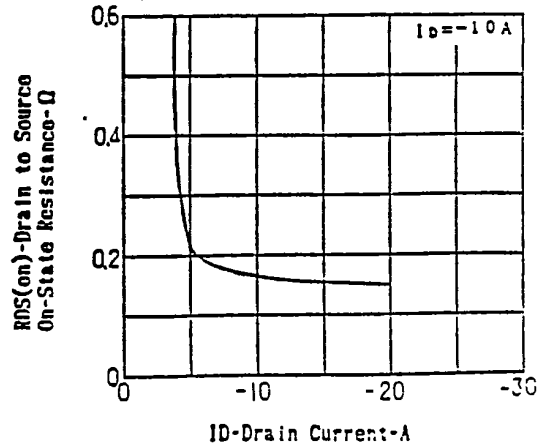


TOTAL POWER DISSIPATION vs.
CASE TEMPERATURE



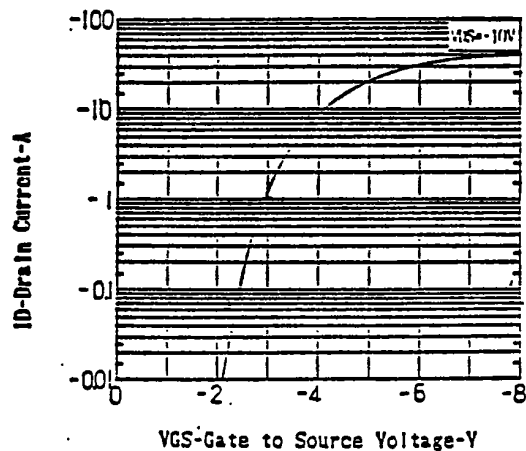
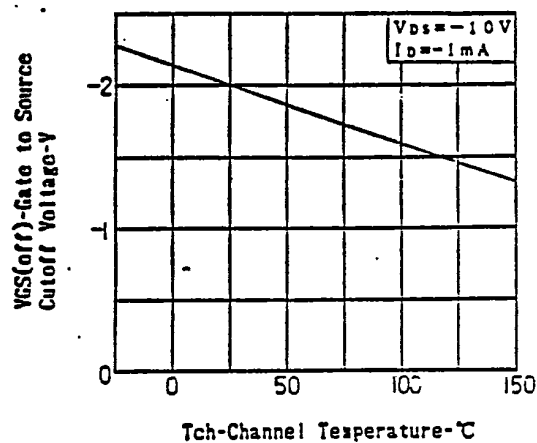
DRAIN CURRENT vs. DRAIN TO
SOURCE VOLTAGE



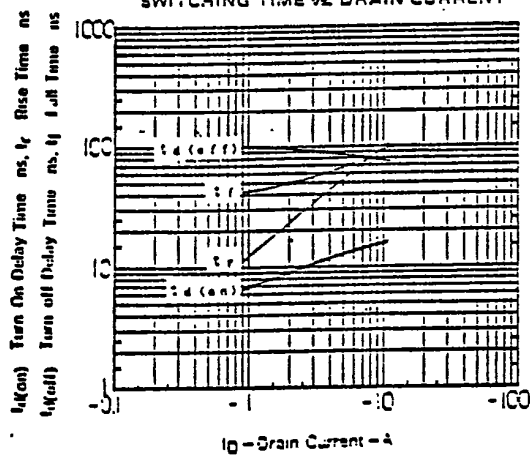
FORWARD TRANSFER ADMITTANCE
vs. DRAIN CURRENTSOURCE TO DRAIN DIODE
FORWARD VOLTAGECAPACITANCE vs. DRAIN TO
SOURCE VOLTAGEDRAIN TO SOURCE ON-STATE RESISTANCE
vs. GATE TO SOURCE VOLTAGEDRAIN TO SOURCE ON-STATE RESISTANCE
vs. CHANNEL TEMPERATUREDRAIN TO SOURCE ON-STATE RESISTANCE
vs. DRAIN CURRENT

NEC ELECTRON DEVICE

TRANSFER CHARACTERISTICS

GATE TO SOURCE CUTOFF VOLTAGE
vs. CHANNEL TEMPERATURE

SWITCHING TIME vs. DRAIN CURRENT



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