N-CHANNEL MOS FIELD EFFECT POWER TRANSISTOR

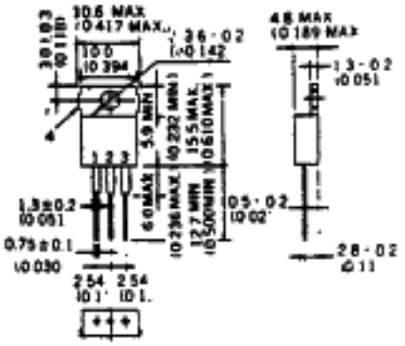
2SK702

DESCRIPTION The 2SK702 is N-Channel MOS Field Effect Power Transistor designed for solenoid, motor and lamp driver.

FEATURES

- 4 V Gate Drive – Logic level –
- Low $R_{DS(on)}$
- No Second Breakdown

PACAKGE DIMENSIONS
in millimeters (inches)



1. Gate
2. Drain
3. Source
4. Fin (Drain)

JEDEC: TO-220AB

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

- Storage Temperature . . . . . −55 to +150 °C
- Junction Temperature . . . . . 150 °C Maximum

Maximum Power Dissipations

- Total Power Dissipation . . . . . 1.5 W
- Total Power Dissipation (T_C = 25 °C) . . . 50 W

Maximum Voltages and Currents (T_a = 25 °C)

- V_{DSS} Drain to Source Voltage . . . . . 100 V
- V_{GSS} Gate to Source Voltage . . . . . ±20 V
- $I_{D(DC)}$ Drain Current (DC) . . . . . ±5 A
- $I_{D(pulse)}$ Drain Current (pulse)* . . . . . ±20 A

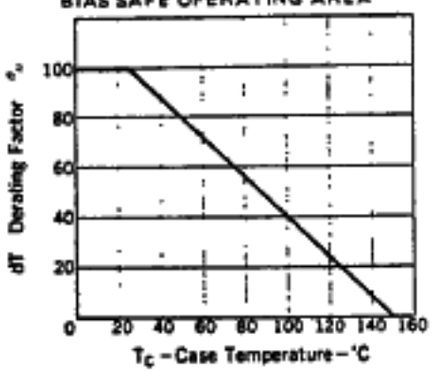
* PW ≤ 300 μs, Duty Cycle ≤ 2 %

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

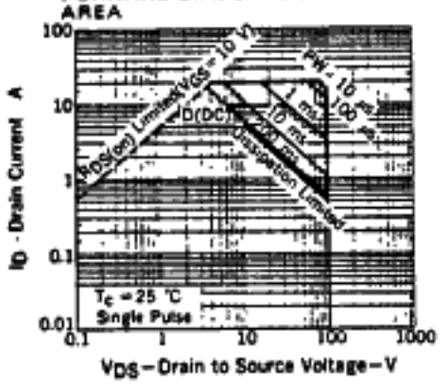
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
$R_{DS(on)}$	Drain to Source On-State Resistance		0.20	0.45	Ω	V_{GS} = 10 V, I_D = 5 A
$R_{DS(on)}$	Drain to Source On-State Resistance		0.25	0.50	Ω	V_{GS} = 4 V, I_D = 5 A
$V_{GS(off)}$	Gate to Source Cutoff Voltage	1.0		2.5	V	V_{DS} = 10V, I_D = 1 mA
$\|y_{fs}\|$	Forward Transfer Admittance	4			S	V_{DS} = 10 V, I_D = 3 A
I_{DSS}	Drain Leakage Current			10	μA	V_{DS} = 100 V, V_{GS} = 0
I_{GSS}	Gate to Source Leakage Current			±100	nA	V_{GS} = ±20 V, V_{DS} = 0
C_{iss}	Input Capacitance		900		pF	V_{DS} = 10 V
C_{oss}	Output Capacitance		250		pF	V_{GS} = 0
C_{rss}	Reverse Transfer Capacitance		50		pF	f = 1 MHz
$t_{d(on)}$	Turn On Delay Time		10		ns	
t_r	Rise Time		40		ns	I_D = 3 A, V_{CC} ≒ 50 V
$t_{d(off)}$	Turn Off Delay Time		110		ns	R_L = 17 Ω, R_{in} = 10 Ω
t_f	Fall Time		30		ns	

TYPICAL CHARACTERISTICS (T_a = 25 °C)

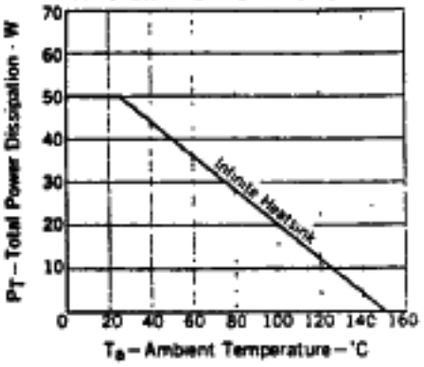
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



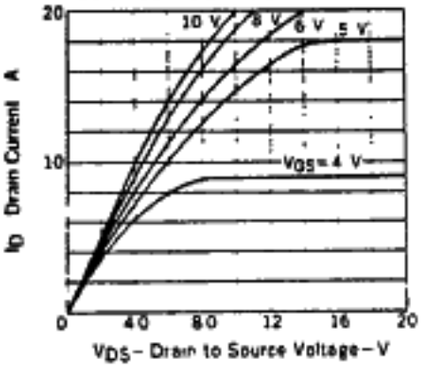
FORWARD BIAS SAFE OPERATING AREA



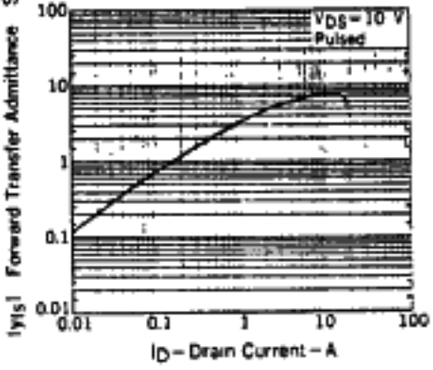
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



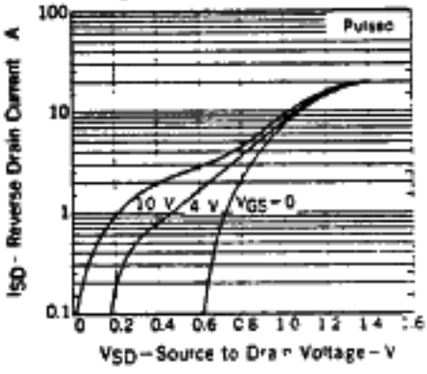
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



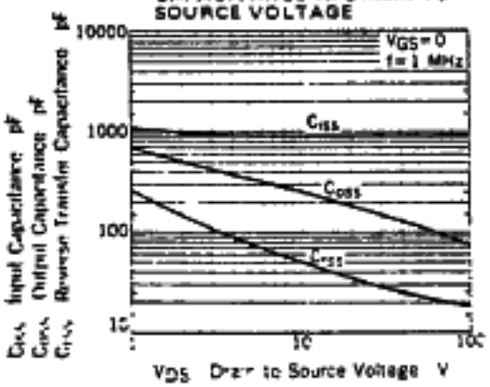
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



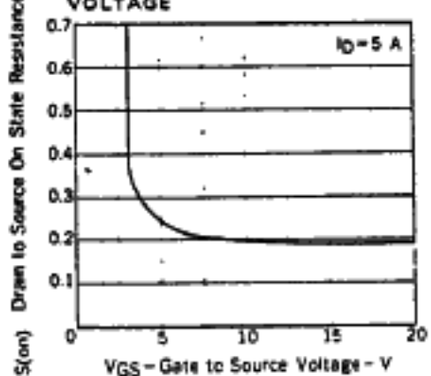
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



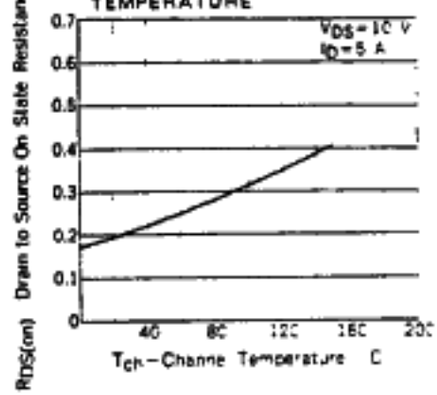
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE

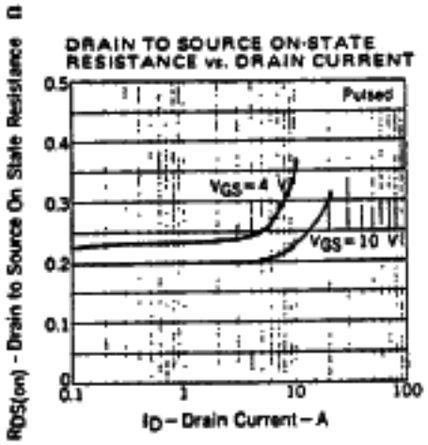


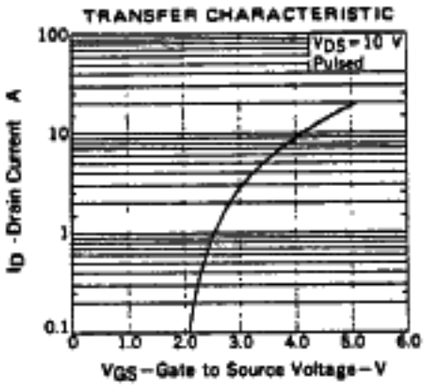
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE

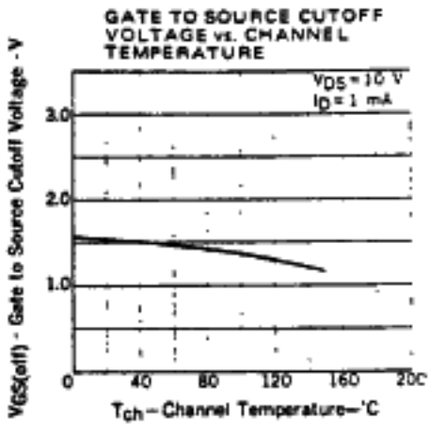


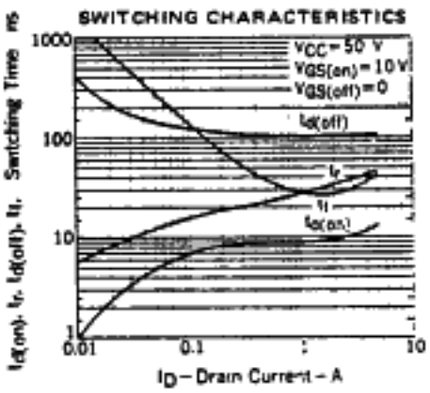
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE











SWITCHING TIME TEST CIRCUIT