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N-CHANNEL MOS FIELD EFFECT POWER TRANSISTOR

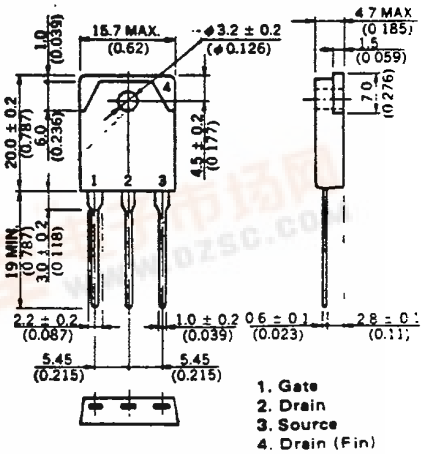
2SK798

DESCRIPTION The 2SK798 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 Secondary Breakdown

PACKAGE DIMENSIONS
in millimeters (inches)



ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

Storage Temperature	−55 to +150 °C	
Channel Temperature	150 °C Maximum	

Maximum Power Dissipations

Total Power Dissipation (T_a = 25 °C)	3.0	W
Total Power Dissipation (T_c = 25 °C)	150	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)	±40	A
$I_{D(pulse)}$	Drain Current (pulse)*	±160	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			31	mΩ	V_{GS} = 10 V, I_D = 20 A
$R_{DS(on)}$	Drain to Source On-State Resistance			40	mΩ	V_{GS} = 4 V, I_D = 20 A
$V_{GS(off)}$	Gate to Source Cutoff Voltage	1.0		2.5	V	V_{DS} = 10 V, I_D = 1 mA
$\lvert y_{fs} \rvert$	Forward Transfer Admittance	5.0			S	V_{DS} = 10 V, I_D = 20 A
I_{DSS}	Drain Leakage Current			100	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		8000		pF	V_{DS} = 10 V, V_{GS} = 0, f = 1 MHz
C_{oss}	Output Capacitance		1800		pF	
C_{rss}	Reverse Transfer Capacitance		450		pF	
$t_{d(on)}$	Turn-On Delay Time		60		ns	I_D = 20 A, V_{CC} ≒ 50 V, R_L = 2.5 Ω, R_{in} = 10 Ω
t_r	Rise Time		120		ns	
$t_{d(off)}$	Turn-Off Delay Time		400		ns	
t_f	Fall Time		250		ns	

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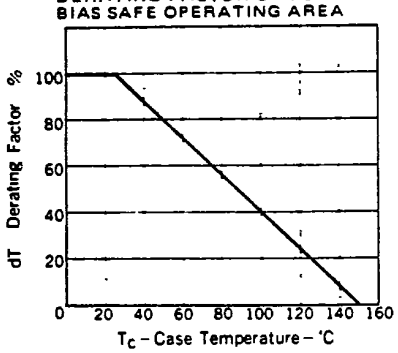
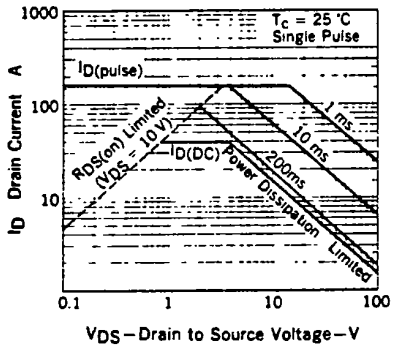
TYPICAL CHARACTERISTICS (T_a = 25 °C)

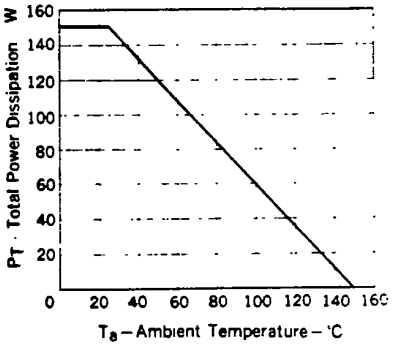
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



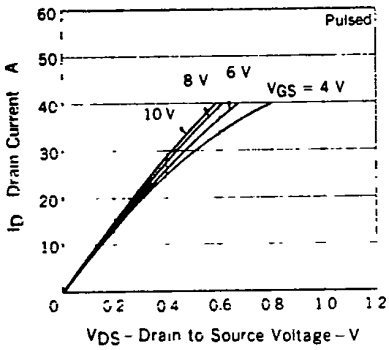
FORWARD BIAS SAFE OPERATING AREA



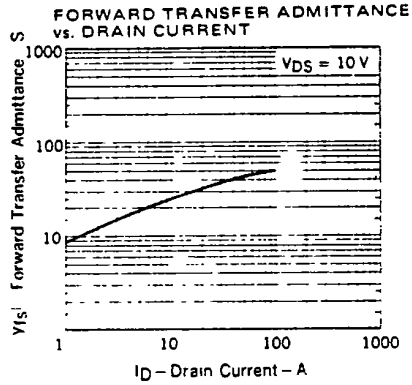
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



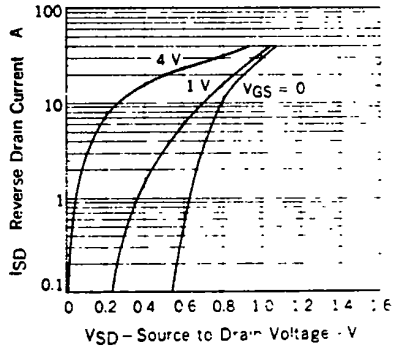
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



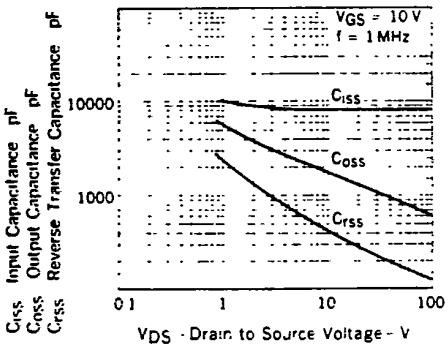
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



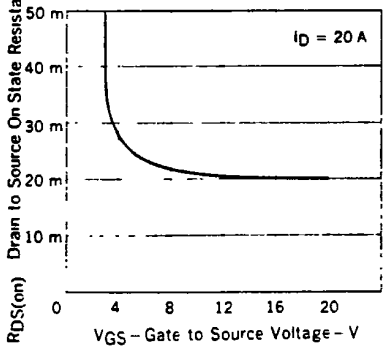
SOURCE TO DRAIN BODY DIODE FORWARD VOLTAGE



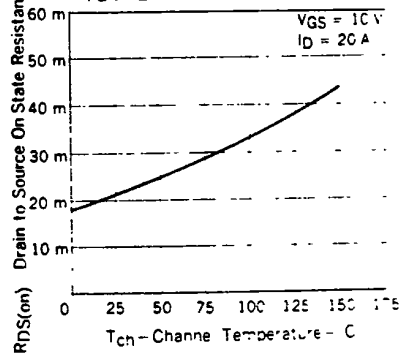
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE

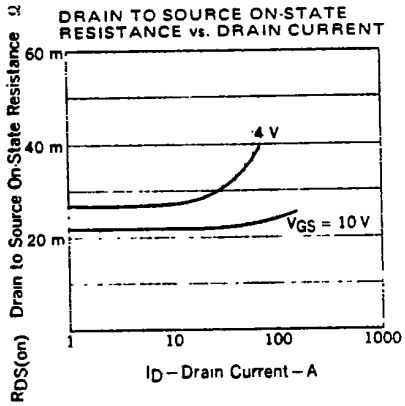


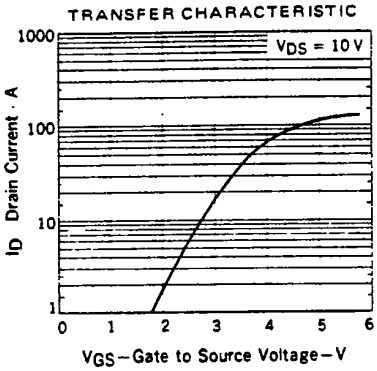
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE

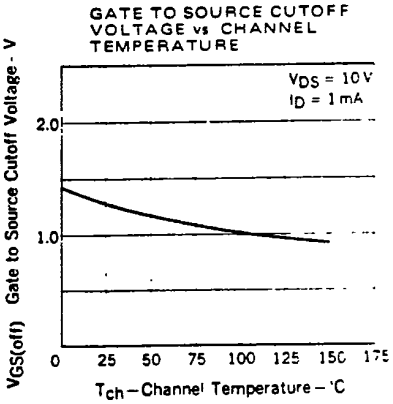


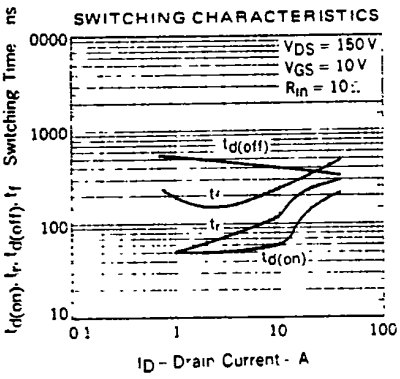
DRAIN TO SOURCE ON-STATE RESISTANCE vs CHANNEL TEMPERATURE

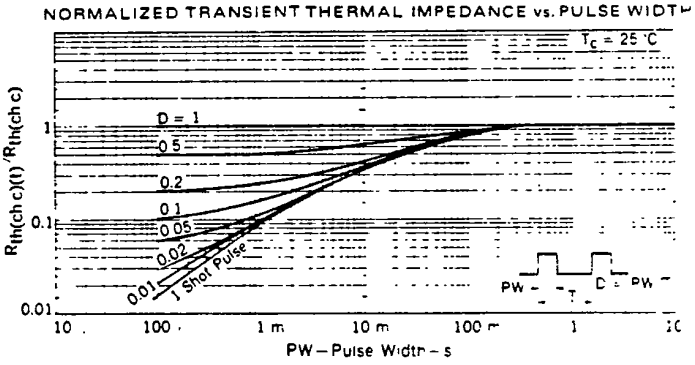
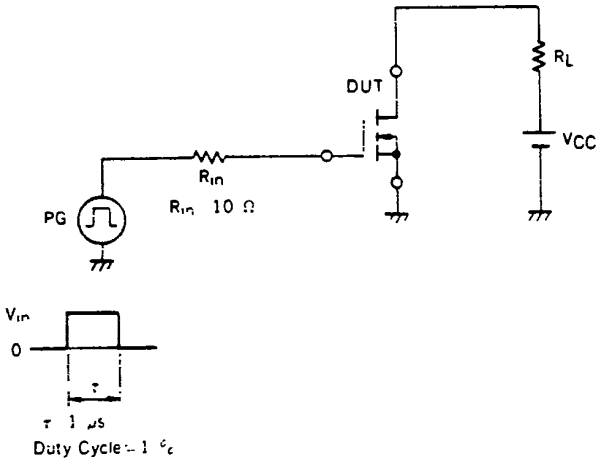
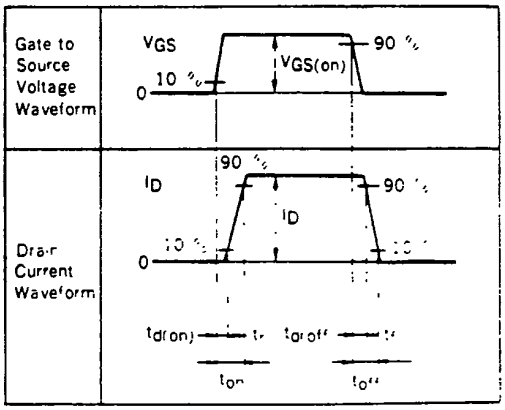












SWITCHING TIME TEST CIRCUIT