MOS FIELD EFFECT POWER TRANSISTORS

2SK738, 2SK738-Z

FAST SWITCHING
N-CHANNEL SILICON POWER MOS FET
INDUSTRIAL USE

FEATURES

- Suitable for switching power supplies, actuater 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 °C)

Drain to Source Voltage	V_{DSS}	30	V
Gate to Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	$I_{D(DC)}$	±2.0	A
Peak Drain Current	$I_{D(pulse)}$*	±8.0	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	°C
Storage Temperature	T_{stg}	–55 to +150	°C

* PW ≦ 300 μs, Duty Cycle ≦ 10 %
** T_C = 25 °C
*** Mounted on ceramic substrate of 2.5 cm² x 0.7 mm

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain Leakage Current	I_{DSS}			10	μA	V_{DS} = 30 V, V_{GS} = 0
Gate to Source Leakage Current	I_{GSS}			±100	nA	V_{GS} = ±20 V, V_{DS} = 0
Gate to Source Cutoff Voltage	$V_{GS(off)}$	1.0		2.5	V	V_{DS} = 10 V, I_D = 1 mA
Forward Transfer Admittance	$\|y_{fs}\|$	1.0			S	V_{DS} = 10 V, I_D = 1 A
Drain to Source On-State Resistance	$R_{DS(on)}$		0.1	0.17	Ω	V_{GS} = 10 V, I_D = 1 A
Drain to Source On-State Resistance	$R_{DS(on)}$		0.15	0.25	Ω	V_{GS} = 4 V, I_D = 0.8 A
Input Capacitance	C_{iss}		550		pF	V_{DS} = 10 V, V_{GS} = 0 f = 1 MHz
Output Capacitance	C_{oss}		300		pF	
Reverse Transfer Capacitance	C_{rss}		150		pF	
Turn-On Delay Time	$t_{d(on)}$		10		ns	I_D = 1 A, V_{CC} = 15 V $V_{GS(on)}$ = 10 V R_L = 15 Ω R_{in} = 10 Ω
Rise Time	t_r		20		ns	
Turn-Off Delay Time	$t_{d(off)}$		80		ns	
Fall Time	t_f		20		ns	

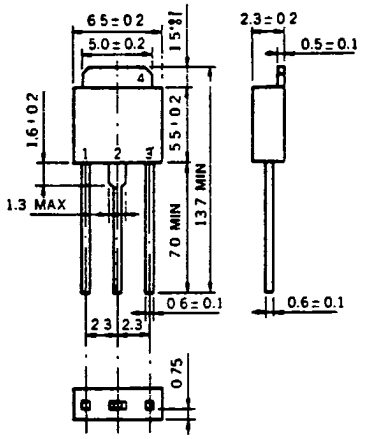
NEC cannot assume any responsibility for any circuits shown or represent that they are free from patent infringement.

© NEC Corporation 1986

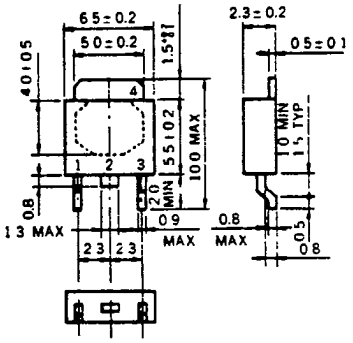
Downloaded from Elcodis.com electronic components distributor

PACKAGE DIMENSIONS (Unit : mm)

2SK738

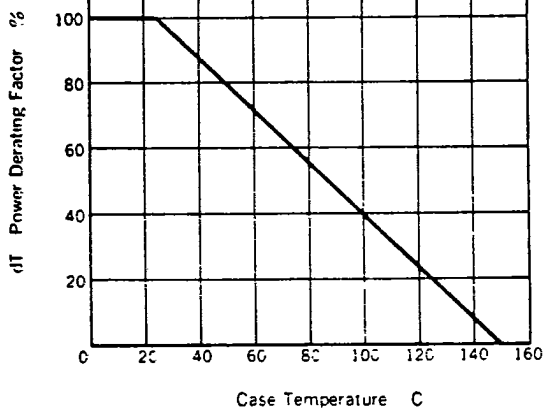


2SK738-Z

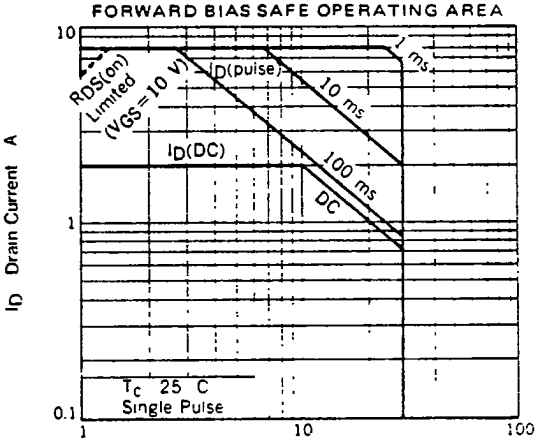


1. Gate
2. Drain
3. Source
4. Drain (Fin)

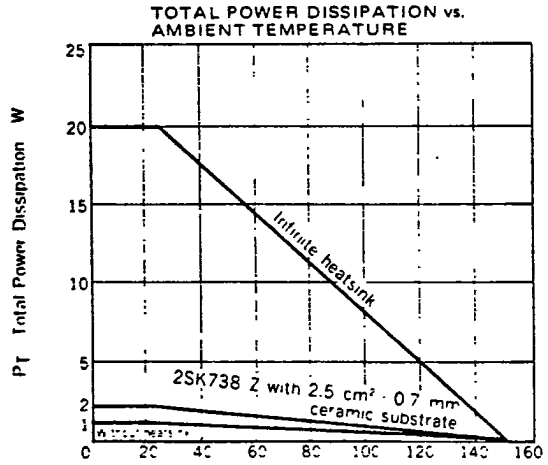
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



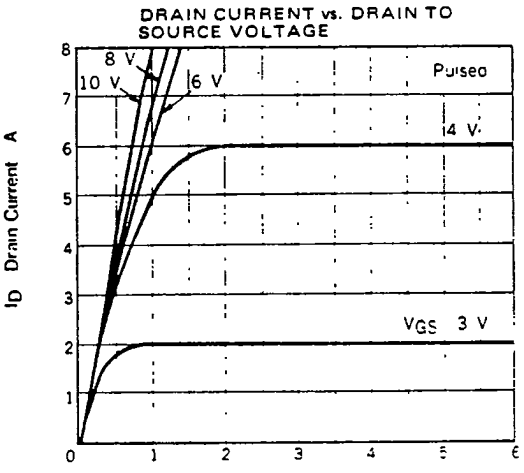
FORWARD BIAS SAFE OPERATING AREA



TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE

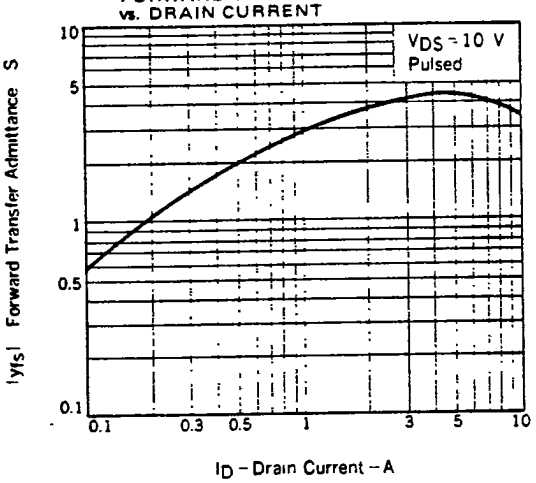


DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE

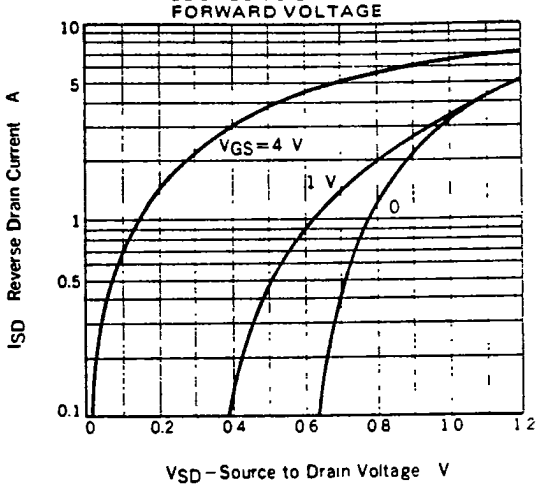


Downloaded from Elcodis.com electronic components distributor

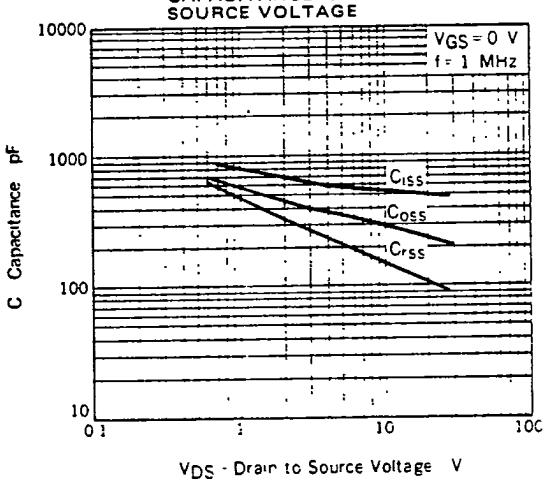
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



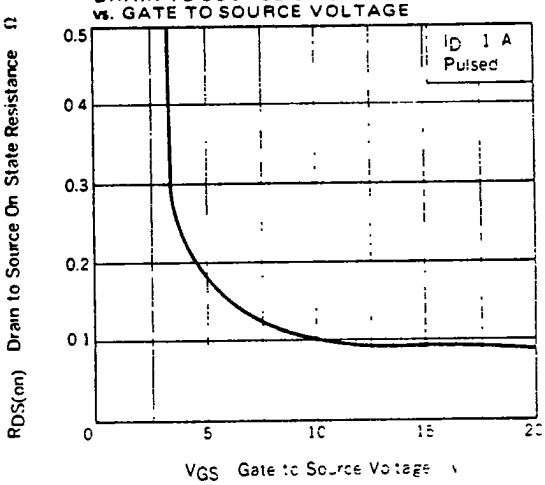
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



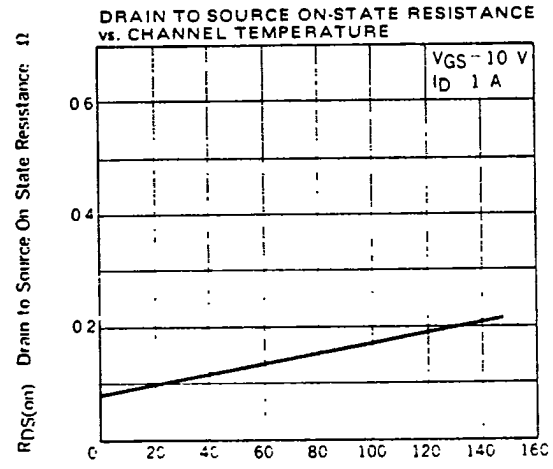
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



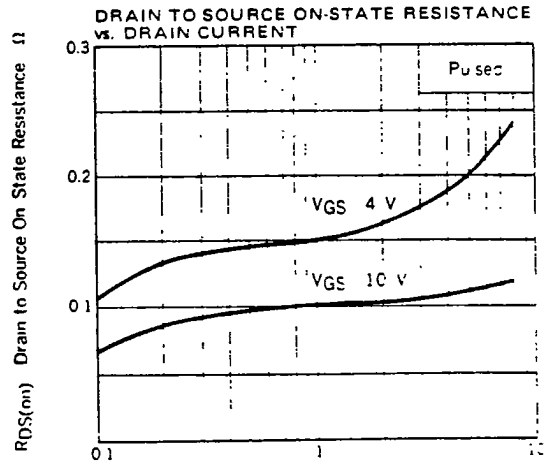
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE

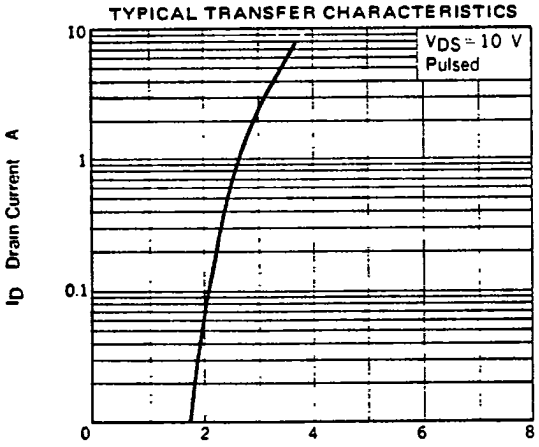


DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT

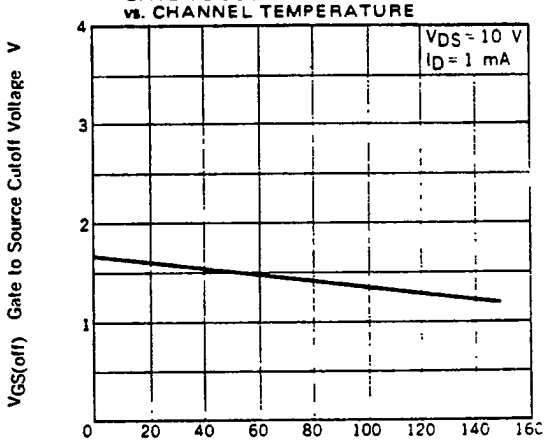


Downloaded from Elcodis.com electronic components distributor

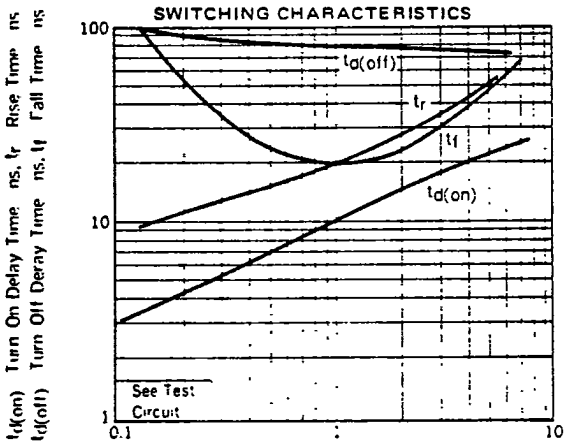
TYPICAL TRANSFER CHARACTERISTICS



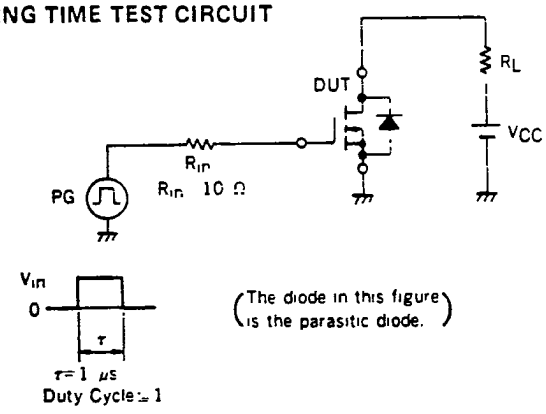
GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE

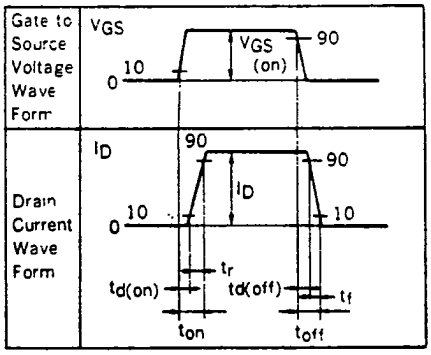


SWITCHING CHARACTERISTICS



SWITCHING TIME TEST CIRCUIT





TC–1816
November 1986M
Printed in Japan

4

Downloaded from Elcodis.com electronic components distributor