



MOS FIELD EFFECT POWER TRANSISTORS

2SK738, 2SK738-Z

FAST SWITCHING N-CHANNEL SILICON POWER MOS FET INDUSTRIAL USE

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}	30	V
Gate to Source Voltage	V_{GS}	± 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	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

* $PW \leq 300 \mu\text{s}$, Duty Cycle $\leq 10\%$

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

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

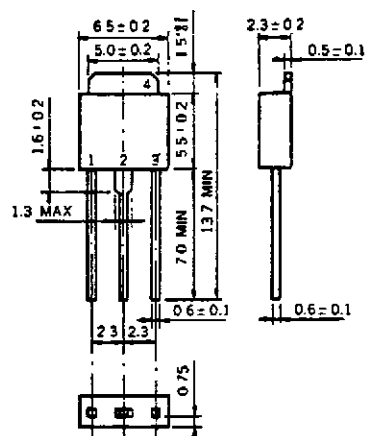
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

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

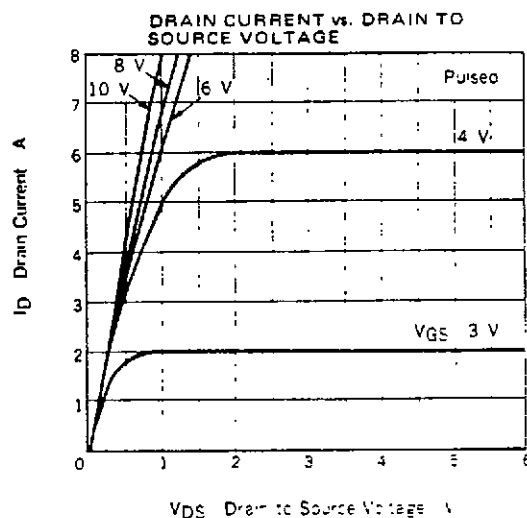
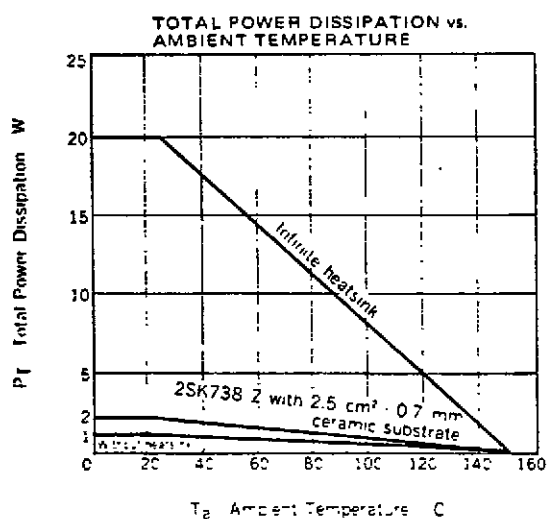
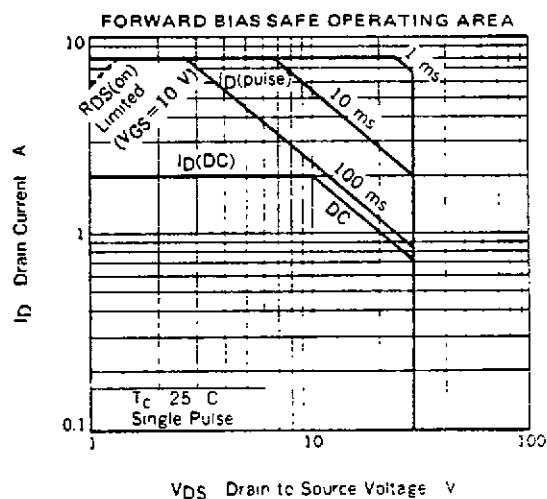
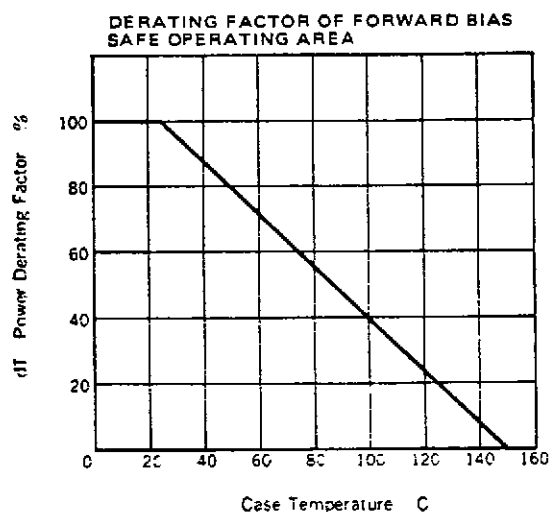
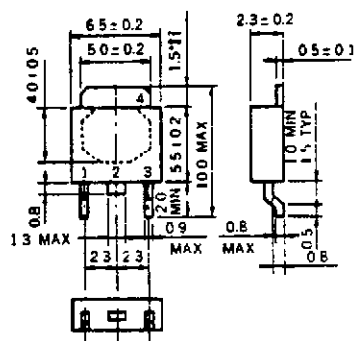
PACKAGE DIMENSIONS (Unit : mm)

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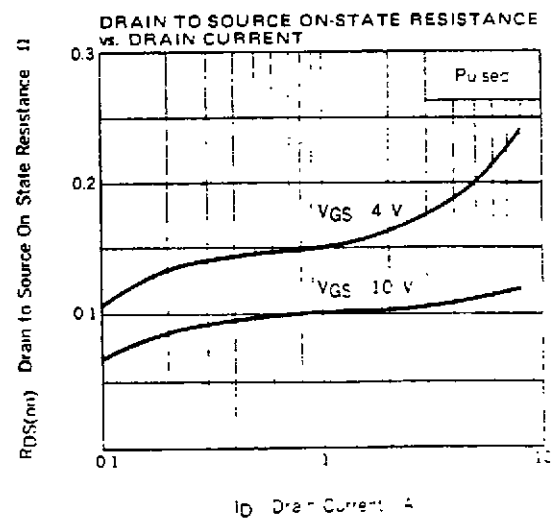
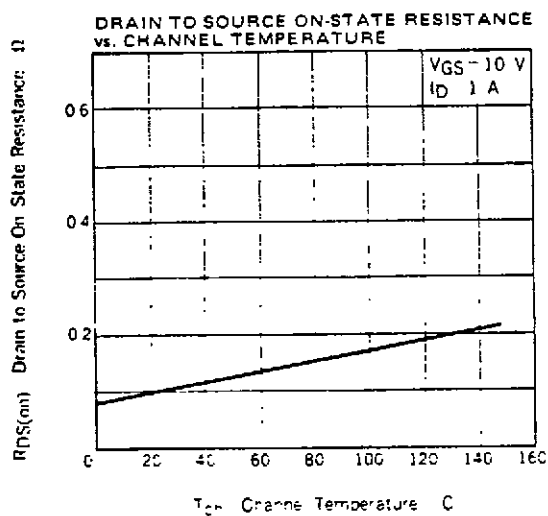
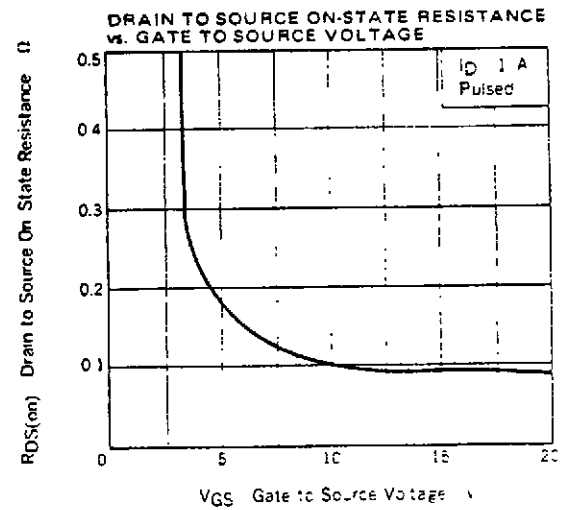
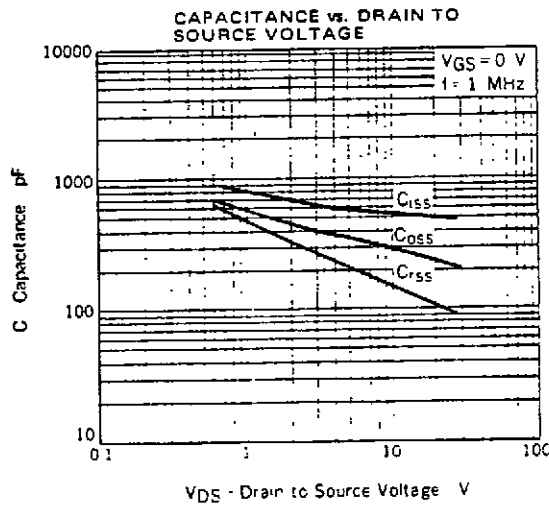
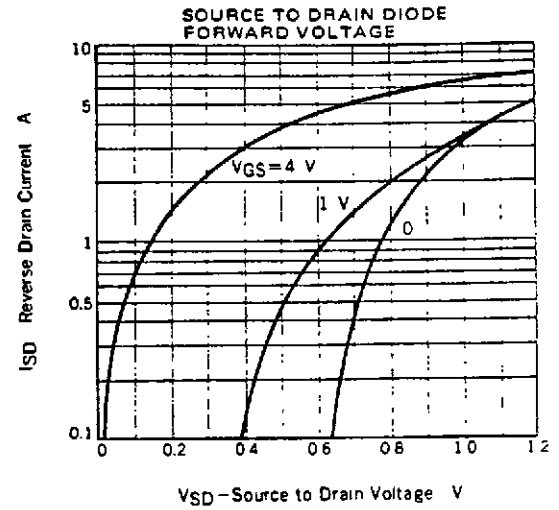
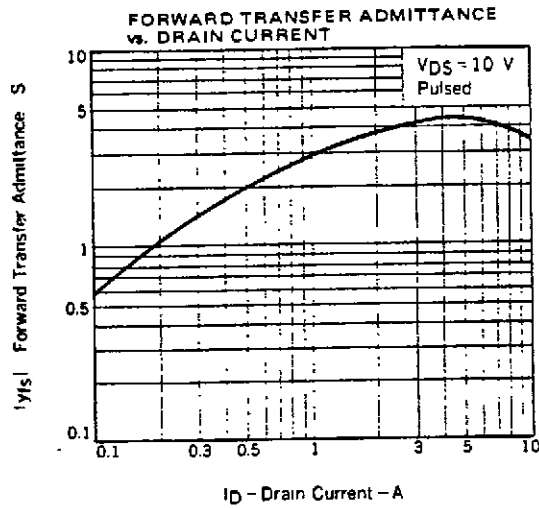
1. Gate
2. Drain
3. Source
4. Drain (Fin)

2SK738-Z



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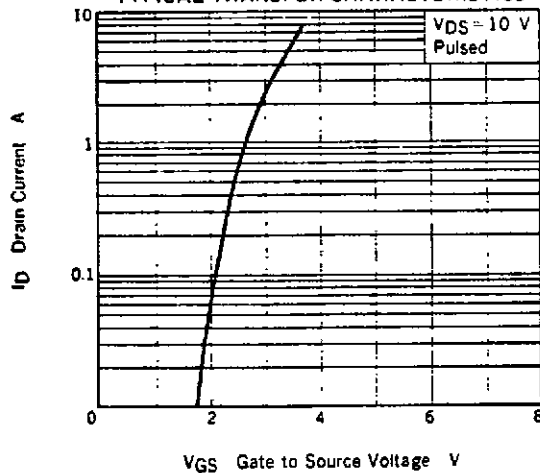
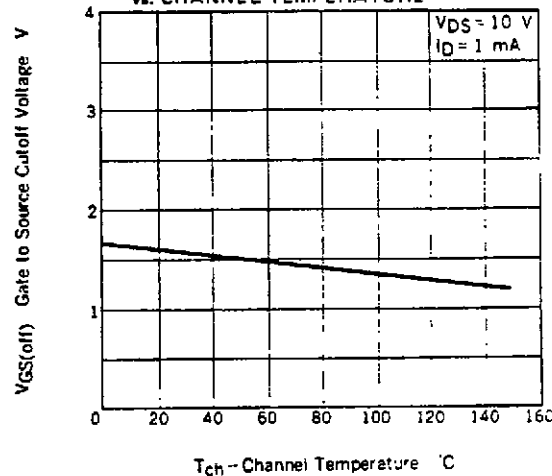
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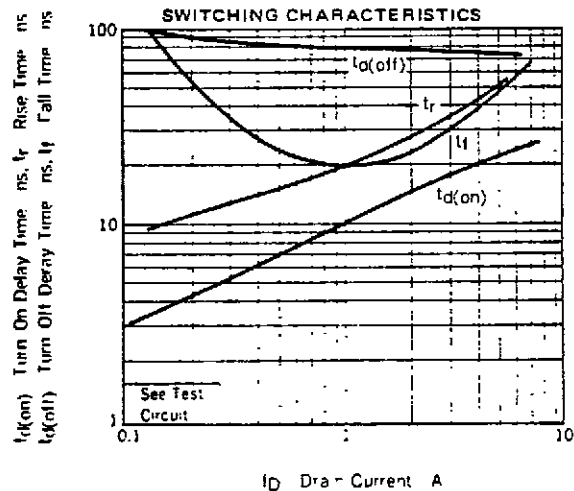
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NEC ELECTRON DEVICE

TYPICAL TRANSFER CHARACTERISTICS

GATE TO SOURCE CUTOFF VOLTAGE
VS. CHANNEL TEMPERATURE

SWITCHING CHARACTERISTICS



SWITCHING TIME TEST CIRCUIT

