

# N-CHANNEL MOS FIELD EFFECT POWER TRANSISTOR

## 2SK591

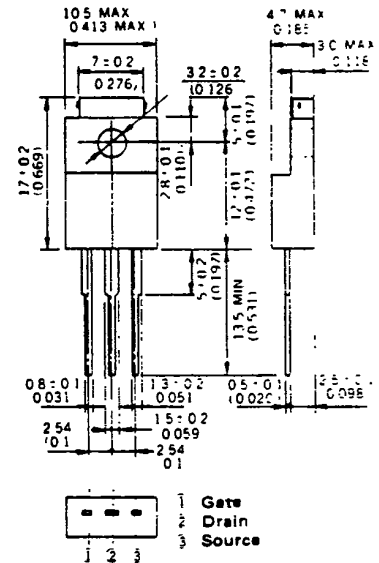
**DESCRIPTION** The 2SK591 is N-Channel MOS Field Effect Power Transistor designed for solenoid, motor and lamp driver.

- FEATURES**
- 4 V Gate Drive — Logic level —
  - Low  $R_{DS(on)}$
  - No Secondary Breakdown

**ABSOLUTE MAXIMUM RATINGS**

Maximum Temperatures	
Storage Temperature	..... -55 to + 150 °C
Channel Temperature	..... 150 °C Maximum
Maximum Power Dissipations	
Total Power Dissipation ( $T_a = 25 °C$ )	... 2.0 W
Total Power Dissipation ( $T_c = 25 °C$ )	... 35 W
Maximum Voltages and Currents ( $T_a = 25 °C$ )	
$V_{DSS}$ Drain to Source Voltage	..... 60 V
$V_{GSS}$ Gate to Source Voltage	..... ±20 V
$I_{D(DC)}$ Drain Current (DC)	..... ±15 A
$I_{D(pulse)}$ Drain Current (pulse)*	..... ±60 A
*PW ≤ 300 μs, Duty Cycle ≤ 10 %	

**PACKAGE DIMENSIONS**  
in millimeters (inches)

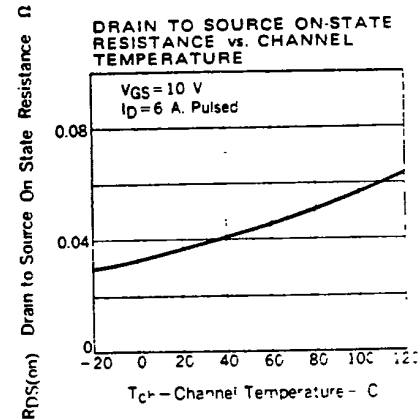
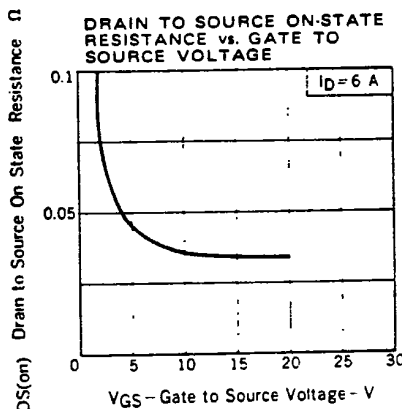
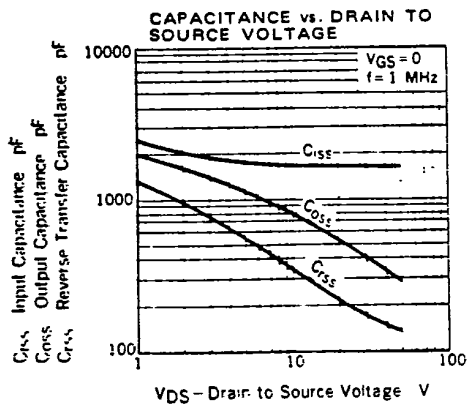
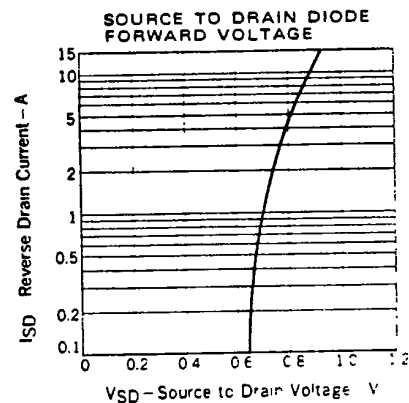
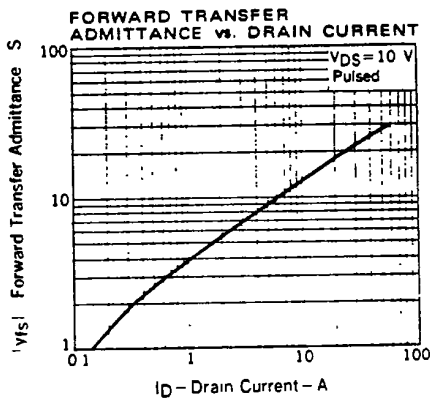
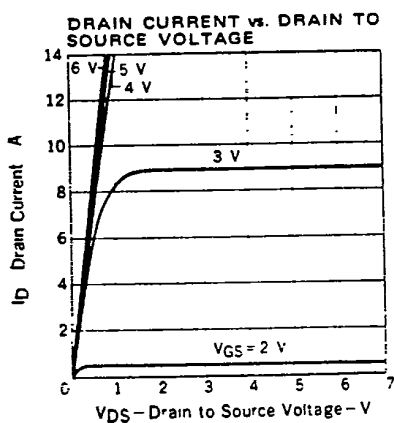
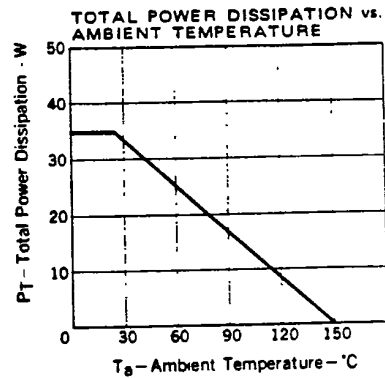
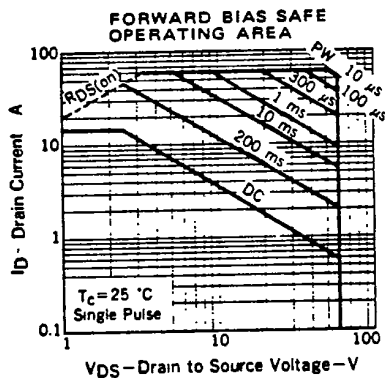
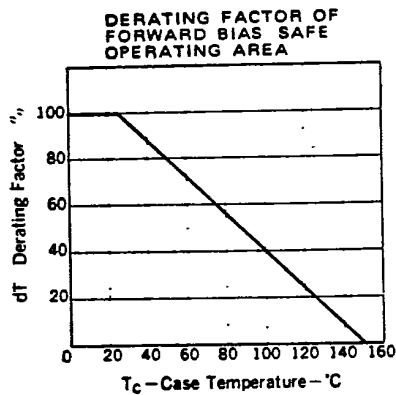


**ELECTRICAL CHARACTERISTICS ( $T_a = 25 °C$ )**

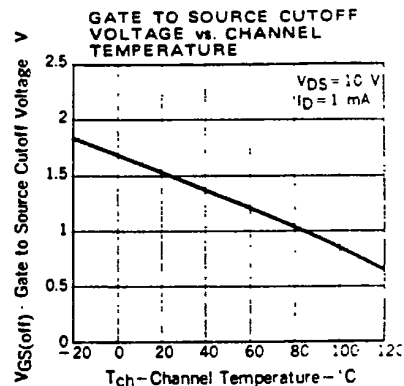
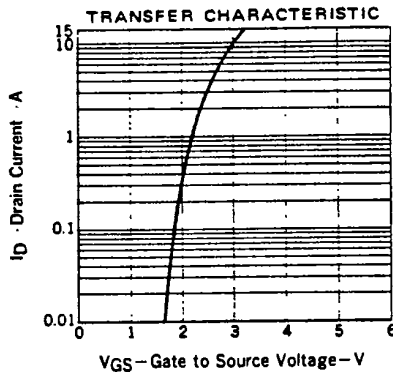
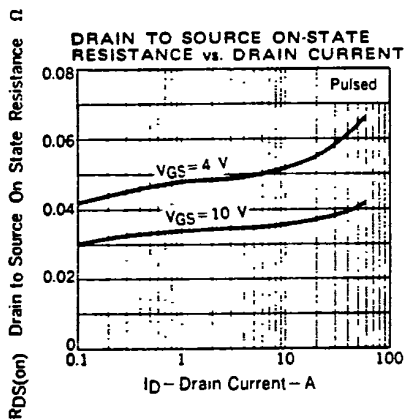
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
$R_{DS(on)}$	Drain to Source On-State Resistance			0.055	Ω	$V_{GS} = 10 V, I_D = 6 A$
$R_{DS(on)}$	Drain to Source On-State Resistance			0.070	Ω	$V_{GS} = 4 V, I_D = 6 A$
$V_{GS(off)}$	Gate to Source Cutoff Voltage	1		2.5	V	$V_{DS} = 10 V, I_D = 1 mA$
$ Y_{fs} $	Forward Transfer Admittance	5			S	$V_{DS} = 10 V, I_D = 6 A$
$I_{DSS}$	Drain Leakage Current			10	μA	$V_{DS} = 60 V, V_{GS} = 0$
$I_{GSS}$	Gate to Source Leakage Current			±100	nA	$V_{GS} = ±20 V, V_{DS} = 0$
$C_{iss}$	Input Capacitance		1800		pF	$V_{DS} = 10V$
$C_{oss}$	Output Capacitance		800		pF	$V_{GS} = 0$
$C_{rss}$	Reverse Transfer Capacitance		350		pF	$f = 1 MHz$
$t_{d(on)}$	Turn On Delay Time		20		ns	$I_D = 6 A, V_{CC} ≈ 30 V$ $R_L = 5 Ω, V_{GS(on)} = 10 V$ $R_{in} = 10 Ω$
$t_r$	Rise Time		85		ns	
$t_{d(off)}$	Turn Off Delay Time		240		ns	
$t_f$	Fall Time		230		ns	

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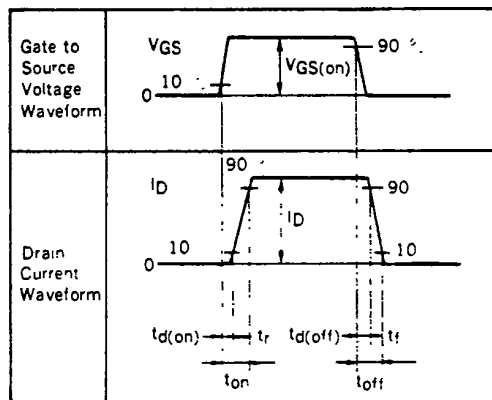
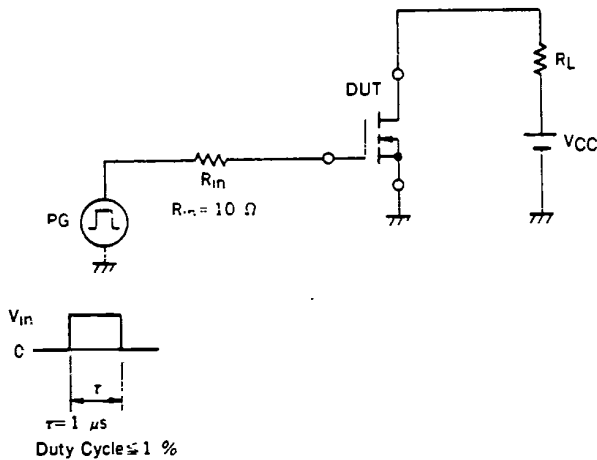
TYPICAL CHARACTERISTICS ( $T_c = 25^\circ\text{C}$ )



XCED1



**SWITCHING TIME TEST CIRCUIT**



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Datasheets for electronics components.