



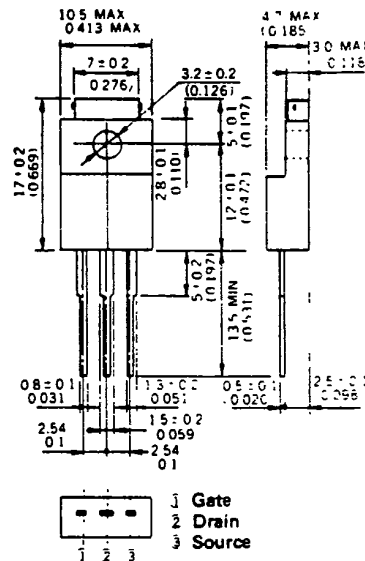
# N-CHANNEL MOS FIELD EFFECT POWER TRANSISTOR

## 2SK659

**DESCRIPTION** The 2SK659 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**

<b>Maximum Temperatures</b>	
Storage Temperature	-55 to +150 °C
Channel Temperature	150 °C Maximum
<b>Maximum Power Dissipations</b>	
Total Power Dissipation ( $T_a = 25 °C$ )	2.0 W
Total Power Dissipation ( $T_c = 25 °C$ )	35 W
<b>Maximum Voltages and Currents (<math>T_a = 25 °C</math>)</b>	
$V_{DS}$ Drain to Source Voltage	60 V
$V_{GS}$ Gate to Source Voltage	±20 V
$I_{D(DC)}$ Drain Current (DC)	±12 A
$I_{D(pulse)}$ Drain Current (pulse)*	±60 A

\*PW ≤ 300 μs, Duty Cycle ≤ 10 %

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

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
$R_{DS(on)}$	Drain to Source On-State Resistance			0.075	Ω	$V_{GS} = 10 V, I_D = 6 A$
$R_{DS(on)}$	Drain to Source On-State Resistance			0.095	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		1300		pF	$V_{DS} = 10 V$
$C_{oss}$	Output Capacitance		600		pF	$V_{GS} = 0$
$C_{rss}$	Reverse Transfer Capacitance		260		pF	$f = 1 MHz$
$t_d(on)$	Turn-On Delay Time		15		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		75		ns	
$t_d(off)$	Turn-Off Delay Time		80		ns	
$t_f$	Fall Time		80		ns	

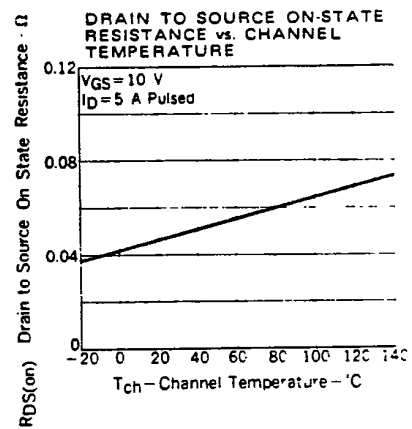
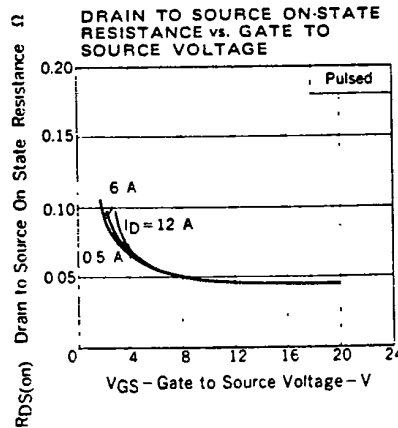
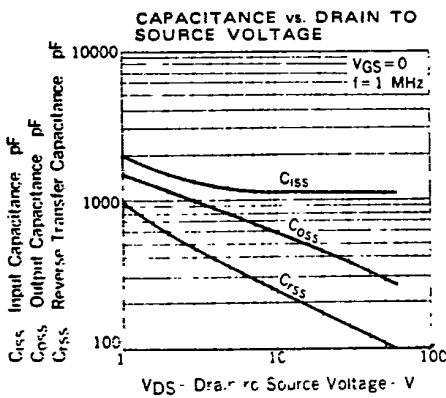
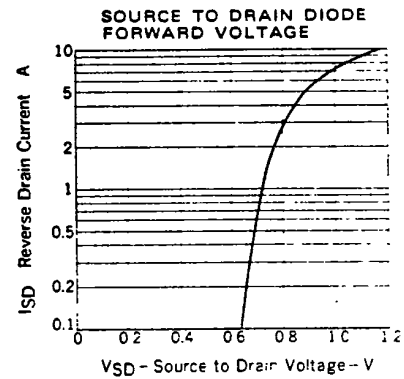
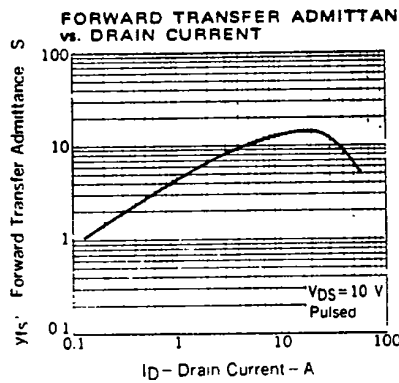
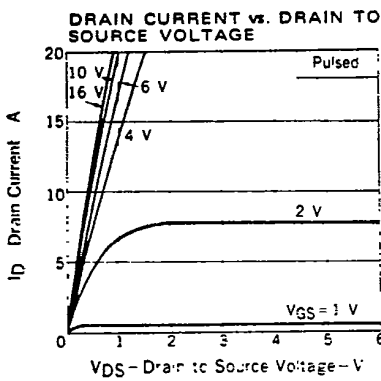
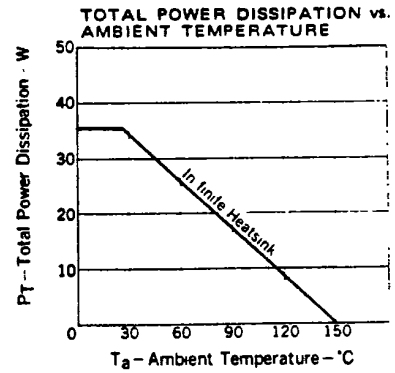
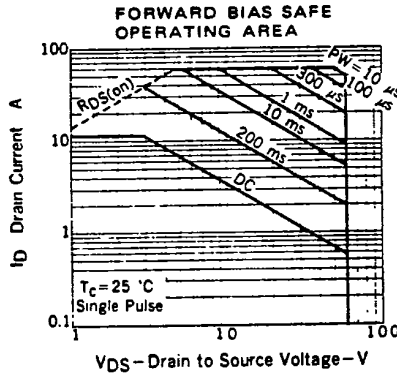
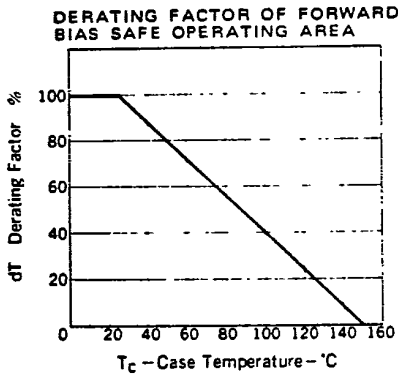
NEC cannot assume any responsibility for any circuits shown or represent that they are free from patent infringement.

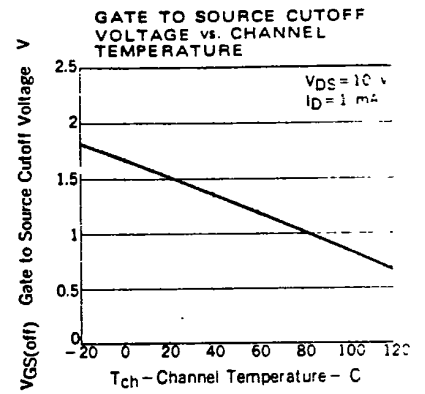
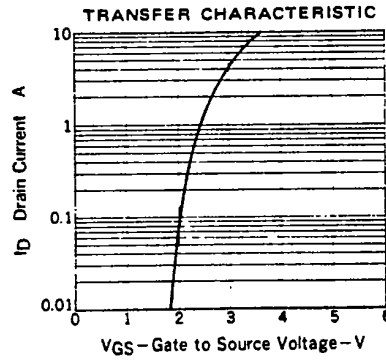
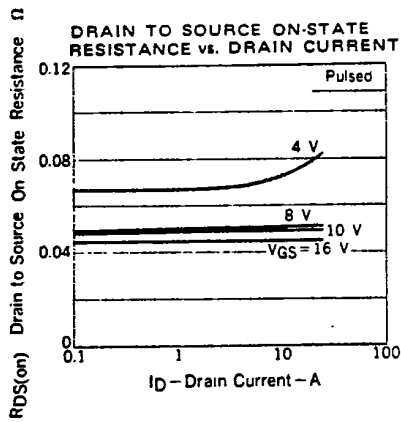
# 2SK659

N E C ELECTRONICS INC

98 DE 6427525 0018860 6

## TYPICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)





**SWITCHING TIME TEST CIRCUIT**

