

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

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

Storage Temperature -55 to $+150^{\circ}\text{C}$

Channel Temperature 150°C Maximum

Maximum Power Dissipations

Total Power Dissipation ($T_a = 25^{\circ}\text{C}$) 2.0 W

Total Power Dissipation ($T_c = 25^{\circ}\text{C}$) 35 W

Maximum Voltages and Currents ($T_a = 25^{\circ}\text{C}$)

V_{DS} Drain to Source Voltage 60 V

V_{GS} Gate to Source Voltage ± 20 V

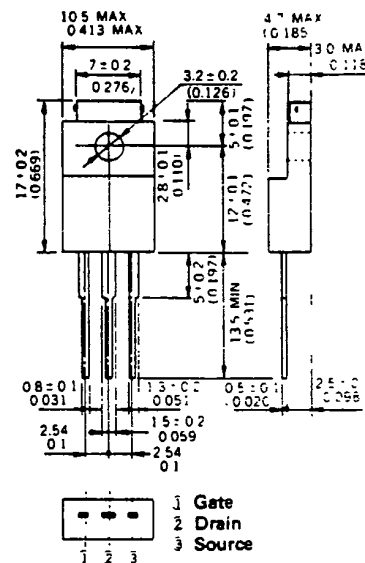
$I_{D(DC)}$ Drain Current (DC) ± 12 A

$I_{D(pulse)}$ Drain Current (pulse)* ± 60 A

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

PACKAGE DIMENSIONS

in millimeters (inches)



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

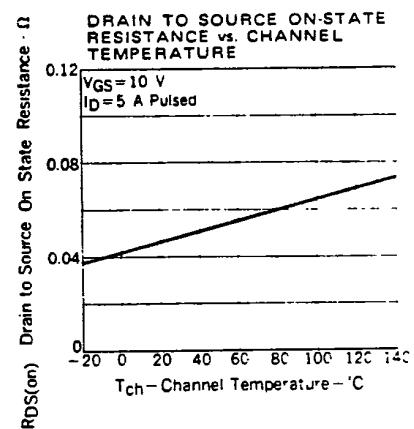
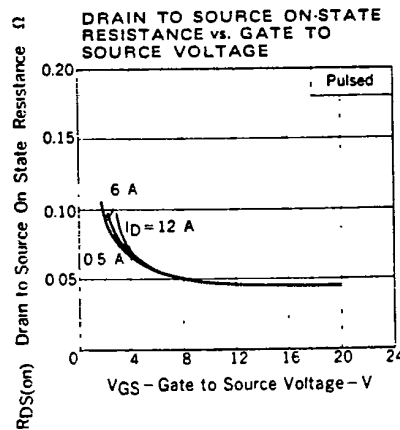
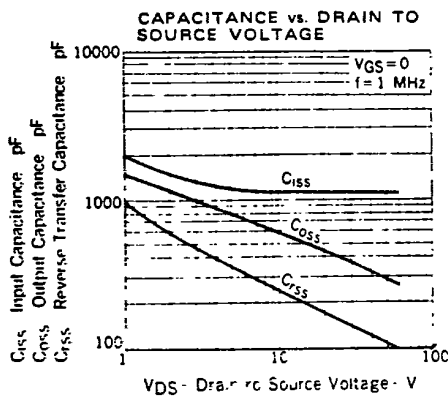
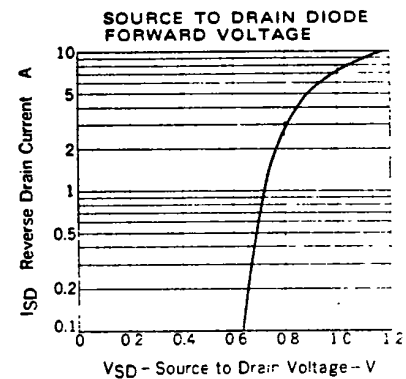
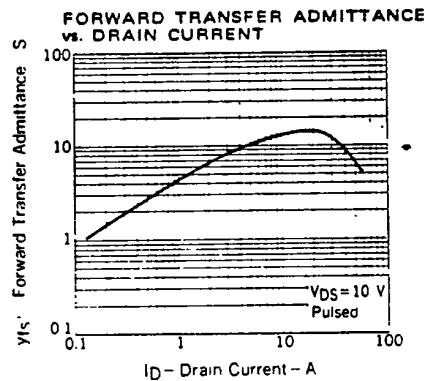
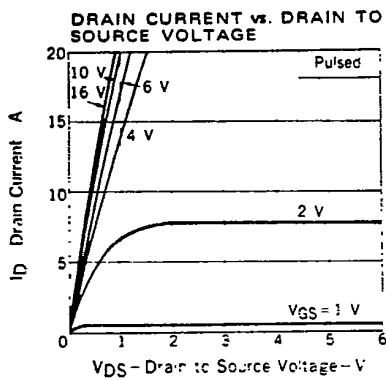
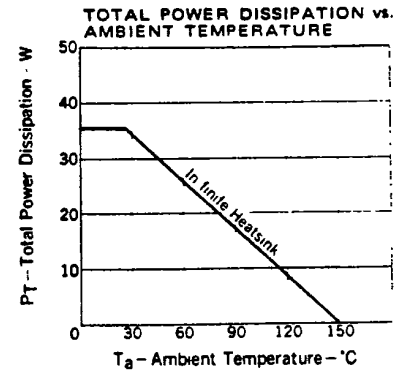
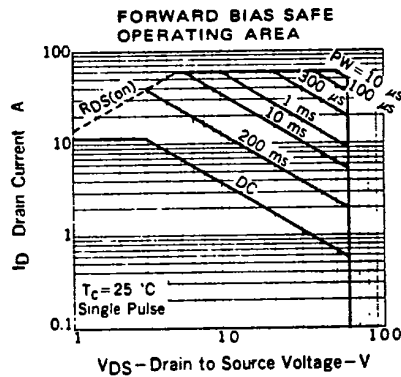
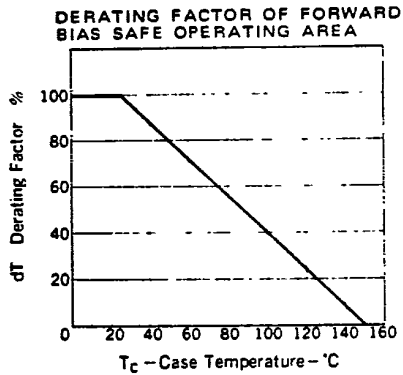
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
$R_{DS(on)}$	Drain to Source On-State Resistance			0.075	Ω	$V_{GS} = 10\text{ V}, I_D = 6\text{ A}$
$R_{DS(on)}$	Drain to Source On-State Resistance			0.095	Ω	$V_{GS} = 4\text{ V}, I_D = 6\text{ A}$
$V_{GS(off)}$	Gate to Source Cutoff Voltage	1		2.5	V	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$
$ y_{fs} $	Forward Transfer Admittance	5			S	$V_{DS} = 10\text{ V}, I_D = 6\text{ A}$
I_{DSS}	Drain Leakage Current			10	μA	$V_{DS} = 60\text{ V}, V_{GS} = 0$
I_{GSS}	Gate to Source Leakage Current			± 100	nA	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0$
C_{iss}	Input Capacitance		1300		pF	$V_{DS} = 10\text{ V}$
C_{oss}	Output Capacitance		600		pF	$V_{GS} = 0$
C_{rss}	Reverse Transfer Capacitance		260		pF	$f = 1\text{ MHz}$
$t_d(on)$	Turn-On Delay Time		15		ns	$I_D = 6\text{ A}, V_{CC} = 30\text{ V}$
t_r	Rise Time		75		ns	$R_L = 5\ \Omega, V_{GS(on)} = 10\text{ V}$
$t_d(off)$	Turn-Off Delay Time		80		ns	$R_{in} = 10\ \Omega$
t_f	Fall Time		80		ns	

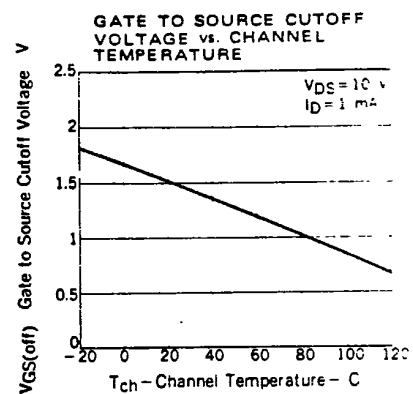
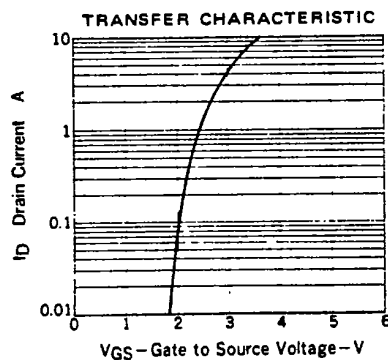
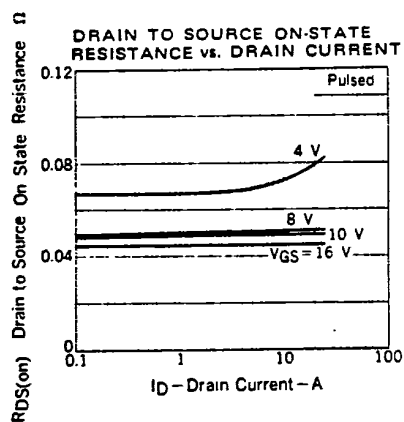
NEC cannot assume any responsibility for any circuits shown or represent that they are free from patent infringement.

2SK659

N E C ELECTRONICS INC

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



SWITCHING TIME TEST CIRCUIT

