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P1 98.2



N-CHANNEL MOS FIELD EFFECT POWER TRANSISTORS

2SK1059, 2SK1059-Z

DESCRIPTION The 2SK1059, 2SK1059-Z are 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 Second Breakdown
 - Designed for Hybrid Integrated Circuits

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures	
Storage Temperature	-55 to +150 °C
Junction Temperature	150 °C Maximum
Maximum Power Dissipations	
Total Power Dissipation*	2.0 W
Total Power Dissipation ($T_c = 25\text{ °C}$)**	20 W
Maximum Voltages and Currents ($T_a = 25\text{ °C}$)	
V_{DSS} Drain to Source Voltage	60 V
V_{GSS} Gate to Source Voltage	±20 V
$I_{D(DC)}$ Drain Current (DC)	±5 A
$I_{D(pulse)}$ Drain Current (pulse)***	±20 A

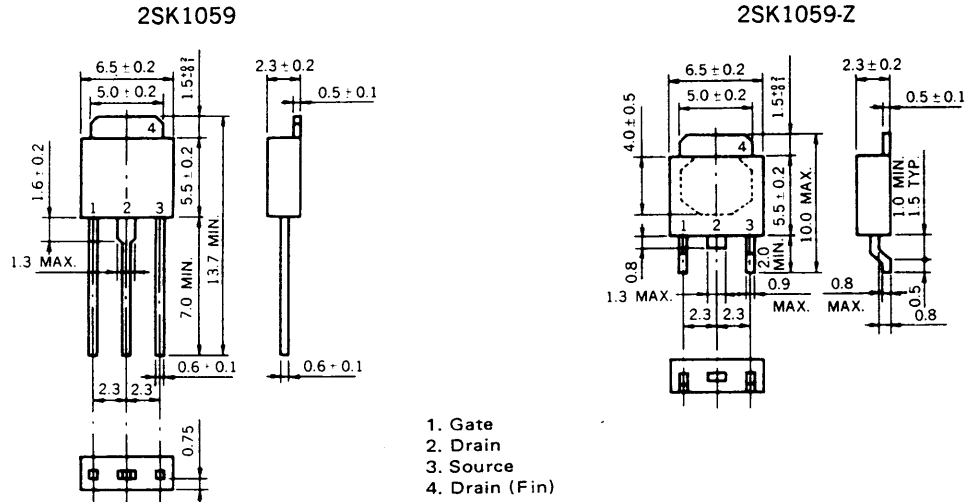
* Mounted on ceramic substrate of 7.5 cm² x 0.7 mm
 ** $T_c = 25\text{ °C}$
 *** $PW \leq 10\ \mu s$, Duty Cycle $\leq 1\%$

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

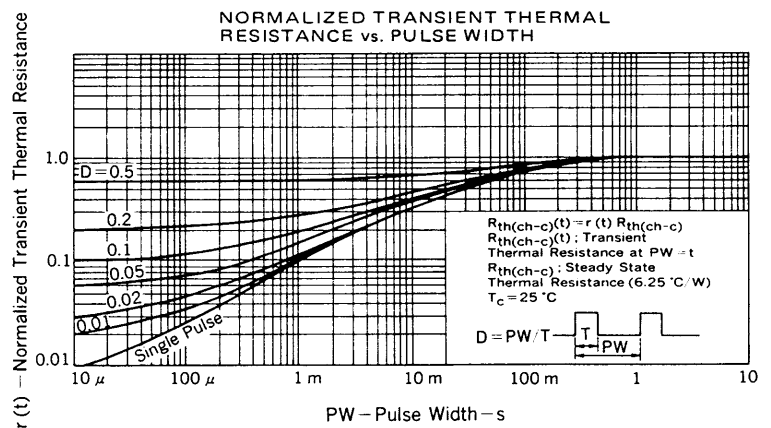
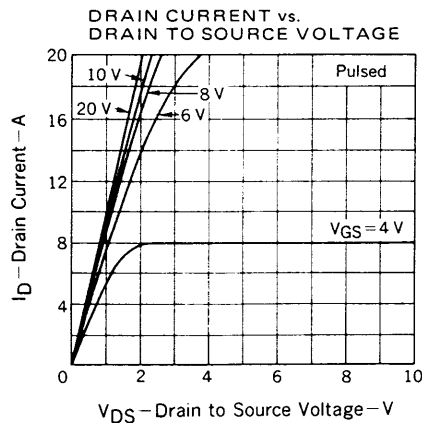
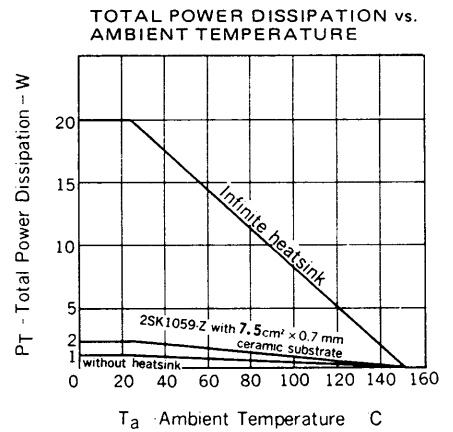
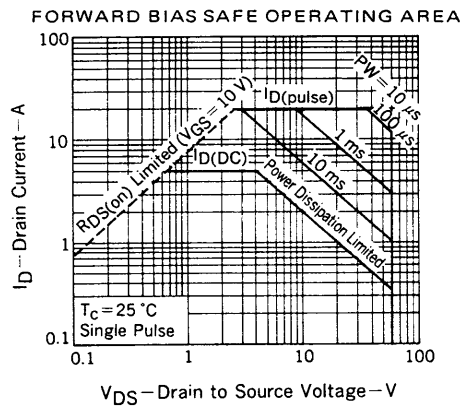
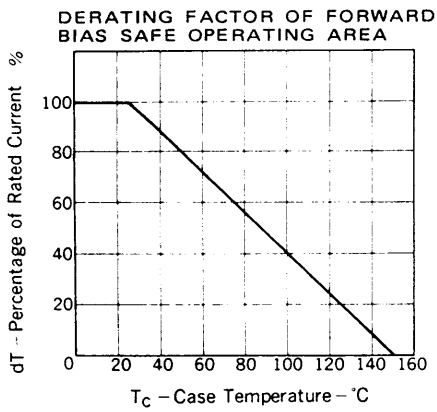
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
$R_{DS(on)}$	Drain to Source On-State Resistance		0.1	0.135	Ω	$V_{GS} = 10\text{ V}, I_D = 3\text{ A}$
$R_{DS(on)}$	Drain to Source On-State Resistance		0.15	0.22	Ω	$V_{GS} = 4\text{ V}, I_D = 3\text{ A}$
$V_{GS(off)}$	Gate to Source Cutoff Voltage	1.0		2.5	V	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$
$ y_{fs} $	Forward Transfer Admittance	4.0			S	$V_{DS} = 10\text{ V}, I_D = 3\text{ A}$
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		900		pF	$V_{DS} = 10\text{ V}$ $V_{GS} = 0$ $f = 1\text{ MHz}$
C_{oss}	Output Capacitance		350		pF	
C_{rss}	Reverse Transfer Capacitance		100		pF	
$t_{d(on)}$	Turn-On Delay Time		10		ns	$I_D = 3\text{ A}, V_{DD} = 10\text{ V}$ $R_L = 17\ \Omega$ $R_{in} = 10\ \Omega$
t_r	Rise Time		40		ns	
$t_{d(off)}$	Turn-Off Delay Time		110		ns	
t_f	Fall Time		30		ns	

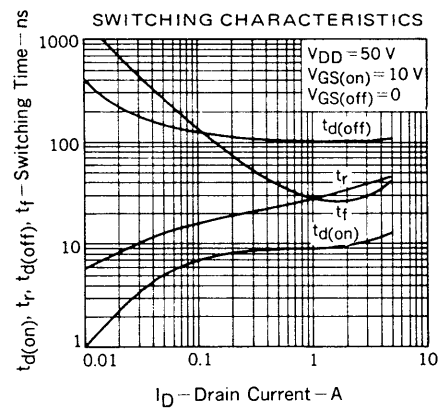
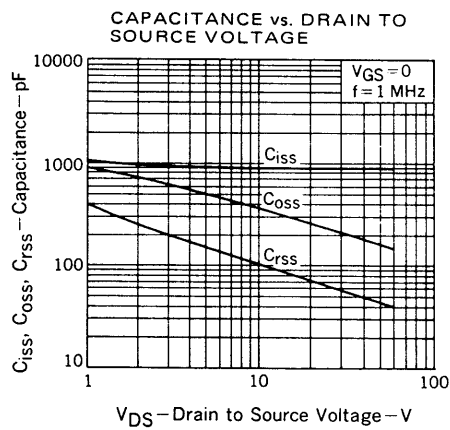
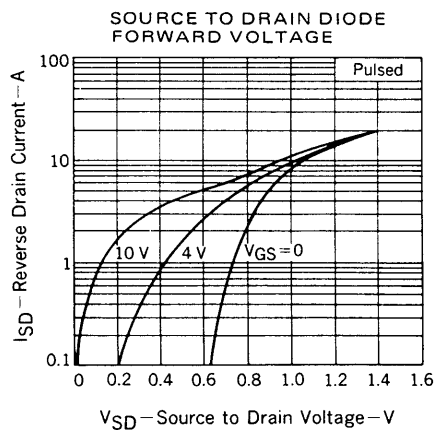
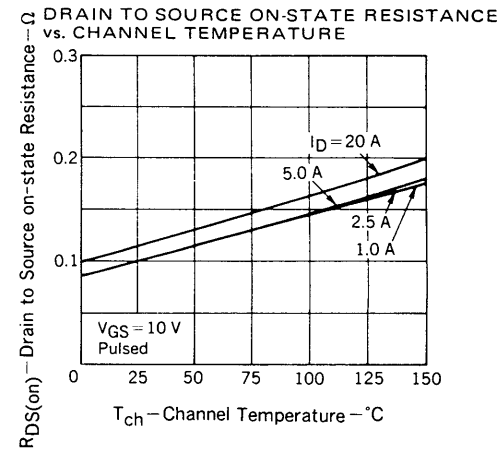
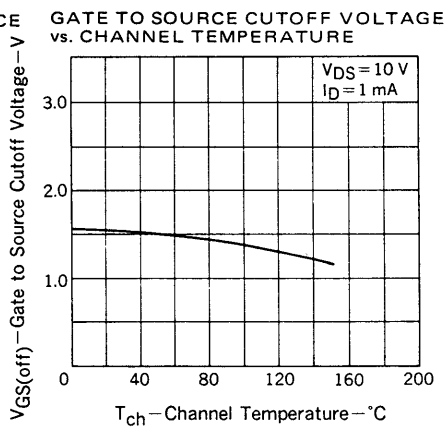
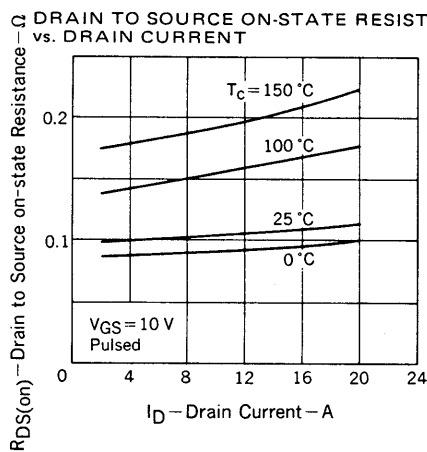
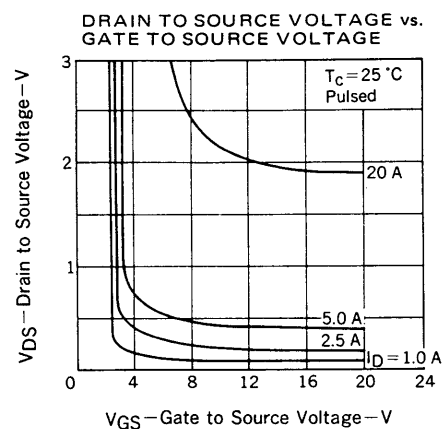
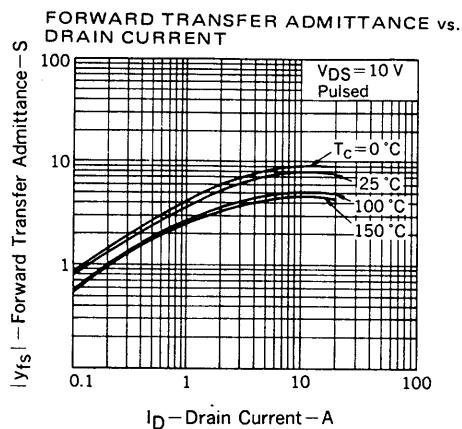
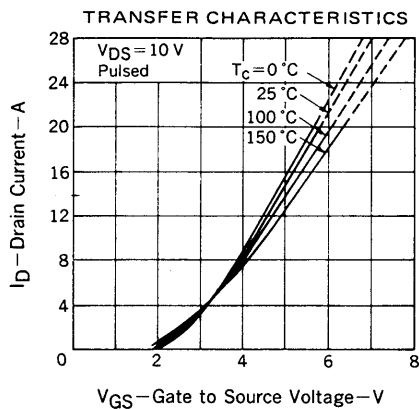
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PACKAGE DIMENSIONS (Unit: mm)

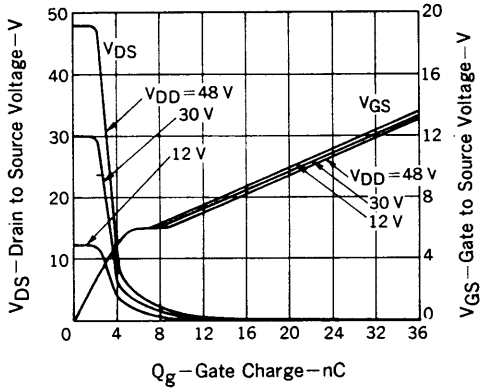


TYPICAL CHARACTERISTICS (T_a = 25 °C)

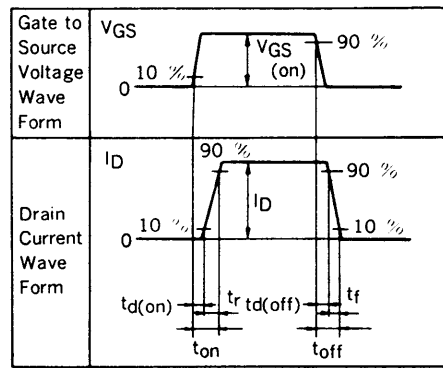
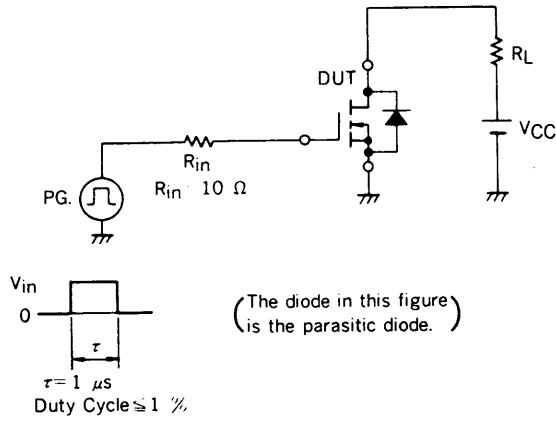




DYNAMIC INPUT/OUTPUT CHARACTERISTICS



SWITCHING TIME TEST CIRCUIT



GATE CHARGE TEST CIRCUIT

