

N-CHANNEL MOS FET FOR SWITCHING

DESCRIPTION

The 2SK1658 is an N-channel vertical type MOS FET which can be driven by 2.5 V power supply.

As the MOS FET is low Gate Leakage Current, it is suitable for appliances including Filter Circuit.

FEATURES

- Directly driven by ICs having a 3 V power supply.
- Has low Gate Leakage Current

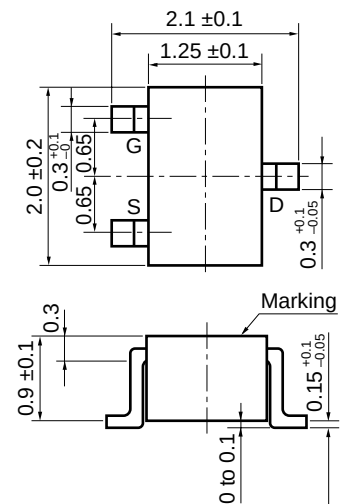
$$I_{GSS} = \pm 5 \text{ nA MAX. } (V_{GS} = \pm 3.0 \text{ V})$$

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

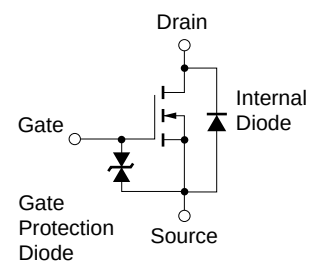
Drain to Source Voltage ($V_{GS} = 0 \text{ V}$)	V_{DSS}	30	V
Gate to Source Voltage ($V_{DS} = 0 \text{ V}$)	V_{GSS}	± 7	V
Drain Current (DC) ($T_C = 25^\circ\text{C}$)	$I_{D(DC)}$	± 100	mA
Drain Current (pulse) ^{Note}	$I_{D(pulse)}$	± 200	mA
Total Power Dissipation ($T_A = 25^\circ\text{C}$)	P_T	150	mW
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Operating Temperature	T_{opt}	-55 to $+80$	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to $+150$	$^\circ\text{C}$

Note. $PW \leq 10 \text{ ms}$, Duty Cycle $\leq 50\%$

PACKAGE DRAWING (Unit : mm)



EQUIVALENT CIRCUIT



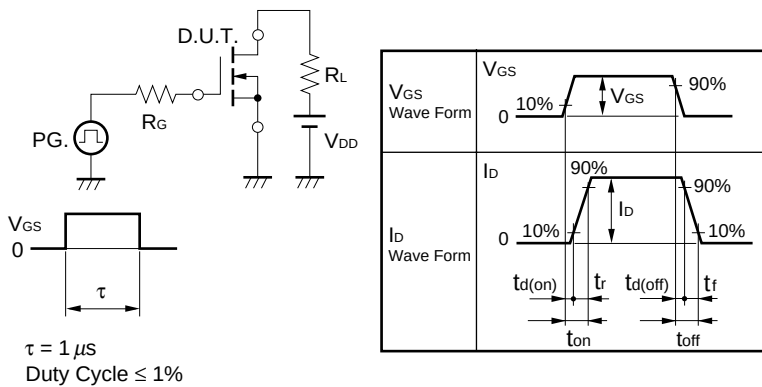
Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device is actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

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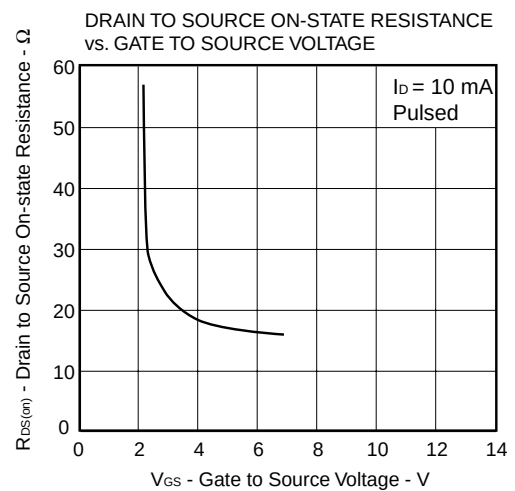
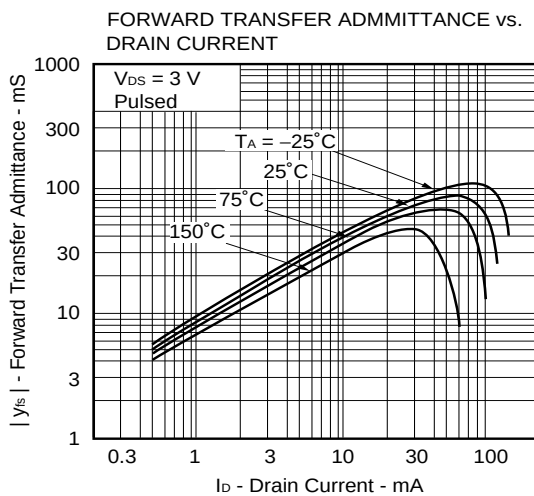
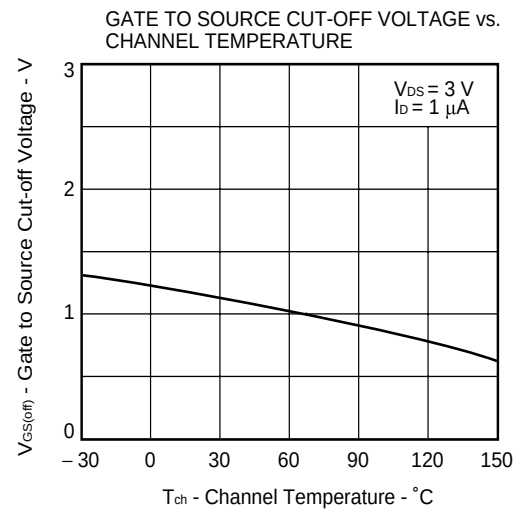
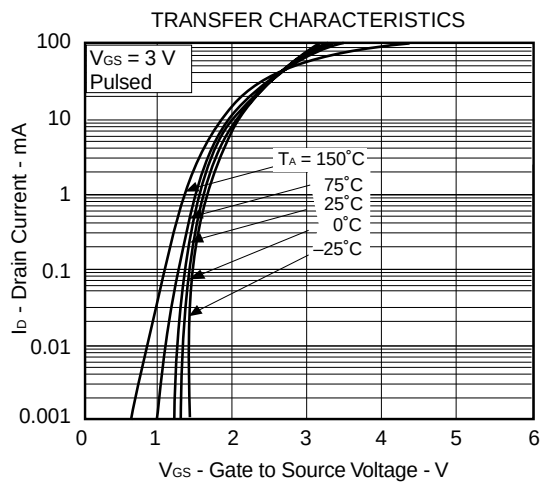
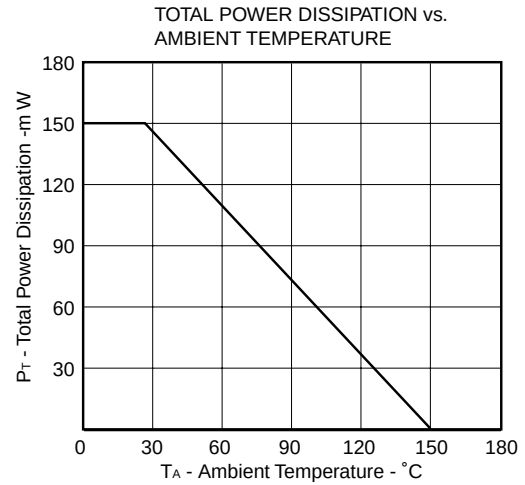
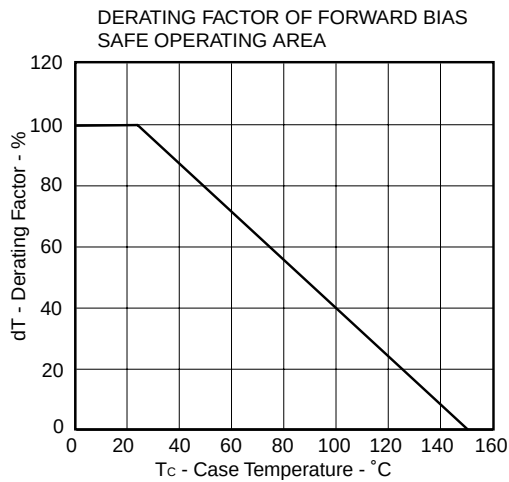
★ ELECTRICAL CHARACTERISTICS (T_A = 25°C)

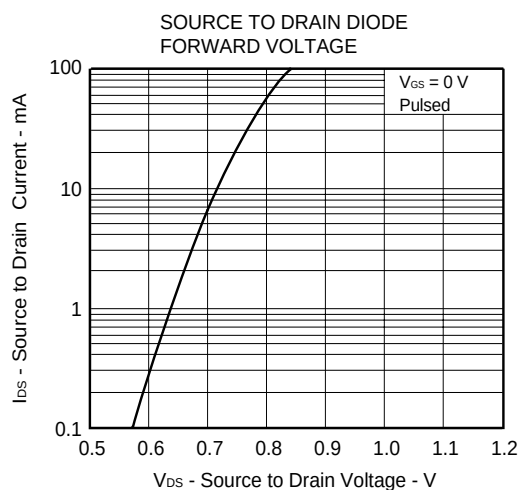
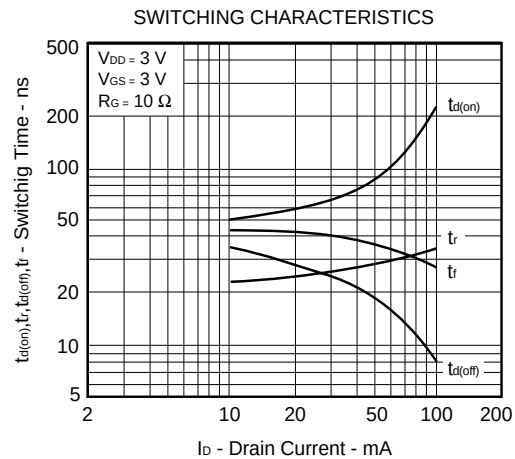
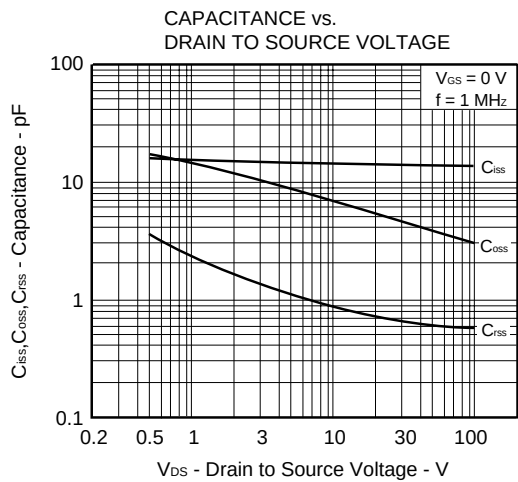
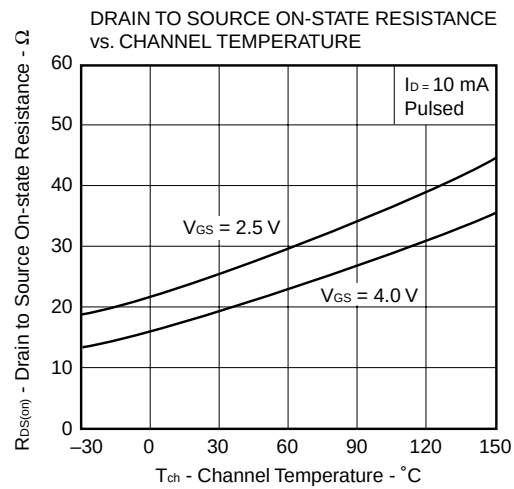
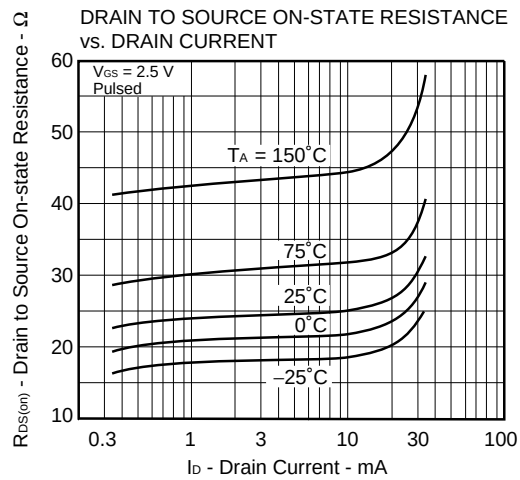
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V			10	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±3.0 V, V _{DS} = 0 V			±5.0	nA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = 3.0 V, I _D = 1.0 μA	0.9	1.2	1.5	V
Forward Transfer Admittance	y _{fs}	V _{DS} = 3.0 V, I _D = 10 mA	20	40		mS
Drain to Source On-state Resistance	R _{DS(on)1}	V _{GS} = 2.5 V, I _D = 10 mA		25	45	Ω
	R _{DS(on)2}	V _{GS} = 4.0 V, I _D = 10 mA		18	25	Ω
Input Capacitance	C _{iss}	V _{DS} = 3.0 V		15		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		10		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		1.5		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = 3.0 V, I _D = 10 mA		50		ns
Rise Time	t _r	V _G = 3.0 V		23		ns
Turn-off Delay Time	t _{d(off)}	R _G = 10 Ω		34		ns
Fall Time	t _f	R _L = 300 Ω		43		ns

TEST CIRCUIT SWITCHING TIME



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





RECOMMENDED SOLDERING CONDITIONS

Recommended solder conditions for this product are described below.

For details on recommended soldering conditions, refer to Information Document “**Semiconductor Device Mounting Technology Manual**” (C10535E).

For soldering methods and conditions other than those recommended, consult NEC.

Surface Mount Type

2SK1658

Soldering Method	Soldering Conditions	Symbol of Recommended Conditions
Infrared reflow	Package peak temperature: 235°C, Time: 30 seconds MAX. (210°C MIN.), Number of times: 3 MAX.	IR35-00-3
VPS	Package peak temperature: 215°C, Time: 40 seconds MAX. (200°C MIN.), Number of times: 3 MAX.	VP15-00-3
Wave soldering	Soldering bath temperature: 260°C MAX., Time: 10 seconds MAX., Number of times: 1, Preheating temperature: 120°C MAX. (package surface temperature)	WS60-00-1

Caution Do not use two or more soldering methods in combination.

[MEMO]

[MEMO]

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