

# MOS FIELD EFFECT TRANSISTOR 2SK3107

## N-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR HIGH SPEED SWITCHING

### DESCRIPTION

The 2SK3107 is a switching device which can be driven directly by a 2.5 V power source.

The 2SK3107 has excellent switching characteristics, and is suitable for use as a high-speed switching device in digital circuits.

### FEATURES

- Can be driven by a 2.5 V power source
- Low gate cut-off voltage

### ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK3107	SC-75 (USM)

Marking: D1

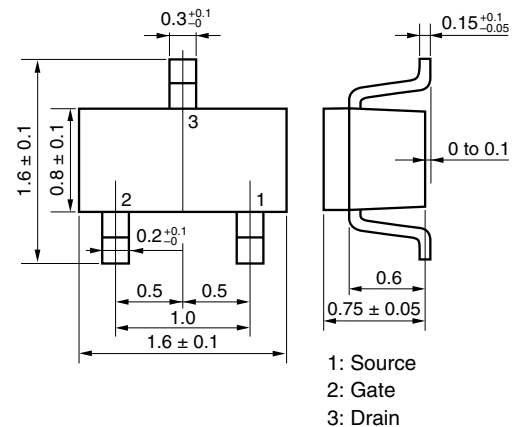
### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)

Drain to Source Voltage	V <sub>DSS</sub>	30	V
Gate to Source Voltage	V <sub>GSS</sub>	±20	V
Drain Current (DC)	I <sub>D(DC)</sub>	±0.1	A
Drain Current (pulse) <sup>Note1</sup>	I <sub>D(pulse)</sub>	±0.4	A
Total Power Dissipation <sup>Note2</sup>	P <sub>T</sub>	200	mW
Channel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

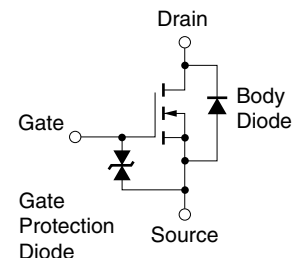
- Notes**
1. PW ≤ 10 μs, Duty Cycle ≤ 1%
  2. Mounted on ceramic substrate of 3.0 cm<sup>2</sup> x 0.64 mm

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

### ★ PACKAGE DRAWING (Unit: mm)



### EQUIVALENT CIRCUIT



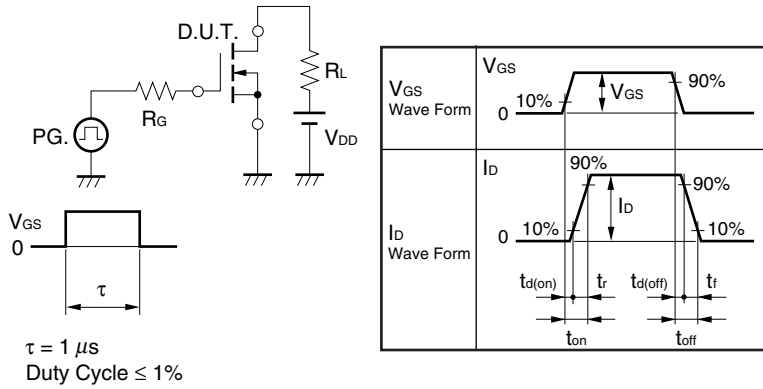
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**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

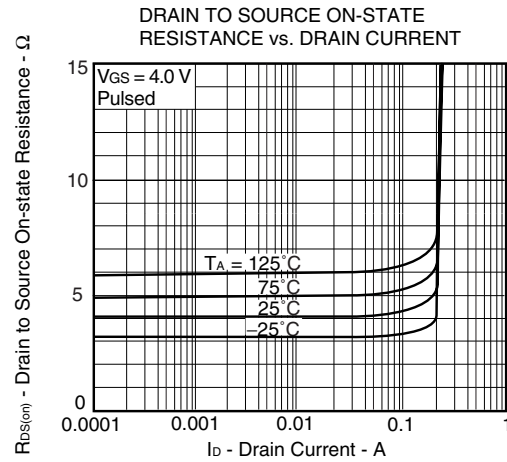
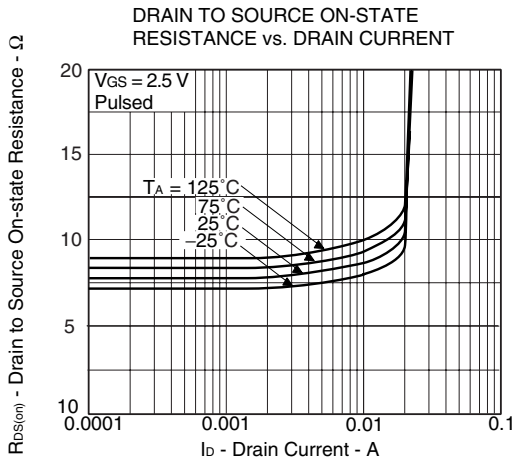
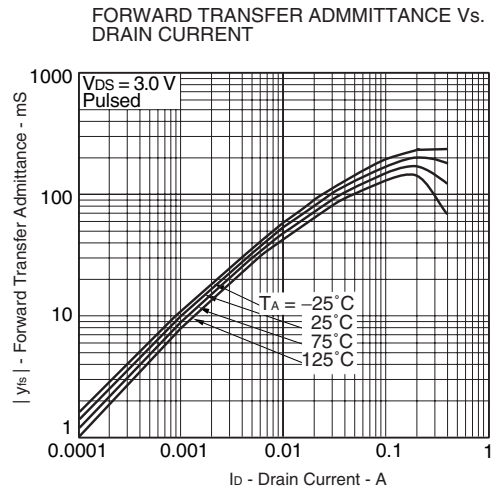
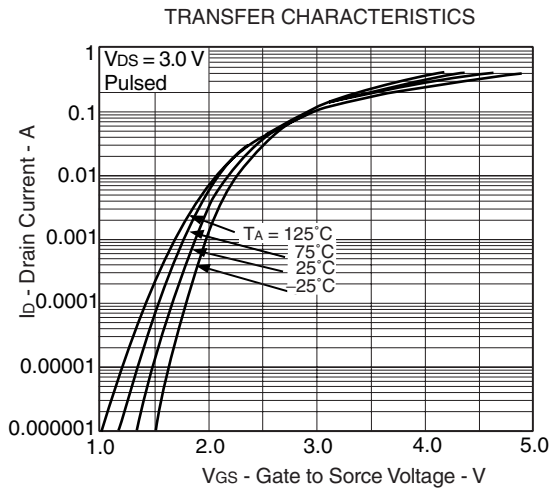
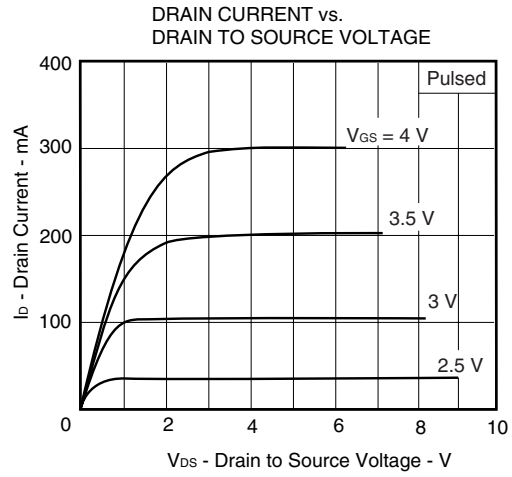
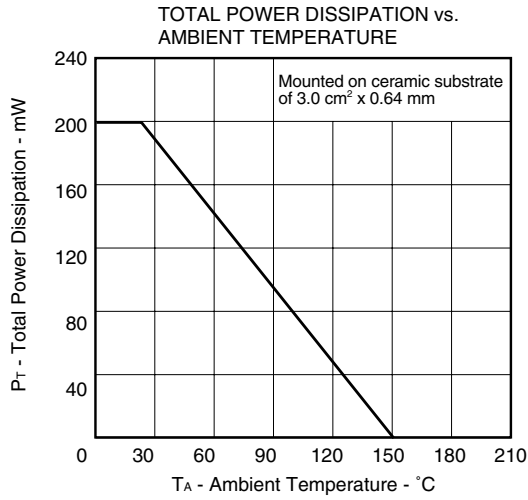
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V			1.0	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> = 0 V			±10	μA
Gate Cut-off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 3.0 V, I <sub>D</sub> = 10 μA	1.0	1.4	1.8	V
Forward Transfer Admittance <sup>Note</sup>	y <sub>fs</sub>	V <sub>DS</sub> = 3.0 V, I <sub>D</sub> = 10 mA	20			mS
Drain to Source On-state Resistance <sup>Note</sup>	R <sub>DS(on)1</sub>	V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 1.0 mA		8.0	15	Ω
	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 10 mA		4.0	8.0	Ω
	R <sub>DS(on)3</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 10 mA		3.0	5.0	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 3.0 V		9.0		pF
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> = 0 V		12		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	f = 1 MHz		2.1		pF
Turn-on Delay Time	T <sub>d(on)</sub>	V <sub>DD</sub> = 3.0 V		40		ns
Rise Time	t <sub>r</sub>	I <sub>D</sub> = 10 mA		55		ns
Turn-off Delay Time	t <sub>d(off)</sub>	V <sub>GS</sub> = 4.0 V		68		ns
Fall Time	t <sub>f</sub>	R <sub>G</sub> = 10 Ω, R <sub>L</sub> = 300 Ω		64		ns

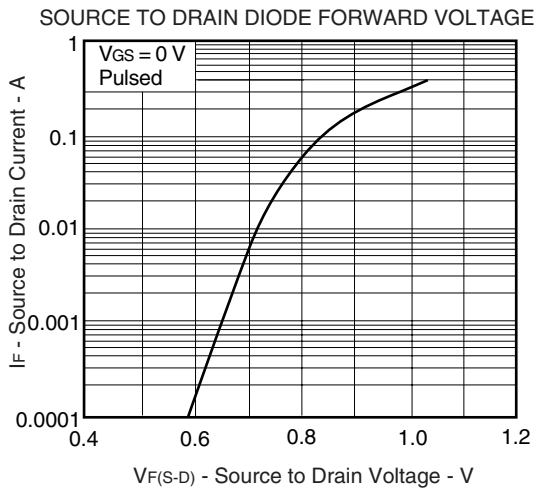
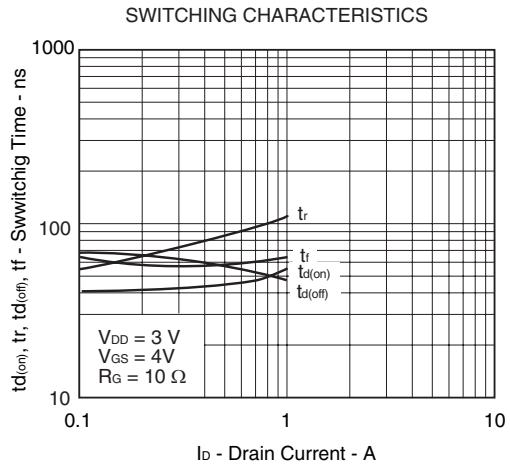
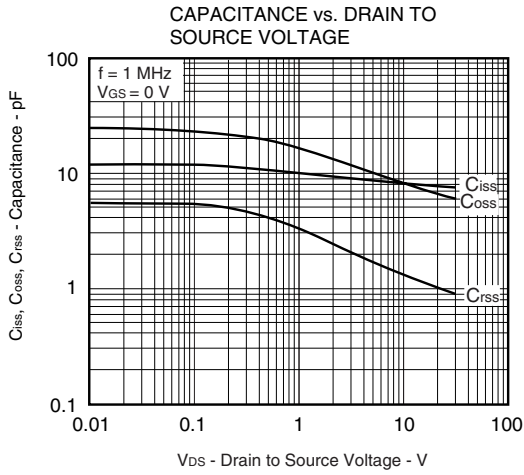
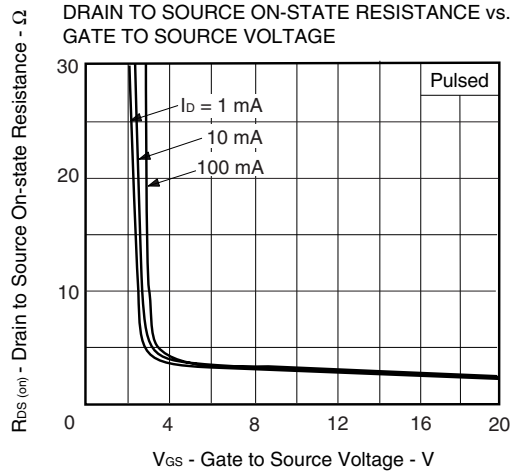
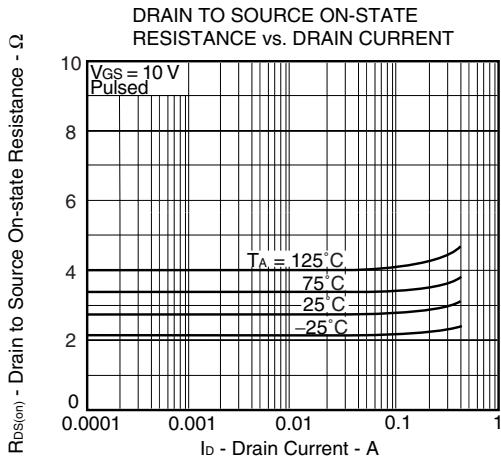
**Note** Pulsed

**TEST CIRCUIT SWITCHING TIME**



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





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