DATA SHEET

NEC

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

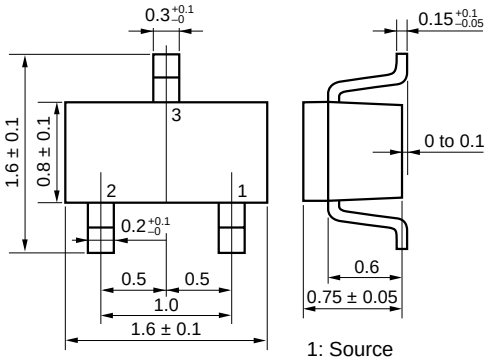
- Can be driven by a 2.5 V power source
- Low gate cut-off voltage

ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK3107	SC-75 (USM)

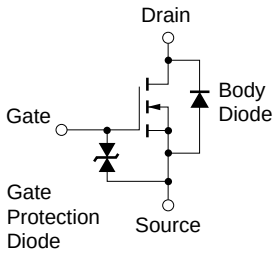
Marking: D1

PACKAGE DRAWING (Unit: mm)



1: Source
2: Gate
3: Drain

EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage	V_{DSS}	30	V
Gate to Source Voltage	V_{GSS}	±20	V
Drain Current (DC)	$I_{D(DC)}$	±0.1	A
Drain Current (pulse) Note1	$I_{D(pulse)}$	±0.4	A
Total Power Dissipation Note2	P_T	200	mW
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C

Notes 1. PW ≤ 10 μs, Duty Cycle ≤ 1%

2. Mounted on ceramic substrate of 3.0 cm^2 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.

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The mark <R> shows major revised points.

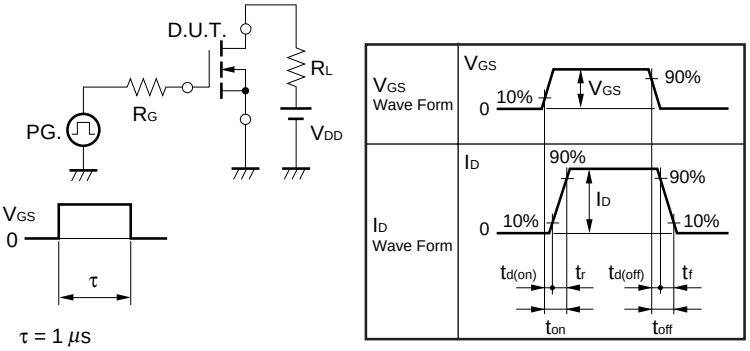
The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what:" field.

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			1.0	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±20 V, V_{DS} = 0 V			±10	μA
Gate Cut-off Voltage	$V_{GS(off)}$	V_{DS} = 3.0 V, I_D = 10 μA	1.0	1.4	1.8	V
Forward Transfer Admittance [Note]	$\|y_{fs}\|$	V_{DS} = 3.0 V, I_D = 10 m A	20			mS
Drain to Source On-state Resistance [Note]	$R_{DS(on)1}$	V_{GS} = 2.5 V, I_D = 1.0 m A		8.0	15	Ω
	$R_{DS(on)2}$	V_{GS} = 4.0 V, I_D = 10 mA		4.0	8.0	Ω
	$R_{DS(on)3}$	V_{GS} = 10 V, I_D = 10 mA		3.0	5.0	Ω
Input Capacitance	C_{iss}	V_{DS} = 3.0 V		9.0		pF
Output Capacitance	C_{oss}	V_{GS} = 0 V		12		pF
Reverse Transfer Capacitance	C_{rss}	f = 1 MHz		2.1		pF
Turn-on Delay Time	$T_{d(on)}$	V_{DD} = 3.0 V		40		ns
Rise Time	t_r	I_D = 10 mA		55		ns
Turn-off Delay Time	$t_{d(off)}$	V_{GS} = 4.0 V		68		ns
Fall Time	t_f	R_G = 10 Ω, R_L = 300 Ω		64		ns

Note Pulsed

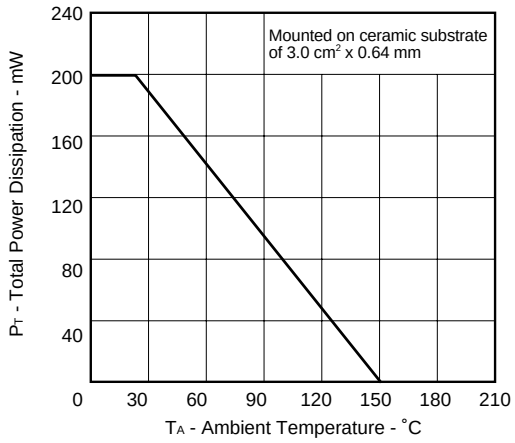
TEST CIRCUIT SWITCHING TIME



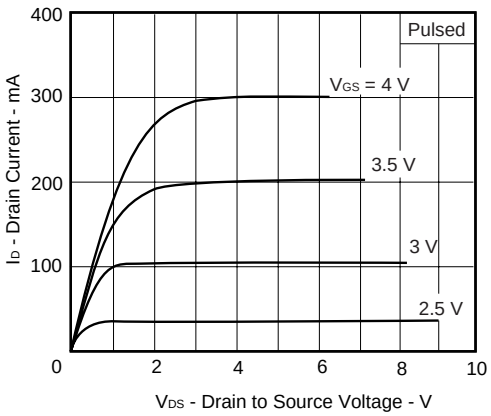
τ = 1 μs
Duty Cycle ≤ 1%

TYPICAL CHARACTERISTICS (T_A = 25 °C)

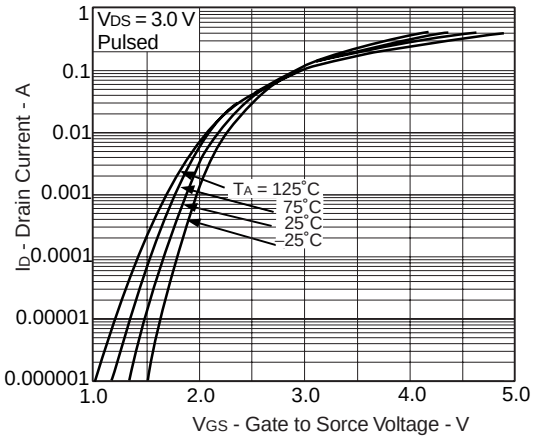
TOTAL POWER DISSIPATION vs.
AMBIENT TEMPERATURE



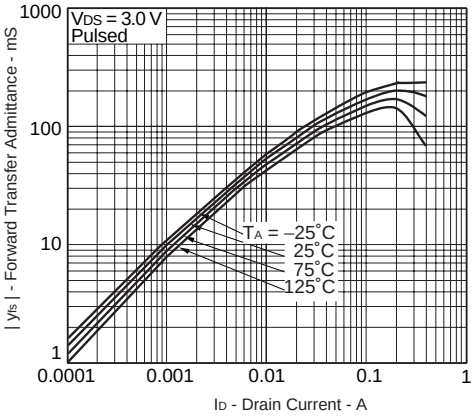
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



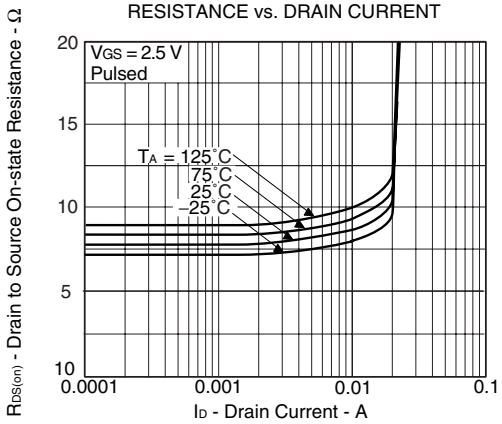
TRANSFER CHARACTERISTICS



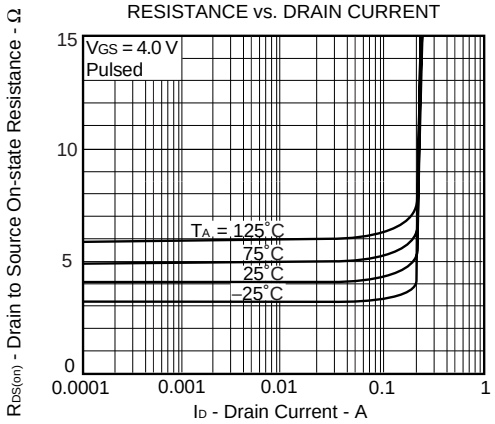
FORWARD TRANSFER ADMMITTANCE Vs.
DRAIN CURRENT



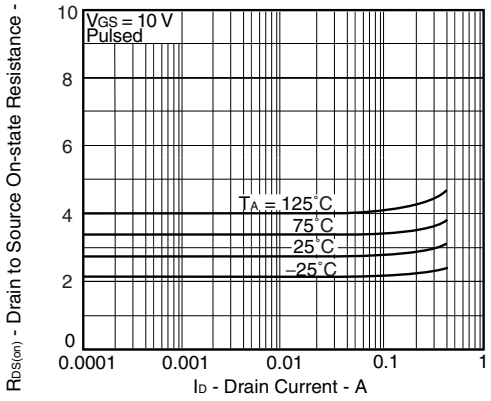
DRAIN TO SOURCE ON-STATE
RESISTANCE vs. DRAIN CURRENT



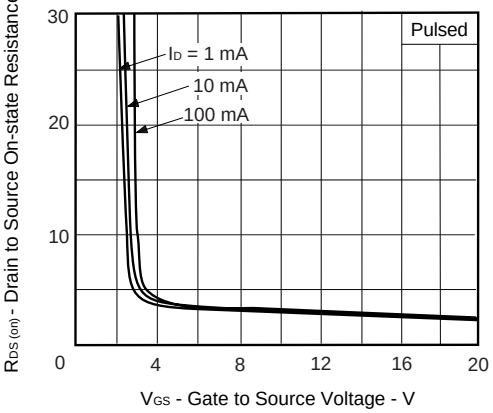
DRAIN TO SOURCE ON-STATE
RESISTANCE vs. DRAIN CURRENT



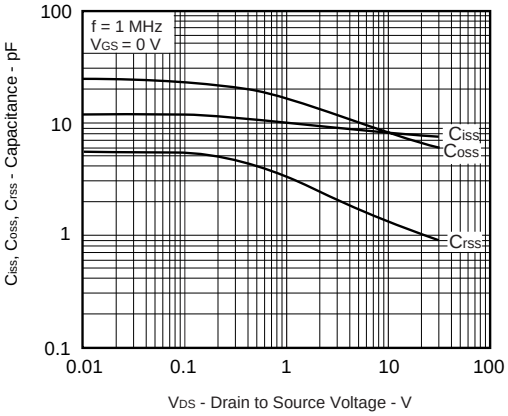
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



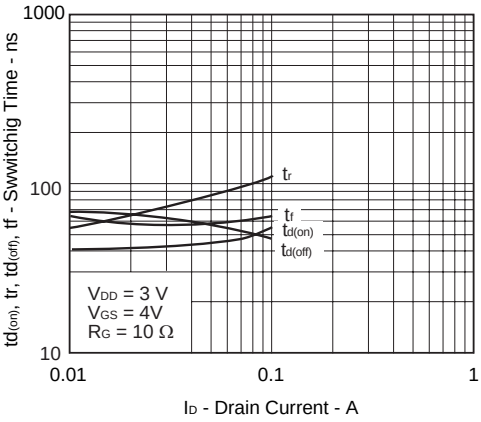
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



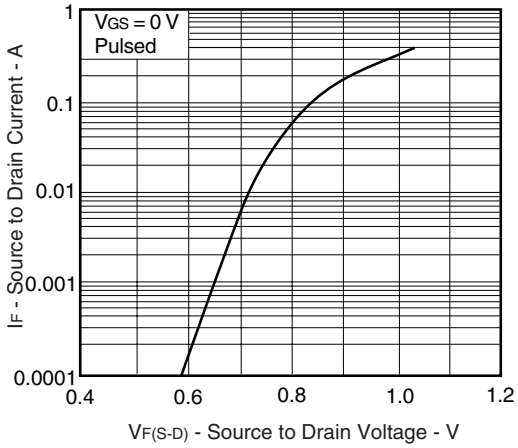
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



<R> SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



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