

N-CHANNEL MOS FIELD EFFECT TRANSISTOR  
FOR HIGH SPEED SWITCHING

DESCRIPTION

The 2SK1399 is an N-channel vertical type MOS FET can be driven by 2.5 V power supply.

The 2SK1399 is driven by low voltage and does not require consideration of driving current, it is suitable for appliances including VCR cameras and headphone stereos which need power saving.

FEATURES

- Can be driven by a 3.0 V power source
- Not necessary to consider driving current because of its high input impedance
- Possible to reduce the number of parts by omitting the bias resistor
- Can be used complementary with the 2SJ185

ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK1399	SC-59 (Mini Mold)

Marking: G12

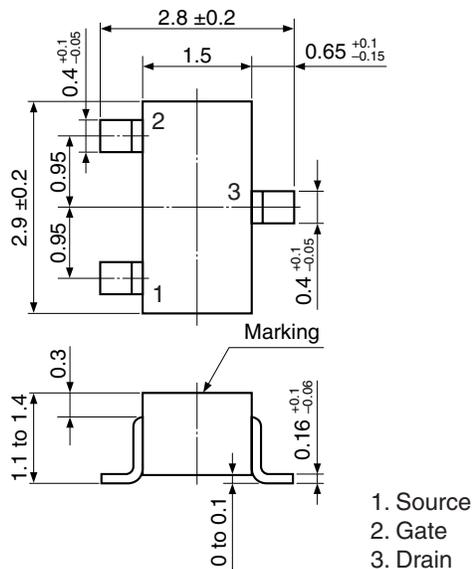
ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)

Drain to Source Voltage (V <sub>GS</sub> = 0 V)	V <sub>DSS</sub>	50	V
Gate to Source Voltage (V <sub>bs</sub> = 0 V)	V <sub>GSS</sub>	±7.0	V
Drain Current (DC)	I <sub>D(DC)</sub>	±100	mA
Drain Current (pulse) <sup>Note</sup>	I <sub>D(pulse)</sub>	±200	mA
Total Power Dissipation (T <sub>c</sub> = 25°C)	P <sub>T</sub>	200	mW
Channel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

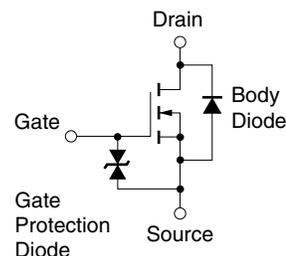
Note PW ≤ 10 ms, Duty Cycle ≤ 50%

- ★ **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



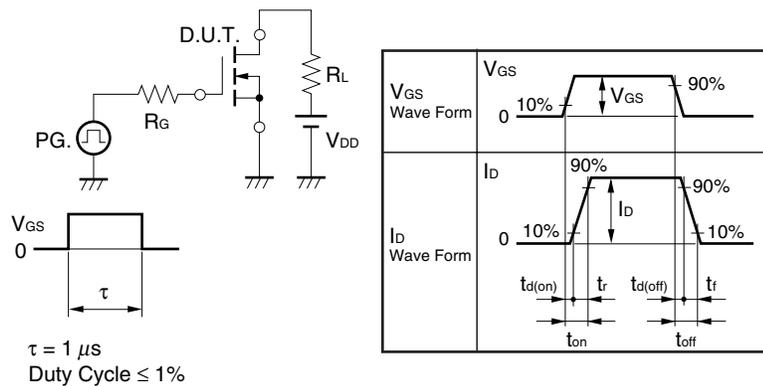
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**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**

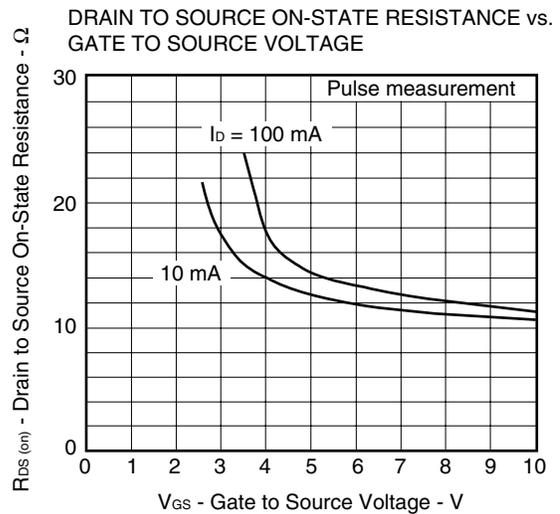
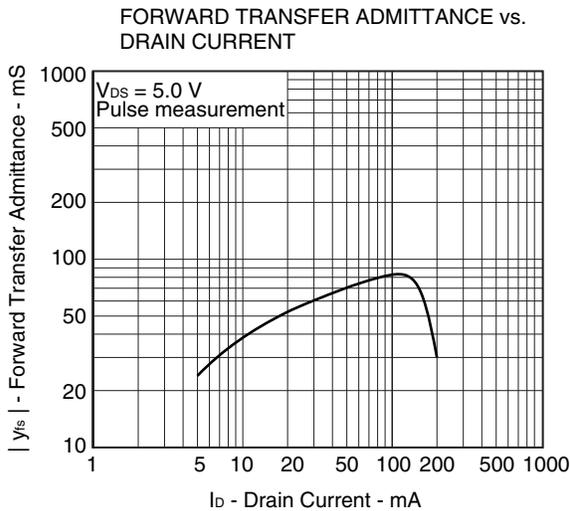
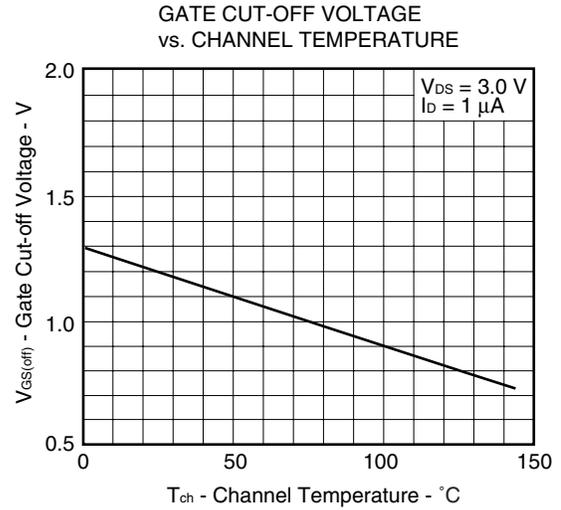
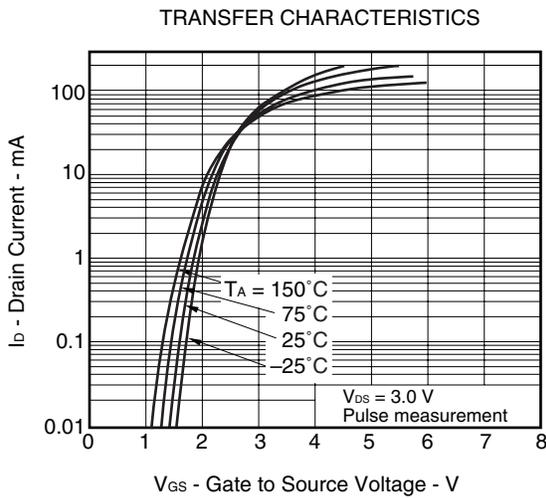
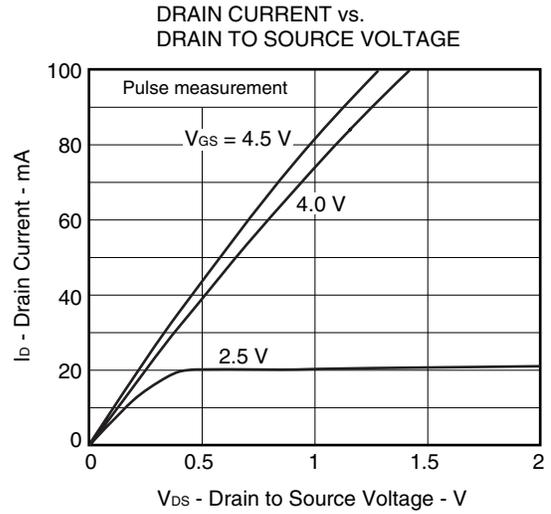
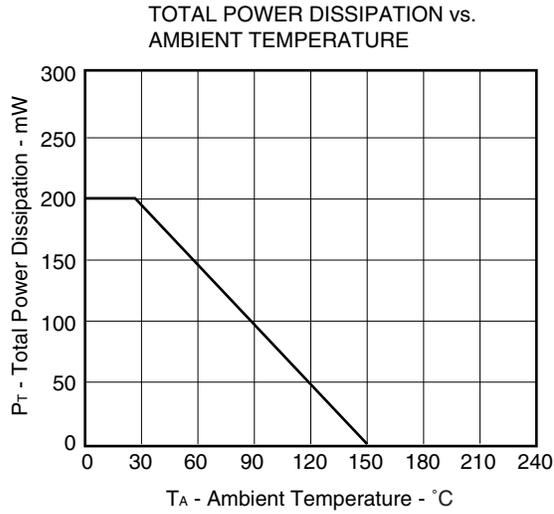
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 50 V, V <sub>GS</sub> = 0 V			10	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±7.0 V, V <sub>DS</sub> = 0 V			±5.0	μA
Gate Cut-off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 3.0 V, I <sub>D</sub> = 1.0 μA	0.9	1.2	1.5	V
Forward Transfer Admittance <b>Note</b>	y <sub>fs</sub>	V <sub>DS</sub> = 3.0 V, I <sub>D</sub> = 10 mA	20	38		mS
Drain to Source On-state Resistance <b>Note</b>	R <sub>DS(on)1</sub>	V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 10 mA		22	40	Ω
	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 10 mA		14	20	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 3.0 V		8.0		pF
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> = 0 V		7.0		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	f = 1 MHz		3.0		pF
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 3.0 V, I <sub>D</sub> = 20 mA		15		ns
Rise Time	t <sub>r</sub>	V <sub>GS</sub> = 3.0 V		100		ns
Turn-off Delay Time	t <sub>d(off)</sub>	R <sub>G</sub> = 10 Ω		30		ns
Fall Time	t <sub>f</sub>			35		ns

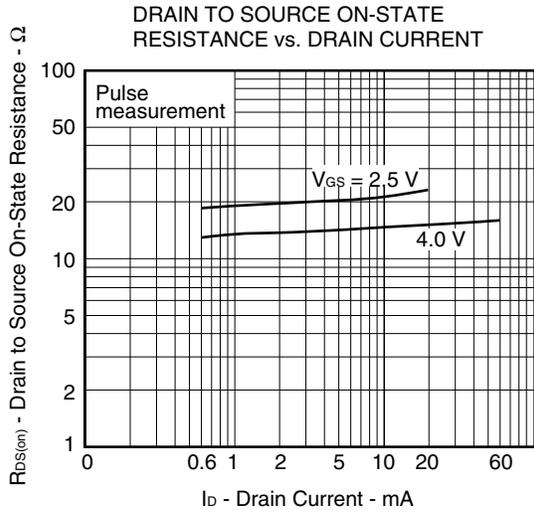
**Note** Pulsed

**TEST CIRCUIT SWITCHING TIME**



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





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