

N-CHANNEL MOS FET FOR HIGH SPEED SWITCHING

★ DESCRIPTION

The 2SK1398 is N-channel MOS Field Effect Transistor designed for a high-speed switching device in digital circuits.

The 2SK1398 is driven by a 2.5-V power source, it is suitable for applications including headphone stereos which need power saving.

ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK1398	SST

FEATURES

- Directly driven by ICs having a 3-V power supply.
- 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 2SJ184.

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage (V _{GS} = 0 V)	V _{DSS}	50	V
Gate to Source Voltage (V _{DS} = 0 V)	V _{GSS}	±7.0	V
Drain Current (DC)	I _{D(DC)}	±100	mA
Drain Current (pulse) ^{Note}	I _{D(pulse)}	±200	mA
Total Power Dissipation	P _T	250	mW
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

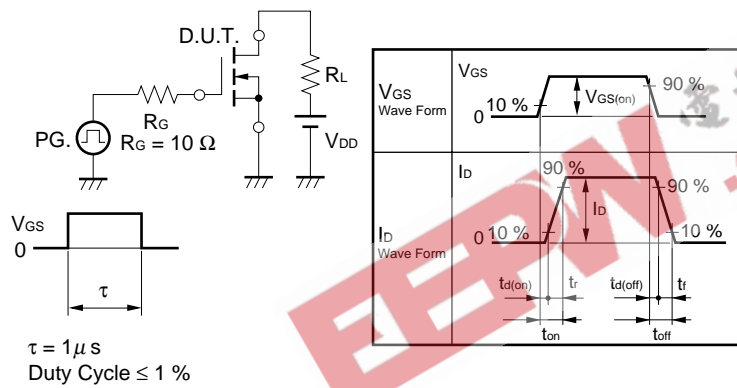
Note PW ≤ 10 ms, Duty cycle ≤ 50 %

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Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

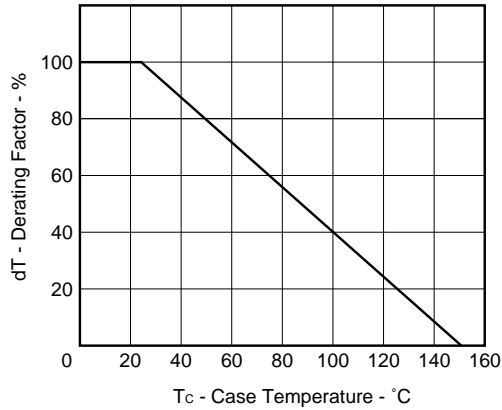
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-off Current	I _{DSS}	V _{DS} = 50 V, V _{GS} = 0 V			10	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±7.0 V, V _{DS} = 0 V			±5.0	μA
Gate to Source Cut-off Voltage	V _{GS(off)}	V _{DS} = 3.0 V, I _D = 1.0 μA	0.9	1.2	1.5	V
Forward Transfer Admittance	y _{fs}	V _{DS} = 3.0 V, I _D = 10 mA	20	38		mS
Drain to Source On-state Resistance	R _{DS(on)1}	V _{GS} = 2.5 V, I _D = 10 mA		22	40	Ω
	R _{DS(on)2}	V _{GS} = 4.0 V, I _D = 10 mA		14	20	Ω
Input Capacitance	C _{iss}	V _{DS} = 3.0 V		8		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		7		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		3		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = 3.0 V		15		ns
Rise Time	t _r	I _D = 20 mA		100		ns
Turn-off Delay Time	t _{d(off)}	V _{GS(on)} = 3.0 V		30		ns
Fall Time	t _f	R _G = 10 Ω, R _L = 150 Ω		35		ns

TEST CIRCUIT SWITCHING TIME

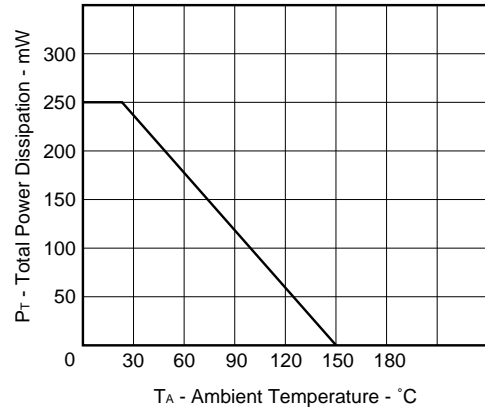


TYPICAL CHARACTERISTICS (T_A = 25 °C)

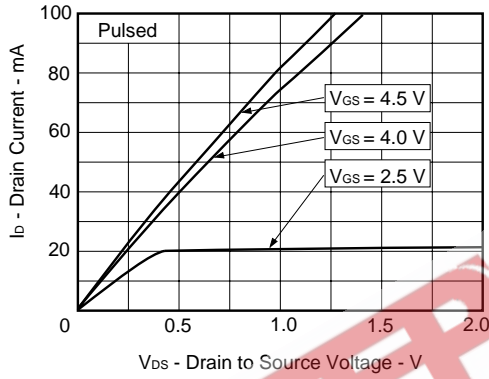
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



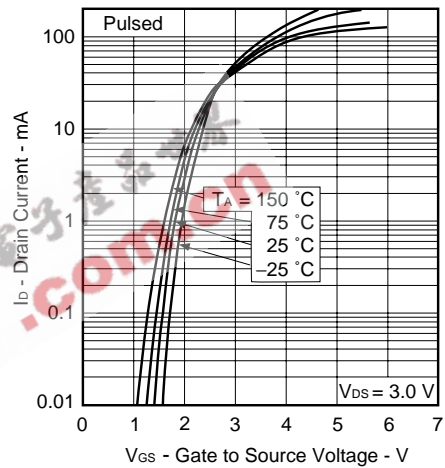
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



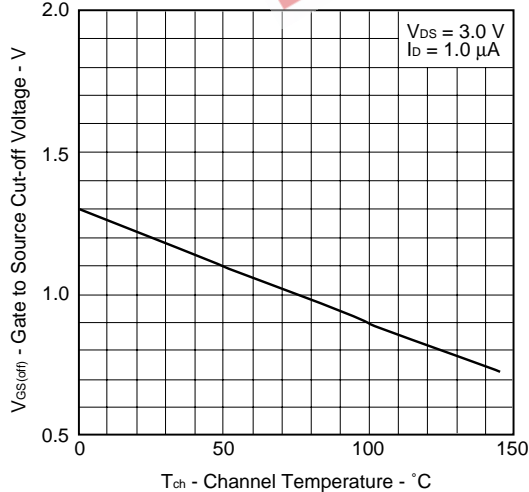
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



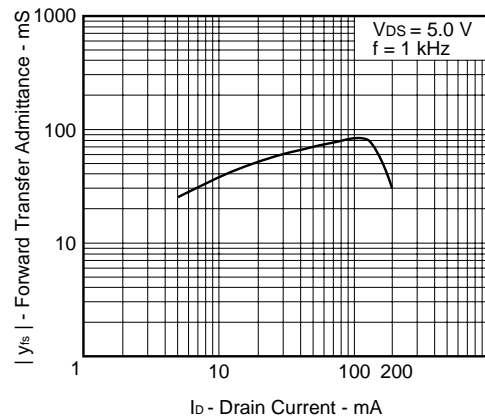
FORWARD TRANSFER CHARACTERISTICS

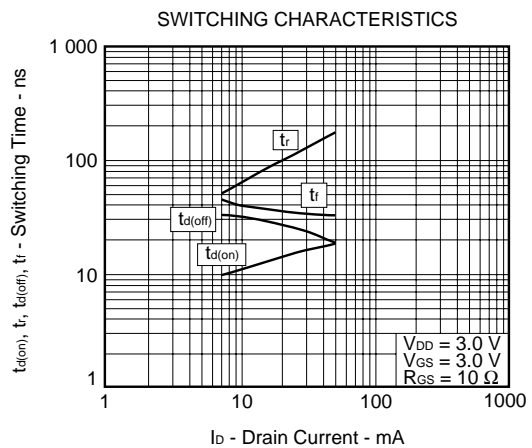
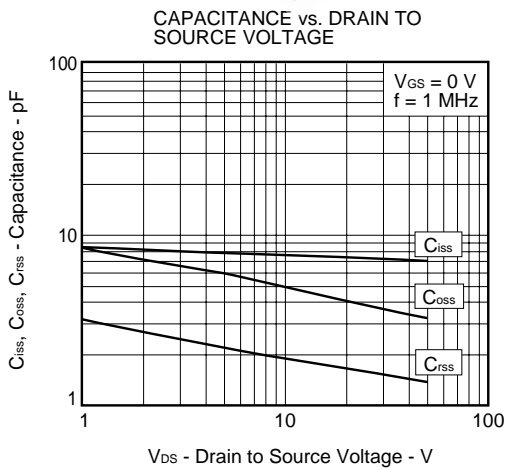
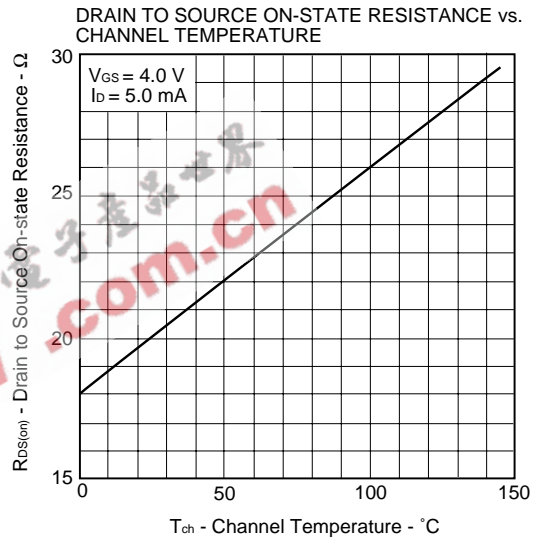
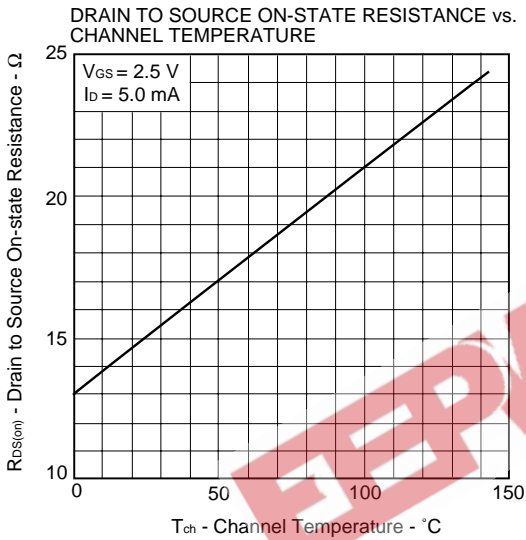
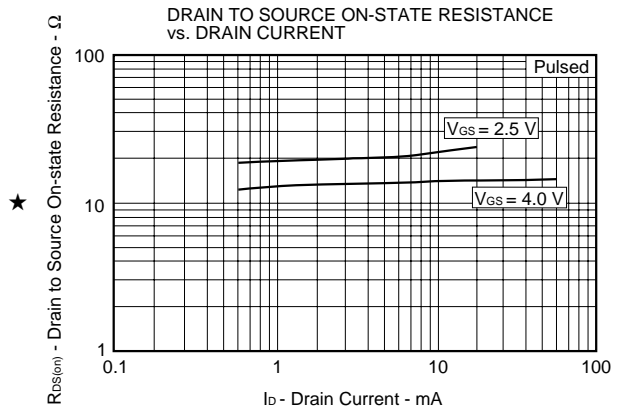
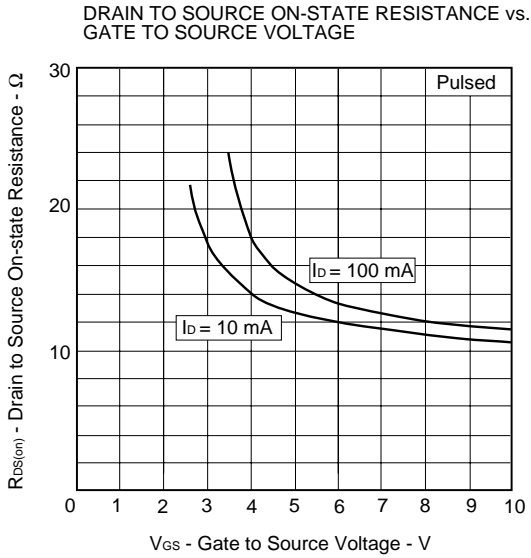


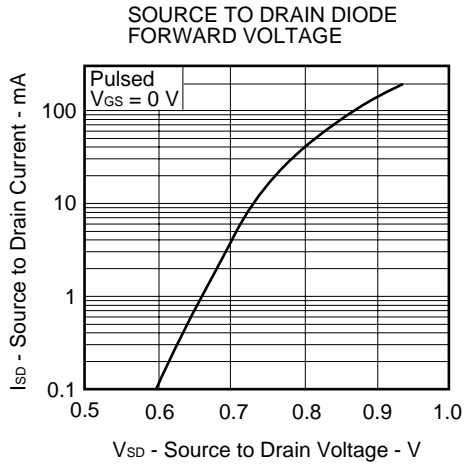
GATE TO SOURCE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



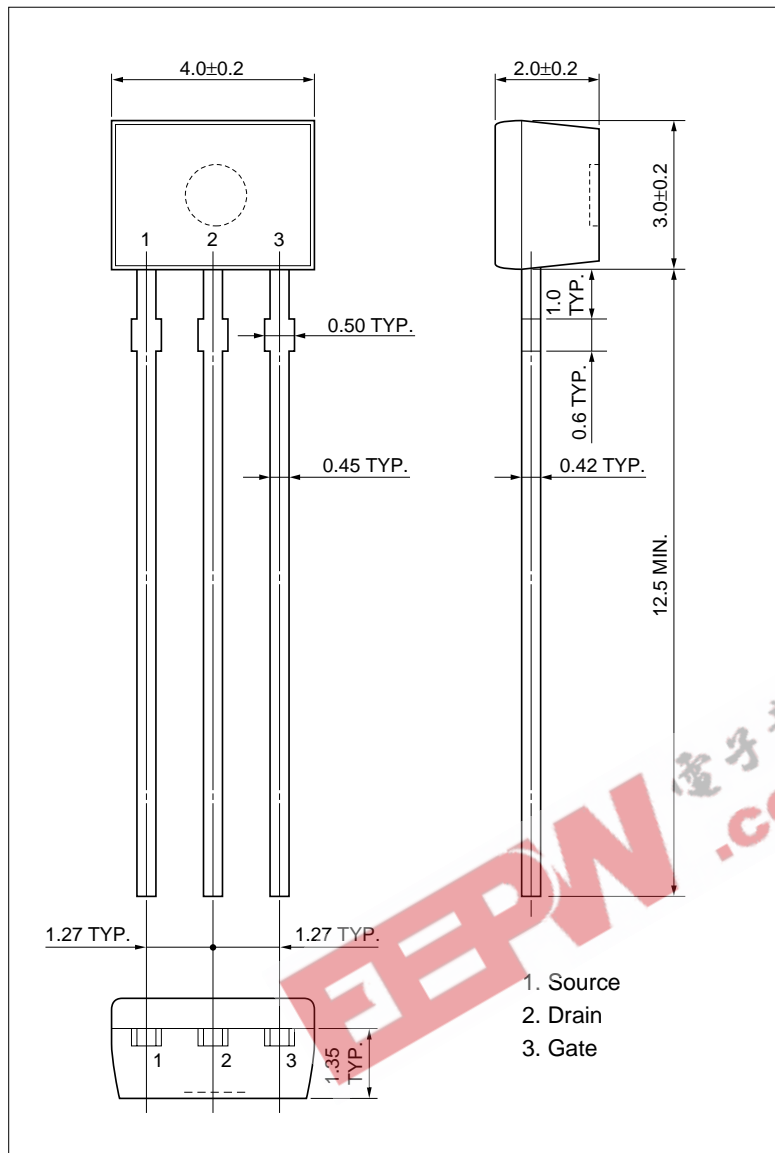




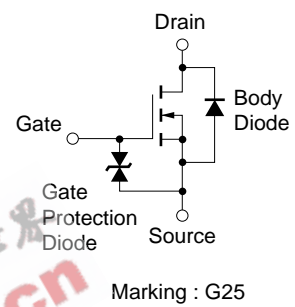
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PACKAGE DRAWING (Unit: mm)

SST



EQUIVALENT CIRCUIT



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.

[MEMO]



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