NEC

MOS FIELD EFFECT TRANSISTOR
2SK3503

N-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR HIGH SPEED SWITCHING

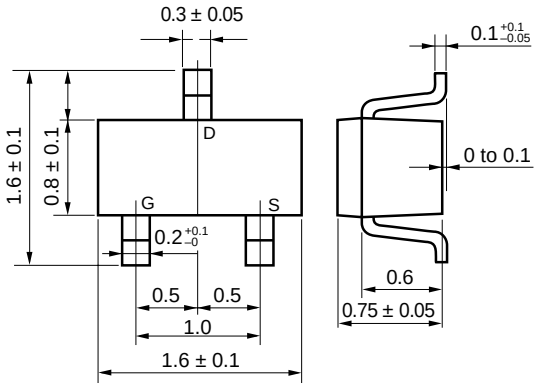
DESCRIPTION

The 2SK3503 is an N-channel vertical MOS FET. Because it can be driven by a voltage as low as 1.5 V and it is not necessary to consider a drive current, this FET is ideal as an actuator for low-current portable systems such as headphone stereos and video cameras.

FEATURES

- Automatic mounting supported
- Gate can be driven by a 1.5 V power source
- Because of its high input impedance, there's no need to consider a drive current
- Since bias resistance can be omitted, the number of components required can be reduced

PACKAGE DRAWING (Unit : mm)



ORDERING INFORMATION

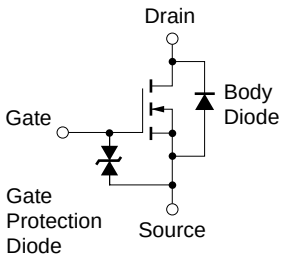
PART NUMBER	PACKAGE
2SK3503[Note]	SC-75 (USM)

Note Marking: E1

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage (V_{GS} = 0 V)	V_{DSS}	16	V
Gate to Source Voltage (V_{DS} = 0 V)	V_{GSS}	±7.0	V
Drain Current (DC) (Tc = 25°C)	$I_{D(DC)}$	±0.1	A
Drain Current (pulse) [Note1]	$I_{D(pulse)}$	±0.4	A
Total Power Dissipation (T_C = 25°C)[Note2]	P_T	200	mW
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C

EQUIVALENT CIRCUIT



Notes 1. PW ≤ 10 μs, Duty Cycle ≤ 1%

2. Mounted on ceramic substrate of 3.0 cm^2 × 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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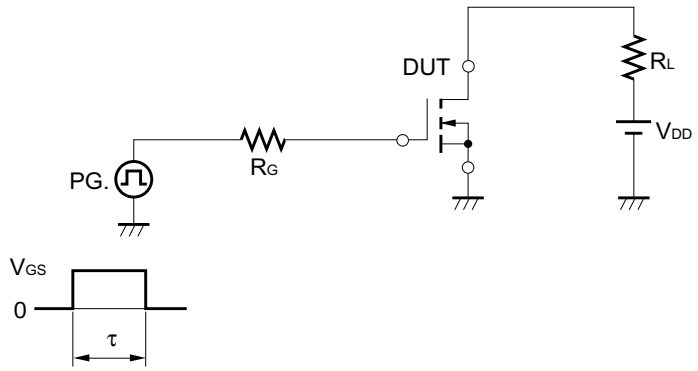
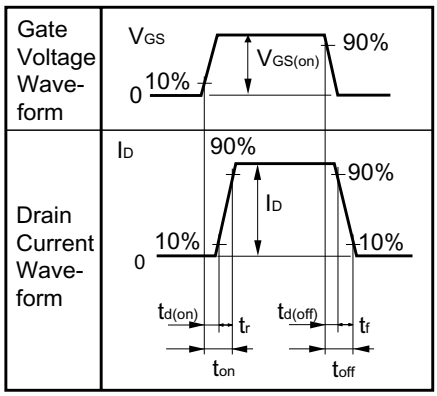
ELECTRICAL CHARACTERISTICS (T_A = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16 V, V_{GS} = 0 V			1.0	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±7.0 V, V_{DS} = 0 V			±3.0	μA
Gate Cut-off Voltage	$V_{GS(off)}$	V_{DS} = 3 V, I_D = 10 μA	0.5	0.8	1.1	V
Forward Transfer Admittance	$\|y_{fs}\|$	V_{DS} = 3 V, I_D = 10 mA	20			mS
Drain to Source On-state Resistance	$R_{DS(on)1}$	V_{GS} = 1.5 V, I_D = 1 mA		20	50	Ω
	$R_{DS(on)2}$	V_{GS} = 2.5 V, I_D = 10 mA		7	15	Ω
	$R_{DS(on)3}$	V_{GS} = 4.0 V, I_D = 10 mA		5	12	Ω
Input Capacitance	C_{iss}	V_{GS} = 0 V		10		pF
Output Capacitance	C_{oss}	V_{DS} = 3 V		13		pF
Reverse Transfer Capacitance	C_{rss}	f = 1 MHz		3		pF
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 3 V, I_D = 10 mA		15		ns
Rise Time	t_r	$V_{GS(on)}$ = 3 V		70		ns
Turn-off Delay Time	$t_{d(off)}$	R_G = 10 Ω		100		ns
Fall Time	t_f			110		ns

SWITCHING TIME MEASUREMENT CIRCUIT AND CONDITIONS

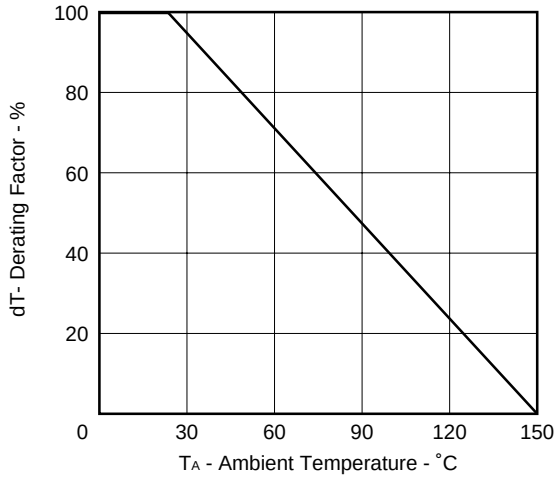


τ = 1 μs
Duty Cycle ≤ 1%

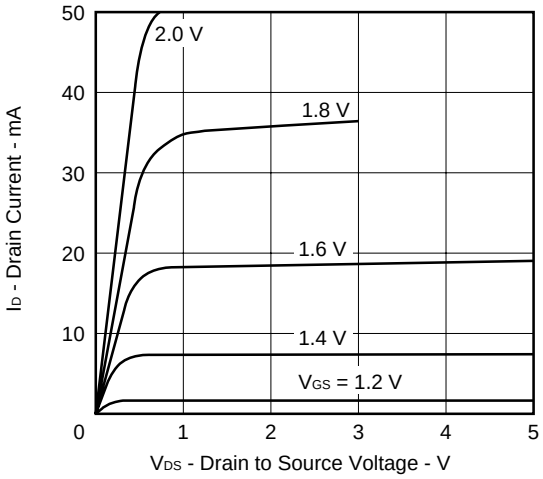


TYPICAL CHARACTERISTICS (T_A = 25°C)

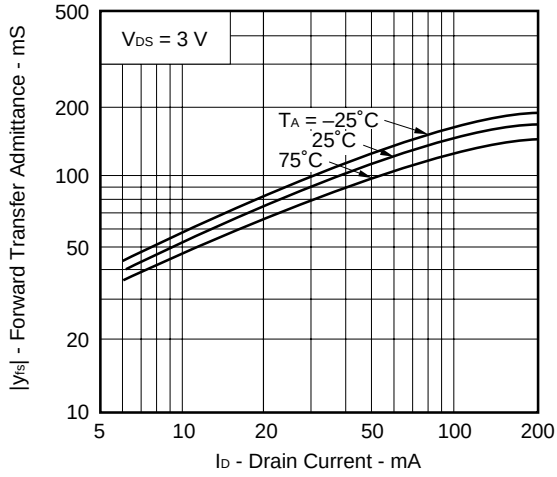
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



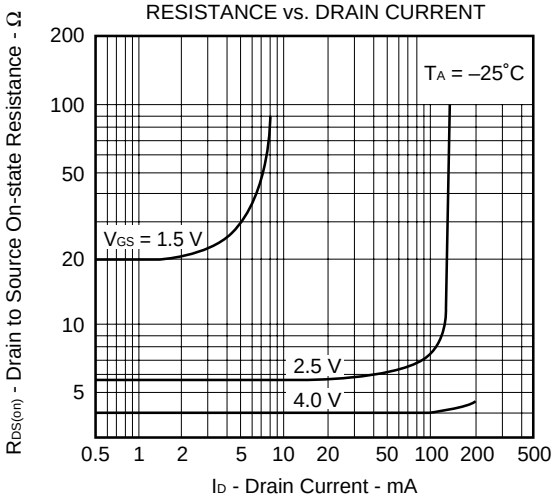
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



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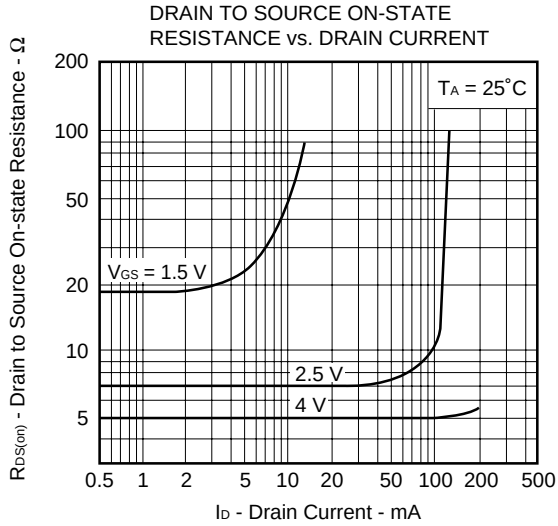

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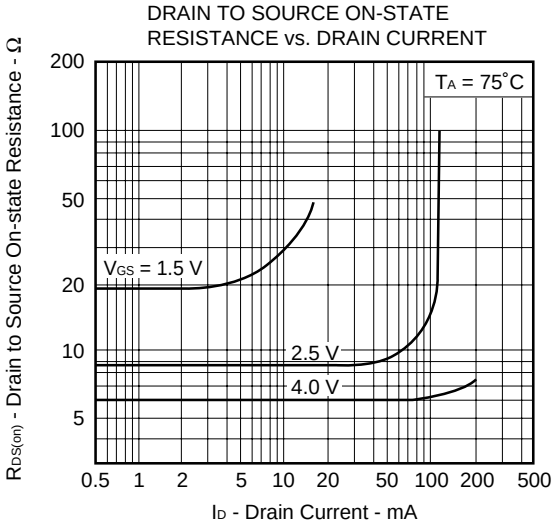
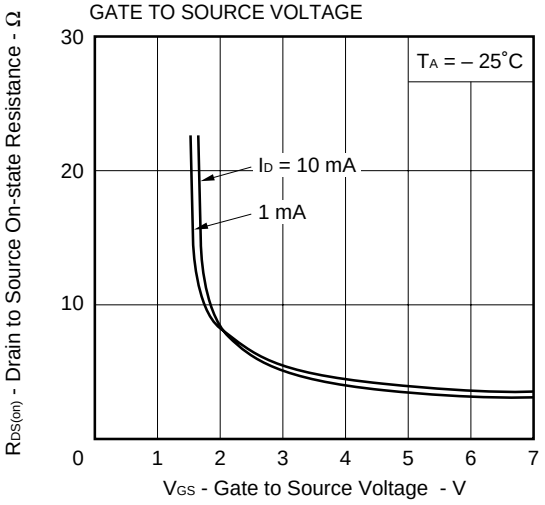
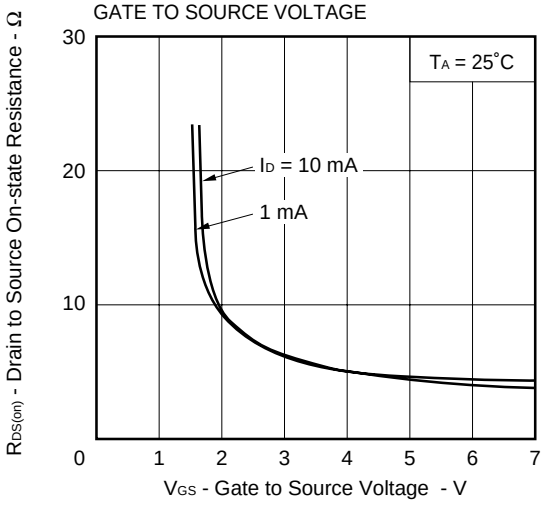


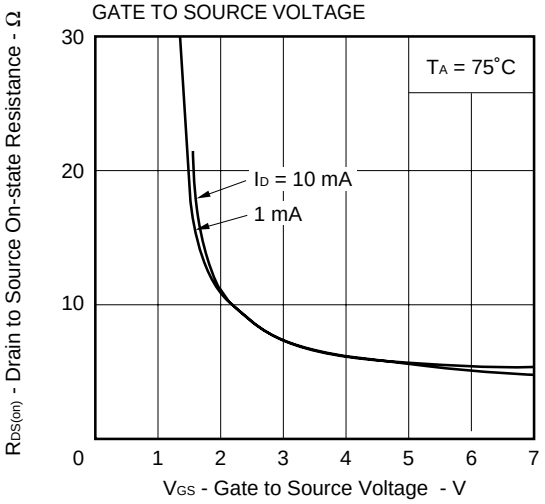
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



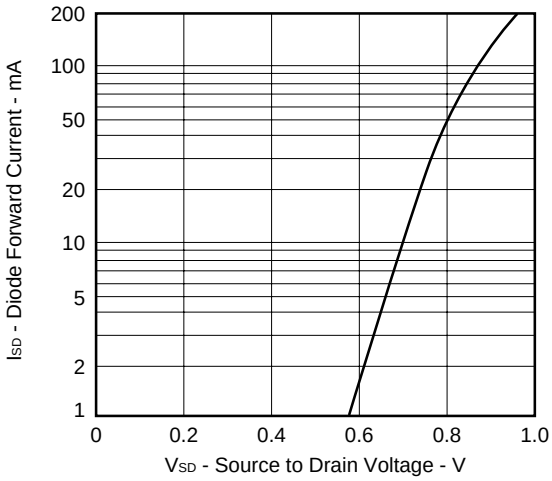
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



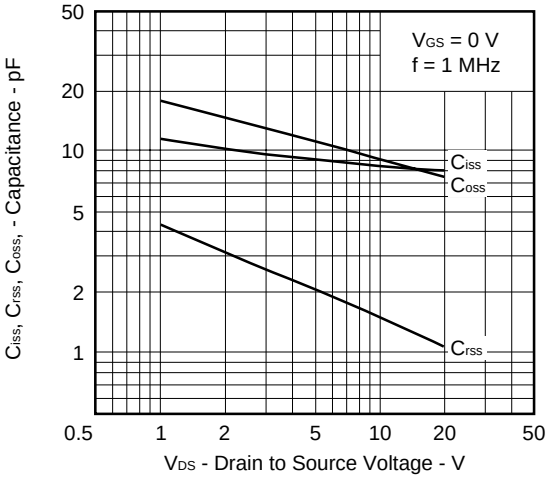
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



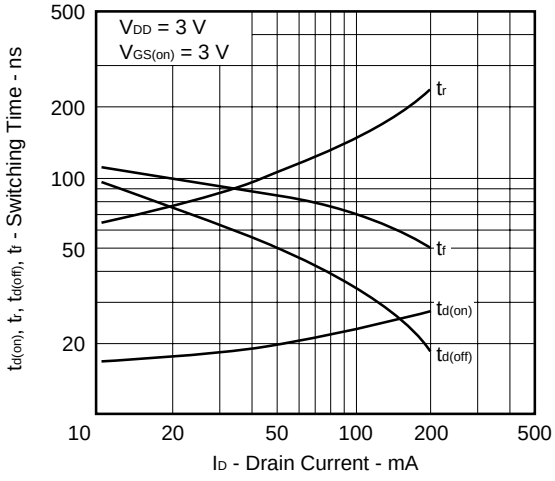
SOURCE TO DRAIN DIODE FORWARD
VOLTAGE



CAPACITANCE vs.
DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



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