NEC

MOS FIELD EFFECT TRANSISTOR
2SJ559

P-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR HIGH SPEED SWITCHING

DESCRIPTION

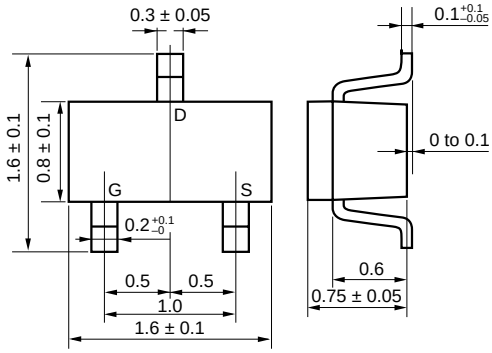
The 2SJ559 is a switching device which can be driven directly by a 2.5 V power source.

The 2SJ559 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.

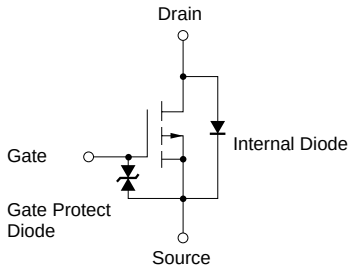
PACKAGE DRAWING (Unit : mm)



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

EQUIVALENT CIRCUIT



Marking : C1

Notes 1. PW ≤ 10 μs, Duty Cycle ≤ 1 %

2. Mounted on ceramic substrate of 3.0cm^2 × 0.64 mm

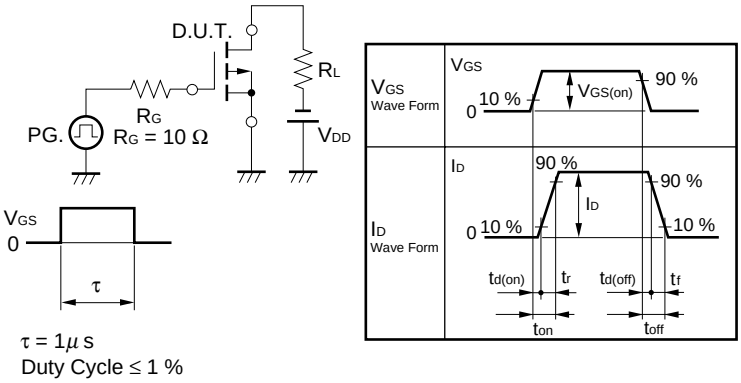
Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

Document No. D13801EJ1V0DS00 (1st edition)
Date Published June 1999 NS CP(K)
Printed in Japan

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-off Current	I_{DSS}	V_{DS} = –30 V, V_{GS} = 0 V			–1	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 V, I_D = –10 μA	–1.0	–1.4	–1.7	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} = –2.5 V, I_D = –1 mA		23	60	Ω
	$R_{DS(on)2}$	V_{GS} = –4 V, I_D = –10 mA		11	23	Ω
	$R_{DS(on)3}$	V_{GS} = –10 V, I_D = –10 mA		6	13	Ω
Input Capacitance	C_{iss}	V_{DS} = –3 V		5		pF
Output Capacitance	C_{oss}	V_{GS} = 0 V		15		pF
Reverse Transfer Capacitance	C_{rss}	f = 1 MHz		1.3		pF
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = –3 V		140		ns
Rise Time	t_r	I_D = –10 mA		330		ns
Turn-off Delay Time	$t_{d(off)}$	$V_{GS(on)}$ = –4 V		220		ns
Fall Time	t_f	R_G = 10 Ω, R_L = 300 Ω		320		ns

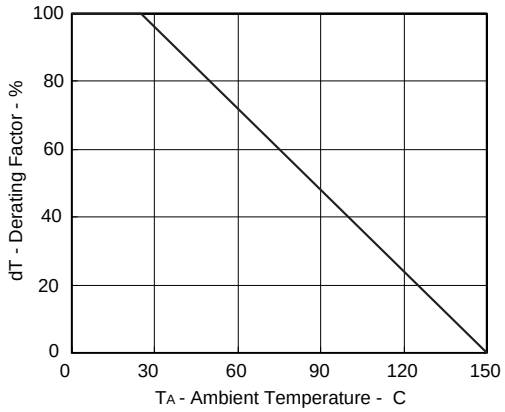
TEST CIRCUIT SWITCHING TIME



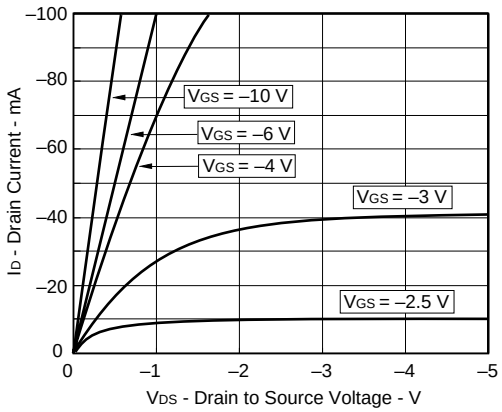
τ = 1μ s
Duty Cycle ≤ 1 %

TYPICAL CHARACTERISTICS (T_A = 25°C)

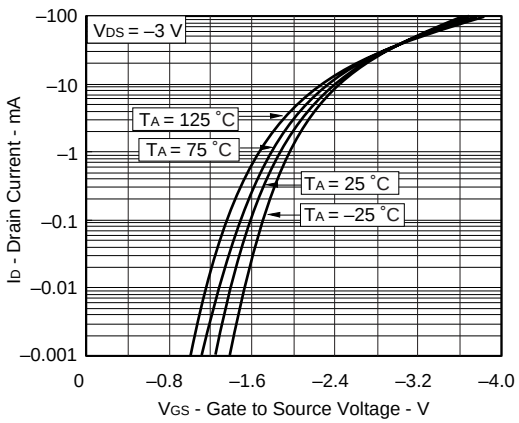
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



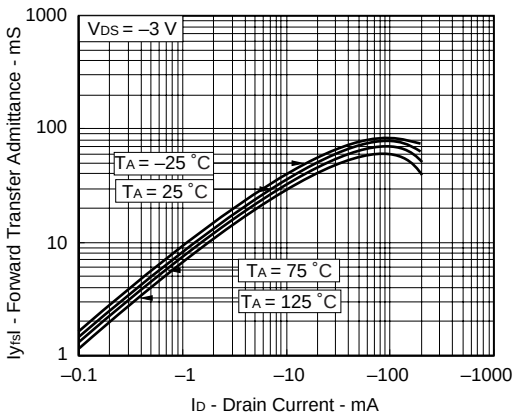
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



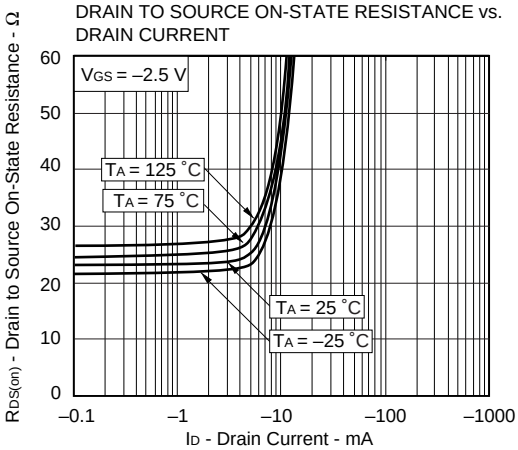
TRANSFER CHARACTERISTICS



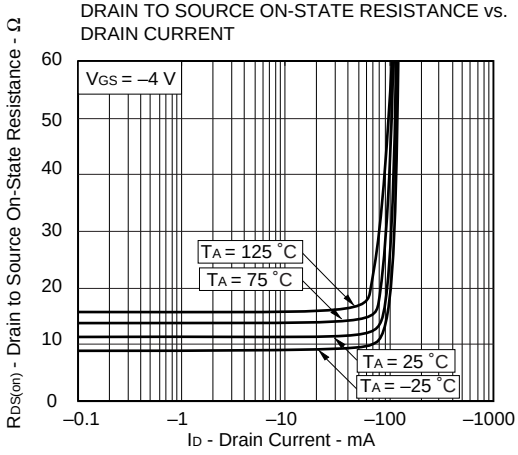
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



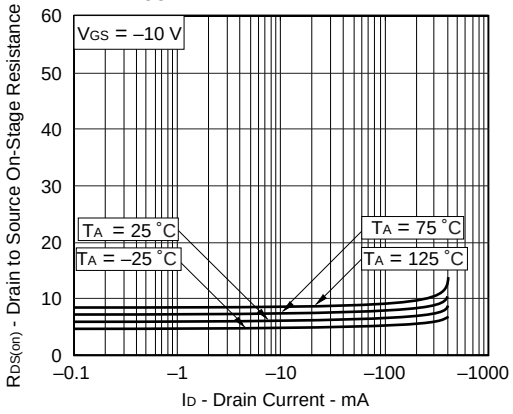
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



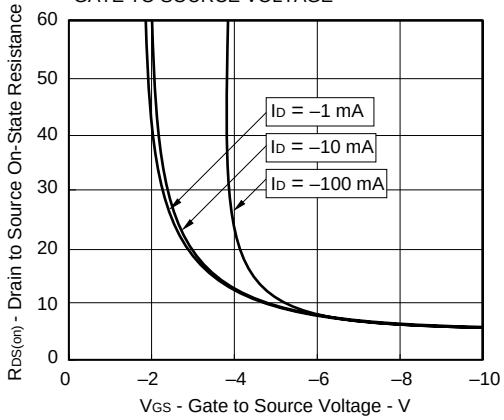
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



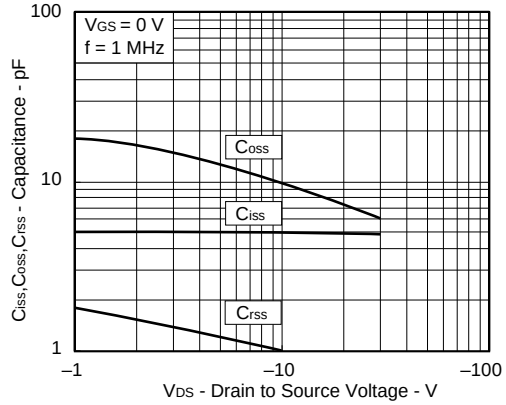
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



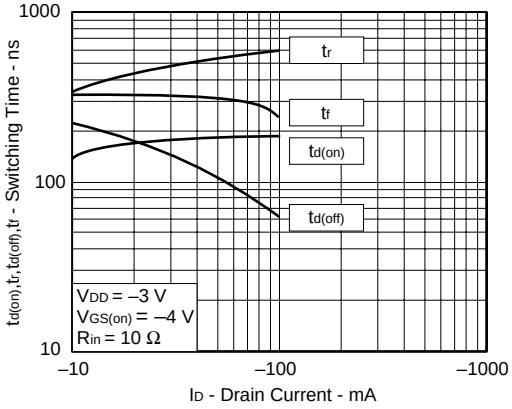
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



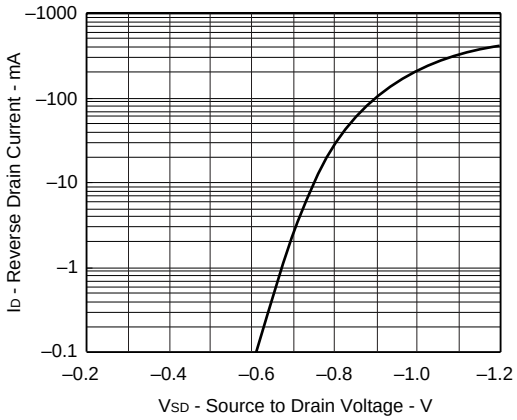
CAPACITANCE vs.
DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE
FORWARD VOLTAGE



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