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April 1st, 2010
Renesas Electronics Corporation

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DATA SHEET

RENESAS

MOS FIELD EFFECT TRANSISTOR
2SJ210

P-CHANNEL MOSFET FOR SWITCHING

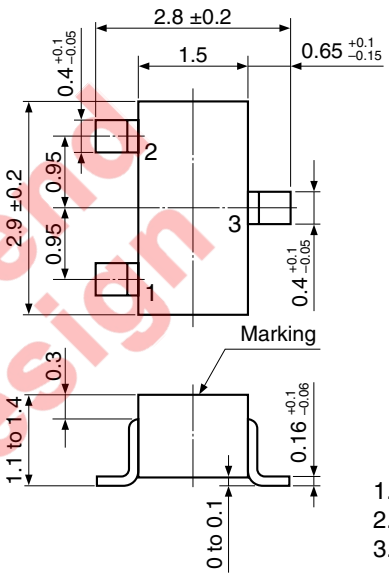
The 2SJ210, P-channel vertical type MOSFET, is a switching device which can be driven directly by the output of ICs having a 5 V power source.

The 2SJ210 has excellent switching characteristics and is suitable as a high-speed switching device in digital circuits.

FEATURES

- Directly driven by the output of ICs having a 5 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.

PACKAGE DRAWING (Unit: mm)



1. Source
2. Gate
3. Drain

<R>

ORDERING INFORMATION

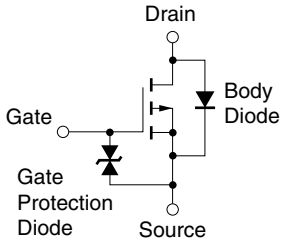
PART NUMBER	PACKAGE
2SJ210	SC-59 (Mini Mold)

Marking: H16

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage (V_{GS} = 0 V)	V_{DSS}	–60	V
Gate to Source Voltage (V_{DS} = 0 V)	V_{GSS}	∓20	V
Drain Current (DC)	$I_{D(DC)}$	∓200	mA
Drain Current (pulse) Note	$I_{D(pulse)}$	∓400	mA
Total Power Dissipation	P_T	200	mW
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C

EQUIVALENT CIRCUIT



Note PW ≤ 10 ms, Duty Cycle ≤ 50%

<R> **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.
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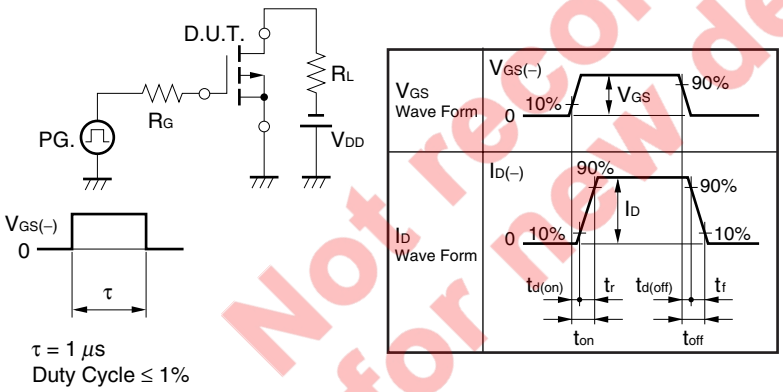
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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = –60 V, V_{GS} = 0 V			–1.0	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ∓20 V, V_{DS} = 0 V			∓1.0	μA
Gate Cut-off Voltage	$V_{GS(off)}$	V_{DS} = –5.0 V, I_D = –1.0 μA	–1.4	–1.8	–2.4	V
Forward Transfer Admittance Note	$\|y_{fs}\|$	V_{DS} = –5.0 V, I_D = –10 mA	20	45		mS
Drain to Source On-state Resistance Note	$R_{DS(on)1}$	V_{GS} = –4.0 V, I_D = –10 mA		10	15	Ω
	$R_{DS(on)2}$	V_{GS} = –10 V, I_D = –10 mA		6	10	Ω
Input Capacitance	C_{iss}	V_{DS} = –5.0 V		27		pF
Output Capacitance	C_{oss}	V_{GS} = 0 V		21		pF
Reverse Transfer Capacitance	C_{rss}	f = 1 MHz		3		pF
Turn-on Delay Time	$t_{d(on)}$	V_{GS} = –4.0 V, R_G = 10 Ω		120		ns
Rise Time	t_r	V_{DD} = –5.0 V		190		ns
Turn-off Delay Time	$t_{d(off)}$	I_D = –10 mA		150		ns
Fall Time	t_f			180		ns

<R> **Note** Pulsed

TEST CIRCUIT SWITCHING TIME



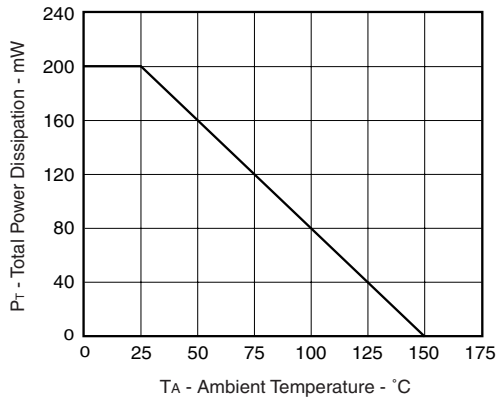
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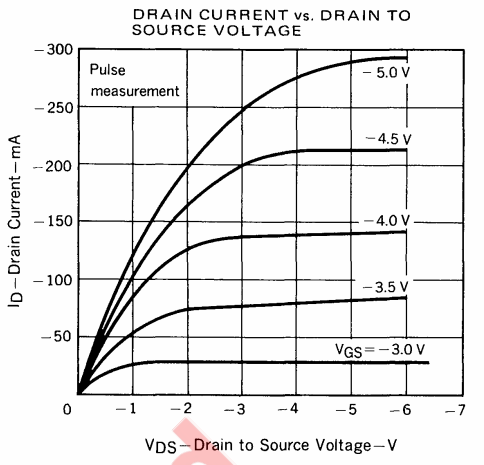
TYPICAL CHARACTERISTICS (T_A = 25°C)

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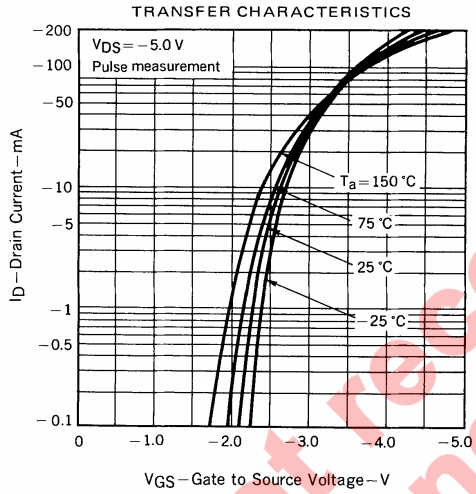
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



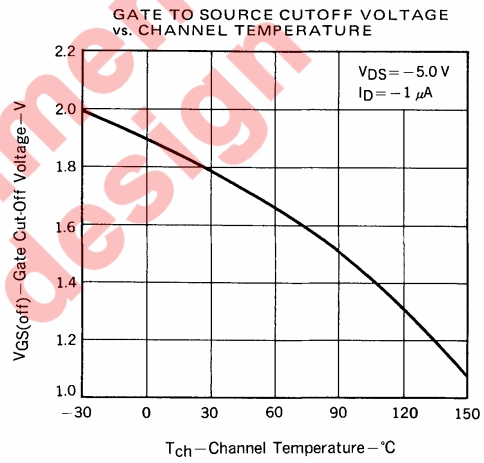
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



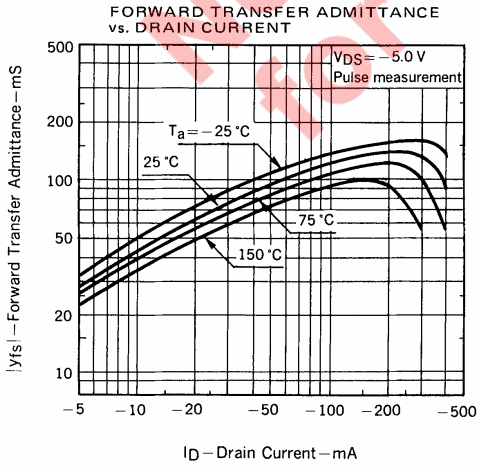
TRANSFER CHARACTERISTICS



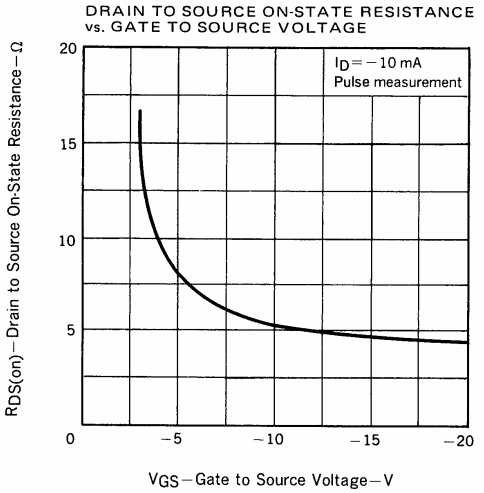
GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE



FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



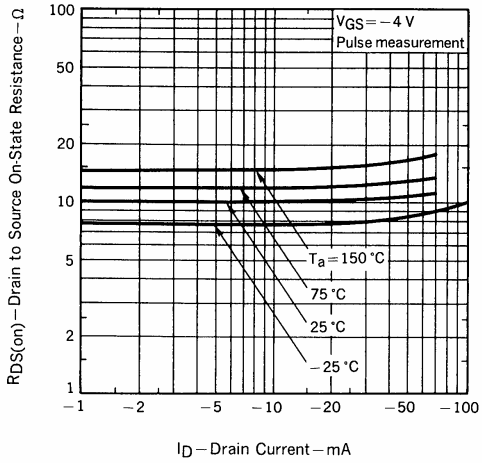
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



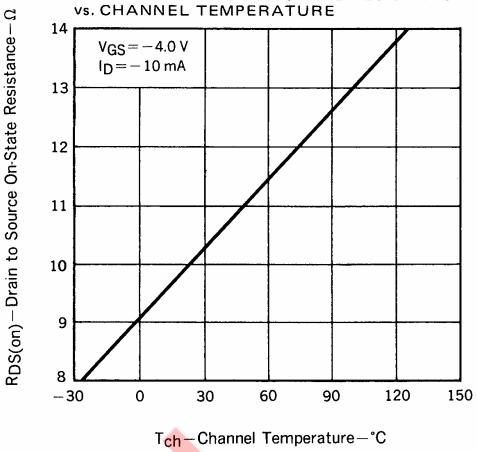
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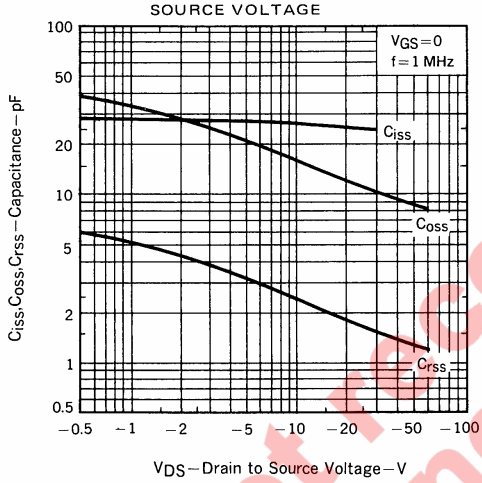
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



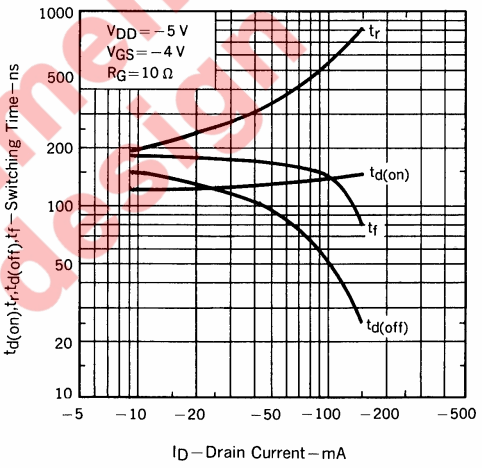
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



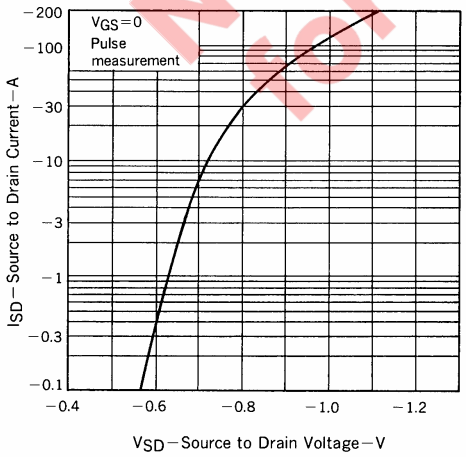
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



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