

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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**EOL announced Product**

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N-CHANNEL MOSFET  
FOR SWITCHING

DESCRIPTION

The 2SK1588 is an N-channel vertical type MOSFET which can be driven by 2.5 V power supply.

As the MOSFET 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

- Directly driven by ICs having a 3 V power supply.
- Low on-state resistance  
 $R_{DS(on)1} = 0.5 \Omega \text{ MAX. (} V_{GS} = 2.5 \text{ V, } I_D = 1.0 \text{ A)}$   
 $R_{DS(on)2} = 0.3 \Omega \text{ MAX. (} V_{GS} = 4.0 \text{ V, } I_D = 1.5 \text{ A)}$

ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK1588	SC-62 (Power Mini Mold)

Marking: NG

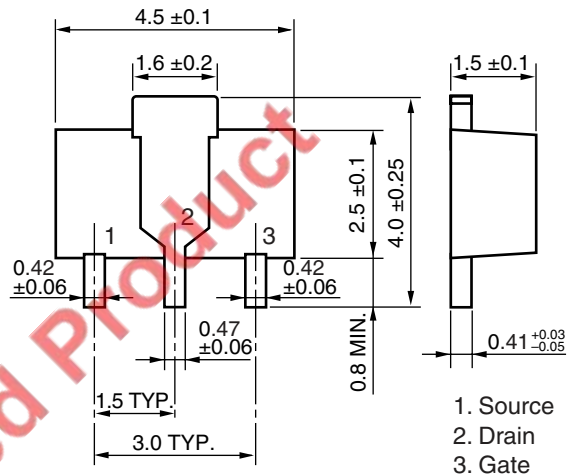
ABSOLUTE MAXIMUM RATINGS (TA = 25°C)

Drain to Source Voltage (VGS = 0 V)	V <sub>DSS</sub>	16	V
Gate to Source Voltage (VDS = 0 V)	V <sub>GSS</sub>	±16	V
Drain Current (DC)	I <sub>D(DC)</sub>	±3.0	A
Drain Current (pulse) <sup>Note1</sup>	I <sub>D(pulse)</sub>	±6.0	A
Total Power Dissipation <sup>Note2</sup>	P <sub>T</sub>	2.0	W
Channel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

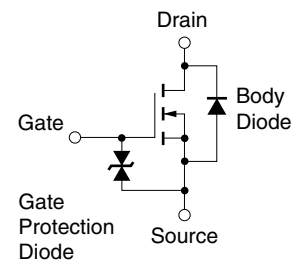
- Notes 1. PW ≤ 10 ms, Duty Cycle ≤ 50%  
 2. Mounted on ceramic substrate of 16 cm<sup>2</sup> x 0.7 mm

**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.

PACKAGE DRAWING (Unit: mm)



EQUIVALENT CIRCUIT



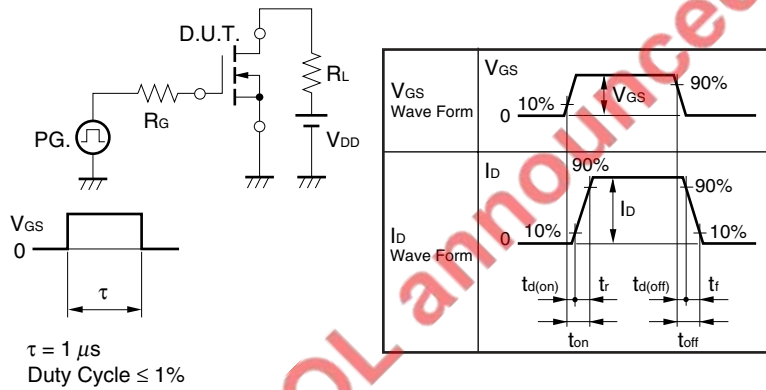
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**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**

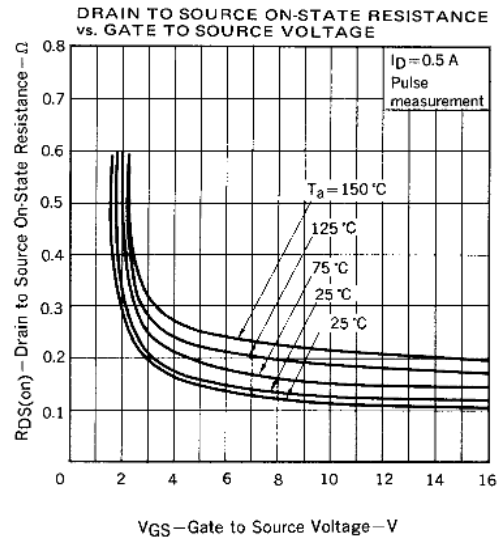
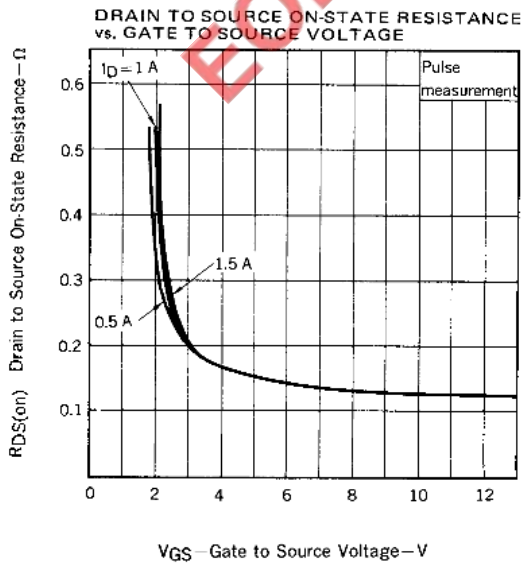
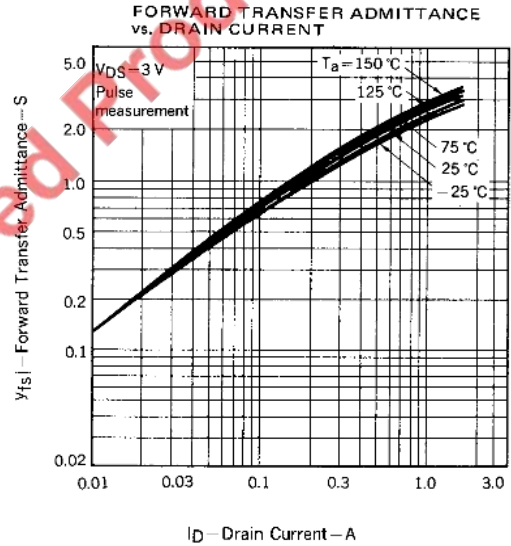
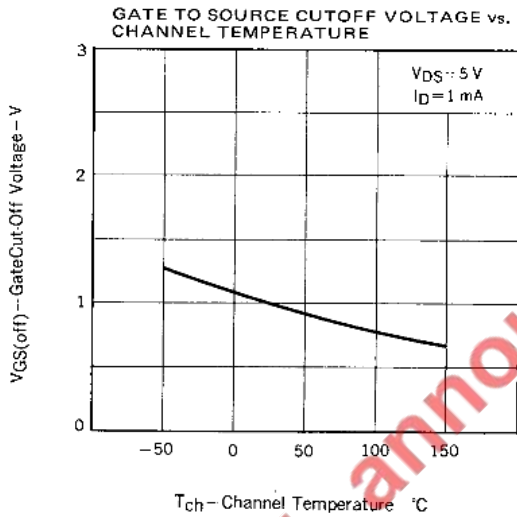
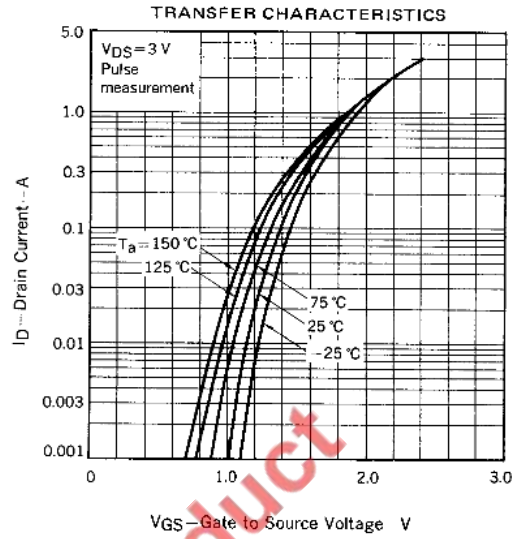
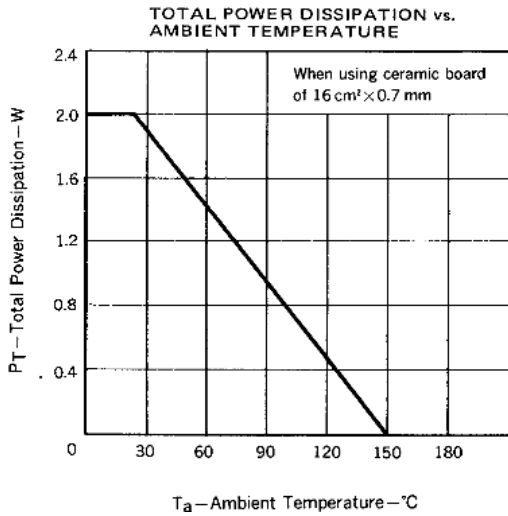
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V			1.0	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±16 V, V <sub>DS</sub> = 0 V			±5.0	μA
Gate Cut-off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 5.0 V, I <sub>D</sub> = 1.0 mA	0.8	1.0	1.6	V
Forward Transfer Admittance <b>Note</b>	y <sub>fs</sub>	V <sub>DS</sub> = 3.0 V, I <sub>D</sub> = 1.0 A	0.4	3.0		S
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> = 1.0 A		0.25	0.5	Ω
	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 4.0 V, I <sub>D</sub> = 1.5 A		0.17	0.3	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 3.0 V		240		pF
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> = 0 V		250		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	f = 1 MHz		60		pF
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 3.0 V, I <sub>D</sub> = 1.5 A		140		ns
Rise Time	t <sub>r</sub>	V <sub>GS</sub> = 3 V		650		ns
Turn-off Delay Time	t <sub>d(off)</sub>	R <sub>G</sub> = 10 Ω		120		ns
Fall Time	t <sub>f</sub>			160		ns

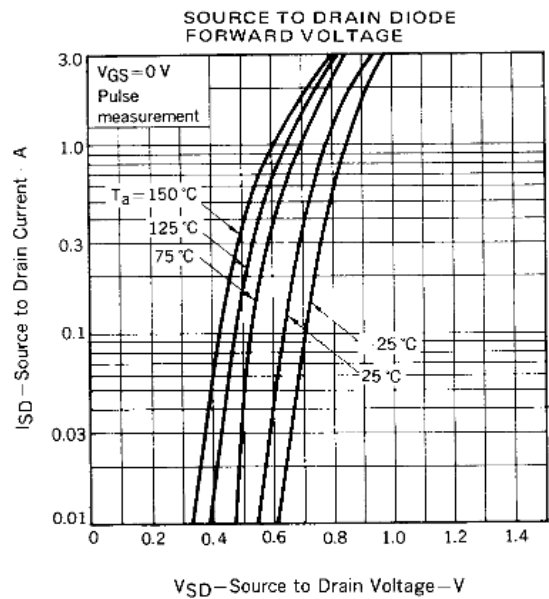
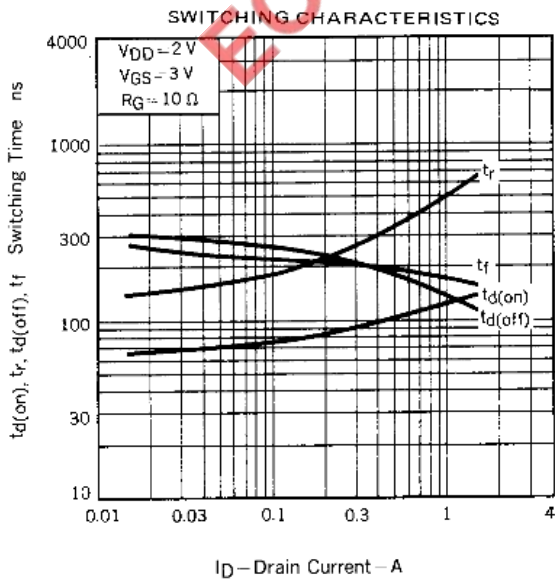
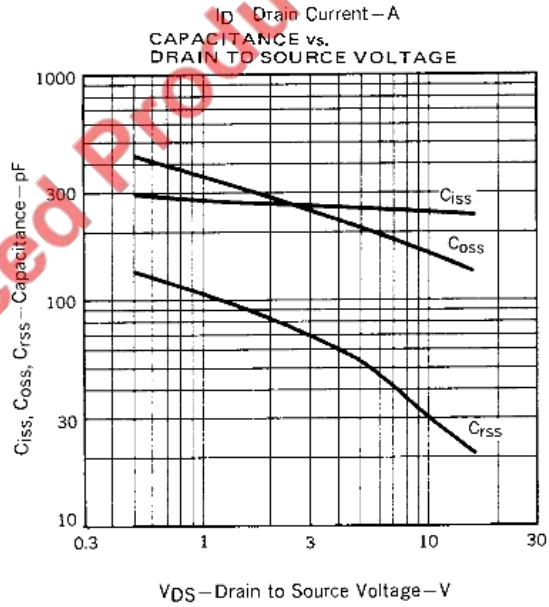
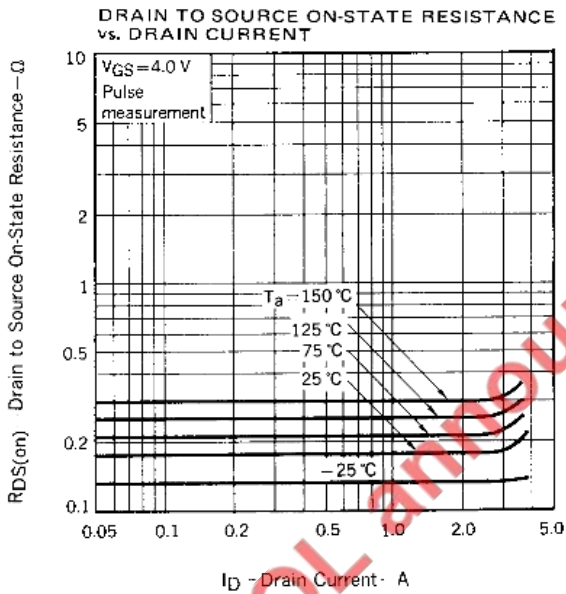
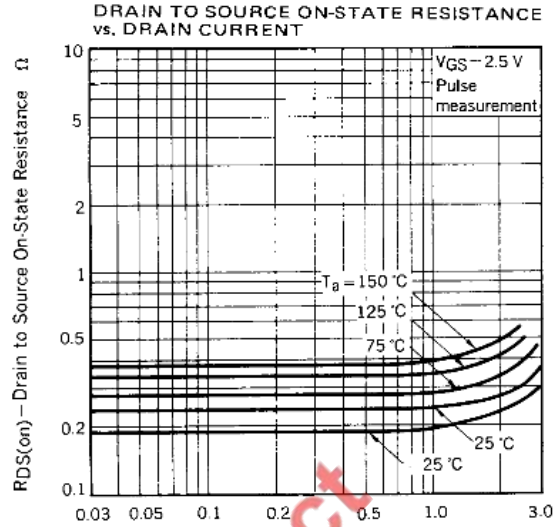
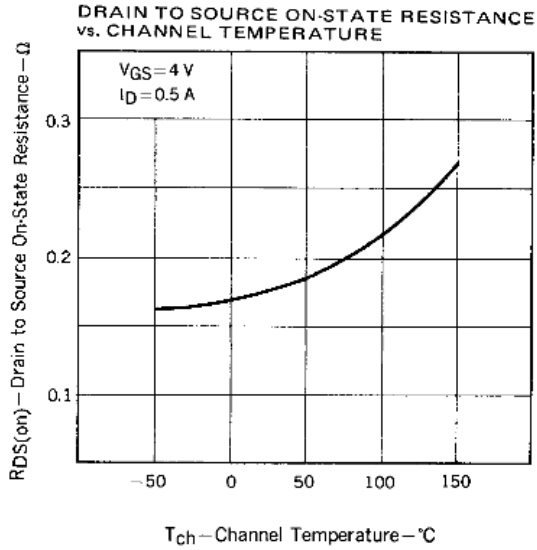
**Note** Pulsed

**TEST CIRCUIT SWITCHING TIME**



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





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