Old Company Name in Catalogs and Other Documents

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

April 1st, 2010 Renesas Electronics Corporation

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

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DATA SHEET



HETERO JUNCTION FIELD EFFECT TRANSISTOR

NE3511S02

X TO Ku BAND SUPER LOW NOISE AMPLIFIER N-CHANNEL HJ-FET

FEATURES

- Super low noise figure and high associated gain
 NF = 0.30 dB TYP., Ga = 13.5 dB TYP. @ f = 12 GHz
- · Micro-X plastic (S02) package

APPLICATIONS

- · X to Ku-band DBS LNB
- · Other X to Ku-band communication systems

ORDERING INFORMATION

Part Number	Order Number	Package	Quantity	Marking	Supplying Form
NE3511S02-T1C	NE3511S02-T1C-A	S02 (Pb-Free)	2 kpcs/reel	В	• 8 mm wide embossed taping
NE3511S02-T1D	NE3511S02-T1D-A		10 kpcs/reel		Pin 4 (Gate) faces the perforation side of the tape

Remark To order evaluation samples, contact your nearby sales office.

Part number for sample order: NE3511S02

ABSOLUTE MAXIMUM RATINGS ($T_A = +25^{\circ}C$)

Parameter	Symbol	Ratings	Unit
Drain to Source Voltage	V _{DS}	4	V
Gate to Source Voltage	V _{GS}	-3	V
Drain Current	ΙD	loss	mA
Gate Current	lg	100	μΑ
Total Power Dissipation	Ptot Note	165	mW
Channel Temperature	Tch	+125	°C
Storage Temperature	T _{stg}	-65 to +125	°C

Note Mounted on 1.08 cm² × 1.0 mm (t) glass epoxy PCB

Caution Observe precautions when handling because these devices are sensitive to electrostatic discharge.

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RECOMMENDED OPERATING CONDITIONS ($T_A = +25$ °C)

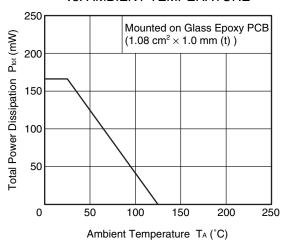
Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Drain to Source Voltage	VDS	1	2	3	V
Drain Current	ΙD	5	10	20	mA
Input Power	Pin	_	_	0	dBm

ELECTRICAL CHARACTERISTICS (T_A = +25°C, unless otherwise specified)

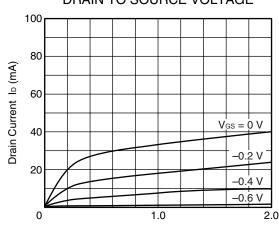
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Gate to Source Leak Current	Igso	V _G S = -3 V	1	0.5	10	μΑ
Saturated Drain Current	IDSS	V _{DS} = 2 V, V _{GS} = 0 V	20	40	70	mA
Gate to Source Cutoff Voltage	VGS (off)	$V_{DS} = 2 \text{ V}, I_{D} = 100 \ \mu\text{A}$	-0.2	-0.7	-1.7	V
Transconductance	gm	V _{DS} = 2 V, I _D = 10 mA	50	65	-	mS
Noise Figure	NF	V _{DS} = 2 V, I _D = 10 mA, f = 12 GHz	_	0.30	0.45	dB
Associated Gain	Ga		12.5	13.5	-	dB

TYPICAL CHARACTERISTICS (TA = +25°C, unless otherwise specified)

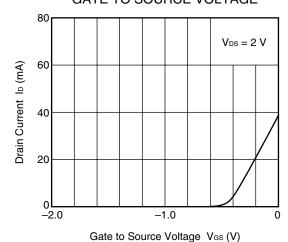
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE

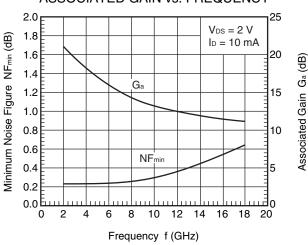


DRAIN CURRENT vs. GATE TO SOURCE VOLTAGE

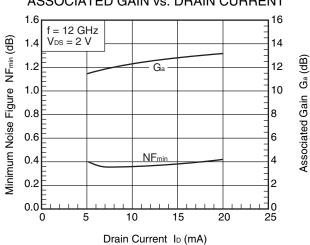


Drain to Source Voltage VDS (V)

MINIMUM NOISE FIGURE, ASSOCIATED GAIN vs. FREQUENCY



MINIMUM NOISE FIGURE, ASSOCIATED GAIN vs. DRAIN CURRENT



Remark The graphs indicate nominal characteristics.

NEC NE3511S02

S-PARAMETERS

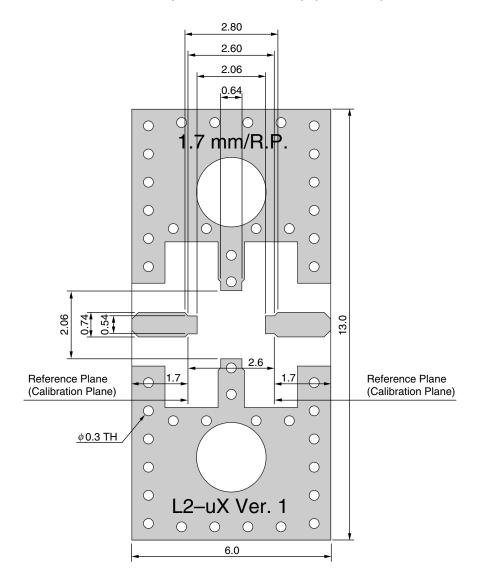
S-parameters/Noise parameters are provided on our web site in a form (S2P) that enables direct import to a microwave circuit simulator without keyboard input.

Click here to download S-parameters.

 $[\mathsf{RF} \ \mathsf{and} \ \mathsf{Microwave}] \to [\mathsf{Device} \ \mathsf{Parameters}]$

URL http://www.ncsd.necel.com/microwave/index.html

RF MEASURING LAYOUT PATTERN (REFERENCE ONLY) (UNIT: mm)



RT/duroid 5880/ROGERS

t = 0.254 mm

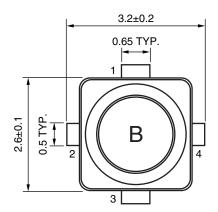
 $\varepsilon r = 2.20$

tan delta = 0.0009 @ 10 GHz

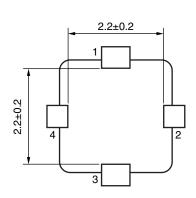
PACKAGE DIMENSIONS

S02 (UNIT: mm)

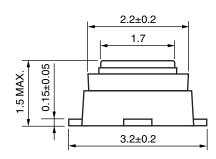
(Top View)



(Bottom View)



(Side View)



PIN CONNECTIONS

- 1. Source
- 2. Drain
- 3. Source
- 4. Gate



RECOMMENDED SOLDERING CONDITIONS

This product should be soldered and mounted under the following recommended conditions. For soldering methods and conditions other than those recommended below, contact your nearby sales office.

Soldering Method	Soldering Conditions	Condition Symbol	
Infrared Reflow	Peak temperature (package surface temperature) Time at peak temperature Time at temperature of 220°C or higher Preheating time at 120 to 180°C Maximum number of reflow processes Maximum chlorine content of rosin flux (% mass)	: 260°C or below : 10 seconds or less : 60 seconds or less : 120±30 seconds : 3 times : 0.2%(Wt.) or below	IR260
Partial Heating	Peak temperature (terminal temperature) Soldering time (per side of device) Maximum chlorine content of rosin flux (% mass)	: 350°C or below : 3 seconds or less : 0.2%(Wt.) or below	HS350

Data Sheet PG10642EJ01V0DS

Caution Do not use different soldering methods together (except for partial heating).

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M8E 02.11-1

NEC NE3511S02

Caution

GaAs Products

This product uses gallium arsenide (GaAs).

GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points.

- Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below.
 - Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials.
- 2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal.
- Do not burn, destroy, cut, crush, or chemically dissolve the product.
- Do not lick the product or in any way allow it to enter the mouth.

▶For further information, please contact

NEC Compound Semiconductor Devices Hong Kong Limited

E-mail: contact@ncsd-hk.necel.com

Hong Kong Head Office TEL: +852-3107-7303 FAX: +852-3107-7309
Taipei Branch Office TEL: +886-2-8712-0478 FAX: +886-2-2545-3859
Korea Branch Office TEL: +82-2-558-2120 FAX: +82-2-558-5209

NEC Electronics (Europe) GmbH http://www.eu.necel.com/

TEL: +49-211-6503-0 FAX: +49-211-6503-1327

California Eastern Laboratories, Inc. http://www.cel.com/

TEL: +1-408-988-3500 FAX: +1-408-988-0279

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