

# HETERO JUNCTION FIELD EFFECT TRANSISTOR **NE3515S02**

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

#### FEATURES

- Super low noise figure, high associated gain and middle output power
  - NF = 0.3 dB TYP.,  $G_a$  = 12.5 dB TYP. @ f = 12 GHz,  $V_{DS}$  = 2 V,  $I_D$  = 10 mA
  - Po (1dB) = +14 dBm TYP. @ f = 12 GHz, VDS = 3 V, ID = 25 mA set (Non-RF)
- Micro-X plastic (S02) package

#### **APPLICATIONS**

- X to Ku-band local buffer amplifier, PA driver amplifier, low noise amplifier, mixer
- DBS LNB, VSAT
- · Other X to Ku-band communication systems

#### ORDERING INFORMATION

Part Number	Order Number	Package	Quantity	Marking	Supplying Form
NE3515S02-T1C	NE3515S02-T1C-A	S02 (Pb-Free)	2 kpcs/reel	G	8 mm wide embossed taping
NE3515S02-T1D	NE3515S02-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: NE3515S02-A

#### ABSOLUTE MAXIMUM RATINGS (TA = +25°C)

Parameter	Symbol	Ratings	Unit
Drain to Source Voltage	Vds	4	V
Gate to Source Voltage	Vgs	-3	V
Drain Current	lь	loss	mA
Gate Current	lg	100	μA
Total Power Dissipation	Ptot Note	165	mW
Channel Temperature	Tch	+125	°C
Storage Temperature	Tstg	-65 to +125	°C

Note Mounted on 1.08  $\text{cm}^2 \times 1.0 \text{ mm}$  (t) glass epoxy PCB

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

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.

#### **RECOMMENDED OPERATING CONDITIONS (TA = +25°C)**

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Drain to Source Voltage	Vds	1	2	3	V
Drain Current	lo	5	10	25	mA
Input Power	Pin	-	-	0	dBm

#### ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = +25°C, unless otherwise specified)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Gate to Source Leak Current	lgso	$V_{GS} = -3 V$	I	0.5	10	μA
Saturated Drain Current	IDSS	$V_{DS} = 2 V, V_{GS} = 0 V$	32	60	88	mA
Gate to Source Cutoff Voltage	VGS (off)	$V_{DS} = 2 V, I_{D} = 100 \mu A$	-0.2	-0.8	-1.4	V
Transconductance	gm	Vps = 2 V, lp = 10 mA	45	70	I	mS
Noise Figure	NF	Vbs = 2 V, lb = 10 mA, f = 12 GHz	I	0.3	0.5	dB
Associated Gain	Ga		11	12.5	I	dB
Gain 1 dB Compression	Po (1 dB)	Vps = 3 V, Ip = 25 mA set (Non-RF),	_	+14	_	dBm
Output Power		f = 12 GHz				





**Remark** The graphs indicate nominal characteristics.

16

14

12

10

4

Ga (dB)

Associated Gain



Remark The graphs indicate nominal characteristics.

#### **S-PARAMETERS**

- S-parameters and noise parameters are provided on our Web site in a format (S2P) that enables the direct import of the parameters to microwave circuit simulators without the need for keyboard inputs.
- Click here to download S-parameters.
- [RF and Microwave] ® [Device Parameters]
- · URL http://www.necel.com/microwave/en/

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



RT/duroid 5880/ROGERS t = 0.254 mm εr = 2.20 tan delta = 0.0009 @10 GHz

#### PACKAGE DIMENSIONS

#### S02 (UNIT: mm)



(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

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

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.
	<ul> <li>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.</li> </ul>
	<ol> <li>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.</li> </ol>
	<ol><li>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.</li></ol>
	• 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.

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