HETERO JUNCTION FIELD EFFECT TRANSISTOR

NE350184C

K-BAND SUPER LOW NOISE AMPLIFIER
N-CHANNEL HJ-FET

FEATURES

- Super low noise figure and high associated gain
  NF = 0.7 dB TYP., G_a = 13.5 dB TYP. @ f = 20 GHz
- Micro-X ceramic (84C) package

APPLICATIONS

- 20 GHz-band DBS LNB
- Other K-band communication systems

ORDERING INFORMATION

Part Number	Order Number	Package	Quantity	Marking	Supplying Form
NE350184C-T1	NE350184C-T1-A	84C (Pb-Free)	1 kpcs/reel	A	• 12 mm wide embossed taping • Pin 4 (Gate) faces the perforation side of the tape
NE350184C-T1A	NE350184C-T1A-A		5 kpcs/reel		

Remark To order evaluation samples, contact your nearby sales office.
Part number for sample order: NE350184C

ABSOLUTE MAXIMUM RATINGS (T_A = +25°C)

Parameter	Symbol	Ratings	Unit
Drain to Source Voltage	V_{DS}	4	V
Gate to Source Voltage	V_{GS}	–3	V
Drain Current	I_D	I_{DSS}	mA
Gate Current	I_G	80	μA
Total Power Dissipation	P_{tot} Note	165	mW
Channel Temperature	T_{ch}	+150	°C
Storage Temperature	T_{stg}	–65 to +150	°C

Note Mounted on 1.08 cm^2 × 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)

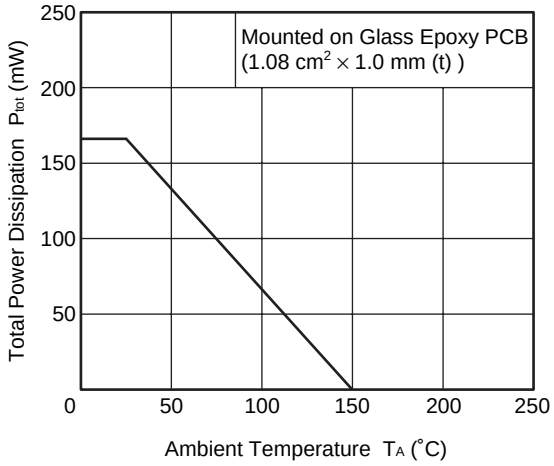
Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Drain to Source Voltage	V_{DS}	1	2	3	V
Drain Current	I_D	5	10	15	mA
Input Power	P_{in}	–	–	0	dBm

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

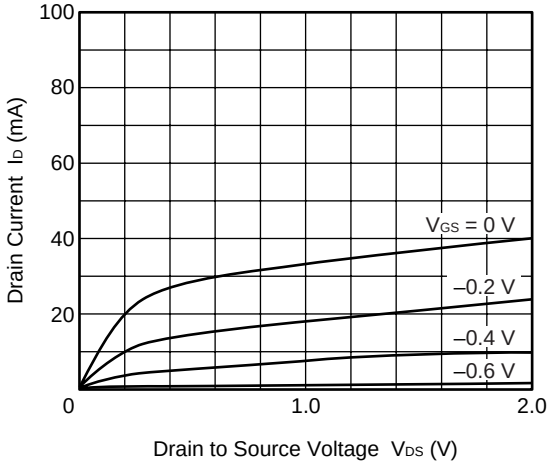
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Gate to Source Leak Current	I_{GSO}	V_{GS} = –3 V	–	–	10	μA
Saturated Drain Current	I_{DSS}	V_{DS} = 2 V, V_{GS} = 0 V	15	–	70	mA
Gate to Source Cutoff Voltage	$V_{GS(off)}$	V_{DS} = 2 V, I_D = 100 μA	–0.2	–	–2.0	V
Transconductance	g_m	V_{DS} = 2 V, I_D = 10 mA	40	–	–	mS
Noise Figure	NF	V_{DS} = 2 V, I_D = 10 mA, f = 20 GHz	–	0.7	1.0	dB
Associated Gain	G_a		11	13.5	–	dB

TYPICAL CHARACTERISTICS (T_A = +25°C)

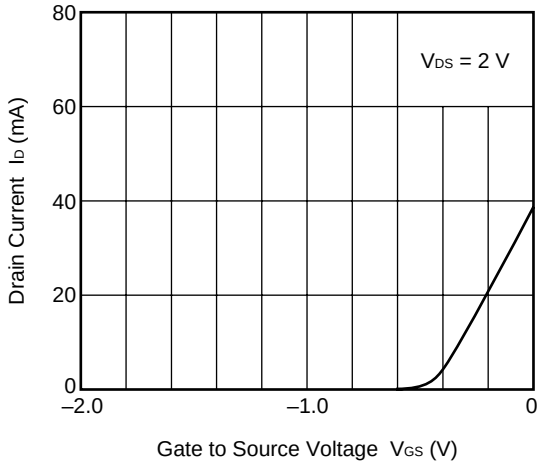
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



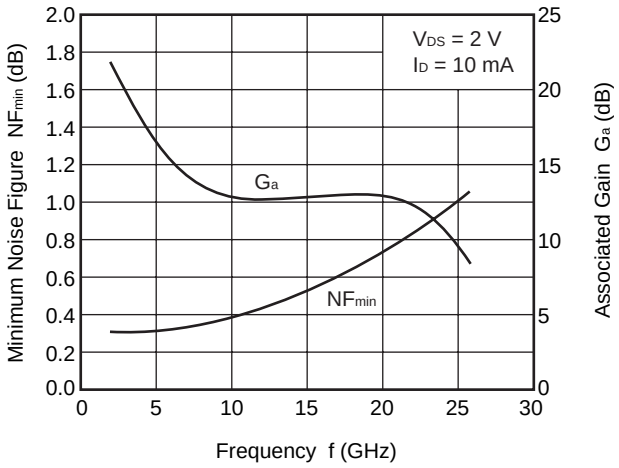
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



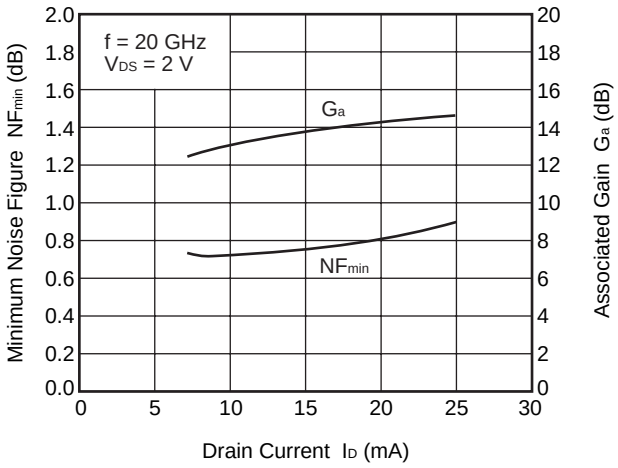
DRAIN CURRENT vs. GATE TO SOURCE VOLTAGE



MINIMUM NOISE FIGURE, ASSOCIATED GAIN vs. FREQUENCY



MINIMUM NOISE FIGURE, ASSOCIATED GAIN vs. DRAIN CURRENT



Remark The graphs indicate nominal characteristics.

S-PARAMETERS

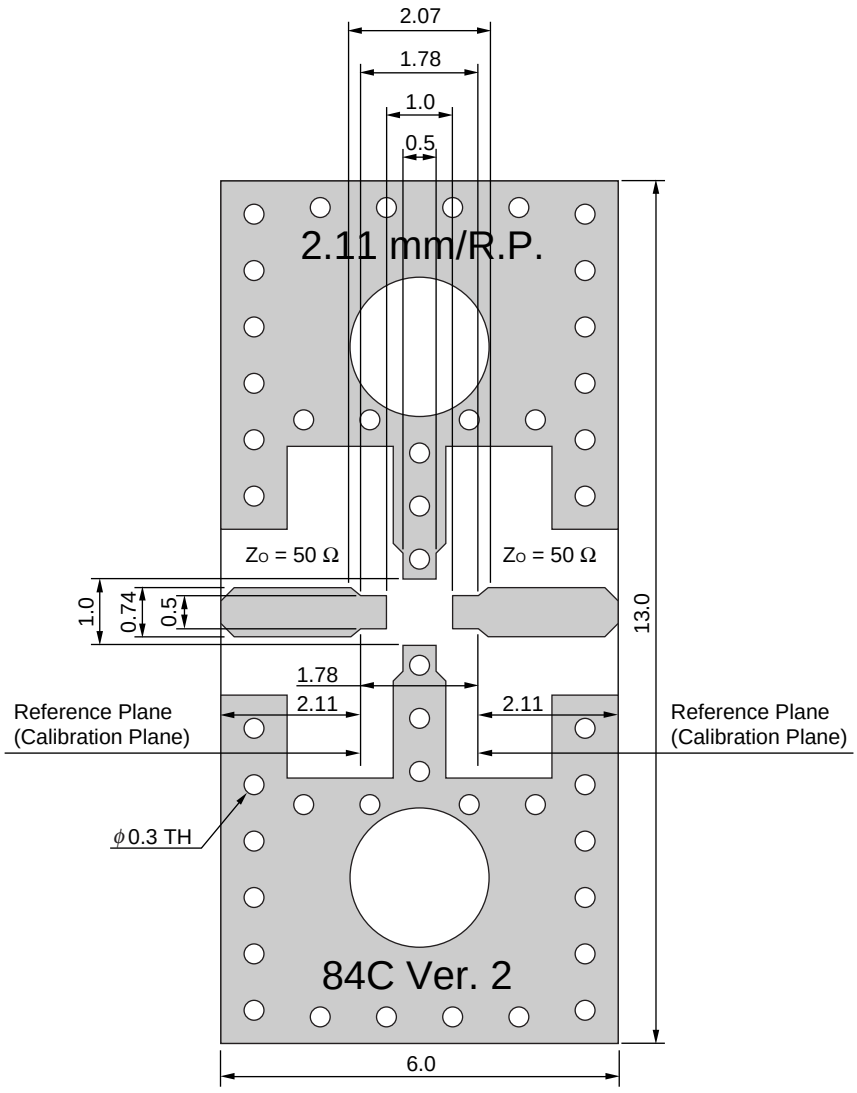
S-parameters/Noise parameters are provided on the NEC Compound Semiconductor Devices Web site in a form (S2P) that enables direct import to a microwave circuit simulator without keyboard input.

Click here to download S-parameters.

[RF and Microwave] → [Device Parameters]

URL http://www.ncsd.necel.com/

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



RT/duroid 5880/ROGERS

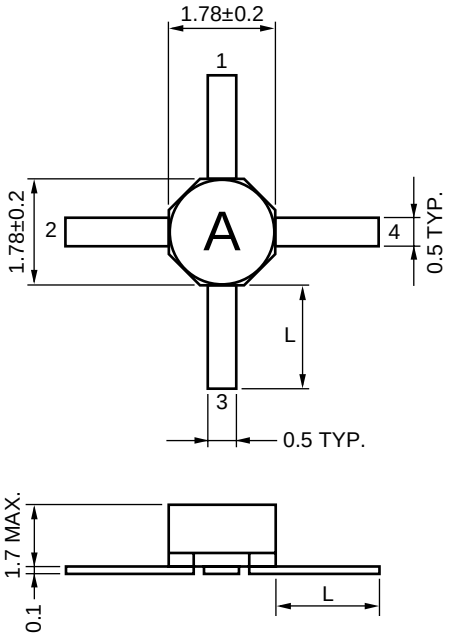
t = 0.254 mm

εr = 2.20

tan delta = 0.0009 @10 GHz

PACKAGE DIMENSIONS

84C (UNIT: mm)



L = 1.0±0.2 (All leads)

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).

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Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL's understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
Lead (Pb)	< 1000 PPM	-A	-AZ
		Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.