

To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

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

April 1st, 2010
Renesas Electronics Corporation

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

Send any inquiries to <http://www.renesas.com/inquiry>.

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HETERO JUNCTION FIELD EFFECT TRANSISTOR

Phase-out/Discontinued

NE4211M01

**C to Ku BAND SUPER LOW NOISE AMPLIFIER
N-CHANNEL HJ-FET**

FEATURES

- Super low noise figure & associated gain:
 $NF = 0.75$ TYP., $G_a = 12$ dB TYP. @ $f = 12$ GHz
 $NF = 0.4$ TYP., $G_a = 16$ dB TYP. @ $f = 4$ GHz
- 6-pin super minimold package
- Gate width: $W_g = 160 \mu m$

ORDERING INFORMATION

Part Number	Package	Marking	Supplying Form
NE4211M01-T1	6-pin super minimold	V74	<ul style="list-style-type: none"> • 8 mm wide embossed taping • Pin 1, 2, 3 face the perforation side of the tape • Qty 3 kpcs/reel

Remark To order evaluation samples, contact your nearby sales office.
 Part number for sample order: NE4211M01

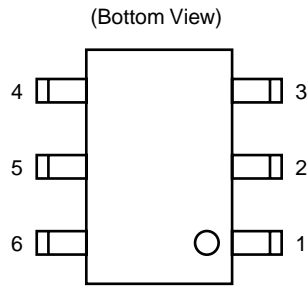
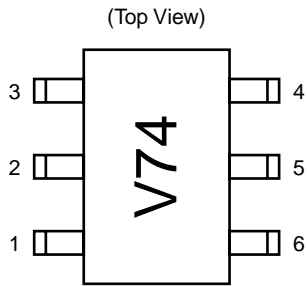
ABSOLUTE MAXIMUM RATINGS (T_A = +25°C)

Parameter	Symbol	Ratings	Unit
Drain to Source Voltage	V _{DS}	4.0	V
Gate to Source Voltage	V _{GS}	-3.0	V
Drain Current	I _D	I _{DSS}	mA
Gate Current	I _G	80	μA
Total Power Dissipation	P _{tot}	125	mW
Channel Temperature	T _{ch}	+125	°C
Storage Temperature	T _{stg}	-65 to +125	°C

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

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 Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

PIN CONNECTIONS



Pin No.	Pin Name
1	Gate
2	Source
3	Source
4	Drain
5	Source
6	Source

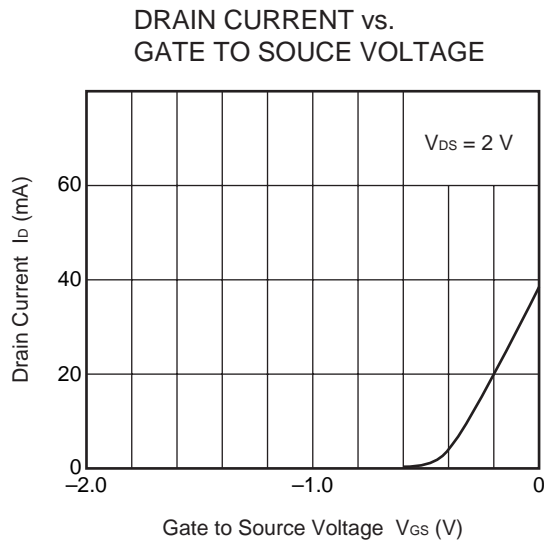
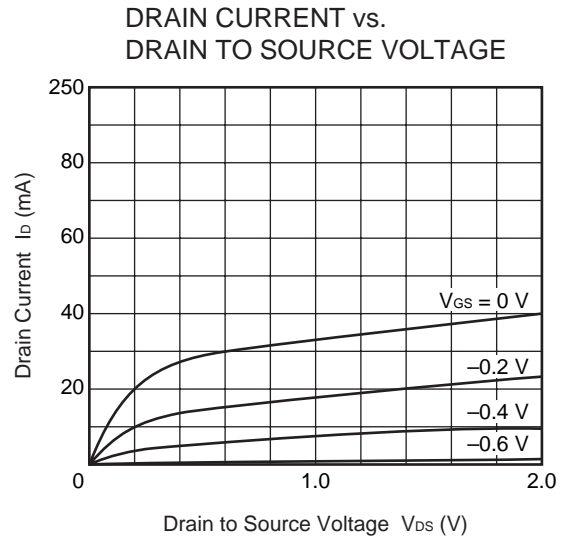
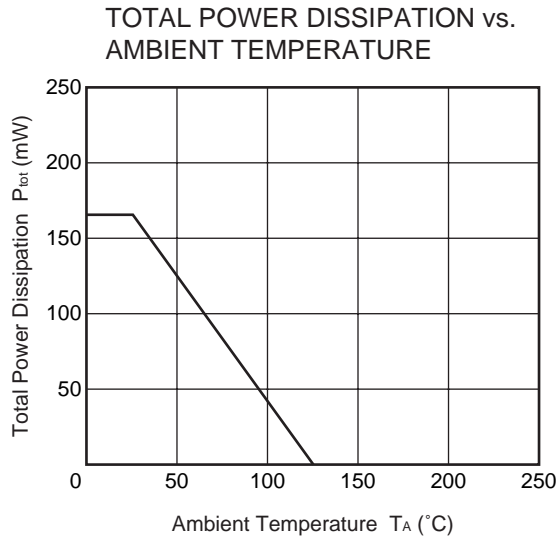
RECOMMENDED OPERATING RANGE (T_A = +25°C)

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, unless otherwise specified)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Gate to Source Leak Current	I _{GSO}	V _{GS} = -3 V	-	0.5	10	μA
Saturated Drain Current	I _{DSS}	V _{DS} = 2 V, V _{GS} = 0 V	15	40	70	mA
Gate to Source Cutoff Voltage	V _{GS(off)}	V _{DS} = 2 V, I _D = 100 μA	-0.2	-0.7	-2.0	V
Trans Conductance	g _m	V _{DS} = 2 V, I _D = 10 mA	40	55	-	mS
Noise Figure	NF	V _{DS} = 2 V, I _D = 10 mA, f = 12 GHz	-	0.75	1.1	dB
Associated Gain	G _a		10	12	-	dB
Noise Figure	NF	V _{DS} = 2 V, I _D = 10 mA, f = 4 GHz	-	0.4	-	dB
Associated Gain	G _a		-	16	-	dB

TYPICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, unless otherwise specified)



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.

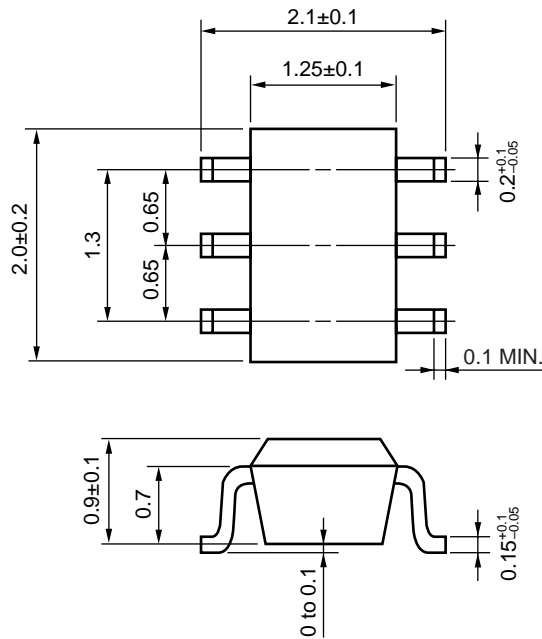
Click here to download S-parameters.

[RF and Microwave] → [Device Parameters]

URL <http://www.csd-nec.com/>

PACKAGE DIMENSIONS

6-PIN SUPER MINIMOLD (UNIT: mm)



PRECAUTION

- (1) Because this device is a HJ-FET with a Schottky barrier gate structure, it is necessary that sufficient care be taken regarding static electricity and strong electric fields.
Take measures against static electricity and make sure the body is earthed when mounting the device.
- (2) Follow the procedure below when operating the device by a gate-and-drain-independent dual power supply.
Directly ground both the source pins.
Fix V_{GS} to approximately -2 V.
Increase V_{DS} to a predetermined voltage level (within the recommended operation range of V_{DS}).
Adjust V_{GS} in line with a predetermined I_D .
- (3) It is recommended that the bias application circuit be able to have a fixed voltage and current.
- (4) Adjust the I/O matching circuit after turning the bias OFF.

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) : 260°C or below Time at peak temperature : 10 seconds or less Time at temperature of 220°C or higher : 60 seconds or less Preheating time at 120 to 180°C : 120±30 seconds Maximum number of reflow processes : 3 times Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	IR260
VPS	Peak temperature (package surface temperature) : 215°C or below Time at temperature of 200°C or higher : 25 to 40 seconds Preheating time at 120 to 150°C : 30 to 60 seconds Maximum number of reflow processes : 3 times Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	VP215
Wave Soldering	Peak temperature (molten solder temperature) : 260°C or below Time at peak temperature : 10 seconds or less Preheating temperature (package surface temperature) : 120°C or below Maximum number of flow processes : 1 time Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	WS260
Partial Heating	Peak temperature (pin temperature) : 350°C or below Soldering time (per side of device) : 3 seconds or less Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	HS350

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

- **The information in this document is current as of January, 2003. The information is subject to change without notice. For actual design-in, refer to the latest publications of NEC's data sheets or data books, etc., for the most up-to-date specifications of NEC semiconductor products. Not all products and/or types are available in every country. Please check with an NEC sales representative for availability and additional information.**
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 "Standard": Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots
 "Special": Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)
 "Specific": Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems and medical equipment for life support, etc.
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M8E 00.4-0110

SAFETY INFORMATION ON THIS PRODUCT

<p>Caution</p>	<p>GaAs Products</p>	<p>The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled or ingested.</p> <ul style="list-style-type: none"> • Do not destroy or burn the product. • Do not cut or cleave off any part of the product. • Do not crush or chemically dissolve the product. • Do not put the product in the mouth. <p>Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.</p>
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► **Business issue**

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► **Technical issue**

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