

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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## 1 W L-BAND POWER GaAs MES FET

### DESCRIPTION

The NE6500179A is a 1 W GaAs MES FET designed for middle power transmitter applications for mobile communication handset and base station systems. It is capable of delivering 1 W of output power (CW) with high linear gain, high efficiency and excellent distortion.

Reliability and performance uniformity are assured by NEC's stringent quality and control procedures.

### FEATURES

- High output power:  $P_{O(1\text{ dB})} = 30.0\text{ dBm TYP.}$
- High linear gain:  $G_L = 12.0\text{ dB TYP.}$
- High power added efficiency:  $\eta_{\text{add}} = 50\% \text{ TYP. @ } V_{\text{DS}} = 6.0\text{ V, } I_{\text{Dset}} = 200\text{ mA, } f = 1.9\text{ GHz}$

### ORDERING INFORMATION

Part Number	Package	Supplying Form
NE6500179A-T1	79A	<ul style="list-style-type: none"> <li>• 12 mm wide embossed taping</li> <li>• Qty 1 kpcs/reel</li> </ul>

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

Part number for sample order: NE6500179A

**Caution** Please handle this device at static-free workstation, because this is an electrostatic sensitive device.

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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.

**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = +25 °C)**

Operation in excess of any one of these parameters may result in permanent damage.

Parameter	Symbol	Ratings	Unit
Drain to Source Voltage	V <sub>DS</sub>	15	V
Gate to Source Voltage	V <sub>GSO</sub>	-7	V
Drain Current	I <sub>D</sub>	2.5	A
Gate Forward Current	I <sub>GF</sub>	20	mA
Gate Reverse Current	I <sub>GR</sub>	20	mA
Total Power Dissipation	P <sub>tot</sub>	7	W
Channel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-65 to +150	°C

**RECOMMENDED OPERATING CONDITIONS**

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Drain to Source Voltage	V <sub>DS</sub>		-	6.0	6.0	V
Gain Compression	G <sub>comp</sub>		-	-	3.0	dB
Channel Temperature	T <sub>ch</sub>		-	-	+125	°C

**ELECTRICAL CHARACTERISTICS**

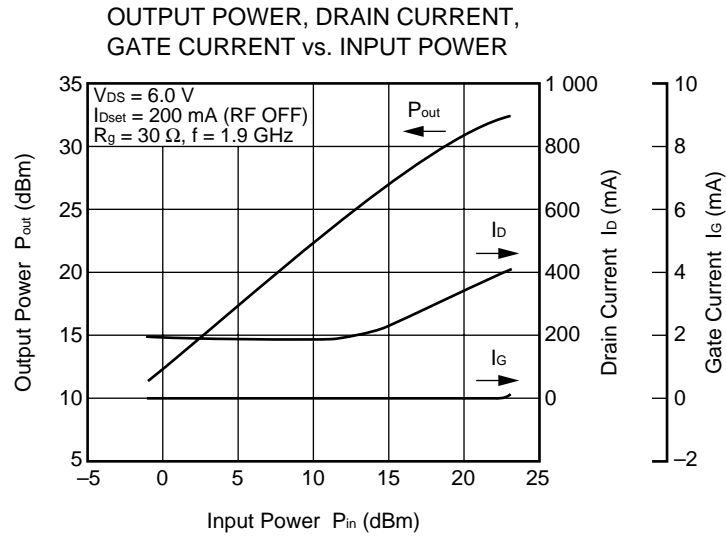
(T<sub>A</sub> = +25 °C, unless otherwise specified, using NEC standard test fixture.)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Saturated Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 2.5 V, V <sub>GS</sub> = 0 V	-	1.8	-	A
Pinch-off Voltage	V <sub>p</sub>	V <sub>DS</sub> = 2.5 V, I <sub>D</sub> = 10 mA	-3.6	-	-1.6	V
Gate to Drain Break Down Voltage	BV <sub>gd</sub>	I <sub>gd</sub> = 10 mA	15	-	-	V
★ Thermal Resistance	R <sub>th</sub>	Channel to Case	-	15	18	°C/W
Gain 1 dB Compression Output Power	P <sub>O (1 dB)</sub>	f = 1.9 GHz, V <sub>DS</sub> = 6.0 V,	-	30.0	-	dBm
Drain Current	I <sub>D</sub>	R <sub>g</sub> = 30 Ω, I <sub>Dset</sub> = 200 mA (RF OFF)	-	340	-	mA
Power Added Efficiency	η <sub>add</sub>	<b>Note 2</b>	-	50	-	%
Linear Gain <sup>Note 1</sup>	G <sub>L</sub>		11.0	12.0	-	dB

**Notes 1.** P<sub>in</sub> = 0 dBm

**2.** DC performance is 100 % testing. RF performance is testing several samples per wafer.  
Wafer rejection criteria for standard devices is 1 reject for several samples.

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



**Remark** The graph indicates nominal characteristics.

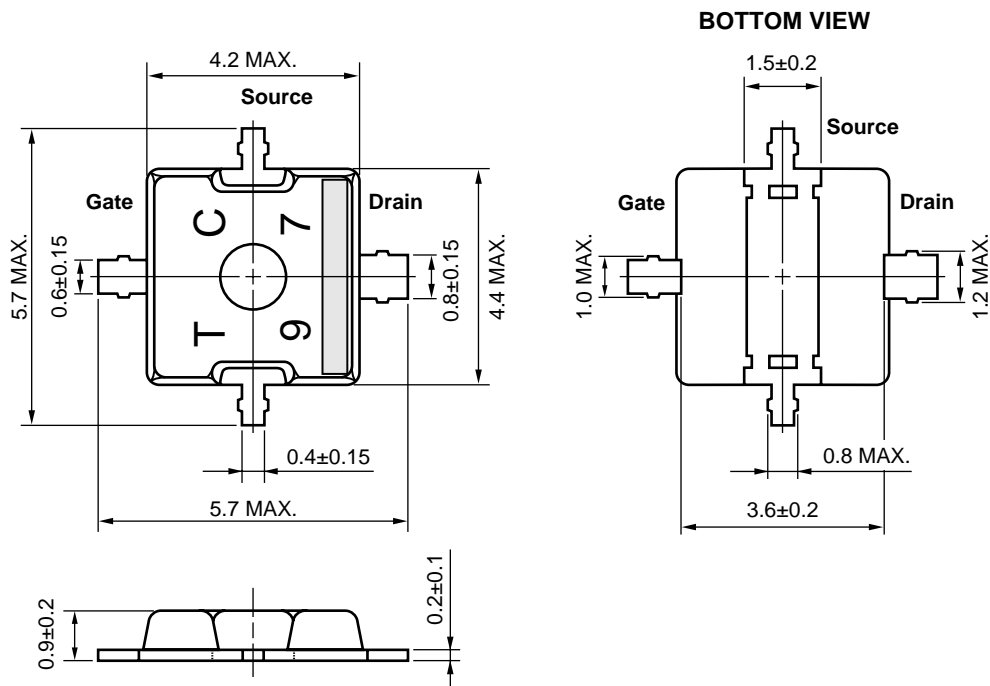
**S-PARAMETERS**

Test Conditions:  $V_{DS} = 6.0\text{ V}$ ,  $I_{Dset} = 200\text{ mA}$  (RF OFF)

Frequency MHz	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)
500	0.895	-145.1	6.305	96.12	0.037	18.49	0.595	-172.3
600	0.890	-152.4	5.356	91.79	0.037	15.64	0.601	-175.2
700	0.886	-158.2	4.684	87.59	0.038	13.66	0.607	-177.3
800	0.884	-163.0	4.157	84.18	0.038	11.83	0.608	-179.2
900	0.881	-167.0	3.708	81.06	0.039	10.32	0.609	178.9
1000	0.879	-170.4	3.381	78.08	0.039	9.36	0.610	177.3
1100	0.879	-173.4	3.105	75.16	0.039	8.22	0.609	175.8
1200	0.879	-176.4	2.880	72.51	0.040	6.99	0.609	174.3
1300	0.877	-179.1	2.681	69.60	0.040	5.95	0.607	172.7
1400	0.876	178.3	2.518	66.85	0.041	5.24	0.607	171.1
1500	0.876	175.7	2.368	64.05	0.041	4.31	0.606	169.4
1600	0.876	173.0	2.237	61.40	0.041	3.11	0.606	167.9
1700	0.877	170.4	2.122	58.60	0.042	1.97	0.604	166.2
1800	0.875	167.7	2.021	55.76	0.042	1.23	0.603	164.6
1900	0.876	165.0	1.927	52.81	0.043	0.05	0.601	162.7
2000	0.875	162.5	1.842	49.91	0.042	-0.66	0.600	160.6
2100	0.876	159.9	1.765	47.10	0.043	-2.19	0.600	158.5
2200	0.875	157.2	1.691	44.16	0.043	-3.00	0.600	156.4
2300	0.875	154.6	1.620	41.13	0.043	-4.19	0.600	154.3
2400	0.875	151.9	1.552	38.07	0.043	-5.43	0.601	152.0
2500	0.876	149.3	1.489	35.13	0.043	-6.55	0.603	149.7
2600	0.876	146.7	1.429	32.08	0.043	-8.05	0.603	147.3
2700	0.877	144.0	1.366	29.08	0.043	-9.20	0.606	144.9
2800	0.876	141.6	1.305	26.27	0.043	-10.15	0.610	142.6
2900	0.875	139.5	1.247	23.72	0.042	-11.98	0.613	140.7
3000	0.880	137.1	1.203	20.91	0.042	-12.74	0.620	138.2

PACKAGE DIMENSIONS

79A (UNIT: mm)



**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	Recommended Condition Symbol
Infrared Reflow	Package peak temperature: 235 °C or below, Time: 30 seconds or less (at 210 °C or higher), Count: 2 times or less, Exposure: limit: None <sup>Note</sup>	IR35-00-2
Partial Heating	Pin temperature: 260 °C or below, Time: 5 seconds or less (per pin row) Exposure: limit: None <sup>Note</sup>	–

**Note** After opening the dry pack, store it at 25 °C or less and 65 % RH or less for the allowable storage period.

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



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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

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

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## ►Technical issue

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