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)

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RENESAS

GaAs MES FET

NE6500278

2.0 W L-BAND, S-BAND POWER GaAs FET
N-CHANNEL GaAs MES FET

DESCRIPTION

The NE6500278 is a power GaAs FET which provides high gain, high efficiency and high output power in L band and S band.

FEATURES

- Class AB operation
- High output power: 35.5 dBm (TYP.)
- High Linear Gain: 9.0 dB (TYP.)
- High power added efficiency: 50 % (TYP.)
- Plastic mold package

ORDERING INFORMATION

PART NUMBER	QUANTITY	PACKING STYLE
NE6500278-E3	100 pcs to 1000 pcs	Embossed taping 12 mm wide. Pin 4 (Gate) face to perforation side of the tape
NE6500278	MAX 100 pcs	Anti-static bag

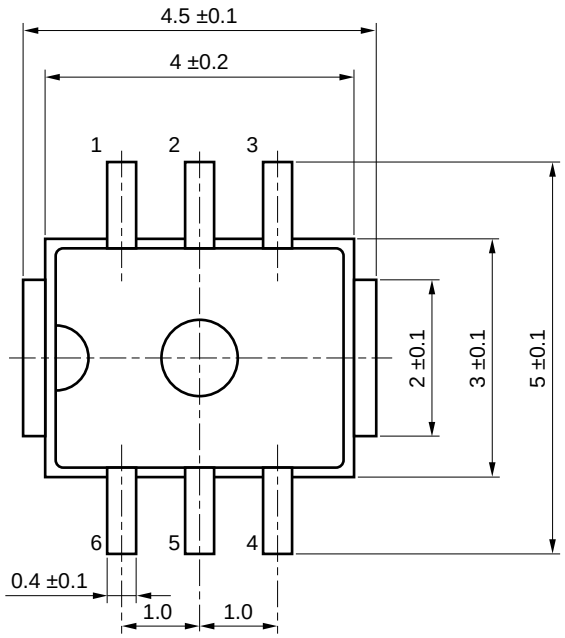
ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

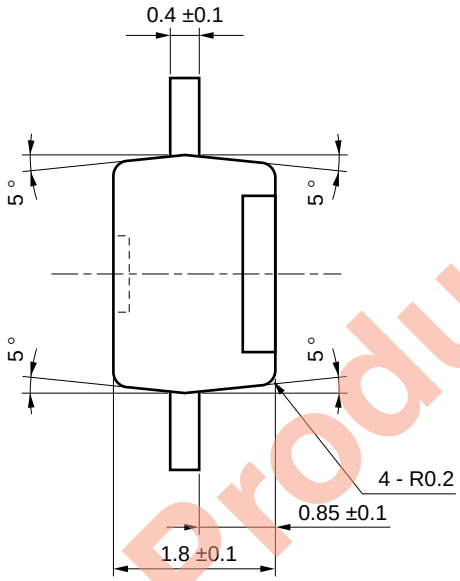
Drain to Source Voltage	V_{DS}	15	V
Gate to Source Voltage	V_{GS}	–7.0	V
Drain Current	I_D	10	A
Gate Forward Current	I_{GF}	20	mA
Gate Reverse Current	I_{GR}	20	mA
Total Power Dissipation	P_T	25	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C

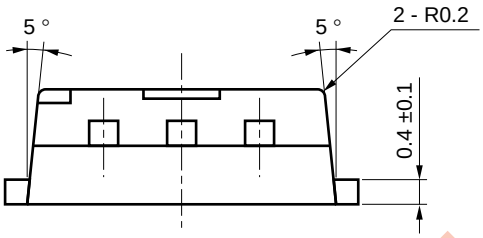
Caution Please handle this device at static-free workstation, because this is an electrostatic sensitive device.

Document No. P12232EJ1V0DS00 (1st edition)
Date Published January 1997 N
Printed in Japan

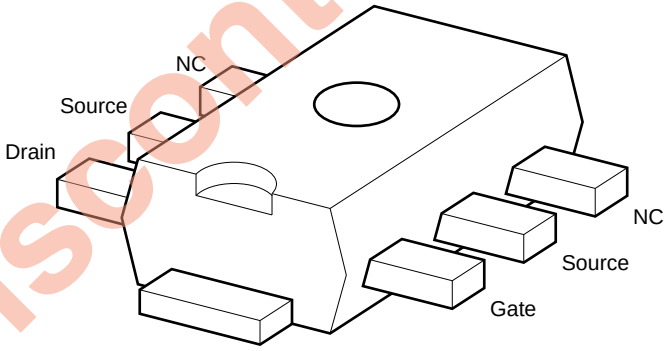
PACKAGE DIMENSIONS (Unit: mm)







1. Drain
2. Source
3. NC
4. NC
5. Source
6. Gate



MAXIMUM OPERATION RANGE

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Drain to Source Voltage	V_{DS}	–	6.0	6.0	V
Channel Temperature	T_{ch}	–	–	125	°C
Input Power	G_{comp}	–	–	3.5	dB_{comp}

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

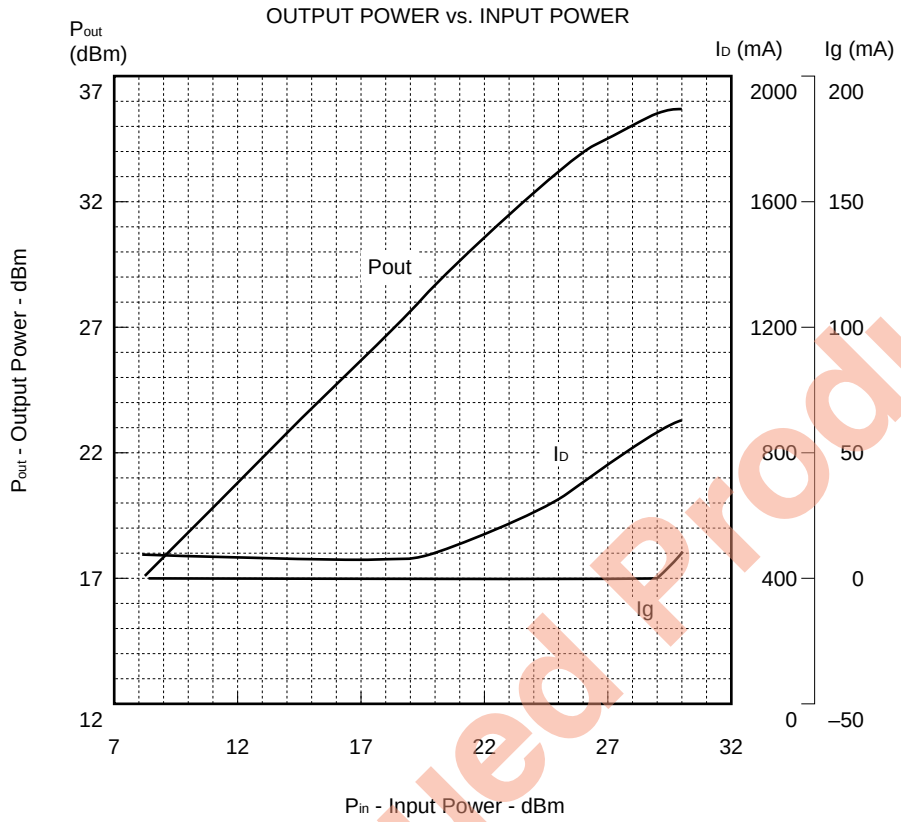
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Saturated Drain Current	I_{dss}	3.2	–	5.6	A	V_{ds} = 2.5 V
Pinch-off Voltage	V_P	–3.6	–	–1.6	V	V_{ds} = 2.5 V, I_{ds} = 21 mA
Thermal Resistance	R_{th}	–	5.0	–	°C/W	Channel to Case

PERFORMANCE SPECIFICATIONS (T_A = 25 °C)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Output Power	P_{out}	–	35.5	–	dBm	f = 1.9 GHz
Drain Current	I_D	–	0.9	–	A	P_{in} = 30 dBm
Power Added Efficiency	η add	–	50	–	%	V_{ds} = 6.0 V
Linear Gain	GL	–	9.0	–	dB	I_{ds} = 500 mAset
						Rg = 0 Ω

TYPICAL RF PERFORMANCE

f = 1.9 GHz, Vd = 6 V, Id = 500 mA set, Rg = 0 Ω



S-PARAMETER

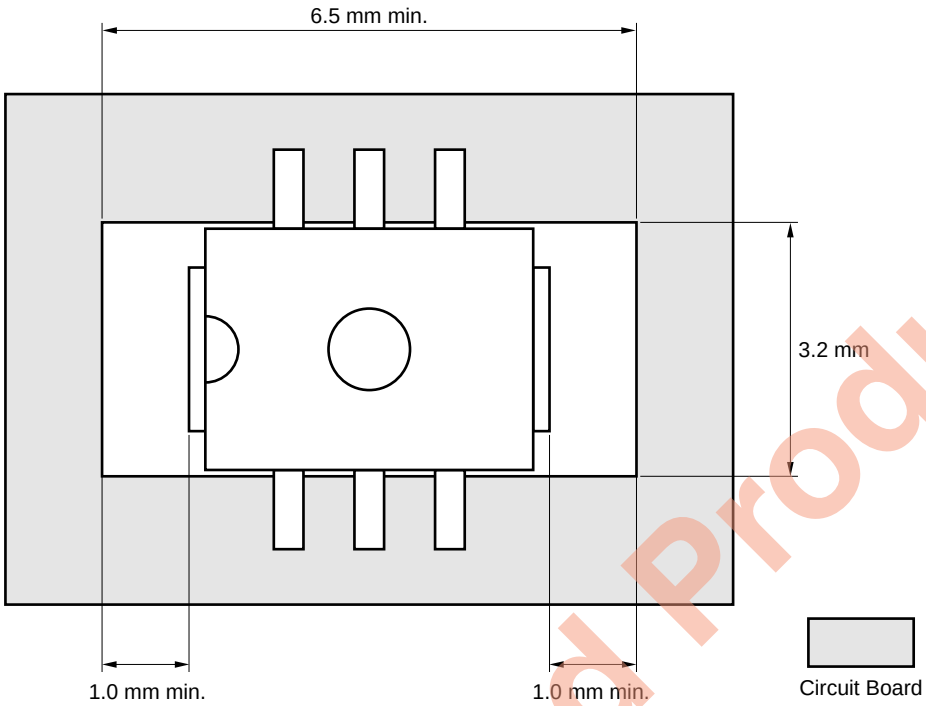
V_D = 6 V, I_d = 0.5 A

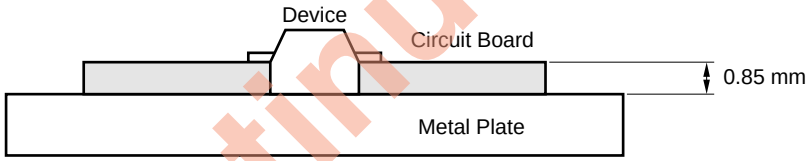
FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}	
MHz	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
1600	0.905	170.2	0.916	90.1	0.055	82.7	0.787	168.3
1610	0.904	170.1	0.908	90.0	0.055	83.1	0.787	168.2
1620	0.904	169.8	0.894	89.8	0.055	83.6	0.788	168.0
1630	0.904	169.5	0.879	89.9	0.056	84.3	0.788	167.8
1640	0.905	169.3	0.868	90.6	0.056	85.2	0.786	167.9
1650	0.905	169.1	0.860	91.6	0.057	85.8	0.787	167.7
1660	0.904	168.9	0.862	92.9	0.059	86.0	0.787	167.6
1670	0.904	168.7	0.872	93.9	0.060	85.6	0.787	167.4
1680	0.904	168.5	0.892	94.3	0.061	84.8	0.787	167.2
1690	0.904	168.2	0.915	93.8	0.062	83.7	0.786	167.0
1700	0.904	168.0	0.932	92.7	0.062	82.6	0.787	166.8
1710	0.904	167.8	0.936	91.0	0.061	81.9	0.785	166.6
1720	0.903	167.5	0.926	89.4	0.060	81.8	0.785	166.3
1730	0.904	167.2	0.906	88.3	0.058	82.5	0.785	166.1
1740	0.902	167.0	0.879	87.8	0.058	83.7	0.786	165.9
1750	0.901	166.7	0.852	88.1	0.058	85.6	0.785	165.8
1760	0.902	166.4	0.835	89.2	0.059	87.3	0.785	165.5
1770	0.902	166.1	0.830	90.9	0.061	88.4	0.785	165.3
1780	0.902	165.9	0.839	92.5	0.063	88.4	0.785	165.2
1790	0.902	165.6	0.859	93.4	0.065	87.5	0.787	165.0
1800	0.902	165.3	0.887	93.1	0.067	86.1	0.786	164.8
1810	0.901	165.1	0.910	91.8	0.067	84.5	0.785	164.7
1820	0.901	164.9	0.919	90.0	0.066	83.2	0.785	164.5
1830	0.902	164.6	0.914	88.0	0.065	82.7	0.784	164.2
1840	0.901	164.4	0.896	86.6	0.064	82.8	0.784	164.0
1850	0.900	164.2	0.871	85.9	0.063	83.5	0.784	163.7
1860	0.900	163.9	0.849	85.7	0.063	84.9	0.783	163.4
1870	0.900	163.5	0.834	86.3	0.063	86.3	0.785	163.2
1880	0.900	163.3	0.827	87.1	0.064	87.4	0.784	162.9
1890	0.900	163.0	0.827	87.9	0.066	88.1	0.785	162.7
1900	0.899	162.7	0.835	88.1	0.068	87.9	0.785	162.5
1910	0.898	162.4	0.843	87.7	0.069	87.4	0.785	162.1
1920	0.899	162.1	0.849	87.0	0.070	86.8	0.785	162.0
1930	0.900	161.8	0.843	86.0	0.070	86.2	0.785	161.8
1940	0.900	161.5	0.837	85.2	0.070	85.9	0.785	161.7
1950	0.899	161.2	0.823	84.8	0.070	86.0	0.785	161.4
1960	0.899	160.9	0.810	84.7	0.070	85.9	0.785	161.2
1970	0.898	160.6	0.801	84.9	0.071	86.1	0.785	161.0
1980	0.899	160.4	0.797	85.2	0.071	85.8	0.785	160.7
1990	0.898	160.1	0.799	85.2	0.071	86.1	0.785	160.4

FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}	
MHz	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
2000	0.898	159.8	0.804	85.0	0.071	85.9	0.785	160.1
2010	0.897	159.4	0.805	84.1	0.071	85.7	0.785	159.9
2020	0.898	159.3	0.800	83.1	0.071	86.0	0.785	159.6
2030	0.899	158.9	0.785	82.2	0.071	86.6	0.784	159.3
2040	0.898	158.7	0.766	81.6	0.071	87.5	0.785	159.1
2050	0.898	158.3	0.744	81.7	0.072	88.6	0.786	158.8
2060	0.898	157.9	0.726	82.4	0.074	89.3	0.786	158.6
2070	0.898	157.6	0.713	83.8	0.077	89.3	0.786	158.4
2080	0.897	157.3	0.711	85.2	0.078	88.5	0.787	158.2
2090	0.898	157.0	0.720	86.6	0.080	87.1	0.787	158.0
2100	0.899	156.7	0.737	87.1	0.080	85.0	0.788	157.7
2110	0.898	156.5	0.757	86.6	0.080	83.8	0.788	157.7
2120	0.898	156.1	0.766	85.2	0.078	83.2	0.787	157.4
2130	0.897	156.0	0.765	83.2	0.076	82.9	0.787	157.2
2140	0.897	155.7	0.749	81.6	0.074	83.8	0.788	156.8
2150	0.897	155.4	0.723	80.7	0.074	85.3	0.788	156.6
2160	0.899	155.0	0.696	80.6	0.074	87.1	0.788	156.3
2170	0.898	154.8	0.673	81.7	0.076	89.0	0.787	156.1
2180	0.896	154.3	0.657	83.5	0.079	89.7	0.788	155.8
2190	0.898	154.1	0.653	85.6	0.083	89.1	0.789	155.5
2200	0.898	153.8	0.663	87.5	0.085	87.7	0.790	155.2
2210	0.899	153.3	0.683	88.7	0.087	85.5	0.789	155.0
2220	0.898	153.0	0.706	88.8	0.087	83.5	0.791	154.8
2230	0.899	152.6	0.724	87.8	0.085	82.0	0.791	154.5
2240	0.898	152.3	0.733	86.1	0.083	81.3	0.790	154.3
2250	0.898	152.0	0.728	84.4	0.081	81.4	0.791	154.1
2260	0.898	151.8	0.714	83.4	0.079	82.2	0.790	153.9
2270	0.898	151.7	0.696	82.9	0.079	83.7	0.790	153.7
2280	0.898	151.3	0.683	83.3	0.079	85.1	0.790	153.5
2290	0.897	151.0	0.673	84.2	0.081	85.9	0.790	153.2
2300	0.897	150.6	0.672	85.2	0.082	86.4	0.790	152.9
2310	0.896	150.3	0.676	85.8	0.084	86.1	0.790	152.6
2320	0.897	150.0	0.685	86.0	0.086	85.3	0.790	152.3
2330	0.896	149.6	0.692	86.0	0.086	84.3	0.791	151.9
2340	0.898	149.2	0.696	85.5	0.086	83.4	0.792	151.6
2350	0.898	148.9	0.695	85.2	0.086	83.0	0.793	151.4
2360	0.898	148.4	0.691	85.0	0.086	82.5	0.793	151.2
2370	0.898	148.1	0.693	85.1	0.086	82.4	0.792	150.9
2380	0.899	147.8	0.697	85.4	0.085	82.0	0.792	150.6
2390	0.899	147.6	0.707	85.4	0.085	81.8	0.794	150.4
2400	0.898	147.3	0.719	84.8	0.085	81.4	0.793	150.1
2410	0.897	147.0	0.732	83.6	0.084	81.4	0.792	149.9
2420	0.899	146.8	0.734	81.7	0.082	81.7	0.793	149.6
2430	0.896	146.5	0.724	79.9	0.081	82.4	0.793	149.3
2440	0.897	146.3	0.705	78.5	0.081	83.7	0.792	149.0
2450	0.898	146.0	0.683	78.0	0.082	85.3	0.792	148.7
2460	0.897	145.5	0.659	78.4	0.084	86.4	0.793	148.4
2470	0.897	145.1	0.643	79.7	0.088	86.6	0.794	148.1
2480	0.898	144.8	0.639	81.7	0.090	85.7	0.793	147.7
2490	0.899	144.3	0.651	83.3	0.093	83.8	0.793	147.4

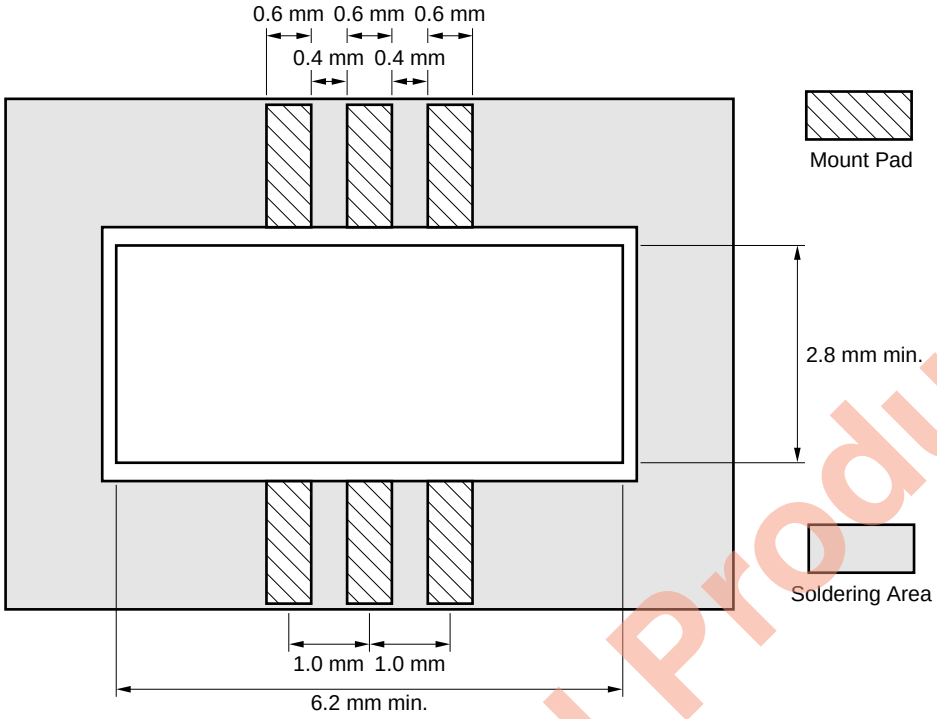
Recommended Design for Mounting

1. Circuit Board





2. Mount Pad on a Circuit Board and Soldering Area on a Metal Plate



Recommended Soldering Conditions

The following conditions (see table below) must have be met when soldering this product.
For more details, refer to our document **"SEMICONDUCTOR DEVICE MOUNTING MANUAL" (C10535E).**

Soldering process	Soldering conditions	Symbol
Infrared ray reflow	Peak package's surface temperature: 230 °C or below, Reflow time: 10 seconds or below (210 °C or higher), Number of reflow process: 3 times or less	IR30-00-3
Partial heating method	Terminal temperature: 230 °C or below, Flow time: 10 seconds or below	

Recommended storage conditions: 25 °C and relative humidity at 65 % or less

Caution

The Great Care must be taken in dealing with the devices in this guide.
The reason is that the material of the devices is GaAs (Gallium Arsenide), which is designated as harmful substance according to the law concerned.
Keep the law concerned and so on, especially in case of removal.

[MEMO]

[MEMO]

M4 96.5