

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>.

Notice

1. All information included in this document is current as of the date this document is issued. Such information, however, is subject to change without any prior notice. Before purchasing or using any Renesas Electronics products listed herein, please confirm the latest product information with a Renesas Electronics sales office. Also, please pay regular and careful attention to additional and different information to be disclosed by Renesas Electronics such as that disclosed through our website.
2. Renesas Electronics does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Renesas Electronics products or technical information described in this document. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
3. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part.
4. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation of these circuits, software, and information in the design of your equipment. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
5. When exporting the products or technology described in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations. You should not use Renesas Electronics products or the technology described in this document for any purpose relating to military applications or use by the military, including but not limited to the development of weapons of mass destruction. Renesas Electronics products and technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations.
6. Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
7. Renesas Electronics products are classified according to the following three quality grades: “Standard”, “High Quality”, and “Specific”. The recommended applications for each Renesas Electronics product depends on the product’s quality grade, as indicated below. You must check the quality grade of each Renesas Electronics product before using it in a particular application. You may not use any Renesas Electronics product for any application categorized as “Specific” without the prior written consent of Renesas Electronics. Further, you may not use any Renesas Electronics product for any application for which it is not intended without the prior written consent of Renesas Electronics. Renesas Electronics shall not be in any way liable for any damages or losses incurred by you or third parties arising from the use of any Renesas Electronics product for an application categorized as “Specific” or for which the product is not intended where you have failed to obtain the prior written consent of Renesas Electronics. The quality grade of each Renesas Electronics product is “Standard” unless otherwise expressly specified in a Renesas Electronics data sheets or data books, etc.
 - “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.
 - “High Quality”: 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; medical equipment or systems for life support (e.g. artificial life support devices or systems), surgical implantations, or healthcare intervention (e.g. excision, etc.), and any other applications or purposes that pose a direct threat to human life.
8. You should use the Renesas Electronics products described in this document within the range specified by Renesas Electronics, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas Electronics shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
9. Although Renesas Electronics endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Further, Renesas Electronics products are not subject to radiation resistance design. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas Electronics product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or system manufactured by you.
10. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. Please use Renesas Electronics products in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Renesas Electronics assumes no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
11. This document may not be reproduced or duplicated, in any form, in whole or in part, without prior written consent of Renesas Electronics.
12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products, or if you have any other inquiries.

(Note 1) “Renesas Electronics” as used in this document means Renesas Electronics Corporation and also includes its majority-owned subsidiaries.

(Note 2) “Renesas Electronics product(s)” means any product developed or manufactured by or for Renesas Electronics.

Evaluation Board Information

EC-NE55410GR

2 W + 10 W VHF to L-Band POWER LDMOS FET Evaluation Board

- **RF performance over frequency**
- **Evaluation Data on NE55410GR**

Single-stage Evaluation Board Data

- **RF Data**
- **S-parameter**
- **Board Information**
- **Impedance Information**

Two-stage Evaluation Board Data

- **RF Data**
- **S-parameter**
- **Board Information**
- **Impedance Information**
- **ACLR Optimum tune**
- **ACLR vs. I_{Dset}**

Document No. PU10712EJ01V0EB (1st edition)

Date Published November 2008 NS

© NEC Electronics Corporation 2008

Printed in Japan

For the purposes of maintaining up-to-date information, the contents of this document are subject to change without notice.

This document outlines general applications for this product. The application circuits and circuit constants provided in this document are simply examples and should not be used for mass production design. Be aware also that there is no intention to standardize the restrictions and characteristics of these application circuits.

The characteristics of high-frequency devices in particular vary depending on the external components and mounting pattern used.

Customers are requested to confirm all characteristics when designing a system based in part or wholly on the information in this document.

Teflon is a trademark owned by E.I. du Pont de Nemours and Company., U.S.A.

- **The information in this document is current as of November, 2008. The information is subject to change without notice. For actual design-in, refer to the latest publications of NEC Electronics data sheets or data books, etc., for the most up-to-date specifications of NEC Electronics products. Not all products and/or types are available in every country. Please check with an NEC Electronics sales representative for availability and additional information.**

- No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Electronics. NEC Electronics assumes no responsibility for any errors that may appear in this document.
- NEC Electronics does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from the use of NEC Electronics products listed in this document or any other liability arising from the use of such products. No license, express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Electronics or others.
- Descriptions of circuits, software and other related information in this document are provided for illustrative purposes in semiconductor product operation and application examples. The incorporation of these circuits, software and information in the design of a customer's equipment shall be done under the full responsibility of the customer. NEC Electronics assumes no responsibility for any losses incurred by customers or third parties arising from the use of these circuits, software and information.
- While NEC Electronics endeavors to enhance the quality, reliability and safety of NEC Electronics products, customers agree and acknowledge that the possibility of defects thereof cannot be eliminated entirely. To minimize risks of damage to property or injury (including death) to persons arising from defects in NEC Electronics products, customers must incorporate sufficient safety measures in their design, such as redundancy, fire-containment and anti-failure features.
- NEC Electronics products are classified into the following three quality grades: "Standard", "Special" and "Specific".

The "Specific" quality grade applies only to NEC Electronics products developed based on a customer-designated "quality assurance program" for a specific application. The recommended applications of an NEC Electronics product depend on its quality grade, as indicated below. Customers must check the quality grade of each NEC Electronics product before using it in a particular application.

"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.

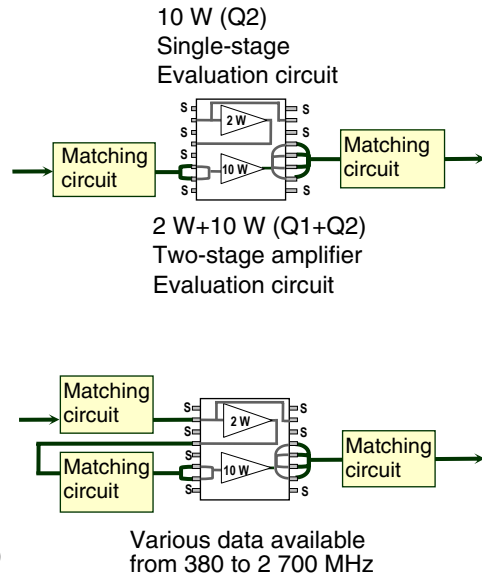
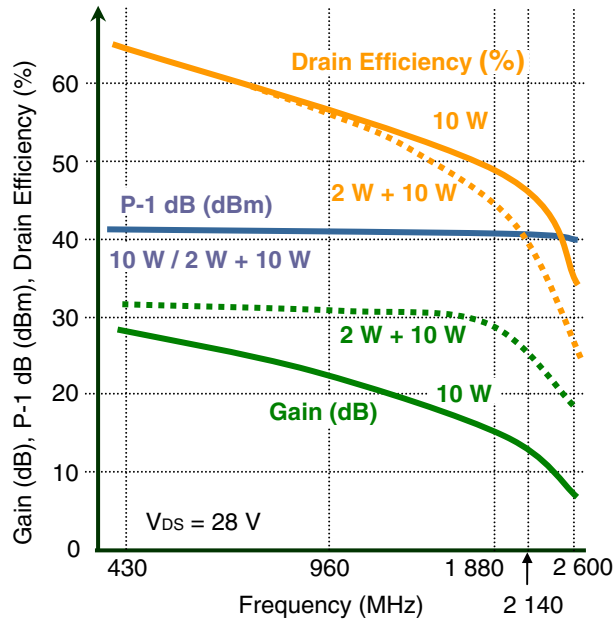
The quality grade of NEC Electronics products is "Standard" unless otherwise expressly specified in NEC Electronics data sheets or data books, etc. If customers wish to use NEC Electronics products in applications not intended by NEC Electronics, they must contact an NEC Electronics sales representative in advance to determine NEC Electronics' willingness to support a given application.

(Note)

- (1) "NEC Electronics" as used in this statement means NEC Electronics Corporation and also includes its majority-owned subsidiaries.
- (2) "NEC Electronics products" means any product developed or manufactured by or for NEC Electronics (as defined above).

RF performance over frequency

(f = 380 to 2 700 MHz, $V_{DS} = 28$ V)



Evaluation Data on NE55410GR

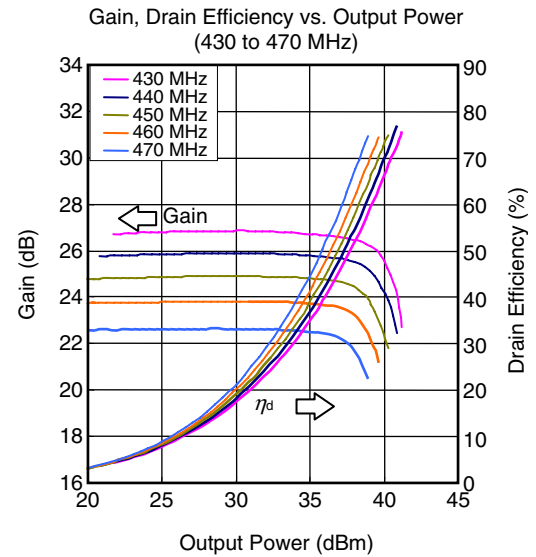
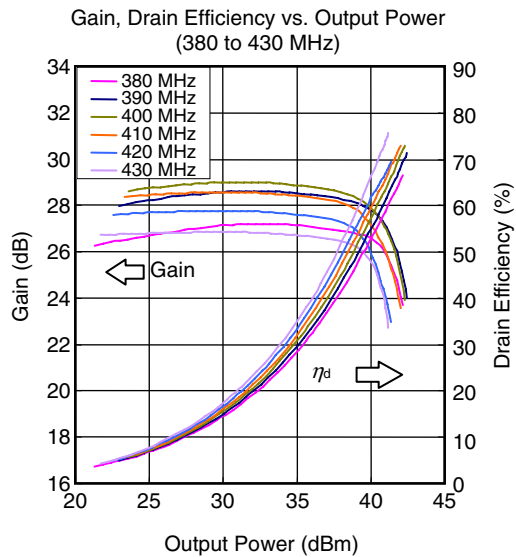
Frequency (MHz)	Single-stage		Two-stage	Application
	2 W (Q1)	10 W (Q2)	2 W + 10 W (Q1 + Q2)	
380 to 470	N/A	Available	N/A	TETRA, Radio
470 to 770	Available	Available	N/A	TV transmitter, IMT-AD
840 to 960	N/A	Available	Available	GSM, EDGE, N-CDMA
870 to 890	N/A	N/A	Available	W-CDMA, cdma2000
1 422 to 1 437	N/A	N/A	Available	Automatic Meter Reading
1 500 to 1 530	N/A	N/A	Available	DCS
1 805 to 1 880	N/A	N/A	Available	GSM1800, DCS, EDGE
1 900 to 2 020	Available	Available	Available	GSM1900, PHS, EDGE
2 090 to 2 190	Available	Available	Available	W-CDMA, cdma2000
2 305 to 2 370	Available	Available	Available	WiMAX, Wibro, IMT-AD
2 535 to 2 605	N/A	N/A	Available	WiMAX, PHS
2 500 to 2 700	Available	Available	Available	WiMAX

Single-stage Evaluation Board Data

RF Data on NE55410GR for 380 to 470 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q2) = 100\text{ mA}$)

Single-stage Amplifier (Q2 Only)



Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
380	40.72	57.05	56.91	27.21
390	40.51	58.11	58.01	28.63
400	39.89	56.50	56.41	28.97
410	39.52	56.42	56.32	28.56
420	39.20	56.58	56.46	27.77
430	39.77	64.33	64.16	26.86

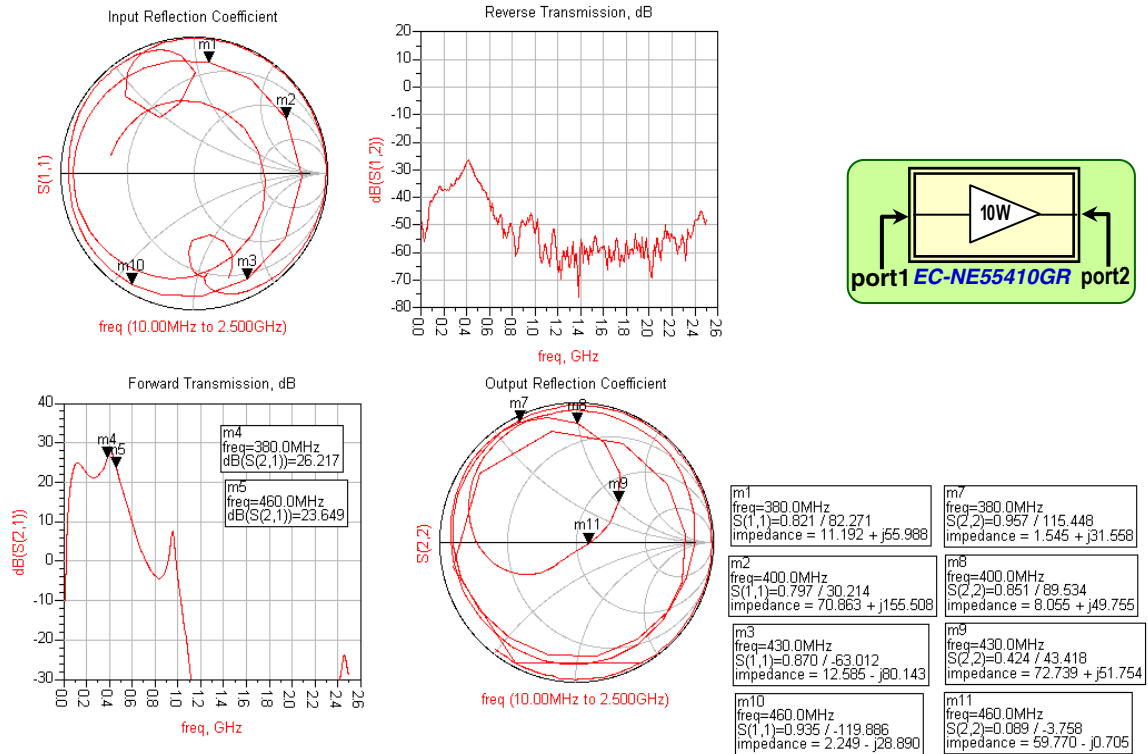
Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
430	39.77	64.33	64.16	26.86
440	39.35	64.59	64.38	25.90
450	38.89	64.38	64.12	24.92
460	38.66	66.91	66.55	23.83
470	38.09	67.63	67.16	22.64

S-parameter on NE55410GR for 380 to 470 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q2) = 100\text{ mA}$)

Single-stage Amplifier (Q2 Only)

Use with S-Parameter Simulations

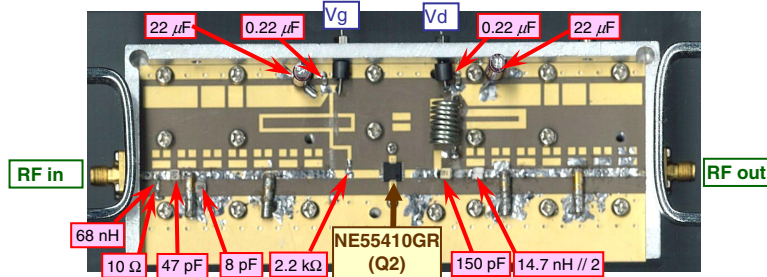


NE55410GR Board Information for 380 to 470 MHz

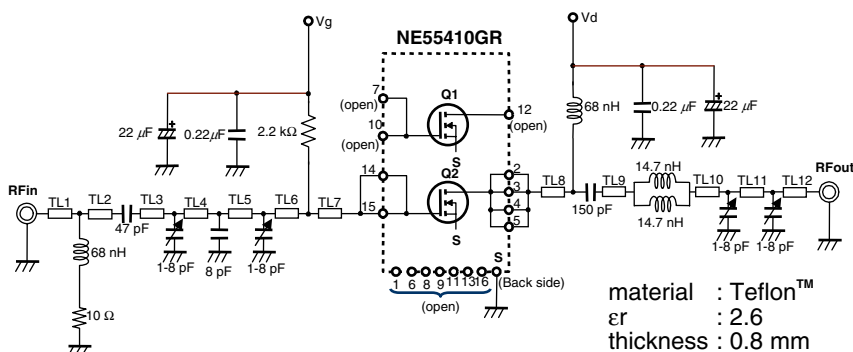
($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 100\text{ mA}$)

Single-stage Amplifier (Q1 Only)

PICTURE OF EVALUATION BOARD



EVALUATION CIRCUIT

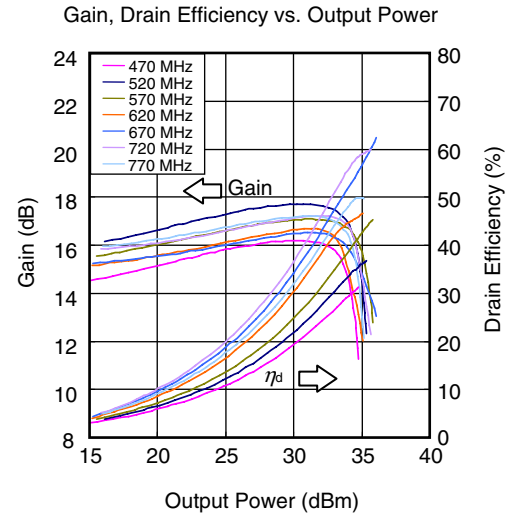
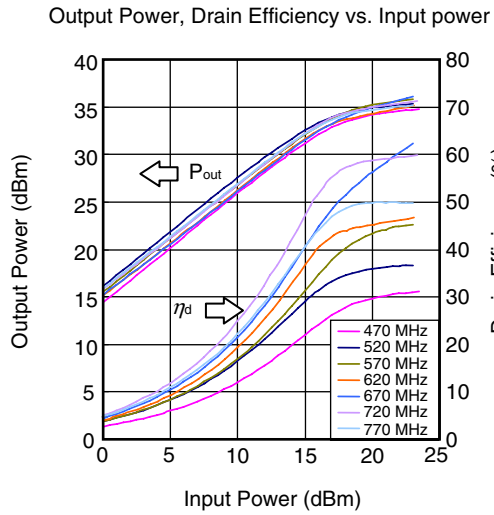


Symbol	Width (mm)	Length (mm)
TL1	2.1	4.0
TL2	2.1	4.0
TL3	2.1	3.0
TL4	2.1	3.0
TL5	2.1	19.0
TL6	2.1	21.0
TL7	2.1	10.0
TL8	2.1	11.5
TL9	2.1	7.0
TL10	2.1	6.5
TL11	2.1	19.0
TL12	2.1	18.0

RF Data on NE55410GR for 470 to 770 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 20\text{ mA}$)

Single-stage Amplifier (Q1 Only)



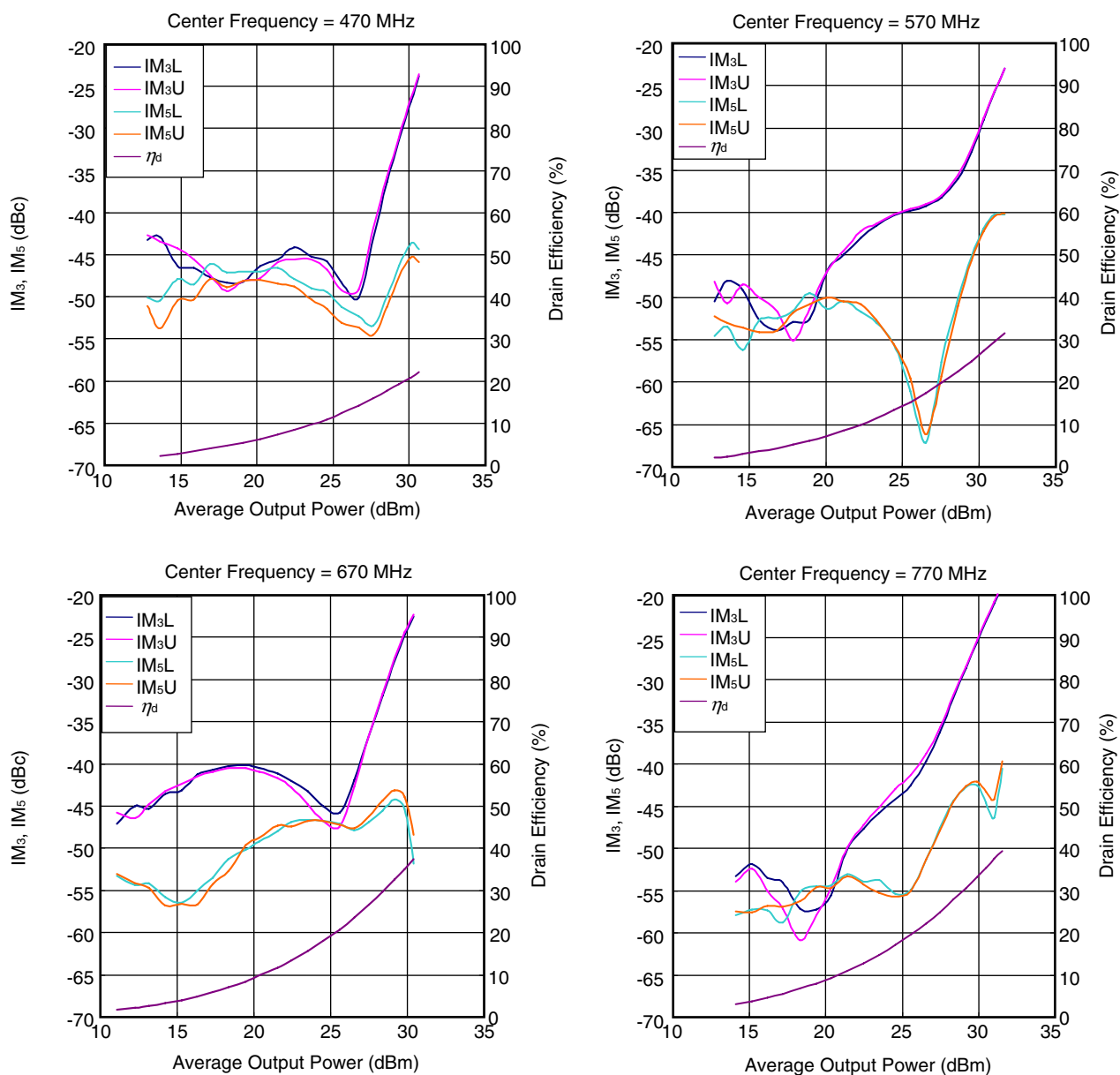
Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
470	33.68	28.42	27.56	16.19
520	34.19	33.98	33.25	17.72
570	34.89	42.07	40.98	17.08
620	33.69	43.98	42.77	16.68
670	34.47	54.02	52.48	16.52
720	34.49	57.61	56.20	17.23
770	34.18	48.67	47.49	17.22

RF Data on NE55410GR for 470 to 770 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 25\text{ mA}$)

Single-stage Amplifier (Q1 Only)

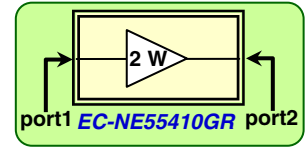
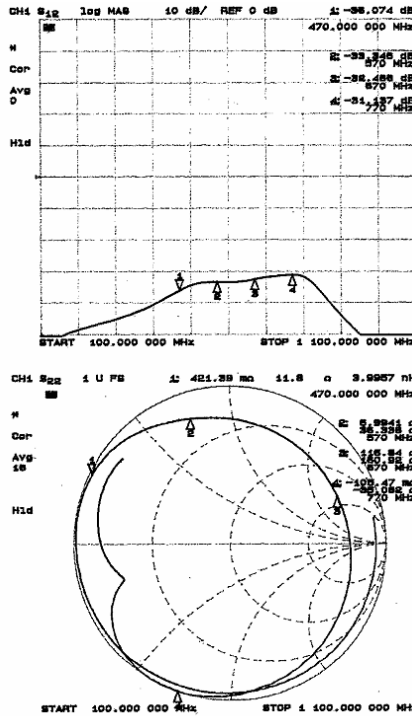
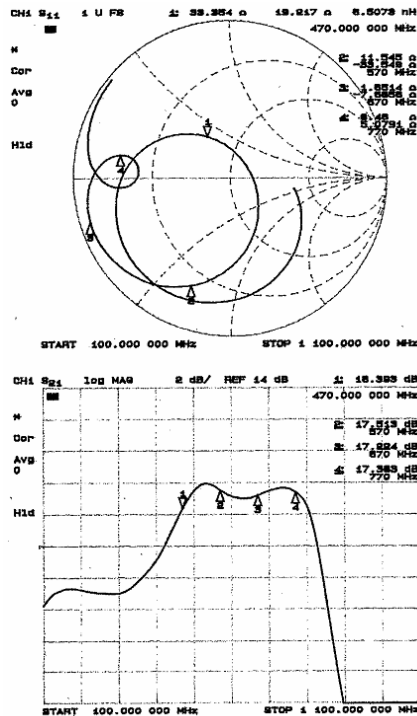
IM₃, IM₅ and Efficiency (100 kHz spacing)



S-parameter on NE55410GR for 470 to 770 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 20\text{ mA}$)

Single-stage Amplifier (Q1 Only)

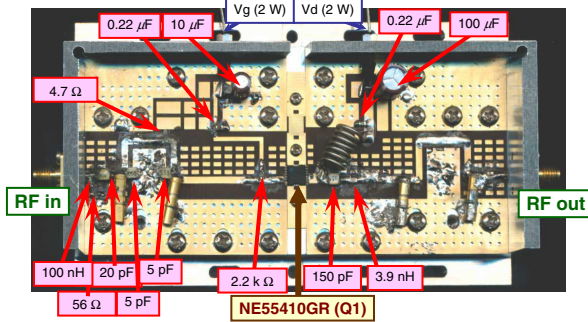


NE55410GR Board Information for 470 to 770 MHz

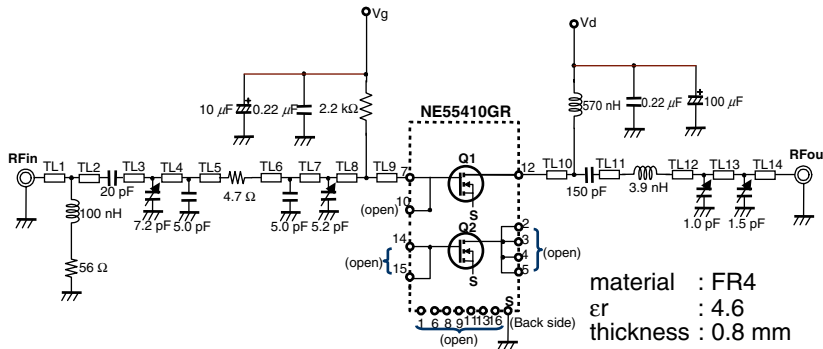
($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 20\text{ mA}$)

Single-stage Amplifier (Q1 Only)

PICTURE OF EVALUATION BOARD



EVALUATION CIRCUIT



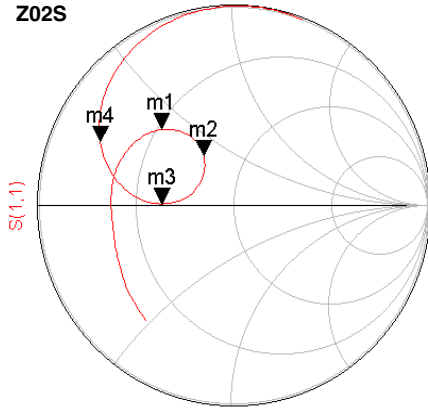
Symbol	Width (mm)	Length (mm)
TL1	1.7	1.5
TL2	1.7	2.0
TL3	1.7	2.0
TL4	1.7	1.0
TL5	1.7	23.0
TL6	1.7	7.0
TL7	1.7	1.0
TL8	1.7	24.5
TL9	1.7	7.0
TL10	2.4	5.5
TL11	1.7	3.0
TL12	1.7	20.5
TL13	1.7	36.0
TL14	1.7	7.0

Impedance Information on 470 to 770 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 20\text{ mA}$)

Single-stage Amplifier (Q1 Only)

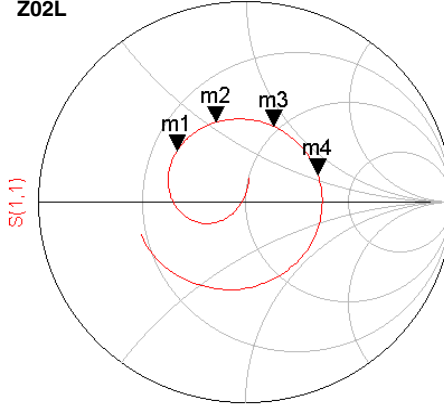
Z02S



freq (100.0MHz to 1.100GHz)

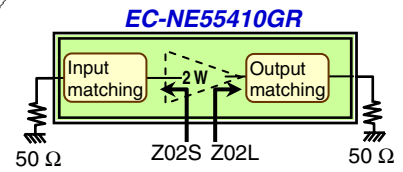
m1
freq=470.0MHz
S(1,1)=0.535 / 134.134
impedance = 17.556 + j18.907
m2
freq=570.0MHz
S(1,1)=0.296 / 121.684
impedance = 32.626 + j18.006
m3
freq=670.0MHz
S(1,1)=0.371 / 178.615
impedance = 22.930 + j0.477
m4
freq=770.0MHz
S(1,1)=0.760 / 154.861
impedance = 7.137 + j10.932

Z02L



freq (100.0MHz to 1.100GHz)

m1
freq=470.0MHz
S(1,1)=0.418 / 142.247
impedance = 22.465 + j13.945
m2
freq=570.0MHz
S(1,1)=0.425 / 109.647
impedance = 27.959 + j27.282
m3
freq=670.0MHz
S(1,1)=0.403 / 70.114
impedance = 47.133 + j42.693
m4
freq=770.0MHz
S(1,1)=0.377 / 21.645
impedance = 97.210 + j31.522

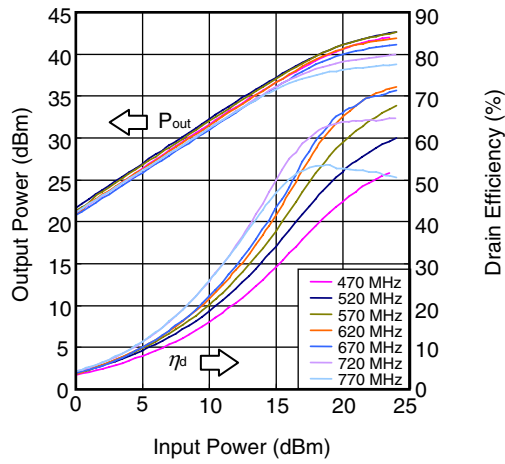


RF Data on NE55410GR for 470 to 770 MHz

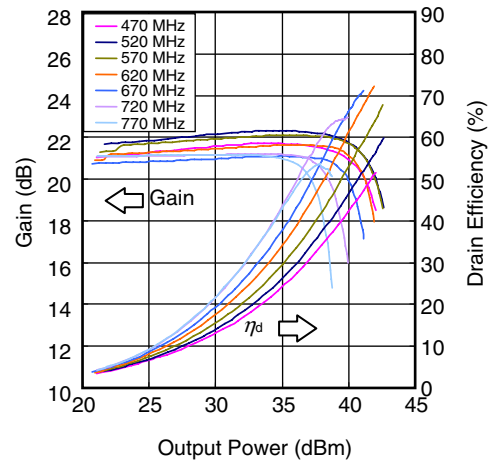
($V_{DS} = 28\text{ V}$, $I_{Dset}(Q2) = 100\text{ mA}$)

Single-stage Amplifier (Q2 Only)

Output Power, Drain Efficiency vs. Input Power



Gain, Drain Efficiency vs. Output Power



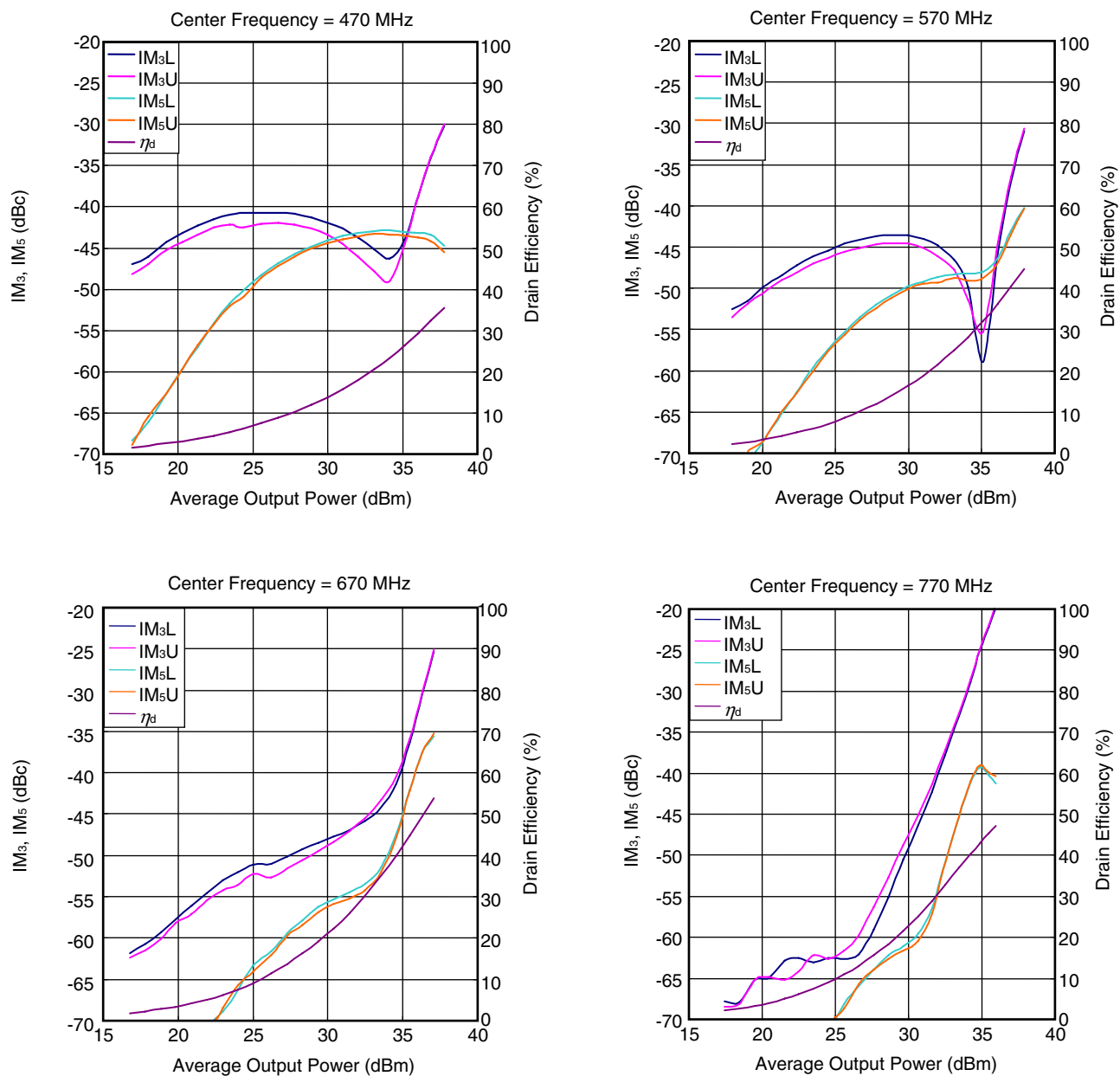
Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
470	40.28	43.57	43.21	21.71
520	40.83	50.52	50.15	22.31
570	41.10	59.01	58.55	22.10
620	40.66	65.11	64.55	21.62
670	39.96	65.99	65.32	21.10
720	38.23	61.38	60.80	21.21
770	37.08	52.13	51.62	21.17

RF Data on NE55410GR for 470 to 770 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q2) = 90\text{ mA}$)

Single-stage Amplifier (Q2 Only)

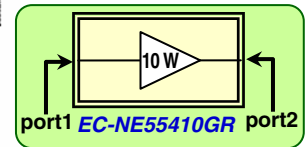
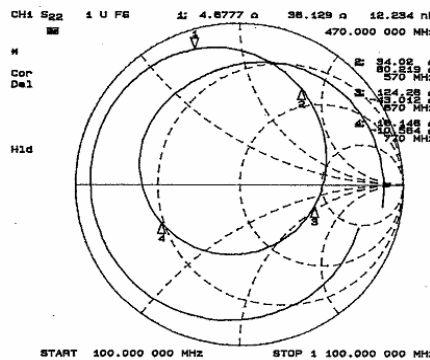
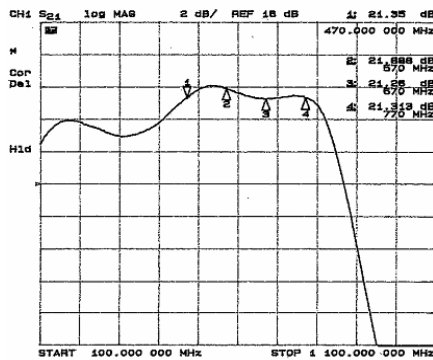
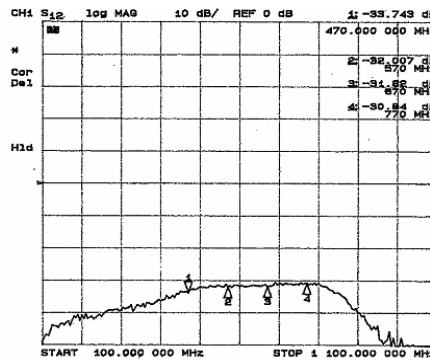
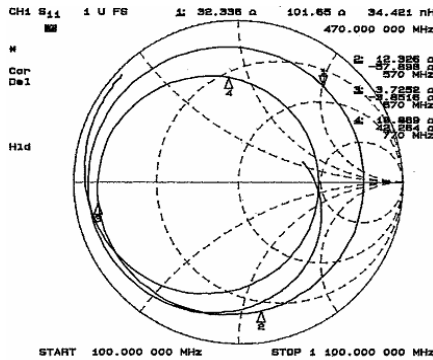
IM₃, IM₅ and Efficiency (100 kHz spacing)



S-parameter on NE55410GR for 470 to 770 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q2) = 100\text{ mA}$)

Single-stage Amplifier (Q2 Only)

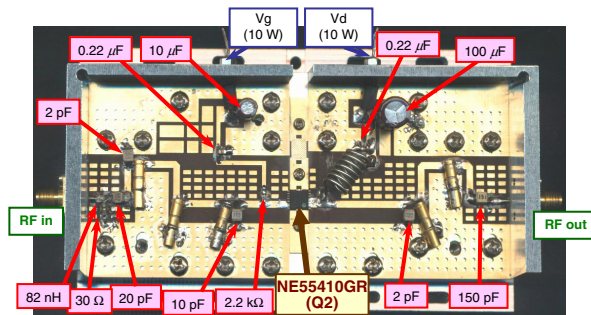


NE55410GR Board Information for 470 to 770 MHz

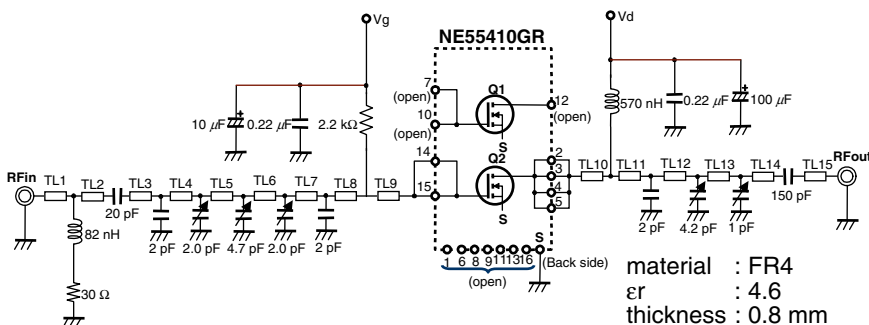
($V_{DS} = 28\text{ V}$, $I_{Dset}(Q2) = 100\text{ mA}$)

Single-stage Amplifier (Q2 Only)

PICTURE OF EVALUATION BOARD



EVALUATION CIRCUIT



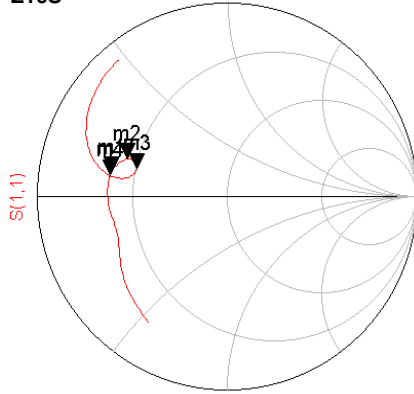
Symbol	Width (mm)	Length (mm)
TL1	1.7	4.5
TL2	1.7	2.0
TL3	1.7	11.0
TL4	1.7	2.0
TL5	1.7	20.0
TL6	1.7	14.5
TL7	1.7	2.0
TL8	1.7	8.0
TL9	1.7	7.0
TL10	2.4	5.5
TL11	1.7	21.5
TL12	1.7	3.0
TL13	1.7	19.0
TL14	1.7	16.0
TL15	1.7	7.0

Impedance Information on 470 to 770 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q2) = 100\text{ mA}$)

Single-stage Amplifier (Q2 Only)

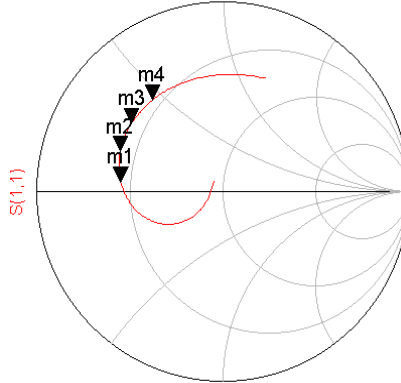
Z10S



freq (100.0MHz to 1.100GHz)

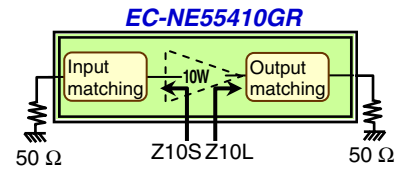
m1
freq=470.0MHz
S(1,1)=0.622 / 168.466
impedance = 11.748 + j4.773
m2
freq=570.0MHz
S(1,1)=0.562 / 159.742
impedance = 14.422 + j8.210
m3
freq=670.0MHz
S(1,1)=0.497 / 163.431
impedance = 17.097 + j6.445
m4
freq=770.0MHz
S(1,1)=0.627 / 169.891
impedance = 11.543 + j4.188

Z10L



freq (100.0MHz to 1.100GHz)

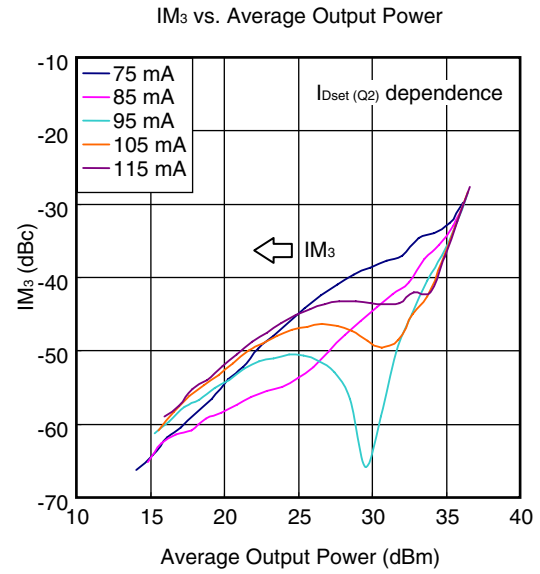
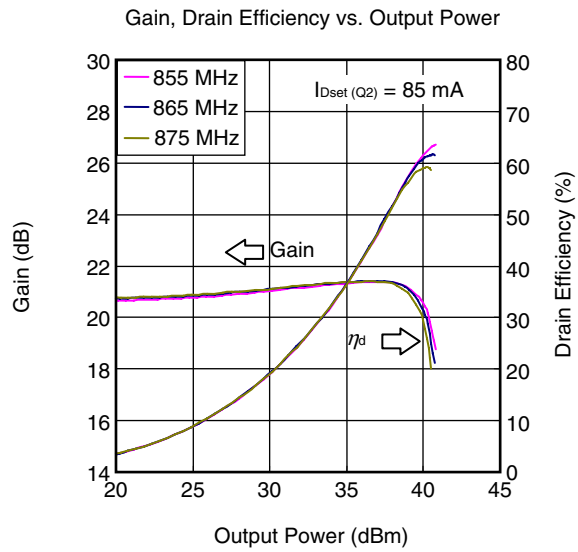
m1
freq=470.0MHz
S(1,1)=0.552 / 174.596
impedance = 14.443 + j2.163
m2
freq=570.0MHz
S(1,1)=0.591 / 159.082
impedance = 13.249 + j8.602
m3
freq=670.0MHz
S(1,1)=0.610 / 143.698
impedance = 13.324 + j15.334
m4
freq=770.0MHz
S(1,1)=0.616 / 128.034
impedance = 14.518 + j22.686



RF Data on NE55410GR for 835 to 895 MHz

($V_{DS} = 29\text{ V}$, $I_{Dset(Q2)} = 75\text{ to }115\text{ mA}$)

Single-stage Amplifier (Q2 Only)



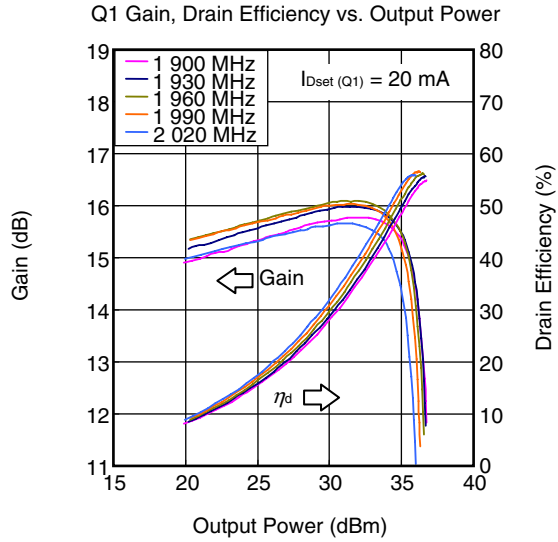
f = 865 MHz, 1.25 MHz spacing

Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
835	40.66	64.96	64.35	21.30
855	40.25	62.34	61.75	21.40
865	39.90	60.53	59.98	21.45
875	39.73	58.57	58.02	21.44
895	39.51	56.00	55.46	21.30

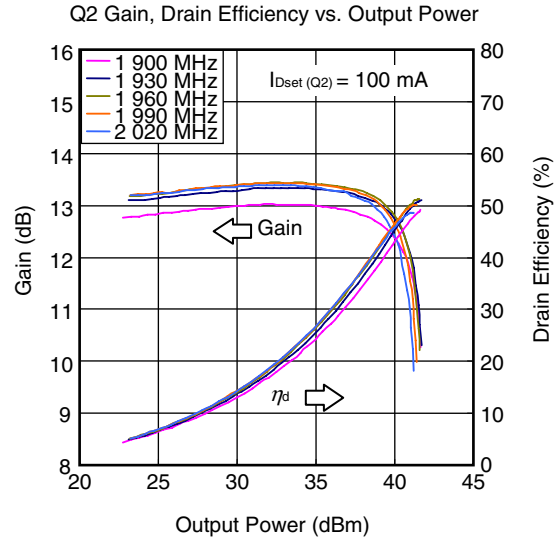
RF Data on NE55410GR for 1 900 to 2 020 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 20\text{ mA}$, $I_{Dset}(Q2) = 100\text{ mA}$)

Single-stage Amplifier (Q1, Q2)



Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
1 900	35.75	51.98	50.26	15.78
1 930	35.64	52.67	51.00	15.99
1 960	35.49	53.52	51.85	16.09
1 990	35.07	53.28	51.64	16.03
2 020	34.69	52.68	50.91	15.67

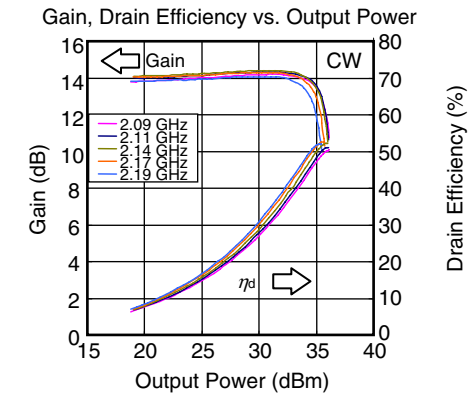


Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
1 900	40.55	45.34	42.54	13.02
1 930	40.76	48.38	45.54	13.33
1 960	40.60	48.79	46.00	13.44
1 990	40.38	47.90	45.14	13.43
2 020	39.94	45.63	43.02	13.39

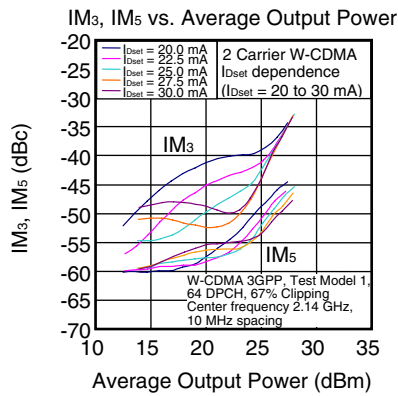
RF Data on NE55410GR for 2 090 to 2 190 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 25\text{ mA}$)

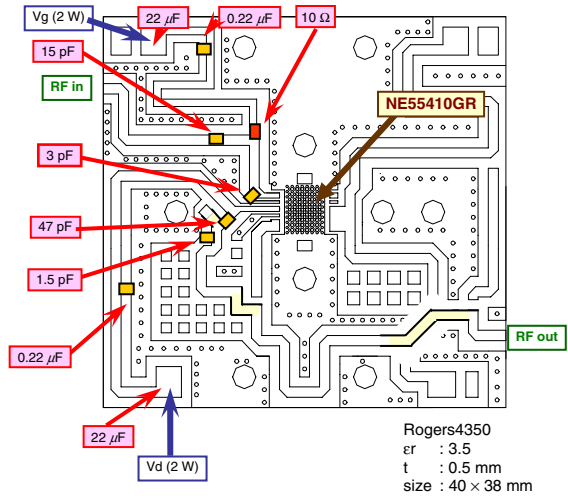
Single-stage Amplifier (Q1 Only)



Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
2 090	35.50	49.14	46.69	14.20
2 110	35.31	49.45	47.13	14.32
2 140	35.16	50.28	47.88	14.37
2 170	34.79	50.44	48.01	14.28
2 190	34.54	50.26	47.69	14.08



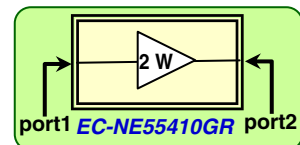
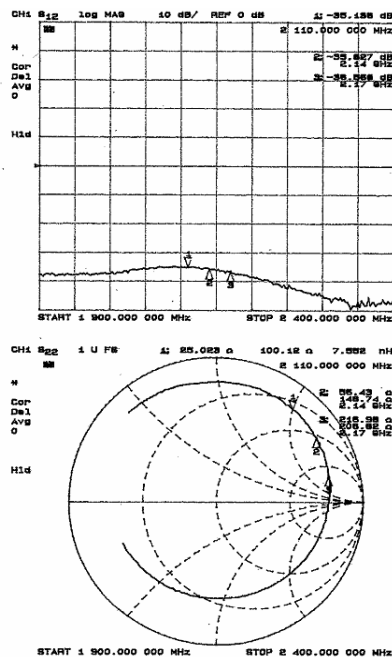
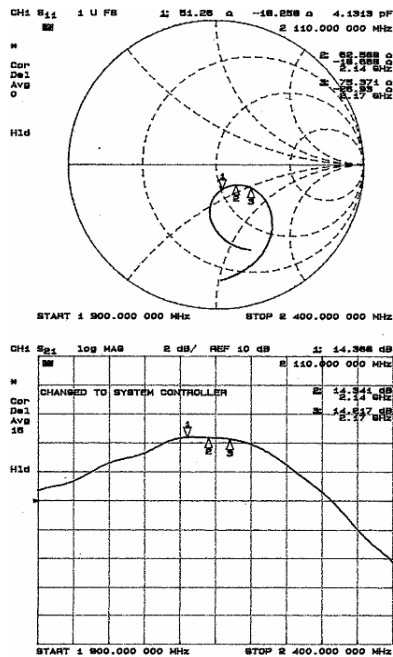
CIRCUIT of EV BOARD



S-parameter on NE55410GR for 2 090 to 2 190 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 25\text{ mA}$)

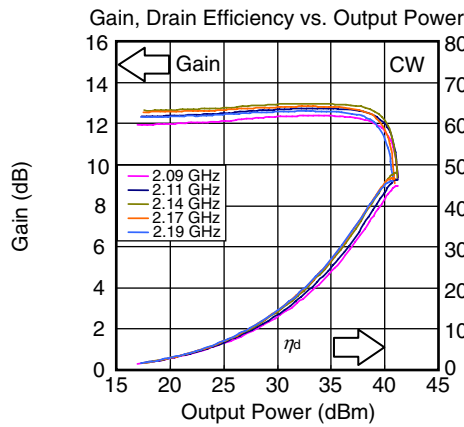
Single-stage Amplifier (Q1 Only)



RF Data on NE55410GR for 2 090 to 2 190 MHz

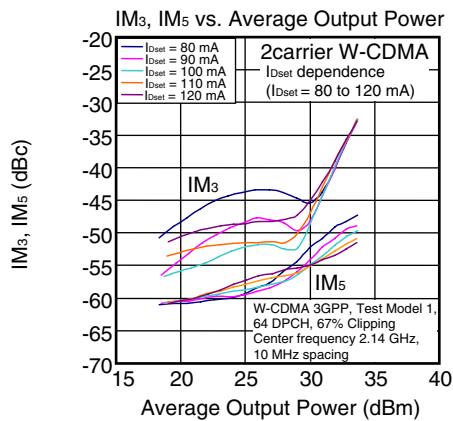
($V_{DS} = 28\text{ V}$, $I_{Dset}(Q2) = 100\text{ mA}$)

Single-stage Amplifier (Q2 Only)

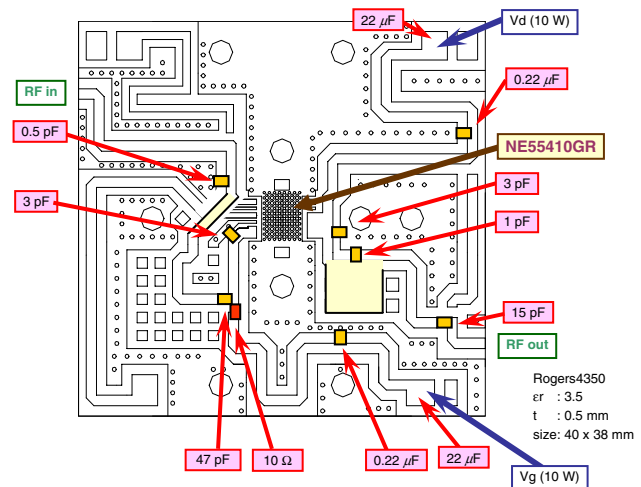


Drain Efficiency (%)

Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	GL (dB)
2 090	40.67	45.14	41.89	12.56
2 110	40.66	46.64	43.18	12.90
2 140	40.40	47.23	44.18	13.06
2 170	40.13	46.44	43.33	12.91
2 190	39.90	45.33	42.16	12.69



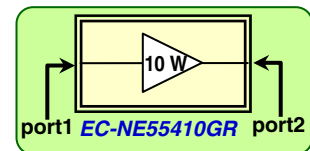
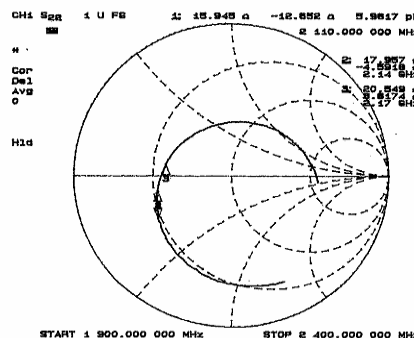
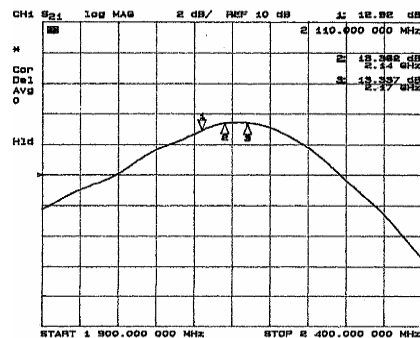
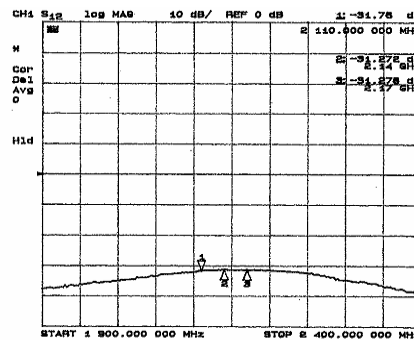
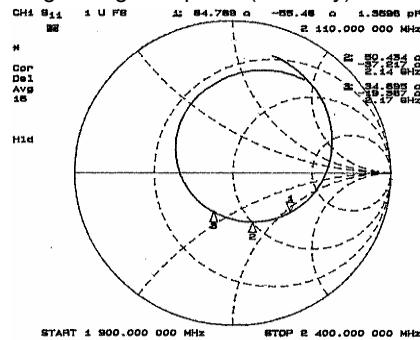
CIRCUIT of EV BOARD



S-parameter on NE55410GR for 2 090 to 2 190 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q2) = 100\text{ mA}$)

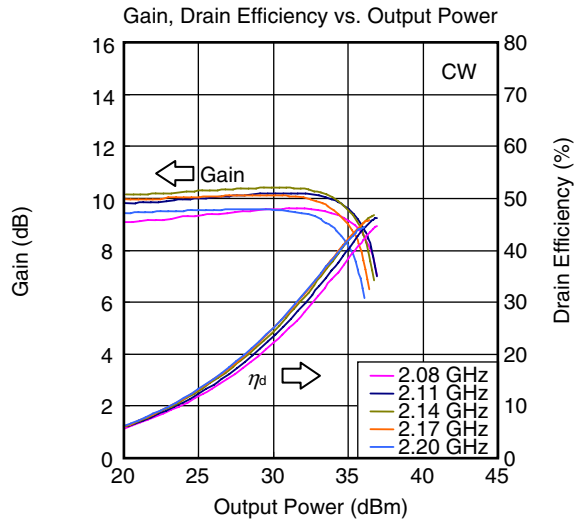
Single-stage Amplifier (Q2 Only)



RF Data on NE55410GR for 2 080 to 2 200 MHz

($V_{DS} = 12\text{ V}$, $I_{Dset}(Q2) = 100\text{ mA}$)

Single-stage Amplifier (Q2 Only)

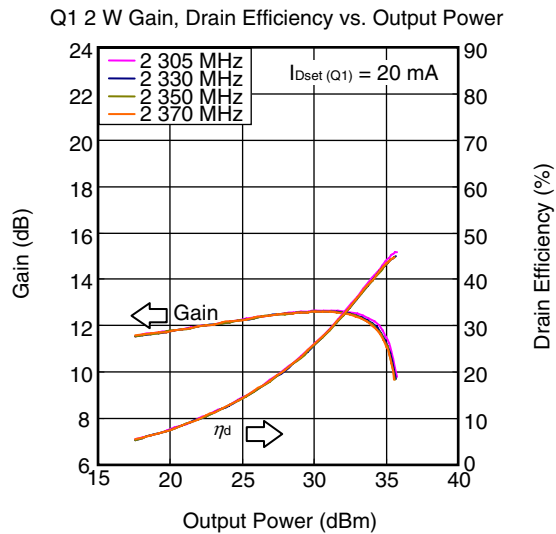


Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
2 080	36.17	42.53	36.39	9.58
2 110	35.84	43.36	37.95	10.20
2 140	35.44	43.38	38.22	10.41
2 170	34.98	42.06	36.74	10.11
2 220	34.73	40.98	35.01	9.56

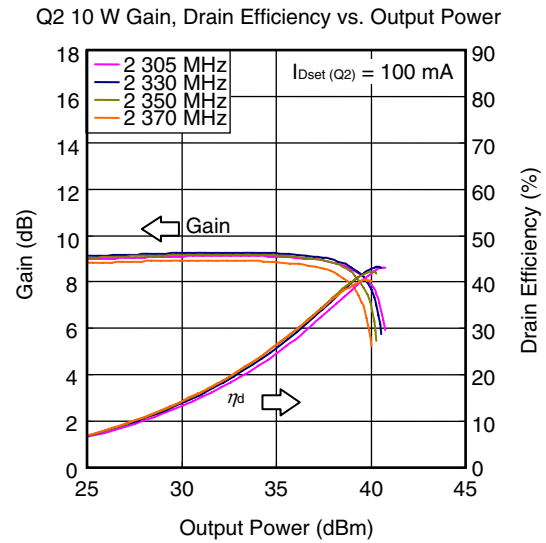
RF Data on NE55410GR for 2 305 to 2 370 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 20\text{ mA}$, $I_{Dset}(Q2) = 100\text{ mA}$)

Single-stage Amplifier (Q1, Q2)



Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
2 305	34.99	43.99	40.90	12.67
2 330	34.90	42.95	39.86	12.62
2 350	34.85	42.72	39.62	12.61
2 370	34.58	41.97	39.08	12.61



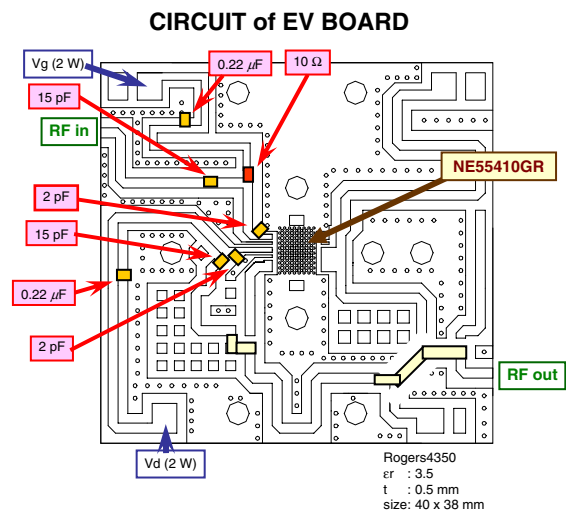
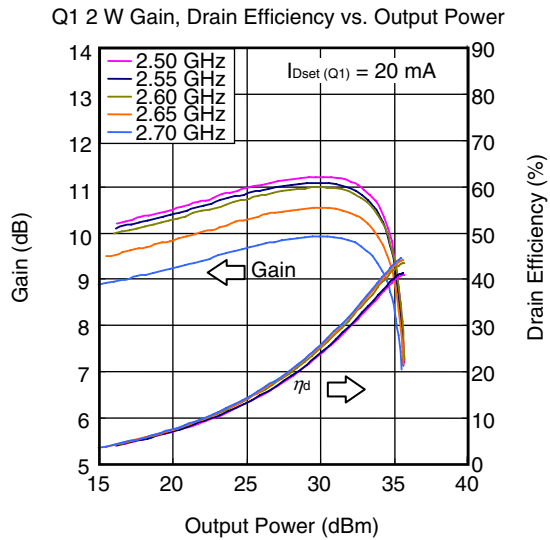
Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
2 305	39.88	41.44	34.87	9.13
2 330	39.59	41.81	35.53	9.27
2 350	39.42	41.25	34.77	9.19
2 370	39.11	39.53	32.84	8.93

RF Data on NE55410GR for 2 500 to 2 700 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 20\text{ mA}$)

Single-stage Amplifier (Q1 Only)

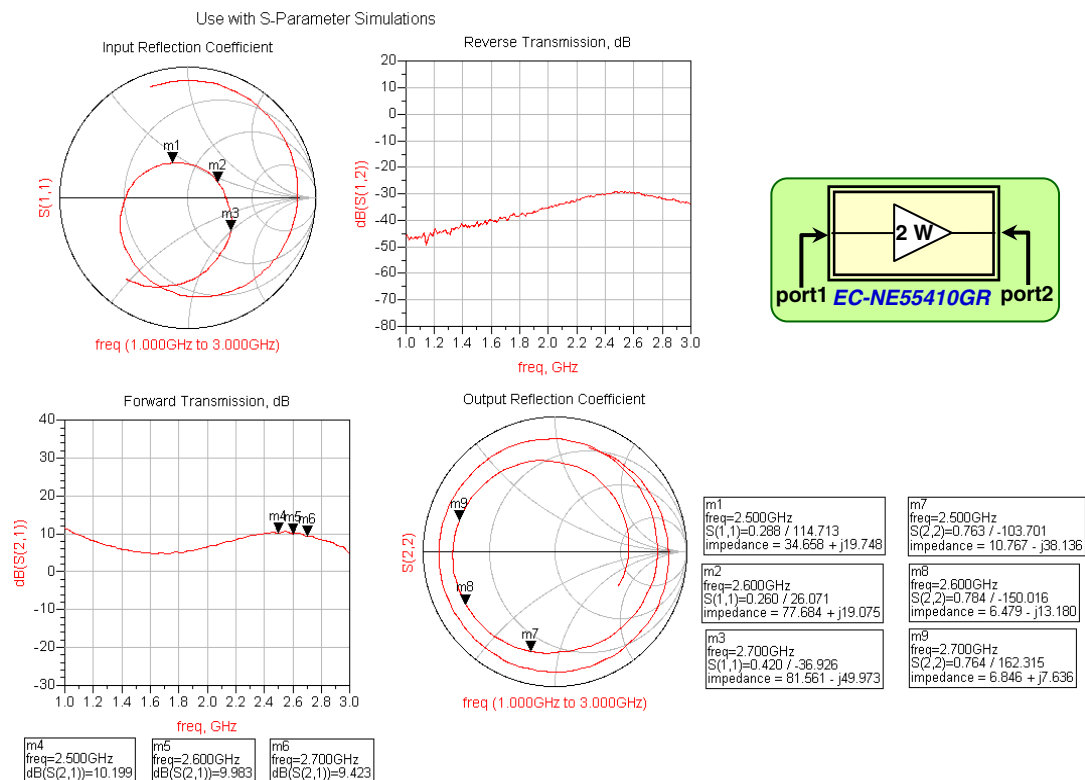
Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
2 500	34.57	38.49	34.72	11.21
2 550	34.49	38.63	34.76	11.08
2 600	34.48	40.39	36.36	10.99
2 650	34.52	41.23	36.63	10.55
2 700	34.47	41.50	36.24	9.94



S-parameter on NE55410GR for 2 500 to 2 700 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 20\text{ mA}$)

Single-stage Amplifier (Q1 Only)

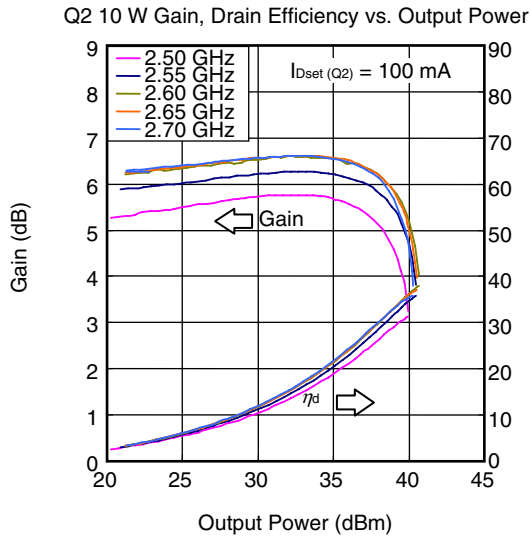


RF Data on NE55410GR for 2 500 to 2 700 MHz

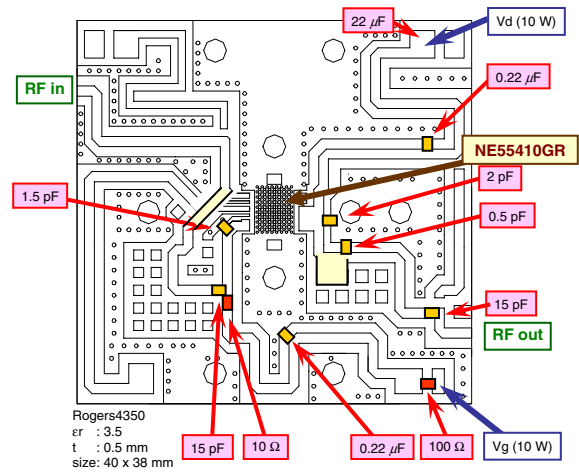
($V_{DS} = 28\text{ V}$, $I_{Dset}(Q2) = 100\text{ mA}$)

Single-stage Amplifier (Q2 Only)

Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
2 500	38.70	28.29	18.89	5.77
2 550	39.52	33.27	23.09	6.27
2 600	39.49	34.70	25.17	6.60
2 650	39.41	34.32	24.82	6.62
2 700	39.28	33.77	24.19	6.60



CIRCUIT of EV BOARD

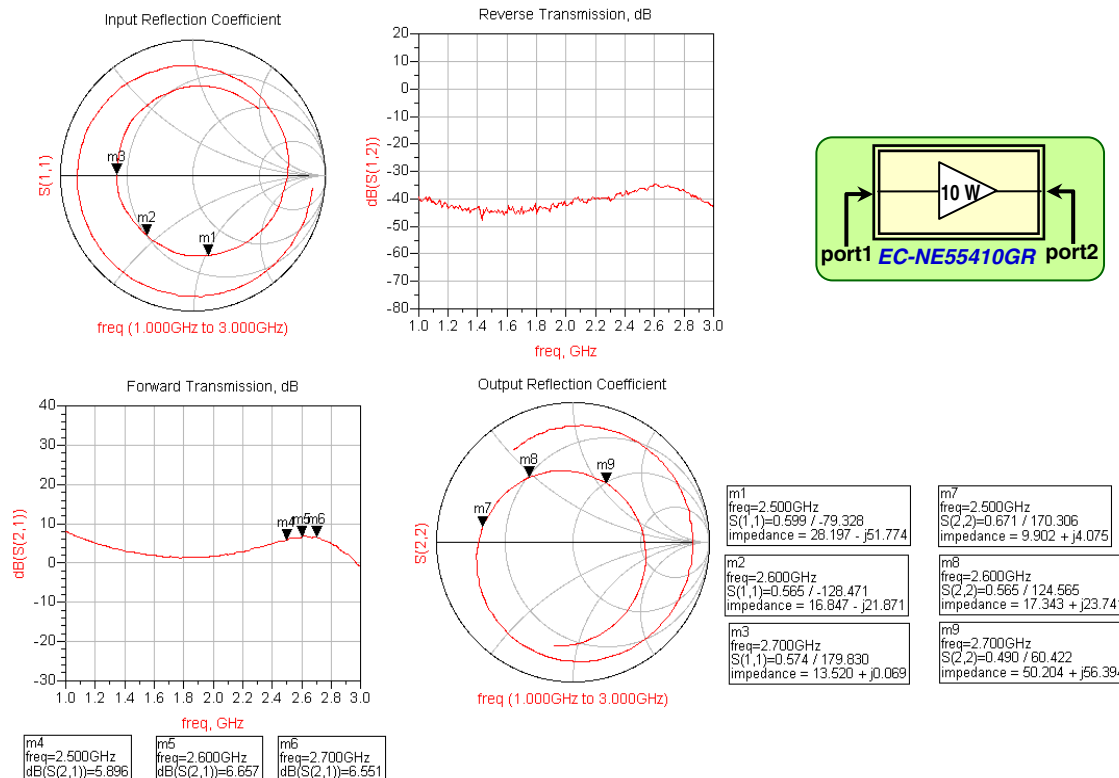


S-parameter on NE55410GR for 2 500 to 2 700 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q2) = 100\text{ mA}$)

Single-stage Amplifier (Q2 Only)

Use with S-Parameter Simulations



Evaluation Board Information PU10712EJ01V0EB

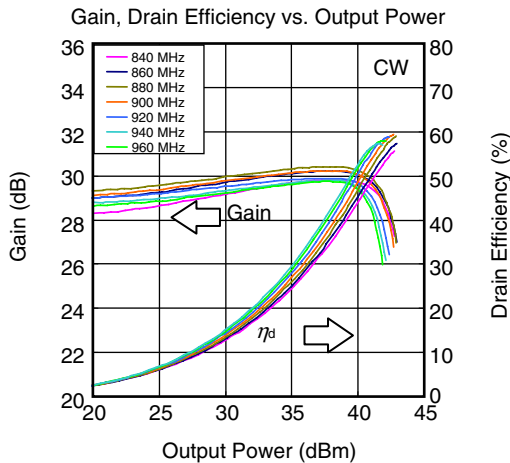
Two-stage Evaluation Board Data

(Cascade Amp.)

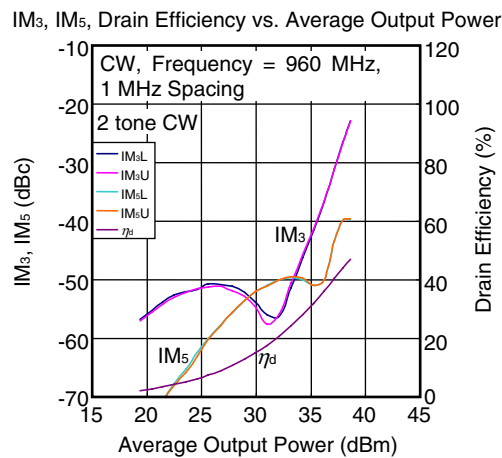
RF Data on NE55410GR for 840 to 960 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

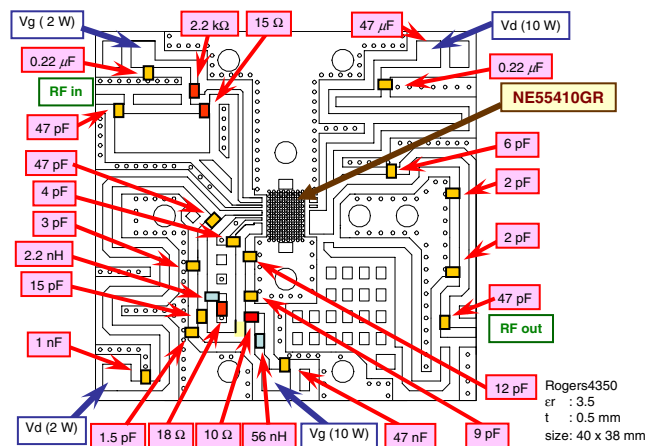
Two-stage Amplifier (Q1 + Q2)



Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	GL (dB)
840	41.84	52.38	52.31	29.84
860	41.68	53.15	53.09	30.21
880	41.76	55.42	55.35	30.42
900	41.59	56.27	56.21	30.23
920	41.27	56.26	56.19	29.89
940	41.06	56.29	56.21	29.78
960	40.70	55.56	55.49	29.75



CIRCUIT of EV BOARD

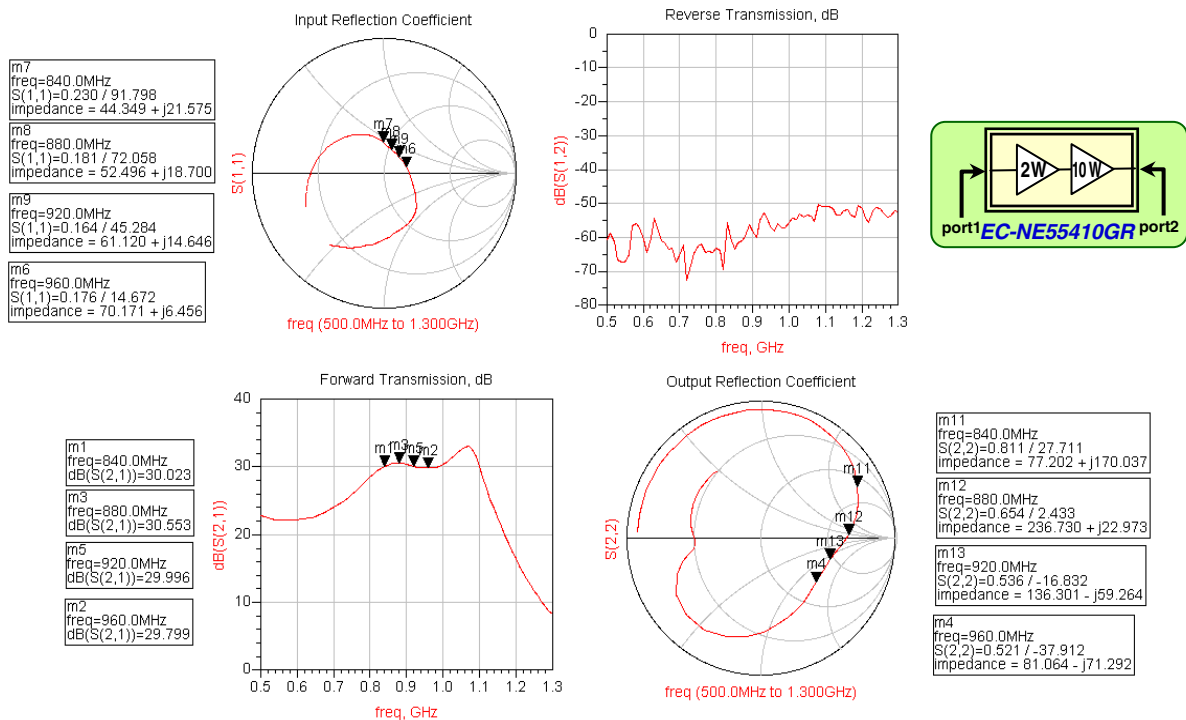


S-parameter on NE55410GR for 840 to 960 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)

Use with S-Parameter Simulations

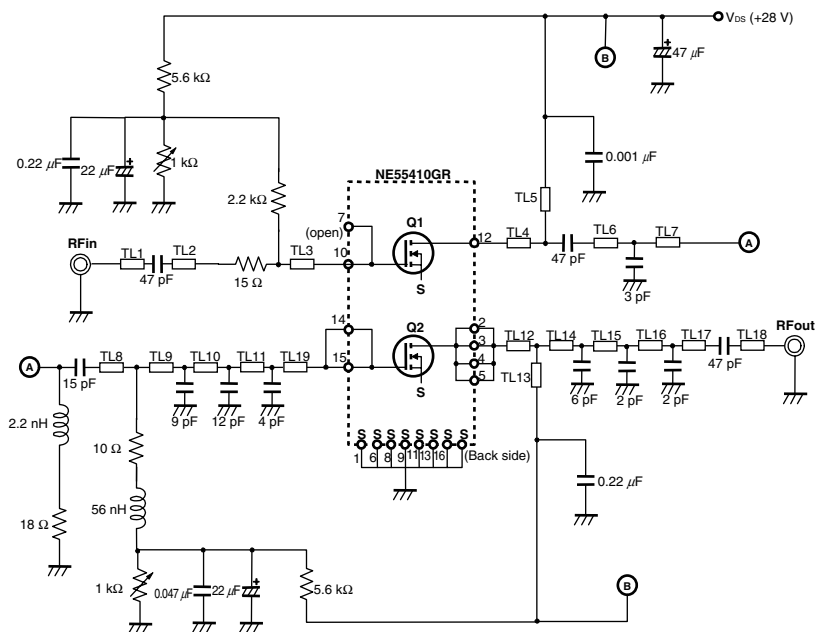


NE55410GR Board Information for 840 to 960 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)

EVALUATION CIRCUIT



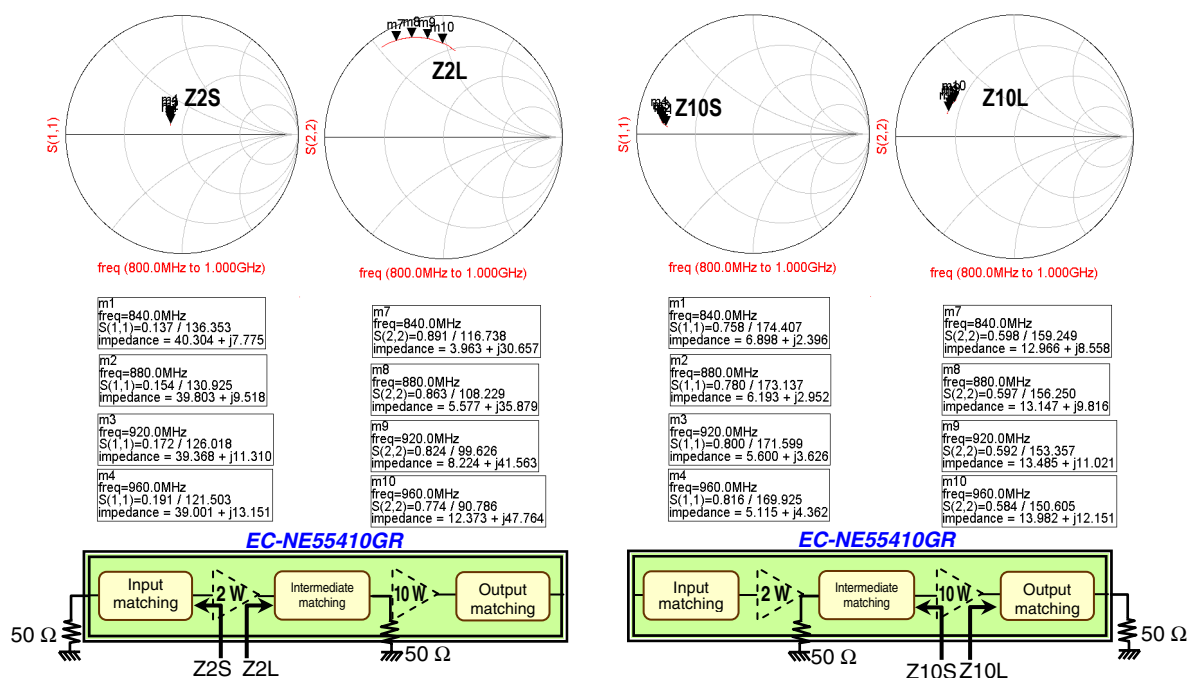
material : Rogers4350
er : 3.5
thickness : 0.51 mm

Symbol	Width (mm)	Length (mm)
TL1	1.0	3.0
TL2	4.5	10.0
TL3	0.5	16.0
TL4	0.5	5.0
TL5	1.0	48.0
TL6	1.0	4.0
TL7	1.0	3.0
TL8	1.0	6.0
TL9	1.0	3.0
TL10	1.0	4.0
TL11	1.0	3.0
TL12	1.0	5.0
TL13	0.8	48.0
TL14	1.0	6.5
TL15	1.0	10.5
TL16	1.0	9.5
TL17	1.0	10.0
TL18	1.0	6.0
TL19	1.0	3.0

Impedance Information on 840 to 960 MHz

$$(V_{DS} = 28 \text{ V}, I_{Dset}(Q1) + I_{Dset}(Q2) = 120 \text{ mA})$$

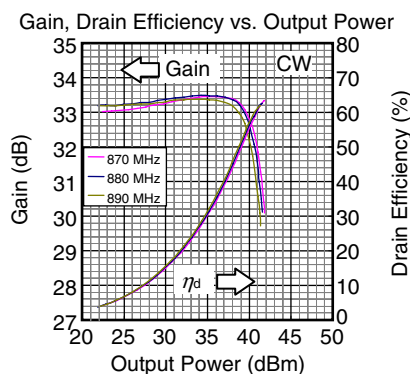
Two-stage Amplifier (Q1 + Q2)



ACLR Optimum tune for NE55410GR for 870 to 890 MHz

$$(V_{DS} = 28 \text{ V}, I_{Dset(Q1)} = 35 \text{ mA}, I_{Dset(Q2)} = 95 \text{ mA})$$

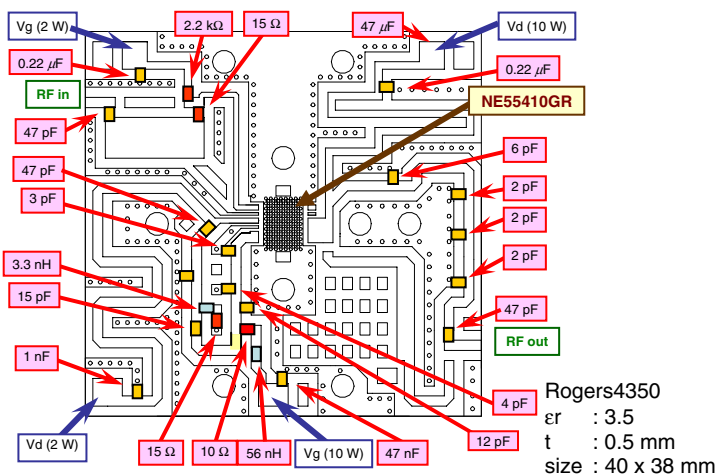
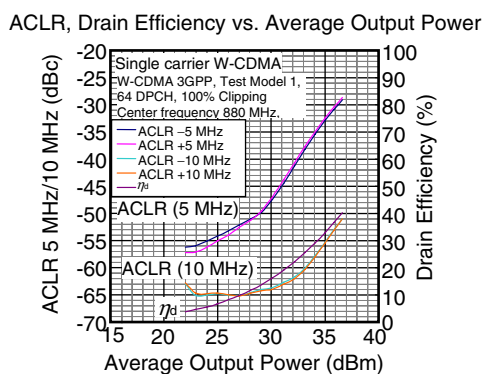
Two-stage Amplifier (Q1 + Q2)



High-gain (33 dB) and Low-distortion Matching
(ACLR = -56 dBc@0.2 W single-carrier W-CDMA)

Frequency (MHz)	P-1 dB (dBm)	η_p (%)	PAE (%)	G _L (dB)
870	40.63	58.69	58.66	33.05
880	40.10	56.80	56.76	33.19
890	39.96	56.76	56.73	33.19

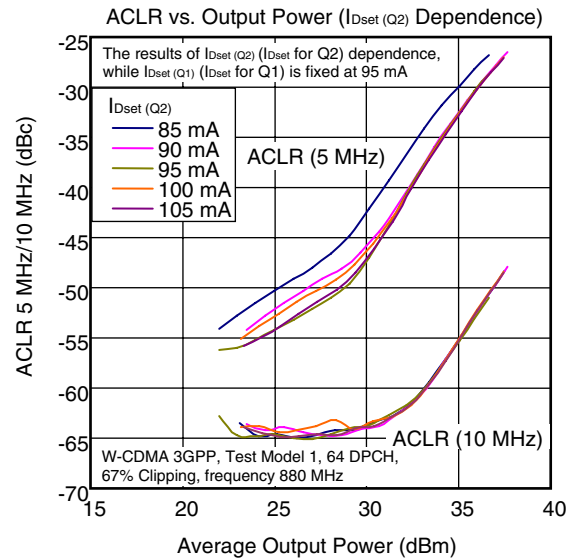
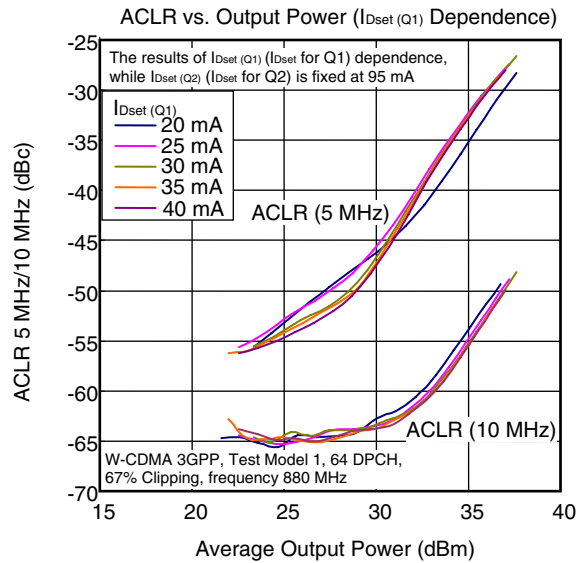
CIRCUIT of EV BOARD



ACLR vs. I_{Dset} on NE55410GR for 880 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 20\text{ to }40\text{ mA}$, $I_{Dset}(Q2) = 85\text{ to }105\text{ mA}$)

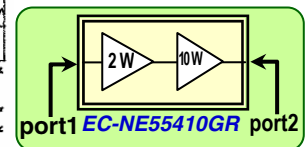
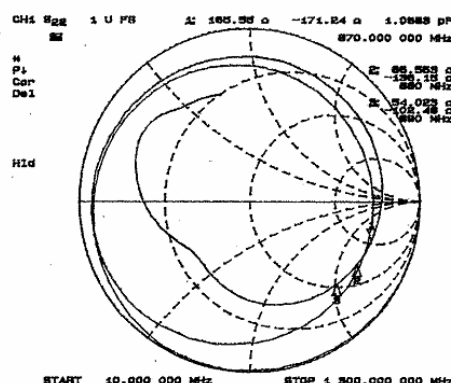
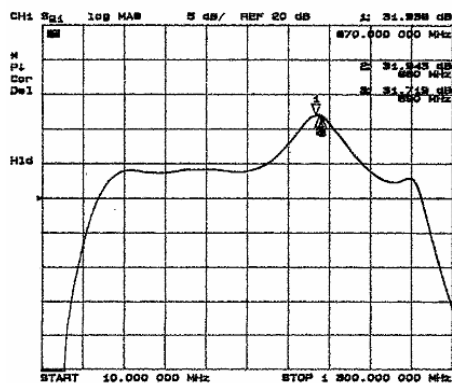
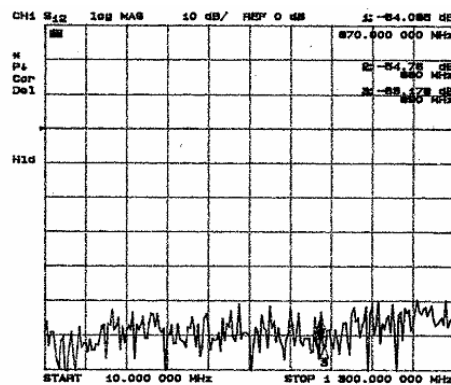
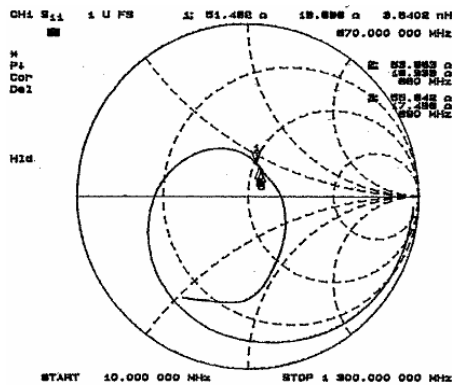
Two-stage Amplifier (Q1 + Q2)



S-parameter on NE55410GR for 870 to 890 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 130\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)

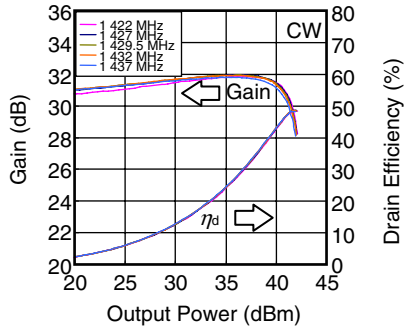


RF Data on NE55410GR for 1 422 to 1 437 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

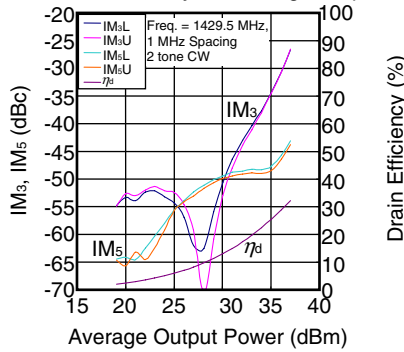
Two-stage Amplifier (Q1 + Q2)

Gain, Drain Efficiency vs. Output Power

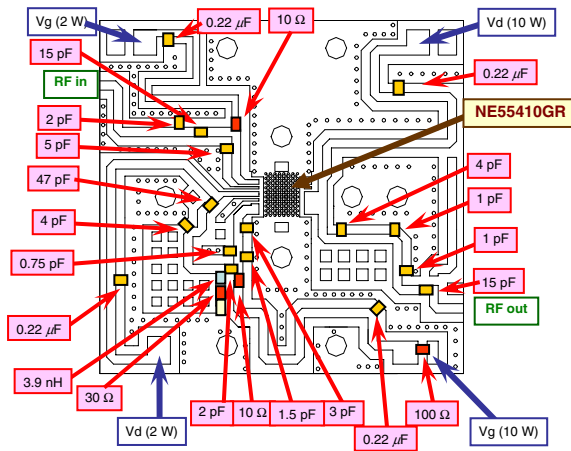


Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	GL (dB)
1 422.0	41.20	47.42	47.38	31.84
1 427.0	40.92	46.68	46.64	31.95
1 429.5	40.89	46.60	46.56	31.95
1 432.0	40.83	46.38	46.34	31.93
1 437.0	40.65	45.70	45.66	31.80

IM₃, IM₅, Drain Efficiency vs. Average Output Power



CIRCUIT of EV BOARD

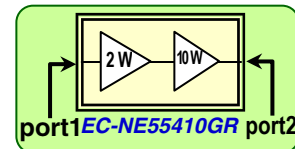
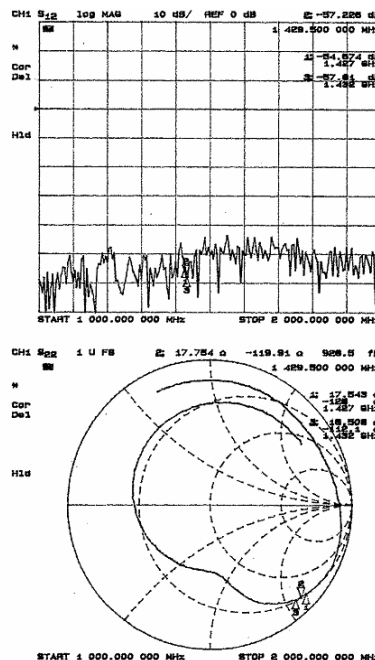
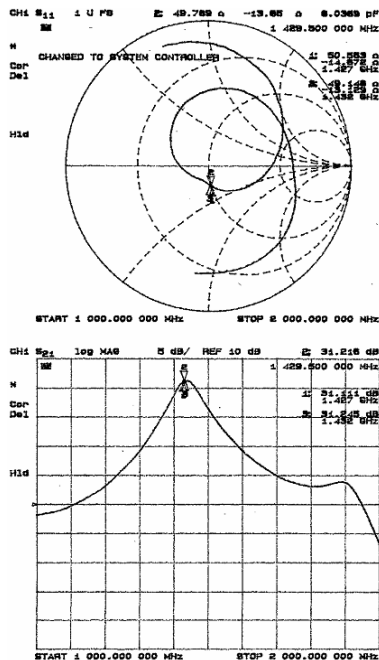


Rogers4350
 ϵ_r : 3.5
 t : 0.5 mm
 size: 40 x 38 mm

S-parameter on NE55410GR for 1 422 to 1 430 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)

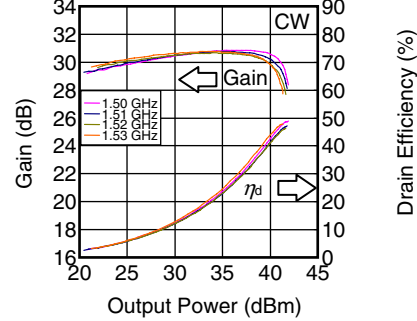


RF Data on NE55410GR for 1 500 to 1 530 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

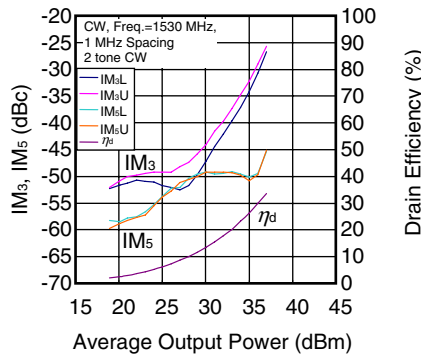
Two-stage Amplifier (Q1 + Q2)

Gain, Drain Efficiency vs. Output Power

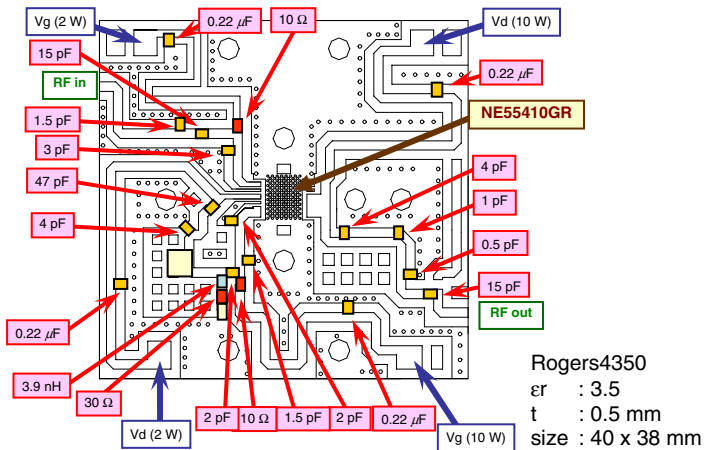


Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
1 500	41.32	47.83	47.78	30.84
1 510	40.86	44.67	44.62	30.75
1 520	40.51	42.94	42.90	30.66
1 530	40.26	44.89	44.84	30.76

IM₃, IM₅, Drain Efficiency vs. Average Output Power



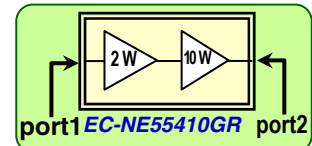
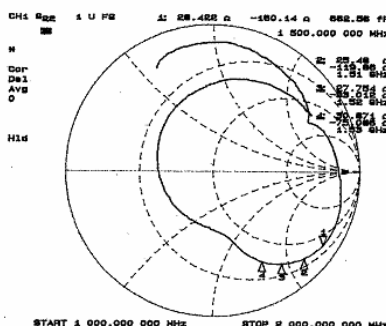
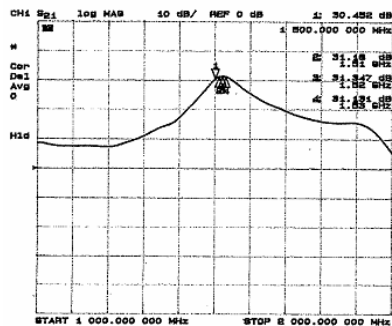
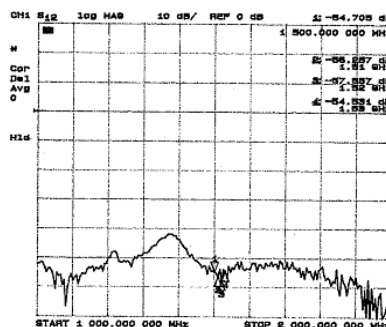
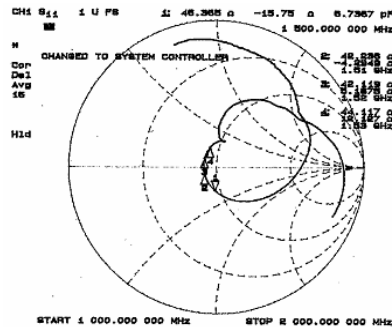
CIRCUIT of EV BOARD



S-parameter on NE55410GR for 1 500 to 1 530 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)

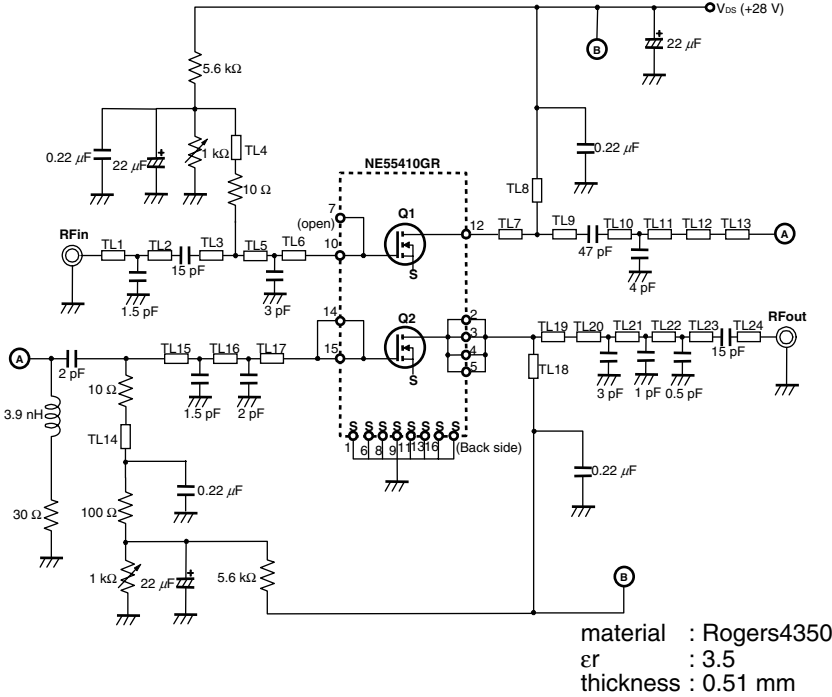


NE55410GR Board Information for 1 500 to 1 530 MHz

(V_{DS} = 28 V, I_{Dset} (Q1) + I_{Dset} (Q2) = 120 mA)

Two-stage Amplifier (Q1 + Q2)

EVALUATION CIRCUIT

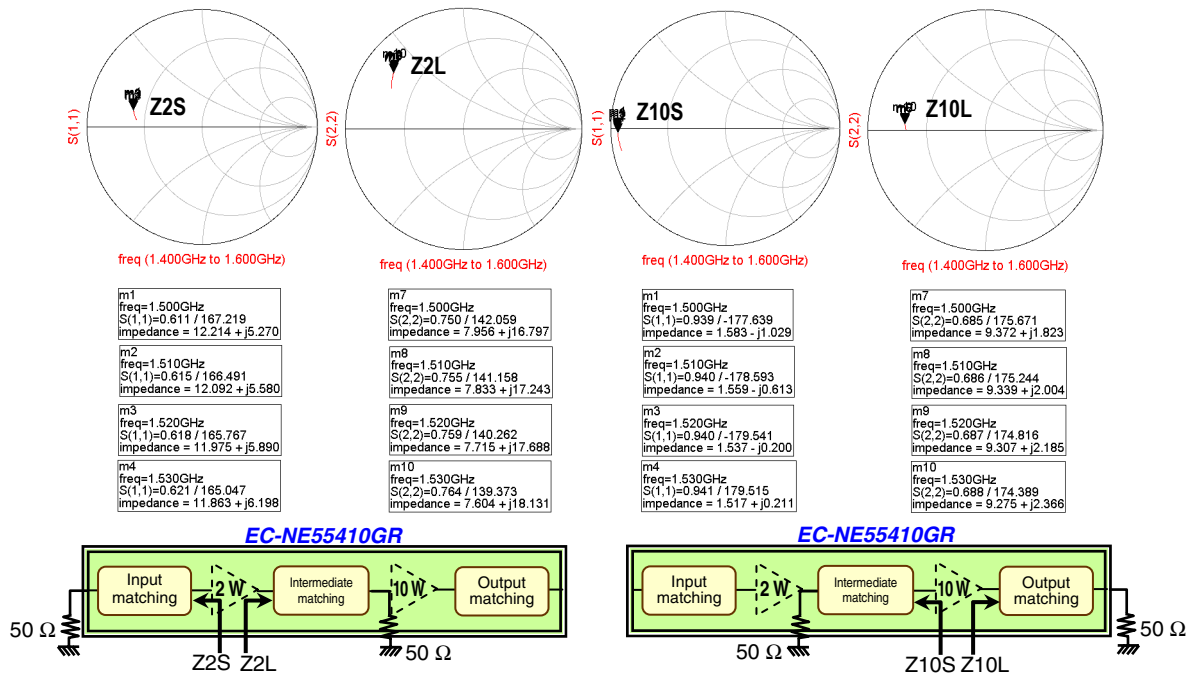


Symbol	Width (mm)	Length (mm)
TL1	1.0	18.0
TL2	1.0	2.0
TL3	1.0	5.0
TL4	1.0	25.0
TL5	1.0	1.5
TL6	0.5	5.5
TL7	0.5	5.0
TL8	1.0	25.0
TL9	1.0	2.5
TL10	1.0	4.0
TL11	1.0	2.0
TL12	2.5	3.5
TL13	1.0	5.0
TL14	1.0	25.0
TL15	1.0	1.0
TL16	1.0	5.0
TL17	1.0	4.0
TL18	1.0	25.0
TL19	2.5	3.5
TL20	1.0	4.0
TL21	2.0	6.0
TL22	1.0	4.0
TL23	1.0	4.0
TL24	1.0	7.0

Impedance Information on 1 500 to 1 530 MHz

(V_{DS} = 28 V, I_{Dset} (Q1) + I_{Dset} (Q2) = 120 mA)

Two-stage Amplifier (Q1 + Q2)

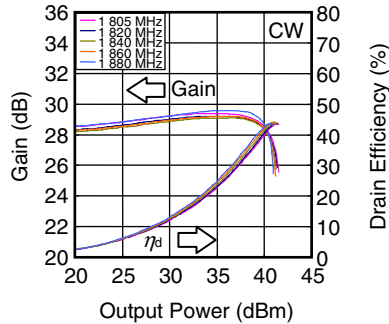


RF Data on NE55410GR for 1 805 to 1 880 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

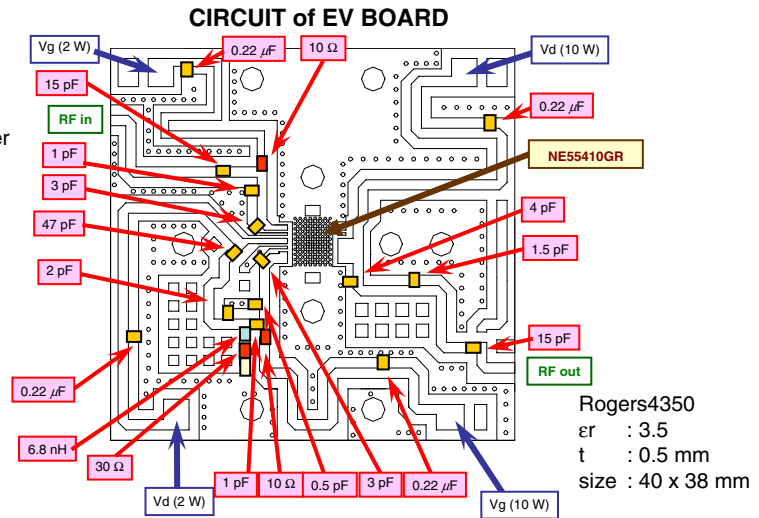
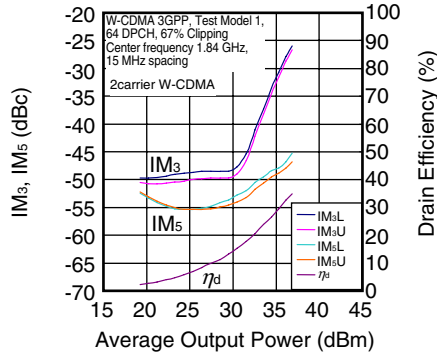
Two-stage Amplifier (Q1 + Q2)

Gain, Drain Efficiency vs. Output Power



Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
1 805	40.26	40.84	40.78	29.39
1 820	40.22	41.22	41.16	29.20
1 840	40.45	42.81	42.74	29.10
1 860	40.40	43.23	43.17	29.20
1 880	40.08	42.75	42.69	29.57

IM₃, IM₅, Drain Efficiency vs. Average Output Power

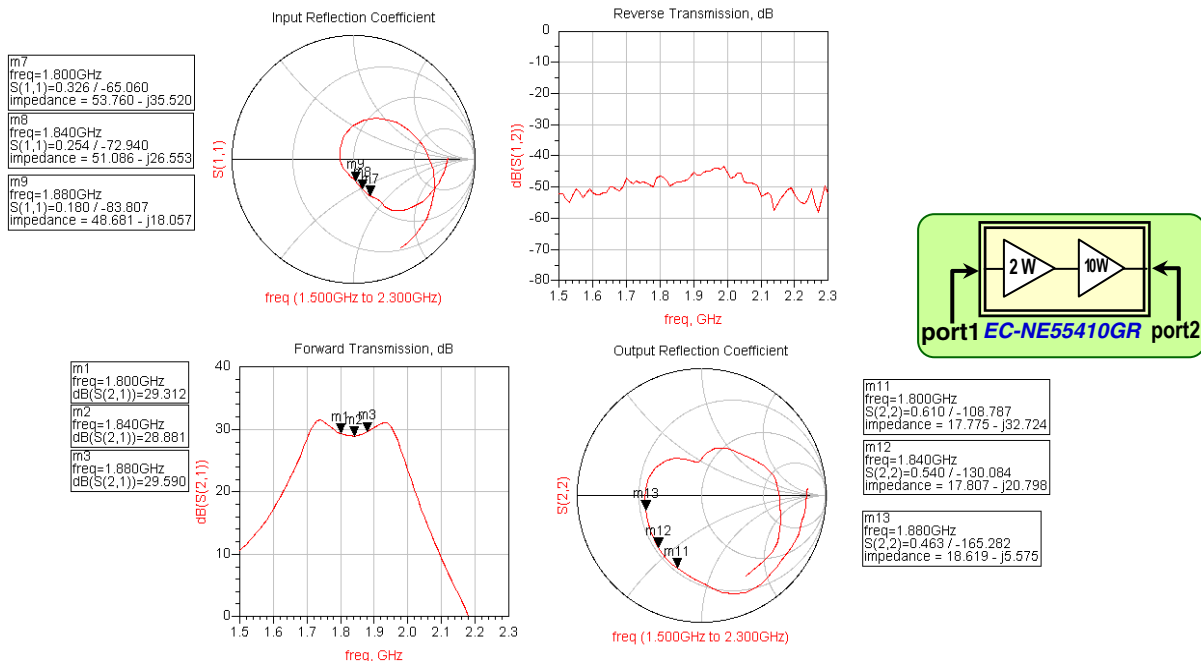


S-parameter on NE55410GR for 1 805 to 1 880 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)

Use with S-Parameter Simulations

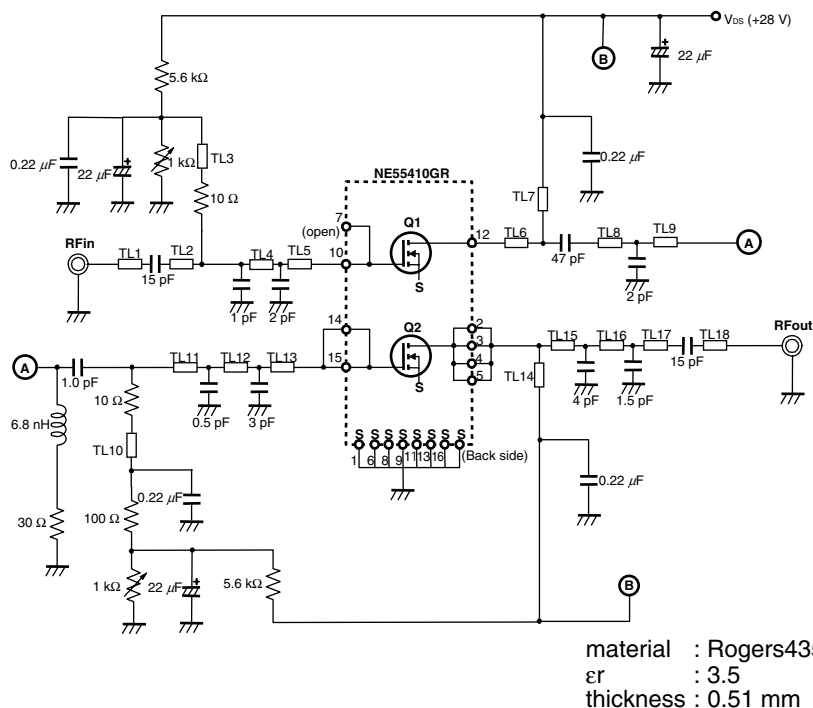


NE55410GR Board Information for 1 805 to 1 880 MHz

$$(V_{DS} = 28 \text{ V}, I_{Dset}(Q1) + I_{Dset}(Q2) = 120 \text{ mA})$$

Two-stage Amplifier (Q1 + Q2)

EVALUATION CIRCUIT

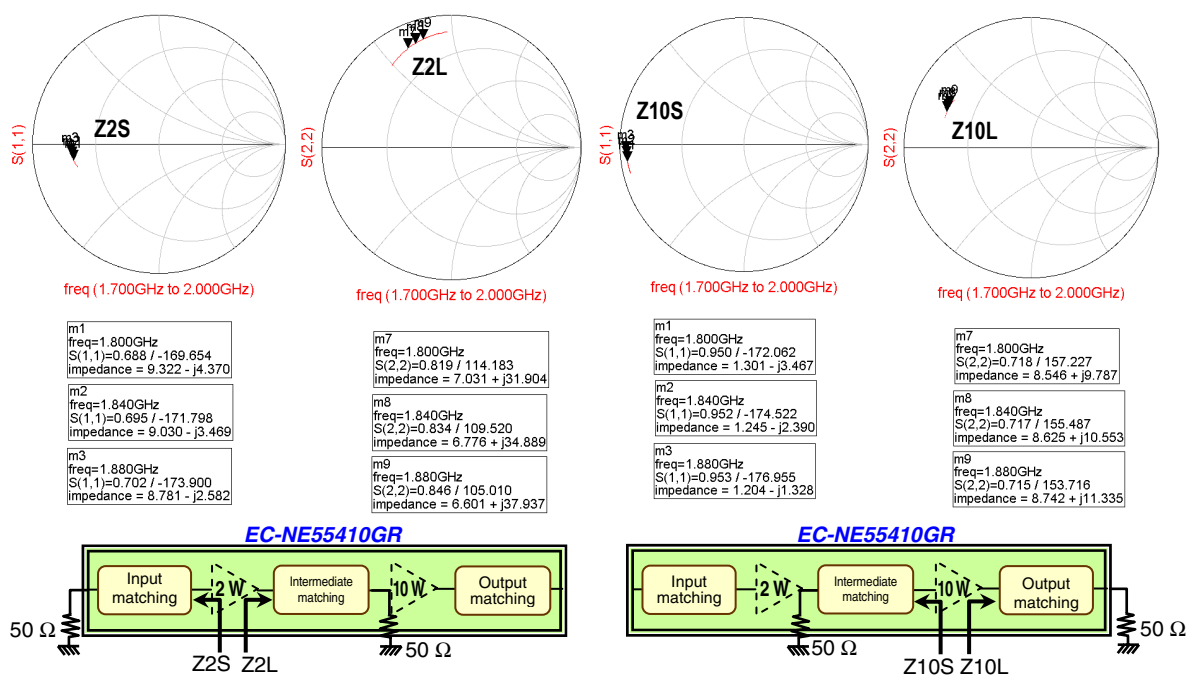


Symbol	Width (mm)	Length (mm)
TL1	1.0	20.0
TL2	1.0	5.0
TL3	1.0	24.0
TL4	1.0	5.0
TL5	0.5	2.5
TL6	0.5	6.0
TL7	1.0	24.0
TL8	1.0	11.0
TL9	1.0	2.0
TL10	1.0	24.0
TL11	1.0	2.0
TL12	1.0	5.0
TL13	1.0	3.5
TL14	1.0	24.0
TL15	1.0	6.5
TL16	1.0	7.0
TL17	1.0	11.0
TL18	1.0	7.0

Impedance Information on 1 805 to 1 880 MHz

$$(V_{DS} = 28 \text{ V}, I_{Dset(Q1)} + I_{Dset(Q2)} = 120 \text{ mA})$$

Two-stage Amplifier (Q1 + Q2)

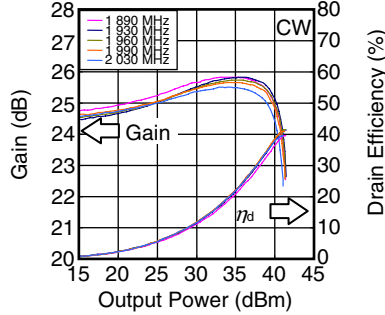


RF Data on NE55410GR for 1 900 to 2 020 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

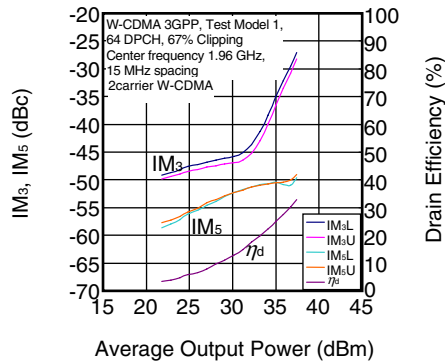
Two-stage Amplifier (Q1 + Q2)

Gain, Drain Efficiency vs. Output Power

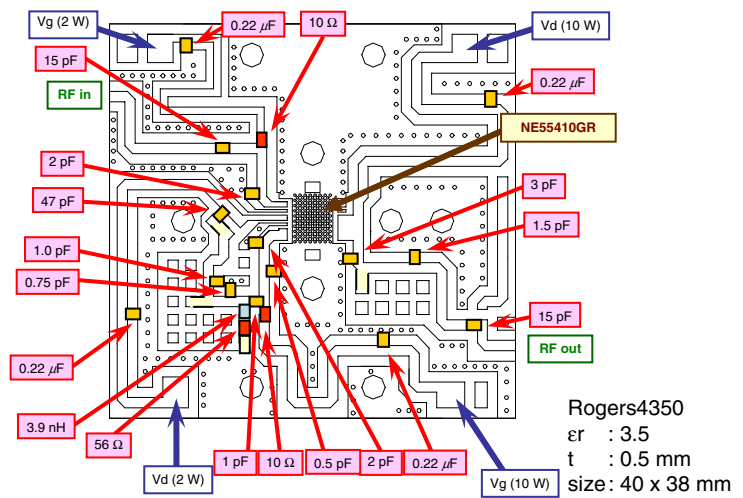


Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
1 890	40.28	37.41	37.29	25.85
1 930	40.49	39.42	39.28	25.81
1 960	40.42	39.63	39.50	25.72
1 990	40.30	39.13	38.99	25.65
2 030	39.92	37.30	37.16	25.49

IM₃, IM₅, Drain Efficiency vs. Average Output Power



CIRCUIT of EV BOARD



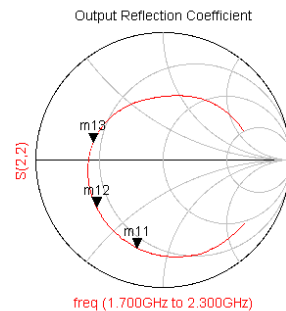
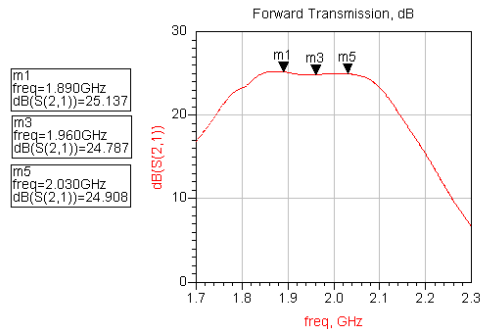
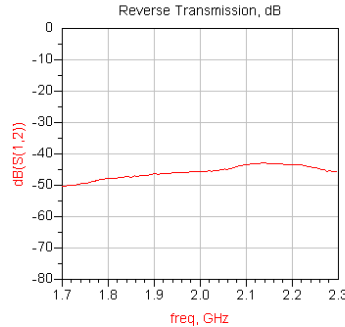
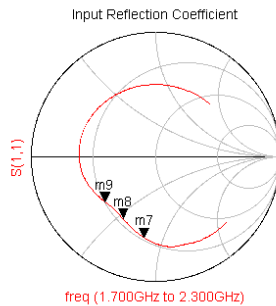
S-parameter on NE55410GR for 1 900 to 2 020 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

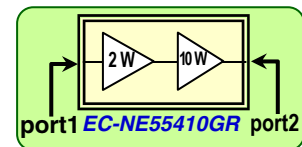
Two-stage Amplifier (Q1 + Q2)

Use with S-Parameter Simulations

m7	freq=1.890GHz
S(1,1)	=0.653 / -98.178
impedance	= 17.769 - j40.100
m8	freq=1.960GHz
S(1,1)	=0.559 / -118.068
impedance	= 18.691 - j26.831
m9	freq=2.030GHz
S(1,1)	=0.543 / -138.902
impedance	= 16.693 - j16.889



m11	freq=1.890GHz
S(2,2)	=0.718 / -106.540
impedance	= 12.603 - j35.764
m12	freq=1.960GHz
S(2,2)	=0.640 / -144.891
impedance	= 12.025 - j14.982
m13	freq=2.030GHz
S(2,2)	=0.567 / 165.827
impedance	= 14.020 + j5.734

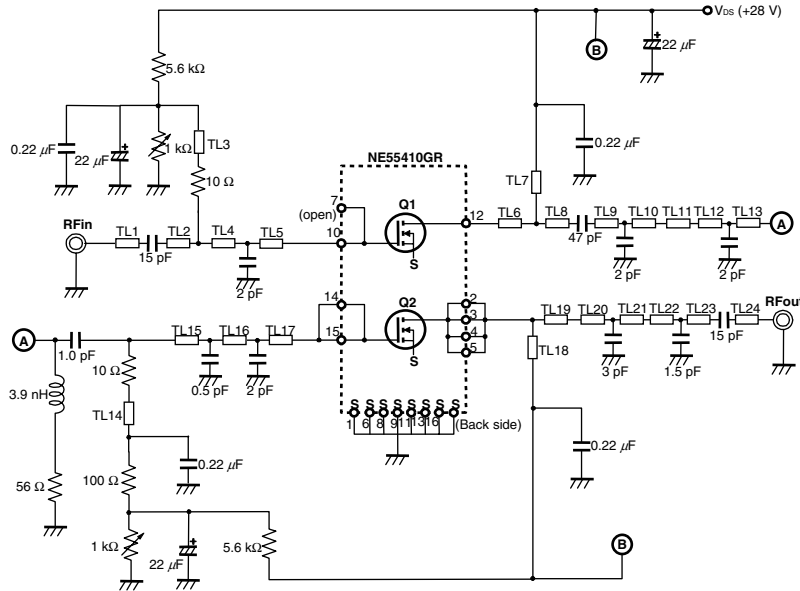


NE55410GR Board Information for 1 900 to 2 020 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)

EVALUATION CIRCUIT



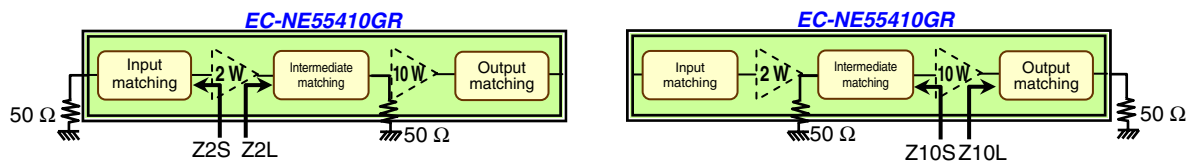
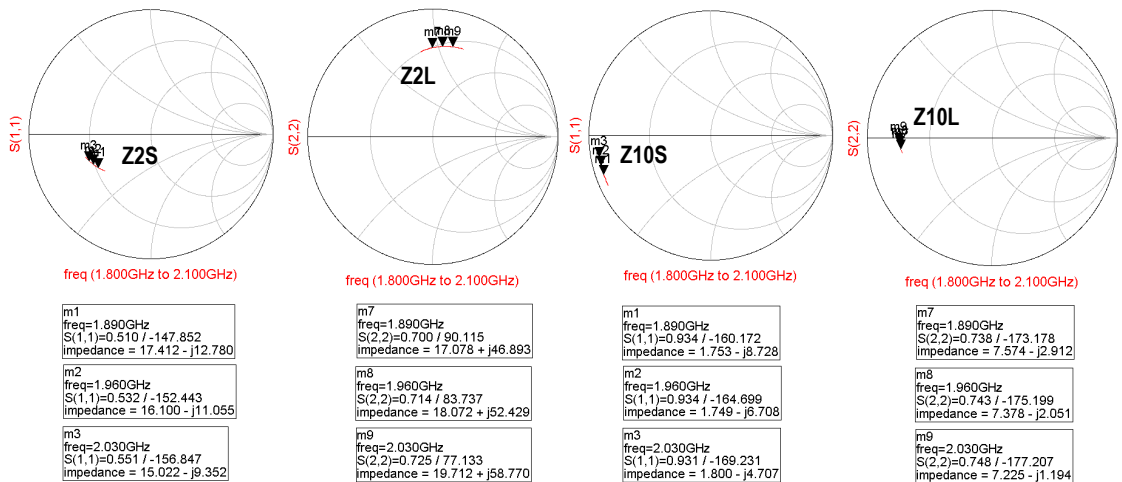
material : Rogers4350
 ϵ_r : 3.5
 thickness : 0.51 mm

Symbol	Width (mm)	Length (mm)
TL1	1.0	20.0
TL2	1.0	5.0
TL3	1.0	5.0
TL4	1.0	4.5
TL5	0.5	2.5
TL6	0.5	5.0
TL7	1.0	24.0
TL8	1.0	2.5
TL9	1.0	10.0
TL10	1.0	1.5
TL11	2.0	1.0
TL12	1.0	1.5
TL13	1.0	0.5
TL14	1.0	24.0
TL15	1.0	6.0
TL16	1.0	2.0
TL17	1.0	2.0
TL18	1.0	24.0
TL19	2.5	3.5
TL20	1.0	1.0
TL21	2.0	1.0
TL22	1.0	4.0
TL23	1.0	12.0
TL24	1.0	7.0

Impedance Information on 1 900 to 2 020 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)

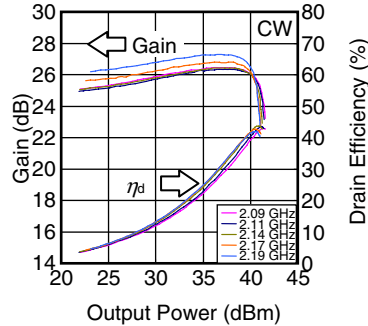


RF Data on NE55410GR for 2 090 to 2 190 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

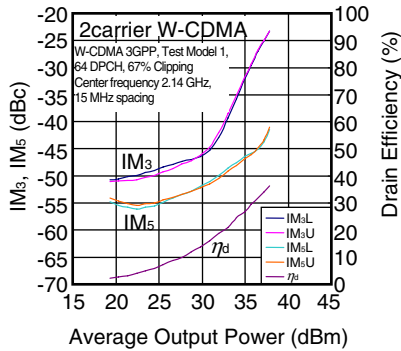
Two-stage Amplifier (Q1 + Q2)

Gain, Drain Efficiency vs. Output Power

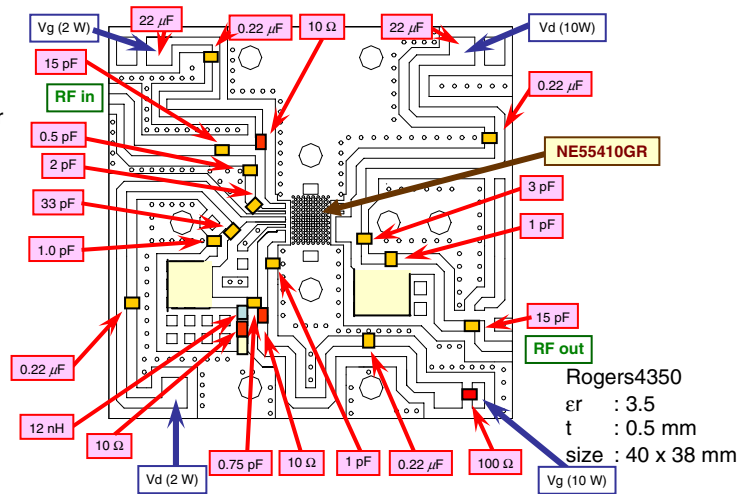


Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
2 090	40.84	41.88	41.76	26.42
2 110	40.94	42.94	42.81	26.22
2 140	40.62	43.04	42.91	26.25
2 170	40.38	41.99	41.87	26.53
2 190	40.22	41.34	42.24	27.00

IM₃, IM₅, Drain Efficiency vs. Average Output Power



CIRCUIT of EV BOARD

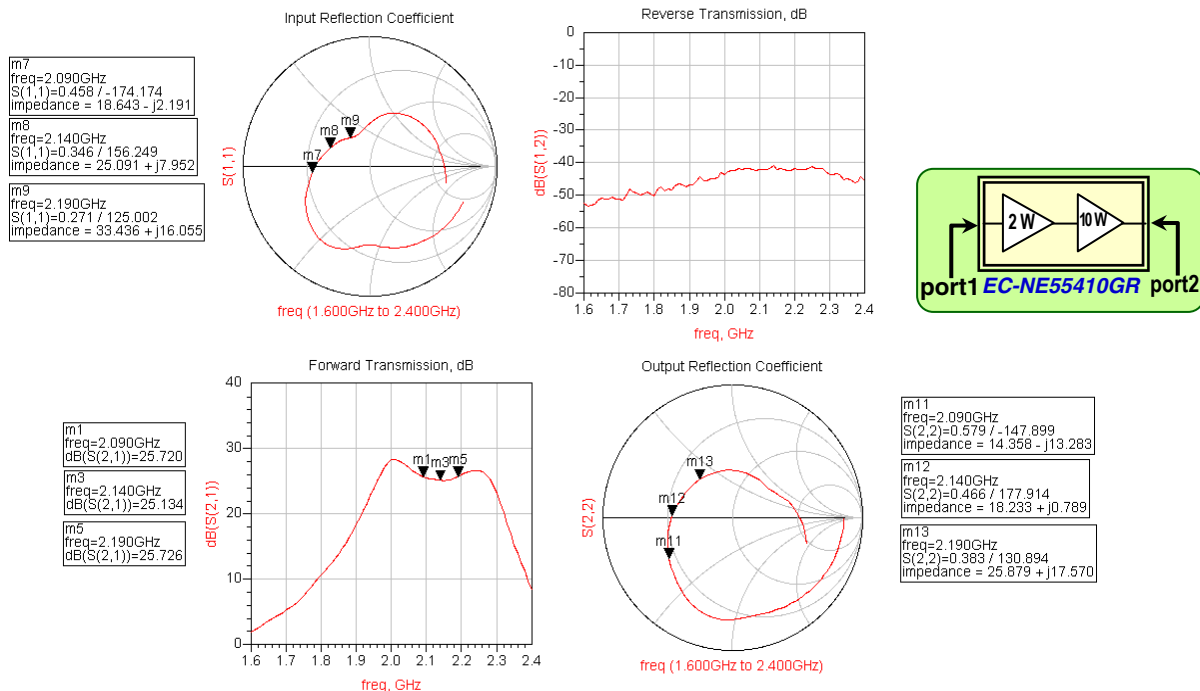


S-parameter on NE55410GR for 2 090 to 2 190 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)

Use with S-Parameter Simulations

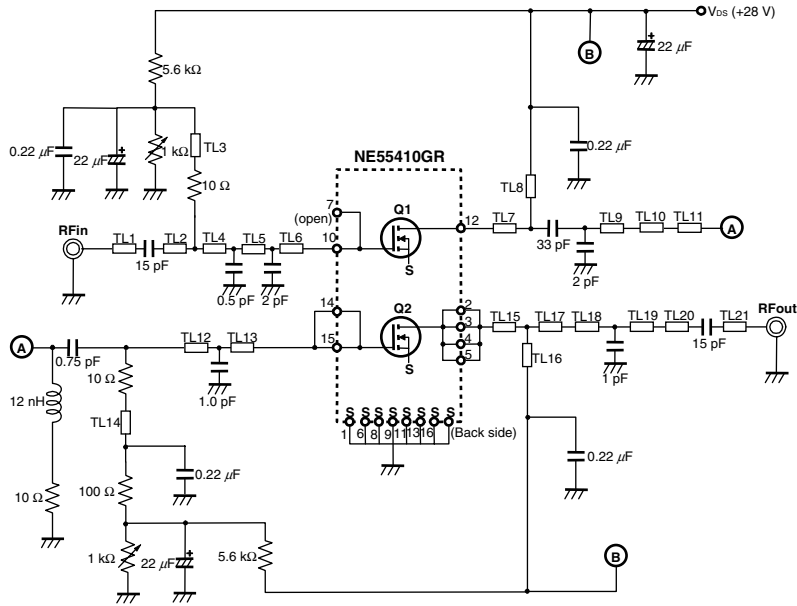


NE55410GR Board Information for 2 090 to 2 190 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)

EVALUATION CIRCUIT



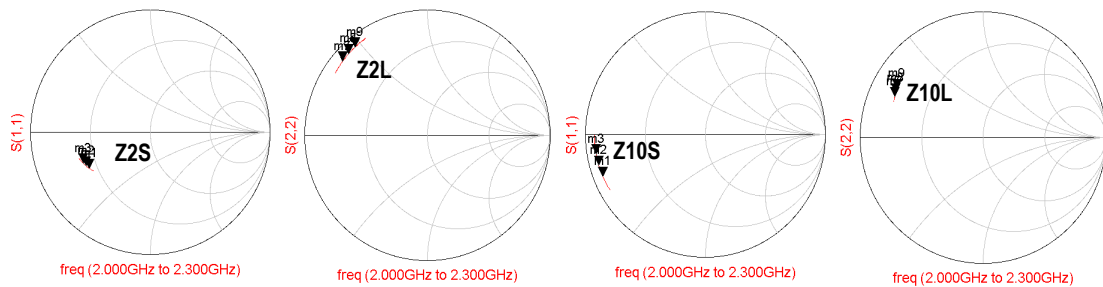
material : Rogers4350
 ϵ_r : 3.5
 thickness : 0.51 mm

Symbol	Width (mm)	Length (mm)
TL1	1.0	17.0
TL2	1.0	4.0
TL3	1.0	24.5
TL4	1.0	2.5
TL5	1.0	3.0
TL6	0.5	2.5
TL7	0.5	4.5
TL8	1.0	25.5
TL9	1.0	2.5
TL10	4.5	4.5
TL11	1.0	3.5
TL12	1.0	4.0
TL13	1.0	4.5
TL14	1.0	25.0
TL15	2.5	2.5
TL16	1.0	27.0
TL17	1.0	2.0
TL18	5.0	4.0
TL19	5.0	2.0
TL20	1.0	12.5
TL21	1.0	5.5

Impedance Information on 2 090 to 2 190 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)



freq (2.000GHz to 2.300GHz)

freq (2.000GHz to 2.300GHz)

freq (2.000GHz to 2.300GHz)

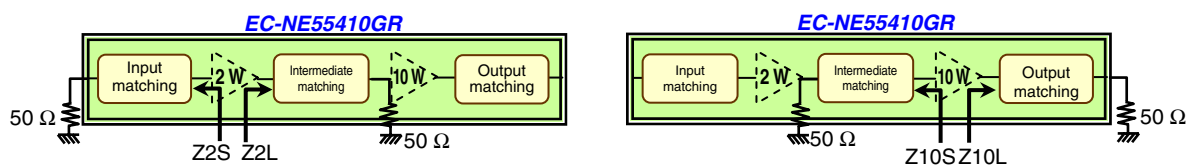
freq (2.000GHz to 2.300GHz)

m1
 freq=2.080GHz
 $S(1,1)=0.590 / -149.911$
 impedance = 13.768 - j12.484
 m2
 freq=2.140GHz
 $S(1,1)=0.604 / -152.819$
 impedance = 13.022 - j11.310
 m3
 freq=2.200GHz
 $S(1,1)=0.616 / -155.638$
 impedance = 12.387 - j10.159

m7
 freq=2.080GHz
 $S(2,2)=0.908 / 139.556$
 impedance = 2.734 + j18.370
 m8
 freq=2.140GHz
 $S(2,2)=0.913 / 134.687$
 impedance = 2.663 + j20.820
 m9
 freq=2.200GHz
 $S(2,2)=0.917 / 130.101$
 impedance = 2.621 + j23.209

m1
 freq=2.080GHz
 $S(1,1)=0.921 / -158.253$
 impedance = 2.146 - j9.588
 m2
 freq=2.140GHz
 $S(1,1)=0.924 / -164.214$
 impedance = 2.026 - j8.921
 m3
 freq=2.200GHz
 $S(1,1)=0.925 / -170.074$
 impedance = 1.953 - j4.335

m7
 freq=2.080GHz
 $S(2,2)=0.788 / 155.842$
 impedance = 6.187 + j10.543
 m8
 freq=2.140GHz
 $S(2,2)=0.794 / 153.515$
 impedance = 6.042 + j11.604
 m9
 freq=2.200GHz
 $S(2,2)=0.800 / 151.210$
 impedance = 5.916 + j12.665

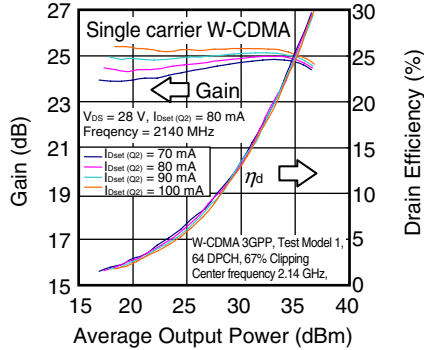


ACLR Optimum tune on NE55410GR for 2 140 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 35\text{ mA}$, $I_{Dset}(Q2) = 80\text{ mA}$)

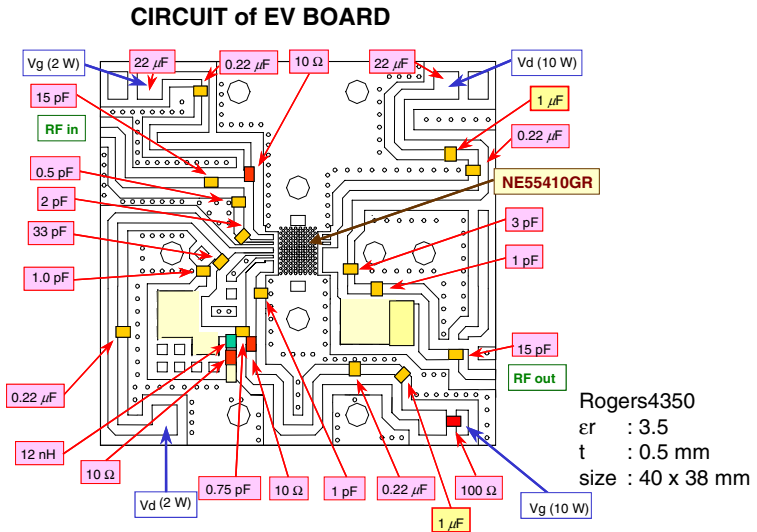
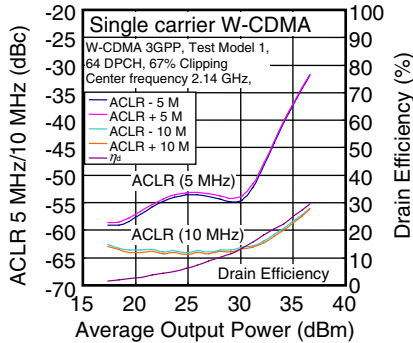
Two-stage Amplifier (Q1 + Q2)

Gain, Drain Efficiency vs. Average Output Power



Low-distortion matching
 (ACLR = -54 dBc @ 1 W single-carrier W-CDMA)

ACLR, Drain Efficiency vs. Average Output Power

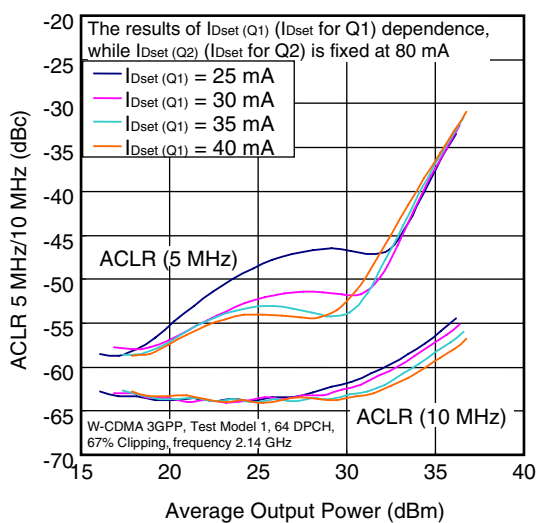


ACLR vs. I_{Dset} on NE55410GR (Q1) at 2 140 MHz

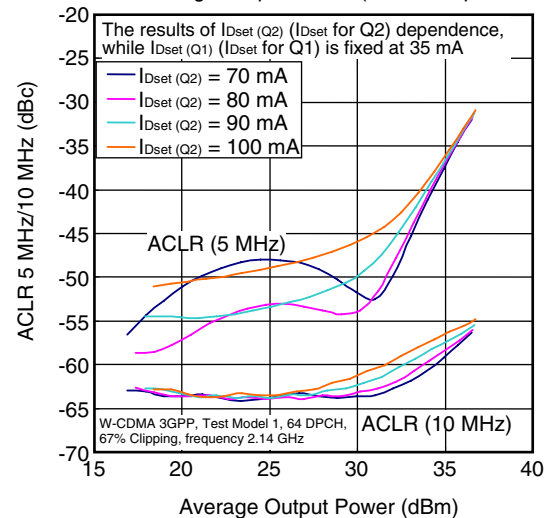
($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) = 35\text{ mA}$, $I_{Dset}(Q2) = 80\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)

ACLR vs. Average Output Power ($I_{Dset}(Q1)$ Dependence)



ACLR vs. Average Output Power ($I_{Dset}(Q2)$ Dependence)

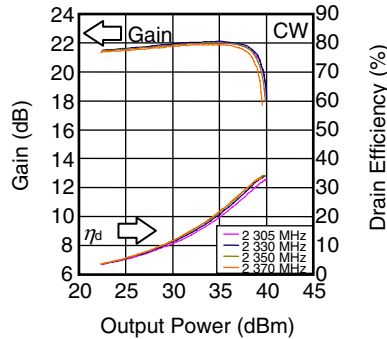


RF Data on NE55410GR for 2 305 to 2 370 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

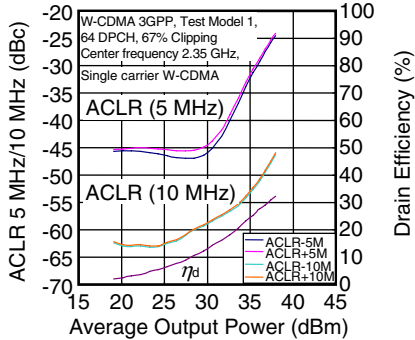
Two-stage Amplifier (Q1 + Q2)

Gain, Drain Efficiency vs. Output Power

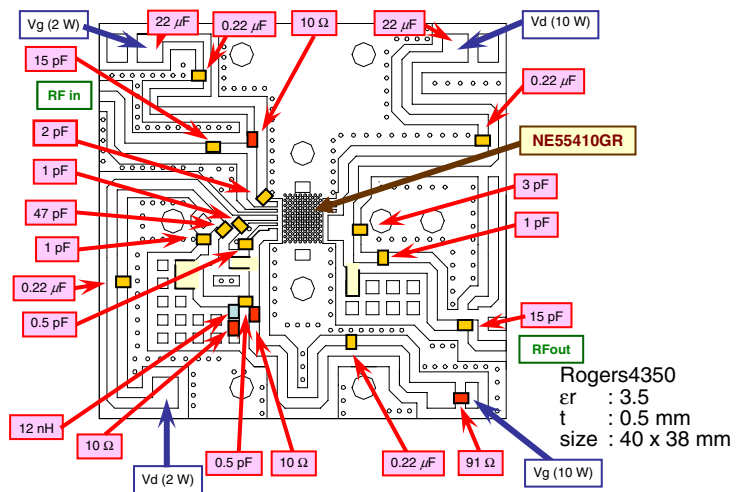


Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	GL (dB)
2 305	39.22	31.25	30.99	22.03
2 330	39.08	32.43	32.17	22.10
2 350	38.93	32.61	32.35	21.99
2 370	38.67	31.95	31.68	21.88

ACLR, Drain Efficiency vs. Average Output Power



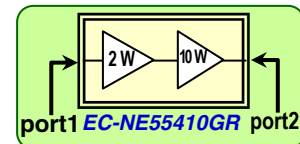
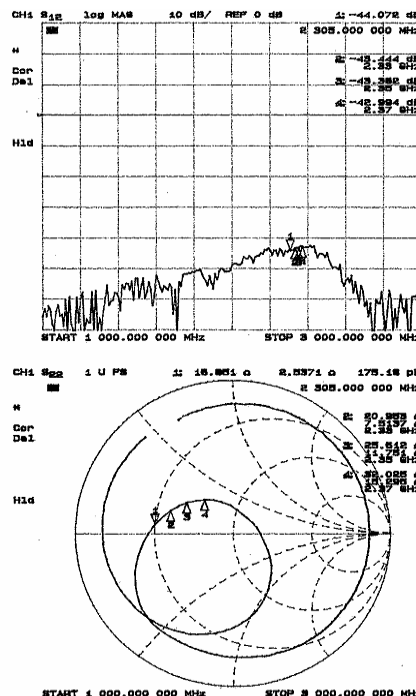
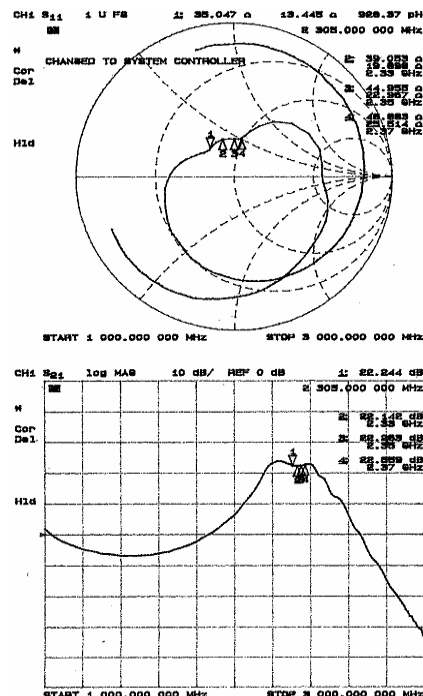
CIRCUIT of EV BOARD



S-parameter on NE55410GR for 2 305 to 2 370 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)

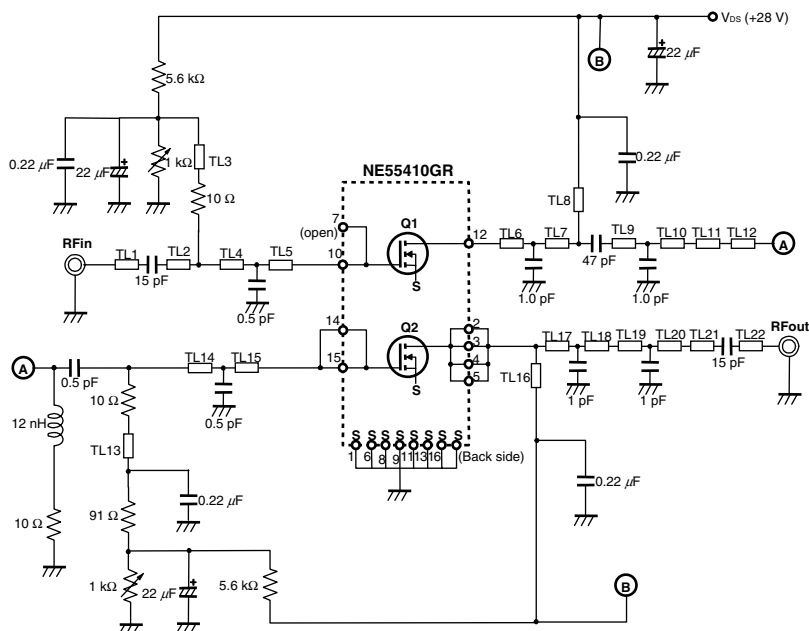


NE55410GR Board Information for 2 305 to 2 370 MHz

$$(V_{DS} = 28 \text{ V}, I_{Dset}(Q1) + I_{Dset}(Q2) = 120 \text{ mA})$$

Two-stage Amplifier (Q1 + Q2)

EVALUATION CIRCUIT



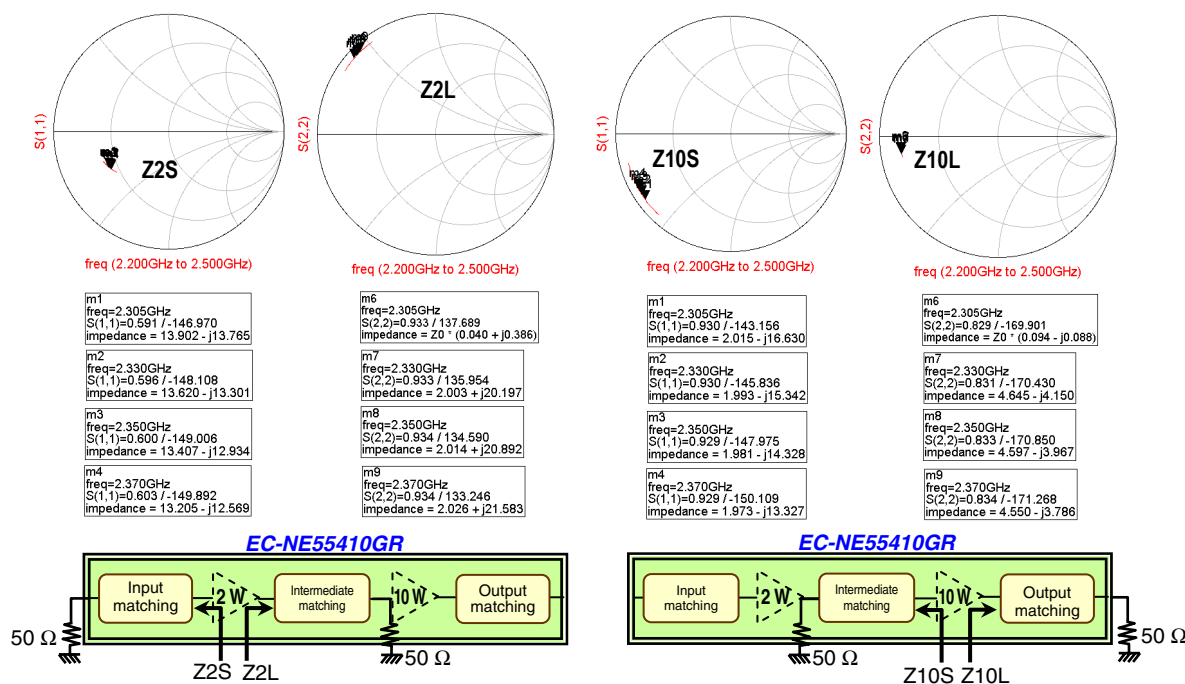
material : Rogers4350
 ϵ_r : 3.5
thickness : 0.51 mm

Symbol	Width (mm)	Length (mm)
TL1	1.0	18.0
TL2	1.0	5.0
TL3	1.0	20.0
TL4	1.0	4.0
TL5	0.5	1.5
TL6	0.5	5.0
TL7	0.5	1.0
TL8	1.0	20.0
TL9	1.0	0.5
TL10	1.0	2.5
TL11	3.0	3.0
TL12	1.0	5.0
TL13	1.0	20.0
TL14	1.0	7.5
TL15	1.0	2.0
TL16	1.0	2.0
TL17	2.5	3.5
TL18	1.0	2.0
TL19	4.5	1.0
TL20	1.0	4.0
TL21	1.0	11.0
TL22	1.0	7.0

Impedance Information on 2 305 to 2 370 MHz

$$(V_{DS} = 28 \text{ V}, I_{Dset}(Q1) + I_{Dset}(Q2) = 120 \text{ mA})$$

Two-stage Amplifier (Q1 + Q2)

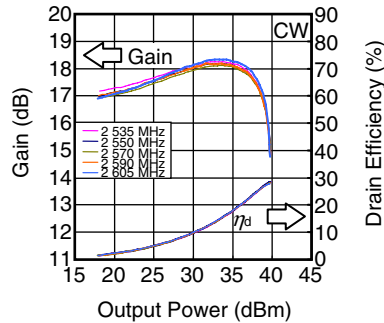


RF Data on NE55410GR for 2 535 to 2 605 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

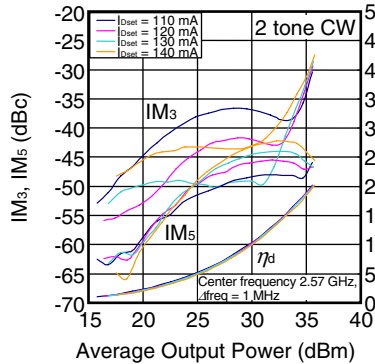
Two-stage Amplifier (Q1 + Q2)

Gain, Drain Efficiency vs. Output Power

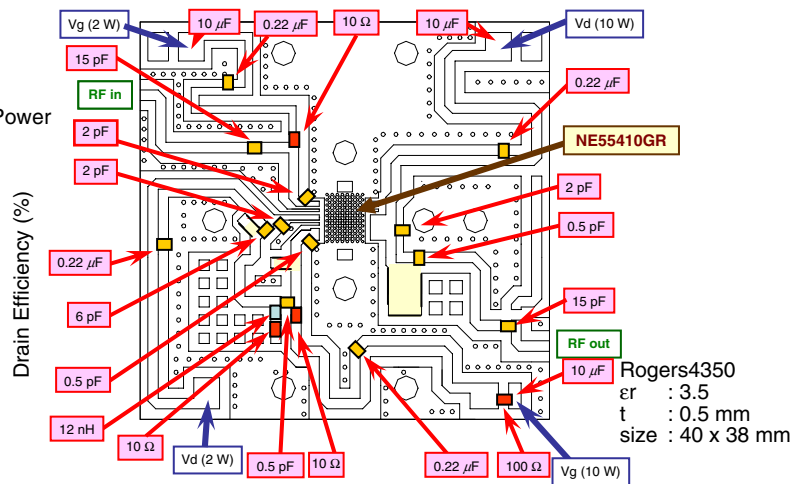


Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	G_L (dB)
2 535	38.68	26.43	25.92	18.33
2 550	38.61	26.26	25.75	18.17
2 570	38.59	26.17	25.66	18.10
2 590	38.60	26.07	25.56	18.16
2 605	38.70	26.25	25.74	18.32

IM₃, IM₅, Drain Efficiency vs. Average Output Power



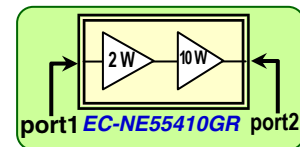
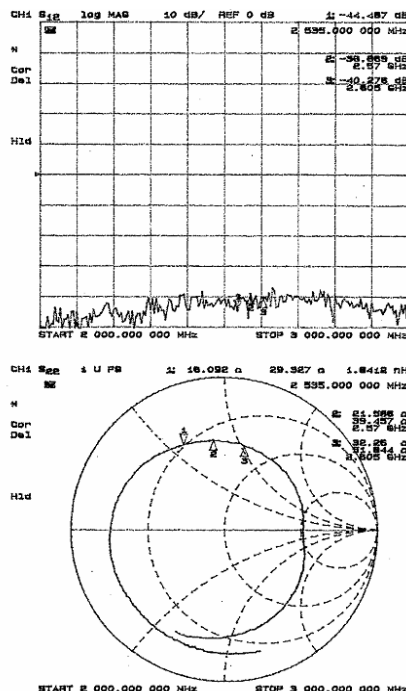
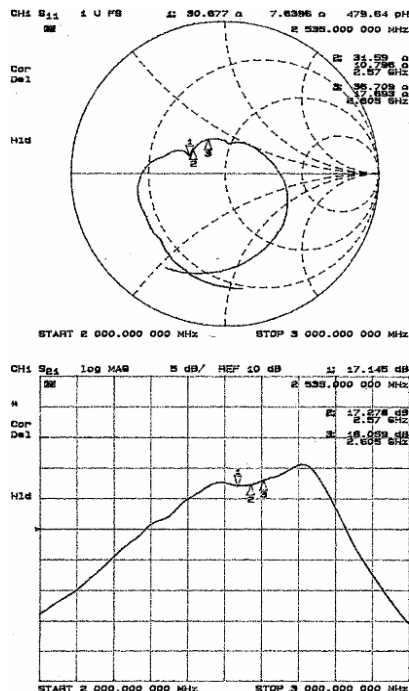
CIRCUIT of EV BOARD



S-parameter on NE55410GR for 2 535 to 2 605 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)

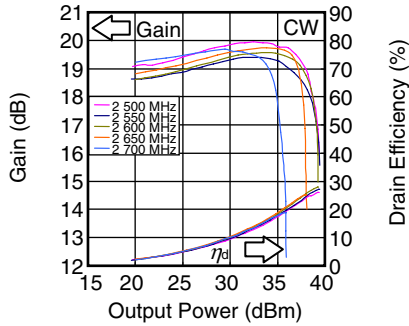


RF Data on NE55410GR for 2 500 to 2 700 MHz

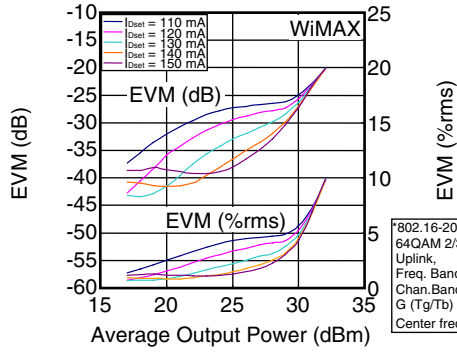
($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)

Gain, Drain Efficiency vs. Output Power

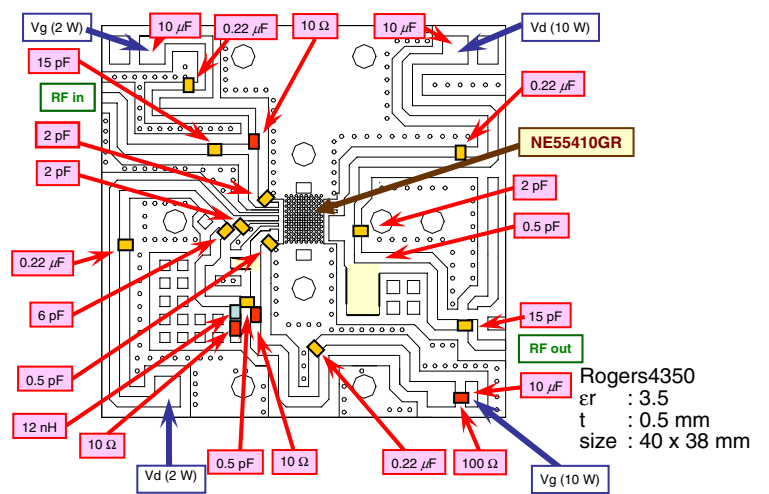


EVM vs. Output Power



Frequency (MHz)	P-1 dB (dBm)	η_d (%)	PAE (%)	GL (dB)
2 500	38.22	24.48	24.16	19.95
2 550	38.20	25.02	24.64	19.39
2 600	38.57	26.68	26.28	19.57
2 650	37.53	24.57	24.22	19.73
2 700	34.84	17.61	17.35	19.69

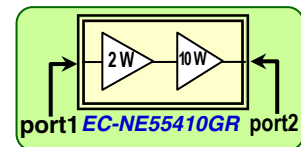
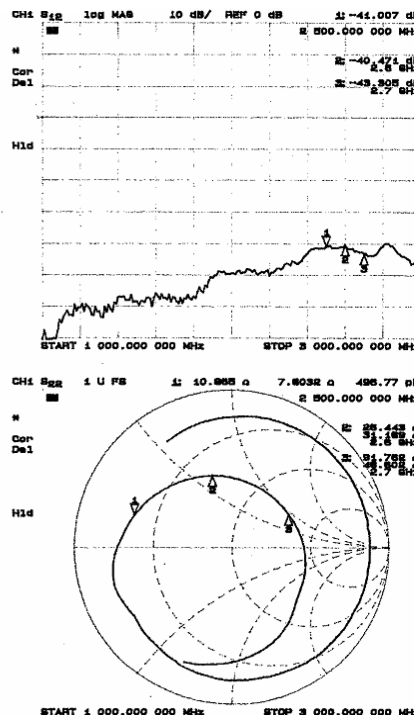
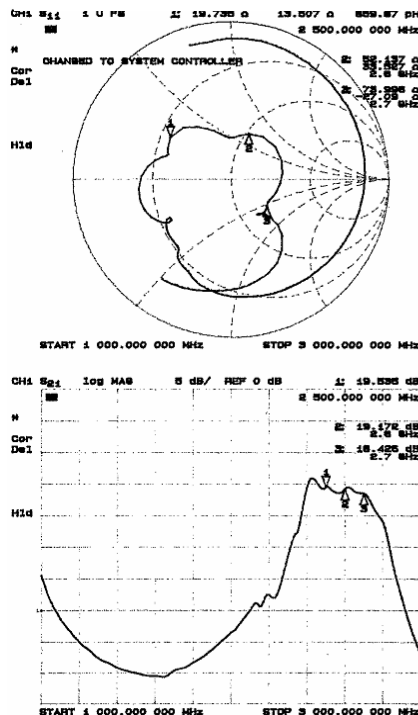
CIRCUIT of EV BOARD



S-parameter on NE55410GR for 2 500 to 2 700 MHz

($V_{DS} = 28\text{ V}$, $I_{Dset}(Q1) + I_{Dset}(Q2) = 120\text{ mA}$)

Two-stage Amplifier (Q1 + Q2)



*For further information,
please contact:*

NEC Electronics Corporation
1753, Shimonumabe, Nakahara-ku,
Kawasaki, Kanagawa 211-8668,
Japan
Tel: 044-435-5111
<http://www.necel.com/>

[America]

NEC Electronics America, Inc.
2880 Scott Blvd.
Santa Clara, CA 95050-2554, U.S.A.
Tel: 408-588-6000
800-366-9782
<http://www.am.necel.com/>

[Europe]

NEC Electronics (Europe) GmbH
Arcadiastrasse 10
40472 Düsseldorf, Germany
Tel: 0211-65030
<http://www.eu.necel.com/>

Hanover Office
Podbielskistrasse 166 B
30177 Hannover
Tel: 0 511 33 40 2-0

Munich Office
Werner-Eckert-Strasse 9
81829 München
Tel: 0 89 92 10 03-0

Stuttgart Office
Industriestrasse 3
70565 Stuttgart
Tel: 0 711 99 01 0-0

United Kingdom Branch
Cygnus House, Sunrise Parkway
Linford Wood, Milton Keynes
MK14 6NP, U.K.
Tel: 01908-691-133

Succursale Française
9, rue Paul Dautier, B.P. 52
78142 Velizy-Villacoublay Cédex
France
Tel: 01-3067-5800

Sucursal en España
Juan Esplandiú, 15
28007 Madrid, Spain
Tel: 091-504-2787

Tyskland Filial
Täby Centrum
Entrance S (7th floor)
18322 Täby, Sweden
Tel: 08 638 72 00

Filiale Italiana
Via Fabio Filzi, 25/A
20124 Milano, Italy
Tel: 02-667541

Branch The Netherlands
Steijgerweg 6
5616 HS Eindhoven
The Netherlands
Tel: 040 265 40 10

[Asia & Oceania]

NEC Electronics (China) Co., Ltd
7th Floor, Quantum Plaza, No. 27 ZhiChunLu Haidian
District, Beijing 100083, P.R.China
Tel: 010-8235-1155
<http://www.cn.necel.com/>

Shanghai Branch
Room 2509-2510, Bank of China Tower,
200 Yincheng Road Central,
Pudong New Area, Shanghai, P.R.China P.C:200120
Tel:021-5888-5400
<http://www.cn.necel.com/>

Shenzhen Branch
Unit 01, 39/F, Excellence Times Square Building,
No. 4068 Yi Tian Road, Futian District, Shenzhen,
P.R.China P.C:518048
Tel:0755-8282-9800
<http://www.cn.necel.com/>

NEC Electronics Hong Kong Ltd.
Unit 1601-1613, 16/F., Tower 2, Grand Century Place,
193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: 2886-9318
<http://www.hk.necel.com/>

NEC Electronics Taiwan Ltd.
7F, No. 363 Fu Shing North Road
Taipei, Taiwan, R. O. C.
Tel: 02-8175-9600
<http://www.tw.necel.com/>

NEC Electronics Singapore Pte. Ltd.
238A Thomson Road,
#12-08 Novena Square,
Singapore 307684
Tel: 6253-8311
<http://www.sg.necel.com/>

NEC Electronics Korea Ltd.
11F., Samik Lavied'or Bldg., 720-2,
Yeoksam-Dong, Kangnam-Ku,
Seoul, 135-080, Korea
Tel: 02-558-3737
<http://www.kr.necel.com/>