



*Consiglio Nazionale delle Ricerche*



**IEIIT**  
**Istituto di Elettronica**  
**e di Ingegneria dell'Informazione**  
**e delle Telecomunicazioni**



## **Technical Report**

**Measured characteristics of the components of the  
Bar-SPOrt radiometer @ 32 GHz: part A of {A, B, C, D}**

IRA 366/04

Measurements performed by Oscar Antonio Peverini (IEIIT), Augusto Olivieri (IEIIT), Jader Monari (IRA), Marco Poloni (IRA) at the IEIIT-CNR institute.

This part A contains the measured data of the following components:

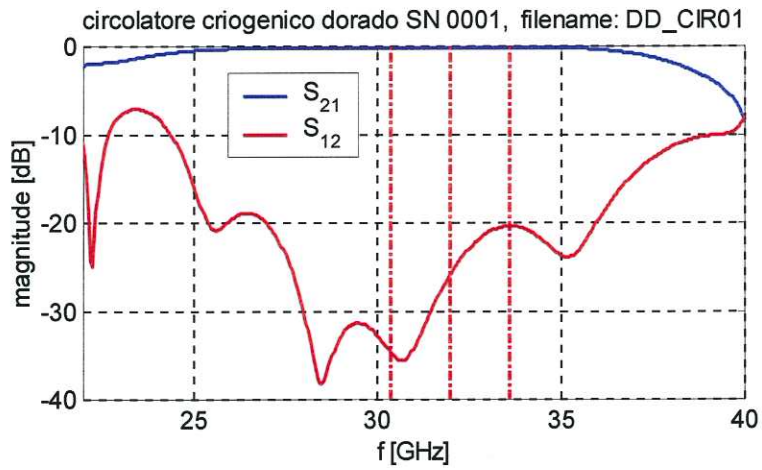
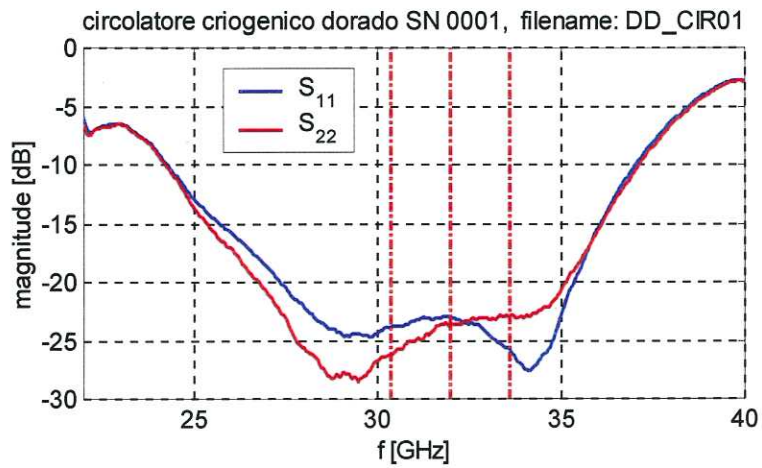
- 3 cryogenic circulators DORADO
- 4 low noise amplifiers NRAO
- 2 phase modulators PMP2640

# CRYOGENIC CIRCULATOR DORADO SN 0001



	mean value of return loss	mean value of insertion loss
@ port # 1	23.656 dB	0.138 dB
@ port # 2	23.915 dB	25.519 dB

NA port 1 connected to port 1 of the circulator 001

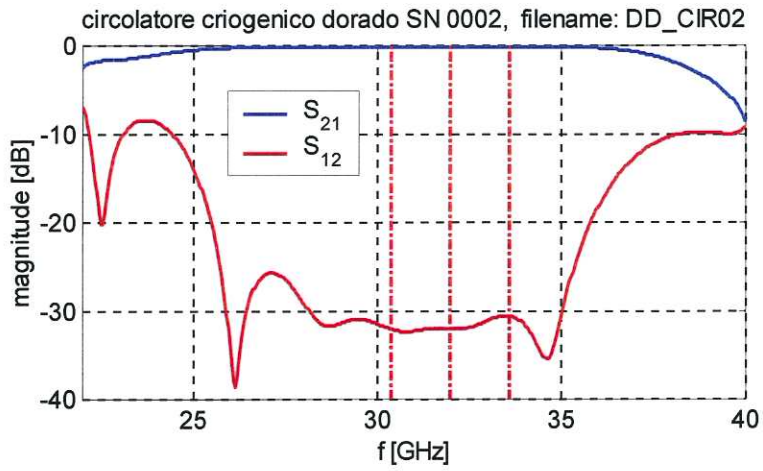
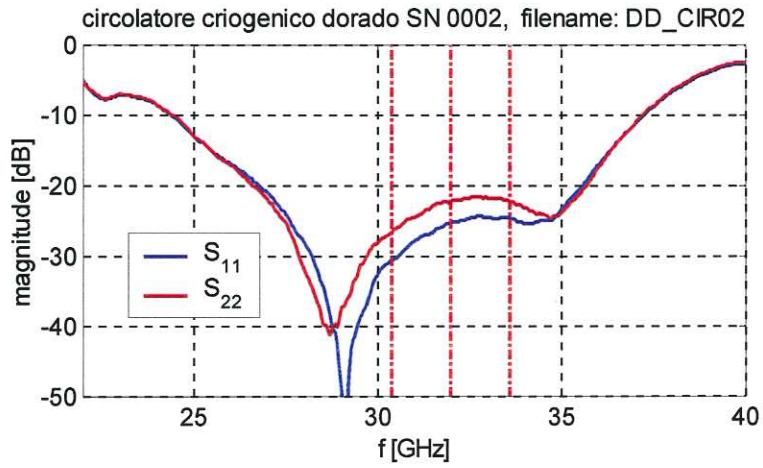


## CRYOGENIC CIRCULATOR DORADO SN 0002



	mean value of return loss	mean value of insertion loss
@ port # 1	25.887 dB	0.187 dB
@ port # 2	22.750 dB	31.764 dB

NA port 1 connected to port 1 of the circulator 002

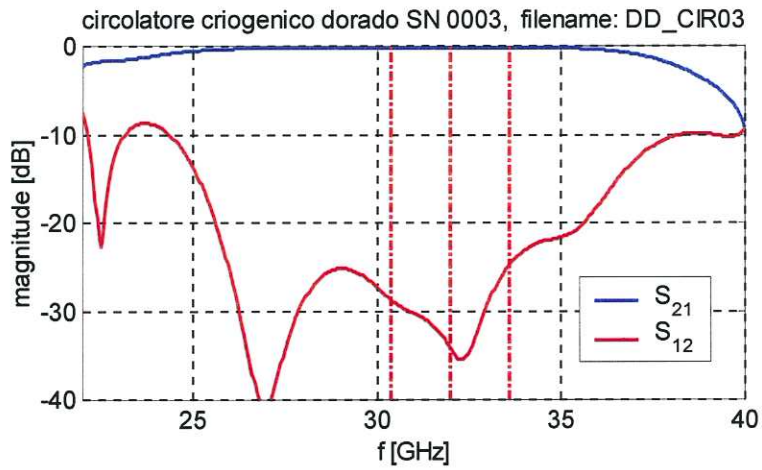
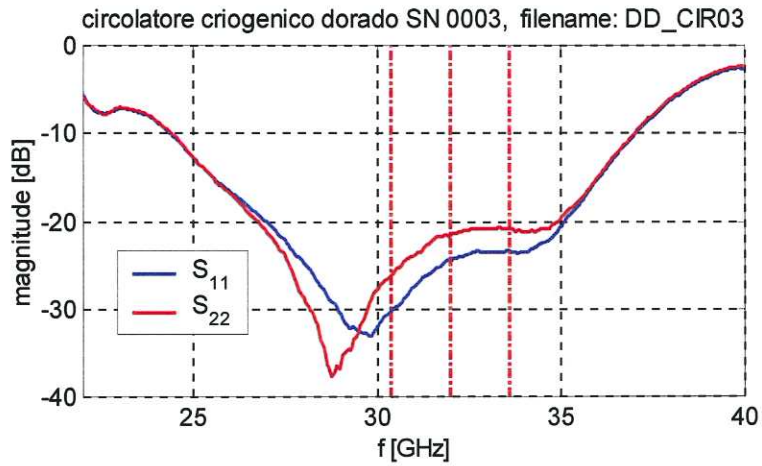


## CRYOGENIC CIRCULATOR DORADO SN 0003

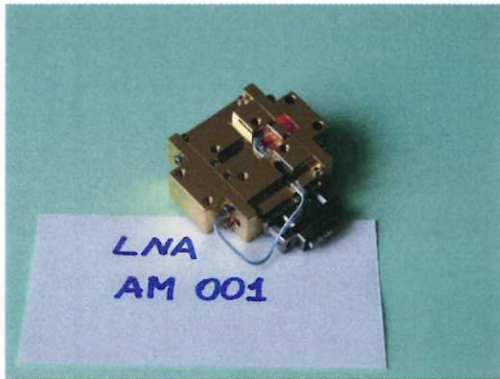


	mean value of return loss	mean value of insertion loss
@ port # 1	25.050 dB	0.151 dB
@ port # 2	21.978 dB	30.550 dB

NA port 1 connected to port 1 of the circulator 003

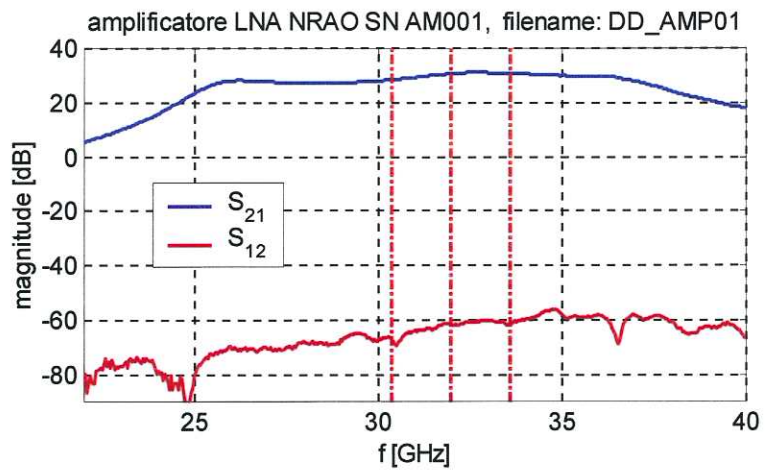
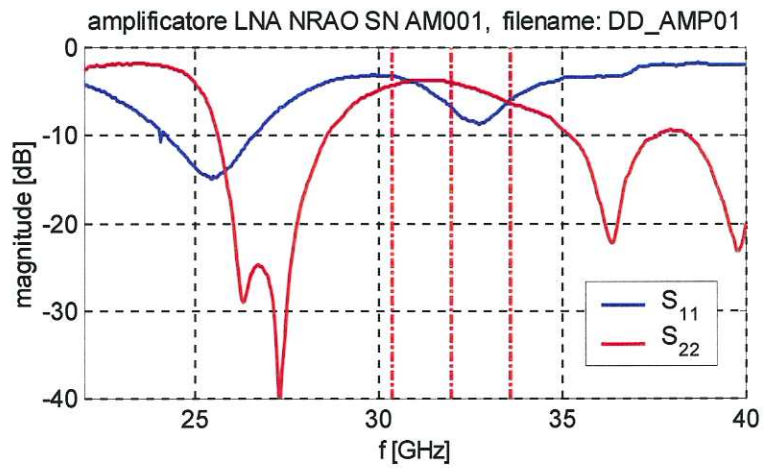


## LOW NOISE AMPLIFIER NRAO SN AM001



	mean value of return loss	mean value of gain
@ port # 1	5.973 dB	30.359 dB
@ port # 2	4.363 dB	-62.087 dB

NA port 1 connected to port 1 of the amplifier 001

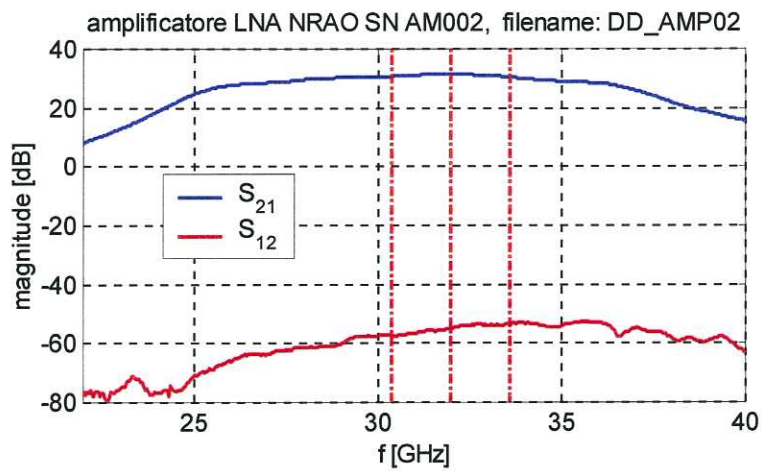
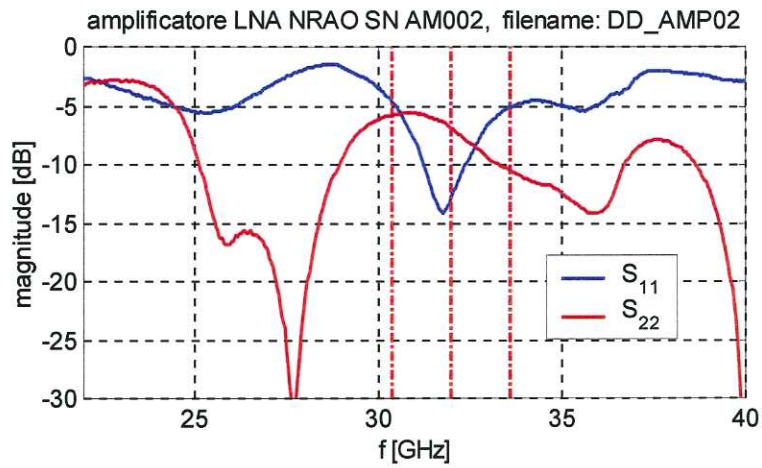


## LOW NOISE AMPLIFIER NRAO SN AM002



	mean value of return loss	mean value of gain
@ port # 1	8.420 dB	31.106 dB
@ port # 2	7.206 dB	-54.963 dB

NA port 1 connected to port 1 of the amplifier 002

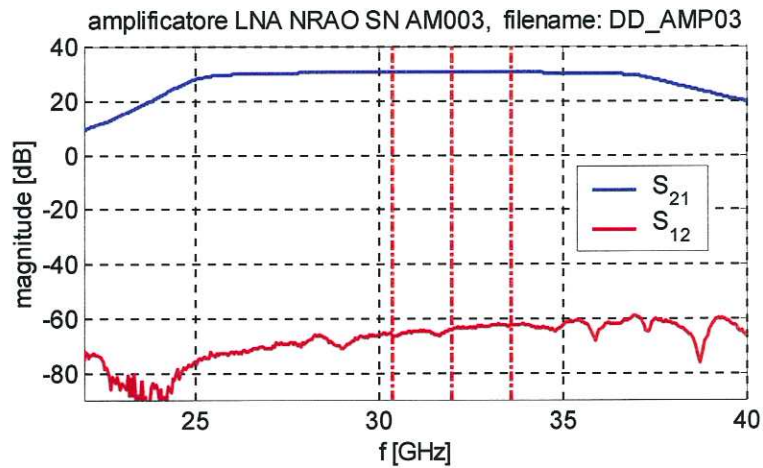
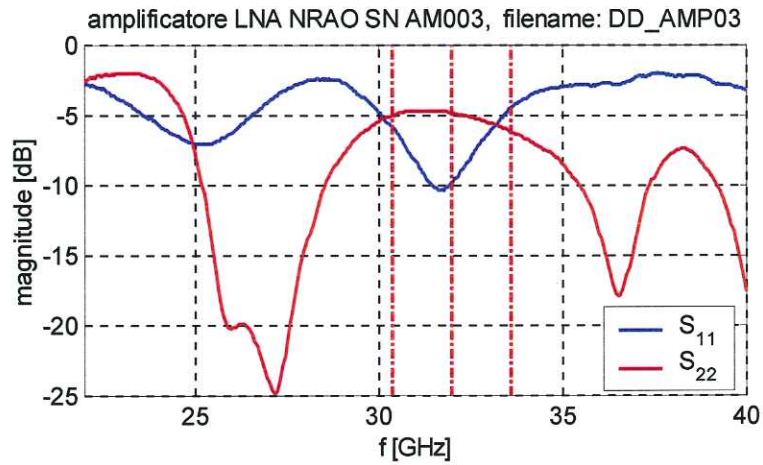


## LOW NOISE AMPLIFIER NRAO SN AM003



	mean value of return loss	mean value of gain
@ port # 1	7.667 dB	30.934 dB
@ port # 2	5.013 dB	-63.920 dB

NA port 1 connected to port 1 of the amplifier 003

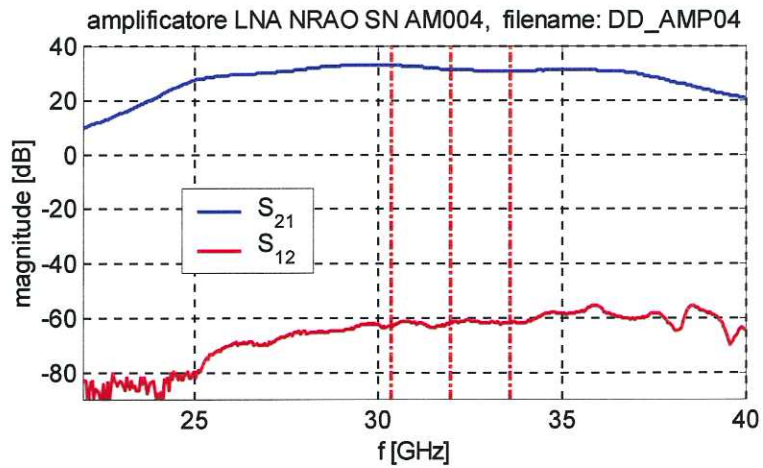
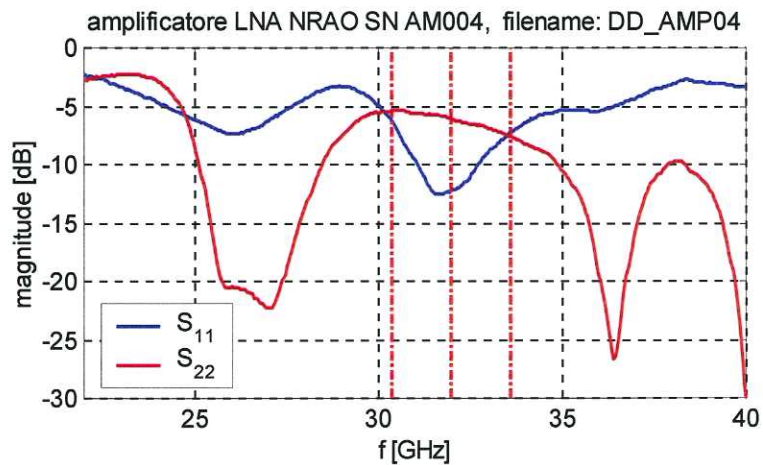


## LOW NOISE AMPLIFIER NRAO SN AM004



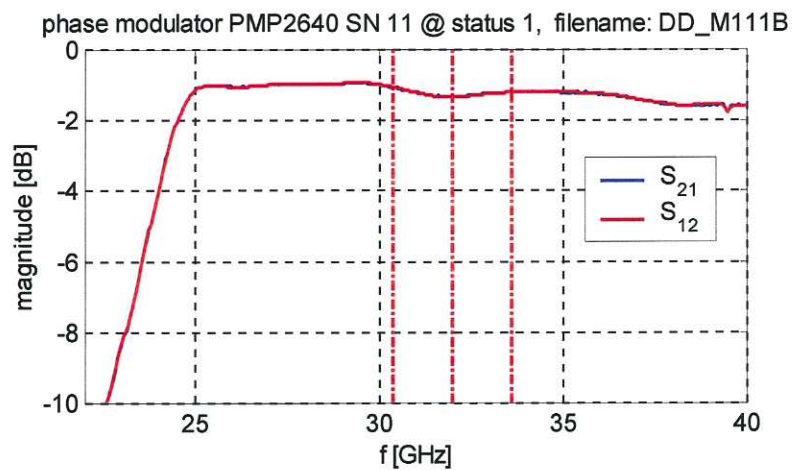
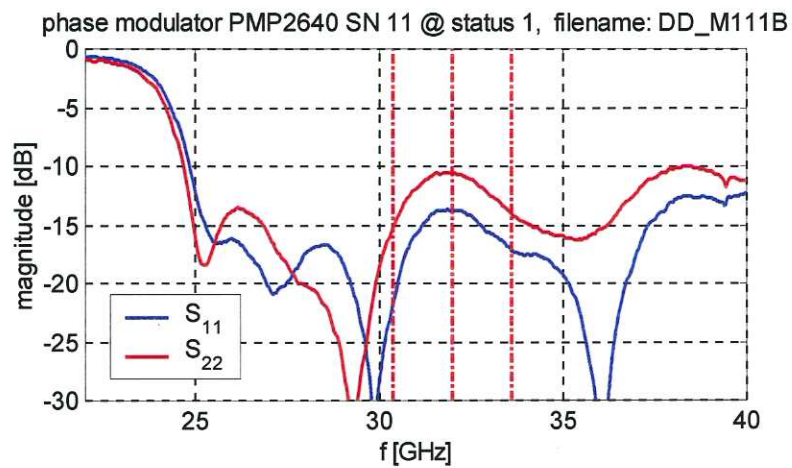
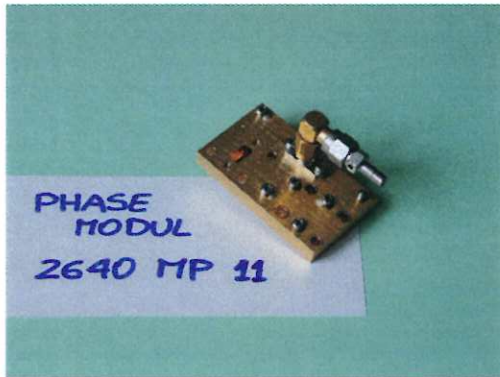
	mean value of return loss	mean value of gain
@ port # 1	9.881 dB	31.686 dB
@ port # 2	6.160 dB	-61.845 dB

NA port 1 connected to port 1 of the amplifier 004



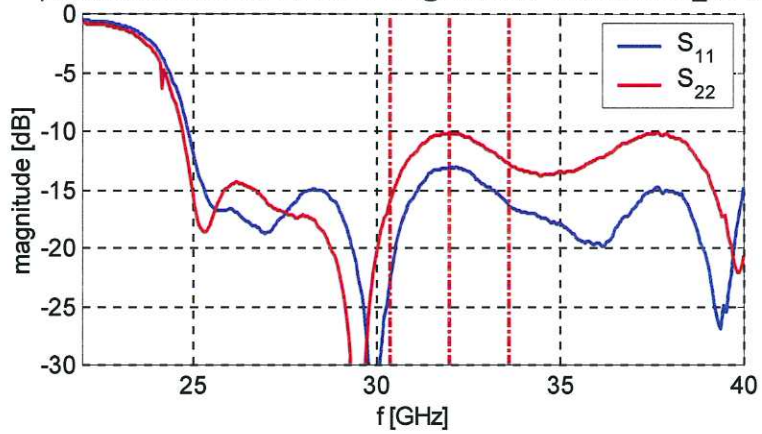


## PHASE MODULATOR PMP2640 SN 11

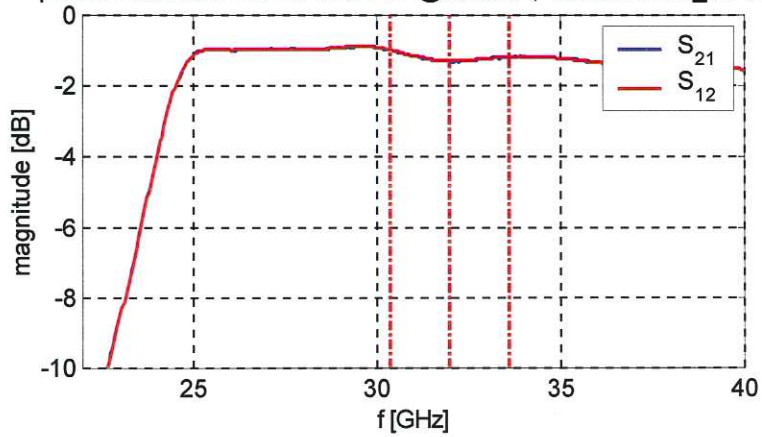


status 1	mean value of return loss	mean value of insertion loss
@ port # 1	15.234 dB	1.249 dB
@ port # 2	11.758 dB	1.250 dB

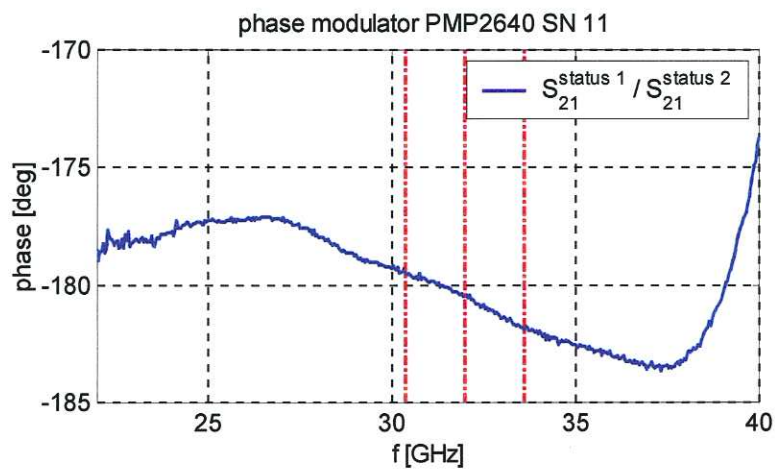
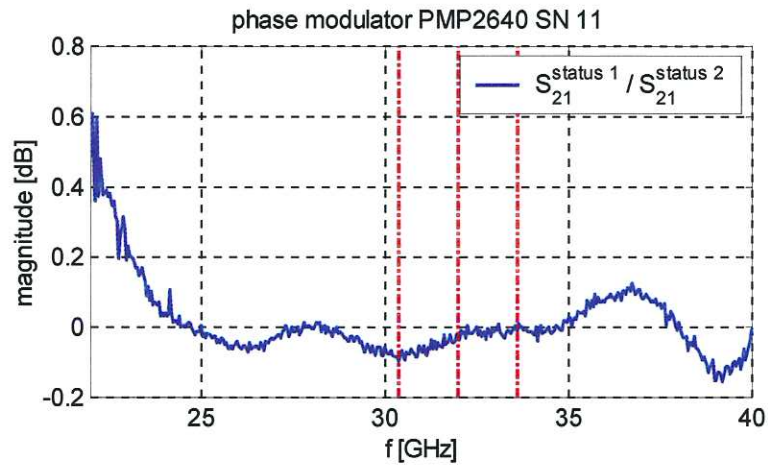
phase modulator PMP2640 SN 11 @ status 2, filename: DD\_M112B



phase modulator PMP2640 SN 11 @ status 2, filename: DD\_M112B

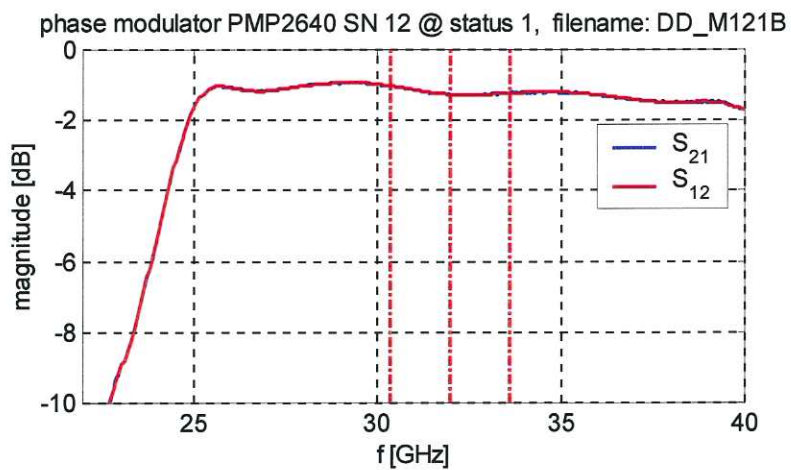
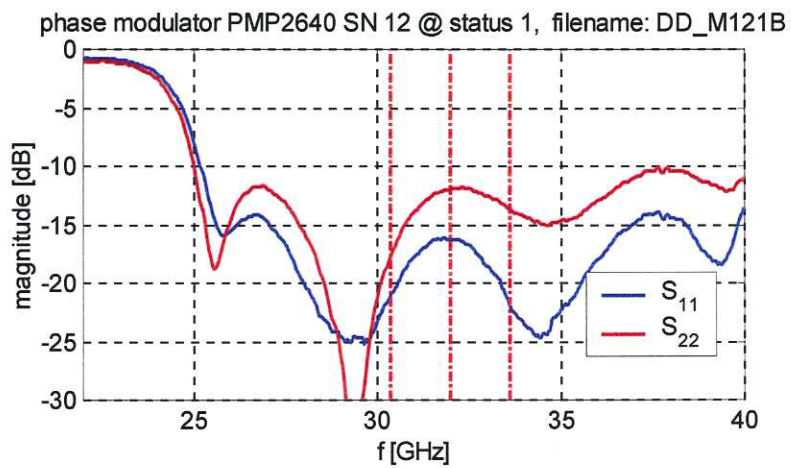
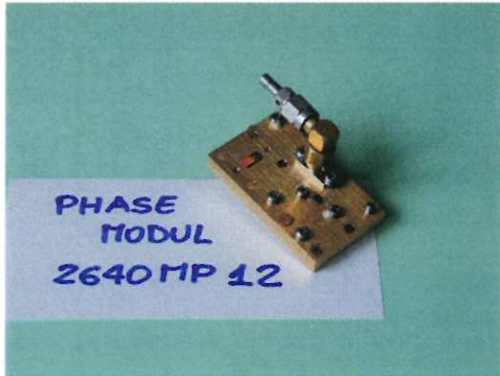


<b>status 2</b>	<b>mean value of return loss</b>	<b>mean value of insertion loss</b>
<b>@ port # 1</b>	<b>14.728 dB</b>	<b>1.212 dB</b>
<b>@ port # 2</b>	<b>11.440 dB</b>	<b>1.212 dB</b>

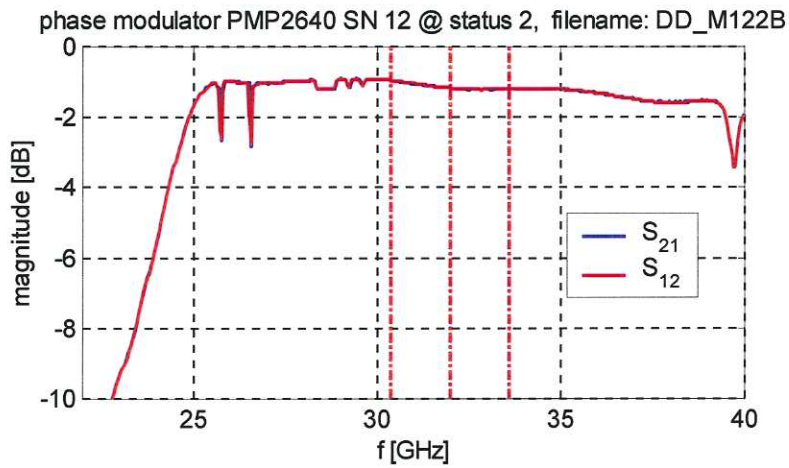
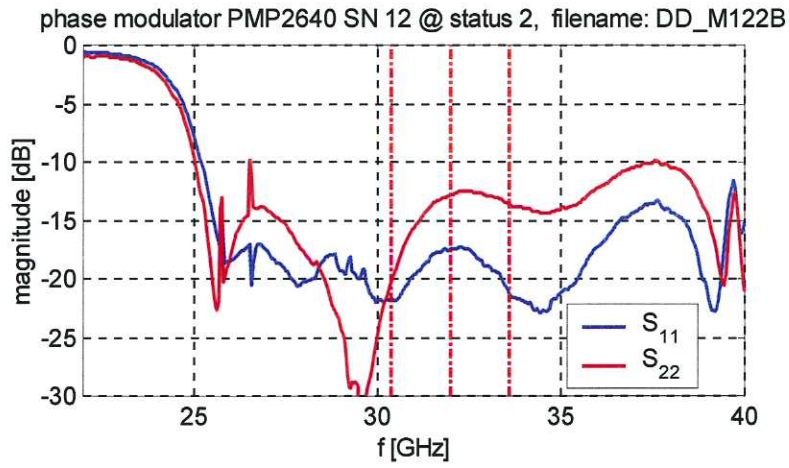


<b>transfer function ratio</b>	<b>magnitude</b>	<b>phase</b>
<b>mean value of</b> $S_{21}^{(\text{status 1})} / S_{21}^{(\text{status 2})}$	<b>-0.037 dB</b>	<b>-180.55 deg</b>
<b>in-band variation of</b> $S_{21}^{(\text{status 1})} / S_{21}^{(\text{status 2})}$	<b>0.101 dB</b>	<b>2.317 deg</b>

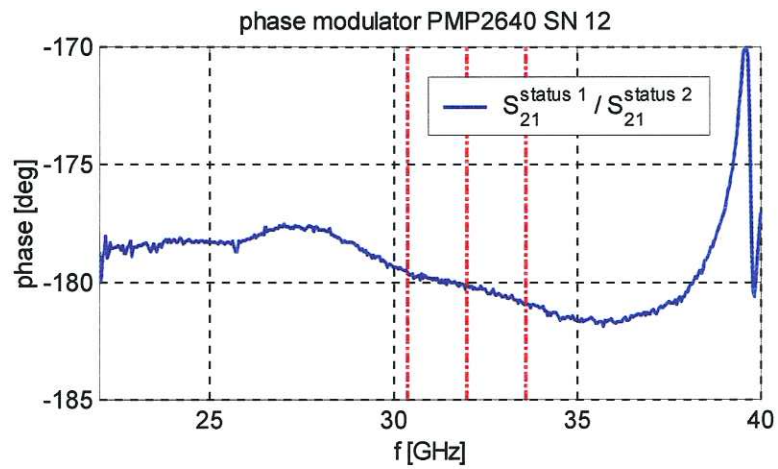
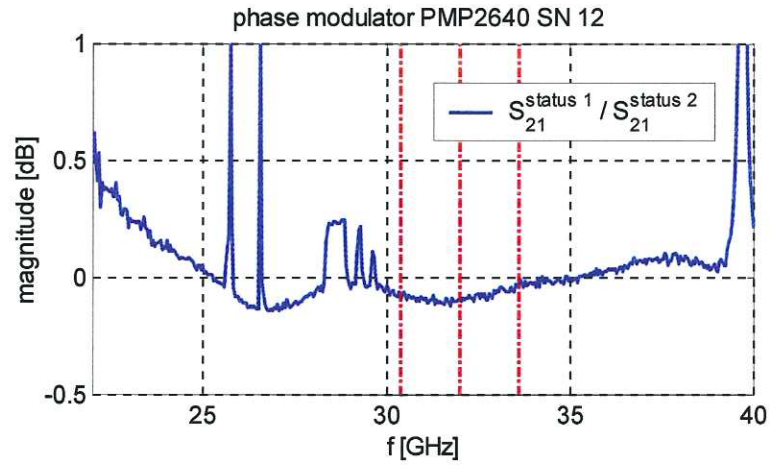
## PHASE MODULATOR PMP2640 SN 12



status 1	mean value of return loss	mean value of insertion loss
@ port # 1	17.713 dB	1.217 dB
@ port # 2	12.978 dB	1.217 dB



<b>status 2</b>	<b>mean value of return loss</b>	<b>mean value of insertion loss</b>
<b>@ port # 1</b>	<b>18.822 dB</b>	<b>1.136 dB</b>
<b>@ port # 2</b>	<b>13.885 dB</b>	<b>1.135 dB</b>



transfer function ratio	magnitude	phase
mean value of $S_{21}^{(\text{status 1})} / S_{21}^{(\text{status 2})}$	-0.081 dB	-180.194 deg
in-band variation of $S_{21}^{(\text{status 1})} / S_{21}^{(\text{status 2})}$	0.088 dB	1.321 deg