| Y-HIGH POWER MICROWAVE CIRCULATOR | Test - No. 001<br>Page: 1 |
|---|---|

**ACCEPTANCE TEST CERTIFICATE**

**for**

**Y-High Power Microwave Circulator**

**Type: 00805.201.206.00**

**Serial No. 964694**

**CUSTOMER: .SNS/LAN**

As result of the performed tests shown in the attached documents it is now certified that the mentioned Y-High Power Microwave Circulator meets the specified requirements of the contract.

| Organisation | Signature | Date |
|---|---|---|
| **AFT** | **gez. Niedermaier** | **14-Feb 2002** |
| **Los Alamos NL** | | |
| | | |

**Appendix 1: Low power tests**

Low power test of Y - High Power Microwave Circulator in Backnang

Serial No.: **964694**

Summary of low power test

| Description | Specified | Measured |
|---|---|---|
| Frequency $f_0$ | 805 MHz | 805 MHz |
| Isolation within Frequency range $f_0 \pm 12$ MHz | > 20 dB | >20 dB |
| VSWR within frequency range $f_0 \pm 12$ MHz | < 1,05 | < 1,05 |
| Insertion loss at $f_0$ | < 0,07 dB | < 0,07dB |

**Remarks:**
Due to customers request the low power data have been remeasured. Calibration data of empty waveguide are included, too.

**Appendix 2: High power tests**

High power test of Y - High Power Microwave Circulator at customer facilities.

Serial No.: **964694**

Power level:

Summary of high power test

| Description | Specified | Measured |
|---|---|---|
| Frequency $f_0$ | 805 MHz | MHz |
| Isolation within frequency range $f_0 \pm 12$ MHz | > 20 dB | dB |
| VSWR within frequency range $f_0 \pm 12$ MHz | < 1,05 | |
| Insertion loss at $f_0$ | < 0,07 dB | dB |

**Remarks:**

# Internal Qualification Report

## High Power Y-Junction Circulator

## SNS 805 MHz –5MW-Rev. 0

Artikel Identifikation/
Article Idenfication No.: 0805.201.206.00

Serien.Nr./
Serial No. / Year: 964694 / 2002

| **Low Power Test Data** | | **26°C** | **30°C** | **35°C** |
|---|---|---|---|---|
| Frequency: | 805 MHz ±12 MHz | ✓ | ✓ | ✓ |
| Isolation: | > 26 dB | -33,11 | -33,39 | -32,87 |
| Isolation in bandwidth +/-2MHz | > 20 dB | -32,65 | -33,27 | -32,18 |
| Isolation in bandwidth +/-12MHz | > 10 dB | -26,50 | -27,72 | -28,94 |
| Return loss (VSWR) | = 1.05 (↔32 dB) | 1,03 | 1,02 | 1,01 |
| Insertion loss: | < 0.07 dB | 0,06 | 0,05 | 0,03 |
| Insertion loss in bandwidth: | < 0.17 dB | 0,08 | 0,08 | 0,06 |
| Magnetic stray field: | < 5 G | | ✓ | |
| Direction of rotation: | cw | ✓ | | |
| Magnetic field in center of junction | Gauss | | | |

**Mechanical Inspection**

| | | |
|---|---|---|
| Configuration: | Y-junction | |
| Microwave flange: | CPR1150 flat | |
| Cooling input connectors: | Hansen type 1” quick disconnect | |
| Cooling system: | demineralized water | |
| Cooling input temperature: | 80° F – 95° F | |
| Cooling pressure: | < 6 Bar | |
| Cooling test pressure for 10 minutes: | > 15 Bar | _____✓_____ |
| Leakage rate: no measurable pressure drop in 20 min. | | _____✓_____ |
| Ambient temperature: | 60° F - 90° F | |
| Mechanical dimensions: | see drawing | |
| Weight: | 235 kg | |
| Add on: | TCU<br>Arc detector<br>Set of cables 200 ft.<br>Manual for circulator<br>Manual for TCU<br>Manual for arc detector | |

**Comments**

| | |
|---|---|
| **Name** | **Date** |
| | **14-Feb. 2002** |

# <u>Qualification report</u> – part 3

**Pressure test of components**

| | | |
|---|---|---|
| capton-type windows | pressured by dry air | break point > 2,7 bar |

**System pressure test**

| | | |
|---|---|---|
| complete circulator | pressured by dry air with 2,5 bar<br>1 hour under water-alcool mix | no bubbles |

14-Feb 2002

..... .....

(Date) (Signature)