NSG 4070B APPLICATION FOR MIL-STD 461F CS 114

<table>
<thead>
<tr>
<th>Test parameter</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard: MIL-STD 461 CS 114</td>
<td>Signal generation: NSG 4070B-0</td>
</tr>
<tr>
<td>Frequency range: 10 kHz to 200 MHz</td>
<td>Modulator: included in NSG 4070B-0</td>
</tr>
<tr>
<td>Curve 1 to 5: see diagrams</td>
<td>Power meter: 3x included in NSG 4070B-0</td>
</tr>
<tr>
<td>Modulation: 1 kHz pulse modulation, 50% duty cycle</td>
<td>Power amplifier: CBA 400M-110</td>
</tr>
<tr>
<td>Test method: Substitution method with monitoring probe</td>
<td>Directional coupler: DCP 0100A</td>
</tr>
<tr>
<td>Monitoring probe: only for information, no limiting/control of the injected level</td>
<td>Current injection probe: CIP 9136A</td>
</tr>
<tr>
<td></td>
<td>Monitoring probe: MD 4070</td>
</tr>
<tr>
<td></td>
<td>Calibration jig: PCJ 9201B</td>
</tr>
<tr>
<td></td>
<td>Termination: 50 Ω 10 W</td>
</tr>
<tr>
<td></td>
<td>Attenuation: 26 dB 30 W, 10 dB 30 W, 20 dB 10 W</td>
</tr>
<tr>
<td></td>
<td>Software: incl. in NSG 4070 or optional CSi or WIN 6000</td>
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</table>

WARNING: The power meter inputs are very sensitive. It is the user’s responsibility to ensure that the selected test levels does not damage the equipment. Any hardware/setup changes should be calculated before starting the test.

Calibration set-up for monitoring probe

Remarks:
The monitoring probe MD 4070 needs to be calibrated in the way of its use (active, passive or with switching at a specific frequency from active to passive).
Test level for MIL STD 461F CS114 curve #1

<table>
<thead>
<tr>
<th>Frequency in MHz</th>
<th>Current in dBµA</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01</td>
<td>38</td>
</tr>
<tr>
<td>1</td>
<td>77</td>
</tr>
<tr>
<td>30</td>
<td>77</td>
</tr>
<tr>
<td>200</td>
<td>69</td>
</tr>
</tbody>
</table>

Test level for MIL STD 461F CS114 curve #2

<table>
<thead>
<tr>
<th>Frequency in MHz</th>
<th>Current in dBµA</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01</td>
<td>44</td>
</tr>
<tr>
<td>1</td>
<td>83</td>
</tr>
<tr>
<td>30</td>
<td>83</td>
</tr>
<tr>
<td>200</td>
<td>75</td>
</tr>
</tbody>
</table>

Calibration set-up (for curve #1 and #2)

- Power meter
- ch. 1 stress level
- ch. 2 forward power
- ch. 3 reverse power

Attenuator: 26 dB 30 W
Termination: 50 Ω 10 W
Caution:
Stress levels below 69 dBµA cannot be adjusted due to the power amplifier noise floor. This requires to work with an increased test level or additional attenuator on the BCI probe.

Test set-up with monitoring probe (for curve #1 and #2)

- Power meter
- ch. 1 level monitoring
- ch. 2 forward power
- ch. 3 reverse power

Attenuator: 26 dB, 30 W
Use of MD 4070 in the active mode.
Calibration set-up (for curve #3 and #4)

Power meter
- ch. 1 stress level
- ch. 2 forward power
- ch. 3 reverse power

NSG 4070
RF output

50 Ω Termination
Power amplifier input

Directional coupler
Output

Calibration jig
BCI probe
10 dB attenuator
Ground plane

Attenuator: 10 dB 30 W
Termination: 50 Ω 10 W
Caution:
Stress levels below 69 dBµA cannot be adjusted due to the power amplifier noise floor.
This requires to work with an increased test level or additional attenuator on the BCI probe.

Test set-up with monitoring probe (for curve #3 and #4)

Power meter
- ch. 1 level monitoring
- ch. 2 forward power
- ch. 3 reverse power

NSG 4070
RF output

Power amplifier input
10 dB attenuator

Output

Auxiliary equipment
- AE
- EUT

Directional coupler

Equipment under test
- Insulating
- BCI probe
- Monitoring probe

Use of MD 4070 in the active mode in the range below 50 kHz.
Use of MD 4070 in the passive mode above 50 kHz.
Caution:
The use of the MD 4070 in the active mode during tests with stress levels above 86 dBµA could damage power meter channel 1 of NSG 4070.
Test level — for MIL STD 461F CS114 curve #5

![Graph showing test level for MIL STD 461F CS114 curve #5.](image)

Calibration set-up (for curve #5)

- NSG 4070 RF output
- Power meter
  - ch. 1 stress level
  - ch. 2 forward power
  - ch. 3 reverse power
- Attenuator: 20 dB, 10 W
- Termination: 50 Ω 10 W
- Remarks:
  - Power meter channel 1 needs to be protected with a 20 dB attenuator.

Test set-up with monitoring probe (for curve #5)

- NSG 4070 RF output
- Power meter
  - ch. 1 level monitoring
  - ch. 2 forward power
  - ch. 3 reverse power
- Use of MD 4070 in the passive mode.