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

## Test parameter

| Standards: | MIL-STD 461F CS 114 |
| Frequency range: | 10 kHz to 200 MHz |
| Curve 1 to 5: | see diagrams |
| Modulation: | 1 kHz pulse modulation, 50% duty cycle |
| Test method: | Substitution method with monitoring probe |
| Monitoring probe: | only for information |

## Equipment

| Signal generation: | NSG 4070-0 |
| Modulator: | included in NSG 4070-0 |
| Power meter: | 3x included in NSG 4070-0 |
| Power amplifier: | max. 30 W required |
| RF Switch: | SW 4070 |
| Directional coupler: | DCP 0100 |
| Current injection probe: | CIP 9136A |
| Monitoring probe: | MD 4070 |
| Calibration jig: | PCJ 9201B |
| Termination: | 50 Ω, 10 W |
| Attenuation: | 1x 20 dB, 2x 10 dB, 30 W, 1x 6 dB, 30 W |
| Software: | incl. in NSG 4070 or optional C3i or WIN 6000 |

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**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.

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### Calibration set-up for monitoring probe

![Diagram of calibration set-up]

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

![Graph showing test level for MIL STD 461F CS114 curve #1]

Calibration set-up (for curve #1)

- Attenuator #1: 10 dB, 30 W
- Attenuator #2: not in use
- Attenuator #3: not in use
- Termination: 50 Ω 10 W

Remarks:
- Calibration with a 20 dB increased level.

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

- Attenuator #1: 10 dB, 30 W
- Attenuator #2: not in use
- Attenuator #3: 20 dB, 30 W
- Termination: 50 Ω 10 W

Remarks:
- Test with additional 20 dB attenuator (attenuator #3) between directional coupler and BCI probe.
- Use of MD 4070 on PM ch. 1:
  - The monitoring probe is in the linear measuring range above 54 dBµA stress level (above 70 kHz).
  - The MD 4070 needs to be used in the active mode.
Test level for MIL STD 461F CS114 curve #2

Calibration set-up (for curve #2)

Remarks:
Calibration with a 16 dB increased level.

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

Remarks:
Test with additional 16 dB attenuator (attenuator #3) between directional coupler and BCI probe.

Use of MD 4070 on PM ch.1:
The monitoring probe is in the linear measuring range above 57 dB\µA stress level (above 50 kHz). The MD 4070 needs to be used in the active mode.
**Test level** — for MIL STD 461F CS114 curve #3

![Graph showing test level for MIL STD 461F CS114 curve #3](image)

**Calibration set-up (for curve #3)**

- NSG 4070 RF output
- NSG 4070 User port
- NSG 4070 Power meter ch. 1 stress level ch. 2 forward power ch. 3 reverse power

**Remarks:**
Calibration with a 10 dB increased level.

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

- NSG 4070 RF output
- NSG 4070 User port
- NSG 4070 Power meter ch. 1 stress level ch. 2 forward power ch. 3 reverse power

**Remarks:**
Test with additional 10 dB attenuator (attenuator #3) between directional coupler and BCI probe.

Use of MD 4070 on PM ch.1:
The monitoring probe is in the linear measuring range above 57 dBµA stress level (above 30 kHz). The MD 4070 needs to be used in the active mode.
Test level — for MIL STD 461F CS114 curve #4

Calibration set-up (for curve #4)

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

Remarks:
No additional attenuator required.

Use of MD 4070 on PM ch.1:
The monitoring probe is in the linear measuring range above 66 dBµA stress level (above 30 kHz). The MD 4070 needs to be used in the active mode from 10 to 300 kHz and in the passive mode above 300 kHz.
Test level — for MIL STD 461F CS114 curve #5

Calibration set-up (for curve #5)

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

Remarks:
- Power meter channel 1 needs to be protected with a 10 dB attenuator.
- No additional attenuator required.
- Use of MD 4070 on PM ch.1: The MD 4070 needs to be used in the active mode in the range 10 kHz to 70 kHz and in the passive mode above 70 kHz.