EUROFINS PRODUCT SERVICE GMBH


# RF-EXPOSURE ASSESSMENT

## FCC 47 CFR 2.1091
## IC RSS-102

## Polycom KIRK KT4586 Module

## KT4586

## FCC ID: M72-PK4586
## IC: 1849C-PK4586

## REPORT NUMBER: G0M-1105-1119-C-2

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# 1 General Information

## 1.1 Notes

The results of this test report relate exclusively to the item tested as specified in chapter "Description of test item" and are not transferable to any other test items.

Eurofins Product Service GmbH is not responsible for any generalisations and conclusions drawn from this report. Any modification of the test item can lead to invalidity of test results and this test report may therefore be not applicable to the modified test item.

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**Operator:**

| Date | Eurofins-Lab. | Name | Signature |
|---|---|---|---|
| 27.06.2011 | | C. Weber | C. Weber |

**Technical responsibility for area of testing:**

| Date | Eurofins | Name | Signature |
|---|---|---|---|
| 27.06.2011 | | J.Zimmermann | |

## 1.2 Testing laboratory

EUROFINS PRODUCT SERVICE GMBH
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Telefax : +49 33631 888 660

**DAKKS ACCREDITED TESTING LABORATORY**
DAKKS-REGISTRATION NUMBER: D-PL-12092-01-01

**RECOGNIZED NOTIFIED BODY EMC**
REGISTRATION NUMBER: BNetzA-bS EMV-07/61

**RECOGNIZED NOTIFIED BODY R&TTE**
REGISTRATION NUMBER: BNetzA-bS-02/51-53

**FCC FILED TEST LABORATORY**
REG.-NO. 96970

**A2LA ACCREDITED TESTING LABORATORY**
CERTIFICATE NO. 1983.01

**BLUETOOTH QUALIFICATION TEST FACILITY (BQTF)**
ACCREDITED BY BLUETOOTH QUALIFICATION REVIEW BOARD

**INDUSTRY CANADA FILED TEST LABORATORY**
REG. NO. IC 3470

**Test location, where different:**

| | |
|---|---|
| Name | : ./. |
| Street | : ./. |
| Town | : ./. |
| Country | : ./. |
| Telephone | : ./. |
| Fax | : ./. |

## 1.3 Details of approval holder

| | |
|---|---|
| Name | : Polycom Inc. |
| Street | : 4750 Willow Road |
| Town | : Pleasanton, CA, 94588-2708 |
| Country | : USA |
| Telephone | : +44 1753 723011 |
| Fax | : +44 1600 715 799 |
| | |
| Contact | : Mr. Tony Griffiths |
| Telephone | : +44 1753 723011 |

**Manufacturer**:
(if applicable)

| | |
|---|---|
| Name | : Polycom (Denmark) A/S |
| Street | : Langmarksvej 34 |
| Town | : 8700 Horsens |
| Country | : Denmark |

## 1.4 Application details

| | |
|---|---|
| Date of receipt of application | : 11.05.2011 |
| Date of receipt of test item | : 11.05.2011 |
| Date of assessment | : 27.06.2011 |

## 1.5 Acronyms and abbreviations

| | | |
|---|---|---|
| EUT | : | Equipment under Test |
| TX | : | Transmission |
| RX | : | Reception |
| RBW | : | Measurement Resolution Bandwidth |
| Pol | : | Measurement Polarization |
| N/A | : | Not applicable |

## 1.6 Reference standards

Technical standards : **FCC 47 CFR 1.1310**
**FCC 47 CFR 2.1091**
**FCC 47 CFR 2.1093**

**OET Bulletin 65 : ”** ***Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Elec tromagnetic Fields*****” 1997**

**RSS-102 Issue 4 : “*Radio Frequency (RF) Exposure Com pliance of Radiocommunication Apparatus (All Frequency Bands)*”, 2010**

**Safety Code 6: “*Limits of Human Exposure to Radiofre quency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz*”, 2009**

**IEEE C95.3 : “*IEEE Recommended Practice for Measure ments and Computations of Radio Frequency Electro magnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz–300 GHz*”, 2002**

**Health Canada : “*Technical Guide for Interpretation and Compliance Assessment of Health Canada’s Radiofre quency Exposure Guidelines*”, 2009**

## 1.7 Test item

| | | |
|---|---|---|
| Description of test item | : | Polycom KIRK KT4586 Module |
| Type identification | : | KT4586 |
| Serial Number | : | None |
| Hardware version | : | 004 |
| Software version | : | 001 |
| Radiation sources included | : | UPCS |
| Equipment type | : | Radio module |
| Exposure Category | : | Uncontrolled / General public |
| Device type | : | Mobile |

## 1.8 Referenced documents

| | | |
|---|---|---|
| FCC/IC test report - FP | : | G0M-1105-1119-C-3<br>Eurofins Product Service GmbH |
| FCC/IC test report - PP | : | G0M-1105-1119-C-4<br>Eurofins Product Service GmbH |

## 1.9 Additional information

None

# 2 Exposure Assessment

## 2.1 Device Types

**Fixed**

A fixed device is defined as a device physically secured at one fixed location and cannot be easily relocated.

**Mobile**

A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. (47 CFR 2.1091)

**Portable**

A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. (47 CFR 2.1093)

## 2.2 Exposure Categories

**Occupational / Controlled Exposure**

In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means. Awareness of the potential for RF exposure in a workplace or similar environment can be provided through specific training as part of a RF safety program. If appropriate, warning signs and labels can also be used to establish such awareness by providing prominent information on the risk of potential exposure and instructions on methods to minimize such exposure risks.

**General Public / Uncontrolled Exposure**

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

## 2.3 MPE Limits

| IC Limits for maximum permissible exposure (MPE) | | | | |
|---|---|---|---|---|
| **Frequency range [MHz]** | **Electric field strength [V/m]** | **Magnetic field strength [A/m]** | **Power density [W/m$^2$]** | **Averaging time [min]** |
| **Limits for Occupational / Controlled Exposure** | | | | |
| 0.003 – 1.0 | 600 | 4.9 | | 6 |
| 1 – 10 | 600/f | 4.9/f | | 6 |
| 10 – 30 | 60 | 4.9/f | | 6 |
| 30 – 300 | 60 | 0.163 | 10.0* | 6 |
| 300 – 1500 | $3.54 \cdot f^{0.5}$ | $0.0094 \cdot f^{0.5}$ | f/30 | 6 |
| 1500 – 15000 | 137 | 0.364 | 50 | 6 |
| 15000 – 150000 | 137 | 0.364 | 50 | $616000/f^{0.5}$ |
| 150000 – 300000 | $0.354 \cdot f^{0.5}$ | $9.4 \cdot 10^{-4} \cdot f^{0.5}$ | $3.33 \cdot 10^{-4} \cdot f$ | $616000/f^{0.5}$ |
| **Limits for General Population / Uncontrolled Exposure** | | | | |
| 0.003 – 1.0 | 280 | 2.19 | | 6 |
| 1 – 10 | 280/f | 2.19/f | | 6 |
| 10 – 30 | 28 | 2.19/f | | 6 |
| 30 – 300 | 28 | 0.073 | 2.0* | 6 |
| 300 – 1500 | $1.585 \cdot f^{0.5}$ | $0.0042 \cdot f^{0.5}$ | f/150 | 6 |
| 1500 – 15000 | 61.4 | 0.163 | 10 | 6 |
| 15000 – 150000 | 61.4 | 0.163 | 10 | $616000/f^{0.5}$ |
| 150000 – 300000 | $0.158 \cdot f^{0.5}$ | $4.21 \cdot 10^{-4} \cdot f^{0.5}$ | $6.67 \cdot 10^{-5} \cdot f$ | $616000/f^{0.5}$ |

* = Power density is applicable at frequencies greater than 100MHz
f in MHz

| FCC Limits for maximum permissible exposure (MPE) | | | | |
|---|---|---|---|---|
| **Frequency range [MHz]** | **Electric field strength [V/m]** | **Magnetic field strength [A/m]** | **Power density [mW/cm$^2$]** | **Averaging time [min]** |
| **Limits for Occupational / Controlled Exposure** | | | | |
| 0.3 – 3.0 | 614 | 1.63 | (100)* | 6 |
| 3.0 – 30 | 1842/f | 4.89/f | (900/f$^2$)* | 6 |
| 30 – 300 | 61.4 | 0.163 | 1.0 | 6 |
| 300 – 1500 | | | f/300 | 6 |
| 1500 – 100000 | | | 5.0 | 6 |
| **Limits for General Population / Uncontrolled Exposure** | | | | |
| 0.3 – 1.34 | 614 | 1.63 | (100)* | 30 |
| 1.34 – 30 | 842/f | 2.19/f | (180/f$^2$)* | 30 |
| 30 – 300 | 27.5 | 0.073 | 0.2 | 30 |
| 300 – 1500 | | | f/1500 | 30 |
| 1500 – 100000 | | | 1.0 | 30 |

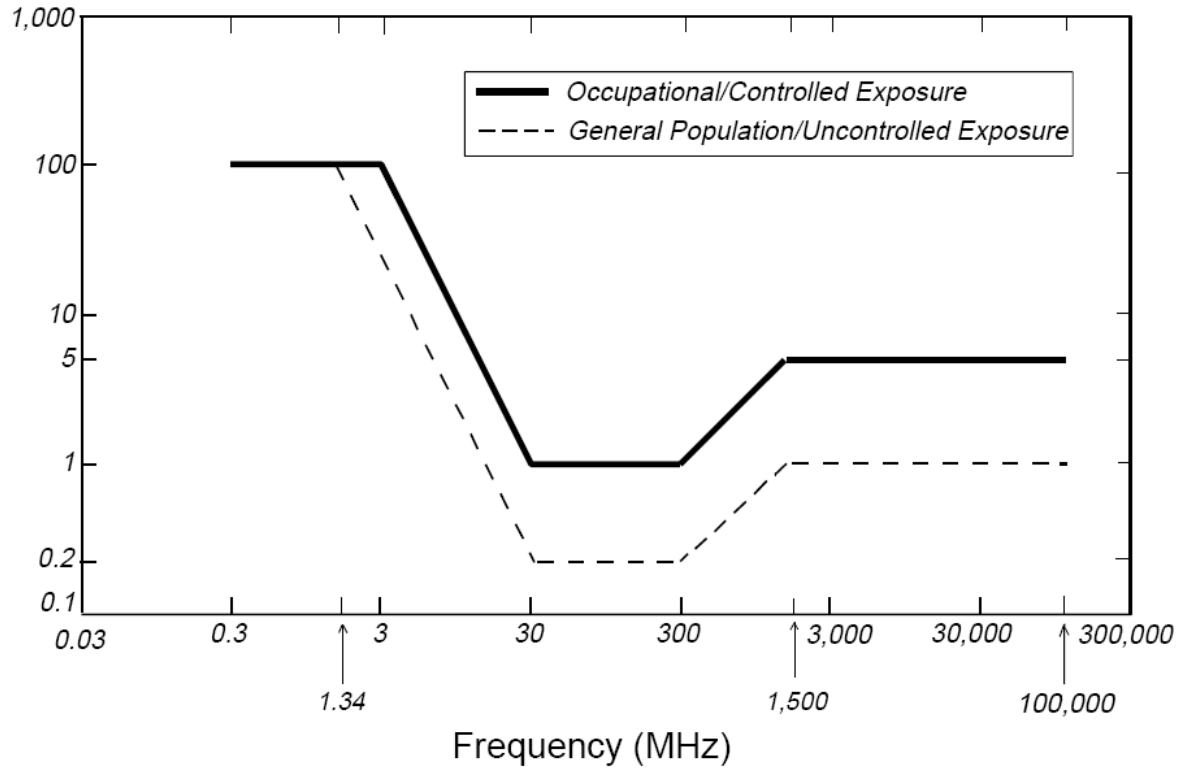
* = Plane-wave equivalent power density
f in MHz
47 CFR 1.1310

***Occupational/controlled*** limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can execise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

***General population/uncontrolled*** exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

*Figure 1.* *FCC Limits for Maximum Permissible Exposure (MPE)*

*Plane-wave Equivalent Power Density*



## 2.4 Exposure assessment

| UPCS - Fixed Part Mode | | |
|---|---|---|
| **Transmission mode** | | |
| Exposure Category | General Public | |
| TX frequency range [MHz] | 1920-1930MHz | |
| Assessment frequency | 1928.45MHz | |
| Duty cycle | 21.0% | |
| Conducted power | 19.27dBm | |
| Radiated power | 19.74dBm | |
| Antenna gain | 1.20dBi | |
| Antenna diameter | 1.50cm | |
| **Far-field distance** | | |
| Wavelength | 0.156m | 15.56cm |
| Antenna far-field distance | 0.003m | 0.29cm |
| **Power Evaluation** | | |
| Conducted power | 84.53mW | 19.27dBm |
| Antenna gain | 1.32 | 1.20dBi |
| Calculated radiated power | 111.43mW | 20.47dBm |
| Measured radiated power | 94.19mW | 19.74dBm |
| **Source averaged power** | | |
| Duty cycle | 21.0% | |
| Duty cycle correction | 0.21 | -6.78dB |
| Maximum radiated power | 94.19mW | 19.74dBm |
| Averaged radiated power | 19.78mW | 12.96dBm |
| **Power density** | | |
| Compliance power density limit | 1.000mW/cm² | 10.00W/m² |
| Power density @ far-field distance | 18.811mW/cm² | 188.110W/m² |
| Power density @ 20cm | 0.004mW/cm² | 0.039W/m² |
| Distance for compliance power density | 0.013m | 1.25cm |
| **Verdict** | **The power density of the EUT at 20cm is below the FCC/IC MPE limit** | |

| UPCS - Portable Part Mode | | |
|---|---|---|
| **Transmission mode** | | |
| Exposure Category | General Public | |
| TX frequency range [MHz] | 1920-1930MHz | |
| Assessment frequency | 1928.45MHz | |
| Duty cycle | 4.2% | |
| Conducted power | 19.01dBm | |
| Radiated power | 19.74dBm | |
| Antenna gain | 1.20dBi | |
| Antenna diameter | 1.50cm | |
| **Far-field distance** | | |
| Wavelength | 0.156m | 15.56cm |
| Antenna far-field distance | 0.003m | 0.29cm |
| **Power Evaluation** | | |
| Conducted power | 79.62mW | 19.01dBm |
| Antenna gain | 1.32 | 1.20dBi |
| Calculated radiated power | 104.95mW | 20.21dBm |
| Measured radiated power | 94.19mW | 19.74dBm |
| **Source averaged power** | | |
| Duty cycle | 4.2% | |
| Duty cycle correction | 0.042 | -13.77dB |
| Maximum radiated power | 94.19mW | 19.74dBm |
| Averaged radiated power | 3.96mW | 5.97dBm |
| **Power density** | | |
| Compliance power density limit | 1.000mW/cm² | 10.00W/m² |
| Power density @ far-field distance | 3.762mW/cm² | 37.622W/m² |
| Power density @ 20cm | 0.001mW/cm² | 0.008W/m² |
| Distance for compliance power density | 0.006m | 0.56cm |
| **Verdict** | **The power density of the EUT at 20cm is below the FCC/IC MPE limit** | |