



Produkte  
Products

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<i>Test Report No.:</i>		<i>Page 1 of 6</i>	
<b>Auftraggeber:</b> <i>Client:</i>	<b>Kpnetworks Ltd.</b> 4-5-11 10F Shiba Minato-ku, Tokyo 108-0014, Japan		
<b>Gegenstand der Prüfung:</b> <i>Test Item:</i>	<b>Gateway Board</b>		
<b>Bezeichnung:</b> <i>Identification:</i>	<b>ISH-1101-003</b>	<b>Serien-Nr.:</b> <i>Serial No.:</i>	<b>N/A</b>
<b>Wareneingangs-Nr.:</b> <i>Receipt No.:</i>	<b>N/A</b>	<b>Eingangsdatum:</b> <i>Date of Receipt:</i>	<b>N/A</b>
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> <b>Good</b> <i>Condition of Test Item at Delivery:</i>			
<b>Prüfport:</b> <i>Testing Location:</i>	<b>TÜV Rheinland Japan Ltd. – Global Technology Assessment Center</b> 4-25-2 Kita-Yamata, Tsuzuki-ku, Yokohama 224-0021, Japan		
<b>Prüfgrundlage:</b> <i>Test Specification:</i>	<b>FCC 47 CFR Part 22, Subpart H</b> <b>FCC 47 CFR Part 24, Subpart E</b>		
<b>Prüfergebnis:</b> <i>Test Result:</i>	<b>Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n).</b> <i>The test item passed the test specification(s).</i>		
<b>Prüflaboratorium:</b> <i>Testing Laboratory:</i>	<b>TÜV Rheinland Japan Ltd. – Global Technology Assessment Center</b> 4-25-2 Kita-Yamata, Tsuzuki-ku, Yokohama 224-0021, Japan		
<b>geprüft/ tested by:</b>		<b>kontrolliert/ reviewed by:</b>	
			
2016-03-10	A. Abe / Inspector	2016-03-10	R. Meiranke / Reviewer
<b>Datum</b> <i>Date</i>	<b>Name/Stellung</b> <i>Name/Position</i>	<b>Unterschrift</b> <i>Signature</i>	<b>Datum</b> <i>Date</i>
			<b>Name/Stellung</b> <i>Name/Position</i>
			<b>Unterschrift</b> <i>Signature</i>
<b>Sonstiges / Other Aspects:</b>			
<p>The Equipment Under Test (EUT) is a printed circuit board that contains a 2.4GHz Wireless LAN transmitter, a Bluetooth transmitter and a PCS module. The PCS module was already tested and certified according to FCC rules (modular approval, FCC ID: QIPPHS8-P).</p> <p>This test report covers only FCC 22H and 24E requirements for the PCS function. Since the PCS module was already granted as a single modular approval, the EUT is deemed to comply with the FCC 22H and 24E requirements without testing. Refer to section 1. General Remarks for details.</p>			
<b>Abkürzungen:</b>	<b>P(ass)</b> = entspricht Prüfgrundlage	<b>Abbreviations:</b>	<b>P(ass)</b> = passed
	<b>F(ail)</b> = entspricht nicht Prüfgrundlage		<b>F(ail)</b> = failed
	<b>N/A</b> = nicht anwendbar		<b>N/A</b> = not applicable
	<b>N/T</b> = nicht getestet		<b>N/T</b> = not tested
<p><b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b> <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i></p>			

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## 1. General Remarks

The EUT (Equipment Under Test) is a printed circuit board that contains a 2.4GHz Wireless LAN transmitter, a Bluetooth transmitter and a PCS module.

The PCS module was already tested and certified according to FCC 22H and 24E as Single Modular Approval (FCC ID: QIPPHS8-P). Therefore, the EUT is deemed to meet the FCC 22H and 24E requirements without testing.

For details regarding the tests performed on the PCS module and the associated application documents, refer to the PCS module FCC application (FCC ID: QIPPHS8-P).

Note:

The PCS module has GSM, EDGE, UMTS/HSPA+ and GPS functions. However the EUT does not use the GSM and EDGE functions of this module. Therefore, the GSM and EDGE functions are not considered in this test report; only UMTS/HSPA+ aspects are covered.

### 1.1 Complementary Materials

There is no attachment to this test report.

## 2. General Product Information

### 2.1 Product Function and Intended Use

The EUT (Equipment Under Test) is a printed circuit board that has two types of unlicensed transmitters: 2.4GHz Wireless LAN and Bluetooth. In additions, the EUT incorporates a certified PCS module. Consequently, 3G communication and GPS receiving functions are also available. Since the EUT will be incorporated into other host equipment, the EUT does not have any enclosure. These hosts are used in an industrial environment such as monitoring system for photovoltaic panels at outdoor environment.

Note: GSM features are **not** supported in the EUT by the specifications.

### 2.2 System Details

#### For Wireless LAN

Radio standard:	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n (20HT/40HT)
Output power:	16.27dBm for IEEE 802.11b 19.27dBm for IEEE 802.11g 19.23dBm for IEEE 802.11n (20HT) 19.14dBm for IEEE 802.11n (40HT)
Antenna gain:	2.1dBi (*)
Antenna type:	Chip antenna
Antenna mounting type:	On board
Frequency range:	2412 - 2462MHz for IEEE 802.11b, 11g, 11n (20HT) 2422 - 2452MHz for IEEE 802.11n (40HT)
Number of channels:	11 for IEEE 802.11b, 11g, 11n (20HT) 7 for IEEE 802.11n (40HT)
Channel spacing:	5MHz
Modulation type:	DSSS coupled with DBPSK, DQPSK and CCK OFDM coupled with BPSK, QPSK, 16QAM and 64QAM
FCC classification:	DTS
Emission designator:	G1D

#### For Bluetooth

Radio standard:	Bluetooth Ver. 4.0 (**)
Output power:	-0.82dBm at Peak
Antenna gain:	2.1dBi (*)
Antenna type:	Chip Antenna
Antenna mounting type:	On board
Frequency range:	2402 - 2480MHz
Number of channels:	79

Channel spacing: 1MHz  
 Modulation type: FHSS coupled with GFSK (1Mbps),  $\pi/4$ -DQPSK (2Mbps) and 8DPSK (3Mbps)  
 FCC classification: DSS (Spread Spectrum Transmitter)  
 Emission designator: F1D (GFSK) and G1D ( $\pi/4$ -DQPSK & 8DPSK)

## Note:

(\*) The chip antenna is shared by wireless LAN and Bluetooth communications. However, wireless LAN and Bluetooth do not transmit simultaneously by the specifications.

(\*\*) This EUT does **not** support Bluetooth Low Energy by the specification.

**For UMTS/HSPA+ (3G)**

Radio standard: UMTS/HSPA+  
 Band FDD5: 850MHz, Band FDD2:1900MHz  
 Output power: 28.40dBm (peak cond.) for 850MHz  
 28.30dBm (peak cond.) for 1900MHz  
 Antenna gain: 0.33dBi at 850MHz  
 2.05dBi at 1880MHz  
 Antenna type: Printed circuit antenna  
 Antenna mounting type: External  
 Frequency range: Band FDD5: UL: 824-849MHz, DL: 869-894MHz  
 Band FDD2: UL: 1850-1910MHz, DL: 1930-1990MHz  
 Emission designator: 4M17F9W (FDD5) and 4M17F9W (FDD2)

**For GPS**

Radio standard: GPS (L1)  
 Antenna gain: 1.49dBi  
 Antenna type: Printed circuit antenna  
 Antenna mounting type: External  
 Frequency range: 1575.42MHz (Rx)

Rated voltage: DC 5V  
 Rated current: Maximum 2.15A  
 Protection class: III

## 2.3 Clock Frequencies

The highest frequency generated or used by the EUT is 800MHz.

## 2.4 Noise Suppressing Parts

Refer to schematics.