

Produkte
Products

Prüfbericht - Nr.: 14025085 001 <i>Test Report No.:</i>			Seite 1 von 9 <i>Page 1 of 9</i>		
Auftraggeber: <i>Client:</i>		Quarton Inc 9F,185,Sec.1 Ta-Tung Rd.,His-Chih Taipei Hsien 221 Taiwan.R.O.C.			
Gegenstand der Prüfung: <i>Test Item:</i>		Short Range Device - Laser Wireless Presenter (2.4GHz)			
Bezeichnung: <i>Identification:</i>		LR-20, LR-20R, LR-20GR Please refer to "Remarks" on page 5.		Serien-Nr.: Engineering sample <i>Serial No.:</i>	
Wareneingangs-Nr.: <i>Receipt No.:</i>		00110209026-001		Eingangsdatum: 09.02.2011 <i>Date of Receipt:</i>	
Prüfart: <i>Testing Location:</i>		TÜV Rheinland Hong Kong Ltd. 8/F., Niche Centre, 14 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong Hong Kong Productivity Council HKPC Building, 78 Tat Chee Avenue, Kowloon, Hong Kong			
Prüfgrundlage: <i>Test Specification:</i>		FCC Part 15 Subpart C ANSI C63.4-2003 CISPR 22:1997			
Prüfresultat: <i>Test Results:</i>		Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben genannter Prüfgrundlage. The above mentioned product was tested and passed .			
Prüflaboratorium: <i>Testing Laboratory:</i>		TÜV Rheinland Hong Kong Ltd. 9-10/F., Emperor International Square, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong			
geprüft/ tested by:			kontrolliert/ reviewed by:		
08.04.2011 Mika Chan Project Engineer			08.04.2011 Sharon Li Assistant Manager		
Datum Name/Stellung Date Name/Position			Datum Name/Stellung Date Name/Position		
Unterschrift Signature			Unterschrift Signature		
Sonstiges: Other Aspects		FCCID: S751240LR20			
Abkürzungen:		Abbreviations:		P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested	
P(ass) = entspricht Prüfgrundlage F(ail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet					
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. <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>					

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Product information

Manufacturers declarations

	Transmitter
Operating frequency range	2403 - 2477 MHz
Type of modulation	FSK
Number of channels	16
Type of antenna	PCB Antenna
Power level	fix
Connection to public utility power line	No
Nominal voltage	V_{nor} : 3.7 V

Product function and intended use

The equipment under test (EUT) is a wireless laser presenter operating at 2.4GHz. It transmits Page up / page down and Wireless keyboard (Play/Esc) & (Screen blank) command to the associated wireless USB dongle. The EUT transmits on one of the 16 channel and channel number was selected during frequency binding procedure after each time it power on. And EUT will switch to next assigned channel when current channel is suffered the interference from other system signals. It is powered by 3.7V Rechargeable Li-ion Battery. The USB connector is for charging only, no data exchange supported.

Submitted documents

Circuit Diagram
Block Diagram
Bill of material
User manual
Rating Label

Remarks

Model	Description
LR-20	Wireless presenter without laser pointer function
LR-20R	Wireless presenter with red laser pointer function
LR-20GR	Wireless presenter with green laser pointer function

The product has been tested together with the following additional accessory:

Laptop computer
Brand: Lenovo
Model: T61
S/N: L3-X9333 08/05

AC adaptor
Brand: Lenovo
Model: 92P1103
Input rating: 100-240V ~ 1.7A-0.9A, 50/60Hz
Output rating: 2.0V, 4.5A

List of Test and Measurement Instruments

	Equipment used	Manufacturer	Model No.	S/N	Due Date
☒	Semi-anechoic Chamber	Frankonia	Nil	Nil	27-Apr-11
☒	Test Receiver	R & S	ESU26	100050	25-May-11
☒	Bi-conical Antenna	R & S	HK116	100241	13-Apr-12
☒	Log Periodic Antenna	R & S	HL223	841516/020	13-Apr-12
☒	Coaxial cable 50ohm	Rosenberger	RTK081-05S-05S-10m	LA2-001-10M / 001	08-Dec-11
☒	Microwave amplifier 0.5-26.5GHz, 25dB gain	HP	83017A	3950M00241	03-Oct-11
☒	High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	9829213	30-Oct-11
☒	Horn Antenna	EMCO	3115	9002-3351	16-Apr-12
☒	Active Loop Antenna	EMCO	6502	9107-2651	06-Feb-11
☒	FSP 30 Spectrum Analyser	R & S	FSP 30	100007	16-Sep-12
☒	Test Receiver	R & S	ESCS30	100201	11-Jan-12
☒	LISN	R & S	ESH3-Z5	100230	11-Jan-12
☒	Pulse Limiter	R & S	ESH3-Z2	Nil	11-Jan-12

Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions measurements is $\pm 5.10\text{dB}$ (30MHz to 200MHz), $\pm 5.08\text{dB}$ (200MHz to 1000MHz) and $\pm 5.00\text{dB}$ (above 1000MHz).

Results FCC Part 15 – Subpart C

Subclause 15.207 – Disturbance Voltage on AC Mains						Pass
Test Port: AC mains input port of the charger Applied voltage: 100VAC Applicable only to equipment designed to be connected to the public utility power line. Adaptor Model: 92P1103 1) Mode of operation: Transmitting						
Live measurement						
Frequency range (MHz)	Frequency (MHz)	Quasi-peak dBµV	Average dBµV	Limit QP (dBµV)	Limit AV (dBµV)	Verdict
0,15 – 0,5	0.150	46.4	20.6	66 - 56	56 - 46	Pass
	0.204	46.2	41.4	66 - 56	56 - 46	Pass
	0.420	45.7	33.0	66 - 56	56 - 46	Pass
	0.474	44.0	27.7	66 - 56	56 - 46	Pass
> 0,5 - 5	0.516	40.2	29.8	56	46	Pass
> 5 - 30	-	-	-	60	50	Pass
Neutral measurement						
Frequency range (MHz)	Frequency (MHz)	Quasi-peak dBµV	Average dBµV	Limit QP (dBµV)	Limit AV (dBµV)	Verdict
0,15 – 0,5	0.210	45.1	36.6	66 - 56	56 - 46	Pass
	0.390	44.9	35.3	66 - 56	56 - 46	Pass
	0.486	41.5	29.5	66 - 56	56 - 46	Pass
> 0,5 - 5	0.570	41.5	26.2	56	46	Pass
> 5 - 30	-	-	-	60	50	Pass
Results: The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150kHz to 30MHz does not exceed the limits. For test Results plots refer to Appendix 1, page 2-3.						

Subclause 15.205 – Band edge compliance of radiated emissions		Pass
Test Specification : ANSI C63.4 – 2003 Mode of operation : Tx mode Port of testing : Enclosure Detector : Peak RBW/VBW : 100 kHz / 300 kHz for $f < 1$ GHz 1 MHz / 3 MHz for $f > 1$ GHz Supply voltage : internal batteries has been activated Temperature : 23°C Humidity : 50%		
Requirement:	Radiated emissions which fall in the restricted bans, as defined in 15.205 (a), must also comply with the radiated emission limits specified in 15.209(a).	
Results:	There is no peak found in the restricted bands. For test protocols refer to Appendix 1, page 4-7.	

Subclause 15.215 (c) – 20 dB Bandwidth		Pass		
Requirement:	The intentional radiators must be designed to ensure that the 20dB bandwidth of the emission, is contained within the frequency band designated in the rule section under which the equipment is operated.			
Test Specification : ANSI C63.4 – 2003 Mode of operation : Tx mode Port of testing : Enclosure RBW/VBW : 100 kHz / 300 kHz for f < 1 GHz 1 MHz / 3 MHz for f > 1 GHz Supply voltage : internal batteries has been activated Temperature : 23°C Humidity : 50%				
Results: For test protocols refer to Appendix 1, page 8-9.				
Frequency (MHz)	20 dB left (MHz)	Limit (MHz)	20 dB right (MHz)	Limit (MHz)
2403	2401.998	> 2400	2404.098	< 2483.5
2442	2440.968	> 2400	2443.128	< 2483.5
2477	2475.956	> 2400	2478.146	< 2483.5

Subclause 15.249 (a) – Radiated Emission (Fundamental and Harmonics)		Pass
Test Specification : ANSI C63.4 – 2003 Mode of operation : Tx mode Port of testing : Enclosure RBW/VBW : 100 kHz / 300 kHz for $f < 1$ GHz 1 MHz / 3 MHz for $f > 1$ GHz Supply voltage : internal batteries has been activated Temperature : 23°C Humidity : 50%		
Requirement: The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following limit.		
Results: PASS		
Fundamental Frequency 2403MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2403.125	84.68	114.0 / P
2403.157	30.38	94.0 / A
Fundamental Frequency 2403MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2402.826	80.48	114.0 / P
2403.307	29.82	94.0 / A
Harmonics 2403MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4806.657	60.51	74.0 / P
4806.336	33.38	54.0 / A
Harmonics 2403MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4806.743	59.15	74.0 / P
4806.423	33.16	54.0 / A
Fundamental Frequency 2442MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2441.826	84.42	114.0 / P
2442.083	30.01	94.0 / A
Fundamental Frequency 2442MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2442.403	80.55	114.0 / P
2442.019	29.70	94.0 / A
Harmonics 2442MHz Vertical Polarization		

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4884.807	60.97	74.0 / P
4884.182	32.91	54.0 / A
Harmonics 2442MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4884.695	56.91	74.0 / P
4884.246	32.58	54.0 / A
Fundamental Frequency 2477MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2447.419	76.35	114.0 / P
2447.035	28.62	94.0 / A
Fundamental Frequency 2477MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2477.099	80.04	114.0 / P
2477.243	29.60	94.0 / A
Harmonics 2477MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4953.573	64.92	74.0 / P
4954.198	33.26	54.0 / A
Harmonics 2477MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4954.839	58.70	74.0 / P
4954.022	32.96	54.0 / A

Subclause 15.249 (d) – Spurious Radiated Emissions		Pass
Test Specification : ANSI C63.4 - 2003 Mode of operation : Tx mode Port of testing : Enclosure Detector : Peak RBW/VBW : 100 kHz / 300 kHz for $f < 1$ GHz 1 MHz / 3 MHz for $f > 1$ GHz Supply voltage : internal batteries has been activated Temperature : 23°C Humidity : 50%		
Requirement:	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.	
Results:	All three transmit frequency modes comply with the field strength within the restricted bands. There is no spurious found below 30MHz.	

Tx frequency 2410MHz			Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
no peak found	---	74.0 / P	no peak found	---	74.0 / P
no peak found	---	54.0 / A	no peak found	---	54.0 / A
Tx frequency 2410MHz			Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
no peak found	---	74.0 / P	no peak found	---	74.0 / P
no peak found	---	54.0 / A	no peak found	---	54.0 / A
Tx frequency 2450MHz			Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
no peak found	---	74.0 / P	no peak found	---	74.0 / P
no peak found	---	54.0 / A	no peak found	---	54.0 / A
Tx frequency 2450MHz			Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
no peak found	---	74.0 / P	no peak found	---	74.0 / P
no peak found	---	54.0 / A	no peak found	---	54.0 / A
Tx frequency 2481MHz			Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
no peak found	---	74.0 / P	no peak found	---	74.0 / P
no peak found	---	54.0 / A	no peak found	---	54.0 / A
Tx frequency 2481MHz			Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m	Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
no peak found	---	74.0 / P	no peak found	---	74.0 / P
no peak found	---	54.0 / A	no peak found	---	54.0 / A