



Prüfbericht - Nr.: 14027948 001			Seite 1 von 8		
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Auftraggeber: <i>Client:</i>		Stadlbauer Marketing + Vertrieb GmbH Rennbahn Allee1 5412 Puch, Salzburg Austria			
Gegenstand der Prüfung: <i>Test Item:</i>		Short Range Device - RC Lap Counter (2.4GHz)			
Bezeichnung: <i>Identification:</i>	800025	Serien-Nr.: <i>Serial No.:</i>	Engineering sample		
Wareneingangs-Nr.: <i>Receipt No.:</i>	00110830112-008	Eingangsdatum: <i>Date of Receipt:</i>	30.08.2010		
	00110926016-001~004		26.09.2010		
Prüfört: <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				
Prüfergebnis: <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. 8-10/F., Goldin Financial Global Square , 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong				
geprüft/ tested by:			kontrolliert/ reviewed by:		
03.11.2011	Mika Chan Senior Project Engineer		03.11.2011	Sharon Li Assistant Manager	
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>
Sonstiges: <i>Other Aspects</i>		FCCID: YFA800025			
Abkürzungen:		Abbreviations:			
P(ass) = entspricht Prüfgrundlage		P(ass) = passed			
F(ail) = entspricht nicht Prüfgrundlage		F(ail) = failed			
N/A = nicht anwendbar		N/A = not applicable			
N/T = nicht getestet		N/T = not tested			
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

	Transceiver
Operating frequency range	2410 - 2481 MHz
Type of modulation	FSK
Number of channels	64
Type of antenna	PCB Antenna
Power level	fix
Connection to public utility power line	No
Nominal voltage	V _{nom} : 4.5 V

Product function and intended use

The equipment under test (EUT) is a transceiver for a RC car lap counting operating at 2.4GHz.

Submitted documents

Circuit Diagram
Block Diagram
Bill of material
User manual
Rating Label

List of Test and Measurement Instruments

Hong Kong Productivity Council (Registration number: 90656)

Equipment	Manufacturer	Type	S/N	Due Date
Semi-anechoic Chamber	Frankonia	Nil	Nil	25-May-12
Test Receiver	R & S	ESU40	100190	26-May-12
Bi-conical Antenna	R & S	HK116	100241	05-May-13
Log Periodic Antenna	R & S	HL223	841516/020	06-May-13
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-13
High Pass Filter (cutoff freq. =1000MHz)	Trilithic	23042	9829213	30-Oct-13
Horn Antenna	EMCO	3115	9002-3351	11-May-13
FSP 30 Spectrum Analyser	R & S	FSP 30	100286	17-Sep-12
Active Loop Antenna	EMCO	6502	9107-2651	19-Apr-12

Results FCC Part 15 – Subpart C

Subclause 15.207 – Disturbance Voltage on AC Mains	N/A
There is no AC power input or output ports on the EUT.	

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 bands, 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 1-3.				
Frequency (MHz)	20 dB left (MHz)	Limit (MHz)	20 dB right (MHz)	Limit (MHz)
2410	2409.33	> 2400	2410.75	< 2483.5
2450	2449.75	> 2400	2450.99	< 2483.5
2481	2480.34	> 2400	2481.95	< 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 2410MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2409.984	93.72	114.0 / P
2409.920	45.65	94.0 / A
Fundamental Frequency 2410MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2409.974	97.83	114.0 / P
2409.798	43.26	94.0 / A
Harmonics 2410MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4820.442	55.66	74.0 / P
4820.042	36.50	54.0 / A
Harmonics 2410MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4819.917	55.74	74.0 / P
4820.125	36.71	54.0 / A
Fundamental Frequency 2450MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2450.349	92.58	114.0 / P
2450.349	44.04	94.0 / A
Fundamental Frequency 2450MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2450.282	93.64	114.0 / P
2450.506	43.17	94.0 / A
Harmonics 2450MHz Vertical Polarization		

Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4900.641	51.77	74.0 / P
4900.801	35.19	54.0 / A
Harmonics 2450MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4900.452	52.54	74.0 / P
4900.628	35.47	54.0 / A
Fundamental Frequency 2481MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2481.127	91.36	114.0 / P
2481.095	43.33	94.0 / A
Fundamental Frequency 2481MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
2481.170	93.00	114.0 / P
2481.138	43.98	94.0 / A
Harmonics 2481MHz Vertical Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4962.484	52.18	74.0 / P
4962.260	35.22	54.0 / A
Harmonics 2481MHz Horizontal Polarization		
Freq MHz	Level dBuV/m	Limit/ Detector dBuV/m
4962.381	51.11	74.0 / P
4962.269	34.57	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	
9640.02		65.57		74.0 / P	
9640.23		42.63		54.0 / A	
Tx frequency 2410MHz			Horizontal Polarization		
Freq MHz		Level dBuV/m		Limit/ Detector dBuV/m	
9639.88		60.51		74.0 / P	
9640.15		40.80		54.0 / A	
Tx frequency 2450MHz			Vertical Polarization		
Freq MHz		Level dBuV/m		Limit/ Detector dBuV/m	
9801.96		56.19		74.0 / P	
9801.35		39.92		54.0 / A	
Tx frequency 2450MHz			Horizontal Polarization		
Freq MHz		Level dBuV/m		Limit/ Detector dBuV/m	
9801.83		54.89		74.0 / P	
9801.31		39.05		54.0 / A	
Tx frequency 2481MHz			Vertical Polarization		
Freq MHz		Level dBuV/m		Limit/ Detector dBuV/m	
9925.16		56.18		74.0 / P	
9924.88		40.06		54.0 / A	
Tx frequency 2481MHz			Horizontal Polarization		
Freq MHz		Level dBuV/m		Limit/ Detector dBuV/m	
no peak found		---		74.0 / P	
no peak found		---		54.0 / A	