

This document was generated in response to a request for additional technical information by Frank Coperich in regards to the type approval of the KWC-2255. The information included in related to the three specific topics discussed in the following email received by Lin Lu on Aug. 31, 2001:

Date: Fri, 31 Aug 2001 15:55:46 -0400 (EDT)
From: OET <oetech@fccsun07w.fcc.gov>
To: LLu@qcpi.com
Subject:

To: Lin Lu, QCP Inc.
From: Frank Coperich
fcoperic@fcc.gov
FCC Application Processing Branch
Re: FCC ID OVFKWC-2255
Applicant: Kyocera Wireless Corp
Correspondence Reference Number: 20487
731 Confirmation Number: EA101704

- 1.) Please specify the lowest and highest operating channel center frequencies for CDMA operation under Part 22.
- 2.) Please provide a justification for the listing of 1851.25 - 1908.75 MHz for CDMA operation under Part 24.
- 3.) The modulation limiting data shows that only 10.8 kHz deviation is achieved which is less than 12 kHz +/- 10 % per Section 22.915(b)(1). Please indicate how this unit will be modified to achieve the desired modulation % capability and submit revised data

1) The lowest and highest operating channel center frequencies for CDMA operation under Part 22

For KWC-2255 in CDMA operation under Part 22, the lower operating channel number is 1013 and the center frequency of this channel is 824.7MHz. The highest operating channel number is 777 and the center frequency of the highest channel is 848.31MHz. The “necessary bandwidth” of the CDMA signal is 1.25MHz.

There were typos in the KWC-2255 Part 22 & Part 24 test report, Exhibit 10, CDMA (under Part 22) section. The typos occurred in the spreadsheet we worked on. The correction is as follows.

Exhibit 10

**Conducted Emissions Test Results (harmonics) - FCC Part 2 and 22, Paragraph 2.1051,
22.917**

FM High Power (No any correction here. Same as original test report)

low band – channel 991

	Frequency (MHz)	Measured Level (dBm)	specification limit (dBm)
1	824.04	25.26	-
2	1648.08	-34.23	-13
3	2472.12	-42.07	-13
4	3296.16	-65.01	-13
5	4120.2	-59.87	-13
6	4944.24	-71.08	-13
7	5768.28	-75.69	-13
8	6592.32	-70.17	-13
9	7416.36	-67.95	-13
10	8240.4	<-85	-13

mid band – channel 383

	Frequency (MHz)	Measured Level (dBm)	specification limit (dBm)
1	836.49	25.25	-
2	1672.98	-33.29	-13
3	2509.47	-41.24	-13
4	3345.96	-54.40	-13
5	4182.45	-52.27	-13
6	5018.94	-68.92	-13
7	5855.43	-73.70	-13
8	6691.92	-83.63	-13
9	7528.41	-74.57	-13
10	8364.9	<-85	-13

high band – channel 799

	Frequency (MHz)	Measured Level (dBm)	specification limit (dBm)
1	848.97	25.20	-
2	1697.94	-32.70	-13
3	2546.91	-46.41	-13
4	3395.88	-64.95	-13
5	4244.85	-49.12	-13
6	5093.82	-64.99	-13
7	5942.79	-63.38	-13
8	6791.76	-76.15	-13
9	7640.73	-72.89	-13
10	8489.7	-73.00	-13

CDMA High Power
(Correction in the frequency list shown in *Italic font*.)

low band – channel 1013

	Frequency (MHz)	Measured Level (dBm)	specification limit (dBm)
1	<i>824.7</i>	24.22	-
2	<i>1649.4</i>	-34.21	-13
3	<i>2474.1</i>	-41.69	-13
4	<i>3298.8</i>	-68.90	-13
5	<i>4123.5</i>	-62.09	-13
6	<i>4948.2</i>	-72.44	-13
7	<i>5772.9</i>	-76.48	-13
8	<i>6597.6</i>	<-85	-13
9	<i>7422.3</i>	<-85	-13
10	<i>8247</i>	<-85	-13

mid band – channel 383

	Frequency (MHz)	Measured Level (dBm)	specification limit (dBm)
1	836.49	24.27	-
2	1672.98	-33.86	-13
3	2509.47	-41.22	-13
4	3345.96	-60.57	-13
5	4182.45	-56.63	-13
6	5018.94	-71.98	-13
7	5855.43	<-85	-13
8	6691.92	<-85	-13
9	7528.41	<-85	-13
10	8364.9	<-85	-13

high band – channel 777

	Frequency (MHz)	Measured Level (dBm)	specification limit (dBm)
1	<i>848.31</i>	24.27	-
2	<i>1696.62</i>	-33.86	-13
3	<i>2544.93</i>	-41.22	-13
4	<i>3393.24</i>	-60.57	-13
5	<i>4241.55</i>	-56.63	-13
6	<i>5089.86</i>	-71.98	-13
7	<i>5938.17</i>	<-85	-13
8	<i>6786.48</i>	<-85	-13
9	<i>7634.79</i>	<-85	-13
10	<i>8483.1</i>	<-85	-13

2) Justification for the listing of 1851.25 – 1908.75 MHz for CDMA operation under Part 24

Under Part 24, based on IS-98D, section 3.1 frequency coverage requirement, section 3.1.2 (see attachment), 1851.25MHz is the lowest channel center frequency, the corresponding channel number is channel 25; 1908.75MHz is the highest channel center frequency and the corresponding channel number is channel 1175. The “necessary bandwidth” of the CDMA signal is 1.25MHz.

KWC-2255 was designed to meet IS-98D requirements. The frequency range that KWC-2255 operates in CDMA operation under Part 24 is from 1850.625MHz to 1909.375MHz.

Table 3.1.1-4. CDMA Preferred Set of Frequency Assignments for Band Class 0

Band Subclass	System Designator	Spreading Rate	Preferred Set Channel Numbers
0	A	1	283 (Primary) and 691 (Secondary)
		3	37, 78, 119, 160, 201, 242 ²
	B	1	384 (Primary) and 777 (Secondary)
		3	425 ² , 466, 507, 548, 589
1	A	1	779 (Primary) and 738 (Secondary)
		3	37, 78, 119, 160, 201, 242, 738 ³
	B	1	486 (Primary) and 568 (Secondary)
		3	404, 445, 486, 527, 568 ³

3.1.2 Band Class 1 (1900 MHz Band)

The channel spacing, CDMA channel designations, and transmit center frequencies for Band Class 1 shall be as specified in Table 3.1.2-1. The Band Class 1 channel numbers are shown in Tables 3.1.2-2 and 3.1.2-3. The preferred set of CDMA frequency assignments for Band Class 1 is given in Table 3.1.2-4.

A mobile station supporting operation in Band Class 1 with Spreading Rate 1 shall support CDMA operations on the valid and conditionally valid channel numbers shown in Table 3.1.2-2. A mobile station supporting operation in Band Class 1 with Spreading Rate 3 shall support CDMA operations on the valid channel numbers shown in Table 3.1.2-3. Note that certain channel assignments are not valid and others are conditionally valid. Transmission on conditionally valid channels is permissible if the adjacent block is allocated to the same licensee or if other valid authorization has been obtained.

² The use of preferred channel numbers 242 or 425 for Spreading Rate 3 ensures that overlaid multi-channel forward link systems with 1.23 MHz inter-channel spacing will contain a Spreading Rate 1 Forward CDMA Channel that aligns with one of the Spreading Rate 1 preferred channel numbers.

³ The use of preferred channel numbers 738, 445, 486, 527, or 568 for Spreading Rate 3 ensures that overlaid multi-channel forward link systems with 1.23 MHz inter-channel spacing will contain a Spreading Rate 1 Forward CDMA Channel that aligns with one of the Spreading Rate 1 preferred channel numbers.

Table 3.1.2-1. CDMA Channel Number to CDMA Frequency Assignment Correspondence for Band Class 1

Transmitter	CDMA Channel Number	Center Frequency of CDMA Channel in MHz
Mobile Station	$0 \leq N \leq 1199$	$1850.000 + 0.050 N$
Base Station	$0 \leq N \leq 1199$	$1930.000 + 0.050 N$

Table 3.1.2-2. CDMA Channel Numbers and Corresponding Frequencies Band Class 1 and Spreading Rate 1

Block Designator	CDMA Channel Validity	CDMA Channel Number	Transmit Frequency Band (MHz)	
			Mobile Station	Base Station
A (15 MHz)	Not Valid	0-24	1850.000-1851.200	1930.000-1931.200
	Valid	25-275	1851.250-1863.750	1931.250-1943.750
	Cond. Valid	276-299	1863.800-1864.950	1943.800-1944.950
D (5 MHz)	Cond. Valid	300-324	1865.000-1866.200	1945.000-1946.200
	Valid	325-375	1866.250-1868.750	1946.250-1948.750
	Cond. Valid	376-399	1868.800-1869.950	1948.800-1949.950
B (15 MHz)	Cond. Valid	400-424	1870.000-1871.200	1950.000-1951.200
	Valid	425-675	1871.250-1883.750	1951.250-1963.750
	Cond. Valid	676-699	1883.800-1884.950	1963.800-1964.950
E (5 MHz)	Cond. Valid	700-724	1885.000-1886.200	1965.000-1966.200
	Valid	725-775	1886.250-1888.750	1966.250-1968.750
	Cond. Valid	776-799	1888.800-1889.950	1968.800-1969.950
F (5 MHz)	Cond. Valid	800-824	1890.000-1891.200	1970.000-1971.200
	Valid	825-875	1891.250-1893.750	1971.250-1973.750
	Cond. Valid	876-899	1893.800-1894.950	1973.800-1974.950
C (15 MHz)	Cond. Valid	900-924	1895.000-1896.200	1975.000-1976.200
	Valid	925-1175	1896.250-1908.750	1976.250-1988.750
	Not Valid	1176-1199	1908.800-1909.950	1988.800-1989.950

3) Revised Modulation Limiting Data

The modulation % capability of KWC-2255 is driven by the software. With modified software setting, KWC-2255 is able to achieve the desired modulation capability. A retest has been performed. The test results are follows.

Re-test with modified software setting -

Transmitter Modulation Requirement - FCC Part 2, Paragraph 2.1047 (b)

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Measured with HP8920 RF communication test set

Audio Input Level (dB)	FM deviation (kHz peak)		
	Modulation frequency		
(0dB=8kHz dev)	400 Hz	1 kHz	2.7 kHz
-20	1.64	2.96	6.81
-15	1.9	3.71	8.14
-10	2.21	4.62	8.74
-5	2.71	6.03	9.04
0	3.48	8	9.4
5	4.32	9.41	9.83
10	9.14	10.23	10.8
15	9.76	11.05	10.32
20	10.23	10.17	10.01

