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March 23, 2000
KM4-00-U03A
EA96738

Attn.:	Joseph Dichose, Electronics Engineer
Re:	FCC ID: ACJ96NKX-TC1851
Applicant:	Matsushita Electric Industrial Co., Ltd.
Correspondence Ref:	12895
731 Confirmation No:	EA96738
FCC E-Mail Date:	03/20/2000
Product Type:	DSS 900 MHz Cordless Telephone Base and Handset System

This is in response to the above referenced correspondence.

1. RF Safety Requirements

The maximum rated direct sequence spread spectrum RF output for the handset unit is 64 mW and the base unit is 104 mW. We understand in order to demonstrate compliance with §§1.1307 and 15.247(b)(4) for environmental assessment and limited exposure to RF energy, we must either place caution marking about spacing or perform SAR measurements. For example, in order not to have to perform SAR measurement on low power base unit, the User Manual would have to include warning to user to maintain a minimum of 20 cm (8 inches) between the base unit and user during operation to satisfy FCC's concern for RF exposure safety precaution. If this is a correct understanding, we will instruct PCTest to perform SAR measurements on both the handset and base unit to avoid not having to place such a negative warning into the User Manual.

2. Manufacturer of Spread Spectrum Chip

The manufacturer is the spread spectrum chip is Level One Communications, Inc.

3. Antenna Gain

This system used omni-directional permanently attached dipole antenna with peak gain of 2.15dBi. Refer to the attached factory engineer explanation for recalculated output power using the antenna gain and power density.

4. Theoretical Process Gain (Chip/Symbol Ratio)

Process gain: 1.5Mchip / 100KBps = 15 = 11.7dB

5. Modulation Type of Transmitter / Verify Signal Generator used for Processing Gain

The modulation type of the transmitter is FSK.
Set Signal Generator in below condition and it can output the same RF signal as the actual set:

External Modulation Input:	TX signal from Dummy Set (Baseband Digital Signal)
Modulation Type:	FSK
Deviation:	525KHz

6. BER Used for Processing Gain Test

We used BER $1x10^{-4}$ (=0.01%) for the processing gain test.

Sincerely yours,

Richard Mullen
Manager

cc: Kwok Chan / FCC
Randy Ortanez / PCTest
K. Nawata / KME-KM4

KM4-00-403A
FCC ID: ACJ96NKX-TC1851
EA 96738

1) Indicate compliance with the RF safety requirements.

Could you please request PCTest Lab to conduct the SAR test soon?
We believe they keep our test sample of KX-TC1851.

2) Indicate the manufacturer of the spread spectrum chip.

Level One Communications, Inc.

3) Indicate the antenna gain. If the antenna gain is not equal to 1, recalculate the antenna output power with the appropriate antenna gain.

This system use a dipole type antenna with a peak gain of 2.15dBi.
Then I recalculated output power using the antenna gain.

The power density in direction $S=(P*G)/(4*PI*r^2)$
Here, Units of S is (mW/m^2), P is conducted power level , G is antenna gain.
$S=(E^2)/(120*PI)$.
Then I can get $P=((E^2)*(r^2))/(30*G)$

On Base : antenna gain is 2.15dBi=1.64

(1ch)
E=-24.6dBm+32.7dB+107dB=115.1dBuV/m=569508.2uV/m
$P=((569508.2u^2)*(3^2))/(30*1.64)=0.0593W=17.73dBm$

(16ch)
E=-24.8dBm+32.8dB+107dB=115.0dBuV/m=561694.3uV/m
$P=((561694.3u^2)*(3^2))/(30*1.64)=0.0577W=17.61dBm$

(31ch)
E=-24.5dBm+32.9dBm+107dB=115.40dBuV/m=58843.7uV/m
$P=((58843.7u^2)*(3^2))/(30*1.64)=0.0634W=18.02dBm$

On Handset : antenna gain is 2.15dBi=1.64

(1ch)
E=-26.4dBm+32.7dB+107dB=113.3dBuV/m=462913.7uV/m
$P=((462913.7u^2)*(3^2))/(30*1.64)=0.0392W=15.93dBm$

(16ch)

$E=-26.5dBm+32.8dB+107dB=113.3dBuV/m=461317.6uV/m$

$P=((461317.6u^2)*(3^2))/(30*1.64)=0.0389W=15.90dBm$

(31ch)

$E=-28.2dBm+32.9dBm+107dB=117.00dBuV/m=384591.8uV/m$

$P=((384591.8u^2)*(3^2))/(30*1.64)=0.0271W=14.32dBm$

4) What is the theoretical process gain? Chip/symbol ratio?.

Process gain : 1.5Mchip/100KBps=15

=11.7dB

5) What is the modulation type of the transmitter? Verify that the Signal Generator used for processing gain measurements is capable of the same signal.

Modulation type of the transmitter is FSK.

We set Signal Generator below condition and it can output same RF signal as actual set .

External modulation input : TX signal from Dummy set (Baseband digital signal)

Modulation type : FSK

Deviation : 525KHz

6) What is the BER used for the processing gain test?

We used BER 1 x 10^{-4} (=0.01%) for the processing gain test.