MPE Estimation

On

Dual-Band CDMA 1xRTT Digital Wireless Module

FCC Part 22 & 24 RSS-129 and RSS-133	
FCC ID:	OVFKWC-M300
IC:	3572A-M300

STATEMENT OF COMPLIANCE

Kyocera Wireless Corp declares under its sole responsibility that the product M300 to which this declaration relates, is in conformity with the appropriate General Population/Uncontrolled RF exposure standards, recommendations and guidelines. It also declares that the product was tested in accordance with the appropriate measurement standards, guidelines and recommended practices.

Any deviations from these standards, guidelines and recommended practices are noted: NONE.

Test performed by:	Binh Thai Test Technician	Date of Test:	09/18/08
Report Prepared by:	Binh Thai Test Technician	Date of Report:	09/18/08
Report Reviewed by:	C. K. Li Director, Regulatory Engineering	Date of Review:	09/22/08

ATTESTATION

I attest that the information provided in RSS102 Annex A is correct; that a Technical Brief was prepared and the information it contains is correct; that the device evaluation was performed or supervised by me; that applicable measurement methods and evaluation methodologies have been followed and that the device meets the SAR and/or RF exposure limits of RSS-102.

Signature:	C. K. Li Digitally signed by C. K. Li DN: CN = C. K. Li, C = US, O = Kyocera Wireless Corp. Location: San Diego, USA Date: 2008.09.30 11:01:02 -07'00'	**Date:**	09/30/09
NAME:	C. K. Li	**TITLE:**	Director, Regulatory Engineering
COMPANY:	Kyocera Wireless Corp.		

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1 INTRODUCTION

This test report describes Maximum Permissible Exposure (MPE) generated from a wireless portable device manufactured by Kyocera Wireless Corp. (KWC). These measurements were performed for compliance with the rules and regulations of the U.S. Federal Communications Commission (FCC). The limit is specified in FCC 1.1210.

2 EQUIPMENT UNDER TEST (EUT)

The wireless device is described as follows:

FCC ID:	OVFKWC-M300	
IC:	3572A-M200	
Product:	Dual-Band CDMA/AMPS Module	
Trade Name:	Kyocera Wireless Corp.	
Model Number:	M200	
Device Category:	Mobile (w/ external antenna)	
RF Exposure Environment:	General Population / Uncontrolled	
External Input/Output:	External antenna ports	
Quantity:	Quantity production is planned	
Antenna Type:	External	
FCC Rule Parts:	§22H	§24H
IC:	RSS	
Multiple Access Scheme:	CDMA	CDMA
TX Frequency (MHz):	824 – 849	1850 - 1910
Emission Designators:	1M25F9W	1M25F9W
Rated Conducted Output Power (dBm):	24.5	24.0

3 RF TECHNICAL BRIEF (RSS102 ANNEX A)

1	**COMPANY NUMBER:**	3572A
2	**MODEL NUMBER:**	M300
3	**MANUFACTURER:**	Kyocera Wireless Corp.
4	**TYPE OF EVALUATION:**	☐ SAR Evaluation: Device Used in the Vicinity of the Human Head; ☐ SAR Evaluation: Body-worn Device; ☒ RF Evaluation
4 a	**SAR Evaluation (Device used in the Vicinity of the Human Head):**	• Multiple transmitters: ☐ Yes ☐ No • Evaluated against exposure limits: ☐ General Public Use ☐ Controlled Use • Duty cycle used in evaluation: _____% • Standard used for evaluation: _____ • SAR value: _____W/kg. ☐ Measured ☐ Computed ☐ Calculated
4 b	**SAR Evaluation: Body-worn Device**	• Multiple transmitters: ☐ Yes ☐ No • Evaluated against exposure limits: ☐ General Public Use ☐ Controlled Use • Duty cycle used in evaluation: _____% • Standard used for evaluation: _____ • SAR value: _____W/kg. ☐ Measured ☐ Computed ☐ Calculated
4 c	**RF Evaluation**	• Evaluated against exposure limits: ☒ General Public Use ☐ Controlled Use • Duty cycle used in evaluation: 100% • Standard used for evaluation: IEEE C95.3 • Measurement distance: 0.2 m • RF value (800MHz band): 0.411 ☐ V/m ☐ A/m ☒ W/m^2 • RF value (1900MHz band): 0.943 ☐ V/m ☐ A/m ☒ W/m^2 ☐ Measured ☐ Computed ☒ Calculated

Note: 1) N/A for Not Applicable, N/P for Not Performed or N/V for Not Available.
2)The worst-case scenario (i.e. highest measured value obtained) was reported.

4 MPE LIMITS

4.1 Limits for the FCC General Population/Uncontrolled Exposure:

Frequency Range (MHz)	Electric Field Strength, E (V/m)	Magnetic Field Strength, H (A/m)	Power Density, S (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	$(180/f^2)$*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

*f = frequency in MHz, *Plane-wave equivalent power density*

4.2 Limits for the IC RSS102 General Population/Uncontrolled Exposure:

Frequency Range (MHz)	Electric Field Strength, E (V/m rms)	Magnetic Field Strength, H (A/m rms)	Power Density, S (W/m^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.003-1	280	2.19	-	6
1-10	280/f	2.19/f	-	6
10-30	28	2.19/f	-	6
30-300	28	0.073	2*	6
300-1500	$1.585f^{0.5}$	$0.0042f^{0.5}$	f/150	6
1500-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158f^{0.5}$	$4.21x10^{-4}f^{0.5}$	$6.67x10^{-5}f$	$616000/f^{1.2}$

f = frequency in MHz

** Power density limit is applicable at frequencies greater than 100 MHz*

5 MPE ESTIMATION FORMULA

MPE power density level can be calculated by the following equation (1):

$$S = \frac{P_t G_t}{4\pi R^2} \qquad \text{..... (1)}$$

Where S = Power Density in mW/cm^2
P_t = Power in mW
G_t = Numeric Antenna Gain
R = distance from antenna to body in cm (= 20 for mobile application)

6 MPE CALCULATIONS

The FCC and IC require that the calculated MPE be equal to or less than a given limit dependent on frequency at a distance of 20 cm from a device to the body of a user.

Band	Freq (MHz)	P_t* (dBm)	G_t (dBi)	R (cm)	S (mW/cm^2)	MPE Limit (mW/cm^2)	Result
CDMA 800	824.70	24.79	8	20	**0.378**	0.550	Passes
	836.52	25.15	8	20	**0.411**	0.558	Passes
	848.31	24.74	8	20	**0.374**	0.566	Passes
CDMA 1900	1851.25	24.41	12	20	**0.870**	1.000	Passes
	1880.00	24.34	12	20	**0.857**	1.000	Passes
	1908.75	24.76	12	20	**0.943**	1.000	Passes

*Note: * Data obtained from worst case configuration at each channel in emission report*

Based on the FCC OET Bulletin 65 Supplement C, 47 CFR §2.1091 and RSS102, it has been calculated that the device will comply with the FCC/IC rules on RF exposure for mobile devices when used with an external antenna system with total gain (antenna gain + connecting cable loss) not to exceed the followings:

Band	Max. System Gain (dBi)
CDMA 800	8.0
CDMA 1900	12.0