TSG-RAN Working Group 4 (Radio) meeting #1 ***TSGR4#1(99)***
Espoo 21st - 22nd January 1999

Agenda Item:

Source: **ARIB**

Title: Baseline document proposal from ARIB SWG4

Document for:

Contents of ARIB Volume 4 ”Specifications of Mobile Station for 3G Mobile System (Ver.1.0-1.0)”[1] and major parameters of RF specification requirements are attached.
As shown the list below, Chapter2 (General requirement), Chapter5, Section5.1 (Transmitting and receiving characteristics) and Section5.4 (Performance requirements) to Section5.5 (Timing requirements) should be discussed in TSG-RAN WG4.
Chapter3 (EMC) and Chapter4 (Safety) are possibly handled in TSG-RAN WG4.
TSG-T (Terminal) WG1 and TSG-T WG2 will be handled other items (e.g. test and interfaces).

Relationship between ARIB Volume4 and 3GPP TSG WGs

Contents of ARIB Volume4		3GPP TSG-RAN WG4	3GPP TSG-T	
			TSG-T WG1	TSG-T WG2
Chapter1 “Introduction”	Sec.1.1 “Scope” to Sec.1.3 “References”	×	×	×
Chapter2 “General Requirement”	Sec.2.1 “Functional Requirements”	–	–	×
	Sec.2.2 “Radio Frequency band” to Sec.2.6 “Antenna Characteristics”	×		–
	Sec.2.7 “Security” to Sec.2.10 “Test Function Requirements”	–	–	×
Chapter3 “EMC”		(×)	–	(×)
Chapter4 “Safety”		(×)	–	(×)
Chapter5, 6 “Technical Requirements”	Section5.1 “RF Specifications” Section5.4 “Performance Requirements” Section5.5 “Timing Requirements”	×	–	–
Chapter7 “Sequence Flow”	N/A	–	–	–
Chapter8 “External Interface”		–	–	×
Chapter9 “Logical Test Interface”		–	×	–
Chapter10 “Reporting Practice” Chapter11 “Standard Test Conditions”	N/A	–	–	–
Chapter12 ”Confidence Limit”		–	×	–
Chapter13 “Measurement Procedures”		–	×	–

Reference

[1] The latest Mobile Station specifications of ARIB Volume 4 ”Specifications of Mobile Station for 3G Mobile System (Ver.1.0-1.0)”, Source: ARIB, 3GPP TSGR4#1(99)002

ANNEX-A

Contents of ARIB Volume 4 "Specification of Mobile Station for 3G Mobile System"

Section items that should be discussed in TSG-RAN/WG4

2. General Requirements
    - 2.1 Functional Requirements
    - 2.2 Radio Frequency Band
    - 2.3 Frequency Allocation
    - 2.4 Chip Rates
    - 2.5 Transmission Power
    - 2.6 Antenna Characteristics
    - 2.7 Security
    - 2.8 Interface Requirements
    - 2.9 Environmental and Reliability Requirements
    - 2.10 Test Function Requirements

5. Technical Requirements for FDD Mode
    - 5.1 RF Specifications
        - 5.1.1 Transmitting Characteristics
            - 5.1.1.1 Frequency Stability
            - 5.1.1.2 Maximum Output Power
            - 5.1.1.3 Output Power Control
                - 5.1.1.3.1 Open Loop Output Power Control
                - 5.1.1.3.2 Closed Loop Output Power Control
                - 5.1.1.3.3 Power Control Dynamic Range
            - 5.1.1.4 Adjacent Channel Leakage Power
                - 5.1.1.4.1 Leakage Power due to Continuous Modulation
                - 5.1.1.4.2 Leakage Power due to Switching Transients
            - 5.1.1.5 Spurious Emission Power
            - 5.1.1.6 Transmitting Intermodulation
            - 5.1.1.7 Transmitting ON/OFF Ratio
            - 5.1.1.8 Modulation Accuracy
            - 5.1.1.9 DTX
            - [5.1.1.10 VOX Control]

        - 5.1.2 Receiving Characteristics
            - 5.1.2.1 Reference Sensitivity
            - 5.1.2.2 Dynamic Range
            - 5.1.2.3 Adjacent Channel Selectivity
            - 5.1.2.4 Intermodulation Sensitivity
            - 5.1.2.5 Spurious Response and Blocking
            - 5.1.2.6 RSSI Detection Range and Accuracy

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            - 5.1.2.7 SIR Measurement Range and Accuracy
            - 5.1.2.8 Spurious Emission Power

        - 5.4 Performance Requirements
            - 5.4.1 General
                - 5.4.1.1 Test Environments
                - 5.4.1.2 Channel Models
                - 5.4.1.3 CDMA Terms
                - 5.4.1.4 CDMA Equations
            - 5.4.2 Demodulation in Static Channel

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Section items that are possibly handled in TSG-RAN/WG4

3. EMC
    - 3.1 Scope and Definitions
    - 3.2 Normative Reference
    - 3.3 General Test Conditions
    - 3.4 Performance Assessment
    - 3.5 Performance Criteria
    - 3.6 Applicability Overview Tables
    - 3.7 Test Methods of Emissions
        - 3.7.1 Limits for radiated disturbance of enclosure
        - 3.7.2 Limits of DC mains terminal disturbance voltage
        - 3.7.3 Limits of AC mains terminal disturbance voltage
    - 3.8 Test Methods of Immunity
        - 3.8.1 RF electro-magnetic field(80-1000MHz)
        - 3.8.2 Electrostatic discharge
        - 3.8.3 Fast transients common mode
        - 3.8.4 RF common mode 9 kHz-80MHz
        - 3.8.5 Transients and surges, vehicular environment
        - 3.8.6 Voltage dips and interruptions
        - 3.8.7 Surges, common and differential mode

4. Safety
    - 4.1 Electrical Safety
    - 4.2 Safety of Radio Equipment
    - 4.3 SAR Requirement
        - 4.3.1 Overview and Scope
        - 4.3.2 Guideline for protection against radio wave
            - 4.3.2.1 Overview and Scope
            - 4.3.2.2 Guideline for electromagnetic field strength
            - 4.3.2.3 Supplementary guideline
            - 4.3.2.4 Guideline for local absorption
        - 4.3.3 Practical SAR Measurement Method
            - 4.3.3.1 Overview and General Principle
            - 4.3.3.2 Homogeneous phantom
            - 4.3.3.3 Electric Field Distribution Measurement Method
            - 4.3.3.4 Temperature Distribution Measurement Method

ANNEX-B

Major parameters of RF specification requirements in ARIB vol.4 [1]

Transmitting Characteristics (5.1.1)

Items		Contents
5.1.1.1	Frequency stability	±0.1 ppm (AFC ON)
5.1.1.2	Maximum output power	Power class: class1 / 33dBm class2 / 27dBm class3 / 24dBm class4 / 21dBm class5 / 10dBm class6 / 0dBm Max power error: +1dB/-3dB
5.1.1.3.1	Open loop output power control	Control step: 1dB Accuracy: ±9dB
5.1.1.3.2	Closed loop output power control	Control step: 1dB Relative accuracy: ±0.5dB for each slot ± 2dB per 10slots
5.1.1.3.3	Power control dynamic range	Minimum controlled output power should be less than -44dBm/4.096MHz
5.1.1.4	Adjacent channel leakage power	ACPR=35dBc, next ACPR=45dBc
		ACP due to switching transients must not exceed ACP requirements due to modulation
5.1.1.5	TX spurious emission power	-36dBm/1kHz (9-150kHz) -36dBm/10kHz (150kHz-30MHz) -36dBm/100kHz (30MHz-1GHz) -30dBm/1MHz (1GHz-(fc-NB*14.5)MHz : except PHS band) -36dBm/300kHz ((fc-NB*14.5)-(fc+NB*14.5)MHz except (fc-NB*2.5)-(fc+NB*2.5)MHz and PHS band) -30dBm/1MHz ((fc+NB*14.5)MHz-11GHz) -40dBm/300kHz(PHS band: 1893.5 – 1919.6 MHz)
5.1.1.6	Transmitting Intermodulation	-35dBc at 5MHz offset / -45dBc at 10MHz offset Interference signal(unmodulated) is -40dBc from desired signal
5.1.1.7	Transmitting ON/OFF ratio	TX noise floor should be less than -50dBm/4.096MHz
5.1.1.8	Modulation accuracy	ρ=0.944 E.V.M.=12.5% R.M.S. The origin offset is at least -20dBc or less
5.1.1.9	DTX	Ramp up : -40 chip / 0 chip Ramp down: 0 chip / +40 chip

Receiving Characteristics (5.1.2)

5.1.2.1	Reference sensitivity	-117dBm for 12.2kbps measurement channel
5.1.2.2	RX dynamic range	Maximum MS usable input level is -25dBm
5.1.2.3	Adjacent channel selectivity	48dB for 12.2kbps measurement channel
5.1.2.4	Intermodulation sensitivity	The level of the interfering signals is -46dBm (10MHz offset tone signal, and 20MHz offset modulated signal)
5.1.2.5	Spurious response and blocking	In-band: -44dBm (over 15MHz offset)
		Out of band: -30dBm (2025-2070MHz and 2210-2255MHz) -15dBm (other frequency)
5.1.2.6	RSCP detection range and accuracy	Absolute accuracy: ± 6 dB Range: -118dBm to -48 dBm Detection period: TBD
		Relative detection range: ± 21dB (When 2 Perch is received) Relative detection accuracy: ± 1dB Detection period: TBD
5.1.2.7	SIR detection range and accuracy	SIR detection range: 0-10 dB Accuracy: ± 1dB Detection period: TBD
5.1.2.8	Receiver spurious emission	-60dBm/4.096MHz (inside IMT-2000 RX-band) -57dBm/100kHz (9kHz-1GHz) -47dBm/100kHz (1-11GHz except IMT-2000 RX-band)

Reference

[1] The latest Mobile Station specifications of ARIB Volume 4 ”Specifications of Mobile Station for 3G Mobile System (Ver.1.0-1.0)”, Source: ARIB, 3GPP TSGR4#1(99)002