



No. DAT-P-114/01-10

A Supplement to Test Report SAR2005024/SAR2005025 of
CT100/CT300 CDMA 2000 1X Mobile Stations

Test name	Electromagnetic Field (Specific Absorption Rate)
Product	CDMA 800MHz Frequency Mobile Station
Model	CT100/CT300
Client	TCL Mobile Communication Co., Ltd
Type of test	FCC Type Approval

**Telecommunication Metrology Center
of Ministry of Information Industry**

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1. Background

As new technologies, for CDMA 2000 1X, EVDO or EVDV, during FCC granting, additional information is requested to demonstrate that the radio configuration and service option used for SAR test is a worst case.

FCC Question 1: Regarding your answer and corresponding report statement, "For SAR test, the maximum power output is very important and essential; it does not matter with radio configurations. In this report, we use typical RC3 to estimate." Please demonstrate that the tested mode is worst case. Conducted power (average) for all possible modes is supporting information.

FCC Question 2: Regarding your answer please fully describe the CDMA2000 capabilities of this fall. Include a listing of all modes, RCs, service options and data rates. Please also describe which modes are for which type of operation/testing/usage.

Then TMC provided a list of all modes to EMCC DR. RASEK, including Radio Configurations, Service Options, Data Rates, and Type of Operation. See Chapter 4.

Based on the response, EMCC DR. RASEK raised the following questions.

EMCC DR. RASEK Question 1: We need a justification, why RC3 was used for SAR test. Please demonstrate that this mode is a worst case. Conducted power (average) for all possible modes is required as supporting information.

EMCC DR. RASEK Question 2: Does this device contain 1X-EVDO or 1X-EVDV? If so please also include conducted power for these modes.

2. Responses to Questionnaire

Reply FCC Question 1 and EMCC DR. RASEK Question 1: See Chapter 3.

Reply FCC Question 2: See Chapter 4.

Reply EMCC DR. RASEK Question 2: Both CT100 (Test Report: SAR2005024) and CT300 (Test Report: SAR2005024) don't support CDMA 1X-EVDO.

3. Demonstration by Measuring Maximum Conducted Output Power

3.1. Method of Measurements

During the process of testing, a communication link was established via Agilent 8960, the EUT (the mobile station) was command to its maximum power transmission and proper modulation.

The EUT was set up for the maximum output power at Test Mode 1,2,3,4,5 as shown in Table1.3-1 of ANSI TIA/EIA-98-D-2001 standard.

Set the following parameters of the Access Parameters Message according to section 4.4.5 of ANSI TIA/EIA-98-D-2001:

Parameter	Value (Decimal)
NOM_PWR	7 (7 dB)
INIT_PWR	15 (15 dB)
PWR_STEP	7 (7 dB/step)
NUM_STEP	15 (16 probes/sequence)
MAX_RSP_SEQ	15 (15 sequences)

Test Parameters were set up for maximum RF output power according to section 4.4.5 of ANSI TIA/EIA-98-D-2001:

Parameter	Units	Value
I_{or}	dBm/1.23MHz	-104
$\frac{PilotE_c}{I_{or}}$	dB	-7
$\frac{TrafficE_c}{I_{or}}$	dB	-7.4

To make the mobile to emit the maximum power; the output power of the base station simulator would be adjusted to the minimum power with the sensitivity of the mobile station to build a steady connection. The power level control parameter in the base station simulator is "0", it means "all up" and requires mobile station to emit with the maximum power.

The channel power was measured with Agilent Spectrum Analyzer E4440A, and averaged over 6 minutes.

Conducted Output Power was measured at the middle RF channel 384 with Full Data Rate.

First we checked the variation of maximum Conducted Output Power with Full, Half, Quarter, Eighth Data Rate. There were no variations. The experimental results correspond with theoretical results.

3.2. Measurement Results

CT100 (Test Report: SAR2005024)

Test Mode (See Table 1.3-1 of ANSI TIA/EIA-98-D-2001)	Conducted output Power, at the middle RF channel 384 with full data rate, averaged over 6 minutes
Test Mode 1: FW RC1, RVS RC1, SO2	24.32
Test Mode 2: FW RC2,RVS RC2, SO9	24.34
Test Mode 3: FW RC3, RVS RC3, SO55	24.50
Test Mode 4: FW RC4, RVS RC3, SO55	24.48
Test Mode 5: FW RC5, RVS RC4, SO55	24.49
Note: FW, Forward Traffic Channel; RVS, Reverse Traffic Channel; RC: Radio Configuration; SO: Service Option	

CT300: (Test Report: SAR2005025)

Test Mode (See Table 1.3-1 of ANSI TIA/EIA-98-D-2001)	Conducted output Power, at the middle RF channel 384 with full data rate, averaged over 6 minutes
Test Mode 1: FW RC1, RVS RC1, SO2	25.14
Test Mode 2: FW RC2,RVS RC2, SO9	25.14
Test Mode 3: FW RC3, RVS RC3, SO55	25.26
Test Mode 4: FW RC4, RVS RC3, SO55	25.25
Test Mode 5: FW RC5, RVS RC4, SO55	25.23
Note: FW, Forward Traffic Channel; RVS, Reverse Traffic Channel; RC: Radio Configuration; SO: Service Option	

3.3. Main Test Instruments

No.	Name	Type	SN	Calibration Date	Valid Period
01	Spectrum Analyzer	Agilent E4440A	MY41000262	2005/12/03	One year

02	Base Station Simulator	Agilent 8960 Series 10 E5515C	GB45360199	2005/09/21	One year
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3.4. Conclusion

It's obvious that the maximum Conducted Output Power at different test modes is identical under the measurement uncertainty. The experimental results correspond with theoretical results.

It is proper to use typical Test Mode 3 (FW RC3, RVS RC3, SO55) as the worst case for SAR test.

4. CT100/CT300 Device Configuration Summary

Reverse Channel Radio Configuration

		RC1	RC2	RC3		RC4
Spreading Rate		1	1	1		1
Rate Set, bps (R-FCCH)		CdmaOne low data rate compatible 1200, 2400, 4800, 9600	CdmaOne high data rate compatible 1800, 3 600, 7200, 14400	1200, 1350, 1500, 2400, 2700, 4800, 9600		1800, 3600, 7200, 14400
Code Rate		1/3	1/2	1/4	1/2	1/4
Modulation		64-ray orthogonal	64-ray orthogonal	BPSK + pilot		BPSK + pilot
Loop Back Service Option (P_REV)	SO2 (≤ 5)	Mux Opt 1 FCCH				
	SO9 (≤ 5)		Mux Opt 2 FCCH			
	SO30 (≤ 5)					
	SO31 (≤ 5)					
	SO55 (≥ 6)	Mux Opt 1 (SO 2) F/R-FCCH	Mux Opt 2 (SO 9) F/R-FCCH	Mux Opt 1 (SO 2) F/R-FCCH		Mux Opt 1 (SO 2) F-FCCH Mux Opt 2 (SO 9) R-FCCH
Test Data Service Option	SO32					

Spreading Rate 1: Reverse Channels

Channel Type	Max. Number
Pilot	1
Secondary Pilot	1
Access	1
Request	1
Acknowledgement	1
Channel Quality Indicator	1
Fundamental	1