

MEASUREMENT OF MODULATION CHARACTERISTICS

SECTION 2.1047

MEASUREMENT 2

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The modulation methods used in CDMA are completely different from those used in FM analog System. The methods used in evaluating the PCBR are described in the EIA/TAIS document IS-97 “recommended Minimum performance Standards for Base Stations Supporting Dual-Mode Wideband Spread Spectrum Cellular Mobile Stations”. The modulation quantify criteria are as follows:

1.0 Modulation Requirements – Section 10.3 of IS-97

Waveform specifications are tested by measuring the waveform quality of ρ , as defined in IS-97 Section 12.4.2.1, and code domain power as defined in 12.4.2.2.

Transmit waveform quality can be viewed as the output of a normalized matched filter. The range of values for the transmit waveform quality is from 1.0 for a perfect CDMA waveform to 0.0 for a non-CDMA signal. As an example, the base station with a 0.5 dB degradation in its transmit waveform would have a quality, ρ , of 0.89.

1.1 Required Results

Section 10.3.2.3 of IS-97 “The normal cross correlation coefficient, ρ , shall be greater than 0.912 (excess power <0.4 dB)”.

The test method and diagrams are taken from IS-97 Section 10.

1.2 Waveform Quality

- 1.2.1 Definition Waveform quality is measured by determining the normalized correlated power between the actual waveform and the identical waveform
- 1.2.2 Method of Measurement – Refer to Figure 2A. of this exhibit for functional block diagram of the test set-up.

1. Configure transmit channel as shown in Table 2.1.
2. Tune the PCBR to the test middle channel.
3. Apply a CDMA digital transmit signal from arbitrary waveform generator at the PCBR backplane that will product 15% modulation level (pilot only) of the appropriate level for full transmit power (TX_IQ_SIN_FULL) –8.24 dB.
4. Set the PCBR power level to 40 for Cellular.
5. Measure Rho. This measurement should be greater than TX_RHO limit.

Type	Number of Channels	Fraction of Power (Linear)	Fraction of Power (dB)	Comments
Pilot	1	0.2000	-7.0	Walsh 0
Sync	1	0.0471	-13.3	Walsh 32, always 1/8 rate
Paging	1	0.1882	-7.3	Walsh 1, full rate only
Traffic	6	0.09412 each	-10.3 each	Variable Walsh Assignments, full rate only

TABLE 2.1 Base Station Test Model, Nominal

1.3 Minimum Standard

The normalized cross correlation coefficient, ρ , shall be greater than 0.912 (excess power <0.4 dB).

1.4 Results

The test verified that the waveform quality factor, the normalized cross correlation coefficient, ρ , is ≥ 0.98 . It also verifies that the frequency assignment is less than (+0.05 PPM) of the frequency assignment.

Figure 2A. RHO TEST SETUP