APPLICANT: Lucent Technologies

EXHIBIT 15

Section 2.1047 Measurements Required: Modulation Characteristics

The TDMA modulation utilized by the PCS-TDMA Dual Radio Module (PDRM) 44WR53, subject of a separate application for certification under AS5CMP-30, is the standard $\pi/4$ differentially encoded quadrature phase shift keying ($\pi/4$ DQPSK). The modulation accuracy measurements were performed with all 3 TDMA time slots modulated with a pseudo-random bit stream. Measurements were made at the transmit antenna terminal with the single carrier power level set to +30.8 dBm (1.2 Watts), and with the PDRM tuned to 1) the lowest settable PCS channel: A-Block Ch 2 1930.08 MHz, 2) mid PCS Band: B-Block Ch 917 1957.53 MHz, and 3) the highest settable PCS channel: C-Block Ch 1998 1989.96 MHz. The required modulation accuracy is specified in TIA/EIA/IS-138-A, July 1996, Section 3.3.2 Digital and in ANSI J-STD-010-1996, Section 3.3 Modulation Requirements. The "minimum standard", or limitation, is stated that the RMS error vector magnitude shall be less than 12.5%.

Measurements were made with a Rohde & Schwarz Spectrum Analyzer 20 Hz to 26.5 GHz FSEM, Model 1079.8500.30, calibrated as required for ISO-9001 compliance. The measurement results and test set-up block diagram are included.

RESULTS:

The PCS-TDMA Multi Carrier Linear Amplifier, 44WA28, does not contain or incorporate modulation circuitry. This test procedure demonstrates that it also does not degrade the modulation accuracy of the PCS-TDMA Dual Radio Module (PDRM) transceiver, 44WR53. The measurement data below demonstrates full compliance with the modulation accuracy requirements specified in TIA/EIA/IS-138-A and in ANSI J-STD-010-1996. The error vector magnitude is less than 12.5% across the PCS Frequency Band 1930.08 – 1989.96 MHz.

| Symbol Table 0 10101001 00011101 11100100 10001001 40 01110001 10000000001 10101001 010011101 10000000 0001101 80 01110001 01001110 100 01010111 1010111 01000000 0001101 100 0101001 10001100 100 010001 1001100 100 010001 1001100 100 0100011 011000 200 0111100 010000110 200 01110100 01000110 200 10100011 11100000 200 10100011 11100100 200 10100011 11100000 200 10100011 11100100 200 10100011 11100100 200 10100011 11100100 201 10100011 11100100 202 10100011 11100100 | RefLvl −10 dBm | PMC | LA | | ж | 24.3 | 3 KHZ | Symbol/Errors Standard NADC |
|---|-------------------|------------|----------|----------|----------|----------|-------|--------------------------------|
| 0 10101001 00011101 11100100 10100111 10001001 | | | | Symbol | Table | | | |
| 40 01111001 110100 0000101 101010 1000101 80 0111001 1101111 1101011 0100000 0001101 120 10111001 0100001 1000110 0111000 010101 160 00010001 0100011 111000 0010101 11101 160 00010001 01100011 1100000 0100011 0101001 200 011100 01000011 1100000 10000100 1000000 240 1111101 010101 00010001 10001010 10010010 240 1111001 0100001 0000001 1000100 1000100 240 1010001 11000100 10000100 10001001 10010010 280 10100001 100000111 11111001 00010100 00010100 320 0110 010000111 11111001 00010100 00010100 | 0 | 10101001 | 00011101 | 11100100 | 10100111 | 1000100 | 1 | |
| 80 01110001 01101111 11010111 0100000 00011101 120 1011001 0100001 10001110 0111000 00101011 160 00010001 0110011 11110000 01000010 011001101 200 0111100 01000110 011000 0100010 01000100 240 1111001 0000010 0000011 0001001 0000100 240 1111011 0110100 0000011 0001001 0000100 280 10100011 1100000 0000111 11111001 000100 320 0110 | 40 | 01111001 | 11011000 | 00001011 | 10100100 | 1000110 | 1 | |
| 120 10111001 1010001110 01111000 00101101 160 0010001 1010001 1010000 01001101 200 01111100 10000110 11000010 01000100 201 0111101 10010011 10000010 01000100 201 0111101 00100011 10000010 0100100 201 01000011 1000001 1000100 1000101 200 0100011 1100000 10000111 1111001 00010100 320 0110 01100010 100000111 1111001 00010100 | 80 | 01110001 | 01101111 | 11010111 | 01000000 | 0001110 | 1 | |
| 160 00010001 01110010 01100011 0110010 200 0111100 1000010 1100010 0100012 240 111101 010110 0001001 10001010 1000101 240 111101 0101010 0001001 10001010 1001010 240 10100011 1100100 10000111 10010010 10000101 250 10100011 1100100 10000111 1111001 00010100 320 0110 110 100000 10000111 1111001 00010100 | 120 | 10111001 | 01010001 | 10001110 | 01111000 | 0010110 | 1 | |
| 200 01111100 10000110 01101001 11000010 01000100 240 1111011 0101010 00010001 10001010 280 10100011 11100100 10000111 11111001 00010100 320 0110 | 160 | 00010001 | 01100011 | 11110000 | 01000011 | 0111011 | 0 | |
| 240 11111011 0110100 00010001 10001010 10010101 280 10100011 11100100 10000111 11111001 00010100 320 0110 | 200 | 01111100 | 10000110 | 01101001 | 11000010 | 0100010 | 0 | |
| 280 10100011 11100100 10000111 11111001 00010100 320 0110 | 240 | 11111011 | 01101101 | 00010001 | 10001010 | 1001010 | 1 | |
| 320 0110 | 280 | 10100011 | 11100100 | 10000111 | 11111001 | 0001010 | כ | |
| | | | | | | | | |
| | | | | | | | | |
| | Error \ | /ector Mag | 3.54 | x rms | 9.41 | х Рка | t syn | n 123 |
| Error Vector Mag 3.54 x rms 9.41 x Pk at sym 123 | Magnitu | ude Error | 0.58 | % rms | -1.38 | %. Pka | t syn | 108 |
| Error Vector Mag 3.54 x rms 9.41 x Pk at sym 123 Magnitude Error 0.58 x rms -1.38 x Pk at sym 108 | Phase E | irror | 2.00 | deg rms | 5.40 | deg Pk a | t syn | 1 123 I |
| Error Vector Mag 3.54 x nms 9.41 x Pk at sym 123 Magnitude Error 0.58 x nms -1.38 x Pk at sym 108 Phase Error 2.00 deg nms 5.40 deg Pk at sym 123 | | ror | 538.95 | Hz | 538.95 | Hz Pk | | |
| Error Vector Mag 3.54 x rms 9.41 x Pk at sym 123 Magnitude Error 0.58 x rms -1.38 x Pk at sym 108 Phase Error 2.00 deg rms 5.40 deg Pk at sym 123 Fraq Error 538.95 Hz 582.95 Hz Pk | Freq Er | ide Droop | 0.21 | dB∕sym | Rho Fa | ctor | 0 | .9987 |
| Error Vector Mag 2.54 x ms 9.41 x Pk at sym 123 Magnitude Error 0.55 x ms -1.38 x Pk at sym 108 Phase Error 2.00 deg ms 5.40 deg Pk at sym 123 Frag Error 538.55 Hz 538.95 Hz Pk Amplitude Droop 0.21 dB/sym Rho Factor 0.9987 | Amplitu | are proop | | | | | | |

Modulation Accuracy: PCS-TDMA carrier at the transmit antenna terminal A-Block Channel 2, 1930.08 MHz Error Vector Magnitude = 3.54% rms

EXHIBIT 15

| | | | Sumbol | Table | | | |
|---------|-----------|----------|----------|----------|-----------|-----|-------|
| | 10101001 | 00011101 | 11100100 | 10101000 | 11010001 | | |
| 10 | 010101001 | 00111111 | 00011000 | 01101110 | 00010111 | | |
| 80 | 10010000 | 10101000 | 01111010 | 11000010 | 01100001 | | |
| 120 | 110010000 | 10011010 | 11010111 | 10001110 | 11010111 | | |
| 160 | 11000110 | 10100011 | 11110001 | 00100001 | 01010010 | | |
| 200 | 11011011 | 11110101 | 11011001 | 00101010 | 11110001 | | |
| 240 | 11111010 | 10110001 | 10000100 | 10000111 | 10101110 | | |
| 280 | 10000011 | 11000101 | 11000001 | 01001010 | 00010100 | | |
| 320 | 0110 | | | | | | |
| | | | | | | | |
| | | | Error S | ummary | | | |
| Error V | ector Mag | 3.61 | x rms | 9.90 | %. Pkat | sym | 150 |
| Magnitu | ide Error | 0.52 | % rms | 1.51 | x Pkat | sym | 52 |
| Phase E | rror | 2.05 | deg rms | -5.67 | deg Pk at | sym | 150 |
| Freq Er | ror | 546.40 | Hz | 546.40 | Hz Pk | | |
| Amplitu | ide Droop | 0.19 | dB∕sym | Rho Fa | ctor | 0 | .9988 |
| IQ Offs | et | 0.60 | × | dml QI | alance | 0 | .20 % |

Modulation Accuracy: PCS-TDMA carrier at the transmit antenna terminal B-Block Channel 917, 1957.53 MHz Error Vector Magnitude = 3.61% rms

| -10 dBm | PMC | CLA | | SR | 24.3 | 3 KHz | Symbol∕Errors Standard NADC | F |
|---|---------------------------------------|------------------------|-------------------------|---------------------------|---------------------------|-------|--------------------------------|-----|
| | | | Symbol | Table | | | | ٦., |
| 0 | 10101001 | 00011101 | 11100100 | 10100111 | 1011100 | 1 | | A |
| 40 | 00000001 | 10101110 | 00111100 | 00000001 | 0010111 | 1 | | |
| 80 | 10110111 | 10111011 | 01110011 | 10111110 | 0001111 | 1 | | |
| 120 | 00110100 | 00010000 | 00001010 | 11011110 | 1100000 | 1 | | |
| 160 | 10011100 | 01100011 | 11110010 | 11110111 | 0010010 | 1 | | |
| 200 | 01110000 | 00000101 | 00110000 | 00100110 | 1100101 | 0 | | |
| 240 | 00001111 | 01010110 | 11001001 | 10100011 | 1101100 | 1 | | |
| 280 | 11000000 | 01110010 | 10001111 | 11100111 | 0001010 | | | |
| | | | | | | | | |
| | | | Error Su | ummary | | | | 1 |
| | ector Mag | 2.97 | % rms | 9.27 | x Pka | t syn | n 121 | |
| Error V | | 0.54 | % rms | -1.64 | %. Pka | t syn | n 105 | |
| Error V Magnitu | ide Error | 0.01 | | | | | | |
| Error V Magnitu Phase E | ide Error Tror | 1.68 | deg rms | -5.32 | deg Pk a | t syn | n 121 | |
| Error V Magnitu Phase E Freq Er | ide Error Irror Iror | 1.68 555.69 | deg rms Hz | -5.32 555.69 | deg Pk a Hz Pk | t syn | n 121 | |
| Error V Magnitu Phase E Freq Er Amplitu | ide Error Tror Tor ide Droop | 1.68 555.69 0.20 | deg rms Hz dB∕sym | -5.32 555.69 Rho Fa | deg Pk a Hz Pk stor | t syn | n 121).9988 | |

Modulation Accuracy: PCS-TDMA carrier at the transmit antenna terminal C-Block Channel 1998, 1989.96 MHz Error Vector Magnitude = 2.97% rms

APPLICANT: Lucent Technologies

EXHIBIT 15

Test set-up for measuring the modulation accuracy of the PCS-TDMA Dual Radio Module transceiver.

FLEXENT™ PCS-TDMA Microcell J41698A-1

