

ADS2003C Training Workbook

Design WCDMA/3GPP Communication System Using ADS



Lab 1&2 DIRECT SEQUENCE SPREAD SPECTRUM

- 1.1 OBJECTIVES
- 1.2 PN CODES
- 1.3 SCRAMBLING
 - 1.3.1 *Data Scrambling*
 - 1.3.2 *De-scrambling*
 - 1.3.3 *Scrambling Applications*
- 1.4 INTERLEAVING
 - 1.4.1 *Data Interleaving*
 - 1.4.2 *De-Interleaving*
 - 1.4.3 *Interleaving Data Processing*
 - 1.4.4 *Interleaving applications*
- 1.5 SPREADING
 - 1.5.1 *Data Spreading*
 - 1.5.2 *RF Spectrum of the Spreaded Signal*
 - 1.5.3 *Despreading*
 - 1.5.3.1 Despreading with the Correct Code
 - 1.5.3.2 Code Generation Synchronization
 - 1.5.3.3 Despreading with an Incorrect Code
- 1.6 USING WALSH CODES IN SPREAD SPECTRUM APPLICATIONS
 - 1.6.1 *Walsh Code Generator*
 - 1.6.2 *Using Orthogonal Codes*
 - 1.6.3 *Non-orthogonal Walsh Codes*
 - 1.6.4 *The Effect of Noise*
- 1.7 RF CONNECTION USING A DS-SS SIGNAL
- 1.8 MULTIPLE ACCESS USING DS-SS (CDMA)

Lab 3&4 BASE STATION SIGNAL SOURCE.

- 2.1 OBJECTIVES
- 2.2 LOGICAL CHANNELS
 - 2.2.1 *Dedicated Physical Channel (DPCH)*
 - 2.2.2 *Synchronization Channel (SCH)*
 - 2.2.3 *Common Pilot Channel (CPICH)*
 - 2.2.4 *Orthogonal Channel Noise Simulator (OCNS) Interferer*
 - 2.2.5 *Combined Channels*
- 2.3 RF POWER CALIBRATION
 - 2.3.1 *RF Power Measurement*
 - 2.3.2 *Power Calibration Procedure.*
- 2.4 CCDF MEASUREMENTS
- 2.5 USING THE “WCDMA3G_CCDF” MEASUREMENT ELEMENT
 - 2.5.1 *Simulation Setup*
 - 2.5.2 *The CCDF Plot*
 - 2.5.3 *The Peak and Average Values of the Power.*
- 2.6 EFFECT OF NON-LINEAR CIRCUITS ON THE SPECTRUM AND CCDF
- 2.7 LAB REVIEW.

Lab5 USER EQUIPMENT SIGNAL SOURCE

- 5.1 OBJECTIVES
- 5.2 LOGICAL CHANNELS
 - 5.2.1 *Dedicated Physical Data Channel (DPDCH)*
 - 5.2.2 *Dedicated Physical Control Channel (DPCCH)*
 - 5.2.3 *Combined Channels*
- 5.3 RF POWER CALIBRATION
- 5.4 CCDF MEASUREMENTS
 - 5.4.1 *CCDF Measurements with HPSK Modulation*
 - 5.4.2 *CCDF Measurements without HPSK Modulation*
- 5.5 LAB REVIEW

Lab6 USER EQUIPMENT TRANSMITTER

- 6.1 OBJECTIVES
- 6.2 UE TRANSMITTER TEST & VERIFICATION PROJECT
- 6.3 MAXIMUM OUTPUT POWER
 - 6.3.1 *Standard Specification for Maximum Output Power*
 - 6.3.2 *The WCDMA3G_PowerMeasure Component*
 - 6.3.3 *Maximum Output Power Measurement*
- 6.4 CCDF
- 6.5 OCCUPIED BANDWIDTH (OBW)
 - 6.5.1 *Standard Specification for OBW*
 - 6.5.2 *OBW Measurement*
 - 6.5.3 *Non-Linear Effects on OBW*
- 6.6 SPECTRUM EMISSION (SE) MASK
 - 6.6.1 *Standard Specification for Spectrum Emission Mask*
 - 6.6.2 *SE Mask Definition*
 - 6.6.3 *Spectrum Emission Mask Measurement*
- 6.7 ADJACENT CHANNEL LEAKAGE POWER RATIO (ACLR)
 - 6.7.1 *Standard Specification for ACLR*
 - 6.7.2 *ACLR Measurement Under Steady State Conditions*
 - 6.7.3 *ACLR Measurement in the Presence of Switching Transients*
 - 6.7.4 *Non-Linear Effects on ACLR.*
- 6.8 ERROR VECTOR MAGNITUDE (EVM)
 - 6.8.1 *Standard Specifications for EVM*
 - 6.8.2 *EVM Measurement*
- 6.9 CODE-DOMAIN POWER SPECTRUM
- 6.10 PEAK CODE-DOMAIN ERROR
 - 6.10.1 *Standard Specification for Peak Code-Domain Error*
 - 6.10.2 *Error-Vector Measurement*
 - 6.10.3 *Peak Code-Domain Error Measurement*
- 6.11 LAB REVIEW

Lab7 USER EQUIPMENT RECEIVER

- 7.1 OBJECTIVES
- 7.2 SIGNAL INTENSITY DEFINITIONS AND MEASUREMENT SETUP
- 7.3 UE RECEIVER TEST & VERIFICATION PROJECT
- 7.4 BASE-STATION SOURCE CALIBRATION
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- 7.6 REFERENCE SENSITIVITY LEVEL
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 - 7.6.2 *Reference Sensitivity Level Measurement.*
 - 7.6.3 *Reference Sensitivity Level measurement for PhyCH*
- 7.7 MAXIMUM INPUT LEVEL
 - 7.7.1 *Standard Requirements for Maximum Input Level*
 - 7.7.2 *Source Calibration for Maximum Input Level Measurement.*
 - 7.7.3 *Maximum Input Level Measurement*
- 7.8 ADJACENT CHANNEL SELECTIVITY (ACS)
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 - 7.8.2 *Source Calibration for ACS*
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- 7.9 BLOCKING CHARACTERISTICS
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 - 7.10.1 *Standard Specifications for Intermodulation Characteristics*
 - 7.10.2 *Source Calibration for Intermod Characteristics Measurement*
 - 7.10.3 *Intermodulation Characteristics Measurement*
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Lab9 BASE STATION TRANSMITTER

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- 9.3 MAXIMUM OUTPUT POWER
 - 9.3.1 *Standard Specifications for the Maximum Output Power*
 - 9.3.2 *Maximum Output Power Measurement*
- 9.4 OCCUPIED BANDWIDTH (OBW)
 - 9.4.1 *Standard Specifications for OBW*
 - 9.4.2 *OBW Measurement*
- 9.5 SPECTRUM EMISSION (SE) MASK
 - 9.5.1 *Standard Specifications for SE Mask*
 - 9.5.2 *SE Mask Definition*
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- 9.6 ADJACENT CHANNEL LEAKAGE POWER RATIO (ACLR)
 - 9.6.1 *Standard Specifications for ACLR*
 - 9.6.2 *ACLR Measurement Under Steady State Conditions*
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- 9.7 ERROR VECTOR MAGNITUDE (EVM)
 - 9.7.1 *Standard Requirements for EVM*
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- 9.8 CODE-DOMAIN POWER SPECTRUM
- 9.9 PEAK CODE DOMAIN ERROR (PCDE)
 - 9.9.1 *Standard Requirements for PCDE*
 - 9.9.2 *Error-Vector Measurement*
 - 9.9.3 *Peak Code-Domain Error Measurement*
- 9.10 LAB REVIEW

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- 10.1 OBJECTIVES
- 10.2 USER EQUIPMENT SOURCE CALIBRATION
- 10.3 CCDF MEASUREMENTS
- 10.4 REFERENCE SENSITIVITY LEVEL
 - 10.4.1 *Standard Requirements for Reference Sensitivity Level*
 - 10.4.2 *Reference Sensitivity Level Measurement*
- 10.5 DYNAMIC RANGE
 - 10.5.1 *Standard Requirements for Dynamic Range*
 - 10.5.2 *Source Calibration for Dynamic Range Measurements*
 - 10.5.3 *Dynamic Range Measurement*
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 - 10.6.1 *Standard Specifications for ACS*
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- 10.7 BLOCKING CHARACTERISTICS.
 - 10.7.1 *Standard Specifications for Blocking Characteristics*
 - 10.7.2 *Signal Source Calibration for Blocking Measurements*
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- 10.8 INTERMODULATION CHARACTERISTICS
 - 10.8.1 *Standard Requirements for Intermodulation Characteristics*
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- 10.9 LAB REVIEW