Index

A
Adaptive Multi-rate (AMR) 304
Advanced Design System (ADS) 83
Advanced Video Codec (AVC) 304
Affine Arithmetic (AA) 272-273
Air-Interface 308
All-Inversion Regions 15, 17, 23, 35-36, 38
Ampere low 167
analog-to-digital converter (ADC) 238, 248
Automatic Gain Control (AGC) 254, 276
automotive sensors 40

B
Bandpass Sampling Rate 252
base assisted ad hoc routing (BAAR) 294
base station (BS) 216, 276, 289
body biasing 7
body control modules (BCM) 42
Broadcast and Multicast Services (BCMCS) 304
bulk acoustic wave (BAW) 149
contour mode disk resonators (CMDR) 161

dead zones 289
decimation 254
deep reactive ion etching (DRIE) 135
digital filter banks 259
Digital Signal Processing (DSP) 267
Digital Signal Processor 10
digital-to-Analog (DAC) 238
Digital Video Broadcasting (DVB) 234, 304, 306
direct-up transmitter 242-243, 245
down-sampling 254

electronic design automation (EDA) 83, 269
Electronics Design Automation (EDA) 83, 269
engine control module (ECM) 42
error vector magnitude (EVM) 237

C
CAN (Controller Area Network) 42
capacitive coupling 172
carrier frequency offset (CFO) 216, 235
carrier sense multiple access (CSMA) 290
Cascaded Comb Integrator (CIC) 257
cascode LNA 8
cathode ray tube (CRT) 42
chemical vapor deposition (CVD) 135
clamped-clamped resonators 158
Code-Division Multiple-Access (CDMA) 276
comb-drive resonator 157
common-source low noise amplifier (CS-LNA) 32
complementary metal-oxide semiconductor (CMOS) 124

D
Fast Fourier Transforms (FFT) 267
Field-Programmable Gate Array (FPGA) 269
File Delivery over Unidirectional Transport (FLUTE) 305
film bulk acoustic wave resonator (FBAR) 125-126
finite element analysis (FEA) 159
Fixed-Point (FxP) arithmetic 268
Fixed-Point Optimization (FPO) 268-269
FlexRay 42-43
fractional-N PLL frequency synthesizer 103
frequency synchronization 216-218, 229, 233-235, 267, 276
frequency synthesizer 16, 38, 48-49, 60, 99, 101-103, 112-113, 115-118, 152
frequency tracking 224, 236
Index

H
Hartley demodulation scheme 240
heterodyne architecture 121, 239
hot spots 289

I
Information Communication and Entertainment system (ICE) 46
input compression point (ICP1) 2, 14
input-referred third-order intercept point (IIP3) 2, 14
Integrated Cellular ad hoc Relay system, (iCAR) 294
inter-carrier interference (ICI) 217
interpolation 254
Interval Arithmetic (iA) 273
interwinding capacitance 202
IP Multimedia Subsystem (IMS) 304
ISM band (Industrial, Scientific and Medical) 48

L
Lateral flux capacitor 191-192
Linear Time-Invariant (LTI) systems 271
Line Model Generator (LMG) 74
LIN (Local Interconnect Network) 42
low-noise amplifiers (LNAs) 124
Low Noise Amplifiers (LNAs) 2, 214
Low Power Circuits 38
LTRA model 74

M
magnetic hysteresis losses 172
magnetic losses 172
MC-CDMA (Multi-Carrier CDMA) 267, 276
Metal-insulator-metal (MIM) capacitors 191-192, 209
metal-oxide-metal (MOM) capacitors 191
Method of Moments (MOM) 84
Microelectromechanical Systems (MEMS) 123, 156
miniaturization 157
Minimum Mean Square Error (MMSE) 278
MMIC (Microwave Monolithic Integrated Circuits) 61, 98
Mobile Assisted Data Forwarding (MADF) 294
mobile station (MS) 289
Moderate inversion (M.I.) 18
Monolithic Capacitors 191
Monolithic Inductors and Transformers 190, 194
MOST (Media Oriented Systems Transport) 43
MOS transistor 16
MOS Transistor Inversion Regions 18
multi-chip-module (MCM) 41
multihop ad hoc network 290, 292, 295
Multihop cellular networks (MCN) 294
Multihop Hybrid Cellular Network 295
multihop hybrid wireless network 290, 293-295
multihop routing 289
multihop wireless network 289
Multimedia Broadcast 304, 307
Multiple-Input Multiple-Output (MIMO) 267
multirate digital signal processing 254
multirate signal processing 254, 260

N
non-linear ties 1
Nyquist theorem 248-249, 255

O
Ohmic losses 171
on-chip spiral inductors 96, 155, 188, 194, 210, 213
Orthogonal frequency division multiple access (OFDMA) 235
orthogonal frequency division multiplexing (OFDM) 216, 236, 276, 287

P
packet-switched streaming (PSS) 304
phase frequency comparator (PFD) 102
phase locked loop (PLL) 100
phase noise (PN) 28
Policy Decision Function (PDF) 304
polyphase filter 258, 260-261
Power Amplifier (PA) 2, 241
practical oscillators 122

Q
quality of service (QoS) 217, 290, 300
quantization 267
QVCO (Quadrature Voltage Controlled Oscillator) 242

R
radio-frequency micro-electro-mechanical systems (RF-MEMS) 120
Real Time Streaming Protocol (RTSP) 304
Real Time Transport Protocol (RTP) 304
relay based cellular network 288
RF IC Design 38, 97, 211
RF integrated circuits (RF ICs) 76, 195

S
Semi-Empirical Modeling 22
Session Initiation Protocol (SIP) 304
shunt switches 164
signal-to-interference-noise ratio (SINR) 289
signal-to-interference ratio (SIR) 291
Signal to Quantization-Noise Ratio (SQNR) 271
silicon on insulator (SOI) substrates 135
single-crystal silicon (SCS) 135
single-interface multihop cellular network routing protocol (SMRP) 294
SiP (System in Package) 62
Software-Defined Radio system (SDR) 238
spatial redundancy 302
spectrum crowding 1
statistical redundancy 302
Strong inversion (S.I.) 18
Sub-Threshold 15-16, 18, 38
superheterodyne receiver 100-101, 239, 241
surface acoustic wave resonator (SAWR) 125
Surface Acoustic Wave (SAW) 124, 239, 265
system capacity 288
system-on-chip (SOC) 120

T
temporal redundancy 303
Third Generation Partnership Project (3GPP) 304
traditional varactors 175
transceiver architecture 48, 117, 181, 239, 264
Transconductance 8, 16-18, 20, 22, 26-27, 32, 38, 124, 132, 147, 149
transimpedance amplifier (TIA) 133
transistor intrinsic capacitances 21
Transition Frequency 16, 19, 38
transmission control module (TCM) 42

U
underpass capacitance 202
up-sampling 254
User Datagram Protocol (UDP) 304

V
Varactor Modeling 25
Variable Gain Amplifiers (VGA) 241
VCO (Voltage Controlled Oscillator) 242
VHDL (Very high speed Hardware Description Language) 269
voltage controlled oscillator (VCO) 51, 102, 173, 214

W
Weak inversion (W.I.) 18
Weaver architecture 240
WiMAX (Worldwide Interoperability for Microwave Access) 287, 309
wine – glass resonator (WGR) 161
wireless personal area networks (WPAN) 237
Word-Length Optimization (WLO) 267, 269, 286
woven capacitor 192-193