

"Cellular Handset & Chip Markets'07"
TABLE OF CONTENTS

I. EXECUTIVE SUMMARY.....	1
A. Overview.....	1
1. Market Drivers	2
2. Cellphone Evolution	4
3. Subscriber & Handset Growth.....	7
4. Chip Market Trends.....	11
II. MOBILE HANDSET MARKET.....	15
A. Overview.....	15
1. WCDMA Handset Vendors: Cream of the Crop?.....	16
B. Handset Market Leaders	17
C. Handset Supplier Shares by Global Region: '06	18
D. Handset Shipments by Type by Region: '06	19
E. Handset Forecast by Technology & Region	20
F. Chinese Handset Market Analysis	22
G. Handset Revenue Forecast by Cellular Technology.....	24
H. Leading Cellular Handset Supplier Profiles.....	26
1. Nokia	26
2. Motorola.....	29
3. Samsung	30
4. Sony-Ericsson	31
5. LG Electronics.....	32
6. BenQ-Siemens	35
7. Sagem	35
8. Kyocera	36
9. Sharp.....	37
10. Ningbo Bird	37
11. Pantech.....	38
12. Panasonic	39
13. Sanyo.....	40
14. UTStarcom-Audiovox.....	41
15. ZTE	41
16. NEC.....	42
17. TCL	42
18. CECT-Philips.....	43
19. Amoi Mobile	44
20. Lenovo	46
21. Huawei	46
22. Haier.....	47
23. Konka	48
I. PHS Handset Suppliers.....	49
J. Smartphone Shipments by OS '05-'06.....	50
K. Pure-play Smartphone Suppliers.....	51
1. RIM.....	51
2. High Tech Computer (HTC)	51
3. Palm	52

TABLE OF CONTENTS

L.	Japan PHS Handset Market Summary.....	53
M.	Handset ODMs	54
1.	Arima Communications	55
2.	Asustek Computer	55
3.	Compal Communications	56
4.	Cal-Comp Electronics.....	57
5.	Inventec Appliances	58
6.	High Tech Computer (HTC)	59
7.	Quantra Computer.....	59
8.	Wistron NeWeb	60
III.	GLOBAL REGION & COUNTRY FORECASTS.....	61
A.	Overview.....	61
B.	Aggressive Growth Countries	62
1.	India	62
2.	China	62
3.	Pakistan.....	62
4.	Russia.....	62
5.	Indonesia	63
6.	Ukraine	63
7.	Brazil.....	63
8.	Bangladesh.....	64
9.	Nigeria	64
10.	Vietnam	64
C.	NORTH AMERICA	65
1.	The Leading N.A. Operators	68
2.	Leading Handset Suppliers Share	68
A.	SOUTH AMERICA	69
3.	S.A. Operators.....	70
4.	Major Handset Suppliers to South America	72
D.	WESTERN EUROPE	75
1.	Leading W. Europe Operators	75
2.	Leading Handset Suppliers to W. Europe	75
3.	Western Europe Forecast of Handsets & Subscribers	76
E.	EASTERN EUROPE	78
1.	Handset Suppliers to E. Europe.....	78
2.	East European Operators.....	79
3.	Subscriber & Handset Forecast: 2006-2011	80
F.	SOUTH KOREA	83
1.	South Korean Handset Suppliers	83
G.	JAPAN	86
1.	Handset Suppliers to Japan's Market.....	86
2.	Japan Operators.....	87
3.	Japan Subscriber & Handset Forecast	89
H.	CHINA	91
1.	PHS	91
2.	2G CDMA & GSM/GPRS	92
3.	TD-SCDMA & WCDMA	92
4.	China's Overall Handset Leaders	95
5.	China's CDMA Handset Leaders	96
6.	China's GSM/GPRS Handset Leaders	97

TABLE OF CONTENTS

7.	China's PHS Handset Leaders.....	98
I.	INDIA.....	99
1.	Leading India Operators.....	101
2.	Leading Handset Suppliers.....	102
J.	SOUTHEAST ASIA.....	103
K.	AFRICA.....	106
L.	OCEANIA.....	108
IV.	MOBILE HANDSET CHIP MARKET SUMMARY.....	109
A.	3G Wireless Cellular Technology Overview.....	111
1.	CDMA2000, WCDMA & TD-SCDMA 3G Technologies.....	111
2.	CDMA1X/GSM (GSM1x) Technology.....	113
3.	3G CDMA EV-DO Rev A Technology.....	113
4.	3G CDMA EV-DO Rev B Technology.....	113
5.	HSDPA Technology.....	114
6.	TD-SCDMA Technology.....	115
V.	RADIO TRANSCEIVERS.....	117
A.	Overview.....	117
B.	Radio Technology.....	117
C.	GSM/GPRS Transceiver Market Shares.....	119
D.	EDGE Transceiver Market Shares.....	120
E.	CDMA Transceiver Market Shares.....	121
F.	WCDMA Transceiver Market Shares.....	122
G.	PHS, PDC, TDMA, iDEN Transceiver Market Shares.....	123
H.	Radio Transceiver Forecast.....	124
I.	RF Transceiver Suppliers.....	126
1.	Analog Devices (EDGE, WCDMA & TD-SCDMA Xceivers).....	127
2.	Airoha (CMOS PHS & GPRS Xceivers).....	128
3.	AKM (WCDMA Xceivers).....	129
4.	Broadcom (EDGE Xceiver & EDGE ULC).....	130
5.	Freescale Semiconductor (EDGE/PA Xceiver).....	130
6.	GCT Semiconductor (CMOS PHS Xceivers).....	131
7.	Infineon (CMOS WEDGE Xceivers).....	131
8.	Micro Linear (SiGe PHS Xceiver).....	133
9.	NXP (Single-Band UMTS/HSDPA Xceiver).....	133
10.	NXP (CMOS EDGE & WEDGE Xceiver).....	134
11.	Quorum Systems (CMOS WEDGE Xceiver).....	134
12.	Qualcomm (CMOS Diversity WEDGE Xceiver).....	135
13.	RDA (CMOS TD-SCDMA, GPRS, & PHS Xceivers).....	135
14.	Renesas (SOI BiCMOS GSM/GPRS/EDGE Xceiver).....	136
15.	RF Micro Devices (EDGE Xceiver & PA).....	137
16.	RF Micro Devices (Total EDGE Xceiver/SW-PA Module).....	138
17.	Sequoia (Quad-Band WEDGE CMOS Xceiver).....	139
18.	Silicon Labs (CMOS GPRS & EDGE Xceivers).....	139
19.	Sirific (CMOS WEDGE & HEDGE Xceiver).....	140
20.	Skyworks Solutions (WEDGE & EDGE Xceivers).....	141
21.	Sony Semiconductor (WCDMA/UMTS Xceiver).....	141
22.	Texas Instruments (GPRS Xceiver & Analog Baseband).....	142

TABLE OF CONTENTS

VI.	POWER AMPLIFIERS	143
A.	PA Forecast.....	144
B.	PA Supplier Profiles	146
1.	Anadigics	146
2.	Axiom Microdevices	146
3.	NXP	147
4.	RF Micro Devices	147
5.	SiGe Semiconductor (PA/Wi-Fi Modules)	149
6.	Skyworks	150
VII.	BASEBAND PROCESSORS	151
A.	Overview.....	151
B.	Low-End Multimedia Basebands	155
C.	Analog Baseband Market & Vendor Shares.....	157
D.	GSM/GPRS Baseband Market & Vendor Shares	158
E.	EDGE Baseband Market & Vendor Shares.....	159
F.	WCDMA/EDGE Baseband Market & Vendor Shares	160
G.	CDMA Baseband Market & Vendor Shares	162
H.	PHS, PDC, TDMA & iDEN Baseband Market & Vendor Shares	163
1.	Summary Digital Baseband Forecast by Air Type	164
I.	TD-SCDMA Chipset Suppliers	165
1.	Analog Devices	165
2.	Chongyou Information Technology (Baseband).....	165
3.	Commit & Putian (Baseband).....	166
4.	Maxim (Transceiver).....	166
5.	RTX Telecom (Complete Chipset)	166
6.	Spreadtrum Communications.....	167
7.	T3G.....	167
J.	Baseband Supplier Profiles	168
1.	Agere/LSI (EDGE Baseband-only Platforms)	170
2.	Agere/LSI (CMOS WCDMA/HSDPA Baseband & ABB).....	170
3.	Analog Devices (EDGE & TD-SCDMA Platforms).....	171
4.	Broadcom (EDGE, WCDMA & WEDGE Basebands)	172
5.	Infineon (CMOS WEDGE Platforms)	174
6.	NXP (EDGE, WCDMA & TD-SCDMA MM Basebands).....	174
7.	Ericsson Mobile Platforms (WCDMA & HSDPA Platforms).....	177
8.	Freescale Semiconductor (WCDMA/HSDPA & EDGE Platforms).....	179
9.	Marvell (GSM/GPRS/WCDMA Baseband).....	181
10.	MediaTek (GPRS Baseband, PMU & Radio Platform)	182
11.	Qualcomm (CDMA200 1x Chip Set Platform)	183
12.	Qualcomm (MSM 6550 CDMA EV-DO BB/RF Platform)	184
13.	Qualcomm (CDMA2000, EV-DO, HEDGE/HSUPA Platform)	186
14.	Spreadtrum (TD-SCMA GSM/GPRS MM Baseband Chip)	187
15.	Sunplus (GSM & PAS Basebands).....	188
16.	Texas Instruments (GPRS Baseband/PMUs).....	189
17.	Texas Instruments (WCDMA Baseband Processor)	190
VIII.	SINGLE-CHIP MODEMS	191
A.	Ultra-Low-Cost Handsets.....	191

TABLE OF CONTENTS

B.	Ultra-Low-Cost Modem Market Size & Vendor Shares	194
C.	Ultra-Low-Cost (BB/RF) Modem Supplier Profiles	196
1.	Analog Devices (GSM/GPRS Integrated Analog & Baseband Chip).....	197
2.	Broadcom (Single-Chip Multimedia GSM/GPRS/EDGE Modem).....	198
3.	Infineon Technologies AG (Single-Chip Modem).....	199
4.	NXP Semiconductor (Three-Chip GSM/GPRS BB & RF Platform)	200
5.	Qualcomm (QSC™ CDMA 1X Single-Chip Modems)	200
6.	Silicon Labs/NXP (GSM/GPRS Single-Chip Modem).....	203
7.	Texas Instruments (GSM/GPRS Single-Chip Modem).....	204
IX.	APPLICATION PROCESSORS.....	207
A.	Overview.....	207
B.	Coprocessors vs. Application Processors	208
C.	Application Processor Market & Vendor Shares.....	213
D.	Application & Co-processor Forecast	214
E.	Application Processor Supplier Profiles.....	216
1.	AMD/ATI Technologies (Media-Graphic/ Mobile TV Processor).....	217
2.	Broadcom (VideoCore Graphics Processor).....	218
3.	Broadcom (HSDPA Baseband & Application Processor)	219
4.	Core Logic (Image & Music-Centric Application Processors)	220
5.	Marvell (Applications Processor & EDGE, WCDMA Baseband).....	221
6.	MtekVision (Image/Graphics Processor).....	222
7.	Nazomi Communications (Java Accelerator).....	224
8.	NeoMagic (MTV Application Processor)	224
9.	Nvidia Corporation (Multimedia Graphics-Focused Processor).....	224
10.	NEC Electronics (Application Processor & Baseband).....	226
11.	NXP (WCDMA/EDGE Application & Baseband Platform)	228
12.	Qualcomm (Snapdragon™)	229
13.	Renesas Technology (FOMA/WCDMA Baseband and Apps Processor)	229
14.	Samsung (MCP Stacked Application Processor)	230
15.	STMicroelectronics (Multimedia/Graphic Application Processor).....	231
16.	Texas Instruments (OMAP2410)	232
17.	Texas Instruments (Application Processor, DBB & RF EDGE Platform)``	232
F.	Ring Tone & Melody Chips	234
X.	CAMERA & ISP IMAGERS.....	237
A.	Overview.....	237
B.	Camera Module Competition.....	241
C.	Image Sensor Market & Vendor Shares	243
D.	Market Forecast	244
E.	Imager Supplier Profiles	245
1.	Magnachip Semiconductor (VGA, SXGA, UXGA & 3.2 MP Imagers).....	245
2.	Micron (VGA, 1.3-, 2-, 3.1-MP Imagers with Optical Autofocus).....	245
3.	OmniVision (CMOS CIF, SGA, VGA, 1.3MP, 2MP, 3.2MP and 5MP).....	247
4.	Samsung (8.4 MP imager)	249
5.	STMicroelectronics (Image Modules and VGA, 1.3- & 2-MP SMIA).....	249
6.	Toshiba Electronic Components (CMOS 3.2 MP & 2MP).....	250
7.	TransChip (CMOS UXGA, SXGA Camera Imager/ISP Chips).....	251
XI.	MOBILE TV.....	253

TABLE OF CONTENTS

A. Overview	253
B. Mobile TV Handset Landscape	254
C. Mobile TV Technologies & Geography	257
1. T-DMB and S-DMB (S/T-DMB)	257
2. DMB in China	258
3. DAB-IP United Kingdom & Others	259
4. ISDB-T Japan	260
5. ISDB-T Brazil (called SBTVD-T)	261
6. MediaFLO USA & Japan	261
7. MediaFLO Japan	262
8. DVB-H	263
9. Taiwan DVB-H	265
10. China (T-DMB, ADTN-T, TMB-TH & DVB-T).....	265
11. TDtv.....	266
D. Mobile TV Market Forecast	267
1. Overall Mobile TV Receiver Forecast Summary	268
2. DVB-H Forecast	271
3. ISDB-T, S-DMB and T-DMB Forecasts.....	273
4. MediaFLO Forecast.....	274
5. Streaming Forecast	274
E. Mobile TV Chip Supplier Overview	276
F. Mobile TV Chip Supplier Profiles	277
1. AFA.....	279
2. ALPS	279
3. Analog Devices- Integrant (DMB, ISDB-T & DMB-TH Tuner).....	279
4. ATI/AMD (DVB-H Demodulator).....	280
5. Broadcom (CMOS DVB-H & DVB-T Monolithic Tuner)	280
6. DiBcom (DVB-H Demodulator, DVB-H Receiver)	281
7. Future Communications IC (S/T-DMB RF tuners)	281
8. Freescale Semiconductor (DVB-H RF Tuner).....	282
9. Frontier Silicon (DVB-H, DMB, DAB-IP Demods)	282
10. GCT Semiconductor (CMOS T-DMB & S-DMB Receivers)	283
11. Legend Silicon (DMB-TH TDS-OFDM Demod)	284
12. Maxim (ISDB-T 1- & 3-segment tuners)	284
13. Mega Chips (ISDB-T-Demod).....	285
14. Microtune (SiGe DVB-H, ISDB-T, T-DMB, DMB-TH Tuners).....	285
15. Mirics Semiconductor (SiGe Multimode Tuner).....	286
16. MStar Semiconductor	286
17. Newport Media (CMOS DVB-H, ISDB-T Tuner/Demods).....	286
18. NXP (DVB-H Demod/Tuner).....	288
19. Qualcomm (MediaFLO Tuner/Demod)	288
20. Samsung Electronics (DVB-H Channel Demod)	288
21. Sanyo Electronics Device Company (ISDB tuner module).....	289
22. Siano Mobile Silicon (CMOS DVB-H, T-DMB & DAB Tuner/Demod).....	289
23. Telegent Systems (CMOS DVB-H/DVB-T/NTSC/PAL Tuner/Demod).....	290
24. Texas Instruments (CMOS DVB-H, ISDB-T Receivers).....	290
XII. GPS	293
A. Overview	293
1. Alternative Satellite Navigation Systems.....	295
B. Cellphone GPS Market & Vendor Shares	297
C. Cellphone GPS Forecast	298

TABLE OF CONTENTS

1.	Personal Navigation Devices (PNDs)	299
D.	GPS Supplier Profiles	300
1.	Fujitsu Microelectronics Europe	301
2.	Global Locate (A-GPS).....	302
3.	GloNav Inc (SiGe GPS receiver).....	303
4.	Infineon.....	304
5.	MediaTek.....	305
6.	RFMD (Software-assisted GPS Receiver).....	305
7.	SiRF.....	306
8.	STMicroelectronics.....	307
9.	Texas Instruments.....	307
10.	Qualcomm.....	308
XIII.	FM STEREO+ RDS RADIO	309
A.	Overview.....	309
B.	FM Market Leaders	310
C.	Cellphone FM Chip Forecast	310
D.	FM & RDS Company Profiles.....	311
1.	Airoha (RDS & RBDS FM)	311
2.	NXP (RDS FM Stereo & AM)	312
3.	RDR (FM Stereo Receiver)	312
4.	ROHM (FM Stereo Receiver).....	312
5.	Sanyo (AM/FM Radio Receiver).....	313
6.	Silicon Laboratories (CMOS RDS/RBDS FM Stereo Xceiver & AM/FM Receiver)	313
7.	STMicroelectronics (RDS Stereo Receiver).....	314
8.	Texas Instruments (Bluetooth & RDS FM Xceiver).....	314
XIV.	CELLPHONE Wi-Fi.....	315
A.	Overview.....	315
B.	Cellular WLAN Market & Vendor Shares	318
C.	Cellular WLAN Forecast.....	319
D.	Cellular WLAN Chip Supplier Profiles	319
1.	Atheros	320
2.	Broadcom (Wi-Fi/Bluetooth/FM).....	321
3.	Conexant (Single Chip 802.11g SDIO-SPI Radio).....	321
4.	CSR (Wi-Fi/Bluetooth).....	322
5.	Marvell (UMC/UMS Wi-Fi/Bluetooth EDS 2.0).....	322
6.	NXP Semiconductors (UMA Wi-Fi & Bluetooth).....	323
7.	Qualcomm	324
8.	STMicroelectronics (SIP-based Wi-Fi)	324
9.	Texas Instruments (UMA Wi-Fi/Bluetooth & Stereo FM)	325
E.	UWB & Mobile WiMAX Outlooks	326
XV.	BLUETOOTH	327
A.	Overview.....	327
B.	Cellphone Bluetooth Market & Vendor Shares	328
C.	Cellphone Bluetooth Forecast	329
D.	Cellphone Bluetooth Supplier Profiles.....	329
1.	Broadcom (130nm CMOS Bluetooth 2.0 RDS & FM)	330
2.	CSR (CMOS Bluetooth 2.0+FM, Bluetooth 2.0 +GPS).....	330

TABLE OF CONTENTS

3.	Kyocera (1, 1 & 1.2 CDMA-compatible RF Module)	331
4.	Marvell (CMOS 90 nm Bluetooth 2.0 EDR+WLAN)	332
5.	NXP (Bluetooth 2.0 EDR).....	332
6.	Qualcomm (CMOS Bluetooth 2.0 EDR Xceiver).....	332
7.	RF Micro Devices (CMOS Bluetooth EDR).....	333
8.	Staccato (Bluetooth 3.0 & USB over UWB)	334
9.	STMicroelectronics (CMOS Bluetooth V2.0 EDR)	335
10.	Texas Instruments (Bluetooth 2.0 EDR & Stereo FM Xceiver).....	335
XVI.	LCD DRIVERS	337
A.	Overview.....	337
B.	Display Resolution Market Analysis.....	338
C.	LCD Driver Chip Forecast.....	339
XVII.	CELLPHONE MEMORY	341
A.	Overview.....	341
1.	Memory Market Status Update	342
2.	Memory Types Employed by Application	344
B.	NOR, NAND, DRAM & PSRAM FORECAST	345
C.	Multi-Chip Package Suppliers	347
1.	MemoCom.....	349
2.	Spansion (PoP Flash)	349
3.	SanDisk	350
D.	NAND Flash Overview.....	351
E.	NOR Flash	353
F.	NAND & NOR Flash Pricing	355
G.	Flash Supplier Profiles.....	356
1.	Hynix (#3 in NAND, 1Gb-16Gb NAND, with 512Mb SDRAM)	356
2.	Intel (#2 in NOR, developing OpenNAND position)	356
3.	Macronix International (# 9 in NOR).....	357
4.	Micron Technology, Inc (# 5 In NAND; 1, 2 & 4Gb NAND).....	357
5.	Qimonda (abandoning NROM NAND)	358
6.	Samsung Electronics Co., Ltd. (# 1 in NAND, #1 in PSRAM).....	359
7.	Spansion (1-Gb ORNAND)	360
8.	Spansion (#1 In NOR Flash)	361
9.	STMicroelectronics (NAND)	361
10.	STMicroelectronics (# 3 NOR Flash, 512Mb MLC)	362
11.	Toshiba (#2 In NAND, # 5 In NOR, #6 in PSRAM).....	362
12.	Silicon Storage Technology (# 9 in NOR, a low-density NOR leader).....	363
13.	Sharp (# 6 in NOR Flash, but fading)	364
H.	SDRAM & PSRAM Overview	365
I.	DRAM.....	366
J.	Market Share Analysis of SDRAM & PSRAM	368
K.	SDRAM & PSRAM Vendor Profiles	369
1.	Cypress Semiconductor Corporation (# 3 in PSRAM)	370
2.	Elpida Memory inc. (# 5 in DRAM, 64-256Mb Mobile SDRAM).....	370
3.	EMLSI (PSRAM & Low-Power SDRAM).....	371
4.	Etron Technology Inc. (128Mb PSRAM & 16Mb-64Mb SDRAM)	371
5.	Fujitsu (16Mb FastCycle SRAM).....	372

TABLE OF CONTENTS

6.	Hynix (64-256 Mb Mobile SDR DRAM, 64Mb PSRAM).....	372
7.	Micron Technology, Inc. (#2 in PSRAM, # 3 DRAM, 1Gb Mobile DRAM)	373
8.	Nanya Technology Corp. (SDRAM).....	373
9.	NEC Electronics (# 4 in PSRAMs, 128Mb COSMORAM-compliant).....	373
10.	Powerchip (SDRAM).....	374
11.	ProMOS Technologies (128Mb/256Mb Mobile SDR DRAM)	374
12.	Qimonda AG (# 4 DRAM; 128-512Mb SDRAM & 64-128Mb Cellular PSRAM).....	375
13.	Renesas (# 5 in PSRAM).....	376
14.	Samsung (#1 In SRAM & DRAM; 1 st 256Mb PSRAM)	376
15.	Silicon7 (16mb-64Mb PSRAM & MCP supplier).....	377
16.	STMicroelectronics (PSRAM & mobile SDRAM in MCPs)	377
17.	Winbond Electronics Corp (PSRAM & SDR DRAM)	378
XVIII.	NEAR FIELD COMMUNICATIONS (NFC).....	379
A.	Overview.....	379
B.	First Handset Technologies	380
C.	Operator Support.....	381
D.	NFC Chip Forecast	382
E.	NFC Chip Supplier Profiles.....	384
1.	Infineon.....	384
2.	Inside Contactless	385
3.	NXP Semiconductor	385
4.	Sony	386
XIX.	APPENDIX	387
	WIRELESS ACRONYMS & ABBREVIATIONS	387
	INDEX	399

TABLE OF CONTENTS

FIGURES

Figure 1 Segmentation of Mobile Phone Market: '06-'11	5
Figure 2 Global Handset Shipments by Technology: 2006	7
Figure 3 Handset Shipment Growth by Major Vendors: '05-'06	8
Figure 4 Global Handset Vendor Unit Market Shares	9
Figure 5 Digital Cellular Handset Revenue by Wireless Technology: '05-'11	10
Figure 6 Handset Pricing by Air Technology: '06-'11	11
Figure 7 Chipset Sales Forecast in Mobile Devices: '04-'11	12
Figure 8 WCDMA Global Market Handset Leaders	16
Figure 9 China Market Handset Vendor Shares: 2006	22
Figure 10 Nokia's '05-'06 YOY Shipment Changes by Major Regions	27
Figure 11 Russian Subscribers by Network: '06	80
Figure 12 South Korean Handset Market by Vendor: '06	84
Figure 13 Global WCDMA Handset Growth: '05-'07	86
Figure 14 China's Handset Sales by Air Type: '06	91
Figure 15 China Handset Sales by Vendor: '06	95
Figure 16 China's CDMA Handset Shipments by Vendor: '06	96
Figure 17 China's GSM/GPRS Handset Shipments by Vendor: '06	97
Figure 18 China's PHS/PAS Handset Shipments by Vendor: '06	98
Figure 19 India Handset Market by Vendor: '06	99
Figure 20 CDMA Handset Shipment Growth By Major Regions: '06-'07	112
Figure 21 GSM/GPRS Radio Transceiver Market by Vendor: '06	119
Figure 22 EDGE RF Transceiver Shipments by Vendor: '06	120
Figure 23 CDMA1x/EV-DO Radio Transceiver Shipments by Vendor: '06	121
Figure 24 WCDMA RF Transceiver Shipments by Vendor: '06	122
Figure 25 PHS, PDC, iDEN & TDMA RF Transceiver Ships by Vendor: '06	123
Figure 26 Cellular PA Market by Vendor: 2006	143
Figure 27 Analog Baseband/Pwr. Mgmt. Market by Vendor: '06	157
Figure 28 GSM/GPRS Baseband Market & Vendor Shares: 2006	158
Figure 29 EDGE Baseband Market Share Leaders	159
Figure 30 WCDMA/EDGE Baseband Market & Vendor Shares: '06	161
Figure 31 WCDMA/EDGE Baseband Market Share Leaders	162
Figure 32 PHS, PDC, TDMA, iDEN Baseband Market & Vendor Shares: '06	163
Figure 33 Total Baseband Shipments by Vendor: 2006	168
Figure 34 EMP Multimedia Evolution of Wireless Platform Technology	178
Figure 35 EMP's Evolution of Multimedia Firmware	179
Figure 36 Ultra-Low-Cost Modem Chip Market by Vendor: '06	194
Figure 37 Application Processor: A Division of Labor	207
Figure 38 Application Processor vs. Coprocessor Sales: 2006	208
Figure 39 Application Coprocessor Market by Category: 2006	209
Figure 40 Application Processor Market Share Leaders	213
Figure 41 Broadcom's HEDGE Apps/Baseband Processor Architecture	219
Figure 42 MtekVision Multimedia Processor Architecture	223
Figure 43 OmniVision's Wavefront Coding Autofocus Scheme	238
Figure 44 Cellphone Camera Imager Sensor Sizes	239
Figure 45 Handset Models by Display Resolution	239
Figure 46 Color Handset Displays by Resolution	240
Figure 47 Camera Imager Shipments Forecast by Pixel Sizes '04-'11	242
Figure 48 Image Sensor Chip Market & Vendor Shares: '06	243
Figure 49 Mobile TV Receiver Shipments by Type: 2006	269
Figure 50 Mobile TV Receiver Shipments Forecast by Type: 2007	270

TABLE OF CONTENTS

Figure 51 Mobile TV Receiver Shipments by Type: 2011	271
Figure 52 GPS Receiver Block Diagram	293
Figure 53 Cellphone GPS Chip Market & Vendor Shares: '06	297
Figure 54 Global Locate's Hammerhead II A-GPS Chip Block Diagram.....	303
Figure 55 Cellphone FM Stereo Market & Vendor Shares: '06	310
Figure 56 Cellphone WLAN Chip Market & Vendor Shares: '06	318
Figure 57 Cellphone Bluetooth Market & Vendor Shares: '06.....	328
Figure 58 Single Display vs. Double Display Handset Forecast	337
Figure 59 Display Driver Market & Vendor Shares: 2006	339
Figure 60 MCP Migration based on Speed & Memory Requirements	348
Figure 61 Cellphone NAND Flash Market & Vendor Shares: 2006.....	351
Figure 62 Cellphone NOR Flash Market & Vendor Shares: 2006.....	353
Figure 63 Cellular SDR DRAM Market & Vendor Shares: 2006	366
Figure 64 Cellular PSRAM Market & Vendor Shares: 2006.....	369

TABLE OF CONTENTS

TABLES

Table 1 Non-Voice Services as Percent of Vodafone's Service Revenues.....	3
Table 2 Top Handset Supplier Ships & Growth: '05-'06	17
Table 3 Top Handset Supplier Shipments by Global Region: '06	18
Table 4 Handset Shipments by Major Region: '06	19
Table 5 Handset Unit Forecast by Technology & Region: '05-'11	20
Table 6 Handset Unit Shipment Forecast by Technology: '06-'11	21
Table 7 Handset Shipment Forecast by Technology: '06-'11	25
Table 8 Smartphone/Wireless PDA Shipment Growth by OS: '05-'06	50
Table 9 3G Operators & Subscribers in Taiwan.....	54
Table 10 Inventec Handset Shipments: 2006 to 2007	58
Table 11 Emerging Countries with Largest Subscriber Growth: '05-'06	61
Table 12 North American Subscribers & Handset Type Forecast: '06-'11	66
Table 13 North American Subscriber Growths By Country: '05-'06	67
Table 14 South America Subscriber & Handset Forecast by Type: '06-'11	72
Table 15 South America Subscriber Growth by Country: 2004-2006	74
Table 16 Western Europe Subscriber & Handset Forecast by Type: '06-'11	76
Table 17 Western Europe Subscriber Growths by Country 2003-2008	77
Table 18 Eastern Europe Handset Supplier Share & Pricing: '06	79
Table 19 Eastern Europe Subscribers & Handset Forecast by Type: '06-'11	81
Table 20 Eastern Europe Subscriber Growth by Country: '05-'06.....	82
Table 21 South Korea Subscriber & Handset Forecast by Type: '06-'11	85
Table 22 Japan's Unit Handset Market by Vendor & Technology: '06	87
Table 23 Japan Subscriber & Handset Forecast by Type: '06-'11	90
Table 24 China's Subscriber and Handset Type Forecast: '06-'11	94
Table 25 India Subscriber & Handset Forecast by Type: '06-'11	100
Table 26 India Operator Growths: 2003 to 2007	101
Table 27 India's GSM & CDMA Handset Supplier Market Shares & Pricing	102
Table 28 India's Handset Supplier Growth & Market Shares: '05-'06	103
Table 29 SEA Subscribers & Handset Type Forecast: '06-'11.....	104
Table 30 SEA Subscriber Growth by Country: '04-'06	105
Table 31 Africa Subscribers & Handset Forecast: '06-'11	106
Table 32 Africa Subscribers by Country: 2003- 2005.....	106
Table 33 Oceania Subscriber & Handset Forecast: '06-'11	108
Table 34 Summary Forecast of Mobile Chip Markets by Chip Type: '06-'11	109
Table 35 WCDMA Frequency Spectrum by Region.....	118
Table 36 Radio Transceiver forecast by Wireless technology	125
Table 37 TI's GPRS Transceiver/Baseband Platforms	142
Table 38 Cellphone Power Amplifier Forecast by Air Technology: '06-'11.....	145
Table 39 HSDPA Speed Categories	152
Table 40 Technology Comparison of WiMAX with 3G	154
Table 41 CDMA EV-DO Rev A, B, C Evolution.....	155
Table 42 Digital Baseband Forecast by Air Type: '06-'11	164
Table 43 Qualcomm's RF & Power Management Chip Platform Options	185
Table 44 Qualcomm MSM7600 RF/PMU Options for Different Frequencies	187
Table 45 Texas Instruments OMAP GPRS Baseband Platforms.....	189
Table 46 Ultra-Low-Cost Integrated BB/Xceiver Chip Forecast: '06-'11	195
Table 47 Comparison of Single-Chip GSM, CDMA & EDGE Modems	197
Table 48 Qualcomm's Single-Chip Modems	202
Table 49 Competing Application Processors	210
Table 50 Application Processor Pricing by Supplier.....	212

TABLE OF CONTENTS

Table 51 Application- & Co-Processor Market Forecast by Type: '06-'11	215
Table 52 Selected Application Processor/Coprocessor Suppliers	216
Table 53 Ring Tone & Melody Chip Forecast: '06-'11	235
Table 54 Camera Imager Forecast: '05-'11	244
Table 55 Comparison of Available Mobile TV Handsets by Type	255
Table 56 Mobile TV Receiver Forecast by Type: '06-'11	268
Table 57 DVB-H MTV Forecast by Country & Operator: '06-'11	272
Table 58 ISDB, S-DMB, T-DMB Forecast by Country: 2006-2011	273
Table 59 MediaFLO MTV Forecast by Country: 2006-2011	274
Table 60 Unicast Mobile TV Streaming Forecast by Region/Operator: '05-'11	275
Table 61 Suppliers of DVB, DMB, ISDB, MediaFLO Demods & Tuners	278
Table 62 Cellphone GPS Chip Forecast: '06-'11	299
Table 63 P GPS PND Market Share Leaders: 3Q/2006	300
Table 64 SiRF GPS Chips	306
Table 65 Forecast of Stereo FM Chip Sales and Volume: '06-'11	311
Table 66 Cellular WLAN Chip Forecast: '06-'11	319
Table 67 Cellphone Bluetooth Forecast: '06-'11	329
Table 68 Display Resolution Statistics	338
Table 69 Display Color Statistics	338
Table 70 Phone Style Statistics	339
Table 71 Display Driver & Display Forecast 2006-2011	340
Table 72 Memory Consumption by Application for DRAM, Flash & SRAMs	344
Table 73 NOR, NAND, DRAM & PSRAM Unit Forecast by Cellphone Type: '06-'11	345
Table 74 Cellphone Memory Revenue Forecast: '06-'11	346
Table 75 Mobile NOR Suppliers Market Share & Sales Growth '05-'06	354
Table 76 Contract Pricing for SLC & MLC NAND Flash by Gbit Size: 1/07	355
Table 77 NOR Flash Pricing by Size: 1/07	355
Table 78 DDR DRAM Pricing by Speed Rating and Size	367
Table 79 PSRAM Suppliers Market Share & Growth from '05-'06	368
Table 80 Low-Power SDRAM Supplier Market Shares & Growth: '05-'06	369
Table 81 Near-Field Communications Chipset Forecast: '05-'11	382