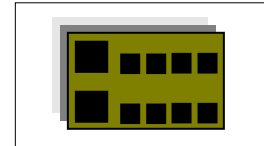


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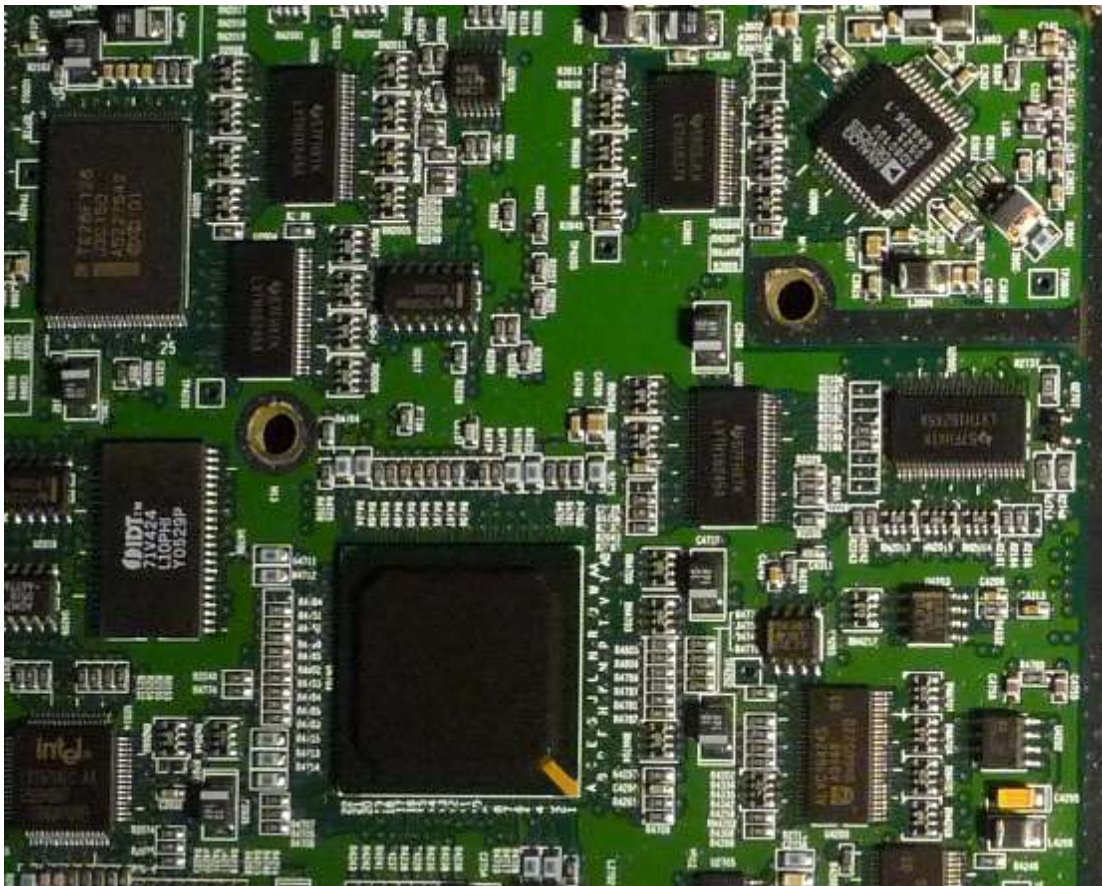
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9th Edition

Global BTS Transceiver Market Analysis and Forecast, 2013-2017

March 2013



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TABLE OF CONTENTS

EXECUTIVE SUMMARY	8
2012 Review.....	9
2013-2017 Forecast	12
Demand Drivers for Our Forecast	13
Summary	14
RESEARCH METHODOLOGY.....	16
CHAPTER 1: OVERALL MARKET PERFORMANCE.....	17
1.1 2012: Weak 1 st Half Leads to Recovery in 2 nd Half.....	17
1.2 OEM Analysis –Ericsson Remains the Market Leader.....	23
1.3 The Chinese Factor	26
1.4 TRx Forecast 2013-2017.....	28
CHAPTER 2: LTE	36
2.1 LTE Market Share	38
2.2 Demand Remains Scattered Across Multiple Frequency Bands	39
2.3 LTE TRx Forecast 2012-2017.....	41
2.4 Momentum for TD-LTE in China, India and beyond.....	47
2.5 New LTE Frequency Bands: 3.5GHz/700MHz	48
2.6 LTE Release 10/11/12- LTE-Advanced and its Impact on TRx	49
2.7 LTE700 Bands 12/13/17	50
2.8 LTE800 Band 20	52
2.9 LTE850 Band 5	54
2.10 LTE1500 Band 11.....	56
2.11 LTE1700 Band 9	58
2.12 LTE1800 Band 3	60
2.13 LTE1900 Band 2/25.....	62
2.14 LTE2100 Band 1	64
2.15 LTE2100AWS Bands 4/10.....	66
2.16 LTE2300 TDD Band 40.....	68
2.17 LTE2600 Band 7	70
2.18 LTE2600 TDD Band 41.....	72
CHAPTER 3: W-CDMA/HSPA+	74
3.1 W-CDMA Market Share Analysis.....	74
3.2 Shipments of W-CDMA900 nearly double in 2012 while W-CDMA2100 drops 28%	77
3.3 The Chinese Factor	78
3.4 W-CDMA Forecast 2013-2017.....	80
3.5 W-CDMA850	84
3.6 W-CDMA900	86
3.7 W-CDMA1900.....	88
3.8 W-CDMA2100.....	90
3.9 W-CDMA2100 AWS	92
3.10 W-CDMA2100 JAPAN	94
CHAPTER 4: GSM DECLINES SHARPLY	96
4.1 GSM Market Share Analysis.....	96
4.2 The Chinese Factor	99
4.3 Both GSM900 and GSM1800 Sharply Decline.....	100
4.4 GSM Forecast 2013-2017	102
4.5 GSM Transceiver Technology Analysis	106

4.6 GSM850	109
4.7 GSM900	111
4.8 GSM1800.....	113
4.9 GSM1900.....	115
CHAPTER 5: CDMA2000 1x/EV-DO	117
5.1 CDMA Market Share Analysis.....	117
5.2 The Chinese Factor	119
5.3 CDMA850 and CDMA1900 Driving Demand	121
5.4 CDMA2000 Forecast 2013-2017	122
5.5 CDMA450	126
5.6 CDMA850	128
5.7 CDMA1900.....	130
5.8 CDMA2100.....	132
CHAPTER 6: GEOGRAPHICAL MARKET SHARE	134
China: LTE Driving Strong Rebound	134
6.1 North & Latin America	137
6.2 Western & Eastern Europe	140
6.3 Africa & Middle East	142
6.4 Asia Pacific.....	145
6.5 Brazil/Russia/India/China (BRIC) Analysis.....	149
CHAPTER 7: TRX OEM COMPANY PROFILES	153
7.1 Alcatel-Lucent	154
7.2 Ericsson.....	161
7.3 Huawei Technologies.....	164
7.4 Nokia Siemens Networks/Motorola	167
7.5 ZTE.....	174

TABLES

Table 1: Global TRx Market Share by OEM, 2011-2012 (Units)	12
Table 2: Global TRx Market Share by Air Interface/Frequency, 2011-2012 (Units).....	19
Table 3: Global TRx Market Share by Air Interface, 2011-2012 (Units)	19
Table 4: Global TRx Market Share by OEM, 2011-2012 (Units)	23
Table 5: Global TRx Pro Forma Market Share by OEM, 2011-2012 (Units)	24
Table 6: Global TRx Market Share, Chinese vs. ROW, 2011-2012 (Units)	26
Table 7: Global TRx Forecast by Air Interface/Frequency, 2013-2017 (Units).....	31
Table 8: Global TRx Forecast by Air Interface/Frequency, 2013-2017 (% Market Share).....	32
Table 9: Global TRx Forecast by Air Interface/Frequency, 2013-2017 (% YoY Growth)	33
Table 10: Global TRx Forecast by Air Interface, 2013-2017 (Units)	34
Table 11: Global TRx Forecast by Air Interface, 2013-2017 (% Market Share).....	34
Table 12: Global TRx Forecast by Air Interface, 2013-2017 (% YoY Growth)	34
Table 13: Global LTE TRx Market Share, 2011-2012 (Units)	38
Table 14: Global LTE TRx Market Share by Frequency, 2011-2012 (Units).....	39
Table 15: Global LTE TRx Forecast, FDD vs. TDD, 2013-2017 (Units)	44
Table 16: Global LTE TRx Shipment Forecast, 2013-2017 (Units).....	44
Table 17: Global LTE TRx Shipment Forecast, 2013-2017 (% Market Share)	44
Table 18: Global LTE TRx Shipment Forecast, 2013-2017 (% Growth YoY).....	45
Table 19: Global LTE700 Bands 12/13/17 TRx Market Share, 2011-2012 (Units)	51
Table 20: Global LTE800 Band 20 TRx Market Share, 2011-2012 (Units)	53
Table 21: Global LTE850 Band 5 TRx Market Share, 2011-2012 (Units)	55
Table 22: Global LTE1500 Band 11 TRx Market Share, 2011-2012 (Units).....	57
Table 23: Global LTE1700 Band 9 TRx Market Share, 2011-2012 (Units)	59
Table 24: Global LTE1800 Band 3 TRx Market Share, 2011-2012 (Units)	61
Table 25: Global LTE1900 Band 2/25 TRx Market Share, 2011-2012 (Units).....	63
Table 26: Global LTE2100 Band 1 TRx Market Share, 2011-2012 (Units)	65
Table 27: Global LTE2100AWS Bands4/10 TRx Market Share, 2011-2012 (Units).....	67
Table 28: Global LTE2300 Band 40 TRx Market Share, 2011-2012 (Units).....	69
Table 29: Global LTE2600 Band 7 TRx Market Share, 2011-2012 (Units)	71
Table 30: Global LTE2600 Band 41 TRx Market Share, 2011-2012 (Units).....	73
Table 31: Global W-CDMA TRx Market Share, 2011-2012 (Units)	76
Table 32: Global W-CDMA TRx Market Share by Frequency, 2011-2012 (Units)	77
Table 33: Global W-CDMA TRx Market Share, Chinese vs. ROW, 2011-2012 (Units)	78
Table 34: Global W-CDMA TRx Shipment Forecast, 2013-2017 (Units).....	82
Table 35: Global W-CDMA TRx Shipment Forecast, 2013-2017 (% Market Share).....	83
Table 36: Global W-CDMA TRx Shipment Forecast, 2013-2017 (% YoY Growth)	83
Table 37: Global W-CDMA850 TRx Market Share, 2011-2012 (Units).....	85
Table 38: Global W-CDMA900 TRx Market Share, 2011-2012 (Units).....	87
Table 39: Global W-CDMA1900 TRx Market Share, 2011-2012 (Units).....	89
Table 40: Global W-CDMA2100 TRx Market Share, 2011-2012 (Units).....	91
Table 41: Global W-CDMA2100 AWS TRx Market Share, 2011-2012 (Units)	93
Table 42: Global W-CDMA2100 JAPAN TRx Market Share, 2011-2012 (Units)	95
Table 43: Global GSM TRx Market Share, 2011-2012 (Units).....	97
Table 44: Global GSM TRx Market Share Pro Forma, 2011-2012 (Units).....	97
Table 45: Global GSM TRx Market Share, Chinese vs. ROW, 2011-2012 (Units)	99
Table 46: Global GSM TRx Market Share by Frequency, 2011-2012 (Units)	100
Table 47: Global GSM TRx Shipment Forecast, 2013-2017 (Units)	104
Table 48: Global GSM TRx Shipment Forecast, 2013-2017 (% Market Share).....	104
Table 49: Global GSM TRx Shipment Forecast, 2013-2017 (% YoY Growth)	104
Table 50: Global GSM TRx Forecast by Transceiver Technology, 2013-2017 (Units).....	107
Table 51: Global GSM850 TRx Market Share, 2012 (Units)	110
Table 52: Global GSM900 TRx Market Share, 2011-2012 (Units).....	112
Table 53: Global GSM1800 TRx Market Share, 2011-2012 (Units).....	114
Table 54: Global GSM1900 TRx Market Share, 2011-2012 (Units).....	116
Table 55: Global CDMA2000 TRx Market Share, 2011-2012 (Units)	118
Table 56: Global CDMA2000 TRx Market Share, Chinese vs. ROW, 2011-2012 (Units)	119
Table 57: Global CDMA2000 TRx Market Share by Frequency, 2011-2012 (Units)	121
Table 58: Global CDMA2000 TRx Shipment Forecast, 2013-2017 (Units).....	125
Table 59: Global CDMA2000 TRx Shipment Forecast, 2013-2017 (% Market Share).....	125
Table 60: Global CDMA2000 TRx Shipment Forecast, 2013-2017 (% YoY Growth)	125
Table 61: Global CDMA450 TRx Market Share, 2011-2012 (Units).....	127
Table 62: Global CDMA850 TRx Market Share, 2011-2012 (Units).....	129

Table 63: Global CDMA1900 TRx Market Share, 2011-2012 (Units)	131
Table 64: Global CDMA2100 TRx Market Share, 2011-2012 (Units)	133
Table 65: Global TRx Shipment Forecast by Region, 2013-2017 (Units)	134
Table 66: Global TRx Shipment Forecast by Region, 2013-2017 (% Market Share)	136
Table 67: Global TRx Shipment Forecast by Region, 2013-2017 (% YoY Growth)	136
Table 68: Brazil/Russia/India/China TRx Forecast, 2012-2017 (Units)	149
Table 69: Brazil/Russia/India/China TRx Forecast, 2012-2017 (% Market Share)	149
Table 70: Alcatel-Lucent TRx Shipments by Air Interface/Frequency, 2011-2012 (Units)	156
Table 71: Alcatel TRx Shipments by Air Interface/Frequency, 2011-2012 (Units)	156
Table 72: Lucent TRx Shipments by Air Interface/Frequency, 2011-2012 (Units)	157
Table 73: Alcatel-Lucent TRx Shipments by Air Interface, 2011-2012 (Units)	157
Table 74: Alcatel TRx Shipments by Air Interface, 2011-2012 (Units)	157
Table 75: Lucent TRx Shipments by Air Interface, 2011-2012 (Units)	157
Table 76: Ericsson TRx Shipments by Air Interface/Frequency, 2011-2012(Units)	162
Table 77: Ericsson TRx Shipments by Air Interface, 2011-2012 (Units)	162
Table 78: Nokia Siemens Networks TRx Shipments by Air Interface/Frequency, 2011-2012 (Units)	168
Table 79: Nokia TRx Shipments by Air Interface/Frequency, 2011-2012 (Units)	168
Table 80: Siemens TRx Shipments by Air Interface/Frequency, 2011-2012 (Units)	169
Table 81: Motorola TRx Shipments by Air Interface/Frequency, 2011-2012 (Units)	169
Table 82: Nokia Siemens Networks TRx Shipments by Air Interface, 2011-2012 (Units)	170
Table 83: Nokia TRx Shipments by Air Interface, 2011-2012 (Units)	170
Table 84: Siemens TRx Shipments by Air Interface, 2011-2012 (Units)	170
Table 85: Motorola TRx Shipments by Air Interface, 2011-2012 (Units)	170
Table 86: ZTE TRx Shipments by Air Interface/Frequency, 2011-2012 (Units)	175
Table 87: ZTE TRx Shipments by Air Interface, 2011-2012 (Units)	175

EXHIBITS

Exhibit 1: Global TRx Forecast 2013-2017, (% YoY Growth)	12
Exhibit 2: Comparison of 2012 Global TRx Forecast vs. Actual Shipments	18
Exhibit 3: Global TRx Shipments, 2011-2012 (Units)	18
Exhibit 4: Global TRx Market Share by Air Interface, 2012 (Units)	20
Exhibit 5: Global TRx Market Share by Technology Generation, 2012 (Units)	21
Exhibit 6: Global UMTS TRx Market Share by Technology, 2012 (Units)	21
Exhibit 7: Global TRx Market Share by Air Interface, 2011-2012 (Units)	22
Exhibit 8: Global TRx Market Share by OEM, 2012 (Units)	24
Exhibit 9: Global TRx Pro Forma Market Share by OEM, 2012 (Units)	25
Exhibit 10: Global TRx Market Share, Chinese vs. ROW, 2011-2012 (Units)	26
Exhibit 11: Global TRx Market Share, Chinese vs. ROW, 2012 (Units)	27
Exhibit 12: Global TRx Forecast 2013-2017, (% YoY Growth)	28
Exhibit 13: Global TRx Shipment Forecast, Prior vs. Current, 2013-2017 (Units)	29
Exhibit 14: Global TRx Shipment Historical Trend, 2002-2012, (% YoY Growth)	29
Exhibit 15: Global TRx Forecast by Air Interface, 2013-2017 (% Market Share)	34
Exhibit 16: Global TRx Forecast by Air Interface, 2017 (% Market Share)	35
Exhibit 17: Comparison of 2012 Global LTE TRx Forecast vs. Actual Shipments	37
Exhibit 18: Global LTE TRx Shipments, 2011-2012 (Units)	37
Exhibit 19: Global LTE TRx Market Share by OEM, 2012 (Units)	38
Exhibit 20: LTE TRx Market Share by Frequency, 2012 (Units)	39
Exhibit 21: Global LTE TRx Market Share by Frequency, 2011-2012 (Units)	40
Exhibit 22: Global LTE TRx Market Share by Duplex Mode, 2012 (Units)	40
Exhibit 23: Global LTE TRx Forecast 2013-2017, (% YoY Growth)	41
Exhibit 24: Global LTE TRx Forecast 2013-2017 (Units)	42
Exhibit 25: Global LTE TRx Forecast, Prior vs. Current, 2013-2017 (Units)	43
Exhibit 26: Global LTE TRx Forecast, FDD vs. TDD, 2013-2017 (Units)	43
Exhibit 27: Global LTE TRx Shipment Forecast by Frequency Band, 2013-2017 (Units)	45
Exhibit 28: TDD Frequency Bands, 1800-2700MHz	47
Exhibit 29: Comparison of 2012 LTE700 Bands 12/13/17 TRx Forecast vs. Actual Shipments	50
Exhibit 30: Global LTE700 Bands 12/13/17 TRx Shipments, 2011-2012 (Units)	50
Exhibit 31: Global LTE700 Bands 12/13 TRx Market Share, 2012 (Units)	51
Exhibit 32: Comparison of 2012 LTE800 Band 20 TRx Forecast vs. Actual Shipments	52
Exhibit 33: Global LTE800 Band 20 TRx Shipments, 2011-2012 (Units)	52
Exhibit 34: Global LTE800 Band 20 TRx Market Share, 2012 (Units)	53
Exhibit 35: Comparison of 2012 LTE850 Band 5 TRx Forecast vs. Actual Shipments	54
Exhibit 36: Global LTE850 Band 5 TRx Shipments, 2011-2012 (Units)	54
Exhibit 37: Global LTE850 Band 5 TRx Market Share, 2012 (Units)	55
Exhibit 38: Comparison of 2012 LTE1500 Band 11 TRx Forecast vs. Actual Shipments	56
Exhibit 39: Global LTE1500 Band 11 TRx Shipments, 2011-2012 (Units)	56
Exhibit 40: Global LTE1500 Band 11 TRx Market Share, 2012 (Units)	57
Exhibit 41: Comparison of 2012 LTE1700 Band 9 TRx Forecast vs. Actual Shipments	58
Exhibit 42: Global LTE1700 Band 9 TRx Shipments, 2011-2012 (Units)	58
Exhibit 43: Global LTE1700 Band 9 TRx Market Share, 2012 (Units)	59
Exhibit 44: Comparison of 2012 LTE1800 Band 3 TRx Forecast vs. Actual Shipments	60
Exhibit 45: Global LTE1800 Band 3 TRx Shipments, 2011-2012 (Units)	60
Exhibit 46: Global LTE1800 Band 3 TRx Market Share, 2012 (Units)	61
Exhibit 47: Comparison of 2012 LTE1900 Band 2/25 TRx Forecast vs. Actual Shipments	62
Exhibit 48: Global LTE1900 Band 2/25 TRx Shipments, 2011-2012 (Units)	62
Exhibit 49: Global LTE1900 Band 2/25 TRx Market Share, 2012 (Units)	63
Exhibit 50: Comparison of 2012 LTE2100 Band 1 TRx Forecast vs. Actual Shipments	64
Exhibit 51: Global LTE2100 Band 1 TRx Shipments, 2011-2012 (Units)	64
Exhibit 52: Global LTE2100 Band 1 TRx Market Share, 2012 (Units)	65
Exhibit 53: Comparison of 2012 LTE2100AWS Bands4/10 TRx Forecast vs. Actual Shipments	66
Exhibit 54: Global LTE2100AWS Bands4/10 TRx Shipments, 2011-2012 (Units)	66
Exhibit 55: Global LTE2100AWS Bands4/10 TRx Market Share, 2012 (Units)	67
Exhibit 56: Comparison of 2012 LTE2300 Band 40 TRx Forecast vs. Actual Shipments	68
Exhibit 57: Global LTE2300 Band 40 TRx Shipments, 2011-2012 (Units)	68
Exhibit 58: Global LTE2300 Band 40 TRx Market Share, 2012 (Units)	69
Exhibit 59: Comparison of 2012 LTE2600 Band 7 TRx Forecast vs. Actual Shipments	70
Exhibit 60: Global LTE2600 Band 7 TRx Shipments, 2011-2012 (Units)	70
Exhibit 61: Global LTE2600 Band 7 TRx Market Share, 2012 (Units)	71
Exhibit 62: Comparison of 2012 LTE2600 Band 41 TRx Forecast vs. Actual Shipments	72

Exhibit 63: Global LTE2600 Band 41 TRx Shipments, 2011-2012 (Units).....	72
Exhibit 64: Global LTE2600 Band 7 TRx Market Share, 2012 (Units).....	73
Exhibit 65: Global W-CDMA TRx Shipments, 2011-2012 (Units).....	75
Exhibit 66: Global W-CDMA TRx Market Share by OEM, 2012 (Units).....	76
Exhibit 67: Global W-CDMA TRx Market Share by Frequency, 2012 (Units).....	77
Exhibit 68: Global W-CDMA TRx Market Share by Frequency, 2011-2012 (Units).....	78
Exhibit 69: Global W-CDMA TRx Market Share, Chinese vs. ROW, 2011-2012 (Units).....	79
Exhibit 70: Global W-CDMA TRx Market Share, Chinese vs. ROW, 2012 (Units).....	79
Exhibit 71: Global W-CDMA TRx Shipment Forecast, 2013-2017, (% YoY Growth).....	80
Exhibit 72: Global W-CDMA TRx Shipment Forecast, 2013-2017 (Units).....	81
Exhibit 73: Global W-CDMA TRx Shipment Forecast, Prior vs. Current, 2013-2017 (Units).....	82
Exhibit 74: Global W-CDMA TRx Shipment Forecast, 2013-2017 (Units).....	83
Exhibit 75: Comparison of 2012 W-CDMA850 TRx Forecast vs. Actual Shipments.....	84
Exhibit 76: Global W-CDMA850 TRx Shipments, 2011-2012 (Units).....	85
Exhibit 77: Global W-CDMA850 TRx Market Share, 2012 (Units).....	85
Exhibit 78: Comparison of 2012 W-CDMA900 TRx Forecast vs. Actual Shipments.....	86
Exhibit 79: Global W-CDMA900 TRx Shipments, 2011-2012 (Units).....	87
Exhibit 80: Global W-CDMA900 TRx Market Share, 2012 (Units).....	87
Exhibit 81: Comparison of 2012 W-CDMA1900 TRx Forecast vs. Actual Shipments.....	88
Exhibit 82: Global W-CDMA1900 TRx Shipments, 2011-2012 (Units).....	89
Exhibit 83: Global W-CDMA1900 TRx Market Share, 2012 (Units).....	89
Exhibit 84: Comparison of 2012 W-CDMA2100 TRx Forecast vs. Actual Shipments.....	90
Exhibit 85: Global W-CDMA2100 TRx Shipments, 2011-2012 (Units).....	90
Exhibit 86: Global W-CDMA2100 TRx Market Share, 2012 (Units).....	91
Exhibit 87: Comparison of 2012 W-CDMA2100 AWS TRx Forecast vs. Actual Shipments.....	92
Exhibit 88: Global W-CDMA2100 AWS TRx Shipments, 2011-2012 (Units).....	93
Exhibit 89: Global W-CDMA2100 AWS TRx Market Share, 2012 (Units).....	93
Exhibit 90: Comparison of 2012 W-CDMA2100 JAPAN TRx Forecast vs. Actual Shipments.....	94
Exhibit 91: Global W-CDMA2100 JAPAN TRx Shipments, 2011-2012 (Units).....	94
Exhibit 92: Global W-CDMA2100 JAPAN TRx Market Share, 2012 (Units).....	95
Exhibit 93: Comparison of 2012 GSM TRx Forecast vs. Actual Shipments (Units).....	96
Exhibit 94: Global GSM TRx Shipments, 2011-2012 (Units).....	97
Exhibit 95: Global GSM TRx Market Share by OEM, 2012 (Units).....	98
Exhibit 96: Global GSM TRx Market Share by OEM Pro Forma, 2012 (Units).....	98
Exhibit 97: Global GSM TRx Market Share, Chinese vs. ROW, 2011-2012 (Units).....	99
Exhibit 98: Global GSM TRx Market Share, Chinese vs. ROW, 2012 (Units).....	100
Exhibit 99: Global GSM TRx Market Share by Frequency, 2012 (Units).....	101
Exhibit 100: Global GSM TRx Market Share by Frequency, 2011-2012 (Units).....	101
Exhibit 101: Global GSM TRx Shipment Forecast, 2013-2017, (% YoY Growth).....	102
Exhibit 102: Global GSM TRx Shipment Forecast, 2013-2017 (Units).....	103
Exhibit 103: Global GSM TRx Shipment Forecast, Prior vs. Current, 2013-2017 (Units).....	104
Exhibit 104: Global GSM TRx Shipment Forecast, 2013-2017 (Units).....	105
Exhibit 105: Global GSM TRx Forecast by Transceiver Technology, 2013-2017 (Units).....	107
Exhibit 106: Global GSM TRx Equivalent Forecast, 2013-2017 (Units).....	108
Exhibit 107: Comparison of 2012 GSM850 TRx Forecast vs. Actual Shipments (Units).....	109
Exhibit 108: Global GSM850 TRx Shipments, 2011-2012 (Units).....	109
Exhibit 109: Global GSM850 TRx Market Share, 2012 (Units).....	110
Exhibit 110: Comparison of 2012 GSM900 TRx Forecast vs. Actual Shipments (Units).....	111
Exhibit 111: Global GSM900 TRx Shipments, 2011-2012 (Units).....	111
Exhibit 112: Global GSM900 TRx Market Share, 2012 (Units).....	112
Exhibit 113: Comparison of 2012 GSM1800 TRx Forecast vs. Actual Shipments (Units).....	113
Exhibit 114: Global GSM1800 TRx Shipments, 2011-2012 (Units).....	113
Exhibit 115: Global GSM1800 TRx Market Share, 2012.....	114
Exhibit 116: Comparison of 2012 GSM1900 TRx Forecast vs. Actual Shipments (Units).....	115
Exhibit 117: Global GSM1900 TRx Shipments, 2011-2012 (Units).....	115
Exhibit 118: Global GSM1900 TRx Market Share, 2012 (Units).....	116
Exhibit 119: Comparison of 2012 CDMA2000 TRx Forecast vs. Actual Shipments (Units).....	117
Exhibit 120: Global CDMA2000 TRx Shipments, 2012-2012 (Units).....	118
Exhibit 121: Global CDMA2000 TRx Market Share by OEM, 2012 (Units).....	119
Exhibit 122: Global CDMA2000 TRx Market Share, Chinese vs. ROW, 2011-2012 (Units).....	120
Exhibit 123: Global CDMA2000 TRx Market Share, Chinese vs. ROW, 2012 (Units).....	120
Exhibit 124: Global CDMA2000 TRx Market Share by Frequency, 2012 (Units).....	121
Exhibit 125: Global CDMA2000 TRx Market Share by Frequency, 2011-2012 (Units).....	122

Exhibit 126: Global CDMA2000 TRx Shipment Forecast, 2013-2017 (% YoY Growth).....	123
Exhibit 127: Global CDMA2000 TRx Shipment Forecast, 2013-2017 (Units).....	124
Exhibit 128: Global CDMA2000 TRx Shipment Forecast, Prior vs. Current, 2013-2017 (Units).....	124
Exhibit 129: Global CDMA2000 TRx Shipment Forecast, 2013-2017 (Units).....	125
Exhibit 130: Comparison of 2012 CDMA450 TRx Forecast vs. Actual Shipments (Units)	126
Exhibit 131: Global CDMA450 TRx Shipments, 2012-2012 (Units).....	126
Exhibit 132: Global CDMA450 TRx Market Share, 2012 (Units)	127
Exhibit 133: Comparison of 2012 CDMA850 TRx Forecast vs. Actual Shipments (Units)	128
Exhibit 134: Global CDMA850 TRx Shipments, 2011-2012 (Units).....	128
Exhibit 135: Global CDMA850 TRx Market Share, 2012 (Units)	129
Exhibit 136: Comparison of 2012 CDMA1900 TRx Forecast vs. Actual Shipments (Units).....	130
Exhibit 137: Global CDMA1900 TRx Shipments, 2011-2012 (Units)	130
Exhibit 138: Global CDMA1900 TRx Market Share, 2012 (Units).....	131
Exhibit 139: Comparison of 2012 CDMA2100 TRx Forecast vs. Actual Shipments (Units).....	132
Exhibit 140: Global CDMA2100 TRx Shipments, 2011-2012 (Units)	132
Exhibit 141: Global CDMA2100 TRx Market Share, 2012 (Units).....	133
Exhibit 142: Global TRx Market Share by Region, 2012 (Units)	135
Exhibit 143: Global TRx Forecast by Region, 2017 (Units)	135
Exhibit 144: North & Latin America TRx Forecast by Region, 2013-2017 (Units)	139
Exhibit 145: Western & Eastern Europe TRx Forecast by Region, 2013-2017 (Units).....	142
Exhibit 146: Africa & Middle East TRx Forecast by Region, 2013-2017 (Units).....	144
Exhibit 147: Asia Pacific TRx Forecast, 2013-2017 (Units).....	148
Exhibit 148: Brazil/Russia/India/China TRx Market Share, 2012 (Units)	149
Exhibit 149: Brazil/Russia/India/China TRx Forecast, 2013-2017 (Units).....	150
Exhibit 150: Brazil TRx Shipment Forecast 2013-2017 (Units)	150
Exhibit 151: Russia TRx Shipment Forecast 2013-2017 (Units)	151
Exhibit 152: China TRx Shipment Forecast 2013-2017 (Units)	151
Exhibit 153: India TRx Shipment Forecast 2013-2017 (Units).....	152
Exhibit 154: China & India TRx Shipment Forecast 2013-2017 (Units)	152
Exhibit 155: Alcatel-Lucent TRx Shipments by Air Interface/Frequency, 2012 (Units)	158
Exhibit 156: Alcatel TRx Shipments by Air Interface/Frequency, 2012 (Units)	158
Exhibit 157: Lucent TRx Shipments by Air Interface/Frequency, 2012 (Units).....	159
Exhibit 158: Alcatel-Lucent TRx Shipments by Air Interface, 2012 (Units)	159
Exhibit 159: Alcatel TRx Shipments by Air Interface, 2012 (Units)	160
Exhibit 160: Lucent TRx Shipments by Air Interface, 2012 (Units).....	160
Exhibit 161: Ericsson TRx Shipments by Air Interface/Frequency, 2012 (Units).....	163
Exhibit 162: Ericsson TRx Shipments by Air Interface, 2012 (Units)	163
Exhibit 163: Huawei TRx Shipments by Air Interface/Frequency, 2012 (Units)	166
Exhibit 164: Huawei TRx Shipments by Air Interface, 2012 (Units).....	166
Exhibit 165: Nokia Siemens Networks TRx Shipments by Air Interface/Frequency, 2012 (Units)	171
Exhibit 166: Nokia TRx Shipments by Air Interface/Frequency, 2012 (Units)	172
Exhibit 167: Siemens TRx Shipments by Air Interface/Frequency, 2012 (Units)	172
Exhibit 168: Motorola TRx Shipments by Air Interface/Frequency, 2012 (Units)	173
Exhibit 169: Nokia Siemens Networks TRx Shipments by Air Interface, 2012 (Units)	173
Exhibit 170: ZTE TRx Shipments by Air Interface/Frequency, 2012 (Units).....	176
Exhibit 171: ZTE TRx Shipments by Air Interface, 2012 (Units)	176

EXECUTIVE SUMMARY

The global base station transceiver (TRx) market in 2012 declined compared to our forecast of a flat market. Total unit shipments across all air interfaces and frequency bands were 8.9 million for 2012, down 9.5% year over year. The migration from single carrier to multi-carrier GSM accounted for a majority of the unit decline.

How well did we do in our forecast from a year ago? Our goal is to be within +/-10% of our forecasts.

The good:

- We were correct in our overall forecast by being within +9.5%
- We were correct in predicting a market growth for CDMA and were off by -7.4%

The not so good:

- We did not account for any TD-SCDMA shipments in our prior forecast
- We were well off our GSM forecast by +46% because of how fast the transition from single carrier to multi-carrier GSM occurred
- We were off by -16% for the WCDMA market however if we include the LTE2100 shipments back into the WCDMA category, our predictions would have been absolutely correct and within 0.5%!
- We were off by +18% for LTE volumes but again, if we reallocated the LTE2100 units back to WCDMA, our forecast was within -4.4%!

A negative % variance means our forecast was higher than actual shipments while a positive % variance means our forecast was lower than actual shipments.

Overall, if we had to give ourselves an assessment, we believe we did a pretty good job in our overall forecast if the mix in WCDMA2100 and LTE2100 was re-allocated.

We continue to believe that many research reports attempt to quantify the overall wireless infrastructure base station equipment market in terms of monetary value. Analyzing the total economic impact of the global base station transceiver market is important but we continue to base the thesis of this report on the estimated unit shipments by each OEM. We believe that this approach continues to lead the market place in offering a deeper and more compelling understanding of the underlying currents of market share gains and losses across frequency bands and air interface standards within the industry.

In this ninth edition of the report, we continue to analyze both the combined and pro forma performance of Alcatel-Lucent and Nokia Siemens Networks+Motorola and have expanded our analysis for LTE.

2012 Review

After a terrible second half of 2011, the wireless infrastructure market was hopeful to see a bottom during the first half of 2012 and show signs of recovery by the second half. By the second quarter of 2012, it was quite clear that the Greek debt crisis was going to overshadow everything. Spending again was frozen as global economic markets braced for the potential sovereign debt default of Greece and uncertainty of the long term viability of the Euro.

Global wireless BTS TRx shipments ended down 9.5% year over year and posted negative growth for the second time in eleven years. The decline in 2011 was followed by a second year of negative growth.

For the past several years, we have been predicting a meltdown of the overall market in shipments due to GSM/EDGE technology transitioning to W-CDMA/HSPA+ and the emergence of LTE. The overall market decline was due to a larger decline in single carrier GSM/EDGE transceiver shipments that were not offset by W-CDMA/HSPA+ shipments and the ramping beginnings of LTE technology.

We can summarize 2012 as the year single mode air interface RF transceiver technology rapidly transitioned to multi-mode air interface RF transceiver technology and LTE technology firmly establishing itself. Multi-mode RF transceivers supporting a combination of GSM/EDGE/W-CDMA/HSPA+ and W-CDMA/HSPA+/LTE technologies rapidly replaced RF transceivers that only support a single air interface.

This conversion has made it more difficult to track actual usage of transceivers by technology. Historically, specific frequency bands have been correlated to air interfaces and mobile services such as GSM900 or GSM1800. We are able to continue to allocate certain air interface technologies by specific frequency bands by as time moves forward, the inclusion of different services on the same frequency band will make it nearly impossible to ensure that the unit shipments correlate to actual air interface usage.

In addition to the migration to multi-mode RF transceivers, GSM/EDGE technology fully transitioned away from single carrier technology to multi-carrier technology, giving way to a 2-3x negative conversion ratio of unit shipments. Mobile operators rapidly swapped out legacy GSM base stations utilizing dual single carrier RF transceiver modules. A legacy GSM base station required six dual carrier RF transceiver modules (12 total TRx) to support a 4+4+4 three sector configuration. This required an entire RF shelf within the base station. With multicarrier GSM/EDGE transceiver modules, the same 4+4+4 capacity could be supported with three RF transceiver modules, creating room in the existing GSM cabinet for three additional RF transceiver modules for extra capacity, another frequency band of operation or support of another air interface technology within the base station cabinet.




Expectations for LTE outside of North America was high in 2012 as auctions in Brazil, the UK, Romania, Denmark, the Netherlands, Croatia, Switzerland, Hong Kong and Malaysia continued the transition to 4G globally. We do note that a few auctions such as Columbia and Morocco were initially scheduled for 2012 but never made it.

We also note that the re-auction of 1800MHz spectrum in India was a complete failure in terms of revenues that were raised relative to Indian government expectations.

Total units shipped for 2012 were 8.9 million, down 9.5% from 2011. Shipments missed our forecast by 9.3%.

Our goal remains to stay within +/-10% of actual results relative to our forecast within the near term (12 months), however it is impossible to predict what the financial markets or political unrest may do to impact global cap ex spending or scheduled spectrum auctions.

The top suppliers by overall base station transceiver shipments as well as by air interface standards for 2012 were:

-  **Overall #1 TRx Supplier:** **Huawei Technologies**
-  **Overall #1 GSM TRx Supplier:** **Huawei Technologies**
-  **Overall #1 W-CDMA TRx Supplier:** **Huawei Technologies**
-  **Overall #1 CDMA TRx Supplier:** **ZTE**
-  **Overall #1 LTE TRx Supplier:** **Ericsson**

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