

ASIC Design Starts By Key End Market Application

August 2010

Study No. SC104-10

© Copyright Semico Research, 2010. All rights reserved.

Reproduction in whole or part is prohibited without the express written permission of Semico.

The contents of this report represent the interpretation and analysis of statistics and information that is generally available to the public or released by responsible agencies or individuals, but is not guaranteed as to its accuracy or completeness.

Table of Contents

Table of Contents	1
List of Tables	3
List of Figures.....	6
Preface.....	8
Executive Overview	9
Key End-Use Applications	10
ASIC Design Start Forecasts.....	12
Design Starts Definition.....	13
Changes in the SoC Design methodology.....	14
Definitions of SoC	16
Key Assumptions for ASIC Design Starts	17
ASIC Design Starts Market Information	19
Current Economic Conditions	24
Computer and Peripheral	27
Desktop Personal Computers	27
Notebook Computers	28
Netbook Computers	30
Tablet PCs.....	32
Color Laser Printers	34
Commercial Color Copiers	36
Personal Copiers	37
Multifunction Machines.....	39
Handheld POS Machines	41
Stationary POS.....	43
Color Inkjet Printers.....	45
NAS Appliance Servers	46
Caching Appliance Servers.....	48
Webhosting Appliance Servers.....	50
All-In-One Network Appliance Servers.....	51
Small Business Application Servers	53
Network Servers Under \$5K.....	55
Network Servers \$5K – \$15K.....	57
Network Servers Over \$15K.....	59
Workstations Under \$5K	60
Workstations \$5 – \$15K	62
Workstations Over \$15K	64
Fax Machines	65
Communications	67
Central Office Switches	67
PBX Switches	68
High-End Routers	70
Mid Range Routers	72
Low-End Routers	74
High-End Hubs	75

Mid-Range Hubs	77
Low-End Hubs	79
High-End Network Switches	80
Mid-Range Network Switches	82
Low-End Network Switches	83
ATM Switches	85
Basic Cell Phones	87
Mid Range Cell Phones.....	89
High End Cell Phones	91
Cellular Base Stations	93
Cable Modems	95
DSL Modems	97
WiMAX Base Stations.....	99
WiMax CPE.....	101
Consumer	104
Handheld Game Consoles.....	104
HDTVs.....	105
Set Top Boxes.....	107
VoIP PBX	109
Digital Still Cameras.....	111
Digital Video Cameras.....	113
MP3 Players	115
DVD Recorders.....	117
DVD Players	119
Video Game Consoles.....	121
E-readers	123
Digital Photo Frames	124
Portable Multimedia Players.....	126
Satellite Radio	128
GPS	130
Industrial	133
Robotic Control Systems	133
High-End ATE	134
Mid-Range ATE.....	136
Low-End ATE.....	138
Machine Tools	139
Automotive.....	141
Automotive Add-on Systems: Entertainment	141
Automotive GPS Systems.....	143
Commercial Vehicles.....	145
Vans / Minivans	147
High-End Passenger Cars.....	148
Mid-Range Passenger Cars	150
Low-End Passenger Cars	151
Summary.....	153

List of Tables

Table 1. Total Worldwide ASIC Design Starts	20
Table 2. Total Worldwide ASIC Unit Shipments (Millions).....	21
Table 3. Total Worldwide Identified ASIC Design Starts	22
Table 4. Total Worldwide Identified ASIC Unit Shipments (Millions)	23
Table 5. Desktop ASIC Design Starts	28
Table 6. Desktop ASIC Unit Shipments (Millions).....	28
Table 7. Notebook ASIC Design Starts.....	30
Table 8. Notebook ASIC Unit Shipments (Millions)	30
Table 9. Netbook ASIC Design Starts.....	31
Table 10. Netbook ASIC Unit Shipments (Millions)	32
Table 11. Tablet PC ASIC Design Starts.....	33
Table 12. Tablet PC ASIC Unit Shipments (Millions)	34
Table 13. Color Laser Printer ASIC Design Starts.....	35
Table 14. Color Laser Printer ASIC Unit Shipments (Millions)	35
Table 15. Commercial Color Copier ASIC Design Starts	37
Table 16. Commercial Color Copier ASIC Unit Shipments (Millions)	37
Table 17. Personal Copier ASIC Design Starts	38
Table 18. Personal Copier ASIC Unit Shipments (Millions)	39
Table 19. Multifunction Machine ASIC Design Starts.....	40
Table 20. Multifunction Machine ASIC Unit Shipments (Millions)	41
Table 21. Handheld POS ASIC Design Starts.....	42
Table 22. Handheld POS ASIC Unit Shipments (Millions)	43
Table 23. Stationary POS ASIC Design Starts.....	44
Table 24. Stationary POS ASIC Unit Shipments (Millions)	45
Table 25. Color Inkjet Printer ASIC Design Starts	46
Table 26. Color Inkjet Printer ASIC Unit Shipments (Millions)	46
Table 27. NAS Appliance Server ASIC Design Starts	48
Table 28. NAS Appliance Server ASIC Unit Shipments (Millions)	48
Table 29. Caching Appliance Server ASIC Design Starts.....	49
Table 30. Caching Appliance Server ASIC Unit Shipments (Millions)	50
Table 31. Webhosting Appliance Server ASIC Design Starts.....	51
Table 32. Webhosting Appliance Server ASIC Unit Shipments (Millions)	51
Table 33. All-In-One Network Appliance Server ASIC Design Starts	52
Table 34. All-In-One Network Appliance Server ASIC Unit Shipments (Millions).....	53
Table 35. Small Business Application Server ASIC Design Starts	54
Table 36. Small Business Application Server ASIC Unit Shipments (Millions)	55
Table 37. Network Server Under \$5K ASIC Design Starts.....	56
Table 38. Network Server Under \$5K ASIC Unit Shipments (Millions)	57
Table 39. Network Servers \$5K – \$15K ASIC Design Starts	58
Table 40. Network Servers \$5K – \$15K ASIC Unit Shipments (Millions).....	58
Table 41. Network Servers Over \$15K ASIC Design Starts	59
Table 42. Network Servers Over \$15K ASIC Unit Shipments (Millions)	60
Table 43. Workstations Under \$5K ASIC Design Starts.....	61
Table 44. Workstations Under \$5K ASIC Unit Shipments (Millions)	62
Table 45. Workstations \$5K – \$15K ASIC Design Starts.....	63
Table 46. Workstations \$5K – \$15K ASIC Unit Shipments (Millions)	63
Table 47. Workstations Over \$15K ASIC Design Starts.....	64
Table 48. Workstations Over \$15K ASIC Unit Shipments (Millions)	65
Table 49. Fax Machine ASIC Design Starts.....	66
Table 50. Fax Machine ASIC Unit Shipments (Millions)	66
Table 51. Central Office Switch ASIC Design Starts.....	68
Table 52. Central Office Switch ASIC Unit Shipments (Millions)	68
Table 53. PBX Switch ASIC Design Starts	69

Table 54. PBX Switch ASIC Unit Shipments (Millions)	70
Table 55. High-End Router ASIC Design Starts	71
Table 56. High-End Router ASIC Unit Shipments (Millions of Units).....	72
Table 57. Mid-Range Router ASIC Design Starts.....	73
Table 58. Mid-Range Router ASIC Unit Shipments (Millions)	73
Table 59. Low-End Router ASIC Design Starts.....	75
Table 60. Low-End Router ASIC Unit Shipments (Millions)	75
Table 61. High-End Hub ASIC Design Starts	76
Table 62. High-End Hub ASIC Unit Shipments (Millions)	77
Table 63. Mid-Range Hub ASIC Design Starts.....	78
Table 64. Mid-Range Hub ASIC Unit Shipments (Millions)	78
Table 65. Low-End Hub ASIC Design Starts.....	79
Table 66. Low-End Hub ASIC Unit Shipments (Millions)	80
Table 67. High-End Switch ASIC Design Starts	81
Table 68. High-End Switch ASIC Unit Shipments (Millions)	82
Table 69. Mid-Range Switch ASIC Design Starts	83
Table 70. Mid-Range Switch ASIC Unit Shipments (Millions).....	83
Table 71. Low-End Switch ASIC Design Starts.....	84
Table 72. Low-End Switch ASIC Unit Shipments (Millions).....	85
Table 73. ATM Switch ASIC Design Starts.....	86
Table 74. ATM Switch ASICs by Type (Millions)	87
Table 75. Basic Cell Phone ASIC Design Starts	88
Table 76. Basic Cell Phone ASIC Unit Shipments (Millions).....	89
Table 77. Mid Range Cell Phone Design Starts	90
Table 78. Mid Range Cell Phone ASICs by Type (Millions).....	91
Table 79. High End Cell Phone ASIC Design Starts	92
Table 80. High End Cell Phone ASIC Unit Shipments (Millions)	93
Table 81. Cellular Base Station ASIC Design Starts	95
Table 82. Cellular Base Station ASIC Unit Shipments (Millions)	95
Table 83. Cable Modem ASIC Design Starts	97
Table 84. Cable Modem ASIC Unit Shipments (Millions)	97
Table 85. DSL Modem Market ASIC Design Starts	98
Table 86. DSL Modem ASIC Unit Shipments (Millions)	99
Table 87. WiMAX Base Station ASIC Design Starts	100
Table 88. WiMAX Base Station ASIC Unit Shipments (Millions)	101
Table 89. WiMAX CPE ASIC Design Starts	102
Table 90. WiMAX CPE ASIC Unit Shipments (Millions).....	103
Table 91. Handheld Game Console ASIC Design Starts.....	105
Table 92. Handheld Game Console ASIC Unit Shipments (Millions)	105
Table 93. HDTV ASIC Design Starts.....	106
Table 94. HDTV ASIC Unit Shipments (Millions)	107
Table 95. Set Top Box ASIC Design Starts	108
Table 96. Set Top Box ASIC Unit Shipments (Millions)	109
Table 97. VoIP PBX ASIC Design Starts	110
Table 98. VoIP PBX ASIC Unit Shipments (Millions).....	111
Table 99. Digital Still Camera ASIC Design Starts.....	112
Table 100. Digital Still Camera ASIC Unit Shipments (Millions)	113
Table 101. Digital Video Camera ASIC Design Starts.....	114
Table 102. Digital Video Camera ASIC Unit Shipments (Millions)	115
Table 103. MP3 Player ASIC Design Starts.....	116
Table 104. MP3 Player ASIC Unit Shipments (Millions)	117
Table 105. DVD Recorder ASIC Design Starts	118
Table 106. DVD Recorder ASIC Unit Shipments (Millions).....	119
Table 107. DVD Player ASIC Design Starts.....	120
Table 108. DVD Player ASIC Unit Shipments (Millions)	121

Table 109. Video Game Console ASIC Design Starts	122
Table 110. Video Game Console ASIC Unit Shipments (Millions).....	123
Table 111. E-reader ASIC Design Starts.....	124
Table 112. E-reader ASIC Unit Shipments (Millions)	124
Table 113. Digital Photo Frame ASIC Design Starts	125
Table 114. Digital Photo Frame ASIC Unit Shipments (Millions)	126
Table 115. Portable Multimedia Player ASIC Design Starts.....	127
Table 116. Portable Multimedia Player ASIC Unit Shipments (Millions)	128
Table 117. Satellite Radio ASIC Design Starts	129
Table 118. Satellite Radio ASIC Unit Shipments (Millions)	130
Table 119. GPS ASIC Design Starts	131
Table 120. GPS ASIC Unit Shipments (Millions).....	132
Table 121. Robotic Control System ASIC Design Starts	134
Table 122. Robotic Control System ASIC Unit Shipments (Millions).....	134
Table 123. High-End ATE ASIC Design Starts	135
Table 124. High-End ATE ASIC Unit Shipments (Millions).....	136
Table 125. Mid-Range ATE ASIC Design Starts.....	137
Table 126. Mid-Range ATE ASIC Unit Shipments (Millions)	137
Table 127. Low-End ATE ASIC Design Starts.....	138
Table 128. Low-End ATE ASIC Unit Shipments (Millions)	139
Table 129. Machine Tool ASIC Design Starts	140
Table 130. Machine Tool ASIC Unit Shipments (Millions).....	140
Table 131. Automotive Entertainment System ASIC Design Starts	142
Table 132. Automotive Entertainment System ASIC Unit Shipments (Millions).....	142
Table 133. Automotive GPS ASIC Design Starts	144
Table 134. Automotive GPS ASIC Unit Shipments (Millions).....	145
Table 135. Commercial Vehicle ASIC Design Starts.....	146
Table 136. Commercial Vehicle ASIC Unit Shipments (Millions)	146
Table 137. Van / Minivan ASIC Design Starts	147
Table 138. Van / Minivan ASIC Unit Shipments (Millions)	148
Table 139. High-End Passenger Car ASIC Design Starts	149
Table 140. High-End Passenger Car ASIC Unit Shipments (Millions).....	149
Table 141. Mid-Range Passenger Car ASIC Design Starts.....	150
Table 142. Mid-Range Passenger Car ASIC Unit Shipments (Millions)	151
Table 143. Low-End Passenger Car ASIC Design Starts	152
Table 144. Low-End Passenger Car ASIC Unit Shipments (Millions)	152

List of Figures

Figure 1. Revised Complexity Definitions for SoCs	15
Figure 2. Total ASIC Design Starts	19
Figure 3. Total ASIC Units by Device Type	20
Figure 4. Total Worldwide Identified ASIC Design Starts by Application	21
Figure 5. Total Worldwide Identified ASIC Unit Volumes by Application Category	22
Figure 6. Original SoC Designs without Derivative Designs	25
Figure 7. Desktop ASIC Design Starts	27
Figure 8. Notebook ASIC Design Starts	29
Figure 9. Netbook Design Starts	31
Figure 10. Tablet PC ASIC Design Starts	33
Figure 11. Color Laser Printer ASIC Design Starts	34
Figure 12. Commercial Color Copier ASIC Design Starts	36
Figure 13. Personal Copier ASIC Design Starts	38
Figure 14. Multifunction Machine ASIC Design Starts	40
Figure 15. Handheld POS ASIC Design Starts	42
Figure 16. Stationary POS Market ASIC Design Starts	44
Figure 17. Color Inkjet Printer ASIC Design Starts	45
Figure 18. NAS Appliance Server ASIC Design Starts	47
Figure 19. Caching Appliance Server ASIC Design Starts	49
Figure 20. Webhosting Appliance Server ASIC Design Starts	50
Figure 21. All-In-One Network Appliance Server ASIC Design Starts	52
Figure 22. Small Business Application Server ASIC Design Starts	54
Figure 23. Network Server Under \$5K ASIC Design Starts	56
Figure 24. Network Servers \$5K – \$15K ASIC Design Starts	57
Figure 25. Network Servers Over \$15K ASIC Design Starts	59
Figure 26. Workstations Under \$5K ASIC Design Starts	61
Figure 27. Workstations \$5K – \$15K ASIC Design Starts	62
Figure 28. Workstations Over \$15K ASIC Design Starts	64
Figure 29. Fax Machine ASIC Design Starts	65
Figure 30. Central Office Switch ASIC Design Starts	67
Figure 31. PBX Switch ASIC Design Starts	69
Figure 32. High-End Router Market ASIC Design Starts	71
Figure 33. Mid-Range Router Market ASIC Design Starts	72
Figure 34. Low-End Router Market (Units/Dollars in Millions)	74
Figure 35. High-End Hub ASIC Design Starts	76
Figure 36. Mid-Range Hub ASIC Design Starts	77
Figure 37. Low-End Hub Design Starts	79
Figure 38. High-End Switch Market ASIC Design Starts	81
Figure 39. Mid-Range Switch Design Starts	82
Figure 40. Low-End Switch ASIC Design Starts	84
Figure 41. ATM Switch ASIC Design Starts	86
Figure 42. Basic Cell Phone ASIC Design Starts	88
Figure 43. Mid Range Cell Phone Market Design Starts	90
Figure 44. High End Cell Phone ASIC Design Starts	92
Figure 45. Cellular Base Station Market ASIC Design Starts	94
Figure 46. Cable Modem ASIC Design Starts	96
Figure 47. DSL Modem ASIC Design Starts	98
Figure 48. WiMAX Base Station ASIC Design Starts	100
Figure 49. WiMAX CPE ASIC Design Starts	102
Figure 50. Handheld Game Console ASIC Design Starts	104
Figure 51. HDTV ASIC Design Starts	106
Figure 52. Set Top Box ASIC Design Starts	108
Figure 53. VoIP PBX ASIC Design Starts	110

Figure 54. Digital Still Camera ASIC Design Starts	112
Figure 55. Digital Video Camera ASIC Design Starts	114
Figure 56. MP3 Player ASIC Design Starts	116
Figure 57. DVD Recorder ASIC Design Starts	118
Figure 58. DVD Player ASIC Design Starts	120
Figure 59. Video Game Console ASIC Design Starts	122
Figure 60. E-reader ASIC Design Starts.....	123
Figure 61. Digital Photo Frame ASIC Design Starts.....	125
Figure 62. Portable Multimedia Player ASIC Design Starts	127
Figure 63. Satellite Radio ASIC Design Starts.....	129
Figure 64. GPS ASIC Design Starts	131
Figure 65. Robotic Control System ASIC Design Starts.....	133
Figure 66. High-End ATE ASIC Design Starts	135
Figure 67. Mid-Range ATE ASIC Design Starts	136
Figure 68. Low-End ATE ASIC Design Starts.....	138
Figure 69. Machine Tool ASIC Design Starts.....	139
Figure 70. Automotive Entertainment System ASIC Design Starts	141
Figure 71. Automotive GPS ASIC Design Starts	144
Figure 72. Commercial Vehicle ASIC Design Starts	145
Figure 73. Van / Minivan ASIC Design Starts	147
Figure 74. High-End Passenger Car ASIC Design Starts	148
Figure 75. Mid-Range Passenger Car ASIC Design Starts.....	150
Figure 76. Low-End Passenger Car ASIC Design Starts.....	151