

# **The HetNet Ecosystem (Small Cells, Carrier Wi-Fi, C-RAN & DAS): 2017 – 2030 – Opportunities, Challenges, Strategies & Forecasts**

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## **Abstracts**

Driven by the growing demand for in-building wireless coverage and the huge influx of mobile data traffic, conventional macrocells alone are no longer deemed sufficient to handle the needs of today's wireless subscribers. In addition, the imminent adoption of centimeter and millimeter wave spectrum, to support higher data rates in 5G networks, necessitates the usage of much smaller cell sizes.

To cope with growing capacity and coverage requirements, mobile operators are significantly increasing their investments in a variety of Heterogeneous Network or HetNet infrastructure technologies such as strategically deployed small cells, carrier Wi-Fi and DAS (Distributed Antenna System) networks. Adding further to the heterogeneity is the shift towards C-RAN (Centralized RAN) architecture, where centralized baseband functionality is shared across a large number of distributed radio nodes to deliver benefits such as resource pooling, multi-cell coordination, network extensibility and energy efficiency.

SNS Research estimates that global investments on small cells, carrier Wi-Fi, C-RAN and DAS will reach more than \$15 Billion by the end of 2017, as mobile operators remain committed to tackle the continued growth of mobile data traffic and evolving coverage requirements. At present, the HetNet market is facing a paradigm shift with multiple advancements ranging from small cell virtualization and neutral hosting to the adoption of unlicensed and shared spectrum. In conjunction with 5G and LTE Advanced network rollouts, these advancements will fuel the market to grow at a CAGR of over 18% between 2017 and 2020.

The “HetNet Ecosystem (Small Cells, Carrier Wi-Fi, C-RAN & DAS): 2017 – 2030 –

Opportunities, Challenges, Strategies & Forecasts” report presents an in-depth assessment of the HetNet ecosystem including enabling technologies, key trends, market drivers, challenges, standardization, regulatory landscape, deployment models, use cases, vertical markets, service provider case studies, opportunities, future roadmap, value chain, ecosystem player profiles and strategies. The report also presents forecasts for HetNet infrastructure investments from 2017 till 2030. The forecasts cover 6 individual submarkets and 6 regions.

The report comes with an associated Excel datasheet suite covering quantitative data from all numeric forecasts presented in the report.

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- 11.12 Artemis Networks
- 11.13 Aselan
- 11.14 Askey Computer Corporation
- 11.15 ASOCS
- 11.16 Athonet
- 11.17 AttoCore
- 11.18 Baicells Technologies
- 11.19 Brocade Communications Systems
- 11.20 Casa Systems
- 11.21 CCN (Cirrus Core Networks)
- 11.22 cellXica
- 11.23 CND (Core Network Dynamics)
- 11.24 Collinear Networks
- 11.25 Contela
- 11.26 CS Corporation
- 11.27 Delta Electronics
- 11.28 Druid Software
- 11.29 EION Wireless
- 11.30 Expeto Wireless
- 11.31 Facebook
- 11.32 Fairwaves
- 11.33 Fujian Sunnada Network Technology
- 11.34 Gemtek Technology
- 11.35 GENBAND
- 11.36 General Dynamics Mission Systems
- 11.37 GIKO GROUP Telecomunicaciones
- 11.38 Google
- 11.39 Guangzhou Iplook Technologies
- 11.40 GWT (Global Wireless Technologies)
- 11.41 Harris Corporation
- 11.42 Hitachi
- 11.43 IDY Corporation
- 11.44 InnoWireless
- 11.45 ip.access
- 11.46 JRC (Japan Radio Company)
- 11.47 Juni Global
- 11.48 Kleos

11.49 Lemko Corporation  
11.50 LGS Innovations  
11.51 Luminate Wireless  
11.52 Mavenir Systems  
11.53 MitraStar Technology Corporation  
11.54 Moseley Associates  
11.55 Netas  
11.56 New Postcom Equipment  
11.57 NewNet Mobile Communications  
11.58 NuRAN Wireless  
11.59 Oceus Networks  
11.60 Omoco  
11.61 OpenCell  
11.62 Panda Electronics Group  
11.63 Parallel Wireless  
11.64 Phluido  
11.65 PMN (Private Mobile Networks)  
11.66 Polaris Networks  
11.67 Potevio  
11.68 Quanta Computer  
11.69 Qucell  
11.70 Quortus  
11.71 Range Networks  
11.72 Redline Communications  
11.73 Sagemcom  
11.74 Samji Electronics  
11.75 SerComm Corporation  
11.76 SiRRAN Communications  
11.77 Sistelbanda  
11.78 SITRONICS  
11.79 SK Telesys  
11.80 Sonus Networks  
11.81 Sooktha  
11.82 SpiderCloud Wireless  
11.83 Star Solutions  
11.84 Starry  
11.85 Technicolor  
11.86 Tecom  
11.87 Tecore Networks

- 11.88 TEKTELIC Communications
- 11.89 Telrad Networks
- 11.90 Telum
- 11.91 Tropico
- 11.92 Vanu
- 11.93 VNL (Vihaan Networks Limited)
- 11.94 WNC (Wistron NeWeb Corporation)
- 11.95 WTL (World Telecom Labs)
- 11.96 Wytec International
- 11.97 Z-Com

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- 12.1 AAS (Amphenol Antenna Solutions)
- 12.2 Ace Technologies Corporation
- 12.3 AceAxis
- 12.4 ACOME
- 12.5 ADRF (Advanced RF Technologies)
- 12.6 Alpha Wireless
- 12.7 American Tower Corporation
- 12.8 Anertai Communications
- 12.9 Arqiva
- 12.10 Bird Technologies
- 12.11 Black Box Corporation
- 12.12 BlueWaveTel
- 12.13 Boomsense/Bangxun Technology
- 12.14 BTI Wireless
- 12.15 CCI (Communication Components, Inc.)
- 12.16 CCI Systems
- 12.17 Cellcomm Solutions
- 12.18 CellMax Technologies
- 12.19 Cellnex Telecom
- 12.20 Cobham Wireless
- 12.21 Comba Telecom
- 12.22 CommScope
- 12.23 Comtech Korea
- 12.24 Corning
- 12.25 Crown Castle International Corporation

- 12.26 Dali Wireless
- 12.27 DENGYO (Nihon Dengyo Kosaku)
- 12.28 DYNE TECH
- 12.29 Eahison Communication
- 12.30 Ethertronics
- 12.31 ExteNet Systems
- 12.32 Filtronic
- 12.33 Foshan Anderson Communication Equipment
- 12.34 Foxcom
- 12.35 Frog Cellsat
- 12.36 Fujian Helios Technologies
- 12.37 Galtronics Corporation
- 12.38 Gamma Nu
- 12.39 Goodman Networks
- 12.40 GRENTECH
- 12.41 Hansen Technology
- 12.42 Hefei Maniron Electronic and Technology
- 12.43 Hilinks Technology
- 12.44 HUBER+SUHNER
- 12.45 Impower Technology
- 12.46 Innertron
- 12.47 Jiangsu Hengxin Technology
- 12.48 Jiangsu Zhengkai Electronics Technology
- 12.49 JMA Wireless
- 12.50 JQL Electronics
- 12.51 Kaelus
- 12.52 Kathrein-Werke KG
- 12.53 Kisan Telecom
- 12.54 KMW
- 12.55 Maven Wireless
- 12.56 MER Group
- 12.57 Microlab
- 12.58 MTI (Microelectronics Technology, Inc.)
- 12.59 MTI Wireless Edge
- 12.60 Nextivity
- 12.61 OFS
- 12.62 OZC (Optical Zonu Corporation)
- 12.63 Panorama Antennas
- 12.64 Raycap

12.65 RF MORECOM KOREA  
12.66 RF Window  
12.67 RFS (Radio Frequency Systems)  
12.68 Rosenberger  
12.69 R-TRON  
12.70 Seontech  
12.71 Shared Access  
12.72 Shenzhen Huaptec  
12.73 Shyam Telecom  
12.74 Skybird Electronic Science & Technology  
12.75 SOLiD  
12.76 Sumitomo Electric Industries  
12.77 Sunwave Solutions  
12.78 Suzhou Hexagon Communication Technologies  
12.79 Telnet Redes Inteligentes  
12.80 TESSCO Technologies  
12.81 Westell Technologies  
12.82 Wevercomm  
12.83 Wilson Electronics  
12.84 Wuhan Fingu Electronic Technology  
12.85 Wuhan Gewei Electronic Technologies  
12.86 Zinwave

### **13 CHAPTER 13: CARRIER WI-FI SPECIALISTS**

13.1 4ipnet  
13.2 ABB  
13.3 Accuris Networks  
13.4 Aerohive Networks  
13.5 Altai Technologies  
13.6 Alvarion Technologies  
13.7 Aptilo Networks  
13.8 Aruba Networks  
13.9 Autelan  
13.10 BandwidthX  
13.11 Browan Communications  
13.12 BSG Wireless  
13.13 Carnegie Technologies  
13.14 D-Link Corporation

- 13.15 Edgewater Wireless Systems
- 13.16 Firetide
- 13.17 Fortinet
- 13.18 GoNet Systems
- 13.19 Handlink Technologies
- 13.20 Kyrio
- 13.21 LigoWave
- 13.22 Linksys
- 13.23 Mojo Networks
- 13.24 NETGEAR
- 13.25 Nomadix
- 13.26 Ruckus Wireless
- 13.27 Senao Networks
- 13.28 Smith Micro Software
- 13.29 Syniverse Technologies
- 13.30 TP-LINK Technologies
- 13.31 Tranzeo Wireless Technologies
- 13.32 TruConnect Technologies
- 13.33 Ubiquiti Networks
- 13.34 Zyxel Communications Corporation

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- 14.1 6WIND
- 14.2 Accedian Networks
- 14.3 Accelink Technologies Corporation
- 14.4 Accuver
- 14.5 ADI (Analog Devices Inc.)
- 14.6 ADLINK Technology
- 14.7 Advantech
- 14.8 Affarii Technologies
- 14.9 Airgain
- 14.10 AirHop Communications
- 14.11 Airrays
- 14.12 AKM (Asahi Kasei Microdevices Corporation)
- 14.13 Akoustis Technologies
- 14.14 ALBEDO Telecom
- 14.15 Allot Communications
- 14.16 Altran



- 14.17 Amarisoft
- 14.18 Amdocs
- 14.19 Anritsu Corporation
- 14.20 Aquantia Corporation
- 14.21 Aricent
- 14.22 ARM Holdings
- 14.23 Artesyn Embedded Technologies
- 14.24 Artiza Networks
- 14.25 Astellia
- 14.26 ASTRI (Hong Kong Applied Science and Technology Research Institute)
- 14.27 ATDI
- 14.28 Azcom Technology
- 14.29 Benetel
- 14.30 Blu Wireless Technology
- 14.31 Blue Danube Systems
- 14.32 BoostEdge
- 14.33 Broadcom
- 14.34 C Squared Systems
- 14.35 Cadence Design Systems
- 14.36 Cambridge Consultants
- 14.37 Cavium
- 14.38 CeedTec
- 14.39 CellMining
- 14.40 Cellwize Wireless Technologies
- 14.41 CelPlan Technologies
- 14.42 Celtro
- 14.43 CEVA
- 14.44 Clavister
- 14.45 Cohere Technologies
- 14.46 Coherent Logix
- 14.47 Collision Communications
- 14.48 Comcores
- 14.49 CommAgility
- 14.50 Creanord
- 14.51 D2 Technologies
- 14.52 Dell Technologies
- 14.53 DigitalGlobe
- 14.54 Direct Beam
- 14.55 eASIC Corporation

- 14.56 EDX Wireless
- 14.57 ENENSYS Technologies
- 14.58 Eoptolink Technology
- 14.59 Ercom
- 14.60 Ethernity Networks
- 14.61 ETRI (Electronics & Telecommunications Research Institute, South Korea)
- 14.62 EXFO
- 14.63 Expway
- 14.64 Faraday Technology Corporation
- 14.65 Federated Wireless
- 14.66 Finisar Corporation
- 14.67 Flash Networks
- 14.68 Flex Logix Technologies
- 14.69 Forsk
- 14.70 Fraunhofer FOKUS (Institute for Open Communication Systems)
- 14.71 Fraunhofer HHI (Heinrich Hertz Institute)
- 14.72 Furuno Electric
- 14.73 Galgus
- 14.74 GenXComm
- 14.75 GigaLight
- 14.76 GlobalFoundries
- 14.77 HCL Technologies
- 14.78 Hisense
- 14.79 HPE (Hewlett Packard Enterprise)
- 14.80 IBM Corporation
- 14.81 iBwave Solutions
- 14.82 IDT (Integrated Device Technology)
- 14.83 IM Technology
- 14.84 Imec International
- 14.85 Infineon Technologies
- 14.86 InfoVista
- 14.87 InnoLight Technology
- 14.88 Intel Corporation
- 14.89 InterDigital
- 14.90 IP Light
- 14.91 iPosi
- 14.92 IS-Wireless
- 14.93 ITRI (Industrial Technology Research Institute, Taiwan)
- 14.94 Juniper Networks

- 14.95 Keima
- 14.96 Keysight Technologies
- 14.97 Koonsys Radiocommunications
- 14.98 Kumu Networks
- 14.99 Lattice Semiconductor
- 14.100 Lime Microsystems
- 14.101 Linker Networks
- 14.102 Lumentum
- 14.103 LuxCarta
- 14.104 MACOM Technology Solutions Holdings
- 14.105 Maja Systems
- 14.106 Mathworks
- 14.107 Maxim Integrated
- 14.108 MaxLinear
- 14.109 Mellanox Technologies
- 14.110 Microsemi Corporation
- 14.111 Mitsubishi Electric Corporation
- 14.112 Mobiveil
- 14.113 Molex
- 14.114 Mosaik
- 14.115 Multiwave Sensors
- 14.116 N.A.T.
- 14.117 Nash Technologies
- 14.118 Netonomics
- 14.119 NETSCOUT Systems
- 14.120 NI (National Instruments)
- 14.121 Node-H
- 14.122 Nomor Research
- 14.123 NXP Semiconductors
- 14.124 Octasic
- 14.125 OE Solutions
- 14.126 Optulink
- 14.127 P.I. Works
- 14.128 Panasonic Corporation
- 14.129 Peraso Technologies
- 14.130 Plasma Antennas
- 14.131 Pletronics
- 14.132 Polystar
- 14.133 PRISMA Telecom Testing

- 14.134 Procera Networks
- 14.135 pureLiFi
- 14.136 Qorvo
- 14.137 Qualcomm
- 14.138 Qulsar
- 14.139 Qwilt
- 14.140 RADCOM
- 14.141 Radio Gigabit
- 14.142 Radisys Corporation
- 14.143 Rakon
- 14.144 Ranplan Wireless Network Design
- 14.145 Red Hat
- 14.146 RED Technologies
- 14.147 RF DSP
- 14.148 Rivada Networks
- 14.149 Rohde & Schwarz
- 14.150 Saguna Networks
- 14.151 SAI Technology
- 14.152 Sarokal Test Systems
- 14.153 SAT (Smart Antenna Technologies)
- 14.154 Sevis Systems
- 14.155 SevOne
- 14.156 Silicon Labs (Silicon Laboratories)
- 14.157 SIRADEL
- 14.158 Sivers IMA
- 14.159 Skyworks Solutions
- 14.160 Source Photonics
- 14.161 Space Data Corporation
- 14.162 SRS (Software Radio Systems)
- 14.163 STMicroelectronics
- 14.164 Tata Elxsi
- 14.165 Tech Mahindra
- 14.166 TEOCO Corporation
- 14.167 TI (Texas Instruments)
- 14.168 Tieto Corporation
- 14.169 TSMC (Taiwan Semiconductor Manufacturing Company)
- 14.170 TTP (The Technology Partnership)
- 14.171 Tulinx
- 14.172 U-blox

14.173 Vasona Networks  
14.174 Vectron International  
14.175 Vencore Labs  
14.176 Viavi Solutions  
14.177 Virtuosys  
14.178 VMware  
14.179 WiPro  
14.180 Wireless Telecom Group  
14.181 WiSig Networks  
14.182 XCellAir  
14.183 Xelic  
14.184 Xilinx

## **15 CHAPTER 15: MOBILE BACKHAUL & FRONTHAUL SOLUTION PROVIDERS**

15.1 3Roam  
15.2 4RF  
15.3 Actelis Networks  
15.4 Actiontec Electronics  
15.5 Actus Networks  
15.6 ADTRAN  
15.7 ADVA Optical Networking  
15.8 Advantech Wireless  
15.9 ALAXALA Networks Corporation  
15.10 Albis-Elcon  
15.11 ALCOMA  
15.12 Allied Data Technologies  
15.13 Allied Telesis  
15.14 APRESIA Systems  
15.15 ARRIS International  
15.16 Avanti Communications Group  
15.17 Aviat Networks  
15.18 AVM (AVM Computersysteme Vertriebs)  
15.19 BluWan  
15.20 BridgeWave Communications  
15.21 CableFree (Wireless Excellence)  
15.22 Calix  
15.23 Cambium Networks  
15.24 Canoga Perkins Corporation

- 15.25 Carlson Wireless Technologies
- 15.26 CarrierComm
- 15.27 CBNL (Cambridge Broadband Networks Ltd.)
- 15.28 CCS (Cambridge Communication Systems)
- 15.29 Ceragon Networks
- 15.30 Cielo Networks
- 15.31 Ciena Corporation
- 15.32 Comtech EF Data Corporation
- 15.33 Comtrend Corporation
- 15.34 Corecess
- 15.35 Coriant
- 15.36 DASAN Zhong Solutions
- 15.37 DragonWave
- 15.38 E-Band Communications
- 15.39 EBLink
- 15.40 ECI Telecom
- 15.41 Ekinops
- 15.42 ELVA-1
- 15.43 Eutelsat Communications
- 15.44 Exalt Wireless
- 15.45 Extreme Networks
- 15.46 FastBack Networks
- 15.47 FibroLan
- 15.48 Furukawa Electric Group
- 15.49 Genmix Technology
- 15.50 Gilat Satellite Networks
- 15.51 HFR
- 15.52 Huahuan
- 15.53 Hughes Network Systems
- 15.54 HXI
- 15.55 InCoax
- 15.56 Infinera
- 15.57 InfiNet Wireless
- 15.58 Inmarsat
- 15.59 Intelsat
- 15.60 Intracom Telecom
- 15.61 IPITEK
- 15.62 Iskratel
- 15.63 KEYMILE

- 15.64 Ligado Networks
- 15.65 LightPointe Communications
- 15.66 Lindsay Broadband
- 15.67 Loea Corporation
- 15.68 MAX4G
- 15.69 Microwave Networks
- 15.70 MIMOtech
- 15.71 MRV Communications
- 15.72 Nexcomm Systems
- 15.73 NexxCom Wireless
- 15.74 Omnitron Systems
- 15.75 OneAccess Networks
- 15.76 OneWeb
- 15.77 Patton Electronics
- 15.78 Polewall
- 15.79 Positron
- 15.80 Proxim Wireless Corporation
- 15.81 RACOM
- 15.82 RAD Data Communications
- 15.83 RADWIN
- 15.84 Raisecom
- 15.85 REMEC Broadband Wireless Networks
- 15.86 SAF Tehnika
- 15.87 SES
- 15.88 Shyam Networks
- 15.89 SIAE Microelectronica
- 15.90 Siklu Communication
- 15.91 SkyFiber
- 15.92 SMC Networks
- 15.93 Solectek Corporation
- 15.94 Spectronite
- 15.95 Star Microwave
- 15.96 Tarana Wireless
- 15.97 Telco Systems
- 15.98 Tellion
- 15.99 Tellumat
- 15.100 Telsey
- 15.101 Thuraya Telecommunications Company
- 15.102 Tilgin



- 15.103 Trango Systems
- 15.104 Transition Networks
- 15.105 Ubiquoss
- 15.106 UTStarcom
- 15.107 ViaSat
- 15.108 VT iDirect
- 15.109 Vubiq Networks
- 15.110 Wave1
- 15.111 Wavesight
- 15.112 XAVi Technologies Corporation
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## **LIST OF COMPANIES MENTIONED**

3GPP (3rd Generation Partnership Project)

3GPP2 (3rd Generation Partnership Project 2)

3Roam

4ipnet

4RF

6Harmonics  
6WIND  
AAS (Amphenol Antenna Solutions)  
ABB  
Accedian Networks  
Accelink Technologies Corporation  
Accelleran  
Accuris Networks  
Accuver  
Ace Technologies Corporation  
AceAxis  
ACOME  
Actelis Networks  
Actiontec Electronics  
Actus Networks  
Adax  
ADB  
ADI (Analog Devices Inc.)  
ADLINK Technology  
ADRF (Advanced RF Technologies)  
ADTRAN  
ADVA Optical Networking  
Advantech  
Advantech Wireless  
Aerohive Networks  
AeroMobile  
Affarii Technologies  
Affirmed Networks  
Agema Systems  
Airgain  
AirHop Communications  
Air-Lynx  
Airrays  
Airspan Networks  
AKM (Asahi Kasei Microdevices Corporation)  
Akoustis Technologies  
ALAXALA Networks Corporation  
ALBEDO Telecom  
Albis-Elcon



ALCOMA  
Allied Data Technologies  
Allied Telesis  
Allot Communications  
Alpha Networks  
Alpha Wireless  
Alphabet  
Altai Technologies  
AltioStar Networks  
Altran  
Alvarion Technologies  
Amarisoft  
Amdocs  
America Movil Group  
American Tower Corporation  
Anertai Communications  
Anritsu Corporation  
APRESIA Systems  
Aptilo Networks  
Aquantia Corporation  
Arcadyan Technology Corporation  
Argela  
ARIB (Association of Radio Industries and Businesses, Japan)  
Aricent  
ARM Holdings  
Arqiva  
ARRIS International  
Artemis Networks  
Artesyn Embedded Technologies  
Artiza Networks  
Aruba Networks  
Aselan  
Askey Computer Corporation  
ASOCS  
Astellia  
ASTRI (Hong Kong Applied Science and Technology Research Institute)  
AT&T  
ATDI  
Athonet

ATIS (U.S. Alliance for Telecommunications Industry Solutions)

AttoCore

Autelan

Avanti Communications Group

Aviat Networks

AVM (AVM Computersysteme Vertriebs)

Axiata Group

Axxcelera Broadband Wireless

Azcom Technology

Baicells Technologies

BandwidthX

BATM Advanced Communications

Baylin Technologies

Beeline

Belkin International

Benetel

Bharti Airtel

Bird Technologies

Black Box Corporation

BLiNQ Networks

Blu Wireless Technology

Blue Danube Systems

BlueWaveTel

BluWan

Boingo Wireless

Boomsense/Bangxun Technology

BoostEdge

BridgeWave Communications

Broadband Forum

Broadcom

Brocade Communications Systems

Browan Communications

BSG Wireless

BT Group

BTI Wireless

C Squared Systems

CableFree (Wireless Excellence)

CableLabs

Cadence Design Systems

Calix  
Cambium Networks  
Cambridge Consultants  
Canoga Perkins Corporation  
Carlson Wireless Technologies  
Carnegie Technologies  
CarrierComm  
Casa Systems  
Cavium  
CBNL (Cambridge Broadband Networks Ltd.)  
CBRS Alliance  
CCA (Competitive Carriers Association)  
CCI (Communication Components, Inc.)  
CCI (Competitive Companies, Inc.)  
CCI Systems  
CCN (Cirrus Core Networks)  
CCS (Cambridge Communication Systems)  
CCSA (China Communications Standards Association)  
CeedTec  
Cellcom (New-Cell)  
Cellcomm Solutions  
CellMax Technologies  
CellMining  
Cellnex Telecom  
Cellular One  
Cellwize Wireless Technologies  
cellXica  
CelPlan Technologies  
Celtro  
Ceragon Networks  
CEVA  
China Mobile  
China Telecom  
China Unicom  
Chunghwa Telecom  
Cielo Networks  
Ciena Corporation  
Cisco Systems  
Clavister

ClearSky Technologies  
Cloudberry Mobile  
CND (Core Network Dynamics)  
Cobham Wireless  
Cohere Technologies  
Coherent Logix  
Collinear Networks  
Collision Communications  
Colt Technology Services Group  
Comba Telecom  
Comcores  
CommAgility  
CommScope  
Comtech EF Data Corporation  
Comtech Korea  
Comtech Telecommunications Corporation  
Comtrend Corporation  
Contela  
Corecess  
Coriant  
Corning  
Cox Communications  
CPqD (Center for Research and Development in Telecommunications, Brazil)  
Creanord  
Crown Castle International Corporation  
CS Corporation  
CTIA  
D2 Technologies  
Dali Wireless  
DASAN Zhong Solutions  
Datang Mobile  
Datang Telecom  
Dell Technologies  
Delta Electronics  
DENGYO (Nihon Dengyo Kosaku)  
DigitalGlobe  
Direct Beam  
D-Link Corporation  
DragonWave

Druid Software  
DSA (Dynamic Spectrum Alliance)  
DT (Deutsche Telekom)  
DYNE TECH  
Eahison Communication  
eASIC Corporation  
E-Band Communications  
EBlink  
EchoStar Corporation  
ECI Telecom  
Edgewater Wireless Systems  
EDX Wireless  
EION Wireless  
Ekinops  
ELVA-1  
Endaga  
ENENSYS Technologies  
Eoptolink Technology  
Ercom  
Ericsson  
Ethernity Networks  
Ethertronics  
ETRI (Electronics & Telecommunications Research Institute, South Korea)  
ETSI (European Telecommunications Standards Institute)  
Eutelsat Communications  
EVOLVE  
Exalt Wireless  
EXFO  
Expeto Wireless  
Expway  
ExteNet Systems  
Extreme Networks  
Facebook  
Fairwaves  
Faraday Technology Corporation  
FastBack Networks  
FCC (U.S. Federal Communications Commission)  
Federated Wireless  
FiberHome Technologies

FibroLan  
Filtronic  
Finisar Corporation  
Firetide  
Flash Networks  
Flex Logix Technologies  
Fon  
Forsk  
Fortinet  
Foshan Anderson Communication Equipment  
Foxcom  
Fraunhofer FOKUS (Institute for Open Communication Systems)  
Fraunhofer HHI (Heinrich Hertz Institute)  
Frog Cellsat  
Fujian Helios Technologies  
Fujian Sunnada Network Technology  
Fujitsu  
Furukawa Electric Group  
Furuno Electric  
Galgus  
Galtronics Corporation  
Gamma Nu  
GCI (General Communication, Inc.)  
Gemtek Technology  
GENBAND  
General Dynamics Mission Systems  
Genmix Technology  
GenXComm  
GigaLight  
GIKO GROUP Telecomunicaciones  
Gilat Satellite Networks  
Global Invacom Group  
GlobalFoundries  
GoNet Systems  
Goodman Networks  
Google  
GRENTech  
GSMA  
GTI

Guangzhou Iplook Technologies  
GWT (Global Wireless Technologies)  
Handlink Technologies  
Hansen Technology  
Harris Corporation  
HCL Technologies  
Hefei Maniron Electronic and Technology  
HetNet Forum  
HFR  
Hilinks Technology  
Hisense  
Hitachi  
HPE (Hewlett Packard Enterprise)  
Huahuan  
Huawei  
HUBER+SUHNER  
Hughes Network Systems  
HXI  
IBM Corporation  
iBwave Solutions  
IDT (Integrated Device Technology)  
IDY Corporation  
IEEE (Institute of Electrical and Electronics Engineers)  
IM Technology  
Imec International  
Impower Technology  
InCoax  
Infineon Technologies  
Infinera  
InfiNet Wireless  
Infinite Electronics  
InfoVista  
Inmarsat  
Innertron  
InnoLight Technology  
InnoWireless  
Intel Corporation  
Intelsat  
InterDigital

Intracom Telecom  
IP Light  
ip.access  
IPITEK  
iPosi  
Iskratel  
IS-Wireless  
ITRI (Industrial Technology Research Institute, Taiwan)  
ITU (International Telecommunications Union)  
Jiangsu Hengxin Technology  
Jiangsu Zhengkai Electronics Technology  
JMA Wireless  
JQL Electronics  
JRC (Japan Radio Company)  
Juni Global  
Juniper Networks  
Kaelus  
Kathrein-Werke KG  
KDDI Corporation  
Keima  
KEYMILE  
Keysight Technologies  
Kisan Telecom  
Kleos  
KMW  
Knowles Corporation  
Koonsys Radiocommunications  
KPN  
KT Corporation  
Kumu Networks  
Kyrio  
Lattice Semiconductor  
Lemko Corporation  
LG Uplus  
LGS Innovations  
Ligado Networks  
LightPointe Communications  
LigoWave  
Lime Microsystems



Lindsay Broadband  
Linker Networks  
Linksys  
Lockheed Martin Corporation  
Loea Corporation  
LTE-U Forum  
Lumentum  
Luminate Wireless  
Luminet  
LuxCarta  
MACOM Technology Solutions Holdings  
Maja Systems  
Mathworks  
Maven Wireless  
Mavenir Systems  
MAX4G  
Maxim Integrated  
MaxLinear  
McWane  
MDG (Mobility Development Group)  
MEF (Metro Ethernet Forum)  
MegaFon  
Mellanox Technologies  
MER Group  
Microlab  
Microsemi Corporation  
Microwave Networks  
MIMOon  
MIMOftech  
MitraStar Technology Corporation  
Mitsubishi Electric Corporation  
Mitsubishi Group  
Mobiveil  
Mojo Networks  
Molex  
Mosaik  
Moseley Associates  
MRV Communications  
MTI (Microelectronics Technology, Inc.)

MTI Wireless Edge  
MTS (Mobile TeleSystems)  
MulteFire Alliance  
Multiwave Sensors  
N.A.T.  
Nash Technologies  
NEC Corporation  
Netas  
NETGEAR  
Netonomics  
NETSCOUT Systems  
New Postcom Equipment  
NewNet Mobile Communications  
Nexcomm Systems  
Nextivity  
NexxCom Wireless  
NGMN (Next Generation Mobile Networks) Alliance  
NI (National Instruments)  
Node-H  
Nokia  
Nokia Networks  
Nokia Technologies  
Nomadix  
Nomor Research  
NTT DoCoMo  
NuRAN Wireless  
Nutaq Innovation  
NXP Semiconductors  
O3b Networks  
Oceus Networks  
Octasic  
OE Solutions  
OFS  
Omnitron Systems  
Omoco  
ON.Lab (Open Networking Lab)  
OneAccess Networks  
OneWeb  
ONF (Open Networking Foundation)

OpenCell  
Optulink  
Optus  
Orange  
OSA (OpenAirInterface Software Alliance)  
OZC (Optical Zonu Corporation)  
P.I. Works  
Panasonic Avionics Corporation  
Panasonic Corporation  
Panda Electronics Group  
Panorama Antennas  
Parallel Wireless  
Patton Electronics  
Peraso Technologies  
Phluido  
Plasma Antennas  
Pletronics  
PMN (Private Mobile Networks)  
Polaris Networks  
Polewall  
Polystar  
Positron  
Potevio  
PRISMA Telecom Testing  
Procera Networks  
Proxim Wireless Corporation  
pureLiFi  
Qorvo  
Qualcomm  
Quanta Computer  
Qucell  
Qulsar  
Quortus  
Qwilt  
RACOM  
RAD Data Communications  
RADCOM  
Radio Gigabit  
Radisys Corporation

RADWIN  
Raisecom  
Rakon  
Range Networks  
Ranplan Wireless Network Design  
Raycap  
Rearden  
Red Hat  
RED Technologies  
Redline Communications  
REMEC Broadband Wireless Networks  
Renaissance Electronics & Communications  
RF DSP  
RF MORECOM KOREA  
RF Window  
RFS (Radio Frequency Systems)  
Rivada Networks  
Rohde & Schwarz  
Rosenberger  
R-TRON  
Ruckus Wireless  
SAF Tehnika  
Sagemcom  
Saguna Networks  
SAI Technology  
Samji Electronics  
Samsung Electronics  
Samsung Group  
Sarokal Test Systems  
SAT (Smart Antenna Technologies)  
SCF (Small Cell Forum)  
SDP Telecom  
Senao Networks  
Seontech  
SerComm Corporation  
SES  
Sevis Systems  
SevOne  
SFR

Shared Access  
Shenzhen Huaptec  
Shyam Group  
Shyam Networks  
Shyam Telecom  
SIAE Microelectronica  
Siklu Communication  
Silicon Labs (Silicon Laboratories)  
Singtel  
SIRADEL  
SiRRAN Communications  
Sistelbanda  
SITRONICS  
Sivers IMA  
SK Telecom  
SK Telesys  
Skybird Electronic Science & Technology  
SkyFiber  
Skyview Capital  
Skyworks Solutions  
SMC Networks  
Smith Micro Software  
SoftBank Group  
Solectek Corporation  
SOLiD  
Sonus Networks  
Sooktha  
Source Photonics  
Space Data Corporation  
Spectronite  
SpiderCloud Wireless  
Sprint Corporation  
SRS (Software Radio Systems)  
ST Engineering (Singapore Technologies Engineering)  
Star Microwave  
Star Solutions  
Starry  
STMicroelectronics  
Sumitomo Electric Industries

Sunwave Solutions  
SuperCom  
Suzhou Hexagon Communication Technologies  
Syniverse Technologies  
Tarana Wireless  
Tata Elxsi  
Tech Mahindra  
Technicolor  
Teco Group  
Tecom  
Tecore Networks  
TEKTELIC Communications  
Telco Systems  
Telecom Italia Group  
Telefonica Group  
Telenor Group  
Telia Company  
Tellion  
Tellumat  
Telnet Redes Inteligentes  
Telrad Networks  
Telsey  
Telstra  
Telum  
Telus Corporation  
TEOCO Corporation  
TESSCO Technologies  
Thuraya Telecommunications Company  
TI (Texas Instruments)  
Tieto Corporation  
Tilgin  
TIM (Telecom Italia Mobile)  
Towerstream Corporation  
TP-LINK Technologies  
Trango Systems  
Transition Networks  
Tranzeo Wireless Technologies  
Tropico  
TruConnect Technologies

TSDSI (Telecommunications Standards Development Society, India)

TSMC (Taiwan Semiconductor Manufacturing Company)

TTA (Telecommunications Technology Association, South Korea)

TTC (Telecommunication Technology Committee, Japan)

TTP (The Technology Partnership)

Tulinx

Turk Telekom

Ubiquiti Networks

Ubiquoss

U-blox

UNICOM Global

UTStarcom

Vanu

Vasona Networks

Vectron International

Vencore Labs

VEON

Verizon Communications

ViaSat

Viavi Solutions

Virgin Media

Virtuosys

VMware

VNL (Vihaan Networks Limited)

Vodafone Group

VT iDirect

VT Systems (Vision Technologies Systems)

Vubiq Networks

Wave1

Wavesight

WBA (Wireless Broadband Alliance)

Webpass

Westell Technologies

Wevercomm

WIA (Wireless Infrastructure Association)

Wi-Fi Alliance

WiFiForward

Wilson Electronics

WiMAX Forum

Wind Tre  
WinnForum (Wireless Innovation Forum)  
WiPro  
Wireless Telecom Group  
WiSig Networks  
WNC (Wistron NeWeb Corporation)  
WTL (World Telecom Labs)  
Wuhan Fingu Electronic Technology  
Wuhan Gewei Electronic Technologies  
Wytec International  
XAVi Technologies Corporation  
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