

The Public Safety LTE & 5G Market: 2023 – 2030 – Opportunities, Challenges, Strategies & Forecasts

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Abstracts

With the commercial availability of 3GPP-standards compliant MCX (Mission-Critical PTT, Video & Data), HPUE (High-Power User Equipment), IOPS (Isolated Operation for Public Safety) and other critical communications features, LTE and 5G NR (New Radio) networks are increasingly gaining recognition as an all-inclusive public safety communications platform for the delivery of real-time video, high-resolution imagery, multimedia messaging, mobile office/field data applications, location services and mapping, situational awareness, unmanned asset control and other broadband capabilities, as well as MCPTT (Mission-Critical PTT) voice and narrowband data services provided by traditional LMR (Land Mobile Radio) systems. Through ongoing refinements of additional standards – specifically 5G MBS/5MBS (5G Multicast-Broadcast Services), 5G NR sidelink for off-network D2D (Device-to-Device) communications, NTN (Non-Terrestrial Network) integration, and support for lower 5G NR bandwidths – 3GPP networks are eventually expected to be in a position to fully replace legacy LMR systems by the late 2020s. National public safety communications authorities in multiple countries have already expressed a willingness to complete their planned narrowband to broadband transitions within the second half of the 2020 decade.

A myriad of fully dedicated, hybrid government-commercial and secure MVNO/MOCN-based public safety LTE and 5G-ready networks are operational or in the process of being rolled out throughout the globe. The high-profile FirstNet (First Responder Network) and South Korea's Safe-Net (National Disaster Safety Communications Network) nationwide public safety broadband networks have been successfully implemented. Although Britain's ESN (Emergency Services Network) project has been hampered by a series of delays, many other national-level programs have made considerable headway in moving from field trials to wider scale deployments – most

notably, New Zealand's NGCC (Next-Generation Critical Communications) public safety network, France's RRF (Radio Network of the Future), Italy's public safety LTE service, Spain's SIRDEE mission-critical broadband network, Finland's VIRVE 2.0 broadband service, Sweden's Rakel G2 secure broadband system and Hungary's EDR 2.0/3.0 broadband network. Nationwide initiatives in the pre-operational phase include but are not limited to Switzerland's MSK (Secure Mobile Broadband Communications) system, Norway's Nytt N?dnett, Germany's planned hybrid broadband network for BOS (German Public Safety Organizations), Netherlands' NOOVA (National Public Order & Security Architecture) program, Japan's PS-LTE (Public Safety LTE) project, Australia's PSMB (Public Safety Mobile Broadband) program and Canada's national PSBN (Public Safety Broadband Network) initiative.

Other operational and planned deployments range from the Halton-Peel region PSBN in Canada's Ontario province, New South Wales' state-based PSMB solution, China's city and district-wide Band 45 (1.4 GHz) LTE networks for police forces, Hong Kong's 700 MHz mission-critical broadband network, Royal Thai Police's Band 26 (800 MHz) LTE network, Qatar MOI (Ministry of Interior), ROP (Royal Oman Police), Abu Dhabi Police and Nedaa's mission-critical LTE networks in the oil-rich GCC (Gulf Cooperation Council) region, Brazil's state-wide LTE networks for both civil and military police agencies, Barbados' Band 14 (700 MHz) LTE-based connectivity service platform, Zambia's 400 MHz broadband trunking system and Mauritania's public safety LTE network for urban security in Nouakchott to local and regional-level private LTE networks for first responders in markets as diverse as Laos, Indonesia, the Philippines, Pakistan, Lebanon, Egypt, Kenya, Ghana, Cote D'Ivoire, Cameroon, Mali, Madagascar, Mauritius, Canary Islands, Spain, Turkey, Serbia, Argentina, Colombia, Venezuela, Bolivia, Ecuador and Trinidad & Tobago, as well as multi-domain critical communications broadband networks such as MRC's (Mobile Radio Center) LTE-based advanced MCA digital radio system in Japan, and secure MVNO platforms in Mexico, Belgium, Netherlands, Slovenia, Estonia and several other countries.

Even though critical public safety-related 5G NR capabilities defined in the 3GPP's Release 17 and 18 specifications are yet to be commercialized, public safety agencies have already begun experimenting with 5G for applications that can benefit from the technology's high-bandwidth and low-latency characteristics. For example, the Lishui Municipal Emergency Management Bureau is using private 5G slicing over China Mobile's network, portable cell sites and rapidly deployable communications vehicles as part of a disaster management and visualization system.

In neighboring Taiwan, the Kaohsiung City Police Department relies on end-to-end

network slicing over a standalone 5G network to support license plate recognition and other use cases requiring the real-time transmission of high-resolution images. The Hsinchu City Fire Department's emergency response vehicle can be rapidly deployed to disaster zones to establish high-bandwidth, low-latency emergency communications using a satellite-backhauled private 5G network based on Open RAN standards. The Norwegian Air Ambulance is adopting a similar private 5G-based NOW (Network-on-Wheels) system for enhancing situational awareness during search and rescue operations.

In addition, first responder agencies in Germany, Japan and several other markets are beginning to utilize mid-band and mmWave (Millimeter Wave) spectrum available for local area licensing to deploy portable and small-scale 5G NPNs (Non-Public Networks) to support applications such as UHD (Ultra-High Definition) video surveillance, control of unmanned firefighting vehicles, reconnaissance robots and drones. In the near future, we also expect to see rollouts of localized 5G NR systems – including direct mode communications – for incident scene management and related use cases, potentially using up to 50 MHz of Band n79 spectrum in the 4.9 GHz frequency range (4,940-4,990 MHz), which has been designated for public safety use in multiple countries including but not limited to the United States, Canada, Australia, Malaysia and Qatar.

SNS Telecom & IT estimates that annual investments in public safety LTE/5G infrastructure and devices reached \$4.3 Billion in 2023, driven by both new projects and the expansion of existing dedicated, hybrid government-commercial and secure MVNO/MOCN networks. Complemented by an expanding ecosystem of public safety-grade LTE/5G devices, the market will further grow at a CAGR of approximately 10% over the next three years, eventually accounting for more than \$5.7 Billion by the end of 2026. Despite the positive outlook, some significant challenges continue to plague the market. The most noticeable pain point is the lack of a D2D communications capability.

The ProSe (Proximity Services) chipset ecosystem failed to materialize in the LTE era due to limited support from chipmakers and terminal OEMs. However, the 5G NR sidelink interface offers a clean slate opportunity to introduce direct mode D2D communications for public safety broadband users, as well as coverage expansion in both on-network and off-network scenarios using UE-to-network and UE-to-UE relays respectively. Recent demonstrations of 5G NR sidelink-enabled MCX services by the likes of Qualcomm have generated renewed confidence in 3GPP technology for direct mode communications.

Until recently, another barrier impeding the market was the non-availability of cost-

optimized RAN equipment and terminals that support operation in spectrum reserved for PPDR (Public Protection & Disaster Relief) communications – most notably Band 68 (698-703 / 753-758 MHz), which has been allocated for PPDR broadband systems in several national markets across Europe, including France, Germany, Switzerland, Austria, Spain, Italy, Estonia, Bulgaria and Cyprus. Other countries such as Greece, Hungary, Romania, Sweden, Denmark, Netherlands and Belgium are also expected to make this assignment. Since the beginning of 2023, multiple suppliers – including Ericsson, Nokia, Teltronic and CROSSCALL – have introduced support for Band 68.

The “Public Safety LTE & 5G Market: 2023 – 2030 – Opportunities, Challenges, Strategies & Forecasts” report presents an in-depth assessment of the public safety LTE and 5G market, including the value chain, market drivers, barriers to uptake, enabling technologies, operational models, application scenarios, key trends, future roadmap, standardization, spectrum availability/allocation, regulatory landscape, case studies, ecosystem player profiles and strategies. The report also presents global and regional market size forecasts from 2023 to 2030, covering public safety LTE/5G infrastructure, terminal equipment, applications, systems integration and management solutions, as well as subscriptions and service revenue.

The report comes with an associated Excel datasheet suite covering quantitative data from all numeric forecasts presented in the report, as well as a list and associated details of over 1,300 global public safety LTE/5G engagements – as of Q1'2024.

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7.1.3.1 470 694 MHz UHF Band

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7.1.4.2 Band 28 (703 803 MHz)

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7.1.5.2 Band 26 (814 894 MHz)

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 - 7.5.11 South Africa
 - 7.5.12 Botswana
 - 7.5.13 Zambia
 - 7.5.14 Kenya
 - 7.5.15 Ethiopia
 - 7.5.16 Uganda
 - 7.5.17 Ghana

- 7.5.18 Rest of the Middle East & Africa
- 7.6 Latin & Central America
 - 7.6.1 Brazil
 - 7.6.2 Mexico
 - 7.6.3 Argentina
 - 7.6.4 Colombia
 - 7.6.5 Chile
 - 7.6.6 Ecuador
 - 7.6.7 Bolivia
 - 7.6.8 Barbados
 - 7.6.9 Trinidad & Tobago
 - 7.6.10 Rest of Latin & Central America

8 CHAPTER 8: STANDARDIZATION, REGULATORY & COLLABORATIVE INITIATIVES

- 8.1 3GPP (Third Generation Partnership Project)
 - 8.1.1 Release 11: HPUE (Power Class 1) for Band 14
 - 8.1.2 Release 12: Early Mission-Critical Enablers ProSe & GCSE
 - 8.1.3 Release 13: MCPTT, IOPS & Further Enhancements
 - 8.1.4 Release 14: Support for MCVideo & MCData Services
 - 8.1.5 Release 15: MCX Refinements, 5G eMBB & Additional Operating Bands
 - 8.1.6 Release 16: Further Evolution of MCX, 3GPP-LMR Interworking, Vertical Application Enablers & 5G URLLC
 - 8.1.7 Release 17: MCX Over 5G, 5G MBS, MCIOPS, NTN Connectivity & 5G NR Sidelink Enhancements
 - 8.1.8 Releases 18, 19 & Beyond: UE-to-UE Relays, VMRs, High-Density 5G MBS & Support for Less Than 5 MHz of Bandwidth
- 8.2 APCO (Association of Public-Safety Communications Officials) International
 - 8.2.1 Public Safety LTE/5G Advocacy Efforts
 - 8.2.2 ANS 2.106.1-2019: Standard for PSG (Public Safety Grade) Site Hardening Requirements
- 8.3 ASTRID
 - 8.3.1 Public Safety LTE/5G-Related Standardization Efforts
- 8.4 ATIS (Alliance for Telecommunications Industry Solutions)
 - 8.4.1 LMR-3GPP Interworking & Public Safety LTE/5G-Related Standardization Efforts
- 8.5 Australian Department of Home Affairs
 - 8.5.1 Leading Australia's National PSMB (Public Safety Mobile Broadband) Program
- 8.6 BDBOS (Federal Agency for Public Safety Digital Radio, Germany)

- 8.6.1 Public Safety LTE/5G-Related Standardization Efforts
- 8.7 BMWK (Federal Ministry for Economic Affairs and Climate Action, Germany)
 - 8.7.1 Standardization Efforts for Critical Communications Over 3GPP Networks
- 8.8 B-TrunC (Broadband Trunking Communication) Industry Alliance
 - 8.8.1 B-TrunC Standard for LTE-Based Critical Communications
- 8.9 CATA (Canadian Advanced Technology Alliance)
 - 8.9.1 Public Safety LTE/5G-Related Advocacy Efforts
- 8.10 CITIG (Canadian Interoperability Technology Interest Group)
 - 8.10.1 Public Safety LTE/5G Advocacy Efforts
- 8.11 DRDC (Defence Research and Development Canada)
 - 8.11.1 DRDC CSS (DRDC Centre for Security Science)
 - 8.11.1.1 Participation in Canada's National PSBN (Public Safety Broadband Network) Program
 - 8.11.1.2 R&D Efforts in Public Safety & Military LTE/5G Networks
- 8.12 DSB (Directorate for Civil Protection, Norway)
 - 8.12.1 Public Safety LTE/5G-Related Standardization Efforts
- 8.13 Erillisverkot (State Security Networks Group, Finland)
 - 8.13.1 Public Safety LTE/5G-Related Standardization Efforts
- 8.14 ETSI (European Telecommunications Standards Institute)
 - 8.14.1 TCCE (TETRA and Critical Communications Evolution) Technical Committee
 - 8.14.1.1 Standards & Guidelines for Critical Communications Broadband & TETRA-3GPP Interworking
 - 8.14.2 CTI (Center for Testing and Interoperability)
 - 8.14.2.1 MCX (Mission-Critical PTT, Video & Data) Plugtests
 - 8.14.3 Other Technical Committees & Critical Communications LTE/5G-Related Standards
- 8.15 FirstNet (First Responder Network) Authority
 - 8.15.1 Overseeing the Buildout, Operation & Evolution of the FirstNet Public Safety Broadband Network
 - 8.15.2 Standardization of Mission-Critical Features for 3GPP Technologies
 - 8.15.3 Innovation & Test Lab
 - 8.15.4 PSAC (Public Safety Advisory Committee)
- 8.16 French Ministry of Interior
 - 8.16.1 Public Safety LTE/5G-Related Standardization Efforts
- 8.17 GCF (Global Certification Forum)
 - 8.17.1 Certification of LTE/5G Devices for Public Safety & Critical Communications Networks
- 8.18 United Kingdom Home Office
 - 8.18.1 Public Safety LTE/5G-Related Standardization Efforts

- 8.19 ICCRA (International Critical Control Rooms Alliance)
- 8.19.1 LTE/5G Support in Critical Control Room Interface Standards
- 8.20 IETF (Internet Engineering Task Force)
 - 8.20.1 Standards & Protocols for Mission-Critical Services Over LTE & 5G Networks
- 8.21 IGOF (International Governmental Operators Forum)
 - 8.21.1 Addressing Broadband-Related Issues in Critical Communications
- 8.22 ISED (Innovation, Science and Economic Development Canada)
 - 8.22.1 Participation in Canada's National PSBN (Public Safety Broadband Network) Program
 - 8.22.2 Regulation of Public Safety Broadband Spectrum
 - 8.22.3 CRC (Communications Research Centre Canada)
 - 8.22.3.1 Interoperability Research and Evaluation of Public Safety LTE/5G Networks
- 8.23 ITU (International Telecommunication Union)
 - 8.23.1 Spectrum Harmonization for PPDR (Public Protection & Disaster Relief) Broadband Systems
 - 8.23.2 Defining the Role of IMT-2020 to Support PPDR Applications
- 8.24 MCOP (Mission-Critical Open Platform)
 - 8.24.1 Open Platform for the Development of Standards-Compliant MCPTT Applications
- 8.25 MCS-TaaSting (Mission-Critical Services Testing-as-a-Service)
 - 8.25.1 Flexible Testing Tools & Certification Procedures for 3GPP's MCX Standards
- 8.26 MOIS (Ministry of the Interior and Safety, South Korea)
 - 8.26.1 Public Safety LTE/5G-Related Standardization Efforts
- 8.27 National Police of the Netherlands
 - 8.27.1 Public Safety LTE/5G-Related Standardization Efforts
- 8.28 NCCOM (Nordic Critical Communication Operators Meeting)
 - 8.28.1 Requirements for Rugged Devices & Other PPDR Broadband Capabilities
- 8.29 Nkom (Norwegian Communications Authority)
 - 8.29.1 Standardization Efforts for Critical Communications Over 3GPP Networks
- 8.30 NSC (National Spectrum Consortium)
 - 8.30.1 Enhancing Spectrum Superiority & 5G Capabilities for Federal Users
- 8.31 NSW (New South Wales) Telco Authority
 - 8.31.1 Role in Australia's National PSMB (Public Safety Mobile Broadband) Program
- 8.32 OMA SpecWorks (Open Mobile Alliance)
 - 8.32.1 PoC (PTT-over-Cellular): V1.04, V2.0 & V2.1
 - 8.32.2 PCPS (Push-to-Communicate for Public Safety)
- 8.33 PIA (PSBN Innovation Alliance)
 - 8.33.1 PSBN Governance in Canada's Ontario Province
- 8.34 PSBTA (Public Safety Broadband Technology Association)

- 8.34.1 Public Safety LTE/5G-Related Activities
- 8.35 PSCE (Public Safety Communication Europe)
 - 8.35.1 Public Safety LTE/5G Standardization
 - 8.35.2 BroadX Projects: Pan-European Interoperable Mobile Broadband for Public Safety
 - 8.35.2.1 BroadMap (2016-2017): Specifications & Roadmap for Procurement
 - 8.35.2.2 BroadWay (2018-2022): R&D/PCP (Pre-Commercial Procurement)
 - 8.35.2.3 BroadNet (2023 & Beyond): Live Procurement and Sustainable Governance
 - 8.35.3 Other Public Safety LTE/5G-Related Work
- 8.36 Public Safety Canada
 - 8.36.1 Federal PSBN (Public Safety Broadband Network) Task Team
 - 8.36.2 TNCO (Temporary National Coordination Office) for Canada's National PSBN
- 8.37 Safe-Net Forum
 - 8.37.1 Technical/Policy Guidance & Ecosystem Development for Critical Communications LTE/5G Networks
- 8.38 TCCA (The Critical Communications Association)
 - 8.38.1 CCBG (Critical Communications Broadband Group)
 - 8.38.2 BIG (Broadband Industry Group)
 - 8.38.3 Future Technologies Group
- 8.39 TIA (Telecommunications Industry Association)
 - 8.39.1 TR-8.8: Subcommittee on Broadband Data Systems
 - 8.39.1.1 Defining Requirements for LMR-3GPP Interworking & Critical Broadband Capabilities
- 8.40 TTA (Telecommunications Technology Association, South Korea)
 - 8.40.1 Functional Requirements, Testing & Certification for Public Safety LTE/5G Technologies
- 8.41 U.S. DHS (Department of Homeland Security)
 - 8.41.1 S&T (Science and Technology) Directorate
 - 8.41.1.1 Public Safety LTE/5G-Related Projects
 - 8.41.2 CISA (Cybersecurity and Infrastructure Security Agency)
 - 8.41.2.1 SAFECOM: Best Practices for LMR-3GPP Integration
- 8.42 U.S. FCC (Federal Communications Commission)
 - 8.42.1 PSHSB (Public Safety and Homeland Security Bureau)
 - 8.42.2 Endorsement of LTE as the Platform for 700 MHz Public Safety LTE Networks
 - 8.42.3 Regulation of Public Safety Broadband Spectrum
 - 8.42.4 Other Engagements Relevant to Public Safety LTE/5G
- 8.43 U.S. NIST (National Institute of Standards and Technology)
 - 8.43.1 CTL (Communications Technology Laboratory)
 - 8.43.2 PSCR (Public Safety Communications Research): R&D Leadership for FirstNet

- 8.43.2.1 R&D, Testing & Evaluation of Technologies for Public Safety LTE/5G
- 8.44 U.S. NPSTC (National Public Safety Telecommunications Council)
 - 8.44.1 Early Leadership in Public Safety LTE
 - 8.44.2 Spectrum Management, LMR-3GPP Integration, Public Safety-Grade Systems & Other Work
- 8.45 U.S. NTIA (National Telecommunications and Information Administration)
 - 8.45.1 FirstNet Governance & Funding
 - 8.45.2 Other Work Related to Public Safety LTE/5G Networks
- 8.46 Vendor-Led Alliances
 - 8.46.1 Huawei's eLTE Industry Alliance
 - 8.46.2 Nokia's Mission-Critical Communications Alliance
 - 8.46.3 L3Harris' Mission Critical Alliance
- 8.47 Others
 - 8.47.1 Government Agencies & National Regulators
 - 8.47.2 Spectrum & Technology Innovation Industry Alliances
 - 8.47.3 Regional & Country-Specific Associations
 - 8.47.4 Academic Institutes, Research Centers & Labs

9 CHAPTER 9: KEY ECOSYSTEM PLAYERS

- 9.1 10T Tech
- 9.2 1NCE
- 9.3 1oT
- 9.4 4K Solutions
- 9.5 4RF
- 9.6 6Harmonics/6WiLInk
- 9.7 6WIND
- 9.8 7P (Seven Principles)
- 9.9 A Beep/Diga-Talk+
- 9.10 A1 Telekom Austria Group
- 9.11 A10 Networks
- 9.12 A5G Networks
- 9.13 AAEON Technology (ASUS ASUSTeK Computer)
- 9.14 Aarna Networks
- 9.15 ABEL Mobilfunk
- 9.16 ABiT Corporation
- 9.17 ABS
- 9.18 Abside Networks
- 9.19 Accedian

- 9.20 AccelerComm
- 9.21 Accelink Technologies
- 9.22 Accelleran
- 9.23 Accenture
- 9.24 Accton Technology Corporation
- 9.25 Accuver (InnoWireless)
- 9.26 ACE Technologies
- 9.27 AceAxis
- 9.28 AceTel (Ace Solutions)
- 9.29 Achronix Semiconductor Corporation
- 9.30 ACOME
- 9.31 Actelis Networks
- 9.32 Action Technologies (Shenzhen Action Technologies)
- 9.33 Actiontec Electronics
- 9.34 Active911
- 9.35 Actus Networks
- 9.36 Adax
- 9.37 Adcor Magnet Systems
- 9.38 ADI (Analog Devices, Inc.)
- 9.39 ADLINK Technology
- 9.40 ADRF (Advanced RF Technologies)
- 9.41 ADT
- 9.42 Adtran
- 9.43 Advanced Energy Industries
- 9.44 AdvanceTec Industries
- 9.45 Advantech
- 9.46 Advantech Wireless Technologies (Baylin Technologies)
- 9.47 Aegex Technologies
- 9.48 Aerial Applications
- 9.49 Aeris
- 9.50 Aerostar International
- 9.51 Aethertek
- 9.52 Affarii Technologies
- 9.53 Affirmed Networks (Microsoft Corporation)
- 9.54 AFL Global
- 9.55 AFRY
- 9.56 Agile (Agile Interoperable Solutions)
- 9.57 AGIS (Advanced Ground Information Systems)
- 9.58 AGM Mobile

- 9.59 AH NET (MVM NET)
- 9.60 AI-LINK
- 9.61 AINA Wireless
- 9.62 Airbus/SLC (Secure Land Communications)
- 9.63 Airfide Networks
- 9.64 Airgain
- 9.65 AirHop Communications
- 9.66 Airlinq
- 9.67 Airspan Networks
- 9.68 Airtower Networks
- 9.69 Airwavz Solutions
- 9.70 AIS (Advanced Info Service)
- 9.71 AiVader
- 9.72 Akamai Technologies
- 9.73 Akoustis Technologies
- 9.74 Alaxala Networks Corporation (Fortinet)
- 9.75 ALBEDO Telecom
- 9.76 albis-elcon (UET United Electronic Technology)
- 9.77 Alcadis
- 9.78 Alea (Leonardo)
- 9.79 Alef (Alef Edge)
- 9.80 Alepo
- 9.81 Alibaba Group
- 9.82 Aliniant
- 9.83 Allbesmart
- 9.84 Allen Vanguard Wireless
- 9.85 Allerio
- 9.86 Allied Telesis
- 9.87 Allot
- 9.88 Alpha Networks
- 9.89 Alpha Wireless
- 9.90 Alsatis Reseaux
- 9.91 Altaeros
- 9.92 Altair Semiconductor (Sony Semiconductor Israel)
- 9.93 ALTAN Redes
- 9.94 Altice Group
- 9.95 ALVIS (Argentina)
- 9.96 AM Telecom
- 9.97 Amantya Technologies

- 9.98 Amarisoft
- 9.99 Amazon/AWS (Amazon Web Services)
- 9.100 Ambra Solutions-ECOTEL
- 9.101 AMD (Advanced Micro Devices)
- 9.102 Amdocs
- 9.103 America Movil
- 9.104 American Tower Corporation
- 9.105 AMI (American Megatrends International)
- 9.106 AMIT Wireless
- 9.107 Ampere Computing
- 9.108 Amphenol Corporation
- 9.109 Ampleon
- 9.110 Amtele Communication
- 9.111 Andesat
- 9.112 ANDRO Computational Solutions
- 9.113 Anktion (Fujian) Technology
- 9.114 Anokiwave
- 9.115 Anritsu
- 9.116 ANS Advanced Network Services (Charge Enterprises)
- 9.117 Antenna Company
- 9.118 Antevia Networks
- 9.119 Antna Antenna Technology
- 9.120 Aorotech
- 9.121 Apple
- 9.122 APRESIA Systems
- 9.123 APSTAR (APT Satellite Company)
- 9.124 APT (Asia Pacific Telecom)
- 9.125 aql
- 9.126 Aquila (Suzhou Aquila Solutions)
- 9.127 Aqura Technologies (Telstra Purple)
- 9.128 Arabsat
- 9.129 Arcadyan Technology Corporation (Compal Electronics)
- 9.130 Archos
- 9.131 Arctic Semiconductor (Formerly SiTune Corporation)
- 9.132 Arete M
- 9.133 Argela
- 9.134 ArgoNET
- 9.135 Aria Networks
- 9.136 Arista Networks

- 9.137 Arkessa (Wireless Logic Group)
- 9.138 Arm
- 9.139 Armour Communications
- 9.140 Arqit Quantum
- 9.141 ArrayComm (Chengdu ArrayComm Wireless Technologies)
- 9.142 Arrcus
- 9.143 Artemis Networks
- 9.144 Artiza Networks
- 9.145 Aruba (HPE Hewlett Packard Enterprise)
- 9.146 Arukona
- 9.147 Asavie
- 9.148 ASELSAN
- 9.149 AsialInfo Technologies
- 9.150 AsiaSat (Asia Satellite Telecommunications Company)
- 9.151 Askey Computer Corporation (ASUS ASUSTeK Computer)
- 9.152 ASOCS
- 9.153 Aspire Technology (NEC Corporation)
- 9.154 ASR Microelectronics
- 9.155 AST SpaceMobile
- 9.156 ASTELLA (Astella Technologies)
- 9.157 ASTRI (Hong Kong Applied Science and Technology Research Institute)
- 9.158 ASUS (ASUSTeK Computer)
- 9.159 Asylon
- 9.160 AT&T
- 9.161 ATDI
- 9.162 ATEL (Asiatelco Technologies)
- 9.163 Atel Antennas
- 9.164 Atesio
- 9.165 Athonet (HPE Hewlett Packard Enterprise)
- 9.166 ATL A Test Lab (Eurofins E&E Electrical and Electronics)
- 9.167 Atlas Telecom
- 9.168 ATN International
- 9.169 Atos
- 9.170 Atrinet
- 9.171 AttoCore
- 9.172 Auden Techno
- 9.173 Auray Technology (Auden Techno)
- 9.174 Avanti Communications
- 9.175 Avari Wireless

- 9.176 AVI
- 9.177 Aviat Networks
- 9.178 AVIWEST (Haivision)
- 9.179 AVM
- 9.180 AW2S Advanced Wireless Solutions and Services (SERMA Group)
- 9.181 AWTG
- 9.182 AXESS Networks (HISPASAT)
- 9.183 Axians (VINCI Energies)
- 9.184 Axiata Group
- 9.185 Axione
- 9.186 Axis Communications
- 9.187 Axon
- 9.188 Axtel
- 9.189 Axxcelera Broadband Wireless (Axxcss Wireless Solutions)
- 9.190 Axxcss Wireless Solutions
- 9.191 Azcom Technology
- 9.192 Azetti Networks
- 9.193 B+B SmartWorx (Advantech)
- 9.194 BAE Systems
- 9.195 Baicells
- 9.196 Ball Aerospace
- 9.197 Ballast Networks
- 9.198 BandRich
- 9.199 BandwidthX
- 9.200 Barrett Communications (Motorola Solutions)
- 9.201 BATS Wireless (Broadband Antenna Tracking Systems)
- 9.202 BAYFU (Bayerische Funknetz)
- 9.203 Baylin Technologies
- 9.204 BBB (BB Backbone Corporation)
- 9.205 BBK Electronics
- 9.206 BCDVideo
- 9.207 Beam Semiconductor
- 9.208 Beamlink
- 9.209 BearCom
- 9.210 BEC Technologies (Billion Electric)
- 9.211 becon
- 9.212 Beeper Communications
- 9.213 Beijer Electronics Group
- 9.214 Belden

- 9.215 BelFone
- 9.216 Bell Canada
- 9.217 Bellantenna
- 9.218 Benetel
- 9.219 BesoVideo
- 9.220 Betacom
- 9.221 Bharti Airtel
- 9.222 BHE (Bonn Hungary Electronics)
- 9.223 BICS (Proximus)
- 9.224 BinnenBereik (NOVEC)
- 9.225 Bird Technologies
- 9.226 BISDN (Berlin Institute for Software Defined Networks)
- 9.227 Bittium
- 9.228 BK Technologies
- 9.229 Black & Veatch
- 9.230 Black Box
- 9.231 BlackBerry
- 9.232 Blackned
- 9.233 BLiNQ Networks (CCI Communication Components Inc.)
- 9.234 Blu Wireless
- 9.235 Blue Arcus Technologies
- 9.236 Blue Wireless
- 9.237 Bluebird
- 9.238 Blueforce Development Corporation
- 9.239 BLUnet Schweiz (Axpo WZ-Systems)
- 9.240 Boeing/Aurora Flight Sciences
- 9.241 Boelink (Shanghai Boelink Communication Technology)
- 9.242 Boingo Wireless (DigitalBridge Group)
- 9.243 Boldyn Networks (Formerly BAI Communications)
- 9.244 Booz Allen Hamilton
- 9.245 Boston Dynamics
- 9.246 Bouygues Telecom
- 9.247 Boxchip
- 9.248 Branch Communications
- 9.249 BravoCom
- 9.250 Bredengen
- 9.251 Broadcom
- 9.252 BroadForward
- 9.253 Broadmobi Shanghai Broadmobi Communication Technology (Wutong Group)

- 9.254 Broadpeak
- 9.255 Broadtech
- 9.256 BSNL (Bharat Sanchar Nigam Limited)
- 9.257 BT Group
- 9.258 BTI Wireless
- 9.259 Bullitt Mobile
- 9.260 Bumicom Telecommunicatie
- 9.261 Bureau Veritas/7Layers
- 9.262 BVSystems (Berkeley Varitronics Systems)
- 9.263 BWT (BlueWaveTel)
- 9.264 B-Yond
- 9.265 C Spire
- 9.266 C Squared Systems
- 9.267 C3Spectra
- 9.268 CableFree (Wireless Excellence)
- 9.269 CableLabs
- 9.270 CACI International/LGS Innovations
- 9.271 Cadence Design Systems
- 9.272 CalAmp
- 9.273 CalChip Connect
- 9.274 Caliber Public Safety
- 9.275 Calix
- 9.276 Calnex Solutions
- 9.277 Caltta Technologies
- 9.278 Cambium Networks
- 9.279 Cambridge Consultants (Capgemini Invent)
- 9.280 CampusGenius
- 9.281 Canoga Perkins
- 9.282 Canonical
- 9.283 Capgemini Engineering
- 9.284 CapX Nederland
- 9.285 Carbyne
- 9.286 Casa Systems
- 9.287 CASIC (China Aerospace Science and Industry Corporation)
- 9.288 Casio Computer Company
- 9.289 Castor Marine
- 9.290 Catalyst Communications Technologies
- 9.291 Cavli Wireless
- 9.292 CBNG (Cambridge Broadband Networks Group)

- 9.293 CCI (Communication Components Inc.)
- 9.294 CCN (Cirrus Core Networks)
- 9.295 CCww (Communications Consultants Worldwide)
- 9.296 Cegeka
- 9.297 CeLa Link Corporation
- 9.298 Celfinet (Cyient)
- 9.299 CellAntenna Corporation
- 9.300 Cellcomm Solutions
- 9.301 Celllient
- 9.302 Cellling 5G
- 9.303 CellMax Technologies (Rosenberger)
- 9.304 Cellnex Telecom
- 9.305 Cellwize (Qualcomm)
- 9.306 cellXica
- 9.307 cellXion
- 9.308 Celona
- 9.309 CelPlan Technologies
- 9.310 Centerline Communications
- 9.311 CENTRA Technology
- 9.312 CentralSquare Technologies
- 9.313 Ceragon Networks
- 9.314 Cerillion
- 9.315 CertusNet
- 9.316 CETC (China Electronics Technology Group Corporation)
- 9.317 CEVA
- 9.318 CGI
- 9.319 Challenge Networks (Vocus)
- 9.320 Charter Communications
- 9.321 Cheerzing (Xiamen Cheerzing IoT Technology)
- 9.322 Chelton
- 9.323 Chemring Technology Solutions
- 9.324 Chengdu NTS
- 9.325 China All Access
- 9.326 China Mobile
- 9.327 China Satcom (China Satellite Communications)
- 9.328 China Telecom
- 9.329 China Unicom
- 9.330 Chunghwa Telecom
- 9.331 Cibicom

- 9.332 CICT China Information and Communication Technology Group (China Xinke Group)
- 9.333 Ciena Corporation
- 9.334 CIG (Cambridge Industries Group)
- 9.335 CIO (Connected IO)
- 9.336 Cirpack
- 9.337 Cisco Systems
- 9.338 Citymesh (Cegeka/DIGI Communications)
- 9.339 CitySwitch
- 9.340 CKH IOD (CK Hutchison)
- 9.341 Clavister
- 9.342 Clear-Com (HME)
- 9.343 Clever Logic
- 9.344 CloudMinds
- 9.345 CMIoT (China Mobile IoT)
- 9.346 Cobham
- 9.347 COCUS
- 9.348 Codan Communications
- 9.349 Codium Networks
- 9.350 Cogisys
- 9.351 Cognizant
- 9.352 Cohere Technologies
- 9.353 Coherent (Formerly II-VI)
- 9.354 Coherent Logix
- 9.355 Coiler Corporation
- 9.356 Collinear Networks (EOS Electro Optic Systems)
- 9.357 Collins Aerospace (RTX Corporation)
- 9.358 Colt Technology Services
- 9.359 Com4 (Wireless Logic Group)
- 9.360 Comarch
- 9.361 Comba Telecom
- 9.362 Combain Mobile
- 9.363 Comcast Corporation
- 9.364 Comcores
- 9.365 Comfone
- 9.366 COMLAB
- 9.367 CommAgility (E-Space)
- 9.368 CommandWear Systems
- 9.369 Commnet Wireless (ATN International)

- 9.370 Comms365
- 9.371 CommScope
- 9.372 Compal Electronics
- 9.373 Comprod
- 9.374 Comptek Technologies (Aero Wireless Group)
- 9.375 Comrod Communication Group
- 9.376 COMSovereign
- 9.377 Comtech Telecommunications Corporation
- 9.378 Comtrend Corporation
- 9.379 Comviva (Tech Mahindra)
- 9.380 CONET Technologies
- 9.381 CONEXIO Corporation
- 9.382 CONGIV (ROBUR Industry Service Group)
- 9.383 Connect Tech
- 9.384 Connect44 Group
- 9.385 Connectivity Wireless Solutions (M/C Partners)
- 9.386 Consort Digital
- 9.387 Contela
- 9.388 Coolpad
- 9.389 CopaSAT
- 9.390 coreNOC
- 9.391 Cornerstone (CTIL)
- 9.392 Cornet Technology
- 9.393 Corning
- 9.394 Cortina Access
- 9.395 Cosemi Technologies
- 9.396 COSMOTE (OTE Group)
- 9.397 Council Rock
- 9.398 Coweaver
- 9.399 Cox Communications
- 9.401 Creanord
- 9.402 CrisisGo
- 9.403 CROSSCALL
- 9.404 Crown Castle International Corporation
- 9.405 CS Corporation
- 9.406 CSG Systems International
- 9.407 CTG (Celestia Technologies Group)
- 9.408 CTL
- 9.409 CTS (Communication Technology Services)

- 9.410 CTS Corporation
- 9.411 Cubic Corporation
- 9.412 Cubic Telecom
- 9.413 Cumucore
- 9.414 Custom MMIC
- 9.415 CybertelBridge
- 9.416 Cyient
- 9.417 Cyrus Technology
- 9.418 D2 Technologies
- 9.419 DAEL Group
- 9.420 Dahua Technology
- 9.421 Dali Wireless
- 9.422 DAMM Cellular Systems
- 9.423 DATA COM
- 9.424 DataSoft
- 9.425 DBcom
- 9.426 dbSpectra
- 9.427 DeepSig
- 9.428 Dejero Labs
- 9.429 DEKRA
- 9.430 Dell Technologies
- 9.431 Delta Electronics
- 9.432 DENGYO (Nihon Dengyo Kosaku)
- 9.433 Dense Air (SIP Sidewalk Infrastructure Partners)
- 9.434 DGS (Digital Global Systems)
- 9.435 Dialogic
- 9.436 Diamond Communications
- 9.437 Digi International
- 9.438 Digicert
- 9.439 Digita (DigitalBridge Group)
- 9.440 Digital Ally
- 9.441 Digital Enhancement
- 9.442 DigitalBridge Group
- 9.443 DigitalRoute
- 9.444 Digitata
- 9.445 DigitGate (Nanjing DigitGate Communication Technology)
- 9.446 Dimetor
- 9.447 DISH Network Corporation
- 9.448 DKK (Denki Kogyo)

- 9.449 D-Link Corporation
- 9.450 Doodle Labs
- 9.451 Doogee
- 9.452 Doosan Corporation
- 9.453 DragonWave-X (COMSovereign)
- 9.454 Drakontas
- 9.455 DriveNets
- 9.456 Drone Aviation (COMSovereign)
- 9.457 DroneSense
- 9.458 Druid Software
- 9.459 DSBJ (Suzhou Dongshan Precision Manufacturing)
- 9.460 DT (Deutsche Telekom)
- 9.461 DTAC (Total Access Communication)
- 9.462 du (EITC Emirates Integrated Telecommunications Company)
- 9.463 Duons
- 9.464 Durabook (Twinhead International Corporation)
- 9.465 Duubee
- 9.466 DZS
- 9.467 Eahison Communication
- 9.468 EANTC
- 9.469 Eastcom (Eastern Communications)
- 9.470 Easycom (Shenzhen Easycom Electronics)
- 9.471 E-Band Communications (Axxcss Wireless Solutions)
- 9.472 e-BO Enterprises
- 9.473 ECE (European Communications Engineering)
- 9.474 EchoStar Corporation
- 9.475 Ecom Instruments (Pepperl+Fuchs)
- 9.476 Ecrio
- 9.477 Edgecore Networks (Accton Technology Corporation)
- 9.478 EdgeQ
- 9.479 Edgybees
- 9.480 edotco Group (Axiata Group)
- 9.481 EDX Wireless
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