

# **Metamaterial Market by Antenna, Reconfigurable Intelligent Surfaces (RIS), lenses and optical modules, sensors and beam steering, anti-reflective films, electromagnetic, terahertz, radio frequency (RF), optical and region - Global Forecast to 2029**

<https://marketpublishers.com/r/M6211E39AB96EN.html>

Date: November 2024

Pages: 265

Price: US\$ 4,950.00 (Single User License)

ID: M6211E39AB96EN

## **Abstracts**

The metamaterial market is projected to reach USD 1.38 billion by 2029 from USD 0.22 billion in 2024 at a CAGR of 44.8% during the forecast period. The key growth factors for the metamaterial market are mainly driven by advancements in telecommunication, increasing applications in healthcare, and the demand of high-performance advanced materials in aerospace & defense. Expansions in 5G infrastructure and integration of metamaterials with antenna design for efficient signal transmission are the chief growth drivers. Market demand in the automotive sector is also further being pushed by a drive in demand for lighter and energy-efficient materials, as seen in electric and autonomous vehicles. Innovations in material design through AI and increasing government initiatives to promote such research will similarly propel metamaterial market size from industries like electronics, automotive, and aerospace & defense.

“Lenses and Optical Modules to register the second highest CAGR in the metamaterial-based product segment of the market during the forecast period.”

The Lenses and Optical Modules segment is expected to grow at the second-highest CAGR in the metamaterials market during the forecast period. The fast growth of the segment is mainly attributed to increasing demand for high-performance optical systems in applications such as automotive, medical imaging, and consumer electronics. Advances in metamaterial technology allow miniaturization and embedding lenses with new functionalities, including better focusing abilities and good manipulation of light into compact modules, which are lightweight. AR and VR will experience a dramatic

development, further demanding more complex optical modules for better quality images and more impressive fields of view. Integration of metamaterials into optical systems leaves open doors for innovation, with flat lenses and superlenses promising to revolutionize traditional lens design with thinner and far more flexible optics. Manufacturers will strive to achieve efficiency and performance by using the lenses and optical modules segment, thus paving for strong growth in the years to come to meet changing demands of the optical industry.

“Aerospace & Defense to account the second largest market share in the market during the forecast period.”

The aerospace & defense sector is expected to hold the second largest market share in the forecast period, considering the high requirement for advanced materials that may enhance performance and efficiency in various applications. Metamaterials offer unique properties like electromagnetic manipulation and lightweight structures that are critical in modern aerospace systems, such as antennas and sensor applications, along with stealth technology. Defense applications particularly need better absorption capability of radar signals and better management of the signals. Also, as far as stealth capabilities as well as communication systems are concerned, metamaterials could be an edge there. Enhanced energy efficiency and durability in aircraft design have the characteristic of being achieved with the help of metamaterials, thus driving their growth in the field. The market for metamaterials is likely to grow rapidly with each new move by companies to introduce advanced materials that can be applied toward the production of next-generation aerospace technology as demands rise, in accordance with more sophisticated innovations designed to support improved performance results while keeping rigidly to the safety and efficiency standards required.

“Europe registered the second largest market share during the forecast period.”

The Europe market is likely to capture the second largest market share during the forecast period, as it has made significant advancement in telecommunication, healthcare, and aerospace & defense sectors. The huge demand for high-performance devices, like antennas for 5G networks and advanced imaging systems, propel the adoption of metamaterials that can highly precisely manipulate electromagnetic waves. Some countries like Germany, France, and the UK lead the way in research and development. Innovation in metamaterial applications such as cloaking technology, sensors, and many more is fostered. Metamaterials are picking up because it sustains energy efficiency. Their performance while being environmentally friendly will increase; therefore, they find their use in various applications. Furthermore, breakthroughs in

material science and engineering and making Europe a vital player on the global market for metamaterials are mainly driven by various collaborations.

The break-up of the profile of primary participants in the metamaterial market-

By Company Type: Tier 1 – 25%, Tier 2 – 35%, Tier 3 – 40%

By Designation Type: C Level – 40%, Director Level – 30%, Others – 30%

By Region Type: North America – 40%, Europe – 25%, Asia Pacific – 20%, Rest of the World – 15%

The major players in the metamaterial market with a significant global presence include Kymeta Corporation (US), Pivotal Commware (US), Echodyne Corp. (US), ALCAN Systems GmbH i.L. (Germany), Metalenx, Inc. (US), and others.

### Research Coverage

The report segments the metamaterial market and forecasts its size by product, application, end use, type, and region. It also provides a comprehensive review of drivers, restraints, opportunities, and challenges influencing market growth. The report covers qualitative aspects in addition to quantitative aspects of the market.

### Reasons to buy the report:

The report will help the market leaders/new entrants in this market with information on the closest approximate revenues for the overall metamaterial market and related segments. This report will help stakeholders understand the competitive landscape and gain more insights to strengthen their position in the market and plan suitable go-to-market strategies. The report also helps stakeholders understand the pulse of the market and provides them with information on key market drivers, restraints, opportunities, and challenges.

The report provides insights on the following pointers:

Analysis of key drivers (growing demand for enhanced wireless communication systems and advancements in optical metamaterials), restraints (high production costs and complex manufacturing processes), opportunities (expansion in

renewable energy sector, advancements in thermal metamaterials, and growing integration of nanotechnology with metamaterials), and challenges (scaling up production of metamaterials for mass markets, stringent regulations, and availability of limited resources)

**Product Development/Innovation:** Detailed insights on upcoming technologies, research & development activities, and new solution and service launches in the metamaterial market.

**Market Development:** Comprehensive information about lucrative markets – the report analyses the metamaterial market across varied regions.

**Market Diversification:** Exhaustive information about new solutions and services, untapped geographies, recent developments, and investments in the metamaterial market.

**Competitive Assessment:** In-depth assessment of market shares, growth strategies, and solution and service offerings of leading players, including Kymeta Corporation (US), Pivotal Commware (US), Echodyne Corp. (US), ALCAN Systems GmbH i.L. (Germany), and Metalenz, Inc. (US).

## Contents

### 1 INTRODUCTION

- 1.1 STUDY OBJECTIVES
- 1.2 MARKET DEFINITION
- 1.3 STUDY SCOPE
  - 1.3.1 MARKETS COVERED
  - 1.3.2 INCLUSIONS AND EXCLUSIONS
  - 1.3.3 YEARS CONSIDERED
- 1.4 CURRENCY CONSIDERED
- 1.5 UNIT CONSIDERED
- 1.6 STAKEHOLDERS
- 1.7 SUMMARY OF CHANGES

### 2 RESEARCH METHODOLOGY

- 2.1 RESEARCH DATA
  - 2.1.1 SECONDARY DATA
    - 2.1.1.1 Secondary sources
    - 2.1.1.2 Key data from secondary sources
  - 2.1.2 PRIMARY DATA
    - 2.1.2.1 List of primary participants
    - 2.1.2.2 Breakdown of primary interviews
    - 2.1.2.3 Key data from primary sources
  - 2.1.3 SECONDARY AND PRIMARY RESEARCH
    - 2.1.3.1 Key industry insights
- 2.2 MARKET SIZE ESTIMATION
  - 2.2.1 BOTTOM-UP APPROACH
  - 2.2.2 TOP-DOWN APPROACH
- 2.3 FACTOR ANALYSIS
  - 2.3.1 DEMAND-SIDE ANALYSIS
  - 2.3.2 SUPPLY-SIDE ANALYSIS
- 2.4 DATA TRIANGULATION
- 2.5 RESEARCH ASSUMPTIONS
- 2.6 RESEARCH LIMITATIONS
- 2.7 RISK ASSESSMENT

### 3 EXECUTIVE SUMMARY

## **4 PREMIUM INSIGHTS**

- 4.1 ATTRACTIVE OPPORTUNITIES FOR PLAYERS IN METAMATERIAL MARKET
- 4.2 METAMATERIAL MARKET, BY PRODUCT
- 4.3 METAMATERIAL MARKET, BY APPLICATION
- 4.4 METAMATERIAL MARKET, BY END USE
- 4.5 METAMATERIAL MARKET, BY TYPE
- 4.6 METAMATERIAL MARKET, BY REGION
- 4.7 METAMATERIAL MARKET, BY COUNTRY

## **5 MARKET OVERVIEW**

### **5.1 INTRODUCTION**

### **5.2 MARKET DYNAMICS**

#### **5.2.1 DRIVERS**

- 5.2.1.1 Growing demand for enhanced wireless communication systems
- 5.2.1.2 Advancements in optical metamaterials

#### **5.2.2 RESTRAINTS**

- 5.2.2.1 High production costs
- 5.2.2.2 Complex manufacturing processes

#### **5.2.3 OPPORTUNITIES**

- 5.2.3.1 Expansion of renewable energy sector
- 5.2.3.2 Advancements in thermal metamaterials
- 5.2.3.3 Growing integration of nanotechnology with metamaterials

#### **5.2.4 CHALLENGES**

- 5.2.4.1 Scaling up production of metamaterials for mass markets
- 5.2.4.2 Limited availability of resources
- 5.2.4.3 Stringent regulatory hurdles

### **5.3 VALUE CHAIN ANALYSIS**

### **5.4 ECOSYSTEM ANALYSIS**

### **5.5 INVESTMENT AND FUNDING SCENARIO**

### **5.6 TRENDS AND DISRUPTIONS IMPACTING CUSTOMER BUSINESS**

### **5.7 TECHNOLOGY ANALYSIS**

#### **5.7.1 KEY TECHNOLOGIES**

- 5.7.1.1 Metasurfaces

#### **5.7.2 COMPLEMENTARY TECHNOLOGIES**

- 5.7.2.1 Wearable electronics

#### **5.7.3 ADJACENT TECHNOLOGIES**

5.7.3.1 Graphene and 2D materials

## 5.8 PRICING ANALYSIS

5.8.1 AVERAGE SELLING PRICE OF PRODUCTS OFFERED BY KEY PLAYERS

5.8.2 AVERAGE SELLING PRICE, BY REGION

## 5.9 KEY STAKEHOLDERS AND BUYING CRITERIA

5.9.1 KEY STAKEHOLDERS IN BUYING PROCESS

5.9.2 BUYING CRITERIA

## 5.10 PORTER'S FIVE FORCES ANALYSIS

5.10.1 THREAT OF NEW ENTRANTS

5.10.2 THREAT OF SUBSTITUTES

5.10.3 BARGAINING POWER OF SUPPLIERS

5.10.4 BARGAINING POWER OF BUYERS

5.10.5 INTENSITY OF COMPETITIVE RIVALRY

## 5.11 CASE STUDY ANALYSIS

5.11.1 ALCAN SYSTEMS ADDRESSES MMWAVE 5G ROLLOUT CHALLENGES WITH LIQUID CRYSTAL SMART ANTENNAS

5.11.2 PIVOTAL COMMUNICATIONS TRANSFORMS MMWAVE DEPLOYMENT WITH PIVOTAL TURNKEY

5.11.3 UNIVERSITY OF EXETER AND VIRGINIA TECH COLLABORATE TO HARNESS ACOUSTIC METAMATERIALS FOR ENHANCED NOISE CONTROL

## 5.12 TRADE ANALYSIS

## 5.13 PATENT ANALYSIS

## 5.14 REGULATORY LANDSCAPE

5.14.1 REGULATORY BODIES, GOVERNMENT AGENCIES, AND OTHER ORGANIZATIONS

5.14.2 REGULATORY FRAMEWORK

5.14.2.1 IEEE Standards for Electromagnetic Compatibility (EMC)

5.14.2.2 ISO and IEC Standards for Advanced Materials

5.14.2.3 ASTM International Standards for Material Properties

5.14.2.4 ITU-R Standards for Wireless Communication

5.14.2.5 IEC Standards for Optical and Photonic Applications

## 5.15 KEY CONFERENCES AND EVENTS, 2024–2025

## 5.16 IMPACT OF AI/GEN AI ON METAMATERIAL MARKET

# 6 METAMATERIAL MARKET, BY PRODUCT

## 6.1 INTRODUCTION

## 6.2 ANTENNAS, RADAR, AND RECONFIGURABLE INTELLIGENT SURFACES

6.2.1 DEMAND FOR HIGH-PERFORMANCE CONNECTIVITY AND 5G-ENABLED



## SOLUTIONS TO DRIVE GROWTH

### 6.2.2 ACTIVE

### 6.2.3 PASSIVE

### 6.2.4 HYBRID

## 6.3 LENSES & OPTICAL MODULES

### 6.3.1 RISING DEMAND FOR PRECISION IMAGING AND MINIATURIZATION TO FUEL MARKET

## 6.4 SENSORS & BEAM STEERING MODULES

### 6.4.1 INCREASING DEMAND IN TELECOMMUNICATIONS TO BOOST MARKET GROWTH

## 6.5 ANTI-REFLECTIVE FILMS

### 6.5.1 ENHANCED OPTICAL EFFICIENCY AND ENERGY SAVINGS TO DRIVE GROWTH

## 6.6 OTHER PRODUCTS

### 6.6.1 RISING DEMAND FOR ADVANCED EMI SHIELDING AND WIRELESS POWER SOLUTIONS TO PROPEL MARKET GROWTH

#### 6.6.1.1 Absorbers

#### 6.6.1.2 Cloaking devices

#### 6.6.1.3 Light & sound filters

#### 6.6.1.4 Isolators & circulators

#### 6.6.1.5 RF filters

#### 6.6.1.6 Transmission lines

#### 6.6.1.7 Wireless charging solutions

## 7 METAMATERIAL MARKET, BY APPLICATION

### 7.1 INTRODUCTION

### 7.2 RF

#### 7.2.1 RISING DEMAND FOR HIGH-SPEED CONNECTIVITY AND DEFENSE APPLICATIONS TO BOOST MARKET

### 7.3 OPTICAL

#### 7.3.1 USE IN HIGH-RESOLUTION IMAGING AND ADVANCED TELECOMMUNICATION SOLUTIONS TO FUEL MARKET

### 7.4 OTHER APPLICATIONS

#### 7.4.1 ADVANCEMENTS IN ACOUSTIC AND THERMAL METAMATERIALS TO DRIVE MARKET GROWTH IN DIVERSE APPLICATIONS

## 8 METAMATERIAL MARKET, BY END USE



## 8.1 INTRODUCTION

## 8.2 CONSUMER ELECTRONICS

### 8.2.1 ADVANCEMENTS TO ENHANCE PERFORMANCE AND ENERGY EFFICIENCY TO BOOST MARKET GROWTH

#### 8.2.1.1 Smartphones

#### 8.2.1.2 Laptops & tablets

#### 8.2.1.3 Head-mounted displays

## 8.3 AUTOMOTIVE

### 8.3.1 ADVANCEMENTS IN META-OPTICS TO ENHANCE SAFETY AND PERFORMANCE TO PROPEL GROWTH

## 8.4 AEROSPACE & DEFENSE

### 8.4.1 RISING DEMAND FOR STEALTH AND LIGHTWEIGHT MATERIALS TO FUEL GROWTH

## 8.5 PHOTOVOLTAICS

### 8.5.1 INCREASING DEMAND FOR RENEWABLE ENERGY DRIVES INNOVATIVE METAMATERIAL DESIGN

## 8.6 ROBOTICS

### 8.6.1 ENHANCED SENSING AND IMAGING TECHNOLOGIES TO FUEL MARKET

## 8.7 HEALTHCARE

### 8.7.1 TARGETED THERAPIES AND ENHANCED IMAGING TECHNOLOGIES TO DRIVE GROWTH

## 8.8 TELECOMMUNICATION

### 8.8.1 RISING DEMAND FOR HIGH-CAPACITY DATA TRANSMISSION TO FUEL MARKET GROWTH

## 8.9 OTHER END USES

### 8.9.1 GROWING DEMAND FOR ENERGY EFFICIENCY AND NOISE REDUCTION SOLUTIONS TO FUEL GROWTH

## 9 METAMATERIAL MARKET, BY TYPE

## 9.1 INTRODUCTION

## 9.2 ELECTROMAGNETIC

### 9.2.1 RISING DEMAND FOR 5G AND ADVANCED IMAGING TO FUEL SEGMENT GROWTH

#### 9.2.1.1 Double negative

#### 9.2.1.2 Single negative

#### 9.2.1.3 Electronic bandgap

#### 9.2.1.4 Double positive

#### 9.2.1.5 Bi-isotropic

9.2.1.6 Chiral

9.2.1.7 Frequency-selective surface-based

### 9.3 OTHER TYPES

9.3.1 INCREASING DEMAND FOR ADVANCED SOUND CONTROL SOLUTIONS TO DRIVE GROWTH

9.3.1.1 Acoustic

9.3.1.2 Thermal

9.3.1.3 Elastic

## 10 METAMATERIAL MARKET, BY FREQUENCY BAND

10.1 INTRODUCTION

10.2 TERAHERTZ

10.3 PHOTONIC

10.4 TUNABLE

10.5 PLASMONIC

## 11 METAMATERIAL MARKET, BY REGION

11.1 INTRODUCTION

11.2 NORTH AMERICA

11.2.1 MACROECONOMIC OUTLOOK FOR NORTH AMERICA

11.2.2 US

11.2.2.1 Increasing demand for advanced communication technologies to drive market growth

11.2.3 CANADA

11.2.3.1 Sustainable technology and renewable energy investments to propel market growth

11.2.4 MEXICO

11.2.4.1 Rising demand for advanced materials and smart city development to drive market growth

11.3 EUROPE

11.3.1 MACROECONOMIC OUTLOOK FOR EUROPE

11.3.2 GERMANY

11.3.2.1 Rising demand for metamaterials in consumer electronics to drive market expansion

11.3.3 UK

11.3.3.1 Research and innovation in metamaterials to propel market growth

11.3.4 FRANCE

11.3.4.1 Collaborative innovation and energy-efficient solutions to boost market growth

11.3.5 REST OF EUROPE

11.4 ASIA PACIFIC

11.4.1 MACROECONOMIC OUTLOOK FOR ASIA PACIFIC

11.4.2 CHINA

11.4.2.1 5G expansion and technological innovation to propel market growth

11.4.3 JAPAN

11.4.3.1 Advancements in telecommunications and energy efficiency to augment market growth

11.4.4 SOUTH KOREA

11.4.4.1 Government initiatives and technological advancements to create market opportunities

11.4.5 INDIA

11.4.5.1 Rising demand for advanced materials to fuel market growth

11.4.6 REST OF ASIA PACIFIC

11.5 ROW

11.5.1 MACROECONOMIC OUTLOOK FOR ROW

11.5.2 MIDDLE EAST & AFRICA

11.5.2.1 Investments in telecommunications to drive market

11.5.2.1.1 Gulf Cooperation Council (GCC)

11.5.2.1.2 Rest of Middle East & Africa

11.5.3 SOUTH AMERICA

11.5.3.1 Economic growth and urbanization to fuel market expansion

11.5.3.1.1 Brazil

11.5.3.1.2 Rest of South America

## **12 COMPETITIVE LANDSCAPE**

12.1 OVERVIEW

12.2 KEY PLAYER STRATEGIES/RIGHT TO WIN, 2020–2024

12.3 MARKET SHARE ANALYSIS, 2023

12.4 REVENUE ANALYSIS, 2018–2023

12.5 COMPANY VALUATION AND FINANCIAL METRICS, 2024 (USD MILLION)

12.6 COMPANY EVALUATION MATRIX: KEY PLAYERS, 2023

12.6.1 STARS

12.6.2 EMERGING LEADERS

12.6.3 PERVASIVE PLAYERS

12.6.4 PARTICIPANTS

## 12.6.5 COMPANY FOOTPRINT: KEY PLAYERS, 2023

12.6.5.1 Company footprint

12.6.5.2 Application footprint

12.6.5.3 Product footprint

12.6.5.4 End use footprint

12.6.5.5 Type footprint

12.6.5.6 Region footprint

## 12.7 COMPANY EVALUATION MATRIX: STARTUPS/SMES, 2023

12.7.1 PROGRESSIVE COMPANIES

12.7.2 RESPONSIVE COMPANIES

12.7.3 DYNAMIC COMPANIES

12.7.4 STARTING BLOCKS

12.7.5 COMPETITIVE BENCHMARKING: STARTUPS/SMES, 2023

12.7.5.1 List of startups/SMEs

12.7.5.2 Competitive benchmarking of startups/SMEs

## 12.8 BRAND/PRODUCT COMPARISON

## 12.9 COMPETITIVE SCENARIO AND TRENDS

12.9.1 PRODUCT LAUNCHES

12.9.2 DEALS

12.9.3 EXPANSIONS

12.9.4 OTHER DEVELOPMENTS

# 13 COMPANY PROFILES

## 13.1 INTRODUCTION

## 13.2 KEY PLAYERS

### 13.2.1 KYMETA CORPORATION

13.2.1.1 Business overview

13.2.1.2 Products/Solutions/Services offered

13.2.1.3 Recent developments

13.2.1.3.1 Product launches

13.2.1.3.2 Deals

13.2.1.4 MnM view

13.2.1.4.1 Right to win

13.2.1.4.2 Strategic choices

13.2.1.4.3 Weaknesses and competitive threats

### 13.2.2 METALENZ, INC.

13.2.2.1 Business overview

13.2.2.2 Products/Solutions/Services offered

- 13.2.2.3 Recent developments
  - 13.2.2.3.1 Product launches
  - 13.2.2.3.2 Deals
- 13.2.2.4 MnM view
  - 13.2.2.4.1 Right to win
  - 13.2.2.4.2 Strategic choices
  - 13.2.2.4.3 Weaknesses and competitive threats
- 13.2.3 ALCAN SYSTEMS GMBH I.L.
  - 13.2.3.1 Business overview
  - 13.2.3.2 Products/Solutions/Services offered
  - 13.2.3.3 Recent developments
    - 13.2.3.3.1 Product launches
    - 13.2.3.3.2 Deals
  - 13.2.3.4 MnM view
    - 13.2.3.4.1 Right to win
    - 13.2.3.4.2 Strategic choices
    - 13.2.3.4.3 Weaknesses and competitive threats
- 13.2.4 ECHODYNE CORP.
  - 13.2.4.1 Business overview
  - 13.2.4.2 Products/Solutions/Services offered
  - 13.2.4.3 Recent developments
    - 13.2.4.3.1 Product launches
    - 13.2.4.3.2 Deals
  - 13.2.4.4 MnM view
    - 13.2.4.4.1 Right to win
    - 13.2.4.4.2 Strategic choices
    - 13.2.4.4.3 Weaknesses and competitive threats
- 13.2.5 PIVOTAL COMMWARE
  - 13.2.5.1 Business overview
  - 13.2.5.2 Products/Solutions/Services offered
  - 13.2.5.3 Recent developments
    - 13.2.5.3.1 Product launches
    - 13.2.5.3.2 Deals
  - 13.2.5.4 MnM view
    - 13.2.5.4.1 Right to win
    - 13.2.5.4.2 Strategic choices
    - 13.2.5.4.3 Weaknesses and competitive threats
- 13.2.6 GREENERWAVE
  - 13.2.6.1 Business overview

- 13.2.6.2 Products/Solutions/Services offered
- 13.2.6.3 Recent developments
  - 13.2.6.3.1 Product launches
  - 13.2.6.3.2 Deals
- 13.2.7 EDGEHOG
  - 13.2.7.1 Business overview
  - 13.2.7.2 Products/Solutions/Services offered
- 13.2.8 METAMAGNETICS
  - 13.2.8.1 Business overview
  - 13.2.8.2 Products/Solutions/Services offered
  - 13.2.8.3 Recent developments
    - 13.2.8.3.1 Product launches
    - 13.2.8.3.2 Other developments
- 13.2.9 FRACTAL ANTENNA SYSTEMS, INC.
  - 13.2.9.1 Business overview
  - 13.2.9.2 Products/Solutions/Services offered
  - 13.2.9.3 Recent developments
    - 13.2.9.3.1 Expansions
- 13.2.10 LUMOTIVE
  - 13.2.10.1 Business overview
  - 13.2.10.2 Products/Solutions/Services offered
  - 13.2.10.3 Recent developments
    - 13.2.10.3.1 Product launches
    - 13.2.10.3.2 Deals
- 13.2.11 TERAVIEW LIMITED
  - 13.2.11.1 Business overview
  - 13.2.11.2 Products/Solutions/Services offered
  - 13.2.11.3 Recent developments
    - 13.2.11.3.1 Product launches
- 13.3 OTHER PLAYERS
  - 13.3.1 2PI INC.
  - 13.3.2 META MATERIALS INC.
  - 13.3.3 MOXTEK, INC.
  - 13.3.4 PLASMONICS INC.
  - 13.3.5 SINTEC OPTRONICS PTE LTD.
  - 13.3.6 PHONONIC VIBES S.R.L.
  - 13.3.7 PHOEBUS OPTOELECTRONICS LLC
  - 13.3.8 APPLIED METAMATERIALS
  - 13.3.9 AMG

- 13.3.10 RADI-COOL SDN BHD
- 13.3.11 METABOARDS
- 13.3.12 JEM ENGINEERING
- 13.3.13 METASONIXX
- 13.3.14 THORLABS, INC.
- 13.3.15 HUAWEI TECHNOLOGIES CO., LTD.
- 13.3.16 NIL TECHNOLOGY
- 13.3.17 ZTE CORPORATION

## **14 APPENDIX**

- 14.1 INSIGHTS FROM INDUSTRY EXPERTS
- 14.2 DISCUSSION GUIDE
- 14.3 KNOWLEDGESTORE: MARKETSANDMARKETS' SUBSCRIPTION PORTAL
- 14.4 CUSTOMIZATION OPTIONS
- 14.5 RELATED REPORTS
- 14.6 AUTHOR DETAILS



## I would like to order

Product name: Metamaterial Market by Antenna, Reconfigurable Intelligent Surfaces (RIS), lenses and optical modules, sensors and beam steering, anti-reflective films, electromagnetic, terahertz, radio frequency (RF), optical and region - Global Forecast to 2029

Product link: <https://marketpublishers.com/r/M6211E39AB96EN.html>

Price: US\$ 4,950.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

[info@marketpublishers.com](mailto:info@marketpublishers.com)

## Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/M6211E39AB96EN.html>

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name:  
Last name:  
Email:  
Company:  
Address:  
City:  
Zip code:  
Country:  
Tel:  
Fax:  
Your message:

**\*\*All fields are required**

Customer signature \_\_\_\_\_

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at <https://marketpublishers.com/docs/terms.html>

To place an order via fax simply print this form, fill in the information below

and fax the completed form to +44 20 7900 3970