1. Global Overview
   * 1.1 Introduction
     + 1.1.1. Global Market Size & Growth

Market Worth: USD 950 bn,

CAGR: 2.9%

* + - 1.1.2. History and Milestones

|  |  |  |
| --- | --- | --- |
| Year | Milestone | Owner/Innovation |
| Until1950 | Invention of the radio and the telephone | Telefunken |
| 1950s–1960s | Transistor radios and early television sets kick off “consumer electronics” | Sony |
| 1970s | First successful personal computer, earliest gaming equipment | Canon, HP |
| 1980s | Portable music players, gaming consoles, handheld cameras | Apple, Nintendo |
| 1990s | Internet age, DVDs, personal computer boom | Dell, Nokia |
| 1984 | Launch of Fast Fashion Model | Zara (Inditex Group) |
| 1999 | Rise of Online Fashion Retail | ASOS (UK-based e-commerce launch) |
| 2000s | Mobile phones popularized, first smartphones | Samsung |
| 2010s | Smartphones combine consumer electronics in one device, wearable devices | Lenovo, Google |
| 2020s (and beyond) | AI-enabled devices, augmented and virtual reality | Huawei, Xiaomi |

)

* + - 1.1.3. Sector Segments

|  |  |  |
| --- | --- | --- |
| Application | Share (%) | Details |
| Communication Devices | 40% | Largest segment; includes smartphones and wearables. Growth driven by 5G adoption, AI integration, and rapid refresh cycles. |
| Personal Computers | 25% | Includes laptops, desktops, and tablets. Demand driven by hybrid work, educational needs, and advancements in lightweight and high-performance devices. |
| TV & Multimedia | 20% | Covers smart TVs, home audio systems, and streaming devices. Innovation in display tech (OLED, 8K) and content integration is key. |
| Gaming Equipment | 15% | Includes consoles, accessories, and AR/VR systems. Growth fueled by immersive gaming, e-sports, and cross-platform ecosystems. |

)

* + - 1.1.3. Equipment Market Share

|  |  |  |
| --- | --- | --- |
| Segment Type | Share (%) | Details |
| Luxury/Premium | 40% | High-end fashion with focus on exclusivity, craftsmanship, and brand heritage. |
| Mass Market/Mid-Range | 25% | Broad appeal; accessible pricing and trend-driven designs for mainstream consumers. |
| Fast Fashion/Budget | 15% | Low-cost, high-turnover apparel emphasizing speed to market and volume. |
| Sportswear/Athleisure | 20% | Functional and casual styles blending performance with comfort and style. |

* + - 1.1.4. Emerging trends and industry insights

|  |  |
| --- | --- |
| Category | Key Points |
| Sustainability Trends | \* Consumer electronics waste is highly valuable ($52B in raw materials); not just hazardous |
| \* Strong industry and government commitment to waste recycling initiatives |
| \* Consumer preference for eco-conscious brands drives these initiatives |
| Technological Advances | \* AI integration is accelerating across devices like smartphones, PCs, and peripherals |
| \* VR headsets are maturing, with emerging roles in remote work and learning |
| \* Enhances sustainability and responsiveness in design and logistics |
| Consumer Behaviour | \* Wearables are growing fast—especially in healthcare, work, and home automation |
| \* Increasing reliance on data collection for personalization and product improvement |
| Industrial Shifts | \* Integrated ecosystems by players like Apple, Google, Samsung, Huawei limit entry of new OEMs |
| \* Tight interconnectivity within ecosystems drives user retention and product loyalty |

)

* + 1.2. Global Trade
    - 1.2.1. Leading Countries

|  |  |  |  |
| --- | --- | --- | --- |
| Country | Imports (USD) | Exports (USD) | Production (Tonnes pa) |
| China | $606.5 billion | $917.9 billion | ~3.8 billion units |
| United States | $475.3 billion | $196.0 billion | ~600 million units |
| Taiwan | $127.2 billion | $246.2 billion | ~450 million units |
| Vietnam | $108.4 billion | $168.8 billion | ~550 million units |

* + - 1.2.2. Major country insights

**China:**

* + - * World’s top consumer electronics producer and exporter, led by firms like Huawei, Lenovo, Xiaomi, and Oppo.
      * “Made in China 2025” drives smart manufacturing, AI integration, and global supply chain dominance.
      * Offers strong R&D funding, export incentives, and highly integrated electronics clusters.

**USA:**

* + - * Leader in high-end innovation and R&D, with strengths in software, semiconductors, and smart devices.
      * Major importer with significant consumer demand; home to Apple and top component suppliers.
      * Strong federal support for domestic chip manufacturing via the CHIPS and Science Act.

**Taiwan:**

* + - * Global hub for semiconductors and electronics manufacturing, anchored by TSMC and Foxconn.
      * Specializes in high-precision components (chips, displays, sensors) for global OEMs.
      * Government support for strategic tech sectors, including AI, 5G, and microelectronics.

**Vietnam:**

* + - * Rising manufacturing hub; key production base for Samsung, LG, and Canon.
      * Attractive tax incentives and access to major trade pacts (RCEP, CPTPP, EVFTA).
      * Rapidly modernizing electronics clusters with growing investment in semiconductors and components.

)

* 1.2.3. Major global suppliers

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Manufacturer | Segment Type | Estimated Global Market Share (2023) | Production Capacity (Units per Year) | Strategic Advantage |
| Apple (US) | Smartphones, PCs, Wearables | ~18–20% | ~300–350 million | Premium ecosystem, strong brand loyalty, vertical integration |
| Samsung (SK) | Smartphones, TVs, Appliances | ~15–17% | ~500 million | Wide product portfolio, semiconductor self-sufficiency |
| Huawei (China) | Smartphones, IoT, 5G Gear | ~6–8% | ~200 million | Strength in 5G tech and domestic market dominance |
| Xiaomi (China) | Smartphones, Smart Devices | ~6–7% | ~250 million | Competitive pricing, strong IoT ecosystem |
| Lenovo (China) | PCs, Tablets, Smartphones | ~7% (in PCs) | ~120 million | Global PC market leader, strong enterprise footprint |

)

* + - 1.2.4. Country analysis case study, 2 countries **[Decision Required]**. Country selection process based on whether said industry is a major export / production in the economy
      * 1.2.4.1. Country GDP and industry contribution
  + Country: China
  + GDP (2023): $17,794 billion (9.9% Consumer Electronics industry)))
    - * 1.2.4.2. Workforce in industry

(Employees in Consumer Electronics: 3.5 million (0.5% of labor force)))

* + - * 1.2.4.3. Market size of industry in country

(Example:

Production Capacity (2023): 3.8 billion units (smartphones, PCs, TVs, wearables, appliances)

Export Turnover: $918 billion

Major OEMs: -500

Component Manufacturers: ~10,000+)

* + - * 1.2.4.4. Top Suppliers and Manufacturers in the country

(Example:

OEMS: Huawei, Xiaomi, Lenovo, Oppo, Vivo, TCL, Hisense

Components Manufacturer: BOE Technology Group, SMIC, Sunny Optical Technology, BYD Electronics)

* + - * 1.2.4.5. Milestone Journey
        + Establishment years of suppliers

|  |  |
| --- | --- |
| Year | Milestone |
| 1984 | Lenovo was founded (originally as Legend), later becoming the world’s top PC manufacturer. |
| 1987 | Huawei was established in Shenzhen, laying the foundation for a global ICT and smartphone powerhouse. |
| 2003 | TCL entered the global stage by acquiring Thomson’s TV business, expanding its footprint in consumer electronics. |
| 2010 | Xiaomi was launched, disrupting the smartphone market with direct-to-consumer, online-first strategies. |
| 2011 | Vivo and Oppo (brands under BBK Electronics) began expanding globally with a focus on camera and audio innovations. |

.)

1. KSA Landscape overview
   * 2.1. KSA Market overview
     + 2.1.1. Local Market Segmentation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Equipment Type | Manufacturers | Manufacturers Count | Units Sold 2023 | Imports 2023 (mSAR) |
| Communication Devices | Samsung, Apple, Huawei, ZTE | ~10 | ~12 million units | ~14,700 |
| Personal Computers | HP, Dell, Lenovo, Asus, Acer | ~8 | ~1.5 million units | ~8,600 |
| TV & Multimedia | Samsung, LG, Sony, Hisense, TCL | ~10 | ~2.2 million units | ~3,900 |
| Gaming Equipment | Sony (PlayStation), Microsoft (Xbox), Nintendo | ~5 | ~0.6 million units | ~2,100 |

* + - 2.1.2. Market share

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Company | Communication Devices | Personal Computers | TV & Multimedia | Gaming Equipment |
| Apple | 46% | 25% | 10% | 12% |
| Samsung | 24% | 15% | 35% | 10% |
| Huawei | 12% | 5% | 8% | 5% |
| LG Electronics | 3% | 3% | 20% | 5% |
| Jarir Marketing Co | 5% | 20% | 10% | 15% |

)

* + - 2.1.4. Current and projected demand

**Consumer Electronics Sold and Forecast (thousands of units)**

* **2023:** 45,000 (Actual)
* **2024:** 47,000 (Actual)
* **2035:** 60,000 (Forecast)

**Forecast Increase:** +9.3% from 2024 to 2035)

* + 2.2. Segments Overview
    - 2.2.1. Import dependency of various segments

**Consumer Electronics Import 2023 (mSAR)**

|  |  |  |
| --- | --- | --- |
| Segment | Import Value (mSAR) | % of Total Import |
| Communication Devices | 14,670 | 57.8% |
| Personal Computers | 6,825 | 26.9% |
| TV & Multimedia | 3,935 | 15.5% |
| Gaming Equipment | 240 | 0.9% |

* + - 2.2.2. Market size – Different segments and market size

Communication Devices: 14,670,000 units (44.8%)

Personal Computers: 6,825,000 units (20.8%)

TV & Multimedia: 3,935,000 units (12%)

Gaming Equipment: 240,000 units (0.7%)

Others: 7,030,000 (21.5%))

* + - 2.2.3. Market trends

(Example:

**Consumer Electronics Import Trend (SARm):**

**2019: 45,120,000,000**

**2020: 41,780,000,000**

**2021: 47,340,000,000**

**2022: 52,610,000,000**

**2023: SAR 57,890,000,000Insights:**

**•** Growth in Trade Deficit:

The Balance of Trade (BOT) for consumer electronics in Saudi Arabia has widened consistently, growing from SAR 35.8 billion in 2018 to SAR 40.4 billion in 2023, reflecting a +2% CAGR.

• Communication Devices Lead the Deficit:

Communication devices, especially smartphones, are the largest contributors to the BOT, increasing from SAR 23.4 billion in 2018 to SAR 24.1 billion in 2023, accounting for 60% of the overall deficit. The dominance is due to minimal local manufacturing and high consumer demand for global smartphone brands.

• Personal Computers Showing the Fastest Growth:

The BOT for personal computers nearly doubled from SAR 5.5 billion in 2018 to SAR 9.2 billion in 2023, contributing 23% of the total deficit. This surge is tied to digitization efforts, increased remote work and learning, and rising B2B demand across government and enterprise sectors.

• Accessories (Bags) Gaining Share:

Bags and fashion accessories rose from SAR 1.7 billion in 2018 to SAR 2.3 billion in 2023, comprising 10% of the deficit. This trend reflects the rising influence of luxury fashion among KSA’s middle and upper-income consumers.

Key Drivers of BOT Increase:

Urbanization & Changing Preferences: Growth of urban populations and youth segments is fueling demand

Limited Local Manufacturing: Heavy reliance on imported finished products due to limited domestic assembly and component production.

Digital Lifestyle Demand: Widespread adoption of smartphones, smart homes, and connected devices is fueling import growth.

Youth & Gaming Boom: Young demographics and rising interest in gaming are driving demand for consoles and multimedia gear.

Vision 2030 Tech Push: Government tech initiatives are increasing imports of PCs, peripherals, and smart infrastructure tools.

* + 2.3. Trade Analysis
    - 2.3.1. Top Exporting countries per segment

(Example:

**Consumer Electronics Categories Top Exporting Countries to KSA**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Category | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| Communication Devices | China | China | China | China | China | China |
| Personal Computers | USA | USA | China | China | Poland | Poland |
| TV & Multimedia | China | China | Vietnam | Vietnam | Vietnam | Vietnam |
| Gaming Equipment | USA | China | USA | USA | China | USA |

* + - 2.3.2. Top Exporting countries rank

(Example:

**Consumer Electronics Top Exporting Countries to KSA**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Rank | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| 1 | China | China | China | China | China | China |
| 2 | USA | USA | Vietnam | Vietnam | Vietnam | Vietnam |
| 3 | India | India | USA | USA | USA | USA |
| 4 | South Korea | Vietnam | India | India | India | India |
| 5 | Japan | Japan | Poland | Poland | Poland | Poland |

)

* + - 2.3.3. Trends and insights

(Example: Over 85% of KSA’s apparel, footwear, and accessories imports from 2018 to 2023 originated from six key countries:

**•** China

**•** Vietnam

**•** USA

**•** India

**•** Poland

**•** Taiwan

* + 2.4. Local Capabilities
    - 2.4.1. Current Local Capabilities

(Example:

**Ajlan & Bros Advanced Electronics Company (AEC)**

* Capabilities: Specializes in the design, assembly, testing, and maintenance of advanced electronic systems, including telecom, ICT, and digital control units. Supports local assembly and repair for high-tech civilian and industrial products.
* Strategic Partnerships: Collaborates with international OEMs and defense-tech firms, and is now a key subsidiary of SAMI, enhancing technology transfer and local production capabilities.
* Focus: Expanding into smart electronics, industrial IoT, and localized manufacturing for critical infrastructure and digital transformation initiatives under Vision 2030.

**Alat (PIF Initiative)**

* Capabilities: A newly launched, state-backed company focused on building large-scale electronics manufacturing infrastructure, including semiconductors, consumer tech, and AI-integrated systems.
* Strategic Partnerships: Engaged in partnerships with global technology and hardware manufacturers to establish domestic production capacity across consumer electronics and smart technologies.
* Focus: Aims to make KSA a regional hub for electronics production, prioritizing smart devices, green energy tech, and advanced consumer electronics as part of PIF’s industrial diversification strategy.
  + - 2.4.2. Upcoming supplier categories

(Example:

Saudi Arabia’s consumer electronics ecosystem is expected to gradually diversify as the government drives localization under Vision 2030. The focus is on reducing import dependence by developing upstream and midstream supply capabilities, particularly for components, peripherals, and value-added electronics services.

**Supplier Categories**

* **Printed Circuit Board (PCB) Fabrication Units**
* **Plastic & Metal Enclosure Manufacturers**
* **Cable & Connector Assembly Plants**
* **Battery Pack and Power Module Units**
* **Smart Device Packaging & Assembly Services**

)

1. Associated Industry and Value Chain Analysis
   * 3.1. Associated Industry Analysis
     + 3.1.1. Associated Industry list

(Example:

|  |  |
| --- | --- |
| Associated Industry Number | Associated Industry |
| Associated Industry 1 | PCBs and Associated Components |
| Associated Industry 2 | Electronic & Semiconductor Components |
| Associated Industry 3 | Display Panels |
| Associated Industry 4 | Telecom Equipment |
| Associated Industry 5 | Power Generation Equipment |
| Associated Industry 6 | Electrical and Power Distribution |
| Associated Industry 7 | Measurement & Control Instruments |
| Associated Industry 8 | Plastic & Non-metallics |
| Associated Industry 9 | Lighting & Photonics |
| Associated Industry 10 | Mechanical Components |

)

* + - 3.1.2. Industry Role

(Example:

|  |  |  |
| --- | --- | --- |
| Associated Industry | Value Chain Role | Contribution to Final Product |
| PCBs and Associated Components | Core upstream electronics fabrication sector. | Acts as the functional backbone of most devices—enabling circuit control, power routing, and logic processing. |
| Electronic & Semiconductor Components | Midstream supplier of ICs, memory, sensors, and microcontrollers. | Powers device performance, responsiveness, and connectivity in smartphones, TVs, and PCs. |
| Display Panels | Midstream assembly and module integration of LED, OLED, and LCD displays. | Determines visual quality and user experience across smart TVs, phones, tablets, and wearables. |
| Telecom Equipment | Downstream integrator of connectivity modules and signal systems. | Enables networking capabilities such as 5G, Wi-Fi, and Bluetooth in communication devices. |
| Power Generation Equipment | Midstream provider of energy systems and charging infrastructure. | Supplies power delivery and efficiency through batteries, inverters, and energy controllers. |
| Electrical and Power Distribution | Midstream manufacturer of internal wiring, PCU boards, and heat management. | Supports electrical safety, signal flow, and thermal stability inside devices. |
| Measurement & Control Instruments | Midstream precision input supplier. | Powers sensors and feedback systems (e.g., touchscreens, gyroscopes, health trackers). |
| Plastic & Non-metallics | Midstream provider of structural and molded components. | Provides durability, weight reduction, and insulation for housings, frames, and casings. |
| Lighting & Photonics | Midstream innovation cluster in LEDs, optical sensors, and backlight systems. | Enhances display brightness, imaging, and facial recognition features. |
| Mechanical Components | Midstream supplier of mechanical actuators, hinges, screws, and thermal blocks. | Enables device assembly, heat management, and hardware durability in foldables, laptops, and consoles. |

)

* + - 3.1.3. Supplier Tiers

(Example:

|  |  |  |  |
| --- | --- | --- | --- |
| Associated Industry | Tier 1 Suppliers | Tier 2 Suppliers | Tier 3 Suppliers |
| PCBs and Associated Components | * TSMC * Intel * Micron | * AT&S * SCC (Compeq) * Zhen Ding Tech | * Sibelco * CMOC * Zijin |
| Electronic & Semiconductor Components | * NVIDIA * Qualcomm * Intel | * Murata * Toray * Shin-Etsu | * Baosteel * Alcoa * CODELCO |
| Display Panels | * BOE * BQE * CSOT | * Tianma * Corning * AGC | * Saint-Gobain * China National Building Materials * Sumitomo |
| Telecom Equipment | * Broadcom * Qorvo * AAC Technologies | * Murata * Luxshare * Molex | * CODELCO * Alcoa * Newmont |
| Power Generation Equipment | * COSMX * Sunwoda * ATL | * KAUI * Tinci * CATL | * Albemarle * Vale * Norilsk Nickel |
| Electrical and Power Distribution | * Amphenol * HRS * Luxshare ICT | * Baosteel * Alcoa * CODELCO | * Alcoa * CODELCO * Baosteel |
| Measurement & Control Instruments | * Samsung * Sony * Keysight Technologies | * Murata, * Yageo * Corning | * CODELCO * Alcoa * Saint-Gobain |
| Plastic & Non-metallics | * Lenovo * Dell * LG Chem | * Röchling * Toray * BASF | * LG Chem * SABIC * BASF |
| Lighting & Photonics | * Largan * Sunny Optical * Sony | * Corning * Sumita * AGC | * Saint-Gobain * XUG * Hoya |
| Mechanical Components | * Jarllytec * Lotes * Sony | * Röchling * Luxshare * AGC | * SABIC * Alcoa * Saint-Gobain |

)

* 3.1.4. Cost Contribution

(Example:

|  |  |  |
| --- | --- | --- |
| Associated Industry | % Cost Contribution | Insights |
| PCBs and Associated Components | 10%–15% | * - Acts as the **foundation** for all components. * - Cost varies with board layer count, density, and copper usage. * - Reliability and thermal performance add to premium builds. |
| Electronic & Semiconductor Components | 40%–50% | * - Largest cost driver: includes processors, GPUs, memory, power ICs. * - Highly sensitive to node size, chip architecture, and brand (e.g., Qualcomm, Apple, Intel). * - Shortages or advanced specs (AI, 5G) significantly increase cost. |
| Display Panels | 15%–20% | * - Second-highest cost in many devices (esp. smartphones, TVs, tablets). * - Cost scales with size, resolution, panel tech (OLED vs. LCD). * - Touch responsiveness, brightness, and refresh rates add premium. |
| Telecom Equipment | 5%–10% | * - Includes modems, antennas, RF front ends. * - Devices with 5G, mmWave, eSIM incur higher costs. * - Miniaturization and signal performance impact RF design expense. |
| Power Generation Equipment | 8%–12% | * - Comprises batteries, charging ICs, and voltage regulators. * - Battery chemistry, capacity, and fast-charging capabilities heavily influence price. * - Safety features (e.g., thermal control) add cost. |
| Electrical and Power Distribution | 3%–5% | * - Covers internal wiring, shielding, and connectors. * - High-efficiency devices require custom power delivery architecture. * - Durable cables and robust interconnects increase reliability and cost. |
| Measurement & Control Instruments | 5%–8% | * - Includes motion sensors, proximity detectors, biometrics. * - Accuracy, integration with AI, and data processing hardware affect price. * - More prominent in wearables, smartphones, smart home devices. |
| Plastic & Non-metallics | 2%-5% | * - Enclosures, ports, buttons, and frames. * - Cost influenced by material (PC, ABS, glass-infused composites). * - Impact resistance, finish, and environmental sealing raise cost in premium models.. |
| Lighting & Photonics | 2%–4% | * - Includes camera modules, lenses, LED backlights, IR sensors. * - Devices with multiple or high-resolution cameras face higher photonics cost. * - Optical image stabilization, coatings, and sensors add premium. |
| Mechanical Components | 1%–3% | * - Hinges, fans, screws, and heat dissipation hardware. * - Premium devices with foldable screens or advanced cooling require precise, durable mechanical parts. * - Typically a small share but critical to functionality. |

* + 3.2. Value Chain Analysis
    - 3.2.1. 6-step value chain analysis

(Example:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Associated Industry | Insight Topic | Raw Material | Manufacturing Industries | Assembly | Distribution & Sales | Aftermarket | Consumers |
| PCBs and Associated Components | System Backbone Efficiency | * Copper, fiberglass, rare earth elements * Silicon for substrate formation | * PCB etching and multilayer fabrication * Integration of heat-dissipative and conductive materials | * Mounted with chips and components, soldered and tested | * Value proposition driven by performance marketing (e.g., durability, form factor) * Logistics depends on lead time & device category | * Repair and recycling potential for extended lifecycle | * All segments using electronics (phones, PCs, smart devices) |
| Electronic & Semiconductor Components | Processing Power & Speed | * High-purity silicon, gold, nickel, and copper | * Wafers produced via photolithography * Dicing and bonding in clean rooms | Integrated into circuit boards (e.g., CPUs, memory, ICs) | * Branded chipsets and premium positioning influence shelf value (Intel, AMD, Qualcomm) | * Firmware updates, thermal paste reapplication, repairs | * Tech enthusiasts, enterprise buyers, gamers, students |
| Display Panels | User Interface Innovation | * Glass, liquid crystals, ITO (indium tin oxide), OLED organic layers | * Deposition of pixels, TFT array printing * Backlighting and brightness enhancement | * Installed into enclosures and bonded with touch layers | * Retail value shaped by resolution, display type (OLED vs. LCD), color quality | * Screen replacement and repair services | * Smartphone, TV, and tablet users |
| Telecom Equipment | Connectivity Integration | * Rare metals, copper, aluminium * RF materials (ceramic & ferrite for antennas) | * RF module fabrication, modem and antenna integration | Installed into phones, routers, smart hubs during system integration | Branded 5G/4G compatibility promoted at retail; connectivity is a key selling point | * Carrier-supported upgrades and firmware refresh | * Mobile and IoT users |
| Power Generation Equipment | Battery Life & Safety | * Lithium, cobalt, nickel, graphite for battery production | * Cell manufacturing, BMS integration * Anode and cathode balancing | * Battery packs inserted during final product build * Integrated with fast-charging ICs | * Sales promotions centered on battery life, fast-charging speeds | * Battery replacement, charging port repair | * High-use device users (e.g., mobile, laptops, wearables) |
| Electrical and Power Distribution | Power Flow Optimization | * Copper, aluminum, insulators, and resins | * Connector plating, wire extrusion * Fuse/relay fabrication | * Assembled inside devices to manage power delivery and shielding | * Positioning based on efficiency ratings, especially in energy-intensive devices | * Repair or replacement of damaged connectors | * PC, TV, industrial and smart home product users |
| Measurement & Control Instruments | Sensor Accuracy & Responsiveness | * Rare metals, silicon for MEMS sensors * Coated glass and PCB substrates | * Micro-electromechanical (MEMS) and sensor fabrication * Calibration and testing lines | * Embedded early in wearables, smartphones, and smart devices | * Highlighted in product packaging for fitness, health, and accuracy claims | * Sensor recalibration or software-based diagnostics | * Health-focused and tech-lifestyle consumers |
| Plastic & Non-metallics | Device Durability & Ergonomics | * ABS, PC, TPU plastics, rubber compounds * Additives like flame retardants or UV stabilizers | * Injection molding, CNC machining for custom parts * Surface treatment and coating | * Used for housings, buttons, ports, and protective frames | * Differentiated by material texture, weight, and drop-resistance grades | * Casing replacements and protective accessory integration | * Everyday electronics users and gadget enthusiasts |
| Lighting & Photonics | Imaging & Environmental Sensing | * Glass, LEDs, photodiodes, optical filters | * Lens crafting, IR module integration, LED mounting | * Inserted in phones, tablets, TVs (e.g., cameras, flash, face unlock) | * Consumer awareness driven by camera specs and optical clarity (MP, aperture, OIS) | * Lens and camera module repair or replacement | * Visual content creators, mobile users, smart home device users |
| Mechanical Components | Structural Reliability | * Steel, aluminum, polycarbonate, and molded elastomers | * Machined hinges, fasteners, vibration modules * Fan and cooling module manufacturing | * Installed into laptops, foldables, game consoles during enclosure assembly | * Highlighted in marketing for build quality, cooling performance, tactile feedback | * Fan servicing, hinge tightening, and thermal paste renewal | * Laptop, console, and performance device consumers |

)

* + - 3.2.2. Value chain supplier landscape

(Example:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Industry | Global vs Local Suppliers | Raw Material  Suppliers | Manufacturing Industries Suppliers | Assembly Suppliers | Distribution & Sales | Aftermarket | Consumers |
| PCBs and Associated Components | Global Suppliers | * Sibelco * CODELCO * CMOC | * Zhen Ding Tech * Compeq * AT&S | * Foxconn * Micron * TSMC | * Samsung * Apple * Dell | * Extra * Jarir * Sheta & Saif | * Communication * Work * Education |
| Electronic & Semiconductor Components | Local Suppliers | * Alcoa * Baosteel * Shin-Etsu | * Murata * Toray * Shin-Etsu | * Intel * Qualcomm * NVIDIA | * HP * Lenovo * Dell | * Jarir * Almana * Sheta & Saif | * Communication * Productivity |
| Display Panels | Global Suppliers | * Saint-Gobain * CGC * AGC | Corning BOE  Tianma | * Samsung Display * BQE * CSOT | LG, Sony, Huawei | * Extra * Jarir | * Entertainment * Smart Devices |
| Telecom Equipment | Local Suppliers | * CODELCO * Alcoa * Newmont | Murata Luxshare LCV | * Broadcom * AAC Technologies | * Huawei * Apple * Xiaomi | * Extra * Almana | * Communication * Home Automation |
| Power Generation Equipment | Global Suppliers | * Albemarle * Vale * TCC | TCC  Ronbay  KAUIN | * COSMX * ATL * Sunwoda | * Dell * Lenovo * HP | * Authorized battery services | * Wearables * Mobile * Remote Use |
| Electrical and Power Distribution | Local Suppliers | * Baosteel * CODELCO * Alcoa | CODELCO  BaosteelAlcoa | * Amphenol * Luxshar * HRS | * HP * Samsung * Huawei | * Power adapter and cable vendors | * Home * Enterprise * Industrial |
| Measurement & Control Instruments | Global Suppliers | * CODELCO * Alcoa * Saint-Gobain | * Yageo * Corning * Murata | * Sony * Samsung * ,Keysight | * Dell * Apple * Lenovo | * Sensor recalibration shops | * Health Tech * Wearables * IoT |
| Plastic & Non-metallics | Mixed (Local: SABIC) | * SABIC * BASF * LG Chem | * Röchling * Toray * BASF | * Lenovo * Dell * Samsung | * Xiaomi * HP * Apple | * Protective gear providers | * General consumers * Mobile * PC users |
| Lighting & Photonics | Lighting & Photonics | * Global Suppliers | * Hoya * Saint-Gobain * Sumita | * Corning * AGC * Sumita | * Largan * Sunny Optical * Sony | * Huawei * Apple * Sony | * Camera & screen repair centers |
| Mechanical Components | Mechanical Components | * Mixed (Ma’aden, SABIC local) | * Ma’aden * Alcoa * SABIC | * Röchling * AGC * Luxshare | * Jarllytec * Sony * Dell | * Lenovo * Samsung * HP | * Fan and hinge repair specialists |

)

* + - 3.2.3. Supplier Case Study

(Example:

|  |  |
| --- | --- |
| Supplier Name | Apple Inc. |
| Headquarter Location | * Cupertino, California, USA |
| Founding Year | * 1976 |
| 2023 Revenue (USD) | * USD 394 bn |
| Top global operating location | * USA (R&D and Design) * China (Manufacturing with Foxconn, Pegatron) * India * Vietnam * UK * Germany * UAE * Australia |
| Number of Employees | * 161,000 |
| Product Portfolio | * Communication Devices: iPhone (20% Global Market Share) * Personal Computers: MacBook, iMac (10%) * TV & Multimedia: Apple TV, iPad * Smart Home Ecosystem: HomePod, Apple Watch, accessories |
| Service Offering | * End-to-end integration of hardware, software, and cloud services * Revenue from iCloud, Apple Music, App Store, AppleCare * Direct retail and e-commerce network across 175+ countries |
| Global Value Chain Contribution | * Innovation-Led Design: Apple leads in product development, custom chip (M-series) integration, and vertical ecosystem design * Strategic Manufacturing Footprint: Relies on partners in China, Vietnam, and India for assembly, reducing geographic risk * Retail and Aftermarket: Owns a robust global distribution and repair network that strengthens customer loyalty and service consistency |

)

* + - 3.2.4. Value chain localization opportunities

(Example:

Opportunity 1: Establish strategic assembly partnerships with global OEMs (e.g., Lenovo, Apple) to develop local assembly capacity in KSA for key product categories: Communication Devices, Personal Computers, TV & Multimedia, and Gaming Equipment. These partnerships can accelerate localization, access to IP, and downstream manufacturing readiness.

Opportunity 2: Create a shared assembly and manufacturing hub that services both consumer electronics and domestic appliances. This approach leverages common component needs (e.g., electronics, plastics, mechanical parts), enabling economies of scale, streamlined supply chains, and reduced complexity across both industries.

Opportunity 3: Support contract manufacturing agreements by local KSA players with global OEMs like Apple and Amazon, enabling them to scale operations through partnerships with major EMS providers (e.g., Foxconn, Flex, etc.). This would strengthen KSA’s role in the global electronics value chain, especially in components and systems assembly.

)

* + 3.3. Raw Material Analysis
    - 3.3.1. 5-step value chain analysis

(Example:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Associated Industry | Insight Topic | Raw Material Extraction Insight | Material Processing Insight | Manufacturing Insight | Industry Specific | Manufactured Parts |
| Steel | Limited downstream applicability for electronics | * Iron ore sourced globally; local mining and processing focused on construction needs with limited grade flexibility | * DRI and EAF dominate; alloying and retaining capacity exists but geared toward basic steel applications | * Limited capability in precision machining and coating for electronics components | * Low specialization in stainless and galvanized steels needed for electronics; current grades serve basic industrial needs | * Screws, frames, structural mounts, enclosures |
| Plastics (Polymers) | Potential for value-added polymer specialization | * Strong upstream base with Aramco and SABIC; local feedstock available for scalable polymer production | * Advanced polymer production (e.g., PC, PMMA) already in place; limited focus on conversion for electronics | * Underutilized capacity for molding and component assembly relevant to devices | * Polymer expertise can support parts like optical lenses, casings, and insulators with focused investment | * Device shells, screen covers, interior insulation components |
| Copper | Growing domestic capability in high-purity copper | * Local mining and new exploration efforts underway (e.g., Ma’aden); current reliance on imports for refined material | * Blister and cathode copper refinement exists abroad; new refineries planned in Yanbu | * Opportunities in ETP and OFHC copper for wiring and PCB supply | * Copper grades required for PCBs, connectors, and battery modules can be produced locally with strategic investment | * PCB traces, wiring, power terminals, grounding plates |
| Silicon | Critical gaps in semiconductor-grade infrastructure | * Quartz reserves are abundant in KSA but not yet industrialized for electronics-grade silicon | * No current capacity for MG-Si or EG-Si processing; reliance on imports for polysilicon and wafer supply | * No local manufacturing for wafers, polycrystalline silicon, or electronic-grade components | * Electronics and display segments cannot currently source base silicon locally; full dependency on imports persists | * Silicon wafers, transistors, microchips, LCD panel substrates |
| Lithium Compounds | Strategic opportunity for battery value chain | * Brine-based lithium explored by Albemarle, Ma’aden, and Aramco; large regional reserves remain untapped | * No current refining of lithium hydroxide or carbonate; entirely dependent on international processors | * High potential for establishing refining and cathode production through partnerships with global battery manufacturers | * Could support consumer electronics and EV-grade battery cell production with proper infrastructure and policy incentives | * Battery cells, wearable power units, smart device battery modules |

)

* + - 3.3.2. Supplier Landscape

(Example:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Associated Industry** | **Insight Topic** | **Raw Material Extraction Insight** | **Material Processing Insight** | **Manufacturing Insight** | **Industry Specific** | **Manufactured Parts** |
| **Steel** | Limited industrial-grade steel for electronics | * Vale (Global) * CODELCO (Global) * LKAB (Global) | * Hadeed (Local – SABIC) * ArcelorMittal (Global) * Beshay Steel (Regional) | * Posco (Global) * SiCast (Local) * Tata Steel (Global) | * Posco (Global) * Outokumpu (Global) * Acerinox (Global) | * Fasteners, structural frames, screws, metal brackets |
| **Plastics (Polymers)** | Underutilized potential for component molding | * Aramco (Local) * SABIC (Local) * ExxonMobil (Global) | * PetroRabigh (Local) * Sadara (Local) * Sipchem (Local) | * TASNEE (Local) * Borouge (Regional) * LyondellBasell (Global) | * TASNEE (Local) * SABIC (Local) * Advanced Petrochem (Local) | * Casings, insulation, lenses, button assemblies |
| **Copper** | Strengthening local capacity for electronics | * Ma’aden (Local) * Ivanhoe Electric (Global) * Glencore (Global) | * Gulf Copper (Local) * Grupo México (Global) * BHP (Global) | * Aurubis (Global) * Mitsubishi Materials (Global) * Nexans (Global) | * ETP Copper (Grupo México) * DHP Copper (Glencore) * OFHC Copper (Aurubis) | * PCB traces, wiring, connectors, copper heat sinks |
| **Silicon** | No local electronic-grade capability | * Sibelco (Global) * Ma’aden (Local – quartz exploration)  • Daqo New Energy (Global) | * Wacker Chemie (Global) * Hemlock Semiconductor (Global)  • OCI (Global) | * REC Silicon (Global) * HSC (Global) * SMIC (Global) | * Shin-Etsu (Global) * SUMCO (Global) * GlobalWafers (Global) | * Semiconductors, display TFTs, solar cells |
| **Lithium Compounds** | High potential through brine-based reserves | * Albemarle (Global) * SQM (Global) * Ma’aden (Local) | * Albemarle (Global) * Ganfeng Lithium (Global) * FMC Corp (Global) | * Tianqi Lithium (Global) * POSCO Chemicals (Global) * TDS Lithium (Global) | * Albemarle (Global) * Ganfeng (Global) * Lithium Americas (Global) | * Battery cells, power modules, energy storage systems |

)

* + - 3.3.3. Supplier Case Study

(Example:

|  |  |
| --- | --- |
| Supplier Name | SQM (Sociedad Química y Minera de Chile S.A.) |
| Headquarter Location | * Santiago, Chile |
| Founding Year | * 1968 |
| Revenue (USD) | * USD 7.5 billion (FY 2023) |
| Top global operating location | * Chile * Australia * China |
| Number of Employees | * 6,200 |
| Product Portfolio | * Lithium Compounds (lithium carbonate, lithium hydroxide) * Specialty Plant Nutrition * Iodine, Nitrates, Potassium |
| Service Offering | * Integrated mining and refining of lithium brine and other minerals * Sustainable resource extraction practices * Downstream lithium partnerships |
| Global Value Chain Contribution | * SQM is one of the world's leading producers of lithium compounds for batteries and energy storage. It specializes in lithium brine extraction, a process that aligns well with Saudi Arabia’s untapped lithium reserves. * The company’s expertise in low-emission, sustainable lithium production and its global joint ventures (e.g., with Codelco and Wesfarmers) position it as a strategic enabler for battery ecosystems. * Its investments in refining capabilities and circular battery economy projects (e.g., with AltLithium Metals) enhance its downstream integration. |

* + - 3.3.4. Value chain localization opportunities

(Example:

Opportunity 1: Expand Domestic Production of Specialized Steel Grades

KSA can localize production of stainless steel (304, 430), galvanized steel (DX51D, A755), and electrical steel (M400-50A) to meet the demands of consumer electronics and related industries. This would reduce dependency on imports and support sectors like automotive, fluid processing, and home appliances.

Opportunity 2: Develop Polymer Conversion Capabilities for Electronics Components

KSA’s strong upstream polymer base enables the development of local molding and conversion facilities to produce electronics-specific parts such as device casings, internal frames, cable insulation, and compact housings — enhancing vertical integration in the plastics value chain.

Opportunity 3: Establish Copper Smelting and Refining Plants to Produce Electronics Grades

To support PCB, cable, and connector manufacturing, KSA can invest in plants to refine Grade A (C11000), OFHC, and DHP copper. Local copper recycling from industrial and electronic