

# Power Electronics for IoT-Enabled Smart Grids and Industrial Automation

Chapter	Title	Page No.
1	Time-Sensitive Networking (TSN) and 6G-Enabled Communication Frameworks for Low-Latency Control of IoT-Powered Industrial Power Electronics	12
2	Energy Harvesting from Ambient Sources for Self-Powered IoT-Enabled Power Electronic Systems in Industrial Automation	38
3	Physics-Informed Deep Learning for Adaptive Power Converter Control in IoT-Integrated Smart Grid Systems	65
4	Neuro-Evolutionary Algorithms for Intelligent Load Management and Demand Response in IoT-Enabled Industrial Power Networks	91
5	Transformer-Based AI Models for Fault Detection and Predictive Maintenance in IoT-Driven Smart Grid Power Electronics	117
6	Federated and Transfer Learning for Distributed Anomaly Detection in IoT-Enabled Power Electronics for Industrial Automation	144
7	Silicon Carbide (SiC) and Gallium Nitride (GaN)-Based Wide Bandgap Power Electronics for High-Efficiency IoT-Integrated Grid Applications	170
8	Blockchain-Enabled Peer-to-Peer (P2P) Energy Trading and Decentralized Grid Control for IoT-Integrated Smart Power Networks	199
9	Quantum Computing for Power Electronics: Quantum Machine Learning Approaches for IoT-Enabled Grid Optimizatio	229
10	Homomorphic Encryption and AI-Based Intrusion Detection for Cyber-Resilient IoT-Connected Smart Power Systems	257
11	Post-Quantum Cryptographic Frameworks for Securing IoT-Enabled Power Electronics in Smart Grid and Industrial Applications	286

12	AI-Driven Secure Communication and Anomaly Detection in 5G-Connected IoT Power Electronics Networks	315
13	Zero-Trust Architecture and Blockchain-Based Security Models for IoT-Integrated Industrial Power Electronics Systems	344
14	Quantum Key Distribution (QKD) for Ultra-Secure Power Electronics Communication in IoT-Based Smart Grid Systems	377
15	Intelligent Control of Electric Vehicle (EV) Charging Infrastructure Using IoT-Enabled Power Electronics and V2G Technology	407
16	Industrial IoT (IIoT)-Driven Predictive Maintenance and Reliability Analysis for Power Electronic Systems in Autonomous Manufacturing	434