Qmax Systems

Electronics Engineering Services

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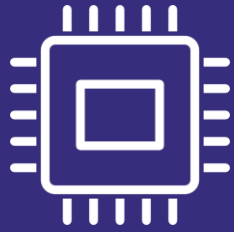
Qmax Introduction

- An Electronics Engineering and R&D Services company

- Complete End to End Product Development

- R&D Team in Chennai, India, Sales office in the USA

- Strong Experience in working on Complex, Cutting Edge Technology

- Multi Domain Expertise – Automotive / Aerospace / Industrial / Medical / Defence
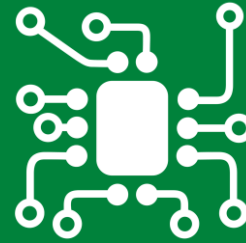
- Incorporated in 2000

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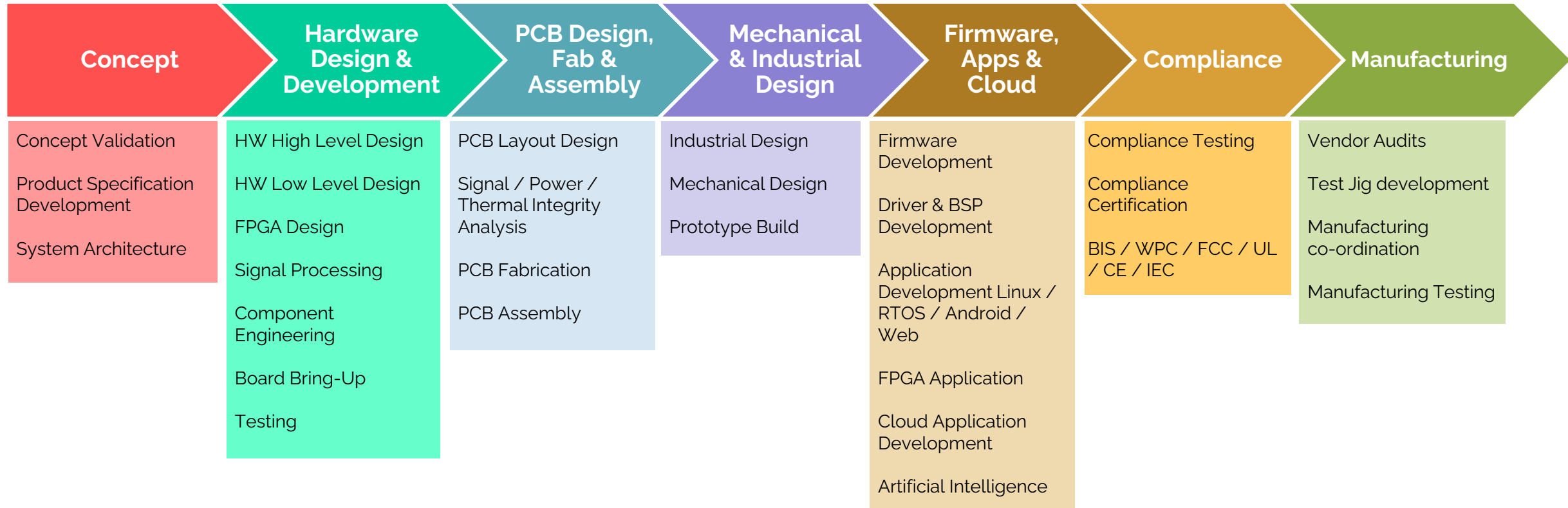SYSTEMS

Services Offered
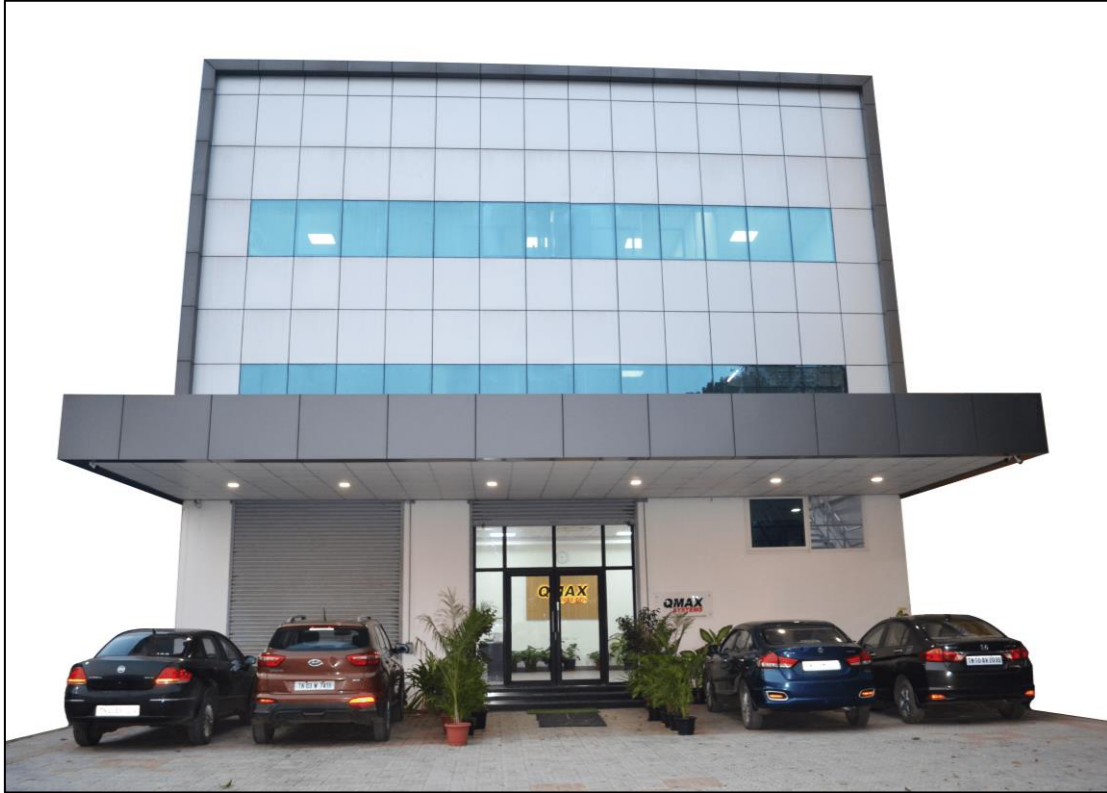

Hardware Design
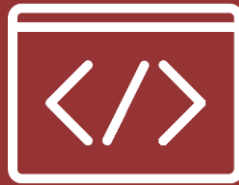
Embedded Firmware

PCB Design

Mechanical & Industrial Design

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Design to Manufacturing

End to End Product Development Services

Concept	Hardware Design & Development	PCB Design, Fab & Assembly	Mechanical & Industrial Design	Firmware, Apps & Cloud	Compliance	Manufacturing
Concept Validation	HW High Level Design	PCB Layout Design	Industrial Design	Firmware Development	Compliance Testing	Vendor Audits
Product Specification Development	HW Low Level Design	Signal / Power / Thermal Integrity Analysis	Mechanical Design	Driver & BSP Development	Compliance Certification	Test Jig development
System Architecture	FPGA Design	PCB Fabrication	Prototype Build	Application Development Linux / RTOS / Android / Web	BIS / WPC / FCC / UL / CE / IEC	Manufacturing co-ordination
	Signal Processing	PCB Assembly		FPGA Application		Manufacturing Testing
	Component Engineering			Cloud Application Development		
	Board Bring-Up			Artificial Intelligence		
	Testing					

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Infrastructure – Chennai HQ

Quality Assurance

- ISO 9001:2015 Certified Company

- Qmax Systems has established, documented, and implemented a Quality Management System.

- The system is maintained and continually improved using the quality policy, quality objectives, internal & external review results, analysis of data, corrective and preventive action and periodic management reviews.

VERITAS

CERTIFICATE
OF REGISTRATION

This is to certify that the Management System of

Qmax Systems India Pvt Ltd

310-2A, Rukmani Nagar, 4th Street, Poonamallee, Chennai -600056, Tamil Nadu, India.

has been assessed and registered by Veritas System Quality Certificates as conforming to the requirements of

ISO 9001:2015

Quality Management System

The Quality Management System is applicable to:

To Provide Electronics Design, Embedded Systems Development, Production & Engineering services as per customer requirements across Industries.

IAF/EA-NACE Code: 19-26.12

Certificate No : VSQC099-42100115 - R1

Initial Certificate Date : 23-07-2022
Re-certification due date: 22-07-2025

Authorised Signatory

Veritas System Quality Certificates Issuing LLC
P.O. Box: 122982, Al Karama, Dubai, United Arab Emirates.

This certificate remains valid while the holder maintains the management system in accordance with the standard(s) above, which will be periodically audited by Veritas System Quality Certificates Issuing LLC.

This certificate remains the property of Veritas System Quality Certificates Issuing LLC and must be returned on request. In the issuance of this certificate, Veritas System Quality Certificates Issuing LLC no liability to any party other than to the client, and then only in accordance with the agreed upon certification agreement. Validity of this certificate may be confirmed at www.veritasassurance.com, directly through QR code by using any device with correct information or email to admin@veritasassurance.com.

Issue No: 01

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IP Protection and Data Security

- **Non-Disclosure Agreements:** NDAs with Employees, Vendors and Customers .

- **Firewall & VPN:** Secure network with firewall and VPN.

- **Need-to-Know Access:** Sensitive info accessible only to necessary individuals.

- **Security Awareness:** Regular employee training on data security and IP Protection.

- **Access Control:** Only authorized personnel can access premises.

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Hardware Capabilities

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Hardware Capabilities

- High-Speed Digital Designs

- Analog and Mixed Signal Designs

- Power Electronics

- RF Designs

- FPGA Based Designs

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In-House Test Equipment

- Rohde & Schwarz - Wideband Radio Communication Tester - CMW-500

- Keysight Oscilloscopes

- Rigol Programmable Power Supplies

- Fluke Digital Multimeters

- Rigol Programmable Function Generators

- FLIR and Uni-T Thermal Cameras

- Uni-T IR Thermometers

- Fluke Temperature Logger

- Temperature Chambers

- Acoustic Testing Chamber

- Drop Test Chamber

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Embedded Firmware Capabilities

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Firmware Capabilities

	Embedded	OS	Apps & Cloud
Capabilities	• Bare Metal C , C_++ • Boot loader • OTA FW Upgrades • Protocol Stack • Low Power & Memory design • Boot time optimisation • Rich GUI • Micro Python	• RTOS • Embedded Linux • Device Drivers • Video/Audio/Camera • Wi-Fi/BLE/LTE • Routers – OPenWRT	• IOT Platform • Edge Processing • Web & App Dashboard • REST API • MEAN Development
Security	• Secure Boot • TPM	• Secure boot • TPM • SSL / SSH • Encrypted Disc	• HTTPS • Secure MQTT • SSL User login

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PCB Design Capabilities

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PCB Design Capabilities

- Schematics Entry

- Library Development : Schematic Symbol / PCB Footprint / 3D Model

- Layout Design

- SI / PI / EMI Analysis / Thermal Analysis

- High Speed Digital / Analog and Mixed Signal / RF Designs

- High Voltage / High Current / Power Electronics

- Solid Expertise in Compliance standards - IPC, UL / FCC / IEC / BIS

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PCB Tools Expertise

- PCB Layout - Cadence Allegro / Altium / Mentor PADS / Expedition

- Schematic Entry - OrCAD Capture / Altium / Concept HDL / PADS Logic

- Signal Integrity / Power Integrity - Sigrity / ADS / HFSS

- Thermal Analysis – FloTHERM / Icepak / Solidworks

- CAM - CAM 350 / Genesis / Valor Enterprise 3000

PCB Analysis Capabilities
Signal Integrity / Power Integrity / Thermal

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Signal Integrity Analysis

- Pre layout & Post layout SI Analysis

- Stack-up Analysis / Optimization

- Trace Impedance Analysis

- Via Optimization

- S-Parameter Extraction

- Crosstalk Analysis

- Co-design (IC/Package/Board)

- IBIS/IBIS-AMI Based System Simulation

- High Speed Serdes Simulations

- DDR / Parallel Bus simulations

- Eye Diagram Analysis

- Timing analysis.

- Connector/Socket/Needle Modeling

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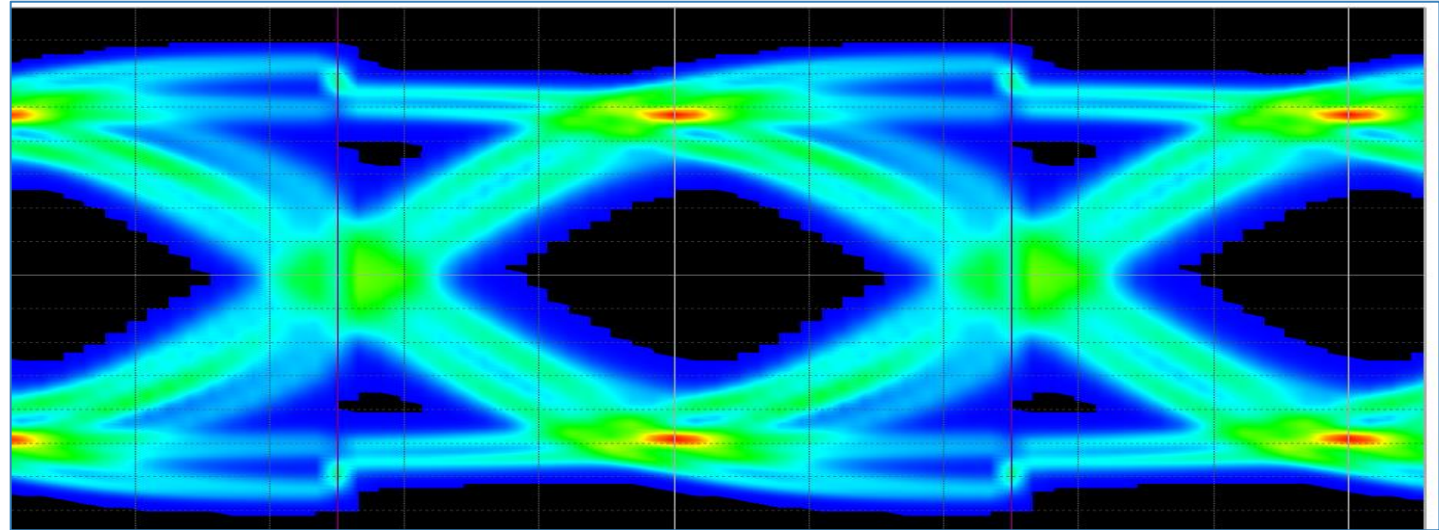
Power Integrity Analysis

- DC IR Drop Analysis

- Power Via Current Analysis

- Plane Current Density Analysis

- PDN Power Impedance Analysis (Z11)

- Decoupling Capacitor Optimization

- Power Plane Resistance, Inductance and Capacitance Analysis

- Transient Noise Analysis.

- Time domain analysis with Current Profile and Voltage regulator models.

- Co-Simulation (Package/Board)

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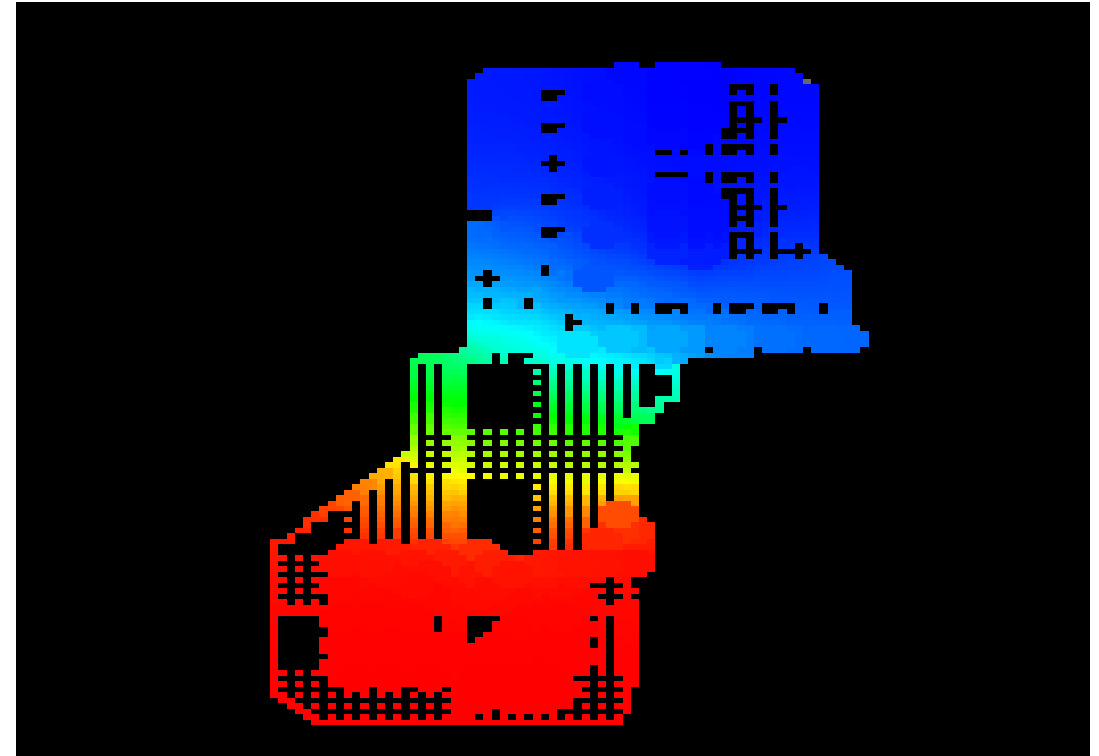
Thermal Analysis

- Complete solution through the design phase

- Chip Level / Board Level / Multi-board / System Level

- JEDEC standards compliance

- Thermal Analysis and Solutions offered:

Chip Level	Board Level	System Level
• Determination of Thermal Values - θjc, θjb • Optimize Copper structure in substrate • Provide recommendations for PCB Design • Extract and Design Simplified Thermal model for further usage (2-R Compact / DELPHI models)	• Determination of Hotspots, Thermal flow, Tj • Optimize placement for better Thermal dissipation & Reliability • Optimize via placements for better conductivity • Selection of materials, heatsinks, TIM • Detailed Thermal simulations across different ambient conditions	• Provide recommendations for Enclosure Design & Modifications • Determine Vents Required • Evaluate Heat spreading and recommend for Forced air cooling and design • Design Thermally enhanced designs - Board & System Combined • Multi board modules

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Simulation Tools Expertise

ANSYS

- SIwave
- Electronics Desktop Designer
- Electronics Desktop Circuit
- HFSS
- Q3D
- Icepak

Siemens

- Hyperlynx SI
- Hyperlynx PI
- Flotherm

Keysight ADS

- Channel Analysis
- Parallel Bus (DDR) Analysis

Cadence Sigrity

- PowerSI
- Clarity 3D
- PowerDC
- OptimizePI
- SystemSI

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Mechanical & Industrial Design Capabilities

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Mechanical Design Services

- Plastic Enclosure Design for Electronics

- Machined Aluminium / Sheet Metal / Extruded Enclosures

- Rugged Metal Enclosures for Military Application – MIL-STD-810 / JSS55555

- IP Rated Enclosures – IP65 / IP 67 / IP68

- Full Mechanical Systems Design

- DFx – Manufacturability / Cost / Assembly / Compliance

- Thermal Analysis / Structural Design and Analysis – Vibration / Impact / Drop

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Industrial Design Services

- Design Research

- Product Story and Sketches / Product Visualization

- CAD and 3D Modelling

- UI & UX design

- Photorealistic Images / Photorealistic Product Animation Videos

- Rapid Prototyping – CNC / FDM / SLA / SLS / Vacuum Casting

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FPGA Capabilities

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FPGA Design Services

- FPGA Design and Development

- FPGA Prototyping and Testing

- Custom IP Core Development

- FPGA-based System Integration

- Migration and Optimization Services

- Combined experience of over 30+ years in FPGA Design

- Cross Domain Experience – Telecommunications / Automotive /Aerospace / Industrial Automation / Consumer Electronics / Medical Devices

FPGA Design Process Flow

FDP	FRD	FAD, VTP	MDD, VTP	Coding	Validation	VTR

- Development Plan
- Requirements
- Architecture
- System Verification Plan
- Module Design
- Module Verification Plan
- Design
- Test Scenarios
- Unit Test
- On Target
- Verification Test Report

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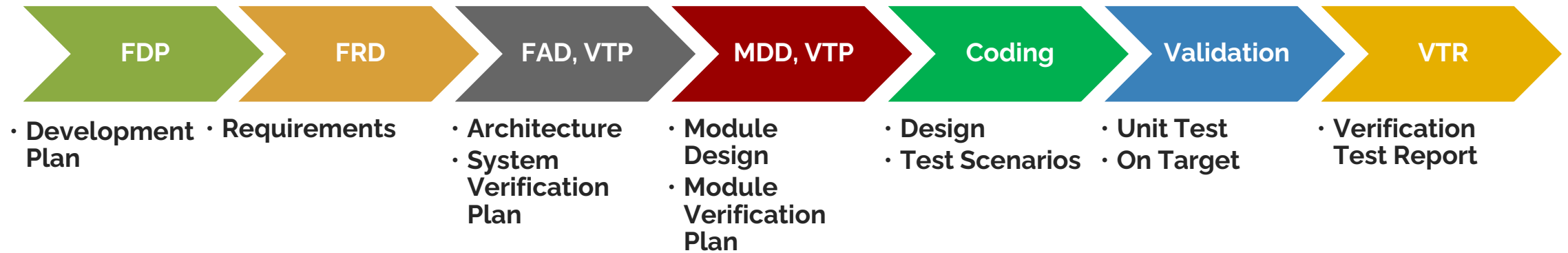
Product Design Case Studies

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11ax Wireless AP - HW Spec

- Qualcomm IPQ8078A SoC

- 8x8 on 5Ghz and 4x4 on 2.4GHz

- MU – MIMO / BLE / SFP+ / GigE

- LTE / GPS / POE / USB / PCIe

- Thermal / SI / PI Analysis

- High Density BGA Packages

Industry's First Streetlight
WiFi 6 Access Point

AP6

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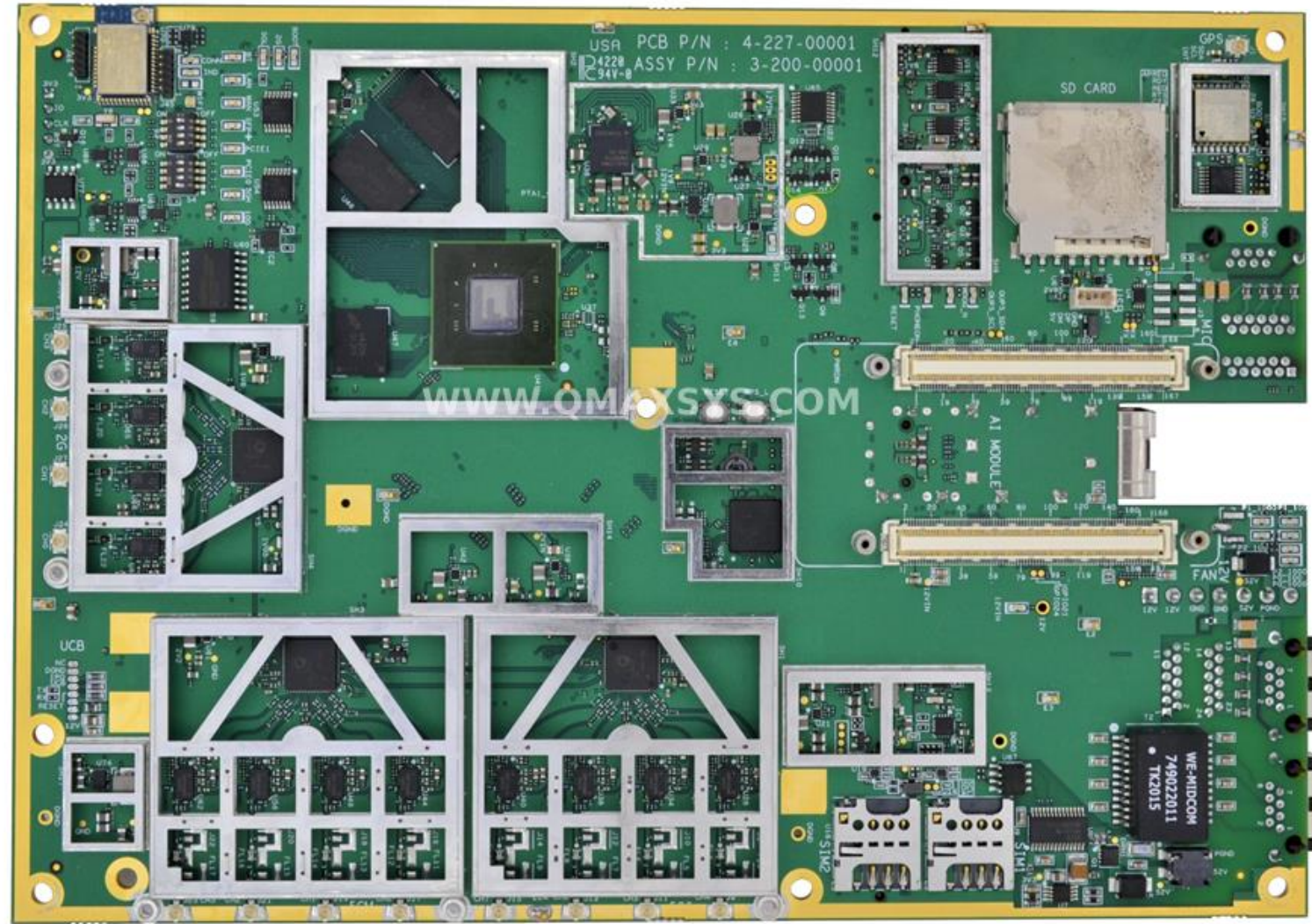
Aerospace Structural Health Monitoring System

- AI enabled Air Frame Structural Analysis

- Altera A10 FPGA

- Digital Signal processing

- Low Power, Light Weight, Compact Design

- Complete HW / FPGA / Enclosure design

- Ultra-Low Noise / SNR of 50dB

- High Speed ADCs / DACs / Sync – E / HV Mux

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FPGA based 4 x 100G Interface Card

- Virtex® UltraScale+ FPGA

- Networking Application

- PCIe Gen 5 to QSFP+ x 4

- 1mm Pitch 2104 pin BGA

- High Density

- High Speed

- 16 Layer PCB

- HDI PCB

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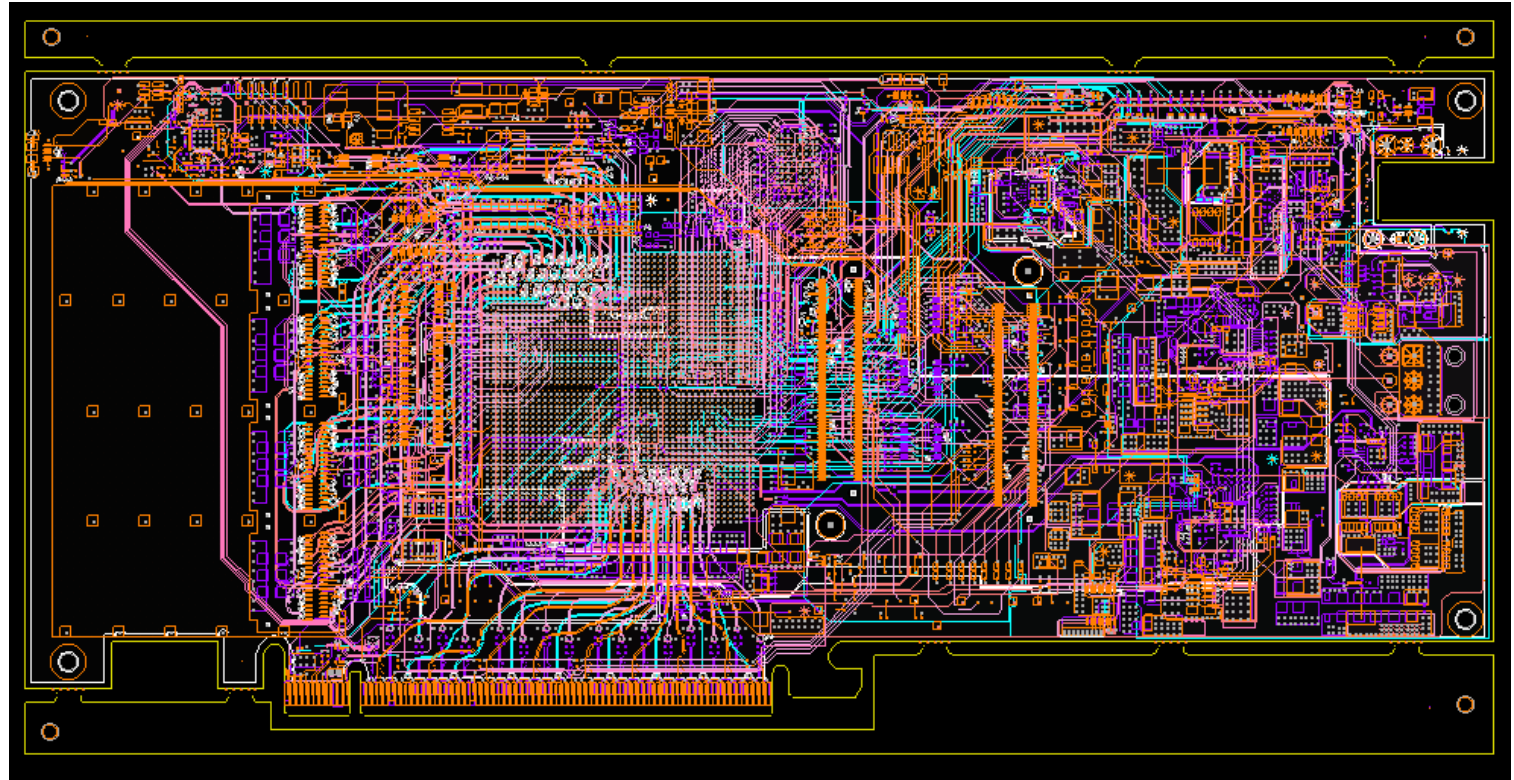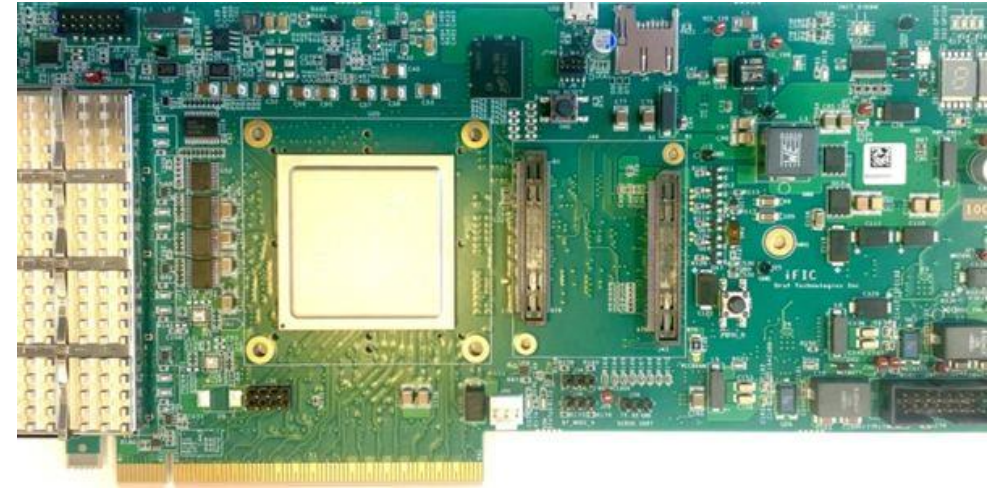
Rugged RF Power Supply

- Plasma Generation Application

- NXP i.MX6UL CPU

- NXP MRFE6VP61K25HR6 Rugged RF Power LDMOS Transistors

- Frequency: 13.56 MHz

- Rated Power: 1kW

- RJ45 / DB25 Communication Ports

- Customized RF Design

- Full Product Development and Delivery

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Connected On-board Diagnostic Device

- Full Product Development - HW / FW / PCB / ID

- ARM Cortex A7 CPU / 1 Gb DDR3 / 4Gb eMMC

- Linux / Over the Air Firmware update (OTAP)

- Wi-Fi / BLE 4.1 / LTE-M / GPS / LCD Display

- Native CAN / Ethernet / USB 2.0

- Accelerometer / Magnetometer / LEDS

- 2000mAh Battery / Wireless Charging

- IP 65 Rated ABS Enclosure

- Deployed in GM Garages across USA

Cybersecurity Device

- MediaTek MT7986AV - Wi-Fi 6/6E Router SoC

- Tri-band Wi-Fi: 4x4 -2.4GHz + 4x4 5GHz + 4x4 5.8GHz

- MU – MIMO / BLE / DDR4 / GigE Ports / USB 3.0

- High Density BGA Packages

- Commercial Application

- Full Product Development

- Thermal / SI / PI Analysis

- RF Tuning / RF Calibration

- Prototyping and Testing

- FCC Certification

- Volume Production

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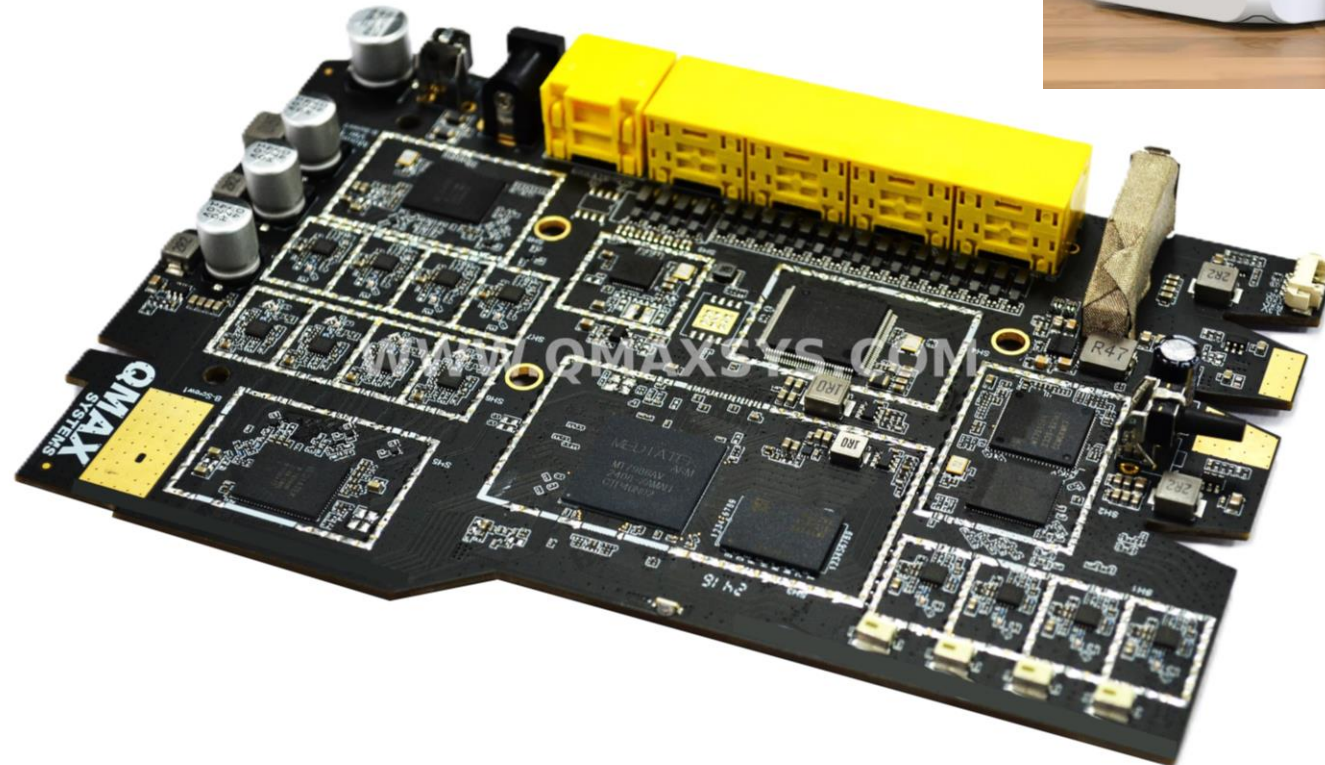
Digital Signage with HDMI Input

- Full Product Development - HW / FW / PCB / ID

- Rockchip 3568 Chipset

- HDMI Input – HDCP compliant

- POE / 4K HDMI Output / 0.96" OLED Display

- Wi-Fi / Bluetooth / Gigabit Ethernet

- 4GB DDR4 RAM / 16GB eMMC

- USB 2.0 / 3.0

- RTC / IR Remote / Extender

- GPIOs / Audio OUT / Status LED

www.qmaxsys.com

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Mixed Reality / Image Processing

- Zynq® UltraScale+ FPGA

- Medical mixed reality application

- Image Processing Application

- HW Design / FW Development / FPGA SW
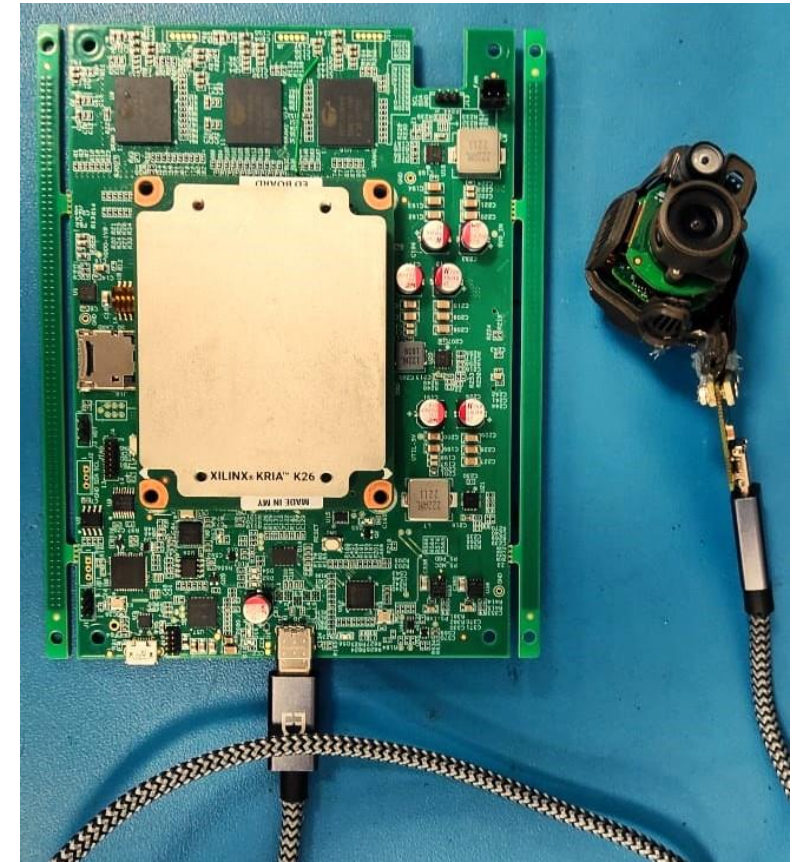
Hip Pack Board With Camera Module
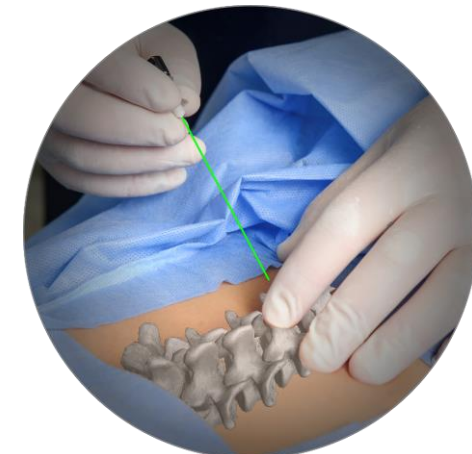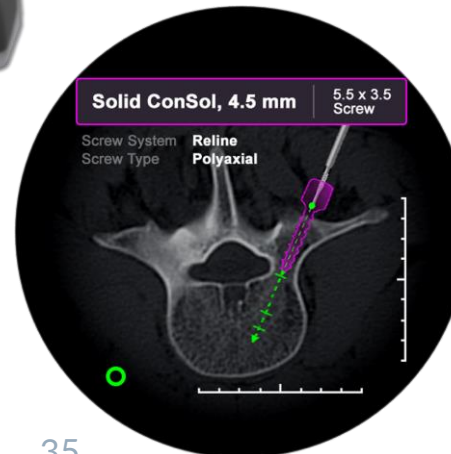
Security System Controller

- Hardware / Firmware design and Development

- IMx6 CPU / STM32 ARM Cortex-M Controller

- Linux / RTOS / Ethernet / DIO / AIO / PoE

- Mechanical / Enclosure Design / DFM

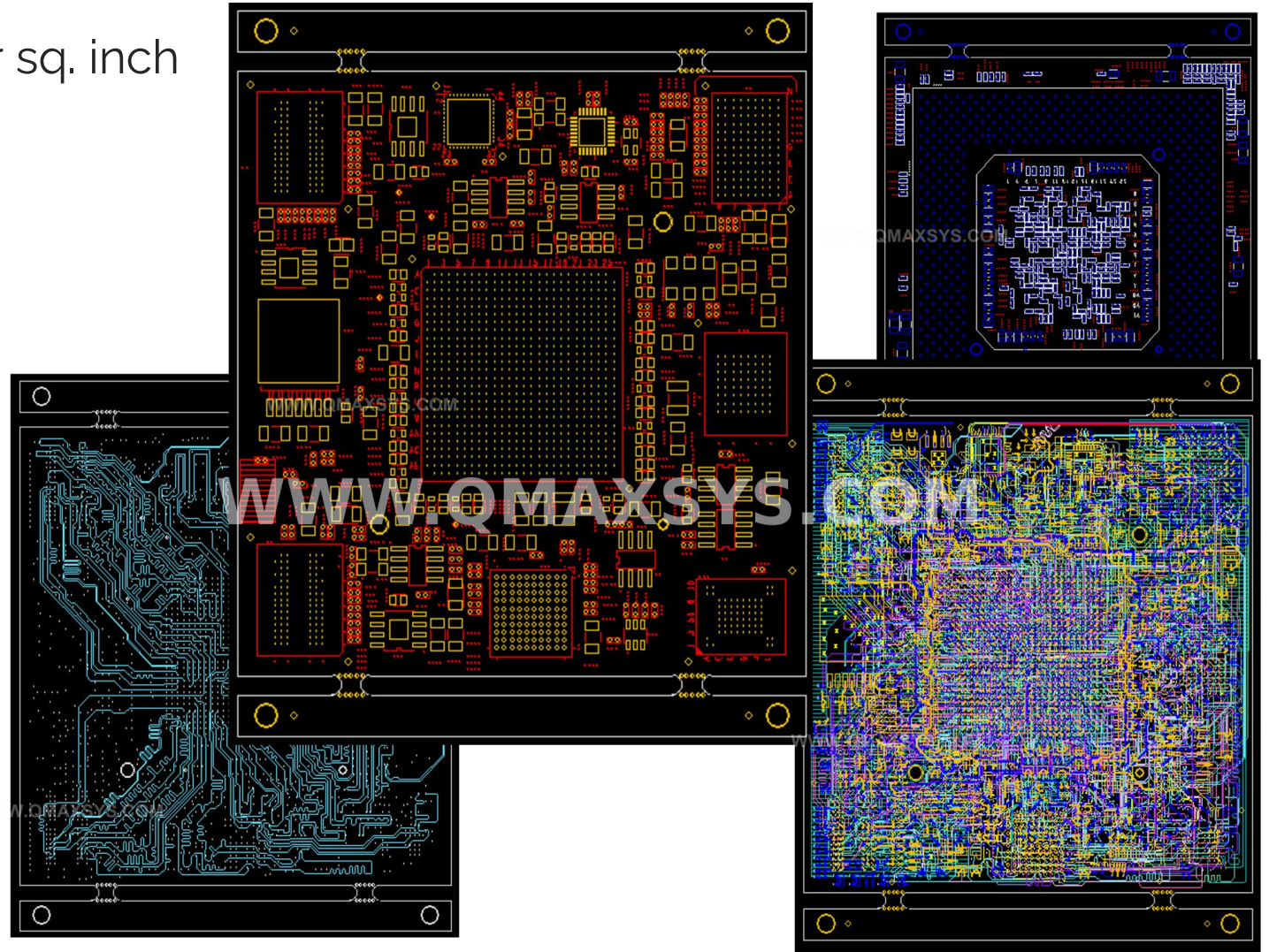- FCC Class B certified

- BGA ICs / Local Assembly

Stackable Design

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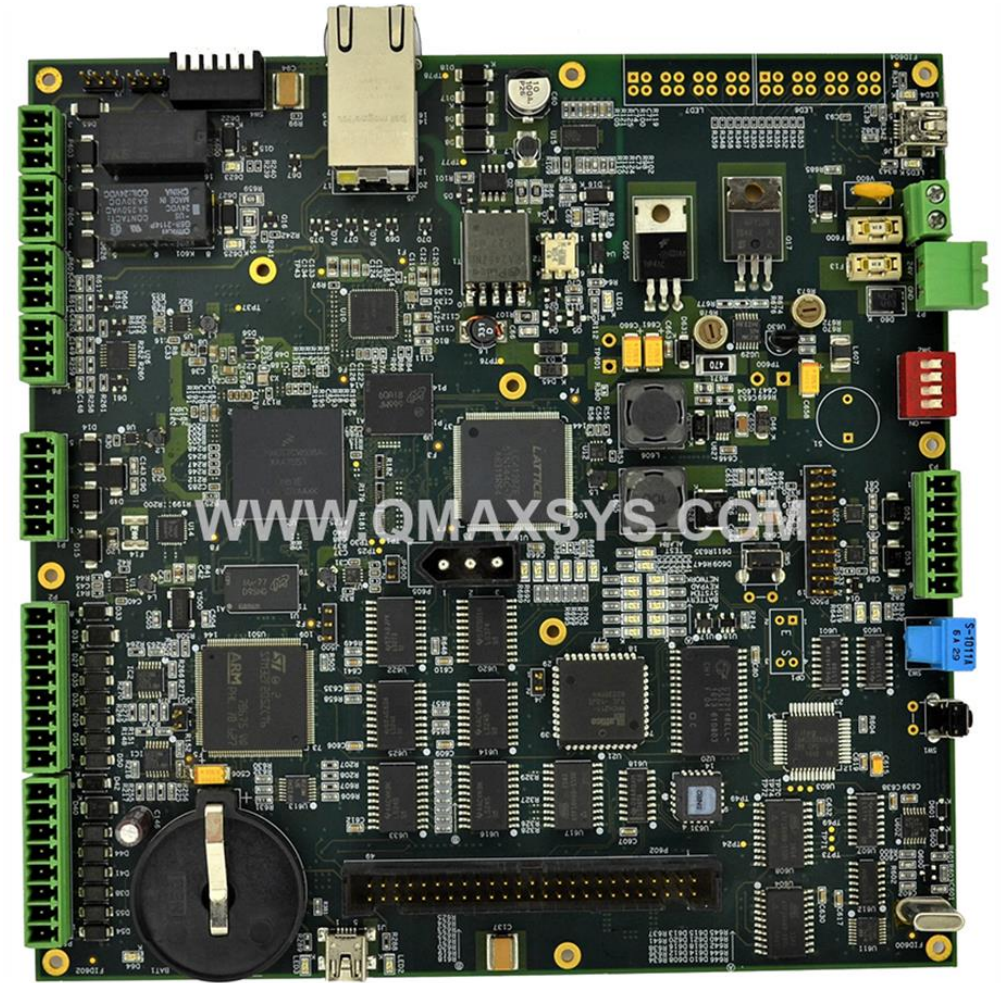
PCB Design Case Studies

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Rugged SBC Board

- Ultra high density – 460 Pins per sq. inch

- Military Application

- 20 layer

- High Speed Digital

- Double side components

- HDI – Blind /Buried Vias

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Networking Board

- 100 GBE Switch/Router Board / High speed / DDR3

- 36 layers / 2597 Pins BGAs

- 19705 pins

- Chipset: BCM88650

- High Current

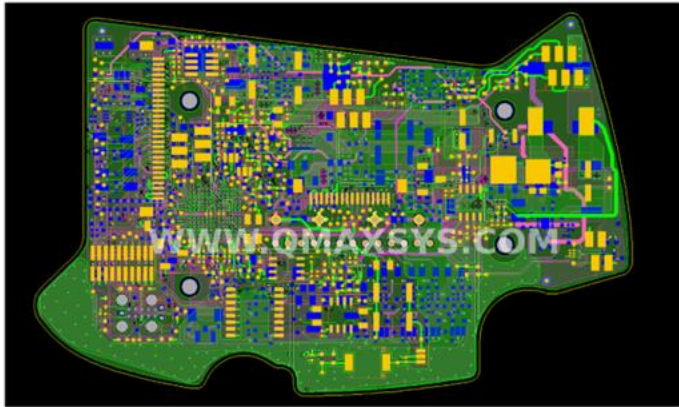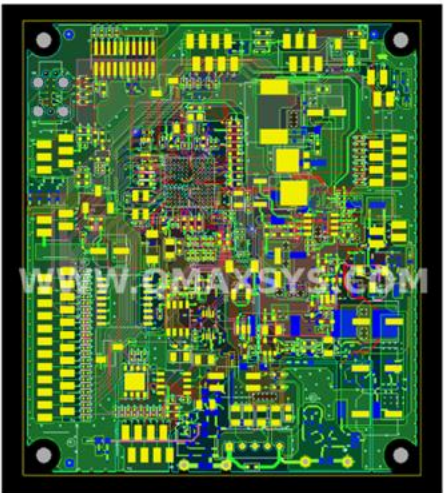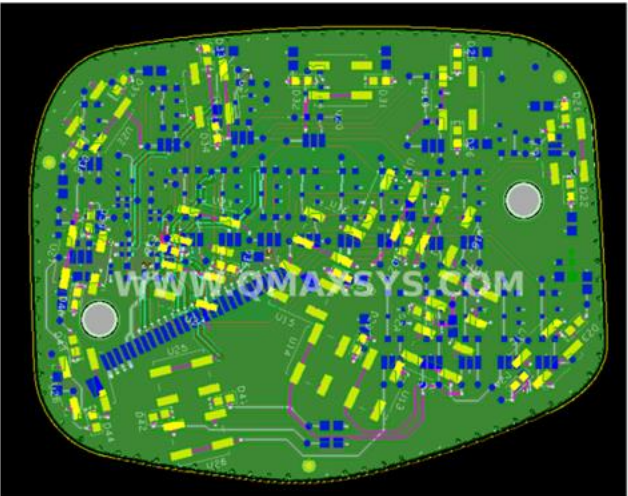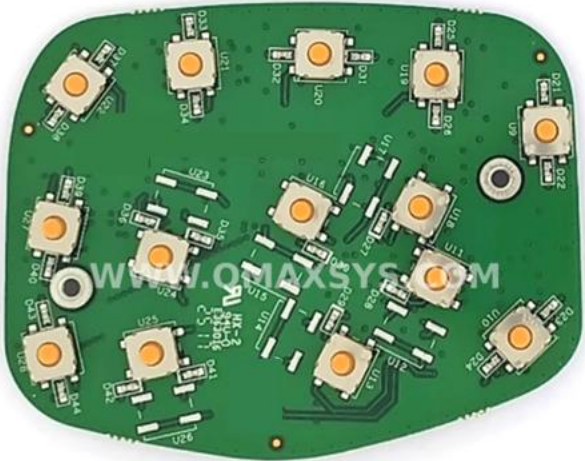- Ultrahigh density

- Cadence Allegro 16.5

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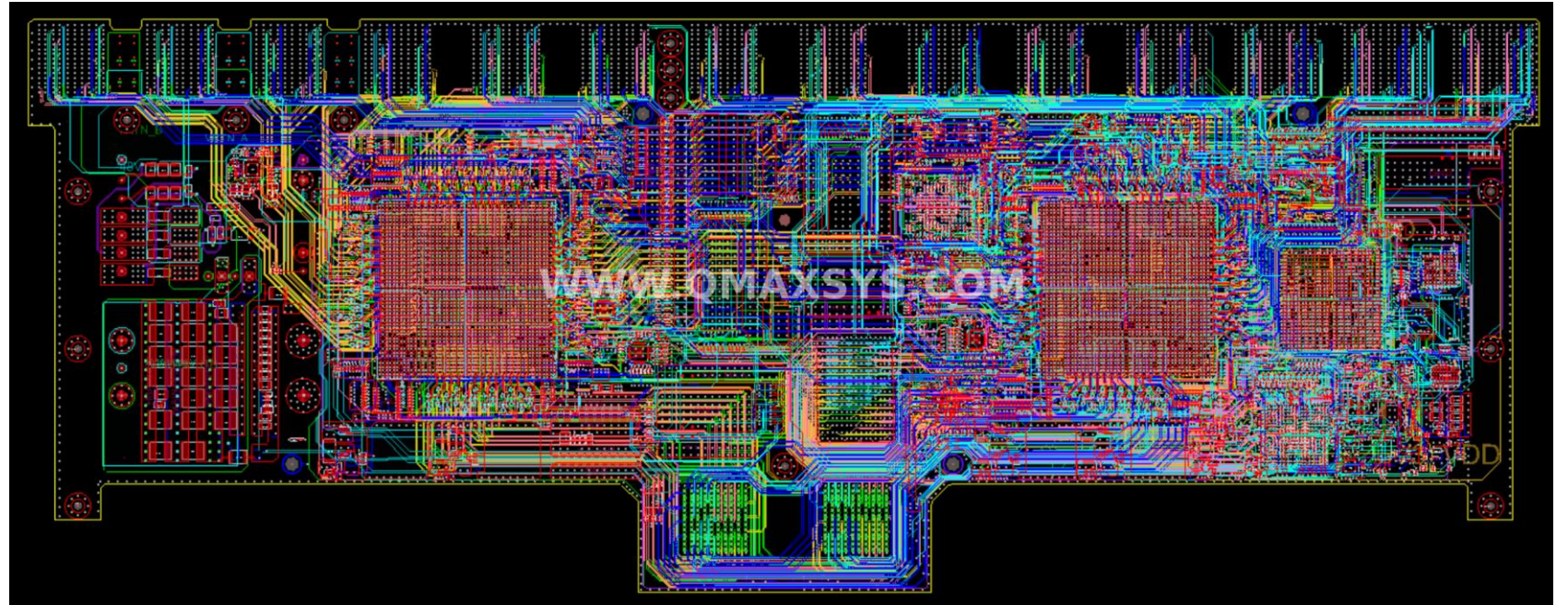
Video Processor PCB

- Video Processing Hardware

- High speed digital / PCIE / DDR3

- Cadence Allegro

- High Current

- Total pin count : 16533

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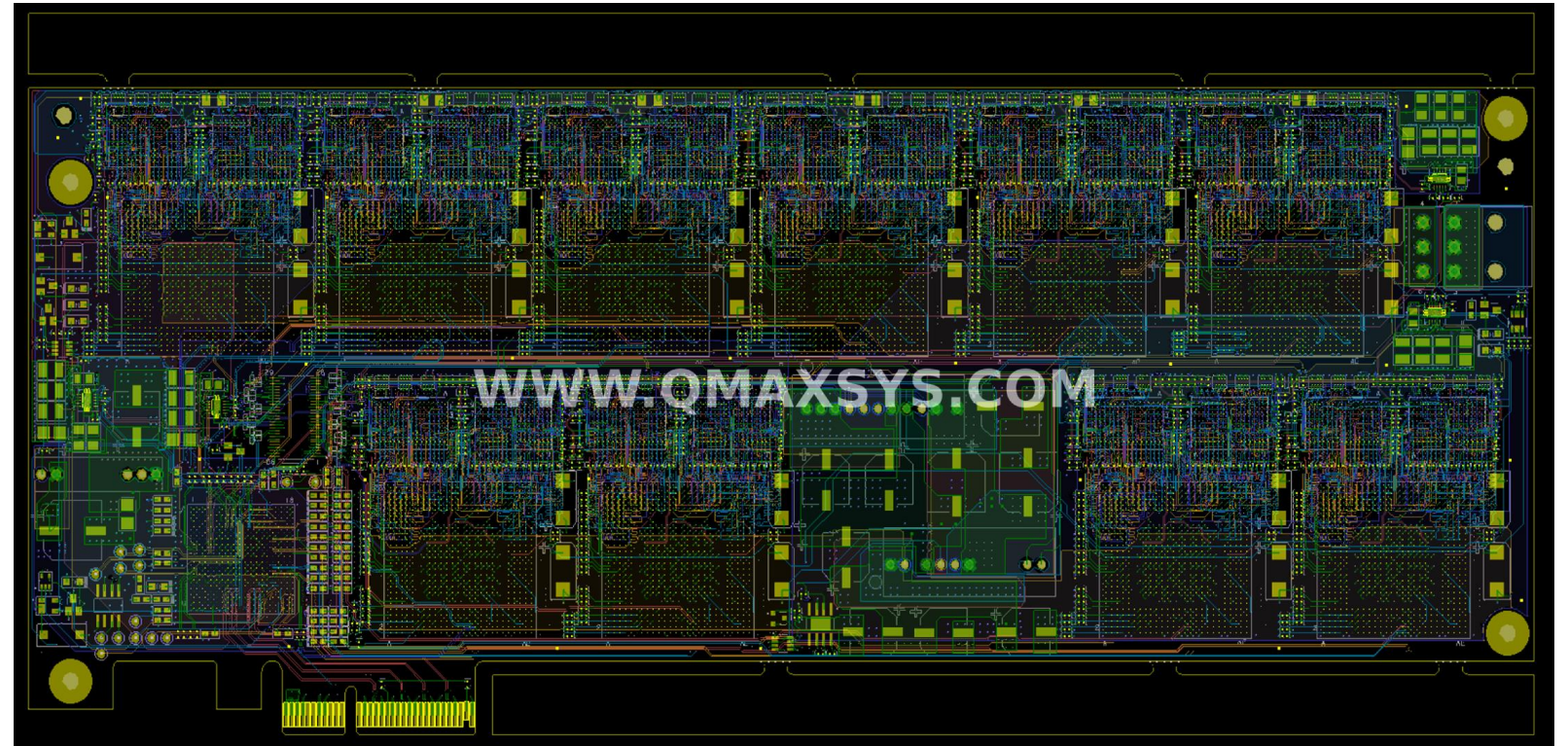
Automotive PCBs

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Industrial Design Case Studies

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Case Studies

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Case Studies

Thanks!

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