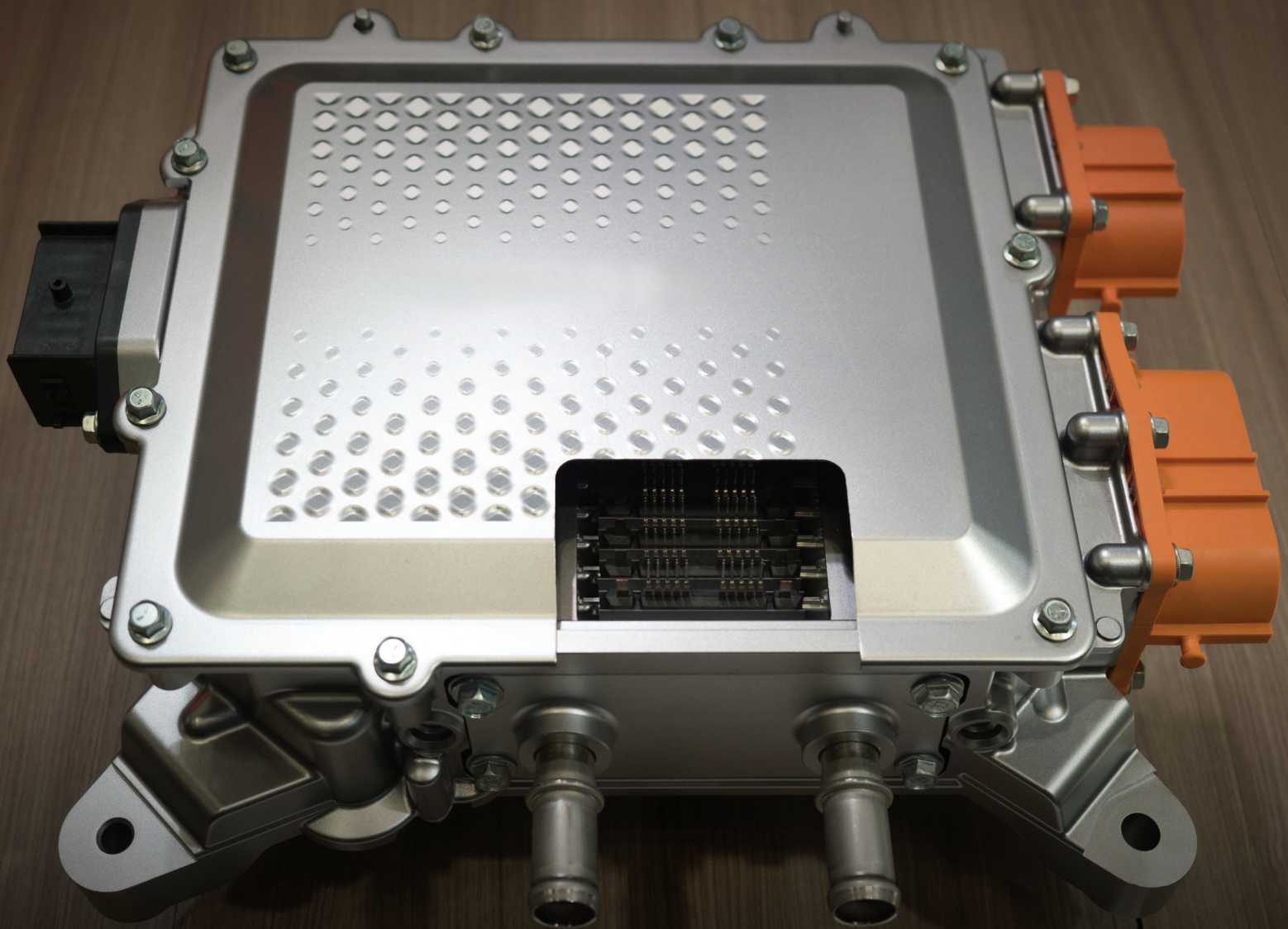


CYIENT

POWER ELECTRONICS



お手を触れないよう
お願いします
Please Do not Touch

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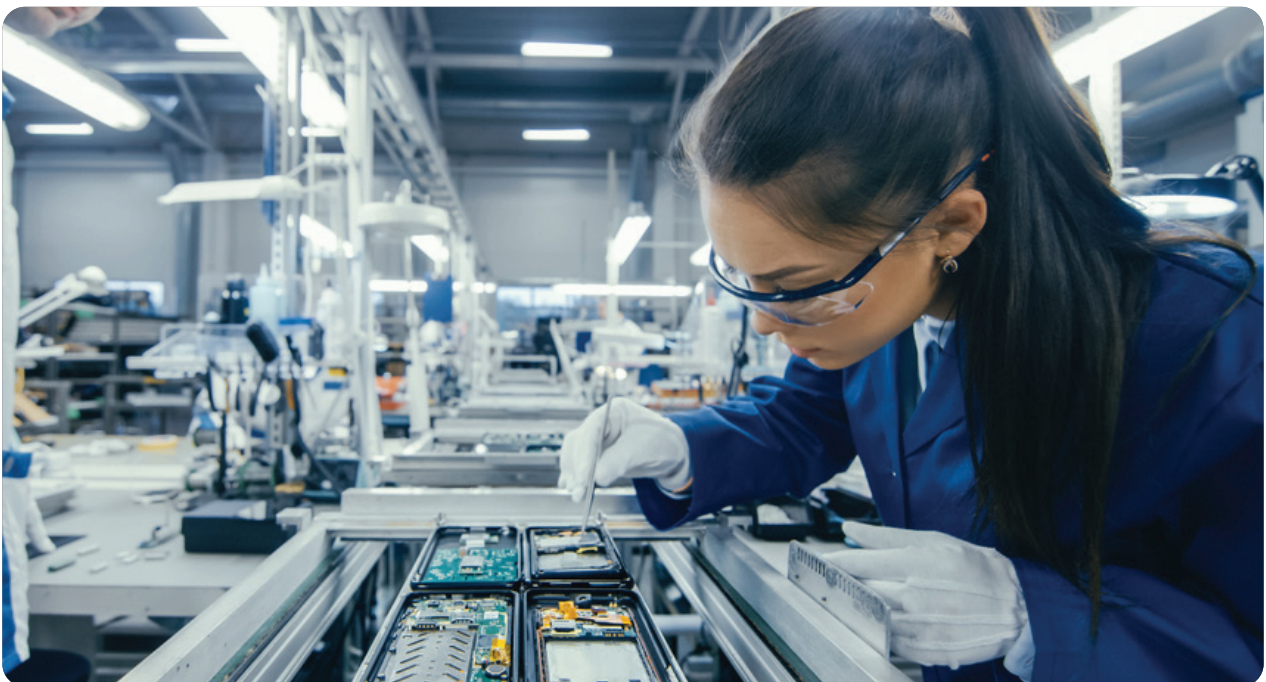
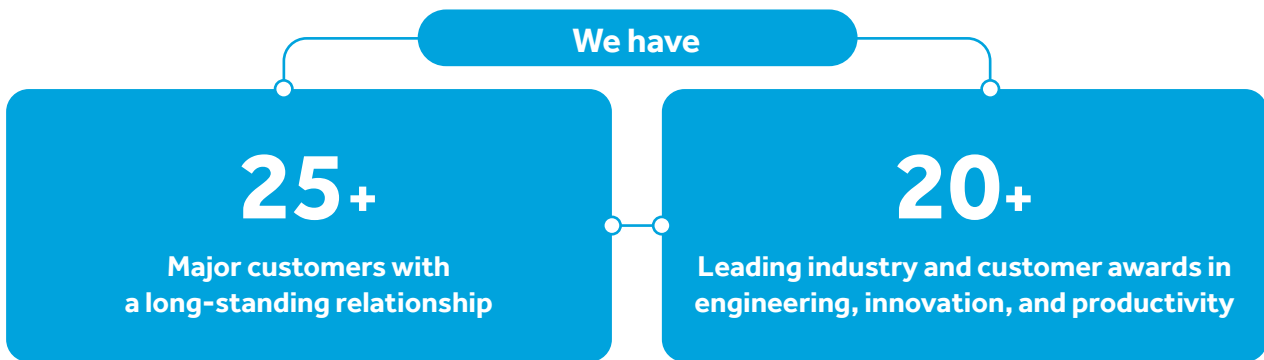
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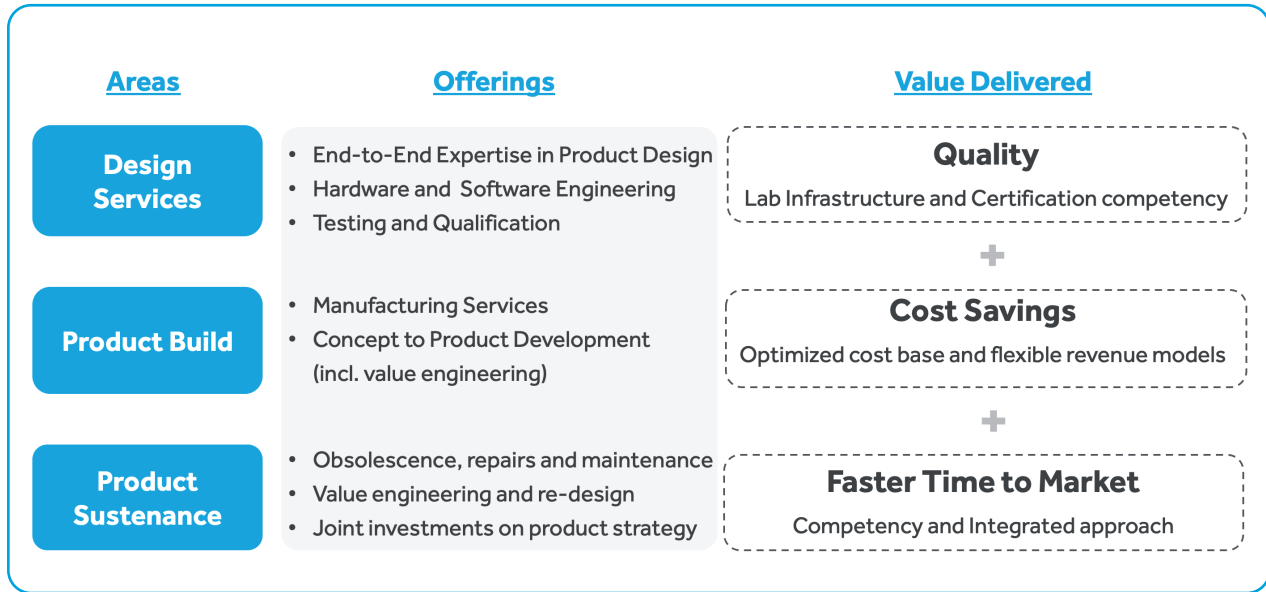
Abstract

At Cyient, we have over 20 years of experience in aero, defense, and rail. We have built enduring relationships with our customers by aligning with their core values, culture, and staying relevant to the future. As a purposeful, diverse, and inclusive organization driven by Values FIRST (Fairness, Integrity, Respect, Sincerity, and Transparency), Cyient is committed to working closely with our customers to improve the world around us. Cyient has 10+ years of experience in design and development of the power electronic systems for multiple industries.

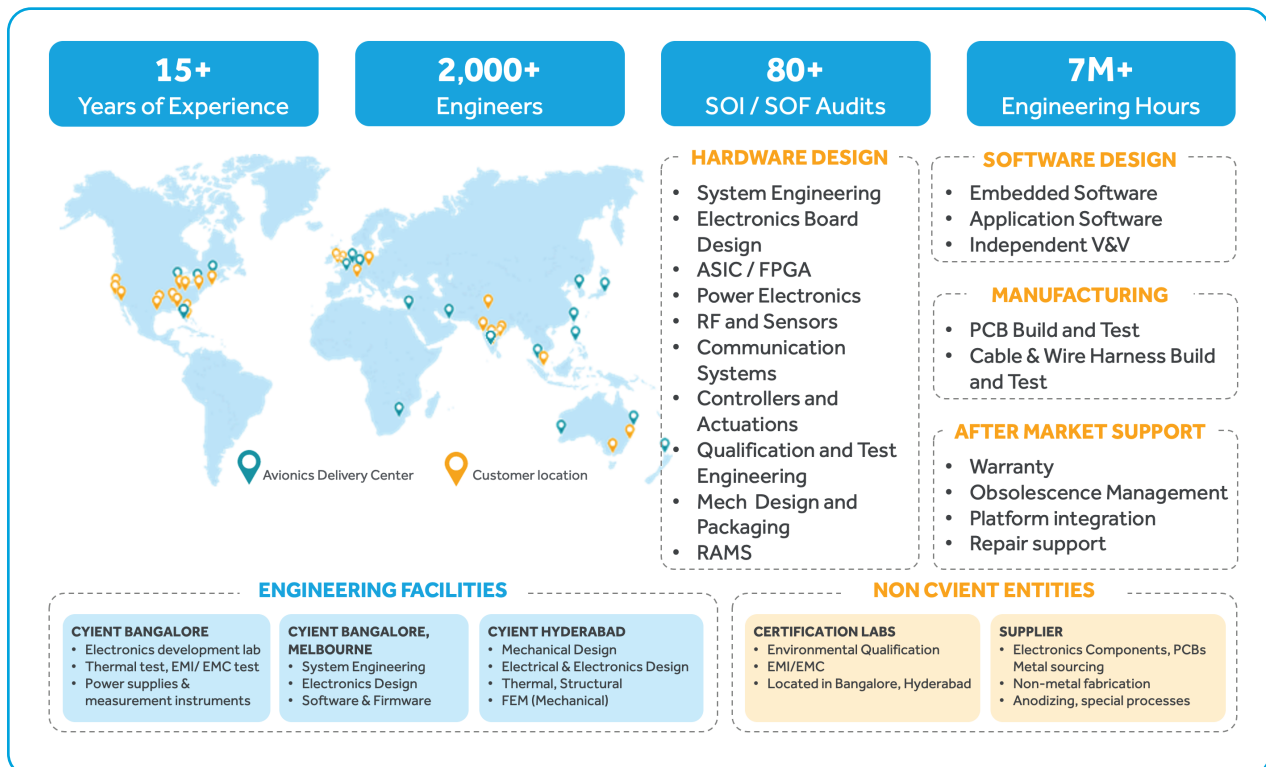


Cyient's Value Proposition: End-to-End Expertise in Product Design

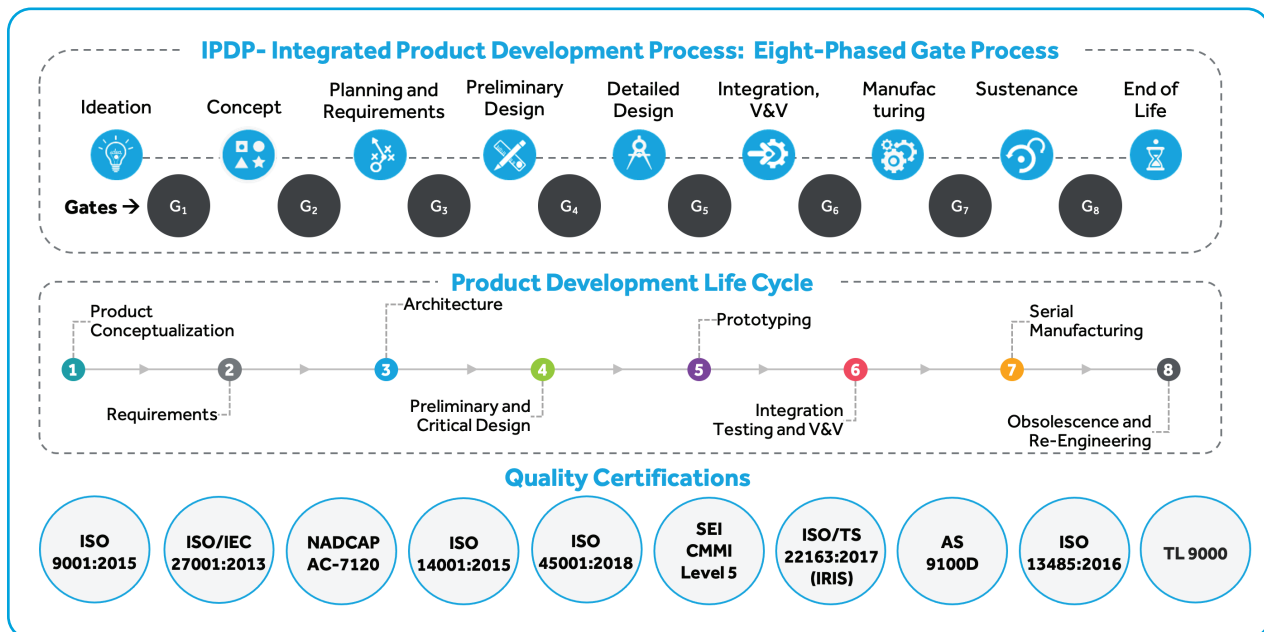
Cyient's Embedded Electronic Product Development Capabilities Including Power Electronics



Cyient's product development process and quality certifications enable us to deliver best-in-class quality products



IPDP- Integrated Product Development Process: Eight-Phased Gate Process



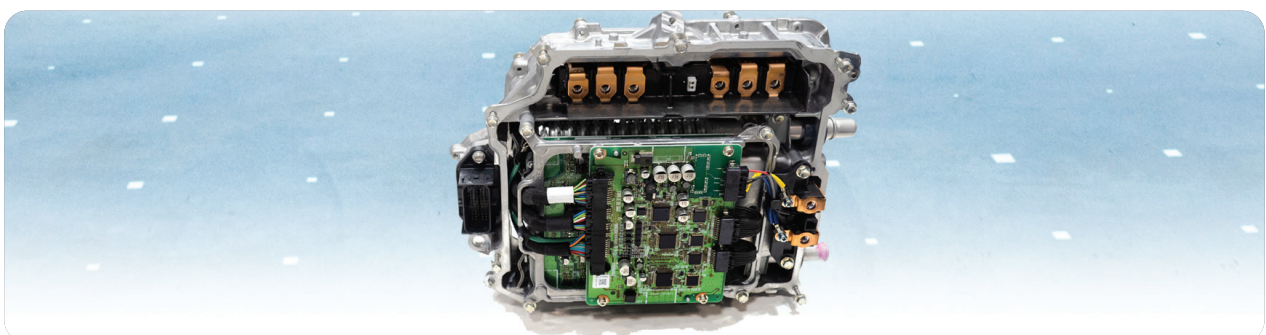
Redefining Power Electronics Engineering for Your Product Roadmap

The market today offers a wide range of power electronics solutions. However, finding the right fit for your product development roadmap, designing the product/solution to specifications, and mitigating challenges are often difficult. Organizations lose a significant portion of their budget and time trying to get this right.

At Cyient, we bring decades of design and engineering expertise in state-of-the-art power electronics for aerospace, electric mobility (motor and traction systems), renewables, and


energy storage systems. We have delivered high-reliability solutions such as intelligent power distribution systems, power conversion units (AC/DC/HVDC), charging systems, and electrical protection systems (I2T, short circuit, ground fault, arc fault, over current, and over voltage).

Our customers have received not just an enhanced and efficient product but, in some cases, a 20% reduction in development and recurring costs.



Cyient's Power Electronics Lab

We have set up a world-class Power Electronics Lab to design, develop, qualify, and certify highly complex products, with the capability to scale on demand.



Power Electronics Lab

A 6000 sq. ft. space equipped with programmable power supplies and inductive and resistive load banks for up to 50KVA and simulated 90KVA testing

50kVA UPS
power backup

28VDC
supply rail






115Vac 400Hz
supply rail

Load Banks


For a virtual walk-through of our labs, click on [Cyientscapes](#)


Cyient's expertise extends across various power electronic systems for multiple industries


Key Power Electronic Systems


Generation 	Distribution 	Conversion 	Battery Management 	Control & Actuation 
Product Lines				
<ul style="list-style-type: none">Generator control unitStart power unit (SPU)Solid State Voltage RegulatorsVoltage source converters, Inverters	<ul style="list-style-type: none">Primary and secondary power distribution panelBus power control unitSolid state power controllerDifferential protection current transformerRigid bus assembly	<ul style="list-style-type: none">DC-DC high and low power convertersMiniature power supplyAC-DC, HVDC convertersAuto-Transformer and Transformer Rectifier unitsEMI Filters	<ul style="list-style-type: none">Battery chargerBattery management system for Lead Acid and Lithium Ion batteriesMonitoring, controlling of charging station	<ul style="list-style-type: none">3Φ & 1Φ AC and DC motor drivesActuation: Steering, doors, brakes, gears
Technologies				
<ul style="list-style-type: none">Voltage and Frequency regulationSpace vector PWM controlRegeneration controlMPPT based control	<ul style="list-style-type: none">3Φ & 1Φ AC, DC solid state switch & controlZCS, ZVS, I2t profile control ,SC, Ground Fault, Arc faultSwitch health status and control, CAN communication	<ul style="list-style-type: none">ZVS & ZCS switchingPlanar magneticsOV, OC, SC, reverse polarity & surge protectionPower factor correction	<ul style="list-style-type: none">High or low voltage battery charging and controlCell balancing techniquesBattery health status and thermal management	<ul style="list-style-type: none">Sine PWM and space vector control (DTC/ FOC)OV, OC, SC, winding fault protectionMicrocontroller, DSP, FPGA


INDUSTRY FOCUS


 Aerospace & Defense

 Automotive

 Rail

 Industrial

 Communications

 Medical and Healthcare

Success Stories

Experience in design and development of distribution systems: Intelligent Solid State Switch Panel

Scope
Design and development of Solid state PDP for primary and secondary power distribution application for a global aircraft OEM

Value Added: Cost Savings + Faster Time to Market

30%
Cost Savings

40%
Reduction in Schedule

Cyient Key Activities

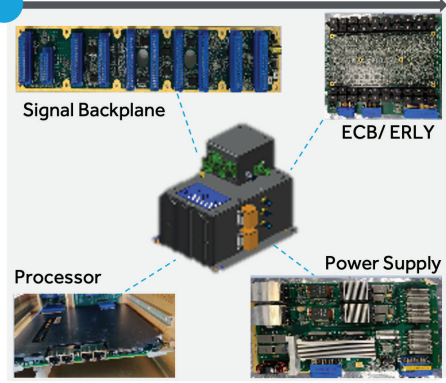
Design & Development

- Requirement development
- Interface Control drawing (ICD) development
- PDP architecture development
- Design and development of legacy parts/subassemblies and complete PDP
- Hardware and software development

Manufacturing & Testing

- Prototypes manufacturing
- Verification tests :
 - Functional and system tests
 - Safe to Fly (StF) Tests : DO-160G and customer specific
 - System/ ground rig tests, Flight testing

Reference Images



Key Highlights

- Commonality in design - adaptable to different aircrafts (multiple configurations)
- Highly programmable for any kind of loads
- Efficient and long life system with low maintenance
- Enhanced protections (I2t, Short Circuit, Ground Fault)
- Single hardware configuration for electronic circuit breaker card and relay card
- Controller SW: DO-178C DAL A compliant

Experience in design and development of conversion systems: HV Miniature Standard Brick Power

Scope
Develop HVDC DC-DC converter for commercial aircrafts, using advanced technology in planar transformers and semiconductor components

Value Added: Cost Savings + Quality

Increased Reliability & Power Efficiency

High Power density

Cyient Key Activities


Design & Development

- Market analysis
- Competitor benchmarking
- Requirements development
- Critical part selection and concept design
- Preliminary design and FE analysis
- Detailed design and FE analysis

Manufacturing & Testing

- Functional testing
- Pre-qualification testing
- Prototype manufacturing

Reference Images



Key Highlights

- Compact form factor and: High Switching frequency (550KHz)
- Lower power loss ensuring better thermal management of end application
- Easy integration: available in industry standard brick size
- Good line and load regulation and transient response
- 270VDC-30VDC converter: operates from 190V to 385V and produces isolated 30V with 2A output current

Quick Links



SolidStatePowerController

Electronic Circuit Breaker

High Speed Computing Processor Module

Redundant Power Supply Multirail Output Power Supply

About Cyient

Cyient (Estd: 1991, NSE: CYIENT) is a consulting-led, industry-centric, global technology solutions company. We enable our customers to apply technology imaginatively across their value chain to solve problems that matter. We are committed to designing tomorrow together with our stakeholders and being a culturally inclusive, socially responsible, and environmentally sustainable organization.

For more information, please visit
www.cyient.com



If you would like to talk to a Cyient power electronics expert, I would be happy to set up a call.

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