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HW Design, HW & SW Testing of ADAS, BMS / Verification & Validation lead, Simulation, Analysis

SUMMARY :

- 12+ years of total working experience for Automotive Industries.
- 6+ years in Japan (2013 - Now)
- **ADAS & AD Product life cycle experience (Requirement Analysis, Schedule Planning L3,L4 , Supplier discussion and decision, Production Support)**
- **Doors Experience**
- **Requirement Analysis experience**
- Experience in Hardware Circuit design, development and Schematic creation, and Verification & Validation (EMC, ENV and Reliability)
- EV, HEV Battery management (BMS) Validation experience for Nissan Leaf.
- BMS Circuit design for Hybrid, Electric Cars
- Experience with requirement management tool Doors
- Product & Process Validation Lead
- Warranty Failure analysis
- ADAS & AD ECU Environment, reliability and EMC validation (V&V)
- Environment validation & reliability validation expert. (Product & Process Validation)
- EMI/EMC validation expert. (Product & Process Validation)
- HW debugging, analysis, test plan creation and hardware testing.
- Electric Vehicle, HEV HW Design for Battery management and testing expert.
- Worked as a bridge engineer for tier 1 client in Japan.
- Automotive product development life cycle knowledge
- EMI/EMC test experience and knowledge, Electric disturbance simulation using Orcad pSpice.
- Knowledge and experience on Automotive products like Battery Management Systems, Telematics, HMI-Infotainment and Clusters
- Have good Knowledge of Hardware Design and development with multilayer boards and testing of boards based on Digital Signal processors and microcontrollers
- Good knowledge in Analog & Digital circuits design
- Power supply (Isolated, Buck, Boost, Buck-Boost & Charge pump) design & Worst Case Circuit Analysis
- Expertise in Signal Integrity analysis for DDR and High speed Flash (Pre & post)
- Knowledge of Component selection and BOM creation
- Expertise in Unit testing using RTRT and Polyspace tools for automotive ECU.
- Japanese proficiency : Beginner (N5 Level)

WORK EXPERIENCE

- **VALEO** , Japan, (Apr-2018 April to NOW) as V&V Team Lead
- **Marelli**, Japan (Apr-2013 to Apr-2018) as “Project Lead” / Formly Calsonic Kansei
- **Larsen & Toubro Ltd**, Bangalore, India (2008 to 2013) as “Senior Engineer”

TECHNICAL SKILLSET

- **Hardware Development :**
  - Microcontroller/Microprocessor and DSP based system design.
  - Design of digital and Mixed signal circuits
  - Design of Power Supply circuits using switching regulators (Buck, Boost & Charge pump) and linear regulators

- Component Stress and Thermal analysis using both MathCAD & OrCAD
- High frequency digital designs, interfaces with LPDDR4, DDR2 SDRAM, NAND/NOR Flash memory etc.

- **Tools Knowledge** :
  - Schematic tools : Mentor Graphics Dx-Designer 2007, OrCAD Capture v16.0
  - Analysis tools : OrCAD PSpice v16.0 Simulations, Mathcad v13.0
  - Signal integrity : Hyperlynx
  - PCB Tools : Altium 6 for PCB design
  - Unit testing tools: RTRT and Polyspace tools
- **Protocols Known** : CAN, USB. Ethernet, RS232/RS485, I2C and SPI communication
- **Microcontrollers**
  Renesas: RH850, R-CAR-D1, Freescale: i.MX6, Power PC MPC8313E, MPC5553, MPC5606 automotive processor
- **Test Instruments:**
  High voltage Battery simulator, ALL EMI/EMC instruments, Data logger, Current Logger, High frequency Oscilloscopes, Spectrum Analyzers, Logic State, Analyzer, Signal Generators, Power Supply, Oscilloscope etc.
- **Documentation :**
  System requirements specification, Hardware Design document, Design Justification document, Integration test report, System Level test reports, preparation of test plans & testing

PROJECT MANAGEMENT

- Role of Bridging between India & Japan.
- Co-ordinate with Japanese customer.
- Active involvement in Requirement analysis, Requirement elicitation, proposal making and project planning Co-ordination with onsite engineer/ customer for daily work input and design iteration, quality and delivery.
- Responsible for quality checks, quality assurance for customer deliverables and review meetings and issue resolutions.
- Coordination with suppliers for Prototype generation.

PROJECT in VALEO

PROJECT: ADAS & Autonomous driving ECU Validation-> Reliability Test, EMC Test, and Verification & Validation

Role : Team Leader
Contribution

- Product & Process Validation (Reliability, Environment and EMC test)
- Reliability and EMI EMC test for AD & ADAS Camera, ECU & Lasers Sensor.
- DV and PV Test Plan creation
- DV and PV Test report creation
- Test support until SOP
- Issue analysis during Development
- Warranty Issue Analysis

- Project Planning & schedule creation
- HW design support, HW testing, Circuit calculation

PROJECTs in Marelli, Japan (formly Calsonic Kansei)

PROJECT: Battery management system Circuit design, Simulation & Environment Validation for Micro Hybrid cars.
Role : Project lead/Bridge Engineer
Contribution

- Hardware design and development of BMS unit
- Design & Analysis of Battery Management System (BMS) & Cell Supervisor Controller (CSC) schematics
- Power supply design & Worst Case Circuit Analysis
- Current draw analysis for BMS Unit
- Worst case circuit for each circuit
- Leading a team of 5
- Spice Simulation
- DFMEA of the circuit.
- Hardware testing

PROJECT: Side view mirror
Role : Project lead/Bridge Engineer

Contribution

- Replacing a car side mirror by camera
- Hardware design and development of Side view camera board
- Leading a team of 6
- Prototype development
- Board bring up and testing

PROJECT: LED backlight design for HUD (Al PCB), Mouse pad Touch Switch design
Role : Project lead/Bridge Engineer
Contribution

- Design a LED board in Aluminum PCB
- Schematic design of Touch switches

PROJECT: 12" TFT Meter Cluster
Role : Project lead/Bridge Engineer
Contribution

- Design of 12" TFT cluster meter board
- Team member/ Team leader, Leading a team of 6
- Prototype development
- Board bring up and testing

PROJECT 6: Smartphone interface design

Role : Project lead/Bridge Engineer

Contribution

- Design a cluster meter having an smartphone interface
- Leading a team of 4

PROJECT 7: HW, Environment & EMC Validation of Nissan leaf, Nissan HEV

Role : Lead

Tools Used : ALL EMI/EMC tools, Data logger etc

Contribution

- Design Analysis of Battery Management Unit (BMU) & Cell Supervisor Controller (CSC) schematics.
- Thermal analysis of all components on board.
- Life test of Boards, Immunity & radiated emission test etc.
- Current draw analysis for BMU and CSC
- Preparation of module test plan
- Validation of EV, HEV BMS.
- Preparation of EMI/EMC Test plan
- Executing the EMI/EMC test
- Analysis of design change

PROJECTs in Larsen & Toubro

PROJECT: Battery Management System

Role : Team Member

Tools Used : Designer, PSPICE, Mathcad

Contribution

- Design & Analysis of Battery Management Unit (BMU) & Cell Supervisor Controller (CSC) schematics
- Power supply (Isolated, LDO, Buck, Boost & Charge pump) design & Worst Case Circuit Analysis
- High side & Low side Switch circuits
- Current draw analysis for BMU and CSC
- Worst case circuit analysis of circuits– Extreme value analysis
- Design simulation using PSPICE-Worst case
- Design justification document preparation
- Preparation of module test plan
- Validation of EV, HEV BMS.

PROJECT: Next Gen USM Acquisition Module

Role : Team member

Tools used : PSPICE, Hyper Lynx (Pre & Post Signal Integrity analysis), USB Emulator from Analog devices, Altium 6 for PCB design

Contribution

- Looked after hardware design, which involved design of processor with BF537, SDRAM memory interface @ 125MHz data rate
- Power supply design for processor & peripherals on board, Ethernet 10/100Mbps interface.
- Signal Integrity analysis (Pre & post)
- Current draw analysis for Complete System
- Preparation of Hardware Design document, test plan, Module & Integration testing of the unit

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- Component selection, circuit & PCB Design for Intrinsic safety as per IEC60079-11

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PROJECT: Next Gen USM Module

Role : Team member
Tools used : PSPICE, Hyper Lynx (Pre & Post Signal Integrity analysis), USB TAP Emulation tool, Altium 6 for PCB design
Contribution

- Looked after hardware design, which involved design of processor circuitry, DDR2 memory interface @ 333MHz data rate
- Power supply design for processor & peripherals on board, Ethernet 10/100Mbps interface, RS232,RS485, HART interface
- Component Selection
- Signal Integrity analysis (Pre & post)
- Preparation of Hardware Design document
- Current draw analysis for Complete System
- Preparation of test plan
- Module & Integration testing of the unit
- 6-Layer PCB design, Controlled impedance (Verify placement, routing)
- Mechanical shock test as per IEC60068-2-27
- Vibration test as per IEC60068-2-6

PROJECT: RTRT and Polyspace testing

Role : Team Member/Lead
Tools used : Rational Test Real Time (RTRT) from IBM, Polyspace from MathWorks.
Contribution

- Co-ordination with customer
- Unit testing of software modules developed for different Engine control unit
- Failure analysis of the tested module

EDUCATION QUALIFICATION:

- Bachelor's Degree in Electronics and Communication (2004- 2008) with First class -79% aggregate from West Bengal University of technology, India.
- HSC : From Assam Rifles Public School, Laitkor, Shillong, India with first class- 62% Aggregate
- SSLC : From Assam Rifles Public School, Laitkor, Shillong, India with first class- 62% Aggregate

PERSONAL DETAILS

Date of Birth	: 01-Jan-1988
Nationality	: INDIAN
Work Permit	: Japan with 5 years validity
Marital Status	: Married
Languages Known	: English, Hindi, basic Japanese (Under learning stage)
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