REVOTECH

| Revotech R&D Center |

REVOTECH

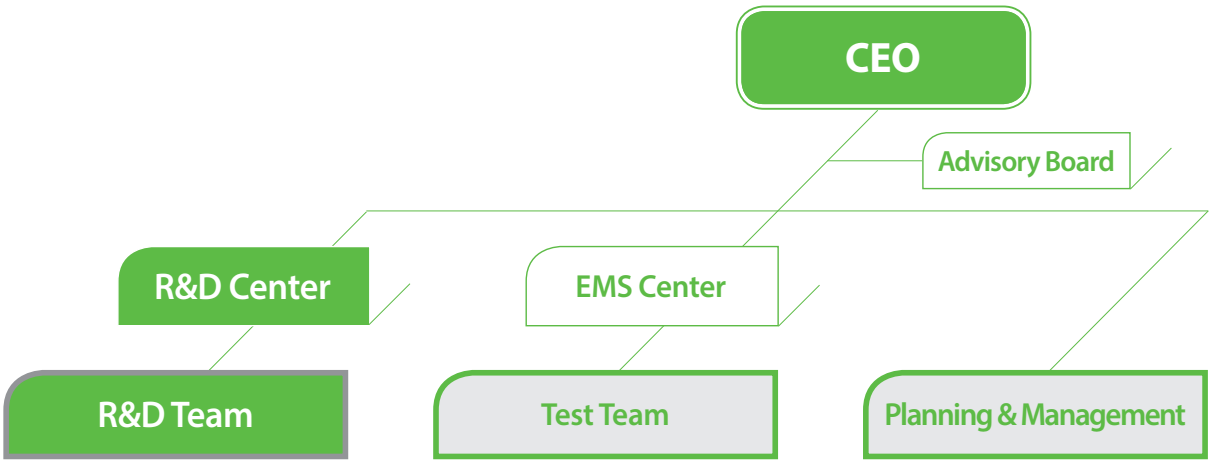
01 Company Overview

Total Solutions for electronics using Both Electromagnetic Environment Institute (Certificate by KOLAS) and R&D Know-How

REVOTECH

Company Name	Revotech Co., Ltd
Established Day	2014. 05. 20
Business Area	• R& D of Electrical equipment • Electromagnetic Testing and Certification
Address	51, Neungwon-ro, Mohyeon-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea
Contacts	Tel. +82-70-4497-6760 Fax. +81-31-322-0085

02 Organization



- **Development Solutions(implementation/ completion / certification)**
- **Specifications consulting**
- **R & D Development services**
- **Government projects**

- Automotive electronics Industrial Electromagnetics
- Certification / Reliability (Equipment Operations and Management)
- Certificate Issued (Preparing)

- Personnel / General Affairs / Accounting
- Business Support
- New Business Planning
- Project Management
- R&D Promotion and Planning

03 Business Areas

R&D(Total Solution for Car Electrical Equipment)

Research stages(service development)

- PROTO Product Design for Customer requirements
- The time-to-market(through Noise reduction circuit design, PCB Artwork, Mechanical Units Design)

Mass Production phase(Development)

- Cost competitiveness, product design through mass production ensuring
- OEM compatible project schedule management, development time and cost savings through optimized circuit design
- Mass Product DV and PV testing

Product consulting in accordance with the changes national and international standards

- Pre-examination, Witness testing, Overall management and support to post-approval time from the initial development phase over electrical equipment Specification's changes(G→K→L)
- Overall project management support services

04 Main Business

Reliable Products' Supply HW(Hardware), SW(Software), and Mechanical design is available by analyzing the system requirements

HW Design

- **Make specification**
  - HW design specifications / Product Specification / reliability test specification writing
- **Circuit Design & Sample Production**
  - The main component selection(Microcontroller, FET, etc.)
  - Schematic / PCB Artwork
  - Circuit Simulation using Pspice Tool
  - EMI Simulation using Electromagnetic Software
- **Sample production**
  - Sample production and basic performance verification
  - LAB EM / chamber EMI / Other electromagnetic verification
- **Test Equipment Design & Production**
  - Performance and reliability testing equipment specification writing & Equipment Setup
- **DV / PV Test & Vehicle Test F/Up**
- **OEM Business**
  - Approval / ESIR Business

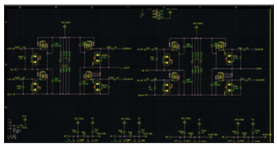
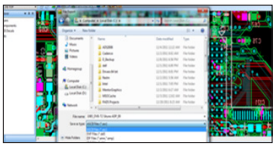
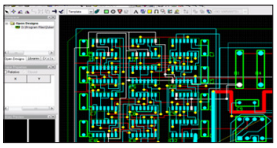
SW Design

- **Create SW design specifications**
- **SW Implementation(with Fail Safe)** Appending 8
- **Self-diagnosis and communication(KWD2000, CAN, etc.) Implementation**
- **DV / PV & Vehicle testing F/Up**

Mechanical Design

- **Mechanical Device Design and Manufacture**
  - Drawings
  - Case Design : Cover & Bottom & BRAK'T Design
  - Parts Design: Bus Bar, Heatsink, Connector
- **Thermal Analysis** Appending 9 **& Thermal Design**
- **Mold Design**
- **Qualified mass production quarantee**

Schematic Software & Artwork Tool

ORCAD	ZUKEN SD	PADS	ZUKEN BD
			

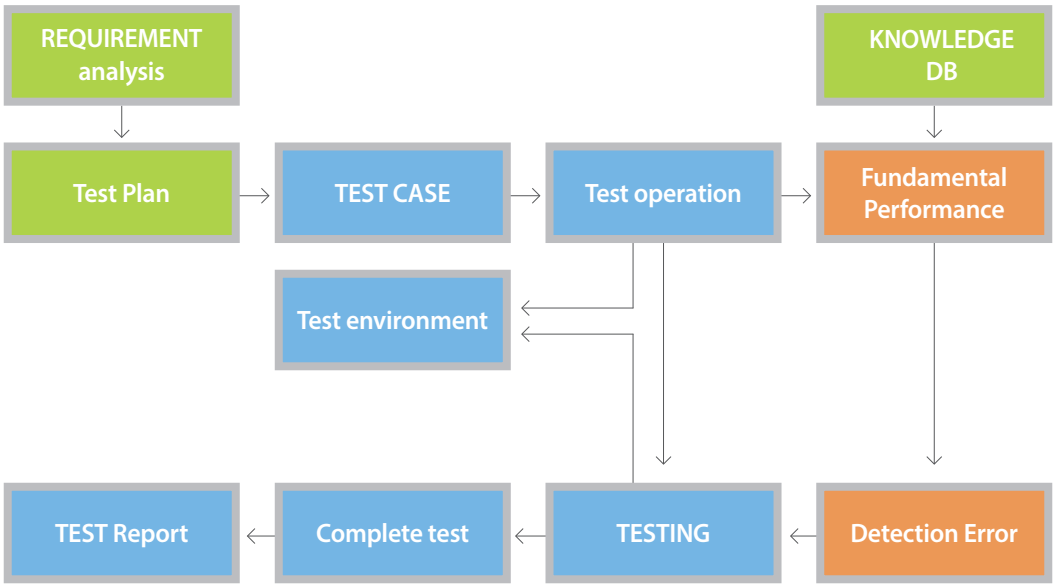
PCB ARTWORK

- Mass corresponding PCB design From initial phase
- Digital circuit and analog circuit design technique hold
- Experience of PCB design and production for vehicle electronics
- Apply design rules for avoiding electromagnetic & impedance match

PCB ARTWORK	PCB Production
PCB LAYOUT	1L-10L PCB Fabrication
Circuit Design	METAL PCB Fabrication
GERBER EDIT	Special PCB
PCB COPY(1L, 2L, 4L)	BGA REWORKING
PCB ARTWORK Training	Product Engineering

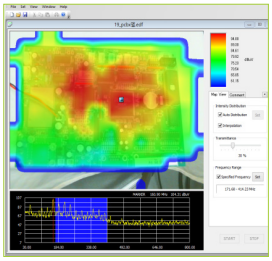
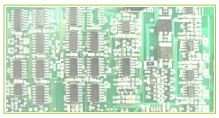
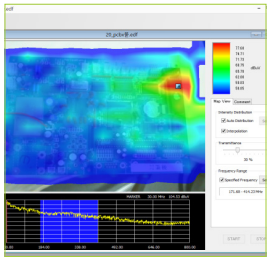
Functional qualification

Test to verify whether or not a normal operation such as an input signal necessary for the operation of the controller(vehicle speed, Wheel speed, Switch, Brake) is applied to the output voltage, the current monitoring, Lamp, motor



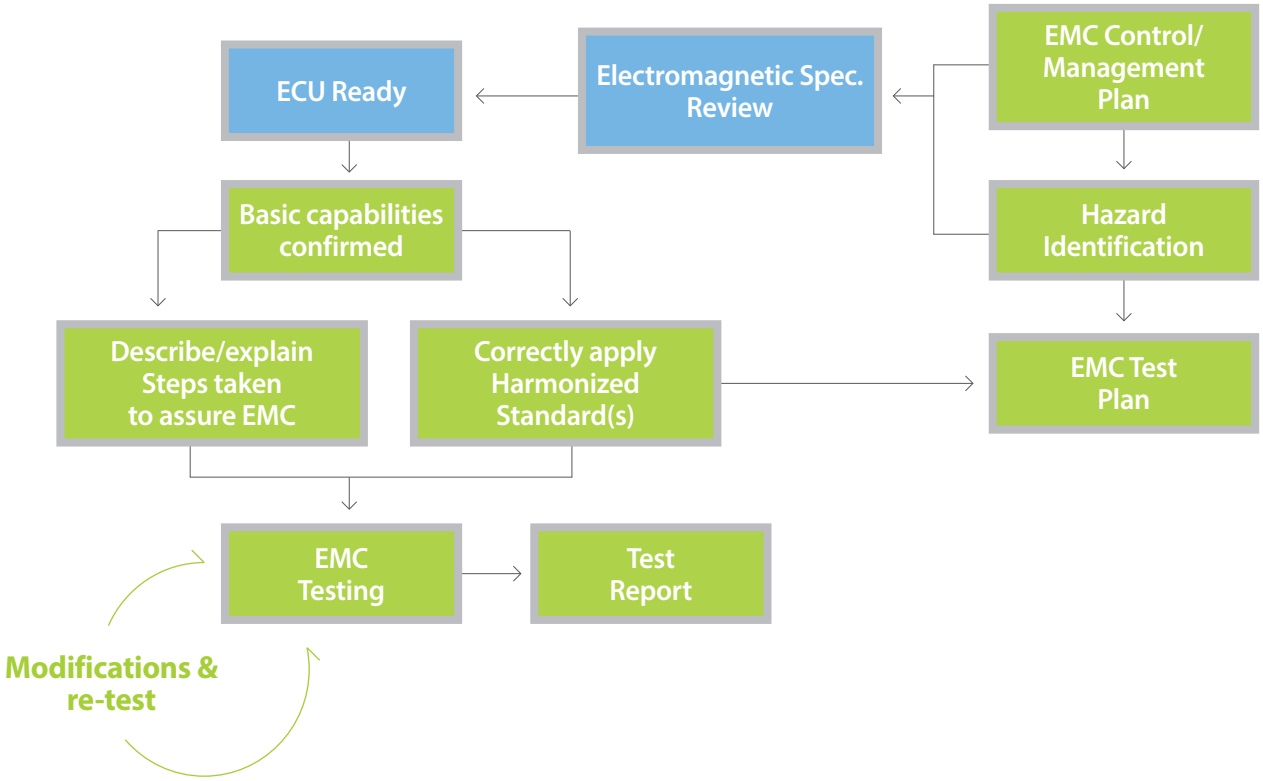
LAB EMI Electromagnetic verification(using EMI Scanner)

Improving EMI(through both the reduction of via and partial shielding of PCB) using EMI Scanner

EMI Measurement / Analysis	EMI Improving	EMI Re-measurement / analysis	Analysis Reports
	 both the reduction of via and partial shielding		

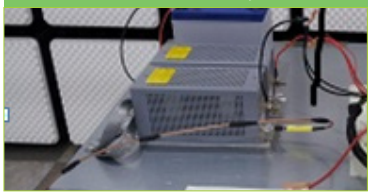
Chamber EMI Verification

Test to verify and analyze the H / W Safety mechanism for a variety of test Fault environment necessary for verification of the EMC Requirement of ECU



Chamber EMI Verification Process

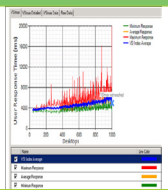
❶ PCE Analy



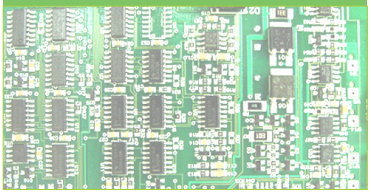
❷ SCE Analysis

❸ RE Analysis

❹ EMI Measure



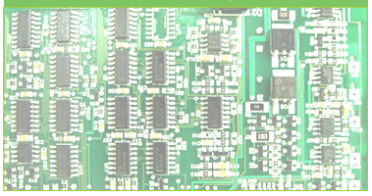
❺ Debugging



Prototype Development

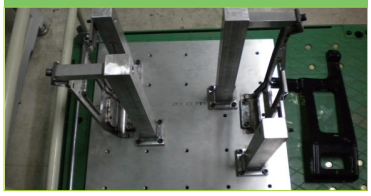
- Reliability for automotive design and production quantities of the product
- Automotive various interface boards, connectors, JIG fabrication experience

ECU Prototype

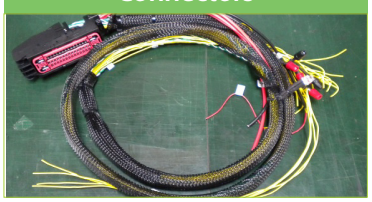


Download JIG

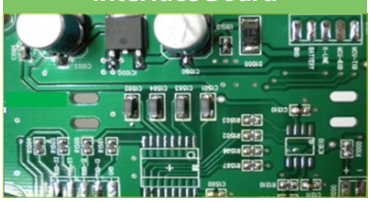
Vibration JIG



Connectors

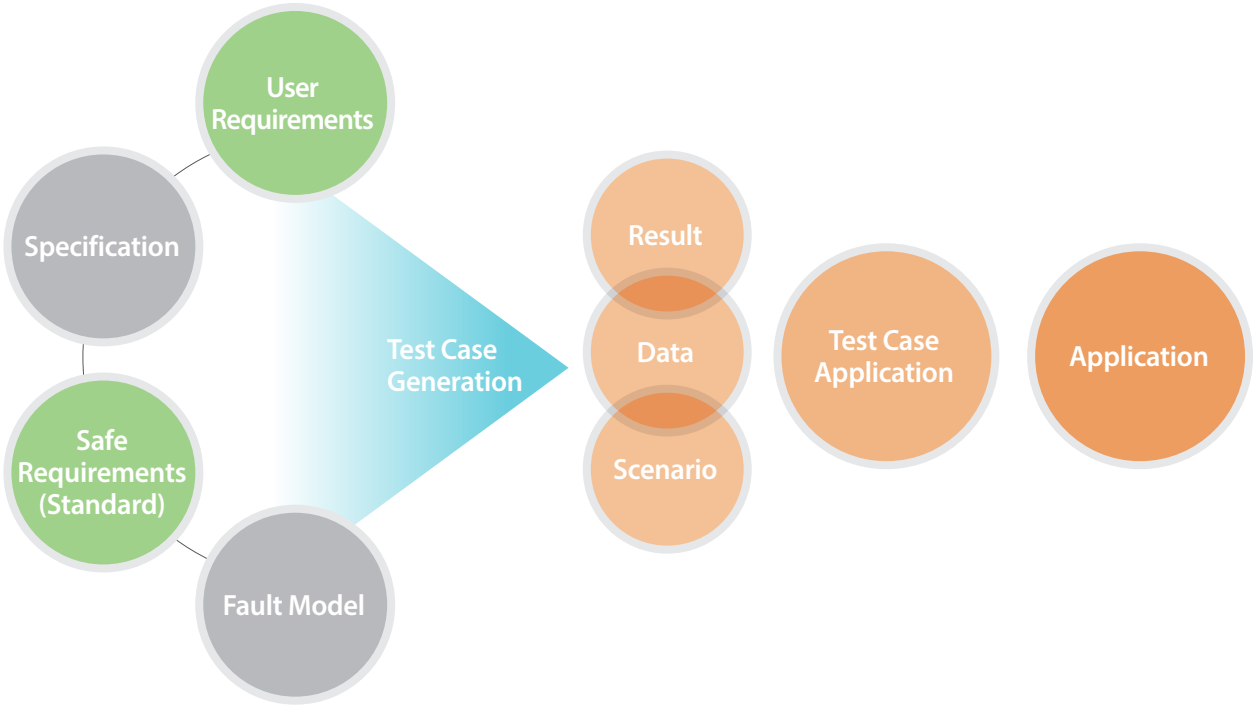


Interface Board



SW Implementation(with Fail Safe)

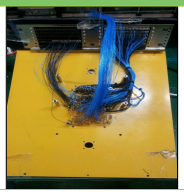
- Fault signal input connected to the controller and JIG
- Fault signal is applied to verify that the controller is operated normally



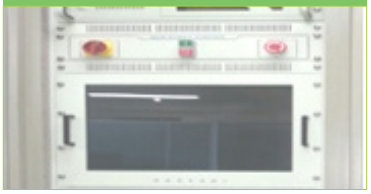
SW Implementation(with Fail Safe)

❶ Top JIG Fab.

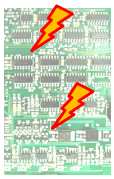
❷ Bottom JIG Fab.



❸ Tester Setting



❹ Function Safety Verification



❺ Analysis Report

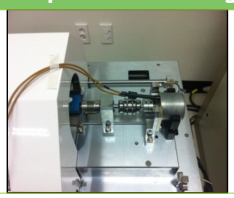
Thermal analysis

Component temperature measured by each Profile, analysis and Test to find the Solution

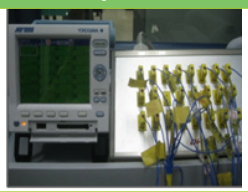
❶ Install Temp Sensor

❷ Heat Chamber Setting

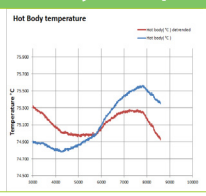
❸ Operation setting



❹ Temp measure



❺ Analysis Report



Function Tester

Equipment	ECU Function Tester
Usage	Test Equipment to test the functionality of the DUT with a plurality of input and output
Photo	

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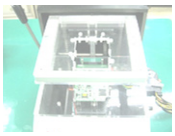
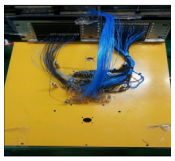
Photo	

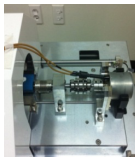
Equipment	ECU EOL Function Tester
Usage	Equipment for testing a control module which is processing the electronic input&output
Photo	

Equipment	Current Probe
Usage	device for measuring the driving current about Power line, the motor phase current, the valve
Photo	

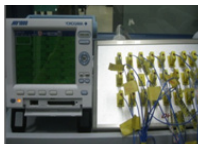
Equipment	LCR Meter
Usage	the equipment for measuring the inductance, the capacitance and Resistance of the passive element
Photo	

Equipment	Unctional test fixture
Usage	A JIG for functional testing of the input-output controller
Photo	

Equipment	Fault Injection Test JIG
Usage	A JIG for fault input at controller
Photo	

Equipment	Driving test JIG
Usage	A JIG for applying a load to the actuator
Photo	

Equipment	THERMOCOUPLE
Usage	to measure the temperature of each element of the controller
Photo	

Equipment	Temperature test RECODER
Usage	Displaying and storing the measured temperature values
Photo	

Equipment	Temperature test Chamber
Usage	Equipment for the thermal shock and thermal vibration test
Photo	

Equipment	Multi - Meter
Usage	The equipment for measuring the current And voltage
Photo	

Equipment	Function Generator
Usage	Equipment for generating various waveforms necessary to control the input
Photo	

Equipment	Oscilloscope
Usage	Equipment for analyzing real-time measurements of the waveforms of various signals in the controller
Photo	

SMT Samples(production) line– Outsourcing partner

Product Equipment

- MAGAZINE LOADER / UNLOADER
- SCREEN PRINTER | DSP-2700
- MOUNTER 1 | MIRAE MPS-1030 : 2EA
- MOUNTER 2 | MIRAE MPS-1020P : 2EA
- REFLOW | REFLIO
- ANTI-STATIC PRODUCT
- REFLOW TEMP PROFILE
- SMD Rework Station | 990D

Product Capability

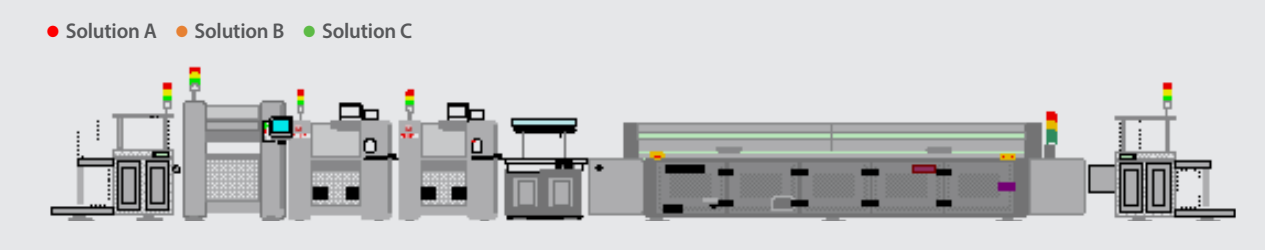
- Max. PCB SIZE : 410 X 360 mm
- PCB DEPTH : 0.4 – 4 mm
- MOUNTER 1 | MIRAE MPS-1030
- MOUNTER 2 | MIRAE MPS-1020P
- REFLOW | RE
- UNLOADER |

Product Equipment

- Environment-friendly Lead Free(non-solder) professional production
- 1005(0402) CHIP Device mounting professional(much shorter production times to hold Feeder)
- Anti-Static production environment
- Passive components(R, C) holds, and provides for customer convenience(free of charge under 4set Assemby)
- Material held for much AUTOMOTIVE
- Increased productivity due to the production history management
- Both BGA And various IC, REWORK and repair

Inspection Device

- VISION Checker : 1Set
- MDPS. ABS, ECS : PCB JIGs for verification



Screen Printer

Division	**Screen Printer**
Equipment Name	TSP - 500
Screen Frame	650 X 550mm, 550 X 650mm

Multi Mounter

Division	**MULTI MOUNTER**
Equipment Name	MPS - 1010
Centering Method	Full Vision
Head Qty	2 Heads X 8 Nozzles

Tray Feeder

Division	**MOUNTER + TRAY FEEDER**
Equipment Name	MPS-1020P
Centering Method	Full Vision
Head Qty	1 Head X 6 Nozzles

Reflower

Division	**REFLOWER**
Equipment Name	AIS-20-82C
Heatingzone Qty	HOTAIRCONVECTION*AIRNOZZLEHot air circulation
Heating Method	upper 8EA/lower 8EA

MEMO

MEMO

REVOTECH

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