



# 4G LTE USB Dongle

## Our Client

One of the leading Telecommunication service provider in Asia Pacific region.

## Why they needed us

They wanted to introduce a new product to enable their customers utilize their 4G LTE Service. They approached us due to our extensive knowledge and experience in Original Design Manufacturing (ODM) for the telecommunication industry.

## What we did

- Conceptualized and defined the industrial design with electrical and mechanical intensive features.
- Evaluated various Class A components like processors, memories, connectors and all relevant components that have mechanical impact.
- Documented High Level Design (HLD) for electrical and mechanical.
- Designed Electrical Schematics based on HLD using OrCAD.
- Generated gerber files for the PCB.
- Designed the Electrical Layout of the Board using Cadence Allegro.
- Designed the Mechanical Model based on the HLD using SolidWorks. Thermal Analysis was done on these models.
- Ensured that there were no obstruction of the electrical components with the mechanical model using EMN and EMP files.
- 3rd party manufacturers were used to handle manufacturing of the mechanical models and the required tooling.
- Routed the PCB based on the schematic and layout using Cadence Allegro.
- Released the gerber files, manufactured and assembled the PCB.
- Tested and debugged the assembled PCB.
- Developed device Drivers for Windows and Linux based OS.
- Ported the OS to the hardware, loaded the device drivers and booted up the device.
- Tested for Electromagnetic Compatibility and Electromagnetic Interference along with various tests for Reliability.
- RF & Analog Simulations done for multi-band RF isolation.
- Developed GUIs for Windows and Linux based OSs.

## What we did

Operating Frequency	400 MHz to 4000 MHz (Single and multi-band designs, model specific) band 38 and 40
Duplex mode	Time Division Duplex (TDD)
UE Category	Category 3 UE
Transmit power	23 dBm $\pm$ 2 dB (Power Class 3)
Radio performance	3GPP TS 36.101 compliant

PHY layer peak data rates	Up to 100 Mbps downlink and 30 Mbps uplink for 20 MHz in TDD
Standards compliance	3GPP R8 LTE compliant
Radio configuration	2 Receive / 1 Transmit
Host interface protocol	USB 2.0
Drivers	Windows XP/Vista/7/Mac OS 10.4 or higher / Linux Kernel 2.6.32 or higher
Operating temperature	-30 to +60°C (-22 to +140 °F)
Storage temperature	-40 to +85 °C (-40 to +185 °F)
Humidity	0 to 90% non-condensing
Standards and Regulatory	Radio: FCC for North America, ETSI EN specifications for Europe
Safety	EN 60950, CE mark, RoHS directive 2002/95/EC
Chipset	Sequans SQN3010

## How they benefited

They were able to utilize our design, manufacturing, assembly and testing capabilities to bring their product to market in a short amount of time.

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### About Redeem Systems

*Redeem Systems is a pure-play Engineering and Digital Services Company with focus on mission critical highly engineered + high availability systems. Our global presence spans Asia-Pacific, Middle-east, Europe and North-America.*

*Our focus verticals include – Tele-communications, Medical Electronics and Aerospace & Strategic Electronics.*

*Our Product Engineering competencies include Product Design and Development, Verification & Validation, Emerging Markets Strategy and Product Life-Cycle Extension through Value Analysis and Value Engineering*

*Our Digital competencies are focused on Industrial Internet-of-Things (IIoT), Engineering Big Data Analytics and Software Defined Networking (SDN)/ Network Functions Virtualization (NFV).*