



WIRELESS & GREEN COMMUNICATION TECHNOLOGY



GreenPeak is a fabless semiconductor company offering innovative ultra low power wireless and battery-free data communication controller chips for consumer electronics and wireless sense and control applications for remote controls, residential services, home automation and security.

GreenPeak's revolutionary technology, based on the IEEE 802.15.4/ZigBee wireless networking standard, allows maintenance-free (no battery replacement) or battery-free (based on energy harvesting) operation in a totally wireless environment.

GreenPeak driven ultra low power networks bring true maintenance-free operation

GreenPeak Technologies brings **wireless and green** solutions for control networks with **high reliability** and **standard compliance** and unique features that make it **robust to interference**.

Ultra Low Power Wireless Control Networks

GreenPeak's comprehensive offering includes IEEE 802.15.4 chips and software, implementation tools and development kits.





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GreenPeak Applications

The new smart and green wireless network for home and office

Ultra low power ZigBee applications for remote controls, residential services, home & building automation and security

Wireless networks have been existing in our homes for decades. Cordless phones and wireless data networks like Wi-Fi and Bluetooth are commoditized applications in our daily lives.

Today, the third wireless network of home applications is emerging and addresses the low power consumption and low data rate sense and control applications like remote controls, energy management, home security, access control, HVAC monitoring, lighting, etc.

The ZigBee RF4CE standard provides a common platform for the development of RF (Radio Frequency) remote controls and devices for industrial, office and home applications providing a wide range of exciting new features such as transmitting through walls and cabinet doors and providing two way interactivity. By using the ultra low power features, these devices are able to run for a decade or more on a single coin cell battery.

ZigBee RF4CE Remote Controls

Remote controls are among the first application to benefit from ultra low power ZigBee RF4CE. As ZigBee RF4CE is based on radio which penetrates walls, furniture, and floors, rather than line of sight optical IR, this new generation of remote control means that users no longer have to stand in front of their TV set or set top box to change channels or program the DVR.

A single ZigBee RF4CE remote can control the entire home's electronic systems - TV, games, communications, home automation, audio, security, environment, etc. By using RF4CE powered sensors located throughout the house, users now have a single remote dashboard that can monitor the status of homes doors and windows.

Residential Applications

GreenPeak's wireless sensor technology can be integrated in a wide variety of applications requiring ultra low power consumption, high reliability and high performance.

- ▶ RF4CE remote controls
- ▶ Home security
- ▶ Access control
- ▶ Temperature monitoring & HVAC control
- ▶ Energy management
- ▶ Home health care solutions
- ▶ 3D glasses
- ▶ Battery free wireless light switching & dimming





Benefits of ZigBee RF4CE Remote Controls

- ▶ Lowest cost BOM for total solution (<2\$): same low cost for RF remote control as for IR remote control
- ▶ Superior range and reliability
- ▶ Robust against Wi-Fi and Bluetooth interference
- ▶ Ultra low power and Green
- ▶ No battery replacement - No maintenance
 - ▶ A single low cost 2032 battery can last for the life time of the product (+15 yr)
 - ▶ No more “elastic bands” around broken battery compartments
- ▶ Two-way communication
- ▶ Active status display - Direct interaction
- ▶ Find-me and push-messaging apps
- ▶ Improved user experience - No pointing - Fast response time
- ▶ Improved aesthetics - Settop box in the closet
- ▶ Robust and small software with only 1-2 months implementation cycle
- ▶ Compliant to industry standards
 - ▶ ZigBee RF4CE
 - ▶ IEEE 802.15.4
 - ▶ ISM 2.4 GHz Global Band

GreenPeak offers the first ZigBee RF4CE certified solution to combine both ultra low power and affordable BOM-bill of material



The GP500C Communications Controller Chip

The GreenPeak 802.15.4 Emerald GP500C chip typically saves up to 85% of the energy of comparable products. The GP500C’s low energy consumption allows developers to build applications with a peak current of about 20mA (two times lower than typical) and a system sleep mode of below 100nA (ten times less than typical) without compromising the network reliability.

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GP500C Features



- ▶ IEEE 802.15.4 compliant - 2.4 GHz worldwide band
- ▶ Supports a variety of ultra low power networking protocols
- ▶ Data rate 250 Kb/s
- ▶ Range 30-50m or 100-150 feet
- ▶ Robust reliability based on embedded hardware antenna diversity to reduce dead spots and link reliability features such as message-over-message enabling, excellent sensitivity, a robust signal processing engine as well as interference detection and avoidance mechanisms
- ▶ Consumes a fraction (10-25%) of the energy of traditional microcontroller based designs by using a lower peak current, ultra low leakage current & very short transmission times via just-in-time transmission scheduling
- ▶ Energy consumption
 - ▶ Sleep current: 100 nA - compared to 1 μ A typical
 - ▶ Communication current: packet processing at least 65% less energy
- ▶ Hardware features
 - ▶ Integrated transceiver/ communications controller
 - ▶ Communication scheduler
 - ▶ Standby controller
 - ▶ Power supply manager
- ▶ Extreme low cost: lower total system bill of material (BOM) makes the GP500C best in class for total system cost
 - ▶ High level of integration of on board components





GreenPeak Company Profile

GreenPeak Technologies is a fabless semiconductor company and is a leader in ultra low power wireless RF communication technology for consumer electronics and wireless sense and control applications. GreenPeak sells a uniquely differentiated ZigBee/IEEE 802.15.4 product portfolio with best performance in range, link reliability, cost and energy consumption.

GreenPeak offers its wireless products and technology to leading OEMs for integration with their applications and provides hardware and software, development kits and reference designs for complete end-solutions.

GreenPeak focuses on the world market and distributes its products in the USA, Europe and Asia.

GreenPeak's headquarters are based in Utrecht - The Netherlands and the company has offices in Belgium, Japan and Korea. The presence in the Asia Pacific region is in line with GreenPeak's objective to be well positioned for growth, to strengthen business activities and, most importantly, to better serve local customers.

GreenPeak is backed by venture capitalists: Gimv (Belgium), DFJ Esprit (UK), Robert Bosch Venture Capital (Germany), Motorola Ventures (USA) and Allegro Investment Fund (Belgium).



Committed to Quality

GreenPeak is ISO-9001:2008 certified and committed to deliver high performance and high quality products. The ISO certification is the recognition of GreenPeak's strong quality focus and demonstrates its commitment to maintain the highest level of excellence, it reflects GreenPeak's focus to meet and exceed customers' expectations and helps GreenPeak to lead the way as a technology innovator.



World Economic Forum Technology Pioneer

GreenPeak was selected by the World Economic Forum as a 2009 Technology Pioneer, in the "energy" category, for its accomplishments as an innovator of the highest caliber, involved in the development of life-changing technology innovation and with the potential for long-term impact on business and society.



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