



## Thermal Energy Harvesters

**Enabling wireless IoT sensors and controls to operate without batteries**

- Continuous output without a "perceptible" temperature differential (in essentially any environment above absolute zero)
- Solid-state structure
- Scalable output and can be made in various form-factors
- No toxic materials
- Low-cost (when mass-production process established)
- Utilizes existing semiconductor manufacturing processes
- Compatible with heterogeneous integration (SIP and PCB)
- Enables the design of self-powered integrated circuits for the IoT
- Evercell™ Video Available

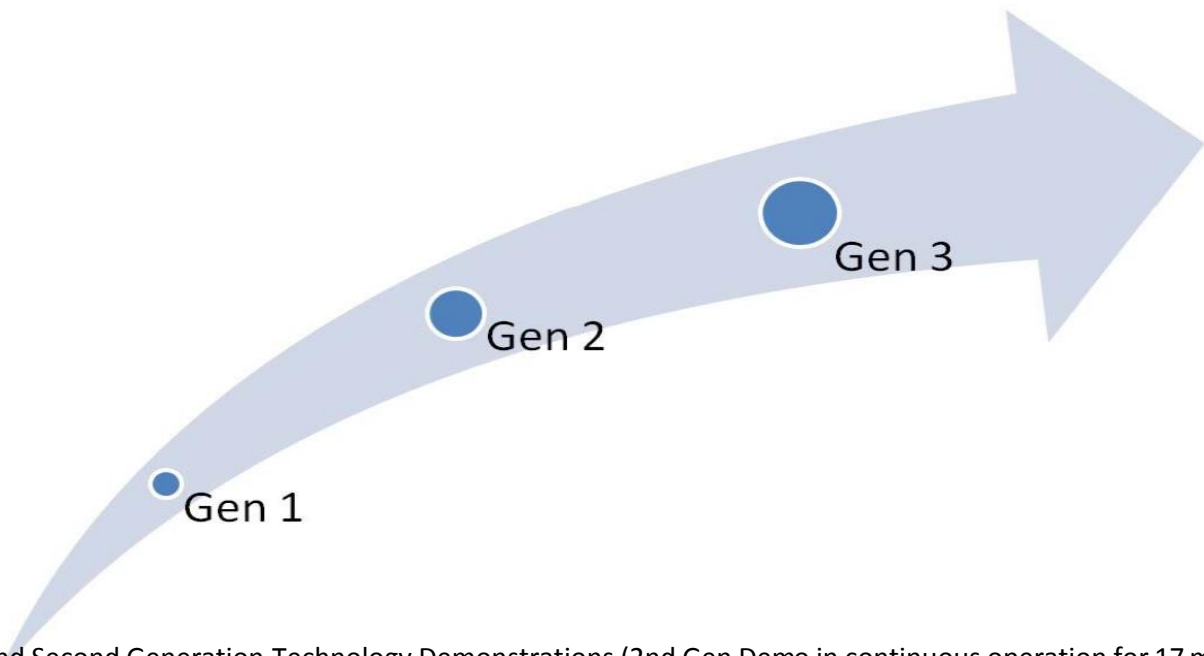
Examples of expected performance for first-generation production devices:

5μW device:  
10cm<sup>2</sup> x 1mm  
1.2V output  
4.2μA continuous current

960nW device:  
50mm x 75mm x 0.1mm  
1.2V output  
800nA continuous current

480nW device:  
30mm x 305mm x 0.2mm  
1.2V output  
400nA continuous current

## Product Development Roadmap



Gen 1 = First and Second Generation Technology Demonstrations (2nd Gen Demo in continuous operation for 17 months)  
Gen 2 = Third Generation (Solid State) Demonstrator Available and Commercial Prototype Development Underway for Q4 2018  
Gen 3 = Qualified Initial Mass Production of Commercial Devices Q3 2019

Patented and patents pending