AdaptivEnergy

AdaptivEnergy.com

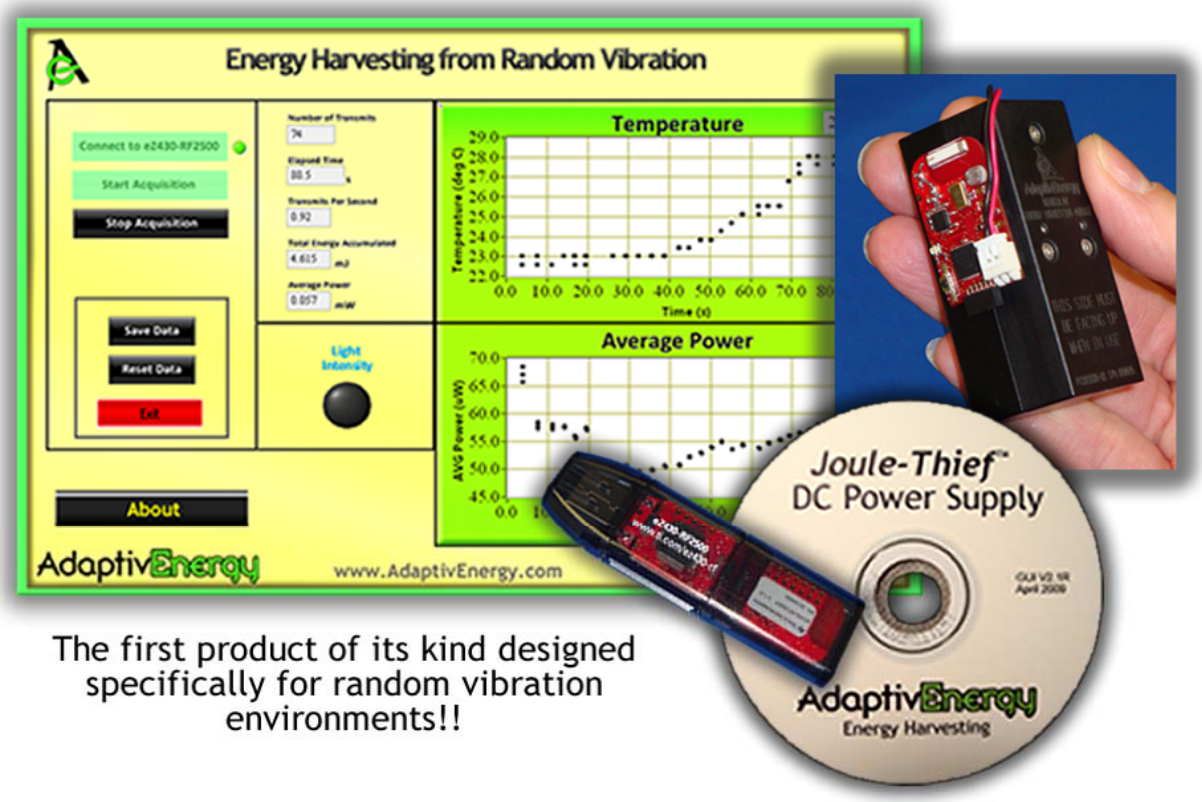
DATA SHEET

Energy Harvesting

Random Vibration Energy Harvesting Demonstration Kit

AdaptivEnergy's Joule-Thief™ energy harvesting power supplies convert ambient mechanical energy, such as vibration and impact events, into a standard DC voltage output. The Random Vibration Demonstration Kit includes everything you need to evaluate the JTRA-e5mini energy harvesting module within your vibration environment. This includes an example self-sustaining microelectronics application with wireless sensors and Texas Instruments' low power MSP430 Wireless Development Tool.

Joule-Thief™'s stress-engineered Smart Energy Beam™ produces more power output per unit volume than any other piezo-based energy harvesting technology available. AdaptivEnergy's highly efficient Energy Key™ electronics are integrated into the Joule-Thief™ module, resulting in a very compact energy harvester with a 2-wire interface to your application.



The first product of its kind designed specifically for random vibration environments!!

Contents

- *JTRA-e5mini Random Vibration Joule-Thief™ DC power supply configured for energy collection from low amplitude vibration environments*
- *Texas Instruments MSP430 micro & CC2500 radio transmitter with USB receiver*
- *Onboard sensors for 2.4GHz wireless data transmission*
- *Wireless sensor application firmware for plug-and-play energy harvesting demonstration*
- *User interface software for signal acquisition and power profiling from your vibration environment*

Experience first-hand how Joule-Thief™ can provide "forever power" to your self-sustaining microelectronic applications

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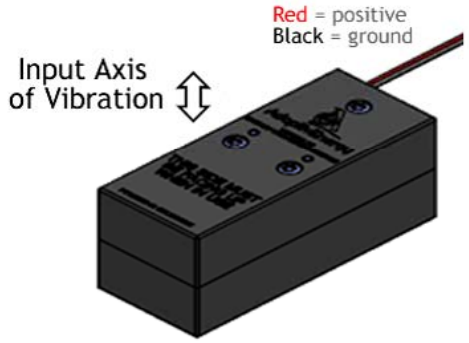
JTRA-e5mini Operation



*Contact AdaptivEnergy for different operating frequencies, alternative power supply configurations, or if you need assistance selecting an energy harvesting module for your specific environment.

JTRA-e5mini Power Output

Freq (Hz)	Acceleration (Grms)	JTRA-e5mini AVG Power (mW)
2.5	1.00	0.095
3.5	1.00	0.102
5	0.50	0.028
10	0.40	0.077
15	0.20	0.036
15	0.40	0.129
Random White Noise	0.15	0.010
Random White Noise	0.25	0.030
Luxury Car Interior	0.03	0.012
Light Truck Interior	0.04	0.014
Light Truck Exterior	0.10	0.070

The data above is provided as a guideline; specific environments may produce slightly different results. Fixed frequency signals are sinusoidal unless otherwise specified.

Wireless Sensor Application Example: *0.020mW average power produces ~720 2.4GHz wireless transmissions per hour with supplied firmware and TI eZ430-RF2500.*

Important Module Usage Information:

- Beam should be mounted per instructions on module ("this side up" is important)
- Mounting mechanism should be as rigid as possible (any damping in the mount will considerably reduce the vibration seen by the unit and therefore its power output)
- For transportation environments, power output will vary by vehicle, driving conditions, driving patterns, and module mounting configuration:
  - Increased number of stoplights or "stopped traffic" conditions will lower average power output due to increased periods without substantial vibration present.
  - Rougher roads will produce higher average power output
  - A beam mounted on a less damped surface (for example, on a windshield vs. on a seat surface) will produce higher power output

AdaptivEnergy's piezoelectric-based Joule-Thief™ *technology, coupled with miniature* Energy Key™ *circuitry, provides "forever power" for self-sustaining microelectronics.*

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