Inverter Technology

Kathryn Miles

Eetrex Incorporated
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- Xcel Energy's Utility Innovation partner in SmartGrid City
- Vehicle-to-Grid (V2G) Technology Leader (Inverger™)
- Escape PHEV systems, CARB Certified, FMVSS
- Prius PHEV systems
- Core Battery Technologies
- Staff of 30 in 5,900 ft² in Boulder, CO, founded in 2006
- Received two grants from the Colorado Governor’s Energy Office
- 56 PHEV Conversions to date over 650,000 miles
- Manufacturing Partner is Methode Electronics Inc., (MEI)
Adding The Plug Opens Possibilities

• Remote Power
• Mobile Power
• Smart Grid Power
• Independent Power
• Quiet Power
Inverger™

- Bi-directional battery charger/inverter
- Intelligent Charger uses Wind/Solar to Charge
Mobile, Distributed Power

• V2H or V2W
  – Turn vehicle into clean and quiet generator, powering “critical” home/work components for 2+ days
  – Strong interest from vehicle OEM’s

• V2X
  – Vehicle is “mobile power”
  – On-demand energy, anywhere

• V2G
  – Storage for renewable
  – Provide regulation
Inverter™ Specs

AC Connection
- 6.6 kW
- Voltage Range: 110 – 240 Volts
- Current Range: 12 – 30 Amps
- Ground Fault Outlet

AC Connector – Per Customer
- E.g. 110/240V, 50A, 3-Pole,
- 4-wire, Grounding, Locking,
  Corrosion Resistant

DC Connection
- Voltage Range: 100 – 400 Volts
- Current Set by AC Connection

Communication
- CAN Bus
- Cellular Modem
Inverger™: Charging at 5kW

Charge Mode Power Analysis:
5kW output
.995 PF line to battery
94.4% Conversion efficiency line to battery
298.89 watts dissipation

AC Line Input:
240.93 Line VAC
5.3174Kw

DC Charge Output:
Battery voltage (controlled load)
360.39 vdc
Charge current 13.925 adc
Output Wattage 5.0184 Kw

Charging Test Data at 5kW

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Discharge Mode Power Analysis:
3Kw Battery source power
.977 Output PF
96.50 Conversion efficiency battery to line
101.88 watts dissipation

DC Input:
3.012 Kw
324.67 DC battery voltage
9.27 Amps DC RMS battery current

AC Line output:
250.21 Line VAC
.977 PF
2.91 Delivered Kw
2.97 KVA
Data Communications & Charge/Discharge Control
Florida Power and Light
Thank You

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