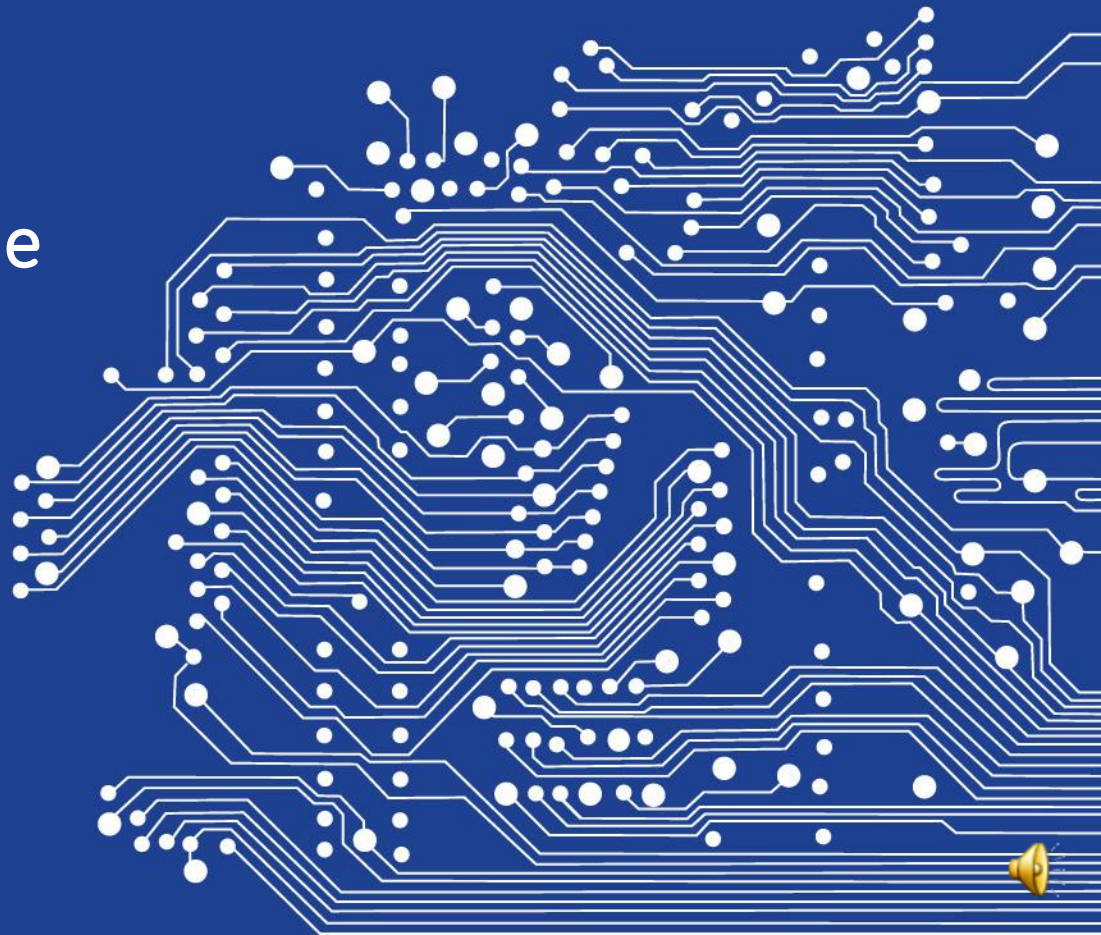
GE Energy

February 2012

Product Training Module

DC-DC Barracuda



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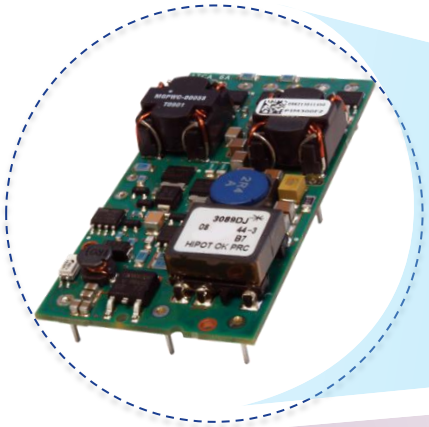
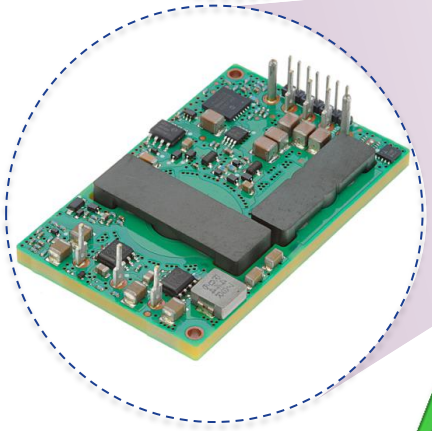
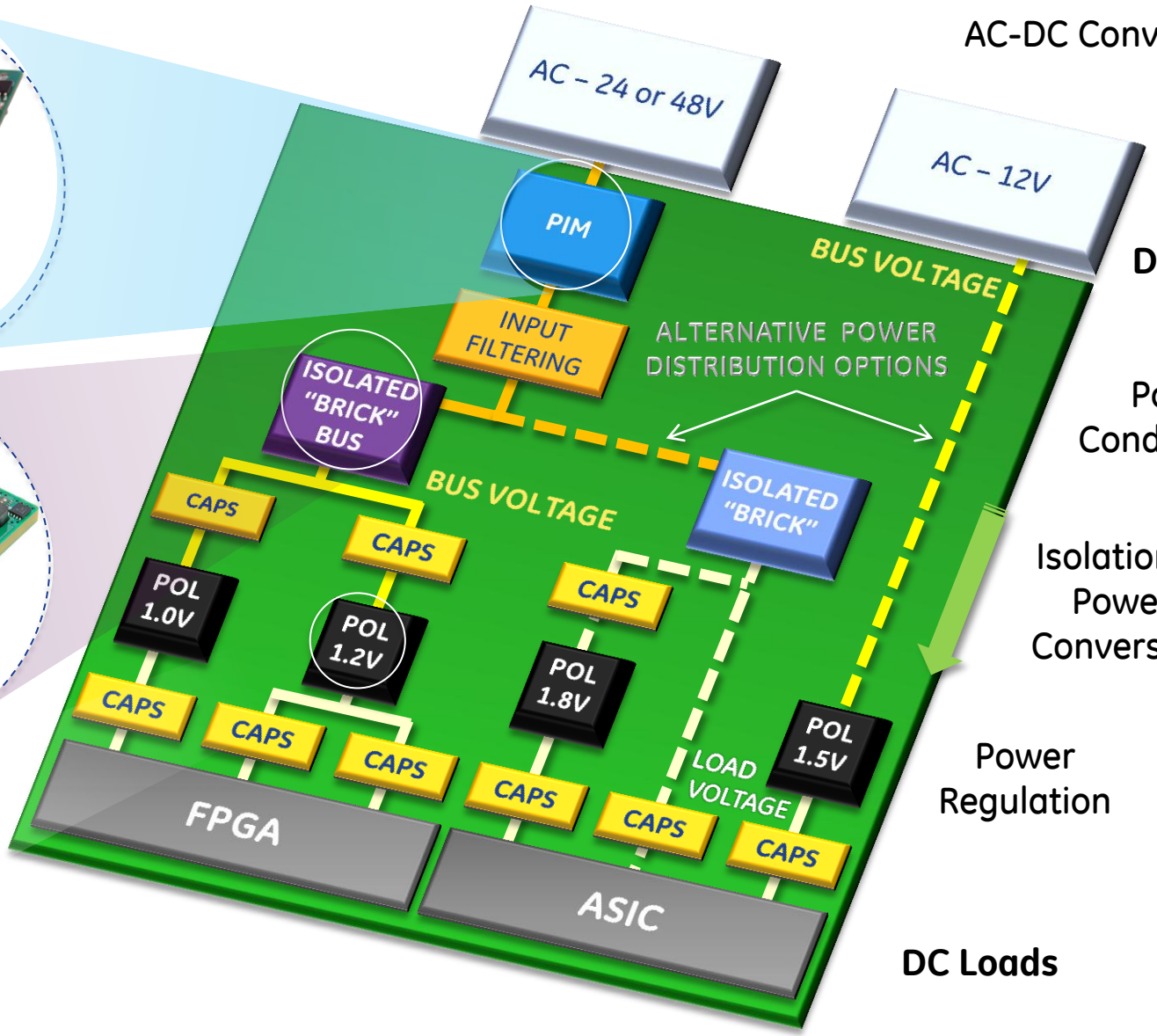
GE Complete Family of DC-DC Solutions







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GE's Barracuda Family

1/8

1/4

STANDARD	DIGITAL
240W EBVW020	240W EBDW020
300W EBVW025	300W EBDW025
300W QBVW025	300W QBDW025
400W QBVW033	400W QBDW033

- Available in both Digital pin-out or Standard bus converter 5-pin format.
- DOSA™ Standard footprints
- PMBUS™ digital system interface.
- Fully Regulated, wide input range
- Exceptional efficiency, 96%
- Exceptional Thermal performance.
- Flexible digital design

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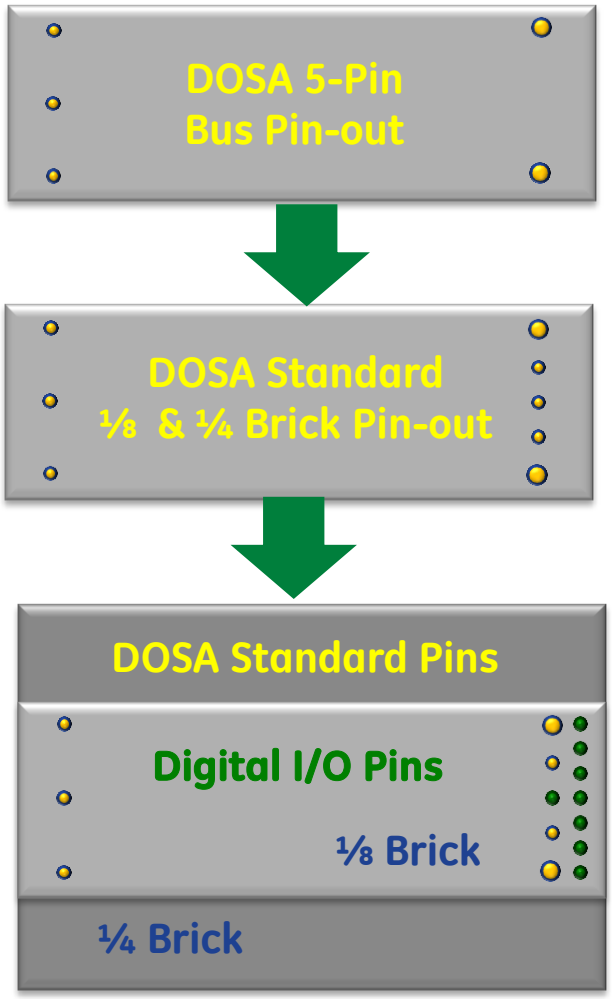
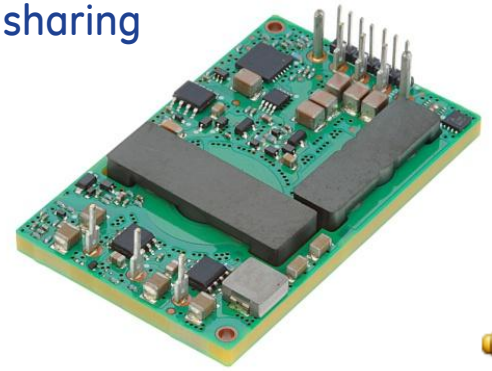
Barracuda Customer Benefits



- **Flexible and Backwards Compatible**
  - Fully Regulated with Wide Input Range
  - Forward and backward compatibility between DOSA standard, 5-Pin bus, and Fully Digital modules for both E-bricks and Q-bricks
  - A single layout accommodates new digital modules as well as all existing legacy modules
  - Configurable output voltage (9.6V, 12V) allows backward replacement into existing 4:1 and 5:1 un-regulated sockets
  - User configurable digital pins
  - -P option for Droop Load sharing
  - -H option for Base Plate



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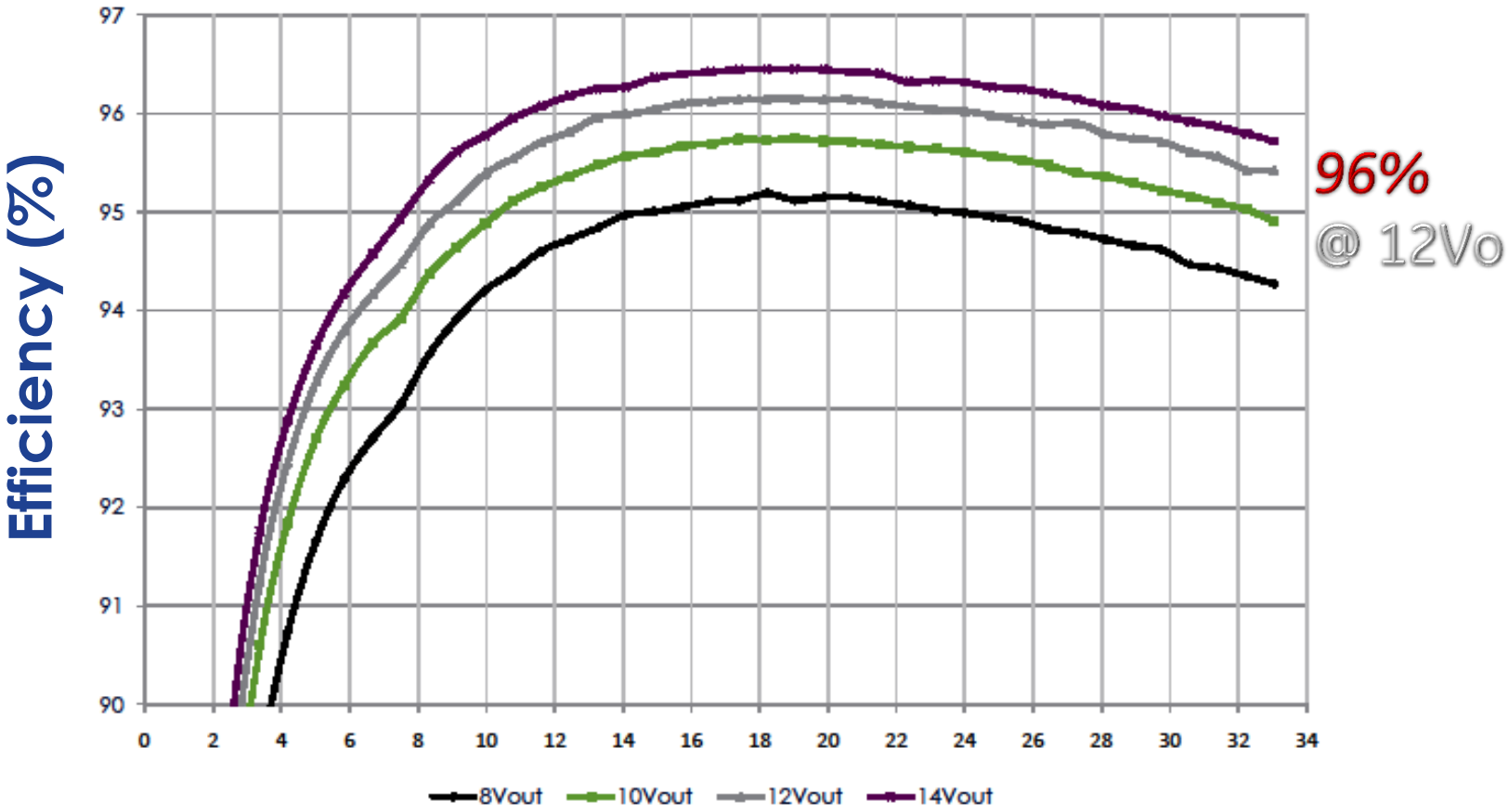
Barracuda Efficiency (QBVW033)



HIGHER EFFICIENCY & EXCEPTIONAL THERMAL PERFORMANCE

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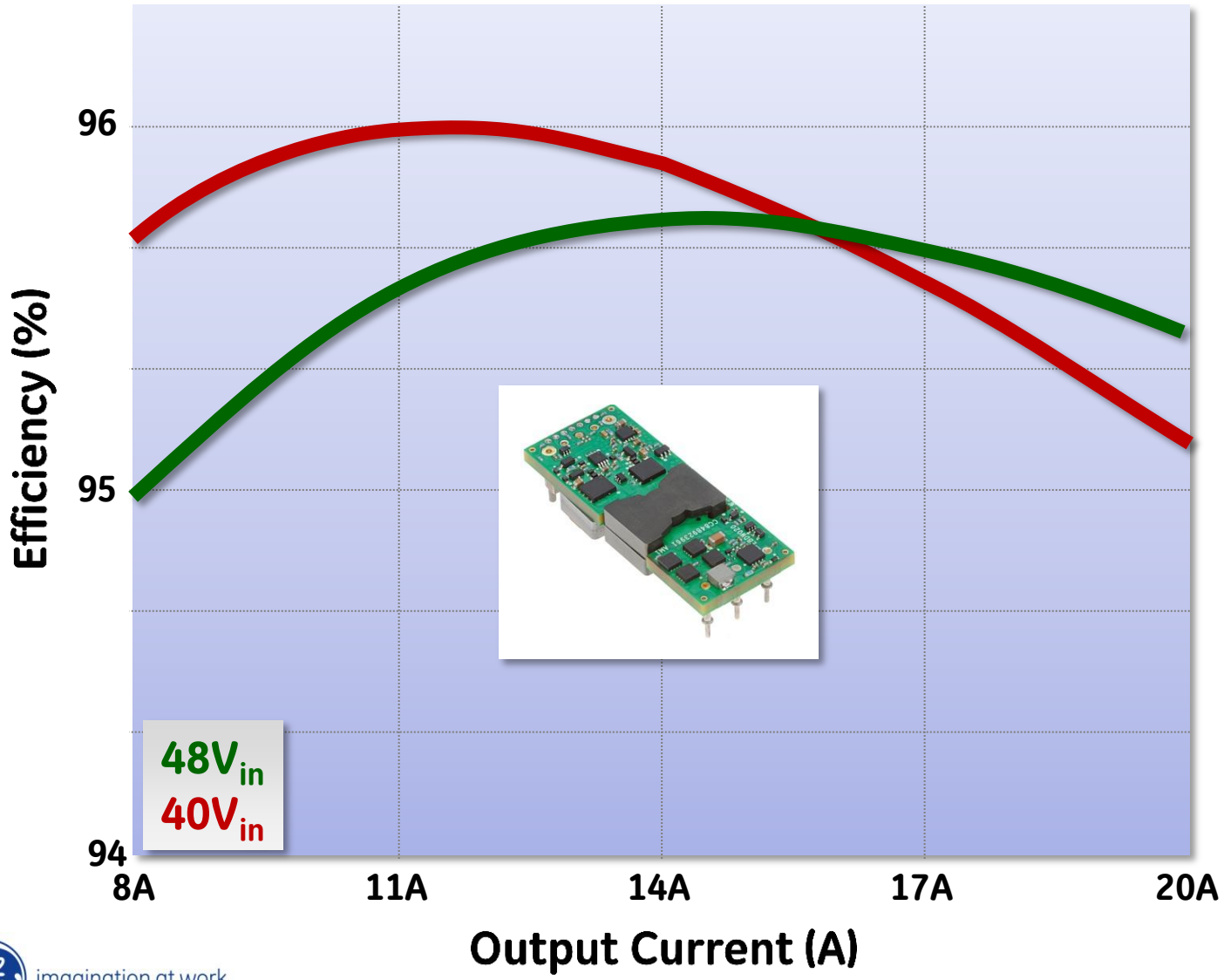
Barracuda Efficiency (EBDW020)



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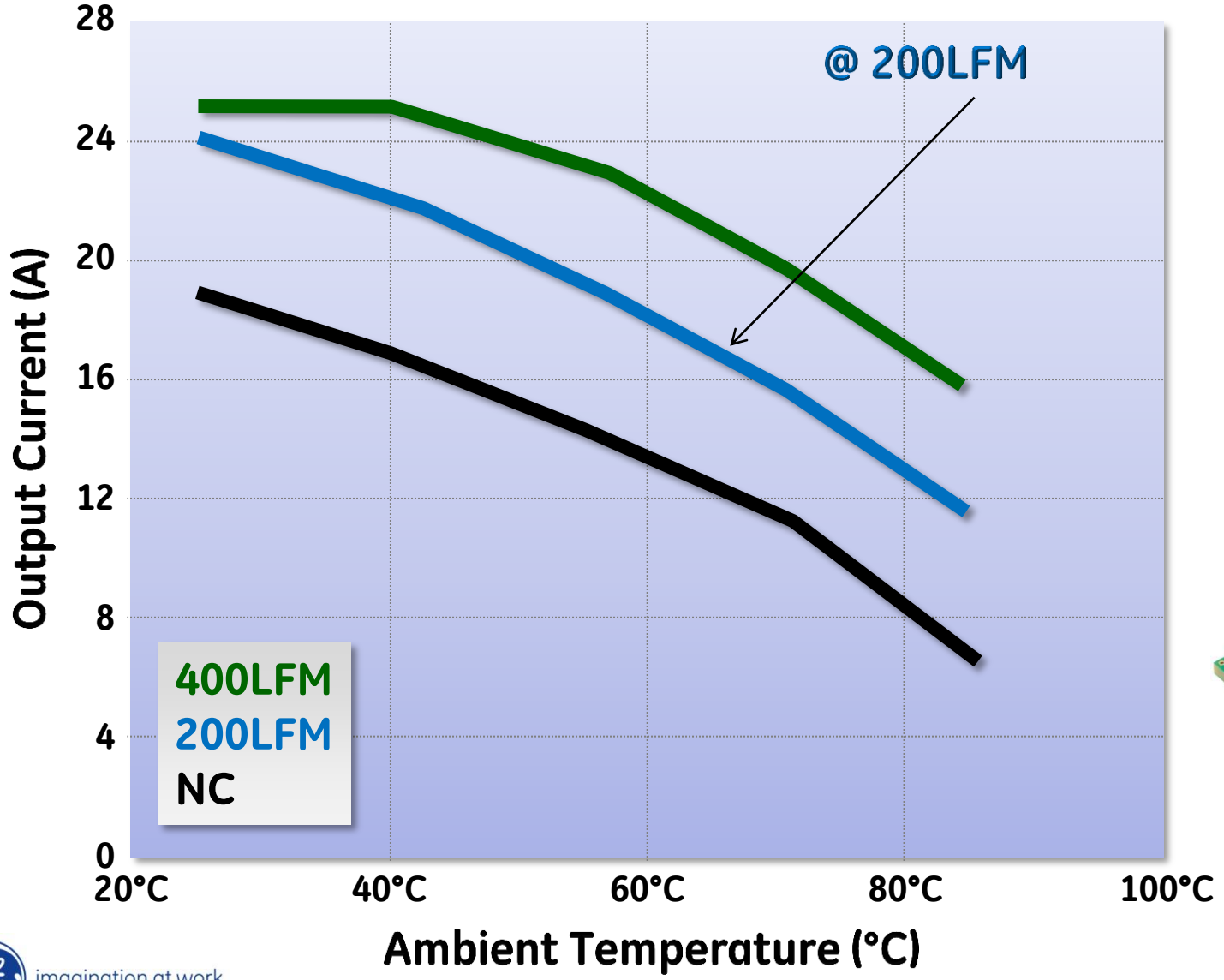
Barracuda De-rating (EBDW025 with Heat Plate)



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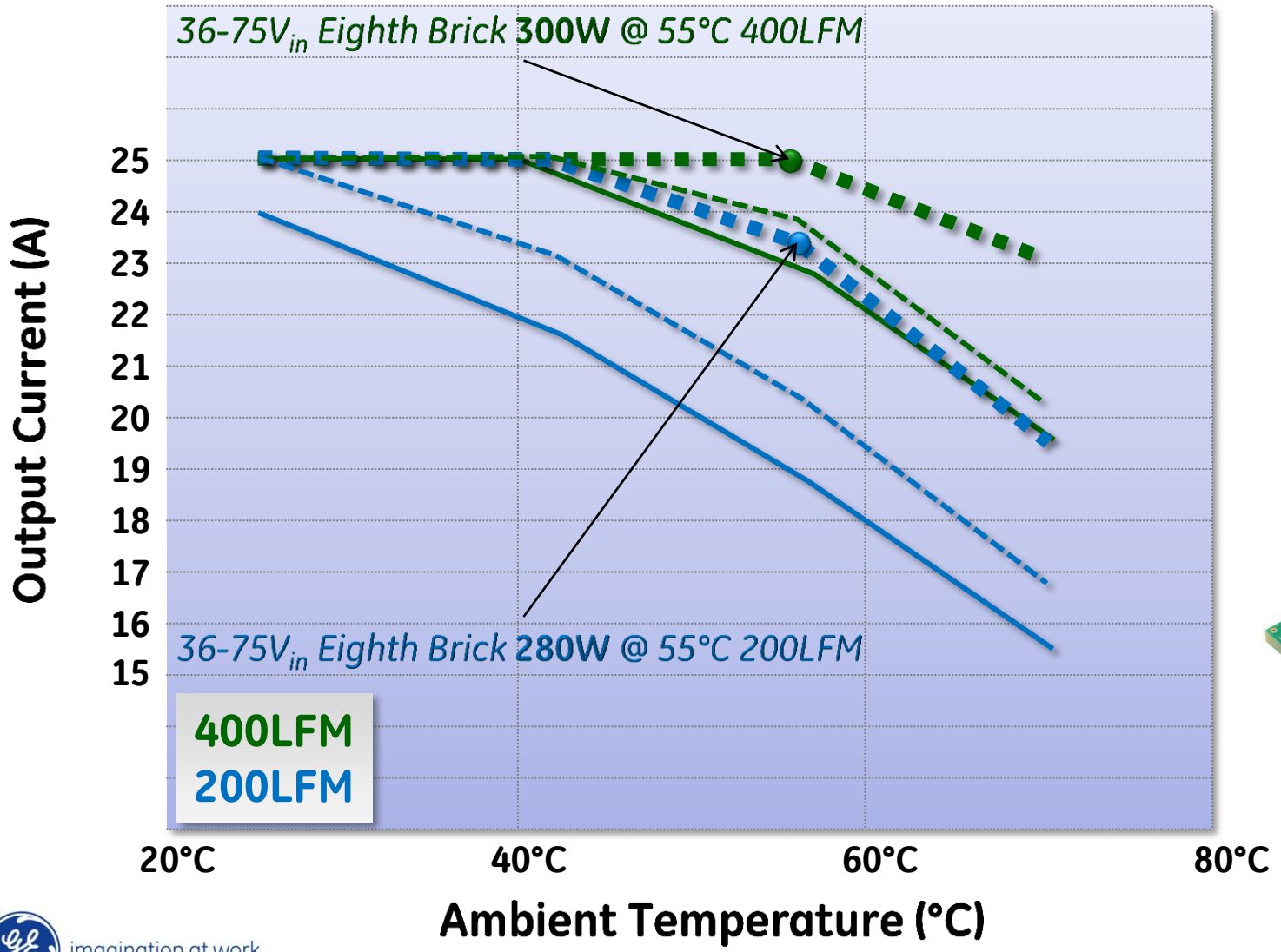
Barracuda (EBDW025 with Heat Plate & Heat Sink)



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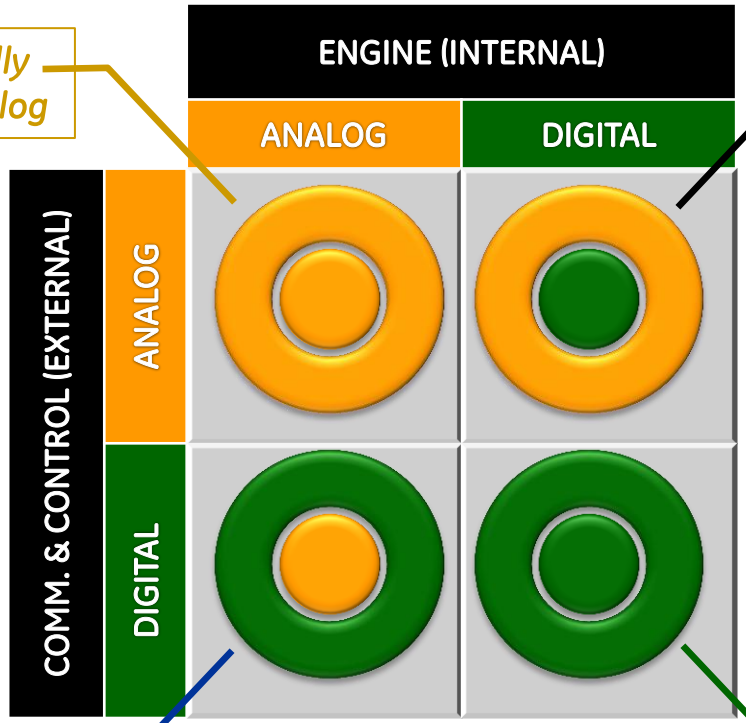
GE DLynx™ & Barracuda™ Digital

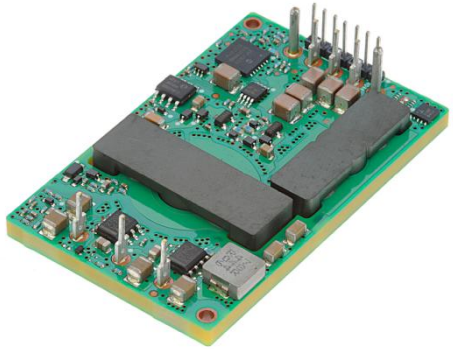
PVX012

Fully Analog



Hybrid Analog

EBVW
QBVW



PDT012

Lower cost
Lower loss
Smaller size
Reliability

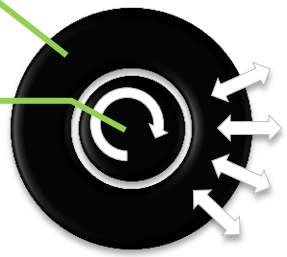
Hybrid Digital

Fully Digital

EBDW
QBDW

Digital Communication
(External Interface)
Uses a digital interface to communicate & control

Digital Core
(Internal Engine)
Need to digitize the world to make PWM decisions & control module output



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Barracuda Digital Feature Summary

Pin Function	Description	Notes
SMALERT	SM BUS ALERT	REFERENCED TO SIGGND
SCLK	SERIAL CLOCK	REFERENCED TO SIGGND
SIGGND	SIGNAL GROUND	SEPARATE FROM Vout(-)
SDAT	SERIAL DATA	REFERENCED TO SIGGND
ADDR1	RESISTOR TO SIGGND FOR MODULE ADDRESS 1	REFERENCED TO SIGGND
ADDR0	RESISTOR TO SIGGND FOR MODULE ADDRESS 0	REFERENCED TO SIGGND
TRIM/C1	ANALOG TRIM OR CONFIGURABLE PIN 1	Analog Trim, Secondary On/Off
C2	CONFIGURABLE PIN 2	Power good, Frequency Sync, Secondary On/Off

Programmable DSC based controller allows multiple features to be mapped to a given pin, provisioned by the user.

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Barracuda QBDW033A0B

Functions & Specications

Functions/Specs.	Specification
Input Voltage Range	36-75V
Output Voltage Range	8.1-13.2V
Efficiency	95% Minimum
Line and Load Regulation	0.2%
Input-Output Isolation	2250Vdc
Operating Temp. Range	-40 – 85°C
Remote Sense Range	5% of V_{OUT}
Output Current Rating	33Adc
Analog On/Off (V_{IN} ref)	√
V_{OUT} Adj via R_{TRIM}	√
Remote Sense	√
Overtemperature Protection	√
Overcurrent Protection	√
Overvoltage Protection	√
Analog On/Off (V_{OUT} ref)	√ (option)
Power Good	√ (option)
Load Share	√ (option)

Functions/Specs.	Via PMBus™
Set V_{OUT} 8.1 – 13.2V	√
Set V_{OUT} droop	√
Margin V_{OUT} High/Low	√
Digital On/Off	√
Adjust V_{IN} On/Off Limits	√
Adjust V_{OUT} OV Fault Limit and Action	√
Adjust V_{OUT} OC Warning/Fault Limit and Action	√
Adjust OT Warning/Fault Limit and Action	√
Adjust V_{IN} OV Fault Limit	√
Adjust PGOOD Limits	√
Adjust Startup Delay and Rise Time	√
Measure I_{OUT}, V_{OUT}, $V_{IN,}$ Temp	√
Monitor faults/alarms/PGOOD	√
Configure SMBAlert/ARA	√
Configure On/Off pin(s) logic	√
Calibrate V_{OUT}, V_{IN} Readings	√
Read module ID, mfg location, etc.	√

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AVS (Adaptive Voltage Scaling)

Adaptively change load and bus voltages to optimize energy consumption

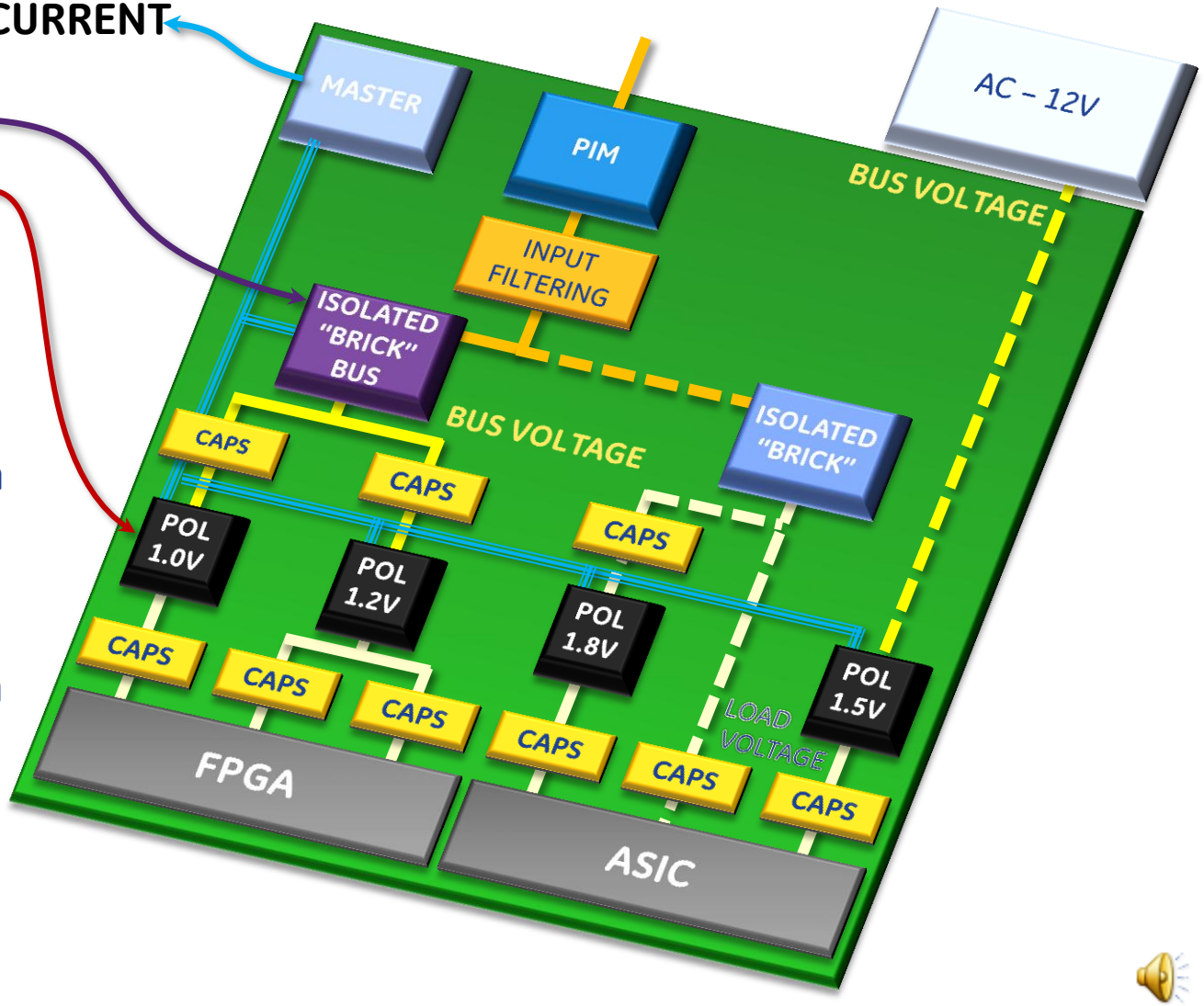
READ BACK BUS & LOAD CURRENT

→ **SET BUS VOLTAGE**

→ **SET LOAD VOLTAGE**

<u>Some of the adaptive variables:</u>

1. Processor needs
2. Temperature variation
3. Board Impedances
4. Component variances
5. Module efficiency
6. IC power consumption



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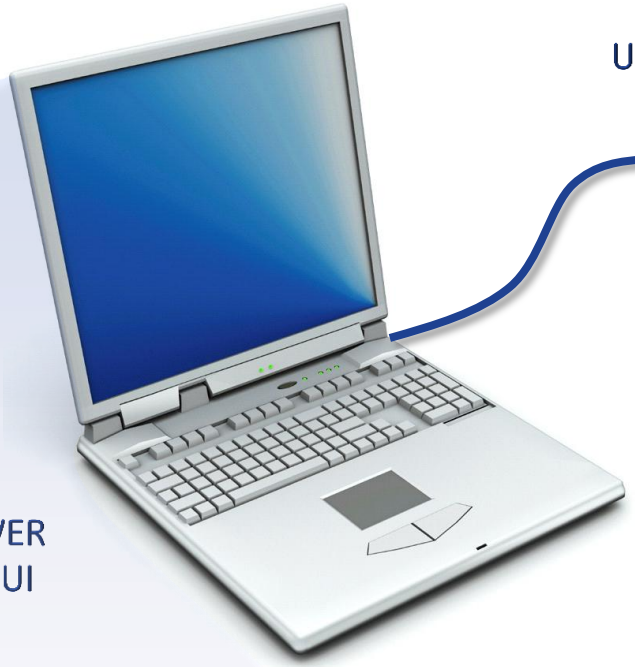
GE Digital Power Insight™ - DPI Kit

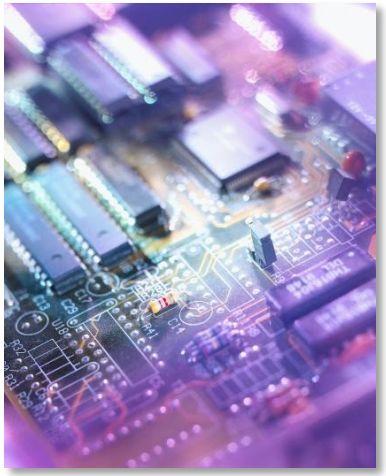


DIGITAL POWER INSIGHT™ GUI

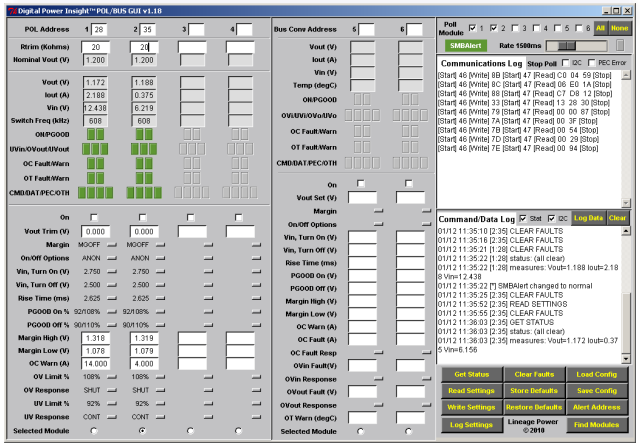
USB – I²C Interface

PMBus™ Daisy Chain

EVALUATION Board (representative)



Application Board



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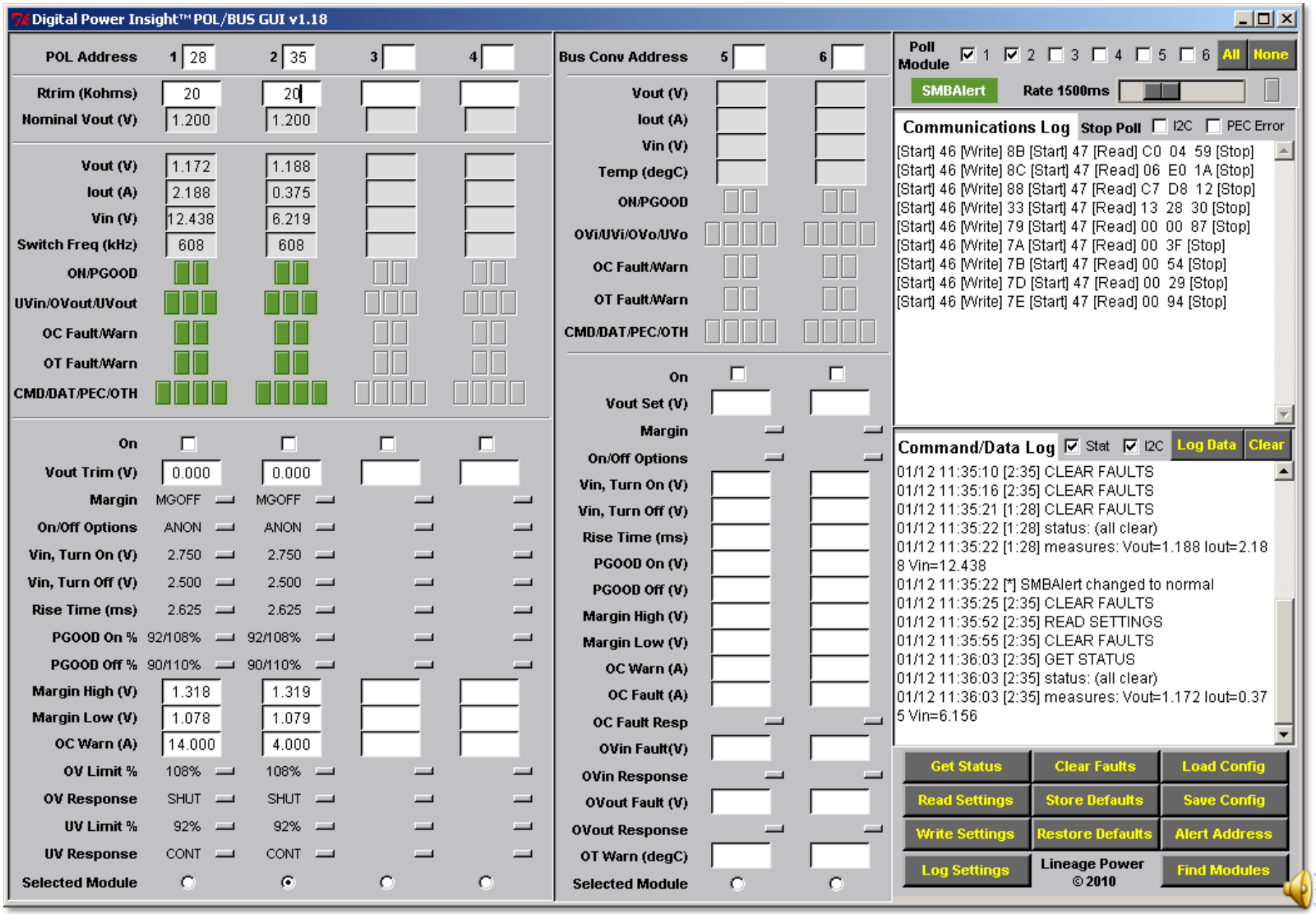
GE Digital Power Insight™ - Simple GUI



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Web Tools

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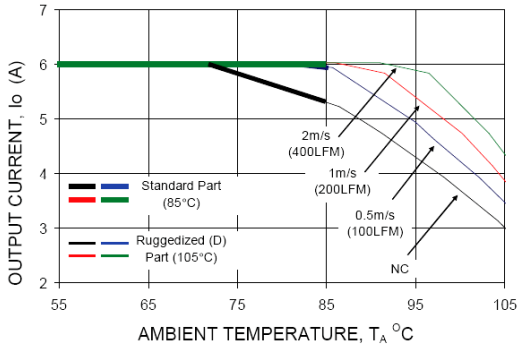
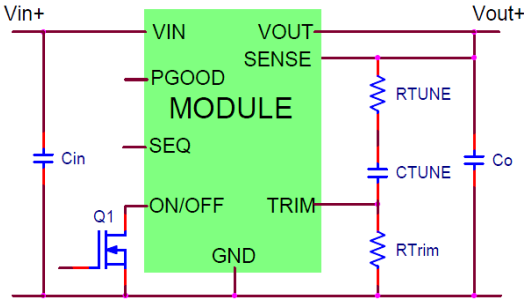
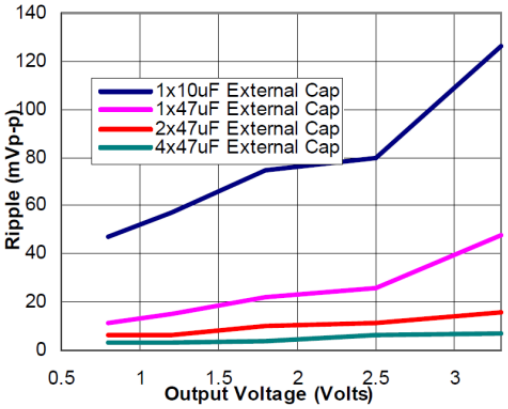
Rich Datasheet Content/Tools



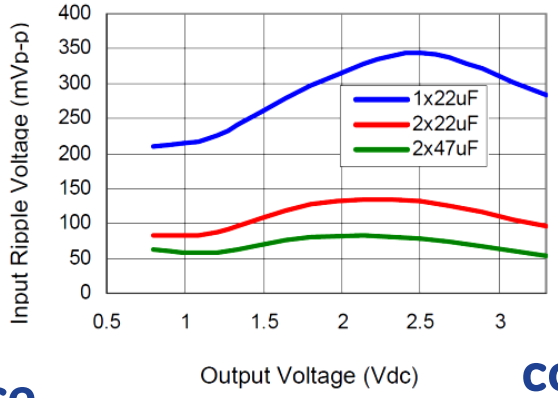
General schematic



Thermal de-rating guidelines & other characteristic curves

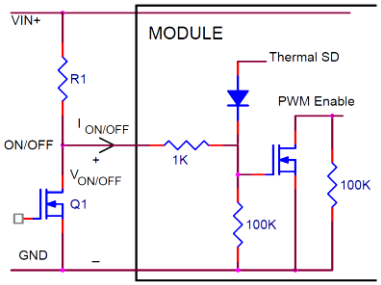


Input capacitance sizing



Noise test configurations

Output filtering



Remote On/Off scheme

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GE ENERGY USEFUL LINKS

GE Barracuda™ Isolated Bus Converter basic information and datasheets:
http://www.lineagepower.com/oem/barracuda.html

GE DPI Digital Power Insight™ GUI:
http://www.lineagepower.com/oem/digitalpowerinsight.html

GE DLynx™ POL basic information:
www.dlynx.info

GE DLynx™ POL datasheets:
www.lineagepower.com/oem/dlynx-series-smt.html

FPGA Selection Guides:
http://www.lineagepower.com/oem/pdf/FPGA_Selection_Guide.pdf

Application Notes & Tools:
http://www.lineagepower.com/oem/downloads.html

www.ge.com/powerelectronics

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