RADX Announces Catalyst-GPU PXIe/CPCIe Modules

Press / Sales Contact:
Ross Q. Smith
info@radxtech.com
+1 (619) 677-1849 x1

RADX Technologies, Inc.
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www.radxtech.com

RADX Catalyst-GPU Family of Low-Cost, COTS, PXIe/CPCIe Modules are the First to Bring Easy-to-Program, Multi-Teraflop, NVIDIA Quadro GPUs to Modular Test & Measurement and Electronic Warfare Markets for Advanced Graphics, DSP & ML/DL Inference AI Apps

File: RADX Announces Catalyst-GPU COTS PXIe Modules 30AUG2022 (26AUG2022 V1.6)

National Harbor, MD, USA, Tuesday, 30AUG2022, RADX® Technologies, Inc. ("RADX"), today at IEEE AUTOTESTCON 2022, announced the Catalyst-GPU™ Family of COTS, low-cost, PXIe/CPCIe GPU Modules. Catalyst-GPUs are the first COTS products that bring the cost-effective, easy-to-program, high-performance compute acceleration and advanced graphics capabilities of NVIDIA® Quadro® T600 and T1000 GPUs to the PXIe/CPCIe platform - the fastest growing platform for Modular Test & Measurement (T&M) and Electronic Warfare (EW) applications.
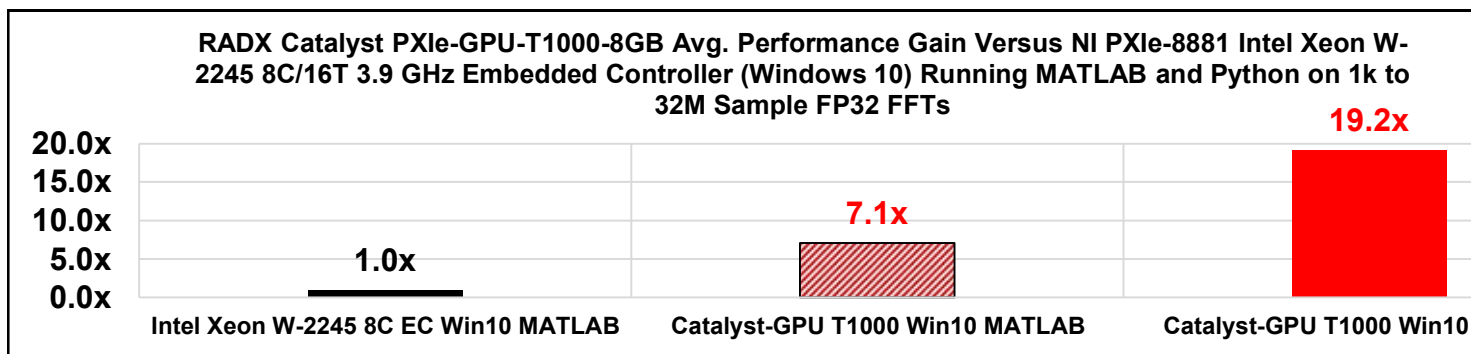
With comprehensive support for MATLAB™, Python, and C/C++, combined with support for virtually all popular computing frameworks, Catalyst-GPUs are easy-to-program for both Windows and Linux operating environments. Catalyst-GPUs feature multi-teraflop (TFLOP) level performance, which is ideal for accelerating Signal Processing applications. In addition, Catalyst-GPUs are ideal for Machine Learning (ML) and Deep Learning (DL) applications, which are becoming increasingly important for AI-based signal classification and geolocation, semiconductor and PCB testing, failure prediction, failure analysis, and other important missions.

Industry Leading Performance - Where Data is Acquired

The Catalyst-GPU T1000 model supports up to 2.5 FP32 TFLOPs. Until now, this level of compute acceleration has not been available in PXIe/CPCIe systems. ***With Catalyst-GPUs, users can now conduct fast and accurate analysis of acquired data directly in the PXIe/CPCIe systems where the data is acquired.***

For example, in an NI PXIe-1092 Chassis with an NI PXIe-8881 Embedded Controller (Intel Xeon W-2245 8C/16T 3.9 GHz) running Windows 10 and MATLAB, the Catalyst-GPU T1000 delivers an average performance gain of 7.1x over the Embedded Controller on FP32 FFTs ranging from 1k to 32M samples in length. Under Python, the Catalyst-GPU T1000 delivers an average performance gain of 19.2x.

RADX Catalyst PXIe-GPU-T1000-8GB Avg. Performance Gain Versus NI PXIe-8881 Intel Xeon W-2245 8C/16T 3.9 GHz Embedded Controller (Windows 10) Running MATLAB and Python on 1k to 32M Sample FP32 FFTs

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Intel Xeon W-2245 8C EC Win10 MATLAB	Catalyst-GPU T1000 Win10 MATLAB	Catalyst-GPU T1000 Win10
1.0x	7.1x	19.2x

On 1k to 32M Sample Length FP32 FFTs, RADX Catalyst-GPU T1000 Delivers an Average Performance Gain of 7.1x Under MATLAB and 19.2x Under Python over NI PXIe-8881 Xeon W-2245 Embedded Controllers

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First COTS, NVIDIA-Based PXIe/CPCIe GPUs for Advanced Graphics and Accelerating DSP & ML/DL Applications for Modular T&M and EW Markets
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On ML and DL AI Applications, the performance gains achievable by Catalyst-GPUs are also quite substantial. On the MATLAB FP32 Deep Learning Inference Benchmarks, the Catalyst-GPU T1000 delivers an average 18.4x performance gain over an Intel Xeon W-2245 8C/16T 3.9 GHz PXIe Embedded Controller.
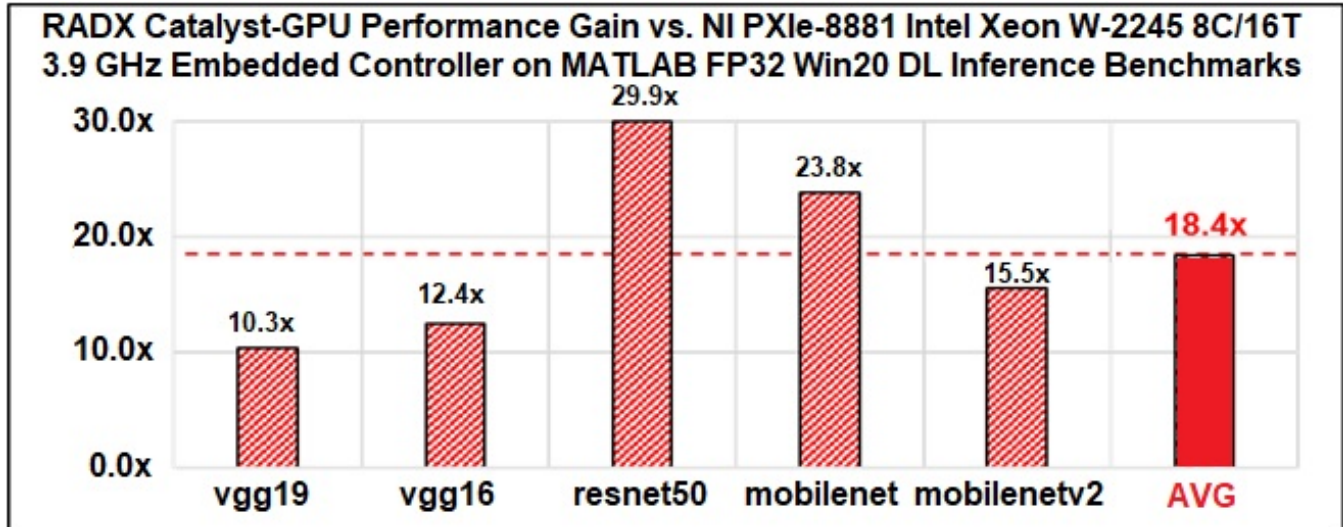

On MATLAB FP32 DL Inference Benchmarks, RADX Catalyst-GPU T1000 Delivers an Average Performance Gain of 18.4x over NI PXIe-8881 Xeon W-2245 Embedded Controllers

"A key use case for Catalyst-GPUs is accelerating MATLAB applications in a convenient and cost-effective manner," said Ross Q. Smith, RADX Co-founder and CEO. *"MATLAB is extremely popular with T&M and EW R&D users and MATLAB's intrinsic support for NVIDIA GPU acceleration means users can now speed up their signal processing and AI applications directly in their PXIe/CPCIe data acquisition systems - without having to transport gigabytes or terabytes of sensitive data to other analysis systems via ethernet or sneakernet, and without having to spend months porting their applications to other platforms."*

Improved Accuracy and RBW for Enhanced LPI Signal Processing

For signal processing applications, Catalyst-GPUs support arbitrary length FFT, PSD, Correlation, and other DSP algorithms. This capability enables accuracy and Resolution Bandwidths (RBWs) that are not practicable in non-GPU based systems. For example, in most FPGAs, the longest practical lengths for FFTs are typically 8k points (samples). However, in Catalyst-GPUs, 1M point and longer FFTs are practical, and, because of the GPU's TFLOP performance capabilities, 1M FFTs may be executed in real-time or near-real-time, depending on the application. With longer FFTs, a signal's true spectral composition becomes more apparent and actionable, and Low Probability of Intercept (LPI) signals become readily detectable and characterizable.
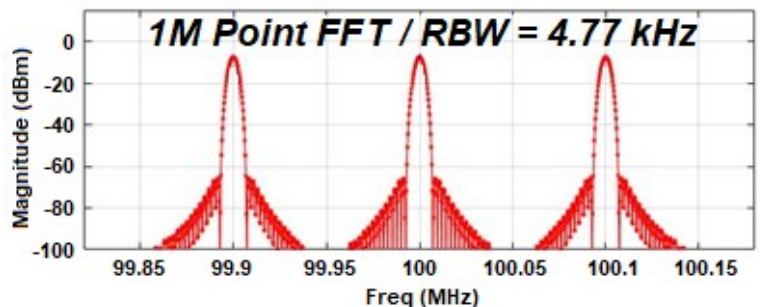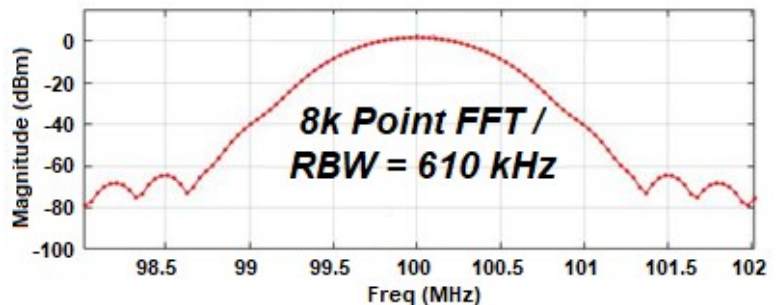
Catalyst-GPU Supports Arbitrary Length DSP Functions to Improve RBW and Accuracy for LPI Signal Detection, Analysis & Classification

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Easy-to-Program via MATLAB, Python and C/C++

One of the most important aspects of Catalyst-GPUs is their ease-of-programming, which stems from their underlying NVIDIA GPUs that support programming via MATLAB™, Python and C/C++, which enables compute acceleration available via NVIDIA CUDA® and OpenCL®. This ease-of-programming has resulted in NVIDIA GPUs becoming the most popular compute accelerators in the world today - with literally millions of engineers, application developers and computer scientists using NVIDIA GPUs to accelerate their applications. Catalyst-GPUs support both Windows and Linux operating environments. In addition, Catalyst-GPUs support popular AI and other frameworks, including MATLAB™, TensorFlow, PyTorch, RAPIDS AI and RAPIDS cuSignal, to name a few.

"NI LabVIEW has efficient methods for calling Python, C/C++ and MATLAB libraries, including RADX' own Transform-DSP libraries. This makes adding Catalyst-GPU acceleration to LabVIEW-based PXIe applications a snap," said Matt Dennie, Director of Engineering and Certified LabVIEW Architect at Acquired Data Solutions (ADS). "Using this approach, we were able to greatly improve the performance and accuracy of one of our LabVIEW signal processing apps in days, versus the weeks or months it would take with other methods."

About Catalyst-GPUs

Based on RADX' patent-pending Catalyst-X™ design, Catalyst-GPU models available today include NVIDIA Quadro T600 and T1000 GPUs; and RADX plans to offer Tech Insertion options in the future, based on COTS GPU availability. Catalyst-GPUs support PCIe Gen 3 x8 interfaces for optimal performance and 4 x miniDP outputs for multi-monitor applications with resolutions up to 4k. The Catalyst-GPU T600 supports 4GB of GDDR6 memory, up to 1.7 FP32 TFLOPs and a Total Graphics Power (TGP) of 38W – suitable for operation in all NI and 3rd-party PXIe chassis. The Catalyst-GPU T1000 supports 8GB of GDDR6 memory, up to 2.5 FP32 TFLOPs and a TGP of 50W, which is optimized for deployment in NI PXIe-1092 and NI PXIe-1095 Chassis, both of which support 58W/Slot or 82W/Slot and PCIe G3 x8 interfaces, which are ideal for optimum GPU performance. For more info on Trifecta-GPUs, please visit www.radxtech.com/products/trifecta-gpu.

Pricing and Availability

Catalyst-GPU T600 and T1000 models have list prices of $2,999 and $3,499, respectively. Lead time for single unit orders is typically 30 days, starting in Q422. Catalyst-GPUs are BAA and TAA Compliant, manufactured in the USA, and are available on GSA via TestMart (https://tinyurl.com/muk72crx).

About RADX

Founded in 2011, RADX Technologies, Inc., is a high-tech small business that develops COTS, High Performance Computing (HPC) hardware and software products that enable advanced signal processing, data acquisition, and ML/DL AI inference applications for SDR and PXIe/CPCIe platforms and T&M and EW markets. As an NI Alliance Silver Partner, RADX focuses on products and solutions, including the Trifecta and Catalyst Family of PXIe/CPCIe Modules and Transform-X™ Software Examples that complement the NI PXIe and USRP product lines. RADX products are BAA / TAA compliant and are available on GSA from TestMart at https://tinyurl.com/muk72crx. RADX is headquartered in California with development locations in UT, NM, and India. For more info on RADX, please visit www.radxtech.com, email info@radxtech.com or call +1 (619) 677-1849 x1.

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