

NVIDIA Comments on the Final Draft Version 4.0 ENERGY STAR Computer Specification 10/13/06

NVIDIA would like to take the opportunity to express that it has serious issues with the definitions of the actual categories resulting in the exclusion of many discrete graphics based computers meeting the tier 1 computer Energy Star specification. With 3D based operating systems and high definition video driving a higher demand for discrete graphics in 2007 and 2008 we are looking at many computers that will be designed to be more efficient than ever before with energy savings in mind but will not meet the computer Energy Star tier 1 specification as defined in the final draft.

- Desktop data set:

| Desktop | | | | | | | | | |
|------------|------------|---------|-----------|------------|---------|-----------|------------|---------|-----------|
| | Category A | | | Category B | | | Category C | | |
| | Total | Passing | % Passing | Qty | Passing | % Passing | Qty | Passing | % Passing |
| Integrated | 54 | 7 | 13% | 39 | 17 | 44% | 0 | 0 | - |
| Discrete | 16 | 1 | 6% | 9 | 2 | 22% | 14 | 3 | 21% |
| Total | 70 | 8 | 11% | 48 | 19 | 40% | 14 | 3 | 21% |

- Observations

- Out of the 39 desktop systems that have discrete graphics, only 6 pass based on the actual category definitions, $6/39 = 15\%$.
- **None** of the desktop systems have more than 256 MB of dedicated video memory.
- The ratio of passing discrete graphics desktop systems is **much** lower than the objective defined by EPA.
- The data set does not provide indication of the GPU type used in the desktop system. For example a 256MB desktop system can be based on 64-bit or 256-bit wide memory frame buffer meaning two very different desktop systems addressing different market segments. It is expected that a performance GPU aimed at a higher end market segment will consume more power in idle mode than a mainstream GPU.
- The upcoming operating systems are driving for larger amount of system memory, there will be very few desktop systems falling in Category A.
- Category B will therefore cover most of the future systems with 0 to 128MB of dedicated video memory, and having only one idle power level to cover both integrated and discrete graphics desktop systems does not seem to be a balanced approach and is intrinsically skewed to favor integrated graphics.
- Category C is also too wide as it covers desktop systems with 64-bit wide frame buffer at 256 MB up to 256-bit wide frame buffers.

- Recommendations

- NVIDIA believes that Category B needs a discrete graphics adder.
- NVIDIA believes that Category C needs a discrete graphics adder based mainly on frame buffer width. Frame buffer width gives a better indication of the market segment a desktop system is designed for.

- Notebook data set

| Notebook | | | | | | |
|------------|------------|---------|-----------|------------|---------|-----------|
| | Category A | | | Category B | | |
| | Total | Passing | % Passing | Qty | Passing | % Passing |
| Integrated | 58 | 18 | 31% | 9 | 1 | 11% |
| Discrete | 4 | 0 | 0% | 23 | 6 | 26% |
| Total | 62 | 18 | 29% | 32 | 7 | 22% |

- Observations

- Out of the 27 notebook systems that have discrete graphics, only 6 pass based on the actual category definitions, $6/27 = 22\%$.
- **Only one** notebook having more than 128 MB of dedicated video memory passes the category B definition.
- **None** of the notebooks having discrete graphics pass the category A definition.
- The ratio of passing discrete graphics notebook systems is lower than the objective defined by EPA.
- The data set does not provide indication of the GPU type used in the notebook. For example a 256MB notebook can be based on 64-bit or 256-bit wide meaning two very different notebooks addressing different market segments. It is expected that a performance GPU aimed at a higher end market segment will consume more power in idle mode than a mainstream GPU.
- The data set does not include the screen size. This information helps better understand the market segment targeted by a notebook.
- Notebooks are designed to conserve energy by nature and the definitions used in the tier 1 computer Energy Star specification are misrepresenting the benefits that notebooks using discrete graphics provide to the end-user. Making sure that a notebook has enabled the proper power management features is more important to save energy than looking strictly at an idle power number.

- Recommendations

- NVIDIA believes that Category A needs a discrete graphics adder.
- NVIDIA believes that Category B needs a discrete graphics adder based mainly on frame buffer width. Frame buffer width gives a better indication of the market segment a notebook is designed for.

NVIDIA believes that the data set used to come up with the category definitions and the category definitions resulting from this data set do not fairly represent the discrete graphics computer market and the benefits it provides to customers. We understand that EPA has looked into some category definition proposals before and decided not to make a change but this was based on a data set and rules that we believe did not adequately represent the discrete graphics market.

In summary, Discrete Graphics based systems should have an adder to the idle power specification numbers.