User Guide

BroadBand Accelerator VBA 3.0/E Cascade Topology Performance Estimator

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Preface Material

This Calculator Instructions Guide describes how to estimate performance of VBA 3.0/E in a Cascaded Topology.

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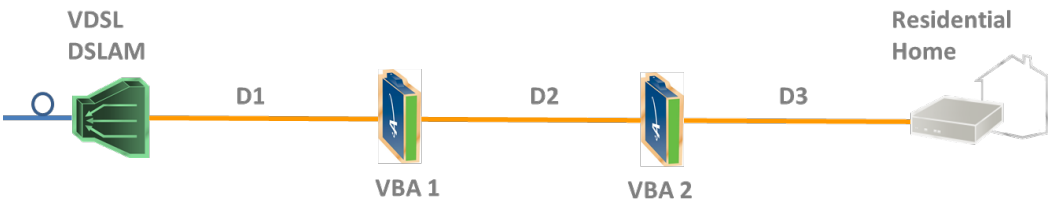
Contents

1 How to use

This "how to use" instructions are for VBA 3.0/E product line cascaded applications.
This calculator estimates the achievable performance for different placements between DSLAM and CPE of VBA 3.0 amplifiers placed one after the other, as shown on the figure below.

BBA 3.0 and 2.0 calculators for a single hop as well as "how to use" instruction documents are available on the Actelis website. Please note Credentials are required to access the documents and calculators.

2 Cascaded topology – Introduction



Legend and Notes:

Span – Distance from the DSLAM to the customer includes three parts:

- D1 = Distance between the DSLAM and the first VBA location (VBA 1).
  D2 = Distance between the first VBA location (VBA 1) and second VBA location (VBA 2)
- D3 = Distance between the second VBA location (VBA 2) and the customer CPE

VBAs

- VBA 1 = VBA card #1.
- VBA 2 = VBA card #2
- All VBA cards support 2 ports for bonded applications
- Each VBA would be installed in its own enclosure.

Powering – No POTS (VoIP can be supported)

- VBA 1 Can be line powered by "POTS" or 48V on the line
- VBA 2 Can be powered by express power, i.e. via a separate line
- Express power can be cascaded to feed the 2 VBAs.
- If Express power is used VBA 3.0E is required.

3 Performance Estimation

All loop distances are listed for 26 awg unless otherwise specified.
Optional conversion ratio listed in 3.3, could be used to convert segment length for mix gauge spans. SNR used for calculation is 6 dB

The table below shows performance expected for various placement of VBA 3.0/E in cascaded topology for loop spans of 4 to 7kft (26 awg) / 5 to 9 kft (24 awg). Other placements can be supported. These are only examples to allow initial planning.

*******Amplified performance may vary based on the DSLAM, CPE, cable plant and other services in the binder ******

3.1 Recommended placement planning rules

Below are Actelis recommendation for placement of the VBAs in the cascaded topology

- Total span should be >= 4000 ft (26 awg) / 5300 ft (24 awg)
- D1 should be >= 2000 ft (26 awg) / 2600 ft (24 awg)
- D1 >=D2
- D2 >= 1000 ft (26 awg) / 1300 ft (24 awg)
- D3 >= 1000 ft and 1500 ft for the longer spans (6000+ ft) (26 awg)
  1300 ft and 2000 ft for longer spans (8000+ ft) (24 awg)

3.2 Performance estimator per placement

The following tables indicate what would be the expected performance for various placements per loop for distances from 4 to 7 kft of 26 awg or for 5 to 9 of 24 awg.

When following the engineering rules above, performance variance per specific loop and various placement is expected to be small. Amplified performance detailed on Figure 1 below is therefore the average VBA rate achieved for DS and US for the various placements.

26awg				RAW		VBA		Gain with VBA	
LOOP	D1	D2	D3	DS	US	DS	US	DS	US
4000	2000	1000	1000	21.8	2.1	35	8	59%	290%
4500	2000	1000	1500						
4500	2000	1500	1000	19.8	1.1	34.0	8	72%	606%
4500	2500	1000	1000						
5000	2000	1000	2000						
5000	2000	1500	1500						
5000	2000	2000	1000	18.1	1.1	28.9	5.6	60%	408%
5000	2500	1000	1500						
5000	2500	1500	1000						
5000	3000	1000	1000						
5500	2000	1000	2500						
5500	2000	1500	2000						
5500	2000	2000	1500						
5500	2500	1000	2000						
5500	2500	1500	1500	15.5	1.1	25.4	4.5	64%	306%
5500	2500	2000	1000						
5500	3000	1000	1500						
5500	3000	1500	1000						
6000	2000	1000	3000						
6000	2000	1500	2500						
6000	2000	2000	2000						
6000	2500	1000	2500						
6000	2500	1500	2000	13.7	1.1	21.3	4.5	55%	309%
6000	2500	2000	1500						
6000	2500	2500	1000						
6000	3000	1000	2000						
6000	3000	1500	1500						
6000	3000	2000	1000						
6500	2000	1500	3000						
6500	2000	2000	2500						
6500	2500	1000	3000						
6500	2500	1500	2500						
6500	2500	2000	2000	12.0	1.1	20.4	3.3	71%	201%
6500	2500	2500	1500						
6500	3000	1000	2500						
6500	3000	1500	2000						
6500	3000	2000	1500						
6500	3000	2500	1000						
7000	2000	2000	3000						
7000	2500	1500	3000						
7000	2500	2000	2500						
7000	2500	2500	2000	11.3	1.1	19.6	1.8	73%	68%
7000	3000	1000	3000						
7000	3000	1500	2500						
7000	3000	2000	2000						
7000	3000	2500	1500						
7000	3000	3000	1000						

Table 1: ***Cascaded VBA 3.0 Performance Estimator – 26 awg***

24 awg				RAW		VBA		Gain with VBA	
LOOP	D1	D2	D3	DS	US	DS	US	DS	US
5333	2667	1333	1333	21.8	2.1	35	8	59%	290%
6000	2667	1333	2000						
6000	2667	2000	1333	19.8	1.1	34.0	8	72%	606%
6000	3333	1333	1333						
6667	2667	1333	2667						
6667	2667	2000	2000						
6667	2667	2667	1333	18.1	1.1	28.9	5.6	60%	408%
6667	3333	1333	2000						
6667	3333	2000	1333						
6667	4000	1333	1333						
7333	2667	1333	3333						
7333	2667	2000	2667						
7333	2667	2667	2000						
7333	3333	1333	2667						
7333	3333	2000	2000	15.5	1.1	25.4	4.5	64%	306%
7333	3333	2667	1333						
7333	4000	1333	2000						
7333	4000	2000	1333						
8000	2667	1333	4000						
8000	2667	2000	3333						
8000	2667	2667	2667						
8000	3333	1333	3333						
8000	3333	2000	2667	13.7	1.1	21.3	4.5	55%	309%
8000	3333	2667	2000						
8000	3333	3333	1333						
8000	4000	1333	2667						
8000	4000	2000	2000						
8000	4000	2667	1333						
8667	2667	2000	4000						
8667	2667	2667	3333						
8667	3333	1333	4000						
8667	3333	2000	3333						
8667	3333	2667	2667	12.0	1.1	20.4	3.3	71%	201%
8667	3333	3333	2000						
8667	4000	1333	3333						
8667	4000	2000	2667						
8667	4000	2667	2000						
8667	4000	3333	1333						
9333	2667	2667	4000						
9333	3333	2000	4000						
9333	3333	2667	3333						
9333	3333	3333	2667	11.3	1.1	19.6	1.8	73%	68%
9333	4000	1333	4000						
9333	4000	2000	3333						
9333	4000	2667	2667						
9333	4000	3333	2000						
9333	4000	4000	1333						

*Table 2:**Cascaded VBA 3.0 Performance Estimator – 24 awg***

3.3 Optional Conversion between gauges

3.3.1 24 awg to 26 awg

To convert a loop span from 24 awg to 26 awg , please multiply the loop length in 24 awg by 0.75. See a few examples below:

- A 6 kft/24 awg loop would be considered equivalent to 6*0.75= 4 kft of 26 awg
- A 2 kft/24 awg segment would be considered equivalent to 2*0.75= 1.5 kft of 26 awg

3.3.2 22 awg to 26 awg

To convert a loop span from 22 awg to 26 awg , please multiply the loop length in 22 awg by 0.6. See a few examples below:

- A 6 kft/22 awg loop would be considered equivalent to 6*0.6= 3.6 kft of 26 awg
- A 2 kft /22 awg segment would be considered equivalent to 2*0.6= 1.2 kft of 26 awg

4 Contacts

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Please contact your local sales representative, service representative or distributor directly for any help needed. For additional information concerning warranty, sales, service, repair, installation, documentation, training or distributor locations, use one of the following:

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