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Z-Axis Connector Company

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High Speed Connectors Email References

From: Brad Castrey To: sales@z-axiscc.com Date: Monday, March 19, 2001 11:20 AM Subject: z-axis connectors

Dear Gentleman,

My name is Brad Castrey and I'm a senior Engineer with XXXX Corp. at the LA Design Center in Torrance Ca. In my past employment I worked with some elastomeric connectors at X-band frequencies. Although I am new to company, I have already seen an application where connectors such as yours could cut our costs dramatically. I would like to contact a sales rep. or someone similar so that we could investigate using your connectors in our design.

The application would contain logic signals and a couple of IF frequencies that would be as high as 5 GHz. I would be interested in knowing performance of these connectors at these frequencies. Also mechanical design considerations, repeatability and cost information would be handy. Do you have information regarding crosstalk and isolation? Currently the plan here is to use a multistage deep-dive wire bond that would be both costly and difficult in high-rate production.

Since I am the only one in our company that has any experience at all (albeit limited) I would like to gain more information and possible samples that I can use to determine the possibility of putting these into our production units.

Thanks for your support, Brad Castrey

-----Original Message----- From: George Glatts To: brad.castrey
cc: fuzz.navagh Sent: 3/30/01 8:51 AM Subject: Connector test fixture

Hi Brad & Fuzz: We've received your sketches (thank-you) and held a preliminary manufacturing/engineering/sales review. Our plan is to deliver to Endive a drawing of our recommended connector and a slot design drawing within a week. Regarding your questions, yes the connector size is reasonable and it will have sharp (although soft) corners. Our slot drawing will show square corners with a note allowing an 0.030" max radius. Our review developed some questions. What are the planned dimensions for the contact pads of the upper and lower pc boards? This fixture should include a mechanical method to provide registration of these pads. (Pad 1 top needs to line up over Pad 1 bottom). Will the pads be gold plated for the fixture and for production?

Also, what is the scope of the planned testing? Will this be for signal integrity only, or will there be environmental tests also?

Best regards,
George Glatts
215 918 0955

George,
Thanks for the quick response. We look forward to receiving your design recommendations.

In answer to your questions, the pad sizes are TBD, but we would like to be able to have them on .050" centers. Probably .025" X .060". Yes, we will incorporate some guide pins or other method of aligning the boards. I haven't given a lot of thought to plating on the boards. The bottom board will not be gold plated. I think it will be solder-plated so we can get surface mount parts on it. The top board will be gold plated, at least on its top surface, so I expect it can also get gold on the backside at little or no extra charge.

The main focus of this testing will be signal integrity, at least up to 5GHz, and hopefully up to 18GHz. The unit which we plan on using these connectors does have environmental specs, so eventually we will be putting the connectors through these tests as well. They include mechanical shock of 10G, random vibration up to 0.2G peak, and temperatures from -33C to +75C.

-----Original Message-----
From: George Glatts
To: Brad Castrey
Sent: 4/4/01 1:53 PM
Subject: Re: z-axis connectors

Dear Mr. Castry:
By Fed X letter, sample connectors and a drawing of our recommended slot dimensions for your test carrier will be delivered to you tomorrow.
The tracking number is 8271 4324 5715. We hope they work as good as they look!

Best regards,
George Glatts

George,

Thanks for the connectors, we received them this morning. We are making the suggested modifications to our test fixture and hope to be able to test them in a week or so. I will share the results of our RF tests with you when we have finished.

As a side note, we met with our production facility in Diamond Springs on Tuesday and formally presented this z-axis connection approach. Currently Diamond Springs is also facing a similar design problem where these elastomers would be of great benefit so they are anxious for our results. We did find that our baseline approach of deep dive wire bonds are unacceptable in production and that we must have a new baseline immediately. I am very optimistic about these elastomers and hope that they prove themselves out in
Thanks again for your support,

Brad Castrey

To: george@z-axiscc.com
Sent: Friday, April 20, 2001 7:22 PM
Subject: tests

Hello George,
Just a quick update. We had some lag in fabricating our test fixture for the elastomers, but will finally be able to perform our tests late next week. Thanks again for your support, and we will be sending the results in about two weeks.

Brad Castrey

----- Original Message -----
From: "George Glatts" <
To: "Brad Castrey" <
Sent: Friday, April 20, 2001 10:53 PM
Subject: Re: tests

Hi Brad:
Your application was on my mind today and on the list to check back with next week. I appreciate your taking the time to provide the update. We forward to learning more about your results.
Best regards,
George

-----Original Message-----

From: George Glatts
Sent: Tuesday, May 15, 2001 9:25 AM
To: Brad Castrey
Subject: News on testing

Hi Brad:

We just finished a meeting with a microwave EE consultant and now we're concerned that your parts may have carbon black inside the silicone that affects high speed signals. Have you been able to start any testing?

Best regards,
George

To: George Glatts From: Brad Castrey Time: Tuesday, May 15, 2001 11:58AM

Hi George, We have had many problems with our own fixture and connectors, with limited time on this task I'm sorry that I haven't been able to progress farther sooner. But yes, last night I finally got one connector into test. The results were very encouraging at the lower frequencies (1 to 9 GHz). But at about 10 GHz the results got very odd. I'm still trying to determine if the behavior is associated with our fixture or not. Luckily, at this point we are more concerned with the performance from 1 to 5 GHz and any higher frequencies would be of interest only for future consideration. This week I will run some more detailed analysis on multiple devices in order to obtain a clearer prediction of their performance. I'm very encouraged by what I see and will be compiling a report which I will send you a copy of. I apologize for the time delay we have had in this evaluation.

Did your EE consultants have any predictions about how this carbon may impede the performance. I would expect that the carbon would act as an attenuator causing a more severe roll off at the higher frequencies. I have not seen this yet. The data shows very little loss at 1 GHz which increased with frequency as expected up to about 8 or 9 GHz. Then at 10 GHz the data rolls off as if the connector is a filter and stabilizes at about 10 dB up to about 20 GHz. This looks more like a resonance or perhaps an extra propagation mode which should have nothing to do with carbon in the connectors. Unfortunately I did not have enough insight into the device performance to build a fixture that would lend itself to a more detailed characterization of these devices before hand. I am going to be limited in my evaluation of the higher frequencies. However I don't want to present data that may not reflect the actual performance of these devices that may cause our designers to dismiss the connectors for higher frequency designs. I want to look at the effects of tuning, and would have liked a chance for evaluation with different signal to ground spacing. However time and money will be my final limitation here.

Thanks for your continued support in this task. I think that we will be able to put together a plan that will allow us to utilize this type of connection for a cost effective solution over wire bonds in our designs.

Brad Castrey
To: George Glatts
From Brad Castrey
Date: 6/13/01 10:13AM

George,

Sorry I've taken so long in evaluating these devices. Unfortunately I have no good news to report. I spent a some time evaluating the connectors up to 10 GHz. So far the results are encouraging but not as good as I expected from previous experience. I was able to determine that there are deficiencies in our test fixture that are degrading the evaluation data. We have pins that align the substrates with the test fixture that are too big and end up detaching the substrates on the fixture. Also, the substrate is too far away from the edge of the fixture causing the tab of the SMA launch to be damaged during assembly. All this results in data that I have very low confidence in. The good news about this is that the data I have been able to take so far can only improve with a properly designed test fixture.

I will be on vacation all next week, so it will be a while longer before I might get better data. I am attaching some data files that you can use at your descretion. I would caution you on presenting this data yourself however, because it is my opinion that I will be able to achieve better performance. (But with the test fixtures I currently am using this may not be the case.) When I complete my evaluation I will send a copy of the report to you. I am not presenting any of this current data myself.

Thanks for your patience and support,

Brad Castrey <<zaxis1.xls>>

To: George Glatts
From: Brad Castrey
Date: 03/20/02 07:58PM

George,

We will be closing this facility soon. Right now I believe that I'll be around until the end of April. This could change. I believe that the designs at XXXXX could benefit from the application of your product. Although, I don't know the best way for you to pursue this at XXXXX I am supplying you with a contact in Diamond Springs California.. Thanks for supporting this effort in the past,
and good luck in the future.

Brad Castrey

RF Performance vs Frequency

