Determining Parts

Ryan Laderach
04/02/11

Abstract:

This application note will look at the steps needed to determine the best parts for a design. Some key ideas are how to select the parts to best satisfy the customer needs and limitations on part selection. Also viewed is sampling of parts to decrease the cost of the project.

Key Terms:

Sampling, Customer Specifications, Limitations

Introduction:

When a designing a product for a customer you will need to choose parts. Choosing parts that are going to be used is normally a simple task. Part A can be used to fulfill a certain design issue; however, Part A may not fulfill all the design issues or may even bring in more issues. To choose the best parts for any design there needs to be multiple criteria used to determine which part will work the best. Having a budget and time constrictions can make choosing parts from a large selection difficult to do.

Objective:

The following will specify the steps needed to determine the ways to choose the parts to best fit into a project. It will be most useful when having to select one or two parts from a collection of possible parts that could range from a dozen to hundreds. This will include different guidelines and restrictions to be used during the design and ordering process, including input from the customer and finding out which parts will not work due to uncontrollable conditions.

Method:

Create a chart

To start out the process, there needs to be specifications for a project that need to be followed. These specifications can be many things such as the goal of this is to have a low power circuit that has to have high accuracy for its function. These specifications are given by the customer and need to be followed. The importance of the specifications will

determine the parts needed to best fit the goal of the design. The customer may also want the products to be limited to a company or a certain product the company makes. This can be extremely helpful in limiting the possible choices. Once all the specifications are in known then its best to make a chart will all the specifications and possible parts that could be used. Take for example; a customer wants a device to stop current when it reaches the magnitude of 1A. The specifications are that it needs to be low power, fast, accurate, small in size, and low cost, with each element having a higher importance than the next. The chart will look like Table 1.

Table 1: Chart to choose parts

Part	Power Consumption	Speed	Accuracy	Size	Cost

From here, possible selections can be added to the chart and any part that fits the function can be added. The specification columns can then be filled in and then used to determine which part will work with the best.

Determining Feasibility

There are many factors outside of what the customer wants that determine if a part is feasible for the design. The biggest limitation is if the part can work in the end product. Taking the example above, if a part is not capable of handling 1A of current, it will not work. By adding another column between the part and the first specification to the chart to state if a part works or why it does not work, you can leave the chance to relook at the part if it becomes feasible without having to research again. Having a budget or a short time frame from when the product is due can severely limit whether a part can be used. The best part might be too costly to work with the budget, or the part may have to be

ordered in quantities of hundreds, or the part is out of stock till after the end result is due. This is where the chart becomes useful in determine the next best thing. Some other limitations are having a product that cannot be tested. This could be from lack of equipment to test or the part being too small to test by conventional methods. This can then add to the problem of having a budget and a time frame so that it could be impossible for the part to work. After determining the feasibility of the parts from the chart, choosing a part should be simplified. The better a part is in an important specification; the higher the part will be in selection. By selecting a part that will work that meets the specifications the best you can help ensure customer satisfaction.

Sampling Parts

Some companies, such as Texas Instruments, have programs where you can sample from a wide selection of parts for free. For Texas Instruments sampling is very simple, when researching a part, there is a link for sample and buy which can be followed, as shown in Figure 1 below.

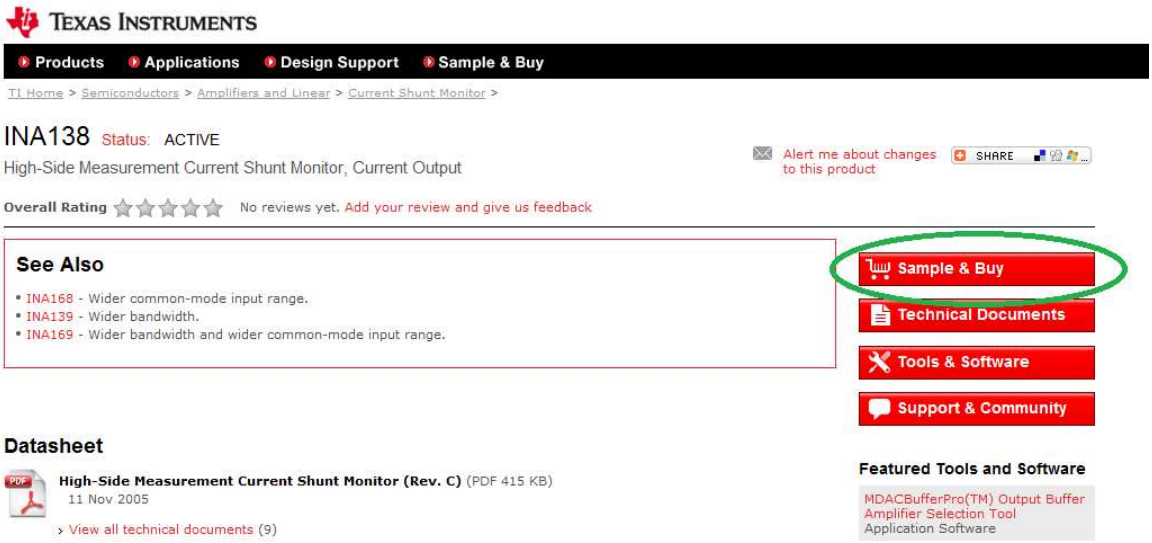

Figure 1: Sample & Buy Link

Then add to cart and create an account if you do not have one. Check the box in the free samples column and select get free samples, as shown in Figure 2. The samples can also be shipped with two day shipping or even shipped over night with both methods being free. Sampling can help with limiting the budget used on testing multiple parts and also be used in moments where a part is needed quickly. There are limitations to sampling, if a part is not in stock with the company it can not be sampled and for Texas Instruments one part can only have five samples. By determining which manufactures or suppliers will sample products, you can limit your research to those specific companies first and then broaden to other companies.

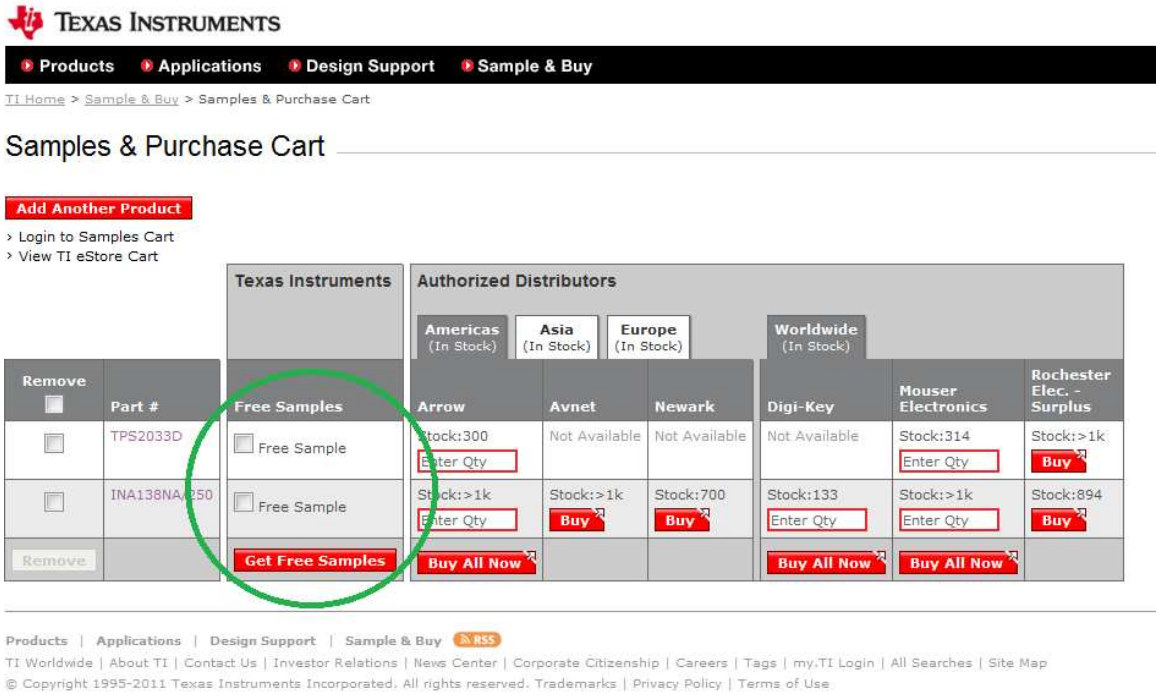

Figure 2: Selecting Free Samples in the Cart

Conclusion:

Having a large selection of parts to choose from in a design can be problematic. Discussed here are methods to determine the parts that will work the best without wasting

time or money. Sampling was also discussed as an alternative method for selecting parts to help with cost and time issues.

References:

Texas Instruments Website, Accessed 04/04/2011 (http://www.ti.com)