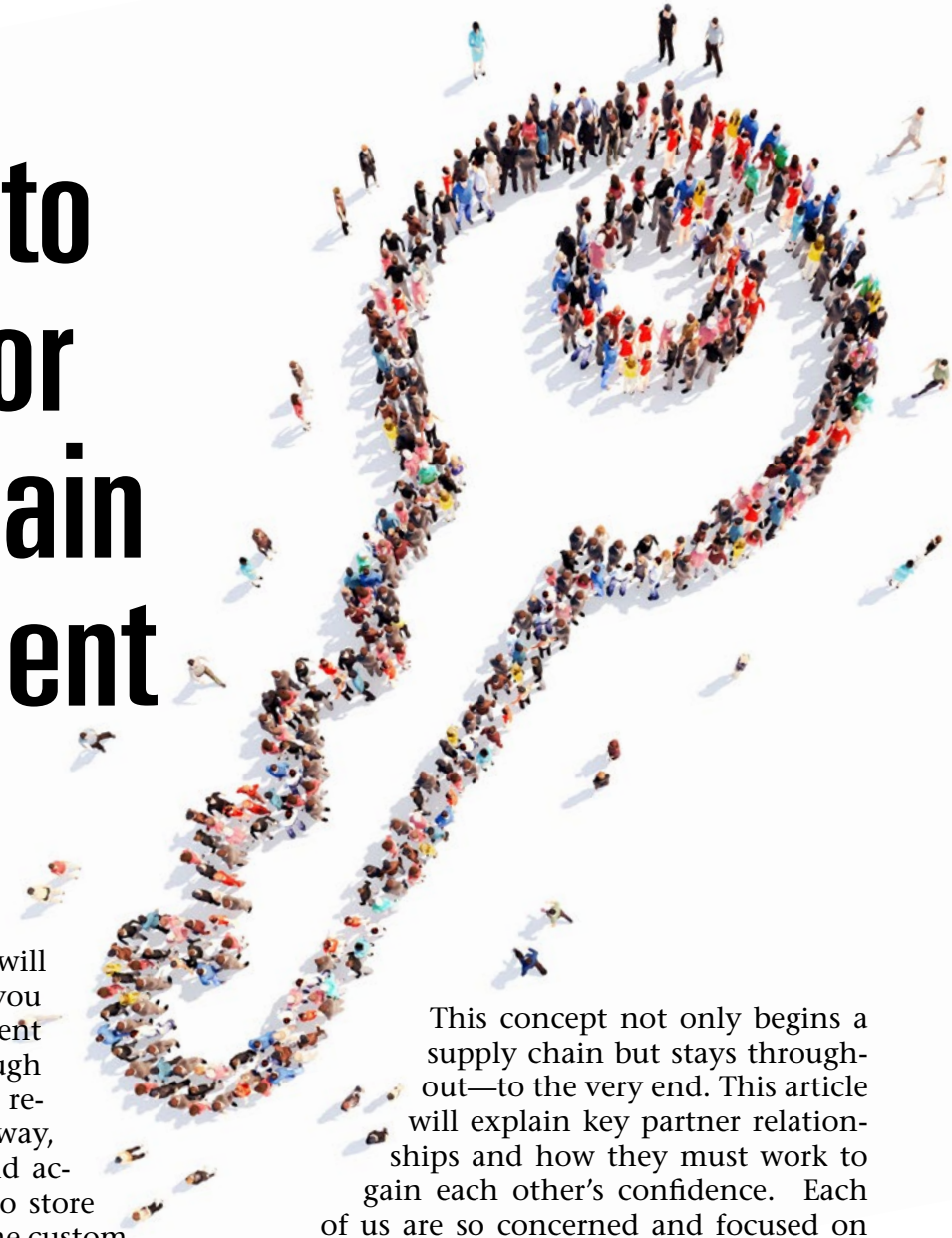
The Keys to Success for Supply Chain Management



by Fred Long
MATRIX ELECTRONICS

Introduction

By the end of this article, I will have provided a guideline to help you achieve supply chain management success. But first, let's walk through the key components and issues regarding this challenge. Along the way, we will offer some suggestions and action items mostly for customers to store in their memory banks. After all, the customer is the one we need to satisfy.

I recently spent some sales road time with a Midwest distributor of PCB supplies. During the two-hour drive to a customer's plant, we discussed our beginnings in the industry. My distributor companion told me that he started as a teenager and his father immediately put him on the road to deliver product directly to any customer that needed it—rush! He would set out and arrive at the customer's loading dock or receiving area to be met by a plant employee who was usually waiting for him. Today, many years later, he still visits the same area accounts in one capacity or another and everyone knows him by name and trusts him. This, quite simply, is customer service.

The phrase can be stated two ways: customer service or service the customer. Either way it is one of the life forces of a successful business. This concept not only begins a supply chain but stays throughout—to the very end. This article will explain key partner relationships and how they must work to gain each other's confidence. Each of us are so concerned and focused on our own needs that many times we forget to be aware of the goal and maybe even the other side's, shall we say, anxieties. The more we know about each other, the better.

Key Issue: The Product and the Supplier

When it comes to results, the most important requirement is the product. When a distributor is awarded a tier one product from a tier one supplier, 50% of the goal has been accomplished. The remaining 50% is now up to the distributor to minimize all the remaining obstacles along the supply chain path and get that product to the customer on time.

The first endeavor is to start with certainty. In my former manufacturing world, if we started to make a printed circuit board with a defective phototool or database it was the beginning of wasted costs and hard times ahead. In our

supply case let's start with a good product. Now the road is already paved.

A tier one supplier probably doesn't reach that status without a quality product. The product is everything and its quality dominates the vitality of the supply chain. Top quality ensures minimal manufacturing process intervention and everyone along the supply chain is motivated knowing that they have played a part in supplying a product that is universally respected and will most likely be a success for the customer.

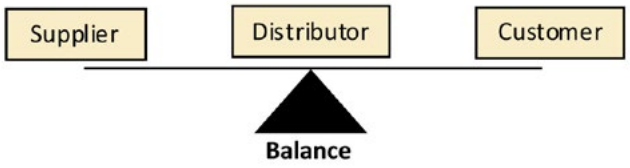
"Quality is more important than quantity. One home run is much better than two doubles." – Steve Jobs

Key Issue: The Distributor and his Capability

Assuming there is a distributor in the supply chain (and who can survive these days in this global economy without one?); he will have two key partner relationships: the supplier and the customer.

Let's focus on the distributor, who, in today's ever-increasingly complex global supply chain, is the glue that results in success—or lack thereof. With utmost skill, the distributor must equally balance the needs of both partners and at the same time, show them dedication, respect, and integrity.

This can be an emotional experience for all parties and the distributor, with guarded humility, is in the middle. He must be up to the task.



The increasing sophistication of printed circuits now requires several distributor skills and proficiencies that were not required in the past and with more and more products born in Asia, the list continues to grow.

Not the least of these capabilities is JIT delivery—a much exhausted term—but one that defines and separates the winners from the losers. In order to deal with a worst-case delivery scenario (a rush JIT) a tier one distributor must possess the following capabilities:

1. Financial stability
2. Local and regional warehousing (controlled environment)
3. Automated value-added services: cutting, paneling, tooling, and packaging
4. Strong local, national and international freight partnerships
5. Consignment offerings when required
6. EDI and B2B web services
7. ISO accreditation (proof and monitoring of responsibility)

Figure 1: The Symbol of quality planning and achievement.

Figure 2: Quality check confirming laminate T_g.

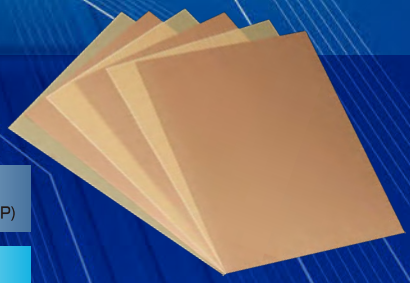
Panasonic

For ICT infrastructure equipment

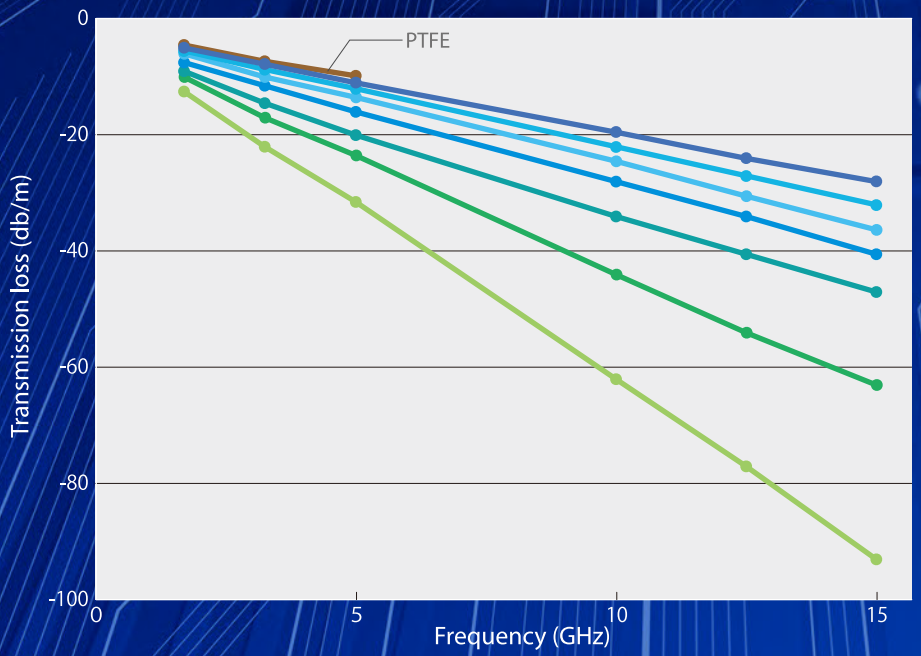
Low transmission loss

multi-layer circuit board materials

MEGTRON series

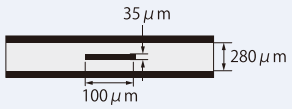


■ Frequency dependence of transmission loss



- MEGTRON7 R-5785(N)(H-VLP)
- MEGTRON6 R-5775(N)(H-VLP)
- MEGTRON6 R-5775(H-VLP)
- MEGTRON6 R-5775(RT)
- MEGTRON4S R-5725(S) / MEGTRON4 R-5725(RT)
- Halogen-free MEGTRON2 R-1577(RT)
- HiPERV R-1755V(RT)

● Evaluation sample



Core	0.13mm
Prepreg	0.06mm×2ply
Length	1m
Cu thickness	t=35 μm
Impedance	50Ω

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8. Ability to transport and store hazardous waste materials
9. Coordinated technical and training services from both the supplier and the distributor

To meet these most difficult delivery requirements, the distributor needs to be proactive and have as much product on the shelf as possible. When it comes to value-added, we call it staging. Materials and equipment need to be in place for quick and efficient completion. For example, in the case of laminate, panels need to be precut to size and be ready for last-minute drilling of tooling holes if required.

Delivery to the customer is the final step, aside from further technical support. Many times the truck driver can be your best salesman and ambassador. His work ethic and reliable delivery routine can be his most important asset.

Key Issue: The Customer's Needs

As long as I can remember, the customer has never been wrong. He wants what he wants and the only way to change his mind is to service the hell out of him. Only then, and if the time is right, will you possibly be able to offer something new and different, but you must know for sure it is the right thing to do. At some point, everyone is a customer and again, relationship and trust are fundamental to the experience.

Figure 3: Laminate slitting, panelling, and tooling.

Figure 4: Copper foil preparation.

Figure 5: Drill and router bits ready for immediate delivery.

Figure 6: Precut laminate panels.

"Give the lady what she wants"
- Marshall Field
(department store founder)

In the PCB manufacturing business there are over 70 different processes from start to finish, requiring many different supplies and most are essential to the final product. In addition, the expertise to manage each process requires many and varying levels of skill.

This complexity requires regular product training and updating, another opportunity for the distributor and the supplier to offer much needed advice.

Walking through a PCB manufacturing company is always interesting. From the engineering CAD room to Class 1000 clean rooms

Figure 7: Chemicals ready for immediate delivery.

to hot and stifling chemical areas, you will see a host of varying activities. There are few businesses in the world that can claim this many different processes and process complexity. It is truly a challenge and everyone needs to chip in to support the supply system.

And so it goes, the supply chain ends when the customer opens the package at his receiving door. Will it be a success and will there be peace?

The Answer to Supply Chain Management Success

And now the moment you've been waiting for: Nothing can replace the personal visit! This means that you must meet with your supply partners eyeball to eyeball.

Here is where balance comes back into play, and you may have heard hints of this along the way. How can you really become successful if you don't get to know your business partners, who in time, and if all goes well, may become your business friends? This goes for everyone: the supplier, the distributor, and the customer.

I remember a visit to a supplier in China. We drove for three hours to a remote plant—another mind-bending cultural story for another day. We met with the manufacturing people, saw the product through its processes, and watched the packaging procedures.

Prior to leaving, we left a host of ideas, requests, and some demands to make sure we received the right product in faraway America. Both sides worked diligently to make it happen. When you meet people in another land and you can't even say hello, but you see the body language and the desire to help, you can't

resist reciprocating. The unique experience of meeting an Asian supplier in a land that was completely foreign to me worked, because we developed mutual respect and trust. Today, the business is still thriving due to those original positive communications. Overcoming those unbelievable challenges will forever be remembered as a positive, true life experience.

In my view, if we had tried to do business without visiting the Asian supply source, it would have resulted in a failure.

As a distributor, when asked, I am always eager to visit a supplier's plant to see how the product is made; visiting the customer puts everything into its proper perspective. Knowing the product and understanding the customer's need is very important to make the supply chain successful. You will then be able to make educated decisions when issues arise.

Get to know your partners. No two people are alike and one of our life challenges is to understand each other so we can all meet our expectations. **PCB**

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Graphene Flexes its Electronic Muscles

Flexing graphene may be the most basic way to control its electrical properties, according to calculations by theoretical physicists at Rice University and in Russia. The Rice lab of Boris Yakobson, in collaboration with researchers in Moscow, found the effect is pronounced and predictable in nanocones and should apply equally to other forms of graphene.

Researchers discovered it may be possible to access what they call an electronic flexoelectric effect in which the electronic properties of a sheet of graphene can be manipulated simply by twisting.

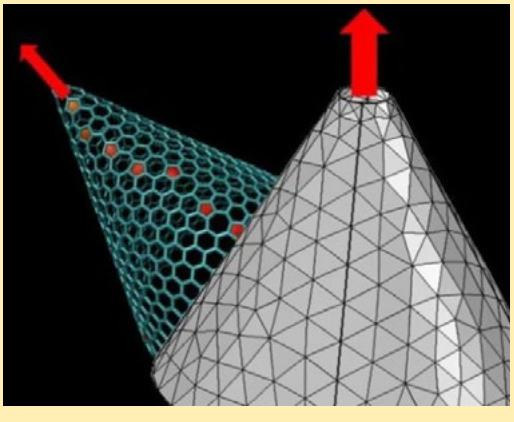
The work will be of interest to those considering graphene elements in flexible touchscreens or memories that store bits by controlling electric dipole moments of carbon atoms, the researchers said.

Perfect grapheme—an atom-thick sheet of carbon—is a conductor, as its atoms' electrical charges balance each other out across the plane. But curvature in graphene compresses the electron clouds of the bonds on the concave side and stretches them on the convex side, thus altering their electric dipole moments, the characteristic that controls how polarized atoms interact with external electric fields.

The researchers discovered they could calculate the flexoelectric effect of graphene rolled into a cone of any size and length.

The researchers used density functional theory to compute dipole moments for individual atoms in a graphene lattice and then figure out their cumulative effect.

"While the dipole moment is zero for flat graphene or cylindrical nanotubes, in between there is a family of cones, actually produced in laboratories, whose dipole moments are significant and scale linearly with cone length," Yakobson said.



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