



## Letter to Our Customers

April 11, 2018

Dear Valued Customer,

As you are likely aware, there is a worldwide shortage of commonly used multi-layer ceramic chip capacitors (MLCC). As a global distributor of the leading capacitor brands, TTI is close to the situation and we offer the following perspective, assurance where possible and suggestions for the future.

There are a number of contributors to the shortage and we believe once you understand the scenario you will likely agree with our team of specialists that the conditions of this market are different than historical shortages and allocations of components – the most critical difference being that this time of constraint will last longer.

**The underlying cause is economic and largely pertains to case size 0402 and up, both low and high CVs, though case size 0201 in some values are included.**

Large case size components have been subject to cost-down pressure for so long that meaningful profit for the manufacturer has been squeezed out. Statistical evidence proves that since the market recovery after the 2007-08 recession the production of MLCCs doubled but the value of the market remained flat, that is until last year when market value increased only slightly over units. We have reached a point that some manufacturers are concentrating their future activity on smaller case sizes and less commoditized technologies of the market like high voltage and flexible termination, with a particular focus on high-reliability end-markets such as automotive and medical. So while manufacturers are adding capacity, it's generally not for commercial commodity parts – making this market condition even more difficult to navigate.

This is not to say that there is no incremental capacity in the works. As pricing reacts to increased demand some capacity is being added for commercial parts but the turnaround time is longer than normal. One holdup is the availability of new equipment that comes from a small group of equipment makers whose backlogs have also grown with the economy.

In early 2017 our product specialists began preparing for this market by aggressively expanding our inventory position on MLCCs with the goal of shielding our customers from expanding lead times and price increases. To further ensure we could support existing customers, we decided to decline orders from new customers for constrained and allocated parts (this situation extends to other dielectrics, resistors, inductors and power semis) – our team intuited that this situation could extend well into 2018.

Now that we are in 2018 conditions are even worse than we anticipated – our product allocation from suppliers has been based on previous year's consumption so even with our decision to reserve our inventory for existing customers, we will not have enough to cover the increases you are experiencing in your businesses. It is not unusual right now to see true demand increases (not artificial as a result of hedging) from customers of 30% or more year on year.

The supply chain is further complicated by the fact that there are a number of buy-resell agreements among MLCC manufacturers and we are already seeing unexpected shortages as a result. As these come into play there may be circumstances where we will be forced to advise our customers that the product is simply not available and the only recourse is to identify and approve an alternate component.

### **So what are we doing?**

At TTI we are actively determining when we will lose inventory coverage, customer by customer, part by part, so that we can give each of our existing customers as much notice as possible. At the same time, we are presenting each customer options in the form of alternate suppliers, alternate part numbers that are perhaps higher performing but still drop-in replacements, and even alternate technologies. During the tantalum shortages in the early 2000s, many customers switched to MLCCs. Reversing that could provide near-term relief, especially as it pertains to polymer capacitors as a backup for some high CV ceramics.

### **The most important thing you can do is evaluate alternate part types and suppliers for both low and high CV MLCCs.**

We understand the time and cost related to this effort, especially on existing products, but we urge you to begin as it may be your only path to ensuring your production lines continue to run.

The intent of this letter is not to cause panic but rather to increase awareness. TTI is as well or better positioned as any in the industry to support you through these shortages and as a supply chain customer of TTI, you will always be our priority. Our intent is to minimize the impact that any of these parts that we supply may have on you and we believe that starts with information and communication.