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Challenges Navigating the Electronic Component Supply Chain

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Companies are discovering that up to date sources for component information are becoming more and more critical

This whitepaper details component supply chain challenges involving parts on allocation, tariffs, compliance regulations and obsolescence

Component management and procurement professionals are experiencing a new set of challenges. When acquiring many types of electronic components and their related information used in company products, the goal is to ensure that expected cost profiles are met and product delivery schedules are not delayed. Global companies are also challenged to provide updated component compliance information which is critical to ensure products can be proven to be either EU or China RoHS compliant. Updated component reporting requirements for EU REACH legislation and California Proposition 65 are also required for REACH SVHC reporting and to assess chemical exposure risks in California for proper product labeling. Add to this export control reporting, DRC Conflict mineral reporting and standard component obsolescence challenges and company employees are trying to weather the “Perfect Storm” of component challenges.

Perhaps the biggest single challenge for procurement organizations over the past year and a half are parts going on allocation, which in simple terms means supply of components are not keeping pace with global demand. This circumstance forces component lead times to become extended for critical components used in products. Distributors are reacting by establishing monthly volume limits for key customers often limiting quantities purchased to last year’s volumes. Inventory quantities of parts on allocation are becoming highly valuable in some cases, seeing a 5X price increase for immediate delivery. All these developments are turning into procurement headaches as it becomes difficult to meet production schedules with desired margins and in some cases, limits a company’s growth. With part shortages expected to continue into 2020, careful production planning, securing second sources and investigating more available FFF or drop-in cross references will be critical in the months ahead. IHS Markit’s BOM Intelligence singled out capacitors (MLCCs and special capacitors), resistors (fixed and network), transistors (bipolar transistors and power FETs), diodes (Zener and Rectifier), inductors and relays as commodities with parts on allocation, some example part numbers are listed below (next page).

“The supply of components fails to keep pace with global demand. This circumstances forces lead times to become extended”.

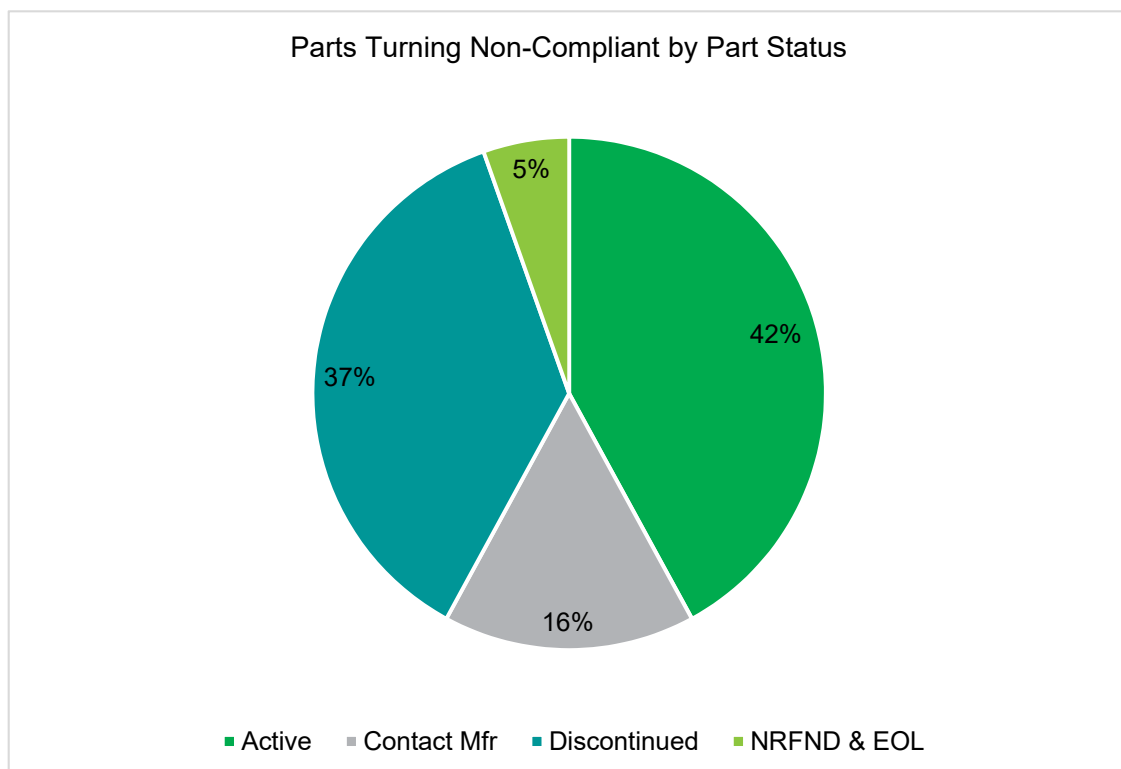
“Besides allocation issues, the need for component information such as tariffs, Country of Origin and final assembly location became vital to understand”.

Part Category / Description	Part Number	Manufacturer	Average Lead Time (Weeks)
Multilayer Ceramic Chip Capacitors	HSZ101KAQBRAKR	Vishay	78
Multilayer Ceramic Chip Capacitors	C0805C470J5GACAUTO	Kemet	47
Rectifier Diodes	SS15-M3/5AT	Vishay	49
Transient Suppressors	TPC20CAHM3/I	Vishay	64
Fixed Inductor	IMC1210ER470J	Vishay	70
Automotive Inductor	B82450A1084C000	TDK	53
Line Transceiver	ST3485EIDT	ST Micro	64
Thin Film Resistors	MCU08050D2501BP500	Vishay	82
Small Signal Bipolar Transistors	QX2TR	Rohm	56

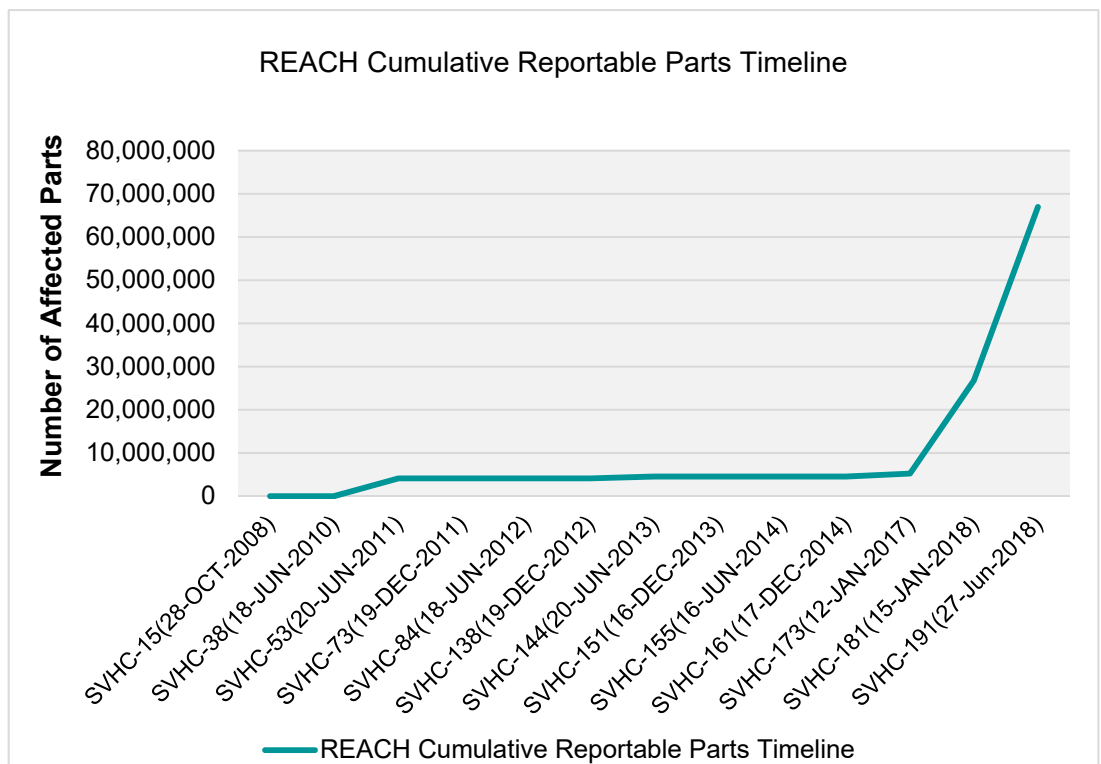
Adding to allocation issues, this summer, procurement has had to grapple with exposure to US tariffs. In March of 2018, the Trump administration announced intentions to apply tariffs on imported and exported goods. Tariffs were targeted primarily on Chinese imports to address a \$375 billion-dollar trade imbalance and to penalize countries for unfair trade practices. Tariffs were imposed in three rounds in July, August and September of 2018. These tariff targeted \$250 billion dollars of goods adding a 10%-25% duty to over 800 electronic products and over 6,000 total products identified by the product Harmonized Tariff Schedule codes (HTS codes). Here again, the need for component information became vital to understand the components and products affected and the Country of Origin or final assembly location. Many manufacturers with Chinese manufacturing facilities have already increased component prices to cover tariff costs. IHS Markit has observed tariff exposure to many component part types including:

- Resistors
- Capacitors
- Inductors
- Circuit Protection Devices
- Switches
- Connectors
- Terminals and Terminal Blocks
- Diodes
- Transistors
- Trigger Devices
- Optoelectronics
- Crystals & Resonators
- Oscillators
- Batteries
- Memory Devices
- Microprocessors & Microcontrollers
- Amplifiers
- ASICs (application specific)

Evolving environmental concerns are also impacting companies and their need for current compliance information. The EU ROHS, or the Restriction on Hazardous Substances, is legislation that had tremendous impact on the electronic component industry in 2006 by banning six harmful substances in concentrations above threshold limits at the homogeneous or sub-part level in components. This created an unprecedented shake up the industry as manufacturers, distributors, and OEMs were trying to navigate all the new part numbers and information needed to ensure RoHS Compliance. In July of 2019, an amended version of the RoHS Recast legislation will ban four additional substances. For the unprepared, products that were RoHS Compliant can overnight become Non-Compliant and therefore be banned for sale in the EU. These newly banned substances are used primarily as plasticizers to improve flexibility and durability of cables and are not expected to have anything close to the impact of the initial version of RoHS. Still, IHS Markit estimates that 10,000 component part numbers are impacted. Companies will need to ensure parts that are expected to become non-RoHS compliant are converted to compliant alternates in the first half of 2019. In fact, most of the parts that will become non-complaint remain available from manufacturers as noted in the pie chart below:



Another environmental regulation adding complexity for compliance managers is the EU REACH legislation. REACH, or the Registration, Evaluation and Authorization of Chemicals, requires companies to report on products containing SVHCs, or Substances of Very High Concern. SVHCs are substances that are known carcinogens, cause reproductive health issues, or damage the environment. REACH is an evolving requirement as SVHCs are added to the reportable substance candidate list twice per year. Initially, in 2008 and for the next few years, REACH was viewed as not having any significant impact to the electronic component industry. However, as more SVHCs became added to the reportable list companies were forced to track substances if they wanted to sell products into the EU. With the addition of 2-Pyrrolidinone, 1-methyl-, CAS# 872-50-4 on June 20, 2011, over 4 million components became impacted from a single manufacturer. The largest impact included the addition of lead (Pb) CAS#7439-92-1 on June 27, 2018. This single addition has added complexity where RoHS compliant parts due to exemption now required REACH reporting. Today, the IHS Markit component database identifies over 58 million active parts that require REACH reporting based on 39 different SVHCs found above threshold levels in components. From the chart below, major jumps in affected part counts relative to REACH SVHCs are listed along with timings.



Note: Candidate List dates without any affected parts are omitted.

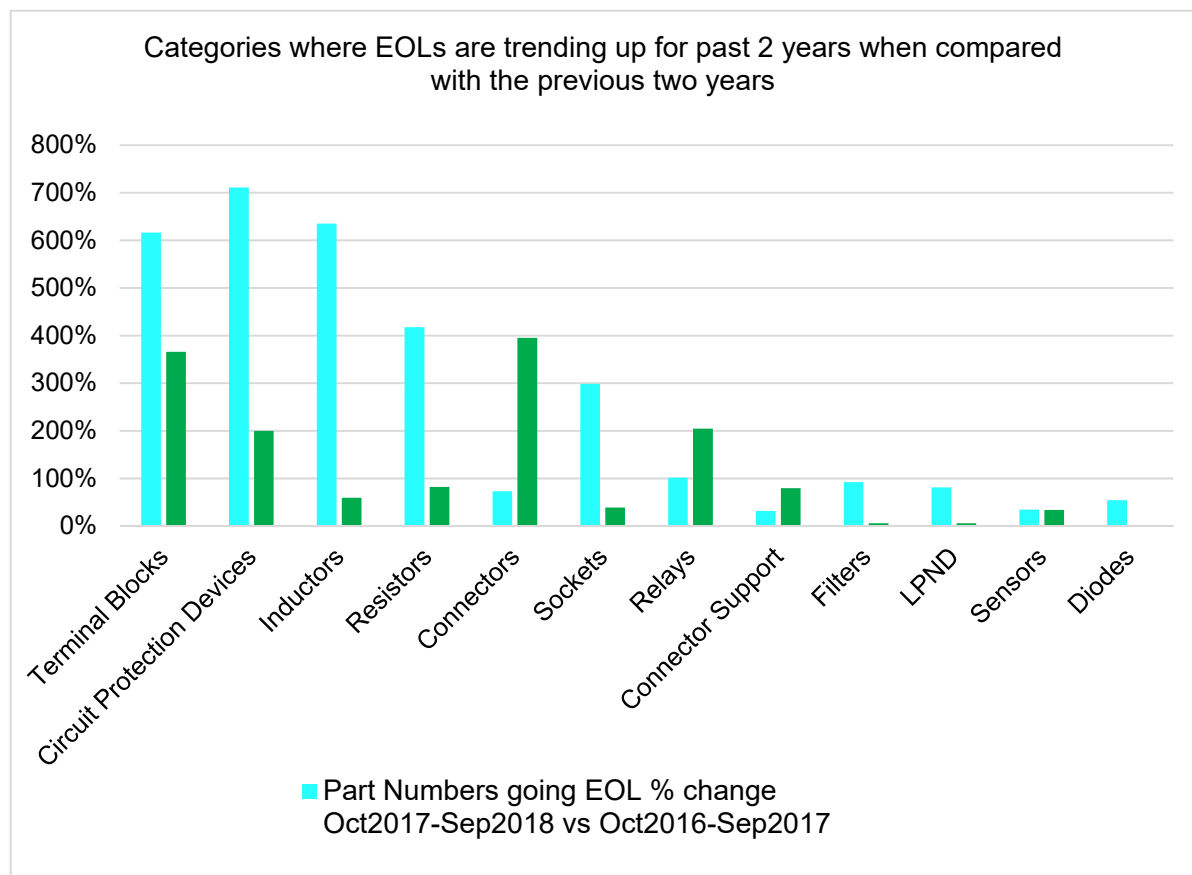
What other compliance and reporting requirements lie ahead? Ask yourself, how much time will it take to stay ahead of new developments and assess potential impacts. Regional challenges will continue to arise; some examples include new labeling requirements for California Proposition 65 that went into force at the end of August. Prop65 requires companies to assess exposure risk to 991 substances that are known carcinogens, harmful to reproductive health or add toxicity to water supplies. Based on exposure risk, labels need to be added to products where risks exist so that consumers can be well informed. IHS Markit has identified over 115 million component part numbers with and without Prop65 substances identified. New regulations such as the UAE RoHS have come into force. Will China follow suit with the EU and update China RoHS adding banned substances?

To complicate matters, reporting requirements for companies today delve into raw materials in their supply chains. The US legislation, the Dodd-Frank act, restricts the processing of ore containing Gold, Tin, Tantalum and Tungsten to a list of approved smelters, identified via Conflict Mineral Report Templates available from component manufacturers. This legislation was enacted to reduce forced labor, child labor and money getting funneled to criminal groups in the Democratic Republic of the Congo.

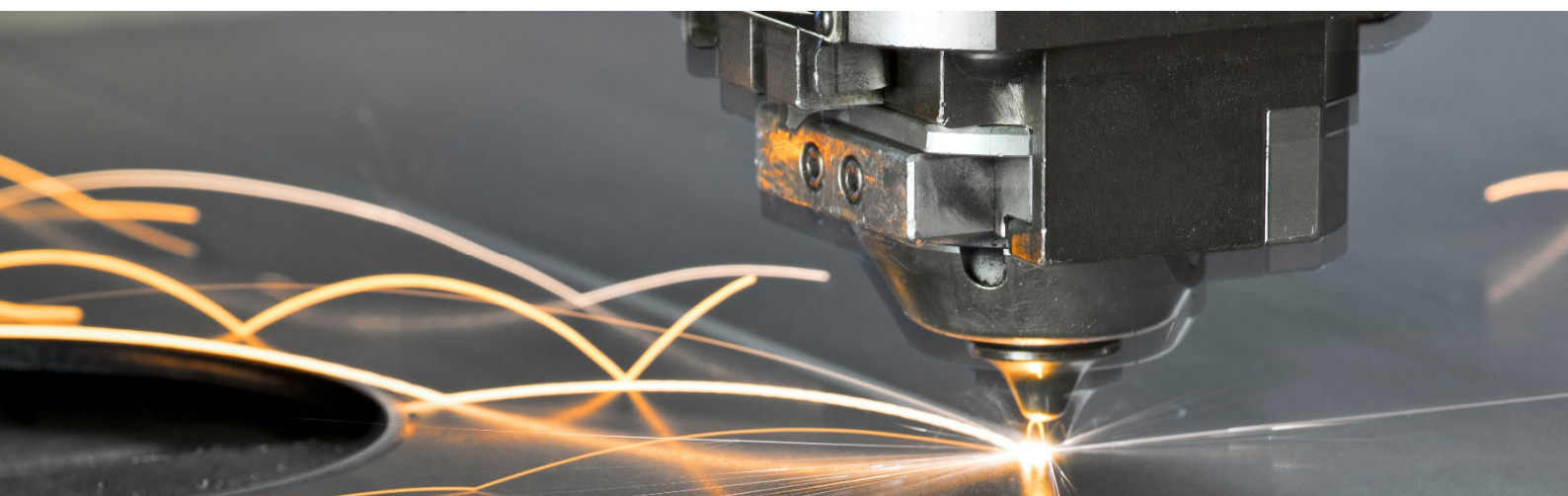
In the future this type of legislation may be expanded. There are discussions underway to broaden this type of legislation to include other parts of the world where human trafficking and human rights abuses exist. Additional legislation in this area will require companies to know much more about their entire supply chain from raw materials to finished goods.

If managing this storm of component market information needs sound manageable, think about the addition of the traditional component obsolescence challenges and consequences of production down time or redesign requirements due to critical part discontinuances. IHS Markit has seen a significant rise in EOL activity for the past two years for both EOL documents and affected part numbers as manufacturers juggle manufacturing capacity to focus on high demand and high margin parts. This has created some interesting trends, discontinuing older technology parts in some areas as shown below (next page):

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In conclusion, the challenges for companies to manage their component supply chain, monitor component obsolescence, keep costs low, and meet production schedules have never been worse. All this is happening in conjunction with company employees trying to work together to ensure they have the information needed to maintain compliance and reporting requirements. All these information needs have reached an unprecedented level; this “Perfect Storm” will swamp the unprepared. For companies that are prepared, they will have better chances to gain market share and ensure uninterrupted global sales.



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