

Market trends and analysis report

- \ MLCC and Chip Resistors continue to be constrained and on allocation.
- \ Tantalums , Aluminum caps, SMD 3-10 mm constrained.
- \ Rectifiers rapidly increasing and product availability constrained.
- \ TVS & ESD Diodes lead time increasing and constrained.
- \ Current sensors, metal strip sensing, wire wound sensing, both constrained. ST Micro reports 26 week lead times on up.
- \ Inductors IHLP series 52 plus weeks constrained especially for the automotive parts .
- \ Passives have historically been the low cost components so there isn't any incentive for component Manufacturers to add capacity instead they are reaping the benefits of improved profit margins.
- \ AVX is slowly reducing production capacity and eventually expected to stop producing general purpose ceramic capacitors.
- \ Wafer stock is starting to decrease and is creating issues on a lot of active components

**Most Manufacturers are focusing on the automotive industry.
No sign of relief this year 2018.**



Main causes of the shortage crisis

- \ **Factors driving the high volume demand are the smartphones, automotive/EV industry, and IoT.**
- \ While visiting one particular manufacturer of MLCC's (multi-layer ceramic chip capacitors), we were advised that a regular smart phone can use up to 800+ MLCC 's ,and an iPhone 8 up can use 1200+ MLCC's per phone keeping up with all the new features. Mobile operating systems, HD display pixel camera resolution, etc. Imagine this is just the smartphone industry, we have IoT (internet of things) and Automotive industries especially Electric Vehicles, **all competing for the same parts.** Huge increase in electronic components for the **whole world.**
- \ The manufacturers of these devices are choosing to be more selective in their product mix, shifting their capacities to leading-edge technologies. **We see very minimal capacity increases by the manufacturers on these allocated products.** A lot of the manufacturers are moving away from the manufacturing of the large case sizes.
- \ Many suppliers are implementing processes for allocation of standard electronic components.
- \ The way companies are dealing with allocating supplies is on a customer basis, using previous years demand levels, Servicing only their current customers.

LEADTIMES & PRICING Analysis

- \ **Passives** - Increased lead time and prices. Major driver is the Automotive EV vehicles, and the mobile markets. Continued constraints and allocation.
- \ **MLCC** - Multilayer ceramic capacitors are constrained and on allocation. A number of major lines from Vishay, AVX, Murata, Panasonic, KOA, Kemet, and Rohm, have been on allocation for some time now. Yageo is very constrained and in some cases rejecting orders. We expect this to only get worse through 2018.
- \ **Chip Resistors** - Lead times 50 plus weeks constrained and on allocation Vishay has been on allocation for some time, a number of other manufacturers are on allocation will continue through the end of this year at least.
- \ **Discrete** - Majority of the Discrete devices increased lead time and pricing. Especially your TVS and esd diodes.
- \ **Mosfet's** - have been increasing driven by tablet and smart phone market 15-20 wks. Legacy IR series Mosfets have been increasing following acquisition by Infineon with IRFHM830XXX, IRFHM831XXX, IRLHM620XXX among the affected product
- \ **Sensors** - Melexis, Infineon, ST Micro, On Semi 16-40 weeks. ST advises automotive components lead time is stretching.
- \ **Relays** - Zettler, Honfa, Panasonic some series constrained, all others appear to be stable
- \ **Filters and Inductors** - Lead times increasing 36+ weeks.
- \ **Memory DRAM** - on allocation, other parts constrained: NAND FLASH- constrained and price increasing
- \ **Microchip** - Constrained .

Strategies for Increased lead times

The best way to prepare for shortages :

- \ Keep lead times up to date
- \ Keep your customers informed
- \ Extended forecast - suggest 12 month rolling forecast, and extended firm orders.

Passives

	Pricing	Lead Time	Supply	General Lead Time
Chip Resistors	Increases	Increases	Allocation	12-50w and allocation
Network & Array Resistors	Stable	Increases	Lt.'s extend	+16w
Non-Linear Resistors	Stable	Stable	Lt.'s extend	13-15w
Thermistors	Stable	Stable	Lt.'s extend	13-15w
Trimmers & Pots	Stable	Stable	No constraints	10-16w
Varistors	Stable	Stable	No constraints	6-14w
Fuses	Stable	Stable	No constraints	2-10w
Frequency Control-Crystals & Oscillators	Stable	Stable	No constraints	10-14w
Resonators	Stable	Stable	No constraints	12-14w
Filters	Stable	Increases	Lt.'s extend	8-32w
Ceramic Capacitors	Increases	Increases	Allocation	20-52+w
SMP Tantalum Capacitors	Increases	Increases	Lt.'s extend	20-40w
Film Capacitors	Stable	Increases	Lt.'s extend	12-16w
Aluminum Capacitors	Stable	Increases	Lt.'s extend	15-40w
Coils-inductors-chokes	Stable	Stable	No constraints	8-20w
Transformers	Stable	Increases	Lt.'s extend	10-14w
Ferrites	Stable	Stable	No constraints	6-12w
Inductors	Stable	Increases	Lt.'s extend	4-40+w



Discretetes

	Pricing	Lead Time	Supply	General Lead Time
Thyristors	Stable	Increases	Lt.'s extend	17-26w
BiPolar Transistors	Stable	Stable	No constraints	4-12w
IGBTs	Stable	Stable	No constraints	4-16w
Transient Voltage Suppressors	Stable	Stable	No constraints	6-18w
Rectifiers	Stable	Increases	Lt.'s extend	12-45w
Small Signal Devices	Stable	Stable	No constraints	6-16w
Zener Diodes	Stable	Stable	No constraints	4-10w
MOSFETs	Stable	Increases	Lt.'s extend	6-16w

- \ Lead time increase for Thyristors and Rectifiers.
- \ For MOSFETs, IXYS is your best choice, but lead times expanding on this manufacturer also.
- \ Rest is stable

Non-Volatile & Volatile Memory

	Pricing	Lead Time	Supply	General Lead Time
Nand-Flash	Increase	Increases	Lt.'s extend	11-26w
Nor-Flash	Increase	Increases	Lt.'s extend	8-22w
EeProm	Stable	Increases	Lt.'s extend	3-18w
SRAM	Stable	Stable	Lt.'s extend	6-30w
DRAM	Stable	Stable	No constraints	6-10w
DDR3-DDR4	Stable	Increases	Lt.'s extend	8-10w
EPROM	Stable	Stable	Lt.'s extend	10-14w

- \ Constrained and some allocation for Nand-Flash and Nor-Flash
- \ Lead time inc. pricing stable at this time ofr EeProm
- \ Stabilizing-ST Micro still long lead times & Cypress has a lot of EOL product. Micron still long lead time
- \ Seems to be Stabilizing for DRAM
- \ Increased lead times & Micron on Allocation for DDR3
- \ Atmel pricing increase



Analog, Linear, Logic

	Pricing	Lead Time	Supply	General Lead Time
Data converters	Stable	Stable	No constraints	8-24+ w
Amplifiers	Stable	Stable	No constraints	8-24 w
Interfaces	Stable	Stable	No constraints	8-20 w
Power Management	Stable	Stable	No constraints	2-16 w
Logic	Increases	Increases	Lt.'s extend	12-28 w
Programmable Logic-FPGA	Stable	Stable	No constraints	8-16 w
Linear	Stable	Stable	No constraints	4-22 w
Sensors	Stable	Stable	No constraints	16-30 w
Standard Analog	Stable	Stable	No constraints	6-8 w

- \ Data Converters are stable besides Automotive VNX series : 24+ weeks
- \ Amplifiers are mostly stable On-Semi and ST Micro increasing lead times, 26 weeks for ST Micro, and 20 weeks for On-Semi
- \ Power Management are stable
- \ Sensors are starting to stabilize
- \ Logic are increasing