

# CMSE 2024 PROGRAM BOOK



**27<sup>th</sup> Annual  
Components for Military & Space Electronics  
Conference & Exhibition**

**April 30th - May 2nd, 2024  
Four Points Sheraton (LAX)  
Los Angeles, CA**

Organized by: TJ Green Associates, LLC

## CMSE 2024

### Message from the Chair

Message from the Chair....

On behalf of the CMSE Program Committee I would like to personally welcome everyone to this year's 27th annual CMSE Conference and Exhibition. One of the unique aspects of CMSE is our focus on both active and passive components. You will find experts in both fields coming together under one roof to converse and share solutions to common challenges of designing and building reliable hardware for both military and commercial space programs. This year we continue our focus on education with three cutting edge tutorials on Tuesday and a special Student-Industry networking reception in the evening.

On Wednesday we focus on next generation heterogeneous packaging along with what's new in the world of capacitors. Thursday we discuss how to digest these new technologies given the current Mil/Space qualification system as "Alternate Grade" parts take center stage in a special Panel discussion.

I'd like to personally thank our sponsors and exhibitors for supporting CMSE and everyone on our CMSE planning committee. So pay attention, take the time to listen, ask good questions and don't hesitate to respectfully challenge each other's ideas and technical opinions.

Welcome to CMSE 2024!



Thomas Green  
CMSE Program Chair



## PROGRAM COMMITTEE

Tom Green  
General Chair

Tom Terlizzi  
Exhibits Chair

Trevor Devaney  
Hi-Rel Laboratories

Jeffrey H. Sokol  
JH Sokol & Associates

Ron Demcko  
Kyocera-AVX Corp.

Jon Rhan  
Vishay

Aaron DerMarderosian  
RTX: Collins Aerospace Mission  
Systems

Bob Lowry  
Electronic Materials Consultant

Larry Harzstark  
Aerospace

Andy Moor  
Northrop Grumman Space Systems

Tomás Zednicek  
EPCI European Passive Component  
Institute

Rick Rodriguez  
Raytheon

Sultan Ali Lilani  
Integra Technologies LLC

Yuri Freeman  
YAGEO

Peter Majewicz  
NASA

Allyson D. Yarbough, PhD  
Aerospace

Anthony Casasnovas  
Honeywell Aerospace

Eric Higham  
Microwave Journal

John Reardon  
COTS Journal





MicroCircuit  
Laboratories

# Precision Automation in Hermetic Package Sealing

## Robotic Cover Sealer (RCS) - Patent Pending

- First fully automated hermetic cover seal processor
- Precision automation & processing enables new package configurations
  - Exact fit covers for smallest package dimensions
  - Photonic data communications in GEO, MEO and LEO satellites
- Dramatic productivity increase
  - < 2 minute change over between packages





# 2024 KEYNOTE SPEAKERS



## **Carl E. McCants, Ph. D.**

*Special Assistant to the Director, Defense Advanced Research Projects Agency (DARPA) for Microelectronics Policy*

Dr. Carl E. McCants is a special assistant to the DARPA director, focusing on efforts to inform microelectronics policy and national strategies for microelectronics research and development.

Prior to his role at DARPA, he was the technical director of the Supply Chain and Cyber Directorate of the National Counterintelligence and Security Center (NCSC), in the Office of the Director of National Intelligence and a senior program manager at the Intelligence Advanced Research Projects Activity (IARPA).

From 2010 to 2012, he was a program manager in the Microsystems Technology Office at DARPA, focused on microelectronic integration and hardware assurance and reliability. From 2003 to 2009, he served as the chief technologist to the director of MTO, and special assistant to the DARPA deputy director.

From 1999 to 2003, McCants was a project manager at Agilent Technologies' Semiconductor Products Group, and from 1988 to 1999, he was a development engineer at Hewlett-Packard's Optical Communication Division.

McCants received his bachelor's degree from Duke University in 1981 and his master's and doctoral degrees from Stanford University in 1982 and 1989, respectively, all in electrical engineering. He is a senior member of the IEEE.

## **David L. Beck**





*Branch Chief for Capability Assessment and Principal for Space (Logistics) Industrial Base for the Space Systems Integration Office, Space Systems Command (SSC), Los Angeles Air Force Base, CA*



David L. Beck is the Branch Chief for Capability Assessment and the Principal for Space (Logistics) Industrial Base for the Space Systems Integration Office, Space Systems Command (SSC), Los Angeles Air Force Base, CA. Mr. Beck is responsible for assessment of (systems, software), industrial base support and sustainment, cybersecurity jointly with SSC/CIO and Space Systems Integration Office, and working with government agencies, industry and foreign partners within the space community on future innovation and technology solutions in the space architecture.

Prior to this position Mr. Beck was the Assistant Program Manager (APM) for PMS 415 Undersea Warfare Systems in the Research and Development Branch PMS415D at Naval Sea Systems Command (NAVSEA) Headquarters in Washington DC. Mr. Beck duties included PM for SLUAS (Submarine Launched Unmanned Aerial System) program which are used on 688i and Virginia Class Submarines. Duties included (Collateral Duty): Cybersecurity Liaison for PMS415, Platform Installations Manager, Supply Chain Manager. Mr. Beck's duties included working with Strategic Programs office as well as other entities within DoD on capabilities for the warfighter. Mr. Beck joined SSC in 2023 and participates in encouraging and innovating college and high school students via serving on several organizations committees and boards that focus on the future of space technology and science.

# HIGH RELIABILITY CERAMIC CAPACITORS

<p><b>PORCELAIN</b></p>  <p><b>HIGH Q NPO</b></p>	<p><b>WIREBONDABLE SINGLE LAYER</b></p>  <p><b>LOW LOSS NPO &amp; BX</b></p>	<p><b>WIREBONDABLE BYPASS</b></p>  <p><b>VL/VB SERIES</b></p>	<p><b>BROADBAND DC BLOCK</b></p>  <p><b>BB SERIES</b></p>
--	---	---	--



100% U.S. MADE • 100% U.S. OWNED

PRESIDIO COMPONENTS, INC. HIGH-RELIABILITY CERAMIC CHIP CAPACITORS

0201 0206 0402 0403 0504 0506 0603 0612 0605 0605 0607

0912 1206 1209 1712 1725 1808 2018 2222

**HIGH Q NPO - Low ESR - "PORCELAIN CAP"**

0402 0603 0605 0711

CDR 11/12 CDR 13/14

0905 1010 2025 3030

**SMD BROADBAND DC BLOCK (BB)**

0201 0302 0402

0602 0603 0605

**PULSE DISCHARGE**

0405 1209 2225

100°K Down to 4°K Low Loss

**CRYOGENIC CRX**

**NON-MAGNETIC**

1KV 5KV 10KV

www.presidiocomponents.com • USA • 1-858-578-9390 • info@presidiocomponents.com

**MIL-PRF-49470 CERAMIC STACKED CAPACITORS**

CASE CODE 6 CASE CODE 3 CASE CODE 3 INTERMEDIATE SIZE CASE CODE 4 CASE CODE 5

"M" STYLE "J" STYLE "L" STYLE

VERTICAL STACKS OTHER STACKS

HV RADIAL LEADED (50+KV)

SOFT LEADS

HIGH TEMPERATURE OPTION AVAILABLE TO 200°C

10V to 10kV in Multiple Dielectrics  
X7R, BX, N2200, NPO

High Q NPO for  
RF Power Amplifiers & Filtering  
High Q - Low ESR

QPL 'S' Level for CDR 11, 12, 13 & 14  
QML for DSCC Dwg. 06019 & 06022

Smallest Most Stable Wirebondable  
Single Layer Capacitors

Wirebondable Bypass and Broadband  
Bypass VL/VB Series

Best in Class Broadband  
DC Block BB Series

**Qualified Military and Space Supplier**

MIL-PRF-123, -49464, -49467, -49470, -55681, -32535  
MIL-STD-202 and MIL-STD-790

NASA S311-P-829 is Part of EPPL2

 <p><b>CERAMIC CHIPS</b> 0201 to 2225</p>	 <p><b>SMPS STACKS</b> MIL-PRF-49470</p>	 <p><b>WIREBONDABLE SINGLE LAYER</b></p>	 <p><b>CUSTOM STACKED CUSTOM ASSEMBLY</b></p>
--	---	--	--



# 2024 TUTORIAL SCHEDULE

Tuesday, April 30

0700 - 0900

Registration and Student Breakfast

## TUTORIAL #1 LOCATION: Los Angeles Room

0800 - 1600

Microelectronic Component Engineering for The 2020s

**Instructors:**

Ron Demcko (*Kyocera/AVX*)  
Trevor Devaney (*Hi-Rel Laboratories*)  
Jon Rhan (*Vishay*)  
Thomas J Green (*TJ Green Associates*)

## TUTORIAL #2 LOCATION: La Jolla Room

0900 - 1615

Heterogeneous Integration Packaging Reliability Challenges and Roadmap

**Instructor:**

Richard Rao, Ph.D.  
(*Marvell Technology*)  
Co-Chair IEEE HIR Reliability TWG

1200 - 1300

STUDENT BUFFET LUNCH (For those attending tutorial classes)  
LOCATION: Hollywood Room

## TUTORIAL #3 LOCATION: Salon C (California Room)

1630 - 1900

Understanding the Military Standards and Update on JEDEC and New Spec Initiatives

**Instructors:**

Lawrence Harzstark (*Aerospace Corp.*)  
Sultan Lilani (*Integra Technologies*)  
Shri Agarwal (*NASA Jet Propulsion Laboratory*)  
Rod De Leon (*Boeing Corporation*)

## Student & Professional Networking Event

Location: *La Jolla Room*  
Time: *1900-2000*

**SMART**  
MICROSYSTEMS™

(Join us for drinks and light snacks)

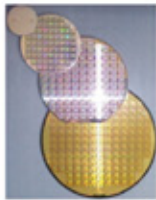
 **Hi-Rel**  
Laboratories



# Space-Grade Electronic Components

## About ES Components

Widely known as an ethical Franchised Distributor of bare die/wafer products, electronic components and as a respected MIL-PRF-38535 Manufacturer, ES Components has the technical resources to bring solutions to your Aerospace and Defense applications.



### RAD Hard MOSFETS

JANKC die for extreme reliability and enhanced radiation hardness in A&D applications with low MOQ's



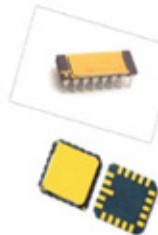
### MIL-PRF-123 Capacitors

123 equivalent PME MLCC's with 0402 to 1825 sizes and 6.3-500v rating; 4000hr life test already complete



### Thin-Film Substrates

High Power/RF options using Alumina, SiO<sub>2</sub>, BeO, etc. with solid gold via process and high conductivity traces



### Custom Packaging

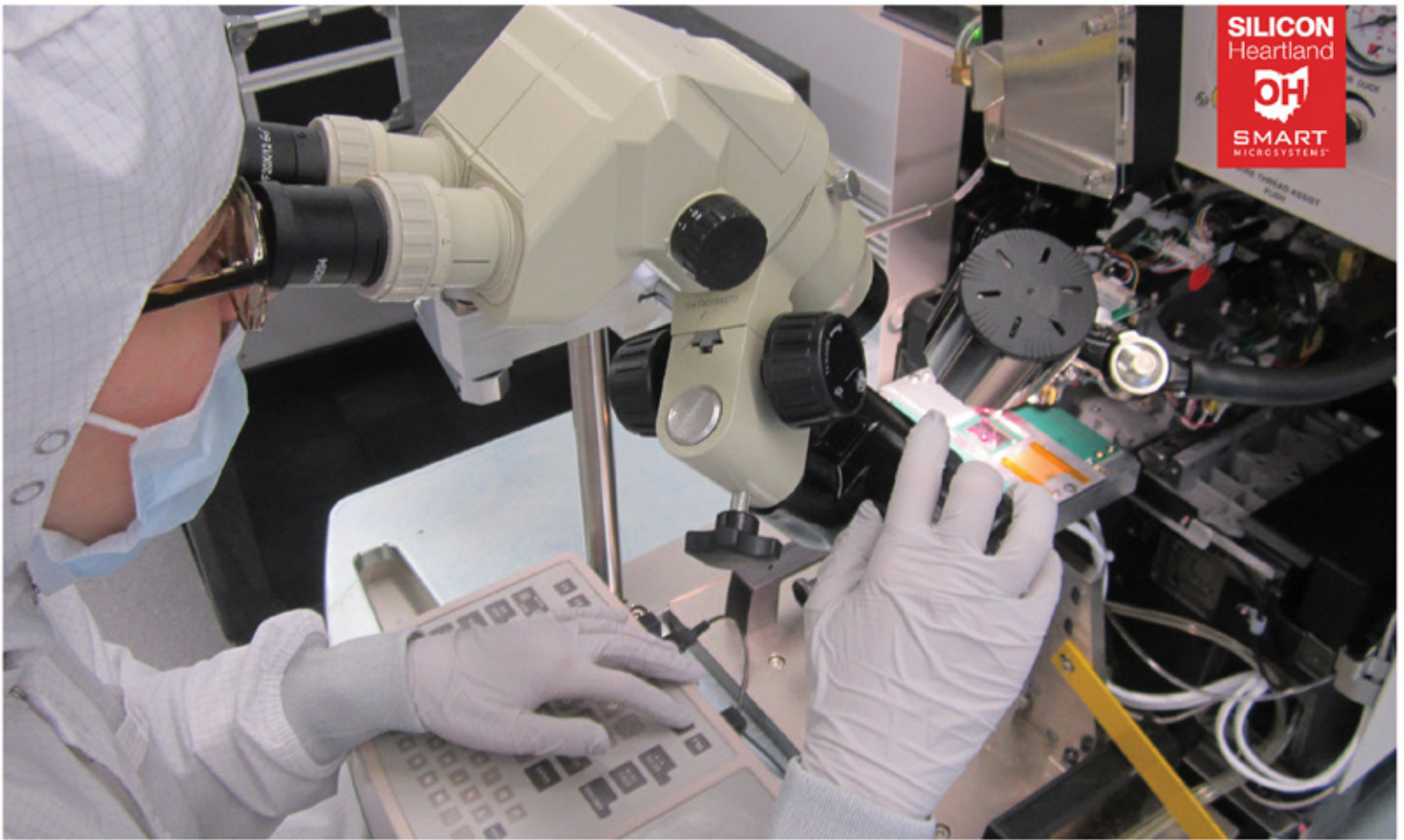
Turnkey hermetic Hi-Rel packaging for single or multiple chips using current or obsolete die.

# 2024 PRESENTATION SCHEDULE

Wednesday, May 1

0700	Coffee available 7AM in Annex across from Presentation Room	
0800-0815	Welcome Intro CMSE General Chair	Thomas J Green TJ Green Associates
<b>Session #1A : Advanced Packaging Session Chair: Daniel West (Kyocera/AVX)</b>		
0815-0840	Wafer Level Packaging and Reliability	Kaysar Rahim NGC
0840-0905	Heterogeneous Integration Packaging Roadmap	Richard Rao, Ph. D. Marvell Technology
0905-0930	Reliability and Quality of Off-chip Interconnects in Advanced Packages in Perspective of High-Reliability Space Applications	Eric Suh NASA/JPL
0930-0955	IBM Advanced Packaging in the Northeast Corridor	Julian Warchall, Ph.D. IBM
0955-1020	<b>COFFEE BREAK : SPONSORED BY Kyocera/AVX</b>	
1020-1045	Reducing Board Surface Area and Improving RF Performance by Embedding Ultra-Thin Capacitors	Ryan Messina Kyocera/AVX
1045-1110	Heterogenous Integration in Complex Integrated Microelectronics Systems	Richard Otte Promex
1110-1200	<b>KEYNOTE: Carl E. McCants, Ph. D. (DARPA) Future Microsystems for Extreme Environments</b>	
1200-1355	<b>LUNCH in the Exhibits Area SPONSORED BY Kyocera/AVX</b>	
<b>Session #1B : Thermal Considerations and Capacitor Technology Session Chair: Kaysar Rahim (NGC)</b>		
1355-1420	Joint SAE/JEDEC Power GaN and SiC Working Group Presentation	Rod de Leon Boeing
1420-1440	Categorization, Developments, and Selection for Thermal Interface Materials	David Saums DS&A
1440-1505	Testing Methodologies and Test Systems for Thermal Interface Materials	David Saums DS&A
1505-1530	Hybrid Inspection and Assembly Process Related Challenges	Aaron Dermarderosian Collins Aerospace/RTX
1530-1550	<b>COFFEE BREAK : SPONSORED BY Kyocera/AVX</b>	
1550-1615	Time Dependent Capacitance Drift of X7R MLCCs Under Exposure	Brian Ward Vishay
1615-1640	Countering Threats from Transients in Magnetics	Victor Quinn Exxelia
1640-1705	The Benefits of High-Reliability in Polymer Tantalum Capacitors	Dr. James Turner Yageo/Kemet
1705-1730	High Energy, High Density Tantalum Capacitors for High Reliability Applications	Jon Rhan Vishay
1745-2000	<b>WELCOME RECEPTION in the Exhibits Area</b>	





## Microelectronic Sub-Assembly Manufacturing.

Wafer Dicing, Inspection and Sorting • Die Attach • Wire Bonding • Encapsulation and Dispensing  
Test & Inspection and Failure Analysis • Reliability and Environmental Life Test  
Super Accelerated UV Weathering Chamber

SMART Microsystems is excited to reside in America's Silicon Heartland, as the Midwest region of the US is now poised to create the next international semiconductor boom. As part of the semiconductor supply chain, SMART Microsystems provides services for microelectronic sub-assembly manufacturing. In addition to process development expertise, SMART Microsystems has in-house Test & Inspection capabilities making it a comprehensive resource for the development and manufacture of the next generation of products that require microelectronic sub-assemblies.

Call us today at **440-366-4203**  
or visit our website for more information about our capabilities and services.

**SMART**  
MICROSYSTEMS™

141 Innovation Drive, Elyria, Ohio 44035  
info@smartmicrosystems.com



[www.smartmicrosystems.com](http://www.smartmicrosystems.com)

# 2024 PRESENTATION SCHEDULE

Thursday, May 2

0700	Coffee available 7AM in Annex across from Presentation Room	
0800-0835	<b>KEYNOTE: David Beck (Space Force) The Critical Needs of a Resilient Industrial Base</b>	
<b>Session # 2A: COTS and Alternate Grade Parts Session Chair: Eric Suh (NASA/JPL)</b>		
0835-0900	Active Packaging for Electronic Components and Assemblies	Anthony Cassanovas Honeywell
0900-0925	An Alternate COTS Approach for Space Missions	Susana Douglas NASA Goddard NEPP
0925-0950	COTS Power supply ESS Vibration failures	Aaron DerMarderosian Collins Aerospace/RTX
0950-1015	An update on non-hermetic Tantalum Polymer Capacitor Performance	Ron Demcko Kyocera/AVX
1015-1040	<b>COFFEE BREAK : SPONSORED BY MicroCircuit Labs</b>	
1040-1055	Lessons learned on buying commercial off the shelf products for up screening	Ben Mendoza Golden Altos
1055-1115	COTS Mission Success Improvement Workshop Results	Dr. Ryan Rairigh Lockheed
1115-1215	<b>Alternate Grade Parts Panel Discussion</b> Panelists: Pete Majewicz (NASA GSFC), Larry Harzstark (Aerospace Corp), Dr. Ryan Rairigh (Lockheed Martin Space), Mark Porter (NASA/JPL)	Moderator: Sultan Lilani Integra Technologies
1215-1330	<b>LUNCH in the Exhibits Area</b>	
1330-1355	Gap Analysis of COTS style EIA-364 standards to MIL-DTL-55302. What is needed and can be done for up screening Interconnects	John Riley Samtec
1335-1410	ASTM TML and TCVM methods and non-hermetics	Jayeshkumar Das, Ph.D. ORS
1410-1435	Precision Automation in Hermetic Package Sealing	Herman Itzkowitz, Rich Richardson MCL
<b>Session #2B : Counterfeits, Trust and Rad Hard Issues Session Chair: Larry Harzstark (Aerospace Corp)</b>		
1435-1500	The Numbers Crunch A Novel Approach to Transparency, Trust, and Assurance in Microelectronic Supply Chains	Richard Smith ERAI
1500-1525	Golden Samples for Counterfeit Mitigation	Lam Nguyen chipsID
1525-1550	Securing Microelectronic Supply Chains with Dendritic Identifiers	Michael N. Kozicki Densec & Arizona State University
1550-1555	<b>COFFEE BREAK : SPONSORED BY MicroCircuit Labs</b>	
1555-1620	VPT Component's Development of Radiation Hardened MOSFETs with LA Semiconductor	Joseph Benedetto VPT Components
1620-1645	QML-P: The latest standard for radiation-hardened, plastic space packaging	Javier Valle Texas Instruments
1645-1710	Microprocessor Reliability Enhancement Under Ionizing Radiation Using Performance Counters.	Antonio E. Teijeiro UTEP
1710-1730	<b>John R. Devaney Award for Best Presentation</b>	





Are you looking for the perfect **GLASS BEAD or PREFORM** for your Hermetic Package?

## GLASS BEADS & CERAMIC

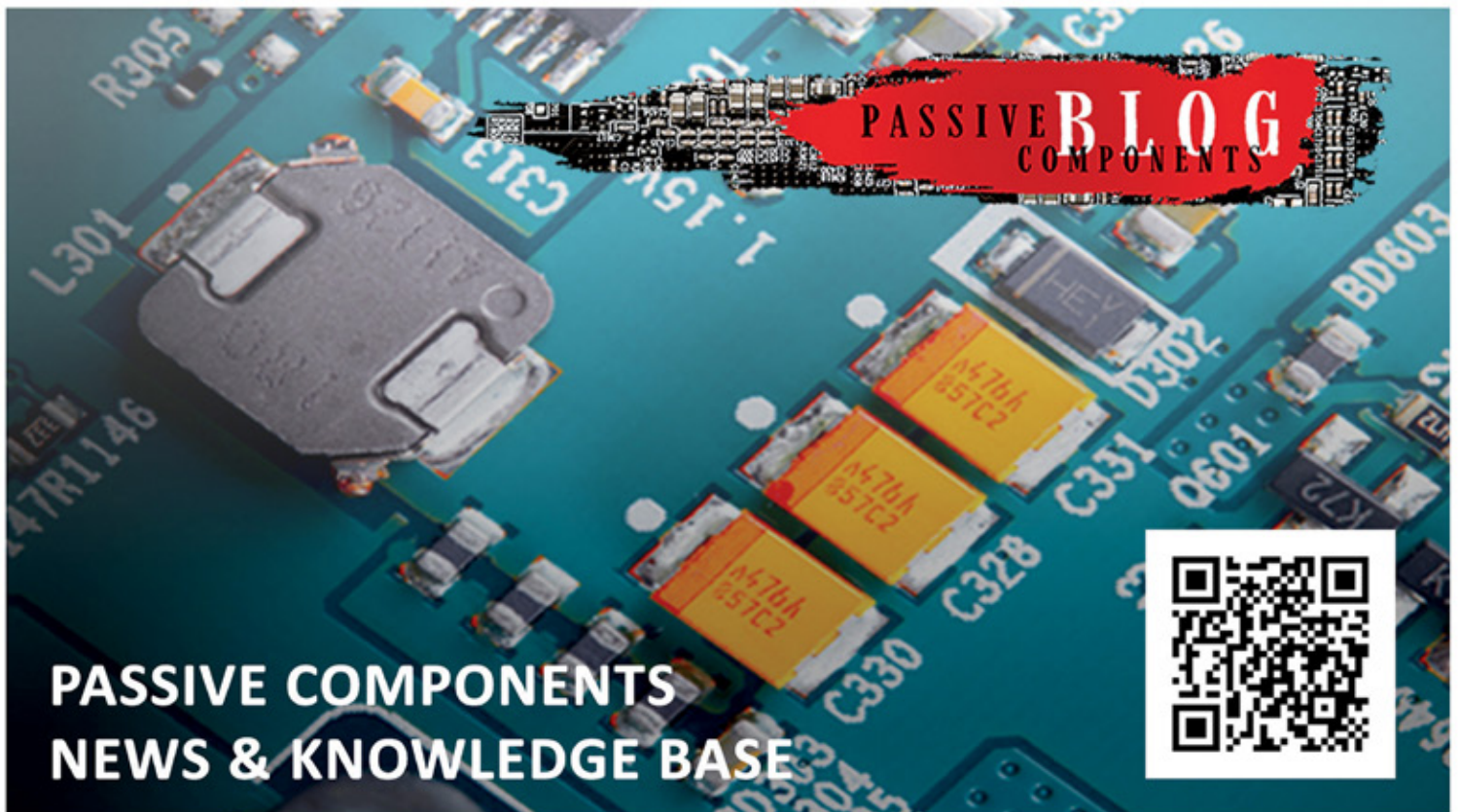
GBC Mechanically Presses Glass Powders into Preforms and offers Drawn Glass Tubing capabilities. Glass Materials include Fusite (K-Glass, T-Glass), as well as Corning 7052, 7070, 9013eqv and Hybralex Alumina-Loaded Glass, and much more to list.

GBC can Isostatically and Mechanically Press Ceramic Powders as well Extrude Ceramics. GBC can CNC machine parts in the Green State, and fire to size, or Precision Hard Grind Ceramics as required. Ceramic Materials offered are 96%, 97.5%, 99.5%, & 99.8% Aluminum Oxide, Zirconium Oxide, Steatite & Cerasil.

Contact Us for A Quote  
t.724.537.7791



sales@gbcmaterials.com  
www.GBCMmaterials.com



PASSIVE COMPONENTS  
NEWS & KNOWLEDGE BASE



[www.passive-components.eu](http://www.passive-components.eu)

# SPONSORS

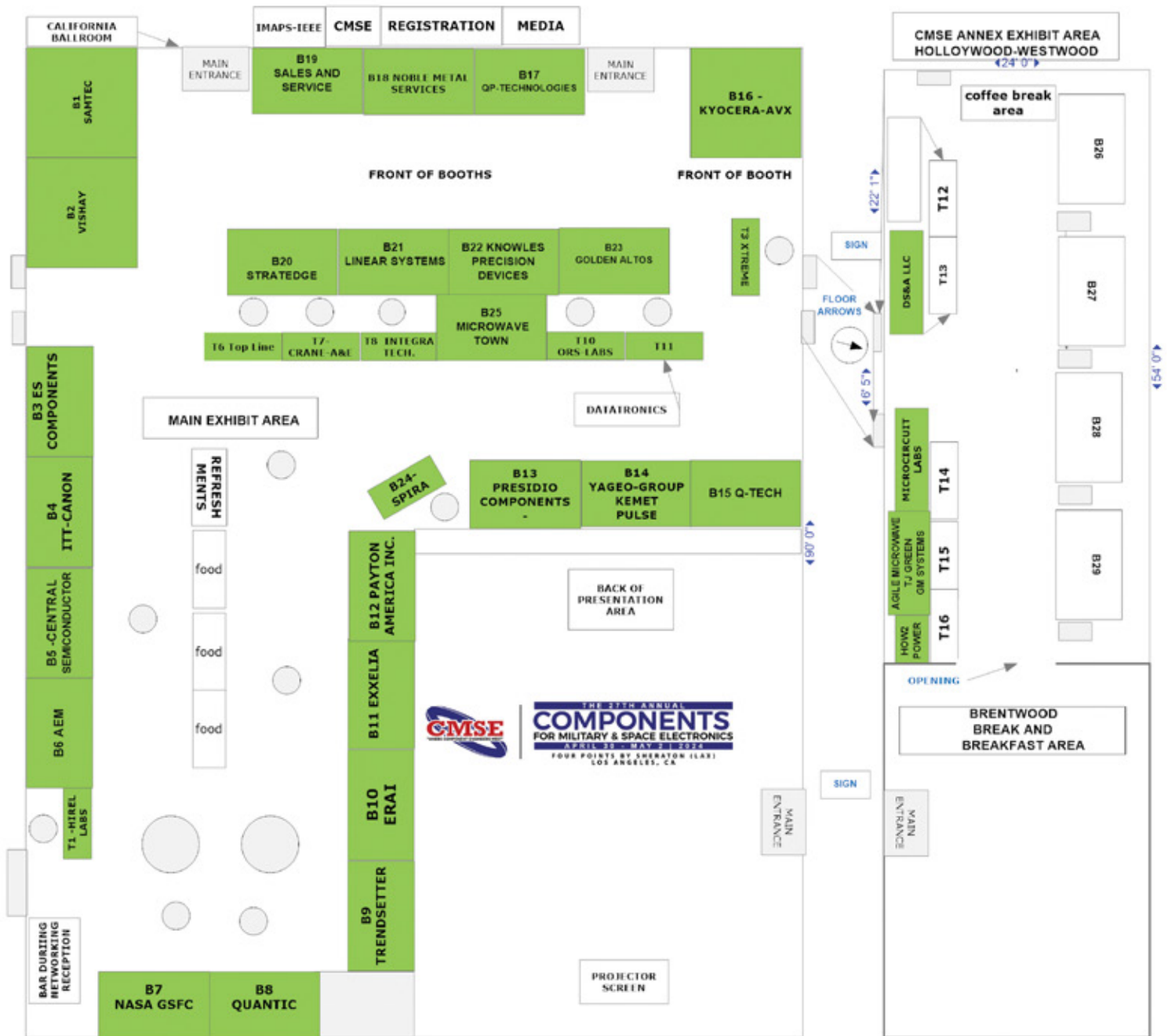




# EXHIBITORS



# 2024 EXHIBIT FLOOR LAYOUT



TO LEARN MORE ABOUT THESE EXHIBITORS SCAN THIS QR CODE





MAIN EXHIBIT AREA	
COMPANY	LOCATION
MAIN EXHIBIT AREA	
AEM	B5
Central Semiconductor	B6
Crane Aerospace & Electronics	T7
DATATRONICS	T11
ERAI, Inc.	B10
ES Components, Inc.	B3
EXXELIA	B11
Golden Altos Corp	B23
Hi-Rel Laboratories, Inc.	T11
Integra Technologies	T8
ITT Cannon	B4
Knowles Precision Devices	B22
KYOCERA AVX	B16
Linear Integrated Systems	B21
MICROWAVE TOWN	B25
NASA/GSFC	B7
Noble Metal Services	B18
Oneida Research Services, Inc.	T10
Payton America Inc	B12
Presidio Components	B13

Q-Tech Corporation	B15
QP Technologies	B17
Quantic Electronics	B8
Sales & Service, Inc.	B14
Samtec	B1
Spira Manufacturing	B24
StratEdge Corporation	B20
TOPLINE CORPORATION	T6
Trendsetter Electronics	B9
Vishay Intertechnology Inc.	B2
XTREME Semiconductor L.P.	T3
YAGEO Group/ KEMET	B14

ANNEX EXHIBIT AREA	LOCATION
HOW2 POWER	T16
AGILE MICROWAVE	T15
TJ GREEN LLC	T15
CIRTEK	T15
Micro Printing Systems	T15
MICROCOAT	T15
GMSYSTEMS	T15
MICROCIRCUIT LABS	T14
DS&A LLC	T13

**GREEN**

TJ GREEN ASSOCIATES, LLC

## TEACHING AND CONSULTING SERVICES

Classes available *virtually* or *in person* at your facility.  
Times and content tailored to meet your training objectives.

[www.tjgreenllc.com](http://www.tjgreenllc.com)

**CRYOGENIC**

**SUPERCONDUCTING**

# **SOLDER COLUMNS**

**GREAT FOR  
QUANTUM COMPUTERS**

**CONNECTS  
CHIPS  
TO PCB**

**INDIUM  
NIOBIUM**



**TopLine<sup>®</sup>**

(800) 776-9888 | [info@TopLine.tv](mailto:info@TopLine.tv)

PATENT PENDING

**BETTER THAN BGA BALLS**