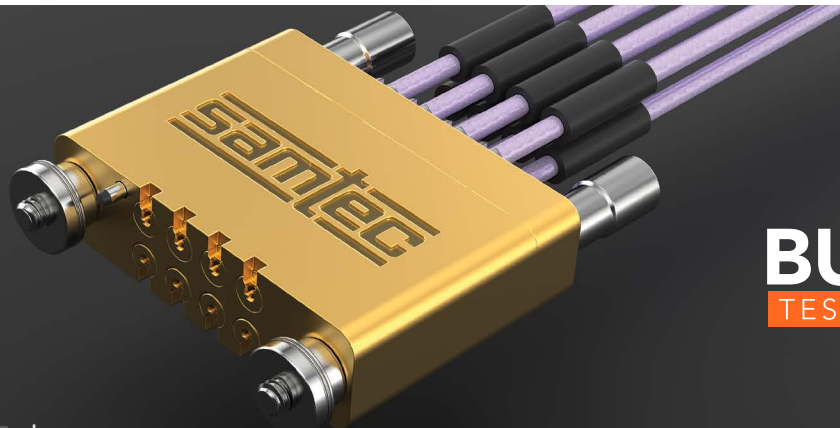


BULLS EYE® TEST SOLUTIONS



BULLSEYE®
TEST POINT SYSTEM

DC TO

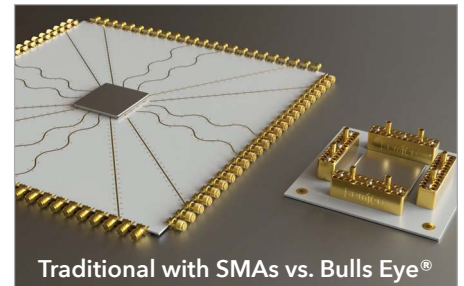
90
GHz

High-Performance Test to 90 GHz

Bulls Eye® is a proven test & measurement solution, ideal for SerDes characterization, clock/data recovery (CDR), mmWave radar systems, automated test equipment, next gen FR2 5G networks, and a variety of high-density high-performance designs.

Bulls Eye® High-Performance Test Assemblies feature a high-density, space-saving design that enables smaller evaluation boards and shorter trace lengths in test and measurement applications to 90 GHz.

- Compression mounts to the board for placement directly adjacent to the SerDes being characterized
- Solderless design improves cost and ease of use within a lab setting
- Single row or double row
- End 2 connection to instrumentation: 1.00 mm, 1.35 mm, 1.85 mm, 2.40 mm or 2.92 mm
- Custom solutions also available

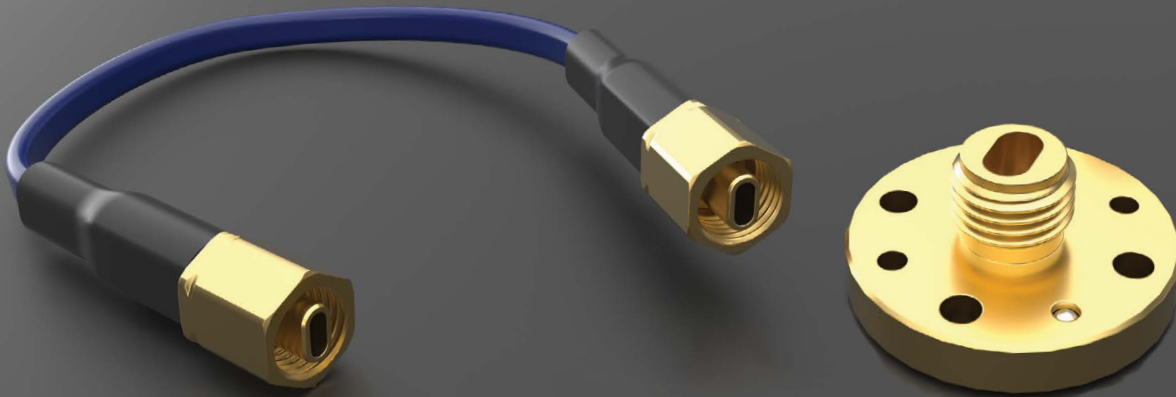


Traditional with SMAs vs. Bulls Eye®

ASSEMBLY	90 GHz	70 GHz	50 GHz	40 GHz
Block Bottom View				
End 2 Connector	1.00 & 1.35 mm	1.85 mm	2.40 mm	2.92 mm
Samtec Series	BE90A	BE70A	BE40A	
Cable Type	.047	.086	MWC-2350CU-01	
Cable Management	Yes			
PCB Transition	Microstrip/CPW or Stripline			
Bulls Eye®	Spring-Loaded Contact; 360° Grounding		Pogo-Pin for Signal & Ground	
No. of Rows	Single or Double		Double	
No. of Positions	1x: 2, 4, 8, 12 2x: 4, 8, 12, 16	1x: 2, 4, 8, 12 2x: 3, 4, 6, 8, 10, 12, 14, 16	2x: 3, 4, 6, 8, 10, 12, 14, 16	
Impedance	50 Ω			
FPGA Development Kit	-		AMD® Xilinx® Zynq® UltraScale+™ RFSoc ZCU1275	
SI Evaluation Kit	Contact: RFgroup@samtec.com	70 GHz: REF-213864-01	50 GHz: REF-213497-01	

Test Assembly	SerDes Characterization
BE90A, 90 GHz	PAM4 224 Gbps
BE70A, 70 GHz	PAM4 112 Gbps
BE40A, 50 GHz	PAM4 56 Gbps

NEXT GENERATION WAVEGUIDE TECHNOLOGY



Flexible Micro Waveguide Technology

Samtec's new **High Frequency Micro Waveguide Technology** is designed to support the demands of next gen mmWave systems. Its cable design allows flexibility, a reduced size, and supports frequencies up to 90 GHz (E-band), while maintaining loss performance that is greatly improved over coaxial cables.

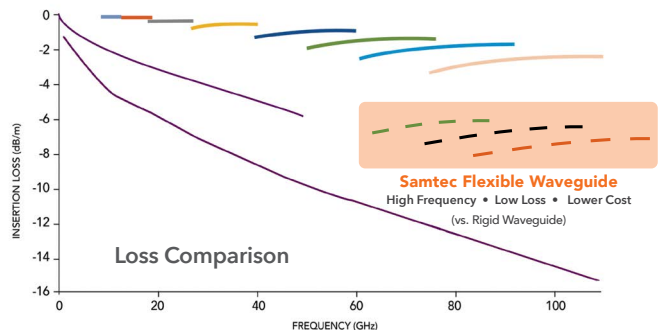
Samtec's innovative waveguide technology is a next generation alternative to rigid metallic waveguides, offering low-loss performance, flexibility, ease of use, and lower cost.

- 60 GHz to 90 GHz, E-Band & 50 GHz to 75 GHz, V-Band
- Flexible cable with dynamic stability
- Loss performance similar to traditional rigid waveguides
- Easy to use, ultra-small form factor

Product	Series	Frequency Band	Dimensions
Waveguide	WF12 = Cross section: 3.10 mm (.122") x 1.55 mm (.061") nom.	E (60 to 90 GHz)	Overall Length: 102 mm (4.00") Min. Threaded Plug: 5 mm (.196") x 8 mm (.314")
Adaptor	WGBA = UG-387 to Threaded Waveguide Jack		Diameter: 19.05 mm (.750") (mates with WR12 standard flange)

V-Band (50 to 75 GHz) WF15 Series: 3.76 mm (.148") x 1.88 mm (.074") nom. cross-section; UG-385 flange adaptor to threaded waveguide jack

Samtec Flexible Waveguide VS. Coax VS. Rigid Waveguide



Samtec Flexible Waveguide

High Frequency, Low Loss, Lower Cost (vs. Rigid Waveguide)

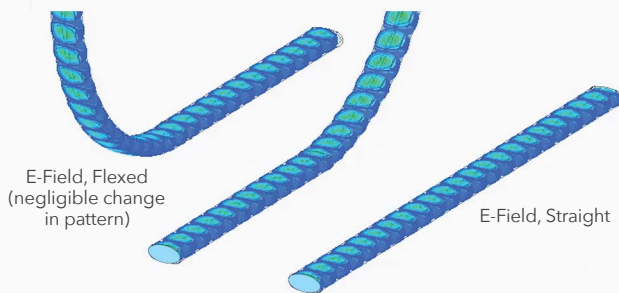
Standard Coax Cable

Standard, High Frequency Low Loss Cable Assemblies

Existing Rigid Waveguide Technology

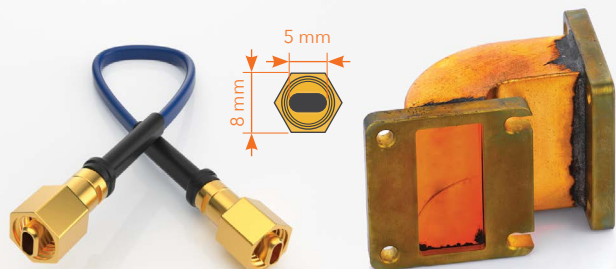
WR90 WR28 WR12 WR62 WR19 WR10 WR42 WR15

Dynamic Stability During Flexure (E-Band Waveguide)



Visit samtec.com/waveguide-dynamic-stability for E-Field animation.

Samtec's Waveguide Technology vs. Traditional Waveguide



✓ Flexible Cable

✗ Rigid, Metallic

MULTI-CHANNEL SOLUTIONS



MAGNUMRF
GANGED RF ASSEMBLIES

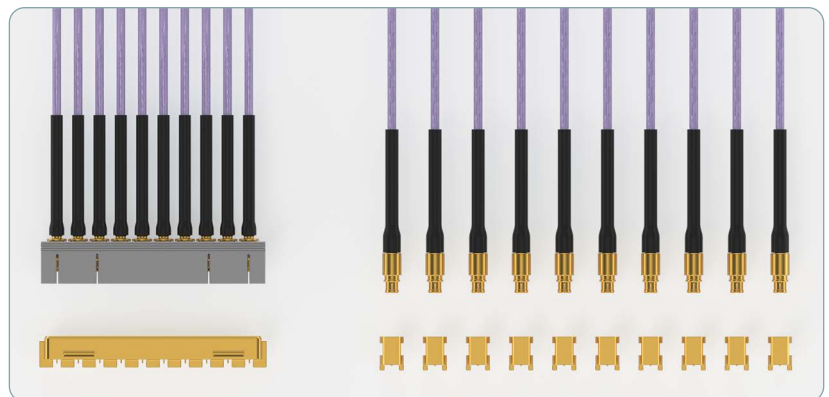
DC TO
65
GHz

Ganged Multi-Port SMPM

Samtec's **Magnum RF® Ganged, Multi-Port Interconnect System** leverages the performance, density and blind mate advantages of the push-on SMPM connector. Magnum RF® is ideal for applications where space is limited and a high operating frequency is required, including 5G/6G Networking, Military/Defense, Radar, and Test & Measurement.

GANGED, MULTI-PORT RF BLOCKS, CABLE ASSEMBLIES AND ADAPTORS

- Mode-free operation up to 65 GHz supports low- or mid-band system requirements
- Micro-miniature, high-density design
- Design also lends itself to smaller diameter materials and smaller bundle sizes for weight savings and increased airflow for cooling when integrated with cable assemblies
- Interconnects are available for meeting both cable-to-board and board-to-board mating requirements
- 3.56 mm (0.140") channel pitch



40% greater density, less processing time, and better positional alignment when more than one channel is required.



Blocks:
GPPC or GPPB Series



Bullet Adaptors:
PRFIA Series (standard or spring-loaded)



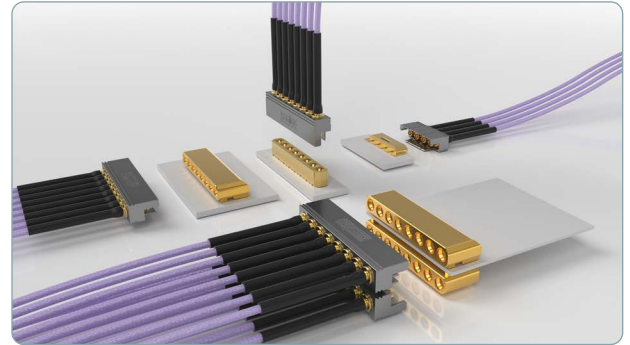
Cable Assembly GC47 Series:
.047" cable, 0.125" bend radius



Cable Assembly GC86 Series:
.086" cable, 0.350" bend radius

CABLE-TO-BOARD

Low Profile			Vertical Launch	
Mated Sets			Mated Sets	
Edge Mount	Block	GPPC-EM	Surface Mount	GPPC-SL or GPPC-CMM
	Cable Assembly	GC47 or GC86		
Right-Angle (Belly-to-Belly or Mid-Board)	Block	GPPC-RA-SM	Cable Assembly	GC47 or GC86
	Cable Assembly	GC47 or GC86		

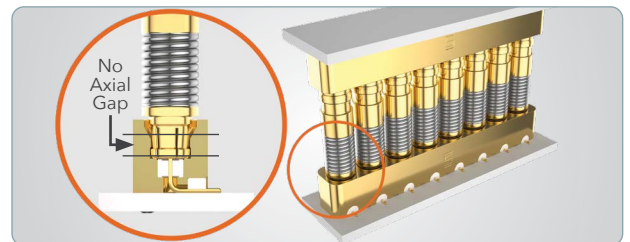


End 2 Options: ganged or discrete

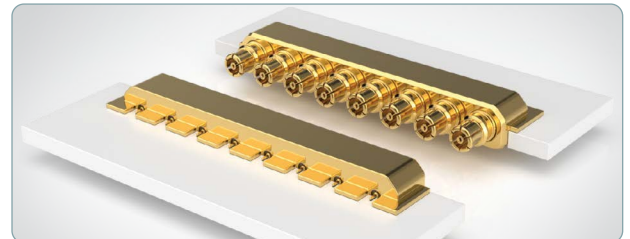
Discrete End 2 Options: 1.00 mm, 1.35 mm, 1.85 mm, 2.40 mm, 2.92 mm, SMPM, SMA

BOARD-TO-BOARD

Mezzanine	
Mated Sets	
Surface Mount	GPPB-SM, GPPC-SL or GPPC-CMM
Bullet	PRFIA
Surface Mount	GPPB-SM, GPPC-SL or GPPC-CMM



Coplanar	
Mated Sets	
Edge Mount	GPPC-EM
Bullet	PRFIA
Edge Mount	GPPC-EM



Perpendicular	
Mated Sets	
Edge Mount	GPPC-EM or SMPM-EM
Bullet	PRFIA
Surface Mount	GPPB-SM, GPPC-SL or GPPC-CMM



- Bullet adaptors accommodate axial, radial misalignment in blind mate applications
- Spring-loaded adaptors provide higher axial misalignment tolerance for maintaining consistent signal contact
- Customized solutions include multiple rows, channel counts and channel pitches

LOW FREQUENCY SOLUTIONS

SHIELDED TWISTED PAIR SYSTEM

- 100 Ω differential pair
- 28 AWG shielded twisted pair cable assembly
- High reliability BeCu contacts
- 1/4-turn bayonet lock

GANGED MICRO-MINI SYSTEMS

- 50 Ω & 75 Ω board stacking and cable assemblies
- High performance rugged contacts
- Variety of End 2 connectors (GRF1H-C, GRF7H-C Series)

ISORATE® SYSTEMS

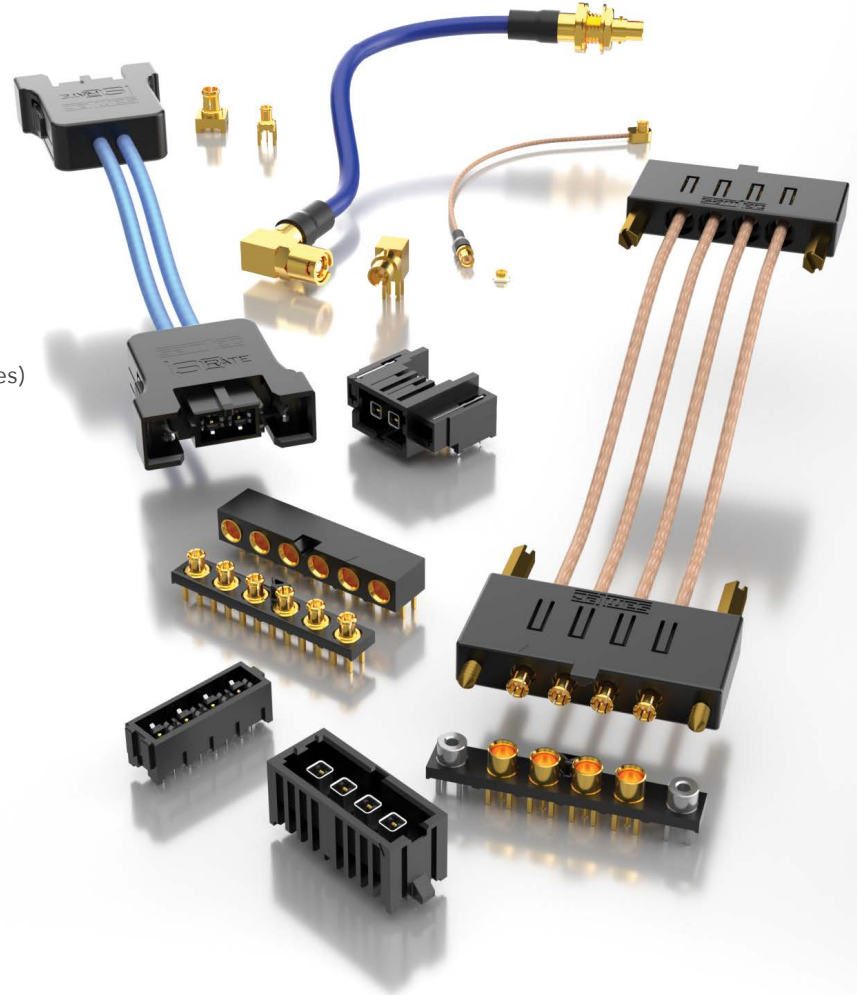
- 50 Ω board stacking and cable assemblies
- Isolated signal systems for 90 percent performance of traditional RF at 50 percent of the cost

MINI & MICRO-MINI INTERCONNECTS

- 75 Ω impedance (MMCX7, MCX7 Series)
- Higher extraction forces (MMCXV Series)
- Not intermateable with standard MMCX, MCX

HIGH-CYCLE U.FL CABLE PLUG

- 500 cycle U.FL compatible plug (HMHF1)
- .047" DIA flexible cable (RF047 Series)



CABLE SOLUTIONS

SERIES	C28S/CJT	GRF1-C/GRF7-C	GRF1H-C/GRF7H-C	RF047	IJ5C/IJ5H
Application	Shielded Twisted Pair	50 Ω & 75 Ω Micro-Mini Ganged	50 & 75 Ω Micro-Mini Hybrid Ganged	50 Ω .047 DIA flexible cable	50 Ω IsoRate®
URL	samtec.com?C28S samtec.com?CJT	samtec.com?GRF1-C samtec.com?GRF7-C	samtec.com?GRF1H-C samtec.com?GRF7H-C	samtec.com?RF047	samtec.com?IJ5C samtec.com?IJ5H

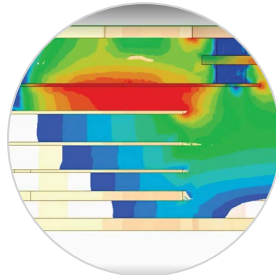
BOARD-TO-BOARD SOLUTIONS

SERIES	GRF1-P/GRF1-J	GRF7-P/GRF7-J	MMCX7	MCX7	MMCXV	IJ5/IP5
Application	50 Ω Micro-Mini Ganged	75 Ω Micro-Mini Ganged	75 Ω Mini and Micro-Mini Interconnects		High-Vibration Micro-Mini	50 Ω IsoRate®
URL	samtec.com?GRF1-P samtec.com?GRF1-J	samtec.com?GRF7-P samtec.com?GRF7-J	samtec.com?MMCX7-TH samtec.com?MMCX7-CA	samtec.com?MCX7-SM samtec.com?MCX7-TH samtec.com?MCX7-CA	samtec.com?MMCXV-TH samtec.com?MMCXV-EM samtec.com?MMCXV-CA	samtec.com?IP5 samtec.com?IJ5

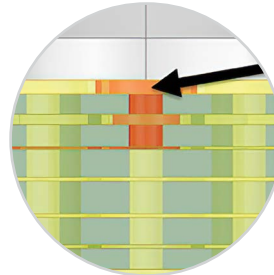
RF DESIGN, DEVELOPMENT & TECHNICAL SUPPORT

SIGNAL INTEGRITY & RF DESIGN EXPERTISE & SUPPORT

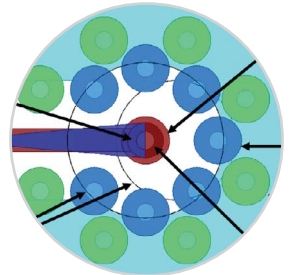
- Launch optimization & design services
- Simulation
- Prototyping
- Physical test and measurement verification
- Full channel analysis, system support
- Application specific design and development assistance



E-field Simulation



3D Modeling



Launch Optimization

TECHNICAL RESOURCES

Samtec's Technical Library contains white papers, application/technical notes, published papers, webinars and presentations on high-performance system design. These resources underscore how Samtec supports interconnectivity needs across multiple industries, applications, performance requirements and operating environments.

WHITE PAPERS

- Wideband RF Launches
- Impacts of Solder Reflow on RF Connectors
- Millimeter Wave Design
- Visit [samtec.com/tech-library](https://www.samtec.com/tech-library)

TECHNICAL REPORTS

- Precision Alignment in Test and Measurement Applications: [samtec.com/alignment](https://www.samtec.com/alignment)

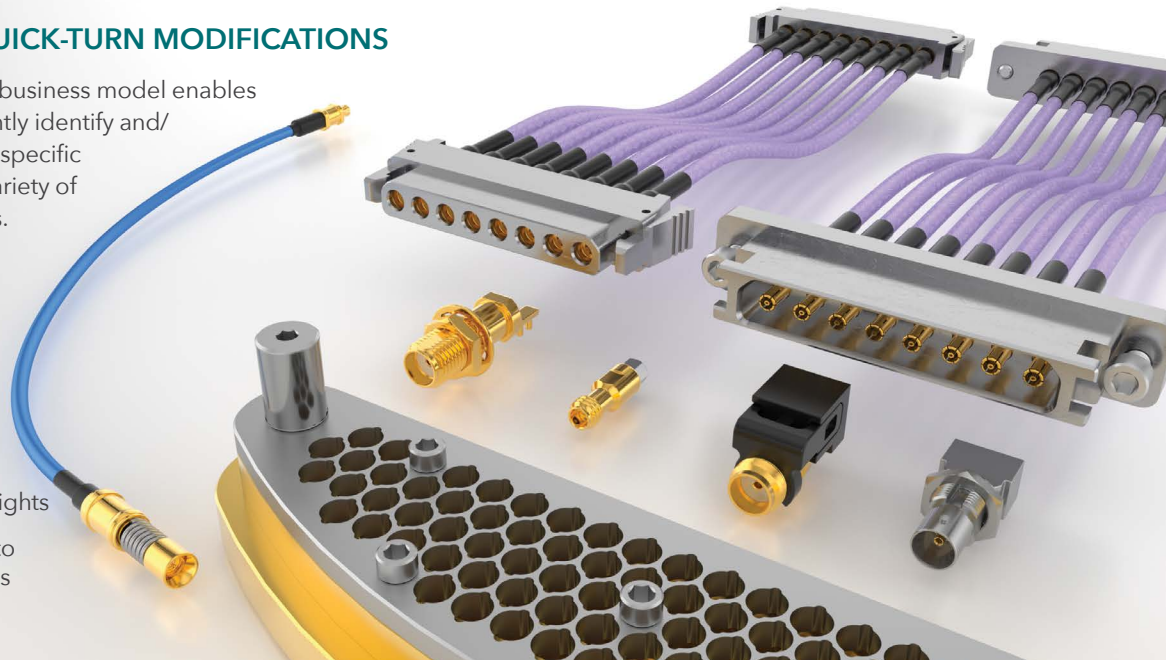
PRESENTATIONS & WEBINARS

- Understanding Transmission Line Discontinuities: [samtec.com/system-impedance](https://www.samtec.com/system-impedance)
- Precision RF Connector PCB Launches for 224 Gbps Devices: [samtec.com/rf-launches-224](https://www.samtec.com/rf-launches-224)

CUSTOM SOLUTIONS & QUICK-TURN MODIFICATIONS

Samtec's fully vertically integrated business model enables the flexibility to quickly and efficiently identify and/or develop innovative, application-specific interconnect solutions to meet a variety of demands in digital/analog systems.

- Board termination types
- Tin dipping capabilities
- Heat-shrink tubing
- Alternate platings
- Pick & place machine designs
- Automated assembly counterweights
- Contact RFGroup@samtec.com to discuss your system requirements





samtec
SUDDEN SERVICE®

UNITED STATES • NORTHERN CALIFORNIA • SOUTHERN CALIFORNIA • SOUTH AMERICA • UNITED KINGDOM
GERMANY • FRANCE • ITALY • NORDIC/BALTIC • BENELUX • ISRAEL • INDIA • AUSTRALIA / NEW ZEALAND
SINGAPORE • JAPAN • CHINA • TAIWAN • HONG KONG • KOREA

[samtec.com/rf](https://www.samtec.com/rf)