

## FLEXIBLE STACKING

INTERCONNECT SOLUTIONS GUIDE

# FLEXIBLE STACKING INTERCONNECT SOLUTIONS

Samtec offers the industry's largest variety of board stacking interconnects, with more ways to connect two or more PCBs than any other connector company. This incredible design flexibility is combined with full engineering support, online tools and an unmatched service attitude in order to find the right solution – standard or custom – for any application.

Most flexible stacking solutions are available through the Reserve® program. With over 200,000 of Samtec's most popular connectors and cables, these eligible products are guaranteed to ship in 1-day.



## DESIGN FLEXIBILITY

Choice of pitch, density, stack height, orientation, standard or modified

Board-to-board and IDC cable assemblies

Rugged, high-reliability contact systems

## **CUSTOMIZABLE**

Mix-and-match headers and sockets for the right solution

Express modifications at standard pricing cost

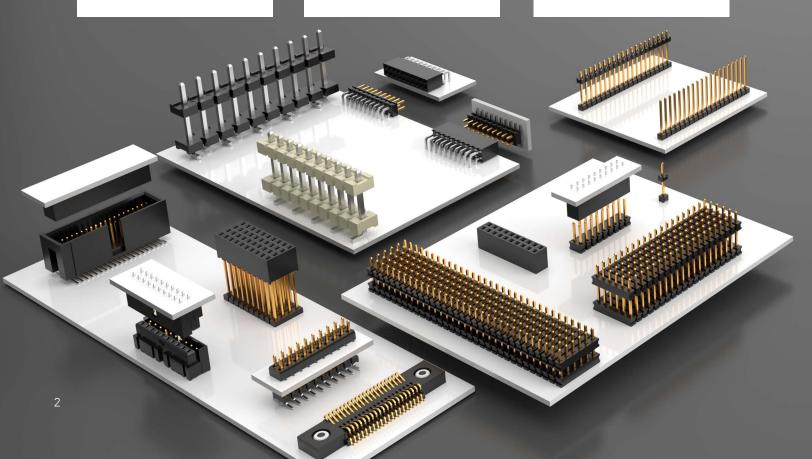
Engineered custom parts also available

## **SUPPORT** & TOOLS

Reserve® - 200,000+ products ship in 1-day

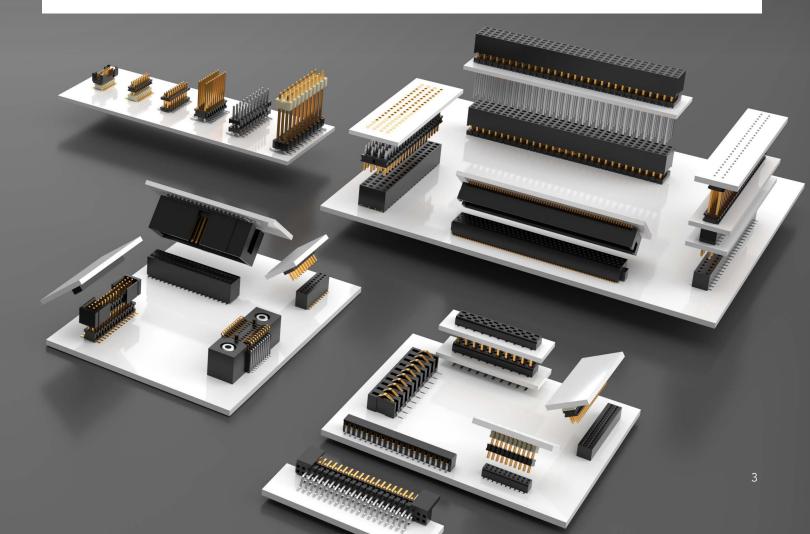
Flexible Stacking Solutionator® -Build a Mated Set®

Free test reports, 3D models, Break Out Region



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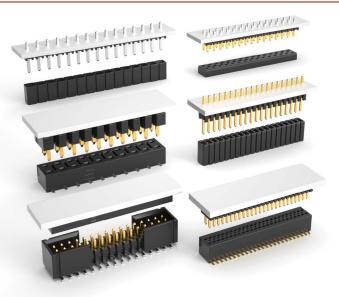


## FLEXIBLE STACKING PRODUCT OVERVIEW



## STANDARD PROFILE VERTICAL

CHOICE OF CONTACT SYSTEM | LARGEST VARIETY SINGLE, DOUBLE & TRIPLE ROW DESIGNS

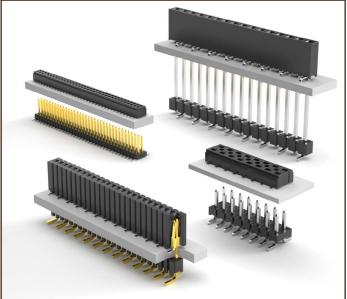


### LOW PROFILE VERTICAL



## ELEVATED PROFILE VERTICAL

UP TO 48.51 mm (1.910") STACK HEIGHT DESIGN FLEXIBILITY | CLEARANCE, AIR FLOW



## **BOTTOM-ENTRY**

TIGER CLAW™ CONTACTS | SPACE SAVING ACCESS TO COMPONENTS WHEN MATED

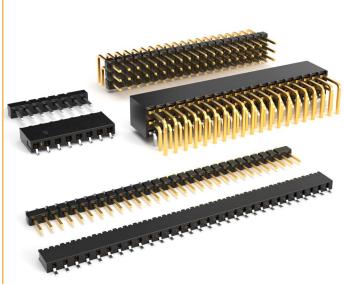




## PERPENDICULAR RIGHT-ANGLE

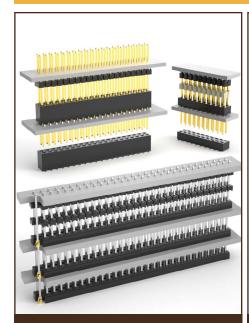
DESIGN FLEXIBILITY │ TIGER CLAW™ & TIGER BUY™ CONTACTS

THROUGH-HOLE & SURFACE MOUNT



## **COPLANAR RIGHT-ANGLE**

-4 ROW DESIGNS │ TIGER CLAW™ & TIGER BEAM™ CONTACTS
SURFACE MOUNT, THROUGH-HOLE & MIXED TECHNOLOGY



## **PASS-THROUGH**

CONNECT 3 OR MORE BOARDS
TIGER CLAW™ & TIGER BEAM™ CONTACTS



## **SELF-NESTING**

TIGER BUY™ CONTACTS
PC/104-*PLUS™* EMBEDDED SOLUTIONS



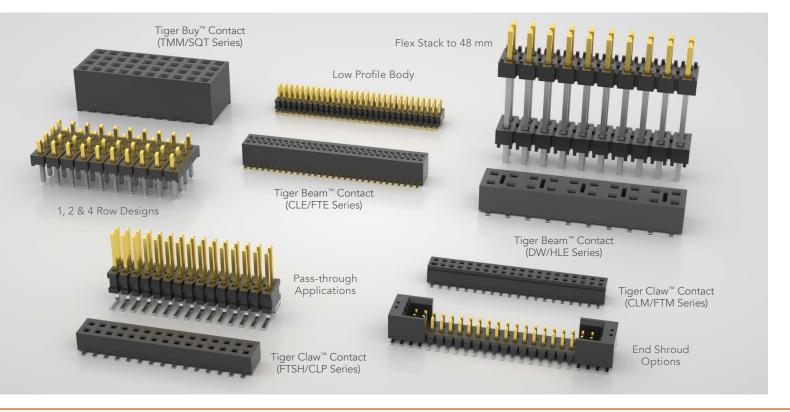
## **IDC CABLE SYSTEMS**

TIGER EYE!" CONTACTS

LOW PROFILE | IDC, FFC & RIBBON

## FLEXIBLE STACKING





With the largest variety of board-to-board interconnects, Samtec makes it easy to find board stackers for any application. Header and socket systems are available in a variety of pitch, density, stack height, orientation and many more standard or custom options.

## **INCREDIBLE FLEXIBILITY**

- Post height: Adjustable in .005" (0.13 mm) increments
- Body positions: Adjustable in .005" (0.13 mm) increments
- Board stacking distance: 1.65 mm (.065") 48.51 mm (1.910")
- Number of pins: 2-300
- Number of rows: 1-6

## **CUSTOMIZABLE**

- Mix-and-match headers and sockets to find the right solution
- Quick and easy custom parts are available.
   Contact asp@samtec.com

## **VARIETY OF PITCHES**

- 0.80 mm (.0315")
- 1.00 mm (.0394")
- .050" (1.27 mm)
- .050" x .050" (1.27 x 1.27 mm)
- .050" x .100" (1.27 x 2.54 mm)
- 2.00 mm (.0787")
- .100" (2.54 mm)
- .156" (3.96 mm)
- .200" (5.08 mm)

## **BUILD IT YOURSELF**

Check out the Flex Stacking Solutionator\* to quickly build a mated set for your specific application. Visit samtec.com/flex-solutionator



## **VARIETY OF CONTACTS**



## **Tiger Eye™ Contact**

- High-reliability
- High mating cycles
- Multi-finger contact





**Tiger Claw™ Contact** 

- Pass-through
- Ultra-low profile
- Dual wipe contact





#### **Tiger Buy™ Contact**

- High-retention
- Cost-effective
- Tuning fork contact



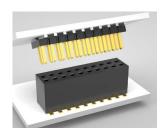


### **Tiger Beam™ Contact**

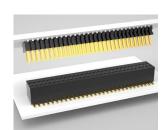
- Best cost
- Reliable performance
- Post & beam contact



## VARIETY OF ORIENTATIONS/APPLICATIONS



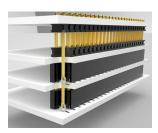
Standard



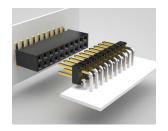
**Low Profile** 



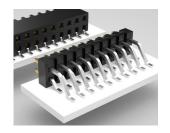
**Elevated** 



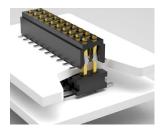
Pass-Through



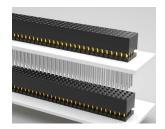
Right-Angle



Coplanar



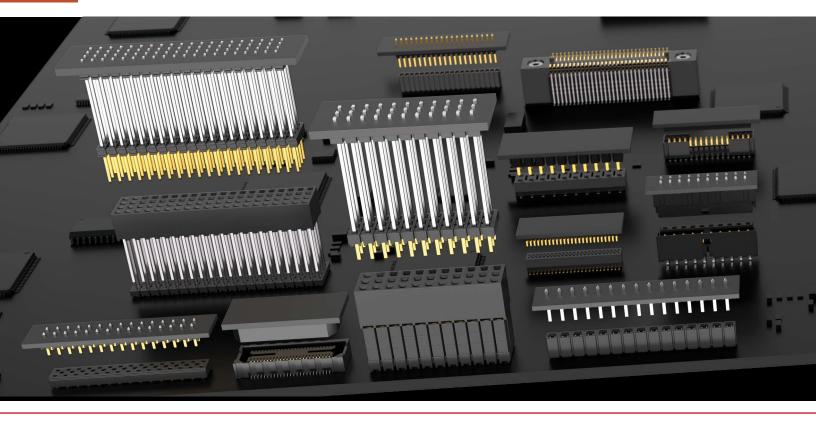
**Bottom Entry** 



**Self-Nesting** 

## **VERTICAL PROFILES**

STANDARD • LOW • ELEVATED



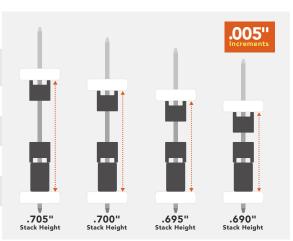
From low to elevated profiles, vertical headers and socket systems are available in a variety of pitch, density, stack height, orientation, and other standard or modified options.

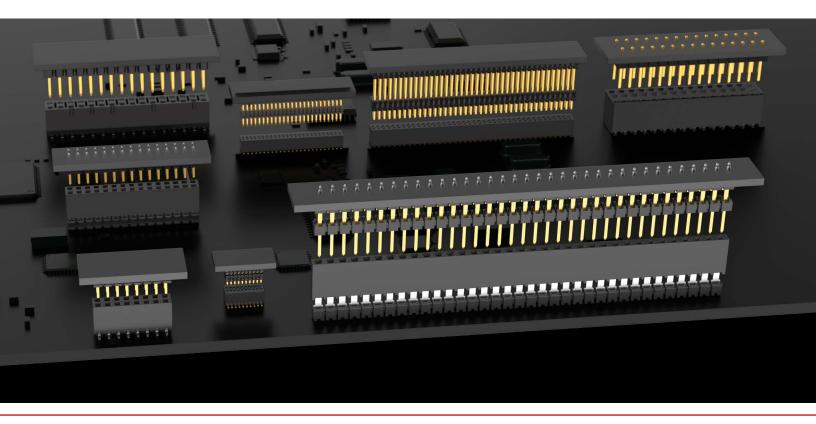
Flex Stack connectors feature the ability to move the plastic insulator in .005" (0.13 mm) increments up and down the terminal pin for a precise stacking height with a standard part number. No minimum order size, no long lead times and no tooling/NRE charges.



#### For a list of popular series and specifications, see page 14.

Post Height and Body Positions	Adjustable in .005" (0.13 mm) increments
Board Stacking Distance	1.65 mm (.065") - 48.51 mm (1.910")
Number of Pins	2 - 300
Number of Rows	1 - 6
Variety of Pitches	0.80 mm (.0315")200" (5.08 mm)
Contact Systems	Tiger Eye™, Tiger Claw™, Tiger Buy™, Tiger Beam™
Tail Options	Surface Mount, Through-Hole, Mixed Technology





- Standard profile offers the largest variety, low profile saves space and elevated profile provides clearance for improved air flow
- 1.00 mm (.034") and .100" (2.54 mm ) pitch one-piece interfaces (FSI, SEI, SIB)
- Blade & Beam (LSH/LTH, BSH/BTH, BSS/BTS, BSE/BTE)
- Floating connectors provide 0.50 mm contact float in the X and Y axes to compensate for misalignment (FS5/FT5)
- Standard and high-power connectors (FHP/FWJ, HFWJ, JW; HPF/HPM, HPW)
- Self-mating connectors for reduced inventory costs (LS2)

- Precision screw machined, and single or ganged shunts and jumpers available
- Shrouded, polarized and keyed
- FleXYZ™ design flexibility in all three axes (TMM-TH, MTMM, TMMH-TH, TW-TH, ESQT, SQT, SQW)
- SI Lite rugged board stacking solutions rated for up to 8 Gbps high-speed signals; visit samtec.com/si-lite



Severe Environment Testing (SET) and Extended Life Product™ (E.L.P.™) qualified solutions (see page 15 for details)

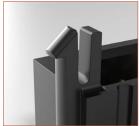
















Mechanical Hold Downs

Locking Clips

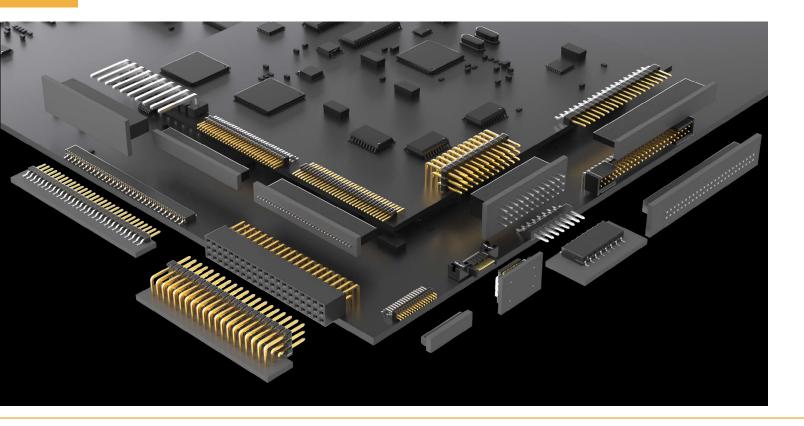
**Board Locks** 

**Guide Posts** 

Alignment Pins

## RIGHT-ANGLE PROFILES

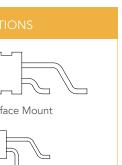
## COPLANAR • PERPENDICULAR

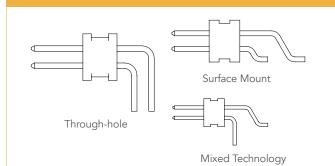


- Right-angle connectors increase design flexibility
- For a list of popular series and specifications, see page 14
- One-piece interface for power or signal (SIR1)
- Floating connectors provide 0.50 mm contact float in the X and Y axes to compensate for misalignment (FS5/FT5)
- Basic Blade & Beam system (BSH/BTH); edge mount available
- Self-mating connectors for reduced inventory costs (LS2)
- Standard and high-power connectors (FHP/FWJ, HFWJ, JW; HPF/HPM, HPW)
- Variety of Pitches .156" (3.96 mm) - 2.00" (5.08 mm) **Number of Pins** 2 - 200 Number of Rows 1 - 4 **Contact Systems** Tiger Claw™, Tiger Buy™, Tiger Beam™ Surface Mount, Through-Hole, Mixed **Tail Options** Technology

- Shrouded, polarized and keyed
- Ruggedizing features including locking clips, board locks, guide posts and alignment pins
- SI Lite solutions rated to run up to 8 Gbps high-speed signals through rugged board stackers; visit samtec.com/si-lite
- Severe Environment Testing (SET) and Extended Life Product™ (E.L.P.™) qualified solutions (see page 15 for details)

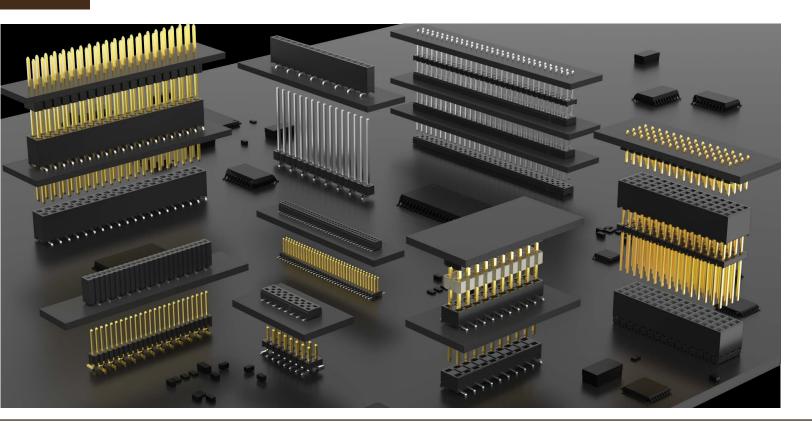






## **ALTERNATE ORIENTATIONS**

## BOTTOM ENTRY • PASS-THROUGH • SELF-NESTING



- Space saving, bottom entry connectors provide access to components when mated
- Pass-through solutions connect three or more boards
- For a list of popular series and specifications, see page 14
- Self-nesting sockets with square post tails for PC/104™ and PC/104-Plus™ applications (ESQT, PTHF, ESQ)



 FleXYZ<sup>™</sup> design flexibility in all three axes: 1-6 rows, up to 50 positions per row, body heights to 20.32 mm (.800")

Variety of Pitches	0.80 mm (.0315") - 2.54 mm (.100")
Number of Pins	1 - 100
Number of Rows	1 - 6
Contact Systems	Tiger Claw™, Tiger Buy™, Tiger Beam™
Tail Options	Surface Mount, Through-Hole (standard or offset), Press-Fit

PCI-SIG®, PCI Express® and the PCIe® design marks are registered trademarks and/or service marks of PCI-SIG.

- SI Lite solutions rated to run up to 8 Gbps high-speed signals through rugged board stackers; compatible with PCIe®, JTAG, LVDS and other industry standards. Visit samtec.com/si-lite.
- Extended Life Product™ (E.L.P.™) certified solutions (see page 15 for details)

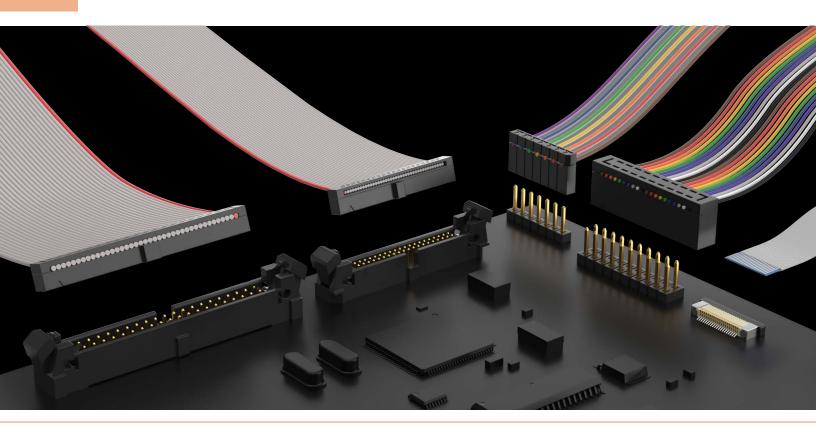






## **IDC CABLE SYSTEMS**

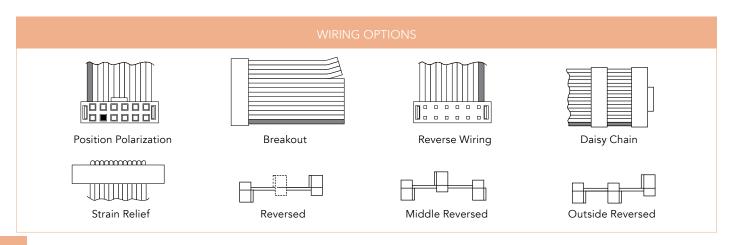
## ASSEMBLIES & HEADERS • FLEX JUMPERS



- Exceptionally low profile designs for space savings
- .050" (1.27 mm) and 2.00 mm (.0787") pitch high-reliability Tiger Eye™ IDC systems (FFSD/ FFMD, TCSD/TCMD, FFTP/FMTP)



- Choice of socket and plug, single or double ended, twisted pair and flat cable
- Mates with Tiger Eye<sup>™</sup> board level connectors, shrouded and ejector terminal strips
- Flexible Flat Ribbon IDC systems with dual beam contacts and no bulky side locks (IDMS/IDMD, IDSS/IDSD)
- Molded-to-Position IDC systems mate with .025" (.064 mm) square post headers (HCSS/HCSD, HCMS/HCMD)
- Mates with .100" (2.54 mm) pitch headers and sockets
- Flat Flexible Cable (FFC) jumpers are easily customizable and mate with ZIF (zero insertion force) connectors (FJH/ZF5S)



## **CUSTOM SOLUTIONS**

## WILLINGNESS, SUPPORT, & EXPERTISE

#### **Industry-Leading Customer Service**

- Quotes and samples in 24 hours
- Prototype and processing assistance
- Dedicated Application Specific Product engineers and technicians

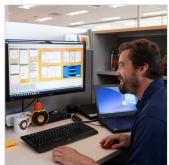
#### Flexible, In-House Manufacturing

- Global Operations, including multiple cable fabrication & assembly facilities
- Quick-turn samples and prototypes
- Custom & modified product support

#### **Signal Integrity Expertise**

- Industry-leading engineering support for high-performance system design
- Full system optimization assistance, including simulation, testing, analysis and evaluation







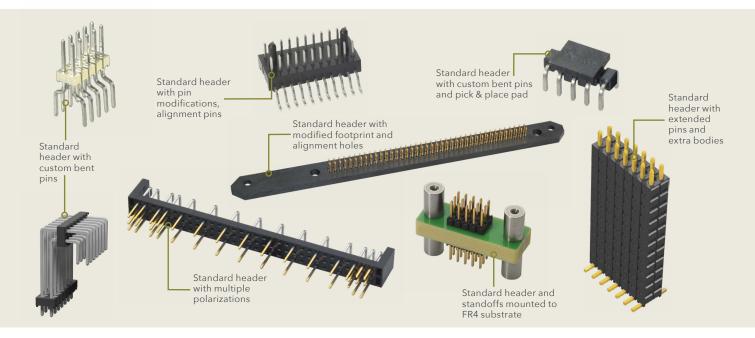


## **CUSTOMS AND EXPRESS MODIFICATIONS**

Samtec is able to support completely new and/or custom designs, as well as common simple modifications - often with low or no NRE charges, short lead times, quick turn samples and low or no MOQs. Visit **samtec.com/custom** or contact **asp@samtec.com.** 

- Contacts and bodies
- Stamping, plating and molding
- Polarization

- Ruggedizing strain relief, screw downs, latches, locks, etc.
- Shielding modifications
- Shrouds and alignment pins
- Wiring
- Pick and place pads
- Packaging and screen printing



# FLEXIBLE STACKING REFERENCE CHART

SERIES		FSI SEI		SIB	CLE	FTE	CLM	FTMH/FTM	MLE	MW		
PITCH		1.00 mm	n (.0394")	.100" (2.54 mm)	0.80 mm (	.0315")	1.00 mm (.0394")					
ORIENTATION				V	V & RA V V & RA V							
BOARD	MIN	3	4.75	3.8	5	_	3.48		4.57	4.62		
STACKING (mm)	MAX	10	1.65		9.14	5	8.43	5.11	9.27			
CONTACT SYSTEM						Tiger Claw™		Tiger Beam™				
MATES		One-Pie	ece	FTE, AW	CLE	FTM, FTMH, MW CLM, MLE		FTM, FTMH, MW	CLM, MLE			

SERIES CLP FLE		FLE	FTS	FTSH	FW	SOLC	TOLC	DWM/ HDWM	FTR	RSM	SLM		
PITCH		.050" x .05	0" (1.27 mm	m x 1.27 mm) .050" x .100" (1.27 mm x 2.54 mm)									
ORIENTATION		V & RA	,	/	V & RA				V				
BOARD	MIN	3.53	5.82	3.53	5.18	7.72	6.	35	9.65	9.78		7.11	
STACKING (mm)	MAX	17.75	19.15	5.82	7.49	19.15	12	.00	22.99 14.73 19.69		19.69	19.43	
CONTACT SYSTEM		Tiger Claw™	Tiger Beam™				Tiger Buy™		Tige				
MATES		FTSH, F	TS, FW		CLP, FLE	TOLC SOLC SMS, SLM, RSM FTR, (H				FTR, (H)DWM, TML, ZML, (H)TMS	(H)TMS, (H)MTMS, (H)DWM, FTR		

SERIES		ммт	TMM/ MTMM	тммн	TW	ZLTMM	CLT	ESQT/ -368	MMS	SMM	SQT	SQW	TLE		
PITCH							2.0	00 mm (.0787")	)						
ORIENTATION		RA	V 8	k RA			V		V & RA	V	V & RA	,	V		
TERMINATION		SMT & MT		T/H & SMT	-	T/H T/H & SMT T/H T/H & SMT SMT T/H T/H & SMT S				SMT					
BOARD	MIN	2	3.63	4.14	7.49	7.62	3.63	9.37	5.94	6.07	7.85		6.99		
STACKING (mm)	MAX	4	18.87	22.07	43.31	13.34	4.98	43.31	19.81	17.78	29.59		17.53		
CONTACT SYSTEM	SYSTEM Tiger Buy <sup>TM</sup> Tiger Buy <sup>TM</sup> Tiger Claw <sup>TM</sup> Eye <sup>TM</sup> Tiger Buy <sup>TM</sup>				Buy™	Tiger Beam™									
MATES		CLT, SQT,	, SQW, ES	ΩT, TLE, SN	ИМ, MMS	SQT, SQW, ESQT, SMM	(M)TMM, TMMH, MMT, TW, TSH	TMMH, (M)TMM, MMT, TW, (Z)LTMM, ESQT, PTT, TSH, TMMS, PTHF	TMMH, (M)TMM, MMT, TW, (Z)LTMM, TSH	(M)TMM, TMMH, MMT, (Z)LTMM, TW, PTT	TMMH, (M)TMM, MMT, TW, (Z)LTMM, PTT, ESQT, TSH	TMMH, (M)TMM, MMT, TW, TSH, (Z)LTMM, PTT	TMMH, (M)TMM, MMT, TW, (Z)LTMM, TSH		

SERIES	DW, EW, ZW			MTSW/ HMTSW	TLW/ MTLW	TSM	TSW/ HTSW	BCS	ESW, ESQ	HLE	SSM	SSQ	ssw
PITCH	PITCH .100" (2.54 mm)												
ORIENTATION			V			V & RA			,	<b>/</b>		V & RA	
TERMINATION		T/H	T/H & SMT	T/I	+	SMT & MT		T/H	T/H		SMT	T/H	T/H & SMT
BOARD	MIN	13.59	10.03	7.24	6.1	7.47	7.87	9.02	13.59	7.47	11.18	10	.03
STACKING (mm)	MAX	48.51	30.73	46.36	20.96	14.48	35.69	18.92	48.51	26.16	30.1	38.35	
CONTACT SYSTEM								Tiger Claw™	Tiger Buy™	Tiger Beam™	Tiger Claw™	Tiger	Buy™
MATES		CES, SLW		SSW, SSQ, ESW, ESQ, BCS, BSW, CES, SLW, HLE, SSM	BSW, CES, SLW, HLE	SSW, SSQ, SSM, BSW, ESW, ESQ, BCS, SLW, CES, HLE	SSW, SSQ, SSM, ESW, ESQ, BCS, BSW, CES, SLW	(H)TSW, (H)MTSW, TSS, ZSS, DW, EW, ZW, HW, TSM, MTLW, PHT	(M)TSW, EW, MTLW, (H)TSS, ZSS, TSM, DW, ZW, HW, TSSH	ZW, (M)TLW,	(M)TSW, TST, TSS, ZST, ZSS, DW, EW, ZW, TSM, HMTSW, HTSW, TSSH, BST, HTSS, (M)TLW	TSW, MTSW, MTLW, EW, ZW, TSS, ZSS, TSM, TSSH, HTSS	(H)TSW, (H)MTSW, MTLW, EW, ZW, TSS, HTSS, ZSS, TSM, TSSH, DW, HW

## **ULTRA RUGGED**TESTING

## **DESIGN QUALIFICATION TESTING**

All Samtec series undergo Design Qualification Testing (DQT). This includes Gas Tight, Normal Force, Thermal Aging, Mating/Unmating/Durability, IR/DWV, Current Carrying Capacity (CCC), and Mechanical Shock/Random Vibration/LLCR and Event Detection.



## EXTENDED LIFE PRODUCT™

E.L.P.™ certified products are tested to additional, rigorous standards which evaluate contact resistance in simulated storage and field conditions.

Products are exposed to 10-year Mixed Flowing Gas, and achieve high mating cycles (250 to 2,500). Certain plating and/or contact options apply.

Visit samtec.com/ELP for a complete list of certified products, or contact ASG@samtec.com.



#### **E.L.P.™** Certified Flexible Stacking Products:

- BCS/TSW .100" Pitch Header & Pass-Through Socket
- BSE/BTE 0.80 mm Pitch Basic Blade & Beam System
- BSH/BTH 0.50 mm Pitch Basic Blade & Beam System
- BSS/BTS 0.635 mm Pitch Basic Blade & Beam System
- CLM/FTMH 1.00 mm Pitch Low Profile Header & Socket
- CLP/FLE/FTSH .050" Pitch Micro Header & Sockets
- CLT/TMMH 2.00 mm Pitch Low Profile Header & Socket
- SMM/TMM 2.00 mm Pitch Low Profile Tiger Eye™ System
- SSM/TSM .100" Pitch Square Post Header & Socket

## SEVERE ENVIRONMENT TESTING

Severe Environment Testing (SET) is a Samtec initiative to test products beyond typical industry standards and specifications to ensure they are more than suitable for rugged/harsh environment industries and other extreme applications. Visit <a href="mailto:samtec.com/SET">samtec.com/SET</a> for a complete list of qualified products, or contact <a href="mailto:SET@samtec.com">SET@samtec.com</a>.

#### Meets or Exceeds MIL-DTL-55301 Testing

- Exceeds VITA™ 47.1 Temperature Cycling Class C4
- Exceeds VITA™ 47.1 Non-Operating Temperature Class C4
- Exceeds VITA™ 47.1 Altitude for DWV
- VITA™ 47.1 Electrostatic Discharge Resistance

#### **SET Qualified Flexible Stacking Products:**

• SSM/TSM - .100" Pitch Square Post Header & Socket

- VITA™ 47.1 Module Insertions
- VITA™ 47.3 Humidity
- VITA™ 47.1 Operating Shock Class OS2
- VITA™ 47.1 Vibration Class VS3
- FTSH/CLP .050" Pitch Header & Socket

## NASA:

SET products are approved for Class D missions that require high-reliability, quick-turn and cost-effective solutions for LEO Satellites, SmallSats, CubeSats and other space exploration applications.

Samtec also utilizes NASA outgassing data to determine if certain products meet NASA's ASTM E595-77/84/90 test requirements. Visit outgassing.nasa.gov for data.



## **SAMTEC**SUDDEN SERVICE®

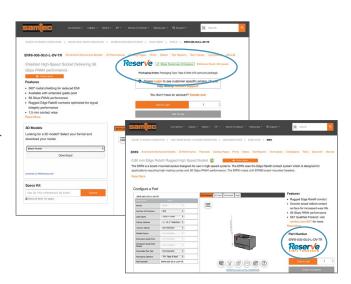
## **UNMATCHED LEAD-TIMES**

Innovative Programs & Systems Enable Deliveries in Days, Not Weeks.



This designation allows customers to quickly and easily identify availability of over 200,000 of Samtec's most popular connectors and cables - guaranteed to ship in 1-day.

Look for the Reserve® badge throughout samtec.com to quickly determine if your part number is eligible, along with current availability, quantity breaks and pricing. Hundreds of part numbers are being added daily!





Free product samples shipped in 24-hours or less have been a cornerstone of Samtec Sudden Service® since the company was founded. Visit samtec.com to quickly request your sample.



An innovative shipping program that **bridges the gap between manufacturing facilities and customers**, allowing for manufacturing flexibility without increased costs, and with even faster lead-times. Contact **ecustomerservice@samtec.com** to learn more.

## 24/7 WORLDWIDE ACCESS

## **Technical Support**

Signal Integrity Group: sig@samtec.com

Application Support Group: asg@samtec.com

Interconnect Processing Group: ipg@samtec.com

Samtec is the Electronics Industry's Service & Technology Leader.

## **Supply Chain Support**

MySamtec<sup>™</sup> Real-Time Account Access: account.samtec.com

Personal Account Managers & CSRs: ecustomerservice@samtec.com

Upfront, Aggressive 24-Hour Quotes: pricing@samtec.com

## **MYSAMTECTM**

A Personalized Web Experience for Easy Ordering.

Samtec's user-friendly eCommerce platform allows you to quickly and easily check product availability and pricing, as well as place and manage your orders online.



## ONLINE TOOLS | Find, Design & Validate Your Solution

Quickly and easily find the right solution, whether you prefer to search by product name or characteristics, browse through pictures, or build an assembly by entering physical specifications.

#### PICTURE SEARCH

Browse through a highlight reel of Samtec's most popular products to find the ideal solution for your application, view specifications, check availability, order samples and more. To find your solution, visit **samtec.com/picturesearch**.



### **DOWNLOADS**

Samtec offers immediate and unlimited access to all the documentation you need to select the right solution for your application from 3D models, prints and footprints to test reports, white papers and so much more.

Visit samtec.com to start exploring.



#### **SOLUTIONATOR®**

Quickly build mated connector sets or design full cable assemblies using a wide variety of user-defined search parameters and filters, view specs and order samples in Samtec's online design tools.









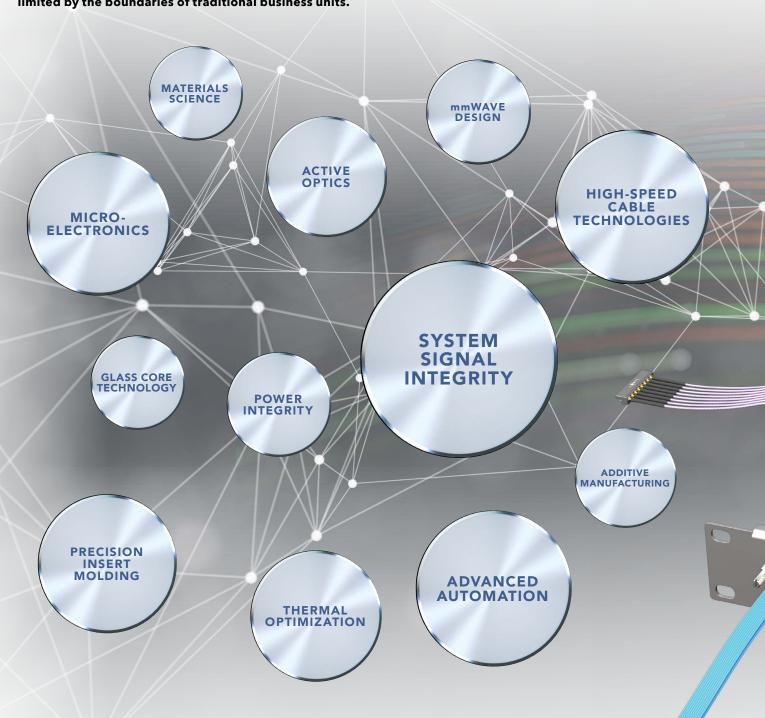




# INTEGRATION LEADS TO INNOVATION

Samtec's integrated business model facilitates high-level design and development of advanced interconnect systems and **TECHNOLOGIES**. Along with industry-leading expertise, this allows us to offer effective strategies and support for **optimizing the entire signal channel of high-performance systems**.

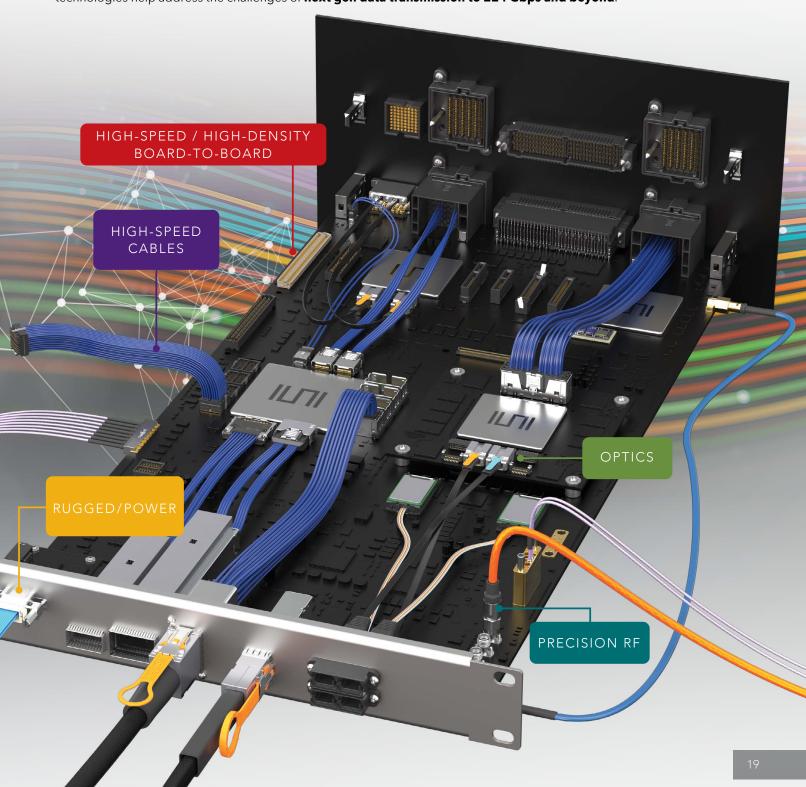
Samtec is structured like no other company in the interconnect industry. We work in a fully integrated capacity that enables true collaboration and results in uniquely innovative **PRODUCTS** because **our technology teams are not limited by the boundaries of traditional business units.** 



# SILICON-TO-SILICON SOLUTIONS

As bandwidth, scale and power requirements continue to challenge conventional engineering methods, Samtec strives to help **optimize the landscape of your entire system** - and develop solutions, together.

**Samtec's industry-leading signal integrity expertise**, full system optimization strategies, and innovative products and technologies help address the challenges of **next gen data transmission to 224 Gbps and beyond**.



## **GLOBAL SUPPORT NETWORK**





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