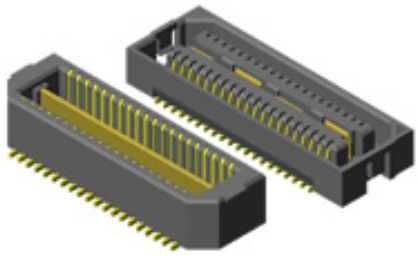
Series: QSH/QTH High Speed Socket 0.5 mm pitch



1.0 SCOPE

1.1 This specification covers performance, tests and quality requirements for the Samtec QSH/QTH High Speed Socket/Terminal 0.5mm pitch Series in a 5mm height configuration (unless otherwise noted).

2.0 ELECTRICAL

2.1 Dielectric Withstanding Voltage, DWV, per EIA-364-20
- 2.1.1 375 VAC mated with QTH

2.2 Insulation Resistance, IR, per EIA-364-21
- 2.2.1 > 5,000 Meg Ohms --- PASS

2.3 Low Level Contact Resistance, LLCR, per EIA-364--23
- 2.3.1 21.8 milli Ohms Average - Contact System
- 2.3.2 4.1 milli Ohms Average - GND System

2.4 Current Carrying Capacity for a 30°C temp rise, CCC, per EIA-364-70
- 2.4.1 1.0 A (6 Contacts in series)
- 2.4.2 7.8 A - GND System, Two Banks

3.0 MATERIALS

3.1 Insulator Material
- 3.1.1 LCP

3.2 Contact
- 3.2.1 Copper Alloy with Gold over 50 microInches Nickel

4.0 MECHANICAL

4.1 Operational Temperature
- 4.1.1 -55 degrees C to 125 degrees C

4.2 Mating/Unmating forces, per EIA-364-13
- 4.2.1 4.5/4.7 lbs respectively - One Bank
- 4.2.2 14.5/13.3lbs respectively - Three Banks
- 4.2.3 27.2/24.8 lbs respectively - Five Banks

4.3 Durability after 100 cycles per EIA-364-17B and EIA-364-31B
- 4.3.1 LLCR change < 15.0 milli-Ohms --- PASS

4.4 Normal Force at 0.006 inches deflection, per EIA-364-04
- 4.4.1 90 gr.

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5.0 ENVIRONMENTAL

5.1 Thermal Aging per EIA-364-17
- 5.1.1 No Evidence of Physical Damage seen --- PASS
- 5.1.2 Change in Contact LLCR not to exceed +15.0 milli-Ohms (L- plating) --- PASS
- 5.1.3 Change in Ground LLCR not to exceed +5.0 milli-Ohms (L- plating) --- PASS
- 5.1.4 Change in Contact LLCR After Thermal and Gas Tight not to exceed +15.0 milli-Ohms (L- plating) --- PASS
- 5.1.5 Change in Ground LLCR After Thermal and Gas Tight not to exceed +5.0 milli-Ohms (L- plating) --- PASS
- 5.1.6 Test Conditions
  - 5.1.6.1 105 degrees C
  - 5.1.6.2 300 hours

5.2 Cyclic Humidity per EIA-364-31
- 5.2.1 No Evidence of Physical Damage seen --- PASS
- 5.2.2 Insulation Resistance > 5000 Meg Ohms --- PASS
- 5.2.3 No evidence of Breakdown or Arcing when applying 750 VAC --- PASS
- 5.2.4 Change in LLCR not to exceed +15.0 milli-Ohms (L- plating) --- PASS
- 5.2.5 Test Conditions
  - 5.2.5.1 Cyclic 25 degrees C to 65 degrees C for 240 hours, at 90% to 95% RH
  - 5.2.5.2 Time Condition "B" (240 hours) for Method III, excluding sub-cycle 7A and 7B

5.3 Thermal Shock per EIA-364-32
- 5.3.1 No Evidence of Physical Damage seen --- PASS
- 5.3.2 Change in Signal LLCR not to exceed +15 mOhm --- PASS
- 5.3.3 Change in GND LLCR not to exceed +5 mOhm --- PASS
- 5.3.4 Test Conditions
  - 5.3.4.1 # Thermal Cycles: 5
  - 5.3.4.2 Hot Temperature: 85 degrees C +3 degrees C/-0 degrees C
  - 5.3.4.3 Cold Temperature: -55 degrees C +0 degrees C/-3 degrees C
  - 5.3.4.4 Dwell/Configuration: 30 Minutes, Mated and Mounted
  - 5.3.4.5 Hot/Cold Transition Instantaneous

5.4 Mechanical Shock per EIA-364-27
- 5.4.1 No Evidence of Physical Damage seen --- PASS
- 5.4.2 Test Conditions
  - 5.4.2.1 Test Condition: Test Condition "A"
  - 5.4.2.2 Peak Value: 50 G
  - 5.4.2.3 Duration: 11.0 milliSec
  - 5.4.2.4 Waveform: Half Sine
  - 5.4.2.5 # Shocks/Direction 3 Shocks/3 Axes (18 total)

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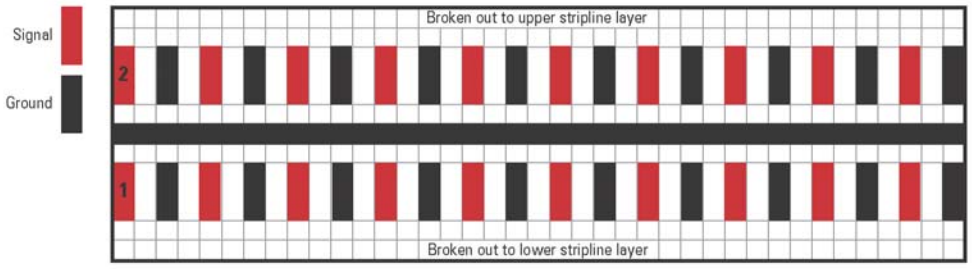
5.5 Vibration per EIA-364-28
- 5.5.1 No Evidence of Physical Damage seen --- PASS
- 5.5.2 Change in Signal LLCR not to exceed +15 mOhm --- PASS
- 5.5.3 Change in GND LLCR not to exceed +5 mOhm --- PASS
- 5.5.4 Test Conditions
  - 5.5.4.1 Test Condition: Test condition V, Random
  - 5.5.4.2 Frequency: 50 to 2000 Hz
  - 5.5.4.3 PSD: 0.04
  - 5.5.4.4 Duration: 2 Hour/Axis, 3 Axes Total
  - 5.5.4.5 G's: 7.3 G rms

6.0 HIGH FREQUENCY PERFORMANCE

6.1 Empirical Boundaries on Performance with Sinusoidal Signals
- 6.1.1 DV configuration, standard configuration, single-ended signaling and standard configuration, differential pair signaling readings based on using a -3dB insertion loss point
- 6.1.2 DV configuration, differential pair configuration, differential pair readings based on using a -3dB insertion loss point
- 6.1.3 System Impedance: 50Ω and 100Ω for Single-Ended and Differential Pair respectively.
- 6.1.4 For complete test information, click HERE

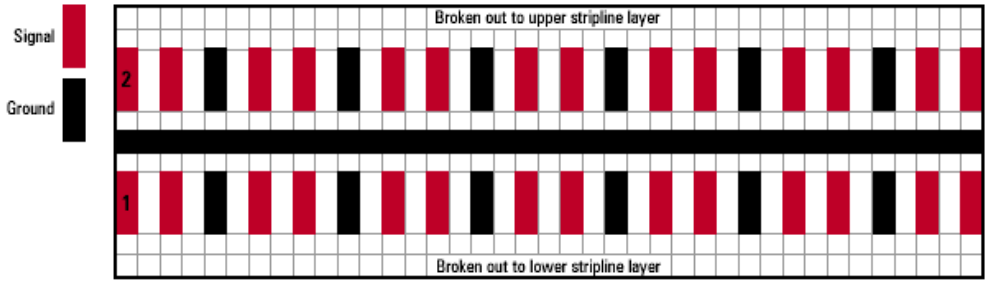
6.2 Standard configuration single-ended signaling, 1:1



Standard configuration, single-ended signaling					
Socket	**Header**	**Mated height**	**Configuration**	**Signaling**	**Performance**
QSH-XXX-01-X-D-A	QTH-XXX-01-X-D-A	5mm	Standard	Single-ended	9 GHz
QSH-XXX-01-X-D-A	QTH-XXX-02-X-D-A	8mm	Standard	Single-ended	8.5 GHz
QSH-XXX-01-X-D-A	QTH-XXX-03-X-D-A	11mm	Standard	Single-ended	6 GHz
QSH-XXX-01-X-D-A	QTH-XXX-04-X-D-A	16mm	Standard	Single-ended	5 GHz
QSH-XXX-01-X-D-A	QTH-XXX-08-X-D-A	30mm	Standard	Single-ended	3 GHz

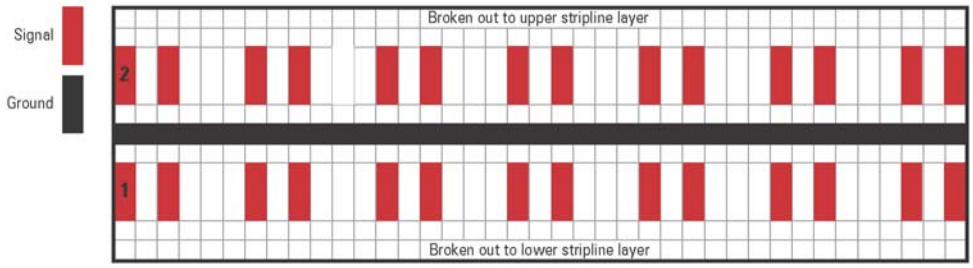
Series: QSH/QTH High Speed Socket 0.5 mm pitch

6.3 Standard Configuration, Differential Pair Signaling



Standard configuration, differential pair signaling					
Socket	**Header**	**Mated height**	**Configuration**	**Signaling**	**Performance**
QSH-XXX-01-X-D-A	QTH-XXX-01-X-D-A	5mm	Standard	Differential	8 GHz
QSH-XXX-01-X-D-A	QTH-XXX-02-X-D-A	8mm	Standard	Differential	8 GHz
QSH-XXX-01-X-D-A	QTH-XXX-03-X-D-A	11mm	Standard	Differential	5 GHz
QSH-XXX-01-X-D-A	QTH-XXX-04-X-D-A	16mm	Standard	Differential	5 GHz
QSH-XXX-01-X-D-A	QTH-XXX-08-X-D-A	30mm	Standard	Differential	1.5 GHz

6.4 Differential Configuration, Differential Pair Signaling

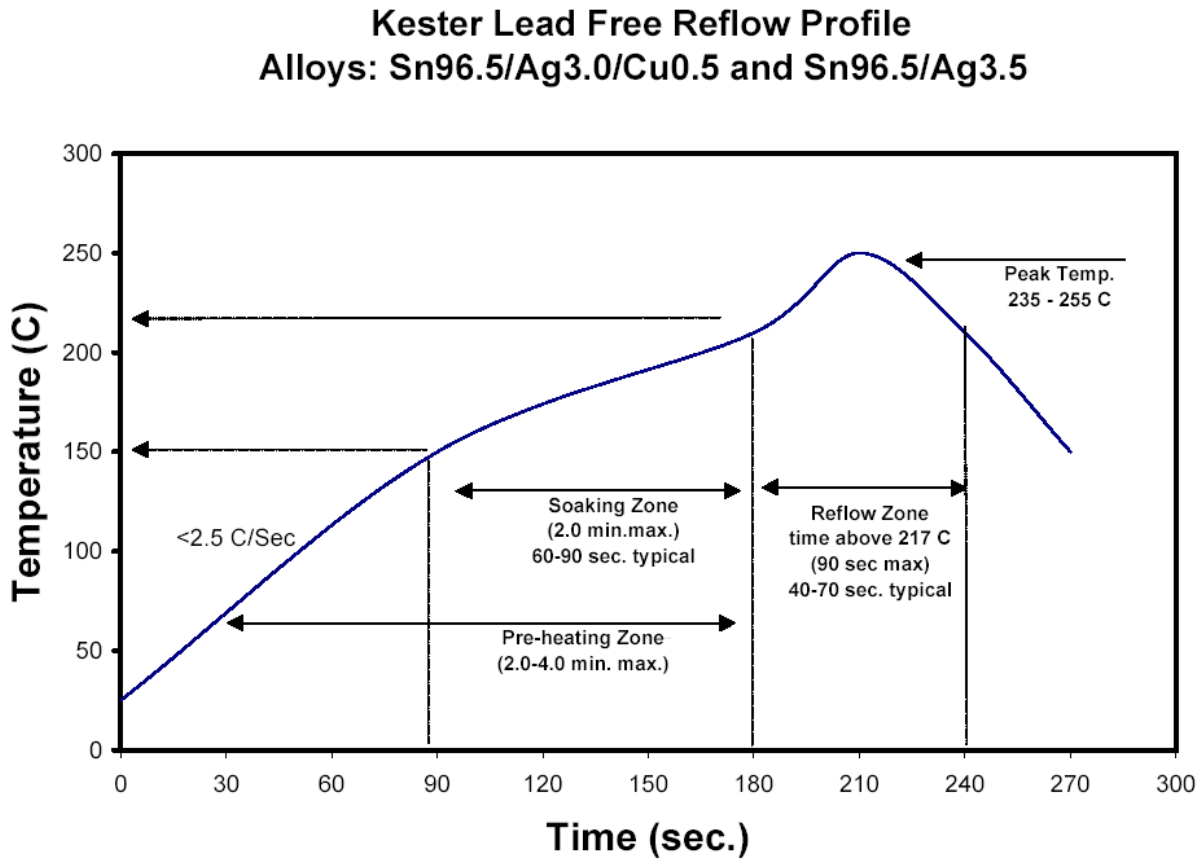


Differential configuration, differential pair signaling					
Socket	**Header**	**Mated height**	**Configuration**	**Signaling**	**Performance**
QSH-XXX-01-X-D-DP-A	QTH-XXX-01-X-D-DP-A	5mm	Differential	Differential	9.5 GHz
QSH-XXX-01-X-D-DP-A	QTH-XXX-02-X-D-DP-A	8mm	Differential	Differential	8.5 GHz
QSH-XXX-01-X-D-DP-A	QTH-XXX-03-X-D-DP-A	11mm	Differential	Differential	6.0 GHz
QSH-XXX-01-X-D-DP-A	QTH-XXX-04-X-D-DP-A	16mm	Differential	Differential	5.5 GHz
QSH-XXX-01-X-D-DP-A	QTH-XXX-08-X-D-DP-A	30mm	Differential	Differential	7.0 GHz

For additional information, contact Samtec Signal Integrity Group sig@samtec.com or 1-(800)-726-8329.

Series: QSH/QTH High Speed Socket 0.5 mm pitch

7.0 PROCESSING, LEAD-FREE



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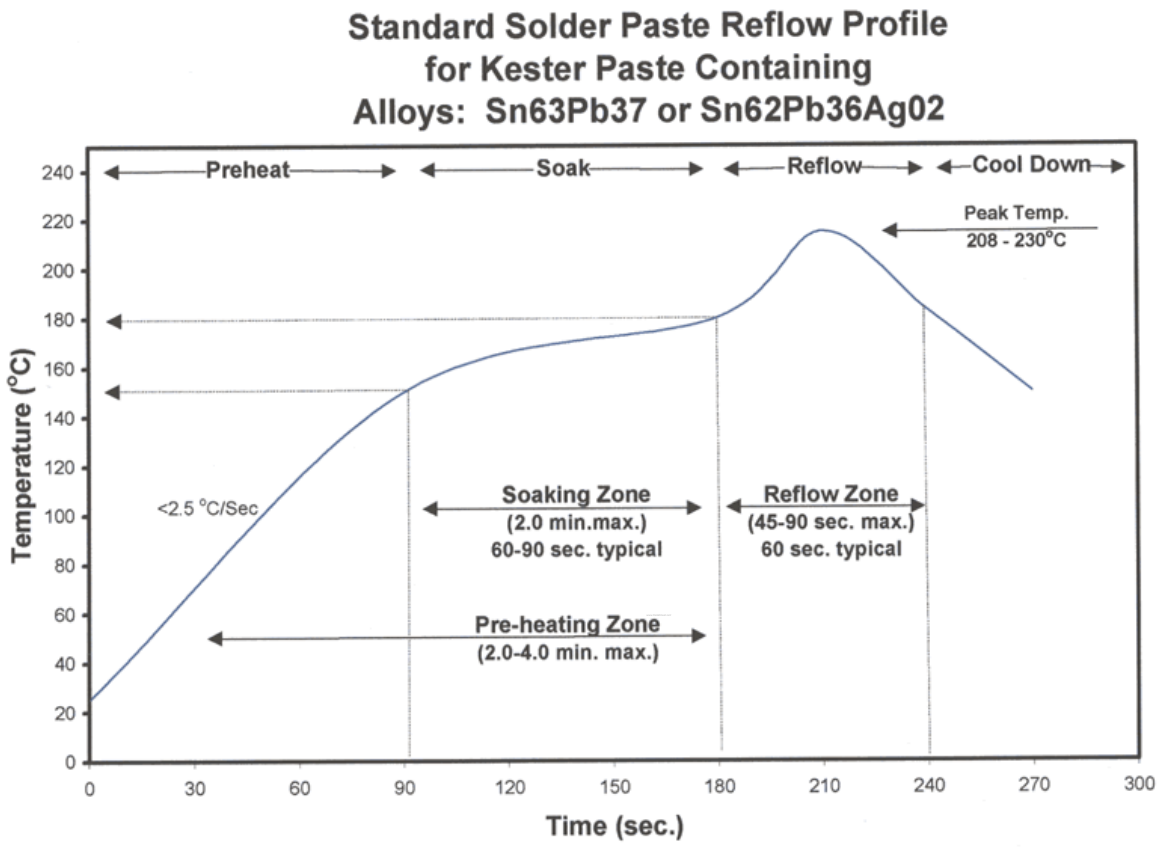
8.0 PROCESSING, Sn63/Pb37



Series: QSH/QTH High Speed Socket 0.5 mm pitch

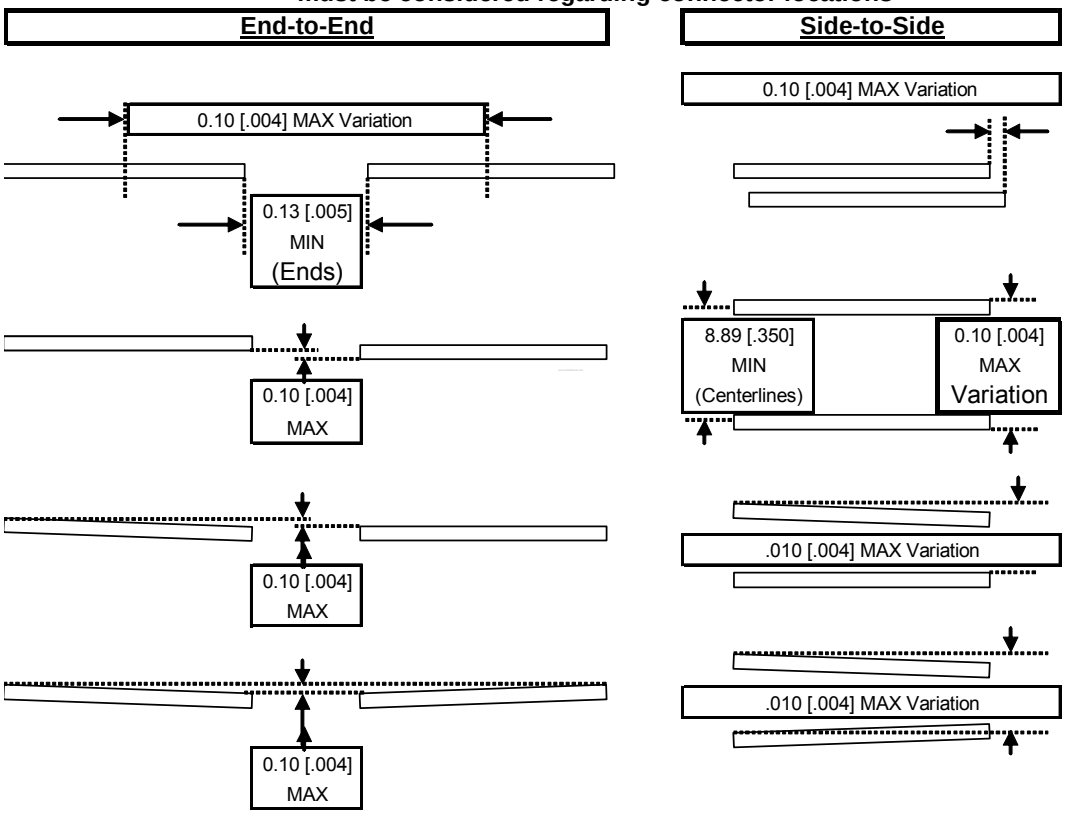
9.0 Multi Connector Processing Placement Limitations – See Following Figures

9.1 When using multiple connectors on a printed circuit board, care must be taken to ensure proper alignment and the following figures illustrate the placement limitations for these connectors, but do not take into account the spacing required for additional components, or automatic placement / rework equipment.

9.2 For applications requiring more than two connectors per board, please contact Samtec's Interconnect Processing group at ipg@samtec.com

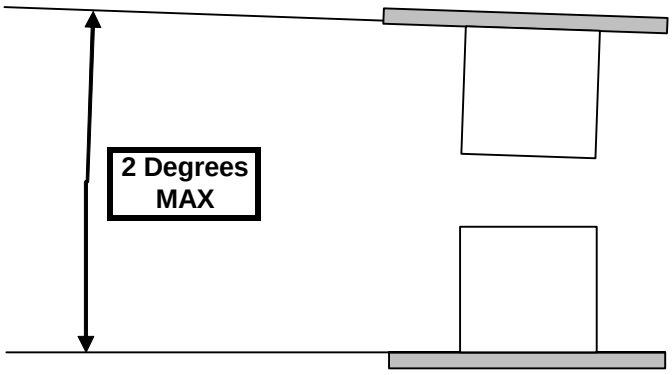
9.3 M**ulti Connector process**ing – Constrained Board Alignment

Constrained Board Alignment-multi connectors processed to boards
CTE differences between PCB / fixturing during re-flow must be considered regarding connector locations



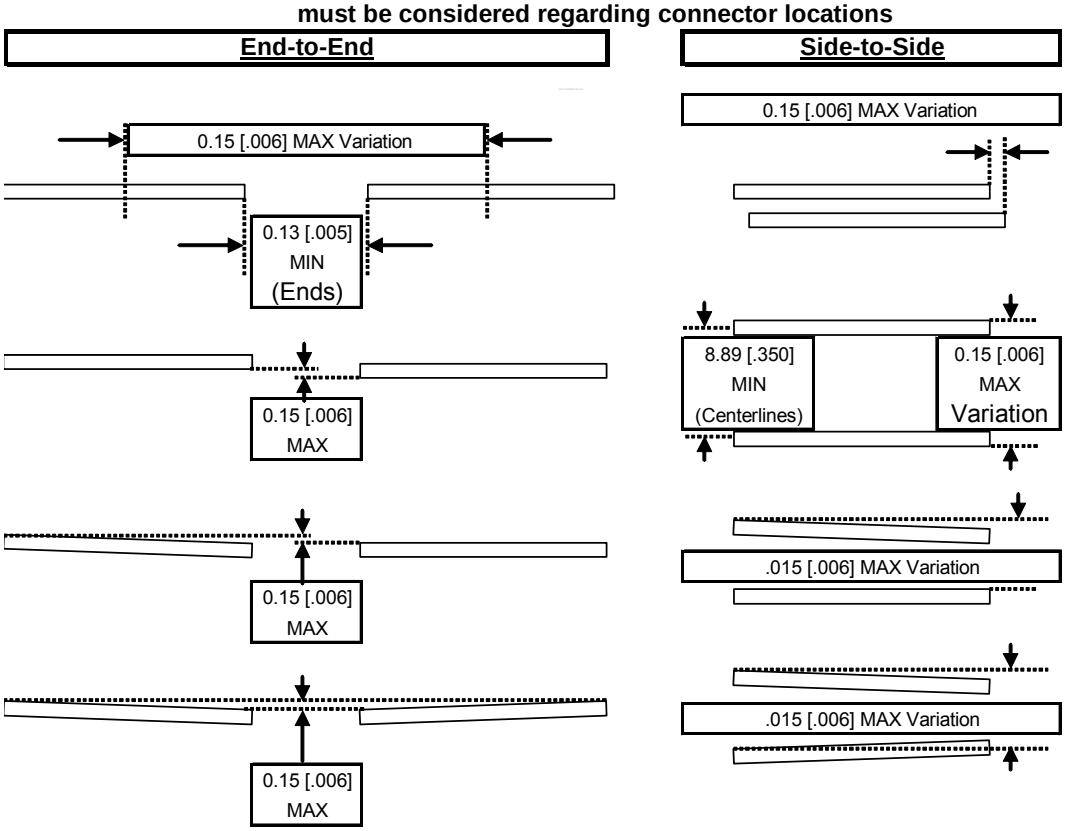
Series: QSH/QTH High Speed Socket 0.5 mm pitch

Constrained Board Alignment-multi connectors processed to boards



9.4 Multi Connector Processing - Free Floating Alignment

Free Floating Board Alignment-multi connectors processed to boards
CTE differences between PCB / fixturing during re-flow must be considered regarding connector locations



Series: QSH/QTH High Speed Socket 0.5 mm pitch

Free Floating Board Alignment-multi connectors processed to boards