



All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters. Unless otherwise specified, dimensions have a tolerance of ± 0.13 [$\pm .005$] and angles have a tolerance of $\pm 2^\circ$. Figures and illustrations are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification covers the requirements for application of FAKRA-compliant SMB 50-ohm right-angle pc board jack assemblies for use in motor vehicle radio frequency interfaces.

These jack assemblies are available in 1 or 2 position. The jack assembly consists of a housing and one subassembly (1 position) or two subassemblies (2 positions). Each subassembly has one signal and four ground through hole contacts. The ground contacts are dedicated make first, break last (MFBL). Each subassembly features a front dielectric, rear dielectric, foot, and four standoffs. The foot stabilizes the jack when seated on the pc board, and the standoffs allow easy pc board cleaning after soldering. The housing features a locking tab which is used to ensure full mating. The jack assemblies are available with or without keying ribs. The keying ribs are used for unique identification to prevent inadvertent mating. These jack assemblies are supplied in hard tray form for manual placement on the pc board.

When corresponding with personnel, use the terminology provided in this specification to facilitate your inquiries for information. Basic terms and features of this product are provided in Figure 1.

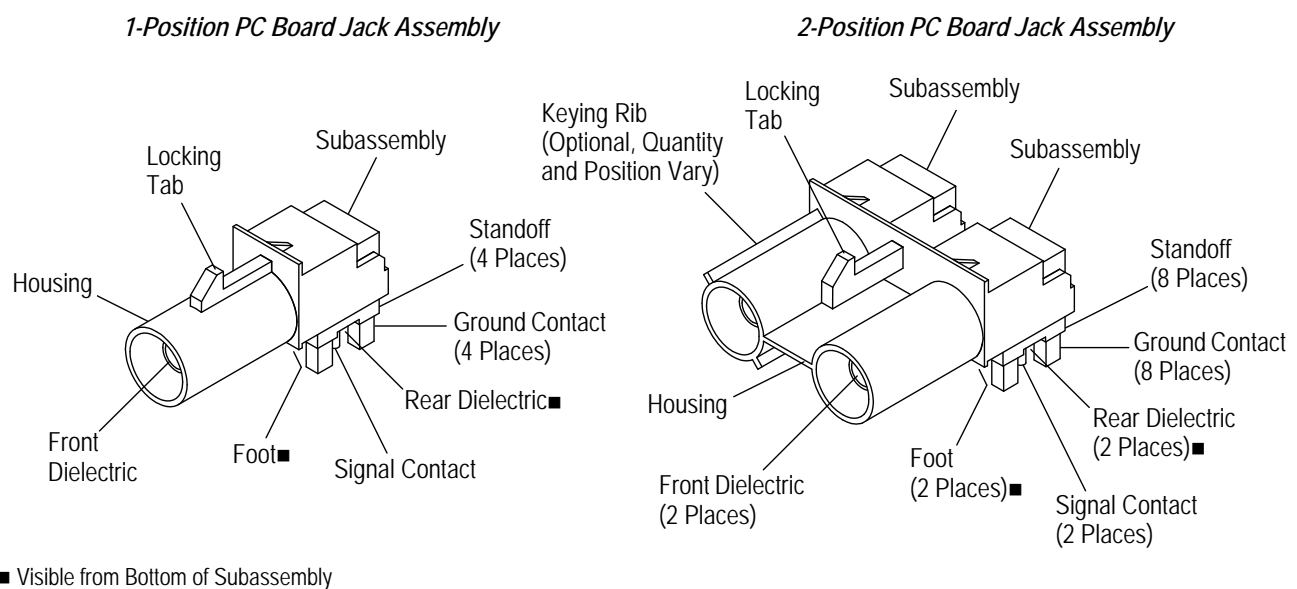


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

Revisions to this application specification include:

- Changed trademark to fluoropolymer in Paragraph 3.3

2.2. Customer Assistance

Reference Product Base Part Number 638817 and Product Code D955 are representative of FAKRA-compliant SMB 50-ohm right-angle pc board jack assemblies. Use of these numbers will identify the product line and expedite your inquiries through a service network established to help you obtain product and tooling information. Such information can be obtained through a local Representative or, after purchase, by calling PRODUCT INFORMATION at the number at the bottom of page 1.

2.3. Drawings

Customer Drawings for product part numbers are available from the service network. If there is a conflict between the information contained in the Customer Drawings and this specification or with any other technical documentation supplied, call PRODUCT INFORMATION at the number at the bottom of page 1.

2.4. Manuals

Manual 402-40 can be used as a guide to soldering. This manual provides information on various flux types and characteristics with the commercial designation and flux removal procedures. A checklist is included in the manual as a guide for information on soldering problems.

2.5. Specifications

Product Specification 108-2054 provides expected product performance and test information.

2.6. Instructional Material

Instruction Sheets (408-series) provide assembly instructions. Documents available which pertain to this product are:

- 408-8414 SMB 50-Ohm Right-Angle PC Board 1-Position Jack Assembly 638817-[]
- 408-8426 SMB 50-Ohm Inline Jack Kit 638831-[]
- 408-8427 SMB 50-Ohm Right-Angle PC Board 2-Position Jack Assembly 638818-[]
- 408-8428 SMB 50-Ohm Inline Plug Kits 638832-[], 1326159-[], and 1488335-[]

2.7. Standards

Application Specification 114-13069 provides product description and application requirements for related mating connectors.

Workmanship Specification 101-21 provides solder fillet requirements.

Test Specification 109-11 provides solderability requirements and quality inspection methods.

These jack assemblies are compatible with Military Standard (MIL-STD)-348, "Radio Frequency Connector Interfaces."

3. REQUIREMENTS

3.1. Safety

Do not stack product shipping containers so high that the containers buckle or deform.

3.2. Limitations

The jack assemblies are designed to operate in a temperature range of -40° to 100°C [-40° to 212°F].

3.3. Material

The housing is made of polybutylene terephthalate (PBT). The subassembly and ground contacts are made of zinc plated with tin over copper. The front dielectric is made of fluoropolymer, and the rear dielectric is made of polymethylpentene. The signal contacts are made of brass plated with gold over nickel.

3.4. Storage

A. Ultraviolet Light

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the jack assembly material.

B. Shelf Life

The jack assemblies should remain in the shipping containers until ready for use to prevent deformation to the contacts. The jack assemblies should be used on a first in, first out basis to avoid storage contamination that could adversely affect performance.

C. Chemical Exposure

Do not store jack assemblies near any chemical listed below as they may cause stress corrosion cracking in the contacts.

Alkalies	Ammonia	Citrates	Phosphates	Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfur Nitrites		Tartrates

3.5. PC Board

A. Material and Thickness

The pc board material shall be glass epoxy (FR-4 or G-10). The pc board thickness range shall be 1.57 through 1.90.

B. Tolerance

Maximum allowable bow of the pc board shall be 0.03 over the length of the jack assembly.

C. Pads

The pc board circuit pads must be solderable in accordance with Test Specification 109-11.

D. Hole Dimensions

The contact holes in the pc board must be drilled and plated through to specific dimensions. The drilled hole size, plating types, and plating thickness are dependent on the application requirements. The finished hole size must be as stated to provide unrestricted insertion and ensure adequate application of solder to the contacts. See Figure 2.

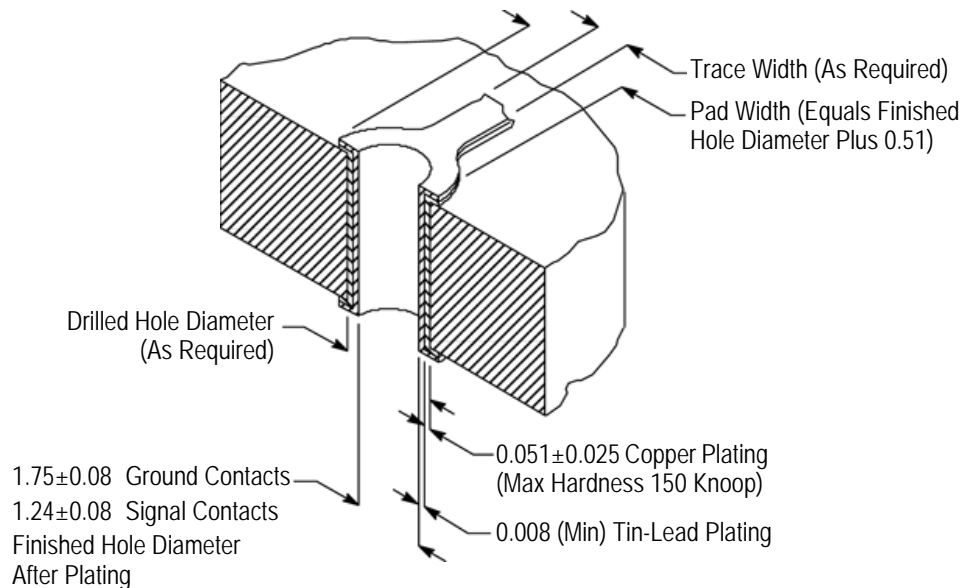


Figure 2

E. Layout

The holes in the pc board must be precisely located to ensure proper placement and optimum performance of the jack assembly. The pc board layout must be designed using the dimensions provided on the customer drawing for the specific jack assembly. A reference sample of the recommended pc board layout is shown in Figure 3.

Sample of Recommended PC Board Layout

Minimum Spacing Between Jack Assemblies is 12.7

Note: Not to Scale

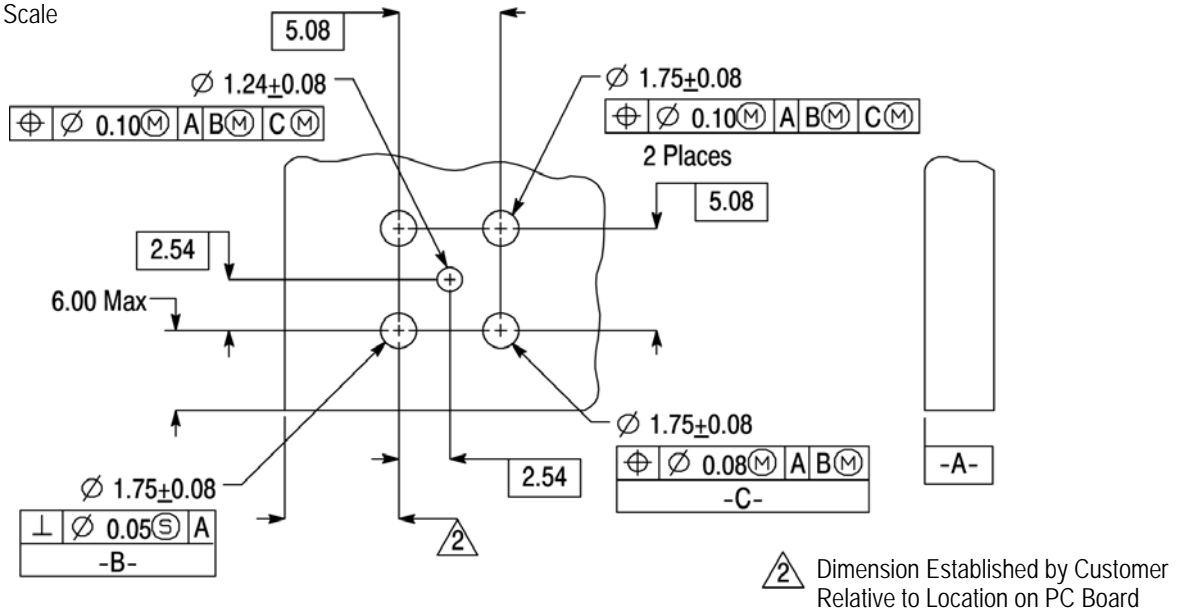


Figure 3

3.6. Spacing

Care must be used to avoid interference between adjacent jack assemblies and other components. The minimum allowable distance between jack assemblies to ensure proper mating is provided in Figure 4.

NOTE

The information provided is for manual placement of jack assemblies. If robotic equipment is used, other space allowances will be required for the grippers.

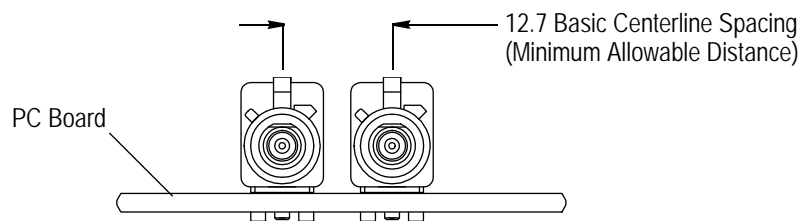


Figure 4

3.7. Placement



Jack assemblies should be handled only by the housing to avoid deformation, contamination, or damage to the contacts.

A. Registration

When placing jack assemblies on the pc board, make sure that the contacts are aligned and started into the matching holes before seating the jack assembly onto the pc board.

B. Seating

The jack assembly standoffs and foot(s) must be flush with the pc board as shown in Figure 5.

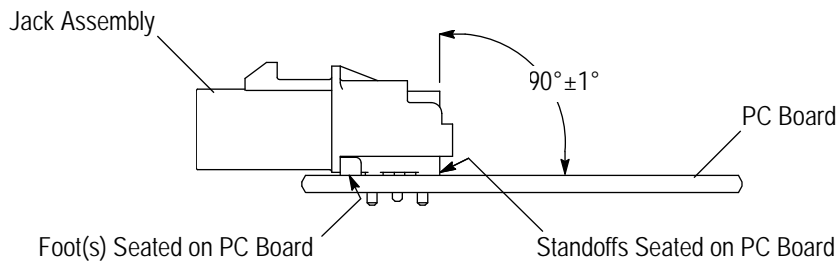


Figure 5

3.8. Soldering

Observe guidelines and procedures when soldering contacts. All solder joints should conform to those specified in Workmanship Specification 101-21 and all other requirements specified in this document. Solder, clean, and dry all wire leads to contacts according to the following:

A. Flux Selection

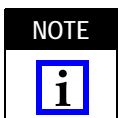
Contact must be fluxed prior to soldering with a mildly active, rosin base flux. Selection of the flux will depend on the type of pc board and other components mounted on the board. Additionally, the flux must be compatible with the wave solder line, manufacturing, health, and safety requirements. Call PRODUCT INFORMATION at the number at the bottom of page 1 for consideration of other types of flux. Flux that is compatible with these jack assemblies are provided in Figure 6.

FLUX TYPE	ACTIVITY	RESIDUE	COMMERCIAL DESIGNATION	
			KESTER	ALPHA
RMA	Mild	Noncorrosive	186	611

Figure 6

B. Process

The jack assemblies can be soldered using wave soldering or equivalent soldering techniques. It is recommended using SN60 or SN62 solder for these jack assemblies. The temperature and exposure time shall be as specified in Figure 7.



It is recommended that a hold-down be used to keep the jack assemblies in place until the soldering process is completed.

KESTER and ALPHA are trademarks of their respective owners.

SOLDERING PROCESS	WAVE TEMPERATURE	TIME (At Max Temperature)
Wave	260°C [500°F]	5 Seconds

Figure 7

C. Cleaning

After soldering, removal of fluxes, residues, and activators is necessary. Consult with the supplier of the solder and flux for recommended cleaning solvents. Cleaners must be free of dissolved flux and other contaminants. Common cleaning solvents that will not affect jack assemblies for the time and temperature specified are listed in Figure 8.

CLEANER		TIME (Minutes)	TEMPERATURE (Maximum)
NAME	TYPE		
ALPHA 2110	Aqueous	1	132°C [270°F]
BIOACT EC-7	Solvent	5	100°C [212°F]
Butyl CARBITOL	Solvent	1	Ambient Room
Isopropyl Alcohol	Solvent	5	100°C [212°F]
KESTER 5778	Aqueous		
KESTER 5779	Aqueous		
LONCOTERGE 520	Aqueous		
LONCOTERGE 530	Aqueous		
Terpene	Solvent		

BIOACT, CARBITOL, and LONCOTERGE are trademarks of their respective owners.

Figure 8

NOTE

If a particular solvent is not listed, contact PRODUCT INFORMATION at the number at the bottom of page 1.



CAUTION

Even when using "no clean" solder paste, it is imperative that the contact interface be kept clean of flux and residue, since it acts as an insulator. Flux may migrate under certain conditions with elevated temperatures and; therefore, cleaning is necessary.



DANGER

Consideration must be given to toxicity and other safety requirements recommended by the solvent manufacturer. Refer to the manufacturer's Material Safety Data Sheet (MSDS) for characteristics and handling of cleaners. Trichloroethylene and Methylene Chloride is not recommended because of harmful occupational and environmental effects. Both are carcinogenic (cancer-causing).



D. Drying

When drying cleaned jack assemblies, make certain that temperature limitations are not exceeded: -40° to 100°C [-40° to 212°F]. Excessive temperatures may cause assembly degradation.

3.9. Keying

Molded-in keying ribs prevent inadvertent mating of similar assemblies. The quantity and position of the keying combinations varies. Keying information is defined on the customer drawing for the specific jack assembly.

3.10. Checking Installed Jack Assembly

The installed jack assembly must have solder fillets evenly formed around each contact. The standoffs and foot(s) must be fully seated on the pc board. See Figure 9.

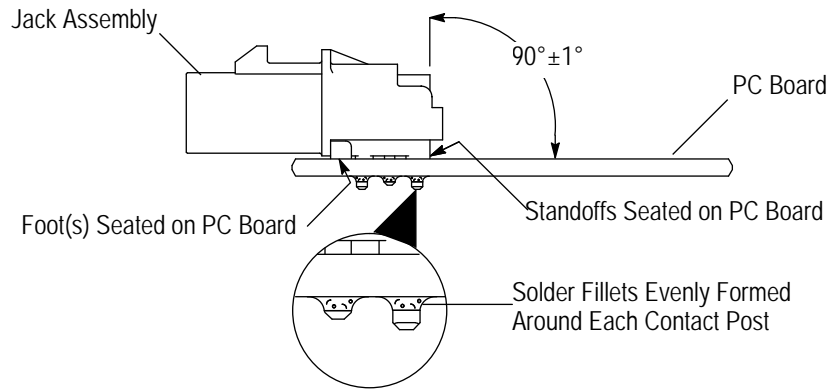


Figure 9

3.11. Repair

The jack assembly is not repairable. Damaged jack assemblies must be removed and replaced. The jack assemblies can be removed from the pc board by standard de-soldering methods. These jack assemblies must NOT be re-used after removal from the pc board.

4. QUALIFICATION

No qualifying support for FAKRA-compliant SMB 50-ohm right-angle pc board jack assemblies was defined at the time of publication of this document.

5. TOOLING

No tooling is required for placement of the jack assemblies on the pc board.

6. VISUAL AID

The illustration below shows a typical application of this product. This illustration should be used by production personnel to ensure a correctly applied product. Applications which DO NOT appear correct should be inspected using the information in the preceding pages of this specification and in the instructional material shipped with the product or tooling.

1-Position Jack Assembly Shown-Requirements Apply Equally to 2-Position Jack Assembly

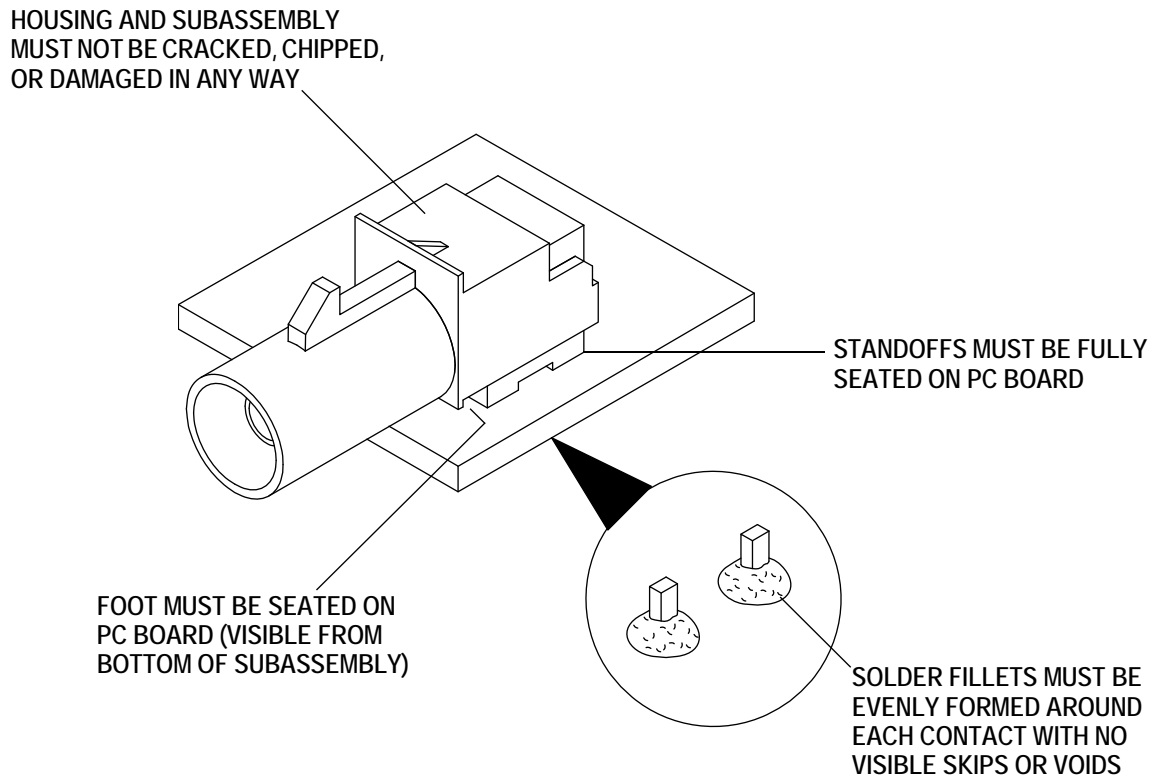


FIGURE 10. VISUAL AID