

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 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 Right-Angle PC Board Male Assemblies for use in motor vehicle radio frequency interfaces. These male assemblies are available in one position only.

The male assembly consists of a plastic housing, dielectric, center contact, and an outer contact. The center contact is a signal contact. The ground contact is dedicated make first, break last (MFBL). The housing provides visual identification of color/key. The color/key is defined by DIN 72594-1. The housing features a locking tab which is used to ensure full mating of the plug. The keying ribs are used for unique identification to prevent inadvertent mating, The ground contact connects prior to the center contact to ensure ground circuit and proper alignment of the pin contact. Four standoffs allow pc board cleaning after soldering.

These male assemblies are supplied in blister packaging form for robotic placement on the pc board.

When corresponding with TE Connectivity 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.

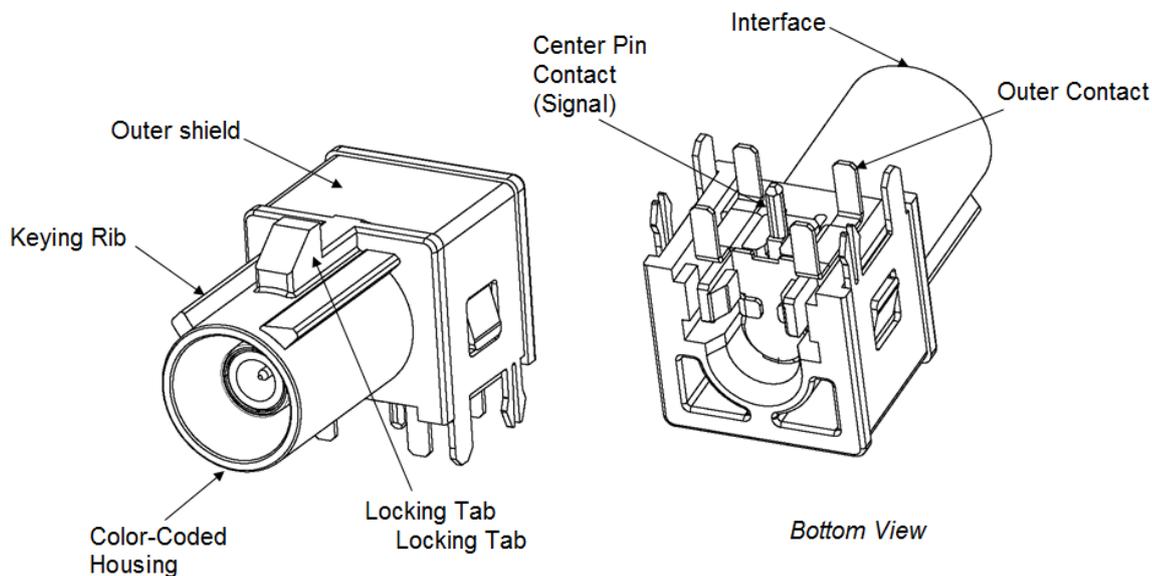


Figure 1

FAKRA is the DIN Standardization Committee of Motor Vehicles (FAKRA) 70010

2. REFERENCE MATERIAL

2.1. Revision Summary

Initial release of application specification

2.2. Customer Assistance

Reference Product Base Part Number 2209201 and Product Code W765 are representative of FAKRA Right-Angle PC Board Male 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. Standards and Publications

Standards and publications developed by the Deutsches Institut für Normung E.V. (DIN) and SAE and United States Council for Automotive Research (USCAR) provide industry test and performance requirements. Documents available which pertain to this product are: DVP&R - PRJ-10-3367-01, DIN 72594-1, SAE/USCAR-2, SAE/USCAR-17, and SAE/USCAR-18.

3. REQUIREMENTS

3.1. Safety

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

3.2. Limitations

The male assemblies are designed to operate in a temperature range of -40°C to 105°C.

3.3. Material

The ground contacts are made of pre-tin plated brass. The housing is made of PA 6T and dielectrics is made of PCT, and 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 male assembly material.

B. Shelf Life

The male assemblies should remain in the shipping containers until ready for use to prevent deformation to the contacts. The male 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 male 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. PG 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 mm.

B. Tolerance

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

C. Layout

The holes in the pc board must be precisely located to ensure proper placement and optimum performance of the male assembly. The pc board layout must be designed using the dimensions provided on the customer drawing for the specific male assembly. The recommended pc board layout is shown in Figure 2.

D. Pads

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

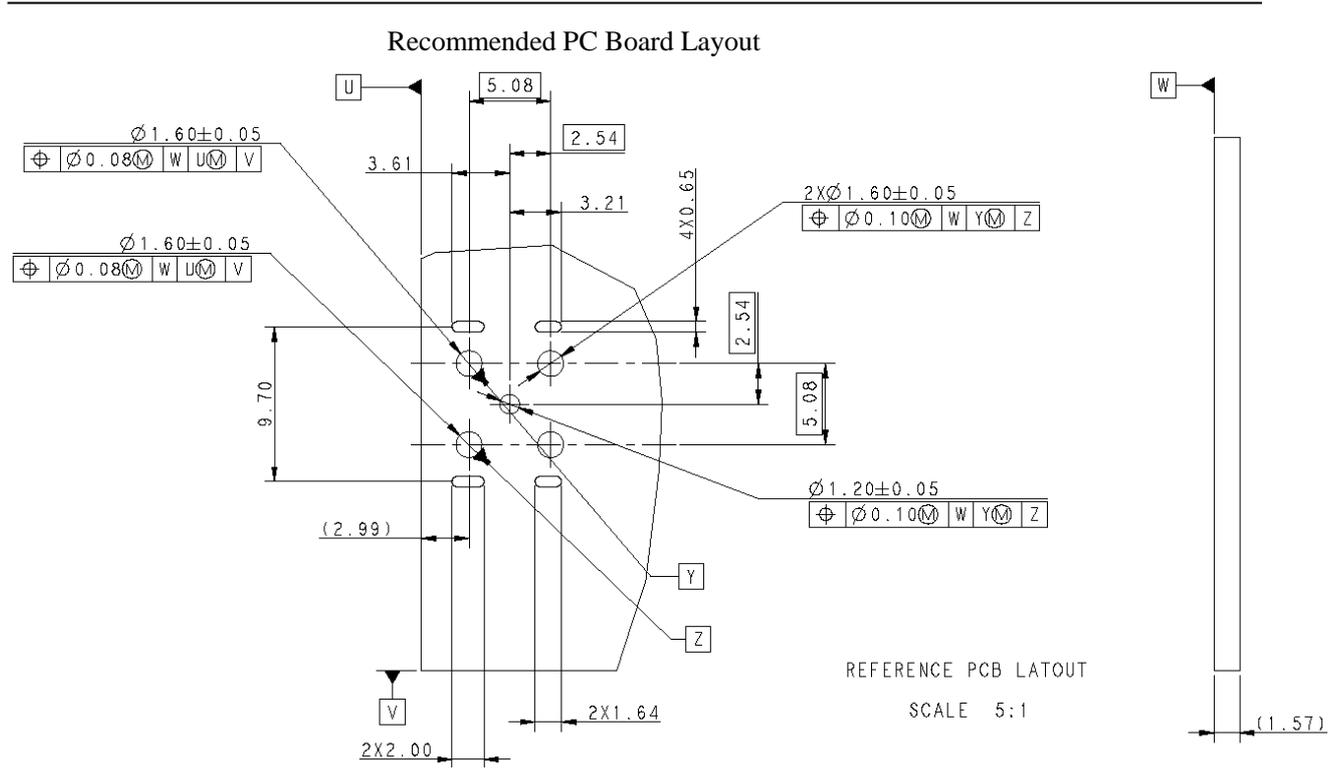


Figure 2

E. 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 3

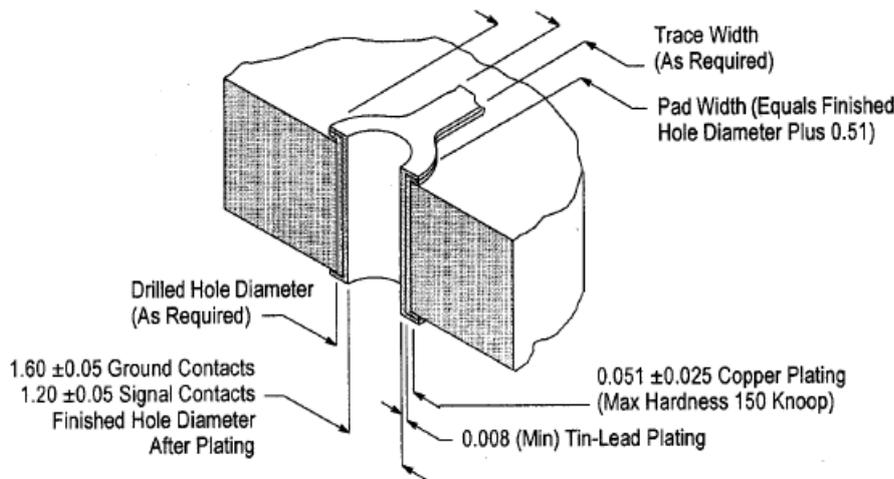
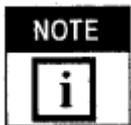


Figure 3

3.6. Spacing

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



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

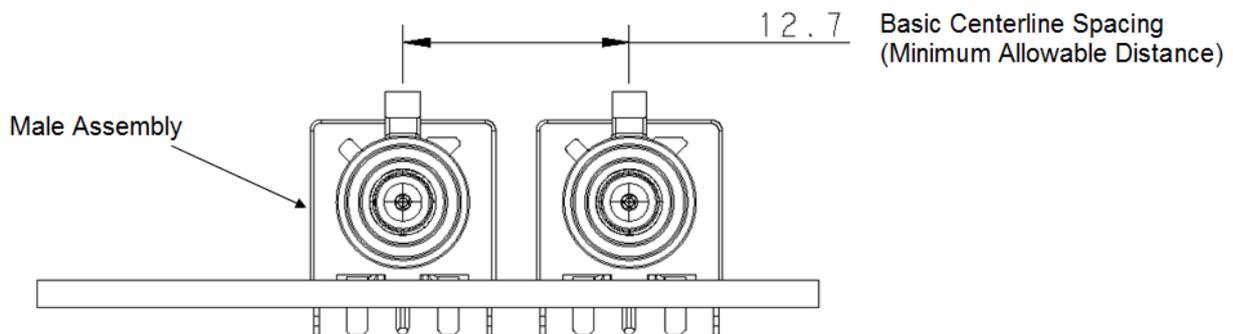


Figure 4

3.7. Placement



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

A. Registration

When placing male assemblies on the pc board, the contacts must be aligned and started into the matching holes before seating the male assembly onto the pc board.

B. Seating

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

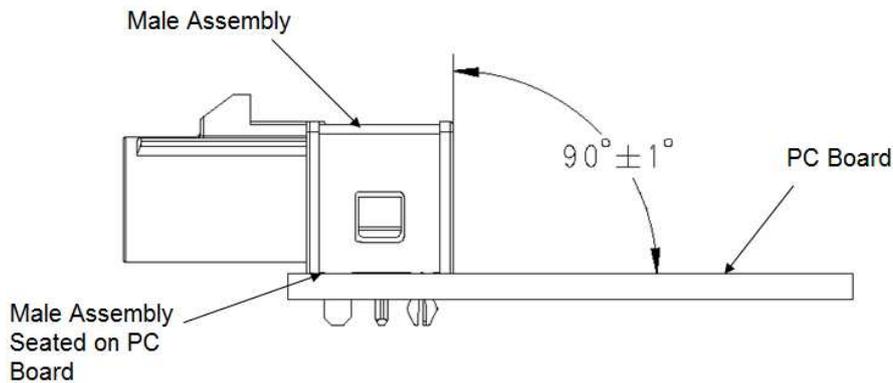


Figure 5

3.8. Soldering

Observe guidelines when soldering contacts. All solder joints should conform to referenced documents and all requirements specified in this application specification. All wire leads must be soldered to contacts and cleaned and dried according to the following:

A. Flux

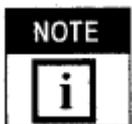
Contacts must be fluxed prior to soldering with a mildly active, rosin base flux. Selection of the flux will depend on the type of pc board and other components mounted on the pc board. Additionally, the-flux must be compatible with the 'wave solder line, manufacturing, health, and safety requirements. 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 male assemblies are provided in Figure 6.

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

Figure 6

B. Process

The male assemblies can be soldered using wave soldering or equivalent soldering techniques. It is recommended using SN60 or SN62 solder for these male 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 male assemblies in place until the soldering process is completed.

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 and times and temperatures that will not affect male assemblies are listed in Figure 8.

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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.

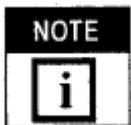


Consideration must be given to toxicity and other safety requirements recommended by the solvent manufacturer. Refer to the manufacturer's Material Safety Data Sheet (MSDS) for characteristics and handling of cleaners. Trichloroethylene and Methylene Chloride is not recommended because of harmful occupational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

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		

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Figure 8



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

D. Drying

When drying cleaned male assemblies, make certain that temperature limitations are not exceeded: -40°C to 105°C. 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 male assembly.

3.10. Checking Installed Male Assembly

The installed male 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.

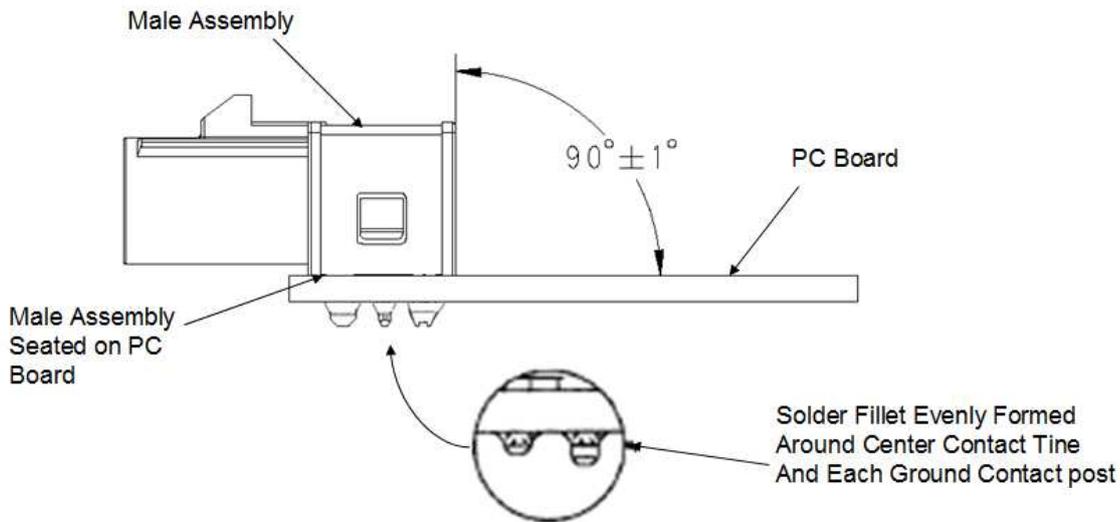


Figure 9

3.11. Repair

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

4. QUALIFICATION

This product is not required to be agency approved.

5. TOOLING

No tooling is required for placement of the male 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.

