**AC 05/28/2024**

**Production Probes New Product Order Form (NPOF) R2.4  
General Information & Detailed Worksheet instructions**

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**RF Products Group: Design Flow**

**Receipt of Order:** Upon receipt of an order, the Field Applications Engineer (FAE) contacts the customer to verify the information within the NPOF is complete and that all supplemental files (if supplied) contain only final design data & are not expected to change. Once the information is confirmed as final, the FAE must **release** the NPOF before the project can enter the Design Center queue.

**NPOF release (Field Applications Engineer):** Verify that all files referenced in the NPOF are included and are the final versions. Once verified, add the comment “Document released” in the **Order Form Edit Record**, then rename the file to append “\_Released” to the document filename (see example below). Cust-Project NPOF.xlsx 🡺 Cust-Project NPOF**\_Released**.xlsx

**Design Input Review:** The Designer reviews all input information & forms a layout plan. If input questions arise, the Designer will contact the customer prior to layout to clarify the input. FYI – a note can be placed on the Probe Head or PCB page of the NPOF requesting the Probe Head or PCB Designer contact the customer prior to design start.

**CAD Layout:** The Designer pulls the appropriate PCB or Probe Head template from the FormFactor, Inc. library and modifies it as needed to meet the requirements as defined in the NPOF. When complete, the design is peer reviewed and a first pass review form is completed. Any issues discovered during the review process are corrected and a customer design review package is prepared. The review package consists of an updated copy of the NPOF and PDF plots of all layers. If the design includes a custom PCB, a set of schematics and a netlist will be included in the review package as well. Note: PCB schematics are not included with very simple layouts.

**Customer review & Approval:** Once the review package is sent to the customer for review the Designer will move on to another project. No further action will be taken until either the design is approved, or a change request is received from the customer. Note: if the **Design Approval Preference** field on the **Cover Page** of the NPOF is set to **No Approval Required**, this step is bypassed and the project moves directly to **Design Release**. After release, a copy of the review package is sent to the customer for their records.

**Design Changes:** All design changes should be submitted in one request. Large changes (change in scope), changes in selected product features, or excessive small change requests may result in additional NRE charges and an extension of the schedule. Note: The shortest design cycle time will be achieved if the information contained in the NPOF is complete and final at the start of the design.

**Design Approval:** Receipt of Design approval triggers Sales-Ops to schedule the product for production and triggers the Design Center to process **Design Release**.

**Design Release:** All files needed for product production are generated and run through a final QC pass. When complete, the Bill of materials is uploaded into the MRP system and all manufacturing files are released for production.

**NPOF conventions & Overview**

**Overview**

The NPOF is an interactive order form designed to minimize and clarify the input required to design custom probe products to meet the needs of our customers. Care must be taken to ensure the data contained within the NPOF is complete & correct, otherwise the products may not perform as expected.

**NPOF Color Convention**



Yellow fields contain cautionary notices

Green fields are editable fields, many contain drop down selections

 **Blue text** indicates values that change based on NPOF content or selection

**Red Text** indicates an error condition or an item in need of correction



**Red corner triangles** indicate fields that contain helpful notes. Hover the cursor over the field to display the note.

**Caution - Inserting data via Copy & Paste**

When using copy / paste functions from within excel, be sure to **Paste special 🡪 values** into the NPOF, otherwise it is possible to copy in formatting from the source document that locks the data, preventing subsequent edits.

**NPOF changes after design start**

NPOFs should not be released to Design with preliminary or ‘enough data to get started’. Large changes (change in scope), multiple small changes, or changes in product features may trigger a requote / reschedule of the project. Any changes needed to the NPOF after design start should be communicated directly to the Designer on the project. The Designer will add Netlist and BOM data during design, therefore, *replacement* NPOFs should not be submitted.

**What does NRE cover?**

Design NRE (Nonrecurring Engineering) charges cover one design pass and a few hours of ‘tuning’. The Designer will modify a copy of a FormFactor, Inc. proprietary database to meet the requirements specified in the NPOF. NRE does not cover multiple design passes, therefore only complete and final input data should be **released** to the Design Center. **Note**: FormFactor Inc. owns all design materials. Databases, fab packages, Gerber files, etc. will not be released outside of FormFactor Inc. unless previously agreed upon in writing.

**Cover Page**

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1. This section is typically completed by FFI personnel: Probe Head & PCB Part numbers are entered by FFI Design, the remaining fields are completed by the FAE or Sales.
2. **Customer contact information** & company name / address. Files for review & approval will be sent to the individuals listed under **Name** and **Alternate Contact.**
3. **Probe head** selection: Choice of **None** (PCB order that does not accept a Probe Head), **Existing FFI** (PCB order for an existing Probe Head), or **New Design** (Enter details on the **Probe\_Head** page). If **New Design** selected, determine **Type** as:
   1. **First Article** – First unique design.
   2. **Revision** – Change of existing design. Prior version design will be obsoleted(EOL). Existing material disposition plan required.
   3. **Derivative** –Change of existing design. Prior version design will co-exist and can still be ordered.
4. **PCB** - Choices are:
   1. **None** – (Custom ISS orders for existing cores only)
   2. **Existing FFI** – Enter the FFI part number (250-xxxx-xx) in section 1 and fill in the blanks on the PCB page (data used by the Probe Depth chart). The probe head Designer will reference the original PCB information on file as needed.
   3. **New Design** – All PCB details are to be entered on the PCB page. **Type** options are **First Article**, **Revision**, or **Derivative**.
   4. **Customer (New)** – Fill in the blanks on the PCB page (data used by the Probe Depth chart). Unless specified otherwise, routing from the DUT to the PCB will be ‘best-fit’. The Probe Head Designer will record the DUT to PCB connections on the Netlist page of the NPOF.
   5. **Customer (Existing)** – Fill in the blanks on the PCB page (data used by the Probe Depth chart) and add the DUT to PCB connection detail to the CBI (Core/Board Interface) column on Pinlist page. The Probe Head Designer will route the probe head accordingly.
5. **Integration** – Planarization of the Probe Head mounting surface of the PCB (if stiffener equipped), and integrated Probe Head/Board testing. Selection combines the Probe Head & PCB under one part number (800-xxxx-00) and enables **Probe Card** selection on the **Test Notes** page (as opposed to Probe Head or PCB only)
6. **Custom ISS** – Activates the Custom ISS page. If Custom ISS is activated, select **Type** as **First Article**, **Revision**, or **Derivative**.
7. **Design Approval Preference** – options are:
   1. **No Approval Required** – Upon design completion, all files required for manufacturing are released and production begins immediately. After release, a copy of the standard file package (see below) is sent to the customer for their records.
   2. **Approval Required (standard file package)** – Files prepared and sent for customer approval consist of pdf plots of each layer, a copy of the NPOF, a schematic & Netlist (if Custom PCB Selected).
   3. **Approval Required (alternate file package)** – Select this option if non-standard files are requested for review. Note: requested files subject to review & approval by FFI, additional charges may apply.

**Pinlist Worksheet, Probe Head section**

**Columns A thru L:**

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Graphical user interface, application

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Select cell G9 to sort by pad name, cell H9 by net, etc.

* **Pwr/Gnd Groups**
  + **Power setting [B3]** – Controls the number of power supply entries on the DUT page & the number of available power domains selectable in column A. A setting of **1** will allow only line type P, a setting of **2** thru **9** will allow line type values P1 through P9 only. A setting of **10** or more allows line types from P01 through Pxx where xx is the maximum number of power domains needed. These options exist for compatibility with older NPOFs and to allow arrangement in the proper order when sorted.
  + **Gnd setting [C3]** – Sets the number of ground returns selectable in column A. A setting of **1** will allow only line type GND, A setting of **2** or more allows line types from GND1 through GNDxx where xx is the maximum number of ground returns needed.
* **Line Types**
  + **N/C** – No Contact. This location will be displayed on the chart; however, no tip will be installed unless specifically requested in the notes section of the pinlist or Probe Head tabs.
  + **DC** – DC lines are non-controlled impedance lines. Each DC line will be routed as an independent net unless specified otherwise.
  + **AC** – AC lines are loosely impedance controlled lines. Each AC line will be routed as an independent net unless specified otherwise.
  + **RF thru RF3** – RF lines are impedance controlled at 50Ω unless specified otherwise in column K. Each RF line will be routed as an independent net unless specified otherwise. Four RF line types (RF, RF1, RF2, RF3) are provided to enable grouping RF lines by speed or other functions on the chart page (i.e. RF group is 2.4GHz, RF1 is 12GHz, RF2 is 20GHz, etc).
  + **LB** – Loop Back. Used to indicate DUT pads that connect only to other DUT Pads.
  + **GNDxx** – Ground (& Pwr) line types are unique in that all signals of type GND will be shorted as one net, all signals of type GND1 will be shorted as a second net, etc.
  + **Pxx** – All pads of a given power line type (P01 for example) will be shorted as a single net, therefore each net must have a unique power line type number (P01, P02, etc).
* **Origin** – One pad should be identified as the origin pin “**O**”(sometimes referred to as pin 1 or pin A1). The origin pin is displayed as a red circle on the Chart and a red box on the Orientation tab to identify DUT orientation.
* **Sense** – Pads with an **S** in the Sense column will receive a second (sense) trace connected as close as possible to the DUT pad which is routed back to a separate CBI point for use with sense circuitry on the PCB. Pins with this option are displayed with a + on the single DUT chart.
* **Pad ID** – Pad designator (1, 2, 3, A1, A2, A3, etc)
* **Pad Center** – X and Y coordinates of the pad (or bump) centers.
* **Pad Name** – Pad name or function
* **Net Name** – Name of the electrical connection the pad belongs to. Note: pads with the same net name will be ganged together (electrically connected) on the Probe Head.
* **Bandwidth (GHz)** – Valid for RF line types only.
* **<>50Ω** – Valid for RF line types only. Use to specify an impedance other than the default 50 ohms.
* **SE or DIFF** – Valid for RF line types only. Use to specify Single Ended or Differential pair.
* **RF Pwr (dBm)** – Valid for RF line types only. Use to specify RF power requirement.

**Columns M thru V:**

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* **Line Match** – Specify groups of lines requiring matching in the **Group(#)** field and choose line matching **tolerance** (**TOL.**, Probe Head only), selectable range is ±1.5ps to ±20ps. Note: High speed CPW lines limit the ability of the Designer to match lengths. The distance from the die pins to the CBI must be of similar length in order to meet this spec with CPW routed nets.
* **TFI** – Thin Film Inductor. Types available are **F**ixed, **T**rimmable and **P**recision trimmable. When selected, requires **Value** (column P) and frequency (enter single frequency in column T).
* **Value / Connects to** – Enter component values in either (or both) **Value** fields, indicate the connection of the other end of the component in the **Connects to** field. Valid **Connects to** entries may be **Series**, a **net name** or a **Pad ID** (in the case of a loop back, for example). Consult Applications Engineering if more than two components are needed on one net. Note: SMT component needs to have wrap around termination.
* **Probe Head Notes** – General purpose Probe Head notes. No entries should be placed here that affect Probe Head specifications. When one note applies to several pins, place the note in the **notes** section of the **Probe Head page** and enter the **Probe Head page** note number here (“**See Probe Head note** **#5”** for example). If **TFI** is used, specify single test frequency.
* **CBI** – Enter pre-determined **C**ore/**B**oard **I**nterface locations here. This section is normally only used if the Probe Head is required work with a PCB that is already in existence (i.e. PCB designed previously).
* **Error conditions**
  + Some RF line speed data is missing! – One or more RF lines are missing Bandwidth entries.
  + Invalid entries detected – One or more lines have missing data (typically XY) or invalid line types. Common line type errors are Px when only P0x is allowed.

**Pinlist Worksheet, PCB section**



Table

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**Note:** When PCB connections are too complex to be entered here, complete the **RF Conn** section only, then reference an external file (schematic, power point, etc) on the PCB page.

* **Tester Ch** – This column is used to specify tester resources on direct dock style PCBs. Enter **BF** (Best Fit) if the channel selection is up to the Designer.
* **RF Conn** – Enter the appropriate RF connector from the drop down list. The contents of the drop down list depend on the PCB selection on the **PCB** page. Not all RF connectors are available in all situations. If **Other** selected, provide connector details (manufacturer, P/N, etc) in PCB Notes (column AG).
* **Line Match** – Enter the appropriate line matching tolerance for the PCB only from the drop down list. If matching by groups is required, designate the groups in the PCB Notes section.
* **Non-RF** – Enter non-RF connectors here. Common entries are **Header**, **D-Sub**, **2x50**, etc.
* **RefDes & Pin#** – When specific connections to a non-RF connector are required, enter here (Examples: J1.7, J2.15, etc).
* **Value / Connects to** – Enter component values in either (or both) **Value** fields, indicate how the other end of the component should be connected in the **Connects to** field. Valid **Connects to** entries may be **Series**, a **net name** that exists elsewhere on the pinlist, or a **Pad ID** (in the case of a loop back, for example).
* **Fuse Value** – Entering a fuse value here will drive the Designer to add a fuse to this circuit.
* **PCB Notes** – General purpose PCB notes. No entries should be placed here that affect PCB specifications. When one note applies to several entries, place a note in the **notes** section of the **PCB page** and enter the **PCB page** note number here (“**See PCB note #5”** for example).

**DUT Worksheet**

**Text

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1. **Project Name** / **Device Type** / **Application Tech** – Project name & Application Tech data is used for internal tracking. Device Type may affect layout technique.
2. **Device Construction**
   1. **Type of Substrate** – Enter substrate type
   2. **Probed Pad Material** – Affects probe tip selection. For example, a sharp point is used to break through the oxides on Al pads, whereas soft materials receive a large contact area to reduce pad (or solder-ball) deformation.
   3. **Pad Arrangement** – Some selections enable or disable other entries.
   4. **[Step Distance]** – Required for Multi-DUT, Custom ISS & some probe alignment options. Alternatively, may be changed to **Die Size** if the above items are not needed (will display on the chart page but is otherwise not used).
   5. **Minimum Pad Size** – Affects probe tip selection
   6. **Minimum Pad Pitch** – Affects probe tip selection
   7. **Minimum Row Pitch** – (enabled only when Pad Arrangement = 2 x N), affect probe tip selection.
   8. **Is the Die Passivated**? – Passivation thickness & depth can affect probe tip selection
   9. **Pad damage sensitivity?** – Affects probe tip selection, a larger tip size is used to distribute probe force to a larger area.
   10. **Device pinout is locked?** – **Requires Customer Confirmation.** Customer or FAE to confirm device information is finalized before layout starts. A change in pinout after layout starts requires re-design work and may incur additional charges.
3. **Probing Details**
   1. **Multi-DUT** – **Yes** enables additional options:
      1. **# of Die** – Displayed on the multi-DUT chart, also affects probe tip count, probe area, etc.
      2. **Die Step Distance** – Used to determine site to site step distance. Affects site placement in multi-DUT chart.
      3. **1st Device Site #** – Enter **0** or **1**.
      4. **Pinlist contains** – If set to **One**, **Pinlist** entries will be multiplied by **# of die**, if set to **All**, all probed pads must be entered on the **Pinlist** page (this option is typically only used when specifying exact CBI connections for every pad on every device).
   2. **Application Environment** – Used for internal tracking
   3. **Probing Temperature** – Affects probe tip configuration & suggested PCB material
   4. **Make/Model of Prober** – This information is useful in debug situations.
   5. **Probe card holder** – This information is useful in debug situations.
   6. **Step Distance** – **Requires Customer Confirmation.** Customer or FAE to confirm listed information is correct. A change in step distance after layout starts requires re-design work and may incur additional charges.
4. **Device Power Supply Details** – The number of entries is controlled by cell **B3** on the **Pinlist** page. Net names are also pulled from the **Pinlist** page. The green shaded areas are used to determine bypass capacitor specifications as well as trace widths of the power supply lines.

**DUT page Errors & Warnings**

**Error: Pad Pattern is larger than specified die size!** – Activated when the probe area (Chart page) + the minimum pad size is larger than the die size. This error can be caused by a swapped X & Y die size.

**Error: Die Pattern overhangs step distance!** – Activated when the step distance is less than the probe area (Chart page) + the minimum pad size. This error is often caused by a swapped X & Y step distance.

**Error: Die Size is larger than step distance!** – Usually triggered by a swapped X & Y in either the die size or step distance.

**Pxx errors found on Pinlist page - Non-existent or blank / incorrect net names** – Activated when a power supply on the **Pinlist** page has no **Net Name** entry (row H), or contains a **Net Name** that is contrary to the **Net Name** of another pad with the same power supply number.

**Warning: Multiple sites are sharing power supplies** – Typically in a multi-DUT configuration no two devices share a power supply. Activates only when multiple devices are entered in the pinlist.

**Warning: Pads overlap** – Pads should not overlap. Activates when minimum pad pitch equals or smaller than minimum pad size.

**High Current Warning - Consult Factory** – For probing non-gold pad material, this warning appears when the current per tip >200mA on a bus with 3 tips or less, or >400mA on a larger bus.

**Chart Page, Single Die Chart**



The single DUT chart is displayed in both large blips and small blips (for dense patterns), otherwise the two charts are identical.

1. **Die Viewpoint** – Shows the current viewpoint of the images in the charts.
2. **Probe area** – XY size of a bounding box containing all XY probe points. Does not take into account actual pad size.
3. **Single DUT Chart Control**
   1. **Coordinate Display** – Options are **Pinlist** or **Probe head**. The **Pinlist** setting displays the XY coordinates exactly as entered on the Pinlist tab. The **Probe Head** setting displays the XY coordinates after readjustment as needed for the Probe Head. For Pyramid cores the 0,0 point is centered on the probe face while the actual probe pattern is shifted to a position where the probe force is even in all directions (North/South/East/West). This shift is necessary to prevent probe head tilt during test. Note that this setting has no effect on Probe Head layout, it is merely a display option that shows the result of this balancing for informational purposes only.
   2. **Display Step Distance (or die size)** – if set to **Yes** will display the step distance or die size as entered on the DUT tab.
   3. **Display minimum pitch** – If set to **Yes** runs a function which calculates the minimum pitch and places an X at each device pin at the calculated distance. Note that this operation if left on will slow spreadsheet performance.

**Chart Page, Multi-DUT Chart**



1. **Stepping Tool** – Selection activates the **Diagonal** or **Rectangular** stepping tool.
2. **Step settings**:
   1. **Diagonal Tool / Diagonal Settings** – Starting from the first DUT, steps the remaining DUTs in increments of up to +/-3 step distances. Vertical or horizontal patterns may be achieved by setting either X or Y at zero.
   2. **Diagonal Tool / Even Die control –** Used to produce staggered or alternating DUT patterns. When the 1st DUT is DUT 1, this tool affects only the even numbered DUTs (2 thru X). If the 1st DUT is DUT 0 it affects only the odd numbered DUTs.
   3. **Rectangular Tool / Rectangle Settings –** Use the **Columns** drop-down to set the number of columns desired, the **Rows** drop-down will update automatically to show the available row options.
   4. **Rectangular Tool / Skip settings –** Used to insert row or column skips.
3. **Probe Area Size** - XY size of a bounding box containing all XY probe points. Does not take into account actual pad size. Probe Head Orientation 1 is the size of the orthogonal bounding box (in dotted black), Probe Head Orientation 2 is the size of the diagonal bounding box (in dotted blue). Note that use of Probe Head Orientation 2 will require the Probe Head to be installed at the specified angle on the PCB.
4. **P.H. Orientation**: Probe head orientation selection. Choices are **P.H. Orientation 1**, **P.H. Orientation 2,** or **Designer’s choice**. If **P.H. Orientation 1** or **P.H. Orientation 2** is selected, the Designer will not alter the requested pattern. If **Designer’s choice** is selected, the Designer will select a pattern that achieves the best fan-out for the Probe Head.

**Orientation Page**

1. **Probe area Outline & Origin Pin\*** – The black dashed outline represents the probe area.   
   \* The Die Origin Pin appears if the NPOF is in single DUT mode & an orientation pin has been identified on the **Pinlist** tab.
2. **Probe Head outline** – the general shape of the probe head is shown here. Note that in **Multi-DUT** mode with **P. H. Orientation 2** selected (**Chart** page), the image will be shown correctly rotated.
3. **PCB settings:**
   1. **PCB Shape\*** – This setting determines the PCB shape shown on the main orientation image.  
      \* This control is displayed only if the NPOF cannot determine correct PCB shape based on the PCB page settings.
   2. **PCB Feature Select** – Select from the available features or type in a custom feature to be used to indicate PCB orientation.
   3. **PCB Arrows** (or alternate feature from above)– Use this setting to move the blue PCB orientation marker to the appropriate location on the PCB image.
4. **PCB outline** – See **3a** above to edit.
5. **Display Settings**
   1. **Viewed from** – Choices are **Tester Side** or **Wafer Side**. Note this setting affects the display only, it does not affect the design of the probe card in any way.
   2. **Rotate Core Frame** (single DUT mode only) – Use this setting to rotate the frame + or – 45 degrees. If rotations greater than 45 degrees are required, the source XY coordinates on the **Pinlist** page must be rotated.
   3. **PCB Settings –** See number 3 above.
   4. **Wafer Flat/Notch & Operator Position** – Controls orientation of these features.
6. **Magnified Multi-DUT Probe Area** (multi-DUT mode only) – Displays the individual die images/orientation pins within the probe area.
7. **Orientation Approval** – Set to **Approved** once satisfied with the orientation settings or set to **Designer’s Choice** if orientation is flexible.

**Probe Head Worksheet**

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**1**

**2**

**3**

**4**

**5**

1. **Probe Head Selection** – Select Probe Head type from drop down list. I/O & RF limits of the selected Probe Head are displayed at right, max probe area is displayed at the base of the **Probe Depth** chart.
2. **Summary Data** – Miscellaneous probe head data based on Probe Head selection & input from the DUT and Pinlist tabs.
3. **Probe Head Options** (option availability varies depending on Probe Head Selection)
   1. **Install Edge Sense** – A mechanical system that detects wafer contact. Options are **Yes** or **No**.
   2. **Core ID Option** – Add a small PCB to the Probe Head frame that includes an ID resistor or EEPROM and a connector used for electrical connection to the PCB.
   3. **Leakage Spec** – (RFL or MSL only)
   4. **Planarization Spacer** – Used in some direct-dock probe applications
   5. **Core Frame Window** –(Not available for P2000) Seals the Probe Head. Usually used in cold temperature testing (not compatible with the above Planarization Spacer).
   6. **Total # of components** – Used to verify Pinlist tab selection.
   7. **Probe/Pad Alignment** – (Pyramid cores sized LSI & less only) Used for visual alignment. Select desired option from drop-down list.
   8. **Routing Keep-outs** – If set to **Yes** offers several keep-out options.
   9. **Membrane Layer(s)** – Used to override the default number of metal layers that is typically used for the selected product.
   10. **Label Options:  
       Laser Engraving** – Allows a laser engraved (static) label of up to 12 characters.  
       **Core Frame Product Label –** Enter **Paper Label** with text up to 12 characters, or **Data Matrix Label** of up to 12 characters. Note: the Serialization option consumes 3 characters.

**Core Box Label –** Enter **Text Label** with text up to 12 characters, or **Barcode Label** of up to 10 characters. Note: the Serialization option consumes 3 characters.

1. **Probe Depth** – Set Core Draft Selection to choose the probe depth required. The PCB portion of the Probe Depth display is controlled by entries on the PCB page. Note: Actual probe depth will vary with PCB thickness for Pyramid products. Note: The Pyramid probe head has a tolerance of +/- 0.012”.  
   **Requires Customer Approval:** If the displayed probe depth is not correct, the product will not be correct. Due to the three-dimensional configuration of the membrane, a change in Probe Head depth after layout requires considerable re-design work and may incur additional charges.  
   **Note:** custom probe depths are not available.
2. **Probe Head Notes** – The notes section is used to provide supplemental design detail. Do not enter input data here that already exists elsewhere in the NPOF.   
   Reference external documents (schematics for example) to provide a starting point for the layout “Layout similar to 700-xxxx-00 except for…”, or provide input that is referenced in the **Pinlist** section by note number “All lines referenced by this note are to be matched as a group” for example.   
   If any note requests additional or alternate performance or mechanical specification as compared to the product spec sheet, set the flag in the upper right “Is any item below request for non-standard performance specification?” to **Yes**, otherwise set to **No**. All such non-standard requests must be reviewed and approved prior to acceptance.

**PCB Worksheet**



1. **PCB Type** – Options are:
   1. **ATE Interface:** This type of PCB hard docks to the test head and has a predefined size, shape and metal pattern. Use the **Selection** drop-down to choose the appropriate make & model. The default thickness will be used unless an alternative thickness is entered. **Note:** This option requires a tester configuration file that details the type and location of tester resources installed in the customer’s test system.
   2. **Cable Interface:** Use this option for PCBs that are connected to test equipment via cabling. 4.5” x 7” are the most common, however other lengths or shapes may be selected.  
      **Note:** The **Edge Mill** option appears when the probe head is set to Pyramid/RFC. Edge milling the PCB decreases the distance between the mounting surface of the PCB and the wafer, effectively increasing probe depth (shown on the Probe Head tab – probe depth chart).
   3. **Configured (Pyramid RFC, RFL or MSL only):** This type of PCB is a generic design that can be configured using a variety of components (coax RF connectors, in-line headers, caps/resistors) and may be somewhat re-routed by way of trace cutting/jumpering.
2. **General PCB Information** – This section provides some generic information about the selected PCB type.
3. **Design Requirements** – The information in this section is a brief summary of the data found in the PCB section of the Pinlist tab.
4. **PCB Options** (PCB type / Selection dependent):
   1. **PCB Handles –** (Agilent 407x). See details [here](#PCB_Handles).
   2. **Edge Connector –** (Configured RFB-47-CSK). See details [here](#PCB_Edge_Conn).
   3. **Electrical Connections –** Choose **Best Fit** or one of the dedicated options. Best fit is the least expensive option and typically results in the cleanest routing & shortest lead time.
   4. **Install Edge Sense –** This option will be set to ‘required’ if edge sense is selected on the Probe Head page, otherwise it is optional.
   5. **PCB Material –** Select from the drop-down list, or select **Other** to specify an alternative.
   6. **Fuses on power nets –** A **Yes** entry here will result in installation of a fuse holder & fuse on all power supplies listed on the **DUT** page with current requirements above 100mA.
   7. **Probe Card Hardware** – Select **Source / Installed** options for Stiffener, RF Bracket & PCB to RF Bracket cables as follows:
      1. **Factory / Factory** – Item will be purchased & installed by FormFactor.
      2. **Customer / Factory**– Item will be supplied by the customer and shipped to FormFactor for installation at the factory. **Note:** Late arrival of customer supplied components, receipt of unexpected components or shortages, or last minute assembly changes are likely to cause an extension of the product delivery date.
      3. **N/A or Cust Installed** – Item either doesn’t apply, or the customer will install this item themselves.
5. **File References –** List any additional files that are required to complete the design.
6. **PCB Notes –** Add any additional relevant design information here. **Note:** please do not enter information here that already exists in other locations of the NPOF.

**PCB Edge Connector Detail** – (see image below). If set to **Yes**, allows selection between two types (48 & 70 finger connectors) as well as the option to cut the PCB to a specific length.  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
 **70 Finger Edge Connector installed on RFB-47-CSK**

**PCB Handle options** (RFB-407x only) Choice of **Standard** or **Flush Mount** (extra cost options)  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
 **RFB-407x Standard Handles RFB-407x Flush Mount Handles**

**Custom ISS Worksheet\***

\* The ISS setup appears only if the ‘Options: Custom ISS’ has been enabled on the **Cover Page** tab.

A picture containing graphical user interface

Description automatically generated 



1. **ISS Options**
   1. **Substrate Size** – Choose **1”** or **3”** (square). Note: selection affects price.
   2. **Pattern defined on: –** Use the ISS **Configuration Table** if possible, otherwise a custom pattern may be defined on a separate document. Note that custom patterns may affect NRE charges.
   3. **ISS Label –** Choose from the existing project name, or select **Other** and enter an alternative.
   4. **Fill un-used sites with Alignment Marks –** A **Yes** entry fills undefined (blank) entries in the configuration chart with alignment marks.
   5. **Rotate ISS 90° –** Some rectangular patterns can achieve more sites if rotated.
   6. **Add loads to un-used RF pads in Thru –** A **Yes** entry enables customer to specify load value to all un-used RF pads (not used in Thru pattern definition table) in Thru.
2. **Configuration table entry modes**
   1. **Structure entry mode – Single Die** mode inserts a row of single die patterns for each **Structure Type** entered in the table, whereas the **Multi-Die** option adds the entire multi-DUT pattern (except when Alignment Marks are selected)
   2. **Column Spacing –** Select from **1x Step** (standard spacing), **2x Step** (skip die), or **1x step +** (custom spacing, not applicable for Multi-Die)
   3. **Row Spacing –** Same options as above
3. **ISS Configuration Table**
   1. **Structure Type –** (**Note Short, Open & Load settings apply to all RF ports at once**)  
      Available structures:
      1. **Alignment Marks –**  50µm square alignment marks are added at each pad location
      2. **Load –** Select one of the predefined load values in the **Load Ω** section.
      3. **Offset Open**
      4. **Offset Short**
      5. **Open**
      6. **Short**
      7. **Thru –** Up to 10 different thru patterns may be defined (see section 4)
   2. **Load Ω –** Load value selection enabled only when **Load** is selected or **Add loads to un-used RF pads in Thru** is **Yes**.
   3. **Verification Standard –** (optional) changes the last pattern in the row to **Offset Open** or **Offset Short.**
4. **Thru pattern definition table –** Use this section to define up to 10 thru sites configurations with as many as 16 two port thru paths each.
5. **Special Instructions –** Add any special instructions here. Special instructions may be subject to additional product or NRE charges, and/or lead time.

**Test Notes Worksheet**

A screenshot of a report

Description automatically generated

1. **Standard Test Reports** – PB3500 data is provided for all Probe Heads. S-Parameters are provided for all products that contain RF lines. Low Leakage reports are specific to the Pyramid RFL & MSL products.  
   **Create Reports for**:
   1. First Article only – the report will be generated for only the first item manufactured.
   2. Every Article – The report will be run for every item manufactured

**Applies To**:

1. **Probe Head Only** if ‘New Design’ is selected for the probe head on the cover page.
2. **PCB Only** if ‘New Design’ is selected for the PCB on the cover page.
3. **PH+PCB** if integration selected on the cover page
4. **Additional cost options** – Six additional test reports are available utilizing the same ‘Create Reports for’ and ‘Applies to’ settings as above.  
   **SI and PI Simulation** – Set the appropriate ‘Applies to’ settings, number of nets, and enter the details of the request in the ‘Other special tests or reports’ section
5. **Other special tests or reports** – Enter any additional requirements here. Note that any entry here will trigger a review and may incur additional costs or add lead time.

**Order Form Edit Record**



Use this section to record changes to the NPOF document. If the change applies to a new product rev, enter the appropriate rev letter in the Rev section.

Note: This is a document change record, not a revision history of the products listed on the various tabs.