





P/L DM INTEGRATION PROCEDURE (PRELIMINARY) 22-23 JAN 2020





1) DM AIT PROCEDURES

- BASELINE PROCEDURE
- ALTERNATIVE PROCEDURE

2) OPEN POINTS





CRYSTALS SUB-ASSEMBLY



WRAP EACH CRYSTAL WITH 1 REFLECTIVE PAPER LAYER (DF2000MA ~105 µm thick)



CRYSTALS SUB-ASSEMBLY

USING A **CUSTOM EQUIPMENT**, _____ ALIGN THE CRYSTALS AND WRAP THEM WITH KAPTON/MYLAR TAPE TO:

- 1) OBTAIN A <u>SOLID ASSEMBLY</u>
- 2) INCREASE THE LATERAL DIMENSIONS TO FIT PRECISELY INTO THE RECTANGULAR SLOT ON THE CRYSTAL BOX

NOTE: MAYBE BETTER TO ALIGN THE UNWRAPPED CRYSTAL SURFACE (-> CLEAN AND «SOFT» CUSTOM EQUIPMENT

CONTROL THE MAXIMUM LATERAL DIMENSIONS WITH A CUSTOM CONTROL[~] TEMPLATE



ASSEMBLY & INTEGRATION PROCEDURE (PRELIMINARY)

CRYSTAL BOX SUB-ASSEMBLY





CRYSTAL BOX SUB-ASSEMBLY

PLACE THE CRYSTAL SUB-ASSEMBLIES INTO THE CRYSTAL BOX

TIGHTEN THE <u>CRYSTAL BOX LID</u> SCREWS, TURN IT UPSIDE-DOWN AND PLACE THE <u>SILICONE PADS</u>





FEE/PAYLOAD SUPPORT STRUCTURE SUB-ASSEMBLY

PLACE THE CRYSTAL SUB-ASSEMBLIES INTO THE CRYSTAL BOX

TIGHTEN THE CRYSTAL BOX LID SCREWS, TURN IT UPSIDE-DOWN AND PLACE THE SILICONE PADS

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PLACE THE <u>BOTTOM SUPPORT</u>
<u>STRUCTURE</u> ON THE <u>FEE-PCB</u> AND USE
A CUSTOM JIG TO HOLD THEM FIRMLY
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FEE/CRYSTAL BOX ASSEMBLY

PLACE THE CRYSTAL SUB-ASSEMBLIES INTO THE CRYSTAL BOX

TIGHTEN THE CRYSTAL BOX LID SCREWS, TURN IT UPSIDE-DOWN AND PLACE THE SILICONE PADS

PLACE THE BOTTOM SUPPORT STRUCTURE ON THE FEE-PCB AND USE A CUSTOM JIG TO HOLD THEM FIRMLY



TEST

HANDLING THE JIG, PLACE THE <u>FEE-PCB</u> ON THE <u>CRYSTAL BOX</u> <u>SUB-ASSEMBLY</u>, TIGHTEN THE SCREWS AND REMOVE THE JIG VACUUM TO REMOVE AIR BUBBLES





OPTICAL FILTER POSITIONING

PLACE THE CRYSTAL SUB-ASSEMBLIES INTO THE CRYSTAL BOX

TIGHTEN THE CRYSTAL BOX LID SCREWS, TURN IT UPSIDE-DOWN AND PLACE THE SILICONE PADS

PLACE THE BOTTOM SUPPORT STRUCTURE ON THE FEE-PCB AND USE A CUSTOM JIG TO HOLD THEM FIRMLY

HANDLING THE JIG, PLACE THE FEE-PCB ON THE CRYSTAL BOX SUB-ASSEMBLY, TIGHTEN THE SCREWS AND REMOVE THE JIG

FOLD THE <u>FEE LATERAL WINGS</u> AND PLACE THE <u>OPTICAL FILTER</u> IN THE <u>BOTTOM SUPPORT STRUCTURE</u> RECESS







P/L SUPPORT STRUCTURE ASSEMBLY

FIX THE <u>TOP SUPPORT STRUCTURE</u> ONTO THE <u>BOTTOM SUPPORT</u> <u>STRUCTURE</u> & MOUNT THE <u>P/L TOP RIB</u>







PCB STACK ASSEMBLY

FIX THE TOP SUPPORT STRUCTURE ONTO THE BOTTOM SUPPORT STRUCTURE & MOUNT THE P/L TOP RIB

TURN THE ASSEMBLY UPSIDE-DOWN, FIX THE <u>STACK GUIDE RAILS</u> AND PLACE THE <u>TOP SPACERS</u>





PCB STACK ASSEMBLY

FIX THE TOP SUPPORT STRUCTURE ONTO THE BOTTOM SUPPORT STRUCTURE & MOUNT THE P/L TOP RIB

TURN THE ASSEMBLY UPSIDE-DOWN, FIX THE STACK GUIDE RAILS AND PLACE THE TOP SPACERS



STACK UP <u>BEE-PCB</u> WITH <u>PSU-PCB</u>, UNFOLD THE <u>FEE LATERAL WINGS</u> AND PLACE THE TWO PCBs ON THE <u>GUIDE RAILS</u>





PCB STACK ASSEMBLY

FIX THE TOP SUPPORT STRUCTURE ONTO THE BOTTOM SUPPORT STRUCTURE & MOUNT THE P/L TOP RIB

TURN THE ASSEMBLY UPSIDE-DOWN, FIX THE STACK GUIDE RAILS AND PLACE THE TOP SPACERS

STACK UP BEE-PCB WITH PSU-PCB, UNFOLD THE FEE LATERAL WINGS AND PLACE THE TWO PCBs ON THE GUIDE RAILS

FOLD AGAIN THE <u>FEE LATERAL WINGS</u>, PLUG THE <u>CONNECTORS</u> AND PLACE THE <u>PDHU-PCB</u> WITH THE SPACERS (HARNESS)





FIX THE TOP SUPPORT STRUCTURE ONTO THE BOTTOM SUPPORT STRUCTURE & MOUNT THE P/L TOP RIB

TURN THE ASSEMBLY UPSIDE-DOWN, FIX THE STACK GUIDE RAILS AND PLACE THE TOP SPACERS

STACK UP BEE-PCB WITH PSU-PCB, UNFOLD THE FEE LATERAL WINGS AND PLACE THE TWO PCBs ON THE GUIDE RAILS

FOLD AGAIN THE FEE LATERAL WINGS, PLUG THE CONNECTORS AND PLACE THE PDHU-PCB WITH THE SPACERS (HARNESS)

FIX THE <u>P/L BOTTOM RIB</u> TO THE END OF THE <u>GUIDE RAILS</u> AND MOUNT THE <u>C/S RAILS</u> ON THE SIDE OF THE <u>RIBS</u>

PCB STACK ASSEMBLY







ALTERNATIVE ASSEMBLY PROCEDURE

INTEGRATE THE FEE BOTTOM SIDE





ALTERNATIVE ASSEMBLY PROCEDURE

INTEGRATE THE FEE BOTTOM SIDE

PLACE CAREFULLY THE FEE PCB ON THE CRYSTAL BOX, WITH OPENED LATERAL WINGS, AND INTEGRATE ASICs AND WIRE BONDING





ALTERNATIVE ASSEMBLY PROCEDURE

INTEGRATE THE FEE BOTTOM SIDE

PLACE CAREFULLY THE FEE PCB ON THE CRYSTAL BOX, WITH OPENED LATERAL WINGS, AND INTEGRATE ASICs AND WIRE BONDING

PLACE CAREFULLY THE BOTTOM SUPPORT STRUCTURE ON THE FEE USING THE CENTERING PINS

PERFORM SDDs TEST





ALTERNATIVE ASSEMBLY PROCEDURE

INTEGRATE THE FEE BOTTOM SIDE

PLACE CAREFULLY THE FEE PCB ON THE CRYSTAL BOX, WITH OPENED LATERAL WINGS, AND INTEGRATE ASICs AND WIRE BONDING

PLACE CAREFULLY THE BOTTOM SUPPORT STRUCTURE ON THE FEE USING THE CENTERING PINS

PERFORM SDDs TEST

PLACE THE CRYSTAL SUB-ASSEMBLIES INTO THE CRYSTAL BOX AND CLOSE THE LID

REMOVE AIR BUBBLES PERFORM TEST



OPEN POINTS





DEVISE & BUILD JIGS, EQUIPMENT, MOCK-UP and TOOLS USEFUL to ASSEMBLY & TEST EASILY and SAFELY (PAYLOAD TEAM INTERACTION, DM AIT ACTIVITIES)



FINALIZE TUNGSTEN SHIELDS MOUNTING METHOD (GLUED or SCREWED) (PAYLOAD TEAM INTERACTION, DM AIT ACTIVITIES)



INTEGRATE AIT ACTIVITIES to OBTAIN A STEP-BY-STEP PROCEDURE (PAYLOAD TEAM - AIV TEAM INTERACTION)

OPEN POINTS







<u>FEE-PCB ASSEMBLING</u>: EXTREME CARE shall be PERFORMED when **ASSEMBLING FEE ON METALLIC PARTS**, due to SENSITIVE COMPONENTS (wire bonding, SMD components)

(RECOVERY: MOUNTING JIGS, POSITIONING PINS, PROCEDURES)



<u>FEE to BEE CONNECTOR INSERTION</u>: difficulties in **PLUG/UNPLUG SAMTEC CONNECTORS** due to NON PARALLEL INSERTION (rotation of the lateral wings)

(RECOVERY: shorten TOP SPACERS to have more CLEARANCES)

THANKS FOR YOUR ATTENTION

ANY QUESTION?

