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	LTR	DESCRIPTION	DATE	APPROVED
	A	PRODUCTION RELEASE	09/10/15	Linda Kilgus
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L3 HARRIS TECHNOLOGIES INC. PROPRIETARY INFORMATION

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Project/Production Order #:			 L3HARRIS	Telemetry & RF Products 1515 Grundy's Lane Bristol, PA 19007	
DWN	D. Goldberg	09/01/15		PRINTED WIRING BOARD STATEMENT OF WORK	GD60050698
CKD	N/A	---			
EE	N/A	---			
ME	N/A	---			
PM	K. Foss	09/03/15			
PR	N/A	---			
PS	N/A	---			
MC	D. Goldberg	09/08/15			
MFG	N/A	---			
CE	N/A	---			
QA	M. Rosnick	09/10/15	SIZE	CAGE CODE	
TE	N/A	---	A	13923	
BD	N/A	---			
SW	N/A	---			
SHT 1 OF <u>6</u>					

1.0 PURPOSE

To define special requirements for Printed Wiring Boards (PWBs) Manufacturers to follow for products manufactured for L3Harris Telemetry and RF Products (L3Harris TR&F) when these requirements are not covered by the purchase order or supporting documentation.

2.0 DEFINITIONS

Suspect lot: A manufacturing lot which may contain as yet undetected failures. Lots are considered suspect when a failure threshold has been exceeded.

3.0 REFERENCES

IS61004269 Internal spec supplement for PWB ENIG finish IAW IPC-4552
FM110-F-0201 Supplier Proposed Change Notification-Supplied Part Deviation Request Form

4.0 HIERARCHY: ALL L3HARRIS TR&F PURCHASE ORDERS SHALL BE IN THE FOLLOWING ORDER OF PRECEDENCE

A. Purchase Order, L3Harris drawings and specifications, Printed Wiring Board Statement of Work.

5.0 SPECIFICATIONS AND CERTIFICATIONS

5.1 Solder requirements are to ANSI-J-STD-001 class 3.

5.2 Boards shall be manufactured in accordance with IPC-6011/6012.

5.3 Unless otherwise specified on the drawing Class 3 requirements shall be used.

6.0 GENERAL REQUIREMENTS

- A. No ozone depleting chemicals can be used in any of the manufacturing processes.
- B. PWBs must be manufactured in accordance with drawings provided and/or (ECN's) engineering change notices as provided.
- C. L3Harris TR&F will supply technical support as required.
- D. In process inspections may be specified by L3Harris TR&F and may include source inspection prior to shipment.
- E. Quality Assurance (QA) Codes are identified on the purchase order line for each part number. Definitions of the individual QA codes shall be found at: <https://www.l3harris.com/all-capabilities/airborne-telemetry>. L3Harris Terms and Conditions shall be found at: <http://l3harris.com/supply-chain>.
- F. Supplier must have a documented plan for calibrating equipment used for to produce PWBs.

7.0 PROCESS REQUIREMENTS

- 7.1 Supplier to ensure that the PWB drawing and photo master are the most current by contacting the L3Harris TR&F buyer to ensure the most recent documents are used in manufacturing. For all PWBs purchased for L3Harris TR&F requirements, the PWB supplier is required to perform 100 percent inspection and record the attributes for the first piece of this Purchase Order unless a First Article report has been done for the same part on a previous purchase order and is still valid per the conditions listed below. The First Article(s) shall be representative of the production run, utilizing production tooling and processes.
- 7.2 The following data must be recorded/collected:
- 7.2.1 Each dimension on the drawing shall be measured and the result recorded along with appropriate tolerance.
- 7.2.2 If there is multiples of the same measurement on the drawing, each must be measured and individual measurements noted or a range of values given.
- 7.2.3 The Asset number (or other unique identifier) and calibration due date of every instrument used to make the above measurements shall be recorded.
- 7.2.4 Each note on the drawing shall have the method of compliance recorded (i.e., verified by inspection, note is a design direction, etc).
- 7.2.5 Lot information for any raw materials used in the construction of the part shall be recorded.
- 7.2.6 Certificates of conformance from the originator of the material shall be included as well as certificates of conformance for all finishing or coating processes.
- 7.3 The First Article Inspection Report (FAIR) shall be approved by the supplier's quality assurance function. Additionally, the supplier shall perform additional First Article Inspection(s) after every major tooling or process change, every design/revision change, and when there has been a gap in production of the part of more than 2 years. Records of all first article activity will be documented, treated as quality / acceptance records, maintained by the supplier and made available to L3Harris TR&F if requested. A copy of the FAIR shall accompany the delivery of hardware.
- 7.4 Printed wiring boards purchased under any purchase order shall be fabricated in accordance with the requirements of IPC-6011/6012 unless otherwise stated on the master drawing. Multi layer boards require (positive) etchback. PWB's using teflon base material may use IPC-6018 unless otherwise stated on the master drawing. When delivered in panel form there shall be no defective circuits. IPI solder mask per IPC-SM-840 type b, class 3 is to be used on type 3 PWB's in lieu of any dry film solder mask requirement on the drawing. FR5 (natural) per IPC-4101/23 is an acceptable substitute for FR5 (white). 100% electrical testing to the net list data is required. GFG material shall be utilized in place of GFN material on multilayer (3 or more) 5400xxxx series PWB's.
- 7.5 Coupons and a Supplier microsection report per panel are required for each lot/date code of PWB ordered. A 3rd party microsection report per lot from an approved DLA/DSCC lab is required for each lot/date code of PWB ordered. Master drawing must be supplied to the 3rd party test lab for analysis. Master drawing must be supplied to the 3rd party test lab for proper analysis.
- 7.6 If possible, all PWB's shall contain three fiducials minimum (.035" to .05: diameter) All BGA and Fine-Pitch footprints shall have local fiducials (two minimum).

7.7 L3Harris TR&F internal specification "IS61004269" (INTERNAL SPEC SUPPLEMENT FOR PWB ENIG FINISH IAW IPC-4552) is invoked on all PCBs/PWBs requiring ENIG finish per fabrication drawing finish note. The requirements contained in the "IS" shall be subject to Inspection acceptance by the PCB/PWB supplier and their third party lab on affected product as of the latest revision date of the IS. Supporting records and documentation showing IS compliance shall be made available, with lot conformance documentation, to L3Harris TR&F upon request. Verification of conformance to the requirements within the IS shall be included in the third party independent analysis report.

8.0 TEST FAILURE THRESHOLD

- A. Failure of more than 20% of the panels or parts in a lot for the same type of defect shall cause the lot to be suspect. Manufacturer shall contact L3Harris TR&F regarding all suspect lots for potential referee or additional evaluation testing.
- B. Any manufacturing lot with greater than 40% defects of panels or parts will require written approval before they may be shipped to L3Harris TR&F. Supplier shall submit a waiver form documenting the defect type and quantities to be approved by L3Harris and shipped with hardware.

9.0 CHANGES OR DEVIATIONS

- A. Supplier shall not make any changes in design, materials or processes which may affect the acceptability (dimensional, visually, functionally, durability, etc.) of the items to be delivered to L3Harris TR&F without prior notification. For the purpose of this clause, a process is defined as any procedure, system or practice used during the manufacture or production of a deliverable item (i.e. soldering, cleaning, finishing, etc). L3TE may require a re-qualification of the part depending on the nature of the change.
- B. Advance notification of a process change shall be communicated to L3Harris TR&F by submitting the Supplier Proposed Process Change Notification-Supplied Part Deviation Form FM110-F-0201.
- C. All changes to drawings, procedures and operating requirements of the items on the purchase order must be approved in writing by L3Harris TR&F.
- D. Only L3Harris TR&F purchasing personnel have the authority to change the terms of a purchase order. No other L3Harris TR&F personnel have the authority to approve changes. All changes shall be communicated from the purchasing department and shall be confirmed in writing. A change is defined as any deviation from the purchase order quantity, price, delivery, documentation, terms and conditions, or the form, fit, or function of the item or service purchased. Any deviation from this requirement will be at the supplier's risk and may result in a default of the purchase order at no cost to L3Harris TR&F.
- E. All deviations from build requirements and/or material availability shall require an approved Supplier Proposed Process Change Notification-Supplied Part Deviation Request Form FM110-F0201. This form is found at: <https://www.l3harris.com/all-capabilities/airborne-telemetry>. A copy of the approved form shall be submitted with each approved shipment. NOTE: Assembly Drawings and their respective notations will over rule any assembly conflicts with this document.

10.0 Foreign Object Control

10.1 Supplier shall maintain a foreign object (FO) control program with a documented and current plan assuring work is accomplished in a manner preventing foreign objects or materials from entering and remaining in deliverable items. The supplier shall identify a FO control person responsible for implementing the FO control program. Supplier shall provide FO control program training to employees performing operations on L3Harris TR&F FOD sensitive products. Maintenance of the work area and control of tools, parts and material shall preclude the risk of FO incidents. Prior to closing inaccessible or obscured areas and compartments during assembly, the supplier shall inspect for foreign objects/materials. Tooling, jigs, fixtures, and test or handling equipment shall be maintained in a state of cleanliness and repair to prevent foreign object damage (FOD). The supplier shall document and investigate all FO incidents assuring elimination of the root cause. L3Harris TR&F shall have the right to perform inspections; verification and FO control program audits at supplier's facility to assure program documentation and effectiveness. Supplier shall flow down requirements as required to their suppliers to ensure compliance to this requirement.

11.0 **COMSEC CONTROLLED DOCUMENTS**

- a. Supplier shall maintain a procedure for the management, security, storage, and access for L3Harris TR&F supplied COMSEC documentation. It is the supplier's responsibility to own, implement, and ensure compliance with the requirements defined herein:
- i. Maintain ownership and not distribute to anyone.
 - ii. Keep log of who has documents at all times.
 - iii. Not to make copies or reproductions.
 - iv. To secure drawings in an unseen area when not in use.
 - v. Returned documents to L3Harris TR&F when work has been completed.
 - vi. No foreign nationals can perform work on any parts or view documentation for these assemblies.

12.0 **COUNTERFEIT AVOIDANCE**

Only new and authentic materials are to be used in products delivered to Buyer. No counterfeit or suspect counterfeit parts are to be contained within the delivered product. Parts shall be purchased directly from the OCMs/OEMs, or through the OCM/OEMs Franchised Distributor. Documentation must be available that authenticates traceability to the applicable OCM/OEM. Independent Distributors (Brokers) shall not be used without written consent from Buyer (L3Harris TR&F).

Definitions

Counterfeit – a part that is an illegal or unauthorized copy or substitute of an OEM item; an item that does not contain the proper external or internal materials or components required by the OEM or that is not constructed in accordance with OEM specification; an item or component thereof that is used, refurbished or reclaimed but the Seller represents as being a new item; an item that has not successfully passed all OEM required testing, verification, screening and quality control but that Seller represents as having met or passed such requirements; or an item with a label or other marking intended, or reasonably likely, to mislead a reasonable person into believing a non-OEM item is a genuine OEM item when it is not. Parts that have been modified pursuant to a specific L3Harris TR&F purchase order requirement, such as refinished, up-screened, or up-rated parts that are properly identified as such are not considered suspect or counterfeit.

Suspect Counterfeit – A part in which there is an indication by visual inspection, testing, or other information that it may have been misrepresented by the supplier or manufacturer and may meet the definition of a counterfeit part.

OCM – Original component manufacturer

OEM – Original equipment manufacturer

Franchise Distributor – - A distributor with whom the OCM has a contractual agreement to buy, stock, re-package, sell and distribute its product lines. Franchised distributors normally offer the product for sale with full manufacturer's warranty. Franchising contracts may include clauses that provide for the OCM's marketing and technical support, failure analysis and corrective action, and exclusivity of inventory.

Independent Distributor (Broker) – A distributor that purchases parts with the intention to resell them. Independent Distributors may be franchised for selected, but not all, product lines. For purposes of counterfeit risk mitigation, a distributor is considered independent when not franchised for the item to be procured.

13.0 TRACEABILITY

- 13.1 Traceability is required for all materials used in the production of product for L3Harris TR&F. Seller shall maintain a traceability system on all materials and consumables used in the manufacture ring from receipt at Seller's facility to shipment of the end product to L3harris TR&F. The system shall provide for two-way traceability.
- 13.1.1 Traceability forward, where each part can be traced to the next assembly and subsequently to the end product delivered to L3Harris TR&F.
- 13.1.2 Traceability backward, where each end product can be traced back to an individual part receipt at the Seller's facility, with the original component manufacturer's lot date code.