NASA Electronic Parts and Packaging (NEPP) Program

Information Management and Dissemination (IMD) Project

Hybrid Supplier Survey and Assessment

Checklist

NASA

NASA Electronic Parts Project (EPAR)
Code 562
Goddard Space Flight Center
Greenbelt, MD 20771

HYBRID SUPPLIER SURVEY AND ASSESSMENT CHECKLIST

Date:

Company Name:

Address:

CAGE Code:

Technical Assessment Team:
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7.

HYBRID SUPPLIER SURVEY/ASSESSMENT CHECKLIST

Number	I. QUALITY MANAGEMENT PLAN	Comments
1	**QML Status**	
	Class K Since_____	
	Class H Since_____	
	Non-Compliant using QML line	
2	**Certification** 38534	
	38535	
	ISO9001	
3	**Device Specifications** SCDs	
	SMDs	
4	**TRB Program**	
	Complies with 38534, Appendix A requirements	
	Has adopted optional plan that allows modification of generic flow, fabrication, design, testing, and inspection	
5	**Performs Element Evaluation per** Class K	
	Class H	

HYBRID SUPPLIER SURVEY/ASSESSMENT CHECKLIST

Number	I. QUALITY MANAGEMENT PLAN (Cont.)	Comments
6.	**Last DSCC Audit**_____	
7	**Quality System Review** QA Manual	
	Training of Personnel	
	Training Frequency	
8	**Training Evaluation** On-line	
	Off-line	
9	**Statistical Process Control (SPC) Verification**	
	Fabrication	
	Assembly	
	Test	

HYBRID SUPPLIER SURVEY/ASSESSMENT CHECKLIST

Number	II. DESIGN AND DOCUMENTATION CONTROL	Comments
1	**Design Process**	
	Design Rules/Procedures/Verification	
	Conversion of Customer requirements	
	Design of Experiments	
	Derating Rules	
	Thermal Analysis/Verification	
	Radiation Test	
	Design Qualification	
	Life Test	
2	**Document Control**	
	Design Software	
	Detailed Assembly Procedures	
	Detailed Test Procedures	
	Change Control (process, assembly, test)	
	Traveler	
	Data Retention	
	Retention of Test Samples	
	Retention of Qual./Test Samples	

HYBRID SUPPLIER SURVEY/ASSESSMENT CHECKLIST

Number	III. MATERIALS	Comments
1	**Incoming Inspection** Visual (sample or 100 %)	
	Sample Electrical	
	C-of-C Only	
	Element Evaluation (Performed In-house)	
	O Per Class K Flow	
	O Per Class H Flow	
	Element Evaluation (Performed by Supplier)	
	Per Class K Flow	
	Per Class H Flow	
	Element Evaluation Test Data Available?	
2	**Procurement** Item Drawing used	
	Specification used	
	Customer Approved	
3	**Approved Suppliers**	
	Approved List of Suppliers	
	Rating System in Place	
	Ship-to-Stock	
	Sole Source	

HYBRID SUPPLIER SURVEY/ASSESSMENT CHECKLIST

Number	IV. PROCESSES	Comments
1	**Substrate Fabrication**	
	Fabricated In-house	
	Procured from outside supplier	
	O Specification used: O Mil spec	
	O Vendor spec	
	Thick Film process	
	Thin Film process	
	Oven firing profile/data	
	Set-up for Single layer printing	
	Multi-layer printing	
	Co-fired	
	Pre emulsified screen	
	Resistors printed	
	Laser-trim operations	
	O Abrasive trim	
	O Static trim	
	O Dynamic trim	
	2 or 4 point probe resistance	

Number	IV. PROCESSES (Cont.)	Comments
	Termination type	
	Dielectric layers	
	Capacitors printed	
	Capacitors stacked	
	O Stacking performed In-house	
	O Stacking done by supplier	
	In-process monitor	
	Substrate qualification	
	O Specification used	
	O Mil Spec	
	O Vendor Spec	
	Rework Requirements	
2	**Substrate-to Header Attach**	
	Solder type	
	Epoxy type	
	Attach flow	
	Heat spreader (e.g. moly tabs, etc.)	
	Process Controls	

Number	IV. PROCESSES (Cont.)	Comments
3	**Die Attach - (Epoxy)**	
	Die metallization	
	Epoxy (883 Method 5011) qualified	
	Epoxy control	
	Epoxy cure	Note temperature
	Epoxy shelf life	
	Die attach rework requirements	Note temperature
	Cleaning flow method	Inspection/verification
4	**Die Attach - (Solder)**	
	Solder type	
	Flux type	
	Solder temperature	
	Solder joint inspect.	
	Cleaning flow	
	Attach Voiding/X-ray	

HYBRID SUPPLIER SURVEY/ASSESSMENT CHECKLIST

Number	IV. PROCESSES (Cont.)	Comments
5	**Die Attach - (Eutectic)**	
	Base plate temperature	
	Base plate temperature joint inspection	
6	**Magnetic Element Attach**	
	Transformer/Inductor attached to header	
	Adhesive for bottom attach	
	Adhesive used on inside top cover	
	Meets out-gassing requirements	
	Wire routing/Staking	
	Magnet wire stripping - abrasive	
	Magnet wire stripping - chemical	
	Magnet wire attach - hand solder	
	Cleaning Procedure	
	Magnet wire attach - reflow	
	Type of Solder used	
	Reflow temperature	

Number	IV. PROCESSES (Cont.)	Comments
7	**Element Attachment Verification**	
	Meets 38534 constant acceleration req.	
	Mechanical shock test	
	Thermal shock test	
8	**Stacked Component Attachment**	
	Capacitor stacking on frame	
	Capacitor attached directly to substrate	
9	**Wire Bonding**	
	Automatic bonding machines	
	Wire material and sizes used	
	Thermosonic bonding	
	Thermocompression bonding	
	Ribbon bonding	
	Destructive wire pull test	
	Non-destructive wire pull test	
	Generates Test Coupon	
	Performs ball shear test	

Number	IV. PROCESSES (Cont.)	Comments
	Performs die shear test	
	Rework procedures	
	SPC Charts	
10	**Cleaning**	
	Prior to die bonding	
	Prior to wire bonding	
	After soldering operations	
	Cleaning procedures	
	UV ozone, plasma cleaning - type	
	Inspection after cleaning	
	Aqueous based material	
	Baked-out after cleaning	
11	**Package Sealing**	
	Ceramic, metal, plastic	
	Pre-seal vacuum bake - time, temp.	
	RGA analysis	
	Sealing environment Ni/He	

Number	IV. PROCESSES (Cont.)	Comments
	Dew point monitor setting	
	Resistance weld	
	Parallel seam weld	
	Leak testing	
	O Fine	
	O Gross	
	Package rework	
	Header and lid material	
	Plating	
	O Performed In-house	
	O Performed outside	
	O Plating Material	
12	**Package Material**	
	Ceramic, metal, or plastic	
	Glass-to-metal seal	
	Getter material used	
	O 883 Method 5011 qualified	
	O Package with 5011 qualified	
	Package evaluation/test	

HYBRID SUPPLIER SURVEY/ASSESSMENT CHECKLIST

Number	IV. PROCESSES (Cont.)	Comments
13	**Clean Room**	
	Class 100K, 10K, 1K, 100, 10	
	Particulate monitor/count	
	Laminar-flow work stations	
	Storage of unsealed hybrids	
	Nitrogen cabinets storage	
14	**ESD Control**	
	Work station grounding	
	Wrist strap material	
	Humidity control	
	Solder irons, wire bonder grounding	
15	**Training**	
	Operator Training schedule	
	Training records	
16	**Failure Analysis**	
	Design-of-experiment setup	
	Test lab sophistication	

HYBRID SUPPLIER SURVEY/ASSESSMENT CHECKLIST

Number	V. TESTING	Comments
1	**Incoming inspection**	
	Material accepted based on C-of-C	
	Level of testing performed at receiving	
	Segregation/Storage of Class K, H lots	
	Issue procedure - kit or bulk	
	Traceability of material issued	
	Epoxy shelf life control	
2	**Element Evaluation Testing**	
	Performed in-house	
	Performed by supplier	
	Test samples stored at supplier	
	Test data package requested	
3	**Screening**	
	Screening flow per MIL-PRF-38534	Note Deviations:
	Additional screening imposed	List Tests:
	Screening fall-out/lot acceptance	

Number	V. TESTING (Cont.)	Comments
	Burn-in test bias and temperature	
	O Static burn-in	
	O Dynamic burn-in	
	QCI (In-line or End-of-Line?)	
	Tests performed by outside vendors	List Tests:
	Resolution of conflict with test data	
	Hermeticity testing after solder dip?	
	Group B Tests	
	Life test set-up verification	
	FA lab capabilities	
4	**Metrology**	
	Calibration methods	
	Calibration records/recall system	
	Performed in-house?	

HYBRID SUPPLIER SURVEY/ASSESSMENT CHECKLIST

General Assessment