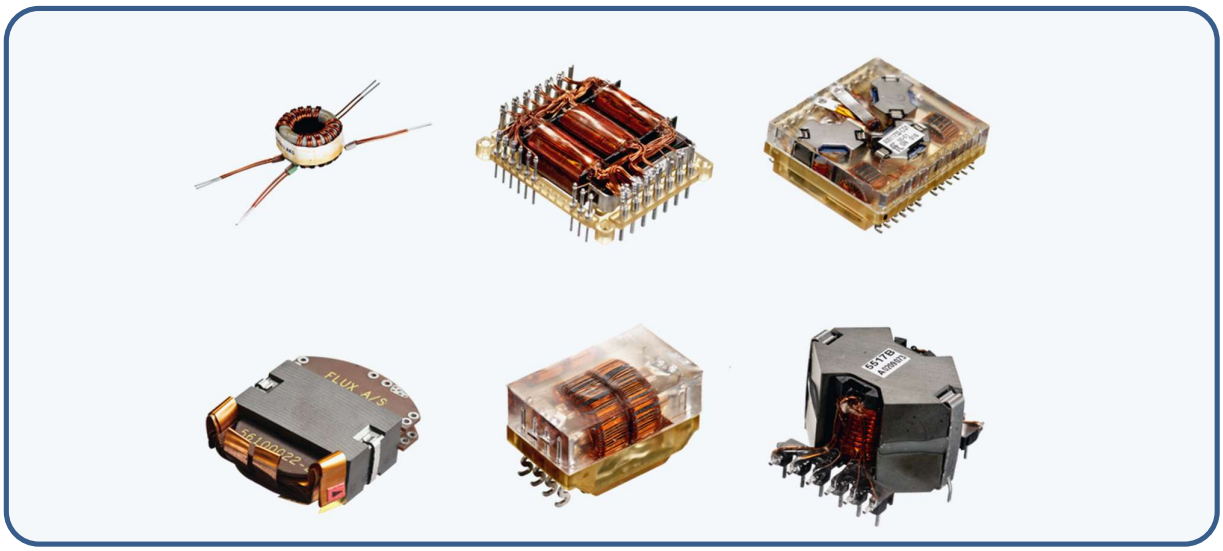
Qualification Test Report:

Various Topologies

Document:	08690380	**Issue:**	1
Date:	31st March 2021	**Page:**	1 of 115



Author

Michael D. Simpson

Business Director

(Defence and Space)

Lars A. Gregersen

DOCUMENT CHANGE LOG

Change No.	Date	Initiator	Pages Affected	Short Description of Change

TABLE OF CONTENTS

1. INTRODUCTION 6

2. REFERENCE DOCUMENTS 6

3. SAMPLES DEFINITION 6

3.1 Range of component families for testing 6

3.2 Qualification of transformers and inductors based on similarity 8

3.3 Manufacturing and screening of samples 9

3.4 Range of materials for Qualification Testing 10

3.5 Range of processes for Qualification Testing 12

3.6 Retention of qualification status 13

4. QUALIFICATION TESTING 13

4.1 Test Report matrix 14

4.2 Test Facilities 19

4.3 Compliance towards MIL-PRF-27 20

5. TEST METHODS AND REQUIREMENTS 21

5.1 Screening 21

5.2 Electrical characteristics 21

5.2.1 Electrical characteristics test method 21

5.2.2 Electrical characteristics requirements 21

5.3 Visual inspection 21

5.3.1 Visual inspection method 21

5.3.2 Visual inspection requirements 21

5.4 Thermal Shock 22

5.4.1 Thermal shock method 22

5.4.2 Thermal shock requirement 22

5.5 Dielectric Withstanding Voltage 22

5.5.1 Dielectric withstanding voltage method 22

5.5.2 Dielectric withstanding voltage requirements 23

5.6 Solderability 23

5.6.1 Solderability method 23

5.6.2 Solderability requirements 23

5.7 Resistance to solvent 23

5.7.1 Resistance to solvent method 23

5.7.2 Resistance to solvent requirements 23

5.8 Terminal strength 23

5.8.1 Pull method 23

5.8.2 Terminal strength requirements 24

5.9 Vibration 24

5.9.1 Vibration test method 24

5.9.2 Vibration test requirements 24

5.10 Mechanical Shock 25
5.10.1 Mechanical shock method 25
5.10.2 Mechanical shock requirements 25
5.11 Moisture resistance 25
5.11.1 Moisture resistance method 25
5.11.2 Moisture resistance requirements 25
5.12 Overload 25
5.12.1 Overload method 25
5.12.2 Overload resistance requirements 25
5.13 Life test 26
5.13.1 Operating Life test method 26
5.13.2 Life test requirements 26
5.14 Visual and Mechanical Examination (DPA) 26
5.14.1 Visual and Mechanical Examination method 26
5.14.2 Visual and Mechanical Examination Pass Criteria 26
6. ACCEPT / REJECT CRITERIA 26
7. TEST RESULTS 27
7.1 Presentation of results 27
7.2 Vibration and Mechanical Shock 27
7.2.1 Random Vibration 27
7.2.2 Mechanical Shock 500g 27
7.3 Moisture Test 28
7.3.1 One cycle 28
7.3.2 Full Test 28
7.4 Internal Examination (DPA) 29
7.4.1 Q1 – 12129013 29
7.4.2 Q2 – 14220174 29
7.4.3 Q3 – 14220153 30
7.4.4 Q4 – 14140024 30
7.4.5 Q5 – 14230080 31
7.4.6 Q6 – 14011001 31
7.4.7 Q7 – 14050029-4-B 32
7.4.8 Q8 – 14121023-2-B 32
7.4.9 Q9 – 12141085-2-B 33
7.4.10 Q10 – 14210147-1-B 33
7.4.11 Q11 – 12341031-2-B 34
7.4.12 Q12 – 12311047-3-B 34
7.4.13 Q13 – 12001166-1 35
7.4.14 Q14 – 14260113-1-B 35
7.4.15 Q15 – 14280034-1-C 36

7.4.16 Q16 – 14790201-1-B 36
7.4.17 Q17 – 14790101-1-B 37
7.4.18 Q18 – 14170209-1-B 37
7.4.19 Q19 – 14271041-1-B 38
7.4.20 Q20 – 12800014-1-B 38
7.4.21 Q21 – 14120057-1-B 39
7.4.22 Q22 – 12000100-1-B 39
7.4.23 Q23 – 12121156-1-C 40
7.5 Observations and Observations on testing 41
7.6 Minor Nonconformances 41
7.7 Critical Failures 41
8. CONCLUSION 41

1. INTRODUCTION

This document report the status for Qualification Testing of Magnetic topologies listed in section 3.1.

In addition to main qualification testing a supplemental test campaign was performed in 2017. The components comprise a range of component families and a range of materials and

processes used for manufacturing the components.

The qualification tests and criteria's are based on the requirements given in MIL-PRF-27, for grade 5 transformers and inductors.

All testing is performed in accordance with FT 08690374 (RD1).

2. REFERENCE DOCUMENTS

Ref.	Document	Title
RD1	FT 08690374	Qualification Test procedure
RD2	MIL-PRF-27	General Specification for Transformers and Inductors
RD3	MIL-STD-202	Test Method Standards – Electronic and Electrical Component Parts
RD4	MIL-STD-981	Design, Manufacturing and Quality Standards for Custom Electromagnetic Devices for Space Applications
RD5	FT 08690019	Process Identification Document
RD6	FT 08711502	Screening Test Procedure for Transformers and Inductors
RD7	FT 08783001	Nonconforming Product
RD8	FT 08690027	Declared Materials List
RD9	FT 08690028	Declared Processes List
RD10	ECSS-Q-ST-70-08	Manual soldering of high-reliability electrical connections
RD11	ESCC 3201	Coils, RF and Power Fixed – Generic Specification
RD12	ESCC 20100	Requirements for Qualification of Standard Electronic Components for Space Applications

3. SAMPLES DEFINITION

3.1 Range of component families for testing

The magnetic component topologies covered by this Qualification test procedure are:

- Table 3.1a - samples covering RM topology
- Table 3.1b - samples covering EFD topology
- Table 3.1c - samples covering Double Aperture cores topology
- Table 3.1d - samples covering Toroidal topology
- Table 3.1e - samples covering Aircoil topology
- Table 3.1f - samples covering Integrated Magnetics topology
- Table 3.1g - samples covering Planar topology
- Table 3.1h - samples covering Amobeads
- Table 3.1h - samples used to cover misc processes

Sample	Flux PN	Description	Core	Size	Other
Q1	12129013-1-C	DM Choke	3F3	RM5	FLUX SMT
Q2	14220174-1-B	Aux Supply Transformer	3C92	RM8	Through hole
Q3	14220153-2-B	Push Pull Forward Transformer	3C96	RM10lp	Pins & Flying leads

Table 3-1a - RM topology

Sample	Flux PN	Description	Core	Size	Other
Q4	14140024-1-B	Transformer		EFD 15	Pins
Q5	14230080-1-B	Transformer EFD-	N87	EFD 25	Pins

Table 3-1b - EFD topology

Sample	Flux PN	Description	Core	Size	Other
Q6	14011001-5	Balun Transformer Parylene Coated	Balun	6.2 X 7.2 X 5	Double Aperture

Table 3-1c - Double Aperture Cores topology

Sample	Flux PN	Description	Core	Size	Other
Q7	14050029-4-B	Current Transformer	N30	Ø6.3mm	Stacked cores
Q8	14121023-3-B	BDR Current Sense Transformer	N30	R10	On base
Q9	12141085-2-B	Input Inductor	Hiflux 58048	Ø12.7mm	Solithane
Q10	14210147-1-B	Flyback Transformer	MPP 55120	Ø28.4mm	Base
Q11	12341031-2-B	Common Mode Filter	ZW-43610-TC	Ø36.00mm	Splice to AWG
Q12	12311047-3-B	QFE DM Choke	Hi FLUX	Ø38.00mm	Bandaging

Table 3-1d - Toroidal topology

Sample	Flux PN	Description	Core	Size	Other
Q13	12001166-1	Aircoil	None	2 turns	

Table 3-1e - Aircoil topology

Sample	Flux PN	Description	Core	Size	Other
Q14	14260113-1-B	IM Transformer	PC40	IM 1	Flat Wire
Q15	14280034-1-C	IM Transformer	PC40	IM 2	

Table 3-1f - Integrated Magnetics topology

Sample	Flux PN	Description	Core	Size	Other
Q16	14790201-1-B	Current sense 1:100	3C95	ER9,5	
Q17	14790101-1-B	Current Sense 1:50:50		EE5	
Q18	14170209-1-B	Flyback EE18 Trafo	N87	ELP 18/4/10	14 Layer PCB Flux
Q19	14271050	IM (Special)	3C95	EE32	Foil
Q20	12800014-1-B	EP5 Inductor	3C94	EP5 Inductor	

Table 3-1g - Planar topology

Sample	Flux PN	Description	Core	Size	Other
Q22	12000100-1-B	Noise Suppression	Amobead	4-2-8W	

Table 3-1h - Amobeads topology

Sample	Flux PN	Description	Core	Size	Other
Q21	14120057	Command Transformer	YW-40705-TC		Potting High Temp solder
Q23	12121156-1-C	Input Filter	MP1305P4AF		New Core

Table 3-1i - Misc processes

Five of samples representing the above-mentioned topology will be tested. The range of sizes and variants within each topology, covered by this qualification, is defined in the rules of similarity

3.2 Qualification of transformers and inductors based on similarity

FLUX has tailored the requirements of MIL-STD 981[RD4]. Similarity is judged against a family of qualified devices, rather than a single device

Only inductors and/or transformers that have passed qualification inspection shall be used as reference devices for establishing qualification by similarity.

Inductors or transformers deemed to be qualified on the basis of similarity shall be manufactured at the same production facility utilising the same processes as the reference device.

A similar device is an inductor or transformer that meets the following conditions when compared to the reference device(s).

Qualification by similarity is not applicable for Class S components.

Clause		C	PC	Comments
a)	Same or lower operating temperature	✓		Family of devices will be qualified from – 55 ° C to + 125 °C, actual operating parameters will be determined by the end user
b)	Same or lower operating frequency and the same or lower operating power.	✓		Device will operate with a FLUX specified range, actual operating parameters will be determined by the end user.
c)	Same or lower ambient temperature.	✓		Family of devices will be qualified from – 55 ° C to + 125 °C, actual ambient temperature will be determined by the end user
d)	To be used at an atmospheric pressure of the same or lower altitude.	✓		Family of devices will be qualified at atmospheric pressure, actual altitude will be determined by the end user.
e)	To be used at the same or lower operating voltages and the same or lower dielectric stress per mil of same insulation.	✓		Device will operate with a FLUX specified range, actual operating parameters will be determined by the end user
f)	Same or lower shock and vibration requirements.	✓		
g)	Same or greater life time expectancy.	✓		
h)	Same or lower temperature class.	✓		
i)	Same family as defined in 4.2 thru 4.7.	✓		
j)	Same grade as defined in the applicable military specifications.	✓		
k)	Same type of external and internal mounting, same type of case construction with nominal wall thickness within 25 percent when a case is used, same shape, and same termination (pin or hook terminals).	✓		
l)	Linear envelope dimensions neither greater than 150 percent nor less than 70 percent of the corresponding dimensions. The total volume of envelope not to exceed 250 percent.	✓		150 / 70 % of linear dimensions, total volume not typically calculated (theoretical max if all three dimensions 150% = 337,5%). Volume will be calculated where all 3 dimension exceed 100%.
m)	Same or greater wire size (cross-sectional area), and the same wire coating material for corresponding windings.	✓		
n)	Same processing material and specification for case, finish and marking.	✓		
o)	Same processing material and composition for potting, insulation (tapes and films), impregnation, staking and filling.	✓		
p)	Same material composition, characteristic and coating for the ferrite and MMP core, same shape, and the same manufacturer.		✓	Grouped by core type, manufacturer and size
q)	Same bobbin material and characteristics.	✓		
r)	Same solder composition and welding.	✓		
s)	Same construction and material for the terminals. For terminals of the same dimensions the required terminal strength requirements to be the same or lower.	✓		

Table 3-2 Rules of similarity

3.3 Manufacturing and screening of samples

The components were manufactured by Flux A/S.

3.4 Range of materials for Qualification Testing

DML Ref	Part	Nature	Size Range	Comments
01.001	Aluminium Block Fixture	AA6082-T6/T651		
02.002	Copper Foil Electrolytical	99,9 % Cu – 0,05% O;	Not Applicable	
02.005	Brass MS58 Terminal Pin	Brass MS58. Plated with 2,5 mm Ni and 5 mm Sn90Pb10 by manufacturer	Not Applicable	
02.006	Cu C12200 (UNS) Pins	C12200 Copper Electrodeposit with 8µm Sn60Pb40 by manufacturer on 2µm Ni barrier	Not Applicable	
02.007	Tin Bronze Terminal	CuSn6	Not Applicable	
02.009	Copper Foil	Copper Foil	Not Applicable	
02.010	Cu_ETP	Copper	Not Applicable	
05.007	Chromium Nickel Steel	Chromium Nickel SteelC<1%, Si>1%, Mn>2%	Not Applicable	
06.002	Stainless Steel Spring	Clamps for RM 4 Low Profile Ferrite Cores, Without Ground Terminal	Not Applicable	
06.004	Stainless Steel Spring	Clamps with Ground Clamps for RM Ferrite Cores	Not Applicable	
06.005	Clamps	STAINLESS SPRING STEEL, AISI 301	Not Applicable	
06.006	Clamps	STAINLESS SPRING STEEL, AISI 301	Not Applicable	
06.008	Stainless Steel Spring	Clamps for EFD Ferrite cores	Not Applicable	
06.010	Fixing Items	STAINLESS SPRING STEEL, AISI 301	Not Applicable	
07.001	Solder	Tin Solder: Sn63 Pb37	Not Applicable	
07.002	Solder	Tin Solder: Sn60 Pb40	Not Applicable	
07.003	Solder	Tin Solder: Sn94 Ag4	Not Applicable	High Temperature
08.002	Toriod Core MPP and Hiflux	Molypermalloy Powder, Hiflux NiFe Powder Graded into 2% bands	Between 5,243mm & 14,475mm Ø	
08.008	Toroid Core	Ferro Magnetic Oxide	Between 4,41mm & 33,15mm Ø	
08.009	Double Aperture Core	Ferro Magnetic Oxide	Between 6.2mm X 7,25 mm and 9,3mm X 10.875mm	
08.013	Toroid Core Parylene Coated	Ferrite Core Parylene Coated	Between 6,67mm & 14,3mm Ø	
08.015	RM Core 3F3	Ferro Magnetic Oxide	Between RM4 & RM16	
08.018	RM Core PC90 & PC95	Ferro Magnetic Oxide	Between RM4 & RM8	
08.021	RM / EFD Core	Ferroxcube 3C96	Various	
08.022	EFD Core	Ferro Magnetic Oxide	Between EFD25 & EFD 30	
08.023	Toroid Core Hi Flux	Molypermalloy Powder, Hiflux NiFe Powder Graded into 2% bands	Upto 58,5mm Ø	
08.024	RM and Integrated Magnetics Core	Ferro Magnetic Oxide	Depending on form	
08.025	Ferroxcube 3C92	Ferro Magnetic Oxide	Various	
08.026	Ferroxcube 3C95	MnO (19%), ZnO(10%), FE_2O_3(71%)	Depending on form	
08.029	Ferrite core N87	Manganese Zinc Ferrite MnO (25%), ZnO(5%), FE_2O_3(70%)	Depending on form	
08.031	Power Ferrite	MN92	Not Applicable	
08.039	Toroid Core Hitachi	Metglas Alloy	Not Applicable	
10.001	Scotchweld EC2216	2- part epoxy adhesive	Not Applicable	
10.002	Solithane C113/300	Polyurethane	Not Applicable	
10.006	Glue	Loctite 648	Not Applicable	
11.001	CIL-8100 M Label	Polyester Label / Acrylic Adhesive	Not Applicable	
11.003	3M Tape 1205	Polymide /Acrylic Adhesive	Not Appicable	
11.004	3M Tape 92	Polymide / Silicone Adhedsive	Not Applicable	
11.005	Temp Lace H231H	Teflon Braid /Syn Rubber	Not Applicable	
11.006	Temp Lace AA52081 C4	Polyester w synthetic rubber finish	Not Applicable	

DML Ref	Part	Nature	Size Range	Comments
14.002	CV 2500	Silicone 2 part	Not Applicable	
15.001	Coilformer and coil carrier	Polyerephtalate, Glass fibre reinforced	Not Applicable	
15.003	Epcos Washer	Polycarbonate	Not Applicable	
15.005	Ultem 1010R-7101	Polyetherimid (PEI)	Not Applicable	
15.006	Ultem 1000-1000 Natural	Polyetherimid (PEI)	Not Applicable	
15.008	Liquid-crystal Polymers (LCP) UL 94V	Liquid-crystal Polymers (LCP) UL 94V	Not Applicable	
16.002	Silicone Rubber Tube	Silicone Rubber Tube	Not Applicable	
16.007	Silicone Rubber Tube	Silicone Rubber Tube	Not Applicable	
17.004	Cho-Therm 1671	Silicone elastomer	Not Applicable	
17.005	Cho-Seal 1285	Silicone elastomer	Not Applicable	
18.002	PCB	Polymide Glass fibre and plated copper with SnPb on terminals	Not Applicable	
18.003	GFR Thermosetting Plastic	Phenolic with glass fibre Green	Not Applicable	
18.004	GFR Thermosetting Plastic	Phenolic with glass fibre Green +155ºC	Not Applicable	
18.006	(PF) GFR	Phenol Formaldhyde	Not Applicable	
19.001	Copper Wire	Theic-Mod Polyester with Polyamide-imide overcoating	From Ø 0,710MM upwards	
19.002	Copper Wire	Theic-Mod Polyesterimide Enamelled	From Ø 0,560MM upwards	
19.003	Copper Wire	Polyesterimide Enamelled	From Ø 0,080MM upwards	
19.004	Copper Wire	Polyurethane Polymide Enamelled Copper Wire (Magnesol)	From Ø 0,100MM upwards	
19.006	Copper Wire	AWG (Filica Wire)	From AWG 18 upwards	
20.001	Thread	Thread	Not Applicable	
20.002	Epoxy Glass Laminate	Epoxy Glass Laminate GF, FR4	Not Applicable	

Table 3-3 Materials List

3.5 Range of processes for Qualification Testing

All design and manufacturing activities are complete. This list details the processes used.

Item No. And user code	Process identification.	User name & Ass.	Process description.	Criticality.
FT.01.002	Gluing with Scotchweld EC2216	1) FLUX A/S 2) FT08711101	Gluing of transformers	Standard
FT.03.001	Imgregnation with CV2500 or MAPSIL QS1123	1) FLUX A/S 2) FT08710901	Impregnation of transformers	Standard
FT.03.002	Imgregnation with solithane 113	1) FLUX A/S 2) FT08710902	Impregnation of transformers	Standard
FT.07.001	Wire stripping	1) FLUX A/S 2) FT08710601	Chemical stripping of wire Ø<0.56mm	Standard
FT.07.002	Wire stripping	1) FLUX A/S 2) FT08710602	Mechanical stripping of wire Ø>0.60mm	Standard
FT.07.003	Wire stripping	1) FLUX A/S 2) FT08710602	Thermal stripping (solderable enamelled wire)	Standard
FT.07.004	Wire stripping	1) FLUX A/S 2) FT07400005	Class 1 stripping	Standard
FT.07.005	Wire cleaning	1) FLUX A/S 2) FT07510017	Cleaning after Class 1 stripping	Standard
FT.07.006	Wire winding	1) FLUX A/S 2) FT08710501	Wire winding of transformers and inductors with coilformer	Standard
FT.07.007	Wire winding	1) FLUX A/S 2) FT08710503	Wire winding of transformers and inductors on toroids	Standard
FT.07.008	Staking of thin wire	1) FLUX A/S 2) ECSS-Q-ST-70-08C	Staking of thin wire to avoid stress	Standard
FT.08.001	Soldering	1) FLUX A/S 2) ECSS-Q-ST-70-08C	Soldering with Sn63Pb37	Standard
FT.08.002	High temperature Soldering	1) FLUX A/S 2) ECSS-Q-ST-70-08C	Soldering with Sn96Ag4	Standard
FT.08.003	Soldering of planar transformers	1) FLUX A/S 2) ECSS-Q-ST-70-08C	Soldering with Sn96Ag4	Standard
FT.09.001	Pure tin removal	1) FLUX A/S 2) FT08710604	Removal of pure tin surface finishes	Sensitive
FT.09.002	Pretinning	1) FLUX A/S 2) FT08710604	Pretinning	Standard
FT.13.001	Wire tempering	1) FLUX A/S 2) FT07140001	Tempering of enamelled wires after winding to avoid solvent induced crazing	Standard
FT.13.002	Destressing of carrier	1) FLUX A/S 2) ASD/PROC/90025 & FT07120059	Destressing of carrier	Standard
FT.14.001	Assembly of cores	1) FLUX A/S 2) ASD/PROC/90025 & FT07120059	Core Assembly	Standard
FT.14.002	Insertion of pins	1) FLUX A/S 2) FT08710701	Insertion of pins into carrier	Standard
FT.14.003	Modification of coilformer	1) FLUX A/S 2) FT08710204	Modification of coilformer	Standard
FT.15.001	Marking	1) FLUX A/S 2) FT08711001	Marking and serialisation	Standard
FT.16.001	Grinding of cores	1) FLUX A/S 2) FT08710120	Grinding of ferrite cores	Standard
FT.16.002	Toriods on coupelle	1) FLUX A/S 2) FT07150092	Assembly and potting of toroids in coupelles	Standard
FT.16.003	Packing and Shipping	1) FLUX A/S 2) TBA	Packing and Shipping	Standard
FT.16.004	Bandaging of toroids	1) FLUX A/S 2) TBA	Bandaging of toroids	Standard
FT.17.001	Incoming inspection	1) FLUX A/S 2) FT08781001	Incoming inspection	Standard
FT.17.002	MIP/KIP	1) FLUX A/S 2) FT08710401	Mandatory and Key inspection points	Standard
FT.17.003	Manufacturing control	1) FLUX A/S 2) FT08775101	Manufacturing control	Standard
FT.17.004	Screening	1) FLUX A/S 2) FT07160068	Screening test for inductors and transformers	Standard
FT.17.005	In production testing	1) FLUX A/S 2) FT07160069	Measuring of magnetic components	Standard
FT.17.006	Material Inspection	1) FLUX A/S 2) FT08710301	Material Inspection prior to use	Standard
FT.17.007	Visual Inspection	1) FLUX A/S 2) FT08711204	In production visual inspection	Standard
FT.17.008	Final Inspection	1) FLUX A/S 2) FT08711204	Final Inspection	Standard

Table 3-3 Processes List

3.6 Retention of qualification status

There is a conflict between the retention periods stated in MIL-PRF-27 [RD2] and MIL-STD-981[RD4]. For purposes of this specification, MIL-PRF-27 [RD2] holds precedence

Qualification status is valid for a period of sixty months from the date of initial qualification (start of testing date), provided that during this period the topology using the same materials and processes, has been manufactured at least once each successive twelve month period.

4. QUALIFICATION TESTING

Qualification is performed based on with MIL-PRF-27[RD2] Table V (Qualification Inspection)

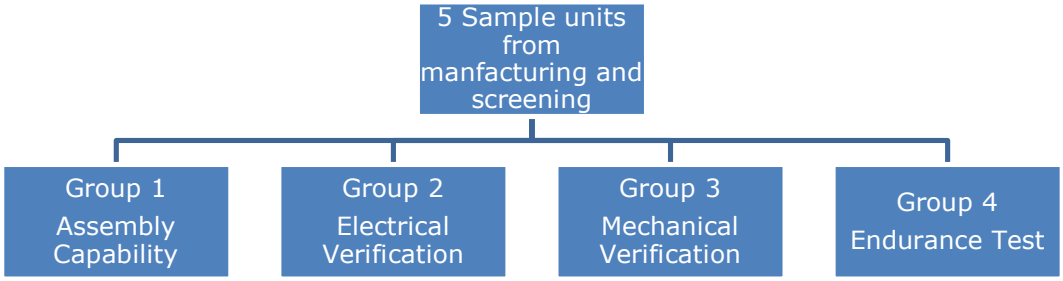


Table 4-1 Test Sub-groups

4.1 Test Report matrix

Group and Test		Q1 - 12129013					Q2 - 14220174					Q3 - 14220153					Q4 - 14140024					Q5 - 14230080				
		001	002	003	004	005	046	047	048	049	050	122	123	124	125	126	015	016	017	018	019	173	174	175	176	177
Group 1	Screening	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Solderability	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Visual Inspection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Group 2	Terminal Strength	✓	✓	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	✓	✓	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Visual Inspection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Dielectric Withstanding Voltage (at atmospheric pressure)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Electrical characteristics (room temperature)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Group 3	Vibration	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Mechanical Shock	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Visual Inspection	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Dielectric withstanding voltage (At reduced voltage)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Thermal shock	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Electrical characteristics (inductance)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Moisture resistance	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Winding continuity	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Electrical characteristics (inductance)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Overload	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Dielectric withstanding voltage (At reduced voltage)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Induced Voltage	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Insulation resistance	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Winding continuity	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Visual and mechanical examination	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Electrical characteristics	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Visual and Mechanical Examination (DPA)	✓					✓					✓					✓					✓				
Group 4	Life test			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Dielectric withstanding voltage (At reduced voltage)			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Insulation resistance			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Electrical characteristics			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Visual and mechanical examination			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓

Pass	Passed with comments See section 7.5/7.6	Fail See section 7.7	This test is required, however it is Not Applicable for this part type	In accordance with Test procedure this test is not required for this S/N	Pending

Test Report matrix (continued)

Group and Test		Q6 - 14011001					Q7 - 14050029					Q8 - 14121023					Q9 - 12141085					Q10 - 14210147				
		1	2	3	4	5	1209	1210	1211	1212	1213	701	702	703	704	705	033	034	035	036	037	041	042	043	044	045
Group 1	Screening	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Solderability	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Visual Inspection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Group 2	Terminal Strength	N/A	N/A	N/A	N/A	N/A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	✓	✓	✓	✓	✓
	Visual Inspection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Dielectric Withstanding Voltage (at atmospheric pressure)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Electrical characteristics (room temperature)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Group 3	Vibration	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Mechanical Shock	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Visual Inspection	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Dielectric withstanding voltage (At reduced voltage)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Thermal shock	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Electrical characteristics (inductance)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Moisture resistance	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Winding continuity	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Electrical characteristics (inductance)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Overload	✓	✓				✓	✓									✓	✓				✓	✓			
	Dielectric withstanding voltage (At reduced voltage)	✓	✓				✓	✓									✓	✓				✓	✓			
	Induced Voltage	✓	✓				✓	✓									✓	✓				✓	✓			
	Insulation resistance	✓	✓				✓	✓									✓	✓				✓	✓			
	Winding continuity	✓	✓				✓	✓									✓	✓				✓	✓			
	Visual and mechanical examination	✓	✓				✓	✓									✓	✓				✓	✓			
	Electrical characteristics	✓	✓				✓	✓									✓	✓				✓	✓			
	Visual and Mechanical Examination (DPA)	✓					✓										✓					✓				
Group 4	Life test			✓	✓	✓			✓	✓	✓								✓	✓	✓			✓	✓	✓
	Dielectric withstanding voltage (At reduced voltage)			✓	✓	✓			✓	✓	✓								✓	✓	✓			✓	✓	✓
	Insulation resistance			✓	✓	✓			✓	✓	✓								✓	✓	✓			✓	✓	✓
	Electrical characteristics			✓	✓	✓			✓	✓	✓								✓	✓	✓			✓	✓	✓
	Visual and mechanical examination			✓	✓	✓			✓	✓	✓								✓	✓	✓			✓	✓	✓

Pass	Passed with comments See section 7.5/7.6	Fail See section 7.7	This test is required, however it is Not Applicable for this part type	In accordance with Test procedure this test is not required for this S/N	Pending

Test Report matrix (continued)

Group and Test		Q11 - 12341031					Q12 - 12311047					Q13 - 12001166					Q14 - 14260113					Q15 - 14280034				
		037	038	039	040	041	2941	2942	2943	2944	2945	1	2	3	4	5	013	014	015	016	017	039	040	041	042	043
Group 1	Screening	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Solderability	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Visual Inspection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Group 2	Terminal Strength	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Visual Inspection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Dielectric Withstanding Voltage (at atmospheric pressure)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Electrical characteristics (room temperature)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Group 3	Vibration	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Mechanical Shock	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Visual Inspection	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Dielectric withstanding voltage (At reduced voltage)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Thermal shock	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Electrical characteristics (inductance)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Moisture resistance	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Winding continuity	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Electrical characteristics (inductance)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Overload	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Dielectric withstanding voltage (At reduced voltage)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Induced Voltage	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Insulation resistance	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Winding continuity	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Visual and mechanical examination	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Electrical characteristics	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Visual and Mechanical Examination (DPA)	✓					✓					✓					✓					✓				
Group 4	Life test			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Dielectric withstanding voltage (At reduced voltage)			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Insulation resistance			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Electrical characteristics			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Visual and mechanical examination			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓

Pass	Passed with comments See section 7.5/7.6	Fail See section 7.7	This test is required, however it is Not Applicable for this part type	In accordance with Test procedure this test is not required for this S/N	Pending

Test Report matrix (continued)

Group and Test		Q16 - 14790201					Q17 - 14790101					Q18 - 14170209					Q19- 14271050					Q20 - 12800014				
		069	070	071	072	073	028	029	030	031	032	017	018	019	020	021	001	003	005	002	004	028	029	030	031	032
Group 1	Screening	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Solderability	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Visual Inspection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Group 2	Terminal Strength	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	✓	✓	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Visual Inspection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Dielectric Withstanding Voltage (at atmospheric pressure)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Electrical characteristics (room temperature)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Group 3	Vibration	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Mechanical Shock	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Visual Inspection	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Dielectric withstanding voltage (At reduced voltage)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Thermal shock	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Electrical characteristics (inductance)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Moisture resistance	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Winding continuity	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Electrical characteristics (inductance)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Overload	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Dielectric withstanding voltage (At reduced voltage)	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Induced Voltage	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Insulation resistance	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Winding continuity	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Visual and mechanical examination	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Electrical characteristics	✓	✓				✓	✓				✓	✓				✓	✓				✓	✓			
	Visual and Mechanical Examination (DPA)	✓					✓					✓					✓					✓				
Group 4	Life test			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Dielectric withstanding voltage (At reduced voltage)			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Insulation resistance			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Electrical characteristics			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Visual and mechanical examination			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓

Pass	Passed with comments See section 7.5/7.6	Fail See section 7.7	This test is required, however it is Not Applicable for this part type	In accordance with Test procedure this test is not required for this S/N	Pending

Test Report matrix (continued)

Group and Test		Q21 - 14120057					Q22 - 12000100					Q23 - 12121156				
		408	409	410	411	412	4	5	3	1	2	006	007	008	009	010
Group 1	Screening	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Solderability	✓	✓	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	✓	✓	✓	✓	✓
	Visual Inspection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Group 2	Terminal Strength	✓	✓	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Visual Inspection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Dielectric Withstanding Voltage (at atmospheric pressure)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Electrical characteristics (room temperature)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Mounting on PCB and Fixture	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Visual Inspection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Electrical characteristics (inductance)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Group 3	Vibration	✓	✓				✓	✓				✓	✓			
	Mechanical Shock	✓	✓				✓	✓				✓	✓			
	Visual Inspection	✓	✓				✓	✓				✓	✓			
	Dielectric withstanding voltage (At reduced voltage)	✓	✓				✓	✓				✓	✓			
	Thermal shock	✓	✓				✓	✓				✓	✓			
	Electrical characteristics (inductance)	✓	✓				✓	✓				✓	✓			
	Moisture resistance	✓	✓				✓	✓				✓	✓			
	Winding continuity	✓	✓				✓	✓				✓	✓			
	Electrical characteristics (inductance)	✓	✓				✓	✓				✓	✓			
	Overload	✓	✓				✓	✓				✓	✓			
	Dielectric withstanding voltage (At reduced voltage)	✓	✓				✓	✓				✓	✓			
	Induced Voltage	✓	✓				✓	✓				✓	✓			
	Insulation resistance	✓	✓				✓	✓				✓	✓			
	Winding continuity	✓	✓				✓	✓				✓	✓			
	Visual and mechanical examination	✓	✓				✓	✓				✓	✓			
	Electrical characteristics	✓	✓				✓	✓				✓	✓			
	Visual and Mechanical Examination (DPA)	✓					✓					✓				
Group 4	Life test			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Dielectric withstanding voltage (At reduced voltage)			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Insulation resistance			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Electrical characteristics			✓	✓	✓			✓	✓	✓			✓	✓	✓
	Visual and mechanical examination			✓	✓	✓			✓	✓	✓			✓	✓	✓

Pass	Passed with comments See section 7.5/7.6	Fail See section 7.7	This test is required, however it is Not Applicable for this part type	In accordance with Test procedure this test is not required for this S/N	Pending/In progress

4.2 Test Facilities

All testing was performed at FLUX facilities, Asnaes, and Force facilities in Horsholm, Denmark.

4.3 Compliance towards MIL-PRF-27

Compliance between table 4-2 and MIL-PRF-27[RD2] requirements for grade 5 transformers and inductors, is given in table 4-3:

Test or Inspection	C / NC	Test / Doc	Notes
Solderability	C	T	Soldering Iron method
Resistance to solvents	C	D	Resistance to solvent known for all materials
Resistance to soldering heat	C	T	Part of solderability test
Terminal strength	C	T	
Dielectric withstanding voltage (At atm. pressure)	C	T	
Dielectric withstanding voltage (At bar pressure)	NC	-	Not performed due to excessive cost. Test is not required as part of MIL-STD-981 group B inspection.
Induced voltage	C	T	Only for machine wound components
Insulation resistance	C	T	
Electrical characteristics	C	T	
Temperature rise	NC	-	Component performance not relevant for process qualification.
Corona discharge	N/A	-	All components operate below 100V/mil
Salt spray	NC	-	No components are subjected to salty environment
Vibration	C	T	
Shock	C	T	Test conditions E used
Dielectric withstanding voltage (At reduced voltage)	C	T	
Induced voltage	C	T	Only for machine wound components
Winding continuity	C	T	
Thermal shock (100 cycles)	C	T	100 cycles performed
Winding continuity	C	T	
Immersion	NC	-	No components are subjected to wet environment
Moisture resistance	C	T	Test performed without polarisation, no load, excl. vibration
Overload	C	T	
Low Temperature Storage		T	This is an additional test not specified in MIL-PRF-27[RD2]
Dielectric withstanding voltage (At reduced voltage)	C	T	
Induced voltage	C	T	Only for machine wound components
Insulation resistance	C	T	
Winding continuity	C	T	
Visual and mechanical examination	C	T	
Electrical characteristics	C	T	
Flammability	C	D	Flammability data used
Visual and Mechainical examination (Internal)	C	T	
Life test	C	T	
Dielectric withstanding voltage (At reduced voltage)	C	T	
Insulation resistance	C	T	
Visual and mechanical examination	C	T	
Electrical characteristics	C	T	
Fungus	C	D	All materials used are fungus resistant

Table 4-3 Compliance Matrix

5. TEST METHODS AND REQUIREMENTS

5.1 Screening

Screening shall be performed in accordance with FT08711502(RD6) as specified in the detail specifications and the test matrix in table 4-2.

5.2 Electrical characteristics

The applicable electrical characteristics and tolerances shall be as specified on the transformer or inductor manufacturing drawing.

5.2.1 Electrical characteristics test method

Electrical characteristics are defined as inductance. The applicable electrical characteristics for each sample are specified on the detail specifications. Measurements shall be performed in accordance with FT08711502(RD6) with the test conditions as specified in the detailed specifications.

5.2.2 Electrical characteristics requirements

The measured electrical characteristics shall fall within the limits specified on the detailed specifications. Drift shall be calculated with reference to first measurement after production screening.

5.3 Visual inspection

Visual inspection shall be performed as specified in table 4-2.

5.3.1 Visual inspection method

Visual inspection shall be aided by magnification appropriate to the size of inspection item, between 4x to 10x magnification. Additional magnification shall be used to resolve suspected anomalies or defects.

5.3.2 Visual inspection requirements

5.3.2.1 External

The qualification models shall be examined to verify that the materials, external design and construction, physical dimensions, marking and workmanship are in accordance with the requirements defined in the relevant procedures and the applicable documents given in chapter 2.

5.3.2.2 Post-test

Not more than 10% of the surface shall have pooling, flaking, chipping, cracking, crazing or other impairment of the protective coating. There shall be no leakage of the filling material, no evidence of other physical damage, such as cracks, bursting, or bulging of the case or corrosion affecting the mechanical or electrical operation of the samples in accordance with MIL-PRF-27(RD2).

5.4 Thermal Shock

5.4.1 Thermal shock method

Thermal shock shall be performed using an environmental chamber. The following test conditions shall be used:

Test Conditions	
Minimum temperature	- 55ºC ±3°C
Maximum temperature	+120°C ±3°C
Transition temperature	Room Temperature
Dwell time at min. and max. temperature	30 min.
Dwell time at transition temperature	4 min.
Transfer time	< 5 min.
Number of cycles	100

Table 5-1 Thermal Shock

The first five cycles shall be run continuously. After five cycles, the test may be interrupted after the completion of any full cycle, and the components allowed returning to room ambient temperature before testing is resumed.

5.4.2 Thermal shock requirement

The components shall be examined for evidence of leakage and other visible damage according to MIL-PRF-27[RD2].section 3.24.

5.5 Dielectric Withstanding Voltage

Atmospheric pressure is applicable for all components

5.5.1 Dielectric withstanding voltage method

The dielectric withstanding voltage test serves to determine whether insulating materials and spacing between different parts in the magnetic component are adequate.

The test consists of the application of an AC voltage higher than rated voltage for a specific time between mutually insulated portions of a component part or between insulated portions and ground.

The test shall be applied between each winding and shield and all of the other windings and shields connected to the core (if accessible). Alternatively the test shall be applied between each winding and shield and each of the other windings, shields and core (if accessible).

For toroids where the core is not accessible, the components shall be wrapped in conductive material (ESD-foam) and the test shall be applied between each winding and the conductive material.

Voltage	500 V rms.
Max. Current	0.10 mA ± 0.02 mA
Ramp Time	Max. 1 s
Dwell Time	Min. 5 s
Frequency	50 Hz

Table 5-2 Dielectric Withstanding Voltage(DWV)

5.5.2 Dielectric withstanding voltage requirements

During and after the test the magnetic device shall be inspected for evidence of arcing, flashover, breakdown of insulation, and damage in accordance with MIL-PRF-27(RD2), section 4.7.9.1.

5.6 Solderability

Solderability shall be performed on samples with PCB terminals. Solderability is not applicable for flying leads.

5.6.1 Solderability method

Solderability shall be tested by the "Soldering iron method", specified in MIL-STD-202 (RD3) , method 208. By using the "Soldering iron method" no separate test for resistance to soldering heat will be performed, and the purpose of this test will be:

a) Qualification of the component resistance to heat when soldered with a soldering iron.

b) Qualification of the solderability of the component terminals.

Practical test method to be applied:

- Minimum two of each type of terminals shall be tested
- A standard soldering iron shall be used. Tip temperature shall be 330 °C +/- 10 °C
- Solder alloy shall be Sn63Pb37 and FLUX shall be type RMA.
- The solder tip shall be held on the middle of the terminal for 2 Sec +/- 0,5 sec
- Solder iron tip shall be calibrated to reach 280°C on the calibration wire in 2 sec

5.6.2 Solderability requirements

The pins shall be visually inspected. Any termination that has less than 5% of the examination area dewetted, nonwetted or with pinholes will be accepted. Inspection is in accordance with MIL-STD-202 (RD3), method 208.

5.7 Resistance to solvent

Not applicable when resistance to solvent data is available. This data is available for the labels used by FLUX, as confirmation FLUX will subject 10 labels to test. These labels will be affixed to dummy units and tested as follows.

5.7.1 Resistance to solvent method

Components shall be tested in accordance with MIL-STD-202 (RD3), method 215.

The following shall apply:

- The marked portion of the components shall be brushed.
- The solvents tested shall be:
  - Demineralized water
  - 2-propanol

5.7.2 Resistance to solvent requirements

Not more than 10 % of the surface shall have peeling, flaking, cracking or corrosion affecting the mechanical or electrical operation of the component in accordance with MIL-PRF-27(RD2), section 3.24.

5.8 Terminal strength

Up to a maximum of 4 identical terminals per sample is to be subjected to terminal strength test. Terminal strength test is not applicable for flying leads or heavy units that require additional fixation

5.8.1 Pull method

The components shall be tested in accordance with MIL-STD-202, method 211. The following details shall apply:

A force shall be applied in the direction of the axis of the termination. The force shall be gradually applied up to 10 N and this force shall be held for 5 – 10 seconds.

5.8.2 Terminal strength requirements

After each test the terminals shall be examined for loosening and rupturing and other mechanical damage in accordance with MIL-PRF-27[RD2], section 4.7.7. Unless otherwise specified, all terminals on each test sample shall be subjected to the above-mentioned tests, up to a maximum of four identical terminals per sample.

5.9 Vibration

Components from subgroup 3 shall be exposed to vibration test. The components shall be mounted on PCB's.

5.9.1 Vibration test method

The components shall be mounted on PCBs on vibration fixture. The components shall be exposed to random vibration according to MIL-STD-202 [RD3], method 214, condition H.

Test conditions are as follows:

- Random vibration
  Vibration level: 30 g rms.
  Duration: 5 minutes per axis.
  Level applied to fixture.

Axis	Frequency Range (Hz)	Level	G rms. Acceleration	Duration per axis
X,Y,Z	20 -100	+ 6 dB/oct	30	300 sec.
	100-1600	0.5 g²/Hz		
	1600-2000	- 12 dB/oct		

Table 5-3 Vibration Test Level

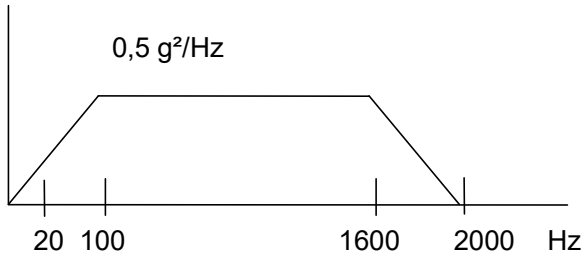


Table 5-4 Vibration test PSD spectrum

5.9.2 Vibration test requirements

There shall be no evidence of physical damage in accordance with MIL-PRF-27[RD2], section 3.18

5.10 Mechanical Shock

5.10.1 Mechanical shock method

The components shall be mounted on a PCB and a vibration fixture. The components shall be exposed to three shocks in each direction of the three perpendicular axes.

Due to the high demands of space industry, FLUX has elected to increase the demands specified by MIL-PRF-27(RD1), which states the units be tested accordance with MIL-STD-202(RD2), method 213 condition I which has a peak value of 100G shock with a sawtooth shape.

To this end, FLUX has decided that the peak value of the shocks is to be 500G with a half sine shape in accordance with MIL-STD-202(RD2), method 213 condition D Mechanical shock requirements.

5.10.2 Mechanical shock requirements

There shall be no evidence of physical damage in accordance with MIL-PRF-27(RD1), section 4.7.17.

5.11 Moisture resistance

5.11.1 Moisture resistance method

Moisture resistance is to be performed by exposing the components to a number of temperature and humidity cycles as specified in MIL-STD-202 (RD3), method 106F. The components are not to be polarised or loaded during humidity cycles. Cycle steps 7a (-10°C conditioning) and 7b (vibration) are not applicable.

5.11.2 Moisture resistance requirements

There shall be no evidence of physical damage, or corrosion affecting the mechanical or electrical operation of the component, in accordance with MIL-PRF-27(RD2), section 4.7.20.

5.12 Overload

5.12.1 Overload method

Overload test is performed by applying operating conditions as specified for each component, with the following exceptions:

- Input voltage is to be at 112% of normal input voltage
- Temperature: +125° C - 5° C +0ºC

The operating conditions are applied for at least 48h in accordance with in accordance with MIL-PRF-27(RD2), section 6.11.

5.12.2 Overload resistance requirements

There shall be no evidence of physical damage, or corrosion affecting the mechanical or electrical operation of the component, in accordance with MIL-PRF-27(RD2), section 4.7.20.

5.13 Life test

5.13.1 Operating Life test method

Components shall be tested in accordance with MIL-PRF-27[RD2]. Life test shall be performed by exposing the components to 5 cycles a week for 12 weeks. Four of the cycles consist of 20 hours at 105 degree C with operating conditions applied and 3 hours at room temperature, with no operations conditions applied.

The fifth cycle consist of 68 hours at 105 degree C with operating conditions applied and 3 hours at room temperature, with no operations conditions applied.

The transition times are to be 30 min +- 5 min each. During transition the samples shall be applied with operating conditions.

5.13.2 Life test requirements

There shall be no evidence of physical damage in accordance with MIL-PRF-27[RD2], section 3.24.

5.14 Visual and Mechanical Examination (DPA)

5.14.1 Visual and Mechanical Examination method

The components are to be moulded into adequate material and cut and polished. The cross section cut shall include solderings if any, and the core. Multiple cutplanes may be necessary. The components are to be visually inspected and photographed.

5.14.2 Visual and Mechanical Examination Pass Criteria

There shall not be any evidence of physical damage of core, wires, coilformer, solderings, and insulation materials or impregnation material.

6. ACCEPT / REJECT CRITERIA

Qualification samples where one or more sample units do not fulfil the requirements for any one or more tests are to be removed and are considered not acceptable. If, however, the cause of the failure can be identified as bad workmanship, wrong handling or similar reasons and is clearly not related to the general performance of material, process or topology, the sample can be considered as acceptable.

7. TEST RESULTS

7.1 Presentation of results

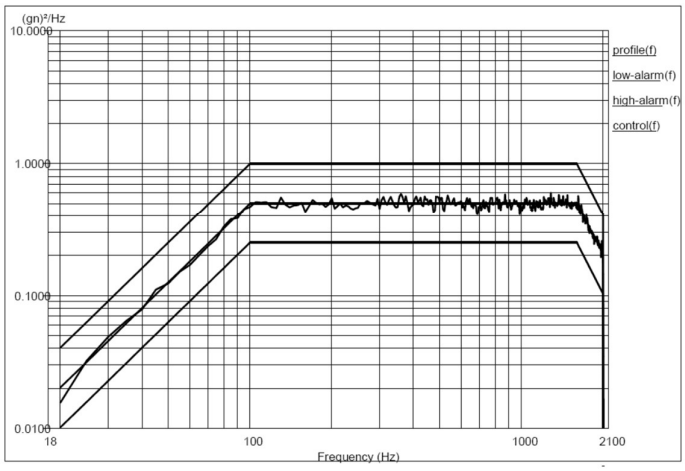
The results are presented and summerised in herein any remarks relevant to the test campaign are detailed in sections 7.5 through 7.8.

7.2 Vibration and Mechanical Shock

Vibration and Mechanical shock was performed at Force all units passed without comments

7.2.1 Random Vibration

This was performed on all units from subgroup 3

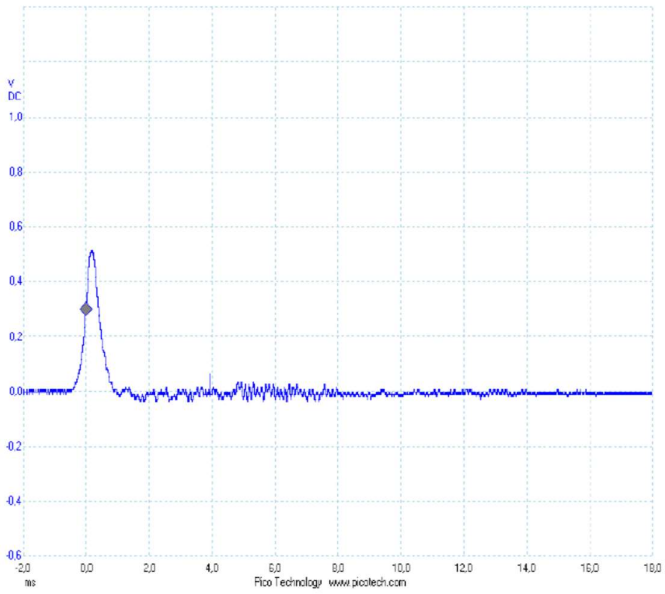


Vibration

Recorded PSD from run 1.

30 g_{rms}, 5 min.

7.2.2 Mechanical Shock 500g



Shock 500g

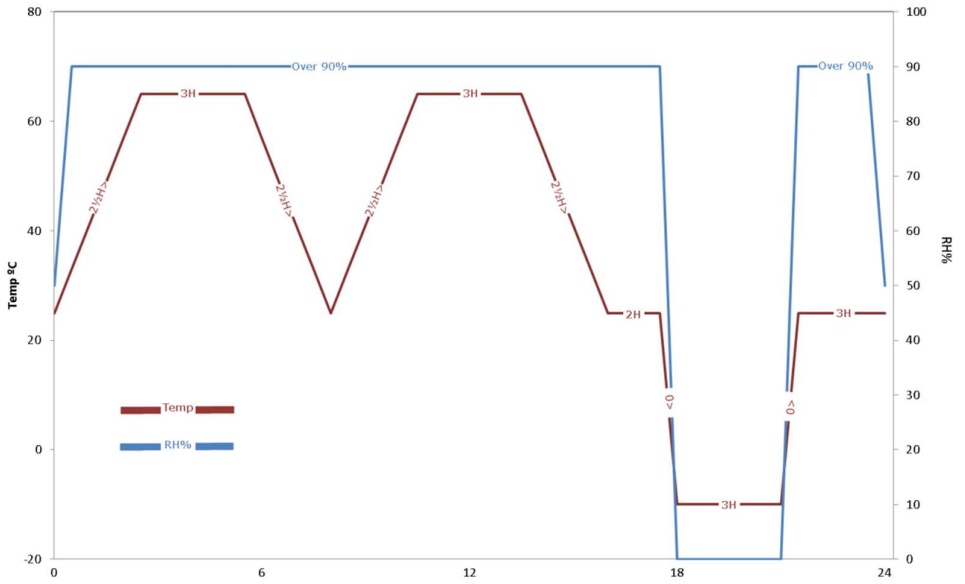
Recorded shock pulse

1 mV/g verti-cally.

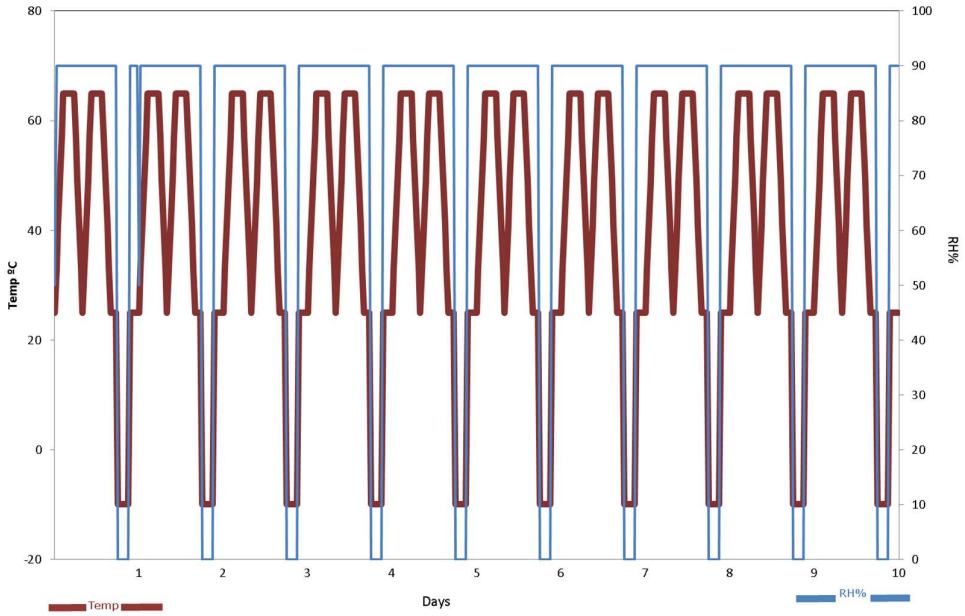
500 g, 1 ms

7.3 Moisture Test

7.3.1 One cycle

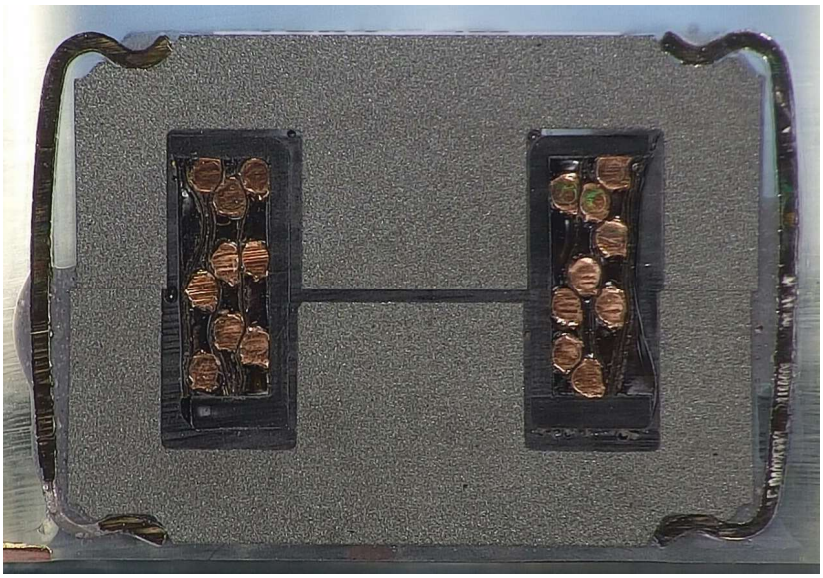


7.3.2 Full Test



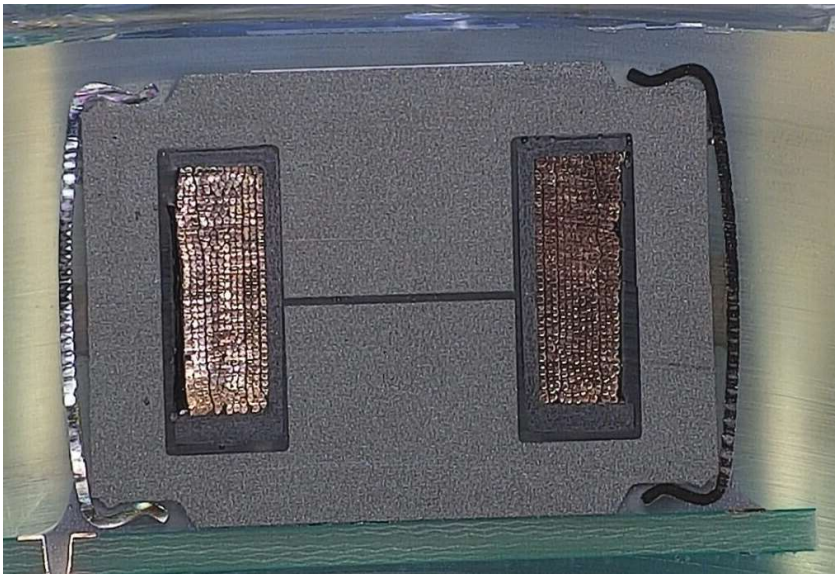
7.4 Internal Examination (DPA)

7.4.1 Q1 – 12129013



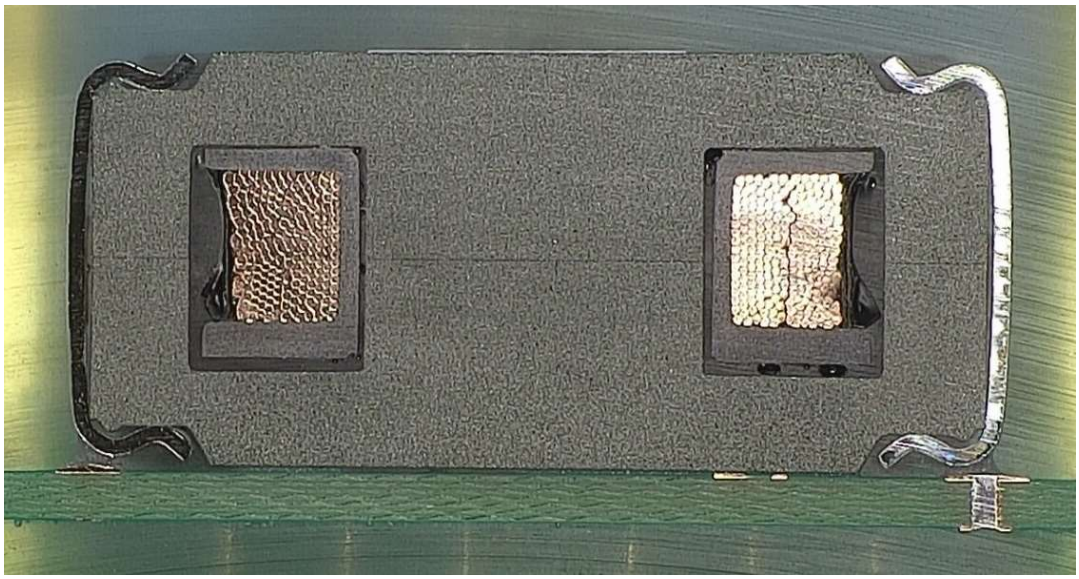
Comments: None

7.4.2 Q2 – 14220174



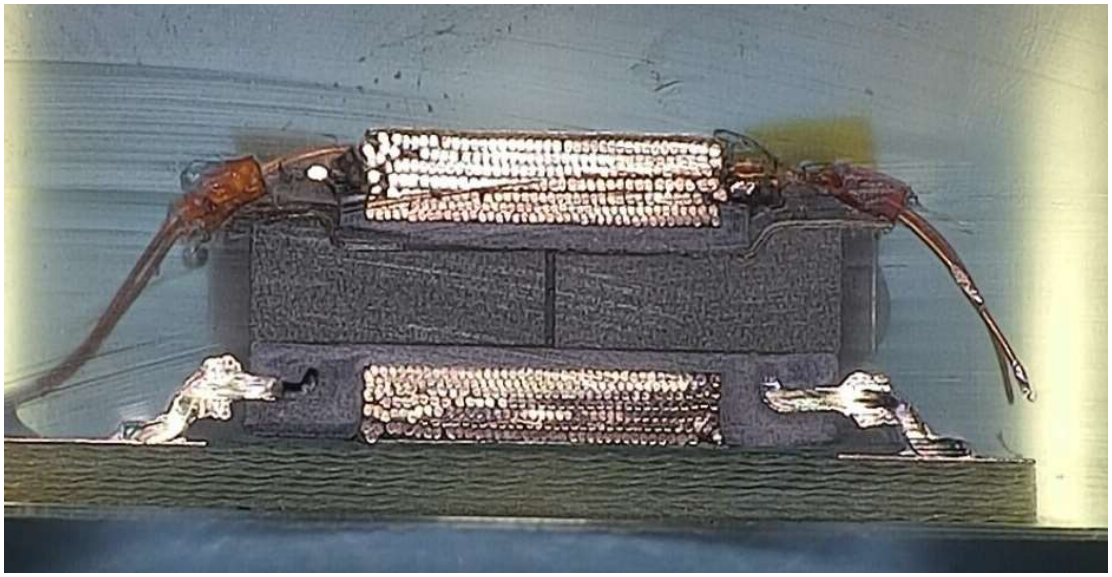
Comments:

7.4.3 Q3 – 14220153



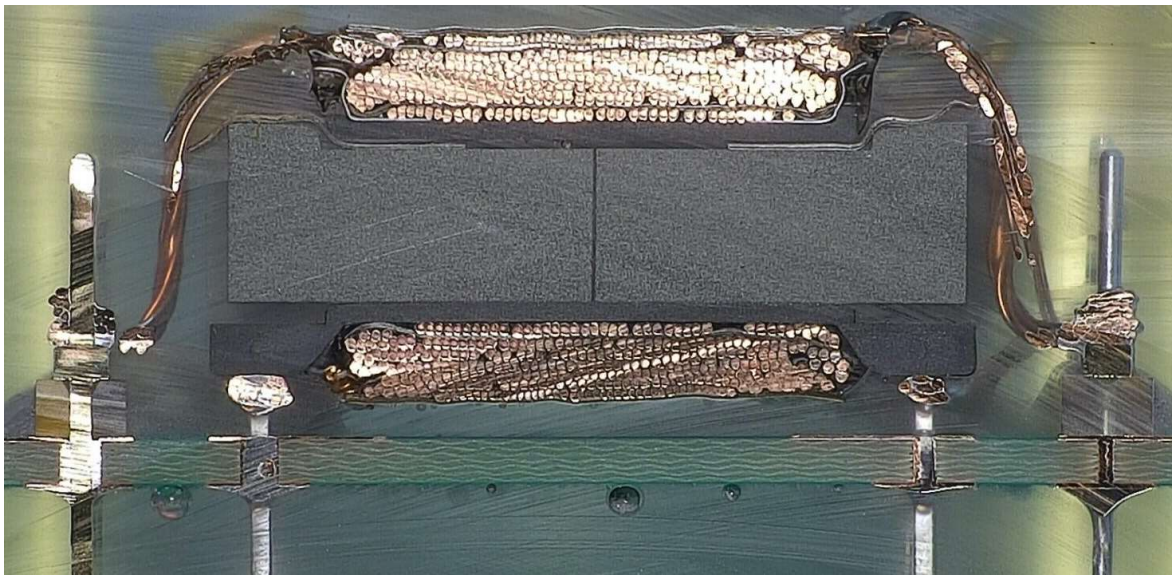
Comments: None

7.4.4 Q4 – 14140024



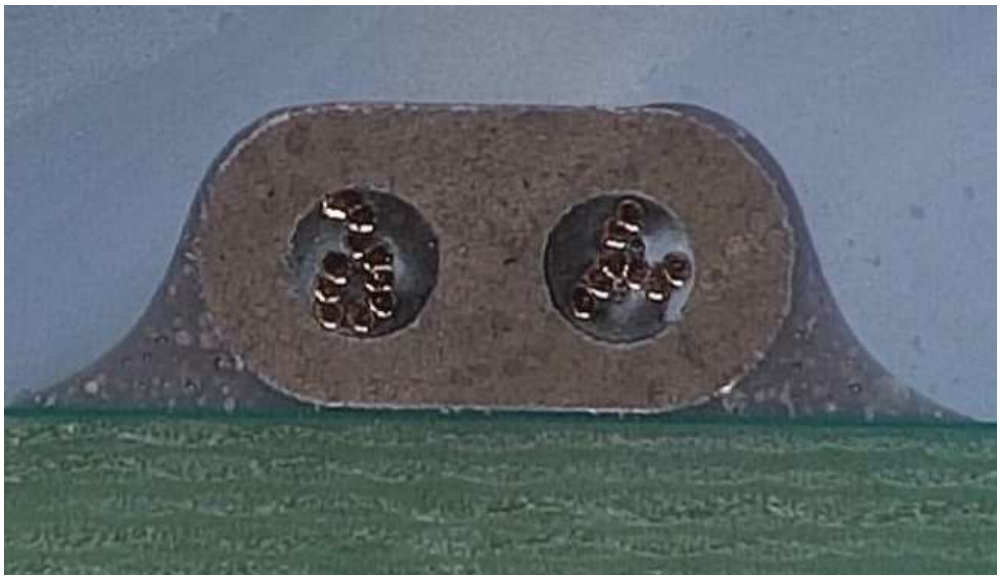
Comments: None

7.4.5 Q5 – 14230080



Comments: None

7.4.6 Q6 – 14011001

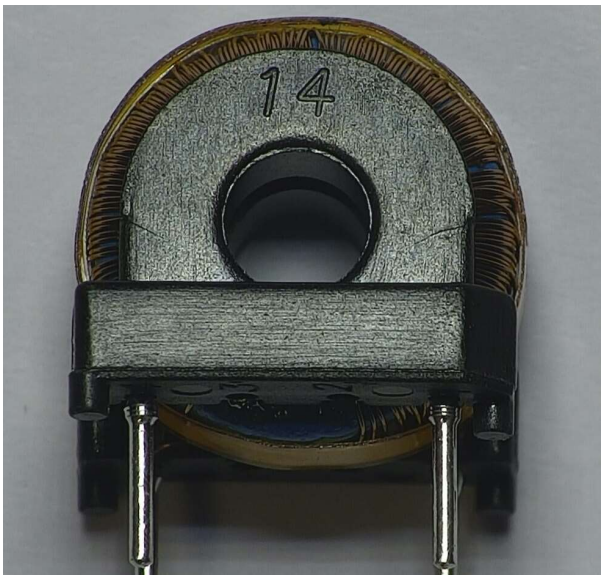


Comments: None.

7.4.7 Q7 – 14050029-4-B

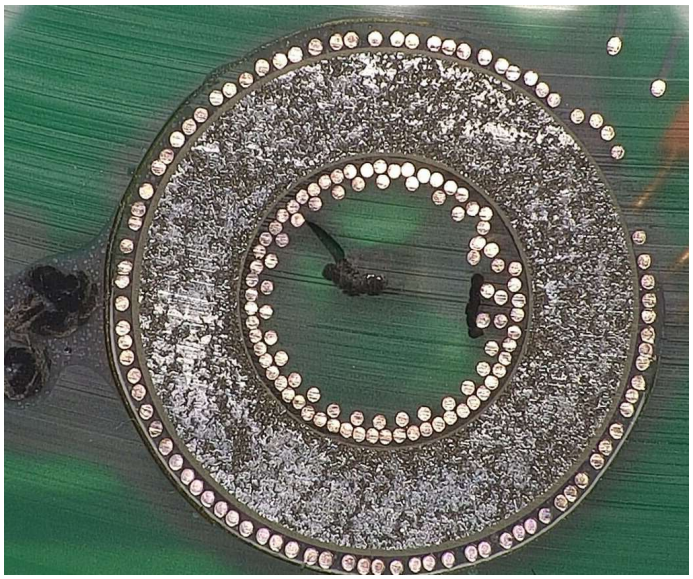
Comments: None

7.4.8 Q8 – 14121023-2-B



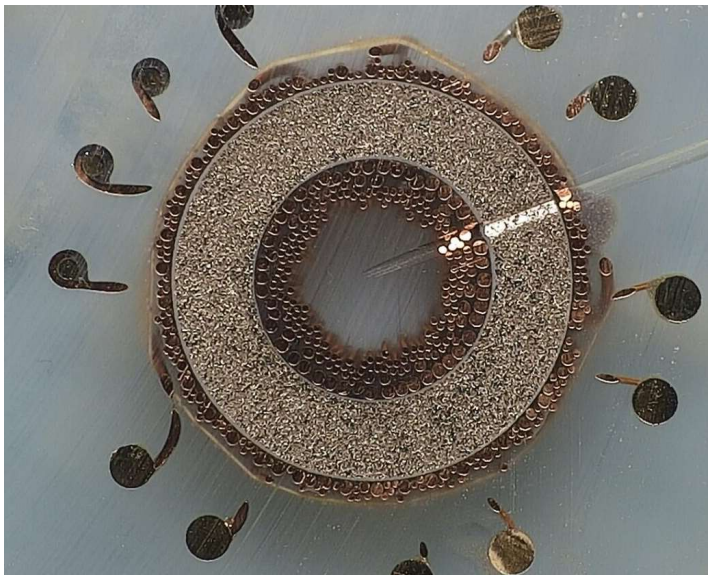
Comments: Pending

7.4.9 Q9 – 12141085-2-B



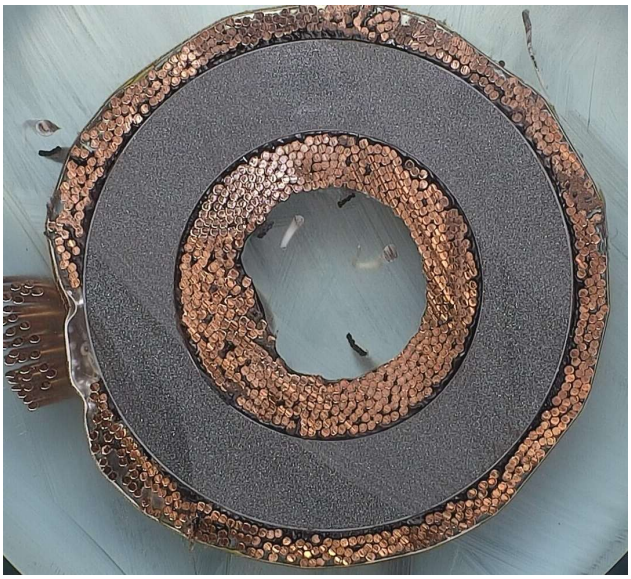
Comments: None

7.4.10 Q10 – 14210147-1-B



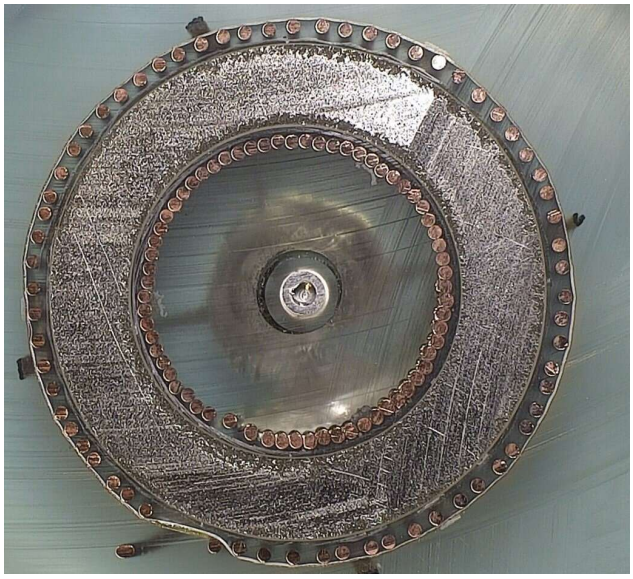
Comments: None

7.4.11 Q11 – 12341031-2-B



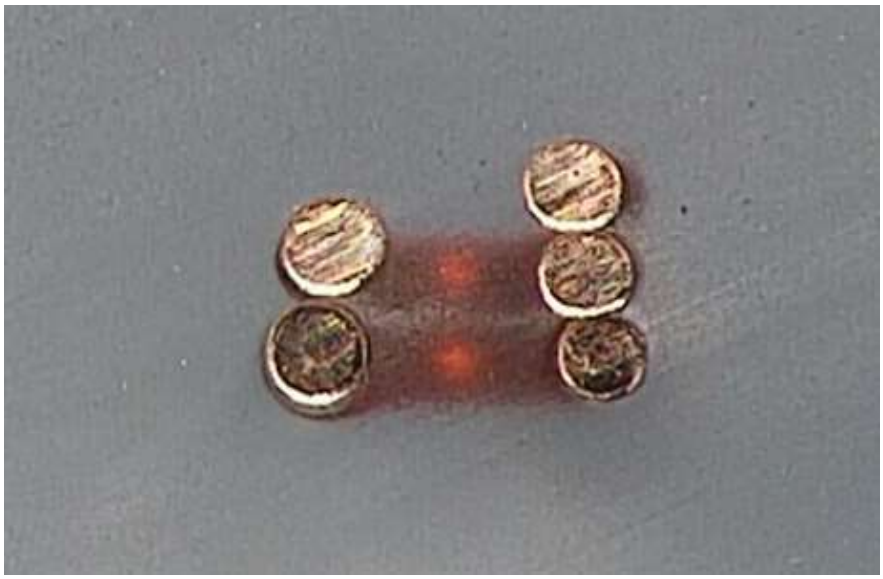
Comments:

7.4.12 Q12 – 12311047-3-B



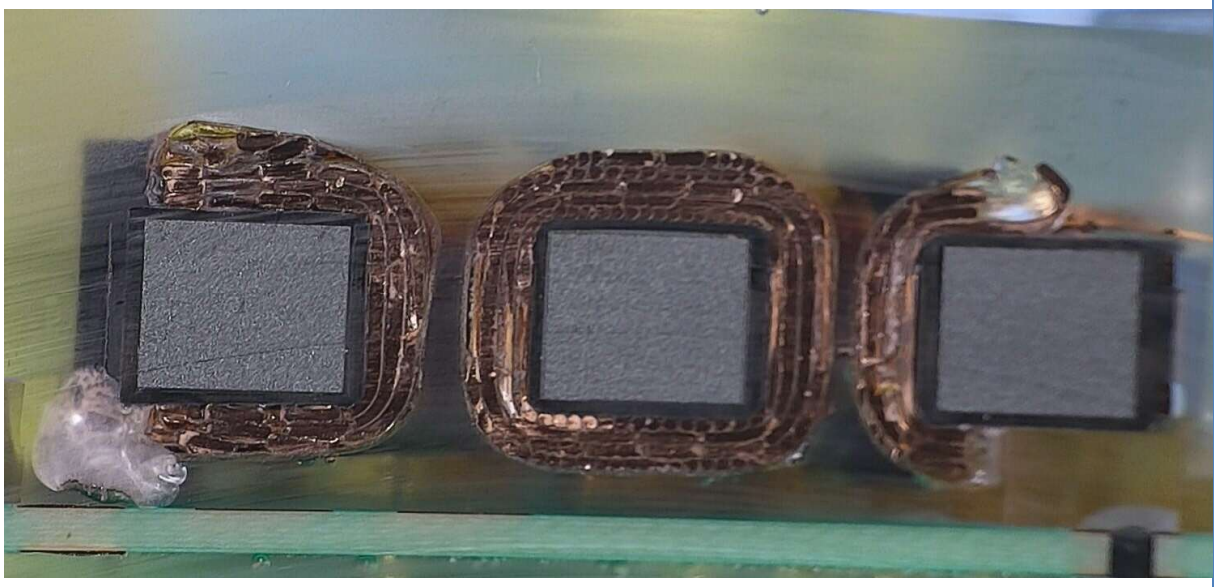
Comments: None

7.4.13 Q13 – 12001166-1



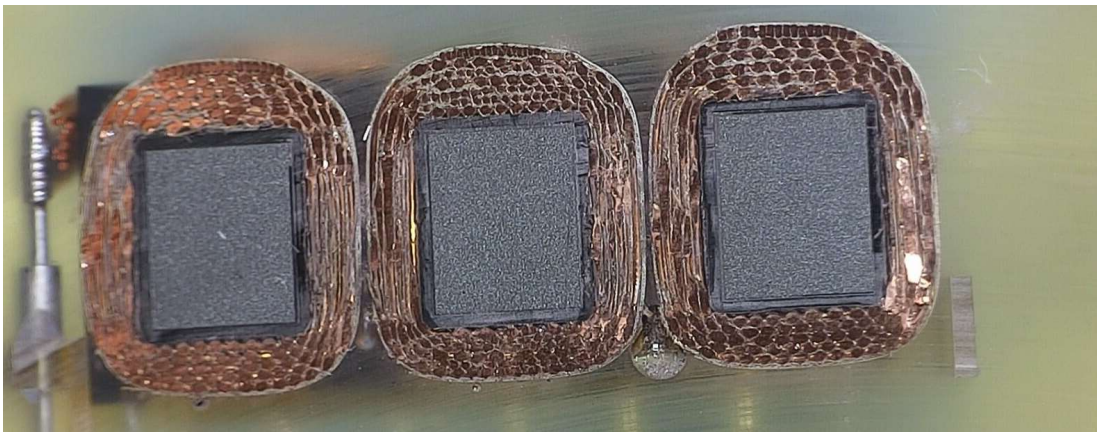
Comments: None

7.4.14 Q14 – 14260113-1-B



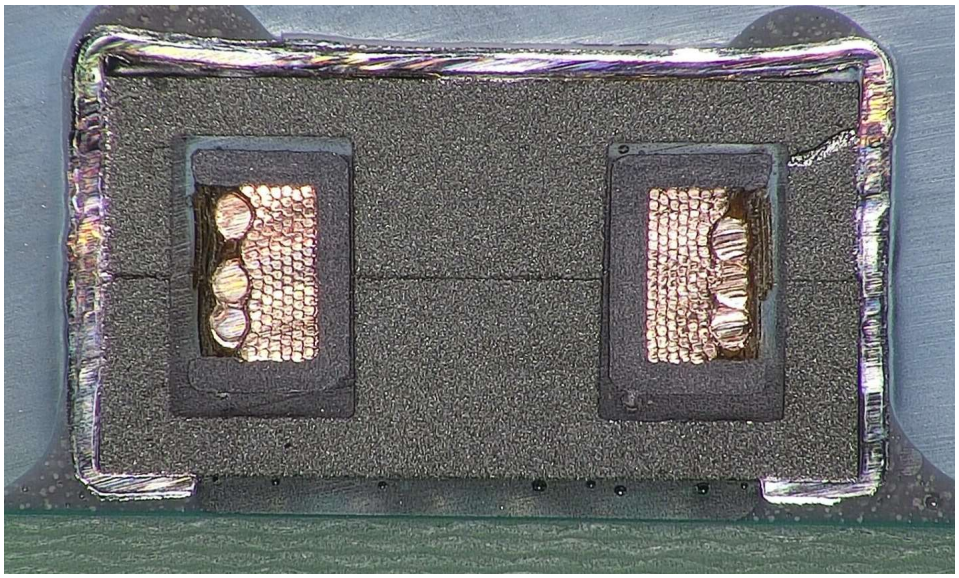
Comments: Small marks from the micro sectioning blade.

7.4.15 Q15 – 14280034-1-C



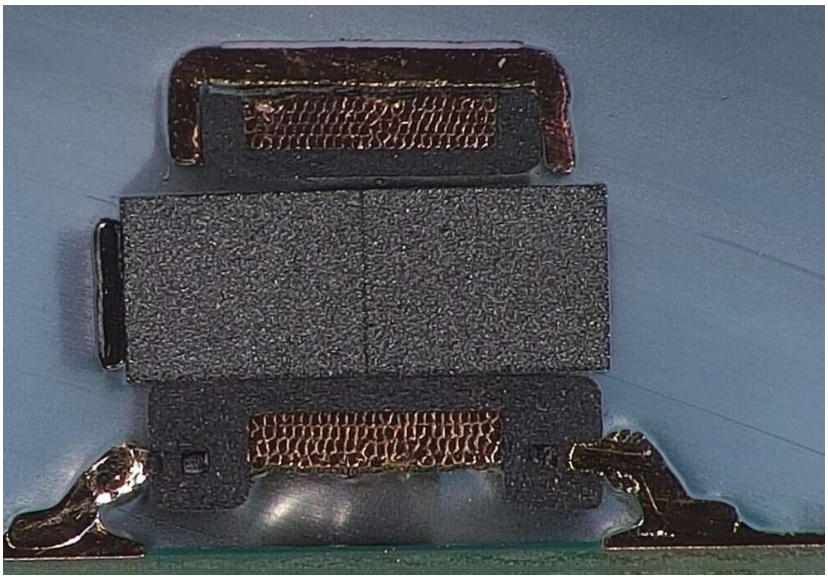
Comments: None

7.4.16 Q16 – 14790201-1-B



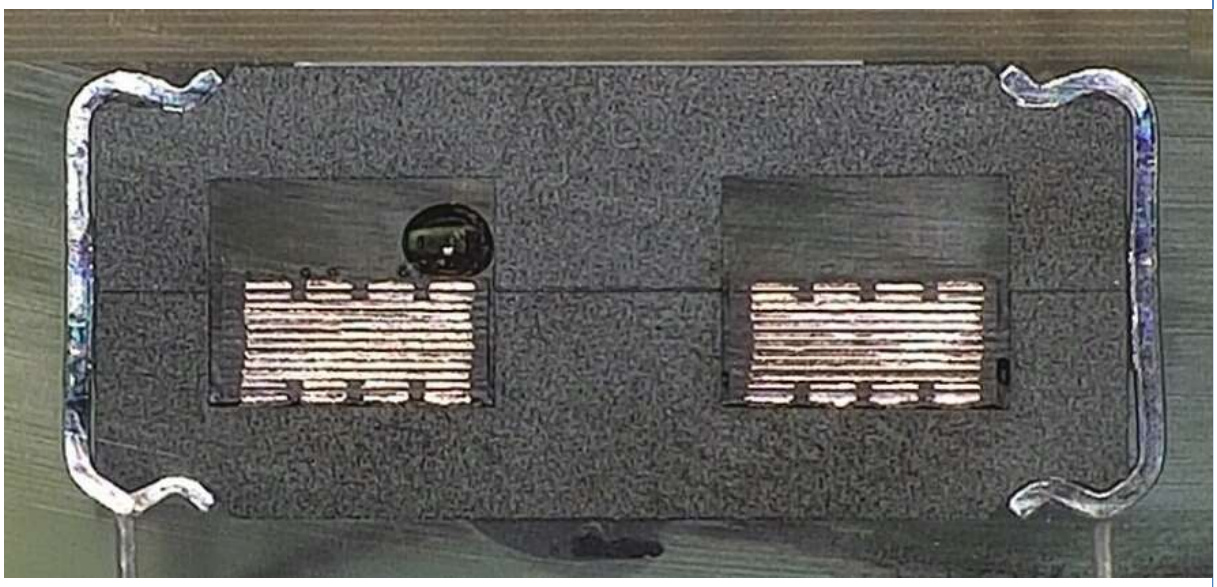
Comments: Small mark from micro sectioning process

7.4.17 Q17 – 14790101-1-B



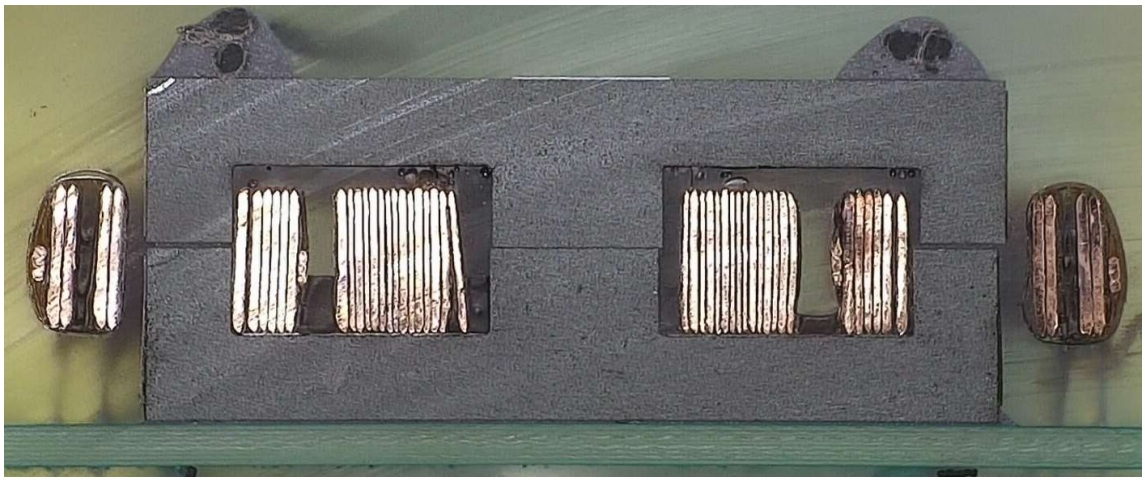
Comments: None.

7.4.18 Q18 – 14170209-1-B



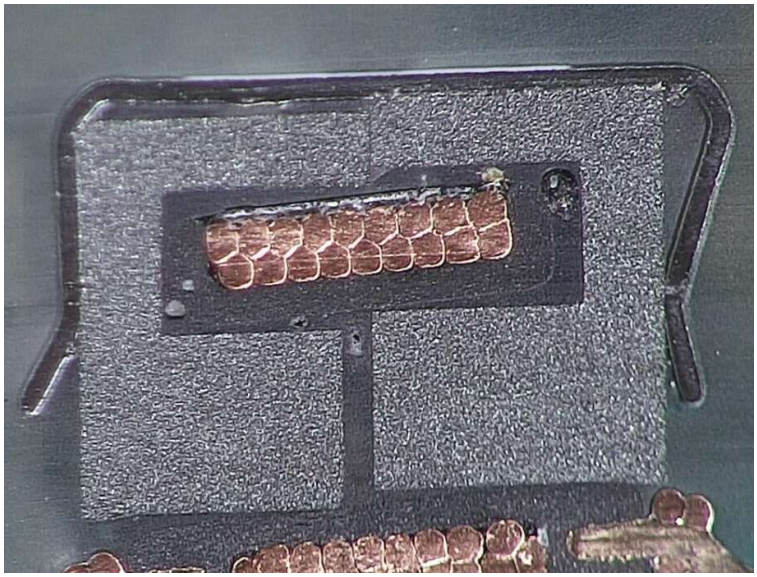
Comments: None

7.4.19 Q19 – 14271041-1-B



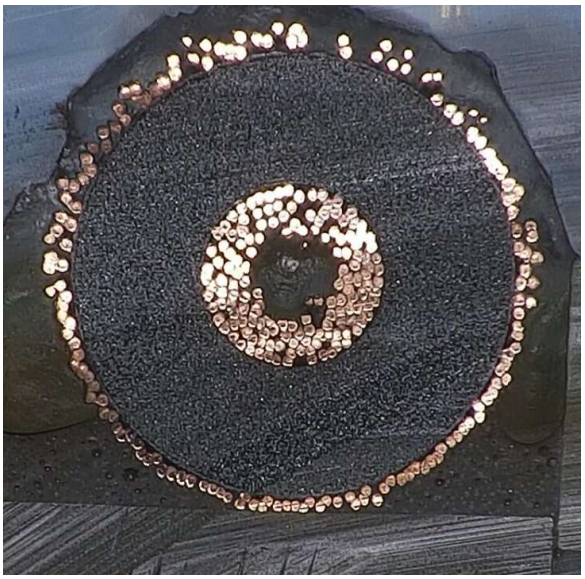
Comments: None

7.4.20 Q20 – 12800014-1-B



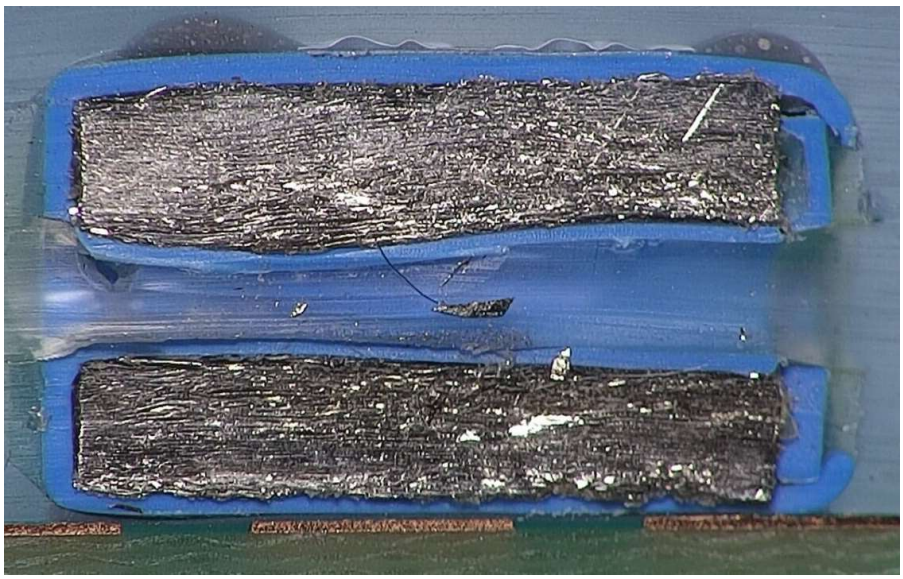
Comments: None

7.4.21 Q21 – 14120057-1-B



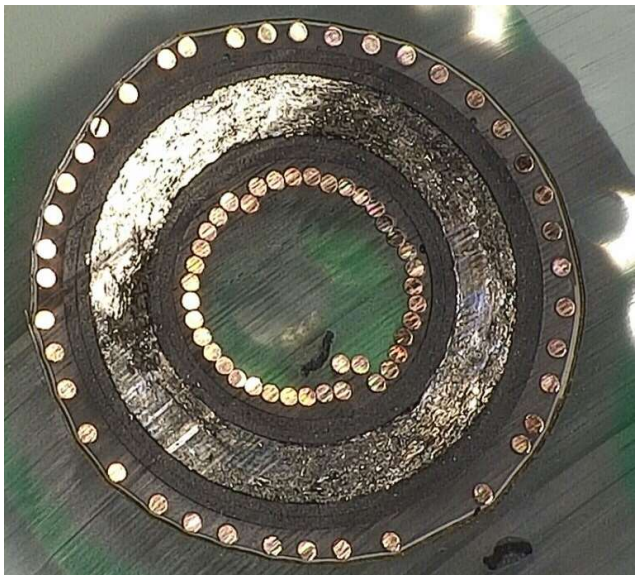
Comments: The unit is potted with CV2500, it was attempted to remove it using Digesil silicone remover. The area surrounding the core is the remaining CV2500.

7.4.22 Q22 – 12000100-1-B



Comments: None

7.4.23 Q23 – 12121156-1-C



Comments: None

7.5 Observations and Observations on testing

- Screening.
  - Q19 units slightly above limits on inductance
  - Q20 units slightly below limits on inductance
- Solderability.
  - Q22 – The unit has no leads.
- Terminal Strength.
  - Q2 – The unit has flying leads
  - Q4 – Due the shape of the terminal it is not possible to apply the force perpendicular to the unit.
  - Q5 – The units are classed as heavy and additional fixation is required.
  - Q6 – The unit has flying leads.
  - Q9 – The unit has flying leads.
  - Q11 – The unit has flying leads
  - Q12 – The unit has flying leads
  - Q13 – The unit has flying leads
  - Q16 – Due the shape of the terminal it is not possible to apply the force perpendicular to the unit.
  - Q17 – Due the shape of the terminal it is not possible to apply the force perpendicular to the unit.
  - Q19 – The unit has foil leads.
  - Q20 – Due the shape of the terminal it is not possible to apply the force perpendicular to the unit.
  - Q22 – The unit has no leads.
  - Q23 – The unit has flying leads.
- Microsectioning
  - Q16 – There is a small blemish from resulting from the micro section process, the blemish is on the surface only.

7.6 Minor Nonconformances

None

7.7 Critical Failures

- Life Testing.
  - Q8 - The three units from subgroup 4 were physically damaged life testing. The coating on the wire has bubbled and melted, the wire is rated at 180ºC. A suspected error in the test setup resulted in the units exceeding the curie point and in the subsequent damage. Flux has contacted the customer for details regarding electrical conditions. 3 replacement units will be subjected to subgroup 4 at the earliest opportunity. As a precaution the units from subgroup 3 were stopped prior to overload testing pending resolution of the conditions to be used.

8. CONCLUSION

All units that have completed qualification are deemed to have passed as defined in FT 08690374(RD1). Q08 will complete testing once the issue highlighted in section 7.7 is resolved.

Annex 1 – Test Sheets

Q01 – 12129013-1-C

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance µH	Insul MOhm			
CONDITIONS			500V 60s		0,250V 100kHz	500V		375V 5s	
LIMITS					Max 0,945				
					Min 0,855	5000			
S/N: 001	✓	✓	✓	✓	0,896	✓	✓	✓	✓
S/N: 002	✓	✓	✓	✓	0,885	✓	✓	✓	✓
S/N: 003	✓	✓	✓	✓	0,869	✓	✓	✓	✓
S/N: 004	✓	✓	✓	✓	0,877	✓			
S/N: 005	✓	✓	✓	✓	0,893	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance µH	Insul MOhm				
CONDITIONS	0,250V 100kHz	500V				
LIMITS	Max 0,945					
	Min 0,855	5000				
S/N: 001	0,917	✓	✓			
S/N: 002	0,916	✓	✓			
S/N: 003	0,916	✓	✓			
S/N: 004				✓	✓	✓
S/N: 005				✓	✓	✓

Q01 – 12129013-1-C

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance µH	Insul MOhm			Inductance µH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	0,250V 100kHz	500V			0,250V 100kHz	500V
LIMITS			Max 0,945				Max 0,945	
			Min 0,855	5000			Min 0,855	5000
S/N: 001								
S/N: 002								
S/N: 003								
S/N: 004	✓	✓	0,872	✓	✓	✓	0,868	✓
S/N: 005	✓	✓	0,908	✓	✓	✓	0,910	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance µH	Insul MOhm		
CONDITIONS		375V 5s			0,250V 100kHz	500V		
LIMITS					Max 0,945			
					Min 0,855	5000		
S/N: 001								
S/N: 002								
S/N: 003								
S/N: 004	✓	✓	✓	✓	0,880	✓	✓	✓
S/N: 005	✓	✓	✓	✓	0,970		✓	

Q02 – 14220174-1-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance µH	Insul MOhm			
CONDITIONS			500V 60s		0,250V 10kHz	500V		375V 5s	
LIMITS					Max 27,5				
					Min 22,5	10			
S/N: 046	✓	See section 7.5	✓	✓	24,7	✓	✓	✓	✓
S/N: 047	✓		✓	✓	24,4	✓	✓	✓	✓
S/N: 048	✓		✓	✓	24,5	✓	✓	✓	✓
S/N: 049	✓		✓	✓	24,5	✓			
S/N: 050	✓		✓	✓	24,4	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance µH	Insul MOhm				
CONDITIONS	0,250V 10kHz	500V				
LIMITS	Max 27,5					
	Min 22,5	10				
S/N: 046	24,6	✓	✓			
S/N: 047	24,4	✓	✓			
S/N: 048	24,6	✓	✓			
S/N: 049				✓	✓	✓
S/N: 050				✓	✓	✓

Q02 – 14220174-1-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Electrical Characteristics	
			Inductance µH	Insul MOhm		Inductance µH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	0,250V 10kHz	500V		0,250V 10kHz	500V
LIMITS			Max 27,5			Max 27,5	
			Min 22,5	10		Min 22,5	10
S/N: 046							
S/N: 047							
S/N: 048							
S/N: 049	✓	✓	24,6	✓	✓	24,4	✓
S/N: 050	✓	✓	24,2	✓	✓	24,3	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance µH	Insul MOhm		
CONDITIONS		375V 5s			0,250V 10kHz	500V		
LIMITS					Max 27,5			
					Min 22,5	10		
S/N: 046								
S/N: 047								
S/N: 048								
S/N: 049	✓	✓	✓	✓	24,7	✓	✓	✓
S/N: 050	✓	✓	✓	✓	24,5	✓	✓	

Q03 – 14220153-2-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Mounting on PCB and Fixture	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance µH	Insul MOhm			
CONDITIONS			500V 60s		0,100V 150kHz	500V		375V 5s	
LIMITS					Max 320,0				
					Min 190,0	500			
S/N: 122	✓	✓	✓	✓	224,3	✓	✓	✓	✓
S/N: 123	✓	✓	✓	✓	227,9	✓	✓	✓	✓
S/N: 124	✓	✓	✓	✓	225,4	✓	✓	✓	✓
S/N: 125	✓	✓	✓	✓	219,1	✓			
S/N: 126	✓	✓	✓	✓	215,4	✓			

TEST	Insulation Resistance	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
		Inductance µH	Insul MOhm				
CONDITIONS		0,100V 150kHz	500V				
LIMITS		Max 320,0					
		Min 190,0	500				
S/N: 122	✓	216,7	✓	✓			
S/N: 123	✓	223,9	✓	✓			
S/N: 124	✓	228,8	✓	✓			
S/N: 125					✓	✓	✓
S/N: 126					✓	✓	✓

Q03 – 14220153-2-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics		Thermal Shock
			Inductance µH	Insul MOhm			Inductance µH	Insul MOhm	
CONDITIONS	375V 5s	100 cycles	0,100V 150kHz	500V			0,100V 150kHz	500V	
LIMITS			Max 320,0				Max 320,0		
			Min 190,0	500			Min 190,0	500	
S/N: 122									
S/N: 123									
S/N: 124									
S/N: 125	✓	✓	215,2	✓	✓	✓	211,1	✓	✓
S/N: 126	✓	✓	210,2	✓	✓	✓	207,3	✓	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance µH	Insul MOhm		
CONDITIONS		375V 5s			0,100V 150kHz	500V		
LIMITS					Max 320,0			
					Min 190,0	500		
S/N: 122								
S/N: 123								
S/N: 124								
S/N: 125	✓	✓		✓	215,2	✓	✓	✓
S/N: 126	✓	✓		✓	213,9	✓	✓	

Q04 – 14140024-1-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance µH	Insul MOhm			
CONDITIONS			500V 60s		0,100V 100kHz	500V		375V 5s	
LIMITS					Max 37,71				
					Min 27,69	500			
S/N: 015	✓	See section 7.5	✓	✓	31,84	✓	✓	✓	✓
S/N: 016	✓		✓	✓	31,16	✓	✓	✓	✓
S/N: 017	✓		✓	✓	31,70	✓	✓	✓	✓
S/N: 018	✓		✓	✓	31,72	✓			
S/N: 019	✓		✓	✓	31,03	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance µH	Insul MOhm				
CONDITIONS	0,100V 100kHz	500V				
LIMITS	Max 37,71					
	Min 27,69	500				
S/N: 015	31,79	✓	✓			
S/N: 016	31,11	✓	✓			
S/N: 017	31,61	✓	✓			
S/N: 018				✓	✓	✓
S/N: 019				✓	✓	✓

Q04 – 14140024-1-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance µH	Insul MOhm			Inductance µH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	0,100V 100kHz	500V			0,100V 100kHz	500V
LIMITS			Max 37,71				Max 37,71	
			Min 27,69	500			Min 27,69	500
S/N: 015								
S/N: 016								
S/N: 017								
S/N: 018	✓	✓	31,71	✓	✓	✓	31,60	✓
S/N: 019	✓	✓	30,10	✓	✓	✓	30,92	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		DPA
					Inductance µH	Insul MOhm	
CONDITIONS		375V 5s			0,100V 100kHz	500V	
LIMITS					Max 37,71		
					Min 27,69	500	
S/N: 015							
S/N: 016							
S/N: 017							
S/N: 018	✓	✓	✓	✓	31,67	✓	✓
S/N: 019	✓	✓	✓	✓	30,97	✓	

Q05 – 14230080-1-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance µH	Insul MOhm			
CONDITIONS			500V 60s		0,100V 125kHz	500V		375V 5s	
LIMITS					Max 10,56				
					Min 8,64	5000			
S/N: 173	✓	See section 7.5	✓	✓	9,86	✓	✓	✓	✓
S/N: 174	✓		✓	✓	9,53	✓	✓	✓	✓
S/N: 175	✓		✓	✓	9,76	✓	✓	✓	✓
S/N: 176	✓		✓	✓	9,71	✓			
S/N: 177	✓		✓	✓	9,85	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance µH	Insul MOhm				
CONDITIONS	0,100V 125kHz	500V				
LIMITS	Max 10,56					
	Min 8,64	5000				
S/N: 173	9,80	✓	✓			
S/N: 174	9,54	✓	✓			
S/N: 175	9,76	✓	✓			
S/N: 176				✓	✓	✓
S/N: 177				✓	✓	✓

Q05 – 14230080-1-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance µH	Insul MOhm			Inductance µH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	0,100V 125kHz	500V			0,100V 125kHz	500V
LIMITS			Max 10,56				Max 10,56	
			Min 8,64	5000			Min 8,64	5000
S/N: 173								
S/N: 174								
S/N: 175								
S/N: 176	✓	✓	9,71	✓	✓	✓	9,67	✓
S/N: 177	✓	✓	9,81	✓	✓	✓	9,71	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance µH	Insul MOhm		
CONDITIONS		375V 5s			0,100V 125kHz	500V		
LIMITS					Max 10,56			
					Min 8,64	5000		
S/N: 173								
S/N: 174								
S/N: 175								
S/N: 176	✓	✓	✓	✓	9,68	✓	✓	✓
S/N: 177	✓	✓	✓	✓	9,73	✓	✓	

Q06 – 14011001-5

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance nH	Insul MOhm			
CONDITIONS			500V 60s		I=100mA F=300kHz A/C – B/D	300V		375V 5s	
LIMITS					Max 165				
					Min 110	500			
S/N: 001	✓	See section 7.5	✓	✓	131	✓	✓	✓	✓
S/N: 002	✓		✓	✓	129	✓	✓	✓	✓
S/N: 003	✓		✓	✓	130	✓	✓	✓	✓
S/N: 004	✓		✓	✓	126	✓			
S/N: 005	✓		✓	✓	128	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance nH	Insul MOhm				
CONDITIONS	I=100mA F=300kHz A/C – B/D	300V				
LIMITS	Max 165					
	Min 110	500				
S/N: 001	161,5	✓	✓			
S/N: 002	155,2	✓	✓			
S/N: 003	156,2	✓	✓			
S/N: 004				✓	✓	✓
S/N: 005				✓	✓	✓

Q06 – 14011001-5

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance nH	Insul MOhm			Inductance nH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	I=100mA F=300kHz A/C – B/D	300V			I=100mA F=300kHz A/C – B/D	300V
LIMITS			Max 165				Max 165	
			Min 110	500			Min 110	500
S/N: 001								
S/N: 002								
S/N: 003								
S/N: 004	✓	✓	136	✓	✓	✓	148	✓
S/N: 005	✓	✓	139	✓	✓	✓	153	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance nH	Insul MOhm		
CONDITIONS		375V 5s			I=100mA F=300kHz A/C – B/D	300V		
LIMITS					Max 165			
					Min 110	500		
S/N: 001								
S/N: 002								
S/N: 003								
S/N: 004	✓	✓	✓	✓	129	✓	✓	✓
S/N: 005	✓	✓	✓	✓	150	✓	✓	

Q07 – 14050029-4-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance mH	Insul MOhm			
CONDITIONS			500V 60s		0,300V 10kHz	500V		375V 5s	
LIMITS					Max 27,25				
					Min 16,35	5000			
S/N: 1209	✓	✓	✓	✓	23,01	✓	✓	✓	✓
S/N: 1210	✓	✓	✓	✓	23,74	✓	✓	✓	✓
S/N: 1211	✓	✓	✓	✓	24,25	✓	✓	✓	✓
S/N: 1212	✓	✓	✓	✓	23,40	✓			
S/N: 1213	✓	✓	✓	✓	24,22	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance mH	Insul MOhm				
CONDITIONS	0,300V 10kHz	500V				
LIMITS	Max 27,25					
	Min 16,35	5000				
S/N: 1209	22,98	✓	✓			
S/N: 1210	24,27	✓	✓			
S/N: 1211	24,95	✓	✓			
S/N: 1212				✓	✓	✓
S/N: 1213				✓	✓	✓

Q07 – 14050029-4-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance mH	Insul MOhm			Inductance mH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	0,300V 10kHz	500V			0,300V 10kHz	500V
LIMITS			Max 27,25				Max 27,25	
			Min 16,35	5000			Min 16,35	5000
S/N: 1209								
S/N: 1210								
S/N: 1211								
S/N: 1212	✓	✓	23,26	✓	✓	✓	23,79	✓
S/N: 1213	✓	✓	24,56	✓	✓	✓	24,65	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance mH	Insul MOhm		
CONDITIONS		375V 5s			0,300V 10kHz	500V		
LIMITS					Max 27,25			
					Min 16,35	5000		
S/N: 1209								
S/N: 1210								
S/N: 1211								
S/N: 1212	✓	✓	✓	✓	23,55	✓	✓	✓
S/N: 1213	✓	✓	✓	✓	24,65	✓	✓	

Q08 – 14121023-3-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance mH	Insul MOhm			
CONDITIONS			500V 60s		0,250V 100kHz	500V		375V 5s	
LIMITS					Max 22,00				
					Min 13,20	10			
S/N: 701	✓	✓	✓	✓	18,39	✓			
S/N: 702	✓	✓	✓	✓	21,46	✓			
S/N: 703	✓	✓	✓	✓	20,48	✓			
S/N: 704	✓	✓	✓	✓	18,86	✓			
S/N: 705	✓	✓	✓	✓	20,58	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance mH	Insul MOhm				
CONDITIONS	0,250V 100kHz	500V				
LIMITS	Max 22,00					
	Min 13,20	10				
S/N: 701						
S/N: 702						
S/N: 703						
S/N: 704				✓	✓	✓
S/N: 705				✓	✓	✓

Q08 – 14121023-3-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance mH	Insul MOhm			Inductance mH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	0,250V 100kHz	500V			0,250V 100kHz	500V
LIMITS			Max 22,00				Max 22,00	
			Min 13,20	10			Min 13,20	10
S/N: 701								
S/N: 702								
S/N: 703								
S/N: 704	✓	✓	17,05	✓	✓	✓	16,89	✓
S/N: 705	✓	✓	18,17	✓	✓	✓	18,29	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance mH	Insul MOhm		
CONDITIONS		375V 5s			0,250V 100kHz	500V		
LIMITS					Max 22,00			
					Min 13,20	10		
S/N: 701								
S/N: 702								
S/N: 703								
S/N: 704								
S/N: 705								

Q09 – 12141085-2-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance µH	Insul MOhm			
CONDITIONS			500V 60s		0,250V 100kHz	500V		375V 5s	
LIMITS					Max 71,3				
					Min 58,3	5000			
S/N: 033	✓	See section 7.5	✓	✓	61,9	✓	✓	✓	✓
S/N: 034	✓		✓	✓	60,6	✓	✓	✓	✓
S/N: 035	✓		✓	✓	61,3	✓	✓	✓	✓
S/N: 036	✓		✓	✓	60,9	✓			
S/N: 037	✓		✓	✓	62,4	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance µH	Insul MOhm				
CONDITIONS	0,250V 100kHz	500V				
LIMITS	Max 71,3					
	Min 58,3	5000				
S/N: 033	61,74	✓	✓			
S/N: 034	61,03	✓	✓			
S/N: 035	61,75	✓	✓			
S/N: 036				✓	✓	✓
S/N: 037				✓	✓	✓

Q09 – 12141085-2-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance µH	Insul MOhm			Inductance µH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	0,250V 100kHz	500V			0,250V 100kHz	500V
LIMITS			Max 71,3				Max 71,3	
			Min 58,3	5000			Min 58,3	5000
S/N: 033								
S/N: 034								
S/N: 035								
S/N: 036	✓	✓	61,50	✓	✓	✓	61,60	✓
S/N: 037	✓	✓	63,18	✓	✓	✓	63,2	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance µH	Insul MOhm		
CONDITIONS		375V 5s			0,250V 100kHz	500V		
LIMITS					Max 71,3			
					Min 58,3	5000		
S/N: 033								
S/N: 034								
S/N: 035								
S/N: 036	✓	✓	✓	✓	61,6	✓	✓	✓
S/N: 037	✓	✓	✓	✓	63,2	✓	✓	

Q10 – 14210147-1-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance µH	Insul MOhm			
CONDITIONS			500V 60s		0,250V 100kHz	500V		375V 5s	
LIMITS					Max 138,2				
					Min 92,2	5000			
S/N: 041	✓	✓	✓	✓	118,5	✓	✓	✓	✓
S/N: 042	✓	✓	✓	✓	119,3	✓	✓	✓	✓
S/N: 043	✓	✓	✓	✓	117,2	✓	✓	✓	✓
S/N: 044	✓	✓	✓	✓	118,4	✓			
S/N: 045	✓	✓	✓	✓	117,7	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance µH	Insul MOhm				
CONDITIONS	0,250V 100kHz	500V				
LIMITS	Max 138,2					
	Min 92,2	5000				
S/N: 041	118,01	✓	✓			
S/N: 042	118,99	✓	✓			
S/N: 043	116,75	✓	✓			
S/N: 044				✓	✓	✓
S/N: 045				✓	✓	✓

Q10 – 14210147-1-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance µH	Insul MOhm			Inductance µH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	0,250V 100kHz	500V			0,250V 100kHz	500V
LIMITS			Max 138,2				Max 138,2	
			Min 92,2	5000			Min 92,2	5000
S/N: 041								
S/N: 042								
S/N: 043								
S/N: 044	✓	✓	118,18	✓	✓	✓	117,21	✓
S/N: 045	✓	✓	118,06	✓	✓	✓	117,20	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance µH	Insul MOhm		
CONDITIONS		375V 5s			0,250V 100kHz	500V		
LIMITS					Max 138,2			
					Min 92,2	5000		
S/N: 041								
S/N: 042								
S/N: 043								
S/N: 044	✓	✓	✓	✓	118,41	✓	✓	✓
S/N: 045	✓	✓	✓	✓	118,26	✓	✓	

Q11 – 12341031-2-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance µH	Insul MOhm			
CONDITIONS			500V 60s		0,250V 100kHz	500V		375V 5s	
LIMITS					Max 2798,5				
					Min 1214,2	5000			
S/N: 037	✓	See section 7.5	✓	✓	1983,7	✓	✓	✓	✓
S/N: 038	✓		✓	✓	1557,4	✓	✓	✓	✓
S/N: 039	✓		✓	✓	1628,0	✓	✓	✓	✓
S/N: 040	✓		✓	✓	2056,7	✓			
S/N: 041	✓		✓	✓	1657,4	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance µH	Insul MOhm				
CONDITIONS	0,250V 100kHz	500V				
LIMITS	Max 2798,5					
	Min 1214,2	5000				
S/N: 037	2101,5	✓	✓			
S/N: 038	1652,0	✓	✓			
S/N: 039	1656,8	✓	✓			
S/N: 040				✓	✓	✓
S/N: 041				✓	✓	✓

Q11 – 12341031-2-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance µH	Insul MOhm			Inductance µH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	0,250V 100kHz	500V			0,250V 100kHz	500V
LIMITS			Max 2798,5				Max 2798,5	
			Min 1214,2	5000			Min 1214,2	5000
S/N: 037								
S/N: 038								
S/N: 039								
S/N: 040	✓	✓	2160,0	✓	✓	✓	2152,9	✓
S/N: 041	✓	✓	1751,3	✓	✓	✓	1749,8	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance µH	Insul MOhm		
CONDITIONS		375V 5s			0,250V 100kHz	500V		
LIMITS					Max 2798,5			
					Min 1214,2	5000		
S/N: 037								
S/N: 038								
S/N: 039								
S/N: 040	✓	✓	✓	✓	2193,6	✓	✓	✓
S/N: 041	✓	✓	✓	✓	1775,1	✓	✓	

Q12 – 12311047-3-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance µH	Insul MOhm			
CONDITIONS			500V 60s		0,250V 100kHz	500V		375V 5s	
LIMITS					Max 483,95				
					Min 395,96	5000			
S/N: 2941	✓	See section 7.5	✓	✓	415,32	✓	✓	✓	✓
S/N: 2942	✓		✓	✓	413,11	✓	✓	✓	✓
S/N: 2943	✓		✓	✓	429,99	✓	✓	✓	✓
S/N: 2944	✓		✓	✓	425,94	✓			
S/N: 2945	✓		✓	✓	410,66	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance µH	Insul MOhm				
CONDITIONS	0,250V 100kHz	500V				
LIMITS	Max 483,95					
	Min 395,96	5000				
S/N: 2941	419,48	✓	✓			
S/N: 2942	418,49	✓	✓			
S/N: 2943	429,29	✓	✓			
S/N: 2944				✓	✓	✓
S/N: 2945				✓	✓	✓

Q12 – 12311047-3-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance µH	Insul MOhm			Inductance µH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	0,250V 100kHz	500V			0,250V 100kHz	500V
LIMITS			Max 483,95				Max 483,95	
			Min 395,96	5000			Min 395,96	5000
S/N: 2941								
S/N: 2942								
S/N: 2943								
S/N: 2944	✓	✓	431,33	✓	✓	✓	433,64	✓
S/N: 2945	✓	✓	416,87	✓	✓	✓	418,85	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance µH	Insul MOhm		
CONDITIONS		375V 5s			0,250V 100kHz	500V		
LIMITS					Max 483,95			
					Min 395,96	5000		
S/N: 2941								
S/N: 2942								
S/N: 2943								
S/N: 2944	✓	✓	✓	✓	432,74	✓	✓	✓
S/N: 2945	✓	✓	✓	✓	418,13	✓	✓	

Q13 – 12001166-1

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance µH	Insul MOhm			
CONDITIONS			500V 60s		V=10mV f=100kHz	500V		375V 5s	
LIMITS					Max				
					Min	5000			
S/N: 001	✓	See section 7.5	✓	✓	0,018	✓	✓	✓	✓
S/N: 002	✓		✓	✓	0,019	✓	✓	✓	✓
S/N: 003	✓		✓	✓	0,019	✓	✓	✓	✓
S/N: 004	✓		✓	✓	0,018	✓			
S/N: 005	✓		✓	✓	0,019	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance µH	Insul MOhm				
CONDITIONS	V=10mV f=100kHz	500V				
LIMITS	Max					
	Min	5000				
S/N: 001	0,018	✓	✓			
S/N: 002	0,019	✓	✓			
S/N: 003	0,019	✓	✓			
S/N: 004				✓	✓	✓
S/N: 005				✓	✓	✓

Q13 – 12001166-1

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance µH	Insul MOhm			Inductance µH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	V=10mV f=100kHz	500V			V=10mV f=100kHz	500V
LIMITS			Max				Max	
			Min	5000			Min	5000
S/N: 001								
S/N: 002								
S/N: 003								
S/N: 004	✓	✓	0,018	✓	✓	✓	0,018	✓
S/N: 005	✓	✓	0,019	✓	✓	✓	0,019	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance µH	Insul MOhm		
CONDITIONS		375V 5s			V=10mV f=100kHz	500V		
LIMITS					Max			
					Min	5000		
S/N: 001								
S/N: 002								
S/N: 003								
S/N: 004	✓	✓	✓	✓	0,018	✓	✓	✓
S/N: 005	✓	✓	✓	✓	0,019	✓	✓	

Q14 – 14260113-1-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics				Life Test
					Inductance µH			Insul MOhm	
CONDITIONS			500V 60s		100Mv 100kHz A	B	C	500V	
LIMITS					Max 24,25	Max	Max 24,25		
					Min 21,95	Min 45,3	Min 21,95	5000	
S/N: 013	✓	✓	✓	✓	22,79	46,40	22,76	✓	✓
S/N: 014	✓	✓	✓	✓	22,65	46,68	22,66	✓	✓
S/N: 015	✓	✓	✓	✓	22,62	46,18	22,54	✓	✓
S/N: 016	✓	✓	✓	✓	22,63	46,71	22,63	✓	
S/N: 017	✓	✓	✓	✓	22,69	46,40	22,61	✓	

TEST	Dielectric Withstanding Voltage	Insulation Resistance	Electrical Characteristics			
			Inductance µH			Insul MOhm
CONDITIONS	375V 5s		100Mv 100kHz A	B	C	500V
LIMITS			Max 24,25	Max	Max 24,25	
			Min 21,95	Min 45,3	Min 21,95	5000
S/N: 013	✓	✓	22,64	46,59	22,63	✓
S/N: 014	✓	✓	22,51	47,19	22,69	✓
S/N: 015	✓	✓	22,50	46,75	22,49	✓
S/N: 016						
S/N: 017						

Q14 – 14260113-1-B

TEST	Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics Inductance µH			
							Inductance µH			Insul MOhm
CONDITIONS					375V 5s	100 cycles	100Mv 100kHz A	B	C	500V
LIMITS							Max 24,25	Max	Max 24,25	
							Min 21,95	Min 45,3	Min 21,95	5000
S/N: 013	✓									
S/N: 014	✓									
S/N: 015	✓									
S/N: 016		✓	✓	✓	✓	✓	22,70	47,43	22,80	✓
S/N: 017		✓	✓	✓	✓	✓	22,66	47,08	22,68	✓

TEST	Moisture Resistance	Winding Continuity	Electrical Characteristics			
			Inductance µH			Insul MOhm
CONDITIONS			100Mv 100kHz A	B	C	500V
LIMITS			Max 24,25	Max	Max 24,25	
			Min 21,95	Min 45,3	Min 21,95	5000
S/N: 013						
S/N: 014						
S/N: 015						
S/N: 016	✓	✓	22,51	46,95	22,59	✓
S/N: 017	✓	✓	22,42	46,52	22,50	✓

Q14 – 14260113-1-B

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics				Visual Inspection	DPA
					Inductance µH			Insul MOhm		
CONDITIONS		375V 5s			100Mv 100kHz A	B	C	500V		
LIMITS					Max 24,25	Max	Max 24,25			
					Min 21,95	Min 45,3	Min 21,95	5000		
S/N:										
S/N:										
S/N:										
S/N:	✓	✓	✓	✓	22,56	47,1	22,57	✓	✓	✓
S/N:	✓	✓	✓	✓	22,51	46,6	22,59	✓	✓	

Q15 – 14280034-1-C

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics				Life Test
					Inductance µH			Insul MOhm	
CONDITIONS			500V 60s		100mV 100kHz A	B	C	500V	
LIMITS					Max 16,86	Max 33,7	Max 16,86		
					Min 15,26	Min	Min 15,26	5000	
S/N: 039	✓	✓	✓	✓	16,13	27,1	16,02	✓	✓
S/N: 040	✓	✓	✓	✓	16,37	27,5	16,25	✓	✓
S/N: 041	✓	✓	✓	✓	16,10	27,4	16,15	✓	✓
S/N: 042	✓	✓	✓	✓	16,09	27,3	16,16	✓	
S/N: 043	✓	✓	✓	✓	16,08	27,2	15,98	✓	

TEST	Dielectric Withstanding Voltage	Insulation Resistance	Dielectric Withstanding Voltage	Electrical Characteristics			
				Inductance µH			Insul MOhm
CONDITIONS	375V 5s		375V 5s	100mV 100kHz A	B	C	500V
LIMITS				Max 16,86	Max 33,7	Max 16,86	
				Min 15,26	Min	Min 15,26	5000
S/N: 039	✓	✓	✓	16,11	27,16	16,04	✓
S/N: 040	✓	✓	✓	16,41	27,71	16,30	✓
S/N: 041	✓	✓	✓	16,08	27,28	16,10	✓
S/N: 042							
S/N: 043							

Q15 – 14280034-1-C

TEST	Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics Inductance µH			
							Inductance µH			Insul MOhm
CONDITIONS					375V 5s	100 cycles	100mV 100kHz			500V
							A	B	C	
LIMITS							Max 16,86	Max 33,7	Max 16,86	
							Min 15,26	Min	Min 15,26	5000
S/N: 039	✓									
S/N: 040	✓									
S/N: 041	✓									
S/N: 042		✓	✓	✓	✓	✓	15,99	27,22	16,09	✓
S/N: 043		✓	✓	✓	✓	✓	15,98	27,16	15,81	✓

TEST	Moisture Resistance	Winding Continuity	Electrical Characteristics			
			Inductance µH			Insul MOhm
CONDITIONS			100mV 100kHz			500V
			A	B	C	
LIMITS			Max 16,86	Max 33,7	Max 16,86	
			Min 15,26	Min	Min 15,26	5000
S/N: 039						
S/N: 040						
S/N: 041						
S/N: 042	✓	✓	16,01	27,0	16,06	✓
S/N: 043	✓	✓	15,97	26,9	15,86	✓

Q15 – 14280034-1-C

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics				Visual Inspection	DPA
					Inductance µH			Insul MOhm		
CONDITIONS		375V 5s			100mV 100kHz A	100mV 100kHz B	100mV 100kHz C	500V		
LIMITS					Max 16,86	Max 33,7	Max 16,86			
					Min 15,26	Min 27,3	Min 15,26	5000		
S/N: 039										
S/N: 040										
S/N: 041										
S/N: 042	✓	✓	✓	✓	15,94	27,1	15,95	✓	✓	✓
S/N: 043	✓	✓	✓	✓	15,89	26,9	15,77	✓	✓	

Q16 – 14790201-1-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance mH	Insul MOhm			
CONDITIONS			500V 60s		V=0,250V f=100kHz	500V		375V 5s	
LIMITS					Max 14,38				
					Min 8,63	5000			
S/N: 069	✓	See section 7.5	✓	✓	9,18	✓	✓	✓	✓
S/N: 070	✓		✓	✓	8,97	✓	✓	✓	✓
S/N: 071	✓		✓	✓	9,12	✓	✓	✓	✓
S/N: 072	✓		✓	✓	9,40	✓			
S/N: 073	✓		✓	✓	9,18	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance mH	Insul MOhm				
CONDITIONS	V=0,250V f=100kHz	500V				
LIMITS	Max 14,38					
	Min 8,63	5000				
S/N: 069	9,03	✓	✓			
S/N: 070	8,98	✓	✓			
S/N: 071	9,18	✓	✓			
S/N: 072				✓	✓	✓
S/N: 073				✓	✓	✓

Q16 – 14790201-1-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance mH	Insul MOhm			Inductance mH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	V=0,250V f=100kHz	500V			V=0,250V f=100kHz	500V
LIMITS			Max 14,38				Max 14,38	
			Min 8,63	5000			Min 8,63	5000
S/N: 069								
S/N: 070								
S/N: 071								
S/N: 072	✓	✓	9,85	✓	✓	✓	9,19	✓
S/N: 073	✓	✓	9,27	✓	✓	✓	8,99	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance mH	Insul MOhm		
CONDITIONS		375V 5s			V=0,250V f=100kHz	500V		
LIMITS					Max 14,38			
					Min 8,63	5000		
S/N: 069								
S/N: 070								
S/N: 071								
S/N: 072	✓	✓	✓	✓	9,41	✓	✓	✓
S/N: 073	✓	✓	✓	✓	9,08	✓	✓	

Q17 – 14790101-1-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance µH	Insul MOhm			
CONDITIONS			500V 60s		V=0,250V f=100kHz	500V		375V 5s	
LIMITS					Max 1155				
					Min 595	5000			
S/N: 028	✓	See section 7.5	✓	✓	658	✓	✓	✓	✓
S/N: 029	✓		✓	✓	874	✓	✓	✓	✓
S/N: 030	✓		✓	✓	901	✓	✓	✓	✓
S/N: 031	✓		✓	✓	726	✓			
S/N: 032	✓		✓	✓	805	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance µH	Insul MOhm				
CONDITIONS	V=0,250V f=100kHz	500V				
LIMITS	Max 1155					
	Min 595	5000				
S/N: 028	767	✓	✓			
S/N: 029	899	✓	✓			
S/N: 030	925	✓	✓			
S/N: 031				✓	✓	✓
S/N: 032				✓	✓	✓

Q17 – 14790101-1-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance µH	Insul MOhm			Inductance µH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	V=0,250V f=100kHz	500V			V=0,250V f=100kHz	500V
LIMITS			Max 1155				Max 1155	
			Min 595	5000			Min 595	5000
S/N: 028								
S/N: 029								
S/N: 030								
S/N: 031	✓	✓	746	✓	✓	✓	722	✓
S/N: 032	✓	✓	843	✓	✓	✓	767	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance µH	Insul MOhm		
CONDITIONS		375V 5s			V=0,250V f=100kHz	500V		
LIMITS					Max 1155			
					Min 595	5000		
S/N: 028								
S/N: 029								
S/N: 030								
S/N: 031	✓	✓	✓	✓	750	✓	✓	✓
S/N: 032	✓	✓	✓	✓	828	✓	✓	

Q18 – 14170209-1-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance µH	Insul MOhm			
CONDITIONS			500V 60s		V=0,250V f=125kHz	500V		375V 5s	
LIMITS					Max 185,1				
					Min 167,5	5000			
S/N: 017	✓	✓	✓	✓	174,7	✓	✓	✓	✓
S/N: 018	✓	✓	✓	✓	168,3	✓	✓	✓	✓
S/N: 019	✓	✓	✓	✓	170,6	✓	✓	✓	✓
S/N: 020	✓	✓	✓	✓	173,2	✓			
S/N: 021	✓	✓	✓	✓	173,0	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance µH	Insul MOhm				
CONDITIONS	V=0,250V f=125kHz	500V				
LIMITS	Max 185,1					
	Min 167,5	5000				
S/N: 017	176,8	✓	✓			
S/N: 018	170,3	✓	✓			
S/N: 019	172,2	✓	✓			
S/N: 020				✓	✓	✓
S/N: 021				✓	✓	✓

Q18 – 14170209-1-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance µH	Insul MOhm			Inductance µH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	V=0,250V f=125kHz	500V			V=0,250V f=125kHz	500V
LIMITS			Max 185,1				Max 185,1	
			Min 167,5	5000			Min 167,5	5000
S/N: 017								
S/N: 018								
S/N: 019								
S/N: 020	✓	✓	184,2	✓	✓	✓	173,1	✓
S/N: 021	✓	✓	186,9	✓	✓	✓	172,6	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance µH	Insul MOhm		
CONDITIONS		375V 5s			V=0,250V f=125kHz	500V		
LIMITS					Max 185,1			
					Min 167,5	5000		
S/N: 017								
S/N: 018								
S/N: 019								
S/N: 020	✓	✓	✓	✓	173,4	✓	✓	✓
S/N: 021	✓	✓	✓	✓	173,2	✓	✓	

Q19 – 14271041-1-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics				Life Test
					Inductance µH			Insul MOhm	
CONDITIONS			500V 60s		30mV 100kHz A	30mV 100kHz B*	30mV 100kHz C	500V	
LIMITS					Max 3,86	Max 7,83	Max 3,86		
					Min 3,50	Min 6,41	Min 3,50	5000	
S/N: 001	✓	See section 7.5	✓	✓	3,54	7,81	3,56	✓	✓
S/N: 003	✓		✓	✓	3,55	7,82	3,52	✓	✓
S/N: 005	✓		✓	✓	3,54	7,76	3,53	✓	✓
S/N: 002	✓		✓	✓	3,52	7,54	3,50	✓	
S/N: 004	✓		✓	✓	3,57	7,82	3,53	✓	

TEST	Dielectric Withstanding Voltage	Insulation Resistance	Electrical Characteristics			
			Inductance µH			Insul MOhm
CONDITIONS	375V 5s		30mV 100kHz A	30mV 100kHz B*	30mV 100kHz C	500V
LIMITS			Max 3,86	Max 7,83	Max 3,86	
			Min 3,50	Min 6,41	Min 3,50	5000
S/N: 001	✓	✓	3,50	7,82	3,51	✓
S/N: 003	✓	✓	3,56	7,81	3,55	✓
S/N: 005	✓	✓	3,53	7,77	3,54	✓
S/N: 002						
S/N: 004						

Q19 – 14271050-1-B

TEST	Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics Inductance µH			
							Inductance µH			Insul MOhm
CONDITIONS					375V 5s	100 cycles	30mV 100kHz			500V
							A	B*	C	
LIMITS							Max 3,86	Max 7,83	Max 3,86	
							Min 3,50	Min 6,41	Min 3,50	5000
S/N: 001	✓									
S/N: 003	✓									
S/N: 005	✓									
S/N: 002		✓	✓	✓	✓	✓	3,54	7,05	3,56	✓
S/N: 004		✓	✓	✓	✓	✓	3,57	7,20	3,58	✓

TEST	Moisture Resistance	Winding Continuity	Electrical Characteristics			
			Inductance µH			Insul MOhm
CONDITIONS			30mV 100kHz			500V
			A	B*	C	
LIMITS			Max 3,86	Max 7,83	Max 3,86	
			Min 3,50	Min 6,41	Min 3,50	5000
S/N: 001						
S/N: 003						
S/N: 005						
S/N: 002	✓	✓	3,52	7,06	3,50	✓
S/N: 004	✓	✓	3,56	7,21	3,54	✓

Q19 – 14271050-1-B

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics				Visual Inspection	DPA
					Inductance µH			Insul MOhm		
CONDITIONS		375V 5s			30mV 100kHz A	30mV 100kHz B*	30mV 100kHz C	500V		
LIMITS					Max 3,86	Max 7,83	Max 3,86			
					Min 3,50	Min 6,41	Min 3,50	5000		
S/N: 001										
S/N: 003										
S/N: 005										
S/N: 002	✓	✓	✓	✓	3,50	7,09	3,50	✓	✓	✓
S/N: 004	✓	✓	✓	✓	3,55	7,17	3,57	✓	✓	

**Above limits on screening*

Q20 – 12800014-1-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance µH*	Insul MOhm			
CONDITIONS			500V 60s		V=0,01V f=300kHz	500V		375V 5s	
LIMITS					Max 0,151				
					Min 0,137	5000			
S/N: 028	✓	See section 7.5	✓	✓	0,136	✓	✓	✓	✓
S/N: 029	✓		✓	✓	0,138	✓	✓	✓	✓
S/N: 030	✓		✓	✓	0,137	✓	✓	✓	✓
S/N: 031	✓		✓	✓	0,137	✓			
S/N: 032	✓		✓	✓	0,139	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance µH*	Insul MOhm				
CONDITIONS	V=0,01V f=300kHz	500V				
LIMITS	Max 0,151					
	Min 0,137	5000				
S/N: 028	0,140	✓	✓			
S/N: 029	0,141	✓	✓			
S/N: 030	0,142	✓	✓			
S/N: 031				✓	✓	✓
S/N: 032				✓	✓	✓

Q20 – 12800014-1-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance µH*	Insul MOhm			Inductance µH*	Insul MOhm
CONDITIONS	375V 5s	100 cycles	V=0,01V f=300kHz	500V			V=0,01V f=300kHz	500V
LIMITS			Max 0,151				Max 0,151	
			Min 0,137	5000			Min 0,137	5000
S/N: 028								
S/N: 029								
S/N: 030								
S/N: 031	✓	✓	0,138	✓	✓	✓	0,139	
S/N: 032	✓	✓	0,140	✓	✓	✓	0,141	

TEST	Overload	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
				Inductance µH*	Insul MOhm		
CONDITIONS				V=0,01V f=300kHz	500V		
LIMITS				Max 0,151			
				Min 0,137	5000		
S/N: 028							
S/N: 029							
S/N: 030							
S/N: 031	✓	✓	✓	0,134	✓	✓	✓
S/N: 032	✓	✓	✓	0,133	✓	✓	

*Below limits on screening

Q21 – 14120057-1-B

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance mH	Insul MOhm			
CONDITIONS			300V 60s		V=0,01V f=10kHz	300V		375V 5s	
LIMITS					Max 34,60				
					Min 18,34	10			
S/N: 408	✓	✓	✓	✓	25,30	✓	✓	✓	✓
S/N: 409	✓	✓	✓	✓	29,89	✓	✓	✓	✓
S/N: 410	✓	✓	✓	✓	28,49	✓	✓	✓	✓
S/N: 411	✓	✓	✓	✓	28,00	✓			
S/N: 412	✓	✓	✓	✓	27,64	✓			

TEST	Electrical Characteristics		Visual Inspection	Mechanical Shock	Random Vibration	Visual Inspection
	Inductance mH	Insul MOhm				
CONDITIONS	V=0,01V f=10kHz	300V				
LIMITS	Max 34,60					
	Min 18,34	10				
S/N: 408	26,93	✓	✓			
S/N: 409	30,91	✓	✓			
S/N: 410	30,19	✓	✓			
S/N: 411				✓	✓	✓
S/N: 412				✓	✓	✓

Q21 – 14120057-1-B

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance mH	Insul MOhm			Inductance mH	Insul MOhm
CONDITIONS	225V 5s	100 cycles	V=0,01V f=10kHz	300V			V=0,01V f=10kHz	300V
LIMITS			Max 34,60				Max 34,60	
			Min 18,34	10			Min 18,34	10
S/N: 408								
S/N: 409								
S/N: 410								
S/N: 411	✓	✓	28,15	✓	✓	✓	28,46	✓
S/N: 412	✓	✓	28,12	✓	✓	✓	28,34	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance mH	Insul MOhm		
CONDITIONS		225V 5s			V=0,01V f=10kHz	300V		
LIMITS					Max 34,60			
					Min 18,34	10		
S/N: 408								
S/N: 409								
S/N: 410								
S/N: 411	✓	✓	✓	✓	28,30	✓	✓	✓
S/N: 412	✓	✓	✓	✓	28,30	✓	✓	

Q22 – 12000100-1-B

TEST	Solderability	Terminal Strength	Visual Inspection	Electrical Characteristics		Life Test
				SAT TIME µs ts		
CONDITIONS				Vpeak=1.0V		
LIMITS				Max 7,44		
				Min 5,28		
S/N: 004	See section 7.5	See section 7.5	✓			✓
S/N: 005			✓			✓
S/N: 003			✓			✓
S/N: 001			✓			
S/N: 002			✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	SAT TIME µs ts					
CONDITIONS	Vpeak=1.0V					
LIMITS	Max 7,44					
	Min 5,28					
S/N: 004	7,23		✓			
S/N: 005	6,93		✓			
S/N: 003	7,19		✓			
S/N: 001				✓	✓	✓
S/N: 002				✓	✓	✓

Q22 – 12000100-1-B

TEST	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
		SAT TIME µs ts				SAT TIME µs ts	
CONDITIONS	100 cycles	Vpeak=1.0V				Vpeak=1.0V	
LIMITS		Max 7,44				Max 7,44	
		Min 5,28				Min 5,28	
S/N: 004							
S/N: 005							
S/N: 003							
S/N: 001	✓	6,82		✓	✓	7,18	
S/N: 002	✓	6,96		✓	✓	6,84	

TEST	Overload	Electrical Characteristics		Visual Inspection	DPA
		SAT TIME µs ts			
CONDITIONS		Vpeak=1.0V			
LIMITS		Max 7,44			
		Min 5,28			
S/N: 004					
S/N: 005					
S/N: 003					
S/N: 001	✓	7,04		✓	✓
S/N: 002	✓	6,98		✓	

Q23 – 12121156-1-C

TEST	Solderability	Terminal Strength	Dielectric Withstanding Voltage	Visual Inspection	Electrical Characteristics		Life Test	Dielectric Withstanding Voltage	Insulation Resistance
					Inductance mH	Insul MOhm			
CONDITIONS			500V 60s		V=0,250V f=10kHz	500V		375V 5s	
LIMITS					Max				
					Min	5000			
S/N: 006	✓	See section 7.5	✓	✓	6048	✓	✓	✓	✓
S/N: 007	✓		✓	✓	5480	✓	✓	✓	✓
S/N: 008	✓		✓	✓	5625	✓	✓	✓	✓
S/N: 009	✓		✓	✓	5694	✓			
S/N: 010	✓		✓	✓	4762	✓			

TEST	Electrical Characteristics		Visual Inspection	Random Vibration	Mechanical Shock	Visual Inspection
	Inductance mH	Insul MOhm				
CONDITIONS	V=0,250V f=10kHz	500V				
LIMITS	Max					
	Min	5000				
S/N: 006	4011	✓	✓			
S/N: 007	3379	✓	✓			
S/N: 008	3496	✓	✓			
S/N: 009				✓	✓	✓
S/N: 010				✓	✓	✓

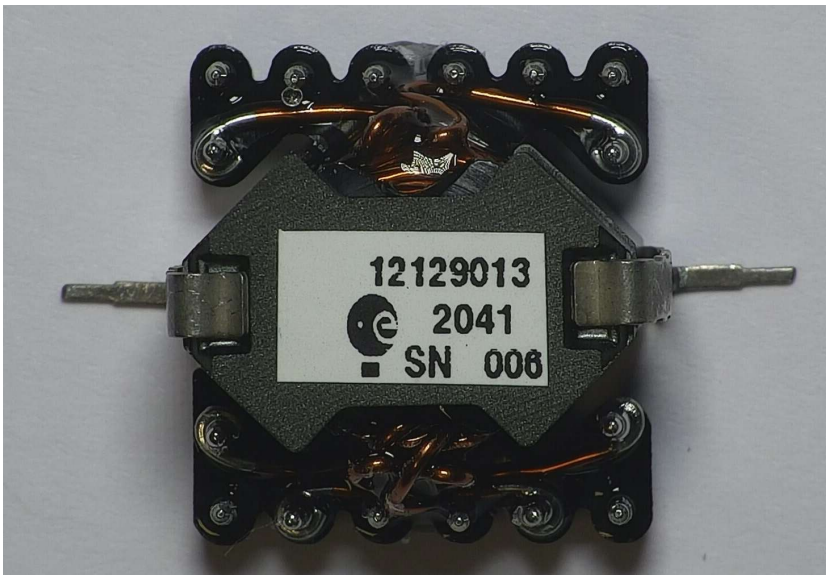
Q23 – 12121156-1-C

TEST	Dielectric Withstanding Voltage	Thermal Shock	Electrical Characteristics		Moisture Resistance	Winding Continuity	Electrical Characteristics	
			Inductance µH	Insul MOhm			Inductance µH	Insul MOhm
CONDITIONS	375V 5s	100 cycles	V=0,250V f=10kHz	500V			V=0,250V f=10kHz	500V
LIMITS			Max				Max	
			Min	5000			Min	5000
S/N: 006								
S/N: 007								
S/N: 008								
S/N: 009	✓	✓	5242	✓	✓	✓	5921	✓
S/N: 010	✓	✓	3726	✓	✓	✓	4638	✓

TEST	Overload	Dielectric Withstanding Voltage	Induced Voltage	Winding Continuity	Electrical Characteristics		Visual Inspection	DPA
					Inductance µH	Insul MOhm		
CONDITIONS		375V 5s			V=0,250V f=10kHz	500V		
LIMITS					Max			
					Min	5000		
S/N: 006								
S/N: 007								
S/N: 008								
S/N: 009	✓	✓	✓	✓	5511	✓	✓	✓
S/N: 010	✓	✓	✓	✓	5245	✓	✓	

Annex – Test Samples

Q1 – 12129013-1-C

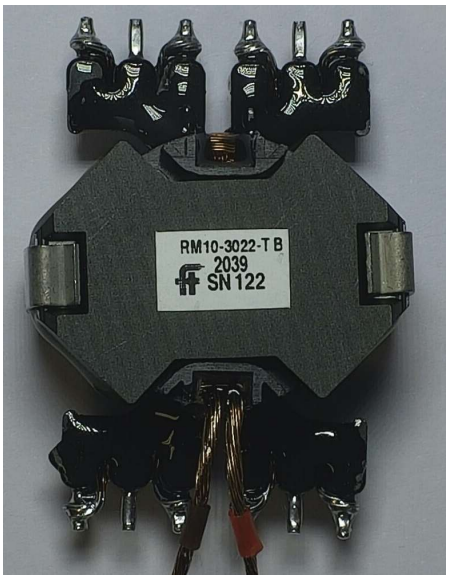


Topology:	***RM***
Customer Ref	***DM Choke***
Core:	***3F3***
Size:	***RM5***
Other:	***Flux SMT***

Q2 – 14220174-1-B

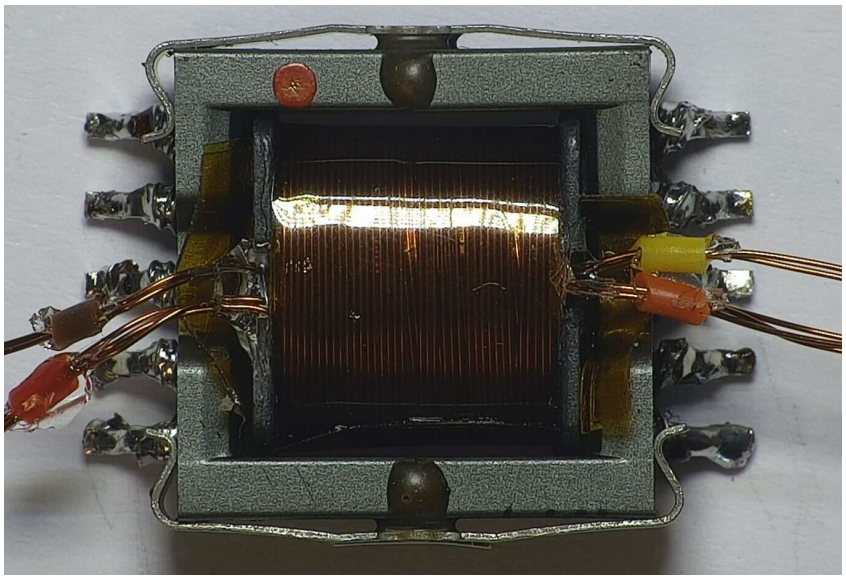
Topology:	***RM***
Customer Ref	***Aux Supply Transformer***
Core:	***3C92***
Size:	***RM8***
Other:	***Through hole***

Q3 – 14220153-2-B



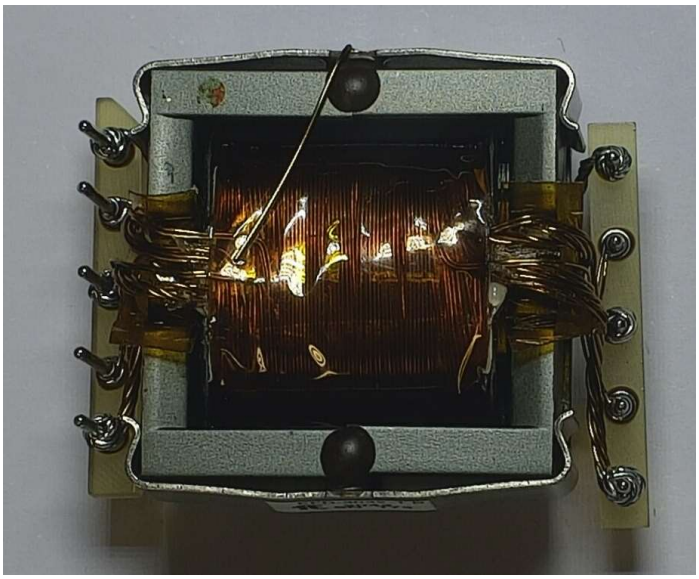
Topology:	***RM***
Customer Ref	***Push Pull Forward Trans***
Core:	***3C96***
Size:	***RM10LP***
Other:	***Pins and flying leads***

Q4 – 14140024-1-B



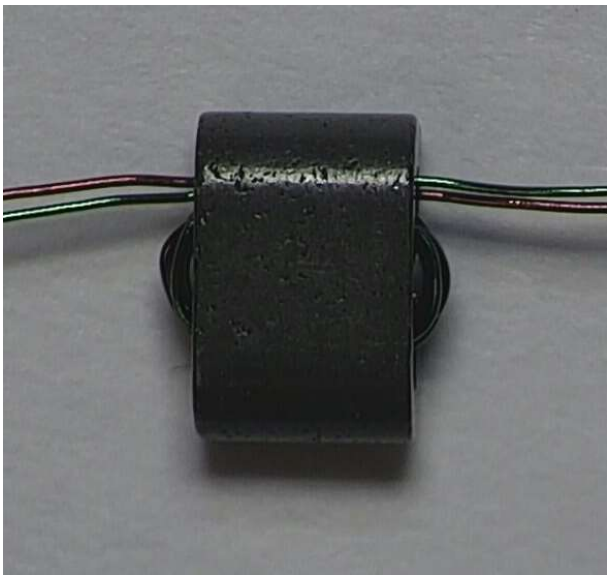
Topology:	***EFD***
Customer Ref	***Transformer***
Core:	***N87***
Size:	***EFD15***
Other:	***Pins***

Q5 – 14230080-1-B



Topology:	***EFD***
Customer Ref	***Transformer***
Core:	***N87***
Size:	***EFD25***
Other:	***Pins***

Q6 – 14011001-5

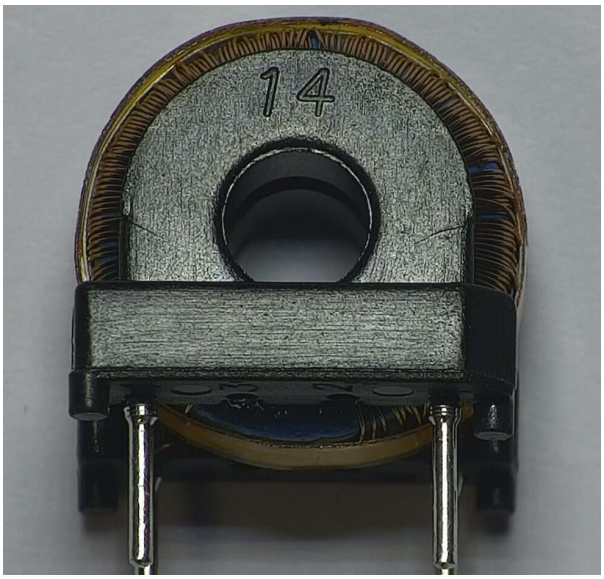


Topology:	***Double Aperture***
Customer Ref	***Balun Parylene coated***
Core:	***Balun***
Size:	***6,2 x 7,2 x 5***
Other:	***Double Aperture***

Q7 – 14050029-4-B

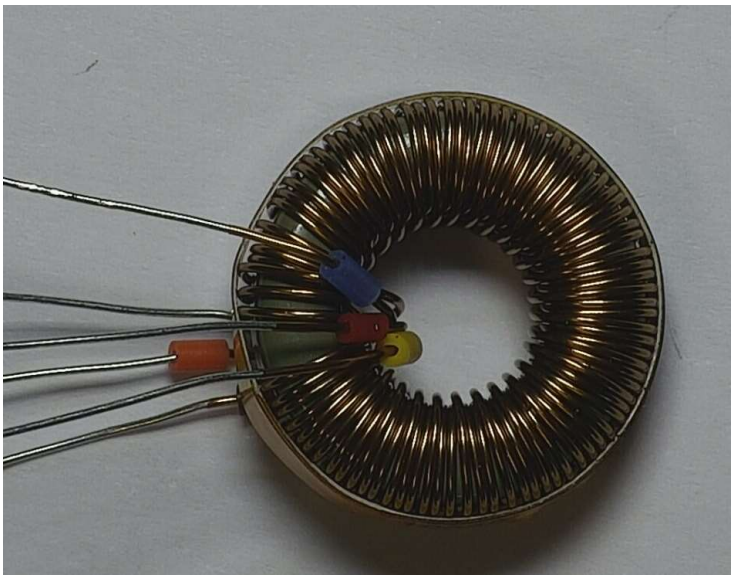
Topology:	***Toroid***
Customer Ref	***Current Transformer***
Core:	***N30***
Size:	***Ø6,3mm***
Other:	***Stacked Cores***

Q8 – 14121023-3-B



Topology:	***Toroid***
Customer Ref	***BDR Current Sense Trans***
Core:	***N30***
Size:	***R10***
Other:	***On Base***

Q9 – 12141085-2-B

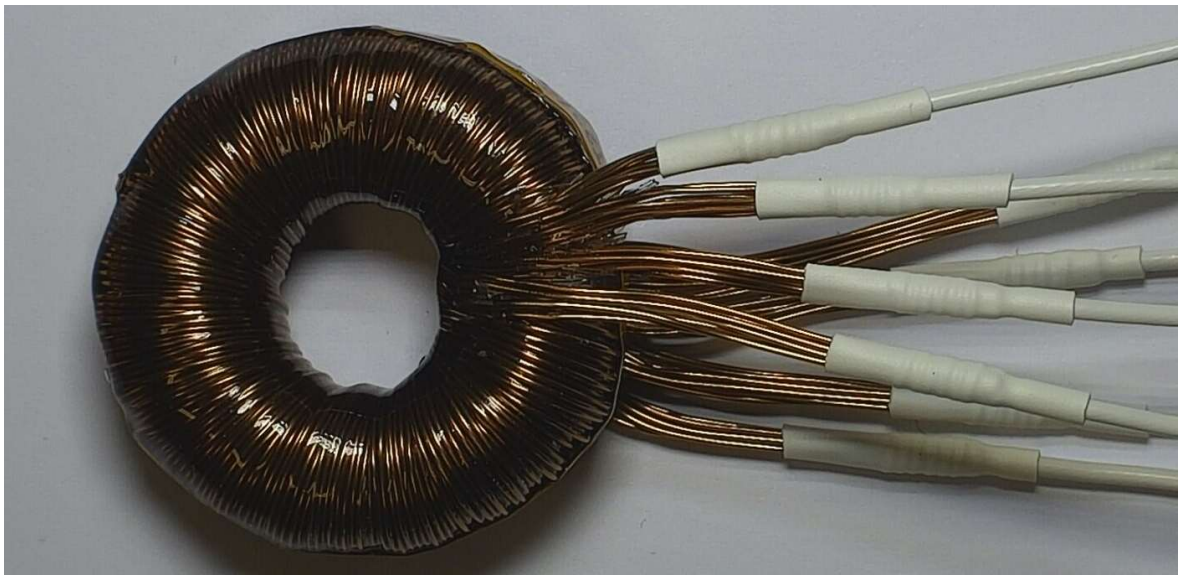


Topology:	***Toroid***
Customer Ref	***Input Inductor***
Core:	***HiFlux***
Size:	***Ø12,7mm***
Other:	***Solithane***

Q10 – 14210147-1-B

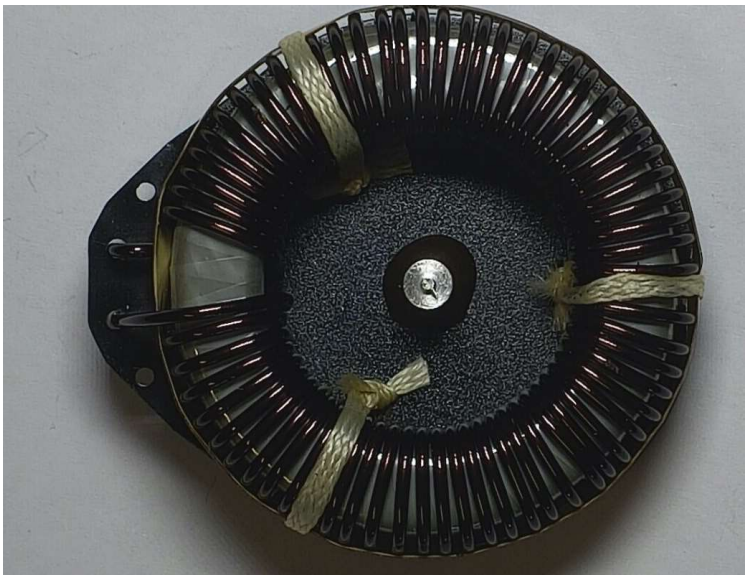
Topology:	***Toroid***
Customer Ref	***Flyback Transformer***
Core:	***MPP***
Size:	***Ø28,4mm***
Other:	***On Base***

Q11 – 12341031-2-B



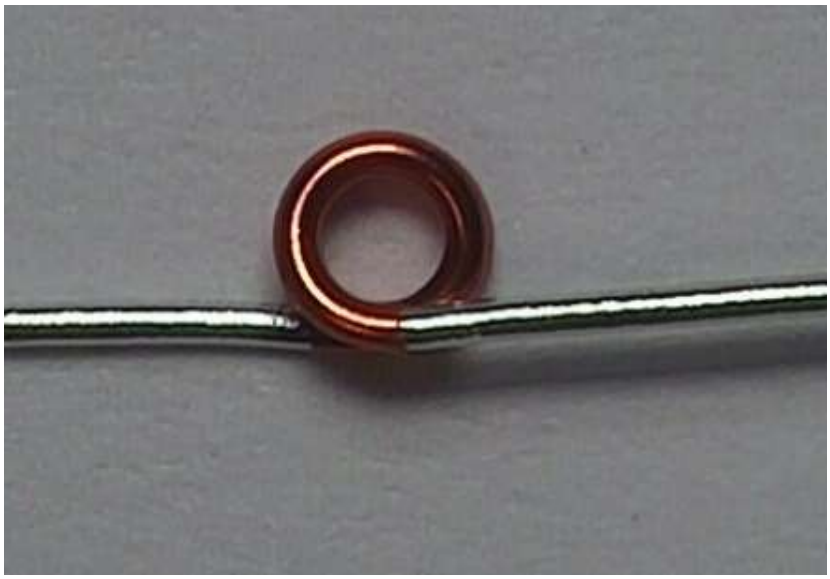
Topology:	***Toroid***
Customer Ref	***Common Mode Filter***
Core:	***ZW-43610***
Size:	***Ø36,00mm***
Other:	***Splice to AWG***

Q12 – 12311047-3-B



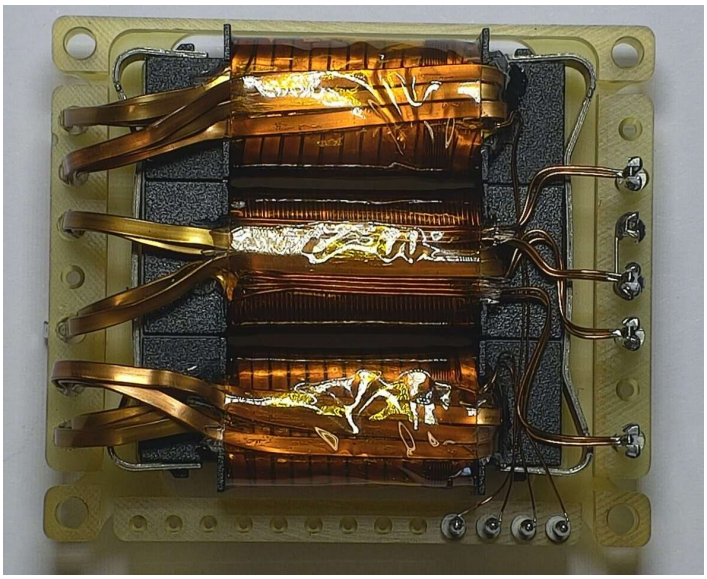
Topology:	***Toroid***
Customer Ref	***QFE DM Choke***
Core:	***HiFlux***
Size:	***Ø38,00mm***
Other:	***Bandaging***

Q13 – 12001166-1-B



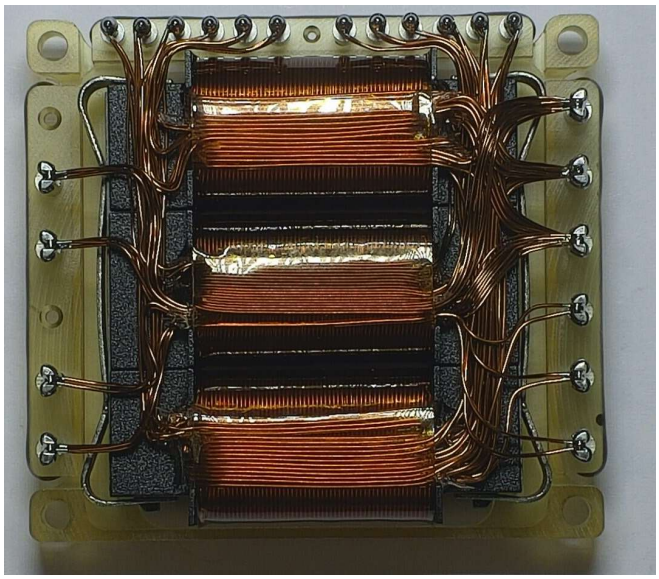
Topology:	***Aircoil***
Customer Ref	***Aircoil***
Core:	***None***
Size:	***2 turns***
Other:	***-***

Q14 – 14260113-1-B



Topology:	***Intergrated Magnetics***
Customer Ref	***Im Transformer***
Core:	***PC40***
Size:	***Size 1***
Other:	***Flat Wire***

Q15 – 14280034-1-B



Topology:	***Intergrated Magnetics***
Customer Ref	***Im Transformer***
Core:	***PC40***
Size:	***Size 2***
Other:	***-***

Q16 – 14790201-1-B

Topology:	***Planar***
Customer Ref	***Current Sense 1:100***
Core:	***3C95***
Size:	***ER9,5***
Other:	***-***

Q17 – 14790101-1-B

Topology:	***Planar***
Customer Ref	***Current Sense 1:50:50***
Core:	
Size:	***EE5***
Other:	***-***

Q18 – 14170209-1-B

Topology:	***Planar***
Customer Ref	***Flyback EE18 Transformer***
Core:	***N87***
Size:	***ELP 18/4/10***
Other:	***14 Layer PCB***

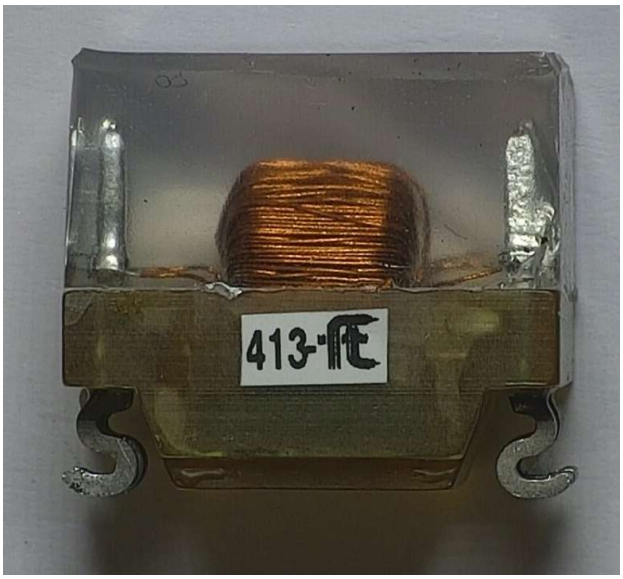
Q19 – 14271050

Topology:	**Planar**
Customer Ref	**IM Special**
Core:	**3C95**
Size:	**EE32**
Other:	**Foil**

Q20 – 12800014-1-B

Topology:	***Planar***
Customer Ref	***EP5 Inductor***
Core:	***3C94***
Size:	***EP5***
Other:	***-***

Q21 – 14120057



Topology:	***Planar***
Customer Ref	***Command Transformer***
Core:	***YW-40705***
Size:	***EP5***
Other:	***High Temp Solder***

Q23 – 12121156-1-C

Topology:	***Toroid***
Customer Ref	***-***
Core:	***MP1305***
Size:	***Ø15,9mm***
Other:	***Hitachi metals***

Q22 – 12000100-1-B

Topology:	***Ammobead***
Customer Ref	***Noise Suppression***
Core:	***Amobead***
Size:	***4-2-8W***
Other:	***-***