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Herschel

DPU Declared Components List
Materials List
Processes List

Document Ref.: SPIRE-IFS-DOC-001031

Issue: 1.1


Prepared by: R. Orfei

Date: 21 February 2002


SPIRE_DPU_DCL-ML-PL_Issue1.doc

Distribution List:

K. King		
B. Swinyard		
J. Delderfield		
E. Sawyer		
J.L. Auguères		
C. Cara		
D. Pouliquen		
D. Ferrand		
G. Olofsson		
R. Cerulli		
S. Molinari		
A. Di Giorgio		
A. Longoni		


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Document Status Sheet:

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Issue	Revision	Date	Reason for Change
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1 INTRODUCTION


1.1 Scope of the document

This document is the preliminary Declared Components List, Materials List and Processes List in terms of selection and approval for the SPIRE-DPU subsystem. It has to be noted that all DPU electronic components will be purchased through the Coordinated Parts Procurement Agency set up by ESA and contracted to Tecnologica (Sevilla, Spain) and TOP-REL (Rome, Italy).

Acronyms and Abbreviations

1.1.1 Acronyms

AD	Architectural Design
ATP	Acceptance Test Plan
AVM	Avionic Model
CIDL	Configuration Identification Document List
CSL	Configuration Status List
CNR	Consiglio Nazionale delle Ricerche
CPP	Coordinated Parts Procurement
CPP	Coordinated Parts Procurement Board
CPU	Control Processing Unit
CDMS	Central Data Management System
CDMU	Central Data Management Unit
CQM	Cryogenic Qualification Model
DCU	Detector Control Unit
DDD	Detailed Design Document
DPU	Digital Processing Unit
EEPROM	Electrically Erasable Programmable Read Only Memory
EMC	Electro Magnetic Compatibility
EMI	Electro Magnetic Interference
ESA	European Space Agency
FIRST	Far InfraRed and Submillimeter Telescope
HK	HouseKeeping
HW	HardWare
IBDR	Instrument Baseline Design Review
ICD	Interface Control Document
ICDR	Instrument Critical Design Review
ICU	Instrument Control Unit
IHDR	Instrument Hardware Design Review

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IFSI Istituto di Fisica dello Spazio Interplanetario


ISVR Instrument Science Verification Review
MCU Mechanism Control Unit
NA Not Applicable
OBS On-Board Software
PA Product Assurance
PDU Power Distribution Unit
PROM Programmable Read Only Memory
S/C SpaceCraft
SCC SpaceCraft Components
SCU S..... Control Unit
SEU Single Event Upset
SPIRE Spectral and Photometric Imaging Receiver
S/S SubSystem
SVM Service Module
SW Software
TBC To Be Confirmed
TBD To Be Defined
TBW To Be Written

TV Thermal Vacuum
WBS Work Breakdown Structure

1.2 References

1.2.1 Applicable Documents

Document Reference	Name
AD1	SPIRE Instrument Specification
AD2	FIRST/Planck Instrument Interface Document Part A
AD3	FIRST/Planck Instrument Interface Document Part B Instrument “SPIRE”
AD4	Product Assurance Plan for the FIRST-SPIRE Instrument
AD5	SPIRE Product Tree

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AD6	FIRST SPIRE DPU Subsystem Specification Document
AD7	ESA Preferred Parts List. ESA PSS-01-603

1.2.2 Reference Documents

Document Reference	Name
RD1	SPIRE Design Description
RD2	SPIRE Preliminary EEE Parts List
RD3	Carlo Gavazzi Space: DPU Preliminary Declared Components List

2 Status of the lists

This is the first issue of the DPU Declared Components List, Materials List and Processes List prepared for the DDR.

The electronic components list presented (taken from RD3) has already been subjected to scrutiny by the Coordinated Parts Procurement Boards (CPPB) and it is still subject to be updated in just a few items, mainly for standardisation of packages and types.


2.1 Overview of the DPU

The DPU is the only subsystem that interfaces electrically with the spacecraft for telemetry and telecommand. It takes care of the command execution and synchronisation, it controls all the subsystems, packages the telemetry and takes care of the health-autonomous mode.

The DPU electronics will consist of a single box, positioned in the warm part of the S/C and as close as possible to the DCU, the MCU and SCU sub-systems.

3 Notes on Components Criticality

With the present EEE lists there are no criticalities implied.

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4 Introduction to the Components and Materials Lists

It has to be stressed the point that IFSI is involved in the design and manufacturing of the DPU/ICU of the three Herschel instruments, so the lists will be nearly the same for the three instruments. In the following pages the components and Bill of Materials are reported. The components are corresponding to the ones actually shown in the electrical schematics and soldered in the related printed boards and are reported for each printed board:

- CPU,
- CPU PIGGY-BACK;
- PL-IF,
- DC/DC Converter and Motherboard.

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5 PRELIMINARY DECLARED COMPONENTS LIST

DRAWING TITLE HSO/FIRST-DPU: CPU BOARD Electrical Part List (SPIRE)		CARLO GAVAZZI SPACE S.p.A. 	
HIGHER ASSEMBLY DPU-EM-110.00-0	DRAWING NUMBER DPU-EM-110.01-3	REV. /	DATE

ITEM	DESCRIPTION	PROC.SPEC	SUPPLIER	P/N-ID.CODE	QTY	EM NOTE
For the parts relevant to the F.M. All the columns shall be filled up and are applicable to the procurement. For the parts relevant to the E.M. the filling up of all the columns is encouraged (mandatory if required by the contract), so as to allow procurement flexibility in front of cost & time saving reasons.						
C1	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C2	Tantalum Capacitor 15uF 30V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0545	1	
C3	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C4	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C5	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C6	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C7	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C8	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C9	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C10	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	



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C11	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C12	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C13	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C14	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C15	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C16	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C17	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C18	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C19	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C20	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C21	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C22	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C23	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C24	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C25	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C26	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C27	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C28	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C29	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C30	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C31	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C32	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C33	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C34	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C51	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C58	Chip Ceramic Capacitor 100pF 100V 5%	MIL-PRF-55681/8	KEMET	CDR32BP101BJWR	1	
C59	Tantalum Capacitor 15uF 30V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0545	1	



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C60	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C61	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C62	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C63	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C64	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C65	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C66	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C67	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C68	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C69	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C70	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C71	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C72	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C73	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C74	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C75	Tantalum Capacitor 8,2uF 60V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0585	1	
C80	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C81	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C82	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C83	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C84	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C85	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C86	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C87	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C88	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C89	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C90	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	



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D2	Switching diode	MIL-PRF-19500/578	CDI	JANS1N6642US	1	
JP1	JUMPER				1	HEADER 2 pins
JP2	JUMPER Position 3-4				1	HEADER 2X2 pins
JP5	JUMPER Positions 1-3 and 2-4				2	HEADER 3X2 pins
JP6	JUMPER Positions 2-4 and 3-5				2	HEADER 3X2 pins
JP7	JUMPER Position 3-4				1	HEADER 2X2 pins
O1	20MHz, TTL CLOCK OSCILLATOR	MIL-PRF-55310/16	VECTRON	M55310/16-S31A20M00000	1	
P1	96-pin Male Solder Connector 90°	RFA	FRB	KDC 096 1310	1	HARTING 09 03 196 6921
P2	96-pin Male Solder Connector 90°	RFA	FRB	KDC 096 1310	1	HARTING 09 03 196 6921
P3	60-pin Micro Strip Connector Male	AMP-spec. 108-1272	AMP	536280-2	1	
P4	60-pin Micro Strip Connector Male	AMP-spec. 108-1272	AMP	536280-2	1	
R2	Chip Resistor 100R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100DR	1	
R3	Chip Resistor 1MR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B1F00R	1	
R7	Network Resistor 13+1 pin 10KO 0,325W 5%	MIL-PRF-83401/3	DALE	M8340103M1002JB	1	
R8	Network Resistor 13+1 pin 10KO 0,325W 5%	MIL-PRF-83401/3	DALE	M8340103M1002JB	1	
R9	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R10	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R11	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R12	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R13	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R14	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R15	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R16	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R17	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R18	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R19	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R20	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R21	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R22	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R23	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	



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R24	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R25	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R26	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R27	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R28	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R29	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R30	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R31	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R32	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R33	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R34	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R35	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R36	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R37	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R38	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R39	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R40	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R41	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R42	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R43	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R44	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R45	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R46	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R47	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R48	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R49	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R50	JUMPER					
R51	JUMPER					
R53	JUMPER				1	SMD (0805) 0R0 5% RS 136-957
R54	JUMPER				1	SMD (0805) 0R0 5% RS 136-957



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R55	JUMPER				1	SMD (0805) 0R0 5% RS 136-957
R56	JUMPER				1	SMD (0805) 0R0 5% RS 136-957
R57	JUMPER				1	SMD (0805) 0R0 5% RS 136-957
R58	JUMPER				1	SMD (0805) 0R0 5% RS 136-957
R59	JUMPER				1	SMD (0805) 0R0 5% RS 136-957
R61	JUMPER				1	SMD (0805) 0R0 5% RS 136-957
R62	JUMPER				1	SMD (0805) 0R0 5% RS 136-957
R63	JUMPER				1	SMD (0805) 0R0 5% RS 136-957
R64	JUMPER				1	SMD (0805) 0R0 5% RS 136-957
R65	JUMPER				1	SMD (0805) 0R0 5% RS 136-957
R139	Network Resistor 13+1 pin 10KO 0,325W 5%	MIL-PRF-83401/3	DALE	M8340103M1002JB	1	
R140	Network Resistor 13+1 pin 10KO 0,325W 5%	MIL-PRF-83401/3	DALE	M8340103M1002JB	1	
R141	Network Resistor 13+1 pin 10KO 0,325W 5%	MIL-PRF-83401/3	DALE	M8340103M1002JB	1	
R142	Network Resistor 13+1 pin 10KO 0,325W 5%	MIL-PRF-83401/3	DALE	M8340103M1002JB	1	
R143	Network Resistor 13+1 pin 10KO 0,325W 5%	MIL-PRF-83401/3	DALE	M8340103M1002JB	1	
R144	Network Resistor 13+1 pin 10KO 0,325W 5%	MIL-PRF-83401/3	DALE	M8340103M1002JB	1	
R145	Chip Resistor 1.82K 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B1E82R	1	
R147	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R148	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R149	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R150	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R151	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R152	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R153	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R154	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R155	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R156	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R157	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R158	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R159	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	



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R160	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R161	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R162	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R163	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R164	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R165	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R166	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R167	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R168	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R169	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R170	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R171	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R172	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R173	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R174	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R175	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R176	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R177	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R178	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R179	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R180	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R181	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R182	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R183	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R184	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R185	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R186	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R187	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R188	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R189	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	



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R190	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R191	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R192	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R193	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R194	Chip Resistor 10R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10D0R	1	
R195	JUMPER					
R196	JUMPER					
U1	16-bit Latch 54ACTQ16374W-QV	5962-94528	NATIONAL	5962-9452801VXA	1	FAIRCHILD 74ACTQ16374SSC
U2	8-bit Buffer 54ACTQ244W-RQMLV	5962-92186	NATIONAL	5962R9218601VSA	1	FAIRCHILD 74ACTQ244SC
U3	16-bit Latch 54ACTQ16374W-QV	5962-94528	NATIONAL	5962-9452801VXA	1	FAIRCHILD 74ACTQ16374SSC
U4	32K x 8 bit Radiation Hardened PROM UT28F256-45PCCH	5962-96891	UTMC	5962H9689103VYC	1	EEPROM ST M27C256B-45 B1
U5	Hex Inverter Schmitt Trigger 54HC14K	ESA/SCC 9409/007	STM	940900702BF	1	FAIRCHILD 74AC14SC
U6	16-bit Latch 54ACTQ16374W-QV	5962-94528	NATIONAL	5962-9452801VXA	1	FAIRCHILD 74ACTQ16374SSC
U7	16-bit Transceiver 54ACTQ16245WRQV	5962-95620	NATIONAL	5962R9562001VXA	1	FAIRCHILD 74ACTQ16245SSC
U8	16 eq gates Actel Rad Tolerant FPGA RT54SX32S-CQ208E		ACTEL	To be defined by CPP	1	A54SX32A-PQ208
U9	16-bit Transceiver 54ACTQ16245WRQV	5962-95620	NATIONAL	5962R9562001VXA	1	FAIRCHILD 74ACTQ16245SSC
U10	16-bit Buffer 54ACTQ16244W-RQV	5962-95619	NATIONAL	5962R9561901VXA	1	FAIRCHILD 74ACTQ16244SSC
U11	16-bit Buffer 54ACTQ16244W-RQV	5962-95619	NATIONAL	5962R9561901VXA	1	FAIRCHILD 74ACTQ16244SSC
U12	16-bit Buffer 54ACTQ16244W-RQV	5962-95619	NATIONAL	5962R9561901VXA	1	FAIRCHILD 74ACTQ16244SSC
U15	512K x 8 bit Static RAM 25ns UT9Q512-UCC	5962-00536	UTMC	5962D0053601TUC	1	AEROFLEX ACT-S512K8N-025F3C
U16	512K x 8 bit Static RAM 25ns UT9Q512-UCC	5962-00536	UTMC	5962D0053601TUC	1	AEROFLEX ACT-S512K8N-025F3C
U17	512K x 8 bit Static RAM 25ns UT9Q512-UCC	5962-00536	UTMC	5962D0053601TUC	1	AEROFLEX ACT-S512K8N-025F3C
U18	512K x 8 bit Static RAM 25ns UT9Q512-UCC	5962-00536	UTMC	5962D0053601TUC	1	AEROFLEX ACT-S512K8N-025F3C
U26	32/40-bit floating point DSP microprocessor TSC21020F-20SBSV	5962-99539	ATMEL	5962-9953901VXC	1	ANALOG D. ADSP-21020-KG80
U28	512K x 8 bit Static RAM 25ns UT9Q512-UCC	5962-00536	UTMC	5962D0053601TUC	1	AEROFLEX ACT-S512K8N-025F3C
U29	512K x 8 bit Static RAM 25ns UT9Q512-UCC	5962-00536	UTMC	5962D0053601TUC	1	AEROFLEX ACT-S512K8N-025F3C
U30	512K x 8 bit Static RAM 25ns UT9Q512-UCC	5962-00536	UTMC	5962D0053601TUC	1	AEROFLEX ACT-S512K8N-025F3C
U31	512K x 8 bit Static RAM 25ns UT9Q512-UCC	5962-00536	UTMC	5962D0053601TUC	1	AEROFLEX ACT-S512K8N-025F3C
U32	512K x 8 bit Static RAM 25ns UT9Q512-UCC	5962-00536	UTMC	5962D0053601TUC	1	AEROFLEX ACT-S512K8N-025F3C
U33	512K x 8 bit Static RAM 25ns UT9Q512-UCC	5962-00536	UTMC	5962D0053601TUC	1	AEROFLEX ACT-S512K8N-025F3C



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1	Printed Circuit Board	CNES/QFT/SP-0117	PRINTCA/VIASYSTEMSCSI	DPU-FM-110.03-0 REV /	1	DPU-EM-110.03-0 REV /
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Bill Of Material					
DESCRIPTION	PROC.SPEC	SUPPLIER	P/N-ID.CODE	Totale	
Printed Circuit Board	CNES/QFT/SP-0117	PRINTCA/VIASYSTEMSCSI	DPU-FM-110.03-0 REV /	1	
Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	60	
Tantalum Capacitor 15uF 30V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0545	2	
JUMPER				17	
Chip Ceramic Capacitor 100pF 100V 5%	MIL-PRF-55681/8	KEMET	CDR32BP101BJWR	1	
Tantalum Capacitor 8,2uF 60V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0585	1	
Switching diode	MIL-PRF-19500/578	CDI	JANS1N6642US	1	
JUMPER Position 3-4				2	
JUMPER Positions 1-3 and 2-4				1	
JUMPER Positions 2-4 and 3-5				1	
20MHz, TTL CLOCK OSCILLATOR	MIL-PRF-55310/16	VECTRON	M55310/16-S31A20M00000	1	
96-pin Male Solder Connector 90°	RFA	FRB	KDC 096 1310	2	
60-pin Micro Strip Connector Male	AMP-spec. 108-1272	AMP	536280-2	2	
Chip Resistor 100R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100DR	1	
Chip Resistor 1MR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B1F00R	1	
Network Resistor 13+1 pin 10KO 0,325W 5%	MIL-PRF-83401/3	DALE	M8340103M1002JB	8	
Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
Chip Resistor 1.82K 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B1E82R	1	
16-bit Latch 54ACTQ16374W-QV	5962-94528	NATIONAL	5962-9452801VXA	3	
8-bit Buffer 54ACTQ244W-RQMLV	5962-92186	NATIONAL	5962R9218601VSA	1	
32K x 8 bit Radiation Hardened PROM UT28F256-45PCCH	5962-96891	UTMC	5962H9689103VYC	1	
Hex Inverter Schmitt Trigger 54HC14K	ESA/SCC 9409/007	STM	940900702BF	1	
16-bit Transceiver 54ACTQ16245WRQV	5962-95620	NATIONAL	5962R9562001VXA	2	
16 eq gates Actel Rad Tolerant FPGA RT54SX32S-CQ208E		ACTEL	To be defined by CPP	1	
16-bit Buffer 54ACTQ16244W-RQV	5962-95619	NATIONAL	5962R9561901VXA	3	
512K x 8 bit Static RAM 25ns UT9Q512-UCC	5962-00536	UTMC	5962D0053601TUC	10	

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32/40-bit floating point DSP microprocessor TSC21020F-20SBSV	5962-99539	ATMEL	5962-9953901VXC	1
Chip Resistor 10R 0,1W 1%2	MIL-R-55342/6	DALE	M55342K06B10D0R	88
Total				215

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DRAWING TITLE		CARLO GAVAZZI SPACE S.p.A. 	
HSO/FIRST-DPU: CPU PIGGY BACK Electrical Part List (SPIRE)			
HIGHER ASSEMBLY	DRAWING NUMBER	REV.	DATE
DPU-EM-120.00-0	DPU-EM-120.01-3	/	

ITEM	DESCRIPTION	PROC.SPEC	SUPPLIER	P/N/ID.CODE	QTY	EM NOTE
For the parts relevant to the F.M. All the columns shall be filled up and are applicable to the procurement. For the parts relevant to the E.M. the filling up of all the columns is encouraged (mandatory if required by the contract), so as to allow procurement flexibility in front of cost & time saving reasons.						
C1	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C2	Tantalum Capacitor 15uF 30V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0545	1	
C3	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C4	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C5	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C6	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C7	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C8	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C9	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C10	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C11	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C12	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	



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C13	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C14	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C15	Chip Ceramic Capacitor. 1nF 100V 10%	MIL-PRF-55681/8	KEMET	CDR32BP102BKWR	1	
D1	Switching diode	MIL-PRF-19500/578	CDI	JANS1N6642US	1	
P1	60-pin Micro Strip Connector Female	AMP-spec. 108-1272	AMP	536279-2	1	
P2	60-pin Micro Strip Connector Female	AMP-spec. 108-1272	AMP	536279-2	1	
R1	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R2	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R3	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
U1	256K x 32 bit EEPROM	79C0832RP0125.99	SEI	79C0832RT2FX-20	1	79C0832RPQE-20
U2	16-bit Transceiver 54ACTQ16245WRQV	5962-95620	NATIONAL	5962R9562001VXA	1	FAIRCHILD 74ACTQ16245SSC
U3	16-bit Transceiver 54ACTQ16245WRQV	5962-95620	NATIONAL	5962R9562001VXA	1	FAIRCHILD 74ACTQ16245SSC
1	Printed Circuit Board	CNES/QFT/SP-0117	PRINTCA/VIASYSTEMSCSI	DPU-FM-120.03-0 REV /	1	DPU-EM-120.03-0 REV /

Bill Of Material					
DESCRIPTION	PROC.SPEC	SUPPLIER	P/N-ID.CODE	Totale	
Printed Circuit Board	CNES/QFT/SP-0117	PRINTCA/VIASYSTEMSCSI	DPU-FM-120.03-0 REV /	1	
Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	13	
Tantalum Capacitor 15uF 30V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0545	1	
Switching diode	MIL-PRF-19500/578	CDI	JANS1N6642US	1	
Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	3	
16-bit Transceiver 54ACTQ16245WRQV	5962-95620	NATIONAL	5962R9562001VXA	2	
Chip Ceramic Capacitor. 1nF 100V 10%	MIL-PRF-55681/8	KEMET	CDR32BP102BKWR	1	
60-pin Micro Strip Connector Female	AMP-spec. 108-1272	AMP	536279-2	2	
256K x 32 bit EEPROM	79C0832RP0125.99	SEI	79C0832RT2FX-20	1	
Total				25	

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DRAWING TITLE <div style="text-align: center;">HSO/FIRST-DPU: PL IF Board Electrical Part List (SPIRE)</div>		<div style="text-align: right;"> CARLO GAVAZZI SPACE S.p.A.  </div>	
HIGHER ASSEMBLY DPU-EM-210.00-0	DRAWING NUMBER DPU-EM-210.01-3	REV. /	DATE

ITEM	DESCRIPTION	PROC.SPEC	SUPPLIER	P/N/ID.CODE	QTY	EM NOTE
For the parts relevant to the F.M. All the columns shall be filled up and are applicable to the procurement. For the parts relevant to the E.M. the filling up of all the columns is encouraged (mandatory if required by the contract), so as to allow procurement flexibility in front of cost & time saving reasons.						
C1	Chip Ceramic Capacitor 10nF 100V 10%	MIL-PRF-55681/8	KEMET	CDR32BX103BKWR	1	
C2	Tantalum Capacitor 10uF 50V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0565	1	
C3	Tantalum Capacitor 10uF 50V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0565	1	
C4	Chip Ceramic Capacitor 10nF 100V 10%	MIL-PRF-55681/8	KEMET	CDR32BX103BKWR	1	
C5	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C6	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C7	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C8	Chip Ceramic Capacitor 100pF 100V 5%	MIL-PRF-55681/8	KEMET	CDR32BP101BJWR	1	
C9	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C10	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C11	Chip Ceramic Capacitor 100pF 100V 5%	MIL-PRF-55681/8	KEMET	CDR32BP101BJWR	1	
C12	Chip Ceramic Capacitor 100pF 100V 5%	MIL-PRF-55681/8	KEMET	CDR32BP101BJWR	1	



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C13	Chip Ceramic Capacitor 100pF 100V 5%	MIL-PRF-55681/8	KEMET	CDR32BP101BJWR	1	
C14	Chip Ceramic Capacitor 100pF 100V 5%	MIL-PRF-55681/8	KEMET	CDR32BP101BJWR	1	
C15	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C16	Chip Ceramic Capacitor 100pF 100V 5%	MIL-PRF-55681/8	KEMET	CDR32BP101BJWR	1	
C17	Chip Ceramic Capacitor 100pF 100V 5%	MIL-PRF-55681/8	KEMET	CDR32BP101BJWR	1	
C18	Chip Ceramic Capacitor 100pF 100V 5%	MIL-PRF-55681/8	KEMET	CDR32BP101BJWR	1	
C19	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C20	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C21	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C22	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C23	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C24	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C25	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C26	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C27	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C28	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C29	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C30	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C31	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C32	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C33	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C34	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C35	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C36	Chip Ceramic Capacitor ADJ 10%					
C37	Chip Ceramic Capacitor ADJ 10%				1	
C38	Chip Ceramic Capacitor ADJ 10%				1	
C39	Chip Ceramic Capacitor ADJ 10%					



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C40	Chip Ceramic Capacitor ADJ 10%					
C41	Chip Ceramic Capacitor ADJ 10%				1	
C42	Chip Ceramic Capacitor ADJ 10%				1	
C43	Chip Ceramic Capacitor ADJ 10%				1	
C44	Chip Ceramic Capacitor ADJ 10%				1	
C45	Chip Ceramic Capacitor ADJ 10%				1	
C46	Chip Ceramic Capacitor ADJ 10%				1	
C47	Chip Ceramic Capacitor ADJ 10%				1	
C48	Chip Ceramic Capacitor ADJ 10%				1	
C49	Chip Ceramic Capacitor ADJ 10%				1	
C50	Chip Ceramic Capacitor ADJ 10%				1	
C51	Chip Ceramic Capacitor ADJ 10%				1	
C52	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C53	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C54	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C55	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C56	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C57	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C58	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C59	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C60	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C61	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C62	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C63	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C64	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C65	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C66	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C67	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	



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C68	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C69	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C70	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C71	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C72	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C73	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C74	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C75	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
CN1	Connector		AMP	2-767004-2	1	
D1	Ultra Fast Rectifier Diode	MIL-PRF-195500/477	MICROSEMI	JANS1N5811US	1	
JP1	2 Jumper pin				1	
JP2	3 Jumper pin				1	
JP3	3 Jumper pin				1	
JP4	3 Jumper pin				1	
JP5	2 Jumper pin				1	
JP6	8x2 Jumper pin				1	
JP7	2 Jumper pin				1	
JP8	2 Jumper pin				1	
JP9	2 Jumper pin				1	
JP10	2 Jumper pin				1	
JP11	2 Jumper pin				1	
L1	Inductor 220uH					
P1	96-pin Male Solder Connector 90°	N.A.	FRB	KDC 096 1310	1	
P2	96-pin Male Solder Connector 90°	N.A.	FRB	KDC 096 1310	1	
R1	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R2	Resistor 56,2R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N56R2FR	1	
R3	Resistor 56,2R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N56R2FR	1	
R4	Resistor 56,2R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N56R2FR	1	



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R5	Resistor 56,2R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N56R2FR	1	
R6	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R7	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R8	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R9	Metal film 3.74K 0.1% 5ppm	MIL-PRF-55182/9	DALE	RNC90Y3K7400BR	1	
R10	Metal film 1.24K 0.1% 5ppm	MIL-PRF-55182/9	DALE	RNC90Y1K2400BR	1	
R11	Metal film 1K 0.1% 5ppm	MIL-PRF-55182/9	DALE	RNC90Y1K0000BR	1	
R12	Metal film 1K 0.1% 5ppm	MIL-PRF-55182/9	DALE	RNC90Y1K0000BR	1	
R13	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R14	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R15	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R16	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R17	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R18	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R19	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R20	Metal film ADJ 0.1% 5ppm				1	
R21	Metal film ADJ 0.1% 5ppm				1	
R22	Metal film ADJ 0.1% 5ppm				1	
R23	Metal film ADJ 0.1% 5ppm				1	
R24	Chip Resistor 3,01KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B3E01R	1	
R25	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R26	Chip Resistor ADJ 0,1W 1%				1	
R27	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R28	Chip Resistor 3,01KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B3E01R	1	
R29	Chip Resistor 3,01KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B3E01R	1	
R30	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R31	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R32	Chip Resistor ADJ 0,1W 1%				1	
R33	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R34	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	



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R35	Chip Resistor ADJ 0,1W 1%				1	
R36	Chip Resistor 3,01KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B3E01R	1	
R37	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R38	Chip Resistor 3,01KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B3E01R	1	
R39	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R40	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R41	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R42	Chip Resistor ADJ 0,1W 1%				1	
R43	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R44	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R45	Chip Resistor ADJ 0,1W 1%				1	
R46	Chip Resistor 3,01KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B3E01R	1	
R47	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R48	Chip Resistor 3,01KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B3E01R	1	
R49	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R50	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R51	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R52	Chip Resistor ADJ 0,1W 1%				1	
R53	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R54	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R55	Chip Resistor ADJ 0,1W 1%				1	
R56	Chip Resistor 3,01KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B3E01R	1	
R57	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R58	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R59	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R60	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R61	Chip Resistor ADJ 0,1W 1%				1	
R62	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R63	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R64	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	



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R65	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R66	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R67	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R68	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R69	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R70	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R71	Chip Resistor ADJ 0,1W 1%				1	
R72	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R73	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R74	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R75	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R76	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R77	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R78	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R79	Chip Resistor ADJ 0,1W 1%				1	
R80	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R81	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R82	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R83	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R84	Chip Resistor ADJ 0,1W 1%				1	
R85	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R86	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R87	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R88	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R89	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R90	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R91	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R92	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R93	Chip Resistor ADJ 0,1W 1%				1	
R94	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	



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R95	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R96	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R97	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R98	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R99	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R100	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R101	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R102	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R103	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R104	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R105	Chip Resistor ADJ 0,1W 1%				1	
R106	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R107	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R108	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R109	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R110	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R111	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R112	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R113	Chip Resistor ADJ 0,1W 1%				1	
R114	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R115	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R116	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R117	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R118	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R119	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R120	Chip Resistor ADJ 0,1W 1%				1	
R121	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R122	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R123	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R124	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	



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R125	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R126	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R127	Chip Resistor ADJ 0,1W 1%				1	
R128	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R129	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R130	Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	1	
R131	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R132	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R133	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R134	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R135	Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	1	
R136	Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	1	
R137	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R138	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R139	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R140	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R141	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R142	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R143	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R144	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
R145	Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	1	
T1	MIL-STD-1553 Long Stub Transformer, Turns Ratio 2:1	MIL-T-21038, MIL-STD-202	BETA TRANSFORMER	HLP6002	1	
T2	MIL-STD-1553 Long Stub Transformer, Turns Ratio 2:1	MIL-T-21038, MIL-STD-202	BETA TRANSFORMER	HLP6002	1	
U1	Hex Inverter Schmitt Trigger 54HC14K	ESA/SCC 9409/007	STM	940900702BF	1	
U2	MIL-STD-1553 Advanced Communication Engine BU-61582F1	SEE REMARKS	DDC	SEE REMARKS	1	
U3	16MHz, TTL CLOCK OSCILLATOR	MIL-PRF-55310/16	VECTRON	M55310/16-S31A16M00000	1	
U4	Voltage reference AD584TH/QMLVR	5962-38128	AD	5962R3812802VGA	1	
U5	12-bit A/D Converter AD574ATD/QMLV	5962-85127	AD	5962-8512702VXA	1	
U6	Operational Amplifier OP27SA J5	MIL-M-38510/135	AD	M38510/13503SGA	1	
U7	8 Channel Analog Multiplexer HS1-508BRH-Q	5962-96742	INTERSIL	5962F9674202VEC	1	



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U8	Quad RS422 Receiver HS9-26C32RH-Q	5962-95689	INTERSIL	5962H9583402VXC	1	
U9	Quad RS422 Receiver HS9-26C32RH-Q	5962-95689	INTERSIL	5962H9583402VXC	1	
U10	Quad RS422 Driver HS9-26C31RH-Q	5962-96663	INTERSIL	5962F9666301VXC	1	
U11	Quad RS422 Receiver HS9-26C32RH-Q	5962-95689	INTERSIL	5962H9583402VXC	1	
U12	Quad RS422 Driver HS9-26C31RH-Q	5962-96663	INTERSIL	5962F9666301VXC	1	
U13	Quad RS422 Driver HS9-26C31RH-Q	5962-96663	INTERSIL	5962F9666301VXC	1	
U14	Quad RS422 Receiver HS9-26C32RH-Q	5962-95689	INTERSIL	5962H9583402VXC	1	
U15	Quad RS422 Driver HS9-26C31RH-Q	5962-96663	INTERSIL	5962F9666301VXC	1	
U16	16K x 9 bit FIFO Memory SMDP67206FV-15SV	5962-93177	ATMEL	5962-9317704VZC	1	
U17	16K x 9 bit FIFO Memory SMDP67206FV-15SV	5962-93177	ATMEL	5962-9317704VZC	1	
U18	16K x 9 bit FIFO Memory SMDP67206FV-15SV	5962-93177	ATMEL	5962-9317704VZC	1	
U19	16K x 9 bit FIFO Memory SMDP67206FV-15SV	5962-93177	ATMEL	5962-9317704VZC	1	
U22	8-bit Buffer 54ACTQ244W-RQMLV	5962-92186	NATIONAL	5962R9218601VSA	1	
U23	16K x 9 bit FIFO Memory SMDP67206FV-15SV	5962-93177	ATMEL	5962-9317704VZC	1	
U24	16K x 9 bit FIFO Memory SMDP67206FV-15SV	5962-93177	ATMEL	5962-9317704VZC	1	
U25	16K x 9 bit FIFO Memory SMDP67206FV-15SV	5962-93177	ATMEL	5962-9317704VZC	1	
U26	16K x 9 bit FIFO Memory SMDP67206FV-15SV	5962-93177	ATMEL	5962-9317704VZC	1	
U29	8-bit Buffer 54ACTQ244W-RQMLV	5962-92186	NATIONAL	5962R9218601VSA	1	
U30	16 eq gates Actel Rad Tolerant FPGA RT54SX32S-CQ208E		ACTEL	To be defined by CPP	1	

Bill Of Material

DESCRIPTION	PROC.SPEC	SUPPLIER	P/N-ID.CODE	Totale
Chip Ceramic Capacitor 10nF 100V 10%	MIL-PRF-55681/8	KEMET	CDR32BX103BKWR	2
Tantalum Capacitor 10uF 50V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0565	2
Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	47
Chip Ceramic Capacitor 100pF 100V 5%	MIL-PRF-55681/8	KEMET	CDR32BP101BJWR	8
Chip Ceramic Capacitor ADJ 10%			(vuote)	
Connector		AMP	2-767004-2	
Ultra Fast Rectifier Diode	MIL-PRF-195500/477	MICROSEMI	JANS1N5811US	1




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2 Jumper pin			(vuote)	
3 Jumper pin			(vuote)	
3 Jumper pin			(vuote)	
Inductor 220uH		(vuote)	(vuote)	
96-pin Male Solder Connector 90°	N.A.	FRB	KDC 096 1310	2
Chip Resistor 10KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B10E0R	20
Resistor 56,2R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N56R2FR	4
Metal film 3.74K 0.1% 5ppm	MIL-PRF-55182/9	DALE	RNC90Y3K7400BR	1
Metal film 1.24K 0.1% 5ppm	MIL-PRF-55182/9	DALE	RNC90Y1K2400BR	1
Metal film 1K 0.1% 5ppm	MIL-PRF-55182/9	DALE	RNC90Y1K0000BR	2
Metal film ADJ 0.1% 5ppm		(vuote)	(vuote)	
Chip Resistor 3,01KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B3E01R	8
Chip Resistor 100KR 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B100ER	33
Chip Resistor ADJ 0,1W 1%		(vuote)	(vuote)	
Chip Resistor 332R 0,1W 1%	MIL-R-55342/6	DALE	M55342K06B332DR	24
8x2 Jumper pin			(vuote)	
Resistor 22,1R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N22R1FR	32
MIL-STD-1553 Long Stub Transformer, Turns Ratio 2:1	MIL-T-21038, MIL-STD-202	BETA TRANSFORMER	HLP6002	1
		BETA TRANSFORMER	HLP6002	1
Hex Inverter Schmitt Trigger 54HC14K	ESA/SCC 9409/007	STM	940900702BF	1
MIL-STD-1553 Advanced Communication Engine BU-61582F1	SEE REMARKS	DDC	SEE REMARKS	1
16MHz, TTL CLOCK OSCILLATOR	MIL-PRF-55310/16	VECTRON	M55310/16-S31A16M00000	1
Voltage reference AD584TH/QMLVR	5962-38128	AD	5962R3812802VGA	1
12-bit A/D Converter AD574ATD/QMLV	5962-85127	AD	5962-8512702VXA	1
Operational Amplifier OP27SA J5	MIL-M-38510/135	AD	M38510/13503SGA	1
8 Channel Analog Multiplexer HS1-508BRH-Q	5962-96742	INTERSIL	5962F9674202VEC	1
Quad RS422 Receiver HS9-26C32RH-Q	5962-95689	INTERSIL	5962H9583402VXC	3
Quad RS422 Driver HS9-26C31RH-Q	5962-96663	INTERSIL	5962F9666301VXC	4
Quad RS422 Receiver HS9-26C32RH-Q	5962-95689	INTERSIL	5962H9583402VXC	1
16K x 9 bit FIFO Memory SMDP67206FV-15SV	5962-93177	ATMEL	5962-9317704VZC	8

 IFSI CNR	Herschel DPU Declared Components List Materials List Processes List	Ref. SPIRE-IFS-DOC-001031 Issue 1.1 Date: 21/02/2002 Page 33 of 66
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8-bit Buffer 54ACTQ244W-RQMLV	5962-92186	NATIONAL	5962R9218601VSA	2
16 eq gates Actel Rad Tolerant FPGA RT54SX32S-CQ208E		ACTEL	To be defined by CPP	
Total				264

DRAWING TITLE		CARLO GAVAZZI SPACE S.p.A.		
HSO/FIRST-DPU: DC/DC BOARD Electrical Part List (SPIRE)				
HIGHER ASSEMBLY	DRAWING NUMBER		REV.	DATE
DPU-EM-310.00-0	DPU-EM-310.01-3		/	

ITEM	DESCRIPTION	PROC.SPEC	SUPPLIER	P/N-ID.CODE	QTY	EM NOTE
For the parts relevant to the F.M. All the columns shall be filled up and are applicable to the procurement. For the parts relevant to the E.M. the filling up of all the columns is encouraged (mandatory if required by the contract), so as to allow procurement flexibility in front of cost & time saving reasons.						
C2	Tantalum Capacitor ADJ 10% (CLR79)				1	
C4	Chip Ceramic Capacitor 0,47uF 50V 10%	MIL-PRF-55681/11	KEMET	CDR35BX474AKWR	1	
C5	Chip Ceramic Capacitor 0,47uF 50V 10%	MIL-PRF-55681/11	KEMET	CDR35BX474AKWR	1	
C6	Chip Ceramic Capacitor 3,3nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BP332AKWR	1	
C7	Ceramic Capacitor 1uF 50V 10%	MIL-C-39014/2	AVX-KEMET	CKR06BX105KR	1	
C8	Ceramic Capacitor 1uF 50V 10%	MIL-C-39014/2	AVX-KEMET	CKR06BX105KR	1	
C9	Chip Ceramic Capacitor 0.1uF 50V 5%	MIL-PRF-55681/9	KEMET	CDR33BX104AJWR	1	
C10	Tantalum Capacitor 8,2uF 60V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0585	1	
C11	Tantalum Capacitor 8,2uF 60V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0585	1	
C12	Tantalum Capacitor 8,2uF 60V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0585	1	
C13	Tantalum Capacitor 8,2uF 60V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0585	1	
C14	Chip Ceramic Capacitor 100nF 100V 10%	MIL-PRF-55681/11	KEMET	CDR35BX104BKWR	1	



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C15	Chip Ceramic Capacitor 100nF 100V 10%	MIL-PRF-55681/11	KEMET	CDR35BX104BKWR	1	
C16	Chip Ceramic Capacitor 3,3nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BP332AKWR	1	
C17	Chip Ceramic Capacitor 0,47uF 50V 10%	MIL-PRF-55681/11	KEMET	CDR35BX474AKWR	1	
C18	Chip Ceramic Capacitor 0,47uF 50V 10%	MIL-PRF-55681/11	KEMET	CDR35BX474AKWR	1	
C19	Chip Ceramic Capacitor 3,3nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BP332AKWR	1	
C20	Ceramic Capacitor 1uF 50V 10%	MIL-C-39014/2	AVX-KEMET	CKR06BX105KR	1	
C21	Chip Ceramic Capacitor 3,3nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BP332AKWR	1	
C22	Ceramic Capacitor 1uF 50V 10%	MIL-C-39014/2	AVX-KEMET	CKR06BX105KR	1	
C23	Ceramic Capacitor 1uF 50V 10%	MIL-C-39014/2	AVX-KEMET	CKR06BX105KR	1	
C120	Ceramic Capacitor 1uF 50V 10%	MIL-C-39014/2	AVX-KEMET	CKR06BX105KR	1	
C121	Chip Ceramic Capacitor 3,3nF 100V 10%	MIL-PRF-55681/10	KEMET	CDR34BP332BKWR	1	
C122	Chip Ceramic Capacitor 10nF 50V 10%	MIL-C-55861/8	KEMET	CDR31BX103AKWR	1	
C123	Tantalum Capacitor 100uF 25V 10% CLR79	MIL-C-39006/22	MALLORY	M39006/22-0531	1	
C125	Chip Ceramic Capacitor 0,47uF 50V 10%	MIL-PRF-55681/11	KEMET	CDR35BX474AKWR	1	
C126	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C127	Tantalum Capacitor 47uF 10V 10% CLR79	MIL-C-39006/22	MALLORY	M39006/22-0485	1	
C128	Tantalum Capacitor 47uF 10V 10% CLR79	MIL-C-39006/22	MALLORY	M39006/22-0485	1	
C129	Chip Ceramic Capacitor 0.1uF 100V 10%	MIL-PRF-55681/11	KEMET	CDR35BX104AKWR	1	
C130	Chip Ceramic Capacitor 0,47uF 50V 10%	MIL-PRF-55681/11	KEMET	CDR35BX474AKWR	1	
C131	Chip Ceramic Capacitor 0,47uF 50V 10%	MIL-PRF-55681/11	KEMET	CDR35BX474AKWR	1	
C132	Chip Ceramic Capacitor 0,47uF 50V 10%	MIL-PRF-55681/11	KEMET	CDR35BX474AKWR	1	
C133	Chip Ceramic Capacitor 0,47uF 50V 10%	MIL-PRF-55681/11	KEMET	CDR35BX474AKWR	1	
C134	Tantalum Capacitor 8,2uF 60V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0585	1	
C135	Ceramic Capacitor 1uF 50V 10%	MIL-C-39014/2	AVX-KEMET	CKR06BX105KR	1	
C136	Tantalum Capacitor 8,2uF 60V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0585	1	
C137	Tantalum Capacitor 8,2uF 60V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0585	1	
C138	Chip Ceramic Capacitor 10nF 50V 10%	MIL-C-55861/8	KEMET	CDR31BX103AKWR	1	



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C139	Chip Ceramic Capacitor ADJ 10% 50V (CDR35)				1	
C140	Chip Ceramic Capacitor 4,7nF 50V 10%	MIL-C-55861/8	KEMET	CDR31BX472BKWR	1	
C141	Chip Ceramic Capacitor ADJ 10% 50V (CDR35)				1	
C143	Chip Ceramic Capacitor ADJ 10% 50V (CDR35)				1	
C144	Tantalum Capacitor 8,2uF 60V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0585	1	
C145	Chip Ceramic Capacitor 100pF 100V 5%	MIL-PRF-55681/8	KEMET	CDR32BP101BJWR	1	
C146	Chip Ceramic Capacitor 220pF 100V 10%	MIL-PRF-55681/8	KEMET	CDR32BP2211BKWR	1	
C147	Chip Ceramic Capacitor 0.1uF 100V 10%	MIL-PRF-55681/11	KEMET	CDR35BX104AKWR	1	
C148	Chip Ceramic Capacitor 3,3nF 100V 10%	MIL-PRF-55681/10	KEMET	CDR34BP332BKWR	1	
C149	Ceramic Capacitor 1uF 50V 10%	MIL-C-39014/2	AVX-KEMET	CKR06BX105KR	1	
C150	Ceramic Capacitor 1uF 50V 10%	MIL-C-39014/2	AVX-KEMET	CKR06BX105KR	1	
C153	Chip Ceramic Capacitor 10nF 50V 10%	MIL-C-55861/8	KEMET	CDR31BX103AKWR	1	
C154	Chip Ceramic Capacitor ADJ 10% 50V (CDR35)				1	
C155	Chip Ceramic Capacitor ADJ 10% 50V (CDR35)				1	
C156	Chip Ceramic Capacitor 10nF 50V 10%	MIL-C-55861/8	KEMET	CDR31BX103AKWR	1	
C157	Ceramic Capacitor 1uF 50V 10%	MIL-C-39014/2	AVX-KEMET	CKR06BX105KR	1	
C158	Tantalum Capacitor 20uF 10V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0481	1	
C159	Chip Ceramic Capacitor 0,47uF 50V 10%	MIL-PRF-55681/11	KEMET	CDR35BX474AKWR	1	
C160	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C161	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C162	Tantalum Capacitor 15uF 30V 10% CLR79	MIL-C-39006/22	MALLORY	M39006/22-0545	1	
C163	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C164	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C165	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C166	Tantalum Capacitor 15uF 30V 10% CLR79	MIL-C-39006/22	MALLORY	M39006/22-0545	1	
C167	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C168	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C169	Chip Ceramic Capacitor 10nF 50V 10%	MIL-C-55861/8	KEMET	CDR31BX103AKWR	1	
C171	Chip Ceramic Capacitor 0,47uF 50V 10%	MIL-PRF-55681/11	KEMET	CDR35BX474AKWR	1	
C172	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	



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C173	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C174	Ceramic Capacitor 1uF 50V 10%	MIL-C-39014/2	AVX-KEMET	CKR06BX105KR	1	
C175	Chip Ceramic Capacitor 22nF 50V 10%	MIL-PRF-55681/11	KEMET	CDR35BP223AKWR	1	
C176	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C177	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C178	Chip Ceramic Capacitor 10nF 50V 10%	MIL-C-55861/8	KEMET	CDR31BX103AKWR	1	
C179	Chip Ceramic Capacitor 10nF 50V 10%	MIL-C-55861/8	KEMET	CDR31BX103AKWR	1	
C180	Chip Ceramic Capacitor 10nF 50V 10%	MIL-C-55861/8	KEMET	CDR31BX103AKWR	1	
C181	Chip Ceramic Capacitor 10nF 50V 10%	MIL-C-55861/8	KEMET	CDR31BX103AKWR	1	
C182	Chip Ceramic Capacitor 10nF 50V 10%	MIL-C-55861/8	KEMET	CDR31BX103AKWR	1	
C183	Chip Ceramic Capacitor 10nF 50V 10%	MIL-C-55861/8	KEMET	CDR31BX103AKWR	1	
C184	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C185	Tantalum Capacitor 15uF 30V 10% CLR79	MIL-C-39006/22	MALLORY	M39006/22-0545	1	
C186	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C187	Chip Ceramic Capacitor ADJ 10% 50V (CDR35)				1	
C188	Chip Ceramic Capacitor ADJ 10% 50V (CDR35)				1	
C189	Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	1	
C190	Chip Ceramic Capacitor ADJ 10% 50V (CDR35)				1	
C191	Tantalum Capacitor 15uF 30V 10% CLR79	MIL-C-39006/22	MALLORY	M39006/22-0545	1	
C192	Chip Ceramic Capacitor ADJ 10% 50V (CDR35)				1	
D2	Diode Zener 12V 1,5W 5%	MIL-PRF-19500/406	MICROSEMI	JANS1N4467US	1	
D3	Ultra Fast Rectifier Diode	MIL-PRF-195500/477	MICROSEMI	JANS1N5811US	1	
D6	Diode Zener 10V 1,5W 5%	MIL-PRF-19500/406	MICROSEMI	JANS1N4465US	1	
D7	Ultra Fast Rectifier Diode	MIL-PRF-195500/477	MICROSEMI	JANS1N5811US	1	
D28	Ultra Fast Rectifier Diode	MIL-PRF-195500/477	MICROSEMI	JANS1N5811US	1	
D29	Ultra Fast Rectifier Diode	MIL-PRF-195500/477	MICROSEMI	JANS1N5811US	1	
D30	Ultra Fast Rectifier Diode	MIL-PRF-195500/477	MICROSEMI	JANS1N5811US	1	
D31	Ultra Fast Rectifier Diode	MIL-PRF-195500/477	MICROSEMI	JANS1N5811US	1	
D32	Switching diode	ESA/SCC5101/026	MICROSEMI	JANS1N6642US	1	
D33	Switching diode	ESA/SCC5101/026	MICROSEMI	JANS1N6642US	1	



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D34	Switching diode	ESA/SCC5101/026	MICROSEMI	JANS1N6642US	1	
D35	Switching diode	ESA/SCC5101/026	MICROSEMI	JANS1N6642US	1	
D36	Switching diode	ESA/SCC5101/026	MICROSEMI	JANS1N6642US	1	
D37	Switching diode	ESA/SCC5101/026	MICROSEMI	JANS1N6642US	1	
D38	Switching diode	ESA/SCC5101/026	MICROSEMI	JANS1N6642US	1	
D39	Switching diode	ESA/SCC5101/026	MICROSEMI	JANS1N6642US	1	
D40	Ultra Fast Rectifier Diode	MIL-PRF-195500/477	MICROSEMI	JANS1N5811US	1	
D41	Switching diode	ESA/SCC5101/026	MICROSEMI	JANS1N6642US	1	
D42	Ultra Fast Rectifier Diode	MIL-PRF-195500/477	MICROSEMI	JANS1N5811US	1	
D43	Switching diode	ESA/SCC5101/026	MICROSEMI	JANS1N6642US	1	
D44	Ultra Fast Rectifier Diode	MIL-PRF-195500/477	MICROSEMI	JANS1N5811US	1	
D47	Ultra Fast Rectifier Diode	MIL-PRF-195500/477	MICROSEMI	JANS1N5811US	1	
D48	Switching diode	ESA/SCC5101/026	MICROSEMI	JANS1N6642US	1	
D49	Switching diode	ESA/SCC5101/026	MICROSEMI	JANS1N6642US	1	
D50	Diode Zener 5,1V 0,5W 5%	MIL-PRF-19500/533	MICROSEMI	JANS1N6317US	1	
D51	Diode Zener 5,1V 0,5W 5%	MIL-PRF-19500/533	MICROSEMI	JANS1N6317US	1	
D52	Diode Zener 5,1V 0,5W 5%	MIL-PRF-19500/533	MICROSEMI	JANS1N6317US	1	
D53	Dual power diode	MIL-PRF-19500/608A	MICROSEMI	1N6660JANS	1	
D54	Diode Zener 10V 1,5W 5%	MIL-PRF-19500/406	MICROSEMI	JANS1N4465US	1	
JP1	2 Jumper pin				1	
JP2	2 Jumper pin				1	
JP3	2 Jumper pin				1	
JP4	2 Jumper pin				1	
JP5	2 Jumper pin				1	
JP6	2 Jumper pin				1	
JP7	2 Jumper pin				1	
JP8	2 Jumper pin				1	
L1	Inductor 3mH		CGS		1	
L2	Inductor 50uH		CGS		1	
L3	Inductor ADJ		CGS		1	



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L6	Inductor 200uH		CGS		1	
P1	96-pin Male Solder Connector 90°	N.A.	FRB	KDC 096 1310	1	
P2	96-pin Male Solder Connector 90°	N.A.	FRB	KDC 096 1310	1	
R1	JUMPER (RWR81)				1	
R3	JUMPER (RWR81)				1	
R6	Chip Resistor 10R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B10D0R	1	
R7	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R9	Chip Resistor 10K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B10E0R	1	
R10	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R12	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R13	JUMPER (RM1206)				1	
R16	Chip Resistor 100K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B100ER	1	
R17	Chip Resistor 20K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B20E0R	1	
R18	Chip Resistor 10K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B10E0R	1	
R20	Chip Resistor 100K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B100ER	1	
R21	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R22	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R23	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R103	Resistor 0,1R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81NR100FR	1	
R104	Resistor 50R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81N50R0FR	1	
R105	Resistor 50R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81N50R0FR	1	
R106	Resistor 10R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81N10R0FR	1	
R107	Resistor 75R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81N75R0FR	1	
R108	Resistor 75R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81N75R0FR	1	
R109	Resistor 0,1R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81NR100FR	1	
R110	Resistor ADJ 1W 1% (RWR81)				1	
R111	Resistor 0,1R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81NR100FR	1	
R112	Resistor ADJ 1W 1% (RWR81)				1	
R113	Resistor ADJ 1W 1% (RWR81)				1	



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R114	Resistor ADJ 1W 1% (RWR81)				1	
R115	Resistor 10R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81N10R0FR	1	
R116	Chip Resistor 2,49K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E49R	1	
R117	Chip Resistor 1,5K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E50R	1	
R118	JUMPER (RWR81)				1	
R119	Resistor 15R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N15R0FR	1	
R120	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R121	Chip Resistor 2,49K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E49R	1	
R122	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R123	Chip Resistor 20K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B20E0R	1	
R124	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R125	Resistor 50R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81N50R0FR	1	
R126	Resistor ADJ 1W 1% (RWR81)				1	
R127	Chip Resistor 3,6K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B3E60R	1	
R128	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R129	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R130	Resistor 50R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81N50R0FR	1	
R131	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R132	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R133	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R134	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R135	Chip Resistor 7,5R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B7D50R	1	
R136	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R137	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R138	Chip Resistor 1,5K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E50R	1	
R139	Resistor 15R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N15R0FR	1	
R140	Chip Resistor 5,11R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B5D11R	1	
R141	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R142	Chip Resistor 5,11K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B5E11R	1	
R143	Chip Resistor 2,49K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E49R	1	



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R144	Chip Resistor 2K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E00R	1	
R145	Chip Resistor 1,5K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E50R	1	
R146	Chip Resistor 6,2K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B6E20R	1	
R147	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R148	Resistor 75R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81N75R0FR	1	
R149	Resistor 75R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81N75R0FR	1	
R150	Chip Resistor 1,8K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E80R	1	
R151	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R152	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R153	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R154	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R155	Resistor ADJ 1W 1% (RWR81)				1	
R156	Resistor ADJ 1W 1% (RWR81)				1	
R157	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R158	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R159	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R160	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R161	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R162	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R163	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R164	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R165	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R166	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R167	Chip Resistor 3,32K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B3E32R	1	
R168	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R169	Chip Resistor 2,75K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E75R	1	
R170	Chip Resistor 330R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B330DR	1	
R171	JUMPER (RM1206)				1	
R172	Chip Resistor 33R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B33D0R	1	
R173	Chip Resistor 5,11K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B5E11R	1	



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R174	Chip Resistor 5,11K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B5E11R	1	
R175	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R176	Chip Resistor 475K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B475ER	1	
R177	Chip Resistor 3,32K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B3E32R	1	
R178	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R179	Chip Resistor 2,75K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E75R	1	
R180	Chip Resistor 10K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B10E0R	1	
R181	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R182	Chip Resistor 10K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B10E0R	1	
R183	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R184	Chip Resistor 10K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B10E0R	1	
R185	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R186	JUMPER (RM1206)				1	
R187	JUMPER (RM1206)				1	
R188	JUMPER (RM1206)				1	
R189	Metal film 5K 0.1% 5ppm	MIL-R-55182/9	DALE	RNC90Y5K0000BR	1	
R190	Chip Resistor 2,21K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E21R	1	
R191	Chip Resistor 2,21K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E21R	1	
R192	Chip Resistor 2,21K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E21R	1	
R193	Chip Resistor 10K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B10E0R	1	
R194	JUMPER				1	
R195	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R196	JUMPER				1	
R197	JUMPER				1	
R198	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R199	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R200	Metal film 10K 0.1% 5ppm	MIL-R-55182/9	DALE	RNC90Y10K000BR	1	
R201	Metal film 15K 0.1% 5ppm	MIL-R-55182/9	DALE	RNC90Y15K000BR	1	
R202	Metal film 1K 0.1% 5ppm	MIL-R-55182/9	DALE	RNC90Y1K0000BR	1	
R203	Metal film 1,5K 0.1% 5ppm	MIL-R-55182/9	DALE	RNC90Y1K5000BR	1	



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R204	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R205	Chip Resistor 5,11K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B5E11R	1	
R206	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R207	NOT MOUNTED					
R208	Chip Resistor 10R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B10D0R	1	
R209	Chip Resistor 10R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B10D0R	1	
R210	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R211	Chip Resistor 10R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B10D0R	1	
R212	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R213	Chip Resistor 2,49K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E49R	1	
R214	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R215	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R216	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R217	Metal film ADJ 0.1% 5ppm (RNC90Y)				1	
R218	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R219	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R220	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R221	Chip Resistor 2,49K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E49R	1	
R222	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R223	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R224	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R225	Metal film ADJ 0.1% 5ppm (RNC90Y)				1	
R226	Metal film ADJ 0.1% 5ppm (RNC90Y)				1	
R227	Metal film ADJ 0.1% 5ppm (RNC90Y)				1	
R228	Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	1	
R229	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R230	Chip Resistor 5,6R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B5D60R	1	
R231	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R232	Chip Resistor 5,6R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B5D60R	1	
R233	Chip Resistor 5,6R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B5D60R	1	



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R234	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R235	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R236	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
R237	Chip Resistor ADJ 0,25W 1% (RM1206)				1	
TRF1	TRANSFORMER1		CGS		1	
TRF2	TRANSFORMER2		CGS		1	
TRF3	TRANSFORMER3		CGS		1	
Q1	HEXFET Transistor P-channel	MIL-PRF-19500/595	IR	JANS2N7236	1	
Q7	Transistor Power MOSFET N channel	MIL-PRF-19500/592	IR	JANS2N7224	1	
Q8	Transistor Power MOSFET N channel	MIL-PRF-19500/592	IR	JANS2N7224	1	
Q9	Transistor Power MOSFET N channel	MIL-PRF-19500/592	IR	JANS2N7224	1	
Q10	Transistor Power MOSFET N channel	MIL-PRF-19500/592	IR	JANS2N7224	1	
Q11	Transistor NPN (SMD)	MIL-PRF-19500/255	SEMICOA	JANS2N2222AUB	1	
Q12	Transistor NPN (SMD)	MIL-PRF-19500/255	SEMICOA	JANS2N2222AUB	1	
Q13	Transistor NPN (SMD)	MIL-PRF-19500/255	SEMICOA	JANS2N2222AUB	1	
Q14	PNP Power Transistor Hight Speed Switching	MIL-PRF-19500/545	SEMICOA	JANS2N5151	1	
Q15	NPN Power Transistor Hight Speed Switching	MIL-PRF-19500/544	SEMICOA	JANS2N5152	1	
U1	Voltage Comparator/Buffer LM111HPQMLV	5962-00524	NATIONAL	5962P0052401VGA	1	
U2	Positive Voltage Regulator LM117HRQMLV	5962-99517	NATIONAL	5962R9951703VXA	1	
U6	Pulse Width Modulator Controller Current Mode UC1846JQMLV	5962-86806	TI	5962-8680601VEA	1	
U10	Precision Quad.Voltage Comparator LM139AWRQMLV	5962-96738	NATIONAL	5962R9673801VDA	1	
U11	Pulse Width Modulator Controller Current Mode UC1846JQMLV	5962-86806	TI	5962-8680601VEA	1	
U12	Positive Voltage Regulator LM117HRQMLV	5962-99517	NATIONAL	5962R9951703VXA	1	
U13	Voltage reference AD584TH/QMLVR	5962-38128	AD	5962R3812802VGA	1	
U14	Precision Quad Op. Amp. OP400AY/QML	5962-87771	AD	5962-8777101VCA	1	
U15	Precision Quad Op. Amp. OP400AY/QML	5962-87771	AD	5962-8777101VCA	1	
U16	Positive Voltage Regulator LM117HRQMLV	5962-99517	NATIONAL	5962R9951703VXA	1	
U17	Temperature Trasducer AD590MF	5962-87571	AD	5962-8757104VXA	1	
U18	Negative Voltage Regulator LM137HPQMLV	5962-99517	NATIONAL	5962P9951701VXA	1	
1	Printed Circuit Board	CNES/QFT/SP-0117	PRINTCA/VIASYSTEMSCSI	DPU-FM-310.03-0 REV /	1	DPU-EM-310.03-0 REV /



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Bill Of Material				
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Printed Circuit Board	CNES/QFT/SP-0117	PRINTCA/VIASYSTEMSCSI	DPU-FM-310.03-0 REV /	1
Chip Ceramic Capacitor 100nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BX104AKSR	15
Chip Ceramic Capacitor 100pF 100V 5%	MIL-PRF-55681/8	KEMET	CDR32BP101BJWR	1
Ultra Fast Rectifier Diode	MIL-PRF-195500/477	MICROSEMI	JANS1N5811US	10
2 Jumper pin				
96-pin Male Solder Connector 90°	N.A.	FRB	KDC 096 1310	2
Voltage reference AD584TH/QMLVR	5962-38128	AD	5962R3812802VGA	1
Chip Ceramic Capacitor 0,47uF 50V 10%	MIL-PRF-55681/11	KEMET	CDR35BX474AKWR	11
Chip Ceramic Capacitor 3,3nF 50V 10%	MIL-PRF-55681/9	KEMET	CDR33BP332AKWR	4
Chip Ceramic Capacitor 0.1uF 50V 5%	MIL-PRF-55681/9	KEMET	CDR33BX104AJWR	1
Chip Ceramic Capacitor 100nF 100V 10%	MIL-PRF-55681/11	KEMET	CDR35BX104BKWR	2
Chip Ceramic Capacitor 10nF 50V 10%	MIL-C-55861/8	KEMET	CDR31BX103AKWR	11
Chip Ceramic Capacitor 3,3nF 100V 10%	MIL-PRF-55681/10	KEMET	CDR34BP332BKWR	2
Chip Ceramic Capacitor 0.1uF 100V 10%	MIL-PRF-55681/11	KEMET	CDR35BX104AKWR	2
Chip Ceramic Capacitor 22nF 50V 10%	MIL-PRF-55681/11	KEMET	CDR35BP223AKWR	1
Chip Ceramic Capacitor 4,7nF 50V 10%	MIL-C-55861/8	KEMET	CDR31BX472BKWR	1
Chip Ceramic Capacitor 220pF 100V 10%	MIL-PRF-55681/8	KEMET	CDR32BP2211BKWR	1
Diode Zener 12V 1,5W 5%	MIL-PRF-19500/406	MICROSEMI	JANS1N4467US	1
Diode Zener 10V 1,5W 5%	MIL-PRF-19500/406	MICROSEMI	JANS1N4465US	2
Switching diode	ESA/SCC5101/026	MICROSEMI	JANS1N6642US	12
Diode Zener 5,1V 0,5W 5%	MIL-PRF-19500/533	MICROSEMI	JANS1N6317US	3
Dual power diode	MIL-PRF-19500/608A	MICROSEMI	1N6660JANS	1
Inductor 3mH		CGS		
Inductor 50uH		CGS		
Inductor ADJ		CGS		
Inductor 200uH		CGS		
Resistor 0,1R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81NR100FR	3



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Resistor 10R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81N10R0FR	2
Resistor 15R 1W 1%	MIL-PRF-39007/9	DALE-IRC	RWR81N15R0FR	2
Resistor 50R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81N50R0FR	4
Metal film 5K 0.1% 5ppm	MIL-R-55182/9	DALE	RNC90Y5K0000BR	1
Metal film 1K 0.1% 5ppm	MIL-R-55182/9	DALE	RNC90Y1K0000BR	1
Metal film 10K 0.1% 5ppm	MIL-R-55182/9	DALE	RNC90Y10K000BR	1
Metal film 15K 0.1% 5ppm	MIL-R-55182/9	DALE	RNC90Y15K000BR	1
Metal film 1,5K 0.1% 5ppm	MIL-R-55182/9	DALE	RNC90Y1K5000BR	1
TRANSFORMER1		CGS		
TRANSFORMER2		CGS		
TRANSFORMER3		CGS		
HEXFET Transistor P-channel	MIL-PRF-19500/595	IR	JANS2N7236	1
PNP Power Transistor Hight Speed Switching	MIL-PRF-19500/545	SEMICOA	JANS2N5151	1
Positive Voltage Regulator LM117HRQMLV	5962-99517	NATIONAL	5962R9951703VXA	3
Pulse Width Modulator Controller Current Mode UC1846JQMLV	5962-86806	TI	5962-8680601VEA	2
Negative Voltage Regulator LM137HPQMLV	5962-99517	NATIONAL	5962P9951701VXA	1
Precision Quad.Voltage Comparator LM139AWRQMLV	5962-96738	NATIONAL	5962R9673801VDA	1
Precision Quad Op. Amp. OP400AY/QML	5962-87771	AD	5962-8777101VCA	2
Temperature Trasducer AD590MF	5962-87571	AD	5962-8757104VXA	1
Ceramic Capacitor 1uF 50V 10%	MIL-C-39014/2	AVX-KEMET	CKR06BX105KR	11
Chip Ceramic Capacitor ADJ 10% 50V (CDR35)				
JUMPER (RWR81)				
Chip Resistor 10R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B10D0R	1
Chip Resistor 1K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E00R	21
Chip Resistor 10K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B10E0R	6
Chip Resistor ADJ 0,25W 1% (RM1206)				
JUMPER (RM1206)				
Chip Resistor 100K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B100ER	2
Chip Resistor 20K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B20E0R	1
Resistor ADJ 1W 1% (RWR81)				



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Chip Resistor 3,32K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B3E32R	2
Chip Resistor 5,11K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B5E11R	4
Resistor 75R 1W 1%	MIL-R-39007/9	DALE-IRC	RWR81N75R0FR	4
Chip Resistor 7,5R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B7D50R	1
Chip Resistor 2,49K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E49R	5
Chip Resistor 5,11R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B5D11R	1
Chip Resistor 475K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B475ER	1
Chip Resistor 2,75K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E75R	2
Chip Resistor 2K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E00R	1
Chip Resistor 1,8K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E80R	1
Chip Resistor 1,5K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B1E50R	3
JUMPER (RWR81)				
Chip Resistor 20K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B20E0R	1
Chip Resistor 3,6K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B3E60R	1
Chip Resistor 6,2K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B6E20R	1
Chip Resistor 330R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B330DR	1
JUMPER (RM1206)				
Chip Resistor 33R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B33D0R	1
Chip Resistor 2,21K 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B2E21R	3
JUMPER				
Chip Resistor 10R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B10D0R	3
Metal film ADJ 0.1% 5ppm (RNC90Y)				
Chip Resistor 5,6R 0,25W 1%	MIL-R-55342/7	DALE	M55342K07B5D60R	3
Transistor Power MOSFET N channel	MIL-PRF-19500/592	IR	JANS2N7224	4
Transistor NPN (SMD)	MIL-PRF-19500/255	SEMICOA	JANS2N2222AUB	3
NPN Power Transistor Hight Speed Switching	MIL-PRF-19500/544	SEMICOA	JANS2N5152	1
Voltage Comparator/Buffer LM111HPQMLV2	5962-00524	NATIONAL	5962P0052401VGA2	1
Tantalum Capacitor ADJ 10% (CLR79)				
Tantalum Capacitor 8,2uF 60V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0585	8
Tantalum Capacitor 100uF 25V 10% CLR79	MIL-C-39006/22	MALLORY	M39006/22-0531	1

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Tantalum Capacitor 47uF 10V 10% CLR79	MIL-C-39006/22	MALLORY	M39006/22-0485	2
Tantalum Capacitor 20uF 10V 10% CLR79	MIL-PRF-39006/22	MALLORY	M39006/22-0481	1
Tantalum Capacitor 15uF 30V 10% CLR79	MIL-C-39006/22	MALLORY	M39006/22-0545	4
Total				307

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CUSTOMER ID	EFFECTIVITY
DRAWING TITLE HSO/FIRST-DPU: MOTHERBOARD Electrical Part List	CARLO GAVAZZI SPACE S.p.A. 
HIGHER ASSEMBLY DPU-EM-410.00-0	DRAWING NUMBER DPU-EM-410.01-0 REV. / DATE

ITEM	DESCRIPTION	PROC.SPEC	SUPPLIER	P/N-ID.CODE	QTY	EM NOTE
JP1	Jumper				1	HEADER 2 pin MALE
JP2	Jumper				1	HEADER 2 pin MALE
JP3	Jumper				1	HEADER 2 pin MALE
JP4	Jumper				1	HEADER 2 pin MALE
P1	96 pin Female Solder Connector		FRB	KDC 096 2232	1	HARTING, 09 03 196 6825
P2	96 pin Female Solder Connector		FRB	KDC 096 2232	1	HARTING, 09 03 196 6825
P3	96 pin Female Solder Connector		FRB	KDC 096 2232	1	HARTING, 09 03 196 6825
P4	96 pin Female Solder Connector		FRB	KDC 096 2232	1	HARTING, 09 03 196 6825
P5	96 pin Female Solder Connector		FRB	KDC 096 2232	1	HARTING, 09 03 196 6825
P6	96 pin Female Solder Connector		FRB	KDC 096 2232	1	HARTING, 09 03 196 6825
P7	96 pin Female Solder Connector		FRB	KDC 096 2232	1	HARTING, 09 03 196 6825
P8	96 pin Female Solder Connector		FRB	KDC 096 2232	1	HARTING, 09 03 196 6825

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P9	96 pin Female Solder Connector		FRB	KDC 096 2232	1	HARTING, 09 03 196 6825
P10	96 pin Female Solder Connector		FRB	KDC 096 2232	1	HARTING, 09 03 196 6825
P11	96 pin Female Solder Connector		FRB	KDC 096 2232	1	HARTING, 09 03 196 6825
P12	96 pin Female Solder Connector		FRB	KDC 096 2232	1	HARTING, 09 03 196 6825
Bill Of Material						
DESCRIPTION		PROC.SPEC	SUPPLIER	P/N-ID.CODE	Total	
Jumper					4	
96 pin Female Solder Connector			FRB	KDC 096 2232	12	
Total					16	

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6 Preliminary Materials List

6.1 GROUP 1 - Paints and Adhesives

PART/DWG NUMBER	QTY	ITEM N°	NOMENCLATURE	MATERIAL IDENTIFICATION					NON METALLIC MATERIAL			USAGE EVAL.						MUA STAT	REMARKS (SPECIAL CURE, ETC)
				MAT'L CODE	MATERIAL DESCRIPTION	MATERIAL MFGR	MATERIAL SPEC	PROCESS SPECIF.	WT (g)	THK (mm)	AREA (mm ²)	F L M	A G E	S C C	C O R	T V S	T O X		
Conformal Coating of PCBs	9	1	PCBs Conformal Coating	89131	SILICON POLYMER CV 1152	Mc GHAN NUSIL CORP.	Tech. Bulletin of Manufact.	GROUP :4 ITEM N°1 GROUP :16 N°3 GROUP :17 N°1	1000	1	110	A				A	K		ESA-PSS-01-701 GD-PR-CGS-033
Potting of electrical components	10	2	Potting Compound	03484	RTV 566A/B	GENERAL ELECTRIC	MB0130-85 STM0706-02 STM0051-02	GROUP : 3 ITEM N°1 GROUP :16 N°3 GROUP :17 N°1	2	10	100	A				A	K		MSFC-HDBK-527F ESA-PSS-01-701 GD-PR-CGS-011
Adhesion of identification label	10	3	General purpose glue	05475	ECCOBOND 285 cat. 11	EMERSON & CUMING	Tech. Bulletin of manufacturer	GROUP : 1 ITEM N°1 GROUP :16 N°3 GROUP :17 N°1	1	1	10	A				A	K		MSFC-HDBK-527F PA 072
Adhesion of non structural parts	15	4	General purpose glue	05066	SCOTCH WELD 2216 B/A	3M	MB-0120-086 MIL-A-46864	GROUP : 1 ITEM N°2 GROUP :16 N°3 GROUP :17 N°1	4	0,01	10	A				B	K		MSFC-HDBK-527F ESA-PSS-01-701 Tech. Bulletin of manufacturer
Adhesion of non structural parts	70	5	Screw locking compound	06354	Loctite 222	LOCTITE	MIL-S-46163A. Tech. Bulletin of Manufact.	GROUP: 1 ITEM N° 3 GROUP :16 N°3 GROUP :17 N°1	<5	<0.1	NA	C				A			MAPTIS . Use for thread locking only.
Electrical isolation of connection	12	6	Heat shrinkable insulant sleeve	20021	THERMOFIT RT876	RAYCHEM	MIL-I-23053/5 MIL-R-46846	GROUP: 16 ITEM N° 4 GROUP :16 N°3 GROUP :17 N°1	15	0,41min 0,89max	1000	X				A	K		MSFC-HDBK-527F ESA-PSS-01-701

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6.2 GROUP 4 - Non-metallic Materials

PART/DWG NUMBER	QTY	ITEM N°	NOMENCLATURE	MATERIAL IDENTIFICATION					NON METALLIC MATERIAL			USAGE EVAL.						MUA STAT	REMARKS (SPECIAL CURE, ETC)	
				MAT'L CODE	MATERIAL DESCRIPTION	MATERIAL MFGR	MATERIAL SPEC	PROCESS SPECIF.	WT (g)	THK (mm)	AREA (mm ²)	F L M	A G E	S C C	C O R	T V S	T O X			
PCBs	9	1	Printed Circuit Boards	05543	FR4	- VIASYSTEMS division C.S.I. PRINTCA	MIL-P-18177 MC8024-1	GROUP : 5 N°1 GROUP : 8 N°1,2 GROUP:16 N°1,2,3 GROUP:17 N°1,2,3	1000	1.6	110	A					A	K		MSFC-HDBK-527F ESA-PSS-01-710 CNES/QFT/SP-0117 NASA Ref. Pub. 1124 rev.2
PCBs	9	2	Printed wiring board rigid	00153 MAPTIS	Polymide impregnated woven fiberglass fabric, heat resistant (GI), base material: GIN0016CH/CHB2X	- ISOLA - VIASYSTEMS division C.S.I. - PRINTCA	MIL-P-13949G/10 CANCELLED ref. only	GROUP: 5 N°1 GROUP: 8 N°1,2 GROUP:16 N°1,2,3 GROUP:17 N°1,2,3	1000	1.6	110	A					A	K		ESA PSS-01-710 CNES/QFT/SP.0117
Thermal interface for electronic components	200	3	Thermal interface material	64178	Cho-Therm 1671	CHOMERICS	Tech. Bulletin of Manufact.	GROUP :16 N°3 GROUP :17 N°1	1	0.3	100	A					A	K		MSFC-HDBK-527F Tech. Bulletin of Manufact.
Thermal interface filler		4	THERM-A-GAP A274	04617 MAPTIS	Silicone rubber with aluminum oxide filler on aluminum carrier adhered to substrate with acrylic adhesive	CHOMERICS	Tech. Bulletin of Manufact.	GROUP: 5 N°4 GROUP :16 N°3 GROUP :17 N°1	132	2,54	22,7K	A						K		Maptis
Mechanical parts		5	PEEK	02166	Polyetheretherketone	POLYPENCO / FURON / LNP Eng.	MIL-P-46183	GROUP :16 N°3 GROUP :17 N°1	10	3	200	A					A	K		ESA tests 718, M205 NASA REF. PUB. 1124 rev.2 (GSC14250)
Mechanical parts		12	PTFE	00016	Polytetrafluoroethylene	DUPONT / FURON	AMS 3651	GROUP :16 N°3 GROUP :17 N°1	90	5	100	A					A	K		Maptis

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6.3 GROUP 5 - Metallic Materials

6.3.1 Aluminum Materials

PART/DWG NUMBER	QTY	ITEM N°	NOMENCLATURE	MATERIAL IDENTIFICATION					NON METALLIC MATERIAL			USAGE EVAL.						MUA STAT	REMARKS (SPECIAL CURE, ETC)	
				MAT'L CODE	MATERIAL DESCRIPTION	MATERIAL MFGR	MATERIAL SPEC	PROCESS SPECIF.	WT (g)	THK (mm)	AREA (mm ²)	F L M	A G E	S C C	C O R	T V S	T O X			
Board Stiffener	25	1	Aluminum Alloy	50669	AL-7075-T7351 PLATE	COPPER & BRASS / BENJAMIN	QQ-A-250/12 AMS4078 ASTMB209 MB0170-078	GROUP 9 N° 1,2 GROUP 11 N° 1 GROUP :16 N°3 GROUP :17 N°1	3000					A	B					MSFC-HDBK -527F ESA-PSS-01-701 coated in according to MIL-C-5541C and/or MIL-A-8625
Mechanical parts		2	Aluminum Alloy	10047	AL-7075-T7351 BAR	COPPER & BRASS / BENJAMIN	QQ-A-225/9 AMS4124 ASTM B211	GROUP 9 N° 1,2 GROUP 11 N° 1 GROUP :16 N°3 GROUP :17 N°1	3000					A	B					Maptis coated in according to MIL-C-5541C and/or MIL-A-8625
Mechanical parts		3	Aluminum Alloy	50669	AL-3.4364- T7351 PLATE	ALIMEX	DIN 29546 LN 9073 DAN 26 DAN 422 EN 10204/3.1B	GROUP 9 N° 1,2 GROUP 11 N° 1 GROUP :16 N°3 GROUP :17 N°1	3000					A	B					Maptis coated in according to MIL-C-5541C and/or MIL-A-8625
Mechanical parts		4	Aluminum Alloy	10047	AL-3.4364- T7351 ROUND BAR	ALIMEX	DIN 65113 LN 1799 LN 29765/A EN 10204/3.1B	GROUP 9 N° 1,2 GROUP 11 N° 1 GROUP :16 N°3 GROUP :17 N°1	3000					A	B					Maptis coated in according to MIL-C-5541C and/or MIL-A-8625
Mechanical parts		5	Aluminum Alloy	50646	AL-6061-T651 PLATE	COPPER & BRASS / BENJAMIN	QQ-A-250/11 ASTM B209	GROUP 9 N° 1,2 GROUP 11 N° 1 GROUP :16 N°3 GROUP :17 N°1	3000					A	B					Maptis coated in according to MIL-C-5541C and/or MIL-A-8625



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Mechanical parts		6	Aluminum Alloy	50648	AL-6061-T6511 ROD EXTRUDED	COPPER & BRASS / BENJAMIN	QQ-A-200/8 ASTM B221 AMS 4173	GROUP 9 N° 1,2 GROUP 11 N° 1 GROUP :16 N°3 GROUP :17 N°1	3000						A	B				Maptis coated in according to MIL-C-5541C and/or MIL-A-8625
Mechanical parts		7	Aluminum Alloy	50646	AL-3.3214-T651 PLATE	COPPER & BRASS / BENJAMIN	DIN 29546 LN 9073 DAN 26 DAN 422 EN 10204/3.1B	GROUP 9 N° 1,2 GROUP 11 N° 1 GROUP :16 N°3 GROUP :17 N°1	3000						A	B				Maptis coated in according to MIL-C-5541C and/or MIL-A-8625
Mechanical parts		8	Aluminum Alloy	50648	AL-3.3214- T6511 ROD EXTRUDED	COPPER & BRASS / BENJAMIN	DIN 65113 LN 1799 EN 10204/3.1B	GROUP 9 N° 1,2 GROUP 11 N° 1 GROUP :16 N°3 GROUP :17 N°1	3000						A	B				Maptis coated in according to MIL-C-5541C and/or MIL-A-8625

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6.3.2 Stainless Steels Materials

PART/DWG NUMBER	QTY	ITEM N°	NOMENCLATURE	MATERIAL IDENTIFICATION					NON METALLIC MATERIAL			USAGE EVAL.						MUA STAT	REMARKS (SPECIAL CURE, ETC)
				MAT'L CODE	MATERIAL DESCRIPTION	MATERIAL MFGR	MATERIAL SPEC	PROCESS SPECIF.	WT (g)	THK (mm)	AREA (mm ²)	F L M	A G E	S C C	C O R	T V S	T O X		
Mechanical parts		9	Stainless Steels	10370	AISI 316 PLATE, BAR	COPPER & BRASS / BENJAMIN	QQ-S-763 AMS 5524 MIL-S-5059 ASTM A182 ASTM A276 ASTM A479	GROUP 9 N° 3 GROUP 11 N° 1 GROUP :16 N°3 GROUP :17 N°1	2000					A	A				Maptis Surface passivation treatment in according to QQ-P-35

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6.3.3 Copper Alloy Materials

PART/DWG NUMBER	QTY	ITEM N°	NOMENCLATURE	MATERIAL IDENTIFICATION					NON METALLIC MATERIAL			USAGE EVAL.						MUA STAT	REMARKS (SPECIAL CURE, ETC)		
				MAT'L CODE	MATERIAL DESCRIPTION	MATERIAL MFGR	MATERIAL SPEC	PROCESS SPECIF.	WT (g)	THK (mm)	AREA (mm ²)	F L M	A G E	S C C	C O R	T V S	T O X				
Thermal dissipaters		10	Oxygen-Free Copper Alloy	10354	Cu 99,99% min. PLATE	COPPER & BRASS	ASTM B-170 ASTM B-179-93 ASTM F-68-93	GROUP 9 N° 4 GROUP 11 N° 1 GROUP :16 N°3 GROUP :17 N°1	2000						A	A					Maptis ESA-PSS-01-701(C-5) coated in according to QQ-N-290A (nickel plating)
Thermal dissipaters		11	Electrolytic Touch-Pitch (ETP) Copper Alloy	50827	Cu+Ag 99,90% min. PLATE	MIORINI	ASTM B5 ASTM B152	GROUP 9 N° 4 GROUP 11 N° 1 GROUP :16 N°3 GROUP :17 N°1	2000						A	A					Maptis coated in according to QQ-N-290A (nickel plating)

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6.3.4 Miscellaneous Metallic Materials

PART/DWG NUMBER	QTY	ITEM N°	NOMENCLATURE	MATERIAL IDENTIFICATION					NON METALLIC MATERIAL			USAGE EVAL.						MUA STAT	REMARKS (SPECIAL CURE, ETC)
				MAT'L CODE	MATERIAL DESCRIPTION	MATERIAL MFGR	MATERIAL SPEC	PROCESS SPECIF.	WT (g)	THK (mm)	AREA (mm ²)	F L M	A G E	S C C	C O R	T V S	T O X		
Inductor core	4	12	Magnetic core ferrites: B64290-K45-X38 B64290-K632-X35	50864	Ni-Fe alloy	SIEMENS	Tech. Bulletin of Manufact.		200					A	A				Maptis
Inductor core	4	13	Magnetic EFD core ferrite: B66417-160-K187	50864	Ni-Fe alloy	SIEMENS	Tech. Bulletin of Manufact.		300					A	A				Maptis
Transformer core	4	14	Magnetic EFD core ferrite: B66421-G-X187	50864	Ni-Fe alloy	SIEMENS	Tech. Bulletin of Manufact.		300					A	A				Maptis
Transformer core	4	15	Magnetic core ferrite: B64290-K44-X38	50864	Ni-Fe alloy	SIEMENS	Tech. Bulletin of Manufact.		200					A	A				Maptis

6.4 GROUP 6 - Mechanical Parts

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6.4.1 Semi-finished or Finished Mechanical Components

PART/DWG NUMBER	QTY	ITEM N°	NOMENCLATURE	MATERIAL IDENTIFICATION					NON METALLIC MATERIAL			USAGE EVAL.						MUA STAT	REMARKS (SPECIAL CURE, ETC)
				MAT'L CODE	MATERIAL DESCRIPTION	MATERIAL MFGR	MATERIAL SPEC	PROCESS SPECIF.	WT (g)	THK (mm)	AREA (mm ²)	F L M	A G E	S C C	C O R	T V S	T O X		
Card-lock Retainer	42	1	PCBs Locking Retainer MHA260- 4.80ETM2 (black anodize per MIL- A-8625 type III class 2)	10024	AL6061-T6	CALMARK	QQ-A-200/8	GROUP : 9 ITEM N° 2 GROUP :16 N°3 GROUP :17 N°1	15	NA	NA			A	B				MSFC-HDBK-527F Housing: coated per MIL-A-8625 type III class 2

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6.4.2 GROUP 7 – Fasteners

PART/DWG NUMBER	QTY	ITEM N°	NOMENCLATURE	MATERIAL IDENTIFICATION					NON METALLIC MATERIAL			USAGE EVAL.						MUA STAT	REMARKS (SPECIAL CURE, ETC)
				MAT'L CODE	MATERIAL DESCRIPTION	MATERIAL MFGR	MATERIAL SPEC	PROCESS SPECIF.	WT (g)	THK (mm)	AREA (mm ²)	F L M	A G E	S C C	C O R	T V S	T O X		
Fastener		1	Helicoil	10268	AISI 304	BOLLHOFF	LN 9499	GROUP :16 N°3 GROUP :17 N°1						A	A				MAPTIS
Fastener		2	Helicoil	10268	AISI 304	BOLLHOFF	LN 9039	GROUP :16 N°3 GROUP :17 N°1						A	A				MAPTIS
Fastener		3	Grower	10268	AISI 316	BOSSARD	DIN 7991	GROUP :16 N°3 GROUP :17 N°1						A	A				MAPTIS
Fastener		4	Cylinder head screw	10268	AISI 316	BOSSARD	DIN 912	GROUP 1 N°2,3 GROUP :16 N°3 GROUP :17 N°1						A	A				MAPTIS
Fastener		5	Flat washer	10268	AISI 316	BOSSARD	DIN 433	GROUP :16 N°3 GROUP :17 N°1						A	A				MAPTIS
Fastener		6	Nut	10268	AISI 316	BOSSARD	DIN 439B	GROUP :16 N°3 GROUP :17 N°1						A	A				MAPTIS
Fastener		7	Countersunk screw	10268	AISI 316	BOSSARD	DIN 965A	GROUP 1 N°2,3 GROUP :16 N°3 GROUP :17 N°1						A	A				MAPTIS
Fastener		8	Countersunk screw	10268	AISI 316	BOSSARD	DIN 7991	GROUP 1 N°2,3 GROUP :16 N°3 GROUP :17 N°1						A	A				MAPTIS
Fastener		9	Low profile cylinder head screw	10268	AISI 316	BOSSARD	DIN 6912	GROUP 1 N°2,3 GROUP :16 N°3 GROUP :17 N°1						A	A				MAPTIS

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6.4.3 GROUP 8 – Wires

PART/DWG NUMBER	QTY	ITEM N°	NOMENCLATURE	MATERIAL IDENTIFICATION					NON METALLIC MATERIAL			USAGE EVAL.						MUA STAT	REMARKS (SPECIAL CURE, ETC)
				MAT'L CODE	MATERIAL DESCRIPTION	MATERIAL MFGR	MATERIAL SPEC	PROCESS SPECIF.	WT (g)	THK (mm)	AREA (mm ²)	F L M	A G E	S C C	C O R	T V S	T O X		
Electrical connections		1	Wires for cables	01188	Wires AWG , 22,24, 24 tws, 26	GORE	ESA/SCC/3901/018	GROUP : 7 ITEM N° 1 GROUP : 8 ITEM N° 1				A				A	K		MAPTIS ESA SCC QPL
Inductor and Transformer		2	Copper wire for winding type (0.4 mm, 0.25 mm): Tenvex H	50827	Round copper wire (Cu ETP) enamelled with modified polyesterimide resins overcoated with amide-imide resins	INVEX (ITALY)	MIL-W-583C type H	GROUP : 8 ITEM N° 1						A	A				MAPTIS

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7 DECLARED PROCESSES LIST

Herein the list of the processes used for the DPU boards are shown.

7.1 GROUP N° 1 - ADHESIVE BONDING

ITEM N°	PROCESS IDENTIFICATION	SPECIFICATION ISSUE/REV.	PROCESS DESCRIPTION	USE AND LOCATION	MANUFACTURER NAME	ASSOCIATED ITEMS IN MATERIAL LIST	CRITICALITY OF THE PROCESS	JUSTIFICATION FOR VALIDATION APPROVAL	ESA VAL.
1	Adhesion of identification label	PA 072 issue 1	Adhesion of identification label with epoxide adhesive Eccobond 285 cat.11	Adhesion of identification label	CGS	GROUP 1 N°3	NOT CRITICAL	MSFC-HDBK-527(05475)	
2	Adhesion of non structural parts	Technical Bulletin of manufacturer	Adhesion of non structural parts with Scotch-weld 2216B/A	Adhesion of bonding and screw locking	CGS	GROUP 1 N°4 GROUP 7 N°4,7,8,9	NOT CRITICAL	ESA PSS-01-701 MSFC-HDBK-527(05066)	
3	Adhesion of non structural parts	Technical Bulletin of manufacturer	Adhesion of non-structural parts with Loctite 222	Locking of screws	CGS	GROUP 1 N° 5 GROUP 7 N° 4,7,8,9	NOT CRITICAL		
4	Adhesion of non structural parts	Technical Bulletin of manufacturer	Adhesion of non-structural parts with Thermal -A-Gap-A274	Glueing of A274-pad to mechanical parts	CGS	GROUP 4 N° 3	NOT CRITICAL		

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7.2 GROUP N° 3 - ENCAPSULATION/MOULDING

ITEM N°	PROCESS IDENTIFICATION	SPECIFICATION ISSUE/REV.	PROCESS DESCRIPTION	USE AND LOCATION	MANUFACTURER NAME	ASSOCIATED ITEMS IN MATERIAL LIST	CRITICALITY OF THE PROCESS	JUSTIFICATION FOR VALIDATION APPROVAL	ESA VAL.
1	Potting of electrical components	GD-PR-CGS-011 iss.1	Potting of electrical components with RTV566A/B	Potting of electrical components on PCB	CGS	GROUP 1 N°2	NOT CRITICAL	ESA-PSS-01-701 MSFC-HDBK-527(03484)	

7.3 GROUP N° 4 - PAINTING/COATING

ITEM N°	PROCESS IDENTIFICATION	SPECIFICATION ISSUE/REV.	PROCESS DESCRIPTION	USE AND LOCATION	MANUFACTURER NAME	ASSOCIATED ITEMS IN MATERIAL LIST	CRITICALITY OF THE PROCESS	JUSTIFICATION FOR VALIDATION APPROVAL	ESA VAL.
1	Conformal Coating	GD-PR-CGS-033 iss.1	Conformal coating on assembled PCBs with CV1152	Conformal coating on PCB	CGS	GROUP 1 N°1	NOT CRITICAL	ESA-PSS-01-701	

7.4 GROUP N° 5 - CLEANING

ITEM N°	PROCESS IDENTIFICATION	SPECIFICATION ISSUE/REV.	PROCESS DESCRIPTION	USE AND LOCATION	MANUFACTURER NAME	ASSOCIATED ITEMS IN MATERIAL LIST	CRITICALITY OF THE PROCESS	JUSTIFICATION FOR VALIDATION APPROVAL	ESA VAL.
1	Cleaning	PA071 iss.1	Cleaning of PCBs	PCBs of the electronic box	CGS	GROUP 4 N° 1, 2	NOT CRITICAL	PA071 iss.1	

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7.5 GROUP N° 7 - CRIMPING

ITEM N°	PROCESS IDENTIFICATION	SPECIFICATION ISSUE/REV.	PROCESS DESCRIPTION	USE AND LOCATION	MANUFACTURER NAME	ASSOCIATED ITEMS IN MATERIAL LIST	CRITICALITY OF THE PROCESS	JUSTIFICATION FOR VALIDATION APPROVAL	ESA VAL.
1	Crimping	PA 082 iss.1 PSS-01-726 iss.2	Crimping of high reliability electrical connection	Wires crimping on connectors	CGS	GROUP 8: N°1	CRITICAL FOR RELIABILITY	ESA-PSS-01-726 iss.2	

7.6 GROUP N° 8 - SOLDERING

ITEM N°	PROCESS IDENTIFICATION	SPECIFICATION ISSUE/REV.	PROCESS DESCRIPTION	USE AND LOCATION	MANUFACTURER NAME	ASSOCIATED ITEMS IN MATERIAL LIST	CRITICALITY OF THE PROCESS	JUSTIFICATION FOR VALIDATION APPROVAL	ESA VAL.
1	Manual Soldering	GD-PL-CGS-016 PSS-01-708 iss.1	Soldering of high reliability electrical connection	Electrical components on PCBs	CGS	GROUP 8: N°1,2 GROUP 4 N° 1,2	CRITICAL FOR RELIABILITY	ESA-PSS-01-708 iss.1 GD-PL-CGS-016	
2	Manual SMT Soldering	GD-PL-CGS-016 PSS-01-738 iss.1	High-reliability soldering for surface-mount and mixed technology printed circuit	Electrical components on PCBs	CGS	GROUP 4 N° 1,2	CRITICAL FOR RELIABILITY	ESA-PSS-01-738 iss.1 GD-PL-CGS-016	YES

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7.7 GROUP N° 9 - SURFACE CONVERSION TREATMENTS

ITEM N°	PROCESS IDENTIFICATION	SPECIFICATION ISSUE/REV.	PROCESS DESCRIPTION	USE AND LOCATION	MANUFACTURER NAME	ASSOCIATED ITEMS IN MATERIAL LIST	CRITICALITY OF THE PROCESS	JUSTIFICATION FOR VALIDATION APPROVAL	ESA VAL.
1	Chemical conversion coating on aluminium alloy with Alodine 1200	MIL-C-5541C	Surface treatment of aluminium alloy to prevent corrosion	Mechanical parts	IMAS MAROTTA MUTITECH	GROUP 5 N° 1÷8	NOT CRITICAL	MIL-C-5541C	
2	Anodic coating on aluminium alloy	MIL-A-8625 class 1,2 type II and type III	Surface treatment of aluminium alloy to prevent corrosion and provide black surface	Mechanical parts	IMAS MAROTTA MUTITECH.	GROUP 5 N° 1÷8 GROUP 6 N° 1	NOT CRITICAL	MIL-A-8625	
3	Passivation treatment for corrosion-resistant steel	QQ-P-35	Surface treatment of steel to prevent corrosion	Mechanical parts	IMAS MAROTTA MUTITECH	GROUP 5 N° 9	NOT CRITICAL	QQ-P-35	
4	Nickel plating electrodeposited	QQ-N-290	Surface plating of copper alloy to prevent corrosion	Mechanical parts	IMAS MAROTTA MUTITECH	GROUP 5 N° 10,11	NOT CRITICAL	QQ-N-290	

7.8 GROUP N° 11 - MACHINING

ITEM N°	PROCESS IDENTIFICATION	SPECIFICATION ISSUE/REV.	PROCESS DESCRIPTION	USE AND LOCATION	MANUFACTURER NAME	ASSOCIATED ITEMS IN MATERIAL LIST	CRITICALITY OF THE PROCESS	JUSTIFICATION FOR VALIDATION APPROVAL	ESA VAL.
1	Stiffener and others mechanical parts machining	PA 070 iss.1	Construction of mechanical parts	Stiffener and others mechanical parts for boards	Marotta, IMAS	GROUP 5 N° 1÷11	NOT CRITICAL	PA070 Is.1	

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7.9 GROUP N° 16 - MISCELLANEOUS

ITEM N°	PROCESS IDENTIFICATION	SPECIFICATION ISSUE/REV.	PROCESS DESCRIPTION	USE AND LOCATION	MANUFACTURE R NAME	ASSOCIATED ITEMS IN MATERIAL LIST	CRITICALITY OF THE PROCESS	JUSTIFICATION FOR VALIDATION APPROVAL	ESA VAL.
1	Repair and modification of PCB and solder joint	PA063 iss.1 PSS-01-728 iss.2	Repair and modification of PCB and solder joint	PCBs	CGS	GROUP 4 N° 1,2	CRITICAL FOR RELIABILITY	ESA-PSS-01-728 iss.2	
2	PCB manufacturing	For double side : PSS-01-710 iss.1 For Multilayer : CNES/QFT/SP-0117 iss.1 rev.A	Manufacturing of double side and multilayer PCBs	PCBs	PRINTCA, VIASYSTEMS division C.S.I.	GROUP 4 N° 1,2	NOT CRITICAL	For double side : PSS-01-710 iss.1 For Multilayer : CNES/QFT/SP-0117 iss.1 rev.A	
3	Flight electronic equipment production and inspection control plan	GD-PL-CGS-016, Is. 1	Flight electronic equipment Flight electronic equipment production and inspection control plan control plan	Equipment production and inspection control plan	CGS	All items	NOT CRITICAL	GD-PL-CGS-016, Is. 1	Y
4	Cabling	PA 082 iss.1 PSS-01-726 iss.2 Technical cabling doc.	Electrical Isolation of connection by mean shrinkable tubes	Connectors	CGS	GROUP 1 N° 6	NOT CRITICAL	ESA PSS-01-726, Is. 2	

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7.10 GROUP N° 17 - INSPECTION PROCEDURES

ITEM N°	PROCESS IDENTIFICATION	SPECIFICATION ISSUE/REV.	PROCESS DESCRIPTION	USE AND LOCATION	MANUFACTURER NAME	ASSOCIATED ITEMS IN MATERIAL LIST	CRITICALITY OF THE PROCESS	JUSTIFICATION FOR VALIDATION APPROVAL	ESA VAL.
1	Incoming inspection procedure	PA049 iss.1	Incoming inspection of the Hi-Rel Parts	Electronic Box	CGS	All items	NOT CRITICAL	PA049 iss.1	
2	MIP and KIP inspection Plan	GD-PL-CGS-003 iss.1	MIP - KIP	Electronic Box	CGS	GROUP 4 N° 1,2	NOT CRITICAL	GD-PL-CGS-003 iss.1	
3	Inspection on assembled PCBs	PA 005 iss.1	Inspection on assembled PCBs	PCBs of Box	CGS	GROUP 4 N° 1,2	NOT CRITICAL	PA 005 iss.1	