EQAP DOCUMENT FOR LEVEL II SIMULATOR

**PURCHASE ORDER NO: ASL/IA/RCI/R/IA6/0213/14/089/090 (Dated – 31/12/2015)**

**: ASL/DD2/RCI/R/DD23/0213/14/2580/2597 (Dated – 31/12/2015)**

**: ASL/SFD/RCI/R/DD1/0213/14/550/533 (Dated – 30/12/2015)**

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| --- | --- | --- | --- | --- | --- |
| **PREPARED BY :** | | | **CHECKED BY:** | | |
| **Mr. Srinivas K Mr. Edwin Raju**  **M/S DATASOL (B) Pvt Ltd** | | | **Mr. Mohan Babu Mrs. Sabitha Rani**  **M/S DATASOL (B) Pvt Ltd** | | |
| **REVIEWED BY :** | | | | | |
| **Mr. KAREEM REDDY Sc ‘C’**  **(SINT-CHECKOUT, ASL)** | **Mrs. NOMI SONOWAL**  **(Sc ‘D’, SINT-CHECKOUT, ASL)** | | | | **Mr. MUKESH KUMAR**  **(SC- ‘E’, R & QA, ASL)** |
| **VERIFIEDBY :** | | | | | |
| **Mr. L. PARIDA**  **(Sc ‘F’, SINT-CHECKOUT, ASL)** | | **(SSQAG REP)** | | **Mr. GIRIDHAR RAO**  **(SC- ‘F’, R & QA, ASL)** | |
| **APPROVED BY:** | | | | | |
| **Mrs. R SHEENA RANI**  **(SC -‘G’, Tech. Dir. Checkout)** | | | **Mr. BRIG A PRADHAN**  **(PRINCIPLE DIR. SSQAG)** | | |
| **ISSUE AUTHORISED BY:** | | | | | |
| **Dr. TESSY THOMAS**  **(SC- ‘H’, DIRECTOR, ASL)** | | | | | |

**Manufactured By:**

**DATASOL (B) PVT. LTD.**

“Datasol House”, #793, 17th Cross,

Vyalikaval HBCS, (Behind BEL Corporate Office),

VeerannaPallya, Nagawara BANGALORE - 560045

**Record of Revisions**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S/N | Rev No. | Date | Section (s) changed | ChangedBy(Datasol) | Details of Revisions |
| 1. | 1.0 | 28-11-2016 | -- |  | -- |
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**Distribution table:**

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| **TABLE OF CONTENTS** | | | |
| **S/N** | **DESCRIPTION** | **Page** | |
| 1.0 | SCOPE OF WORK | 6 | |
| 1.1 | INTRODUCTION | 6 | |
| 2.0 | OVER VIEW OF THE DOCUMENT | 7 | |
| 3.0 | STAGES OF SSQAG INSPECTION | 7 | |
| 4.0 | LIST OF REFERENCE | 7 | |
| 5.0 | LIST OF DELIVERABLES | 8 | |
| 6.0 | CLASSIFICATION OF GSE | 9 | |
| 7.0 | INTRODUCTION OF SIMULATOR PC | 10 | |
| 7.1 | IDENTIFICATION | 10 | |
| 7.1.1 | TECHNICAL SPECIFICATIONS OF SIMULATOR PC | 12 | |
| 7.1.2 | HARDWARE DESCRIPTION OF MODULES | 12 | |
| 7.1.2 (A) | AIMB-584 MOTHER BOARD | 13 | |
| 7.1.2 (B) | STORAGE DEVICE (SATADOM) | 15 | |
| 7.1.2 (C) | FILTER MODULE SPECIFICATION | 17 | |
| 7.1.2 (D) | POWER SUPPLY MODULE SPECIFICATION | 18 | |
| 7.1.2 (E) | DDC - DAQ CARD - 1553B DUAL NODE BU-67110I200R-JL0 | 19 | |
| 7.1.3 | PROCESS FLOW CHART OF SIMULATOR PC | 23 | |
| 8.0 | KVM (KEYBOARD / VGA / TP) DBPL-LEVEL2SIM-RKVM | 25 | |
| 8.1 | DISPLAY SPECIFICATIONS | 26 | |
| 8.2 | KEYBOARD SPECIFICATIONS | 26 | |
| 8.2.1 | PROCESS FLOW CHART OF KVM | 27 | |
| 8.3 | ELECTRICAL CONFIGURATION | 29 | |
| 8.4 | WIRING DETAILS OF SIMULATOR PC | 29 | |
| 8.4.1 | SPC INTERNAL WIRING DETAILS | 29 | |
| 8.4.2 | SPC CABLE LOOMS | 32 | |
| 9.0 | SIMULATOR INTERFACE UNIT | 34 | |
| 9.1 | SYSTEM OVERVIEW | 34 | |
| 9.2 | CURRENT LIMITING RESISTOR and OPTO ISOLATOR CIRCUIT | 37 | |
| 9.3 | VOLTAGE LEVEL SHIFTING CIRCUIT | 38 | |
| 9.4 | RELAY CIRCUIT TO BE OPERATED BY MIU DOP | 39 | |
| 9.5 | BATTERY SIMULATION | 39 | |
| 9.6 | POWER SUPPLY CIRCUIT | 40 | |
| 9.7 | POWER SUPPLY SPECIFICATIONS | 40 | |
| 9.7.1 | PROCESS FLOW CHART OF SIU | 41 | |
| 9.8 | ELECTRICAL CONFIGURATION FOR SIU | 43 | |
| 9.8.1 | SIU INTERNAL WIRING DETAILS | 43 | |
| 9.8.2 | J1 CONNECTOR | 43 | |
| 9.8.3 | J101 CONNECTOR | 44 | |
| 9.8.4 | J102 CONNECTOR | 44 | |
| 9.8.5 | J103 CONNECTOR | 46 | |
| 9.8.6 | J104 CONNECTOR | 47 | |
| 9.8.7 | M1 CONNECTOR | 49 | |
| 9.8.8 | M2 CONNECTOR | 51 | |
| 9.8.9 | M3 CONNECTOR | 52 | |
| 9.9 | M4 CONNECTOR | 53 | |
| 9.9.1 | M5 CONNECTOR | 55 | |
| 10.0 | LIST OF CABLE LOOMS | 57 | |
| 10.1 | SIU TO MIU CABLE ELECTRICAL CONFIGURATION | 57 |
| 10.1.1 | AC INPUT POWER CABLE FOR SIU | 57 |
| 10.1.2 | SIU TO MIU CABLE LOOMS | 58 |
| 10.2 | SIU TO LJB INTERFACE CABLES | 64 |
| 10.2 (A) | A5 UMBILICAL LOOMS | 64 |
| 10.2 (B) | A4 UMBILICAL LOOMS | 72 |
| 10.2 (C) | A3 UMBILICAL LOOMS | 77 |
| 10.3 | FLOW CHART OF CABLE LOOMS | 81 |
| 10.4 | PROCESS FLOW DESCRIPTIONS | 82 |
| 10.5 | ACCEPTANCE TEST | 82 |
| 11.0 | FAMILY TREE OF LEVEL II SIMULATOR | 83 |
| 12.0 | PROCESS FLOW CHART | 84 |
| 12.1 | DESCRIPTION OF PROCESS FLOW CHART | 85 |
| 13.0 | ENVIRONMENTAL SPECIFICATION | 90 |
| 14.0 | SAFETY PRECAUTIONS | 99 |
| 15.0 | STORAGE &HANDLING DETAILS | 100 |
| 15.1 | PACKING DETAILS | 100 |
| 16.0 | ANNEXURE “A” BILL OF MATERIALS (BOM) |  |
| 17.0 | ANNEXURE “B” QA MATRIX | 1of B - 3 of B |
| 18.0 | ANNEXURE “C” PCB SCHEMATICS & LAYOUTS |  |
| 19.0 | ANNEXURE “D” CONTINUITY / IR / COLD / RETENTION / PCB TEST REPORTS |  |
| 20.0 | ANNEXURE “E” FUNCTIONAL TEST REPORTS SPC & SIU |  |

LIST OF ABBREVIATIONS

* SIU - SIMULATOR INTERFACE UNIT
* MIU - MISILE INTERFACE UNIT
* SPC - SIMULATOR PC
* KVM - KEYBOARD, VIDEO, MOUSE
* LJB - LAUNCHER JUNCTION BOX
* LIU - LAUNCHER INTERFACE UNIT
* SSD - SOLID STATE DRIVE
* RAM - RANDOM ACCESS MEMORY
* CPU - CENTRAL PROCESSING UNIT
* I/O - INPUT / OUTPUT
* PREET - Pre-Environmental Testing (Parameters to be monitored before commencement of test)
* INSET - In-Situ Environmental Testing (Parameters to be monitored during the test)
* POET - Post environmental testing (Parameters to be monitored after the test completion) RH Relative humidity

# 1.0 SCOPE OF WORK

* Fabrication, assembly & integration of 19” rack Mountable with front and rear doors
* Simulator Interface Unit **(GSE Class 2)**
* Tray for mounting MIU
* Simulator PC **(GSE Class 2)**
* Fabrication of simulator test jig
* All components must be as per ASL QA requirements
* All connectors and cables to be MIL Grade
* Vendor should procure all the required BOMs
* One MIU will be given by ASL as a FIM for each set of Umbilical level simulator

# 1.1 INTRODUCTION

**Level II Simulator** is used to test the total checkout system connectivity and to validate the command‐response protocol.

### Level II Simulator rack consists of

* Simulator PC
* Simulator Interface units
* MIU & Cable tray
* Set of interfacing cables

The Industrial PC consists of two nodes 1553 card for communication with embedded computer (MIU‐Missile Interface Unit) and checkout system. MIU has got all the digital and analog inputs and outputs that collects umbilical data from checkout system periodically and posts them to industrial PC. Simulator Interface Unit consists of the signal conditioner, power supply and the external interface connectors.

# 2.0 OVERVIEW OF THE DOCUMENT

This LEVEL II SIMULATOR document details the Qualification Assurance Plan for electrical specifications & detailed descriptions of checking the resources of LEVEL II SIMULATOR. Since this unit comes under Class 2, it undergoes below mentioned stages with respect to the JSS55555 standards.

1. Various Stages of Quality Plans.
2. Various Stages of Quality Checks.
3. Various stages of Environmental & EMI/EMC Tests.
4. Various stages of Functional Tests.
5. Various stages of Endurance Tests.

# 3.0 STAGES OF SSQAG INSPECTION

Vendor shall make the following documents available for inspection by the agency SSQAG nominated by ASL for

1. PCB, component level inspection: following certificates/ reports shall be verified during inspection.
   * Certificates (Group A and Group B) for PCB’s if any
   * Component and connectors certificates /reports/datasheets
   * Mechanical housing, raw material, radiography and dimensional inspection reports.
2. Sub assembly level inspection (before as well as after application of conformal coating)
3. Unit level functional tests
4. Environmental tests
5. Endurance tests

## 4.0 LIST OF REFERENCES

The following list of references may be helpful for you to understand the concept of the custom design.

1. Technical Specification as per the P.O
2. Mechanical QAP & Drawings submitted along with ATP & EQAP Documents
3. Hardware Design Document of LEVEL II SIMULATOR (HDD Document)

**5.0 LIST OF DELIVERABLES**

As per the Purchase Order Deliverable are listed below:

|  |  |  |
| --- | --- | --- |
| **SL No** | **Item Description** | **Quantity** |
| 1 | 19” Rack with front and rear door, cable tray & mounting tray, AC power extension point. | 17 Sets |
| **Model No: DBPL-L2SIM-SPC**  19” Half Rack mount 5U level 2 simulator PC with DDC make BU-67110i200R-JL0: PCI dual node 1553B card and I/O’s are terminated on MIL-Series D38999 connector. |
| **Model No:DBPL-L2SIM-RKVM**  19” rack mount 2U, 15” Display with keyboard and touchpad with mating cables. |
| **Model No:DBPL-L2SIM-SIU**  19” rack mount 4U simulator interface unit. |
| MIL-STD-1553B Data Bus Network.  Make – CompuPower |
| 2 | Simulator Interfacing Cables | 17 Sets |
| 3 | SIU TO LJB Cables for type –1 configuration | 05 Sets |
|  | SIU TO LJB Cables for type –2 configuration | 06 Sets |
|  | SIU TO LJB Cables for type –3 configuration | 06 Sets |
| 4 | **Model No: DBPL-L2SIM-TESTJIG**  Simulator Test Jig with interfacing cables with simulator PC test software | 02 Sets |
| 5 | REDHAT Enterprise Linux 6.0 or above with media and 1 year support | 03 Sets |
| 6 | Driver Software & Test Software for 1553B Card | 01 Set |
| 7 | Simulator PC test software | 01 No |
| 8 | External USB based DVD drive | 01 No |
| **SPARES** | | |
| 9 | DC-DC Converter Murata UMR-5/2000/D24E-C 28V/5V-2A | 10 Nos |
| 10 | Relay 1A DPDT/28 Coil supply | 10 Nos |

# 6.0 CLASSIFICATION OF Systems GSE’s and AT APPLICABILITY MATRIX

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 1: Classification of GSEs and QT / AT Applicability Matrix** | | | | | | | | | |
| Sl No | Item | GSE Class | Functional Test | | Entest (QT) | | Entest (AT) | SSQAG | Reference |
| Test Req | SSQAG |
| 1 | Level -2 Simulator (Simulator PC with Simulator I/F box) | 2 | Y | Y | N | N | Y | Y | ASL/21/42, Dated 20/12/2004 |
| 2 | Simulator Test Jig | -- | Y | N | N | N | N | -- | ASL/21/42, Dated 20/12/2004 |

**Y: Applicable N: Not Applicable**

# Table 2: ENTEST APPLICABILITY MATRIX

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table 2: ENTEST Applicability Matrix** | | | | | |
| Sl No | Item | ESS | Damp Heat | EMI / EMC | Remarks   * 1 Unit out of every lot of 6 units shall undergo ESS, Damp Heat & EMI / EMC tests. Refer Tests 1 through 3 in table-3 * Remaining units of the lot(s) shall undergo random vibration only. Refer test 4 in table-3   **Note:** KVM to be kept outside the chamber during Thermal cycle. |
| 1 | Level -2 Simulator (Simulator PC with Simulator I/F box) | Y | Y | Y |
| 2 | Simulator Test Jig | NA | NA | NA |

# 7.0 INTRODUCTION OF SIMULATOR PC

The design is built around i7 based processor board (AIMB-584 QG2) mounted inside the chassis from where required peripherals / connectivity will be achieved. The unit has various connectivity such as Gigabit Ethernet, USB ports, Keyboard/TP interface & VGA O/P, apart from this DDC 1553 Communication card also. Terminations of all these specified ports are through Rugged Connectors. The unit has 32 GB SATADOM & 500GB SATA (HDD), where the application program and the OS reside. The unit performance can be checked with a PC based test jig which will facilitate simulation of 1553 communication. All interfaces are bought out through MIL standard circular connectors.

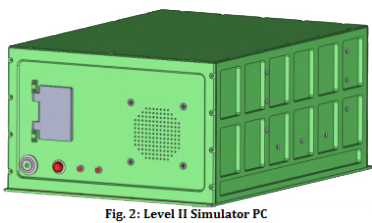
The Simulator PC is powered 1U form factor AC power supply. All I/O’s from RIO (Rear input / output) modules are terminated on D38999 / MS3470 circular connectors at the rear plate. It Interfaces to the LIU & MIU as per configuration.

**7.1 IDENTIFICATION**

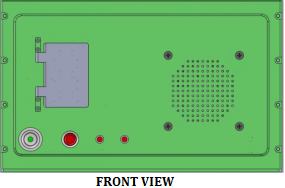
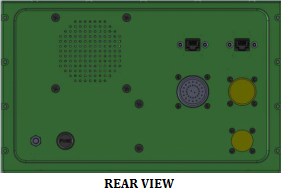
The “Level II simulator” supplied by Datasol to ASL, Hyderabad will be here after identified as given below.

**SYSTEM DESCRIPTION : SIMULATOR PC**

**PART NO : DBPL-L2SIM-SPC**



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/N** | **Connector Description** | **Connector**  **Identification** | **Mounting**  **Type** | **Connector Part Number** |
| 1 | 1553 | 1553 Dual node card | Fixed-13S | 13S Circular Part No: D38999/20-F-B-35S |
| 2 | AC i/p | AC Power | Fixed‐3P | 3P Circular Part No: MS3470‐W12‐3P |
| 3 | LAN | ETHERNET CONNECTOR | Fixed | RJ45 Standard connector |
| 4 | USB | USB CONNECTOR | Fixed | USB Standard connector |
| 5 | KVM POWER / KBD / TP | LCD Display Interface (KB/Mouse, VGA, KVM Power) | Fixed-26S | 26S Circular Part No: MS3470-W-16-26S |



**7.1.1 Technical Specifications of Simulator PC**

* CPU: Intel 4th generation Core i7-4790 processor, 3.60 Ghz or higher
* 4GB DDR3 1333/1600MHz SDRAM(Non ECC)
* 2 PCI + 1 PCIe x16 + 1 PCIe x 4 Slots
* VGA supports up to 1600 x 1200 or higher
* Rear side having 1 (VGA +KBD+TP) through one circular connector, 2 LAN ports, 1 power & one 1553 connector
* In front having 3 USB (one is 2.0), HDD / Power LED with reset & power switch.
* DDC two node Mil-std-1553B Card BU-67110i200R-JL0
* Cooling fans with low sound level less than 30dB
* Power off / on switch, reset button
* LED indicator for power / HDD
* 500GB SATA HDD
* 32 GB SATADOM
* Operating system Red Hat Enterprise Linux 6.0 or above
* All the circular connectors used are MIL-STD

# 7.1.2 HARDWARE DESCRIPTION OF MODULES

Simulator PC having below mentioned modules assembled inside

7.1.2 (A) - Mother board

7.1.2 (B) - SATADOM Storage Module 32GB

7.1.2 (C) - Filter Module

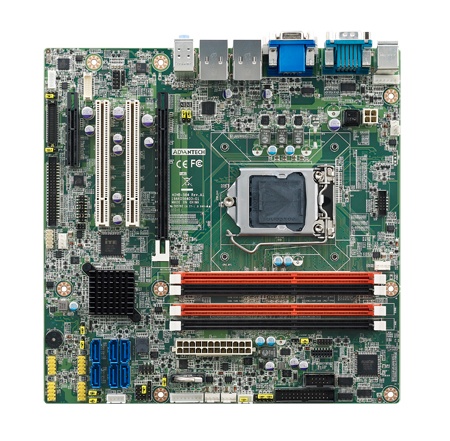
7.1.2 (D) - Power Supply Module

7.1.2 (E) - DDC 1553 communication card

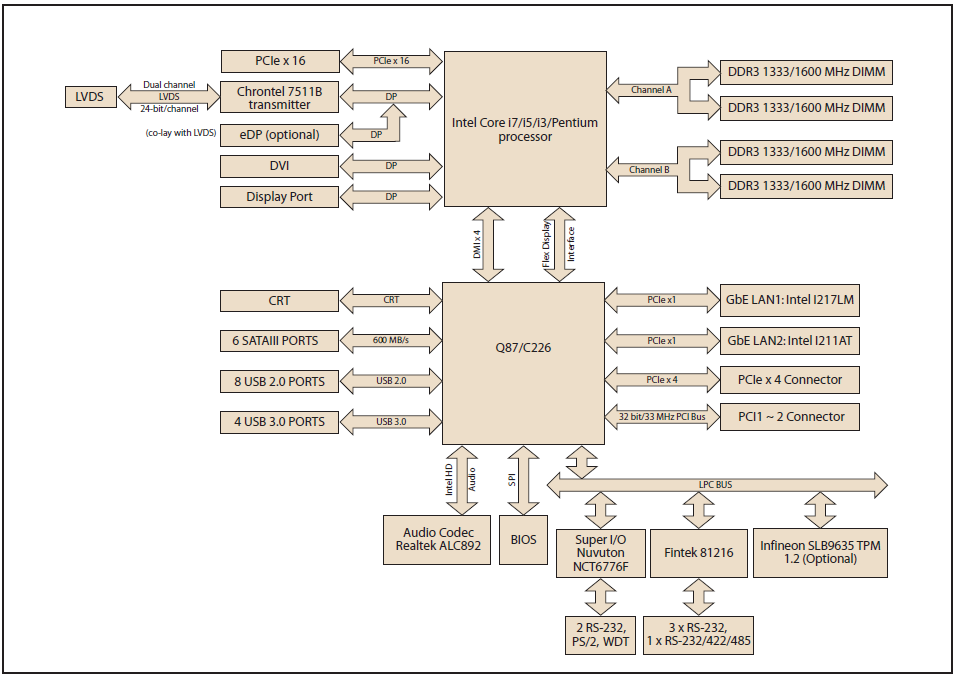
**7.1.2(A) AIMB-584 MOTHER BOARD**

**MOTHER BOARD FEATURES:**

AIMB-584 is designed with the Intel Q87/C226 for industrial applications that require both performance computing and enhanced power management capabilities. The motherboard supports Intel Core i7 Xeon E3-1275v3 3.5GHz/ E3-1225v3 3.2GHz/E3-1268L 2.3GHz/ Core i7-4770 3.1GHz/ Core i7-4790 3.60GHZ / Core i5-4570 2.9GHz/ Core i3 4330 3.5GHz/ Pentium G3420 3.2 GHz/ Celeron G3320TE 2.3 GHz processor up to 8 MB L3cache and DDR3 1333/1600 up to 32GB up to 16 GB. A rich I/O connectivity of 6serial ports, 8 USB 2.0, 4 USB 3.0, dual GbE LAN, 6 SATA III ports.



**Fig 3: AIMB-584 QG2 MOTHER BOARD**

****

**Fig 4: MOTHER BOARD AIMB-584 BLOCK DIAGRAM**

**Schematic showing Connectivity**

### Mother Board AIMB -584QG2 SPECIFICATIONS

* **CPU :** Intel 4th generation core i7-4790 processor, 3.60Ghz or higher
* **Memory :** Up to 32 GB in 4 slots 240-pin DIMM sockets. Supports dual-channelDDR3 1333/1600MHz SDRAM. AIMB-584QG2 supports non-ECC unbuffered DIMMs and do not support any memory configuration that mixes non-ECC with ECC unbuffered DIMMs
* **Graphics :** Intel® HD Graphics
* **VGA :** Supports VGA up to resolution 2048 x 1536 @ 75Hz refresh rate
* **USB :** Supports up to 8 USB 2.0 ports with transmission rates up to 80Mbps and 4 USB 3.0 ports with transmission rates up to 5 Gbps
* **SATA :** Six on-board SATA connectors with data transmission rate up to 600 MB
* **LAN :** Supports dual 10/100/1000 Mbps Ethernet port (s) via PCI Express x1 bus which provides 500 MB/s data transmission rate
* **Controller:** LAN1: Intel I217LM; LAN2: Intel I211AT

### Mechanical and environmental specifications

* Operating temperature: 0 ~ 60° C (32 ~ 140° F, Depending on CPU)
* Storage temperature: -40° C ~ 85° C (-40 ~ 185° F)
* Humidity: 5 ~ 95% non-condensing
* Power supply voltage: +3.3 V, +5 V, +12 V, -12 V, 5 Vsb
* Board size: 240 mm x 240 mm (9.6" x 9.6")
* Board weight: 0.365 kg

## 7.1.2(B) STORAGE DEVICE (SATADOM)



**Fig 5: SATADOM**

### TECHNICAL SPECIFICATIONS:

|  |  |
| --- | --- |
| Connector Type | Standard 7 Pin SATA Connector |
| Flash Type | SLC (Single Level Cell) |
| Density | 2GB, 4GB, 8GB, 16GB, 32GB |
| Transfer Mode | SATA II, SATA I, PIO 0~4,  MDMA 0~2, UDMA 0~6 |
| Sustained R/W Performance | Read:135 MB/sec (max.)  Write**:**130 MB/sec (max.) |

### Environmental Specifications:

|  |  |
| --- | --- |
| DC Input | +5V DC ± 5% |
| Power consumption  (Max.) | Read: 180 mA  Write: 200 mA  Idle: 110 mA |
| Operating Temperature | 0°C~+70°C (Standard Grade)  -40°C ~+85°C (Industrial Grade) |
| Storage Temperature | -55°C~+95°C |
| Humidity | Relative Humidity: 10-95%,  non-condensing |
| Flash Endurance | 100,000 program/erase cycles |
| MTBF | > 4,000,000 hours |
| Certification | CE, FCC, RoHS |

## 7.1.2(C) FILTER MODULE SPECIFICATION

### Initial EMI/EMC Protection



**Fig 6: MF-510 FILTER**

**Technical Specification:**

* Maximum Continuous
* Operating Voltage: 250 VAC
* Operating Frequency: 50/60Hz
* Rated Currents: 1A to 6 A
* High Potential test voltage: L to G 1500VAC, L to L 1414VDC
* Overload Capability: 6 x Rated current for 8 sec
* Temperature Range: -25°C to 85°C

## 7.1.2(D) POWER SUPPLY MODULE SPECIFICATION

APPLICATION

**Fig 7:PS8-350FATX-XE**

**Features:**

* Product: PS8-350FATX-XE
* Product Description: Delta AC to DC 100-240V FLEX ATX 350W Switch Power Supply with PFC
* Application: Switch Power Supply
* Manufacturer: Delta Electronics
* Form Factor: FLEX
* Output Power : 350W
* Output: +3.3V @ 16; +5V @ 16A; +12V1 @ 18A; +12V2 @ 18A; -12V @ 0.3; +5Vsb(DC) @ 3A
* Efficiency : 82%
* Main Connector : ATX (20 + 4pin)
* Input Voltage Range : 100 - 240V
* Input Current : 115V@7A maximum
* Input Frequency : 47 - 63Hz
* Input Current Type: AC to DC
* Storage Temp: -40°C to+75°C
* Storage Humidity :95% RH
* MTBF: 200K hours at 25°C
* FAN Speed Control: Yes
* Power Switch Function: No
* Safety and EMC: Class B
* Safety Standard:FCC / UL+CUL / CE / CB / TUV / CCC / BSMI
* RoHS Status : Yes
* EOL :Q4 / 2020
* Replacement Model : TBA
* Maximum Power:300W - 399W

**7.1.2(E) DDC - DAQ Card - 1553B Dual node BU-67110i200R-JL0**

## MAKE: DDC

## PART NO: BU-67110i200R-JL0

## DIGITAL COMMUNICATION CARD

The 1553B with part #: BU-67110i is a PCI card. The BU-67110i200R-JL0 contains two dual redundant MIL-STD-1553 channels and is a perfect fit for military aerospace applications. The PCI versions offer front panel I/O and include a cable to easily interface to all 1553 channels. The unique I/O mix and high channel count on a single card saves space, power, weight, and cost-making this ideal solution for systems with limited space.

The card includes the AceXtreme® MIL-STD-1553 C Software Development Kit (SDK) and drivers to support all modes of operation for Linux, VxWorks and Windows 2000/XP/Vista/7, including source code samples and detailed documentation. A common SDK exists across all operating systems for all cards allowing the programmer portability across different –platforms. The BusTracer Graphical User Interface is optionally available and has point and click application source code generation capability to reduce risk and shorten development cycles.

All bus relative configurations, such as base memory and interrupt assignment, are automatically controlled by BIOS software.3U Compact PCI with Rear I/O has following features.

* **1553B CARD FEATURES**
* Up to (8) Dual Redundant MIL-STD-1553 Channels.
* Multi – Function: BC/MT or Multi – RT/MT.
* 1553 Bus Playback on all models.
* Supports MIL-STD-1553 A/B & MIL-STD-1760
* Transformer and / or direct coupled.
* BC Disable for RT only applications.
* Tx inhibit for MT only applications.
* 2 External RT address Inputs

* **1553B CARD BENEFITS**
* Rugged PMC Design for Harsh Environments.
* Available in PCI form factors with cable for test environment
* Unique I/O Mix & High Channel Count Reduces: Space, Power, Weight, and Cost.
* Shorten Development Cycle and Reduce Risk with Automated Code Generation
* IRIG-106 Chapter 10 On-board formatting.
* On-Board DMA engine for low CPU-PCI utilization.
* **DDC-BU-67110i200R-JL0 (Hardware Configuration and Operation)**

The BU-67x10F/M/I/T card utilizes the PCI interface, and as such does not require any jumpers or switches to set the Base address or interrupt values. The job of configuration for Plug-and-Play PCI is performed by the operating system. During the initial power on boot process, the system performs an enumeration of the PCI bus and allocates a resource configuration that satisfies the card requirements. The system will save the configuration information in the BU-67x10i PCI configuration space registers. These registers are configured at the factory to contain information that identifies the card type; vendor, required memory sizes, and interrupts resources. When the driver loads, it will access the configuration registers and identify how the system has configured the card. After identifying each of the installed cards, the device driver will enumerate each of the channels on the card and create a configuration structure that defines the allocated address and interrupt. This information is directly available to the MIL-STD-1553 AceXtreme® Software Development Kit and is necessary for read, write and interrupt operations.



**Fig. 8: BU-67x10i Front I/O PCI Card**

* **SIGNAL FLOW FOR 1553B bus signals**

Level2 simulator is interfaced to the checkout system through launcher junction box and Mil‐Std‐1553 bus. The power to missile sub‐systems from checkout system is available through various umbilical connectors at the junction box. This will be monitored by either digital input or analog input of the MIU through signal conditioning at SIB.Level2 simulator communicates with launcher interface unit (LIU) in checkout system through Mil‐Std‐1553 bus. It receives the commands from checkout system through 1553 bus and responds to the same.

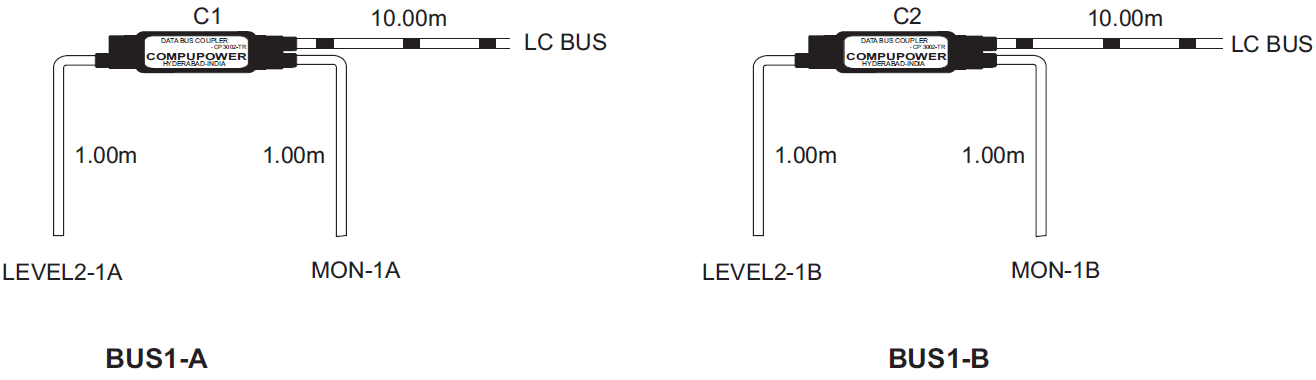
Mil‐Std‐1553B cables are to be integrated with molded inline stub coupler, terminators and respective type of connectors shown below images.

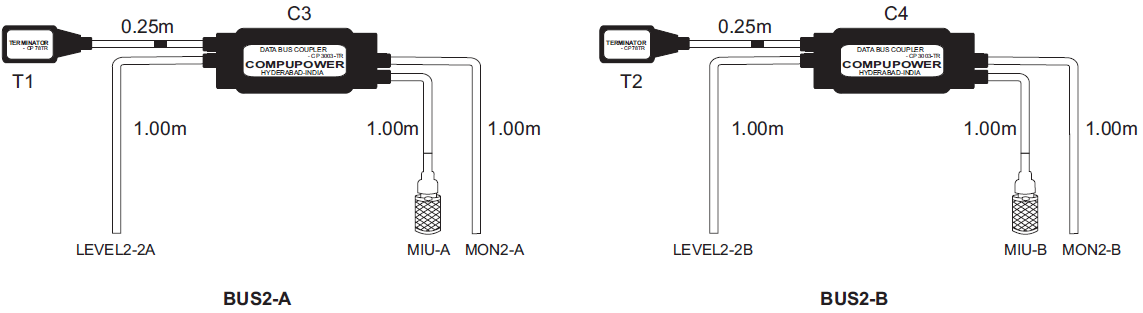
Four integrated cables are supplied for 2 Mil‐std‐1553b nodes for both bus‐A and bus‐B.

Level2 simulator 1553B node‐1 (level2‐1A&B) will be used for communication with LIU in checkout system and Level2 simulator 1553B node‐2 (level2‐2A&B) will be used for communication with MIU. All the 4 buses are terminated with a single 13 pin connectors on the simulator PC.

For node‐1 connectivity, a dual stub coupler with one end terminator and the other end of the bus extended 10pin connector as LC bus for LIU connectivity is used. The second stub line will be used for monitoring purpose if required. For bus‐B also same connectivity is repeated with LC bus termination on the same 10 pin connector.

For node‐2 connectivity, a three-stub coupler with terminators on both bus ends is used. The second stub connected to MIU‐bus‐A and the third stub line will be used for monitoring purpose if required. For bus‐B also same connectivity is repeated.



****

NOTE: CABLE: RAYCHEM 10614-9

LEVEL2-1A, LEVEL2-1B, LEVEL2-2A, LEVEL2-2B: D38999-26WB-35PN (1no).

MON-1A, MON-1B, MON2-A, MON2-B: CJ70-47 (4nos).

LC BUS: MS3475-W12-10PN (1no).

C1, C2: CP 3002-TR IN-LINE DUAL STUB COUPLER WITH TERMINATOR

C3, C4: CP 3003-TR IN-LINE THREE STUB COUPLER WITH TERMINATOR

T1, T2: CP 78TR MOULDED TERMINATOR

MIU-A, MIU-B: RAYCHEM DK621-0411S

**BUS INDICATION (**AT REGULAR INTERVALS OF 0.2m APPROXIMATELY)

**BUS2-A: YELLOW COLOR**

**BUS2-B: GREEN COLOR**

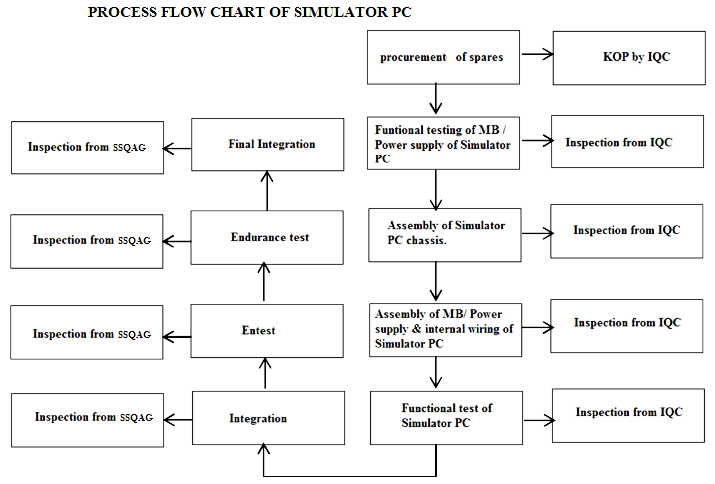
TOLERANCE ON CABLE LENGTHS: \_500mm IS +50mm

>500mm I +100mm

THE CABLE LENGTHS ARE TAKEN AS BARE CABLE LENGTHS ONLY AND DO NOT INCLUDE COUPLER/CONNECTOR LENGTHS.

**Fig 9: Cable Assembly (Drawing No: DYNA300-10)**

**7.1.3 PROCESS FLOW CHART OF SIMULATOR PC**

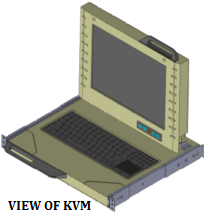
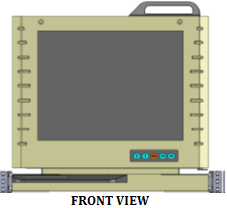
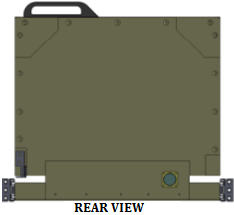
****

|  |  |  |  |
| --- | --- | --- | --- |
| **PROCESS FLOW CHART OF SIMULATOR PC DESCRIPTION** | | | |
| **P/N** | **DESCRIPTION** | **TOOLS** | **REMARKS** |
| **1** | **Procurement of Spare (KOP) Components Inspection** | -- | Inspection by Datasol QC |
|  | 1. Identify the components as per the BOM. The components are accepted based on label/Marking available on the component 2. Check the component Part No. & Conformance of Certificates (for main components) 3. Visually inspect components if any damages are there 4. They are checked for visual defects like bending of termination, tarnish terminations & surface imperfection etc. 5. Check all the components are at proper position as per the layout drawing | 10X Magnifier & Multimeter | SSQAG Inspection. |
| **2** | **Functional Testing** | -- | -- |
|  | All the I/O ports at the circular connectors are checked as per “Annexure F” | Ref “Annexure F” | Inspection by Internal QC |
| 3 | Assembly of Simulator PC Chassis | ---- | Inspection by Internal QC |
| 4 | Assembly of MB / SMPS and Internal wiring of Simulator PC | ---- | Inspection by Internal QC |
| 5 | Functional test of Simulator PC as per “Annexure F” | Ref “Annexure F” | Inspection by Internal QC |
| 6 | Integration | ----- | Inspection by Internal SSQAG |
| 7 | Entest as mentioned in Table – 3 & 4 | ---- | Inspection by Internal SSQAG |
| 8 | Endurance test as mentioned in Table – 3 & 4 | ---- | Inspection by Internal SSQAG |
| 9 | Final Integration | ----- | Inspection by Internal SSQAG |

**8.0 KVM (KEYBOARD / VGA / TP) DBPL-L2SIM-RKVM**

**8.1 VGA**

**8.2 KEYBOARD / TP**



**FIG: 10**

**Connector Mounted on the Rear Panel of KVM - Part No: MS3470‐W16‐26P**

**8.1 Display Specifications**

****

**FIG: 11**

**Part No: IDS-311515" XGA Industrial Open Frame Monitor**

* 15" XGA LCD panel with LED backlight for 20% power saving and environmental protection
* Optional brightness 250~1200 cd/m2 for different application environments
* -20° ~ +60° C wide range operating temperature
* 5-wire resistive and optional P-cap (dual touch is supported) touchscreen solution
* Combo touch interface: RS-232 and USB
* Dual signal interface with VGA & DVI
* Integrated bracket for easy installation
* Versatile mounting methods for rear mounting and VESA mounting
* Anti-Reflective treatment (optional)
* Optical bonding (optional)

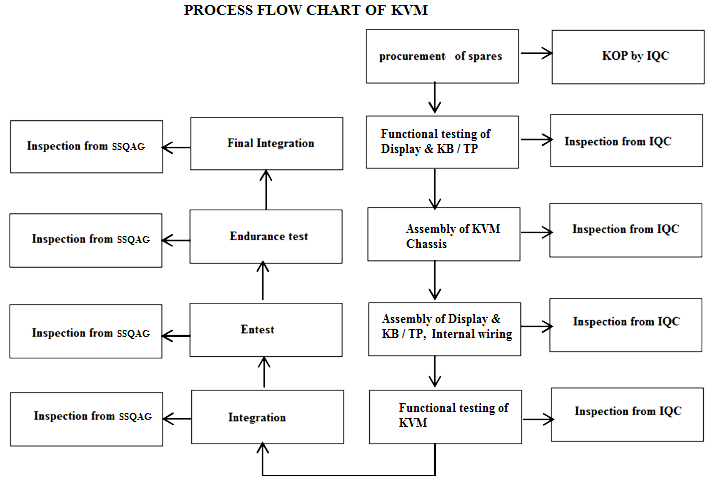


**8.2 Keyboard Specifications**

**Part No: SB-97-TP Keyboard**

* CABLE LENGTH: 5.25' straight USB (1.6 m)
* KEY SWITCHMATERIAL: Industrial Silicone rubber
* LIFE: Greater than 10 million cycles
* POWER SPECTRAL DENSITY: 0.04g/Hz
* FREQUENCY RANGE: 20Hz - 2kHz Duration of Test Per Axis:3 hours
* POWER USB: 200mA@5V (from CPU port)
* COMPATIBILITY: All Windows and Macintosh OS
* TEMPERATURE RANGE: Storage -40°C to +90°C (-40F to +194F);Operating: -40°C to +70°C (-40F to +158F)
* WEIGHT: 1.2 lbs +/- 0.10 lbs (0.64 kg +/- 0.05kg)
* DIMENSIONS: 14.934" x 5.89" x 0.50"

**8.2.1 PROCESS FLOW CHART OF KVM**



|  |  |  |  |
| --- | --- | --- | --- |
| **PROCESS FLOW CHART OF KVM DESCRIPTION** | | | |
| **PN.**  **No.** | **DESCRIPTION** | **TOOLS** | **REMARKS** |
| **1** | **Procurement of Spare (KOP) Components Inspection** | -- | Inspection by Datasol QC |
|  | 1. Identify the components as per the BOM. The components are accepted based on label/Marking available on the component 2. Check the component Part No. & Conformance of Certificates (for main components) 3. Visually inspect components if any damages are there 4. They are checked for visual defects like bending of termination, tarnish terminations & surface imperfection etc. 5. Check all the components are at proper position as per the layout drawing | 10X Magnifier &Multimeter | SSQAG Inspection. |
| **2** | **Functional Testing** | -- | -- |
|  | 1. Power ON System. Connect the display’s VGA cable to the systems VGA port. Open the console Screen and Type #**xrandr** then check in for 1024x768 resolutions. And the display should be clearly visible. 2. Connect USB Keyboard to Standard USB Connector of the unit & Switch ON the unit. that any no. Keys (randomly selected) on the Keyboard are functioning correctly. And, observe the NUM Lock & Caps Lock LEDs ON/OFF operation. | -- | Inspection by Internal QC |
| 3 | Assembly of KVM Chassis | -- | Inspection by Internal QC |
| 4 | Assembly of Display / KB/ TP and Internal wiring of KVM | -- | Inspection by Internal QC |
| 5 | Functional test of KVM as per “Annexure F” | Ref “Annexure F” | Inspection by Internal QC |
| 6 | Integration | -- | Inspection by Internal SSQAG |
| 7 | Entest as mentioned in Table – 3 & 4 | -- | Inspection by Internal SSQAG |
| 8 | Endurance test as mentioned in Table – 3 & 4 | -- | Inspection by Internal SSQAG |
| 9 | Final Integration | -- | Inspection by Internal SSQAG |

**8.3 ELECTRICAL CONFIGURATION**

All the cable used for wiring will be of LCSO approved PTFE insulated silver plated copper wire. The list of cables used is as below.

Teflon cables: 20/19/32V for KVM signal & power wiring

1553 Bus cable: RAYCHEM 10614-9 or equivalent

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SL NO** | **CONNECTOR REF** | **CONNECTOR PART NO** | **NO. OF WIRES** | **AWG** | **USED PINS** | **UNUSED PINS** |
| 1 | 1553 | D38999/20WB-35SN | 12 | BUS CABLE | 1 to 5 & 7 to 13 | 6 |
| 2 | AC / IP | MS3470-W12-3P | 3 | 20 AWG | A, B, C | NIL |
| 3 | LAN | RJ 45 standard connector | 8 | Std CAT5 | 1 to 8 | NIL |
| 4 | USB | USB standard connector | 4 | Std CAT5 | 1 to 4 | NIL |
| 5 | KVM POWER | MS3470-W16-26S | 20 | 20 AWG | A to N, U to X, b & c | S, T, Y, Z, a, d & e |
| 6 | KVM I/P | MS3470-W16-26P | 20 | 20 AWG | A to N, U to X, b & c | S, T, Y, Z, a, d & e |

The signals like MIL-1553, LAN, USB, VGA, & AC Power input for simulator PC and KVM are routed through above connectors with the cables mentioned above.

**8.4 WIRING DETAILS OF SIMULATOR PC**

**8.4.1 SPC INTERNAL WIRING DETAILS**

1. **AC I/P POWER WIRING.**

|  |  |  |  |
| --- | --- | --- | --- |
| **SIGNAL** | **POWER SUPPLY PS8-350FATX-XE (350W)** | **MF-510** | **SPC MS3470-W12-3P**  **AC I/P** |
| PHASE | LINE | LINE | A |
| NEUTRAL | NEUTRAL | NEUTRAL | B |
| EARTH | EARTH | EARTH | C |

1. **KVM POWER WIRING.**

|  |  |  |  |
| --- | --- | --- | --- |
| **SIGNAL NAME** | **VGA CPU CARD**  **DB15P** | **KB / TP**  **SB-97-TP**  **USB** | **CIRCULAR**  **MS3470-W16-26S**  **KVM POWER** |
| Red | 1 | - | A |
| Green | 2 | - | B |
| Blue | 3 | - | C |
| GND | 5 | - | D |
| GND | 6 | - | E |
| GND | 7 | - | F |
| GND | 8 | - | G |
| NC | 9 | - | H |
| GND | 10 | - | J |
| DDC DATA | 12 | - | K |
| HSYNC | 13 | - | L |
| VSYNC | 14 | - | M |
| DDC CLK | 15 | - | N |
| NC | - | - | S |
| NC | - |  | T |
| USB VCC | - | USB PIN1 | U |
| USB DATA - | - | USB PIN2 | V |
| USB DATA + | - | USB PIN3 | W |
| USB GND | - | USB PIN4 | X |
| NC | - | - | Y |
| NC | - | - | Z |
| NC | - | - | a |
| PWR (+12V) | - | - | b |
| GND | - | - | c |
| NC | - | - | d |
| NC | - | - | e |

1. **LAN WIRING**

|  |  |  |
| --- | --- | --- |
| **LAN** | | |
| Pin # | COLOUR CODE | Standard Connector RJ 45 female connector |
| 1 | White / Orange | 1 |
| 2 | Orange | 2 |
| 3 | White / Green | 3 |
| 4 | Blue | 4 |
| 5 | White / Blue | 5 |
| 6 | Green | 6 |
| 7 | White / Brown | 7 |
| 8 | Brown | 8 |

1. **USB WIRING**

|  |  |  |
| --- | --- | --- |
| **USB 3.0** | | |
| Pin # | Signal | Standard female connector |
| 1 | VCC | 1 |
| 2 | Data - | 2 |
| 3 | Data + | 3 |
| 4 | GND | 4 |
| **USB 2.0** | | |
| Pin # | Signal | Standard female connector |
| 1 | VCC | 1 |
| 2 | Data - | 2 |
| 3 | Data + | 3 |
| 4 | GND | 4 |

1. **1553 WIRING**

|  |  |  |  |
| --- | --- | --- | --- |
| **Signal** | **68 PIN SCSI CONNECTOR** | **BNC** | **1553**  **P/N: D38999-20WB-35SN** |
| CH 1 A BUS (+) | 37 | BUS A 1 (+) | 1 |
| CH 1 A BUS (-) | 35 | BUS A 1 (-) | 2 |
|  |  | SHIELD | 3 |
| CH 1 B BUS (+) | 38 | BUS B 1 (+) | 9 |
| CH 1 B BUS (-) | 36 | BUS B 1 (-) | 10 |
|  |  | SHIELD | 11 |
| CH 2 A BUS (+) | 3 | BUS A 2 (+) | 4 |
| CH 2 A BUS (-) | 1 | BUS A 2 (-) | 5 |
|  |  | SHIELD | 12 |
| CH 2 B BUS (+) | 4 | BUS B 2 (+) | 7 |
| CH 2 B BUS (-) | 2 | BUS B 2 (-) | 8 |
|  |  | SHIELD | 13 |

1. **WIRING DETAILS OF SIMULATOR KVM**

| **SIGNAL NAME** | **VGA CPU CARD**  **DB15P** | **KB / TP**  **SB-97-TP**  **USB** | **KVM**  **MS3470-W16-26P**  **KVM CABLE** |
| --- | --- | --- | --- |
| Red | 1 | - | A |
| Green | 2 | - | B |
| Blue | 3 | - | C |
| GND | 5 | - | D |
| GND | 6 | - | E |
| GND | 7 | - | F |
| GND | 8 | - | G |
| NC | 9 | - | H |
| GND | 10 | - | J |
| DDC DATA | 12 | - | K |
| HSYNC | 13 | - | L |
| VSYNC | 14 | - | M |
| DDC CLK | 15 | - | N |
| NC | - | - | S |
| NC | - |  | T |
| USB VCC | - | USB PIN1 | U |
| USB DATA - | - | USB PIN2 | V |
| USB DATA + | - | USB PIN3 | W |
| USB GND | - | USB PIN4 | X |
| NC | - | - | Y |
| NC | - | - | Z |
| NC | - | - | a |
| PWR (+12V) | - | - | b |
| GND | - | - | c |
| NC | - | - | d |
| NC | - | - | e |

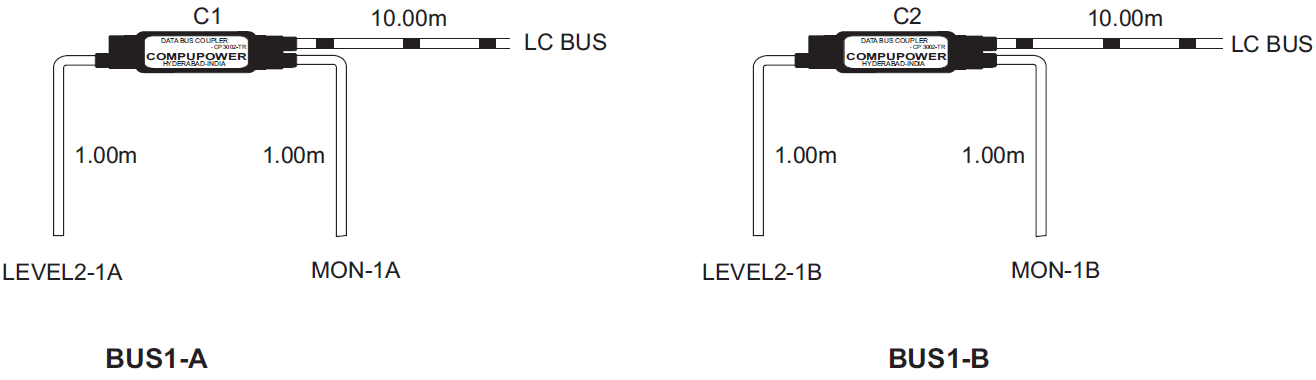
**8.4.2 SPC CABLE LOOMS**

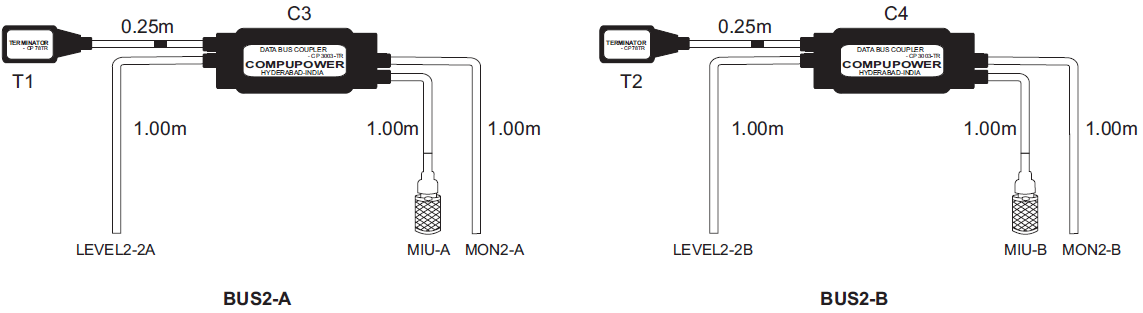
1. **AC I/P POWER WIRING.**



|  |  |  |
| --- | --- | --- |
| **SIGNAL** | **SPC MS3475-W12-3S**  **AC I/P** | **AC PLUG 6A** |
| PHASE | A | LINE |
| NEUTRAL | B | NEUTRAL |
| EARTH | C | EARTH |

1. **1553cable looms**





|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Signal** | **BNC** | **1553**  **P/N: D38999-26WB-35PN** | **Coupler** | **LC Bus**  **P/N:**  **MS3475 W12 10PN** | **MIU**  **P/N**  **DK-621- 0411 SN** | **MON** |
| CH 1 A BUS (+) | BUS A 1 (+) | 1 | C1 |  |  | 1A (+) |
| CH 1 A BUS (-) | BUS A 1 (-) | 2 |  |  | 1A (-) |
|  | SHIELD | 3 |  |  |  | SHIELD |
| CH 1 B BUS (+) | BUS B 1 (+) | 9 | C2 |  |  | 1B (+) |
| CH 1 B BUS (-) | BUS B 1 (-) | 10 |  |  | 1B (-) |
|  | SHIELD | 11 |  |  |  | SHIELD |
| CH 2 A BUS (+) | BUS A 2 (+) | 4 | C3 |  | MIU A (+) | 2A (+) |
| CH 2 A BUS (-) | BUS A 2 (-) | 5 |  | MIU A (-) | 2A (-) |
|  | SHIELD | 12 |  |  | SHIELD | SHIELD |
| CH 2 B BUS (+) | BUS B 2 (+) | 7 | C4 |  | MIU B (+) | 2B (+) |
| CH 2 B BUS (-) | BUS B 2 (-) | 8 |  | MIU B (-) | 2B (-) |
|  | SHIELD | 13 |  |  | SHIELD | SHIELD |

1. **KVM Cable Loom.**



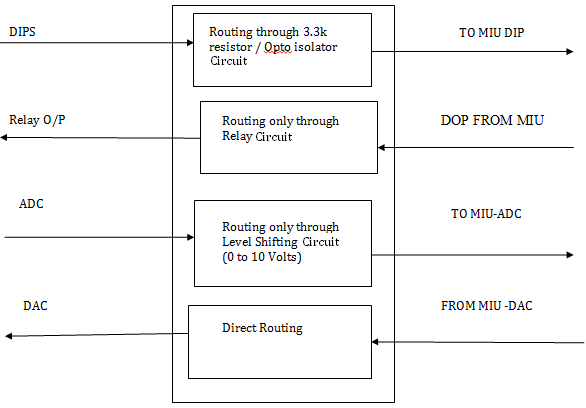
| **SIGNAL NAME** | **CIRCULAR**  **MS3475-W16-26P**  **KVM POWER** | **CIRCULAR**  **MS3475-W16-26S**  **KVM I/P** |
| --- | --- | --- |
| Red | A | A |
| Green | B | B |
| Blue | C | C |
| GND | D | D |
| GND | E | E |
| GND | F | F |
| GND | G | G |
| +5 V | H | H |
| GND | J | J |
| DDC DATA | K | K |
| HSYNC | L | L |
| VSYNC | M | M |
| DDC CLK | N | N |
| NC | S | S |
| NC | T | T |
| USB VCC | U | U |
| USB DATA - | V | V |
| USB DATA + | W | W |
| USB GND | X | X |
| NC | Y | Y |
| NC | Z | Z |
| NC | a | a |
| PWR (+12V) | b | b |
| GND | c | c |
| NC | d | d |
| NC | e | e |

**9.0 SIMULATOR INTERFACE UNIT**

**9.1 SYSTEM OVERVIEW:**

This system contains the circuits for conditioning the signals from the checkout system to meet the MIU input specifications. It interfaces umbilical signals from checkout system to the MIU. MIU has got the resources such as digital input, digital output, ADC and DACs. The following circuits are to be incorporated in PCBs inside SIU to ensure that umbilical signals meet the MIU resource specifications.

* Current limiting resistor cum OPTO isolator circuit
* Voltage level shifting circuit
* Relay circuit which will be operated by MIU DOPs
* Required (MIU & SIM) Power supplies



**A5 CONNECTIVITY DRAWING**



**A4 CONNECTIVITY DRAWING**



**A3 CONNECTIVITY DRAWING**



The following circuits are incorporated on PCBs inside SIU to ensure that umbilical signals meet the MIU resource specifications.

* Current limiting resistor
* OPTO Isolator circuit
* Voltage level shifting Circuit
* Relay circuit which will be operated by MIU DOPs
* Required (MIU & SIMULATOR) Power supplies.

The above circuits are realised on PCB named as SCB (Signal Conditioning Board).

Each board contains number of resources as shown below.

* + - 1. Current Limit Resistor: 44 Ch’s.
      2. OPTO Isolation: 8 Ch’s.
      3. Voltage Level Shifter: 24 Ch’s.
      4. Relay Outputs: 8 Ch’s.

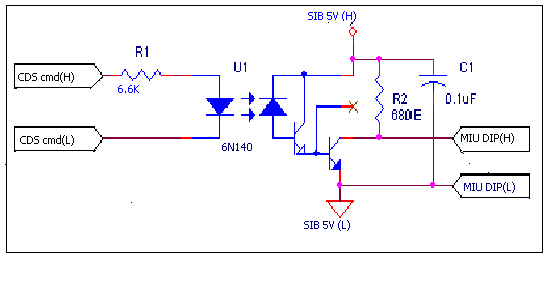
We have used SCB1 & SCB2 in SIU. Each SCB contains the above mentioned resources. But the SCB1 contains one DC-DC module to convert 28VDC to 5VDC for OPTO circuit output. The same DC-DC is routed to SCB2 for powering other 8ch’s of OPTO Isolation.

**9.2 CURRENT LIMITING RESISTOR and OPTO ISOLATOR CIRCUIT:**

The MIU digital input channels are designed for taking an input of 5V, but the requirement is to read an input of 35V. To limit the current to opto isolator for the input voltage of 35V, a current limiting resistor of 3.3K / 0.25W is provided at the input of each channel.

Thus for each channel, one 3.3K resistor is used for all 86 DIP channels at SIU. Each SCB in SIU is with 44 numbers of 3.3K resistors.





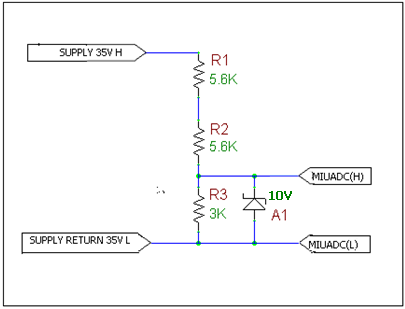
**Fig 15: OPTO isolator circuit**

There are few umbilical signals namely CDS1 & CDS2, whose outputs are through low brake in checkout systems. In MIU all DIP lows are shorted, thus when CDS high is permanently connected to DIP (H) and whenever a signal comes through low brake, all CDS DIPS will be read. To avoid this situation all the CDS channels are isolated with each other. Thus the above opto – isolator circuit is used for all CDS lines.

16 channels of opto isolation are provided in SIU. There are two SCB boards available each are with 8 channels of opto isolation.

**9.3 VOLTAGE LEVEL SHIFTING CIRCUIT:**

The MIU analog input channels are designed for taking an input of 10V, but the requirement is to read input of 35V. Hence the voltage divider network to bring down the voltage level from 35V to 10V or less than 10V. The following voltage divider network is used where, the output voltage will be 7.4V for input of 35V. The 10V zener provides the protection in case of resistor failure.

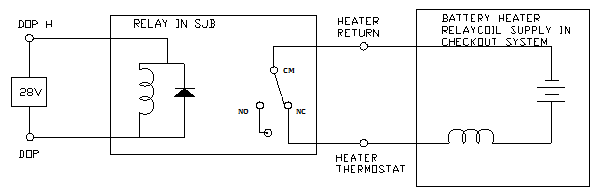


**Fig 16: level shifting circuit**

For all the 48 channels of ADC, the input as to pass through the above circuit and then to MIU ADC channels. Hence 24 channels of voltage divider network is populated in SCB1 & SCB2 will have another 24 channels. Input and output are terminated on 50 pin D-Sub connectors.

**9.4 RELAY CIRCUIT TO BE OPERATED BY MIU DOP:**

The relays are used for switching the relay coil supply of heater lines in the checkout system as shown below and to switch simulated battery supply to discharge voltage Monitoring lines will be operated by digital output from the MIU.

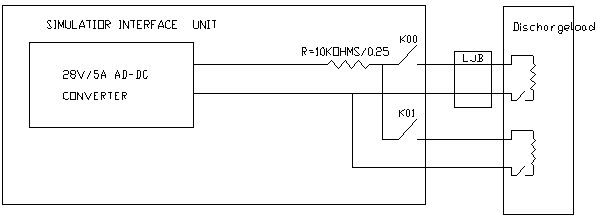


**Fig 17: Relay circuit**

**9.5 BATTERY SIMULATION:**

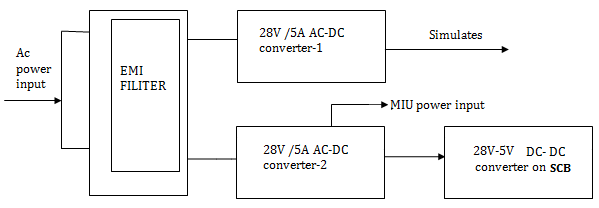
The battery simulation circuit requires a power source, a current limiting resistor to limit the current in case discharge load is connected and a relay to switch ON or OFF the simulated battery based on the command from checkout system. Digital outputs as to dry the relays for which a source of 28V (coil supply for relays is require and will be provided by MIU).

Battery discharge line of the checkout systems can be cleared by battery simulation with 28V / 5A AC to DC Converter. This converter simulates either two battery whose total load current will be 33.42A or a single battery whose load current will be 4.5A. since this load current cannot be supplied by simulated battery (28V / 5A AC to DC converter), a current limiting resistor of value 10K / 0.25W is put on umbilical line in SIU that takes the simulated battery line in to the discharge load. So battery high line requires a brake which is simulated by SPDT toggle switch (SW 3) provided on simulator junction box.



**9.6 POWER SUPPLY CIRCUIT:**

Two AC-DC Converters (28V/5A output) are required, one is to provide input power to MIU and DC-DC convertor and another one is to simulate battery. DC-DC converter output provides Vcc for OPTO isolator in the SIU. Both power supply modules should be mounted inside the simulator interface unit. Toggle switch is provided for AC input and DC-DC converter output. In the SIU, EMI filter will be used in the power input line to the AC-DC converter. Shielded twisted pair cables should be used for wiring of the power lines from the connector to the input of DC-DC converter.



**9.7 POWER SUPPLY SPECIFICATIONS:**

Power supply will be mounted inside the simulator junction box and the termination of the supply will be through terminal blocks mounted on din-rail and distributed to the OPTO boards and relay contacts.



Input: 230VAC

Outputs: SIM 28V: 28V @5Amps,

PC 5V: 5V @5Amps

SIM 5V: 5V @5Amps.

The following models of MEANWELL will be used in the system

**POWER SUPPLY (AC-DC):**

RSP-150-27: 28V @ 5Amps (SIM 28V).

MODEL: S-150-27

SPECIFICATION

DC OUTPUT VOLTAGE: 28V

OUTPUT V. TOLERANCE: ±1%

OUTPUT RATED CURRENT: 5.6A

OUTPUT CURRENT RANGE: 0-5.6A

RIPPLE & NOISE: 240mV (p-p)

Two AC-DC converters of 28V/5A output required one to provide input power to MIU and dc-dc convertor and another one to simulate battery. Dc –dc converter output provides vcc

DC-DC Converter specs:

Make: Murata

Part no: UWR-5/2000-D24E-C

Input voltage: 18-36V

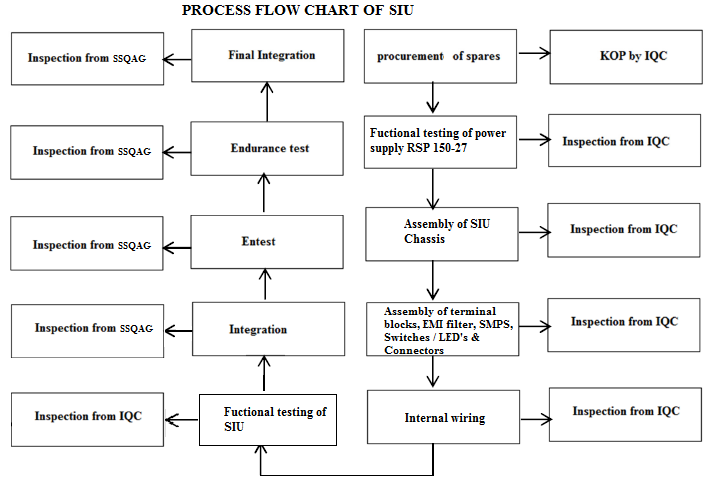
Output: 5V/2A-10W

Efficiency>80%

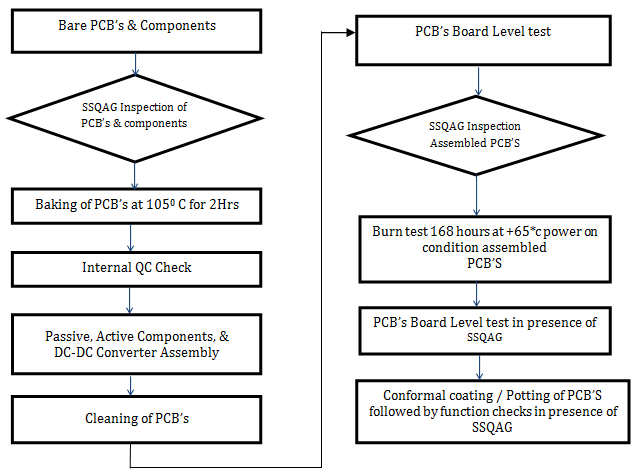
Line regulation: ±0.2%

Load regulation: ±0.5%

**9.7.1 PROCESS FLOW CHART OF SIU**



**PROCESS FLOW CHART OF PCB**

****

|  |  |  |  |
| --- | --- | --- | --- |
| **PN.**  **No.** | **DESCRIPTION** | **TOOLS** | **REMARKS** |
| **1** | **Procurement of Spare (KOP) Components Inspection** | -- | Inspection by IQC |
|  | 1. Identify the components as per the BOM. The components are accepted based on label/Marking available on the component 2. Check the component Part No. & Conformance of Certificates (for main components) 3. Visually inspect components if any damages are there 4. They are checked for visual defects like bending of termination, tarnish terminations & surface imperfection etc. 5. Check all the components are at proper position as per the layout drawing | 10X Magnifier &Multimeter | Inspection by SSQAG |
| **2** | **Functional Testing** | -- | -- |
|  | Functional testing of the SMPS by connecting 230V AC and check the output (28VDC) | -- | Inspection by IQC |
| 3 | Assembly of SIU Chassis | -- |
| 4 | Assembly of terminal block, EMI filters, SMPS switches, LED’s & connectors | -- |
| 5 | Internal wiring | -- |
| 6 | Functional test of SIU | Ref “ Annexure F” |
| 7 | Integration | -- | Inspection by SSQAG |
| 8 | Entest as mentioned in Table – 3 & 4 | -- |
| 9 | Endurance test as mentioned in Table – 3 & 4 | -- |
| 10 | Final Integration | -- |

|  |  |  |  |
| --- | --- | --- | --- |
| **PN.**  **No.** | **DESCRIPTION** | **TOOLS** | **REMARKS** |
| **1** | **Bare PCB’s , Components& Procurement** |  |  |
|  | Visually inspect the PCBs using 10X microscope for any voids, burns, bubbles & surface imperfection etc.  As per KOP the components will be inspected P/N, make & temp range | 10X Magnifier, Multimeter, Measuring Scale & Vernier | SSQAG Inspection |
| **2** | Baking of PCB’s |  |  |
|  | Baking of PCB’s at 1050 for 2 Hrs. | Thermal Chamber | Inspection by IQC |
| **3** | **Passive & Active Components Assembly** |  |  |
|  | Each components will be monitored individually |  | Inspection by IQC |
| **4** | **Cleaning of PCB’s** |  |  |
|  | Clean the soldered PCB’s with isopropyl alcohol as per the two tray cleaning method, The two trays shall be filled with isopropyl alcohol; The unclean PCB shall be placed in first tray for 30 min’s. Then clean the board with a Nylon brush. | Isopropyl Alcohol, Trays & Nylon Brush | Inspection by Datasol QC |
| **5** | **Board Level PCB TESTING** |  |  |
|  | Assembled PCB is submitted to SSAQAG for Inspection | 10X Magnifier | SSQAG Inspection. |
| **6** | **Burn test** |  |  |
|  | Assembled PCB’s kept in power on condition in 550 C up to 168 hrs |  |  |
| **7** | **Board Level PCB TESTING** |  | Inspection by Datasol QC |
| **8** | **Conformal Coating** |  |  |
|  | Clean the assembled PCBs with isopropyl alcohol by three tray method & dry it at 650C ± 50C for 4 Hrs. to remove trapped moisture, Masking of PCB to be done before the baking of PCB. Then baking of PCB for 2 Hrs. at 1050C | Conformal Coating Material: Silicon Based or Acrylic based spray, that conforms to MIL-I-46058C |  |

**9.8 ELECTRICAL CONFIGURATION FOR SIU:**

All the cables used for wiring will be of LCSO approved PTFE/TEFLON insulated silver-plated copper wire. The following cables are used for wiring.

Teflon cables: 22/19/34E for signal wiring and 20/19/32E, for power wiring. The type of cable used on each connector is mentioned in the following table.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SL NO.** | **CONNECTOR REF** | **CONNECTOR PART NO** | **NO. OF WIRES** | **AWG** | **USED PINS** | **UNUSED PINS** |
| 1 | J1 | MS3470-W12-3PN | 3 | 20AWG | A,B,C | NIL |
| 2 | J101 | MS3470-W12-10SN | 4 | 20AWG | A,B,C,D | E,F,G,H,J,K |
| 3 | M1 | MS3470-W24-61SN | 60 | 20AWG | A to Z,a to Z,AA to NN | PP |
| 4 | M2 | MS3470-W24-61PN | 60 | 20AWG | A to Z,a to Z,AA to NN | PP |
| 5 | M3 | MS3470-W22-55PN | 52 | 20AWG | A to Z,a to Z,AA to GG | y, GG, HH |
| 6 | M4 | D38999-20WG 35PN | 78 | 22AWG | 1 to 78 | 79 |
| 7 | M5 | D38999-20WH-35PN | 99 | 22AWG | 1 to 99 | 100 |
| 8 | DOP-J103 | D38999 20WF35PN | 35 | 22AWG | 1 to 20, 22 to 35, | 21, 36 to 66 |
| 9 | DIP-J104 | D38999 20WJ 35PN | 96 | 22AWG | 1 to 88, 95 to102 | 89 to 94, 103 to 128 |
| 10 | DAC/ADC-J102 | D38999-20WJ-35SN | 69 | 22AWG | 1 to 57, 61 to 72 | 58 to 60, 73 to 128 |

**9.8.1 SIU INTERNAL WIRING DETAILS.**

**9.8.2 J1 CONNECTOR**

**P/N: MS3470 W12 3PN**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **J1** | **EMI FLTR** | **SIU PW SWITCH** |  | **SIU PW SWITCH** | **TB** | **MIU PWR SUPP** | **SIM PWR SUPP** | **WIRE** | **COLOUR** | **SIGNAL** | **REMARKS** |
| A | P | COM1 | NO1 | TB 1 | L | L | 20AWG | RED | AC LINE |  |
| B | N | COM2 | NO2 | TB 2 | N | N | 20AWG | BLACK | AC NEUTRAL |  |
| C | - |  |  |  | TB 3 | E | E | 20AWG | GREEN | EARTH |  |

**9.8.3 J101 CONNECTOR**

**P/N: MS3470 W12 10SN**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **J101** | **TB** | **MIU PW SWITCH** |  | **SCB CONN / MIU PW SWITCH** | **TB** | **MIU PWR SUPP** | **WIRE** | **COLOUR** | **SIGNAL** | **REMARKS** |
| A | TB6 | NO1 | B1P2,61 | TB 4 | H | 20AWG | RED | 28V HIGH |  |
| C | COM 1 |
| B | TB5 | NO2 | B1P2,62 | TB 5 | L | 20AWG | BLACK | 28V LOW |  |
| D | COM2 |

**9.8.4 J102 CONNECTOR**

**P/N: D38999 20WJ 35SN**

| **Resource allocated** | **SIU connector** | **SIU TB** | **SCB CON** |
| --- | --- | --- | --- |
| ADC0 | SJ102.01 |  | B1D6, 1 |
| AGND | SJ102.49 | TB 10 | B1D6, 2 |
| ADC1 | SJ102.02 |  | B1D6, 3 |
| AGND | SJ102.50 | TB 10 | B1D6, 4 |
| ADC2 | SJ102.03 |  | B1D6, 5 |
| AGND | SJ102.51 | TB 10 | B1D6, 6 |
| ADC3 | SJ102.04 |  | B1D6, 7 |
| AGND | SJ102.52 | TB 10 | B1D6, 8 |
| ADC4 | SJ102.05 |  | B1D6, 9 |
| AGND | SJ102.53 | TB 10 | B1D6, 10 |
| ADC5 | SJ102.06 |  | B1D6, 11 |
| AGND | SJ102.54 | TB 10 | B1D6, 12 |
| ADC6 | SJ102.07 |  | B1D6, 13 |
| AGND | SJ102.55 | TB 10 | B1D6, 14 |
| ADC7 | SJ102.08 |  | B1D6, 15 |
| AGND | SJ102.56 | TB 10 | B1D6, 16 |
| ADC8 | SJ102.09 |  | B1D6, 17 |
| AGND | SJ102.57 | TB 10 | B1D6, 18 |
| ADC9 | SJ102.10 |  | B1D6, 19 |
| AGND |  | TB 10 | B1D6, 20 |
| ADC10 | SJ102.11 |  | B1D6, 21 |
| AGND |  | TB 10 | B1D6, 22 |
| ADC11 | SJ102.12 |  | B1D6, 23 |
| AGND |  | TB 10 | B1D6, 24 |
| ADC12 | SJ102.13 |  | B1D6, 25 |
| AGND |  | TB 10 | B1D6, 26 |
| ADC13 | SJ102.14 |  | B1D6, 27 |
| AGND |  | TB 10 | B1D6, 28 |
| ADC14 | SJ102.15 |  | B1D6, 29 |
| AGND |  | TB 10 | B1D6, 30 |
| ADC15 | SJ102.16 |  | B1D6, 31 |
| AGND |  | TB 10 | B1D6, 32 |
| ADC16 | SJ102.17 |  | B1D6, 33 |
| AGND |  | TB 10 | B1D6, 34 |
| ADC17 | SJ102.18 |  | B1D6,35 |
| AGND |  | TB 10 | B1D6, 36 |
| ADC18 | SJ102.19 |  | B1D6, 37 |
| AGND |  | TB 10 | B1D6,38 |
| ADC19 | SJ102.20 |  | B1D6, 39 |
| AGND |  | TB 10 | B1D6, 40 |
| ADC20 | SJ102.21 |  | B1D6, 41 |
| AGND |  | TB 10 | B1D6, 42 |
| ADC21 | SJ102.22 |  | B1D6, 43 |
| AGND |  | TB 10 | B1D6, 44 |
| ADC22 | SJ102.23 |  | B1D6, 45 |
| AGND |  | TB 10 | B1D6, 46 |
| ADC23 | SJ102.24 |  | B1D6, 47 |
| AGND |  | TB 10 | B1D6, 48 |
| ADC24 | SJ102.25 |  | B2D6, 1 |
| AGND |  | TB 10 | B2D6, 2 |
| ADC25 | SJ102.26 |  | B2D6, 3 |
| AGND |  | TB 10 | B2D6, 4 |
| ADC26 | SJ102.27 |  | B2D6, 5 |
| AGND |  | TB 10 | B2D6, 6 |
| ADC27 | SJ102.28 |  | B2D6, 7 |
| AGND |  | TB 10 | B2D6, 8 |
| ADC28 | SJ102.29 |  | B2D6, 9 |
| AGND |  | TB 10 | B2D6, 10 |
| ADC29 | SJ102.30 |  | B2D6, 11 |
| AGND |  | TB 10 | B2D6, 12 |
| ADC30, | SJ102.31 |  | B2D6, 13 |
| AGND, RLY1 COM |  | TB 10 | B2D6, 14 |
| ADC31 | SJ102.32 |  | B2D6, 15 |
| AGND,RLY2 COM |  | TB 10 | B2D6, 16 |
| ADC32 | SJ102.33 |  | B2D6, 17 |
| AGND, RLY3 COM |  | TB 10 | B2D6, 18 |
| ADC33, | SJ102.34 |  | B2D6, 19 |
| AGND, RLY4 COM |  | TB 10 | B2D6, 20 |
| ADC34 | SJ102.35 |  | B2D6, 21 |
| AGND, RLY5 COM |  | TB 10 | B2D6, 22 |
| ADC 35 | SJ102.36 |  | B2D6, 23 |
| AGND |  | TB 10 | B2D6, 24 |
| ADC 36 | SJ102.37 |  | B2D6, 25 |
| AGND |  | TB 10 | B2D6, 26 |
| ADC37 | SJ102.38 |  | B2D6, 27 |
| AGND |  | TB 10 | B2D6, 28 |
| ADC 38 | SJ102.39 |  | B2D6, 29 |
| AGND |  | TB 10 | B2D6, 30 |
| ADC 39 | SJ102.40 |  | B2D6, 31 |
| AGND |  | TB 10 | B2D6, 32 |
| ADC 40 | SJ102.41 |  | B2D6,33 |
| AGND |  | TB 10 | B2D6, 34 |
| ADC 41 | SJ102.42 |  | B2D6, 35 |
| AGND |  | TB 10 | B2D6, 36 |
| ADC 42 | SJ102.43 |  | B2D6, 37 |
| AGND |  | TB 10 | B2D6, 38 |
| ADC 43 | SJ102.44 |  | B2D6, 39 |
| AGND |  | TB 10 | B2D6, 40 |
| ADC 44 | SJ102.45 |  | B2D6, 41 |
| AGND |  | TB 10 | B2D6, 42 |
| ADC 45 | SJ102.46 |  | B2D6, 43 |
| AGND |  | TB 10 | B2D6, 44 |
| ADC 46 | SJ102.47 |  | B2D6, 45 |
| AGND |  | TB 10 | B2D6, 46 |
| ADC 47 | SJ102.48 |  | B2D6, 47 |
| AGND |  | TB 10 | B2D6, 48 |

**9.8.5 J103 CONNECTOR**

**P/N: D38999 20WF 35PN**

| **DOP** | **SIU connector** | **SIU TB** | **SCB CON** |
| --- | --- | --- | --- |
| DOP 01 | J103.1 |  | B1D4, 20 |
|  |  | TB-29 | B1D4, 1 |
| DOP 02 | J103.2 |  | B1D4, 21 |
|  |  | TB-29 | B1D4, 2 |
| DOP 03 | J103.3 |  | B1D4, 22 |
|  |  | TB-29 | B1D4, 3 |
| DOP 04 | J103.4 |  | B1D4, 23 |
|  |  | TB-29 | B1D4, 4 |
| DOP 05 | J103.5 |  | B1D4, 24 |
|  |  | TB-29 | B1D4, 5 |
| DOP06 | J103.6 |  | B1D4, 25 |
|  |  | TB-29 | B1D4, 6 |
| DOP08 | J103.7 |  | B1D4, 26 |
|  |  | TB-29 | B1D4, 7 |
| DOP09 | J103.8 |  | B1D4, 27 |
|  |  | TB-29 | B1D4, 8 |
| DOP10 | J103.9 |  | B1D4, 28 |
|  |  | TB-29 | B1D4, 9 |
| DOP11 | J103.10 |  | B1D4, 29 |
|  |  | TB-29 | B1D4, 10 |
| DOP12 | J103.11 |  | B1D4, 30 |
|  |  | TB-29 | B1D4, 11 |
| DOP13 | J103.12 |  | B1D4, 31 |
|  |  | TB-29 | B1D4,12 |
| DOP15 | J103.13 |  | B1D4, 32 |
|  |  | TB-29 | B1D4, 13 |
| DOP16 | J103.14 |  | B1D4, 33 |
|  |  | TB-29 | B1D4, 14 |
| DOP17 | J103.15 |  | B1D4, 34 |
|  |  | TB-29 | B1D4, 15 |
| DOP18 | J103.16 |  | B1D4, 35 |
|  |  | TB-29 | B1D4, 16 |
| DOP19 | J103.17 |  | B2D4, 20 |
|  |  | TB-29 | B2D4, 1 |
| DOP20 | J103.18 |  | B2D4, 21 |
|  |  | TB-29 | B2D4, 2 |
| DOP22 | J103.22 |  | B2D4, 22 |
|  |  | TB-29 | B2D4, 3 |
| DOP23 | J103.23 |  | B2D4, 23 |
|  |  | TB-29 | B2D4, 4 |
| DOP24 | J103.24 |  | B2D4, 24 |
|  |  | TB-29 | B2D4, 5 |
| DOP25 | J103.25 |  | B2D4, 25 |
|  |  | TB-29 | B2D4, 6 |
| DOP26 | J103.26 |  | B2D4, 26 |
|  |  | TB-29 | B2D4, 7 |
| DOP27 | J103.27 |  | B2D4, 27 |
|  |  | TB-29 | B2D4, 8 |
| DOP29 | J103.28 |  | B2D4, 28 |
|  |  | TB-29 | B2D4, 9 |
| DOP30 | J103.29 |  | B2D4, 29 |
|  |  | TB-29 | B2D4, 10 |
| DOP31 | J103.30 |  | B2D4, 30 |
|  |  | TB-29 | B2D4, 11 |
| DOP32 | J103.31 |  | B2D4, 31 |
|  |  | TB-29 | B2D4, 12 |
| DOP33 | J103.32 |  | B2D4, 32 |
|  |  | TB-29 | B2D4, 13 |
| DOP34 | J103.33 |  | B2D4, 33 |
|  |  | TB-29 | B2D4, 14 |
| DOP36 | J103.34 |  | B2D4, 34 |
|  |  | TB-29 | B2D4, 15 |
| DOP37 | J103.35 |  | B2D4, 35 |
|  |  | TB-29 | B2D4, 16 |
|  | J103.19 | TB-29 |  |
|  | J103.20 | TB-29 |  |
|  | J103.21 |  |  |
| DOP 38 | J103.36 |  |  |
| DOP 39 | J103.37 |  |  |
| DOP 40 | J103.38 |  |  |
| DOP 41 | J103.39 |  |  |
| DOP 42 | J103.40 |  |  |
| DOP 43 | J103.41 |  |  |
| DOP 44 | J103.42 |  |  |
| DOP 45 | J103.43 |  |  |

**9.8.6 J104 CONNECTOR**

**P/N: D38999 20WJ 35PN**

| **Resource allocated** | **SIU connector** | **SCB Connector** |
| --- | --- | --- |
| DIP0 | SJ104.1 | B1D5, 7 |
| DIP1 | SJ104.2 | B1D5, 8 |
| DIP2 | SJ104.3 | B1D5, 9 |
| DIP3 | SJ104.4 | B1D5, 10 |
| DIP4 | SJ104.5 | B1D5, 11 |
| DIP5 | SJ104.6 | B1D5, 12 |
| DIP6 | SJ104.7 | B1D5, 13 |
| DIP7 | SJ104.8 | B1D5, 14 |
| DIP8 | SJ104.9 | B1D5, 15 |
| DIP9 | SJ104.10 | B1D5, 16 |
| DIP10 | SJ104.11 | B1D5, 17 |
| DIP11 | SJ104.12 | B1D5, 18 |
| DIP12 | SJ104.13 | B1D5, 19 |
| DIP13 | SJ104.14 | B1D5, 20 |
| DIP14 | SJ104.15 | B1D5, 21 |
| DIP15 | SJ104.16 | B1D5, 28 |
| DIP16 | SJ104.17 | B1D5, 29 |
| DIP17 | SJ104.18 | B1D5, 30 |
| DIP18 | SJ104.19 | B1D5, 31 |
| DIP19 | SJ104.20 | B1D5, 32 |
| DIP20 | SJ104.21 | B1D5, 33 |
| DIP21 | SJ104.22 | B1D5, 34 |
| DIP22 | SJ104.23 | B1D5, 35 |
| DIP23 | SJ104.24 | B1D5, 36 |
| DIP24 | SJ104.25 | B1D5, 37 |
| DIP25 | SJ104.26 | B1D5, 38 |
| DIP26 | SJ104.27 | B1D5, 39 |
| DIP27 | SJ104.28 | B1D5, 40 |
| DIP28 | SJ104.29 | B1D5, 41 |
| DIP29 | SJ104.30 | B1D5, 42 |
| DIP30 | SJ104.31 | B1D5, 47 |
| DIP31 | SJ104.32 | B1D5, 48 |
| DIP32 | SJ104.33 | B1D5, 49 |
| DIP33 | SJ104.34 | B1D5, 50 |
| DIP34 | SJ104.35 | B1D5, 51 |
| DIP35 | SJ104.36 | B1D5, 52 |
| DIP36 | SJ104.37 | B1D5, 53 |
| DIP 37 | SJ104.38 | B1D5, 54 |
| DIP 38 | SJ104.39 | B1D5, 55 |
| DIP39 | SJ104.40 | B1D5, 56 |
| DIP40 | SJ104.41 | B1D5, 57 |
| DIP41 | SJ104.42 | B1D5, 58 |
| DIP42 | SJ104.43 | B1D5, 59 |
| DIP43 | SJ104.44 | B1D5, 60 |
| DIP44 | SJ104.45 | B2D5, 7 |
| DIP45 | SJ104.46 | B2D5, 8 |
| DIP46 | SJ104.47 | B2D5, 9 |
| DIP47 | SJ104.48 | B2D5, 10 |
| DIP48 | SJ104.49 | B2D5, 11 |
| DIP49 | SJ104.50 | B2D5, 12 |
| DIP50 | SJ104.51 | B2D5, 13 |
| DIP51 | SJ104.52 | B2D5, 14 |
| DIP52 | SJ104.53 | B2D5, 15 |
| DIP53 | P105.103 | B2D5, 16 |
| DIP54 | P105.104 | B2D5, 17 |
| DIP55 | P102.112 | B2D5, 18 |
| DIP56 | P102.113 | B2D5, 19 |
| DIP57 | P103.29 | B2D5, 20 |
| DIP58 | P103.30 | B2D5, 21 |
| DIP59 | P103.31 | B2D5, 28 |
| DIP60 | P103.32 | B2D5, 29 |
| DIP61 | P103.33 | B2D5, 30 |
| DIP62 | P103.34 | B2D5, 31 |
| DIP63 | P103.35 | B2D5, 32 |
| DIP64 | P103.36 | B2D5, 33 |
| DIP65 | P103.37 | B2D5, 34 |
| DIP66 | P103.38 | B2D5, 35 |
| DIP67 | P103.39 | B2D5, 36 |
| DIP68 | SJ104.69 | B2D5, 37 |
| DIP 69 | SJ104.70 | B2D5, 38 |
| DIP 70 | SJ104.71 | B2D5, 39 |
| DIP 71 | SJ104.72 | B2D5, 40 |
| DIP 72 | SJ104.73 | B2D5, 41 |
| DIP 73 | SJ104.74 | B2D5, 42 |
| DIP74 | SJ104.75 | B2D5, 47 |
| DIP75 | SJ104.76 | B2D5, 48 |
| DIP76 | SJ104.77 | B2D5, 49 |
| DIP77 | SJ104.78 | B2D5, 50 |
| DIP78 | SJ104.79 | B2D5, 51 |
| DIP79 | SJ104.80 | B2D5, 52 |
| DIP80 | SJ104.81 | B1D5, 1 |
| DIP81 | SJ104.82 | B1D5, 22 |
| DIP82 | SJ104.83 | B1D5, 2 |
| DIP83 | SJ104.84 | B1D5, 23 |
| DIP84 | SJ104.85 | B1D5, 3 |
| DIP85 | SJ104.86 | B1D5, 24 |
| DIP86 | SJ104.87 | B1D5, 4 |
| DIP87 | SJ104.88 | B1D5, 25 |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| **Resource allocated** | **SIU connector** | **SIU TB** |
| DIGITAL INPUT RETURN | SJ104.95 | TB 10 |
| DIGITAL INPUT RETURN | SJ104.96 | TB 10 |
| DIGITAL INPUT RETURN | SJ104.97 | TB 10 |
| DIGITAL INPUT RETURN | SJ104.98 | TB 10 |
| DIGITAL INPUT RETURN | SJ104.99 | TB 10 |
| DIGITAL INPUT RETURN | SJ104.100 | TB 10 |
| DIGITAL INPUT RETURN | SJ104.101 | TB 10 |
| DIGITAL INPUT RETURN | SJ104.102 | TB 10 |

**9.8.7 M1 CONNECTOR**

**P/N: MS3470 W24 61SN**

| **Resource allocated** | **SCB CON** | **SIU TB** | **Connector pin details** |
| --- | --- | --- | --- |
| DIP0 | B1D2, 7 |  | M1.A |
| DIP1 | B1D2, 8 |  | M1.B |
| DIP2 | B1D2, 9 |  | M1.C |
| DIP3 | B1D2, 10 |  | M1.D |
| DIP4 | B1D2, 11 |  | M1.E |
| DIP5 | B1D2, 12 |  | M1.F |
| DIP6 | B1D2, 13 |  | M1.G |
| DIP7 | B1D2, 14 |  | M1.H |
| DIP8 | B1D2, 15 |  | M1.J |
| DIP9 | B1D2, 16 |  | M1.K |
| DIP10 | B1D2, 17 |  | M1.L |
| DIP11 | B1D2, 18 |  | M1.M |
| DIP12 | B1D2, 19 |  | M1.N |
| DIP13 | B1D2, 20 |  | M1.P |
| DIP14 | B1D2, 21 |  | M1.R |
| DIP15 | B1D2, 28 |  | M1.S |
| DIP16 | B1D2, 29 |  | M1.T |
| DIP17 | B1D2, 30 |  | M1.U |
| DIP18 | B1D2, 31 |  | M1.V |
| DIP19 | B1D2, 32 |  | M1.W |
| DIP20 | B1D2, 33 |  | M1.X |
| DIP21 | B1D2, 34 |  | M1.Y |
| DIP22 | B1D2, 35 |  | M1.Z |
| DIP23 | B1D2, 36 |  | M1.a |
| DIP24 | B1D2, 37 |  | M1.b |
| DIP25 | B1D2, 38 |  | M1.c |
| DIP26 | B1D2, 39 |  | M1.d |
| DIP27 | B1D2, 40 |  | M1.e |
| DIP80 | B1D2, 2 |  | M1.f |
| DIP81 | B1D2, 23 |  | M1.g |
| DIP82 | B1D2, 44 |  | M1.h |
| DIP83 | B1D2, 4 |  | M1.i |
| DIP84 | B1D2, 25 |  | M1.j |
| DIP85 | B1D2, 46 |  | M1.k |
| DIP86 | B1D2, 6 |  | M1.m |
| DIP87 | B1D2, 27 |  | M1.n |
|  | B1D2, 1,22,43,3 | TB 8 | M1.p |
|  | B1D2, 24,45,5,26 | TB 9 | M1.q |
| DIP28 | B1D2, 41 |  | M1.r |
|  |  | TB 10 | M1.s |
| DIP29 | B1D2, 42 |  | M1.t |
|  |  | TB 10 | M1.u |
| DIP30 | B1D2, 47 |  | M1.v |
|  |  | TB 10 | M1.w |
| DIP31 | B1D2, 48 |  | M1.x |
|  |  | TB 10 | M1.y |
| DIP32 | B1D2, 49 |  | M1.z |
| DIP33 | B1D2, 50 |  | M1.AA |
|  |  | TB 10 | M1.BB |
|  |  | TB 10 | M1.CC |
|  |  | TB 10 | M1.DD |
|  |  | TB 10 | M1.EE |
|  |  | TB 10 | M1.FF |
|  |  | TB 10 | M1.GG |
|  |  | TB 10 | M1.HH |
|  |  | TB 10 | M1.JJ |
|  |  | TB 10 | M1.KK |
|  |  | TB 10 | M1.LL |
|  |  | TB 10 | M1.MM |
|  |  | TB 10 | M1.NN |

**9.8.8 M2 CONNECTOR**

**P/N: MS3470 W24 61PN**

| **Resource allocated** | **SCB CON** | **SIU TB** | **Connector pin details** |
| --- | --- | --- | --- |
| ADC0 | B1D3, 1 |  | M2.A |
| AGND | B1D3, 2 |  | M2.B |
| ADC1 | B1D3, 3 |  | M2.C |
| AGND | B1D3, 4 |  | M2.D |
| ADC2 | B1D3, 5 |  | M2.E |
| AGND | B1D3, 6 |  | M2.F |
| ADC3 | B1D3, 7 |  | M2.G |
| AGND | B1D3, 8 |  | M2.H |
| ADC4 | B1D3, 9 |  | M2.J |
| AGND | B1D3, 10 |  | M2.K |
| ADC5 | B1D3, 11 |  | M2.L |
| AGND | B1D3, 12 |  | M2.M |
| ADC6 | B1D3, 13 |  | M2.N |
| AGND | B1D3, 14 |  | M2.P |
| ADC7 | B1D3, 15 |  | M2.R |
| AGND | B1D3, 16 |  | M2.S |
| ADC8 | B1D3, 17 |  | M2.T |
| AGND | B1D3, 18 |  | M2.U |
| ADC9 | B1D3, 19 |  | M2.V |
| AGND | B1D3, 20 |  | M2.W |
| ADC10 | B1D3, 21 |  | M2.X |
| AGND | B1D3, 22 |  | M2.Y |
| ADC11 | B1D3, 23 |  | M2.Z |
| AGND | B1D3, 24 |  | M2.a |
| ADC12 | B1D3, 25 |  | M2.b |
| AGND | B1D3, 26 |  | M2.c |
| ADC13 | B1D3, 27 |  | M2.d |
| AGND | B1D3, 28 |  | M2.e |
| ADC14 | B1D3, 29 |  | M2.f |
| AGND | B1D3, 30 |  | M2.g |
| ADC15 | B1D3, 31 |  | M2.h |
| AGND | B1D3, 32 |  | M2.i |
| ADC16 | B1D3, 33 |  | M2.j |
| AGND | B1D3, 34 |  | M2.k |
| ADC17 | B1D3, 35 |  | M2.m |
| AGND | B1D3, 36 |  | M2.n |
| ADC18 | B1D3, 37 |  | M2.p |
| AGND | B1D3, 38 |  | M2.q |
| ADC19 | B1D3, 39 |  | M2.r |
| AGND | B1D3, 40 |  | M2.s |
| ADC20 | B1D3, 41 |  | M2.t |
| AGND | B1D3, 42 |  | M2.u |
| ADC21 | B1D3, 43 |  | M2.v |
| AGND | B1D3, 44 |  | M2.w |
| ADC22 | B1D3, 45 |  | M2.x |
| AGND | B1D3, 46 |  | M2.y |
| ADC23 | B1D3, 47 |  | M2.z |
| AGND | B1D3, 48 |  | M2.AA |
| ADC24 | B2D3, 1 |  | M2.BB |
| AGND | B2D3, 2 |  | M2.CC |
| ADC25 | B2D3, 3 |  | M2.DD |
| AGND | B2D3, 4 |  | M2.EE |
| ADC26 | B2D3, 5 |  | M2.FF |
| AGND | B2D3, 6 |  | M2.GG |
| ADC27 | B2D3, 7 |  | M2.HH |
| AGND | B2D3, 8 |  | M2.JJ |
| ADC28 | B2D3, 9 |  | M2.KK |
| AGND | B2D3, 10 |  | M2.LL |
| ADC29 | B2D3, 11 |  | M2.MM |
| AGND | B2D3, 12 |  | M2.NN |

**9.8.9 M3 CONNECTOR**

**P/N: MS3470 W22 55PN**

| **Resource allocated** | **SCB CON** | **SIU TB** | **Connector pin details** |
| --- | --- | --- | --- |
| ADC30, | B2D3, 13 |  | M3.A |
| AGND, RLY1(CM) | B2D3, 14, B1D1,18 | TB 24 | M3.B |
| RLY1(NC) | B1D1, 34 |  | M3.C |
| ADC31 | B2D3, 15 |  | M3.D |
| AGND,RLY2(CM) | B2D3, 16, B1D1, 19 | TB 25 | M3.E |
| RLY2(NC) | B1D1, 35 |  | M3.F |
| ADC32 | B2D3, 17 |  | M3.G |
| AGND, RLY3(CM) | B2D3, 18, B1D1, 20 | TB 26 | M3.H |
| RLY3(NC) | B1D1, 36 |  | M3.J |
| ADC33, | B2D3, 19 |  | M3.K |
| AGND, RLY4(CM) | B2D3, 20, B1D1, 21 | TB 27 | M3.L |
| RLY4(NC) | B1D1, 37 |  | M3.M |
| ADC34 | B2D3, 21 |  | M3.N |
| AGND, RLY5(CM) | B2D3, 22, B1D1, 22 | TB 28 | M3.P |
| RLY5(NC) | B1D1, 38 |  | M3.R |
| DIP39, input to toggle switches CCSC-1, 2 & 3 NC | B1D2, 56 | TB 11 | M3.S |
|  |  | TB 10 | M3.T |
| DIP40, input to toggle switches CCSC-4 & 5 NC | B1D2, 57 | TB 12 | M3.U |
|  |  |  | M3.V |
| CCSC-1 TS COM |  | TB 11 | M3.W |
| CCSC-2 TS COM |  | TB 11 | M3.X |
| CCSC-3 TS COM |  | TB 11 | M3.Y |
| CCSC-4 TS COM |  | TB 12 | M3.Z |
| CCSC-5 TS COM |  | TB 12 | M3.a |
| U1 CMS |  | TB 18 | M3.b |
|  |  | TB 18 | M3.c |
| U2 CMS |  | TB 19 | M3.d |
|  |  | TB 19 | M3.e |
| U3 CMS |  | TB 20 | M3.f |
|  |  | TB 20 | M3.g |
| GG CMS |  | TB 21 | M3.h |
|  |  | TB 21 | M3.i |
| OM CMS |  | TB 22 | M3.j |
|  |  | TB 22 | M3.k |
| CO CMS |  | TB 23 | M3.m |
|  |  | TB 23 | M3.n |
| 28V(H) |  | TB 16H | M3.p |
|  |  | TB 16H | M3.q |
| RLY 6(CM) | B1D1,23 | TB 13 | M3.r |
|  |  | TB 13 | M3.s |
|  |  | TB 13 | M3.t |
|  |  |  | M3.u |
| RLY 7(CM) | B1D1, 24 | TB 14 | M3.v |
|  |  | TB 14 | M3.w |
|  |  | TB 14 | M3.x |
|  |  |  | M3.y |
| RLY 6-NC | B1D1, 39 | TB 17 | M3.z |
|  |  | TB 17 | M3.AA |
|  |  | TB 17 | M3.BB |
|  |  | TB 17 | M3.CC |
|  |  | TB 17 | M3.DD |
|  |  | TB 17 | M3.EE |
|  |  | TB 17 | M3.FF |
|  |  | TB 17 | M3.GG |
|  |  |  | M3.HH |
| RLY 7-NC | B1D1, 40 | TB 17 |  |
| *RLY 6 & 7 N0 TO 28V(H) THROUGH 10k RESISTOR* |  | TB 15 |  |

**9.9 M4 CONNECTOR**

**P/N: D38999 20WG 35PN**

| **Resource allocated** | **SCB CON** | **SIU TB** | **Connector pin details** |
| --- | --- | --- | --- |
| DIP34 | B1D2, 51 |  | M4.1 |
| DIP35 | B1D2, 52 |  | M4. 3 |
| DIP36 | B1D2,53 |  | M4.5 |
| DIP 37 | B1D2,54 |  | M4.7 |
| DIP 38 | B1D2, 55 |  | M4. 9 |
| DIP41 | B1D2,58 |  | M4. 11 |
| DIP42 | B1D2,59 |  | M4.13 |
| DIP43 | B1D2,60 |  | M4.15 |
| DIP44 | B2D2, 7 |  | M4. 17 |
| DIP45 | B2D2, 8 |  | M4. 19 |
| DIP46 | B2D2, 9 |  | M4.21 |
| DIP47 | B2D2, 10 |  | M4.23 |
| DIP48 | B2D2, 11 |  | M4. 25 |
| DIP49 | B2D2, 12 |  | M4.27 |
| DIP50 | B2D2, 13 |  | M4. 29 |
| DIP51 | B2D2, 14 |  | M4.31 |
| DIP52 | B2D2,15 |  | M4. 33 |
| DIP53 | B2D2,16 |  | M4. 35 |
| DIP54 | B2D2,17 |  | M4. 37 |
| DIP55 | B2D2,18 |  | M4.39 |
| DIP56 | B2D2, 19 |  | M4.41 |
| DIP57 | B2D2, 20 |  | M4.43 |
| DIP58 | B2D2, 21 |  | M4.45 |
| DIP59 | B2D2, 28 |  | M4.47 |
| DIP60 | B2D2, 29 |  | M4.49 |
| DIP61 | B2D2, 30 |  | M4.51 |
| DIP62 | B2D2, 31 |  | M4.53 |
| DIP63 | B2D2, 32 |  | M4.55 |
| DIP64 | B2D2, 33 |  | M4.57 |
| DIP65 | B2D2, 34 |  | M4.59 |
| DIP66 | B2D2, 35 |  | M4.61 |
| DIP67 | B2D2, 36 |  | M4.63 |
| ADC 35 | B2D3, 23 |  | M4.65 |
| AGND | B2D3,24 |  | M4.66 |
| ADC 36 | B2D3, 25 |  | M4.67 |
| AGND | B2D3, 26 |  | M4.68 |
| ADC37 | B2D3, 27 |  | M4.69 |
| AGND | B2D3, 28 |  | M4.70 |
| ADC 38 | B2D3, 29 |  | M4.71 |
| AGND | B2D3, 30 |  | M4.72 |
| ADC 39 | B2D3, 31 |  | M4.73 |
| AGND | B2D3, 32 |  | M4.74 |
| ADC 40 | B2D3,33 |  | M4.75 |
| AGND | B2D3, 34 |  | M4.76 |
| ADC 41 | B2D3, 35 |  | M4.77 |
| AGND | B2D3, 36 |  | M4.78 |
|  |  | TB 10 | M4. 2 |
|  |  | TB 10 | M4.4 |
|  |  | TB 10 | M4. 6 |
|  |  | TB 10 | M4. 8 |
|  |  | TB 10 | M4.10 |
|  |  | TB 10 | M4.12 |
|  |  | TB 10 | M4. 14 |
|  |  | TB 10 | M4. 16 |
|  |  | TB 10 | M4. 18 |
|  |  | TB 10 | M4.20 |
|  |  | TB 10 | M4.22 |
|  |  | TB 10 | M4.24 |
|  |  | TB 10 | M4.26 |
|  |  | TB 10 | M4. 28 |
|  |  | TB 10 | M4.30 |
|  |  | TB 10 | M4.32 |
|  |  | TB 10 | M4.34 |
|  |  | TB 10 | M4.36 |
|  |  | TB 10 | M4. 38 |
|  |  | TB 10 | M4.40 |
|  |  | TB 10 | M4.42 |
|  |  | TB 10 | M4.44 |
|  |  | TB 10 | M4.46 |
|  |  | TB 10 | M4.48 |
|  |  | TB 10 | M4. 50 |
|  |  | TB 10 | M4.52 |
|  |  | TB 10 | M4. 54 |
|  |  | TB 10 | M4.56 |
|  |  | TB 10 | M4.58 |
|  |  | TB 10 | M4.60 |
|  |  | TB 10 | M4.62 |
|  |  | TB 10 | M4. 64 |

**9.9.1 M5 CONNECTOR**

**P/N: D38999 20WH 35PN**

| **Resource allocated** | **SCB CON** | **SIU TB** | **Connector pin details** |
| --- | --- | --- | --- |
| ADC 42 | B2D3, 37 |  | M5.1 |
| AGND | B2D3, 38 |  | M5.2 |
| ADC 43 | B2D3, 39 |  | M5.3 |
| AGND | B2D3, 40 |  | M5.4 |
| ADC 44 | B2D3, 41 |  | M5.5 |
| AGND | B2D3, 42 |  | M5.6 |
| ADC 45 | B2D3, 43 |  | M5.7 |
| AGND | B2D3, 44 |  | M5.8 |
| ADC 46 | B2D3, 45 |  | M5.9 |
| AGND | B2D3, 46 |  | M5.10 |
| ADC 47 | B2D3, 47 |  | M5.11 |
| AGND | B2D3, 48 |  | M5.12 |
| DIP68 | B2D2, 37 |  | M5.13 |
| DIP 69 | B2D2, 38 |  | M5.14 |
| DIP 70 | B2D2, 39 |  | M5.15 |
| DIP 71 | B2D2, 40 |  | M5.16 |
| DIP 72 | B2D2, 41 |  | M5.17 |
| DIP 73 | B2D2, 42 |  | M5.18 |
| DIP74 | B2D2, 47 |  | M5.19 |
| DIP75 | B2D2, 48 |  | M5.20 |
| DIP76 | B2D2, 49 |  | M5.21 |
| DIP77 | B2D2, 50 |  | M5.22 |
| DIP78 | B2D2, 51 |  | M5.23 |
| DIP79 | B2D2, 52 |  | M5.24 |
| *Rly8-NC* | B1D1, 41 |  | M5.25 |
| Rly8-NO | B1D1, 8 |  | M5.26 |
| Rly8-CM | B1D1, 25 |  | M5.27 |
| Rly9-NC | B1D1, 42 |  | M5.28 |
| Rly9-NO | B1D1, 9 |  | M5.29 |
| Rly9-CM | B1D1, 26 |  | M5.30 |
| Rly10-NC | B1D1, 43 |  | M5.31 |
| Rly10-NO | B1D1, 10 |  | M5.32 |
| Rly10-CM | B1D1, 27 |  | M5.33 |
| Rly11-NC | B1D1, 44 |  | M5.34 |
| Rly11-NO | B1D1, 11 |  | M5.35 |
| Rly11-CM | B1D1, 28 |  | M5.36 |
| Rly12-NC | B1D1, 45 |  | M5.37 |
| Rly12-NO | B1D1, 12 |  | M5.38 |
| Rly12-CM | B1D1, 29 |  | M5.39 |
| Rly13-NC | B1D1, 46 |  | M5.40 |
| Rly13-NO | B1D1, 13 |  | M5.41 |
| Rly13-CM | B1D1, 30 |  | M5.42 |
| Rly14-NC | B1D1, 47 |  | M5.43 |
| Rly14-NO | B1D1, 14 |  | M5.44 |
| Rly14-CM | B1D1, 31 |  | M5.45 |
| Rly15-NC | B1D1, 48 |  | M5.46 |
| Rly15-NO | B1D1, 15 |  | M5.47 |
| Rly15-CM | B1D1, 32 |  | M5.48 |
| Rly16-NC | B1D1, 49 |  | M5.49 |
| Rly16-NO | B1D1, 16 |  | M5.50 |
| Rly16-CM | B1D1, 33 |  | M5.51 |
| Rly17-NC | B2D1, 34 |  | M5.52 |
| Rly17-NO | B2D1, 1 |  | M5.53 |
| Rly17-CM | B2D1, 18 |  | M5.54 |
| Rly18-NC | B2D1, 35 |  | M5.55 |
| Rly18-NO | B2D1, 2 |  | M5.56 |
| Rly18-CM | B2D1, 19 |  | M5.57 |
| Rly19-NC | B2D1, 36 |  | M5.58 |
| Rly19-NO | B2D1, 3 |  | M5.59 |
| Rly19-CM | B2D1, 20 |  | M5.60 |
| Rly20-NC | B2D1, 37 |  | M5.61 |
| Rly20-NO | B2D1, 4 |  | M5.62 |
| Rly20-CM | B2D1, 21 |  | M5.63 |
| Rly21-NC | B2D1, 38 |  | M5.64 |
| Rly21-NO | B2D1, 5 |  | M5.65 |
| Rly21-CM | B2D1, 22 |  | M5.66 |
| Rly22-NC | B2D1, 39 |  | M5.67 |
| Rly22-NO | B2D1, 6 |  | M5.68 |
| Rly22-CM | B2D1, 23 |  | M5.69 |
| Rly23-NC | B2D1, 40 |  | M5.70 |
| Rly23-NO | B2D1, 7 |  | M5.71 |
| Rly23-CM | B2D1, 24 |  | M5.72 |
| Rly24-NC | B2D1, 41 |  | M5.73 |
| Rly24-NO | B2D1, 8 |  | M5.74 |
| Rly24-CM | B2D1, 25 |  | M5.75 |
| Rly25-NC | B2D1, 42 |  | M5.76 |
| Rly25-NO | B2D1, 9 |  | M5.77 |
| Rly25-CM | B2D1,26 |  | M5.78 |
| Rly26-NC | B2D1, 43 |  | M5.79 |
| Rly26-NO | B2D1, 10 |  | M5.80 |
| Rly26-CM | B2D1, 27 |  | M5.81 |
| Rly27-NC | B2D1, 44 |  | M5.82 |
| Rly27-NO | B2D1, 11 |  | M5.83 |
| Rly27-CM | B2D1,28 |  | M5.84 |
| Rly28-NC | B2D1, 45 |  | M5.85 |
| Rly28-NO | B2D1, 12 |  | M5.86 |
| Rly28-CM | B2D1, 29 |  | M5.87 |
| Rly29-NC | B2D1,46 |  | M5.88 |
| Rly29-NO | B2D1, 13 |  | M5.89 |
| Rly29-CM | B2D1, 30 |  | M5.90 |
| Rly30-NC | B2D1, 47 |  | M5.91 |
| Rly30-NO | B2D1, 14 |  | M5.92 |
| Rly30-CM | B2D1, 31 |  | M5.93 |
| Rly31-NC | B2D1, 48 |  | M5.94 |
| Rly31-NO | B2D1, 15 |  | M5.95 |
| Rly31-CM | B2D1, 32 |  | M5.96 |
| Rly32-NC | B2D1, 49 |  | M5.97 |
| Rly32-NO | B2D1, 16 |  | M5.98 |
| Rly32-CM | B2D1, 33 |  | M5.99 |

**10.0 LIST OF CABLE LOOMS**

**10.1 SIU to MIU Cable Electrical Configurations.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SL NO.** | **CONNECTOR REF** | **CONNECTOR PART NO** | **NO. OF WIRES** | **AWG** | **USED PINS** | **UNUSED PINS** |
| 1 | P101 | MS3475-W12-10S | 4 | 20AWG | A to D | E to K |
| 2 | P102 | D38999-26WJ-35SN | 71 | 22AWG | 1 to 4,8 to 15,29 to 32,34 to39,41,43,46,52 to 65,68 to 74 ,76,79 to 82,85,86,87,90 to 99,101 to 105,112,113 | 5,6,7,16 to 28,33,40 ,42,44,45,47 to 51,66,67,75,77,78,83,84,88,89,100,106 to111,114 to 128 |
| 3 | P103 | D38999-26WE-35PN | 38 | 22AWG | 29 to39,42to44 | 1 to 28,40,41,45 to 55 |
| 4 | P104 | D38999-26WE-35PN | 14 | 22AWG | 29 to 39,42 to 44 | 1 to 28,40,41,45 to 55 |
| 5 | P105 | D38999-26WJ-35PN | 99 | 22AWG | 1 to 20,22 to 35,44 to 51,55 to 61,64 to 74,76 to104,107,108 | 21,36 to43,52 to54, 62,63,75,106,105,109 to128 |
| 7 | P108 | D38999-26WE-35SN | 9 | 22AWG | 22 to30, | 1 to 21,31 to 55 |
| 8 | PJ1O1 | MS3475-W12-10P | 4 | 20AWG | A to D | E to K |
| 9 | PJ102 | D38999-26WJ-35PN | 69 | 22AWG | 1 to 57, 61 to 72 | 58 to 60,73 to 128 |
| 10 | PJ103 | D38999-26WF-35SN | 66 | 22AWG | 1 to 35 | 36 to 66 |
| 11 | PJ104 | D38999-26WJ-35SN | 96 | 22AWG | 1 to 88,95 to 102 | 89 to 94, 103 to 128 |

**10.1.1 AC INPUT POWER CABLE FOR SIU**

**LOOM J1**



|  |  |  |
| --- | --- | --- |
| **SIGNAL** | **SIU MATING**  **J1:**MS3470 W12-3PN | **AC PLUG** |
| LINE | A | PHASE |
| NEUTRAL | B | NEUTRAL |
| EARTH | C | EARTH |

**10.1.2 SIU TO MIU CABLE LOOMS**

**LOOM PJ101 TO P101**



|  |  |  |
| --- | --- | --- |
| **SIGNAL** | **SIU MATING**  **PJ101:**MS3475W12-10P | **MIU MATING**  **P101:**MS3475W12-10S |
| 28 V HIGH | A | A |
| 28 V HIGH | C | C |
| 28 V LOW | B | B |
| 28 V LOW | D | D |

* + 1. **PJ102 TO P102 LOOM**



| **Resource allocated** | **SIU MATING**  **PJ102:** D38999 26WJ-35PN | **MIU MATING**  **P102:**D38999/26WJ-35SN |
| --- | --- | --- |
| ADC0 | PJ102.01 | P102.29 |
| ADC1 | PJ102.02 | P102.31 |
| ADC2 | PJ102.03 | P102.34 |
| ADC3 | PJ102.04 | P102.36 |
| ADC4 | PJ102.05 | P102.38 |
| ADC5 | PJ102.06 | P102.41 |
| ADC6 | PJ102.07 | P102.43 |
| ADC7 | PJ102.08 | P102.46 |
| ADC8 | PJ102.09 | P102.52 |
| ADC9 | PJ102.10 | P102.53 |
| ADC10 | PJ102.11 | P102.58 |
| ADC11 | PJ102.12 | P102.59 |
| ADC12 | PJ102.13 | P102.60 |
| ADC13 | PJ102.14 | P102.61 |
| ADC14 | PJ102.15 | P102.62 |
| ADC15 | PJ102.16 | P102.63 |
| ADC16 | PJ102.17 | P102.64 |
| ADC17 | PJ102.18 | P102.65 |
| ADC18 | PJ102.19 | P102.68 |
| ADC19 | PJ102.20 | P102.69 |
| ADC20 | PJ102.21 | P102.70 |
| ADC21 | PJ102.22 | P102.71 |
| ADC22 | PJ102.23 | P102.72 |
| ADC23 | PJ102.24 | P102.73 |
| ADC24 | PJ102.25 | P102.74 |
| ADC25 | PJ102.26 | P102.76 |
| ADC26 | PJ102.27 | P102.79 |
| ADC27 | PJ102.28 | P102.80 |
| ADC28 | PJ102.29 | P102.81 |
| ADC29 | PJ102.30 | P102.82 |
| ADC30, | PJ102.31 | P102.85 |
| ADC31 | PJ102.32 | P102.86 |
| ADC32 | PJ102.33 | P102.87 |
| ADC33, | PJ102.34 | P102.90 |
| ADC34 | PJ102.35 | P102.91 |
| ADC 35 | PJ102.36 | P102.92 |
| ADC 36 | PJ102.37 | P102.93 |
| ADC37 | PJ102.38 | P102.94 |
| ADC 38 | PJ102.39 | P102.95 |
| ADC 39 | PJ102.40 | P102.96 |
| ADC 40 | PJ102.41 | P102.97 |
| ADC 41 | PJ102.42 | P102.98 |
| ADC 42 | PJ102.43 | P102.99 |
| ADC 43 | PJ102.44 | P102.101 |
| ADC 44 | PJ102.45 | P102.102 |
| ADC 45 | PJ102.46 | P102.103 |
| ADC 46 | PJ102.47 | P102.104 |
| ADC 47 | PJ102.48 | P102.105 |
| RET LINES | PJ102.49 | P102.30 |
| RET LINES | PJ102.50 | P102.32 |
| RET LINES | PJ102.51 | P102.35 |
| RET LINES | PJ102.52 | P102.37 |
| RET LINES | PJ102.53 | P102.39 |
| RET LINES | PJ102.54 | P102.54 |
| RET LINES | PJ102.55 | P102.55 |
| RET LINES | PJ102.56 | P102.56 |
| RET LINES | PJ102.57 | P102.57 |
| DAC | PJ102.61 | P102.1 |
| DAC | PJ102.62 | P102.2 |
| DAC | PJ102.63 | P102.3 |
| DAC | PJ102.64 | P102.4 |
| DAC | PJ102.65 | P102.8 |
| DAC | PJ102.66 | P102.9 |
| DAC | PJ102.67 | P102.10 |
| DAC | PJ102.68 | P102.11 |
| DAC | PJ102.69 | P102.12 |
| DAC | PJ102.70 | P102.13 |
| DAC | PJ102.71 | P102.14 |
| DAC | PJ102.72 | P102.15 |

* + 1. **PJ103 to P105 LOOM**



| **Resource allocated** | **SIU MATING**  **PJ103:**D38999-26WF-35SN | **MIU MATING**  **P105:**D38999/26WJ-35PN |
| --- | --- | --- |
| DOP 01 | PJ103.1 | P105.1 |
| DOP 02 | PJ103.2 | P105.2 |
| DOP 03 | PJ103.3 | P105.3 |
| DOP 04 | PJ103.4 | P105.4 |
| DOP 05 | PJ103.5 | P105.5 |
| DOP06 | PJ103.6 | P105.6 |
| DOP08 | PJ103.7 | P105.7 |
| DOP09 | PJ103.8 | P105.8 |
| DOP10 | PJ103.9 | P105.9 |
| DOP11 | PJ103.10 | P105.10 |
| DOP12 | PJ103.11 | P105.11 |
| DOP13 | PJ103.12 | P105.12 |
| DOP15 | PJ103.13 | P105.13 |
| DOP16 | PJ103.14 | P105.14 |
| DOP17 | PJ103.15 | P105.15 |
| DOP18 | PJ103.16 | P105.16 |
| DOP19 | PJ103.17 | P105.17 |
| DOP20 | PJ103.18 | P105.18 |
| DOP22 | PJ103.22 | P105.22 |
| DOP23 | PJ103.23 | P105.23 |
| DOP24 | PJ103.24 | P105.24 |
| DOP25 | PJ103.25 | P105.25 |
| DOP26 | PJ103.26 | P105.26 |
| DOP27 | PJ103.27 | P105.27 |
| DOP29 | PJ103.28 | P105.28 |
| DOP30 | PJ103.29 | P105.29 |
| DOP31 | PJ103.30 | P105.30 |
| DOP32 | PJ103.31 | P105.31 |
| DOP33 | PJ103.32 | P105.32 |
| DOP34 | PJ103.33 | P105.33 |
| DOP36 | PJ103.34 | P105.34 |
| DOP37 | PJ103.35 | P105.35 |
| SHIELD | PJ103.21 | P105.21 |
| C.SUPP(H) | PJ103.19 | P105.19 |
| C.SUPP(H) | PJ103.20 | P105.20 |
| DOP 38 | PJ103.36 | P105.36 |
| DOP 39 | PJ103.37 | P105.37 |
| DOP 40 | PJ103.38 | P105.38 |
| DOP 41 | PJ103.39 | P105.39 |
| DOP 42 | PJ103.40 | P105.40 |
| DOP 43 | PJ103.41 | P105.41 |
| DOP 44 | PJ103.42 | P105.42 |
| DOP 45 | PJ103.43 | P105.43 |

**PJ104 LOOM**



* + 1. **PJ104 TO P102 L00M**

|  |  |  |
| --- | --- | --- |
| **Resource allocated** | **SIU MATING**  **PJ104:**D38999-26WJ-35SN | **MIU MATING**  **P102:**D38999/26WJ-35SN |
| DIP55 | PJ104.56 | P102.112 |
| DIP56 | PJ104.57 | P102.113 |

* + 1. **PJ104 TO P103 LOOM**

| **Resource allocated** | **SIU MATING**  **PJ104:**D38999-26WJ-35SN | **MIU MATING**  **P103:**D38999/26WE-35PN |
| --- | --- | --- |
| DIP57 | PJ104.58 | P103.29 |
| DIP58 | PJ104.59 | P103.30 |
| DIP59 | PJ104.60 | P103.31 |
| DIP60 | PJ104.61 | P103.32 |
| DIP61 | PJ104.62 | P103.33 |
| DIP62 | PJ104.63 | P103.34 |
| DIP63 | PJ104.64 | P103.35 |
| DIP64 | PJ104.65 | P103.36 |
| DIP65 | PJ104.66 | P103.37 |
| DIP66 | PJ104.67 | P103.38 |
| DIP67 | PJ104.68 | P103.39 |
| DIP LOW | PJ104.97 | P103.42 |
| DIP LOW | PJ104.98 | P103.43 |
| DIP LOW | PJ104.100 | P103.42 |
| DIP LOW | PJ104.101 | P103.43 |
| DIP LOW | PJ104.102 | P103.44 |

* + 1. **PJ104 TO P104 LOOM**

|  |  |  |
| --- | --- | --- |
| **Resource allocated** | **SIU MATING**  **PJ104:**D38999-26WJ-35SN | **MIU MATING**  **P104:**D38999/26WE-35PN |
| DIP68 | PJ104.69 | P104.29 |
| DIP 69 | PJ104.70 | P104.30 |
| DIP 70 | PJ104.71 | P104.31 |
| DIP 71 | PJ104.72 | P104.32 |
| DIP 72 | PJ104.73 | P104.33 |
| DIP 73 | PJ104.74 | P104.34 |
| DIP74 | PJ104.75 | P104.35 |
| DIP75 | PJ104.76 | P104.36 |
| DIP76 | PJ104.77 | P104.37 |
| DIP77 | PJ104.78 | P104.38 |
| DIP78 | PJ104.79 | P104.39 |
| DIP LOW | PJ104.99 | P104.39 |

* + 1. **PJ 104 TO P105 LOOM**

| **Resource allocated** | **SIU MATING**  **PJ104:**D38999-26WJ-35SN | **MIU MATING**  **P105:**D38999/26WJ-35PN |
| --- | --- | --- |
| DIP0 | PJ104.1 | P105.44 |
| DIP1 | PJ104.2 | P105.45 |
| DIP2 | PJ104.3 | P105.46 |
| DIP3 | PJ104.4 | P105.47 |
| DIP4 | PJ104.5 | P105.48 |
| DIP5 | PJ104.6 | P105.49 |
| DIP6 | PJ104.7 | P105.50 |
| DIP7 | PJ104.8 | P105.51 |
| DIP8 | PJ104.9 | P105.55 |
| DIP9 | PJ104.10 | P105.56 |
| DIP10 | PJ104.11 | P105.57 |
| DIP11 | PJ104.12 | P105.58 |
| DIP12 | PJ104.13 | P105.59 |
| DIP13 | PJ104.14 | P105.60 |
| DIP14 | PJ104.15 | P105.61 |
| DIP15 | PJ104.16 | P105.64 |
| DIP16 | PJ104.17 | P105.65 |
| DIP17 | PJ104.18 | P105.66 |
| DIP18 | PJ104.19 | P105.67 |
| DIP19 | PJ104.20 | P105.68 |
| DIP20 | PJ104.21 | P105.69 |
| DIP21 | PJ104.22 | P105.70 |
| DIP22 | PJ104.23 | P105.71 |
| DIP23 | PJ104.24 | P105.72 |
| DIP24 | PJ104.25 | P105.73 |
| DIP25 | PJ104.26 | P105.74 |
| DIP26 | PJ104.27 | P105.76 |
| DIP27 | PJ104.28 | P105.77 |
| DIP28 | PJ104.29 | P105.78 |
| DIP29 | PJ104.30 | P105.79 |
| DIP30 | PJ104.31 | P105.80 |
| DIP31 | PJ104.32 | P105.81 |
| DIP32 | PJ104.33 | P105.82 |
| DIP33 | PJ104.34 | P105.83 |
| DIP34 | PJ104.35 | P105.84 |
| DIP35 | PJ104.36 | P105.85 |
| DIP36 | PJ104.37 | P105.86 |
| DIP 37 | PJ104.38 | P105.87 |
| DIP 38 | PJ104.39 | P105.88 |
| DIP39, | PJ104.40 | P105.89 |
| DIP40, | PJ104.41 | P105.90 |
| DIP41 | PJ104.42 | P105.91 |
| DIP42 | PJ104.43 | P105.92 |
| DIP43 | PJ104.44 | P105.93 |
| DIP44 | PJ104.45 | P105.94 |
| DIP45 | PJ104.46 | P105.95 |
| DIP46 | PJ104.47 | P105.96 |
| DIP47 | PJ104.48 | P105.97 |
| DIP48 | PJ104.49 | P105.98 |
| DIP49 | PJ104.50 | P105.99 |
| DIP50 | PJ104.51 | P105.100 |
| DIP51 | PJ104.52 | P105.101 |
| DIP52 | PJ104.53 | P105.102 |
| DIP53 | PJ104.54 | P105.103 |
| DIP54 | PJ104.55 | P105.104 |
| DIP LOW | PJ104.95 | P105.107 |
| DIP LOW | PJ104.96 | P105.108 |

* + 1. **PJ104 TO P108 LOOM**

|  |  |  |
| --- | --- | --- |
| **Resource allocated** | **SIU MATING**  **PJ104:**D38999-26WJ-35SN | **MIU MATING**  **P108:**D38999/26WE-35SN |
| DIP79 | PJ104.80 | P108.22 |
| DIP80 | PJ104.81 | P108.23 |
| DIP81 | PJ104.82 | P108.24 |
| DIP82 | PJ104.83 | P108.25 |
| DIP83 | PJ104.84 | P108.26 |
| DIP84 | PJ104.85 | P108.27 |
| DIP85 | PJ104.86 | P108.28 |
| DIP86 | PJ104.87 | P108.29 |
| DIP87 | PJ104.88 | P108.30 |

**10.2 SIU TO LJB CABLE LOOMS**

**10.2(A) A5 UMBILICAL LOOMS**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SIU to LJB A5 LOOM ELECTRICAL CONFIGURATION** | | | | | | |
| S.NO | CONNECTOR REFRENCE NO | CONNECTOR PART NO | NO OF WIRES | AWG | USED PIN | UNUSED PIN |
| 1 | M1 | MS3475-W24-61PN | 41 | 20 | E to H, R to a, c to LL. | A to D, J to P, b, MM to PP |
| 2 | M2 | MS3475-W24-61SN | 60 | 20 | A to NN | PP |
| 3 | M3 | MS3475-W22-55SN | 44 | 20 | A to U, W to p, r to t, z to BB | V,q, u to y, CC to HH |
| 4 | M4 | D38999 26 WG 35SN | 75 | 22 | 1 to 65,67,69,71,73,75 | 66,68,70,72,74,76 to 79 |
| 1 | U1 | MS3475-W24-61SN | 41 | 20 | A to C, F,G, K,L,P,R,U,V,Y,Z, c to CC, EE, FF, PP | D,E,H,J,M,N,S ,T,W,X, a,b,DD,GG to NN, |
| 2 | U2 | MS3475-W24-61PN | 51 | 20 | A to t, w to EE, PP | u,v,FF to NN |
| 3 | U3 | MS3475-W22-55PN | 38 | 20 | A to f, h to r | g, s to HH |
| 4 | U4 | MS3475-W14-19PN | 14 | 20 | A to P | R to V |
| 5 | U5 | MS3475-W22-55PN | 34 | 20 | A to k | m to HH |
| 6 | U6 | MS3475-W20-41PN | 34 | 20 | A to k | m to t |

1. **M1 CABLE LOOM.**



**LOOM M1 TO U1**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M1:**MS 3475-W24-61PN | **UMB MATING**  **U1:**MS 3475-W24-61SN |
| DISCHARGE COIL SUPP. | M1.c | U1.EE |
| DISCHARGE COIL SUPP(L) | M1.KK | U1.FF |

**LOOM M1 TO U2**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M1:**MS3475-W24-61PN | **UMB MATING**  **U2:**MS3475-W24-61PN |
| EMG. PWR OFF | M1.R | U2.B |
| EMG. PYRO SAFE | M1.S | U2.s |
| TC LPST SENSE2 | M1.a | U2.w |
| EMG. PWR OFF (L) | M1.FF | U2.C |
| EMG. PYRO OFF (L) | M1.GG | U2.t |

**LOOM M1 TO U3**

| **SIGNAL NAME** | **SIU MATING**  **M1:**MS3475-W24-61PN | **UMB MATING**  **U3:**MS3475-W22-55SN |
| --- | --- | --- |
| FLT PYRO BAT SAFE CMD (N) | M1.E | U3.N |
| FLT PYRO BAT ARM CMD (N) | M1.F | U3.P |
| FLT PYRO BAT SAFE CMD (R) | M1.G | U3.S |
| FLT PYRO BAT ARM CMD (R) | M1.H | U3.T |
| PL.PACK BATT. SAFE CMD (N) | M1.T | U3.E |
| PL.PACK BATT. ARM CMD (N) | M1.U | U3.F |
| PL.PACK LIFT OFF COIL SUPP. (N) (H) | M1.V | U3.G |
| PL.PACK BATT. SAFE CMD (R) | M1.W | U3.J |
| PL.PACK BATT. ARM CMD (R) | M1.X | U3.K |
| PL.PACK LIFT OFF COIL SUPP (R) (H) | M1.Y | U3.L |
| TC LPST SENSE1 | M1.Z | U3.f |
| OFF RELAY COIL SUPP.ENABLE (H) | M1.d | U3.p |
| OFF RELAY COIL SUPP.ENABLE (H) | M1.e | U3.B |
| CDS1 BAT/PYRO SAFE CMD | M1.f | U3.V |
| CDS1 BAT ARM CMD | M1.g | U3.b |
| CDS1 PYRO ARM CMD | M1.h | U3.W |
| CDS1 LPST CMD | M1.i | U3.c |
| CDS2 BAT/PYRO SAFE CMD | M1.j | U3.Y |
| CDS2 BAT ARM CMD | M1.k | U3.d |
| CDS2 PYRO ARM CMD | M1.m | U3.Z |
| CDS2 LPST CMD | M1.n | U3.e |
| CDS1 COIL SUPP. (H) | M1.p | U3.X |
| CDS2 COIL SUPP. (H) | M1.q | U3.a |
| LIU Coil Supply (N) (L) | M1.DD | U3.R |
| LIU Coil Supply (R) (L) | M1.EE | U3.U |
| PL Pack Lift Off Coil Supply (L) (N) | M1.HH | U3.H |
| PL Pack Lift Off Coil Supply (L) (R) | M1.JJ | U3.M |
| Relay ON/OFF Coil Supply Control (L) | M1.LL | U3.C |

**LOOM M1 TO GG(U4)**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M1:**MS 3475-W24-61PN | **UMB MATING**  **GG(U4):**MS 3475-W14-19PN |
| GG PYRO SUPPLY (N)(H) | M1.r | GG.(P703)A |
| GG PYRO SUPPLY (N) (L) | M1.s | GG.B |
| GG PYRO SUPPLY (R) (H) | M1.t | GG.C |
| GG PYRO SUPPLY (R) (L) | M1.u | GG.D |
| GG PYRO SUPPLY (N) (H) | M1.v | GG.E |
| GG PYRO SUPPLY (N) (L) | M1.w | GG.F |
| GG PYRO SUPPLY (R) (H) | M1.x | GG.G |
| GG PYRO SUPPLY (R) (L) | M1.y | GG.H |
| GG SAFETY BREAK COIL SUPPLY(H) | M1.z | GG.L |
| GG SAFETY BREAK COIL SUPPLY(H) | M1.AA | GG.M |
| GG SAFETY BREAK COIL SUPPLY(L) | M1.BB | GG.N |
| GG SAFETY BREAK COIL SUPPLY(L) | M1.CC | GG.P |

1. **M2 CABLE LOOM.**



**LOOM M2 TO U1**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M2:**MS3475-W24-61SN | **MIU MATING**  **U1:**MS3475W24-61SN |
| Bat GG Pyro Supply (N) (H) | M2.x | U1.B |
| Bat GG Pyro Supply (N) (L) | M2.y | U1.C |
| Bat GG Pyro Supply (N) (H) | M2.z | U1.F |
| Bat GG Pyro Supply (N) (L) | M2.AA | U1.G |
| Bat GG Pyro Supply (N) (H) | M2.BB | U1.K |
| Bat GG Pyro Supply (N) (L) | M2.CC | U1.L |
| Bat GG Pyro Supply (R) (H) | M2.DD | U1.P |
| Bat GG Pyro Supply (R) (L) | M2.EE | U1.R |
| Bat GG Pyro Supply (R) (H) | M2.FF | U1.U |
| Bat GG Pyro Supply (R) (L) | M2.GG | U1.V |
| Bat GG Pyro Supply (R) (H) | M2.HH | U1.Y |
| Bat GG Pyro Supply (R) (L) | M2.JJ | U1.Z |
| Nozzle Support Motor Supply (H) | M2.KK | U1.t |
| Nozzle Support Motor Supply (L) | M2.LL | U1.u |
| Nozzle Support Motor Supply (H) | M2.MM | U1.v |
| Nozzle Support Motor Supply (L) | M2.NN | U1.w |

**LOOM M2 TO U2**

| **SIGNAL NAME** | **SIU MATING**  **M2:** MS3475-W24-61SN | **MIU MATING**  **U2:**MS3475-W24-61PN |
| --- | --- | --- |
| OBC/CCSC/PASS Supply (H) | M2.A | U2.D |
| OBC/CCSC/PASS Supply (L) | M2.B | U2.E |
| OBC/CCSC/PASS Supply (H) | M2.C | U2.F |
| OBC/CCSC/PASS Supply (L) | M2.D | U2.G |
| CPIF II/CPIF III/ CONT Coil Supp (H) | M2.E | U2.H |
| CPIF II/CPIF III /CONT Coil Supp (L) | M2.F | U2.J |
| CPIF II/CPIF III /CONT Coil Supp (H) | M2.G | U2.K |
| CPIF II/CPIF III /CONT Coil Supp (L) | M2.H | U2.L |
| BS CCSC EXT Supply (H) | M2.J | U2.M |
| BS CCSC EXT Supply (L) | M2.K | U2.N |
| BS CCSC EXT Supply (H) | M2.L | U2.P |
| BS CCSC EXT Supply (L) | M2.M | U2.R |
| CPIF I /SCP 1502 EXT Supply(H) | M2.N | U2.S |
| CPIF I /SCP 1502 EXT Supply(L) | M2.P | U2.T |
| CPIF I /SCP 1502 EXT Supply(H) | M2.R | U2.U |
| CPIF I /SCP 1502 EXT Supply(L) | M2.S | U2.V |
| S1 RCS EXT Supply (H) | M2.T | U2.W |
| S1 RCS EXT Supply (L) | M2.U | U2.X |
| S1 RCS EXT Supply (H) | M2.V | U2.Y |
| S1 RCS EXT Supply (L) | M2.W | U2.Z |
| PL RCS EXT Supply (H) | M2.X | U2.a |
| PL RCS EXT Supply (L) | M2.Y | U2.b |
| PL RCS EXT Supply (H) | M2.Z | U2.c |
| PL RCS EXT Supply (L) | M2.a | U2.d |
| SCP 4501 EXT Supply (H) | M2.b | U2.e |
| SCP 4501 EXT Supply (L) | M2.c | U2.f |
| SCP 4501 EXT Supply (H) | M2.d | U2.g |
| SCP 4501 EXT Supply (L) | M2.e | U2.h |
| RINS/MINGS EXT Supply (H) | M2.f | U2.i |
| RINS/MINGS EXT Supply (L) | M2.g | U2.j |
| RINS/MINGS EXT Supply (H) | M2.h | U2.k |
| RINS/MINGS EXT Supply (L) | M2.i | U2.m |
| SCP1501 Supply lines (H) | M2.j | U2.n |
| SCP1501 Supply lines (L) | M2.k | U2.p |
| SCP1501 Supply lines (H) | M2.m | U2.q |
| SCP1501 Supply lines (L) | M2.n | U2.r |
| S3T2 PSSU EXT Supply (H) | M2.p | U2.x |
| S3T2 PSSU EXT Supply (L) | M2.q | U2.y |
| S3T2 PSSU EXT Supply (H) | M2.r | U2.z |
| S3T2 PSSU EXT Supply (L) | M2.s | U2.AA |
| PL T2 PSSU EXT Supply (H) | M2.t | U2.BB |
| PL T2 PSSU EXT Supply (L) | M2.u | U2.CC |
| PL T2 PSSU EXT Supply (H) | M2.v | U2.DD |
| PL T2 PSSU EXT Supply (L) | M2.w | U2.EE |

1. **M3 CABLE LOOM**



* + 1. **LOOM M3 TO U1**

| **SIGNAL NAME** | **SIU MATING**  **M3:**MS3475-W22-55SN | **MIU MATING**  **U1:**MS3475W24-61SN |
| --- | --- | --- |
| PL ELEC Bat Heater | M3.A | U1.c |
| PL ELEC Bat Return | M3.B | U1.e |
| S3 Bat Heater | M3.D | U1.f |
| S3 Bat Return | M3.E | U1.h |
| FNC II Bat Heater | M3.G | U1.i |
| FNC II Bat Return | M3.H | U1.k |
| FNC I(A1) Bat Heater | M3.K | U1.m |
| FNC I (A1) Bat Return | M3.L | U1.p |
| FNC I(A2) Bat Heater | M3.N | U1.q |
| FNC I (A2) Bat Return | M3.P | U1.s |
| PL ELEC Bat Thermostat | M3.C | U1.d |
| S3 Bat Thermostat | M3.F | U1.g |
| FNC II Bat Thermostat | M3.J | U1.j |
| FNC I (A1) Bat Thermostat | M3.M | U1.n |
| FNC I (A2) Bat Thermostat | M3.R | U1.r |
| U1 CMS | M3.b | U1.A |
| U1 CMS | M3.c | U1.PP |
| S1BATTERY (150V) DISCH. VOLTAGE(H) | M3.r | U1.x |
| S1BATTERY (150V) DISCH. VOLTAGE(H) | M3.s | U1.z |
| S1BATTERY (150V) DISCH. VOLTAGE(H) | M3.t | U1.BB |
| S1BATTERY (150V) DISCH. VOLTAGE(L) | M3.z | U1.y |
| S1BATTERY (150V) DISCH. VOLTAGE(L) | M3.AA | U1.AA |
| S1BATTERY (150V) DISCH. VOLTAGE(L) | M3.BB | U1.CC |

* + 1. **LOOM M3 TO U2**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M3:**MS3475-W22-55SN | **MIU MATING**  **U2:**MS3475-W24-61PN |
| U2 CMS | M3.d | U2.A |
| U2 CMS | M3.e | U2.PP |

* + 1. **LOOM M3 TO U3**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M3:**MS3475-W22-55SN | **MIU MATING**  **U3:**MS3475-W22-55SN |
| ON RELAY COIL SUPP. DISABLE (H) | M3.S | U3.r |
| ON RELAY COIL SUPP. DISABLE (L) | M3.T | U3.q |
| ON RELAY COIL SUPP. DISABLE (H) | M3.U | U3.D |
| CCSC-1 ON Relay coil supply status | M3.W | U3.i |
| CCSC-2 ON Relay coil supply status | M3.X | U3.j |
| CCSC-3 ON Relay coil supply status | M3.Y | U3.k |
| CCSC-4 ON Relay coil supply status | M3.Z | U3.m |
| CCSC-5 ON Relay coil supply status | M3.a | U3.n |
| U3 CMS | M3.f | U3.A |
| U3 CMS | M3.g | U3.HH |
| LPST RET | M3.p | U3.h |

* + 1. **LOOM M3 TO GG(U4)**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M3:**MS3475-W22-55SN | **MIU MATING**  **GG(U4):**MS 3475-W14-19PN |
| GG CMS SUPP | M3.h | GG.J |
| GG STATUS | M3.i | GG.K |

* + 1. **LOOM M3 TO OM(U5)**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M3:**MS3475-W22-55SN | **MIU MATING**  **OM(U5):**MS3475-W22-55PN |
| OM CMSSUPP | M3.j | OM.j |
| OM CMSSTATUS | M3.k | OM.k |

* + 1. **LOOM M3 TO CO(U6)**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M3:**MS3475-W22-55SN | **MIU MATING**  **CO(U6):**MS3475-W20-41PN |
| CO CMSSUPP | M3.m | CO.j |
| CO CMSSTATUS | M3.n | CO.k |

1. **M4 CABLE LOOM.**



**i. LOOM M4 TO U1**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M4:**D38999 26WG 35SN | **MIU MATING**  **U1:**MS3475-W20-41PN |
| PL SIMULATION SUPP. (H) | M4.65 | U1.GG |
| PL SIMULATION SUPP. (H) | M4.67 | U1.HH |
| PL SIMULATION SUPP. (H) | M4.69 | U1.JJ |
| PL SIMULATION SUPP. (H) | M4.71 | U1.KK |
| BS SIMULATION SUPP. (H) | M4.73 | U1.LL |
| BS SIMULATION SUPP. (H) | M4.75 | U1.MM |

1. **LOOM M4 TO OM(U5)**

| **SIGNAL NAME** | **SIU MATING**  **M4:**D38999 26WG 35SN | **MIU MATING**  **OM(U5):**MS3475-W22-55PN |
| --- | --- | --- |
| O-M Pyro BOLT-1 Supp(H) (N) | M4.1 | OM.A(P704) |
| O-M Pyro BOLT-1 Supp(L) (N) | M4. 2 | OM.B |
| O-M Pyro BOLT-1 Supp(H) (R) | M4. 3 | OM.C |
| O-M Pyro BOLT-1 Supp(L) (R) | M4.4 | OM.D |
| O-M Pyro BOLT-2 Supp(H) (N) | M4.5 | OM.E |
| O-M Pyro BOLT-2 Supp(L) (N) | M4. 6 | OM.F |
| O-M Pyro BOLT-2 Supp(H) (R) | M4.7 | OM.G |
| O-M Pyro BOLT-2 Supp(L) (R) | M4. 8 | OM.H |
| O-M Pyro BOLT-3 Supp(H) (N) | M4. 9 | OM.J |
| O-M Pyro BOLT-3 Supp(L) (N) | M4.10 | OM.K |
| O-M Pyro BOLT-3 Supp(H) (R) | M4. 11 | OM.L |
| **SIGNAL NAME** | **SIU MATING**  **M4:**D38999 26WG 35SN | **MIU MATING**  **OM(U5):**MS3475-W22-55PN |
| O-M Pyro BOLT-3 Supp(L) (R) | M4.12 | OM.M |
| O-M Pyro BOLT-4 Supp(H) (N) | M4.13 | OM.N |
| O-M Pyro BOLT-4 Supp(L) (N) | M4. 14 | OM.P |
| O-M Pyro BOLT-4 Supp(H) (R) | M4.15 | OM.R |
| O-M Pyro BOLT-4 Supp(L) (R) | M4. 16 | OM.S |
| O-M Pyro BOLT-5 Supp(H) (N) | M4. 17 | OM.T |
| O-M Pyro BOLT-5 Supp(L) (N) | M4. 18 | OM.U |
| O-M Pyro BOLT-5 Supp(H) (R) | M4. 19 | OM.V |
| O-M Pyro BOLT-5 Supp(L) (R) | M4.20 | OM.W |
| O-M Pyro BOLT-6 Supp(H) (N) | M4.21 | OM.X |
| O-M Pyro BOLT-6 Supp(L) (N) | M4.22 | OM.Y |
| O-M Pyro BOLT-6 Supp(H) (R) | M4.23 | OM.Z |
| O-M Pyro BOLT-6 Supp(L) (R) | M4.24 | OM.a |
| O-M Pyro BOLT-7 Supp(H) (N) | M4. 25 | OM.b |
| O-M Pyro BOLT-7 Supp(L) (N) | M4.26 | OM.c |
| O-M Pyro BOLT-7 Supp(H) (R) | M4.27 | OM.d |
| O-M Pyro BOLT-7 Supp(L) (R) | M4. 28 | OM.e |
| O-M Pyro BOLT-8 Supp(H) (N) | M4. 29 | OM.f |
| O-M Pyro BOLT-8 Supp(L) (N) | M4.30 | OM.g |
| O-M Pyro BOLT-8 Supp(H) (R) | M4.31 | OM.h |
| O-M Pyro BOLT-8 Supp(L) (R) | M4.32 | OM.i |

**LOOM M4 TO CO(U6)**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M4:**D38999 26 WG 35SN | **MIU MATING**  **CO(U6):**MS3475-W20-41PN |
| C-O Pyro BOLT-1 Supp(H) (N) | M4. 33 | CO.A(P705) |
| C-O Pyro BOLT-1 Supp(L) (N) | M4.34 | CO.B |
| C-O Pyro BOLT-1 Supp(H) (R) | M4. 35 | CO.C |
| C-O Pyro BOLT-1 Supp(L) (R) | M4.36 | CO.D |
| C-O Pyro BOLT-2 Supp(H) (N) | M4. 37 | CO.E |
| C-O Pyro BOLT-2 Supp(L) (N) | M4. 38 | CO.F |
| C-O Pyro BOLT-2 Supp(H) (R) | M4.39 | CO.G |
| C-O Pyro BOLT-2 Supp(L) (R) | M4.40 | CO.H |
| C-O Pyro BOLT-3 Supp(H) (N) | M4.41 | CO.J |
| C-O Pyro BOLT-3 Supp(L) (N) | M4.42 | CO.K |
| C-O Pyro BOLT-3 Supp(H) (R) | M4.43 | CO.L |
| C-O Pyro BOLT-3 Supp(L) (R) | M4.44 | CO.M |
| C-O Pyro BOLT-4 Supp(H) (N) | M4.45 | CO.N |
| C-O Pyro BOLT-4 Supp(L) (N) | M4.46 | CO.P |
| C-O Pyro BOLT-4 Supp(L) (R) | M4.48 | CO.S |
| C-O Pyro BOLT-4 Supp(H) (R) | M4.47 | CO.R |
| C-O Pyro BOLT-5 Supp(H) (N) | M4.49 | CO.T |
| C-O Pyro BOLT-5 Supp(H) (R) | M4.51 | CO.V |
| C-O Pyro BOLT-5 Supp(L) (N) | M4. 50 | CO.U |
| C-O Pyro BOLT-5 Supp(L) (R) | M4.52 | CO.W |
| C-O Pyro BOLT-6 Supp(H) (N) | M4.53 | CO.X |
| C-O Pyro BOLT-6 Supp(L) (N) | M4. 54 | CO.Y |
| C-O Pyro BOLT-6 Supp(H) (R) | M4.55 | CO.Z |
| C-O Pyro BOLT-6 Supp(L) (R) | M4.56 | CO.a |
| C-O Pyro BOLT-7 Supp(H) (N) | M4.57 | CO.b |
| C-O Pyro BOLT-7 Supp(L) (N) | M4.58 | CO.c |
| C-O Pyro BOLT-7 Supp(H) (R) | M4.59 | CO.d |
| C-O Pyro BOLT-7 Supp(L) (R) | M4.60 | CO.e |
| C-O Pyro BOLT-8 Supp(L) (N) | M4.62 | CO.g |
| C-O Pyro BOLT-8 Supp(H) (N) | M4.61 | CO.f |
| C-O Pyro BOLT-8 Supp(H) (R) | M4.63 | CO.h |
| C-O Pyro BOLT-8 Supp(L) (R) | M4. 64 | CO.i |

**10.2(B) A4 UMBILICAL LOOMS**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SIU to LJB A4 LOOM ELECTRICAL CONFIGUARATION** | | | | | | |
| S/N | CONNECTOR REFRENCE NO | CONNECTOR PART NO | NO OF WIRES | AWG | USED PIN | UNUSED PIN |
| 1 | M1 | MS3475-W24-61PN | 41 | 20 | A to q, y, BB, NN | r to x, z, AA to PP |
| 2 | M2 | MS3475-W24-61SN | 50 | 20 | A to CC | DD to PP |
| 3 | M3 | MS3475-W22-55SN | 35 | 20 | A V M, S to Z, b to g, p , r to u, z to CC | N to R, a, h to n, q,v to y, DD to HH |
| 4 | U1 | MS3475-W24-61SN | 55 | 20 | A to t, y to BB, EE to PP, | u to x, CC , DD, |
| 5 | U2 | MS3475-W24-61PN | 34 | 20 | F to X, a to f, I to m, w, x, BB to GG | A to E, y, z, g, h, n to v, y to AA, HH to PP |
| 6 | U3 | MS3475-W22-55PN | 40 | 20 | A to P, X to e, j to y, BB, EE, FF, GG, | R to W, g to i, z, AA, CC, DD, HH |

1. **M1 CABLE LOOM.**



**LOOM M1 TO U1**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M1:**MS3475-W24-61PN | **MIU MATING**  **U1:**MS3475-W24-61PN |
| S1 IGNITION CMD 1 (N) | M1.A | U1.X |
| S1 IGNITION CMD 2 (N) | M1.B | U1.Y |
| S1 IGNITION CMD 1 (R) | M1.C | U1.b |
| S1 IGNITION CMD 2 (R) | M1.D | U1.c |
| CIS PYRO SUPP ARM ( R) | M1.E | U1.e |
| CIS PYRO SUPP SAFE ( R) | M1.F | U1.f |
| CIS PYRO SUPP ARM ( N) | M1.G | U1.g |
| CIS PYRO SUPP SAFE ( N) | M1.H | U1.h |
| EMG. POWER OFF | M1.J | U1.q |
| EMG. PYRO SAFE ONBOARD | M1.K | U1.s |
| DISCHARGE COIL SUPP. | M1.b | U1.y |
| DISCHARGE COIL SUPP. | M1.c | U1.AA |
| OFF RELAY COIL SUPP.ENABLE (H) | M1.d | U1.N |
| DISCHARGE COIL SUPP(L) | M1.y | U1.z |
| EMG. PWR OFF (L) | M1.BB | U1.r |
| EMG. PYRO OFF (L) | M1.CC | U1.t |
| S1 IGNITION CMD RET.(N) | M1.DD | U1.Z |
| S1 IGNITION CMD RET.(R) | M1.EE | U1.d |
| DISCHARGE COIL SUPP(L) | M1.MM | U1.BB |
| Relay ON/OFF Coil Supply Control (L) | M1.NN | U1.P |

**LOOM M1 TO U2**

| **SIGNAL NAME** | **SIU MATING**  **M1:**MS3475-W24-61PN | **MIU MATING**  **U2:**MS3475-W22-55PN |
| --- | --- | --- |
| IS PYRO BAT SAFE CMD (N) | M1.L | U2.K |
| IS PYRO BAT ARM CMD (N) | M1.M | U2.L |
| IS PYRO BAT SAFE CMD (R) | M1.N | U2.N |
| IS PYRO BAT ARM CMD (R) | M1.P | U2.P |
| EMG. PWR OFF | M1.R | U2.i |
| EMG. PYRO SAFE | M1.S | U2.k |
| LPST SENSE1 | M1.Z | U2.e |
| LPST SENSE2 | M1.a | U2.f |
| CDS1 BAT/PYRO SAFE CMD | M1.f | U2.BB |
| CDS1 BAT ARM CMD | M1.g | U2.CC |
| CDS1 PYRO ARM CMD | M1.h | U2.DD |
| CDS1 LPST CMD | M1.i | U2.EE |
| CDS2 BAT/PYRO SAFE CMD | M1.j | U2.GG |
| CDS2 BAT ARM CMD | M1.k | U2.a |
| CDS2 PYRO ARM CMD | M1.m | U2.b |
| CDS2 LPST CMD | M1.n | U2.c |
| CDS1 COIL SUPP. (H) | M1.p | U2.FF |
| CDS2 COIL SUPP. (H) | M1.q | U2.d |
| COMMAND RET. (N) | M1.FF | U2.M |
| COMMAND RET. (R) | M1.GG | U2.R |
| EMG. PWR OFF (L) | M1.HH | U2.j |
| EMG. PYRO OFF (L) | M1.JJ | U2.m |

**LOOM M1 TO U3**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M1:**MS3475-W24-61PN | **MIU MATING**  **U3:**MS3475-W22-55SN |
| PL.PACK BATT. SAFE CMD (N) | M1.T | U3.X |
| PL.PACK BATT. ARM CMD (N) | M1.U | U3. Y |
| PL.PACK LIFT OFF COIL SUPP. (N) (H) | M1.V | U3.Z |
| PL.PACK BATT. SAFE CMD (R) | M1.W | U3.b |
| PL.PACK BATT. ARM CMD (R) | M1.X | U3.c |
| PL.PACK LIFT OFF COIL SUPP(R) (H) | M1.Y | U3.d |
| OFF RELAY COIL SUPP.ENABLE (H) | M1.e | U3.DD |
| PL Pack Lift Off Coil Supply (L) (N) | M1.KK | U3.a |
| PL Pack Lift Off Coil Supply (L) (R) | M1.LL | U3.e |

1. **M2 CABLE LOOM.**



**LOOM M2 TO U1**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M2:**MS3475-W24-61SN | **MIU MATING**  **U1:**MS3475-W24-61PN |
| CPIF 1 EXTERNAL SUPPLY (H) | M2.A | U1.A |
| CPIF 1 EXTERNAL SUPPLY (L) | M2.B | U1.B |
| CPIF 1 EXTERNAL SUPPLY (H) | M2.C | U1.C |
| CPIF 1 EXTERNAL SUPPLY (L) | M2.D | U1.D |
| BS/CIS CCSC EXTERNAL SUPPLY (H) | M2.E | U1.E |
| BS/CIS CCSC EXTERNAL SUPPLY (L) | M2.F | U1.F |
| BS/CIS CCSC EXTERNAL SUPPLY (H) | M2.G | U1.G |
| BS/CIS CCSC EXTERNAL SUPPLY (L) | M2.H | U1.H |
| CIS RCS EXTERNAL SUPPLY (H) | M2.J | U1.J |
| CIS RCS EXTERNAL SUPPLY (L) | M2.K | U1.K |
| CIS RCS EXTERNAL SUPPLY (H) | M2.L | U1.L |
| CIS RCS EXTERNAL SUPPLY (L) | M2.M | U1.M |
| BS BATTERY PYRO SUPPLY (H) (N) | M2.v | U1.T |
| BS BATTERY PYRO SUPPLY (L) (N) | M2.w | U1.U |
| BS BATTERY PYRO SUPPLY (H) (R) | M2.x | U1.V |
| BS BATTERY PYRO SUPPLY (L) (R) | M2.y | U1.W |

**LOOM M2 TO U2**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M2:**MS3475-W24-61SN | **MIU MATING**  **U2:**MS3475-W22-55PN |
| PL&FNC BAT PYRO SUP (H) (N) | M2.r | U2.F |
| PL&FNC BAT PYRO SUP (L) (N) | M2.s | U2.G |
| PL&FNC BAT PYRO SUP (H) (R) | M2.t | U2.H |
| PL&FNC BAT PYRO SUP (L) (R) | M2.u | U2.J |

**LOOM M2 TO U3**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M2:**MS3475-W24-61SN | **MIU MATING**  **U3:**MS3475-W22-55SN |
| OBC CCSC EXTERNAL SUPPLY (H) | M2.N | U3.A |
| OBC CCSC EXTERNAL SUPPLY (L) | M2.P | U3.B |
| OBC CCSC EXTERNAL SUPPLY (H) | M2.R | U3.C |
| OBC CCSC EXTERNAL SUPPLY (L) | M2.S | U3.D |
| RINS / RSP EXTERNAL SUPPLY (H) | M2.T | U3.E |
| RINS / RSP EXTERNAL SUPPLY (L) | M2.U | U3.F |
| RINS / RSP EXTERNAL SUPPLY (H) | M2.V | U3.G |
| RINS / RSP EXTERNAL SUPPLY (L) | M2.W | U3.H |
| CPIF 2 EXTERNAL SUPPLY (H) | M2.X | U3.J |
| CPIF 2 EXTERNAL SUPPLY (L) | M2.Y | U3.K |
| PL RCS EXTERNAL SUPPLY (H) | M2.Z | U3.L |
| PL RCS EXTERNAL SUPPLY (L) | M2.a | U3.M |
| PL RCS EXTERNAL SUPPLY (H) | M2.b | U3.N |
| PL RCS EXTERNAL SUPPLY (L) | M2.c | U3.P |
| C BAND EXTERNAL SUPPLY (H) | M2.d | U3.j |
| C BAND EXTERNAL SUPPLY (L) | M2.e | U3.k |
| S BAND EXTERNAL SUPPLY (H) | M2.f | U3.m |
| S BAND EXTERNAL SUPPLY (L) | M2.g | U3.n |
| TC 1 EXTERNAL SUPPLY (H) | M2.h | U3.p |
| TC 1 EXTERNAL SUPPLY (L) | M2.i | U3.q |
| TC 2 EXTERNAL SUPPLY (H) | M2.j | U3.r |
| TC 2 EXTERNAL SUPPLY (L) | M2.k | U3.s |
| TM 2 PCM EXTERNAL SUPPLY (H) | M2.m | U3.t |
| TM 2 PCM EXTERNAL SUPPLY (L) | M2.n | U3.u |
| TM 2 TRX EXTERNAL SUPPLY (H) | M2.p | U3.v |
| TM 2 TRX EXTERNAL SUPPLY (L) | M2.q | U3.w |

1. **M3 CABLE LOOM.**



**LOOM M3 TO U1**

| **SIGNAL NAME** | **SIU MATING**  **M3:**MS3475-W22-55SN | **MIU MATING**  **U1:**MS3475-W24-61PN |
| --- | --- | --- |
| BS PM BAT-A HEATER(H) | M3.G | U1.j |
| BS PM BAT-A HEATER(L) | M3.H | U1.k |
| BS PM BAT-B HEATER(H) | M3.K | U1.n |
| BS PM BAT-B HEATER(L) | M3.L | U1.p |
| BS PM BAT-A HEATER(THERMOSTAT) | M3.J | U1.i |
| BS PM BAT-B HEATER(THERMOSTAT) | M3.M | U1.m |
| ON RELAY COIL SUPP. DISABLE (H) | M3.S | U1.R |
| BS ON Relay coil supply status | M3.W | U1.S |
| CIS ON Relay coil supply status | M3.X | U1.a |
| U1 CMS | M3.b | U1.GG |
| U1 CMS | M3.c | U1.HH |
| BS BAT DISCHARGE(H) | M3.r | U1.EE |
| BS BAT DISCHARGE(H) | M3.s | U1.JJ |
| BS BAT DISCHARGE(H) | M3.t | U1.KK |
| BS BAT DISCHARGE(H) | M3.u | U1.LL |
| BS BAT DISCHARGE(L) | M3.z | U1.FF |
| BS BAT DISCHARGE(L) | M3.AA | U1.MM |
| BS BAT DISCHARGE(L) | M3.BB | U1.NN |
| BS BAT DISCHARGE(L) | M3.CC | U1.PP |

**LOOM M3 TO U2**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M3:**MS3475-W22-55SN | **MIU MATING**  **U2:**MS3475-W22-55SN |
| PL\_EL BAT HEATER(H) | M3.A | U2.W |
| PL\_EL BAT HEATER(L) | M3.B | U2.X |
| FNC-2 BAT HEATER(H) | M3.D | U2.T |
| FNC-2 BAT HEATER(L) | M3.E | U2.U |
| PL\_EL BAT HEATER(THERMOSTAT) | M3.C | U2.V |
| FNC-2 BAT HEATER(THERMOSTAT) | M3.F | U2.S |
| U2 CMS | M3.d | U2.w |
| U2 CMS | M3.e | U2.x |

**LOOM M3 TO U3**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M3:**MS3475-W22-55SN | **MIU MATING**  **U3:**MS3475-W22-55SN |
| ON RELAY COIL SUPP. DISABLE (H) | M3.U | U3.BB |
| IS ON Relay coil supply status | M3.Y | U3.EE |
| PL ON Relay coil supply status | M3.Z | U3.GG |
| U3 CMS | M3.f | U3.x |
| U3 CMS | M3.g | U3.y |
| LPST RET | M3.p | U3.FF |

**10.2(C) A3 UMBILICAL LOOMS**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SIU to LJB A3 LOOM ELECTRICAL CONFIGUARATION** | | | | | | |
| S.NO | CONNECTOR REFRENCE NO | CONNECTOR PART NO | NO OF WIRES | AWG | USED PIN | UNUSED PIN |
| 1 | M1 | MS3475-W24-61PN | 40 | 20 | A to K, R to a, c,e to q, DD to KK, NN | L to P, b, d, r to CC, LL, MM, PP |
| 2 | M2 | MS3475-W24-61SN | 50 | 20 | A to CC | DD to PP |
| 3 | M3 | MS3475-W22-55SN | 32 | 20 | A to M, b to g, p to t, v to x, z to BB, DD to FF | N to a, h to n, u, y, CC, GG, HH |
| 1 | U1 | MS3475-W24-61SN | 26 | 20 | A,P to p, t | B to N, q to s, u to PP |
| 2 | U2 | MS3475-W24-61PN | 47 | 20 | A to b, i to m, t, v to JJ, MM to PP | C to h, n to s, u, LL |
| 3 | U3 | MS3475-W22-55PN | 49 | 20 | A to G, J to c, h to BB, DD to HH | H, d to g,CC |

1. **M1 CABLE LOOM.**



**LOOM M1 TO U2**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M1:**MS3475-W24-61PN | **MIU MATING**  **U2:**MS3475-W24-61PN |
| S2 LPST CDS II SENSE I | M1.J | U2.MM |
| S2 LPST CDS II SENSE II | M1.K | U2.PP |
| EMG. PWR OFF | M1.R | U2.i |
| EMG. PYRO SAFE | M1.S | U2.k |
| EMG. PWR OFF (L) | M1.FF | U2.j |
| EMG. PYRO OFF (L) | M1.GG | U2.m |

**LOOM M1 TO U3**

| **SIGNAL NAME** | **SIU MATING**  **M1:**MS3475-W24-61PN | **MIU MATING**  **U3:**MS3475-W22-55PN |
| --- | --- | --- |
| S1 IGNITION CMD 1 (N) | M1.A | U3.L |
| S1 IGNITION CMD 2 (N) | M1.B | U3.M |
| S1 IGNITION CMD 1 (R) | M1.C | U3.S |
| S1 IGNITION CMD 2 (R) | M1.D | U3.T |
| FLIGHT PYRO BAT SAFE CMD (N) | M1.E | U3.J |
| FLIGHT PYRO BAT ARM CMD (N) | M1.F | U3.K |
| FLIGHT PYRO BAT SAFE CMD (R) | M1.G | U3.P |
| FLIGHT PYRO BAT ARM CMD (R) | M1.H | U3.R |
| PL.PACK BATT. SAFE CMD (N) | M1.T | U3.Z |
| PL.PACK BATT. ARM CMD (N) | M1.U | U3.a |
| PL.PACK LIFT OFF COIL SUPP. (N) (H) | M1.V | U3.b |
| PL.PACK BATT. SAFE CMD (R) | M1.W | U3.V |
| PL.PACK BATT. ARM CMD (R) | M1.X | U3.W |
| PL.PACK LIFT OFF COIL SUPP (R) (H) | M1.Y | U3.X |
| LPST SENSE-I | M1.Z | U3.t |
| LPST SENSE-II | M1.a | U3.v |
| DISCHARGE COIL SUPP. | M1.c | U3.w |
| MIU COIL SUPP. | M1.e | U3.B |
| CDS1 BAT/PYRO SAFE CMD | M1.f | U3.h |
| CDS1 BAT ARM CMD | M1.g | U3.i |
| CDS1 PYRO ARM CMD | M1.h | U3.j |
| CDS1 LPST CMD | M1.i | U3.k |
| CDS2 BAT/PYRO SAFE CMD | M1.j | U3.n |
| CDS2 BAT ARM CMD | M1.k | U3.p |
| CDS2 PYRO ARM CMD | M1.m | U3.q |
| CDS2 LPST CMD | M1.n | U3.r |
| CDS1 COIL SUPP. (H) | M1.p | U3.m |
| CDS2 COIL SUPP. (H) | M1.q | U3.s |
| LIU Coil Supply (N) (L) | M1.DD | U3.N |
| LIU Coil Supply (R) (L) | M1.EE | U3.U |
| PL Pack Lift Off Coil Supply (L) (N) | M1.HH | U3.c |
| PL Pack Lift Off Coil Supply (L) (R) | M1.JJ | U3.y |
| DISCHARGE COIL SUPP(L) | M1.KK | U3.x |
| MIU COIL SUPP. (L) | M1.NN | U3.C |

1. **M2 CABLE LOOM.**



1. **LOOM M2 TO U1**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M2:**MS3475-W24-61SN | **MIU MATING**  **U1:**MS3475-W20-41PN |
| BAT PY VALVE SUP(N)(H) | M2.r | U1.P |
| BAT PY VALVE SUP(N)(L) | M2.s | U1.R |
| BAT PY VALVE SUP(N)(H) | M2.t | U1.S |
| BAT PY VALVE SUP(N)(L) | M2.u | U1.T |
| BAT PY VALVE SUP(N)(H) | M2.v | U1.U |
| BAT PY VALVE SUP(N)(L) | M2.w | U1.V |
| BAT PY VALVE SUP(R)(H) | M2.x | U1.W |
| BAT PY VALVE SUP(R)(L) | M2.y | U1.X |
| BAT PY VALVE SUP(R)(H) | M2.z | U1.Y |
| BAT PY VALVE SUP(R)(L) | M2.AA | U1.Z |
| BAT PY VALVE SUP(R)(H) | M2.BB | U1.a |
| BAT PY VALVE SUP(R)(L) | M2.CC | U1.b |

1. **LOOM M2 TO U2**

| **SIGNAL NAME** | **SIU MATING**  **M2:**MS3475-W24-61SN | **MIU MATING**  **U2:**MS3475-W24-61PN |
| --- | --- | --- |
| PL\_EL SUBSYS EXT SUP (H) | M2.A | U2.B |
| PL\_EL SUBSYS EXT SUP (L) | M2.B | U2.C |
| PL\_EL SUBSYS EXT SUP (H) | M2.C | U2.D |
| PL\_EL SUBSYS EXT SUP (L) | M2.D | U2.E |
| RCS EXT SUP (H) | M2.E | U2.F |
| RCS EXT SUP (L) | M2.F | U2.G |
| RCS EXT SUP (H) | M2.G | U2.H |
| RCS EXT SUP (L) | M2.H | U2.J |
| S2 EL SUBSYS EXT SUP (H) | M2.J | U2.K |
| S2 EL SUBSYS EXT SUP (L) | M2.K | U2.L |
| S2 EL SUBSYS EXT SUP (H) | M2.L | U2.M |
| S2 EL SUBSYS EXT SUP (L) | M2.M | U2.N |
| S1 EL SUBSYS EXT SUP (H) | M2.N | U2.P |
| S1 EL SUBSYS EXT SUP (L) | M2.P | U2.R |
| S1 EL SUBSYS EXT SUP (H) | M2.R | U2.S |
| S1 EL SUBSYS EXT SUP (L) | M2.S | U2.T |
| TM-II/TRANSPONDER EXT SUP (H) | M2.T | U2.U |
| TM-II/TRANSPONDER EXT SUP (L) | M2.U | U2.V |
| TM-II/TRANSPONDER EXT SUP (H) | M2.V | U2.W |
| TM-II/TRANSPONDER EXT SUP (L) | M2.W | U2.X |
| TM-I/ TC-I/ TC-II EXT SUP (H) | M2.X | U2.Y |
| TM-I/ TC-I/ TC-II EXT SUP (L) | M2.Y | U2.Z |
| TM-I/ TC-I/ TC-II EXT SUP (H) | M2.Z | U2.a |
| TM-I/ TC-I/ TC-II EXT SUP (L) | M2.a | U2.b |
| HPIGS TH EXT SUP (H) | M2.b | U2.v |
| HPIGS TH EXT SUP (L) | M2.c | U2.w |
| HPIGS TH EXT SUP (H) | M2.d | U2.x |
| HPIGS TH EXT SUP (L) | M2.e | U2.y |
| HPIGS TH EXT SUP (H) | M2.f | U2.z |
| HPIGS TH EXT SUP (L) | M2.g | U2.AA |
| HPIGS TH EXT SUP (H) | M2.h | U2.BB |
| HPIGS TH EXT SUP (L) | M2.i | U2.CC |
| HPIGS FUNC EXT SUP (H) | M2.j | U2.DD |
| HPIGS FUNC EXT SUP (L) | M2.k | U2.EE |
| HPIGS FUNC EXT SUP (H) | M2.m | U2.FF |
| HPIGS FUNC EXT SUP (L) | M2.n | U2.GG |
| HPIGS FUNC EXT SUP (H) | M2.p | U2.HH |
| HPIGS FUNC EXT SUP (L) | M2.q | U2.JJ |

1. **M3 CABLE LOOM.**



**LOOM M3 TO U1**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M3:**MS3475-W22-55SN | **MIU MATING**  **U1:**MS3475-W20-41PN |
| PL\_EL BAT HEATER(H) | M3.A | U1.c |
| PL\_EL BAT HEATER(L) | M3.B | U1.e |
| S2 FNC-2 BAT HEATER(H) | M3.D | U1.f |
| S2 FNC-2 BAT HEATER(L) | M3.E | U1.h |
| S1 FNC-1 BAT-1 HEATER(H) | M3.G | U1.i |
| S1 FNC-1 BAT-1 HEATER(L) | M3.H | U1.k |
| S1 FNC-1 BAT-2 HEATER(H) | M3.K | U1.m |
| S1 FNC-1 BAT-2 HEATER(L) | M3.L | U1.p |
| PL\_EL BAT HEATER(THERMOSTAT) | M3.C | U1.d |
| S2 FNC-2 BAT HEATER(THERMOSTAT) | M3.F | U1.g |
| S1 FNC-1 BAT-1 HEATER(THERMOSTAT) | M3.J | U1.j |
| S1 FNC-1 BAT-2 HEATER(THERMOSTAT) | M3.M | U1.n |
| U1 CMS | M3.b | U1.A |
| U1 CMS | M3.c | U1.t |

**LOOM M3 TO U2**

|  |  |  |
| --- | --- | --- |
| **SIGNAL NAME** | **SIU MATING**  **M3:**MS3475-W22-55SN | **MIU MATING**  **U2:**MS3475-W24-61PN |
| U2 CMS | M3.d | U2.A |
| U2 CMS | M3.e | U2.t |
| S2 LPST RET | M3.q | U2.NN |

**LOOM M3 TO U3**

| **SIGNAL NAME** | **SIU MATING**  **M3:**MS3475-W22-55SN | **MIU MATING**  **U3:**MS3475-W22-55PN |
| --- | --- | --- |
| P.M.Bat A1 Output Discharge (H) | M3.r | U3.D |
| P.M.Bat A1 Output Discharge (H) | M3.s | U3.Y |
| P.M.Bat A1 Output Discharge(H) | M3.t | U3.z |
| P.M.Bat A1 Output Discharge(L) | M3.z | U3.AA |
| P.M.Bat A1 Output Discharge (L) | M3.AA | U3.BB |
| P.M.Bat A1 Output Discharge (L) | M3.BB | U3.F |
| P.M.Bat A2 Output Discharge(L) | M3.DD | U3.GG |
| P.M.Bat A2 Output Discharge (L) | M3.EE | U3.HH |
| P.M.Bat A2 Output Discharge(L) | M3.FF | U3.G |
| P.M.Bat A2 Output Discharge(H) | M3.v | U3.E |
| P.M.Bat A2 Output Discharge (H) | M3.w | U3.EE |
| P.M.Bat A2 Output Discharge(H) | M3.x | U3.FF |
| U3 CMS | M3.f | U3.A |
| U3 CMS | M3.g | U3.DD |
| LPST RET | M3.p | U3.u |

**10.3 FLOW CHART OF CABLE LOOMS:**

Procurement as per BOM

Components Inward Inspection

Assembly of cable looms

Retention check

Isolation check

SSQAG inspection

Internal QC inspection

Internal QC inspection

Internal QC inspection

Continuity check

**10.4 Process Flow Descriptions:**

**Electrical Procurement:** Procurement of components will be done as per BOM

**Inward Inspection:** After receipt of material from vendor it will be inspected by internal QC. Check the components by using 10X microscope if any damages as there. After acceptance of material from QC it should be stored in clean and safe area, if any rejection is there material will be returned to the vendor for replacement.

**Assembly of cable looms:** The inspection will be carried out as per the assembly drawing and BOMand thefollowing checklist will be ensured.

* All components assembled are as per the drawing and are at proper position
* Check the component count as per the BOM
* Check the standard mounting
* Check if any component has been damaged during assembly
* Sleeve clearances from tracks for metal bodied parts
* Check for sufficient stress relief
* Check that proper mounting hasbeen done for heavy components

**10.6 Acceptance Test:**

The Acceptance Test of the LOOMS consists offollowing test

* Continuity checks
* IR / Isolation Checks
* Retention checks

**11.0 FAMILY TREE OF LEVEL II SIMULATOR**

**KVM**

**DBPL-L2SIM-RKVM**

**SIMULATOR PC**

**DBPL-L2SIM-SPC**

**COUPLERS**

**MIU**

**SIMULATOR INTERFACE UNIT**

**DBPL-L2SIM-TESTJIG**

**TEST JIG**

**DBPL-L2SIM-TESTJIG**

**LIU**

**12.0 PROCESS FLOW CHART**

Note: P1 For PCB’S Process

P2 For Mechanical Process Refer MQAP

P3 For Embedded Boards

P4 For Environmental & Process Flow

**PROCESS FLOW CHART FOR LEVEL -II SIMULATOR**

**MECHANICAL PROCESS FLOW as per MQAP**

**P2.0**

**Internal Wiring, Crimping, Continuity, Retention & IR test P1.14**

**SSQAG Inspection**

**P1.17**

**Supplying to customer with logbook for each unit**

**P4.4**

**Packing as per the requirement**

**P4.3**

**Final Integration of the Unit**

**P4.2**

**SSQAG Inspection of PCB’s & components P1.2**

**Bare PCB’s &Components (KOP) Internal inspection P1.1**

**Baking of PCB’s at 105° C for2 hours P1.3**

**Internal QC Check P1.4**

**Passive, ActiveComponents&DC-DC converter assembly P1.5**

**Cleaning of PCB’s P1.6**

**Conformal Coating of PCB’s P1.11**

**PCB’s Board Level test P1.8**

**Importing AIMB-584 Mother boards, Display & Keyboard to DatasolP3.0**

**Internal QC Visual Inspection**

**P3.1**

**Functional Testing**

**P3.2**

**Internal QC**

**Inspection**

**P3.3**

**Screening of Connectors**

**P1.0**

**Potting of PCB’s**

**P1.13**

**Endurance Test by SSQAG**

**P4.1**

**Environmental tests by SSQAG**

**P4.0**

**Burn test 168 hours at +55°C power on condition assembled PCB’s P1.9**

**Final Functional testing of Units**

**P1.16**

**SSQAG Inspection before closing units Final Mechanical Assembly**

**P1.15**

**PCB’s Board Level test P1.12**

**PCB’s Board Level test P1.10**

**SSQAG Inspection for Populated PCB’s**

**P1.7**

**12.1 DESCRIPTION OF PROCESS FLOW CHART:**

|  |  |  |  |
| --- | --- | --- | --- |
| **PN.**  **No.** | **DESCRIPTION** | **TOOLS** | **REMARKS** |
| **P 1.0** | **Screening of connectors** | -- | Inspection by Datasol QC |
| **P 1.1** | **Bare PCB’s & Components (KOP) Internal inspection** | -- | -- |
|  | 1. Visually inspect the PCBs using 10X microscope for any voids, burns, bubbles & surface imperfection etc. 2. Dimensions: The PCBs shall meet the dimensional requirements as specified in the drawing (such as cut outs mounting holes, overall thickness & periphery etc.) 3. Group ‘A’ certificates shall be checked for PCB 4. Group ‘B’ certificates for a batch shall be checked 5. Continuity is checked with respect to schematic at least one PCB per batch. | 10X Magnifier, Multimeter, Measuring Scale & Vernier | Inspection by Internal QC |
| **P1.2** | **Components Inspection** | -- | -- |
|  | 1. Identify the components as per the BOM. The components are accepted based on label/Marking available on the component 2. Check the component Part No. & Conformance of Certificates (for main components) 3. Visually inspect components if any damages are there 4. They are checked for visual defects like bending of termination, tarnish terminations & surface imperfection etc. 5. Check all the components are at proper position as per the layout drawing | 10X Magnifier &Multimeter | Inspection by Internal QC |
| **P 1.3** | **Baking of PCB’s** | -- | -- |
|  | 1. Baking of PCB’s at 1050 for 2 Hrs. | Thermal Chamber | Inspection by Internal QC |
| **P1.4** | **Internal QC Check before assembly of components** |  |  |
|  | 1. Flatness Check 2. Inspect the PCB’s for any abnormalities. | 10X Magnifier | Inspection by Internal QC |
| **P 1.5** | **Passive & Active Components Assembly** | -- | -- |
|  | 1. All passive components of SMD & lead type are assembled in the beginning. 2. The assembly will be checked visually & components are soldered. 3. Then all active components are assembled & will be checked visually & are soldered. 4. Check if any component has been damaged during mounting/soldering. 5. Check for any misalignment of parts with solder pads.   Note: The following points to be considered during the above process.   * Component count as per the BOM * Tin the component leads before soldering, so that the oxides (if any) on the leads are removed & further oxidation (during soldering) due to heat is avoided. * Check for the Polarity. * Insert the components at proper places as per the layout drawing marked on the PCB * Check for Parts tilt. * Check for sleeving/clearance from tracks for metal body parts. * Check for the clearance from card edge/chassis/wire bunch. * Check for sufficient stress-relief has been provided. * Check for any excess length of leads. * Check for lead clearance for chassis mounting components. * Proper mounting of heavy/special components. | Soldering Tool & 10X Magnifier | Inspection by Internal QC |
| **P 1.6** | **Cleaning of PCB’s** | -- | -- |
|  | 1. Clean the soldered PCB’s with isopropyl alcohol as per the two-tray cleaning method. 2. The two trays shall be filled with isopropyl alcohol. 3. The unclean PCB shall be placed in first tray for 30 mins. Then clean the board with a Nylon brush. 4. The board is now put in the second tray for 15 mins. & again cleaned with the brush. 5. Allow it to dry for 30 mins. 6. Then the PCB’s will be offered for visual check (contaminated solder connections ex. Flux residues after cleaning). | Isopropyl Alcohol, Trays & Nylon Brush | Inspection by Internal QC |
| **P 1.7** | **populated PCB’s inspection** |  |  |
|  | Assembled PCB is submitted to SSAQAG for Inspection | 10X Magnifier | SSQAG Inspection. |
| **P 1.8** | **Board Level PCB TESTING** |  | SSQAG Inspection. |
| **P 1.9** | **Burn-in test** | -- | -- |
|  | Assembled PCB’s kept in power on condition in 650 C  Up-to 168 hours | -- | Inspection by Internal QC |
| **P 1.10** | **Board Level PCB testing** |  | Inspection by Internal QC |
| **P1.11** | **Conformal Coating** |  |  |
|  | 1. Clean the assembled PCBs with isopropyl alcohol by three tray method & dry it at 650C ± 50C for 4 Hrs. to remove trapped moisture. 2. Masking of PCB to be done before the baking of PCB. Then baking of PCB for 2 Hrs. at 1050C 3. Apply the conformal coating immediately after baking. If it is not done immediately PCB to be baked again.   Note: Before handling read product & safety data sheets & container labels for safe use & expiry date.   1. Apply the conformal coating uniformly on both sides of PCB by spraying or dipping & allow it to dry. 2. Conformal coating can be cured either at room temperature or by an accelerated heat cure as per manufacturer specifications. At room temp., the curing time shall be minimum 24 Hrs. | Conformal Coating Material: Silicon Based or Acrylic based spray, that conforms to MIL-I-46058C |  |
| **P 1.12** | **Board Level PCB testing** |  | Inspection by Datasol QC |
| **P 1.13** | **Potting of PCB’s**  RTV gel P/N: 3140 & 3145 will be used were ever necessary in SIM PC & SIU |  | SSQAG Inspection. |
| **P 1.14** | **Internal Wiring** | -- | -- |
|  | 1. Pins Crimping of Insertion 2. Nick cut or damage of the wire strands. 3. Reduction in cross section of wires 4. Embedding of insulation into the contact barrel. 5. Damage (Cracking /Bending) to crimped portion or over crimping. 6. Excess deformation of wire strands. 7. Voids in wires strands, bundle, showing under crimping. 8. Non-visibility of wires strands through the inspection hole in the crimp contact barrel. 9. Pins properly inserted or not. 10. Inserted pins licked properly or not. 11. Insertion of Crimping Pins 12. The crimped wires are to be inserted into respective circular connectors as per the wiring list. 13. The shield of the cable is shorted to the back shell provided on the connector. 14. Sleeves & back shell to be provided for all circular connector. 15. Labels for all circular connectors. 16. Wiring 17. Wire insulation damage. 18. Lacing thread burnt & loose. 19. Cable ties are not sufficient. 20. Bending of wires & concentration of stress at one point. 21. Proper sleeving of joints. 22. Strands separation at soldering points. 23. Cable Gauge, stands & color 24. Retention Test   All crimped pins.   1. Continuity Test & IR Test 2. Check for continuity as per the wiring list. 3. Insulation Resistance (IR) Test is conducted between +’ve line & Earth Ground, and resistance should be ≥ 20MΩ. | Soldering Tool, Crimping Tool, Multimeter& 10X Magnifier | Inspection by Internal QC |
| **P 1.15** | **Final Mechanical Assembly** |  | SSQAG Inspection. |
| **P 1.16** | **Functional Testing** | -- | -- |
|  | 1. All the I/O ports at the circular connectors are checked as per Annexure F | As per Annexure F | Inspection by Datasol QC |
| **P 1.17** | **SSQAG Inspection** | -- | -- |
|  | 1. Functional test shall be conducted in presence of SSQAG as per the Functional Test Procedure specified in Annexure F | As per Annexure F | SSQAG Inspection. |
| **P 2.0** | **FOR MECHANICAL PROCESS FLOW AS PER MQAP** |  |  |
| **P 3.0** | **Importing of Embedded Boards** | -- | -- |
|  | Importing of material as per BOM, to Datasol (B) Pvt. Ltd. | -- | Inspection by Internal QC |
| **P 3.1** | **Internal QC Inspection** | -- | -- |
|  | Visual Inspection at Datasol. Check for any damages/scratches on the board. | 10X Magnifier | Inspection by Internal QC |
| **P 3.2** | **Functional Test** | -- | -- |
|  | 1. Testing of I/O ports as per Annexure F | Annexure F | Inspection by Internal QC |
| **P 3.3** | **Inspection** | -- | -- |
|  | 1. Confirmation for received materials as per ordered Part No. 2. COC verification | 10X Magnifier | Internal QC Inspection |
| **P4.0** | **Environmental test** |  |  |
|  | 1. Environmental test shall be carried out as per the given specifications given in **Table-3& 4** 2. If any failure occurs, then report it to FAB (Failure analysis board) for inspection.   If no failure occurs, then go to next step. | Ref Table -3 & 4 | SSQAG Inspection. |
| **P4.1** | **Endurance test** |  |  |
|  | 1. Endurance test shall be carried out as per the specifications given in **Table-3& 4** 2. If any failure occurs, then report it to FAB (Failure analysis board) for inspection. 3. If no failure occurs, then go to next step. | Refer Resources required in Annexure F | SSQAG Inspection. |
| **P4.2** | **Final integration test** | -- | Technical Inspection by Datasol & ASL |
| **P4.3** | **Packing as per requirement** | -- | -- |
| **P4.4** | **Supply unit with log book** | -- | -- |

**Table Description of Process Flow Chart**

**13.0 ENVIRONMENTAL SPECIFICATION:**

**ENVIRONMENTAL TESTING (ENTEST):** These tests are done to test and evaluate performance of the time(s) at the specified environmental conditions.

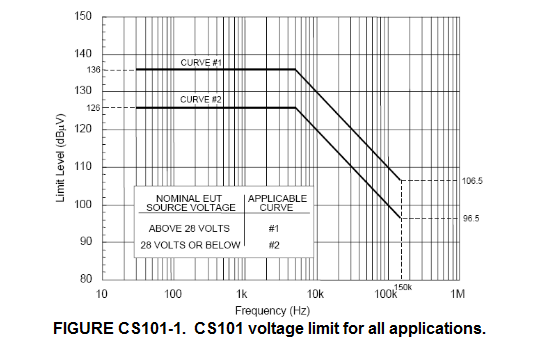
1. **Qualification-level Environmental testing: NOT APPLICABLE**
2. **Acceptance level Environmental testing: APPLICABLE**
3. **Clearance report for MIU (an FIM from ASL) should be submitted to QC by checkout**
4. **SAMPLING: at *Batch level.***

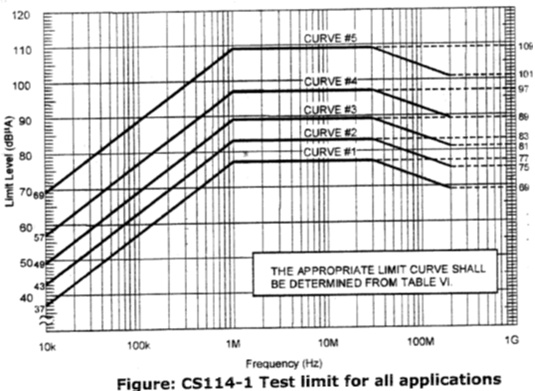
* Batch level acceptance test (also called performance verification test) shall be carried out for Level-2 Simulator (consisting of simulator PC and simulator interface box).
* ***Only one unit / set of Level-2 Simulator shall be selected randomly out of every lot of 06 no’s;*** and it shall undergo **ESS, Damp Heat & EMI / EMC** tests. **Refer tests 1 through 3 in table-3. *For 17 units, a total of 3 sample units should be selected randomly for the tests.***
* The remaining units of the lot(s) shall undergo **Random Vibration only.**  Refer **test 4** in table-3.

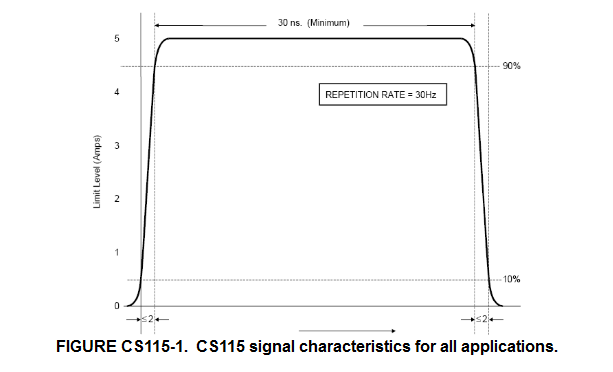
1. **Detailed AT-Level test specifications: Refer tables -2 & 3.**
2. ESS involves random vibration (Pre & Post) and thermal cycling (Refer table-3).
3. All the EMI / EMC tests mentioned in **Table-3 & 4** shall be carried out.
4. NA: Not Applicable.
5. Clearance report for **MIU** (an FIM from ASL) should be submitted to QC by checkout.

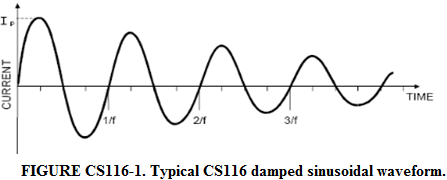
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| **Table-3: Batch-level ENTEST Specifications for Level-2 Simulator** | | | |
| **S. No** | **Description** | **Specification** | **Remarks** |
| 1 | ESS |  |  |
| a. | Random Vibration (Along all the three axis) | **Random Vibration:** 5-20 Hz, 6db per octave. (desirable that is, only if vibration machine capability permits). 20-50 Hz:0.02g2/Hzthen rolling up to 0.001g2/Hz at 500 Hz.  **Duration:** 15 minutes cumulative in three axis. | PREET & POET |
| b. | Temperature Cycling | **Temperature Levels:** -  For simulator PC with KVM: 00 C to +550C.  For simulator interface unit: -  -200 C to +550C. **Dwell time:** 60 minutes.  **Rate of change of Temperature:**  50 C/minute (minimum) total 6 Cycles. | PREET at ambient.  INSET to be done 2 times every cycle:  First before switching OFF (at the end of 550 C condition, during the last 15 minutes of dwelling period) and Second after switching ON (at the end of -200 C condition, during the last 15 minutes of dwelling period). POET at ambient |
| c. | Random Vibration (Along all the three axis) | **Random Vibration:** 5-20 Hz 6db per octave (desirable that is, only if vibration machine capability permits). 20-50Hz:0.02g2/Hz  Then rolling up to 0.001g2/Hz at 500 Hz.  **Duration:** 15 minutes cumulative in three axis. | PREET and POET |
| 2 | Damp Heat | 450 C (RH 95%) for 8 Hrs. | PREET at ambient  INSET at 7 ½ Hrs.  POET at ambient |
| 3 | EMI/EMC | All the EMI / EMC tests mentioned in the table are applicable for the simulator. | Refer table-4 for detailed specifications |
| 4 | Random Vibration (Along all the three axis) | **Random Vibration:** 5-20 Hz, 6db per octave. (desirable that is, only if vibration machine capability permits). 20-50 Hz:0.02g2/Hz  then rolling up to 0.001g2/Hz at 500 Hz.  **Duration:** 30 minutes cumulative in three axis (10 minutes per axis). | PREET & POET |

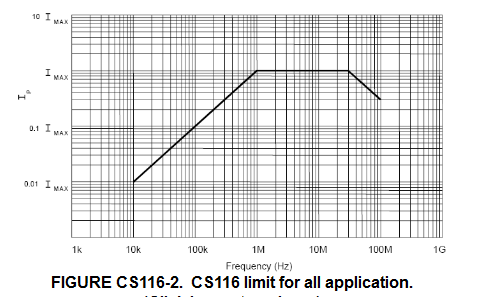
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| **TABLE-4: DETAILED EMI / EMC TEST SPECIFICATION AS PER 461E** | | | | | |
| **S/N** | **TEST** | **TEST DESCRIPTION** | **Applicability / Limit Line / Test Procedure** | **Test Duration** | **Remarks** |
| 1 | CS101 | Conducted Susceptibility power leads, 30Hz to 150KHz. | **Applicability:** Applicable to subsystem AC and DC input power leads, not including returns. On AC lines this requirement is applicable starting from the second harmonic of the equipment under test power frequency.  **Spec. Limit Line**: The equipment shall not exhibit any malfunction, degradation of performance, or deviation from specified indications / tolerances, when subjected to signal voltage levels. CURVE #1 for source. | The test signal voltage shall be applied on to each power lead separately for the complete band of frequency. That is approx. 30 minutes for each test run. | PREET/ INSET /POET |
| 2 | CS114 | Conducted Susceptibility, Bulk Cable Injection, 10KHz to 200 MHz | **Applicability**: Applicable to all interconnecting cable bundles, power cable, and separately on positive (high) line / wire, excluding neutral / ground lines.  **Spec. Limit Line: The** equipment shall not exhibit any malfunction or degradation of performance when subjected to signal voltage (1kHz pulse modulation, 50% duty cycle).  Current limit CURVES #3 and #4 are applicable.  **Curve #3** is applicable in the frequency band of 10 kHz to 2MHz and **curve #4** from 2MHz to 200MHz.  Test setup and Test procedure: As per Mil - Std-461E. | The test signal current shall be applied on to each cable bunch / line separately for the complete band frequency. That is approx. 90 minutes for each test run. | PREET/ INSET /POET |
| 3 | CS115 | Conducted Susceptibility, Bulk Cable Injection, Impulse Excitation. | **Applicability**: Applicable to all interconnecting cable bundles, power cable, and separately on positive (high) line / wire, excluding neutral / ground lines.  **Spec. Limit Line: The** equipment shall not exhibit any malfunction or degradation of performance when subjected to signal characteristics as shown in fig CS115-1  Test setup and test procedure as per Mil - Std-461E. | The test pluses shall be applied on each cable bunch / line separately for duration of 60 seconds. | PREET/ INSET /POET |
| 4 | CS116 | Conducted Susceptibility, damped sinusoidal transients 10kHz to 100MHz | **Applicability**: Applicable to all interconnecting cable bundles, power cable, and separately on positive (high) line / wire, excluding neutral / ground lines.  **Spec. Limit Line**: The equipment shall not exhibit any malfunction or degradation of performance when subjected to the signal in fig CS116-1 & CS116-2, for minimum of six spot frequencies. That is 10kHz, 100kHz, 1MHz, 10MHz and 100MHz.  Test setup and test procedure as per Mil - Std-461E. | The test signal current shall be applied on to each cable for of six spot frequencies. It takes approx. 45 minutes for each cable / wire. | PREET/ INSET /POET |
| 5 | RS103 | Radiated Susceptibility Electric Field, 2MHz to 18GHz | **Applicability**: Applicable to all Equipment / Subsystem enclosures with interconnecting cables.  **Spec. Limit Line**: The equipment shall not exhibit any malfunction or degradation of performance when subjected to field strength of 50V / min the frequency range of 2MHz and 18GHz with 1kHz pulse modulation, 50% duty cycle at 1mtr from equipment for both vertical and horizontal polarization.  Test setup and test procedure as per Mil - Std-461E. | The electrical field shall be applied for complete band of frequency with the scan rates specified in Mil - Std-461E.  (susceptibility testing times). | PREET/ INSET /POET |
| 6 | HESD | Human Electrostatic Discharge | **Applicability**: Applicable to all the interfacing connectors mounted on the equipment and chassis.  **Spec. Limit Line**: The equipment shall not exhibit any malfunction or degradation of performance, when discharged a 20kV pulse with RC network of 150 Ohms and 150 pF.  Test setup and test procedure as per IEC 61000-4-2 / Mil - Std-461E. | 2 Pulses to be discharged on each connector and equipment chassis. | PREET/ INSET /POET |
| 7 | RE102 | Radiated Emissions, electric field, 2MHz to 18 GHz | **Applicability**: Emissions from equipment and their interconnecting cables at 1meter distance from the equipment shall be measured.  **Spec. Limit Line:** Emissions from equipment shall not be radiated more than those shown in fig RE102-4 (Navy Mobile & Army).  Test setup and test procedure as per Mil - Std-461E. | NA | PREET/ INSET /POET |
| 8 | CE102 | Conducted Emissions, power leads, 10KHz to 10MHz | Applicability: Applicable on AC and DC input power leads, including returns (which are not grounded internally), that obtain power from other sources.  **Spec. Limit Line:** Emissions on 28V power leads shall not be exceeded the values shown in fig. CE102-1 (basic curve).  Test setup and test procedure as per Mil - Std-461E. | NA | PREET/ INSET /POET |

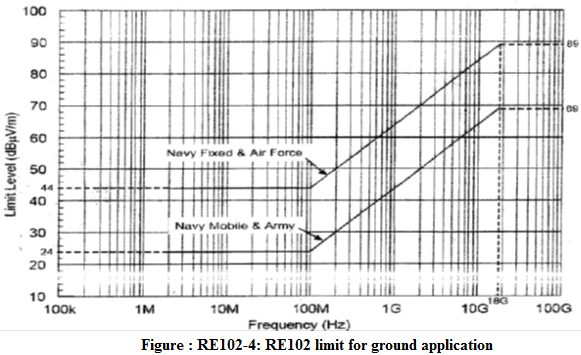


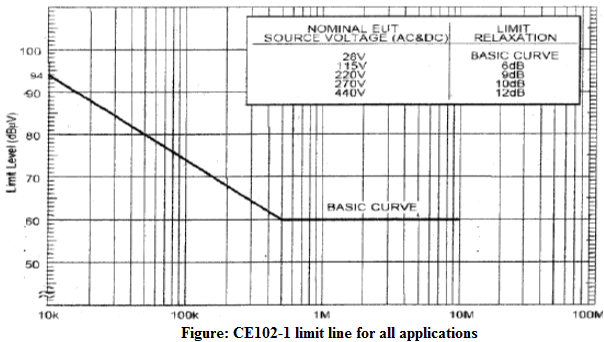






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# 14.0 SAFETY PRECAUTIONS

**SAFETY WARNING**

**VOLTAGES WITHIN THIS EQUIPMENT ARE SUFFICIENTLY HIGH TO ENDANGER LIFE**

**COVERS SHOULD NOT BE REMOVED EXCEPT BY**

**PERSONS QUALIFIED AND AUTHORISED TO DO SO**

**AND THESE PERSONS SHOULD ALWAYS TAKE**

**EXTREME CARES ONCE THE COVERS HAVE BEEN REMOVED.**

**Note:** Please read below safety precautions,

1. Before starting the work, the operator must check and neutralize him/ her self of any electrostatic charge present in the body using the “wrist and ground tester.
2. While working, the operator must wear the “hand strip” which keeps the operator’s body always at ground potential.
3. It is compulsory that, all the units and racks are connected to the common earth point to avoid the shock.
4. The work should always be done on ESD-safe working tables.
5. Prescribed tools should be used for insertion and extraction of crimped pins.

**15.0 STORAGE &HANDLING DETAILS**

|  |  |
| --- | --- |
| **HANDLING AND STORAGE INSTRUCTIONS FOR ELECTRONIC EQUIPMENT**  UP | |
|  | * Store the box in well ventilated room avoiding direct sunlight and moisture * Store the box in ESD protected dust and moisture free environment. * Handle the item in ESD safe area with wrist band . * Datasol supplied packing box/Covers should be used for handling/storage/transportation.   DOWN   * Do not touch the pins of connectors * Dust cap should be used to protect the connectors during handling and storage. |

# 15.1 PACKAGING DETAILS

## INTRODUCTION:

This document describes the process of packing of the finished products before dispatch.

## RESPONSIBILITIES:

Production manager and staff in Production, Delivery boys during dispatch and Transfer.

## INSTRUCTIONS

**Handling**:

1. Usage of Antistatic wrist straps is mandatory. Use wrist straps at the time of Packing.
2. Place desiccators over the board and place it in an antistatic cover and close the cover using antistatic tape.
3. Close the box and fasten with the tapes.
4. Prepare the DC with the PO reference and get it approved by Director(Production)

**Transfer**:

1. Check whether the item is properly packed.
2. See that the items do not get shock or vibration during transit.