

FIRST/ESA/N/0040.10

Rosetta Preferred Parts List as an example for a possible  
FIRST/Planck Parts List.

Please note this is an example only and in no way applicable to  
the FIRST/Planck Project.

Regards

Harm Schaap

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|  Daimler-Benz Aerospace<br><i>Dornier</i> |  | Doc. No.: RO-DSS-LI-1003                     |
| Project:<br><b>ROSETTA</b>   |  | Issue: 1    Date: 29.01.1998<br>Sheet: - 7 - |

## 1. INTRODUCTION

This document shall aid the designer to use only parts, which have proven already successful usage in space. This is to avoid expensive evaluation and qualification work. For parts, which are not listed here and have no adequate history in space, the user has to bear all cost and risk and to perform a selfprocurement.

## 2. PARTS PROCUREMENT POLICY

Generally all users are required to make maximum use of the coordinated procurement scheme, in order to make the scheme cost-effective and qualitywise a success. User self procurement of specialised devices or unique components, needs DORNIER / ESA approval. If a user procures or manufactures high-rel parts by himself, he has to fulfil all procurement requirements as described in RO-DSS-RS-1005 and shall establish an adequate Components Control Plan for EEE parts procurement activities.

For all Components procured via the Parts Procurement Agent (PPA) PAD's will be issued by the PPA for Dornier and ESA approval. In case of user-selfprocurement the user has to care about the PADs and has to obtain approvals from Dornier / ESA.

### 2.1 Procurement Approach

The procurement system is a co-ordinated procurement, whereby the user places orders for high-rel parts to the parts procurement agent and Prime Contractor co-ordinates these orders by means of the non recurring cost element and defines selfprocurement.

The objective of the co-ordinated procurement is to achieve an effective EEE - part procurement. Duplication of cost and effort for the same part type will be avoided by combining the need for different users. Manufacturers of components will not be approached by various parties for the same item. This allows :

better price per piece part (as the quantity is higher: package deals)

to avoid duplication of lot charges

to decrease the number of control activities (e.g. precap)

to avoid duplication of DPA and LAT

to make use of common specification system and thus to achieve standardisation

to avoid minimum by charges

to achieve visibility throughout the program in view of alerts and problem notifications.

to ensure a defined Quality Level throughout the project

The component quality level shall generally be in accordance with PSS-01-60.

## 2.2 User

Each individual user has to establish a Contractors Parts List. In order to have a cost effective procurement by means of type reduction, the user has to provide an application assessment report for all components which are not accepted by the Procurement Control Board (PCB final decision is with Dornier / ESA) for the co-ordinated procurement.

The user has to establish a purchase order towards the PPA or an approved manufacturer ( for selfprocurement) to obtain the parts required for his equipment. The only cost element for the user against any such purchase order placed to the PPA before cut off date, is the recurring part.

The formal procurement details like budgetary cost, telefax order, negotiated cost and formal purchase order will be submitted to the contractors by the PPA.

In those cases where ESA/DORNIER agreed, that the user performs procurement of a component by himself, the user must bear all costs involved in that procurement, and he must fulfil all requirements. In case a part is used by one user only, the Parts Procurement Board may decide that this is a user self Procurement or a candidate for type reduction. For selfprocurement the user has to establish a Component Control Plan incl. the radiation test plan, to place purchase order towards the manufacturer and to provide all necessary documents for approval to the prime contractor to obtain the parts required for his equipment.

Procurement of components shall in general only be performed after approval of the relevant PADs by DOR/ESA. Exceptions can only be given by ESA / DORNIER for individual cases upon request.

## 2.3 Parts Procurement Agent (PPA)

The parts procurement agent has to procure all high-rel parts required by the programme to the requirements. The PPA will issue a overall Procurement status List based on the individual USER CPL's for the entire program. The adress and keypersonal of the PPA is

To be defined

Meanwhile use :

Dornier Satellitensysteme GmbH, Mr. Volker Lindekugel, Dep. RSQ7  
Fax: Germany 7545 8 9330

## 2.4 Dornier

Dornier has a direct contract with the PPA for the procurement of high-rel components. This contract includes all tasks related to the non-recurring cost element of the parts and the procurement agencst services. Dornier coordinates all actions and information towards ESA.

Dornier is responsible for the implementation of the requirements.



### 3. APPLICABLE DOCUMENTS

The following documents are applicable with the latest issue as.

For a conflict between this and the applicable documents the applicable document shall prevail.

|      |  |                |
|------|--|----------------|
| AD-1 | PA-Requirements for Subcontractors             | RO-DSS-RS-1005 |
| AD-2 | Documentation Identification Procedure         | RO-DSS-PR-1001 |
| AD-3 | Configuration and Data Management Requirements | RO-DSS-RS-1006 |
| AD-4 | ESA / SCC Qualified Parts List                 |                |
| AD-5 | General Design Requirement Specification       | RO-DSS-RS-1007 |
| AD-6 | Environmental Requirement Specification        | RO-DSS-RS-1003 |

### 4. QUALITY LEVEL

#### 4.1 Basic Requirements

The following minimum requirements with respect to ESA/SCC or MIL test levels shall apply:

- All active components shall be procured to ESA/SCC Level B or equivalent, as defined below:  
The following MIL specifications are considered equivalent. This is valid for MIL-PRF-38535 class V, MIL-M-38510 class S for integrated circuits. For discrete semiconductors it is MIL-S-19500 Jan S. SCD's (source control drawing), which are under the QML scheme may be acceptable, if they are equivalent to level V. The levels in such SCD specification may differ and can only be accepted after assessment.  
Each lot of active components shall be homogenous and be traceable to wafer level
- For passive parts, Level C according the ESA/SCC specification system is generally acceptable. For certain complex passive components when either high stability is required or when potential failures can only be identified through parameter drift, SCC level B is required (e.g. crystals, reference resistors, fuses, switching devices such as relays).

For passive parts, MIL parts with established reliability failure rate R or S are considered acceptable.

The components selected for use in EM-models, shall be compatible to the flight quality devices in form, fit and function. Plastic packages shall generally not be used and shall be replaced by hermetic seal packages. The EM devices shall also meet the extended temperature range (-20°C → +85°C).

Preference should also be given to manufacturers, who can also supply their products in hi-rel quality.

#### 4.2 Additional Screening

##### SEM requirements

Unless already covered by the applicable procurement specification a SEM requirement in accordance to MIL-STD-883 C method 2018 or MIL-STD-750 method 2017 must be imposed on the manufacturer for the following components:

- integrated circuits (IC)
- microwave components
- MOS-FET components (FET)

##### PIND test

Unless already covered by the relevant procurement specification a PIND test in accordance to MIL-STD-883 C method 2020 condition B must be requested from the manufacturer for all devices with a cavity.

##### Humidity Test (85/85)

This test is required for ceramic capacitors when procured to MIL-ER-specifications.

##### ESD

Handling, classification and testing to SCC 23800 shall be performed if no classification is evident.

##### Others

Beside these requirements listed above other specific requirements may be found necessary to safeguard the application or quality (e.g. Asynchronous Misstest). These must be defined by the procurement authority, subject to approval by the PCB and included in the procurement specification. These requirements may depend on the component technology and/or on experience made in previous procurements or even in this procurement. (high temperature reversed bias (HTRB) with delta criteria may be an example).

#### 4.3 Lot Acceptance Requirements

It shall be ensured that all components are subjected to Lot Acceptance Testing (LAT) as defined in the ESA/SCC specifications, or QCI (Quality Conformance Inspection) as defined in the MIL specifications. The appropriate level ( in addition to PSS-01-60 ) shall be as defined below:

**Level LAT1 or QCI compatible:** Applicable when the component is neither ESA/SCC nor MIL qualified at the time of the procurement and level LAT2 is not applicable.

**Level LAT2 or QCI compatible:** Applicable when the component is not space qualified but has successfully supported other long life and/or high reliability space programmes and the reliability/evaluation data are still valid for the current design.

**Level LAT3 or QCI compatible:** Applicable for all cases not included in level LAT1 or LAT2. Level LAT3 tests may be replaced by incoming inspection. LAT3 tests may be omitted for qualified ranges of components (e.g. 54HC, ...) if continuous procurement is ensured.

Components may need level LAT1 or LAT2 tests if technical problems or alerts exist.

#### 4.4 Hybrid Circuits/ASIC's

Hybrid circuits and the chips, they consist of, shall meet the requirements of PSS-01-608. For the control during design and manufacturing of ASIC technologies the "ESA ASIC Design and Assurance Requirements" (QC/172/RdM) shall be used as guideline.

For existing hybrid design also MIL-PRF-38535 is acceptable. The level in particular for element evaluation shall be fixed on case by case basis.

### 5. RADIATION CONSTRAINTS

The dedicated applicable spacecraft radiation environment and general requirements are provided in the Environmental Specification [AD-103], chapter 3.3.5.

The dedicated applicable design requirements are provided in the General Design Specification [AD-107], chapter 3.15.

Due to the deep space mission characteristic of Rosetta single event effects (SEU) are the main design driving constraints.

#### 5.1 Abbreviations

|      |  |
|------|--|
| TD   | Total Dose effects   |
| SEE  | Single event effect  |
| SEU  | Single event upset   |
| SEB  | Single event burn out  |
| SEGR | Single event gate rupture  |
| SOI  | Silicon on intrinsic silicon wafer, Silicon on Isolator                                  |
| SOS  | Silicon on sapphire  |
| TID  | Total ionising dose  |
| SEL  | Single event latch up  |
|      | Soft error due to heavy ions   |
| LET  | Linear Energy Transfer   |
| RVT  | Radiation verification testing to be done on each lot coming from a wafer diffusion lot. |
| DI   | Dielectric isolated semiconductors   |



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## 5.2 Definitions and Effects

### 5.2.1 General

It is important to understand that the information provided in this document concerning the radiation susceptibility is based on experience for most of the component types. Only for those parts which are sold by the manufacturer as rad-hard components, he accepts also a requirement to guarantee the dedicated performance.

For all other components which are sensitive to radiation no guarantee can be given neither by the manufacturer nor by the CPPA. The manufacturer may change lay-out or production processes which could also result in a different susceptibility to radiation.

### 5.2.2 Total Dose

#### 5.2.2.1 Total Dose Ionising Effects

For the selection of EEE-components the following rules apply:

- If no radiation data are available, Radiation Verification Testing (RVT) has to be performed. SCC 22 900 applies for testing.
  - For components inside the satellite (equal  $\geq 2$  mm Al shielding ) 30 krad total dose tolerance of the component is considered acceptable
  - For components not included above, it must be demonstrated by analysis (either based on the system level analysis and/ or by user sector analysis) that the safety factor of 2 between expected radiation level and the level that the component can tolerate is achieved.
  - For components not included above, it must be demonstrated by analysis (either based on the system level analysis and / or by user sector analysis) that the safety factor of 2 between expected radiation level and the level that the component can tolerate is achieved.
  - Whenever the safety factor of 2 is not met, corrective actions are required (e.g. additional shielding, replacement of components).
  - In addition Radiation Verification Testing may be required
    - for types with known lot to lot variation of dose tolerance, or
    - where the safety factor of 2 is met only marginally , or
    - where the known radiation tolerance of the component is below 5 krad .
- SCC 22 900 applies for testing.
- The user is responsible for the definition of the RVT. The procurer is responsible for its performance.

Dornier will perform the System Radiation Analysis in which the effective shielding by the spacecraft components is computed for each specific unit location (reference = COG). This information will be provided to all subcontractors.

The sector analysis - if applicable - shall be performed by the user based on ESABASE/ DOSRAD.



### 5.2.2.2 Dose Rates

All active electronic parts except linear bipolar semiconductors shall be tested to SCC 22900 and may use high dose rate testing. Linear, bipolar semiconductors have shown more damage at low dose rates. Therefore an evaluation / testing shall be done to dose rates lower than 50 rad (Si) per sec. Preferred is a comparison between a 50 rad and a 0.005 rad per sec. test. If any of those two test results shows a significant difference, than a retest to 0,001 rad (Si) per sec shall be done.

The TID radiation environment must include all radiation components such as X-ray, gamma ray, protons, electrons neutrons, heavy ions and the induced Bremsstrahlung. All such testing shall be done at 25 degree C and with screened high-rel parts.

### 5.2.3 Single Event Effects

Cosmic rays, solar flares and high energy trapped protons can induce various effects, caused by the energy deposited by a high energy particle as it interacts with the sensitive portions of an electrical device.

Therefore all semiconductor parts shall be evaluated for its dedicated sensitivity. Where no data are available, such data have to be created by characterisation testing and or lot testing.

Wherever the appropriate level is not meet, the design shall be as such, that no damage can occur. This can be achieved by fast latch up current switches, which switch off the current before a semiconductor is damaged, or by derating, limiting the semiconductors supply voltage in general. Above is subject to approval by the prime contractor and can be handled in form of a waiver.

#### 5.2.3.1 Single Event Latch Up

Cosmic rays may cause latch-up in certain technologies, primarily CMOS. Latch-up is caused by thyristor action in the substrate initiated by the passage of a heavy ion. Latch-up can be permanent and potentially destructive.

Main sensitive parts are ICs, MOS devices and optical devices. Bipolar, SOS, SOI and DI devices need not to be evaluated.

Parts showing latch up below an effective LET-limit given in AD-1, 5 or 6 shall only be used with an approval from DSS / ESA.

#### 5.2.3.2 Single Event Burn Out

SEB is a destructive effect.

The phenomenon usually occurs only in power MOSFET N-channel transistors. The parasitic bipolar NPN transistor is switched on and induces a short circuit between drain and source.

All power transistors operated in the off-mode may be susceptible to and shall be evaluated for single event burn out. The established survival voltage (VCE for bipolar and Vds for MOSFET) shall be used to asses the design and to calculate the parts application. The application voltage shall be derated to 75 % of the established survival voltage. All testing shall be performed at room temperature and with screened high-rel parts.

### 5.2.3.3 Single Event Gate Rupture

SEGR is a destructive effect. It may result in the formation of a conductive path in the gate oxide.

All power MOSFET operated in the off-mode may be susceptible to and shall be evaluated for single event gate rupture. The established survival voltage  $V_{ds}$  shall be used to assess the design and to calculate the parts application. The application voltage shall be derated to 75 % of the established survival voltage. All testing shall be performed at room temperature, at one elevated temperature ( 125 °C or maximum specified operating temp., whatever is lower) and with screened high-rel parts.

### 5.2.3.4 Single Event Upset

A SEU is a change of state or transient induced by an energetic particle, such as a cosmic ray or proton in a device. These are "soft" errors in that a reset or rewriting of the device causes normal device behaviour thereafter.

Main sensitive parts (all digital microcircuits containing storage elements, logic ICs, CCDs; e.g. flip, flops, counters, RAM's, microprocessor, etc.) shall be characterised so, that an upset rate calculation can be performed. A sufficient number of data points ( a minimum of three ) shall be measured to determine the curve of cross sections versus LET. Irradiation testing shall not exceed the angle between the chip normal and 60 degrees, to establish an effective LET. Particles (ion) ranges shall exceeds 30 microns.

The limits for acceptability shall be as per AD 1, 5 and 6

## 6. DERATING


Derating shall be done to PSS-01-301. Whenever a derating due to radiation effects is needed this shall be calculated on top of the PSS-01-301 derating.

## 7. QUALIFIED , NON-QUALIFIED PARTS AND TYPE REDUCTION

User parts lists will be screened for qualified and non-qualified parts. For non-qualified parts there may be suggestions for replacements with qualified parts from the PPL. For non-qualified parts the user has to deliver a parts application justification. If the user insists on the usage of such non-qualified part, he shall bear all cost and the procurement of such part, in specific also for the evaluation and qualification.

The procurement agent shall in closed loop co-operation with the user, experimenter, DSS, ESA ( also named parts board) try to minimise the number of line items, evaluations and non-Qualified parts. Since this is the major cost saving element DSS as prime contractor requires specific reporting on this topic (DRD-P-01 of AD-1 ).

Sometimes Qualified parts are called standard parts and Non-Qualified parts are called non-standard parts.

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| <p><b>8. NON PACKAGED PARTS</b></p> <p>There will be users on the program, that need unpacked EEE parts, in order to manufacture hybrids or similar components. The CPPA shall be open to adopt such need and try to combine the procurement and testing of dies and the packaged parts in order to avoid costly and time consuming element evaluation.</p> |  |  |

**9. LIST OF COMPONENT MANUFACTURERS**

| Code | Country | Manufacturer                       | Ref_Name / Address     |
|------|---------|------------------------------------|------------------------|
| TBD  | -       | to be defined                      |                        |
| ABC  | USA     | Allen Bradley Corporation          |                        |
| ACT  | USA     | Actel Corporation                  | 955 East Arques Avenue |
| AD   | USA     | Analog Devices                     |                        |
| ALP  | USA     | Alpha                              |                        |
| AMD  | USA     | Advanced Mirco Devices             |                        |
| AMP  | USA     | AMP Connectors                     |                        |
| ANG  | USA     | Angstrohm                          |                        |
| API  | USA     | American Precision Ind.            | Delevan Division       |
| ARC  | GB      | Arcotronics                        |                        |
| ATC  | USA     | American Technical Ceramics Corp.  | One Nordon Lane        |
| AUS  | USA     | Austin Semiconductor               |                        |
| AVX  | GB      | AVX Ltd, Tantalum Division         | Long Road              |
| AVX  | USA     | AVX-Ceramics                       |                        |
| BEN  | USA     | Bendix                             |                        |
| BET  | IRL     | Betatherm Thermistors              |                        |
| BKC  | USA     | BKC International Electronic       |                        |
| BUS  | USA     | Bussmann                           |                        |
| CAD  | USA     | Caddock                            | 1717 Chicago Avenue    |
| CAN  | F       | ITT Cannon                         |                        |
| CAN  | USA     | ITT Cannon                         |                        |
| CDE  | USA     | Cornell-Dubilier Electronics, Inc. | New Bedford, MA        |
| CDI  | USA     | Compensated Devices Inc            |                        |
| CEN  | GB      | Centronic                          |                        |
| CEP  | France  | CEPE                               |                        |
| CMA  | England | Oxley                              |                        |
| COR  | USA     | Corning                            |                        |
| CRC  | USA     | Component Research                 |                        |
| DAL  | USA     | Dale                               |                        |
| DAS  | D       | Dasa Ulm                           |                        |
| DEI  | USA     | Dearborn Electronics, Inc.         | 1221 N. Highway 17/92  |
| DEL  | USA     | Delevan                            |                        |
| DEU  | F       | Deutsch Connector/Relay            |                        |
| EFD  | F       | Eurofarad                          |                        |
| EFT  | D       | Ball Efratom Elektr.               |                        |
| ELE  | USA     | Electra Midland                    |                        |
| ELM  | USA     | Elmwood                            |                        |
| ERI  | CAN     | Murata/Erie                        |                        |
| ERO  | D       | Roederstein                        |                        |
| EUP  | D       | Eupec                              |                        |
| FAC  | USA     | Ford Aerospace                     |                        |
| FCI  | F       | Framatome Connectors               |                        |
| FEN  | USA     | Fenwal                             |                        |
| FRB  | F       | FRB Connectors                     | Souriau                |
| FSC  | USA     | Fairchild Semiconductors           |                        |



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| Code | Country | Manufacturer                       | Ref_Name / Address           |
|------|---------|------------------------------------|------------------------------|
| GEN  | USA     | Genicom Corp.                      | One Genicom Drive            |
| GEP  | F       | Gepe                               |                              |
| GI   | USA     | Gel Instruments                    |                              |
| GLN  | USA     | Glenair                            |                              |
| GPS  | GB      | GEC Plessey Semiconductor          |                              |
| GUL  | USA     | Gulton Thermistors                 |                              |
| HAF  | S       | Hafo                               |                              |
| HAR  | USA     | Harris                             |                              |
| HMP  | GB      | Hybrid Memory Product              |                              |
| HON  | USA     | Honeywell                          |                              |
| HP   | USA     | Hewlett Packard                    |                              |
| HYB  | GB      | HYBRID MEMORY PRODUCTS LIMITED     |                              |
| IDT  | USA     | Integrated Device Technology, Inc. | Santa Clara                  |
| INL  | USA     | Intersil                           |                              |
| INP  | U       | Interpoint Corporation             | 10301 Willows Road           |
| INR  | GB      | International Rectifier            |                              |
| INR  | USA     | International Rectifier            |                              |
| IRC  | USA     | International Restive Co           |                              |
| JAH  | D       | Jahre                              |                              |
| JOH  | USA     | Johanson                           |                              |
| KDC  | USA     | KD Components Inc.                 | 2710 Main St. S.             |
| KEM  | USA     | Kemet Electronics Corporation      |                              |
| KNX  | USA     | KNX                                |                              |
| KOD  | USA     | Eastman Kodak Comp                 |                              |
| LCC  | F       | LCC/CICE                           |                              |
| LIF  | USA     | Little Fuse                        |                              |
| LMI  | USA     | Linfinity Microelectronics Inc.    | 11861 Western Avenue         |
| LOR  | USA     | Loral, earlier IBM Manassas        | works for ACT                |
| LRE  | D       | Leach Relays                       |                              |
| LRE  | F       | Leach International Europe S.A     | 2. Rue Goethe                |
| LTC  | USA     | Linear Technology Corp.            |                              |
| MAL  | USA     | Malco                              |                              |
| MCC  | USA     | Mallory Capacitors Company         |                              |
| MCE  | USA     | Mc Coy Electronics                 |                              |
| MED  | GB      | Marconi El. Dev.                   |                              |
| MEP  | USA     | Meppo Centralab Inc.               |                              |
| MHS  | F       | Matra-Harris                       |                              |
| MIP  | F       | Microspire                         | 16, Parc d'Activites du Beau |
| MIR  | U       | Micrel Semiconductor               | 1849 Fortune Dr.             |
| MIT  | Sweden  | Mitel, earlier Hafo                |                              |
| MOT  | F       | Motorola                           |                              |
| MOT  | USA     | Motorola                           |                              |
| MPC  | USA     | Micropac Industries Inc.           | 725 E. Walnut St.            |
| MS   | USA     | Micro Switch                       | Devison of Honeywell, Inc.   |

| Code | Country | Manufacturer                            | Ref_Name / Address          |
|------|---------|---|-----------------------------|
| MSC  | IRL     | Microsemi Corporation                   |                             |
| MSC  | USA     | Microsemi Corporation, Santa Ana        |                             |
| MSC  | USA     | Microsemi Corporation, Scottsdale       | 8700 E. Thomas Rd.          |
| MSC  | USA     | Microsemi Corporation, Watertown        | 580 Pleasant Street         |
| MSC  | USA     | Microsemi Corp. Colorado                | 800 Hoyt Street             |
| MSI  | USA     | Mini-System Inc.                        | 20 David Road               |
| NES  | USA     | New England Semiconductor               | 6 Lake Street               |
| NSC  | USA     | National Semiconductor                  |                             |
| NYT  | USA     | Nytronics Hirel Inductors               |                             |
| OMR  | USA     | Omnirel                                 | 205 Crawford Street.        |
| OPT  | USA     | Optron                                  |                             |
| ORT  | USA     | Ortel Corporation                       | Alhambra, CA                |
| PEP  | USA     | Piezo Electronic Products               |                             |
| PER  | USA     | Performance                             |                             |
| PMI  | USA     | Precision Monolithics                   |                             |
| POS  | F       | Positronic Industries S.A.              | Zone Industrielle Est       |
| PPC  | USA     | PPC Product Corporation                 |                             |
| QK   | D       | Quarzkeramik                            |                             |
| RAD  | F       | Radiall                                 |                             |
| RAY  | USA     | Raychem                                 |                             |
| RCA  | USA     | Radio Corporation America               |                             |
| RCD  | USA     | RCD Components                          |                             |
| RCL  | USA     | RCL Shallcross Inc.                     |                             |
| RET  | USA     | Reticon                                 |                             |
| RIC  | France  | RICA                                    |                             |
| ROE  | D       | Roederstein GmbH                        | R. Folda - Vertriebstechnik |
| ROS  | USA     | Rosemount                               |                             |
| RTH  | USA     | Raytheon                                |                             |
| SC   | USA     | Shallcross (RCL)                        |                             |
| SCN  | USA     | Semicon Components                      |                             |
| SEC  | USA     | Silvered Electronic Mica Co.<br>(SEMCO) | Willimantic, CT 06226       |
| SEL  | GB      | Semelab                                 | Lutterworth                 |
| SEQ  | USA     | SEEQ Technology Inc.                    |                             |
| SET  | USA     | Semtech Corporation                     |                             |
| SF   | USA     | San Fernando                            |                             |
| SFR  | F       | Sfernice                                |                             |
| SG   | USA     | Silicon General                         |                             |
| SGL  | USA     | Silicon General                         |                             |
| SIE  | D       | Siemens                                 |                             |
| SIL  | D       | Silberkraft                             |                             |
| SLT  | USA     | Silicon Transistor Corp.                |                             |
| SLX  | GB      | Siliconix                               |                             |
| SLX  | USA     | Siliconix                               |                             |
| SOA  | US      | SOA                                     |                             |
| SOL  | USA     | Solitron                                |                             |
| SOU  | F       | Souriau                                 |                             |
| SOV  | F       | Sovcor                                  |                             |
| SPC  | USA     | Spectrum Control                        |                             |

| Code | Country | Manufacturer                   | Ref_Name / Address |
|------|---------|--------------------------------|--------------------|
| SPR  | F       | Sprague                        |                    |
| SPR  | USA     | Sprague                        |                    |
| SPT  | USA     | Spectrum Technology Inc.       |                    |
| SSD  | USA     | Solid State Devices Inc.       |                    |
| STA  | USA     | State of the Art               |                    |
| STC  | GB      | Std Telefon Cop.               |                    |
| STC  | USA     | Silicon Transistor Corporation | Katrine Road       |
| STM  | F       | ST SGS-Thomson                 | SGS                |
| SUH  | D       | Suhner                         |                    |
| TEG  | D       | Telefunken                     |                    |
| TEK  | F       | Tekelec                        |                    |
| TEK  | P       | Tekelec                        | Cascais, Portugal  |
| TEL  | USA     | Teledyne                       |                    |
| TEM  | F       | Temic, Matra Harnis, Nantes    |                    |
| TEX  | F       | Texas Instruments              |                    |
| TEX  | USA     | Texas Instruments              |                    |
| THO  | F       | Thomson CSF                    |                    |
| TMS  | F       | Thomson SGS                    |                    |
| TPN  | USA     | Teledyne Philbrick             |                    |
| TRC  | USA     | TRW Components Intern.         |                    |
| TRW  | USA     | TRW Electronics USA            |                    |
| UC   | USA     | Union Carbide                  |                    |
| ULT  | USA     | Ultronix                       |                    |
| UMT  | USA     | US Microtek                    |                    |
| USC  | USA     | U.S. Crystal Corp.             |                    |
| UTR  | USA     | Unitrode                       |                    |
| VAN  | USA     | Vanguard                       |                    |
| VEC  | USA     | Vectron Laboratories inc.      |                    |
| VIC  | USA     | Victory Engineer Corp.         |                    |
| VIT  | D       | Vitramon                       |                    |
| VIT  | F       | Vitramon                       |                    |
| VRI  | USA     | Vishay Resistor                |                    |
| VSD  | USA     | VSD, Nitron/Dale               |                    |
| VSP  | USA     | Vishay Sprague                 | 70 Pembroke Road   |
| WIN  | USA     | Winchester                     |                    |
| XIC  | USA     | Xicor                          |                    |
| Code | Country | Manufacturer                   | Ref_Name / Adress  |
| YSI  | USA     | Yellow Springs                 |                    |
| QPL  |         | Refer to Qualified Parts List  |                    |





## 10. COMPONENT FAMILY- AND GROUP CODES

| FCODE | GCODE | FAMILY                  | GROUP                                     |
|-------|-------|-------------------------|---|
| 01    | 01    | Capacitor               | Ceramic                                   |
| 01    | 02    | Capacitor               | Chip                                      |
| 01    | 03    | Capacitor               | Tantalum Solid                            |
| 01    | 04    | Capacitor               | Tantalum Non Solid                        |
| 01    | 05    | Capacitor               | Plastic Metallized                        |
| 01    | 06    | Capacitor               | Glass                                     |
| 01    | 07    | Capacitor               | Mica                                      |
| 01    | 08    | Capacitor               | Variable                                  |
| 01    | 09    | Capacitor               | Aluminium Solid                           |
| 01    | 10    | Capacitor               | Feedthrough                               |
| 02    | 01    | Connector               | Circular                                  |
| 02    | 02    | Connector               | Rectangular                               |
| 02    | 03    | Connector               | PCB                                       |
| 02    | 04    | Connector               | Attenuators                               |
| 02    | 05    | Connector               | RF Coaxial                                |
| 02    | 06    | Connector               | Glassfibre                                |
| 02    | 07    | Connector               | Triax                                     |
| 03    | 01    | Crystals                | All                                       |
| 04    | 01    | Diode                   | Switching                                 |
| 04    | 02    | Diode                   | Tectifier                                 |
| 04    | 03    | Diode                   | Voltage Regulator                         |
| 04    | 04    | Diode                   | Voltage Reference / Zener                 |
| 04    | 05    | Diode                   | Schottky Barrier                          |
| 04    | 06    | Diode                   | PIN                                       |
| 04    | 07    | Diode                   | Hot Carrier                               |
| 04    | 08    | Diode                   | Transient Suppression / Zener             |
| 04    | 09    | Diode                   | Tunnel                                    |
| 04    | 10    | Diode                   | High Voltage Rectifier                    |
| 04    | 11    | Diode                   | Varactor                                  |
| 04    | 12    | Diode                   | Step Recovery                             |
| 04    | 13    | Diode                   | Tuning                                    |
| 04    | 14    | Diode                   | Current Regulator                         |
| 04    | 15    | Diode                   | Microwave                                 |
| 05    | 01    | Filter                  | All                                       |
| 06    | 01    | Fuse                    | All                                       |
| 07    | 01    | Inductor / Coil / Choke | RF Coil                                   |
| 07    | 02    | Inductor / Coil / Choke | Cores                                     |
| 07    | 03    | Inductor / Coil / Choke | Chip                                      |
| 08    | 01    | Microcircuit            | Gate / Buffer                             |
| 08    | 02    | Microcircuit            | Flip Flop / Latch                         |
| 08    | 03    | Microcircuit            | Multiplier/Register/Counter/Divider/Adder |
| 08    | 04    | Microcircuit            | Converters                                |
| 08    | 05    | Microcircuit            | De-/Encoder / De-/Multiplexer / Selector  |
| 08    | 06    | Microcircuit            | Comperator / Follower / Regulator         |
| 08    | 07    | Microcircuit            | Function Gen. / Parity Gen.               |
| 08    | 08    | Microcircuit            | Timer / Trigger / Switch                  |
| 08    | 09    | Microcircuit            | Amplifier                                 |
| 08    | 10    | Microcircuit            | Transceiver / Receiver / Driver           |
| 08    | 11    | Microcircuit            | Memory                                    |
| 08    | 12    | Microcircuit            | Transistor Array                          |
| 08    | 13    | Microcircuit            | Multivibrator                             |
| 08    | 14    | Microcircuit            | Oscillator                                |
| 08    | 15    | Microcircuit            | Microprocessor                            |



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| FCODE | GCODE | FAMILY          | GROUP                             |
|-------|-------|-----------------|-----------------------------------|
| 08    | 16    | Microcircuit    | Other Functions                   |
| 08    | 17    | Microcircuit    | ASIC                              |
| 08    | 18    | Microcircuit    | Detector                          |
| 08    | 19    | Microcircuit    | Diode Array                       |
| 08    | 20    | Microcircuit    | Data Acquisition System           |
| 08    | 21    | Microcircuit    | Precision Voltage Reference       |
| 08    | 22    | Microcircuit    | Gate Array                        |
| 08    | 23    | Microcircuit    | Signal Conditioner                |
| 08    | 99    | Microcircuit    | Family                            |
| 09    | 01    | Relay           | Latching                          |
| 09    | 02    | Relay           | Non Latching                      |
| 09    | 03    | Relay           | Solid State                       |
| 10    | 01    | Resistor        | Metal Oxide                       |
| 10    | 02    | Resistor        | Wirewound Precision               |
| 10    | 03    | Resistor        | Wirewound Chassis Mounted / Power |
| 10    | 04    | Resistor        | Variable                          |
| 10    | 05    | Resistor        | Composition                       |
| 10    | 06    | Resistor        | Thick Film                        |
| 10    | 07    | Resistor        | Shunt                             |
| 10    | 08    | Resistor        | Film                              |
| 10    | 09    | Resistor        | Chip                              |
| 10    | 10    | Resistor        | Network                           |
| 10    | 11    | Resistor        | High Voltage                      |
| 11    | 01    | Thermistor      | All                               |
| 11    | 02    | Thermostat      | All                               |
| 12    | 01    | Transistor      | Low Power NPN                     |
| 12    | 02    | Transistor      | Low Power PNP                     |
| 12    | 03    | Transistor      | High Power NPN                    |
| 12    | 04    | Transistor      | High Power PNP                    |
| 12    | 05    | Transistor      | FET N-Channel                     |
| 12    | 06    | Transistor      | FET P-Channel                     |
| 12    | 07    | Transistor      | Microwave                         |
| 12    | 08    | Transistor      | Multiple                          |
| 12    | 09    | Transistor      | Switching                         |
| 12    | 10    | Transistor      | PF NPN Low Power / Low Noise      |
| 12    | 11    | Transistor      | PF PNP Low Power / Low Noise      |
| 12    | 12    | Transistor      | RF FET N-Channel / P-Channel      |
| 13    | 01    | Wire / Cable    | Low Frequency                     |
| 13    | 02    | Wire / Cable    | Coaxial                           |
| 13    | 03    | Wire / Cable    | Glassfibre                        |
| 13    | 04    | Wire / Cable    | Triaxial                          |
| 14    | 01    | Transformer     | All                               |
| 15    | 01    | Motors          | All                               |
| 16    | 01    | Switch          | All                               |
| 18    | 01    | Opto Electronic | Photocoupler                      |
| 18    | 02    | Opto Electronic | LED                               |
| 18    | 03    | Opto Electronic | Display                           |
| 18    | 04    | Opto Electronic | Laser Diode                       |
| 18    | 05    | Opto Electronic | Phototransistor                   |
| 19    | 01    | Thyristor       | All                               |
| 20    | 01    | Sensors         | All                               |
| 21    | 01    | Heater          | All                               |
| 22    | 01    | Lamps (Bulbs)   | All                               |
| 22    | 02    | Lamps (Bulbs)   | Halogen                           |
| 22    | 03    | Lamps (Bulbs)   | UV                                |
| 23    | 01    | Hybrid          | All                               |
| 24    | 01    | Loudspeaker     | All                               |

| FCODE | GCODE | FAMILY        | GROUP                   |
|-------|-------|---------------|-------------------------|
| 30    | 01    | RF-Parts      | Inductor / Coupler      |
| 30    | 02    | RF-Parts      | MIC                     |
| 30    | 03    | RF-Parts      | Hybrids                 |
| 30    | 04    | RF-Parts      | Switches                |
| 30    | 05    | RF-Parts      | Isolators / Circulators |
| 30    | 99    | RF-Parts      | Miscellaneous           |
| 31    | 01    | Battery       | All                     |
| 99    | 99    | Miscellaneous | All                     |



## 11. LEGEND OF LIST COLUMNS

|             |   |  |
|-------------|---|--|
| F           | - | Family Code  |
| Simstyle    | - | Generic Number   |
| Package     | - | Preferred Package / Housing                                  |
| Description | - | Details / Features of the preferred part                     |
| Proc. Spec. | - | Preferred Procurement Specification                          |
| Is          | - | Issue of preferred Proc. Spec.                               |
| Mfg / C     | - | Manufacturer, for more detail refer to section 9 and Country |
| Level       | - | Required Quality Level as per Proc. Spec.                    |
| Q           | - | Qualification Reference with respect to the part             |
| LLI         | - | Long Lead Item ( > 1 year) identifier                        |
| Radiation   | - | Radiation marker   |

## 12. LIST OF PARTS

The parts are sorted to Family and Group Codes.

### Part II

The parts listed under this section are not full PPL- Standard parts, even when they comply with the notes associated to them.

**ROSETTA PREFERRED PARTS LIST**

| SIMSTYLE          | PACKAGE | DESCRIPTION | PROC-SPEC.  | IS | MFG/C   | LEVEL   | Q | LLI | RADIATION |
|-------------------|---------|-------------|---|----|---------|---------|---|-----|-----------|
| <b>CAPACITORS</b> |         |             |   |    |         |         |   |     |           |
| 1                 | 805     | CHIP        | capacitor, ceramic, fixed, type I 4.7 to 1500pF 1%, 5%, 10% 50V E12 values only   | 5A | VIT/G   | SCCC    | Y | N   | n/a       |
| 1                 | 805     | CHIP        | capacitor, ceramic, fixed, type II 390 to 27000pF 10%, 50V E6 values only   | 5A | VIT/G   | SCCC    | Y | N   | n/a       |
| 1                 | 1206    | CHIP        | capacitor, ceramic, fixed, type I 100 to 1500pF/100V 100 to 3900pF/50V 1%, E12 values only  | 5A | VIT/G   | SCCC    | Y | N   | n/a       |
| 1                 | 1206    | CHIP        | capacitor, ceramic, fixed, type II 1000 to 22000pF/100V 10%, 1000 to 56000pF 25V, 50V, 10%, E5 values only                                    | 5A | VIT/G   | SCCC    | Y | N   | n/a       |
| 1                 | 1210    | CHIP        | capacitor, ceramic, fixed, type I 470 to 10000pF 1% 50V, E12 only   | 5A | VIT/G   | SCCC    | Y | N   | n/a       |
| 1                 | 1210    | CHIP        | capacitor, ceramic, fixed, type II 1000 to 120000pF 10%, 50V, 100V E6 values only   | 5A | VIT/G   | SCCC    | Y | N   | n/a       |
| 1                 | 1812    | CHIP        | capacitor, ceramic, fixed type I 1000 to 18000pF 1% 50V, 100V E12 values only   | 5A | VIT/G   | SCCC    | Y | N   | n/a       |
| 1                 | 1812    | CHIP        | capacitor, ceramic, fixed, type II 27000 to 270000pF 10%, 50V, 100V, E6 values only   | 5A | VIT/G   | SCCC    | Y | N   | n/a       |
| 1                 | 2220    | CHIP        | capacitor, ceramic, fixed, type I 2200 to 33000pF 1%, 50V, E12 values only  | 5A | VIT/G   | SCCC    | Y | N   | n/a       |
| 1                 | 2220    | CHIP        | capacitor, ceramic, fixed, type II 10000 to 1000000pF 10% 50V, 100V, E6 values only   | 5A | VIT/G   | SCCC    | Y | N   | n/a       |
| 1                 | CCR05   | CHIP        | capacitor, ceramic, fixed, type I 1 to 9.1pF/200V/0.5pF 10 to 330pF/200V/1% 360 to 1800pF 100V/2% 220 to 3300pF/50V/5%, E12 values only       | 2D | VIT/F   | SCCC    | Y | N   | n/a       |
| 1                 | CCR06   | CHIP        | capacitor, ceramic, fixed, type I 390 to 1800pF/200V/1%, 2%, 5%, 2200 to 4700pF/100V 12%, 5%, 5100 to 18000pF/50V 1%, 2%, 5%, E12 values only | 2D | VIT/F   | SCCC    | Y | N   | n/a       |
| 1                 | CDR11   | CHIP        | capacitor, fixed, porcelain dielectric 0.1 to 9.1pF/0.25pF/150V 10 to 100pF 1% 150V 110 to 1000pF 2% 50V                                      |    | ATC/IUS | MIL-QPL | N | N   | n/a       |
| 1                 | CKR05   | CHIP        | capacitor, ceramic, fixed, type II 10 to 1000pF/200V 10%, 1200 to 10000pF/100V 10%, 12000 to 100000pF 50V 10%, E6 values only                 | 3B | VIT/F   | SCCC    | Y | N   | n/a       |
| 1                 | CKR06   | CHIP        | capacitor, ceramic, fixed, type II 1200 to 10000pF 200v 10%, 12000 to 100000pF 100V 10%, 120000 to 10000000pF 50V 10% E6 values only          | 3B | VIT/F   | SCCC    | Y | N   | n/a       |

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**ROSETTA PREFERRED PARTS LIST**

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| SIMSTYLE          | PACKAGE | DESCRIPTION   | PROC-SPEC.    | IS | MFG/C  | LEVEL   | Q | LLI | RADIATION |
|-------------------|---------|---|---------------|----|--------|---------|---|-----|-----------|
| CLR79             |         | tantalum, non-solid, electrol 30 to 2200uF 6V, 68 to 2200, 6.3V 25 to 850;8V, 20 to 1800;10V, 15 to 1200; 15V, 33 to 1200;16V, 10 to 850;25V, 8 to 560;30V, 12 to 470+017;40V, 5 to 430;50V, 4 to 330;60V, 10 to 330;63V, 3.5 to 250;75V, 4.7 to 100;100V, 125V | SCC-3003-005  | 2B | SPR/F  | SCC C   | Y | N   | n/a       |
| 1                 | CSR13   | tantalum, solid electrol. 5.6 to 330 uF;6V: 3.9 to 220; 10V: 2.7 to 150; 15V: 1.2 to 100; 20V: 5.6 to 47; 35V: 0.022 to 22; 50V: 0.1 to 15; 75V: 0.015 to 2.7; 100V: all 10 %   | SCC-3002-002  | 2D | SPR/F  | SCC C   | Y | N   | n/a       |
| 1                 | CYR10   | capacitor, glass fixed, dielectric: 0.5 to 300pF 1% 2% 5% 500V 300V E12 values only   | MIL-C-23269/1 |    | AVX/US | MIL-QPL | N | N   | n/a       |
| 1                 | CYR15   | capacitor, glass fixed, dielectric 220 to 1200pF 1% 500V 300V E12 values only   | MIL-C-23269/2 |    | AVX/US | MIL-QPL | N | N   | n/a       |
| 1                 | PM96    | capacitor, metallized plastic film dielectric, 0.1 to 47uF 25 to 250V 10% / 20% E12 values  | 512.95.390    | C  | EFD/F  | SCC C   | N | N   | n/a       |
| 1                 | HT86PS  | capacitor, metallized plastic film dielectric, 680pF to 2.2uF, 1.5 to 20KV 10/20% E12 values  | C-109         | 1A | EFD/F  | SCC C   | N | N   | n/a       |
| <b>CONNECTORS</b> |         |   |               |    |        |         |   |     |           |
| 2                 | D*BMA   | connector, electrical, crimp contacts pin/socket type for 3401/020 connectors   | SCC3401/021   | 1A | CAN/F  | SCC B   | Y | N   | n/a       |
| 2                 | D*BMA   | connector, electrical, rectangular miniature removable contacts for type D+BMA  | SCC3401/020   | 1B | CAN/F  | SCC B   | Y | N   | n/a       |
| 2                 | D*M     | connector, electrical solder & wire-wrap contacts; rectangular receptacle and plug 9, 15, 25, 37 and 50 contacts  | SCC3401/001   | 5B | CAN/F  | SCC B   | Y | N   | n/a       |
| 2                 | D*MA    | connector, crimp contacts; rectangular receptacle and plug 9, 15, 25, 37 and 50 contacts  | SCC3401/002   | 1  | CAN/F  | SCC B   | Y | N   | n/a       |
| 2                 | 3401022 | Accessories for 3401-001, 002 and 020   |               | 4  | CAN/F  | SCC B   | Y | N   | n/a       |
| 2                 | HE801   | connector, electrical, pcb, all contacts 2 rows 17, 29, 41, 53, 65, 72, 84, 96, 120 contacts 3 rows 62, 80, 98, 160 contacts  | SCC3401/016   | 4A | FRB/F  | SCC B   | Y | N   | n/a       |
| 2                 | DFE     | Connector, circular, Bayonet Coupling based on MIL-C-38999 Series 2   | SCC3401/044   | 1B | FRB/F  | SCC B   | Y | N   | n/a       |
| 2                 | HE801   | connector, electrical, pcb, contacts wire-wrap contacts for 3401/016  | SCC3401/018   | 3A | FRB/F  | SCC B   | Y | N   | n/a       |
| 2                 | HE801   | connector, electrical, pcb, contacts crimp contacts for 3401/016  | SCC3401/017   | 2C | FRB/F  | SCC B   | Y | N   | n/a       |
| 2                 | HE801   | connector, electrical, pcb, contacts solder & saver contacts for 3401/016   | SCC3401/019   | 4A | FRB/F  | SCC B   | Y | N   | n/a       |

| SIMSTYLE        | PACKAGE    | DESCRIPTION   | PROC-SPEC.      | IS | MFG/C  | LEVEL   | Q | LLI | RADIATION         |
|-----------------|------------|---|-----------------|----|--------|---------|---|-----|-------------------|
| 2               | KMC        | connector, electrical, pcb for solder and wire-wrap contacts 3 rows<br>26, 44, 62, 80, 98, 144 contacts | SCC3401/039     | 1C | FRB/F  | SCC B   | Y | N   | n/a               |
| 2               | KMC        | connector, electrical, pcb, contacts solder contacts for 3401/039                                       | SCC3401/037     | 1B | FRB/F  | SCC B   | Y | N   | n/a               |
| 2               | KMC        | connector, electrical, pcb, contacts wire-wrap contacts for 3401/039                                    | SCC3401/038     | 1B | FRB/F  | SCC B   | Y | N   | n/a               |
| 2               | MDM        | connector, electrical, contacts crimp contacts for 3401/029   | SCC3401/028     | 1A | CAN/F  | SCC B   | Y | N   | n/a               |
| 2               | MDM        | connector, electrical, rectangular microminiature, saver  | SCC3401/041     | 2  | CAN/F  | SCC B   | Y | N   | n/a               |
| 2               | MDM        | connector, electrical, rectangular microminiature; 9, 15, 21, 25, 31<br>and 51 contacts awg #26 & 28    | SCC3401/029     | 2A | CAN/F  | SCC B   | Y | N   | n/a               |
| 2               | SMA        | RF Coaxial Connectors; SMA; 50 Ohm ; male   | SCC3402/002     | 4D | RAD/F  | SCC B   | Y | N   | n/a               |
| 2               | SMA        | RF Coaxial Connectors; SMA; 50 Ohm ; female   | SCC3402/001     | 4C | RAD/F  | SCC B   | Y | N   | n/a               |
| <b>CRYSTALS</b> |            |   |                 |    |        |         |   |     |                   |
| 3               | T1507      | crystal 2.5 to 20 MHz   | SCC3501/002     | 2A | QK/G   | SCC B   | Y | N   | n/a               |
| 3               | T807       | crystal 4 to 140 MHz  | SCC3501/008     | 2A | QK/G   | SCC B   | Y | N   | n/a               |
| 3               | CO-402D-2S | Crystal Oscillator, TTL 1Hz to 100Mhz 1ppm  | MIL-O-55310/16  | E  | VEC/US | Class S | Y | Y   | tolerant to 100 K |
| 3               | CO-422D-2S | Crystal Oscillator, CMOS 0.1Hz to 175Mhz 1ppm   | MIL-O-55310/18  | E  | VEC/US | Class S | Y | Y   | tolerant to 200 K |
| <b>DIODES</b>   |            |   |                 |    |        |         |   |     |                   |
| 4               | 1N3595-1   | diode, switching Vr=125V Ir=1mA If=225mA trr=3usec  | SCC5101/006     | 3B | MSC/IR | SCC B   | Y | N   | n/a               |
| 4               | 1N4148-1   | diode, switching Vr= 75V Ir=0.5uA If=200mA trr=4nsec  | SCC5101/023     | 1A | MSC/IR | SCC B   | Y | N   | n/a               |
| 4               | 1N4150-1   | diode, switching Vr= 50V Ir=100nA If=500mA trr=6nsec  | SCC5101/024     | 1A | MSC/IR | SCC B   | Y | N   | n/a               |
| 4               | 1N4151-1   | diode, switching Vr= 50V Ir=50nA If=10mA trr=4nsec  | SCC5101/025     | 1A | MSC/IR | SCC B   | Y | N   | n/a               |
| 4               | 1N6485-    | diode, voltage regulator pd=1.5W Vz=3.3V to 5.6V  | MIL-S-19500/406 | C1 | MSC/US | JANS    | Y | N   | n/a               |
| 4               | 1N6491     |   |                 |    |        |         |   |     |                   |
| 4               | 1N4460-    | diode, voltage regulator pd=1.5W Vz=6.2V to 200V  | MIL-S-19500/408 | C1 | MSC/US | JANS    | Y | N   | n/a               |
| 4               | 1N4496     |   |                 |    |        |         |   |     |                   |
| 4               | 1N4568A-1  | diode, Voltage Ref. , temp. compensated; Vz=6.4V +-5%;<br>dVz=10mV; PT=475mW                            | MIL-S-19500/452 | C1 | CDI/US | JANS    | Y | N   | 500 Krad(Si)      |
| 4               | 1N6309-    | diode, voltage regulator pd=0.5W Vz=2.4V to 200V  | MIL-S-19500/533 | D1 | MSC/US | JANS    | Y | N   | n/a               |
| 4               | 1N6355     |   |                 |    |        |         |   |     |                   |
| 4               | 1N5309     | diode, current regulator Ip=3mA Vs=25V  | MIL-S-19500/463 | D2 | CDI/US | JANS    | N | N   | n/a               |
| 4               | 1N5416     | diode, power rectifier, Vf=100V, Ifsm=80A   | MIL-S-19500/411 | G  | MSC/US | JANS    | Y | N   | n/a               |
| 4               | 1N5417     | diode, power rectifier, Vf=200V, Ifsm=80A   | MIL-S-19500/411 | G  | MSC/US | JANS    | Y | N   | n/a               |
| 4               | 1N5615     | diode, power rectifier, fast recovery vbr=200V Io=1A trr=150ns  | MIL-S-19500/429 | E1 | MSC/US | JANS    | Y | N   | n/a               |

# ROSETTA PREFERRED PARTS LIST

| SIMSTYLE                | PACKAGE | DESCRIPTION   | PROC-SPEC.            | IS | MFG / C | LEVEL   | Q | LI | RADIATION                                |
|-------------------------|---------|---|-----------------------|----|---------|---------|---|----|--|
| 1 1N5623                | Axial   | diode, power rectifier, fast recovery vbr=1000V IO=1A Itr=500ns | MIL-S-19500/429       | E1 | MSC/US  | JANS    | Y | N  | n/a                                      |
| 1 1N5802                | Axial   | diode, power rectifier, fast recovery vbr=50V IO=2.5A Itr=25ns  | SCC5101/014           | 3A | MSC/IR  | SCC B   | N | N  | n/a                                      |
| 1 1N5806                | DO-35   | diode, power rectifier, fast recovery vbr=150V IO=2.5A Itr=25ns | SCC5101/014           | 3A | MSC/IR  | SCC B   | N | N  | n/a                                      |
| 1 1N5811                | DO-35   | diode, power rectifier, fast recovery vbr=150V IO=6A Itr=30ns   | SCC5101/013           | 3  | MSC/IR  | SCC B   | N | N  | n/a                                      |
| 1 1N6063A-1N6072A       | DO-13   | diode, voltage suppressor, PR=1.5W vbr=7.5 to 220V              | MIL-S-19500/507       | B  | MSC/US  | JANS    | N | N  | n/a                                      |
| 1 1N6102A-1N6137A       | Axial   | diode, voltage suppressor, PR=3W vbr=6,12 to 190V               | MIL-S-19500/516       | C  | MSC/US  | JANS    | Y | N  | n/a                                      |
| 1 1N5712-1              | DO-35   | diode, schottky barrier, vbr=20V, If=35mA, If=150nA             | MIL-S-19500/445       | C  | CDI/US  | JANS    | N | Y  | n/a                                      |
| 1 1N6391                | DO-4    | diode, schottky barrier, fast recovery, vbr=45V If=25A          | MIL-S-19500/553       | 6  | MSC/US  | JANS    | N | N  | n/a                                      |
| 1 1N6392                | DO-5    | diode, schottky barrier, fast recovery, vbr=45V If=60A          | MIL-S-19500/554       | A  | MSC/US  | JANS    | N | N  | n/a                                      |
| <b>FUSES / FUSISTOR</b> |         |   |                       |    |         |         |   |    |  |
| 6 P600L                 |         | Fuse, thick film, 125mA to 20A, 50/75/125V                      | P600L                 | H  | AEM/US  | n.a     | Y | N  | n/a                                      |
| 6 F200R                 |         | Fusistor, thick film, characteristics tbd by user               | F200R                 | A  | AEM/US  | n.a     | N | N  | n/a                                      |
| <b>COILS</b>            |         |   |                       |    |         |         |   |    |  |
| 7 MSC1 10 & 20K         | chip    | moulded, RF, miniature, surface mount, 0.01 to 1000µH           | SCC-3201/008          | 1  | MIP/F   | SCC B   | Y | N  | n/a                                      |
| <b>MICROCIRCUITS</b>    |         |   |                       |    |         |         |   |    |  |
| 8 AD574AT               | 28-DIL  | 12 Bit A/D converter with µP interface                          | 5962-85127            | 1  | AD / US | Class V | Y | N  | 50 K, SEU sensitive, no SEL              |
| 8 DAC08                 | 16-DIL  | 8-Bit high speed multiplying D/A converter                      | MIL-M-38510/113 I-274 | 6  | AD / US | Class S | Y | N  | 50 K (DNL < 5 K)                         |
| 8 AD565AT               | 24-DIL  | 12-Bit D/A Converter  |                       | 1A | AD / US | Class S | N | N  | 100 K (DNL: 10 K), SEU sensitive, no SEL |
| 8 AMP01                 | 18-DIL  | Instrumentation Amplifier                                       | 5962-88630            | A  | AD / US | Class V | Y | N  | 200 K (Note: Input currents out of spec) |
| 8 OP27AJ                | TO-99   | Operational Amplifier, single, low offset, low noise            | MIL-M-38510/135       | B  | AD / US | Class S | Y | N  | 200 K (Note: Input currents out of spec) |





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|---|-------------|-------------|---|-----------------|----|--------|---------|---|-----|--|
| 8 | PM108AJ     | TO-99       | Operational Amplifier, single, low input current              | MIL-M-38510/101 | G2 | AD/US  | Class S | Y | N   | 70 K (Note: Input currents out of spec)                                  |
| 8 | LM124AJ     | 14-DIL      | Operational Amplifier, quad, low power                        | MIL-M-38510/110 | B  | NSC/US | Class S | Y | N   | 200 K (Note: Input currents out of spec)                                 |
| 8 | OP221AJ     | TO-99       | Operational Amplifier, dual, low power                        | I-253           | 3A | AD/US  | Class S | N | N   | 50 K (Note: Input currents and VIO out of spec)                          |
| 8 | OP400AY     | 14-DIL      | Operational Amplifier, quad, low offset, low power            | 5962-87771      | B  | AD/US  | Class V | N | N   | 30 K (Note: Input currents out of spec; Low dose rate test recommended.) |
| 8 | LT117       | TO-39       | Positive Voltage Regulator, VO=1.25 to 37V at 0.5A            | MIL-M-38510/117 | A3 | LTC/US | Class S | Y | Y   | 200 K  |
| 8 | RH137H/K    | TO-39/TO3   | Negative Voltage Regulator, VO=-1.25 to 37V at 0.5A / at 1.5A | MIL-M-38510/118 | 4  | LTC/US | Class S | N | Y   | hard to 100K   |
| 8 | AD 584S & T | TO-99       | Voltage Reference 2.5 / 5 / 7.5 / 10V                         | 5962-38128      |    | ADI/US | Class V | Y | N   | 200 K. Low dose rate test recommended.                                   |
| 8 | PM139A      | 14-DIL / FP | Voltage Comparator, quad, Pd=1200mW                           | MIL-M-38510/112 | A2 | AD/US  | Class S | Y | N   | 200 K  |
| 8 | PM111H      | TO-99       | Voltage Comparator, single, Pd=500mW                          | MIL-M-38510/103 | E1 | AD/US  | Class S | Y | N   | 200 K  |
| 8 | LT119H      | TO-100      | Voltage Comparator, dual, Pd=350mW                            | MIL-M-38510/103 | E  | LTC/US | Class S | Y | Y   | 200 K (Note: Input currents out of spec)                                 |
| 8 | HS26C31RH   | 16-DIL/FP   | Line Driver, quad, with 3 state outputs                       | 5962-95663      | A  | HAR/US | QML-V   | Y | Y   | hard to 100 K  |
| 8 | HS26C32RH   | 16-DIL/FP   | Line Receiver, quad, with 3 state outputs                     | 5962-95689      |    | HAR/US | QML-V   | Y | Y   | hard to 100 K  |
| 8 | HM67202FV   | 28-DIL/FP   | 1K x 9 FIFO   | SCC9301/032     | 1A | MHS/F  | SCC B   | N | Y   | 35 K (functional > 6 K), SEU sensitive, 1 SEL                            |
| 8 | HM65664E    | 28-DIL      | 8K x 8 SRAM   | SCC9301/029     | 1  | MHS/F  | SCC B   | N | Y   | 35 K (functional > 7 K), SEU sensitive, 1 SEL                            |
| 8 | HM65687E    | 22-DIL      | 16K x 16 SRAM   | SCC9301/026     | 1A | MHS/F  | SCC B   | N | Y   | 35 K (functional > 7 K), SEU sensitive, 1 SEL                            |

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| F | SIMSTYLE  | PACKAGE | DESCRIPTION  | PROC-SPEC.         | IS | MFG/C  | LEVEL   | Q | LLI | RADIATION   |
|---|-----------|---------|--|--------------------|----|--------|---------|---|-----|---|
| 8 | HX6228    | 40-FP   | 128K x 8 SRAM 25ns                                       | 5962-1bd           |    | HON/US | QML V   | Y | Y   | hard to 1 Mrad, SEU hard, no SEL                    |
| 8 | HC6856    | 40-FP   | 32K x 8 SRAM 70ns  | 5962-92153         |    | HON/US | QML-V   | Y | N   | hard to 1 Mrad, SEU hard, no SEL.                   |
| 8 | HS6654RH  | 28-FP   | 8K x 8 PROM  | 5962-95626         | A  | HAR/US | QML V   | Y | Y   | hard to 300Krad                                     |
| 8 | MEM8129JM | 32-JLCC | 128K x 8 EEPROM, 200nsec                                 | DMSR-RIBRE-SPE-019 | 1  | HMP/GB | Note 1  | N | Y   | SEU/SEL sensitive                                   |
| 8 | P1750A    | 68-FP   | 16-Bit $\mu$ processor, 25 Mhz, SOS Technology           | I-258              | 2F | PER/US | Class S | N | Y   | hard to 100K, SEU hard, no SEL                      |
| 8 | P1753-25  | 68-FP   | 25 Mhz Memory Management & Protection Unit (MMU), SOS    | I-259              | 3A | PER/US | Class S | N | Y   | hard to 100K, SEU hard, no SEL                      |
| 8 | P1754-25  | 68-FP   | 25 Mhz Processor Interface Circuit (PIC), SOS Technology | I-260              | 2F | PER/US | Class S | N | Y   | hard to 100K, SEU hard, no SEL                      |
| 8 | HS80C86RH | DIL/FP  | uProcessor / Controller                                  | 5962-95722         |    | HAR/US | QML-V   | N | Y   | hard to 100K  |
| 8 | 80386     | QFP164  | uProcessor / Controller, 32 Bit                          | SSQ22668           |    | HAR/US | QML-V   | N | Y   | SEU/ SEL sensitiv                                   |
| 8 | 82380     | QFP164  | 32-Bit DMA Controller                                    | COL-SP-126         | 1  | HAR/US | Note1   | N | Y   | SEU/ SEL sensitiv                                   |
| 8 | HS82C37   | DIL40   | DMA Controller Programmable                              | COL-SP-011         | 2  | HAR/US | Note1   | N | N   | EPI available                                       |
| 8 | HS82C52   | DIL28   | Controller Interface Serial ( uART)                      | COL-SP-012         | 1  | HAR/US | Note1   | N | N   | EPI available                                       |
| 8 | HS82C54   | DIL24   | Interval Timer Programmable                              | COL-SP-018         | 1  | HAR/US | Note1   | N | N   | EPI available                                       |
| 8 | HS82C55A  | DIL40   | Peripheral Interface Programmable                        | COL-SP-013         | 1  | HAR/US | Note1   | N | N   | EPI available                                       |
| 8 | HS82C59A  | DIL28   | Interrupt Controller Programmable                        | COL-SP-021         | 1  | HAR/US | Note1   | N | N   | EPI available                                       |
| 8 | HS82C82   | DIL20   | Octal Latch Bus Driver                                   | COL-SP-015         | 1  | HAR/US | Note1   | N | N   | EPI available                                       |
| 8 | HS82C84   | DIL18   | Clock Generator Driver                                   | COL-SP-010         | 1  | HAR/US | Note1   | N | N   | EPI available                                       |
| 8 | UC1825AJ  | 16-DIL  | High Speed Pulse Width Modulator Controller              | 5962-87681         | C  | UNI/US | Class V | N | Y   | tolerant to 60 K                                    |
| 8 | UC1844AJ  | 8-DIL   | Current Mode Pulse Width Modulator Controller            | 5962-86704         | F  | UNI/US | Class V | N | Y   | tolerant to 200 K                                   |
| 8 | UC1846J   | 16-DIL  | Pulse Width Modulator                                    | MIL-M-38510/702    |    | UNI/US | Class S | N | Y   | tolerant to 50 K                                    |
| 8 | SG1548J   | 16-DIL  | Quad Power Fault Monitor                                 | 5962-89878         |    | LMI/US | QML V   | N | Y   | functional to 200 K (parameters out of spec > 20 K) |
| 8 | HS-508ARH | 16-FP   | 8-Channel Multiplexer with Overvoltage Protection        | 5962-96742         |    | HAR/US | QML V   | Y | Y   | hard to 100Krad                                     |

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| F | SIMSTYLE  | PACKAGE   | DESCRIPTION  | PROC-SPEC.  | IS | MFG/C   | LEVEL | Q | LLI | RADIATION          |
|---|-----------|-----------|--|-------------|----|---------|-------|---|-----|--------------------|
| 8 | HS-1840RH | 28-FP     | 16-Channel Multiplexer / Demultiplexer                             | 5962-95630  |    | HARIUS  | QML V | Y | Y   | hard to 100Krad    |
| 8 | HS-303RH  | 14-FP     | Dual Analog Switch   | 5962-95613  |    | HARIUSA | QML V | Y | Y   | hard to 100Krad    |
| 8 | ACTS630   | 28-DIL/FP | Error Detection and Correction Circuit (EDAC), radiation hardened  | 5962-96721  |    | HARIUS  | QML V | Y | Y   | hard to 100Krad    |
| 8 | ASIC MC   |           | Gate Array, 35000 usable Gates, 0.4 ns delay                       |             |    | MHS/FR  | SCC B | N | Y   | EPI available      |
| 8 | ASIC      |           | ASIC SOS process   |             |    | MIT/S   | SCC B | Y | Y   | hard to 100Krad    |
| 8 | ASIC RBI  |           | Standard Interface ASIC  |             |    | MIT/S   | SCC B | Y | Y   | hard to 100Krad    |
| 8 | 54HC-     | DIL/FP    | microcircuit, digital, monolithic high speed cmos, various types   | see SCC QPL |    | STMF    | SCC B | Y | Y   | hard to 50Krad     |
| 8 | SERIES    |           | according esa scc qpl  |             |    |         |       |   |     |                    |
| 8 | 54HC00    | DIL/FP    | Nand Gate, 2-input, Quad   | SCC9201/105 | 1B | QPL     | SCC B | Y | N   | tolerant to 50Krad |
| 8 | 54HC02    | DIL/FP    | Nand Gate, 2-input, Quad   | SCC9201/113 | 1  | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC03    | DIL/FP    | Nand Gate, 2-input, with open Drain Output, Quad                   | SCC9201/114 | 1  | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC04    | DIL/FP    | Inverter, Hex  | SCC9401/033 | 1A | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC08    | DIL/FP    | And Gate, 2-input, Hex   | SCC9201/106 | 1  | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC10    | DIL/FP    | Nand Gate, 3-input, Triple   | SCC9201/107 | 1  | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC11    | DIL/FP    | And Gate, 3-input, Triple  | SCC9201/117 | 1  | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC14    | DIL/FP    | Schmitt Trigger Inverter, Hex                                      | SCC9409/007 | 1  | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC20    | DIL/FP    | Nand Gate, 4-input, Dual   | SCC9201/118 | 1  | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC21    | DIL/FP    | And Gate, 4-input, Dual  | SCC9201/108 | 1A | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC27    | DIL/FP    | Nor Gate, 3-Input, Triple  | SCC9201/109 | 1A | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC30    | DIL/FP    | Nand Gate, 8-Input   | SCC9201/110 | 1A | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC32    | DIL/FP    | Or Gate, 2-Input, Quad   | SCC9201/111 | 1  | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC42    | DIL/FP    | BCD to Decimar Decoder   | SCC9205/020 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC73    | DIL/FP    | Flip Flop, D-Type, positive edge triggered, Dual                   | SCC9203/071 | 1  | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC74    | DIL/FP    | Flip Flop, D-Type with Preset and Clear, Dual                      | SCC9203/070 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC75    | DIL/FP    | Flip Flop, D-Type with Preset and Clear, Dual                      | SCC9203/050 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC76    | DIL/FP    | Latch, Bistable, D-Type, Quad                                      | SCC9203/065 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC76    | DIL/FP    | Flip Flop, Negative Edge Triggered J-K with Preset and Clear, Dual | SCC9203/061 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC85    | DIL/FP    | Comperator, 4-Bit Magnitude  | SCC9209/004 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC86    | DIL/FP    | Or Gate, Exclusive, 2 input, Quad                                  | SCC9201/119 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC107   | DIL/FP    | Flip Flop, Negative Edge Triggered J-K with direct Clear, Dual     | SCC9203/072 | 1A | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC109   | DIL/FP    | Flip Flop, Positive Edge Triggered J-K with Clear, Dual            | SCC9206/048 | 1D | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC112   | DIL/FP    | Flip Flop, Negative Edge Triggered J-K with Preset and Clear, Dual | SCC9203/051 | 1D | QPL     | SCC B | Y | Y   | tolerant to 50Krad |

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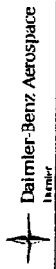
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| F | SIMSTYLE | PACKAGE | DESCRIPTION   | PROC-SPEC.  | IS | MFG/C | LEVEL | Q | LLI | RADIATION          |
|---|----------|---------|---|-------------|----|-------|-------|---|-----|--------------------|
| 8 | 54HC123  | DIL/FP  | Multivibrator, Monostable, Positive or Negative Edge Schmitt-<br>Retriggerable with Clear, Dual | SCC9207/006 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC125  | DIL/FP  | Buffer Bus, Quad  | SCC9401/039 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC126  | DIL/FP  | Buffer Bus with 3-State Output Quad   | SCC9401/046 | 1  | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC132  | DIL/FP  | Nand Gate, 2-Input with Schmitt Trigger Inputs, Quad  | SCC9201/120 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC137  | DIL/FP  | Decoder /Demultiplexer, 3 to 8 Line with Address Latches and<br>Inverted Output                 | SCC9205/013 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC138  | DIL/FP  | Decoder /Demultiplexer, 3 to 8 Line with Inverted Output  | SCC9408/046 | 1  | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC139  | DIL/FP  | Decoder /Demultiplexer, 2 to 4 Line with Inverted Output, Dual                                  | SCC9205/017 | 1  | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC148  | DIL/FP  | Encoder, Priority, 3 to 8 Line  | SCC9410/017 | 1B | QPL   | SCC B | N | Y   | tolerant to 50Krad |
| 8 | 54HC151  | DIL/FP  | Multiplexer, 8-input Channels   | SCC9408/054 | 1  | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC153  | DIL/FP  | Multiplexer, 4-input, positive Logic, Dual  | SCC9408/038 | 1  | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC154  | DIL/FP  | Decoder /Demultiplexer, 4 to 8 Line with Inverted Output  | SCC9205/023 | 1A | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC157  | DIL/FP  | Multiplexer, 2-Input, positive Logic, Quad  | SCC9408/057 | 1  | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC158  | DIL/FP  | Multiplexer, 2 input, with Inverted Output, Quad  | SCC9408/059 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC160  | DIL/FP  | Counter, Synchronous Presettable, 4-Bit Decade with asynchr. Clear                              | SCC9204/062 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC161  | DIL/FP  | Counter, Synchronous, 4-Bit Binary with asynchronous Clear                                      | SCC9204/059 | 1  | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC163  | DIL/FP  | Counter, Synchronous, 4-Bit Binary with synchronous Clear                                       | SCC9204/073 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC164  | DIL/FP  | Register, Shift, 8-Bit Sipo   | SCC9306/041 | 1A | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC165  | DIL/FP  | Register, Shift, 8-Bit Pipo   | SCC9306/042 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC166  | DIL/FP  | Register, Shift, 8-Bit Pipo   | SCC9306/043 | 1  | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC174  | DIL/FP  | Flip Flop D-Type with Clear, Hex  | SCC9306/052 | 1  | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC175  | DIL/FP  | Flip Flop D-Type Edge Triggered with Clear, Quad  | SCC9203/052 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC190  | DIL/FP  | Counter, Decade, Synchronous 4-Bit Up / Down  | SCC9204/068 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC191  | DIL/FP  | Counter, Biary, Synchronous 4-Bit Up / Down   | SCC9204/066 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC193  | DIL/FP  | Counter, Biary, Synchronous 4-Bit Up / Down (Dual Clock with Clear)                             | SCC9204/065 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC194  | DIL/FP  | Register, Shift, 4-Bit Pipo   | SCC9306/047 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC195  | DIL/FP  | Register, Shift, 4-Bit Pipo, with Overriding Clear  | SCC9306/053 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC237  | DIL/FP  | Decoder /Demultiplexer with Address Latches, 3 to 8 Line  | SCC9205/021 | 1B | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC240  | DIL/FP  | Buffer, Bus, with Inverted 3-State Output, Octal  | SCC9401/045 | 1  | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC241  | DIL/FP  | Buffer, Bus, with Inverted 3-State Output, Octal  | SCC9401/034 | 1  | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC242  | DIL/FP  | Buffer, Bus with 3-State Output, Octal  | SCC9401/035 | 1  | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC243  | DIL/FP  | Transceiver, Bus with Inverted 3-State Output, Quad   | SCC9405/011 | 1A | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC244  | DIL/FP  | Transceiver, Bus with 3-State Output, Quad  | SCC9405/012 | 1A | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC244  | DIL/FP  | Buffer / Line Driver with 3-State Output, Octal   | SCC9402/009 | 1  | QPL   | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC244  | DIL/FP  | Buffer / Line Driver with 3-State Output, Octal   | SCC9401/048 | 1  | QPL   | SCC B | Y | Y   | tolerant to 50Krad |

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|---|----------|----------|--|-------------|----|---------|-------|---|-----|--------------------|
| 8 | 54HC245  | DIL/FP   | Transceiver, Bidirectional with 3-State Output, Octal        | SCC9405/013 | 1  | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC251  | DIL/FP   | Multiplexer / Data Selector, 1 to 8 Line with 3-State Output | SCC9408/048 | 1D | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC253  | DIL/FP   | Multiplexer / Data Selector, 1 to 4 Line with 3-State Output | SCC9408/058 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC257  | DIL/FP   | Multiplexer / Selector, 2 Channel with 3-State Output, Quad  | SCC9408/047 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC273  | DIL/FP   | Flip Flop D-Type Edge Triggered with Clear                   | SCC9203/053 | 1  | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC280  | DIL/FP   | Generator / Checker, 9-Bit Odd / Even Parity                 | SCC9206/003 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC283  | DIL/FP   | Adder, Full, 4-Bit Binary with Fast Carry                    | SCC9202/075 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC356  | DIL/FP   | Multiplexer / Register, 8-Channel with 3-State Output        | SCC9306/055 | 1A | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC365  | DIL/FP   | Buffer, Bus with 3-State Output, Hex                         | SCC9401/052 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC367  | DIL/FP   | Buffer, Bus with 3-State Output, Hex                         | SCC9401/044 | 1  | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC368  | DIL/FP   | Buffer, Bus with Inverted 3-State Output, Hex                | SCC9401/054 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC373  | DIL/FP   | Latch, D-Type Transparent with 3-State Output, Octal         | SCC9203/064 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC373  | DIL/FP   | Latch, D-Type Transparent with 3-State Output, Octal         | SCC9401/054 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC374  | DIL/FP   | Flip Flop, D-Type edge Triggered with 3-State Output, Octal  | SCC9203/060 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC386  | DIL/FP   | Or Gate, Exclusive, 2-Input, Quad                            | SCC9201/121 | 1A | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC390  | DIL/FP   | Counter, Decade, 4-Bit, Dual                                 | SCC9204/078 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC393  | DIL/FP   | Counter, Bineray, 4-Bit Negative Edge Triggered, Dual        | SCC9204/074 | 1  | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC540, | DIL/FP   | Buffer, Bus, with Inverted 3-State Output, Octal             | SCC9401/049 | 1A | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC541  | DIL/FP   | Buffer, Bus, with 3-State Output, Octal                      | SCC9401/047 | 1A | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC573  | DIL/FP   | Latch, D-Type Transparent with 3-State Output, Octal         | SCC9202/072 | 1A | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC574  | DIL/FP   | Flip Flop, D-Type Edge Triggered with 3-State Outputs, Octal | SCC9203/054 | 1C | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC590  | DIL/FP   | Counter, Bineray, 8-Bit with 3-State Output                  | SCC9204/071 | 1B | QPL     | SCC B | N | Y   | tolerant to 50Krad |
| 8 | 54HC592  | DIL only | Counter, Bineray, 8-Bit                                      | SCC9204/079 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC595  | DIL/FP   | Latch, Shift Register, 8-Bit with 3-State Output             | SCC9306/051 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC597  | DIL/FP   | Latch, Shift Register  | SCC9306/054 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC623  | DIL/FP   | Transceiver, Bus, with 3-State Output, Octal                 | SCC9401/016 | 1A | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC670  | DIL/FP   | Register, 4-Word x 4-Bit with 3-State Output                 | SCC9410/016 | 1B | QPL     | SCC B | N | Y   | tolerant to 50Krad |
| 8 | 54HC688  | DIL/FP   | Comparator, Equality, 8 bit                                  | SCC9204/074 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC4002 | DIL/FP   | Nor Gate, 4-Input, Dual                                      | SCC9201/130 | 1A | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC4017 | DIL/FP   | Counter / Divider, Decade                                    | SCC9204/072 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC4020 | DIL/FP   | Counter, Binary, 14 Stage                                    | SCC9204/070 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC4024 | DIL/FP   | Counter, Binary, 7-Bit                                       | SCC9204/077 | 1A | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC4040 | DIL/FP   | Counter, Binary, Asynchronous Negative Edge Triggered 12-Bit | SCC9204/069 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC4049 | DIL/FP   | Buffer / Converter with inverted Output, Hex                 | SCC9401/037 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC4050 | DIL/FP   | Buffer / Converter, Hex                                      | SCC9401/038 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |
| 8 | 54HC4051 | DIL/FP   | Multiplexer / Demultiplexer, Analog                          | SCC9408/064 | 1B | QPL     | SCC B | Y | Y   | tolerant to 50Krad |

| F                | SIMSTYLE | PACKAGE | DESCRIPTION   | PROC-SPEC     | IS | MFG/C  | LEVEL | Q | LI | RADIATION          |
|------------------|----------|---------|---|---------------|----|--------|-------|---|----|--------------------|
| 8                | 54HC4053 | DIL/FP  | Multiplexer / Demultiplexer ( 2 x 3 Channel), Analog  | SCC9204/076   | 1B | QPL    | SCC B | Y | Y  | tolerant to 50Krad |
| 8                | 54HC4060 | DIL/FP  | Counter and Oscillator, Asynchronous Negative Edge Triggered 14-Bit                                   | SCC9204/076   | 1B | QPL    | SCC B | Y | Y  | tolerant to 50Krad |
| 8                | 54HC4066 | DIL/FP  | Switch, Bilateral, Quad   | SCC9208/052   | 1A | QPL    | SCC B | Y | Y  | tolerant to 50Krad |
| 8                | 54HC4072 | DIL/FP  | Or Gate, 4-Input, Dual  | SCC9201/124   | 1A | QPL    | SCC B | Y | Y  | tolerant to 50Krad |
| 8                | 54HC4075 | DIL/FP  | Or Gate, 3-Input, Triple  | SCC9201/123   | 1A | QPL    | SCC B | Y | Y  | tolerant to 50Krad |
| 8                | 54HC4078 | DIL/FP  | Nor / Or Gate, 8-Input  | SCC9306/050   | 1A | QPL    | SCC B | Y | Y  | tolerant to 50Krad |
| 8                | 54HC4094 | DIL/FP  | Register, Shift, 8-Bit Shippo with 3-State Output   | SCC9306/050   | 1B | QPL    | SCC B | Y | Y  | tolerant to 50Krad |
| 8                | 54HC4514 | DIL/FP  | Latch / Decoder, 4 to 16 Line   | SCC9205/019   | 2A | QPL    | SCC B | Y | Y  | tolerant to 50Krad |
| 8                | 54HC4520 | DIL/FP  | Counter, Binary, 4-Bit with Clear   | SCC9204/080   | 1B | QPL    | SCC B | N | Y  | tolerant to 50Krad |
| 8                | 54HC4538 | DIL/FP  | Multivibrator, Monostable Retriggerable, Dual   | SCC9207/008   | 1  | QPL    | SCC B | Y | Y  | tolerant to 50Krad |
| <b>RELAYS</b>    |          |         |   |               |    |        |       |   |    |                    |
| 9                | GP2      |         | latching relay, 2A, 6 / 12 / 26V, 2PDT  | SCC-3602-003  | 5  | GEPIF  | SCC B | Y | N  |                    |
| 9                | GP250    |         | latching relay, 2A, 50V, 2PDT   | SCC-3602-010  | 3  | GEPIF  | SCC B | Y | N  |                    |
| 9                | GP3A     |         | latching relay, 10A 6 / 12 / 26V, 2PDT  | SCC-3602-005  | 5  | GEPIF  | SCC B | Y | N  |                    |
| 9                | EL415    |         | latching relay, 15A, 28V, 4PDT  | SCC-3602-004  | 6  | GEPIF  | SCC B | Y | Y  |                    |
| 9                | GP5      |         | non-latching relay, 2A, 6 / 12 / 26V, 2PDT  | SCC-3601-003  | 6  | GEPIF  | SCC B | Y | N  |                    |
| <b>RESISTORS</b> |          |         |   |               |    |        |       |   |    |                    |
| 10               | RLR05    |         | resistor, film, fixed, metal oxide 4,7 to 1.0M 1% E96 series<br>TC=100ppm/°C PD=125mW Umax=200V       | MIL-R-39017/5 | L1 | DAL/US | FRL S | Y | N  |                    |
| 10               | RLR07    |         | resistor, film, fixed, metal oxide 10 to 1M 1% E96 series<br>TC=100ppm/°C PD=250mW Umax=250V          | MIL-R-39017/1 | N2 | DAL/US | FRL S | Y | N  |                    |
| 10               | RLR20    |         | resistor, film, fixed, metal oxide 4,3 to 3,01M 1% E96 series<br>TC=100ppm/°C PD=500mW Umax=350V      | MIL-R-39017/2 | J1 | IRC/US | FRL S | Y | N  |                    |
| 10               | RNC50    |         | resistor, film, fixed, metal oxide 10 to 796K 0,1/1% E96 series<br>TC=25/100ppm/°C PD=50mW Umax=200V  | MIL-R-55182/7 | K2 | DAL/US | FRL S | Y | N  |                    |
| 10               | RNC55    |         | resistor, film, fixed, metal oxide 10 to 2.0M 0,1/1% E96 series<br>TC=25/100ppm/°C PD=125mW Umax=200V | MIL-R-55182/1 | M2 | DAL/US | FRL S | Y | N  |                    |



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| F                  | SIMSTYLE   | PACKAGE | DESCRIPTION  | PROC-SPEC.     | IS | MFG/C  | LEVEL | Q | LI | RADIATION |
|--------------------|------------|---------|--|----------------|----|--------|-------|---|----|-----------|
| 10                 | RNC65      |         | resistor, film, fixed, metal oxide 10 to 3,01M0, 1/1% E96 series<br>TC=25/100ppm/°C PD=250mW Umax=300V | MIL-R-55182/5  | K  | DAL/US | FRL R | Y | N  |           |
| 10                 | RM0705     | chip    | resistor, film, fixed, chip 5.6 to 1,0M 1% TC=50ppm/°C PD=100mW  | MIL-R-55342/6  | E1 | STA/US | FRL S | Y | N  |           |
| 10                 | RM1206     | chip    | resistor, film, fixed, chip 5.6 to 1,0M 1% TC=50ppm/°C PD=250mW  | MIL-R-55342/7  | C2 | STA/US | FRL S | Y | N  |           |
| 10                 | RWR80      |         | resistor, wire wound power, fixed 0.1 to 3,16K 0,1/1% TC=20ppm/°C<br>PD=2W                             | MIL-R-39007/8  | J1 | DAL/US | FRL S | Y | N  |           |
| 10                 | RWR81      |         | resistor, wire wound power, fixed 0.1 to 1,00K 0,1/1% TC=20ppm/°C<br>PD=1W                             | MIL-R-39007/9  | G1 | DAL/US | FRL S | Y | N  |           |
| 10                 | RWR89      |         | resistor, wire wound power, fixed 0.1 to 4,12K 0,1/1% TC=20ppm/°C<br>PD=3W                             | MIL-R-39017/11 | G1 | DAL/US | FRL S | Y | N  |           |
| 10                 | RER60      |         | resistor, wire wound, chassis-mounted 1.0 to 1.0K 0.5/1%<br>TC=30-100ppm/°C PD=5W                      | SCC-4003-0061  | 3A | SFR/FR | SCC C | Y | N  |           |
| 10                 | RER60      |         | resistor, wire wound, chassis-mounted 0,1 to 3,32K 1%<br>TC=30/50/100ppm/°C PD=5W                      | MIL-R-39009/1  | B  | DAL/US | FRL R | Y | N  |           |
| 10                 | RER65      |         | resistor, wire wound, chassis-mounted 1.0 to 2.0K 0.5/1%<br>TC=30-100ppm/°C PD=10W                     | SCC-4003-002   | 2A | SFR/FR | SCC C | Y | N  |           |
| 10                 | RER65      |         | resistor, wire wound, chassis-mounted 0,1 to 5,62K 1%<br>TC=30/50/100ppm/°C PD=10W                     | MIL-R-39009/1  | B  | DAL/US | FRL R | Y | N  |           |
| 10                 | SIL        | SIL     | Resistor Network Thickfilm, 47 Ohms to 1M Ohm / 5 % / Values E48                                       | SCC40045-003   | 1B | SFR/FR | SCC C | Y | N  |           |
| <b>THERMISTORS</b> |            |         |  |                |    |        |       |   |    |           |
| 11                 | YSI44907   |         | thermistor 10K at 25°C   | GSFC-S-311-P18 |    | YSI/US |       | N | N  |           |
| 11                 | 118MF      |         | thermistor Platinum, Radial Leads  | H-102          | 1B | ROS/US |       | N | N  |           |
| 11                 | 31-35TD25A |         | thermistor 1K to 5K  | H-103          | 2B | VIC/US |       | N | N  |           |
| <b>THERMOSTAT</b>  |            |         |  |                |    |        |       |   |    |           |
| 11                 | 3200       |         | thermostat, single contacts (SPST)   | A-100          | 2D | ELM/US |       | N | N  |           |
| <b>TRANSISTORS</b> |            |         |  |                |    |        |       |   |    |           |
| 12                 | 2N2219A    | TO-39   | transistor, low, power, NPN PD=800mW IC=800mA VCEO=50V   | SCC-5201-003   | 5B | STM/FR | SCC B | Y | N  | 200 K     |

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| F             | SIMSTYLE | PACKAGE            | DESCRIPTION   | PROC-SPEC.      | IS | MFG/C  | LEVEL | Q | LLI | RADIATION            |
|---------------|----------|--------------------|---|-----------------|----|--------|-------|---|-----|----------------------|
| 12            | 2N2222A  | TO-18              | HFE=100/300<br>transistor, low, power, NPN PD=500mW IC=800mA VCEO=40V                   | SCC-5201-002    | 4  | STM/FR | SCC B | Y | N   | 200 K                |
| 12            | 2N2369A  | TO-18              | HFE=100/300<br>transistor, low, power, NPN PD=360mW IC=500mA VCEO=15V                   | SCC-5201-006    | 3  | STM/FR | SCC B | Y | N   | 200 K                |
| 12            | 2N2484A  | TO-18              | HFE=40/120<br>transistor, low, power, NPN PD=360mW IC=50mA VCEO=60V                     | SCC-5201-001    | 4B | STM/FR | SCC B | Y | N   | 200 K                |
| 12            | 2N3700   | TO-18              | HFE=250/650<br>transistor, low, power, NPN PD=500mW IC=1000mA VCEO=80V                  | SCC-5201-004    | 4C | STM/FR | SCC B | Y | N   | 200 K                |
| 12            | 2N2894   | TO-18              | HFE=40/150<br>transistor, low, power, PNP PD=360mW IC=200mA VCEO=12V                    | SCC-5202-004    | 3A | STM/FR | SCC B | Y | N   | 200 K                |
| 12            | 2N2905A  | TO-39              | HFE=100/300<br>transistor, low, power, PNP PD=600mW IC=600mA VCEO=60V                   | SCC-5202-002    | 5D | STM/FR | SCC B | Y | N   | 200 K                |
| 12            | 2N2907A  | TO-18              | HFE=100/300<br>transistor, low, power, PNP PD=400mW IC=600mA VCEO=60V                   | SCC-5202-001    | 6  | STM/FR | SCC B | Y | N   | 200 K                |
| 12            | 2N2920   | TO-77              | HFE=150/600<br>transistor, dual, NPN PD=500mW IC=30mA VCEO=60V                          | SCC-5207-002    | 5  | STM/FR | SCC B | Y | N   | 200 K                |
| 12            | 2N3810   | TO-78              | HFE=150/450<br>transistor, dual, PNP PD=500mW IC=50mA VCEO=60V                          | SCC-5207-005    | 5  | STM/FR | SCC B | Y | N   | 100 K                |
| 12            | 2N3811   | TO-78<br>6-Lead    | transistor, dual matched PNP PD=600mW IC=50mA VCEO=60V                                  | MIL-S-19500/336 | C1 | NES/US | JAN S | Y | N   | 200 K                |
| 12            | CFY66    | MICRO-X            | transistor, high electron mobility, gallium arsenide, low noise, small signal, PD=200mW | SCC-5613/002    | 1A | SIE/D  | SCC B | Y | Y   | GaAs - not sensitive |
| 12            | 2N5153   | TO-39              | transistor, high power, PNP PD=1000mW IC=5A VCEO=80V                                    | SCC-5204-002    | 3D | STM/FR | SCC B | Y | N   | 200 K                |
| 12            | 2N5154   | TO-39              | HFE=70/200<br>transistor, high power, NPN PD=1000mW IC=5A VCEO=80V                      | SCC-5203-010    | 3  | STM/FR | SCC B | Y | N   | 200 K                |
| 12            | BUX77    | TO-66 or<br>TO-257 | HFE=70/200<br>transistor, high power, NPN PD=35 or 40W IC=5A VCEO=80V                   | SCC5203-016     | 3D | STM/FR | SCC B | Y | N   | 200 K                |
| 12            | BUX78    | TO-66 or<br>TO-257 | HFE=50/200<br>transistor, high power, PNP PD=35 or 40W IC=5A VCEO=80V                   | SCC5204-006     | 3C | STM/FR | SCC B | Y | N   | 200 K                |
| 1R<br>F/<br>U | 2N6849   | TO-39              | P-Channel MFET VDS=100V ID=6.5A rDS=0.30 (IRFF9130)                                     | MIL-S-19500/564 | D  |        | JAN S | Y | Y   | 50 K                 |





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| F                      | SIMSTYLE  | PACKAGE  | DESCRIPTION  | PROC-SPEC.      | IS | MFG/C     | LEVEL | Q | LLI | RADIATION   |
|------------------------|-----------|----------|--|-----------------|----|-----------|-------|---|-----|---|
| S                      | IR 2N6851 | TO-39    | P-Channel MFET VDS=200V ID=4.0A rDS=0.80 (IRFF9230)  | MIL-S-19500/564 | D  |           | JANS  | Y | Y   | 50 K  |
| F/                     |           |          |  |                 |    |           |       |   |     |   |
| U                      |           |          |  |                 |    |           |       |   |     |   |
| S                      | 12 2N7236 | TO254AA  | P-Channel RH MFET VDS=100V ID=18A rDS=0.20 (IRFM9140)  | MIL-S-19500/595 |    | INR/US    | JANSR | Y | Y   | 100 K to spec   |
|                        | 12 2N7237 | TO254AA  | P-Channel RH MFET VDS=200V ID=11A rDS=0.51 (IRHM9240)  | MIL-S-19500/595 |    | INR/US    | JANSR | Y | Y   | 100 K to spec   |
|                        | 12 2N6782 | TO-39    | N-Channel MFET VDS=100V ID=3.5A rDS=0.60 (IRFF110)   | MIL-S-19500/566 | B1 | INR/US    | JANS  | Y | Y   | 20 K  |
|                        | 12 2N7261 | TO-39    | N-Channel RH MFET VDS=100V ID=8A rDS=0.18 (IRHF7130)   | MIL-S-19500/601 | A  | INR/US    | JANSR | Y | Y   | 100 K to spec, SEGR & SEB hardened                                |
|                        | 12 2N7268 | TO-254AA | N-Channel RH-MFET VDS=100V ID= 34A rDS=0.07 (IRHM7150)   | MIL-S-19500/603 | A  | INR/US    | JANSR | Y | Y   | 100 K to spec, SEGR & SEB hardened                                |
|                        | 12 2N7262 | TO-39    | N-channel RH MFET VDS=200V ID=5.5A rDS=0.40 (IRHF7230)   | MIL-S-19500/601 | A  | INR/US    | JANSR | Y | Y   | 100 K to spec, SEGR & SEB hardened                                |
|                        | 12 2N7269 | TO-254AA | N-channel RH MFET VDS=200V ID=26A rDS=0.10 (IRHM7250)  | MIL-S-19500/603 | A  | INR/US    | JANSR | Y | Y   | 100 K to spec, SEGR & SEB hardened                                |
|                        | 12 2N7270 | TO-254AA | N-channel RH MFET VDS=500V ID=11A rDS=0.45 (IRHM7450)  | MIL-S-19500/603 | A  | INR/US    | JANSR | Y | Y   | 100 K to spec, SEGR & SEB hardened                                |
| <b>OPTO ELECTRONIC</b> |           |          |  |                 |    |           |       |   |     |   |
| 18                     | 3C91C     | TO-72    | opto-isolator PD=230mW VF=1.3V IC=4mA VBRCO=50V  | SCC-5401/001    |    | 3D MIT/S  | SCC B | Y | N   | 100 K @ gamma ray test. Check for tolerance to protons!           |
| 18                     | 6N134     | 14-DIL   | opto-coupler, dual channel, inverted, PD=40mW VR=5V IO=25mA  | SCC-5401-003    |    | 1B HP/US  | SCC B | N | N   | 200 K (1989 data). New characterization test recommended.         |
| 18                     | 4N49      | TO-5     | opto coupler, PD=300mW VCE=40V IC=50mA   | MIL-S-19500/548 |    | B1 MPC/US | JANS  | Y | N   | 200 K @ gamma ray test. Significantly lower tolerance to protons. |
| <b>HEATER</b>          |           |          |  |                 |    |           |       |   |     |   |
| 21                     | Heater    |          | Heater, single and double layer, resistor heater, inductive and noninductive in Polyimide, SCC 4009/002 will apply in future | SCC-4009-001    |    | 3B RIC/F  | SCC   | Y | N   |   |

**ROSETTA PREFERRED PARTS LIST**

| F | SIMSTYLE   | PACKAGE | DESCRIPTION   | S | MFG / C | LEVEL  | Q | LI | RADIATION  |
|---|------------|---------|---|---|---------|--------|---|----|--|
|   |            |         | Part II PPL   |   |         |        |   |    |  |
|   |            |         | Microcircuit  |   |         |        |   |    |  |
| 8 | FPGA 1280  | 172-QFP | FPGA 8K Note 3  | D | ACT/US  | QML V  | Y | Y  | Tolerant to 5 - 10 K (ICCstby), functional to 18 K. SEU sens. no SEL.  |
| 8 | FPGA 14100 | 172-QFP | FPGA Note 3   |   | ACT/US  | QML-V  | N | Y  | Tolerant to 10 - 20 K (ICCstby), functional to 50 K. SEU sens. no SEL. |
| 8 | XMA31750   |         | uProcessor obsolete, but acceptable for available, existing stock and design. |   | GPS/UK  | Note 1 | N | Y  | hard to 100K   |
| 8 | AMA31751   | CQFP84  | MMU obsolete, but acceptable for available, existing stock and design.        |   | GPS/UK  | Note 1 | N | Y  | hard to 100K   |
| 8 | 54AC/ACT   | DIL/FP  | microcircuit. digital. advanced cmos Note 4                                   |   | NSC/US  | QML-V  | N | Y  | hard to 50Krad   |

Note 1 : Parts are from Columbus PPL and being evaluated by Columbus, therefore may only be regarded as future to be confirmed parts

Note 2 : preferred manufacturer are European source, however for cost reasons also MIL manufacturers may have to be considered.

Note 3 : The use of FPGA's must be confirmed by the customer. In the application certain aspects need to be considered. Even for the rad-hard 1280 the user shall not use the so called S-cells because they are SEU sensitive. Due to cost reasons the A1280 RH will not be procured as the non-RH version is also free for SEL and the sensitivity concerning total dose is acceptable for the relative low level of the project.

Note 4 functions only to the extent qualified by SCC and only as far as HC can be replaced for that function.