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**INTEGRATED CIRCUITS, SILICON MONOLITHIC, CMOS  
RADIATION HARDENED 65nm ASIC PLATFORM  
BASED ON TYPE C65SPACE**

**ESCC Detail Specification No. 9202/086**

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## 1 GENERAL

### 1.1 SCOPE

This specification details the ratings, physical and electrical characteristics and test and inspection data for the component type variants and/or the range of components specified below. It supplements the requirements of, and shall be read in conjunction with, the ESCC Generic Specification listed under Applicable Documents.

### 1.2 APPLICABLE DOCUMENTS

The following documents form part of this specification and shall be read in conjunction with it:

- (a) ESCC Generic Specification No. [9000](#).
- (b) [MIL-STD-883](#), Test Methods and Procedures for Microelectronics.

### 1.3 TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS

For the purpose of this specification, the terms, definitions, abbreviations, symbols and units specified in ESCC Basic Specification No. [21300](#) shall apply.

### 1.4 THE ESCC COMPONENT NUMBER AND COMPONENT TYPE VARIANTS

#### 1.4.1 The ESCC Component Number

The ESCC Component number shall be constituted as follows:

Example: 920208601A#####

- Detail Specification Reference: 9202086
- Component Type Variant Number: 01 (as required)
- Total Dose Radiation Level Letter: A (as required)
- Manufacturer-specific ASIC Identification: ##### (as applicable, where ##### is an individual 4-digit code allocated by the Manufacturer to a specific ASIC design)

#### 1.4.2 Component Type Variants

The component type variants applicable to this specification are as follows:

Variant Number	Based on Type	Case	Lead/Terminal Material and Finish (Note 1)	Weight Max g	Total Dose Radiation Level Letter (Note 2)
01	C65SPACE	CQFP-352	D2	28.6	A [300krad(Si)]
02	C65SPACE	CLGA-625	D2	8.8	A [300krad(Si)]

#### NOTES:

1. The lead/terminal material and finish shall be in accordance with the requirements of ESCC Basic Specification No. [23500](#).
2. The total dose radiation level letter shall be as defined in ESCC Basic Specification No. [22900](#). If an alternative radiation test level is specified in the Purchase Order the letter shall be changed accordingly.

1.4.3 Manufacturer-specific ASIC Identification

An ASIC Datasheet shall be produced by the Manufacturer, after negotiation with the Orderer, that, as a minimum, specifies all the requirements unique to the specific ASIC design that are identified herein as being specified in the ASIC Datasheet. The ASIC Datasheet shall be held under configuration control by the Manufacturer. For identification and traceability purposes the Manufacturer shall allocate a unique Manufacturer Specific ASIC Identification to the ASIC Datasheet and the specific ASIC design as specified in Para. 1.4.1.

1.5 MAXIMUM RATINGS

The maximum ratings shall not be exceeded at any time during use or storage. Functional performance for extended periods at the maximum ratings may adversely affect device reliability.

Maximum ratings shall only be exceeded during testing to the extent specified in this specification and when stipulated in Test Methods and Procedures of the ESCC Generic Specification.

Characteristics	Symbols	Maximum Ratings	Units	Remarks
Supply Voltages	$V_{DD}$ $V_{CC}$	-0.3 to 1.32 -0.3 to 3.6	V	Notes 1, 2
Input Voltage Range	$V_{IN}$	-0.5 to 3.6	V	Note 2
Output Voltage Range	$V_{OUT}$	-0.5 to 1.32	V	Note 2
Analog Core Supply Transient Voltage	$V_{DD2V5A}$	-0.3 to 2.75	V	
Device Power Dissipation	$P_D$	See ASIC Datasheet	W	
Operating Temperature Range	$T_{op}$	-55 to $T_{op}$ (max.) See ASIC Datasheet for $T_{op}$ (max.) value	°C	$T_{case}$
Storage Temperature Range	$T_{stg}$	-65 to +150	°C	
Junction Temperature	$T_j$	+150	°C	
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	See ASIC Datasheet	°C/W	
Soldering Temperature	$T_{sol}$		°C	Note 3
CQFP-352 case		+260		
CLGA-625 case		+235		

**NOTES:**

1.  $V_{DD}$  is for core.  $V_{CC}$  is for I/O.
2. With reference to  $V_{SS} = 0V$ .
3. Duration 10 seconds maximum at a distance of not less than 1.6mm from the device body and the same terminal shall not be resoldered until 3 minutes have elapsed.

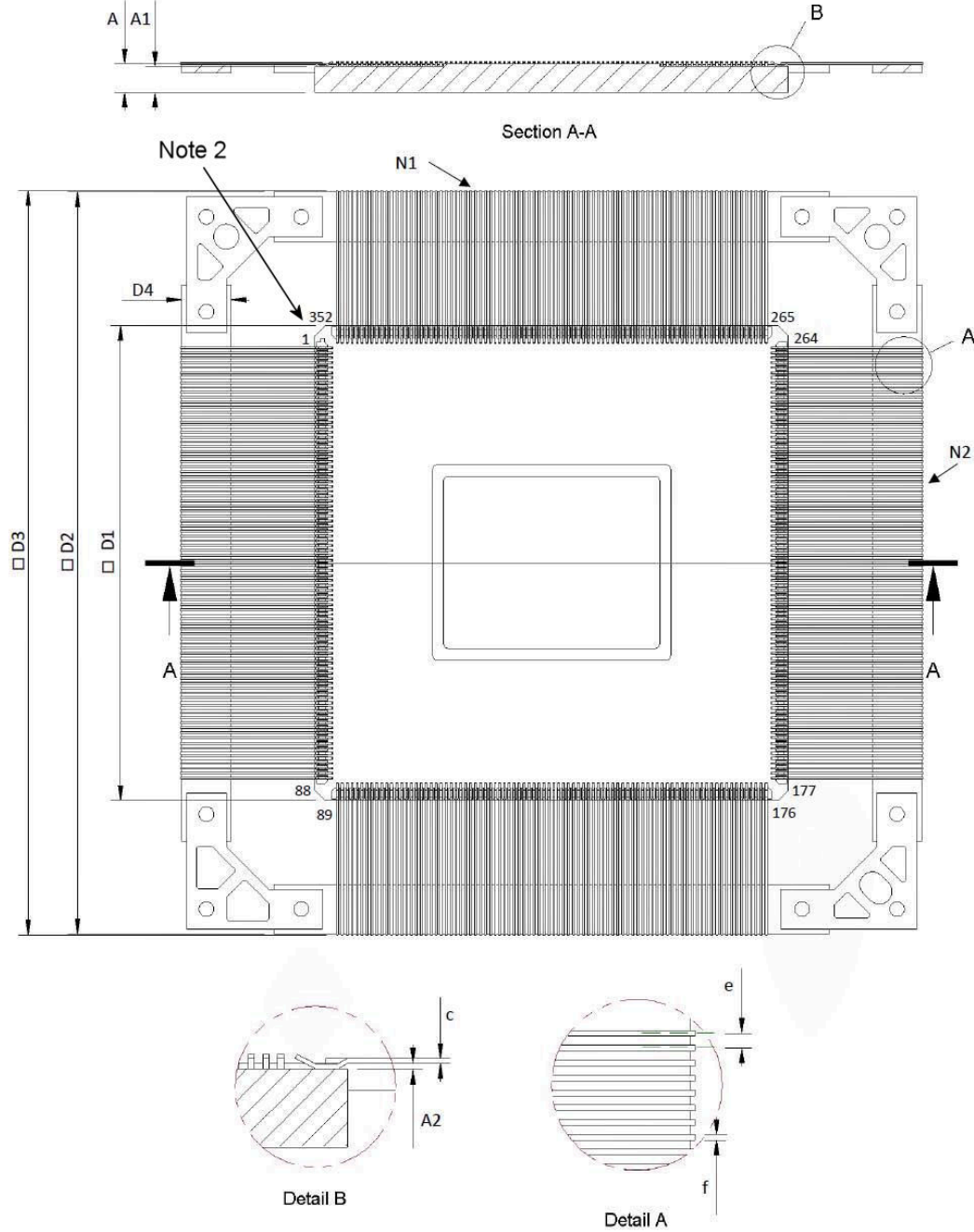
#### 1.6 HANDLING PRECAUTIONS

These devices are susceptible to damage by electrostatic discharge. Therefore, suitable precautions shall be employed for protection during all phases of manufacture, testing, packaging, shipment and any handling.

These components are categorised as Class 1 per ESCC Basic Specification No. [23800](#) with a sensitivity range of 0 to  $\leq 1000\text{V}$  unless otherwise specified in the ASIC Datasheet.

1.7 PHYSICAL DIMENSIONS AND TERMINAL IDENTIFICATION

1.7.1 Ceramic Quad Flat Package (CQFP-352) - 352 Tied Leads



Symbols	Dimensions mm		Notes
	Min	Max	
A	2.52	3.51	
c	0.1	0.17	1
D1	47.67	48.33	
D2	74.62	75.38	

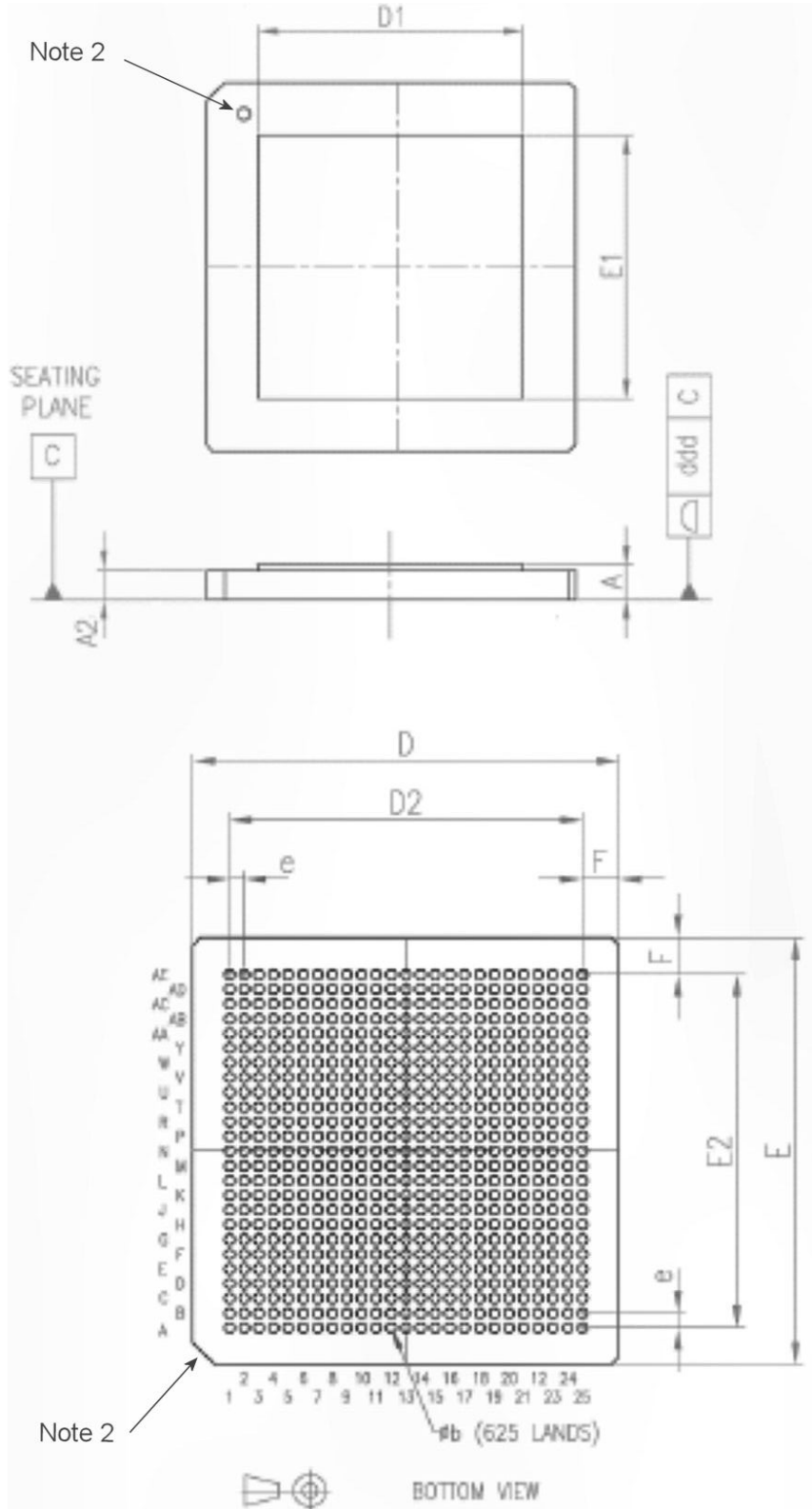


Symbols	Dimensions mm		Notes
	Min	Max	
D3	74.87	76.01	
D4	4.5	5.5	
e	0.5 BSC		
f			1
A1	0.17	0.24	
A2	2.37	2.87	1
N1	88 Leads		
N2	88 Leads		

**NOTES:**

1. Applies to all leads.
2. Terminal identification is specified by reference to the index corner as shown.

1.7.2 Ceramic Land Grid Array (CLGA-625) - 625 Lands



Symbols	Dimensions mm		Notes
	Min	Max	
A	3.29	4.02	
A2	3.06	3.74	
Øb	0.7	0.8	1
D / E	28.85	29.15	
D1	23.55	23.7	
E1	19.22	19.38	
D2 / E2	23.87	24.13	
e	0.87	1.13	
f	2.25	2.75	

**NOTES:**

1. Applies to all lands.
2. Terminal identification is specified by reference to the index corner as shown.

1.8 FUNCTIONAL DIAGRAM

See ASIC Datasheet.

1.9 PIN ASSIGNMENT

See ASIC Datasheet.

1.10 TIMING DIAGRAM

See ASIC Datasheet.

1.11 I/O PROTECTION NETWORK

See ASIC Datasheet.

**2 REQUIREMENTS**

2.1 GENERAL

The complete requirements for procurement of the components specified herein are as stated in this specification and the ESCC Generic Specification. Permitted deviations from the Generic Specification, applicable to this specification only, are listed below.

Permitted deviations from the Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESCC

requirement and do not affect the component's reliability, are listed in the appendices attached to this specification.

### 2.1.1 Deviations from the Generic Specification

#### 2.1.1.1 *Deviations from Screening Tests – Chart F3*

High Temperature Reverse Bias Burn-in shall not be performed.

## 2.2 MARKING

The marking shall be in accordance with the requirements of ESCC Basic Specification No. 21700 and as follows.

As a minimum the information to be marked on the component shall be:

- (a) The ESCC qualified components symbol (for ESCC qualified components only).
- (b) The ESCC Component Number (see Para. 1.4.1).
- (c) Traceability information.

The complete marking shall be as specified in the ASIC Datasheet.

## 2.3 ELECTRICAL MEASUREMENTS AT ROOM, HIGH AND LOW TEMPERATURES

Electrical measurements shall be performed at room, high and low temperatures.

### 2.3.1 Room Temperature Electrical Measurements

The measurements shall be performed at  $T_{amb} = +22 \pm 3$  °C.

The parameters to be tested shall be specified in the ASIC Datasheet.

### 2.3.2 High and Low Temperatures Electrical Measurements

Unless otherwise specified the measurements shall be performed at  $T_{case} = T_{op} (max.) (+0 -5)$  °C as specified in the ASIC Datasheet and  $T_{case} = -55 (+5 -0)$  °C. Unless otherwise specified the characteristics, test methods, conditions and limits shall be the same as specified in Para. 2.3.1, Room Temperature Electrical Measurements.

## 2.4 PARAMETER DRIFT VALUES

Unless otherwise specified, the parameter drift value measurements shall be performed at  $T_{amb} = +22 \pm 3$  °C.

The test methods and test conditions shall be as per the corresponding test defined in Para. 2.3.1, Room Temperature Electrical Measurements.

For all intermediate and end-point electrical measurements during Burn-in and Operating Life testing, the tested parameter shall not vary by more than the applicable drift value limits specified in

paragraph 2.4 of the ASIC Datasheet between initial measurement and the final measurement. Tested values are all parameters specified as “tested parameters” in the ASIC Datasheet.

The corresponding absolute limit values for all other specific characteristics shall not be exceeded.

## 2.5 INTERMEDIATE AND END-POINT ELECTRICAL MEASUREMENTS

Unless otherwise specified the measurements shall be performed at  $T_{amb} = +22 \pm 3 \text{ }^\circ\text{C}$ .

Unless otherwise specified the characteristics, test methods, conditions and limits shall be the same as specified in Para. 2.3.1, Room Temperature Electrical Measurements.

The tested values are all parameters specified as “tested parameters” in the ASIC Datasheet.

## 2.6 POWER BURN-IN CONDITIONS

See ASIC Datasheet.

## 2.7 OPERATING LIFE CONDITIONS

Unless otherwise specified the conditions shall be as specified in Para. 2.6, Power Burn-in Conditions.

## 2.8 TOTAL DOSE RADIATION TESTING

### 2.8.1 Bias Conditions and Total Dose Level for Total Dose Radiation Testing

Continuous bias shall be applied during irradiation testing as specified in the ASIC Datasheet.

The total dose level applied shall be as specified in Para. 1.4.2, in the ASIC Datasheet or in the Purchase Order. The Radiation Dose Rate shall be within Window 2, i.e. 36 to 360 rad(Si)/hour.

### 2.8.2 Electrical Measurements for Total Dose Radiation Testing

Prior to irradiation testing the devices shall have successfully met Room Temperature Electrical Measurements specified in Para. 2.3.1.

Unless otherwise specified the measurements shall be performed at  $T_{amb} = +25 \pm 2 \text{ }^\circ\text{C}$ .

The test methods and test conditions shall be as per the corresponding test defined in Para. 2.3.1, Room Temperature Electrical Measurements.

The parameters to be measured during and on completion of irradiation testing are specified in the ASIC Datasheet.