GLAST LAT DESIGN SPECIFICATION	Document # **LAT-DS-02227-01**	Date 6 June 2003
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	Subsystem/Office Calorimeter Subsystem	
Document Title **CAL GCRC Version 5 Bonding / Packaging Requirements**		

1 Introduction

The GLAST LAT calorimeter readout controller (GCRC) ASIC is a 3015 × 3334 micron silicon die that has been back ground to 17 mil thickness, diced and loaded into waffle packs. There are approximately 850 die cut from 19 wafers from the T31D lot manufactured in the HP Aglient process via MOSIS. These die are to be packaged by ASAT in 80 pin, 14 × 14 mm quad flat packs with ASAT lead frame QPL-80-QFP-0028-R0.

2 Bonding Requirements

Appendix A is the ASAT Qual and Engineering Checklist for the QFP Family for the GCRC5 ASIC.

Appendix B is the ASAT Lead Frame Bonding Diagram. This is also provided electronically as a dwg file.

3 QFP Top Marking

The packaged ASIC shall be marked as identified below:

GLAST LAT
GCRC5 – T31D
ASAT June 03

4 PIN Assignments and Bonding Diagram

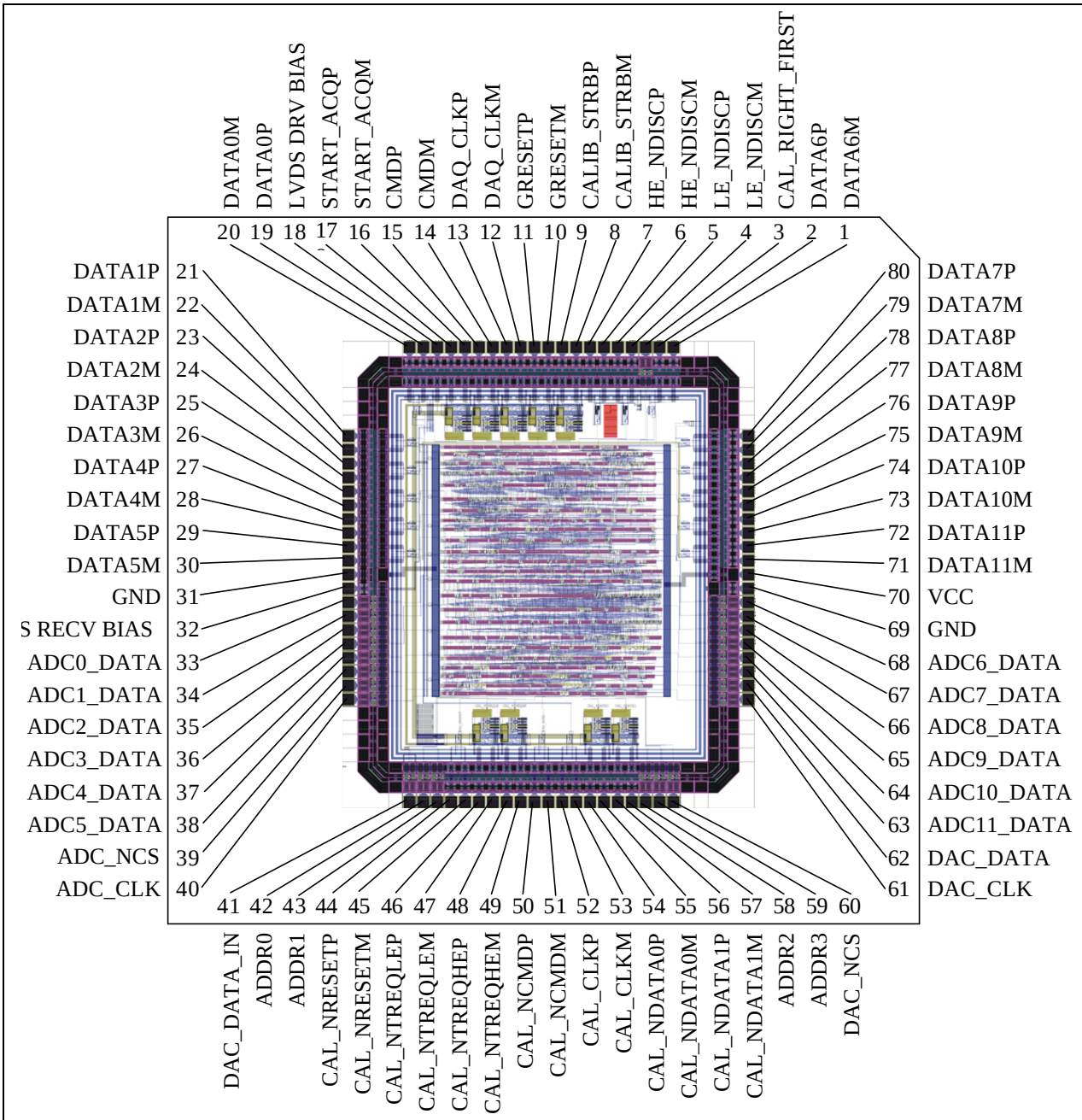


Figure 1. GCRC Version 5 PIN Assignments

Appendix A.
ASAT Qual and Engineering Checklist

Qual & Engineering Checklist for QFP Family
(TQFP / LQFP / MQFP)

QUAL LOT ☒ **Customer Device Qualification lead to new business opportunity (Category 1)** ☐ **Customer Process Improvement which not necessary lead to new business (Category 2)**

ENGG LOT ☐ **Engg evaluations which may lead to new business (Category 3)** ☐ **Other Engg evaluation (Category 4)**

Customer:	Naval Research Lab	Device Number:	GCRC5
M.O.D. Number :		Lot Number:	T31D
		Quantity:	850
Qual Purpose:		FAI Required (new material)	☐ Yes ☐ No

1. PACKAGE TYPE

Lead Count: 80 MCM ☐ Yes ☒ No MSL 1 Package ☒ Yes ☐ No

Body Size: 14 x 14 MM Number of Die: **850**

Package Thickness: 2.0 MM Footprint: 2.0 MM

2. WAFER

Die Size: 3015 x 3334 Microns Wafer Thickness: 17 MILS

Wafer Backgrind: ☐ Yes ☒ No Backgrind Thickness: MILS

Wafer Backside metallization Tolerance: +/- 1.0 MILS

Wafer Diameter: (Choose One) Wafer Material: Silicon

Single-Die/Multi-Die Wafer: (Choose One)

☐ Polyimide Coated ☐ Wafer UV Erase ☐ Probed ☐ Inked ☒ Blind Build

3. LEAD FRAME

Pad size 220 mils ☒ Standard Leadframe ☐ Custom Leadframe

Partnumber / Drawing Number (if custom l/f) QPL-80-QFP-0028-R0 Etched/Stamped: Etched

4. DIE ATTACH

Die Attach epoxy : standard silver die attach epoxy MCM Die Attach Epoxy

Wafer Map Required: ☐ Yes ☒ No Die Position (offset) ☐ Yes ☒ No

5. WIREBOND

Wire Diameter: 1.2 MILS Bonding Diagram Number: **LAT-DS-02227-01**

Pad Pitch: >90 microns Ground Bond: ☐ Yes ☒ No

Staggered Bond Pad ☐ Yes ☒ No - length :

Bond Pad Composition : - loop height :

6. DIE COAT

Die Coat: ☐ Yes ☒ No Die Coat Material:

7. MOLD

Mold Compound MLS1 approved mold compound Die Location Die Up

8. MARKING

Type: Ink Mark Type: (Choose One)

Topmark: ☒ Yes ☐ No Backmark: ☐ Yes ☒ No

Spec. Reference Number : LAT-DS-02227-01

9. PACKING

☒ Tray ☐ Tube ☐ Tape & Reel ☐ Consigned

Bakeable/Unbakeable: Bakeable Packing: (Choose One)

If Bakeable Temperature: 125 °C If Dry Pack/Bag Time:

10. SPECIAL INSTRUCTIONS

Reliability Test In ASAT: ☐ Yes (Go to Page 2) ☒ No

Additional Remarks:

Note : All items should be filled-up

Prepared by :

Approved by :

QUAL/ENGINEERING LOT TEST REQUIREMENTS

Customer: _____

Customer Qual Test Engineer: _____

ASAT Sales/Account Manager: _____

Reference Documents: 1. MIL-STD-883E 2. JESD-22

1. ELECTRICAL TEST

Room Temperature _____ °C

Hot Temperature _____ °C

Cold Temperature _____ °C

2. HIGH TEMPERATURE STORAGE TEST (METHOD 1016)- NO BIAS

Temperature _____ °C

Time _____

Others _____

3. 85/85 TEMPERATURE AND HUMIDITY BIAS TEST (METHOD 1004)- UNBIAS CONDITION

Time _____

4. TEMPERATURE CYCLE – AIR-TO-AIR (METHOD 1010)

Condition B	- 55°C	, + 125°C	Number Of Cycles	_____
Condition C	- 65°C	, + 150°C	Number Of Cycles	_____
Others	°C	, °C	Number Of Cycles	_____

5. THERMAL SHOCK – LIQUID-TO-LIQUID (METHOD 1011)

Condition B	- 55°C	, + 125°C	Number Of Cycles	_____
Condition C	- 65°C	, + 150°C	Number Of Cycles	_____
Others	°C	, °C	Number Of Cycles	_____

6. AUTOCLAVE TEST (121°C, 15 PSIG, 2 ATM, JESD22-A102-B)

Number Of Hours _____

7. H.A.S.T. TEST (JESD22-A110-A)

Temperature _____ °C

Humidity _____

Number Of Hours _____

8. PRE-CONDITIONING (J-STD-020A)

A. Expose To Temperature And Humidity — Temperature _____ °C

Humidity _____

Number Of Hours _____

B. Apply Flux

C. IR Solder Reflow — Profile _____

Number Of Cycles _____

9. MARK PERMANENCY TEST – RESISTANCE TO SOLVENTS (METHOD 2015)

☐ Yes ☐ No

10. SOLDERABILITY TEST (METHOD 2003)

☐ Yes ☐ No

11. X-RAY FOR PACKAGE VOID AND DIE ATTACH VOID (METHOD 2012)

☐ Yes ☐ No

12. STABILIZATION BAKE (METHOD 1008)

Temperature _____ °C

Number Of Hours _____

13. PHYSICAL DIMENSIONS (METHOD 2016)

☐ Yes ☐ No

14. COPLANARITY (JESD22-B108)

Specification Limit _____

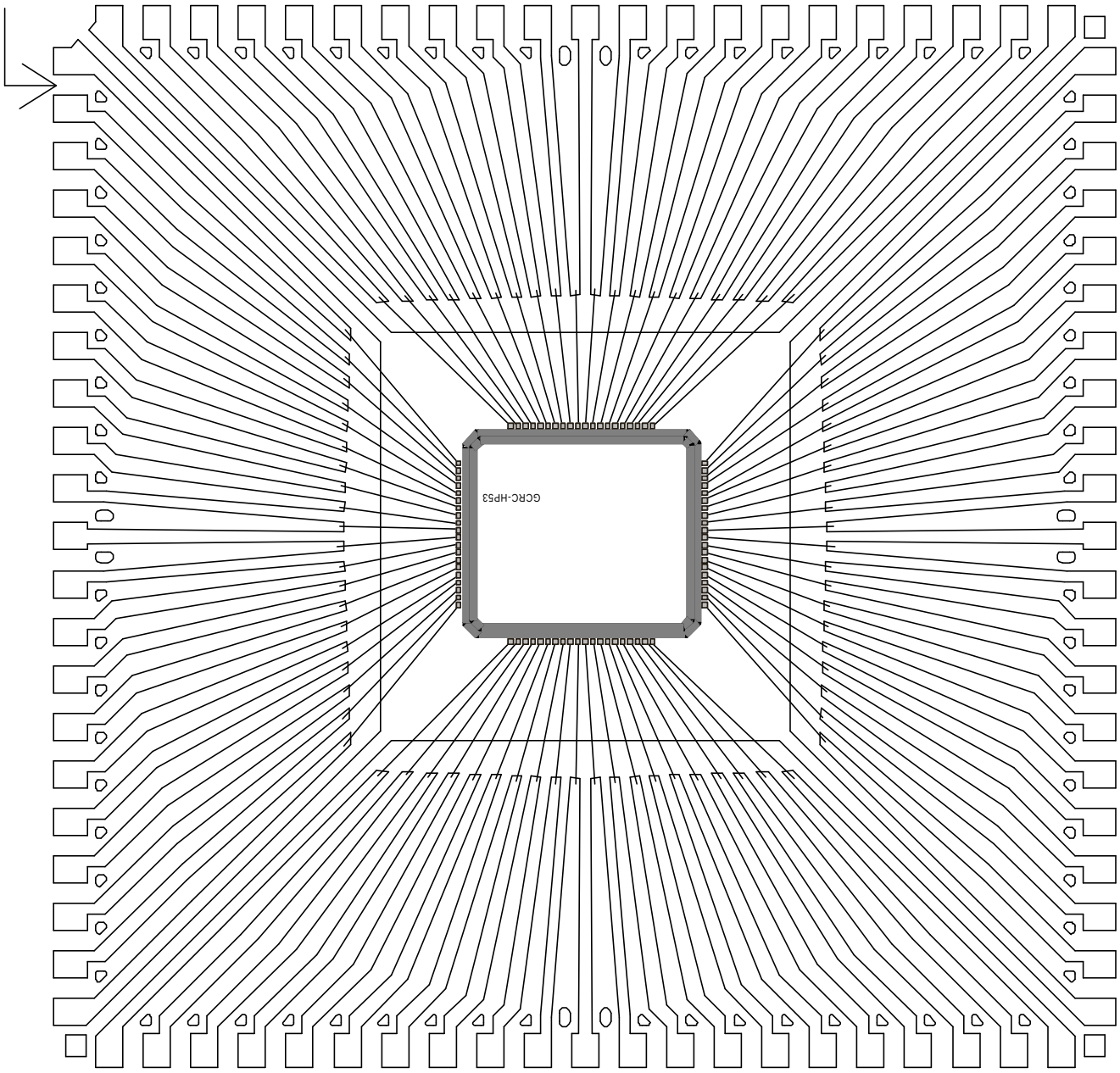
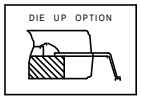
15. LEAD INTEGRITY (METHOD 2004)

☐ Yes ☐ No

Appendix B.
ASAT Bonding Diagram for GCRC5

ASAT™

PIN#:1



CUSTOMER: Naval Research Lab			**FR. TYPE:** 80L 220X220 QFP 14X14 ETCH (C)
DIE SIZE: 121 x 138 mils			
DEVICE NAME: GCRC5			**DRAWING #:** QPL-80-QFP-0028-R0
WIRE LENGTH:	**MAXIMUM:**		**ASAT STOCK #.:**
CUSTOMER DOC. NO: LAT-DS-02227-01		**DATE:** 2 June 2003	**PREPARED AND DRAWN BY:** KAT BULLINGTON **DATE:** 1/27/98
CUSTOMER, APPROVED:	**DATE:**		**DIE LOCATION :** **DIE UP**