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# STANDARD SPACE PRODUCTS PROGRAM

*February 2018*

For general information on Analog Devices Space Qualified products please visit the following address.

<http://www.analog.com/aerospace>

For technical inquiries on Aerospace Engineering Models please email us at [aero@analog.com](mailto:aero@analog.com)

For Sales and Distribution contacts please visit the following address.

<http://www.analog.com/en/about-adi/corporate-information/sales-distribution.html>

## **ANALOG DEVICES STANDARD SPACE LEVEL PROGRAM**

Analog offers a lower cost, shorter lead-time alternative to SCD's if the part is not offered in SMD or JAN. Analog Devices will continue to process devices to a specific source control drawing. However, in most cases, the standard Analog Devices Space Level should satisfy most customers' needs for full process control, traceability, reliability, lot qualifications and certified line.

Analog Devices Standard Space Level processing is based on the current issue of MIL-PRF-38535 QML level "V" (see Attachment 1).

The electrical parameters and end points for the Analog Devices Standard Space Level flow will be as described in the current Analog Devices Space Level data sheet for each part offered.

### **Features of Analog Standard Space Level Program Include the Following:**

1. MIL-PRF-38535 QML "V" certified facilities (Fab, Assembly and Test) unless otherwise noted on the product datasheet.
2. Wafer lot acceptance or SEM on most products except where not applicable. See datasheet.
3. Wafer lot traceability.
4. Hot solder dip lead finish as described in MIL-PRF-38535.
5. Marking with standard part number, lot seal date code and Analog Devices logo.
6. Technology Conformance Inspection, Attachments 2 and 2A.
7. Product Change Notification.

## COMMITMENT TO THE SPACE MARKET

Analog Devices is committed to serving the needs of the world space community by manufacturing the highest quality data conversion and signal processing products.

Analog Devices' entry into the space level market occurred in August 1990 when it acquired Precision Monolithics Inc. located in Santa Clara, California. Analog Devices' certified facilities have been supplying products for military and space applications since 1972. Analog Devices now offers state-of-the-art, data conversion and linear products to the space market place which were previously only available as commercial or military Class B products.

Analog Devices space level operations located in Greensboro, North Carolina coordinates all space level V (class S) activities, including business development, manufacturing and engineering. The addition of new products is derived from our customers' needs and the ability of these products to meet MIL-PRF-38535 QML level V requirements.

Visit our web site (<http://www.analog.com/aerospace>) or call our factory contacts for the latest Class S

updates as well as for radiation information on these and other products.

Analog Devices, Inc. Aerospace Product Line standard product is available in one or more of the following processes:

- ▶ MIL-PRF-38535, QML LEVEL V
- ▶ MIL-PRF-38535, QML R (LEVEL V with Radiation Qualification)
- ▶ MIL-PRF-38535, JAN S
- ▶ MIL-PRF-38535, Analog Devices, Inc.'s Aerospace Product Line Standard Product

See <http://www.analog.com/aerospace>. (Standard Space Level Products Program)

The table beginning on page 3 lists the standard product offered by Analog Device's Aerospace Product Line.

Product is also available in accordance with source control drawings. Please call factory for further information.

For further information see contact list on cover page.

## ANALOG DEVICES SPACE LEVEL PRODUCTS

### Manufacturing Locations

Space Level Compliance	Wafer Fab	Assembly	Screening and Quality Conformance Inspection
MIL-PRF-38535 Class V Compliant QMLV Devices	Full Wafer Lot Acceptance: <ul style="list-style-type: none"> <li>• ADI Wilmington MA</li> <li>• ADI Limerick, Ireland</li> <li>• ADI Santa Clara Die Bank</li> </ul>	ADI Phils, Inc. Cavite, Philippines	ADI Phils, Inc. Cavite, Philippines
Standard Space Products (non-QMLV)	SEM Inspection, most models: <ul style="list-style-type: none"> <li>• ADI Wilmington MA</li> <li>• ADI Limerick, Ireland</li> <li>• ADI Santa Clara Die Bank</li> <li>• TSMC Taiwan</li> </ul>	ADI Phils, Inc. Cavite, Philippines	ADI Phils, Inc. Cavite, Philippines
Customer Specific Special Flows	<ul style="list-style-type: none"> <li>• ADI Wilmington MA</li> <li>• ADI Limerick, Ireland</li> <li>• ADI Santa Clara Die Bank</li> <li>• TSMC Taiwan</li> </ul>	ADI Phils, Inc. Cavite, Philippines	ADI Phils, Inc. Cavite, Philippines

## ATTACHMENT 1

## Analog Devices Standard Space Level Flow

Test	Status/ Alternate Flow	Pkg/ Process	Exceptions	GIDEP Issue Date	Effective Date	PCN Number	Comments MIL-STD-883 Test Method and Condition
1. ESD	No change						Initial qualification
2. Wafer Lot Acceptance	No change		Noted on datasheet if not available. SEM available on all products.				TM 5007
3. Non-destruct bond pull	Alternate Flow				March 2003	02_0064	Equivalent to DSCC QMLV baseline process flow
4. Internal Visual	No change						100% to TM2010, condition A
5. Temperature Cycling	10 cycles						100% to TM1010, condition C
6. Constant Acceleration	No change						100% to TM2001, condition E
7. Visual inspection	No change						100%
8. PIND	No change						100% to TM2020, condition A
9. Serialization	No change						100%
10. X-ray	No change						100% to TM2012
11. T1. Pre Burn-in Elec.	No change						100% in accordance with device specification
12. Reverse Bias Burn-In	No change						100% to TM1015, 72 hr at 150 deg C min, if required
13. T2. Interim Elec.	No change						100% in accordance with device specification
14. Burn-in	No change						100% to TM1015, 240 hr at 125 deg C min
15. T3. Post-Burn-In Elec.	No change						100% in accordance with device specification
16. PDA	No change						5%, 3% catastrophic
17. Final Electrical	No change						100% in accordance with device specification
18. Group A	No change						MIL-PRF-38535
19. Seal, Fine Leak	No change						100% to TM1014
20. Seal, Gross leak	No change						100% to TM1014
21. External Visual	No change						100% to TM2009
22. Radiation Latch-up	No change						When specified
TCI--							
23. Group B	No change						MIL-PRF-38535
24. Group C	No change						MIL-PRF-38535
25. Group D	No change						MIL-PRF-38535
26. Group E	No change						MIL-PRF-38535

## ATTACHMENT 2

### Analog Devices Standard Space Level Offers

1. Group B per MIL-PRF-38535, Table II with attributes.
2. Group C per MIL-PRF-38535, Table IV with attributes and variables.
3. Group D per MIL-PRF-38535, Table V.
4. Group E, subgroup 2. Certificate of Conformance and test report.
  - a. Standard Radiation Test Plan. Test in accordance with MIL-PRF-38535 with test points at 0K, 100Krad, and post 24 hours biased anneal.
5. Delta measurements over pre and post burn-in on selected parameters based on Analog Space Level Data Sheets.
6. Wafer lot acceptance or SEM on most products except where not applicable. See datasheet.
7. Test report (\$2000) with each shipment includes:
  - A. 100% processing attributes data.
  - B. Electrical test variable data.
  - C. Radiographic inspection report.
  - D. Failure analysis report, if applicable.
  - E. Group A attributes data.
  - F. Certificate of Conformance.
  - G. Technology Conformance Inspection data.

## ATTACHMENT 2A

## Technology Conformance Inspection Minimum Sampling Plan

## Group B, MIL-PRF-38535, Table II

Subgroup	Test	Sample Size / Acc	Remarks
1	Resistance to solvents	3(0)	Not required for laser marking.
2	Bond Strength	22(0)*	
	Die Shear	3(0)	
3	Solderability	22(0)**	

\* Applies to the number of wires in minimum of 4 devices.

\*\* Applies to the number of leads on a minimum of 3 devices.

## Group C, MIL-PRF-38535, Table IV

Subgroup	Test	Sample Size / Acc	Remarks
1	Life Test	45(0)	MIL-PRF-38535, app B, ¶ 4.2 c-1

## Group D, MIL-PRF-38535, Table V

Subgroup	Test	Sample Size / Acc	Remarks
1	Physical Dimensions	15(0)	Electrical rejects may be used
2	a. Lead Integrity b. Seal	45(0)*	Electrical rejects may be used
3	a. Thermal shock b. Temperature cycling c. Moisture resistance d. Seal e. Visual f. End-point Electrical	15(0)	Electrically good parts, Destroyed
4	a. Shock b. Vibration, variable freq. c. Acceleration d. Seal e. Visual Examination f. End-Point Electrical	15(0)	Electrically good parts, Destroyed
5	a. Salt Atmosphere b. Seal c. Visual	15(0)	Electrical rejects may be used
6	Internal water vapor	3(0) or 5(1)	Electrical rejects may be used
7	Adhesion of lead finish	15(0)*	Electrical rejects may be used
8	Lid Torque	5(0)	Electrical rejects may be used
9	Soldering Heat	3(0)**	

\* Applies to number of leads in minimum of 3 samples.

\*\* Performed at qualification or design changes which may affect this test.

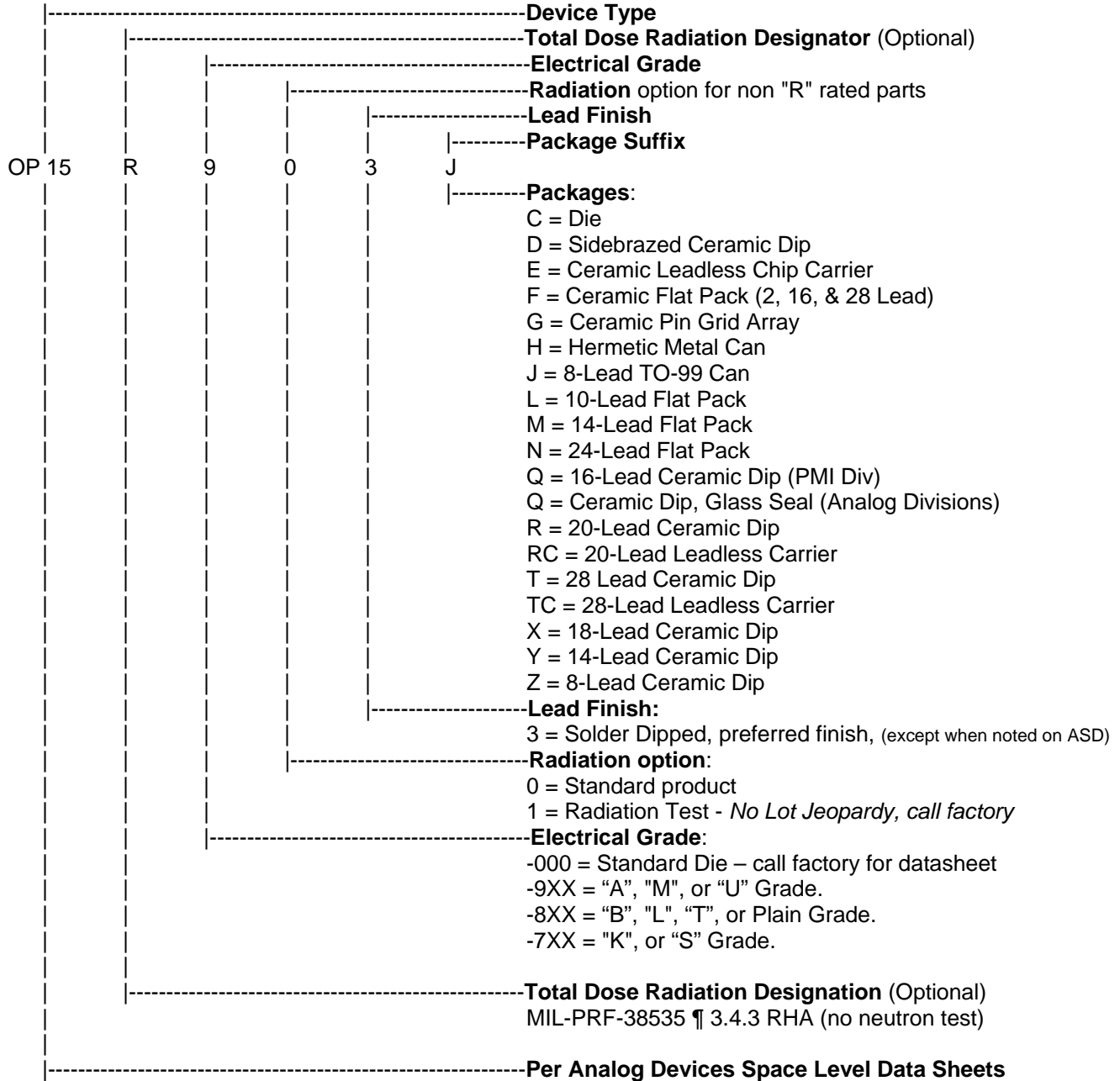
**ATTACHMENT 2A****Technology Conformance Inspection Minimum Sampling Plan****Group E-Subgroup 2, MIL-PRF-38535, Table B-I**

Subgroup	Test	Sample Size / Acc	Remarks
2	Total Ionization Dose	22(0) / wafer lot or 4(0) / wafer	883 Method 1019, Cond. A

## ATTACHMENT 3

### Analog Standard Space Level Product Ordering Information

See Space Qualified Parts List Brochure (<http://www.analog.com/aerospace>) for list of product / package offering.



#### Examples:

- AD9058-803D = AD9058, "T" Grade, Sidebrazed package, Solder-Dipped Lead Finish.
  - AD9058R803D = AD9058, "T" Grade, Sidebrazed package, Solder-Dipped Lead Finish, Qualified to 100Krad
  - PM139-000C = PM139, Standard Die.
  - PM139R000C = PM139, Standard Die, Qualified to 100Krad
- For QML Class "V" products see appropriate Standard Military Drawing 5962-XXXXXVXX.



**REVISION HISTORY**

Rev	Description of Change	Date
0	Initiate	May 9, 2000
A	Add revision history Attachment 1: remove reference to ADI0422, add 10 cycle note Attachment 2: remove # of samples from 1. add minimum to 4a, removed 80% of unit price. Attachment 2A: change "leads in" to "lead on" for Group B notes	Jan. 16, 2001
B	Update web page links.	Dec. 19, 2001
C	Change Radiation test from MIL-STD-883 M5004 to MIL-PRF-38535.	May 31, 2002
D	Add information for standard die on page 6: "Product Ordering Information"	Feb. 7, 2003
E	Modify factory contacts & company address	Oct. 30, 2003
F	Modify factory contacts & company address	Jan. 9, 2006
G	Modify Attachment 1 – Analog Devices Standard Space Level Flow	Oct. 17, 2006
H	Remove ref to ESD marking & Modify factory contacts	Dec. 12, 2006
I	Add program feature clarification to accommodate products with fab or test at a non QML "V" certified facility	July 17, 2007
J	Up-date Group C sample size per Mil-PRF-38535 Rev H.	Sept. 13, 2007
K	Update QCI items as part of standard test report	Nov. 01, 2011
L	Update brand on header	Dec. 14, 2015
M	Update manufacturing location on page 3.	May 06, 2016
N	Updated quantity of Lead Integrity sample size from 15(0) to 45(0) on page 6	Dec 8, 2017
O	Added to Note 3 on Lead finish "(except when noted on ASD)" on page 8	Feb 8, 2018