Product/Process Change Notice - PCN 22_0048 Rev. B

Analog Devices, Inc. One Analog Way, Wilmington, MA 01887, USA

This notice is to inform you of a change that will be made to certain ADI products (see Appendix A) that you may have purchased in the last 2 years. **Any inquiries or requests with this PCN (additional data or samples) must be sent to ADI within 30 days of publication date.** ADI contact information is listed below.

Note: Revised fields are indicated by a red field name. See Appendix B for revision history.

PCN Title:	Addition of ASE Korea as an Alternate Assembly Site for Select LFCSP Products
Publication Date:	29-Mar-2023
Effectivity Date:	08-Sep-2022 *(the earliest date that a customer could expect to receive changed material)*
Revision Description:	Remove Parts.

Description Of Change:

1) Assembly site for selected LFCSP parts are moving from UNISEM MALAYSIA (UG1) to ASE KOREA (AEK).

2) Change in Mold compound from Sumitomo G770HCD to Sumitomo G700LYT.

3) Change in Die Attached from Hysol QMI 519 conductive, Sumitomo CRM 1076NS conductive, Sumitomo CRM 1076DJ conductive to EN4900GC conductive.

Existing qualified BOM in AEK will be used.

Copy Exact LF and Same Package Outline Drawing

Reason For Change:

ASE KOREA (AEK) is being utilized as an additional assembly site for LFCSP products. ADI's assembly subcontractors manufacture products using Analog Devices specified manufacturing flows, materials, process controls and monitors, ensuring the same level of quality and reliability on products they receive from the new site.

Impact of the change (positive or negative) on fit, form, function & reliability:

No impact on form, fit and function or reliability.

Product Identification *(this section will describe how to identify the changed material)*

Parts assembled at AET will be identified by Assembly Lot number and Date Code.

Summary of Supporting Information:

See attached Qualification Result.

Supporting Documents

Attachment 1: Type: Detailed Change Description

ADI_PCN_22_0048_Rev_B_Material Set for 16L 3x3x0.85 and 24L 4x4x0.85 L...

Attachment 2: Type: Qualification Results Summary

ADI_PCN_22_0048_Rev_B_ASE Korea Qualification Report.pdf...

Note: If applicable, the device material declaration will be updated due to material change.

ADI Contact Information:

For questions on this PCN, please send an email to the regional contacts below or contact your local ADI sales representatives.

Americas:	Europe:	Japan:	Rest of Asia:
PCN_Americas@analog.com	PCN_Europe@analog.com	PCN_Japan@analog.com	PCN_ROA@analog.com

Appendix A - Affected ADI Models:

Existing Parts - Product Family / Model Number (124)

HMC1019A / HMC1019ALP4E	HMC1019A / HMC1019ALP4ETR	HMC1118 / HMC1118LP3DE	HMC1118 / HMC1118LP3DETR	HMC1119 / HMC1119LP4ME
HMC1119 / HMC1119LP4METR	HMC1120 / HMC1120LP4E	HMC1120 / HMC1120LP4ETR	HMC1122 / HMC1122LP4ME	HMC1122 / HMC1122LP4METR
HMC2991 / HMC2991LP4E	HMC2991 / HMC2991LP4ETR	HMC305S / HMC305SLP4E	HMC305S / HMC305SLP4ETR	HMC322AG / HMC322ALP4E
HMC322AG / HMC322ALP4ETR	HMC346A / HMC346ALP3E	HMC346A / HMC346ALP3ETR	HMC347AG / HMC347ALP3E	HMC347AG / HMC347ALP3ETR
HMC369 / HMC369LP3E	HMC369 / HMC369LP3ETR	HMC3716 / HMC3716LP4E	HMC3716 / HMC3716LP4ETR	HMC388 / HMC388LP4E
HMC388 / HMC388LP4ETR	HMC390 / HMC390LP4E	HMC390 / HMC390LP4ETR	HMC391 / HMC391LP4E	HMC391 / HMC391LP4ETR
HMC408 / HMC408LP3E	HMC408 / HMC408LP3ETR	HMC409 / HMC409LP4E	HMC409 / HMC409LP4ETR	HMC415 / HMC415LP3E
HMC415 / HMC415LP3ETR	HMC4202 / HMC4202LP3E	HMC4202 / HMC4202LP3ETR	HMC4203 / HMC4203LP3E	HMC4203 / HMC4203LP3ETR
HMC429 / HMC429LP4E	HMC429 / HMC429LP4ETR	HMC431 / HMC431LP4E	HMC431 / HMC431LP4ETR	HMC443 / HMC443LP4E
HMC443 / HMC443LP4ETR	HMC445 / HMC445LP4E	HMC445 / HMC445LP4ETR	HMC470A / HMC470ALP3E	HMC470A / HMC470ALP3ETR
HMC472A / HMC472ALP4E	HMC472A / HMC472ALP4ETR	HMC492 / HMC492LP3E	HMC492 / HMC492LP3ETR	HMC493 / HMC493LP3E
HMC493 / HMC493LP3ETR	HMC500 / HMC500LP3E	HMC500 / HMC500LP3ETR	HMC5011A / HMC5011ALP4E	HMC5011A / HMC5011ALP4ETR
HMC5015 / HMC5015LP4E	HMC5015 / HMC5015LP4ETR	HMC505 / HMC505LP4E	HMC505 / HMC505LP4ETR	HMC506 / HMC506LP4E
HMC506 / HMC506LP4ETR	HMC5202 / HMC5202LP4E	HMC5202 / HMC5202LP4ETR	HMC532 / HMC532LP4E	HMC532 / HMC532LP4ETR
HMC535 / HMC535LP4E	HMC535 / HMC535LP4ETR	HMC539A / HMC539ALP3E	HMC539A / HMC539ALP3ETR	HMC547A / HMC547ALP3E
HMC547A / HMC547ALP3ETR	HMC596 / HMC596LP4E	HMC596 / HMC596LP4ETR	HMC6153 / HMC6153LP4E	HMC6153 / HMC6153LP4ETR
HMC6154 / HMC6154LP4E	HMC6154 / HMC6154LP4ETR	HMC6182 / HMC6182LP3CE	HMC6182 / HMC6182LP3CETR	HMC6187G / HMC6187LP4E
HMC6187G / HMC6187LP4ETR	HMC641AG / HMC641ALP4E	HMC641AG / HMC641ALP4ETR	HMC675 / HMC675LP3E	HMC675 / HMC675LP3ETR
HMC694G / HMC694LP4E	HMC694G / HMC694LP4ETR	HMC705 / HMC705LP4E	HMC705 / HMC705LP4ETR	HMC712A / HMC712ALP3CE
HMC712A / HMC712ALP3CETR	HMC717A / HMC717ALP3E	HMC717A / HMC717ALP3ETR	HMC721 / HMC721LP3E	HMC721 / HMC721LP3ETR
HMC722 / HMC722LP3E	HMC722 / HMC722LP3ETR	HMC7353 / HMC7353LP4E	HMC7353 / HMC7353LP4ETR	HMC7836 / HMC7836LP4E
HMC7836 / HMC7836LP4ETR	HMC7903 / HMC7903LP4E	HMC7903 / HMC7903LP4ETR	HMC792A / HMC792ALP4E	HMC792A / HMC792ALP4ETR
HMC7992 / HMC7992LP3DE	HMC7992 / HMC7992LP3DETR	HMC8073 / HMC8073LP3DE	HMC8073 / HMC8073LP3DETR	HMC862A / HMC862ALP3E
HMC862A / HMC862ALP3ETR	HMC939AG / HMC939ALP4E	HMC939AG / HMC939ALP4ETR	HMC941AG / HMC941ALP4E	HMC941AG / HMC941ALP4ETR
HMC973A / HMC973ALP3E	HMC973A / HMC973ALP3ETR	HMC985AG / HMC985ALP4KE	HMC985AG / HMC985ALP4KETR	

Appendix A - Affected ADI Models::

Removed Parts On All Revisions - Product Family / Model Number (258)

ADH939S / HMC8465LP4E	ADRF5040 / ADRF5040BCPZ	ADRF5040 / ADRF5040BCPZ-R7	ADRF5130 / ADRF5130BCPZ	ADRF5130 / ADRF5130BCPZ-R7
HMC1010 / HMC1010LP4E	HMC1010 / HMC1010LP4ETR	HMC1013 / HMC1013LP4E	HMC1013 / HMC1013LP4ETR	HMC1013 / HMC1013LP4ETR-R1
HMC1018A / HMC1018ALP4E	HMC1018A / HMC1018ALP4ETR	HMC1020 / HMC1020LP4E	HMC1020 / HMC1020LP4ETR	HMC1021 / HMC1021LP4E
HMC1021 / HMC1021LP4ETR	HMC1040 / HMC1040LP3CE	HMC1040 / HMC1040LP3CETR	HMC1044 / HMC1044LP3E	HMC1044 / HMC1044LP3ETR
HMC1045 / HMC1045LP3E	HMC1045 / HMC1045LP3ETR	HMC1063 / HMC1063LP3E	HMC1063 / HMC1063LP3ETR	HMC1065 / HMC1065LP4E
HMC1065 / HMC1065LP4ETR	HMC1082 / HMC1082LP4E	HMC1082 / HMC1082LP4ETR	HMC1094 / HMC1094LP3E	HMC1094 / HMC1094LP3ETR
HMC1095 / HMC1095LP4E	HMC1095 / HMC1095LP4ETR	HMC1096 / HMC1096LP3E	HMC1096 / HMC1096LP3ETR	HMC1097 / HMC1097LP4E
HMC1097 / HMC1097LP4ETR	HMC263G / HMC263LP4E	HMC263G / HMC263LP4ETR	HMC3410 / HMC3410LP4E	HMC3410 / HMC3410LP4ETR
HMC3411 / HMC3411LP4E	HMC3411 / HMC3411LP4ETR	HMC346G / HMC346LP3E	HMC346G / HMC346LP3ETR	HMC348 / HMC348LP3ETR
HMC356 / HMC356LP3E	HMC356 / HMC356LP3ETR	HMC368 / HMC368LP4E	HMC368 / HMC368LP4ETR	HMC370 / HMC370LP4E
HMC370 / HMC370LP4ETR	HMC372 / HMC372LP3E	HMC372 / HMC372LP3ETR	HMC373 / HMC373LP3E	HMC373 / HMC373LP3ETR
HMC375 / HMC375LP3E	HMC375 / HMC375LP3ETR	HMC376 / HMC376LP3E	HMC376 / HMC376LP3ETR	HMC382 / HMC382LP3E
HMC382 / HMC382LP3ETR	HMC384 / HMC384LP4E	HMC384 / HMC384LP4ETR	HMC385 / HMC385LP4E	HMC385 / HMC385LP4ETR
HMC386 / HMC386LP4E	HMC386 / HMC386LP4ETR	HMC389 / HMC389LP4E	HMC389 / HMC389LP4ETR	HMC394 / HMC394LP4E
HMC394 / HMC394LP4ETR	HMC4069 / HMC4069LP4E	HMC4069 / HMC4069LP4ETR	HMC416 / HMC416LP4E	HMC416 / HMC416LP4ETR
HMC427A / HMC427ALP3E	HMC427A / HMC427ALP3ETR	HMC430 / HMC430LP4E	HMC430 / HMC430LP4ETR	HMC441G / HMC441LP3E
HMC441G / HMC441LP3ETR	HMC444 / HMC444LP4E	HMC444 / HMC444LP4ETR	HMC451G / HMC451LP3E	HMC451G / HMC451LP3ETR
HMC455 / HMC455LP3E	HMC455 / HMC455LP3ETR	HMC4623 / HMC4623LP3E	HMC4623 / HMC4623LP3ETR	HMC466 / HMC466LP4E
HMC466 / HMC466LP4ETR	HMC4661A / HMC4661ALP3E	HMC4661A / HMC4661ALP3ETR	HMC4865 / HMC4865LP3E	HMC4865 / HMC4865LP3ETR
HMC494 / HMC494LP3E	HMC494 / HMC494LP3ETR	HMC495 / HMC495LP3E	HMC495 / HMC495LP3ETR	HMC533 / HMC533LP4E
HMC533 / HMC533LP4ETR	HMC540S / HMC540SLP3E	HMC540S / HMC540SLP3ETR	HMC5449 / HMC5449LP3E	HMC5449 / HMC5449LP3ETR
HMC561G / HMC561LP3E	HMC561G / HMC561LP3ETR	HMC566G / HMC566LP4E	HMC566G / HMC566LP4ETR	HMC5688A / HMC5688ALP4E
HMC5688A / HMC5688ALP4ETR	HMC575 / HMC575LP4E	HMC575 / HMC575LP4ETR	HMC5869B / HMC5869BLP3E	HMC5869B / HMC5869BLP3ETR
HMC593 / HMC593LP3ETR	HMC600 / HMC600LP4E	HMC600 / HMC600LP4ETR	HMC602 / HMC602LP4E	HMC602 / HMC602LP4ETR
HMC611G / HMC611LP4E	HMC611G / HMC611LP4ETR	HMC615 / HMC615LP4ETR	HMC629A / HMC629ALP4E	HMC629A / HMC629ALP4ETR
HMC630 / HMC630LP3E	HMC630 / HMC630LP3ETR	HMC631 / HMC631LP3E	HMC631 / HMC631LP3ETR	HMC6499 / HMC6499LP3E
HMC6499 / HMC6499LP3ETR	HMC662 / HMC662LP3E	HMC662 / HMC662LP3ETR	HMC6627A / HMC6627ALP4LE	HMC6627A / HMC6627ALP4LETR
HMC6628 / HMC6628LP4E	HMC6628 / HMC6628LP4ETR	HMC6657 / HMC6657LP4E	HMC6657 / HMC6657LP4ETR	HMC666 / HMC666LP4E
HMC666 / HMC666LP4ETR	HMC668 / HMC668LP3E	HMC668 / HMC668LP3ETR	HMC669 / HMC669LP3E	HMC669 / HMC669LP3ETR
HMC674 / HMC674LP3E	HMC674 / HMC674LP3ETR	HMC680 / HMC680LP4E	HMC6811 / HMC6811CLP3E	HMC6811 / HMC6811CLP3ETR
HMC684 / HMC684LP4E	HMC684 / HMC684LP4ETR	HMC685 / HMC685LP4E	HMC685 / HMC685LP4ETR	HMC686 / HMC686LP4E
HMC686 / HMC686LP4ETR	HMC687 / HMC687LP4E	HMC687 / HMC687LP4ETR	HMC688 / HMC688LP4E	HMC688 / HMC688LP4ETR

HMC689 / HMC689LP4E
HMC689 / HMC689LP4ETR
HMC695 / HMC695LP4E
HMC695 / HMC695LP4ETR
HMC696 / HMC696LP4E
HMC696 / HMC696LP4ETR
HMC697 / HMC697LP4E
HMC697 / HMC697LP4ETR
HMC703 / HMC703LP4E
HMC703 / HMC703LP4ETR
HMC704 / HMC704LP4E
HMC704 / HMC704LP4ETR
HMC713 / HMC713LP3E
HMC713 / HMC713LP3ETR
HMC715 / HMC715LP3E
HMC715 / HMC715LP3ETR
HMC7150 / HMC7150LP3DE
HMC7150 / HMC7150LP3DETR
HMC716 / HMC716LP3E
HMC716 / HMC716LP3ETR
HMC720 / HMC720LP3E
HMC720 / HMC720LP3ETR
HMC723 / HMC723LP3E
HMC723 / HMC723LP3ETR
HMC736 / HMC736LP4E
HMC736 / HMC736LP4ETR
HMC7366 / HMC7366LP3E
HMC7366 / HMC7366LP3ETR
HMC738 / HMC738LP4E
HMC738 / HMC738LP4ETR
HMC739 / HMC739LP4E
HMC739 / HMC739LP4ETR
HMC750 / HMC750LP4E
HMC750 / HMC750LP4ETR
HMC7516 / HMC7516LP4ME
HMC7516 / HMC7516LP4METR
HMC7517 / HMC7517LP4ME
HMC7517 / HMC7517LP4METR
HMC753 / HMC753LP4E
HMC753 / HMC753LP4ETR
HMC759 / HMC759LP3E
HMC759 / HMC759LP3ETR
HMC7799 / HMC7799LP3E
HMC7799 / HMC7799LP3ETR
HMC785 / HMC785LP4E
HMC785 / HMC785LP4ETR
HMC786 / HMC786LP4E
HMC786 / HMC786LP4ETR
HMC794 / HMC794LP3E
HMC794 / HMC794LP3ETR
HMC799 / HMC799LP3E
HMC799 / HMC799LP3ETR
HMC802A / HMC802ALP3E
HMC802A / HMC802ALP3ETR
HMC8207 / HMC8207LP3E
HMC8207 / HMC8207LP3ETR
HMC860 / HMC860LP3E
HMC860 / HMC860LP3ETR
HMC863G / HMC863LP4E
HMC863G / HMC863LP4ETR
HMC898 / HMC898LP4E
HMC899G / HMC899LP4E
HMC902G / HMC902LP3E
HMC902G / HMC902LP3ETR
HMC903G / HMC903LP3E
HMC903G / HMC903LP3ETR
HMC905 / HMC905LP3E
HMC905 / HMC905LP3ETR
HMC909 / HMC909LP4E
HMC909 / HMC909LP4ETR
HMC914 / HMC914LP4E
HMC914 / HMC914LP4ETR
HMC921 / HMC921LP4E
HMC921 / HMC921LP4ETR
HMC942 / HMC942LP4E
HMC942 / HMC942LP4ETR
HMC948 / HMC948LP3E
HMC948 / HMC948LP3ETR
HMC951A / HMC951ALP4E
HMC951A / HMC951ALP4ETR
HMC951B / HMC951BLP4E
HMC951B / HMC951BLP4ETR
HMC966 / HMC966LP4E
HMC966 / HMC966LP4ETR
HMC967 / HMC967LP4E
HMC967 / HMC967LP4ETR
HMC977G / HMC977LP4E
HMC977G / HMC977LP4ETR
HMC980G / HMC980LP4E
HMC980G / HMC980LP4ETR
HMC981G / HMC981LP3E
HMC981G / HMC981LP3ETR
HMC984 / HMC984LP4E
HMC984 / HMC984LP4ETR
HMC988 / HMC988LP3E
HMC988 / HMC988LP3ETR
HMC996 / HMC996LP4E
HMC996 / HMC996LP4ETR

Appendix B - Revision History:

Rev	Publish Date	Effectivity Date	Rev Description
Rev. -	19-Apr-2022	22-Jul-2022	Initial Release.
Rev. A	06-Jun-2022	08-Sep-2022	Remove Parts.
Rev. B	29-Mar-2023	08-Sep-2022	Remove Parts.

BOM CHANGE SUMMARY

- From 4 BOM at UG1 to 1 BOM at AEK.
  - 4 different Adhesive material at UG1 will become 1 Adhesive material at AEK

Assembly Site	From - UNISEM Malaysia (UG1)	To - ASE Korea (AEK)
Wire	Au/1.0	Au/1.0
Die Attach	**Ablestik 2815A conductive** **Hysol QMI 519 conductive** **Sumitomo CRM 1076NS conductive** **Sumitomo CRM 1076DJ conductive**	Hitachi EN 4900GC conductive
Mold Compound	Sumitomo G770HCD	Sumitomo G700LYT
Plating	100Sn	100Sn

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BOM CHANGE SUMMARY

- BOM for 0.8 mil wire

Assembly Site	From - UNISEM Malaysia (UG1)	To - ASE Korea (AEK)
Wire	Au/0.8	Au/0.8
Die Attach	Hysol QMI 519 conductive	Hitachi EN 4900GC conductive
Mold Compound	Sumitomo G770HCD	Sumitomo G700LYT
Plating	100Sn	100Sn

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BOM CHANGE SUMMARY

ANALOG DEVICES
AHEAD OF WHAT'S POSSIBLE™

- BOM for NiPdAu Terminal Finish Composition

Assembly Site	From - UNISEM Malaysia (UG1)	To - ASE Korea (AEK)
Wire	Au/1.0	Au/1.0
Die Attach	Hysol QMI 519 conductive	Hitachi EN 4900GC conductive
Mold Compound	Sumitomo G770HCD	Sumitomo G700LYT
Plating	Ni_Pd_Au	Ni_Pd_Au

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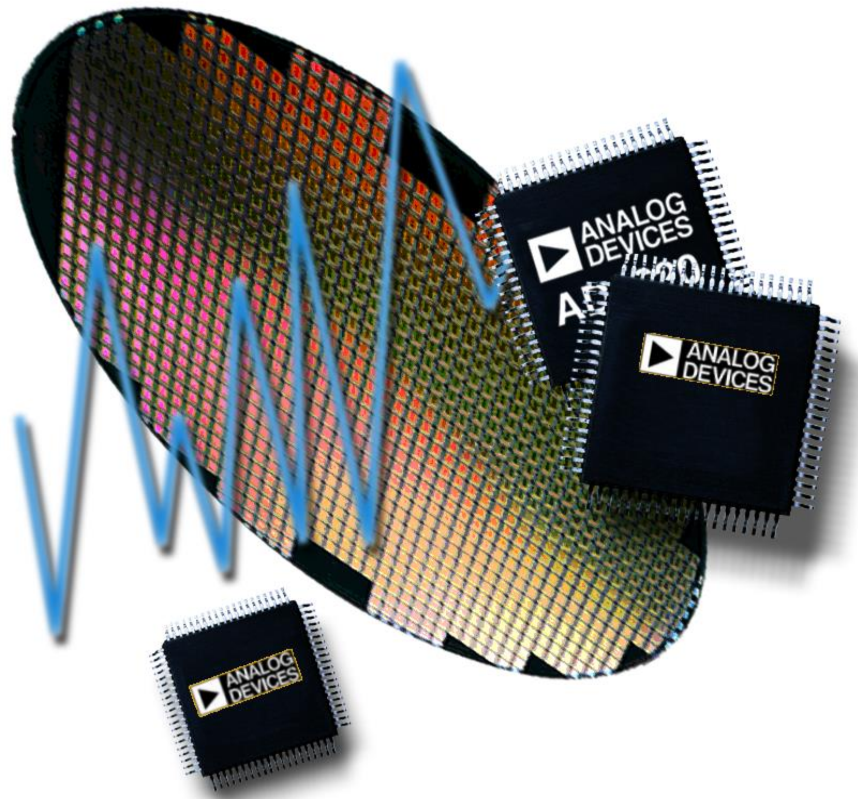

Reliability Report

Report Title: LFCSP at ASE Korea Qualification

Report Number: 19670

Revision: A

Date: 25 March 2022

Summary

This report summarizes the reliability qualification data for sawn lead frame chip scale package (LFCSP) assembled at ASE Korea (AEK).

The AD9695, AD9512, AD7689, ADF41513, SSM3302, ADF4157, HMC637ALP5E, ADF7250, ADF5902, ADAU1979W, and ADV7380 at ASE Korea (AEK) are used as device vehicles for this qualification.

- The AD9695 is a dual, 14-bit, 1300 MSPS/625 MSPS analog-to-digital converter (ADC). The device has an on-chip buffer and a sample-and-hold circuit designed for low power, small size, and ease of use. Table 1 describes the AD9695 product characteristics.
- The AD9512 provides a multi-output clock distribution function for input signals up to 1.6 GHz. The design emphasizes low jitter and low phase noise in order to maximize data converter clocking performance. Table 2 describes the AD9512 product characteristics.
- The AD7689 are 4-channel/8-channel, 16-bit, charge redistribution successive approximation register (SAR) analog-to-digital converters (ADCs) that operate from a single power supply, VDD. Table 3 describes the AD7689 product characteristics.
- The ADF41513 is an ultralow noise frequency synthesizer that can be used to implement local oscillators (LOs) as high as 26.5 GHz in the upconversion and downconversion sections of wireless receivers and transmitters. Table 4 describes the AD7689 product characteristics.
- The SSM3302 is a fully integrated, high efficiency, stereo Class-D audio amplifier. The application circuit requires minimal external components and operates from a single 7 V to 18 V supply. The device is capable of delivering 2 × 10 W of continuous output power into a 4 Ω load (or 2 × 8 W into 8 Ω) with <1% THD + N from a 12 V supply. Table 5 describes the SSM3302 product characteristics.
- The ADF4157 is a 6 GHz fractional-N frequency synthesizer with a 25-bit fixed modulus, allowing subhertz frequency resolution at 6 GHz. It consists of a low noise digital phase frequency detector (PFD), a precision charge pump, and a programmable reference divider. There is a Σ-Δ based fractional interpolator to allow programmable fractional-N division. Table 6 describes the ADF4157 product characteristics.
- The HMC637ALP5E is a gallium arsenide (GaAs), monolithic microwave integrated circuit (MMIC), pseudomorphic high electron mobility transistor (pHEMT) distributed power amplifier which operates between 0.1 GHz and 6 GHz. The amplifier provides 13 dB of gain, 44 dBm output third-order intercept (IP3), and 29 dBm of output power at 1 dB gain compression while requiring 400 mA from a 12 V supply. Table 7 describes the HMC637ALP5E product characteristics.

- The ADF7250 is a low power integrated radio transceiver that supports Bluetooth low energy and other GFSK signaling modes. Key features include ultralow power operation, and best in class sensitivity. Table 8 describes the ADF7250 product characteristics.
- The ADF5902 is a 24 GHz transmitter (Tx) monolithic microwave integrated circuit (MMIC) with an on-chip, 24 GHz voltage controlled oscillator (VCO). The VCO features a fractional-N frequency synthesizer with waveform generation capability with programmable grid array (PGA) and dual transmitter channels for radar systems. Table 9 describes the ADF5902 product characteristics.
- The ADAU1979 incorporates four high performance, analog-to-digital converters (ADCs) with 4.5 V rms capable ac-coupled inputs. The ADCs use a multibit sigma-delta (Σ-Δ) architecture with continuous time front end for low EMI. Table 10 describes the ADAU1979W product characteristics.
- The ADV7380 is a point-to-point Camera Link chip developed to enable the transmission of high definition (HD) video from a remote camera module to an Electronic Camera Unit (ECU) or a Head Unit in an automotive vehicle. Table 11 describes the ADV7380 product characteristics.

Table 1: AD9695 Product Characteristics

Die/Fab

Die Id	TMIB72 A3 /B
Die Size (mm)	3.91 x 3.91
Wafer Fabrication Site	TSMC Fab15
Wafer Fabrication Process	28nm CMOS
Passivation Layer	undoped-oxide/SiN
Bond Pad Metal Composition	AlCu
Polyimide	Yes
Maximum Power Dissipation (W)	3.000

Package/Assembly

Package	64-LFCSP
Body Size (mm)	9.00 x 9.00 x 0.75
Assembly Location	ASE-AEK
Molding Compound	Sumitomo G700LYT
Wire Type	MKE R 2N Gold
Wire Diameter (mils)	0.80
Die Attach	Hitachi EN-4900GC
Lead Frame Material	Copper
Lead Finish	Matte Sn
Moisture Sensitivity Level	3
Maximum Peak Reflow Temperature (C)	260

Table 2: AD9512 Product Characteristics

Die/Fab

Die Id	TML838 / C
Die Size (mm)	3.14 x 3.21
Wafer Fabrication Site	TSMC Fab-3C
Wafer Fabrication Process	0.35µm CMOS
Passivation Layer	undoped-oxide/SiN
Bond Pad Metal Composition	AlCu
Polyimide	No
Maximum Power Dissipation (W)	0.70

Package/Assembly

Package	48-LFCSP
Body Size (mm)	7.00 x 7.00 x 0.75
Assembly Location	ASE (AEK)
Molding Compound	Sumitomo G700LYT
Wire Type	MKE R 2N Gold
Wire Diameter (mils)	0.80
Die Attach	Hitachi EN-4900GC
Lead Frame Material	Copper
Lead Finish	NiPdAu
Moisture Sensitivity Level	3
Maximum Peak Reflow Temperature (C)	260

Table 3: AD7689 Product Characteristics

Die/Fab

Die Id	TMX307/E
Die Size (mm)	2.43 x 2.43
Wafer Fabrication Site	TSMC Fab-9
Wafer Fabrication Process	0.5µm CMOS
Passivation Layer	undoped-oxide/SiN
Bond Pad Metal Composition	AlCu
Polyimide	No
Maximum Power Dissipation (W)	0.013

Package/Assembly

Package	20-LFCSP
Body Size (mm)	4.00 x 4.00 x 0.85
Assembly Location	ASE-AEK
Molding Compound	Sumitomo G700
Wire Type	4N Gold
Wire Diameter (mils)	1.00
Die Attach	Ablestik 8290
Lead Frame Material	Copper Alloy 194
Lead Finish	Matte Sn
Moisture Sensitivity Level	3
Maximum Peak Reflow Temperature (°C)	260

Table 4: ADF41513 Product Characteristics

Die/Fab

Die Id	TMJK97/A
Die Size (mm)	1.63 x 1.63
Wafer Fabrication Site	TSMC Fab 4
Wafer Fabrication Process	0.18µm BiCMOS
Passivation Layer	undoped-oxide/SiN
Bond Pad Metal Composition	AlCu
Polyimide	No
Maximum Power Dissipation (W)	0.300

Package/Assembly

Package	24-LFCSP
Body Size (mm)	4.00 x 4.00 x 0.75
Assembly Location	ASE-AEK
Molding Compound	Sumitomo G700
Wire Type	MKE R 2N Gold
Wire Diameter (mils)	0.80
Die Attach	Ablestik 8290
Lead Frame Material	Copper
Lead Finish	Matte Sn
Moisture Sensitivity Level	3
Maximum Peak Reflow Temperature (C)	260

Table 5: SSM3302 Product Characteristics

Die/Fab

Die Id	TMX307 F
Die Size (mm)	3.23 x 3.23
Wafer Fabrication Site	E_TSMC1008
Wafer Fabrication Process	0.35µm DMOS
Passivation Layer	undoped-oxide/SiN
Bond Pad Metal Composition	AlCu
Polyimide	Yes
Maximum Power Dissipation (W)	3.0

Package/Assembly

Package	40-LFCSP
Body Size (mm)	6X6X0.75
Assembly Location	ASE (AEK)
Molding Compound	Sumitomo G700
Wire Type	4N Gold
Wire Diameter (mils)	1.3
Die Attach	Hitachi EN 4900GC conductive
Lead Frame Material	Copper
Lead Finish	100Sn
Moisture Sensitivity Level	3
Maximum Peak Reflow Temperature (C)	260

Table 6: ADF4157 Product Characteristics

Die/Fab

Die Id	ADF4156
Die Size (mm)	1.39 x 1.47
Wafer Fabrication Site	TSMC 3C 8”
Wafer Fabrication Process	0.35µm BiCMOS DPTM 5.0/3.3V
Approximate Transistor Count	32 thousand
Passivation Layer	undoped-oxide/SiN
Bond Pad Metal Composition	AlCu
Polyimide	No
Maximum Power Dissipation (W)	0.050

Package/Assembly

Package	20-LFCSP
Body Size (mm)	4.00 x 4.00 x 0.75
Operating Temperature Range	-40°C to +85°C
Assembly Location	ASE-AEK
Molding Compound	Sumitomo G700
Wire Type	Gold MKE-R
Wire Diameter (mils)	0.80
Die Attach	Ablestik 8290
Lead Frame Material	Copper
Lead Finish	Matte Sn
Moisture Sensitivity Level	3
Maximum Peak Reflow Temperature (°C)	260

Table 7: HMC637ALP5E Product Characteristics

Die/Fab

Die Id	E5901
Die Size (mm)	2.78 x 2.98
Wafer Fabrication Site	E_WINS0106
Wafer Fabrication Process	0.15µm GaAs pHEMT
Passivation Layer	undoped-oxide/SiN
Bond Pad Metal Composition	Au

Package/Assembly

Package	32-LFCSP
Body Size (mm)	5.00 x 5.00 x 0.75
Assembly Location	ASE (AEK)
Molding Compound	Sumitomo G700LYT
Wire Type	MKE R 2N Gold
Wire Diameter (mils)	0.80
Die Attach	Hitachi EN-4900GC
Lead Frame Material	Copper
Lead Finish	NiPdAu
Moisture Sensitivity Level	3
Maximum Peak Reflow Temperature (°C)	260

Table 8: ADF7250 Product Characteristics

Die/Fab

Die Id	TMJC62B
Die Size (mm)	3.30 x 2.72
Wafer Fabrication Site	TSMC 14
Wafer Fabrication Process	90nm CMOS
Passivation Layer	undoped-oxide/SiN
Bond Pad Metal Composition	AlCu

Package/Assembly

Package	40-LFCSP
Body Size (mm)	6.00 x 6.00 x 0.75
Assembly Location	ASE (AEK)
Molding Compound	Sumitomo G700LYT
Wire Type	MKE R 2N Gold
Wire Diameter (mils)	0.80
Die Attach	Hitachi EN-4900GC
Lead Frame Material	Copper
Lead Finish	Matte Sn
Moisture Sensitivity Level	3
Maximum Peak Reflow Temperature (°C)	260

Table 9: ADF5902 Product Characteristics

Die/Fab

Die Id	TMFW14 / B-T1
Die Size (mm)	1.97 x 2.63
Wafer Fabrication Site	TSMC Fab 4
Wafer Fabrication Process	0.18µm BiCMOS
Approximate Transistor Count	150,000
Passivation Layer	undoped-oxide/SiN
Bond Pad Metal Composition	AlCu

Package/Assembly

Package	32-LFCSP
Body Size (mm)	5.00 x 5.00 x 0.75
Operating Temperature Range	-40°C < TA < 105°C
Assembly Location	ASE (AEK)
Molding Compound	Sumitomo G700
Die Attach Material	Hitachi EN-4900GC
Wire Type	MKE R 2N Gold
Wire Diameter (mills)	1.00
Lead Frame Material	Copper
Lead Finish	Matte Sn
Moisture Sensitivity Level	3
Maximum Peak Reflow Temperature (°C)	260

Table 10: ADAU1979W Product Characteristics

Die/Fab

Die Id	TMDS48 / B0002B
Die Size (mm)	3.46 x 2.63
Wafer Fabrication Site	TSMC Fab-8B
Wafer Fabrication Process	0.18µm CMOS
Approximate Transistor Count	368,000
Passivation Layer	doped-oxide/OxyNitride
Bond Pad Metal Composition	AlCu
Polyimide	Yes
Maximum Power Dissipation (W)	0.060

Package/Assembly

Package	40-LFCSP
Body Size (mm)	6.00 x 6.00 x 0.75
Operating Temperature Range	-40°C to +105°C
Assembly Location	ASE-AEK
Molding Compound	Sumitomo G700
Wire Type	MKE R 2N Gold
Wire Diameter (mils)	0.80
Die Attach	Hitachi EN-4900GC
Lead Frame Material	Copper Alloy 194
Lead Finish	Matte Sn
Moisture Sensitivity Level	3
Maximum Peak Reflow Temperature (°C)	260

Table 11: ADV7380 Product Characteristics

Die/Fab

Die Id	TMJW69 / A
Die Size (mm)	4.82 x 4.00
Wafer Fabrication Site	TSMC Fab-6
Wafer Fabrication Process	0.16µm CMOS
Approximate Transistor Count	6.00 million
Passivation Layer	undoped-oxide/SiN
Bond Pad Metal Composition	AlCu
Polyimide	Yes
Maximum Power Dissipation (W)	0.800

Package/Assembly

Package	48-LFCSP
Body Size (mm)	7.00 x 7.00 x 0.75
Operating Temperature Range	-40°C to +105°C
Assembly Location	ASE-AEK
Molding Compound	Sumitomo G700LYT
Wire Type	MKE R 2N Gold
Wire Diameter (mils)	0.80
Die Attach	Hitachi EN-4900GC
Lead Frame Material	Copper
Lead Finish	Matte Sn
Moisture Sensitivity Level	3
Maximum Peak Reflow Temperature (°C)	260

Description / Results of Tests Performed

Table 12 provides a description of the qualification tests conducted and the associated test results for products manufactured on the same technologies as described in Table 1 and 2. All devices were electrically tested before and after each stress. Any device that did not meet all electrical data sheet limits following stressing would be considered a valid (stress-attributable) failure unless there was conclusive evidence to indicate otherwise.

Table 12: LFCSP at ASE (AEK) Package Qualification Test Results

Test Name	Specification	Conditions	Device	Lot #	Sample Size	Qty. Failures
Autoclave (AC) [1]	JESD22-A102	121C 100%RH 33.3 psia, 96 Hours	ADF4157	Q8667.PC4	77	0
				Q8667.PC5	77	0
				Q8667.PC6	77	0
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	AD7689	Q13940.HS1	77	0
			AD9512	Q12863.HS1	77	0
			ADAU1979W	Q12963.HS1	77	0
			ADF41513	Q12163.18	45	0
			ADF4157	Q8667.HS2	32	0
			ADV7380	Q13235.HS1	32	0
Solder Heat Resistance (SHR) [1]	J-STD-020	MSL-3	AD7689	Q13940.SH1	11	0
				Q13940.SH2	11	0
				Q13940.SH3	11	0
			AD9512	Q12863.SH1	11	0
				Q12863.SH2	11	0
				Q12863.SH3	11	0
			AD9695	Q11437.SH1	11	0
				Q11437.SH2	11	0
				Q11437.SH3	11	0
			ADF41513	Q12163.10	11	0
				Q12163.17	11	0
				Q12163.6	11	0
			ADF4157	Q8667.SH4	11	0
				Q8667.SH5	11	0
				Q8667.SH6	11	0
			SSM3302	Q12461.SH1	11	0
				Q12461.SH2	11	0
				Q12461.SH3	11	0
Temperature Cycling (TC) [1]	JESD22-A104	-65°C/+150°C, 1,000 Cycles	AD9512	Q12863.TC1	77	0
				Q12863.TC2	77	0
				Q12863.TC3	77	0
			HMC637ALP5E	Q16109.TC1	77	0
				Q16109.TC2	77	0
				Q16109.TC3	77	0
			SSM3302	Q12461.TC1	77	0
				Q12461.TC2	77	0
				Q12461.TC3	77	0
			AD7689	Q13940.TC1	77	0
				Q13940.TC2	77	0

Test Name	Specification	Conditions	Device	Lot #	Sample Size	Qty. Failures
		-65°C/+150°C, 500 Cycles		Q13940.TC3	77	0
			ADF41513	Q12163.12	77	0
				Q12163.5	77	0
				Q12163.7	77	0
			ADF4157	Q8667.TC4	77	0
				Q8667.TC5	77	0
				Q8667.TC6	77	0
Unbiased HAST (UHST) [1]	JESD22-A118	130C 85%RH 33.3 psia, 96 Hours	AD7689	Q13940.UH1	77	0
				Q13940.UH2	77	0
				Q13940.UH3	77	0
			ADF41513	Q12163.13	77	0
				Q12163.15	77	0
				Q12163.9	77	0
			ADF5902	Q13626.UH2	77	0
				Q13626.UH3	77	0
				Q13626.UH4	77	0
			ADF7250	Q13825.11	77	0
				Q13825.6	77	0
				Q13825.9	77	0
			SSM3302	Q12461.UH1	77	0
				Q12461.UH2	77	0
				Q12461.UH3	77	0

[1] These samples were subjected to preconditioning (per J-STD-020 Level 3) prior to the start of the stress test. Level 3 preconditioning consists of the following: Bake: 24 hrs @ 125°C, Unbiased Soak: 192 hrs @ 30°C, 60%RH, Reflow: 3 passes through an oven with a peak temperature of 260°C.

Samples of the many devices manufactured with these package and process technologies are continuously undergoing reliability evaluation as part of the ADI Reliability Monitor Program. Additional qualification data is available on Analog Devices' web site.

ESD Test Results

The results of Field-Induced Charged Device Model (FICDM) ESD testing is summarized in Table 13. All parts were electrically tested at room and hot temperatures pre- and post-stress. ADI measures ESD results using stringent test procedures based on the specifications listed. Any comparison with another supplier's results should ensure that the same ESD test procedures have been used. For further details, please see the EOS/ESD chapter of the ADI Reliability Handbook (available via the 'Quality and Reliability' link on Analog Devices' web site)

Table 13: FICDM ESD Results

Device	Package	ESD Test Spec	RC Network	Highest Pass Level	First Fail Level	Class
ADAU1979W	40-LFCSP	JS-002	1Ω, Cpkg	±1250V	NA	C3
ADF41513	24-LFCSP	JS-002	1Ω, Cpkg	±1250V	NA	C3
ADF7250	40-LFCSP	JS-002	1Ω, Cpkg	±500V	±1000V	C2a
AD9695	64-LFCSP	JS-002	1Ω, Cpkg	±500V	±750V	III
ADF4157	20-LFCSP	JS-002	1Ω, Cpkg	±1500V	NA	IV
AD9512	48-LFCSP	JS-002	1Ω, Cpkg	±1250V	NA	C3
AD7689	20-LFCSP	JS-002	1Ω, Cpkg	±1250V	NA	C3
ADV7380	48-LFCSP	JS-002	1Ω, Cpkg	±1250V	NA	C3

Approvals

Reliability Engineer: Pernell Mosuela

Additional Information

Data sheets and other additional information are available on Analog Devices' web site