



# AH102A QUALIFICATION REPORT

## I. INTRODUCTION

The AH102A is a medium power gain block that offers excellent dynamic range in a low-cost surface mount package. The combination of a single supply voltage and an unconditionally stable, internally matched device makes it ideal for both narrow and broadband applications.

## II. SCOPE

This report summarizes the reliability qualification of the AH102A amplifier. The reliability data are obtained through the performance of specified accelerated stress tests described in this document. The AH102A is qualified by similarity to the AH102 and AH101. The active elements of all three devices are identical. The differences between the AH102 and AH102A include an increase in thickness of the silicon nitride passivation layer and the addition of a passive resistor. As a result, the AH102A is qualified by similarity to the AH101 and AH102 for the stresses of Autoclave, High Temperature Operational Life and Highly Accelerated Stress Test. The thicker silicon nitride process is stressed through Temperature Cycle.

## III. APPLICABLE DOCUMENTS

All the test procedures and test methods are consistent with industry standards. The standards referenced in this document are JEDEC standard 22.

## IV. STRESS AND TEST METHODOLOGY

For this qualification, components used in unbiased stresses, Temperature Cycle and Autoclave, were tested as loose parts. Components used in biased stresses, HTOL and HAST, were mounted on qualification boards. Prior to each electrical test, a control unit was measured to ensure proper test system calibration. The testing was performed on an in-house production test station.

The following table defines the test conditions and pass/fail criteria

Measurement	Bias Conditions	Frequency and Power	Pass/Fail
Ids	9V, Maximum 230 mA	N/A	Fail on a >10% change in bias current.
Gain	9V, Maximum 230 mA	800 MHz; Pout ~ 8 dB/tone	Fail on a > 1 dB change in gain.
OIP3	9V, Maximum 230 mA	800 MHz; Pout ~ 8 dB/tone; 10 MHz tone spacing.	Fail on a >10% change in OIP3.



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## V. QUALIFICATION TEST PLAN/RESULTS

Stress or Test	Procedures/Conditions	Device Hours/ Cycles	Sample Size	Failed Units	Date	Reference Document	Part Tested
Preconditioning Level 3	Temp. & Humidity Test 192 hrs. @ +30°C/ 60%RH High Temp. Storage Life 24 hrs @+125°C Infrared Solder Reflow (IR) test 3 cycles w/flux immersion. Max Temp = 235 °C	N/A	332 51	0 0	2001 2004	JESD22-A113 JESD22-A101 JESD22-B101 JESD22-103 JESD22-A112.4	AH101 AH102A
Temperature Cycle	Test Condition C Temp. -65°C (+0°/-10°C) to +150°C (+10°/-0°C) Dwell time = 10 ≥ 15	1000 cycles 500 cycles	154 51	0 0	2001 2004	JESD22-A104-B	AH101 AH102A
Unbiased Autoclave	Test Condition C Temp. 121°C (+/-1°C) Pressure = 15 +/-1psig Relative Humidity = 100%	96 (-1, +5) hours	100	0	2001	JESD22-A102-C	AH101
HAST	Temp. 130°C (+/- 2°C) Relative Humidity 85% (+/- 5%) Vapor Pressure 33.3 psia	96 hours	78	0	2001	JESD22-A110-B	AH101
HTOL	Temp 125°C Vds = 9 V, Max current = 230 mA	1000 hours 1000 hours	78 160 80	0 0 0	2001 2002 2002	JESD22-A108-B.	AH101 AH101 AH102

## VI. DISCUSSION OF RESULTS

### 1. Pre-Conditioning

332 AH101's and 45 AH102A's have completed Level 3 Pre-conditioning with no failures or anomalies.

### 2. Temperature Cycle

154 AH101's have completed 1000 temperature cycles and 51 AH102As have completed 500 temperature cycles with no failures or anomalies.

### 3. Unbiased Autoclave

100 AH101's have completed 96 hours of autoclave with no failures or anomalies.

### 4. HAST

78 AH101's have completed 96 hours of HAST with no failures or anomalies.

### 5. HTOL

238 AH101's and 80 AH102's have completed 1000 Hours of HTOL with no failures or anomalies.

## VII. CONCLUSIONS

The AH102A amplifier in the SOT-89 package are reliable products that have passed industry standard qualification testing.



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