Qualification Test Report on Si MMIC (use UHS0 Process)

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1. Introduction

This report presents UHS0 (fT=25GHz) Process Qualification Test result.
The Process Qualification Test was performed by UPC8182B(B).

2. Qualification Test items and failure criteria

2. 1 Thermal Environmental Test (Table. 1,2)
2. 2 Mechanical Environmental Test (Table. 1,2)
2. 3 High Temperature DC Bias Test (Table. 1,2)

3. Result

3.1 Thermal and Mechanical Environmental Test

As shown Table 3,no failure was observed with respect to thermal environmental test and mechanical environmental test.

3.2 High Temperature DC Bias Test

High temperature DC bias test at Ta=200℃ was performed for UPC8182B(B) using 100 samples. The test was performed for 3000 hours. The test results are shown Table 3.No failure has been observed for 3000 hours. ⊿Icc change is shown in Fig.1.

Table 1 Test Item and Test Condition

Test Items	Test Condition (MIL-STD 883 Method)	Sample Size
Thermal Environmental Test a)Solderability b)Temperature Cycling c)Thermal Shock d)Moisture Resistance e)Hermetic Seal	 2003 1010:Cond.D -65℃ ～ +200℃,100cycles 1011:Cond.A 0℃ ～ +100℃,15cycles 1004:Omit initial conditioning 1071 Fine Leak (Cond.A1) ～1×10^{-9} Pa m^3/s (～1×10^{-8} atm cc/sec) Gross Leak (Cond.C) no stream bubble	8
Mechanical Environmental Test a)Mechanical Shock b)Vibration, Variable Frequency c)Constant Acceleration d)Hermetic Seal	 2002:1.47×10^4 m/s^2(1500G),0.5ms,3axis,5times 2007:100 ～ 2000Hz,196m/s^2(20G),3axis, 4min,4times 2001:1.96×10^5 m/s^2(20000G),3axis,1min.,1time 1071 Fine Leak (Cond.A1) ～1×10^{-9} Pa m^3/s (～1×10^{-8} atm cc/sec) Gross Leak (Cond.C) no stream bubble	8
High Temperature DC Bias Test	1005:Ta=200℃,Vcc=3V,t=3000Hrs	100

Table 2 Parameters and Criteria

Parameters	Symbols	Test Condition	Limits		Delta Criteria
			Min	Max	
Circuit Current	Icc	Vcc=3V (no signal)	—	38mA	±15%
Power Gain	Gp1	Vcc=3V,f=0.9GHz	19dB	25dB	—
	Gp2	Vcc=3V,f=1.9GHz	18dB	24dB	—
	Gp3	Vcc=3V,f=2.4GHz	18dB	24dB	—
Output Power	Pout	Vcc=3V,f=2.4GHz Pin=-5dBm	7dBm	—	—
Noise Figure	NF	Vcc=3V,f=2.4GHZ	—	6.5dB	—

Table 3 Qualification Test Results

Test Items	Results (failure/sample)	Reference
Thermal Environmental Test	0/8	—
Mechanical Environmental Test	0/8	—
High Temp. DC Bias Test	0/100 (at 3000Hrs)	—

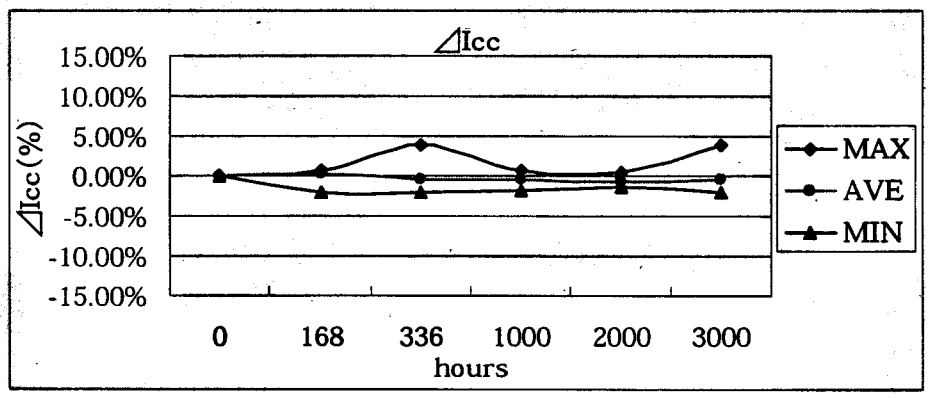

Fig.1 Icc changes on high temperature DC Bias Test.