

## TECHNICAL NOTE

### CAI-2002-0028-D

### Design Changes made from GM401 to GM405

#### SUMMARY

This document is intended to identify the changes made from the GM401 to GM405. The document will be used in identifying the impact on Regulatory Approval and will identify the Independent Testing carried out at each stage.

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Status	Draft A1		

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**CHANGE HISTORY**

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## **1. INTRODUCTION**

### **Purpose**

The purpose of this document is to identify the design changes that have been made between the design of the GM401 (dual band 900/1900 GSM/GPRS module) and the GM405 (low-height dual band 900/1900 GSM/GPRS module).

The intention is to be able to examine the testing required on the GM405 in order to demonstrate compliance against the R&TTE Directive, FCC and UL requirements.

### **1.1 Definitions and Abbreviations**

For the purpose of this document, the following definitions and abbreviations apply:

BEAB     British Electrotechnical Approvals Board

NCB      Notified Certification Body

### **1.2 References**

[1]       Integrator Guidance on FCC requirements

[2]       GM405 Design Validation Specification

## 2. GM401 INDEPENDENT TEST HOUSE REPORTS

GM401 Independent Test House Reports Safety (CB scheme)				
Discipline	Test House	Specification	Report Number	Certificate Number
Safety (CB Scheme)	BABT	IEC 60950, 3 <sup>rd</sup> Edition (1999) EN 60950:2000 (BS 60950:2000) (European National Deviations) AS/NZS 60950: 2000 (Australian/New Zealand National Deviations)	NCB (BEAB) ref. ITE6394. BABT report ref. 609148/01S Date of issue: 17 <sup>th</sup> January 2002	GB4939Z. Date of issue: 30 <sup>th</sup> January 2002
Safety	Underwriters Laboratories Inc.	UL 60950 CSA C22.2 No. 60950	Underwriters Laboratories report ref. E222426. Date of issue: 25 <sup>th</sup> February 2002	Certificate 090502 – E222426. Date of issue: 9 <sup>th</sup> May 2002

<b>GM401 Independent Test House Reports (RF)</b>				
Discipline	Test House	Specification	Report Number	Certificate Number
RF	7 LAYERS	3GPP TS51.010-1 12.1.1 (Conducted spurious emissions – MS allocated a channel) 12.1.2 (Conducted spurious emissions – MS in idle mode) 12.2.1 (Radiated spurious emissions – MS allocated a channel) 12.2.2 (Radiated spurious emissions – MS in idle mode) 13.1 (all temp and voltage conditions) 13.1 (vibration) 13.2 (all temp and voltage conditions) 13.3-1 (all temp and voltage conditions) 13.4 (all temp and voltage conditions) 14.1.1.1, 14.1.1.2 14.1.2.2, 14.2.2, 14.2.4, 14.4.2, 14.4.3, 14.4.5 14.2.1, 14.2.3 14.3 (all temp and voltage conditions) 14.4.1, 14.4.4, 14.4.7 14.5.1 (all temp and voltage conditions) 14.6.1 (all temp and voltage conditions) 14.7.1, 14.8.1  All tests have been run in both 900/1900 bands, except for the following test cases that have been tested on 900 only: 14.1.2.2, 14.2.2, 14.2.4, 14.4.2, 14.4.3, 14.4.5	Report ref: 4-R0016a-2002. Date of issue: 21 <sup>st</sup> February 2002	NC/11616. Date of issue: 15 <sup>th</sup> May 2002

GM401 Independent Test House Reports (RF)				
Discipline	Test House	Specification	Report Number	Certificate Number
RF	BABT	3GPP TS51.010-1 (V 4.6.0) Test case 14.1.2.1 only		Project ref. WG609206. Date of issue: 28 <sup>th</sup> January 2002
RF	BABT	Specification 47 CVR 2 & 47 CFR 24 (FCC parts 2 and 24)  47 CFR2.1046, 24.232 Power Output 47 CFR2.1047 (d) Modulation Characteristics 47 CFR2.1049 (h), 24.238 (b) Occupied Bandwidth 47 CFR 24.238 (b) Band Edge Measurements 47 CFR2.1055, 24.235 Frequency Stability (Temp. variations) 47 CFR2.1055 (d) (1) Frequency Stability (Voltage variations) 47 CFR2.1051, 24.238(a) Conducted Emissions  These tests were carried out in GSM1900 band only (GSM900 is not applicable to this test specification).	BABT report no: RO608941. Date of issue: 21 <sup>st</sup> February 2002	

GM401 Independent Test House Reports (EMC)				
Discipline	Test House	Specification	Report Number	Certificate Number
EMC	BABT	EN 301 489-7: September 2000 Radiated Emissions. Conducted Emissions RF Immunity Fast Transients, common mode Radio Frequency, common mode  The GM401 was tested in GSM900 only since the GSM 1900 band is not applicable to this test specification.  Conducted Emissions, Fast Transients and Radio Frequency Testing were carried out with GM401 on test harness	BABT Report No: OR608941. Date of issue: 26 <sup>th</sup> February 2002.	BABT Certificate No: OR608941. Date of issue: 12 <sup>th</sup> March 2002
EMC	BABT	47 CVR 2 (FCC parts 2 and 15) 47 CFR2.1053 Radiated Emissions 15 Subpart B Radiated Emissions  These tests were carried in GSM1900 band only (GSM900 is not applicable to this test specification)	BABT report no: RO608941. Date of issue: 21 <sup>st</sup> February 2002	



### 3. GM401 TO GM405 DESIGN CHANGES

As shown in the following table, there are only 4 changes from the GM401 to the GM405:

- Baseband screening can:  
In the GM405 a low-height baseband can has been used. This involved exposing areas around high components.
- 50 way connector:  
The board to board connector has been replaced with a low profile variant of the same connector.
- Label  
**The difference between the labels will be basically the FCC Identifier (FCC ID). The FCC ID for the GM401 is PK5GM401 while in the GM405 it is expected to be PK5GM405.**
- Reference manual and safety guide.  
The reference manual and safety guide need to be updated to include GM405. Besides, in order to comply with the FCC requirements, some information must be added to these documents. See ref. [1] for more details.
- Number of legs  
The GM405 has three legs instead of four (a leg has been cut off for the production line).

<b>Changes from GM401 to GM405 (UNASM00168-BrF and UNASM00236-BrD)</b> <b>GSM900/1900 BAND</b>						
Changes made from:	Improvements / Modifications	Part Number		Comments / Recommendations	Date	Ubinetics Testing Recommendations
		GM401	GM405			
GM401 to GM405	Baseband screening can	UNMEC00163rC	UNMEC00284rA	RF retesting: Radiated Spurious Emissions only		Radiated spurious <b>12.2.1</b> (allocated a channel) and <b>12.2.2</b> (idle) – <b>900 / 1900 band (up to 10<sup>th</sup> Harmonic (FCC requirement))</b>  Radiated emissions <b>FCC Part 15 – 1900 band (up to 10<sup>th</sup> Harmonic (FCC requirement))</b>  <b>Testing Completed</b>
GM401 to GM405	50 way connector	UNCON00201	UNCON00274			
GM401 to GM405	Label	UNLBL00103-Dr1	UNLBL00103-Dr2			Update TCF
GM401 to GM405	Reference Manual & Safety Guide					Update TCF

#### 4. GM405 INDEPENDENT TEST HOUSE REPORTS

The table below details the tests that have been performed on the new model GM405 to ensure the new product GM405 still complies with the essential requirements of the R&TTE directive and FCC rules.

GM405 Independent Test House Reports (RF)				
Discipline	Test House	Specification	Report Number	Certificate Number
RF		Radiated Emissions - GSM900 band TS 51.010-1 Test cases 12.2.1 (in call) & 12.2.2 (idle)	BABT / TUV Product Service Test Report WG610074B September 2002-10- 03 GSM Phase 2 Limited Conformance Testing of a UbiNetics GM405 GSM 900 and PCS 1900 Dual Band Module	

GM405 Independent Test House Reports (EMC)				
Discipline	Test House	Specification	Report Number	Certificate Number

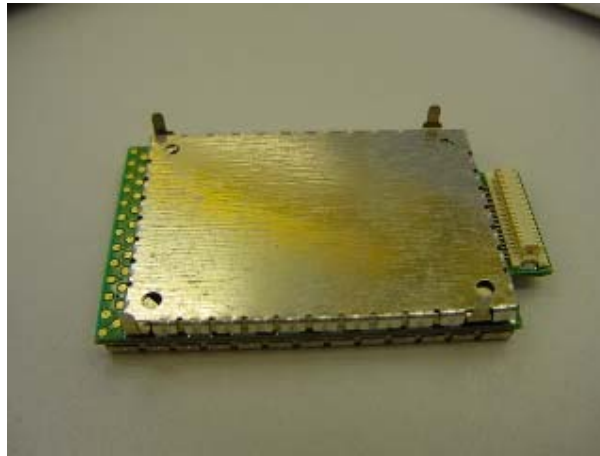
EMC		FCC Part 15 – Radiated emissions	<b>BABT / TUV Product Service Test Report WG610074B September 2002-10-03 GSM Phase 2 Limited Conformance Testing of a UbiNetics GM405 GSM 900 and PCS 1900 Dual Band Module</b>	
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<b>GM405 Independent Test House Reports (Safety)</b>				
Discipline	Test House	Specification	Report Number	Certificate Number
UL Safety		Standard of Information Technology Equipment CSA / UL60950 Third Edition dated December 1 <sup>st</sup> 2000		UL Approval File No. E222426 Issued 04/09/02 Approval obtained

## ANNEX 1. GM401 AND GM405 PHOTOGRAPHS



**GM401 50 way connector**



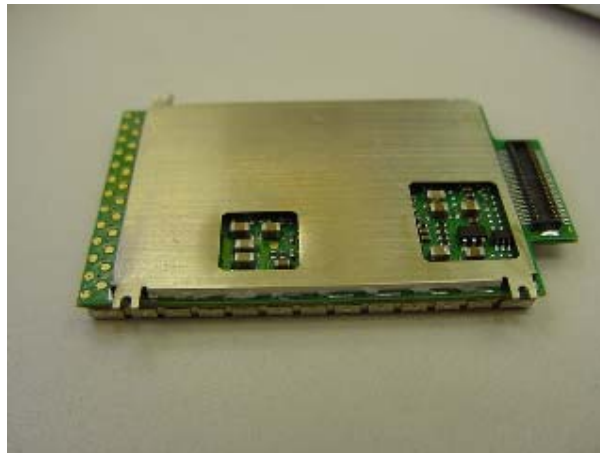
**GM401 baseband can**



**GM401**



**GM405 50 way connector**



**GM405 baseband can**



**GM405 low height**