SPECIFICATION

Part No. : **FXP07.09.0100A**

Product Name : Flexible PCB Penta Band GSM Antenna,
100mm 1.13cable, right angle MMCX connector

Feature : Very low profile penta-band GSM
Adhesive tape for easy mounting
RoHS compliant

Version	Date	Page	Revision Description	Prepared	Approved
A	Jun 16th 2008	All	New product	TW Product Centre	Zita Lin
B	Jul 1st 2008	All	Test result update	TW Product Centre	Zita Lin

Taoglas Limited, Unit 7 Peare Campus, Moyne Business Park, Enniscorthy, Co. Wexford, Ireland
info@taoglas.com +353 53 9169500 www.taoglas.com

I. Introduction

FXP.07 is a general version of stick-on flexible PCB GSM penta-band antenna. It is designed with a cellphone size ground plane so works the best with devices of similar size or bigger. This low profile and conformable antenna can be easily fitted into any housing for plug-and-play application.

II. Specification

Communication System	Penta-band Cellular				
	AMPS	GSM	DCS	PCS	UMTS
Frequency (MHz)	824 ~ 896	880~960	1710~1880	1850~1990	1710~2170
Efficiency (ground plane)	91%	83%	39%	21%	18%
Efficiency (free space)	13%	14%	49%	40%	29%
VSWR	1.06~7.3				
Impedance	50 Ohm				
Radiation Pattern	Omni-directional				
Polarization	Linear				
FPCB	41.0 x 24.0 mm				
Connector	MMCX(M)RA				
Cable	Ø1.13				
Cable Length	100 mm				
Adhesive Tape	3M 467				
Operation Temperature	-40℃ ~ +85℃				
Storage Temperature	-40℃ ~ +85℃				

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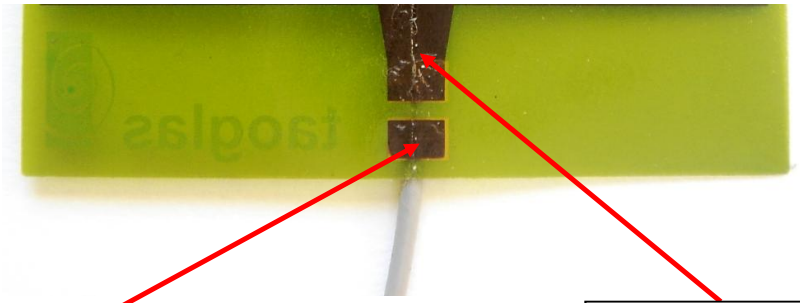
Mounting instructions and ground-plane connection

Peel back 3m paper. On the underside of the antenna is automotive grade 3m adhesive (glue) for sticking the FXP.07 directly to plastic (e.g. housing). The antenna can be curved around housing but should not be folded sharply



Ground connection - this small square pad at the bottom of the FXP.07 can be seen when paper is removed. This should be connected to extra ground or metal to increase efficiency (e.g. allow pad to touch the side of a PCB like the picture above

This is the antenna trace or signal feed and should be allowed to be free from the PCB and allowed to exist in free area on non metal area (plastic housing)_

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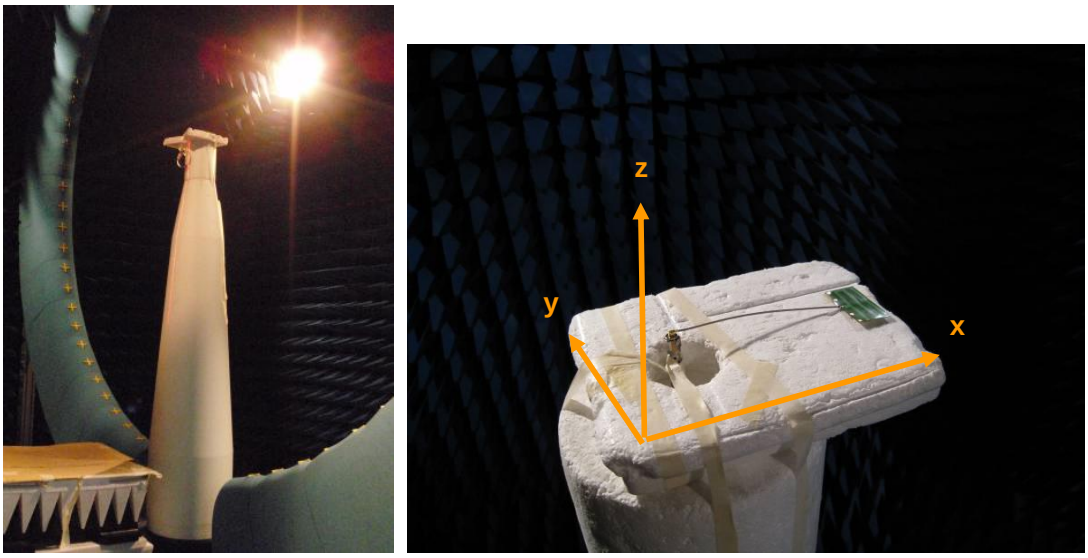
III. Electrical Property

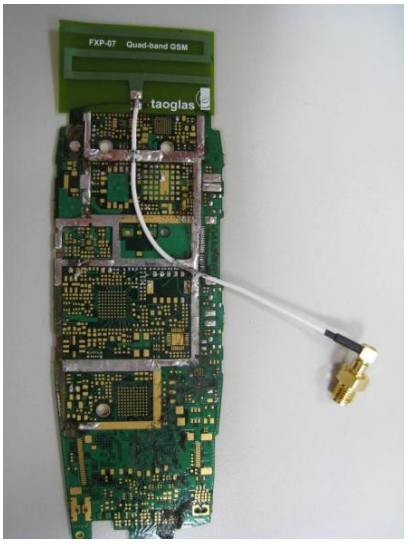
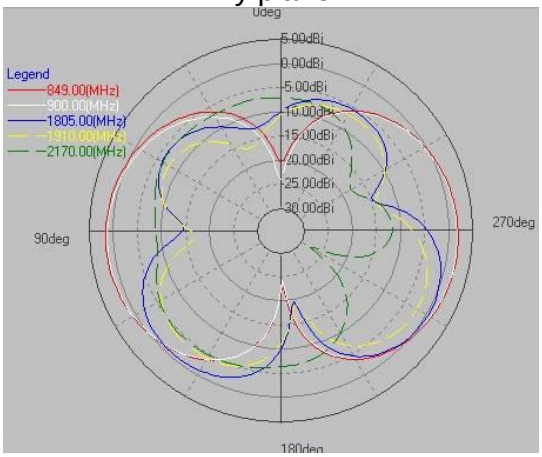
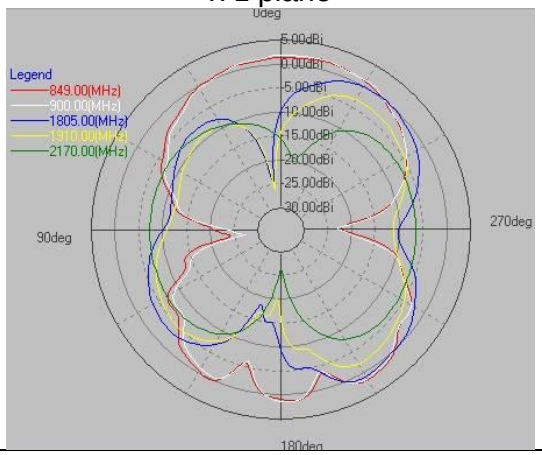
Test Setup

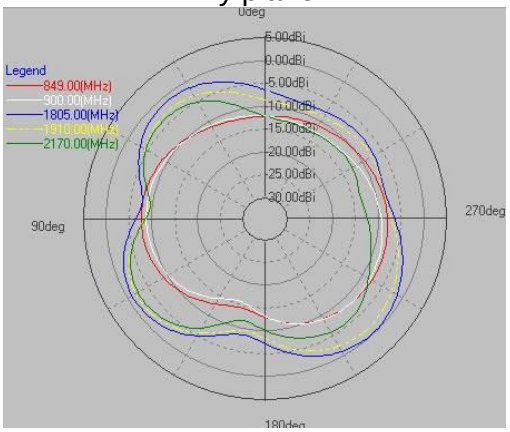
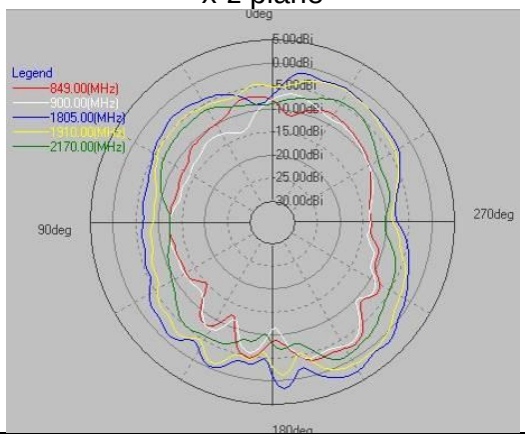
FXP.07 was designed with a cell-phone size ground plane (110 x 45 mm). Tests were setup to demonstrate its RF properties with this ground plane, in free space and adhered to a plastic box to simulate a typical application device. Satimo SG64 3D-chamber is used for radiation and efficiency test with 5% tolerance.



Satimo SG64 3D-chamber and antenna setup reference.

Radiation Pattern

x-y plane	x-z plane
FXP.07 with original ground plane	
 This ground plane is what FXP.07 is originally designed for. So the test result can be treated as a bench mark for this antenna.	x-y plane  x-z plane 

FXP.07 in free space	
 Miniature antenna needs a ground plane for radiation. FXP.07 tested with no ground plane present the extreme cases of the antenna performance.	x-y plane  x-z plane 

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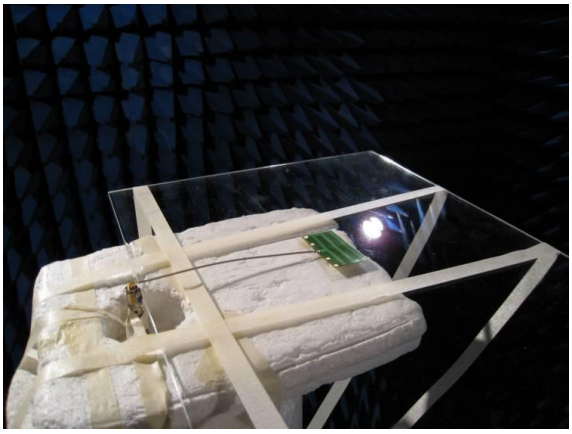
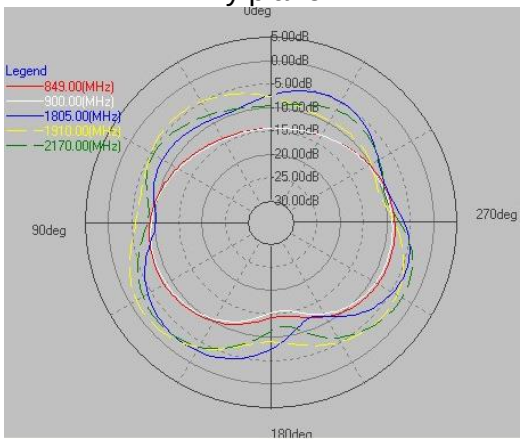
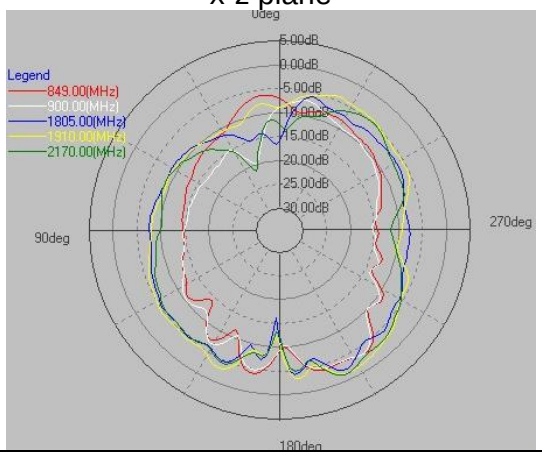
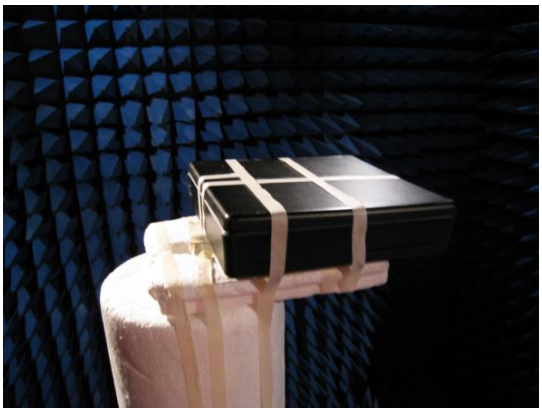
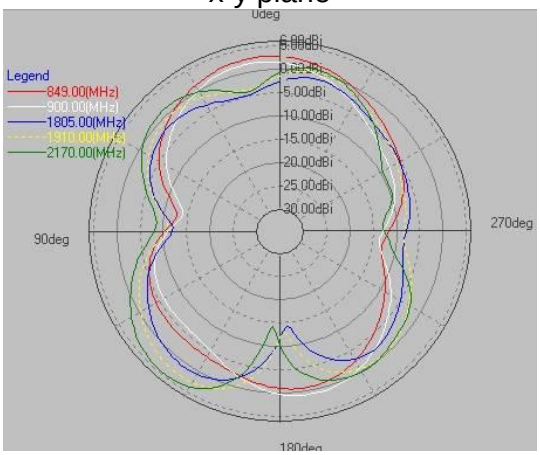
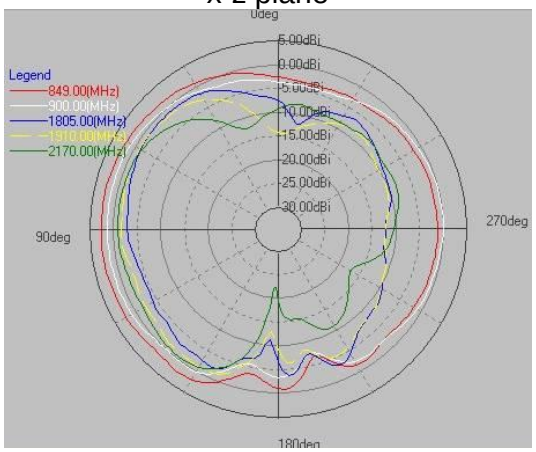
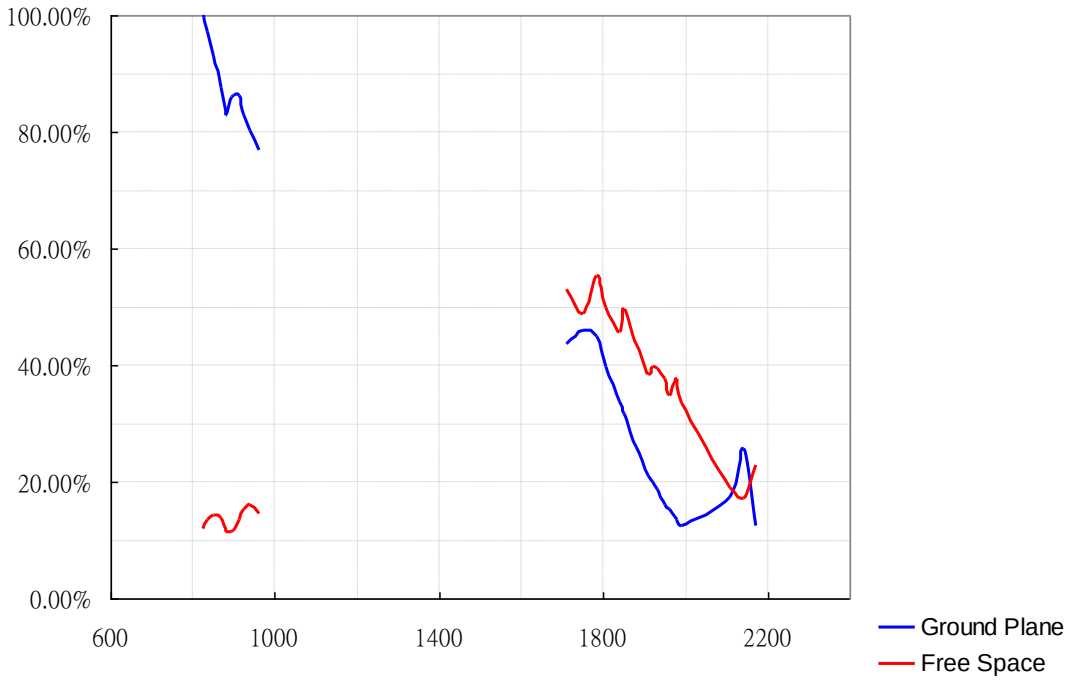
FXP.07 adhere on plastic	
 Majority of the GSM devices is made with plastic housing. This test demonstrate the effects of FXP.07 adhere on a piece of plastic. Compare the result of FXP.07 in free space with and without adhering on a piece of plastic, the plastic mainly degrade the performance of GSM1850MHz band.	x-y plane  x-z plane 

FXP.07 with the ground plane adhere on plastic box	
  More often, FXP.07 is attached to a piece of ground place and packed in a plastic box. This test try to simulate a typical situation when FXP.07 is attached to a piece of PCB, with other piece in a device.	x-y plane  x-z plane 

Efficiency



Miniature antennas couple to the ground plane for radiation so the efficiency of the antenna without a ground plane is largely degrades in lower frequencies. These tests demonstrate the best performance (with the designed ground) and the worst performance (with no ground) possible of FXP.07.