Atacama
Large
Millimeter /
submillimeter
Array

< Front End Repeatability Design Verification >

< FEND-40.00.00.00-XXXX-A-REP >

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Change Record

Version	Date	Affected Section(s)	Change Request #	Reason/Initiation/Remarks
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			–	

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1 Introduction

1.1 Purpose

This document provides measurement procedures and results for receiver repeatability tests to confirm the front-end's amplitude and phase meet the requirements in [AD 01].

1.2 Applicable documents

Documents listed in Table 1 are part of this document to the extent specified herein. If not explicitly stated otherwise, the latest issue of the document is valid.

Table 1: Applicable Document List

Reference	Document Title	ALMA Doc. Number
[AD 01]	Front-End Sub-System for the 12 m Antenna Array – Technical Specifications	FEND-40.00.00.00-001-A-SPE
[AD 02]	Front End Acceptance Test Procedures	FEND-40.00.00.00-079-A-PRO

1.3 Reference documents

Table 2 below is the reference document list containing additional information.

Table 2: Reference Document List

Reference	Document Title	ALMA Doc. Number

1.4 Acronyms

A list of the acronyms used in this document is given in Table 3.

Table 3: Acronyms

Acronym	Meaning
A	Test verification method is by Analysis (Compliance Table)

Table 3: Acronyms

Acronym	Meaning
ALMA	Atacama Large Millimeter Array
C	Compliant with specifications (Compliance Table)
CDR	Critical Design Review
D	Test verification method is by review of Design (Compliance Table)
FE	Front End
FEIC	Front End Integration Center
I	Test verification method is by Inspection
IR	Image Rejection
ICD	Interface Control Document
IF	Intermediate Frequency
IPT	Integrated Product Team
LO	Local Oscillator
NC	Not Compliant with specifications (Compliance Table)
NRAO	National Radio Astronomy Observatory
NT	No Testing Planned for PAI (Compliance Table)
PAI	Preliminary Acceptance In-house
PAS	Provisional Acceptance On-Site (at FEIC)
PC	Partially Compliant with specifications (Compliance Table)
PDR	Preliminary Design Review
R	Test verification method is by Review of design
RF	Radio Frequency
T	Test verification method is by Testing (Compliance Table)
WCA	Warm Cartridge Assembly

2 Test Procedures

Filler.

Figure 1: Measured Amplitude for Band 7

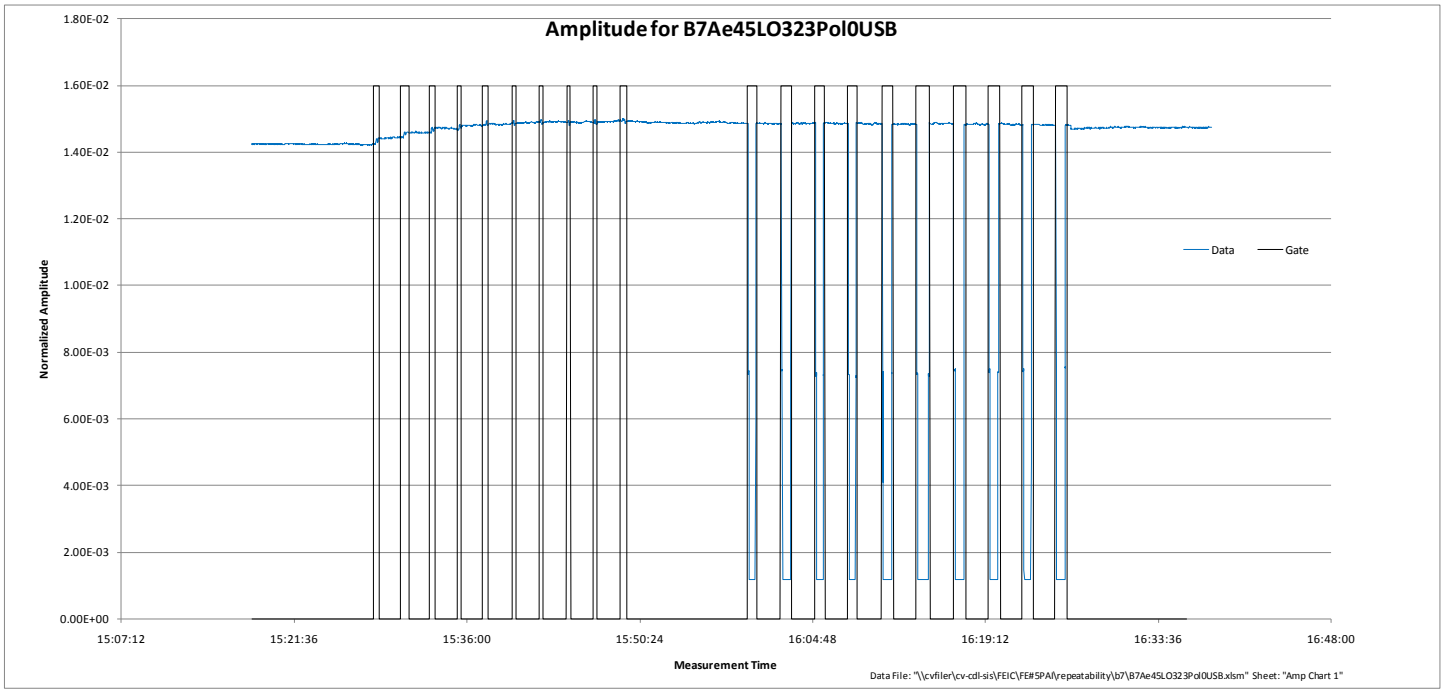

Figure 2: Band 6 Phase

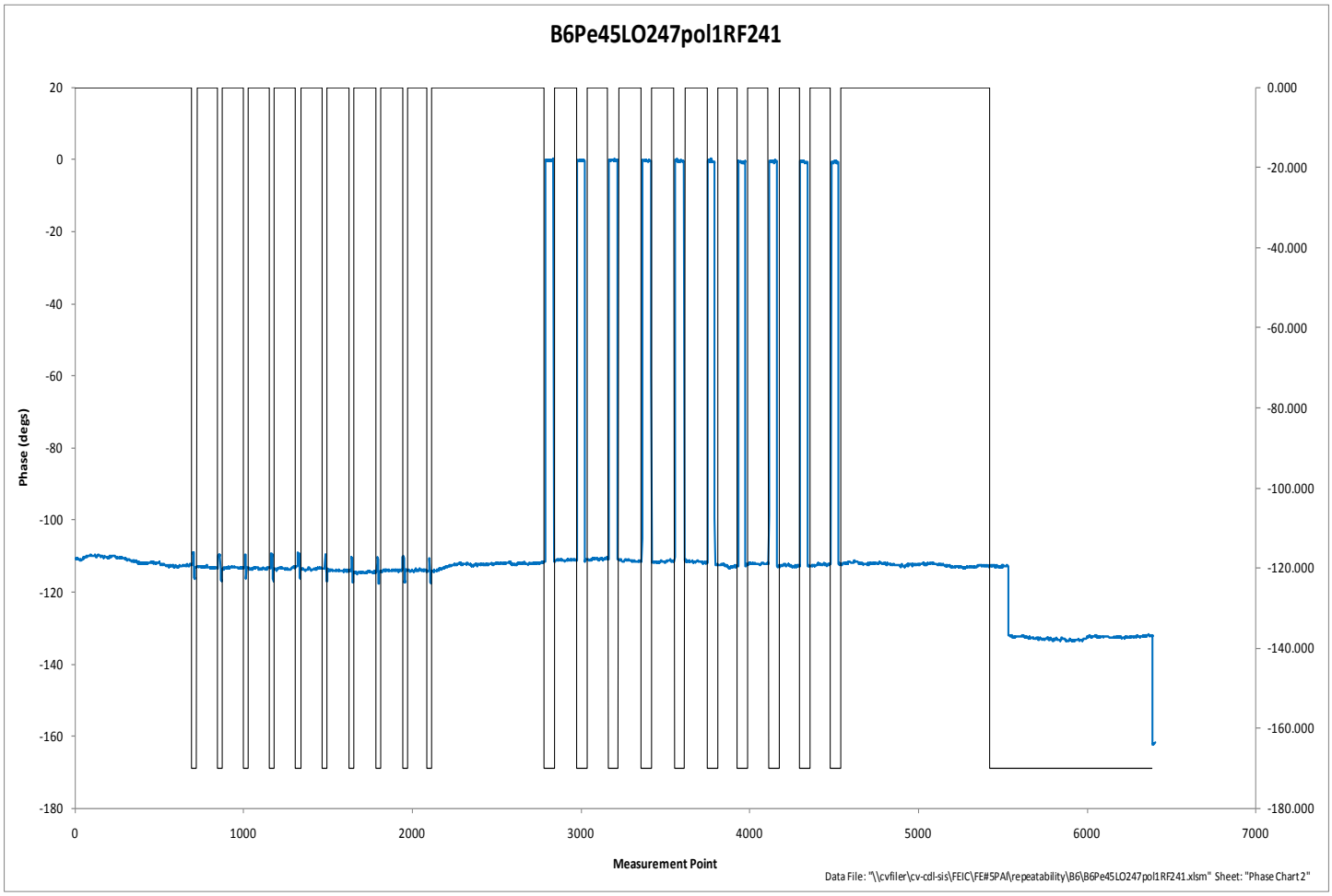

Figure 3: Results

Repeatability (one elevation, one LO per band)							Results		
Elev.	LO	Sb	RF	Pol	Amp Filename	Phase Filename	Amp (Normalized) (Spec: 2e-03)	(Degs) (Spec: 0.7 degs)	File
B3									
10	94	USB	100	0	B3Ae10LO94pol0USB.txt	B3Pe10LO94pol0RF100.s1p			
10	94	USB	100	1	B3Ae10LO94pol1USB.txt	B3Pe10LO94pol1RF100.s1p	3.300E-03	0.336	\\cvfiler\cv-cdl-sis\FEIC\FE#5PAI\repeatability\b3\B3Ae10LO94Pol1LSB.xlsm
10	106	LSB	100	0	B3Ae10LO106pol0LSB.txt	B3Pe10LO106pol0RF100.s1p	4.672E-03	0.630	\\cvfiler\cv-cdl-sis\FEIC\FE#5PAI\repeatability\b3\RF100pol0LSB.xlsm
10	106	LSB	100	1	B3Ae10LO106pol1LSB.txt	B3Pe10LO106pol1RF100.s1p			
B6									
45	241	USB	247	0	B6Ae45LO241pol0USB.txt	B6Pe45LO241pol0RF247.s1p	6.813E-03	2.692	\\cvfiler\cv-cdl-sis\FEIC\FE#5PAI\repeatability\B6\B6Ae45LO241Pol0USBretake.xlsm
45	241	USB	247	1	B6Ae45LO241pol1USB.txt	B6Pe45LO241pol1RF247.s1p	6.896E-03	0.285	\\cvfiler\cv-cdl-sis\FEIC\FE#5PAI\repeatability\B6\B6Ae45LO241Pol1USB.xlsm
45	247	LSB	241	0	B6Ae45LO247pol0LSB.txt	B6Pe45LO247pol0RF241.s1p	4.364E-03	2.415	\\cvfiler\cv-cdl-sis\FEIC\FE#5PAI\repeatability\B6\B6Ae45LO247Pol0LSB.xlsx
45	247	LSB	241	1	B6Ae45LO247pol1LSB.txt	B6Pe45LO247pol1RF241.s1p	2.732E-03	3.189	\\cvfiler\cv-cdl-sis\FEIC\FE#5PAI\repeatability\B6\B6Pe45LO247pol1RF241.xlsm
B7									
45	323	USB	329	0	B7Ae45LO323pol0USB.txt	B7Pe45LO323pol0RF329.s1p	2.147E-02	3.367	\\cvfiler\cv-cdl-sis\FEIC\FE#5PAI\repeatability\b7\B7Ae45LO323Pol0USB.xlsm
45	323	USB	329	1	B7Ae45LO323pol1USB.txt	B7Pe45LO323pol1RF329.s1p	5.312E-03	5.274	\\cvfiler\cv-cdl-sis\FEIC\FE#5PAI\repeatability\b7\B7e45LO323pol1RF329.xlsm
45	329	LSB	323	0	B7Ae45LO329pol0LSB.txt	B7Pe45LO329pol0RF323.s1p	1.474E-02	3.446	\\cvfiler\cv-cdl-sis\FEIC\FE#5PAI\repeatability\b7\B7Ae45LO329Pol0LSB.xlsm
45	329	LSB	323	1	B7Ae45LO329pol1LSB.txt	B7Pe45LO329pol1RF323.s1p	2.189E-03	4.236	\\cvfiler\cv-cdl-sis\FEIC\FE#5PAI\repeatability\b7\B7Ae45LO329Pol1LSB.xlsm
B9									
45	662		668	0	B9Ae45LO662pol0.txt	B9Pe45LO662pol0RF668.s1p			
45	662		668	1	B9Ae45LO662pol1.txt	B9Pe45LO662pol1RF668.s1p			
									\\cvfiler\cv-cdl-sis\FEIC\FE#5PAI\repeatability\FE005Repeatability.xlsx