

TEM/TPS Thermal Vacuum Test Procedures

COVER SHEET

Program: GLAST

Procedure Number: LAT-TD-03631

Procedure Title: TEM/TPS Thermal Vacuum Test Procedure

Paragraph Number: 5.4.1

Paragraph Title: Thermal Vacuum Test

Unit S/N: GLAT1752

TEST READINESS REVIEW COMPLETED AND APPROVED BY THE FOLLOWING:

Test Director: [Signature] Date: 2/4/05

Quality Assurance: [Signature] Date: 2/4/05

Test Conductor: [Signature] Date: 2/4/05

[Signature] [Signature] 2/4/05


REVIEWED AND APPROVED BY THE FOLLOWING:

Test Director: [Signature] Date: 2/11/05

Quality Assurance: [Signature] Date: 2/11/05

Test Conductor: [Signature] Date: 2/11/05


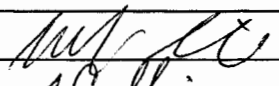
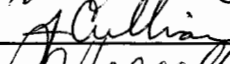
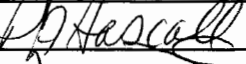
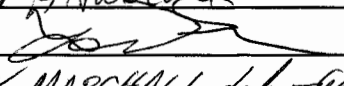

TEM/TPS Thermal Vacuum Test Procedures

TEST DATA SHEET		Unit S/N: GLAT 1752	Date/Temperature: 2/4/5 22.4C	
Title: 5.1.3 Test Equipment		Operator: C.C.	QA: 	
Para./ Step	Test Equipment Description, Manufacturer	Model/LAT Number	Serial/Rev. Number	*Cal./Val. Date
5.1.3.1 - 1	Record Model/LAT number, Serial/Revision number, Calibration due dates and Validation date for all equipment used in this procedure:			
	Adaptor 28 Volt supply cable	LAT-DS-05663	GLAT1951	2/4/5
	Adaptor PS Control cable	LAT-DS-05661	GLAT1953	2/4/5
	Adaptor TEM to GASU cable	LAT-DS-05662	GLAT1952	2/4/5
	Adaptor 28 Volt supply cable	LAT-DS-05663		

APC
2-4-05

* This column is used to enter the date that equipment is validated, when validated equipment is recorded in this data sheet.

TEM/TPS Thermal Vacuum Test Procedures

TEST DATA SHEET		Unit S/N: GLAT1752	Date/Temperature: 2/4/5 22.4C
Title: 5.1.4 Participant List		Operator: C.S.	QA: 
Para./ Step	Title	Print Name	Signature
5.1.4 - 1	Record names of all personnel that take part in the test/operation:		
	Elec. Eng.	Jeffrey Ludvik	
	QA	Joe Cullinan	
	Sys ENGR	DAT HASCALL	
	Elec ENG	Leovid Caporaso	
	QA	JOHN MARSHALL	

TEM/TPS Thermal Vacuum Test Procedures

TEST DATA SHEET		Start Time:	Date/Shift/ Temperature:	
Title: TEM/TPS Thermal Vacuum Test		End Time:	Unit S/N:	
Step	Description	Limits	Unit	Data
Test Setup				
5.2 -1 <i>5.2-3</i>	QAE notified to witness test setup <i>Test</i>	—	Yes/No	2/4/05
TEM/TPS Test Setup Validation				
5.2.6 -1	Perform the Comprehensive Performance Test within the TEM/TPS Performance Procedure LAT-TD-04085	20	in	2/4/05
<i>5.2.7</i>	Verify the TEM/TPS to plate, 20	20	in	Tool # 92407 cal due date 12-15-05
5.2.8 -1	Perform the Comprehensive Performance Test within the TEM/TPS Performance Procedure LAT-TD-04085	—	Yes/No	2/4/05
Start Qualification Test				
5.3.2 Qualification Test				
-1	QAE notified to witness the qualification test		Yes/No	
5.3.2.1 Start of Qualification Test				
-1	Verify the TEM/TPS is still turned on.		Yes/No	
4 - a	Verify the pressure of the chamber.	10e-5	Torr	
4 - b	Verify temperature per hour ramp rate.	>20	Celsius per hour	
4 - c	Verify the temperature of the hot soak.	+60 (+2/-2)	Celsius	
Start Qualification Test				
5.3.2.2 Qualification Soak				
2 - a	Verify the soak of each cycle.	=>4	Hours	N/A
2 - b	Verify during cycle the pressure of the chamber.	10e-5	Torr	
2 - c	Verify the temperature of the cycle	+60 (+2/-2)	Celsius	
2 - d	Verify temperature per hour ramp rate	>20	Celsius per hour	
2 - e	Verify during the cycle the temperature stability	<3 deg	Celsius per hour rate of change	
Start Qualification Test				
5.3.2.3 Transition Qualification				
2 - a	Verify the temperature of the cycle	+55 (+2/-2)	Celsius	
2 - b	Verify temperature per hour ramp rate	>20	Celsius per hour	✓

Hard copies of this document are for REFERENCE ONLY and should not be considered the latest revision.

TEM/TPS Thermal Vacuum Test Procedures

TEST DATA SHEET		Unit S/N: GLAT1752	Date: 2/4/05			
Title: TEM/TPS Thermal Vacuum Test		Operator: L.S.	QA: LAT 2 QA			
Step	Description	Limits	Unit	Value	Pass/ Fail	Operator/ Time
Acceptance Test Cycle 1						
5.3.7 Acceptance Start Test						
-1	QAE notified to witness the Acceptance test	YES	YES /NO	yes	P	
5.3.7.1 Start of Acceptance Test (Transition to Survival Hot)						
1	Verify the TEM/TPS is turned OFF. <i>at start of</i>	OFF	OFF /ON	OFF	P	
4-a	Verify the pressure of the chamber during the transition	<5.0e-5	Torr	2.1x10 ⁻⁵	PASS	
4-b	Verify the temperature of the soak	+60 (+2/-2)	Celsius	59.5 C	PASS	
4-c	Verify the transition rate	<20	Degrees/hour	8.5C/hr	PASS	
5.3.7.2 Hot Survival Soak						
2-a	Verify the duration of the soak. <i>ended</i>	=>4	Hours	4.1 hr	PASS	
2-b	Verify the pressure of the chamber during the soak	<5.0e-5	Torr			
2-c	Verify the temperature of the soak	+60 (+2/-2)	Celsius	59.5 C	PASS	
2-d	Verify end of bakeout					
5.3.7.3 Transition to Acceptance High Temperature						
3-a	Verify the temperature of the soak	+50 (+2/-2)	Celsius	50.9 C	PASS	
3-b	Verify the transition rate	<20	Degrees/hour	5.35C/hr	PASS	
5.3.8.2 Acceptance Soak - Hot						
2	Verify Limited Performance Test had no errors	0	counts	3	PASS	L.S. 6:15 PM 2/5/05
3-a	Verify the duration of the soak.	=>4	Hours	4.3 hr	PASS	
3-b	Verify the pressure of the chamber during the soak	<5.0e-5	Torr	1.9x10 ⁻⁵	PASS	JSL 10:30 AM 2/5/05
3-c	Verify the temperature of the soak	+50 (+2/-2)	Celsius	51 C	PASS	
5.3.8.3 CPT Test						
1	Perform one Comprehensive Performance Test <i>14,20,22 MHz</i>	OK	OK/NG	OK	PASS	JSL 11:40 AM 2/5/05
2	Turn the TEM/TPS power to OFF.	OFF	ON/OFF	OFF	PASS	JSL 11:45 PM 2/5/05
5.3.8.4 Transition to Survival Cold Temperature <i>-40</i>						
3-a	Verify the temperature of the soak	+50 (+2/-2)	Celsius	-40.1	PASS	
3-b	Verify the transition rate	<20	Degrees/hour	12.4C/hr	PASS	

PPC
2-5-05

2-5-05


LPT
627
cycles
completed

LPT
2/4/05
4:41

Temp dropped to 28.9 C at rate 48.8C/hr ; Temp rose to 49.5C at rate 28C/hr. before Hard copies of this document are for REFERENCE ONLY and should not be considered the latest complete transition

revision. LAT-TD -03631-02 Page 86
 5.3.8.1 Hot ACCEPTANCE TURN-ON 120 mA ON TURN ON
 2-C Verify temperature of soak +50 (+2/-2) Celsius 120 mA
 3-A Verify the TEM/TPS is turned ON OFF/ON

TEM/TPS Thermal Vacuum Test Procedures

TEST DATA SHEET		Unit S/N: 6CAT1752	Date: 2/5/04 Time:			
Title: TEM/TPS Thermal Vacuum Test		Operator: C.S.	QA: 			
Step	Description	Limits	Unit	Value	Pass/Fail	Operator/Time
Acceptance Test Cycle 1						
5.3.8.5 Acceptance Soak – Cold Survival						
1 - a	Verify the duration of the soak.	4-8	Hours	4 hr	PASS	
1 - b	Verify the pressure of the chamber during the soak	<5.0e-5	Torr	3.1 x 10 ⁻⁷	PASS	
1 - c	Verify the temperature of the soak	-40 (+2/-2)	Celsius	-40.3 C	PASS	JSL 12:40 PM 2/6/05
5.3.8.6 Cold Survival Turn ON						
1 - a	Turn the TEM/TPS power to ON.	ON	ON/OFF	ON	PASS	JSL 12:50 PM 2/6/05
5.3.8.7 Transition to Acceptance Cold Temperature						
3 - a	Verify the temperature of the soak	-35 (+2/-2)	Celsius	-31.2 C		
3 - b	Verify the transition rate	<20	Degrees/hour	5.2 C/hr	PASS	
5.3.8.8 Acceptance Soak - Cold						
2	Verify Limited Performance Test had no errors	0	counts	644	PASS	C.S. 5:40 PM 2/6/05
3 - a	Verify the duration of the soak.	4-8	Hours	6 hours	P	
3 - b	Verify the pressure of the chamber during the soak	<5.0e-5	Torr	5.4 x 10 ⁻⁷	P	
3 - c	Verify the temperature of the soak	-35 (+2/-2)	Celsius	-31.2 C	P	
5.3.8.9 CPT Test						
-1	Perform one Comprehensive Performance Test 14,20,22 MHz	OK	OK/NG	OK	PASS	C.S. 7 PM 2/6/05

DAH
2/4/05

① Temp dropped to 13.7C at rate 37.6C/hr; Temp then rose to 51.1C at rate 13.7C/hr and started soak at 51.1C

TEM/TPS Thermal Vacuum Test Procedures


TEST DATA SHEET		Unit S/N: GLAT/752		Date: 2-7-05		
Title: TEM/TPS Thermal Vacuum Test		Operator: C.S.		Time:		
Step	Description	Limits	Unit	Value	Pass/Fail	Operator/Time
Acceptance Test Cycle 2-3				Enter Cycle Number = <u>2</u>		
5.3.9.1 Hot Acceptance Temperature Soak						
First attempt 48.4 C PASS						
1 - a	Verify the temperature of the soak	+50 (+2/-2)	Celsius	51.6	PASS	
1 - b	Verify the transition rate	<20	Degrees/hour	10.7 C/hr	PASS	
2	Verify Limited Performance Test had no errors	0	counts	0	PASS	
5 - a	Verify the duration of the soak.	=>4	Hours	4.3 hr	PASS	
5 - b	Verify the pressure of the chamber during the soak	<5.0e-5	Torr	1.1 x 10 ⁻⁵		
5 - c	Verify the temperature of the soak	+50 (+2/-2)	Celsius	51.1	PASS	
5.3.9.2 Acceptance High Temperature Turn-on						
1	Turn the TEM/TPS power to OFF.	OFF	ON/OFF	OFF	PASS	JSL 12:30 PM 2/7/05
2	Turn the TEM/TPS power to ON.	ON	ON/OFF	ON	PASS	JSL 12:30 PM 2/7/05
5.3.9.3 LPT Test						
1	Perform one Limited Performance Test	OK	OK/NG	OK	PASS	C.S. 12:37 PM 2/7/05
5.3.9.3 Transition from Hot Acceptance to Cold Acceptance						
3-a	Verify the temperature of the soak	-35 (+2/-2)	Celsius	-38 C	P	
3-b	Verify the transition rate	<20	Degrees/hour	19 C/hr	P	
5.3.9.5 Acceptance Soak - Cold						
2	Verify Limited Performance Test had no errors	0	counts	1537	PASS	C.S. 12:00 2/7/05
3 - a	Verify the duration of the soak.	4-8	Hours	4.5	P.	
3 - b	Verify the pressure of the chamber during the soak	<5.0e-5	Torr	3.8 x 10 ⁻⁷	P	
3 - c	Verify the temperature of the soak	-35 (+2/-2)	Celsius	-34.2	P.	
5.3.9.6 Acceptance Cold Temperature Turn-on						
1	Turn the TEM/TPS power to OFF.	OFF	ON/OFF	OFF	P	
2	Turn the TEM/TPS power to ON.	ON	ON/OFF	ON	P	
5.3.9.7 LPT Test						
-1	Perform one Limited Performance Test	OK	OK/NG	OK	P	

after first attempt
①

minutes LPT: 2248 cycle comp. etc


Hard copies of this document are for REFERENCE ONLY and should not be considered the latest revision.

TEM/TPS Thermal Vacuum Test Procedures

TEST DATA SHEET		Unit S/N: GLAT1752	Date: 2/8/05 Time:				
Title: TEM/TPS Thermal Vacuum Test		Operator: L.S.	QA: 				
Step	Description	Limits	Unit	Value	Pass/ Fail	Operator/ Time	
Acceptance Test Cycle 2-3			Enter Cycle Number = 3				
5.3.9.1 Hot Acceptance Temperature Soak							
1 - a	Verify the temperature of the soak	+50 (+2/-2)	Celsius	51C	PASS	JSL 11:03 2/8/05	
1 - b	Verify the transition rate	<20	Degrees/hour	12.5C/hr	PASS	↓	
2	Verify Limited Performance Test had no errors	0	counts	0	PASS		
5 - a	Verify the duration of the soak.	=>4	Hours	4	PASS		
5 - b	Verify the pressure of the chamber during the soak	<5.0e-5	Torr	9.1x10 ⁻⁶	PASS		
5 - c	Verify the temperature of the soak	+50 (+2/-2)	Celsius	51C	PASS		
5.3.9.2 Acceptance High Temperature Turn-on							
1	Turn the TEM/TPS power to OFF.	OFF	ON/OFF	OFF	PASS		JSL 11:08 2/8/05
2	Turn the TEM/TPS power to ON.	ON	ON/OFF	ON	PASS	↓	
5.3.9.3 LPT Test							
1	Perform one Limited Performance Test	OK	OK/NG	OK	PASS	JSL 11:10 2/8/05	
5.3.9.3 Transition from Hot Acceptance to Cold Acceptance							
3-a	Verify the temperature of the soak	-35 (+2/-2)	Celsius	-33C	∅	↓	
3-b	Verify the transition rate	<20	Degrees/hour	14	∅		
5.3.9.5 Acceptance Soak - Cold							
2	Verify Limited Performance Test had no errors	0	counts	1516	PASS	LC 10:30 2/8/05	
3 - a	Verify the duration of the soak.	4-8	Hours	5 HOURS		↓	
3 - b	Verify the pressure of the chamber during the soak	<5.0e-5	Torr	2.7x10 ⁻⁷	∅		
3 - c	Verify the temperature of the soak	-35 (+2/-2)	Celsius	-33.6	∅		
5.3.9.6 Acceptance Cold Temperature Turn-on							
1	Turn the TEM/TPS power to OFF.	OFF	ON/OFF	OFF	∅	↓	
2	Turn the TEM/TPS power to ON.	ON	ON/OFF	ON	∅		
5.3.9.7 LPT Test							
-1	Perform one Limited Performance Test	OK	OK/NG	OK	PASS	↓	

Hard copies of this document are for REFERENCE ONLY and should not be considered the latest revision.


TEM/TPS Thermal Vacuum Test Procedures

TEST DATA SHEET		Unit S/N: C1A1752	Date: 2/9/05			
Title: TEM/TPS Thermal Vacuum Test		Operator: C.S.	Time: QA: 			
Step	Description	Limits	Unit	Value	Pass/ Fail	Operator/ Time
Acceptance Test Cycle 4						
5.3.10.1 Hot Acceptance Temperature Soak						
1 - a	Verify the temperature of the soak	+50 (+2/-2)	Celsius	48°C	P	10.M. / 2/9/05 C.S.
1 - b	Verify the transition rate	<20	Degrees/hour	18.20	P	↓
2	Verify Limited Performance Test had no errors	0	counts	1888	P	10.M. / 2/9/05 C.S.
4.5 - a	Verify the duration of the soak.	=>4	Hours	4h45min	P	
4.5 - b	Verify the pressure of the chamber during the soak	<5.0e-5	Torr	7.5e-6	P	
4.5 - c	Verify the temperature of the soak	+50 (+2/-2)	Celsius	51.2	P	
5.3.10.2 Acceptance High Temperature Turn-on						
1	Turn the TEM/TPS power to OFF.	OFF	ON/OFF	OFF	P	
2	Turn the TEM/TPS power to ON.	ON	ON/OFF	ON	P	
5.3.10.3 CPT Test						
1	Perform one Comprehensive Performance Test	OK	OK/NG	OK	PASS	↓
5.3.10.4 Transition from Hot Acceptance to Cold Acceptance						
3-a	Verify the temperature of the soak	-35 (+2/-2)	Celsius	-33	P	2:40 A.M. / 2/9/05 C.S.
3-b	Verify the transition rate	<20	Degrees/hour	15.3	P	
5.3.10.5 Acceptance Soak - Cold						
2	Verify Limited Performance Test had no errors	0	counts	1688	P	
3 - a	Verify the duration of the soak.	4-8	Hours			
3 - b	Verify the pressure of the chamber during the soak	<5.0e-5	Torr	2.4 · 10 ⁻⁷	P	
3 - c	Verify the temperature of the soak	-35 (+2/-2)	Celsius	-33.9		
5.3.10.6 Acceptance Cold Temperature Turn-on						
1	Turn the TEM/TPS power to OFF.	OFF	ON/OFF	OFF	P	
2	Turn the TEM/TPS power to ON.	ON	ON/OFF	ON	P	

PAH
2/4/05


PAH
2/4/05

TEM/TPS Thermal Vacuum Test Procedures

TEST DATA SHEET		Unit S/N: GLA71752	Date: 2/10/05 Time:			
Title: TEM/TPS Thermal Vacuum Test		Operator: C.S.	QA: 			
Step	Description	Limits	Unit	Value	Pass/ Fail	Operator/ Time
Acceptance Test Cycle 4						
5.3.10.7 CPT Test						
2 - a	Turn the TEM/TPS power to ON.	ON	ON/OFF			
-1	Perform one Comprehensive Performance Test (14, 20, 22 MA)	OK	OK/NG	OK	PASS	C.S. 4 AM, 2/10/05
5.3.10.8 Cold Acceptance to Hot Acceptance						
3-a	Verify the temperature of the soak	+50 (+2/-2)	Celsius	48	P	
3-b	Verify the transition rate	<20	Degrees/hour	16.8	P.	
5.3.11.1 End of 4 th cycle short soak						
2	Verify Limited Performance Test had no errors	0	counts	1207	P	
3 - a	Record the pressure of the chamber	<5.0e-5	Torr	3.9x10 ⁻⁶	P	
3 - b	Verify the temperature the bottom flange	+50(+2/-2)	Celsius	50.6	P	
4	Turn the TEM/TPS power to OFF.	OFF	ON/OFF	OFF	P	
5.3.11.2 Start of Shut down ^{+30+2/-2 PAH 2/4/05}						
4	Verify the temperature the bottom flange	±25 (+1/-7)	Celsius	31	P	
5	Record ramp rate	<20	Celsius/hour	16.7	P	

Hard copies of this document are for REFERENCE ONLY and should not be considered the latest revision.

TEM/TPS Thermal Vacuum Test Procedures

TEST DATA SHEET		Unit S/N: GLAT1752	Date: 2/10/05	
Title: TEM/TPS Thermal Vacuum Test		Operator: C.S.	QA: 	
Step	Description	Limits	Unit	Operator
Chamber Shutdown				
5.4 Chamber Shutdown				
5.4.1 - 2	Verify the pressure of the chamber.	760	Torr	ARW
5.4.1 - 3	Verify the temperature of the TEM/TPS.	+25 (+2/-2)	Celsius	ARW
5.4.2 - 2	Perform the Comprehensive Performance Test within the TEM/TPS Performance Procedure LAT-TD-04085.	OK	<input checked="" type="radio"/> OK <input type="radio"/> NG	JSL 2/10/05
5.4.3 Collecting Data Sheets				
-1	Save and attach TEM/TPS Thermal Vacuum Test Data Sheets	YES	Yes/No	C.S.
-2	Save, print, and attach Recorded Profiles	YES	Yes/No	ARW

Appendix B (Connector Mate/Demate Log)

TEM/TPS Thermal Vacuum Test Procedures

The Excel Mate/Demate log form that is below is the actual Excel file imported into this word document. You can copy and paste it into a folder and then open it as an Excel worksheet.

CONNECTOR MATE / DEMATE

UNIT DESCRIPTION:

Connector(s)	Authorized by Procedure & para or NCR	Date	Mate or De-mate M or D	Flight or Test F or T	Verify Power Off Emp. ID#	Pre-mate Inspect		ESD Bleed and Connector Mate		Final Inspect	
						*Emp. ID#	QA	*Emp ID#	QA	*Emp. ID#	QA
<p style="text-align: center;"><i>Connector savers used. No mates/demates for T/V Test</i></p>											

*Personnel that is Mate/Demate certified.

Connector /Bracket R/D:

LAT
2
QA

2-11-05

Hard copies of this document are for REFERENCE ONLY and should not be considered the latest revision.