



DCN No.
LAT-XR-05546-01

LAT PROJECT DOCUMENT CHANGE NOTICE (DCN)

SHEET 1 OF 1

ORIGINATOR: Leonid Sapozhnikov PHONE: 650-926-2002 DATE: 1/7/05

CHANGE TITLE: DCN for TEM Specifications and Requirements Documents ORG.:

DOCUMENT NUMBER	TITLE	NEW REV.
LAT-SS-05522	TEM Specification – Level V Specification	01
LAT-SS-05533	TEM/TPS Specification- Level V Specification	01
LAT-TD-05534	TEM Requirements Verification Matrix	01
LAT-TD-05536	TEM/TPS Requirements Verification Matrix	01

CHANGE DESCRIPTION (FROM/TO):

Initial release

REASON FOR CHANGE:

ACTION TAKEN: Change(s) included in new release DCN attached to document(s), changes to be included in next revision
 Other (specify):


DISPOSITION OF HARDWARE (IDENTIFY SERIAL NUMBERS):	DCN DISTRIBUTION:
<input checked="" type="checkbox"/> No hardware affected (record change only)	
<input type="checkbox"/> List S/Ns which comply already:	
<input type="checkbox"/> List S/Ns to be reworked or scrapped:	
<input type="checkbox"/> List S/Ns to be built with this change:	
<input type="checkbox"/> List S/Ns to be retested per this change:	

SAFETY, COST, SCHEDULE, REQUIREMENTS IMPACT? YES NO

If yes, CCB approval is required. Enter change request number:

APPROVALS	DATE	OTHER APPROVALS (specify):	DATE
ORIGINATOR: L. Sapozhnikov (signature on file)	1/7/05		
ORG. MANAGER: G. Haller (signature on file)	1/7/05		
PSA- Darren Marsh (signature on file)	1/7/05		
Manufacturing- R. Patterson (signature on file)	1/10/05		
Elec.- D. Nelson (signature on file)	1/7/05		
DCC RELEASE: Natalie Cramar (signature on file)	1/10/05	Doc. Control Level: <input checked="" type="checkbox"/> Subsystem <input type="checkbox"/> LAT IPO <input type="checkbox"/> GLAST Project	

DCN No: LAT-XR-05546-01

	Document # LAT-TD-05536-01	Date effective 01/06/2005
	Author(s) Leonid Sapozhnikov Philip Hart Jana Thayer	Supersedes
	Subsystem/Office Electronics & DAQ Subsystem	
Document Title Tower Electronics Module (TEM)/Tower Power Supply (TPS) Requirements Verification Matrix		

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

CHANGE HISTORY LOG

Revision	Effective Date	Description of Changes
1	01/06/2005	Original release

Table of Contents -TOC

1. SCOPE 4

2. DEFINITIONS AND ACRONYMS 4

 2.1 Definitions..... 4

 2.2 Acronyms 4

3. Applicable Documents..... 5

4. TEM Specific requirements to test verification matrix..... 7

 The TEM shall meet the requirements specified in the Tower Electronics Module (TEM) Level V Specification, [10]. The verification matrix for these requirements is described in the Tower Electronics Module (TEM) Requirements Verification Matrix document, [12]..... 7

5. TEM/TPS Requirements to Test Verification Matrix..... 7

1. SCOPE

This document provides a matrix of the Tower Electronics Module (TEM) and TEM Power Supply (TPS) subsystem requirements to verification tests.

2. DEFINITIONS AND ACRONYMS

The following terms, abbreviations, and acronyms are used in this document:

2.1 Definitions

A, An	Analog
A	Analysis
D, Dg	Digital
DR	Data Rate
Eff	Efficiency
F	Functional
μs	microsecond
ns	nanosecond
P	Performance
P/F	Pass/Fail
V	Volt
W	Watt

2.2 Acronyms

AFEE	Analog Front End Electronics
AIDS	Assembly and Inspection Data Sheet
BOB	Break Out Box
BOC	Break Out Cable
CAL	Calorimeter
CC	Cable Controller
CSAM	Computer Scanning Acoustic Microscopy (computer sweeps the EUT with a tone to detect any voids in the ASIC)
EBM	Event Builder Module
EGSE	Electrical Ground Support Equipment
EICIT	Electrical Interface Continuity and Isolation Test (cold checks)
ETech	Electrical Technician
EUT	Equipment Under Test
FE	Front End
FIFO	First-in, First-Out

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

TEM/TPS Requirements Verification Matrix

FPGA	Field-Programmable Gate Array
GASU	Global trigger, ACD, System Unit
GCCC	GLAST Calorimeter Cable Controller
GEM	Global-Trigger Electronics Module
GLAST	Gamma Ray Large Area Space Telescope
GTCC	GLAST Tracker Cable Controller
GTFE	GLAST Tracker Front End
GTRC	GLAST Tracker Readout Controller
HAST	Highly Accelerated Stress Test
ICD	Interface Control Document
LAT	Large Area Telescope
LATp	Large Area Telescope protocol
MCM	Multi Chip Module
MGSE	Mechanical Ground Support Equipment
STM	Safe To Mate
SVT	Stray Voltage Test (hot checks)
T&DF	Trigger and Data Flow
TACK	Trigger Acknowledge
TAM	Trigger Accept Message
TEM	Tower Electronics Module
TKR	Tracker
TPS	Tower Power Supply
TRG	Trigger

3. APPLICABLE DOCUMENTS

<u>Reference</u>	<u>Document Number</u>	<u>Description</u>
[1]	LAT-SS-00284	LAT Trigger Subsystems Specification – Level IV
[2]	LAT-SS-00285	LAT Dataflow Subsystems Specification – Level IV
[3]	LAT-TD-00605	TEM Programming ICD Specification
[4]	LAT-TD-00606	LAT Inter-Module Communications, Manual
[5]	LAT-SS-00183	Power Supply Modules Specification – Level IV
[6]	LAT-SS-00288	TEM Specification and ICD
[7]	GSFC 433-SPEC-0001	GLAST Mission System Specification
[8]	LAT-SS-00238	Calorimeter-LAT ICD
[9]	LAT-SS-00176	Tracker Electrical Interface Specification
[10]	LAT-SS-05522	Tower Electronics Module (TEM) Specification - Level V Specification
[11]	LAT-SS-01281	Tower Power Supply Specification and ICD

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

LAT-TD-05536

TEM/TPS Requirements Verification Matrix

[12]	LAT-TD-05534	Tower Electronics Module (TEM) Requirements Verification Matrix
[13]	LAT-SS-05533	Tower Electronics Module (TEM)/Tower Power Supply (TPS) Specification – Level V Specification
[14]	LAT-TD-00564	LAT Mass Status Report
[15]	LAT-PS-04568	Statement of Work, LAT DAQ EMI Testing
[16]	LAT-SS-00778	LAT Environmental Specification
[17]	LAT-TD-04085-02	TEM/TPS Test Procedure

4. TEM SPECIFIC REQUIREMENTS TO TEST VERIFICATION MATRIX

The TEM shall meet the requirements specified in the Tower Electronics Module (TEM) Level V Specification, [10]. The verification matrix for these requirements is described in the Tower Electronics Module (TEM) Requirements Verification Matrix document, [12].

5. TEM/TPS REQUIREMENTS TO TEST VERIFICATION MATRIX

This document covers the joint TEM/TPS requirements only. The requirements are described in [13]. The **Test Paragraph** field below refers to the paragraph number in the TEM/TPS Test Procedure, [17].

Note: Verification methods are T = Test, A = Analysis, I = Inspection, S = Simulation

Table 1: TEM Requirements to Test Verification Matrix

Requirement Number	Title	Test Paragraph [17]	Verification Method
5.	TEM SPECIFIC REQUIREMENTS	NA	NA
6	TPS SPECIFIC REQUIREMENTS	NA	NA
6.1	TPS Voltage Specifications	NA	NA
6.1.1	CAL HV voltage specification	5.5.2	Test
6.1.2	CAL 3.3 V Analog voltage specification	5.5.2	Test
6.1.3	CAL 3.3 V Digital voltage specification	5.5.2	Test
6.1.4	TKR HV voltage specification	5.5.2	Test
6.1.5	TKR 1.5 V Analog voltage specification	5.5.2	Test
6.1.6	TKR 2.5 V Analog voltage specification	5.5.2	Test
6.1.7	TKR 2.5 V Digital voltage specification	5.5.2	Test
6.1.8	TEM 3.3 V Digital voltage specification	5.5.2	Test
6.2	TPS current specifications	NA	NA
6.2.1	CAL HV current specification	5.5.2	Test
6.2.2	TKR HV current specification	5.5.2	Test
6.2.3	TPS/TEM current specification	5.5.2	Test
6.3	TPS RMS current specifications	NA	NA
6.3.1	CAL HV noise specification	5.7.2	Test
6.3.2	CAL 3.3 V Analog noise specification	5.7.2	Test
6.3.3	CAL 3.3 V Digital noise specification	5.7.2	Test
6.3.4	TKR HV noise specification	5.7.2	Test
6.3.5	TKR 1.5 V Analog noise specification	5.7.3	Test
6.3.6	TKR 2.5 V Analog noise specification	5.7.3	Test
6.3.7	TKR 2.5 V Digital noise specification	5.7.3	Test
7	TEM/TPS REQUIREMENTS	NA	NA

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

TEM/TPS Requirements Verification Matrix

Requirement Number	Title	Test Paragraph [17]	Verification Method
7.1	TEM/TPS Power consumption	NA	NA
7.1.1	Power consumption under maximum load	5.5.2	Test
7.1.2	Power consumption without any CAL/TKR load	5.5.1	Test
7.2	Mass Property		Test
7.3	Center of Gravity Property		Test
7.4	EMI/EMC		Test
7.5	Temperature		Test
7.6	Vibration		Test