Environmental Test Coverpage For PFM Thermal Control

Unit Identfication			
Name	PFM Thermal Control		THE PERSON NAMED IN COLUMN
Part #	10217660-1 rev A	CONTRACTOR CONTRACTOR	
S/N	#002	THE PERSON NAMED IN COLUMN	
ETAS	HS0TCA02		

Environmemtal Testing		THE STATE OF	A CONTRACTOR	1	and the string is	N. Paula	
	Axes Tested	Temperature	Duration or Number of Cycles		Requirement	Source	 Waiver#
Random Vibration Test	Z	85 K	1 min	P*	X, Y, Z at 90 K	D-19155 (ERD) para. 4.7.1.3	HR-SP-JPL-RFW- 007 (Z axis test only/)
High Level Sine Vibe Test	None	NA	NA	NA	X, Y, Z at 90 K	in analogy to SSSD	Omitted by same rationale: as for BDA, and JFETs, ref: HR-SP-JPL-RFW-005
(Bakeciut	NA	80C	24hr	P*	None (other than as part of the assembly procedure)		
Thermal Cycles	NA	RoomT to <12 K	2	P*	1 thermal cycle roomT to 77' K	D-19155 (ERD)	

* Pass based on before/after RmT electrical continuity and visual inspection.

Cold Continuity Measurements were made during each	of the thermal audio			of the latest designation of the latest desi
Dold Community Mociodiomonio More made adming each	of the thermal cycle	S		
THE RESIDENCE IN COLUMN 2 IN C	Pass/Fail	Requirement	Source	Waiver#
Cold Continuity Test (1st Thermal Cycle)	Р	None	NA	
Cold Continuity Test (2nd Thermal Cycle)	Р	None	NA	

JEL

ENVIRONMENTAL TEST AUTHORIZATION AND SUMMARY (ETAS)

ARE ALL PFRS AGAINST THIS UNIT CLOSED? YES								_
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ENVIRONMENTAL TEST AUTHORIZATION AND SUMMARY (ETAS)

OTHER AUTHORIZATION PROVISIONS AND EXPLANATIONS

This ETAS is for qualification testing of the First Flight Model (flight unit 1, which is SN002) of the SPIRE thermal control assembly (TCA). The test consists of 2 cryogenic thermal cycles (including DC electrical continuity tests) and a z-axis cold shake test.

The thermal cycle test will be done with the TCA unit mounted inside the SPIRE cold alignment facility, which has previously been used for thermal cycle tests on the SPIRE BDA's. This test is a set of 2 cycles before vibration. The unit contains only passive electrical components (heaters and resistance thermometers), which will be DC continuity and isolation tested warm and cold during every cycle.

The 3-axis cold vibration test will be performed with the hardware at <100 K with the TCA unit mounted inside the SPIRE cold vibration facility. The hardware has such a low mass (<50grams) and will be vibrated cold, so no accelerometers or force transducers will be used during the primary tests. The vibration levels will be as specified in the Herschel-Plank Environmental Requirements document, proto-flight levels, applied for 2 minutes.

ENVIRONMENTAL TEST AUTHORIZATION AND SUMMARY (ETAS) ENVIRONMENTAL TEST SUMMARY

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HARDWARE	N/S	ETAS	TEST ENVIRONMENT LEVELS & DURATION	DATE TEST PERFORMED	TEST	PASS/	COMMENTS
SPIRE Thermal Control Assembly (10217660-1)	2007	HSOTCA01	Thermal Cycle:		VOEIGO	- AIL	
			2 Thermal cycles from 290K to $<=10$ K, at a pressure of <1 E-5mbar.				
			Vibration: (see IOM 352D-JPF-0447 Rev A. "Vibration Test				
			Plan form Herschel Flight Thermal Control				
			Assembly" for details) LONGITUDINAL (Z-axis)			,	
			ONLY ONLY				
			λ 2 minute Random Vibe 20 Hz 0.007 g ² /Hz				
			20-100 IIZ +3 ub/OCI 100 Hz 0.1 g ² /Hz 100 110 Hz +43 84P/Ozt				
			100-110 Hz 743.8 dB/Oct $110-200 Hz$ 0.4 g ² /Hz $200-210 Hz$ 47.8 dB/Oct				
			210-400 Hz $-42.8 ub/Oct210-400 \text{ Hz} 0.2 \text{ g}^2/\text{Hz}400-2000 Hz$ -12 dB/Oct				
			$2000 \text{ Hz } 0.0003 \text{ g}^2/\text{Hz}$				
			Grms 10.45				
							PAGE 3 JPL 2683 R 1/98 FF

Environmental Test Coverpage For FS Thermal Control

Unit Identfication		
Name	FS Thermal Control	THE RESERVE AND ADDRESS OF THE PARTY OF THE
Part #	10217660-1 rev A	
S/N	#003	A STATE OF THE PARTY OF THE PAR
ETAS	HS0TCA03	

Environmental Testing	-	Sales and the		Was like	The state of the state of	BOX BARRE	
	Axes Tested	Temperature	Duration or Number of Cycles		Requirement	Source	Waiver#
Random Vibration Test	z	85 K	1 min	P*	X, Y, Z at 90 K 1 min per axis	D-19155 (ERD) para. 4.7.1.3	HR-SP-JPL-RFW- 007 (Z axis test only)
High Level Sine Vibe Test	None	NA	NA	NA	X, Y, Z at 90 K	in analogy to SSSD	Omitted by same rationale as for BDA and JFETs, ref: HR-SP-JPL- RFW-005
Bakeout	NA	80C	24hr	P*	None (other than as part of the assembly procedure)		
Thermal Cycles	NA	RoomT to <12 K	2	P*	1 thermal cycle roomT to 77 K	D-19155 (ERD)	

* Pass based on before/after RmT electrical continuity and visual inspection.

Cold Continuity Measurements were made de			10	10/-:
	Pass/Fa	il Requirement	Source	Waiver #
Cold Continuity Test	The second second	TOTAL CONTRACT		E PESSON
(1st Thermal Cycle)	P	None	NA	
Cold Continuity Test				
(2nd Thermal Cycle)	P	None	NA	
THE DECIDENCE OF SHEET SHEET	THE REPORT OF THE PERSON OF			
				N. Company

JPL	
PROJECT	
Herschel	
ILIDALIATELLIA ACEL	

ENVIRONMENTAL TEST AUTHORIZATION AND SUMMARY (ETAS)

	AUTHOR	ZATION SECTION	V	
PROJECT			LOG NO.	
Herschel			HS0TCA03	T
SUBSYSTEM/ASSEMBLY TITLE				DATE ISSUED
SPIRE THERMAL CONTROL, SN003 REFERENCE DESIGNATION NUMBER	PART NO. (IF MULTIPLE, AT	TACHLICT	J. DCV	11/29/2004
	10219660-1	TACH LIST)	REV.	SERIAL NO.
HARDWARE TYPE	T FLIQUE OBARE		PRE-ENVIRONMENTAL INSPECT	ION REPORT NUMBER (ATTACH IR)
☐ EM QUAL ☐ FLIGHT ☐ WIRING HARNESS	_ FLIGHT SPARE	PART NO.	REV.	SERIAL NO.
☐ EM QUAL ☐ FLIGHT	EM SE			
TEST DESCRIPTION (CHECK ALL APPLICABLE)		_	TYPE OF TEST	
	ACOUSTIC EMC	OTHER	QUALIFICATION	FLIGHT ACCEPTANCE
RANDOM VIBRATION THERMAL VAC.	THERMAL ATMOSPHERE		PROTO FLIGHT	RETEST
WILL ALL TESTS/LEVES/DURATIONS REQUIRED BY THE		PERFORMED ON THIS UN ENTER PROJ. DOC. NO.		
YES NO (IF NO, ATTACH EX		ENTER PROJ. DOC. NO.	AND REV	
YES NO (IF NO, ATTACH EX		BRIEF EXPLANATION		
HAVE ALL DESIGN ANALYSES BEEN COMPLETED AND				
YES NO (IF NO, ATTACH EX		BRIEF EXPLANATION		
IS THE TEST ARTICLE IDENTICAL TO OTHER FLIGHT UP				
YES NO (IF NO, ATTACH EX	CEPTIONS LIST)	BRIEF EXPLANATION		·
ARE ALL PFRs AGAINST THIS UNIT CLOSED? NO (IF NO, ATTACH EX	OCRTIONIC LIGHT	BRIEF EXPLANATION		
YES NO (IF NO, ATTACH EX HAVE ALL WAIVERS AND ECRS BEEN APPROVED AND A		BRIEF EXPLANATION		
YES NO (IF NO, ATTACH EX		BRIEF EXPLANATION		
		UTHORIZED BY		
COGNIZANT ENGINEER DAT			DATE ENVIRONMENTAL REQ	UIREMENTS ENG. DATE
'ark Weilert Male Wales 11-29.	Oy Martin	1-12/10/k	* WING	11-29-04
	SUMM	ARY SECTION		
TEST AGENCY (IF MULTIPLE, ATTACH SUMMARY AND T JPL Building 144	TEST DATES) TEST INITIAT	FION DATE ACCUMU	ATED OPERATING HOURS PRIOR	TO FIRST ENVIRONMENTAL TEST
SERIAL NUMBERS ACTUALLY TESTED	TEST TERMINA		NG HOURS DURING ENVIRONMENT	AL EXPOSURE
		DESCRIPTION		
VIBRATION ACOUSTIC	PYROSHOCK SHOCK	THERMAL VA	CUUM TEMPERATURE AT	MOSPHERE OTHER
AXES: X Y Z	AXES: X Y			MOSPHERE LI OTHER
SINE VIBRATION		290K to 10K 32K	And	
	SHOCKS/AXIS:	NO OF CYCLES: 2	NO OF CYCLES:	
EMC COND. SUSC.	COND. EMIS.	ISOLATION	TEMP. LEVEL (°c) AND ACCUMULA	ATED DURATION (HRS.)
ESD RAD. SUSC.	RAD. EMIS.	MAGNETICS	HOT:°c,	_h COLD:°c, h
			°c,	_h COLD:°c, h
WERE THERE ANY PFRS GENERATED DURING ENVIRON YES MO (1F NO, ATTACH EXC		LIST PFR NOS. / BF	RIEF EXPLANATION	
ARE THE POST ENVIRONMENTAL DAMAGE INSPECTION		LIST DED NOC / DE	RIÉF EXPLANATION	
	COPY OF THE INSPECTION	LIST FIR NOS. / Br	AIEF EAFLANATION	
	ATTACH EXPLANATION)			
WERE ALL PLANNED TESTS/LEVELS/DURATIONS ACHIE	VED?	LIST PFR NOS. / BF	RIEF EXPLANATION	
YES NO (IF NO, ATTACH EXC	CEPTIONS LIST)			
TESTS HAVE NOT BEEN SUCCESSFULLY COMPLET	1		1	
COGNIZANT ENGINEER DAT	E TECHNICAL MGR./INSTF	K MKG./PI PREP REP	DATE ENVIRONMENTAL REQU	UIREMENTS ENG. DATE
HARDWARE HAS SUCCESSFULLY COMPLETED THE COGNIZANT ENGINEER DAT	1		REMAINING ACTIONS HAVE BEEN T	· ·
-	0.0		11	
Mich wall 12-16-04	Martin	12/	13/04 / -11 21	ell 12-16-04



ENVIRONMENTAL TEST AUTHORIZATION AND SUMMARY (ETAS)

OTHER AUTHORIZATION PROVISIONS AND EXPLANATIONS

This ETAS is for Protoflight Level testing of the second Flight Model (flight unit 2, which is SN003) of the SPIRE thermal control assembly (TCA). The test consists of 2 cryogenic thermal cycles (including DC electrical continuity tests) and a z-axis cold PF level shake test.

The thermal cycle test will be done with the TCA unit mounted inside the SPIRE cold alignment facility, which has previously been used for thermal cycle tests on the SPIRE BDA's. This test is a set of 2 cycles before vibration. The unit contains only passive electrical components (heaters and resistance thermometers), which will be DC continuity and isolation tested warm and cold during every cycle.

The 1-axis cold vibration test will be performed with the hardware at <100 K with the TCA unit mounted inside the SPIRE cold vibration facility. The hardware has such a low mass (<50grams) and will be vibrated cold, so no accelerometers or force transducers will be used during the primary tests. The vibration levels will be as specified in the Herschel-Plank Environmental Requirements document, protoflight levels, applied for 1 minute.

ENVIRONMENTAL TEST AUTHORIZATION AND SUMMARY (ETAS) FNVIRONMENTAL TEST SLIMMARY

			TEST ENVIRONMENT DATE TEST TO THE TEST TO	AL TEST SUMM	ARY	70040	
HARDWARE	N/S	ETAS	LEVELS & DURATION	PERFORMED	AGENCY	FAIL	COMMENTS
Assembly (10217660-1)	003	HSOTCA03	Thermal Cycle: 2 Thermal cycles from 290K to <=10K, at a la l	LERFORMED A	AGENCY	FAIL	
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