The ATM Forum
Technical Committee

Conformance Abstract Test Suite for the UNI 3.1 ATM Layer of End Systems

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Conformance Abstract Test Suite for the UNI 3.1 ATM Layer of End Systems

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1. Introduction

This Abstract Test Suite (ATS) is the first version of the ATM Layer ATS for End Systems. This ATS is based on the ATM Layer protocol as described in the ATM Forum User-Network Interface (UNI) Specification, Version 3.1 [1]. This ATS is only a part of a complete Conformance Test Suite for the ATM Layer. The other part of this test suite will cover the ATM Layer Intermediate Systems(e.g. Broadband Switches for example). This test suite was designed for point-to-point configurations only, and does not include point-to-multipoint configurations.

The Protocol Implementation eXtra Information for Testing (PIXIT) proforma is provided in Annex A. The PIXIT questionnaire needs to be completed for a particular Implementation Under Test (IUT)prior to conformance testing.

1.1 Definition of Terminologies

For the purposes of conformance testing, the following definitions are used:

End System: A system is either a virtual channel (VC) or a virtual path (VP) end point which is a logical termination of the VC Connection (VCC) or the VP Connection (VPC). In Figure 1-3 of the ATM Forum UNI Specification, Version 3.1, this is referred to as an ATM End-Point.

Intermediate System: An Intermediate System is located between the two End Systems. It can be an end point of a VPC, but it can not be an end point of a VCC. In Figure 1-3 of the ATM Forum UNI Specification Version 3.1, this is referred to as either a Private ATM Switch or a Public ATM Switch.

2. Methodology

This conformance test suite has been developed as described in ISO/IEC International Standard 9646-1 and 2 [2][3]. The test purposes used here are the same as those that have been developed for UNI 3.0 Cell Layer testing. The remote test method has been selected, and test cases have been generated. The notation used in the ATS is the Tree and Tabular Combined Notation (TTCN) as described in ISO/IEC IS 9646-3 [4]. This version of the ATM Layer conformance test suite uses sequential TTCN, but conversion into concurrent TTCN will bring some improvement in the test case description and implementation.

3. Test Configuration

The test configuration shown in Figure 3-1 is appropriate for testing an End System. The ATM tester would use only one Point of Control and Observation (PCO) corresponding to the one port on the IUT. This one PCO would provide the IUT with test stimuli and a means to monitor the output signal externally. In order to observe the generation and reception of ATM cells at the ATM Adaptation Layer (AAL) or Interim Local Management Interface (ILMI) and ATM layer boundary, an upper teser may be needed which would require a second PCO at these boundaries. The applicability of a test method using an upper tester and the particular test method (remote or distributed test methods) for testing End Systems is for further study.

Test Configuration for an End System

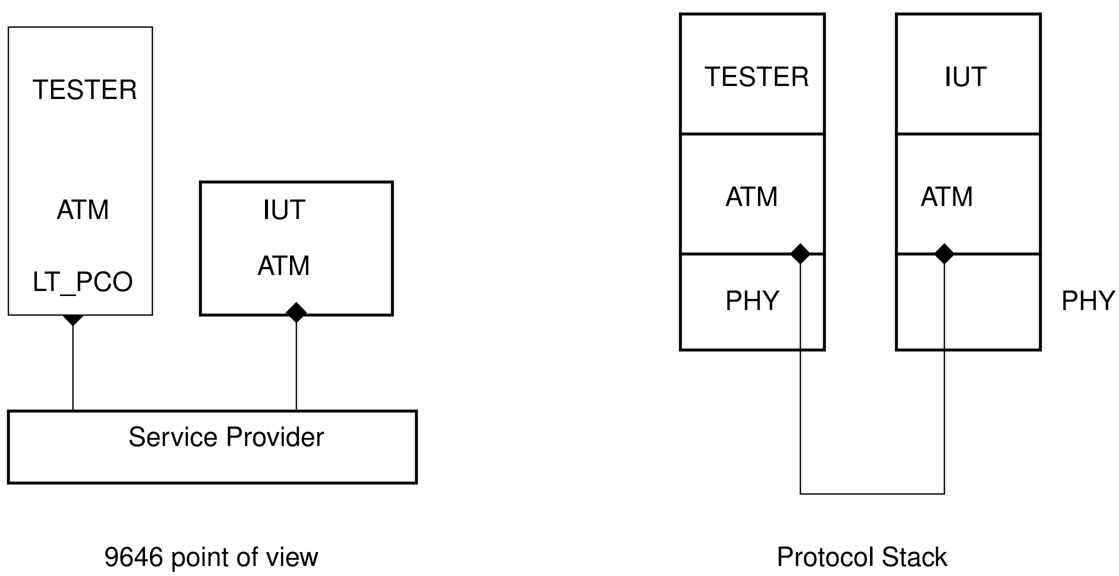

Figure 1. Configuration for testing of an End System.

4. Test Suite Structure

The Test Groups for End Systems are:

ATM Layer Services	Test Groups	Comments
ATM Cell Structure and Encoding at the UNI (General)	• General/	• GFC • VPI/VCI
ATM Layer Functions at the UNI (U-plane)	• Cell_Rate_Decoupling/ • Cell_Discrimination/VCI/ • Cell_Discrimination/PTI/	• Cell rate decoupling • ATM Cell discrimination for the VCI • Payload Type discrimination
ATM Layer Management Specification (M-plane)	• M_plane/Information_Flow/ • M_plane/OAM_Cell_Format/ • M_plane/Fault_Management/ • M_plane/Fault_Management/ Alarm_Surveillance/ • M_plane/Fault_Management/ Connectivity_Verification/ • M_plane/Fault_Management/ Connectivity_Verification/ End_to_End_Loopback • M_plane/Fault_Management/ Connectivity_Verification/UNI_Loopback	• Information Flows • ATM OAM cell format • Fault Management - Alarm Surveillance - Connectivity Verification - End-to-End Loopback - UNI Loopback

5. Assumptions on the Capabilities of the Testers

5.1 Connection Setup

It is assumed that the test equipment provides a means to establish a connection that is independent from the use of Switched Virtual Connections (SVCs) or Permanent Virtual Connections (PVCs). In case SVCs are used, there has to be a way for the tester to determine which VPI/VCI is used, so that the appropriate values can be entered in the PIXIT.

5.2 Unassigned Cells

It is assumed that, if the physical layer requires this, the tester will generate unassigned cells if no data has to be sent. But if the test suite specifies the transmission of a cell, this cell should be sent at the first opportunity. This has to be done even if the test suite specifies an unassigned cell to be sent. In this case the unassigned cell should be generated to the specification given in the PDU Constraint. The ATS expects the tester will pass the stream of unassigned cells received from the IUT. Each test case will deal individually with the unassigned cells. In most of the cases, the unassigned cells will be ignored by the test case.

5.3 Error Generation

The tester is asked to generate errors in some test cases, to allow for testing of alarm conditions. The errors which should be generated are physical failures and virtual path/connection failures. How these errors are generated is left open to the tester and is, therefore, not specified in the test suite.

6. Timers

Four timers have been defined for testing. These timers are:

1. **T_Test**. Used to limit the total test time of each test case. When the test is waiting for a response, or no response from the IUT, it will start the timer. After expiry of T_Test, it will conclude that no response (besides the unassigned cells) is forthcoming. The suggested value for T_Test is 2 seconds.
2. **T_NoResp**. Used to limit the test time waiting for "no response" from the IUT. The suggested value for T_NoResp is 2 seconds.
3. **T_Opr**. Used to allow sufficient time for a test operator to initiate some test action. This timer is used in conjunction with an "Implicit send" for test coordination. The suggested value for T_Opr is 180 seconds.
4. **T_LB**. The time within which the IUT has to return a loopback cell. The default value for T_LB is 1 second.

These timers are not used to verify the exact timing of an implementation, but to limit the time which the test should wait for a message or to limit the total duration of the test. Default values are provided and can be used unless another value is desired.

7. Test Preparation

The tester has to take care of the establishment of the correct VP and VCCs. The test suite does not specify if these connections are SVCs or PVCs. It is left open to the tester to use either method dependent on which one is the most suitable to the IUT.

The VPCs and/or VCCs should be established prior to the execution of the conformance test suite and the appropriate values for the VPI and VCI should be entered in the PIXIT document. If the IUT supports both VP and VC switching, separate VP and VC connections have to be set up to allow testing of both capabilities in the same test run.

For the OAM testing, both end-to-end and segment OAM flows[1] will be tested. For this ATS, which deals with ATM End Systems on the UNI only, this means that an IUT will represent one of the following systems:

- VP segment end system;
- VP connection end system;
- VC segment end system;
- VC connection end system.

A VP segment end system will be any IUT which supports VP service and does not terminate a VP connection; a VP connection end system is an IUT which supports VP service and terminates a VP connection; a VC segment end system will be any IUT offering VC service.

In case an IUT supports multiple configurations, the tester has to set up a separate connection for each

1 In section 3.5.2 of the ATM Forum UNI Specification, Version 3.1, a segment is defined as a single VP or VC link across the UNI.

applicable configuration, enter the VPIs and VCIs in the appropriate spaces in the PIXIT, and run the test suite. It is also possible to test one configuration at a time.

The test cases are grouped into two parts. The first part represents the test cases which use a connection but do not affect it (the connection will be in the same state after the test execution as it was before the test execution), while the second group disturbs a connection and requires that it will be re-established. These are the tests which deal with alarm signals caused by physical errors. If the connection is a SVC, it might be necessary to re-enter the proper values for the VPI/VCIs in the PIXIT and the test suite. If the connection is a PVC, the re-established connection will use the same VPI/VCIs. The testing can be continued without re-entering the values in the PIXIT or test suite.

8. Abbreviations

ATM	Asynchronous Transfer Mode
ATS	Abstract Test Suite
CLP	Cell Loss Priority
FIFO	First in/first out
GFC	Generic Flow Control
HEC	Header Error Control
ISO/IEC	International Organization for Standardization/International Electrotechnical Commission
IUT	Implementation Under Test
OAM	Operation and Maintenance
PCO	Point of Control and Observation
PDU	Protocol Data Unit
PHY	Physical Layer
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
PT	Payload Type
PVC	Permanent Virtual Connection
SVC	Switched Virtual Connection
TTCN	Tree and Tabular Combined Notation
UNI	User-Network Interface
VC	Virtual Channel
VCC	Virtual Channel Connection
VCI	Virtual Channel Identifier
VP	Virtual Path
VPC	Virtual Path Connection
VPI	Virtual Path Identifier

9. References

[1] "ATM User-Network Interface Specification, Version 3.1", ATM Forum, September 1994.

[2] ISO/IEC 9646-1 "Information Technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General Concepts", 1991.

[3] ISO/IEC 9646-2 "Information Technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract test suite specification", 1991.

[4] ISO/IEC 9646-3 "Information Technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The tree and tabular combined notation", 1991.

[5] ATM-Forum/af-test-28.000 - PICS Proforma for the UNI ATM Layer.

Annex A

Protocol Implementation eXtra Information for Testing (PIXIT) Proforma For End Systems

IUT

Name:

____

Version:

____

Machine Configuration:

____

Operating System Identification:

____

IUT Identification:

____

PICS Reference for IUT:

____

Limitations of the IUT:

____

ATM Layer PIXIT - For End Systems

General Information

1 Does the physical interface used for testing require synchronous cell timeslots (e.g., SONET, DS3) ? ____________

2 Enter a sufficient amount of time to guarantee that there is no response from the IUT. (2 seconds recommended) (NORESPtime) ____________

3 Enter a sufficient amount of time to complete each test. (2 seconds recommended) (TESTtime) ____________

OAM specific features

4 Does the IUT support VC alarm signalling on any VCC? (VC_ALARMpar) ____________

5 Does the IUT process the OAM F4 flow while offering VC service only? (VC_F4_SUPpar) ____________

Virtual Path Connections

The following PIXIT questions are specific to the Virtual Path Connections (VPCs) by the IUT and only have to be answered if the VPCs are supported (see PICS).

6 Configure the IUT, setup a VPC and enter the VPI value here: (VPIvpc) ____________

Virtual Circuit Connections

The following PIXIT questions are specific to the Virtual Circuit Connections (VCCs) by the IUT and only have to be answered if the VCCs are supported (see PICS).

7 Configure the IUT, setup a VC Connection and enter the VPI/VCI values here: (VPIvcc) ____________

(VCIvcc) ____________

Implicit Send

The following PIXIT questions are specific to the Implicit Send operation in test case and have to be answered if the IUT supports this capability.

8 Can the IUT be forced to send an User data cell on demand ? (User_Cellpar) ____________

9 Can the IUT be forced to generate an OAM Loopback cell on demand? (Gen_OAM_LBpar) ____________

Annex B

ABSTRACT TEST SUITE for End Systems

The following pages contain the Abstract Test Suite.

I

Test Suite Overview

Test Suite Structure

Suite Name : ATM_UNI_ES_3_1
Standards Ref : ATM Forum User Network Interface Specification, Version 3.1

PICS Ref : ATM Forum/95–1619

PIXIT Ref : ATM_UNI_ES Annex A

Test Method(s) : Remote Single–layer Embedded Test Method

Comments : This conformance test suite deals with end systems only.

Test Group Reference	Selection Ref	Test Group Objective	Page Nr
General/			62
Cell_Rate_Decoupling/			64
Cell_Discrimination/			65
Cell_Discrimination/VCI/			65
Cell_Discrimination/PTI/			65
M_plane/			67
M_plane/OAM_Cell_Format/			67
M_plane/Fault_Management/			72
M_plane/Fault_Management/Alarm_Surveillance/			72
M_plane/Fault_Management/Connectivity_Verification/			73
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/			73
M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/			77

Detailed Comments :

Test Case Index				
Test Group Reference	**Test Case Id**	**Selection Ref**	**Description**	**Page Nr**
General/	Ver_Gen_GFC0_VP		Verify that the IUT encodes all GFC bits to ’0’ in a VPC.	62
General/	Ver_Gen_GFC0_VC		Verify that the IUT encodes all GFC bits to ’0’ in a VCC.	63
General/	Ver_Disc_OAM_Seg_VP_LB		Verify that if the IUT does not support VP level management, it will discard any cells received with VCI=3(i.e., segment F4 flows).	63
General/	Ver_Disc_OAM_End_VP_LB		Verify that if the IUT does not support VP level management, it will discard any cells received with VCI=4 (i.e., End−to−end F4 flows).	64
Cell_Rate_Decoupling/	Ver_Gen_Unass_Cell		Verify that if the IUT has a physical layer that has synchronous cell time slot, it generates and adds unassigned cell to the assigned cell stream to be transmitted, transforming a non−continuous cell stream of assigned cells into a continuous stream of assigned and unassigned cells.	64
Cell_Discrimination/VCI/	Ver_OAM_F4_Coding		Verify that if the IUT supports VP level management, it has the capability to identify and encode OAM F4 flow cells with VCI=3 or VCI=4 for a given VP.	65
Cell_Discrimination/PTI/	Ver_OAM_F5_Coding		Verify that if the IUT supports VC management, it uses the proper coding for segment OAM F5 flow cells with proper PTI code.	65
Cell_Discrimination/PTI/	Disc_OAM_Seg_F5		Verify that if the IUT does not support VC level management, it will ignore (discard) cells with PT code point 100 (Segment OAM F5 flow related).	66
Cell_Discrimination/PTI/	Disc_OAM_End_F5		Verify that if the IUT does not support VC level management, it will ignore (discard) cells with PT code point 101 (End−to−end OAM F5 flow related).	66
M_plane/OAM_Cell_Format/	Disc_F4_Inv_OCT		Verify that the IUT discards an OAM F4 cell which has an invalid OAM Cell Type field.	67
M_plane/OAM_Cell_Format/	Disc_F5_Inv_OCT		Verify that the IUT discards an OAM F5 cell which has an invalid OAM Cell Type field.	67
M_plane/OAM_Cell_Format/	Disc_F4_Inv_OFT		Verify that the IUT discards an OAM F4 cell which has an invalid OAM Function Type field.	68

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Test Case Index				
Test Group Reference	**Test Case Id**	**Selection Ref**	**Description**	**Page Nr**
M_plane/OAM_Cell_Format/	Disc_F5_Inv_OFT		Verify that the IUT discards an OAM F5 cell which has an invalid OAM Function Type field.	68
M_plane/OAM_Cell_Format/	Ign_F4_Inv_CRC		Verify that the IUT ignores a segment OAM F4 loopback cell with an invalid OAM CRC−10 Field.	69
M_plane/OAM_Cell_Format/	Ign_F5_Inv_CRC		Verify that the IUT ignores a segment OAM F5 loopback cell with an invalid OAM CRC−10 field.	69
M_plane/OAM_Cell_Format/	Ver_F4_LB_Res0		Verify that the IUT sets all 7 reserved bits of the OAM F4 Loopback Indication field to ’0’B.	70
M_plane/OAM_Cell_Format/	Ver_F5_LB_Res0		Verify that the IUT sets all 7 reserved bits of the OAM F5 Loopback Indication field to ’0’B.	70
M_plane/OAM_Cell_Format/	Disc_F4_LB_Res1		Verify that the IUT discards an OAM F4 loopback cell with the reserved bits not set to ’0’B.	71
M_plane/OAM_Cell_Format/	Disc_F5_LB_Res1		Verify that the IUT discards an OAM F5 loopback cell with the reserved bits not set to ’0’B.	71
M_plane/Fault_Management/Alarm_Surveilance/	Ver_VP_RDI		Verify that the IUT as an end point of a VP connection will send a VP−RDI in the upstream direction, after receiving a VP−AIS.	72
M_plane/Fault_Management/Alarm_Surveilance/	Ver_VC_RDI		Verify that the IUT shall send a VC−RDI to the upstream direction (toward the public network) on the reception of a VC−AIS.	72
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/	Gen_End_F4_LB		Verify that the IUT can generate the End−to−end Loopback OAM F4 cell for the purpose of End−to−end connectivity verification.	73
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/	Gen_End_F5_LB		Verify that the IUT can generate the End−to−end Loopback OAM F5 cell for the purpose of End−to−end connectivity verification.	73
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/	Ver_VP_End_F4_LB		Verify that if the IUT is an end point of a VPC and the Loopback Indication Field of received End−to−end OAM F4 loopback cell has ’1’B, it will loopback within one second that OAM cell after decrement of the Loopback Indication Field of that cell of the received OAM cell.	74

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Test Case Index

Test Group Reference	Test Case Id	Selection Ref	Description	Page Nr
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/	Ver_VP_End_F4_CT		Verify that if the IUT is an end point of a VPC, it will return an end−to−end OAM F4 loopback cell with the same correlation tag as the original message.	74
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/	Disc_OAM_End_F4_LB0		Verify that if the IUT receives an End−to−end OAM F4 cell with a Loopback Indication field as ’0’B, it will remove that OAM cell.	75
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/	Ver_OAM_End_F5_LB		Verify that if the IUT is an end point of a VCC and the Loopback Indication Field of received End−to−end OAM F5 loopback cell has ’1’B, it will loopback within one second that OAM cell after decrement of the Loopback Indication Field of that cell.	75
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/	Disc_OAM_End_F5_LB0		Verify that if the IUT receives an End−to−end OAM F5 cell with a Loopback Indocation field as ’0’B, it will remove that OAM cell.	76
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/	Ver_VC_End_F5_CT		Verify that if the IUT is an end point of a VCC, it will return an End−to−end OAM F5 loopback cell with the same correlation tag as the original message.	76
M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/	Gen_Seg_F4_LB		Verify that the IUT can generate the UNI Loopback OAM F4 cell for the purpose of the UNI connectivity verification.	77
M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/	Gen_Seg_F5_LB		Verify that the IUT can generate the UNI Loopback OAM F5 cell for the purpose of the UNI connectivity verification.	77
M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/	Ver_VP_Seg_F4		Verify that if the IUT is an end point of a VP Segment at the UNI and the Loopback Indication Field of received Segment OAM F4 Loopback cell has ’1’B, it will loop back that OAM cell after decrement of the Loopback Indication Field of that cell.	78
M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/	Disc_OAM_Seg_F4_LB0		Verify that if the IUT receives a Segment OAM F4 cell with a Loopback indication field as ’0’B, it will remove that OAM cell.	78
M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/	Ver_VC_Seg_F5		Verify that if the IUT is an end point of a VC Segment at the UNI and the Loopback Indication Field of received Segment OAM F5 Loopback cell has ’1’B, it will loop back that OAM cell after decrement of the Loopback Indication Field of that cell.	79

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Test Case Index				
Test Group Reference	**Test Case Id**	**Selection Ref**	**Description**	**Page Nr**
M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/	Disc_OAM_Seg_F5_LB0		Verify that if the IUT receives a Segment OAM F5 cell with a Loopback Indication field as '0'B, it will remove that OAM cell.	79
M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/	Ver_VP_Seg_F4_CT		Verify that if the IUT supports VP service, it will return a Segment OAM F4 loopback cell with the same correlation tag as the original message.	80
M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/	Ver_VC_Seg_F5_CT		Verify that if the IUT supports VC service, it will return a Segment OAM F5 loopback cell with the same correlation tag as the original message.	80
Detailed Comments :				

II

Declarations Part

Test Suite Operations Definition
Operation Name : Valid_HEC(GFC_val,VPI_val,VCI_val,PTI_val,CLP_val:BITSTRING)
Result Type : OCTETSTRING
Comments :
Description
Valid_HEC calculates the proper value for the HEC field of a PDU based on the first four octets of the header and returns a valid HEC value.
Detailed Comments :

Test Suite Operations Definition
Operation Name : Valid_CRC
Result Type : OCTETSTRING
Comments :
Description
Valid_CRC calculates the proper value for the CRC field of an OAM cell. The value used to compute a valid CRC is the text of the OAM cell of the PDU constraint from where this operation is called.
Detailed Comments :

Test Suite Operations Definition
Operation Name : Invalid_CRC
Result Type : OCTETSTRING
Comments :
Description
Invalid_CRC calculates the wrong value for the CRC field of an OAM cell. The value used to compute an invalid CRC is the text of the OAM cell of the constraint from where this operation is called.
Detailed Comments :

Test Suite Operations Definition
Operation Name : PadOctet(octet:BITSTRING; len:INTEGER)
Result Type : OCTETSTRING
Comments :
Description
This operation creates an octetstring by repeating a given "octet" pattern "len" times.
Detailed Comments :

Test Suite Parameter Declarations			
Parameter Name	**Type**	**PICS/PIXIT Ref**	**Comments**
PHY_SYNCH	BOOLEAN	PIXIT 1	Does the physical interface used for testing require synchronous cell timeslot (e.g., SONET, DS3)?
VP_SERVpar	BOOLEAN	PICS 3.3.1	Does the IUT support VP service?
VC_SERVpar	BOOLEAN	PICS 3.3.2	Does the IUT support VC service?
VC_ALARMpar	BOOLEAN	PIXIT 4	Does the IUT support VC alarm signalling on the tested VCC?
VC_F4_SUPpar	BOOLEAN	PIXIT 5	Does the IUT support F4 flows while offering VC service only?
NORESPtime	INTEGER	PIXIT 2	Enter the maximum time it can take for a cell to be forwarded by the IUT.
TESTtime	INTEGER	PIXIT 3	Enter a sufficient amount of time to complete each test.
TOPRtime	INTEGER		Enter a sufficient amount of time for test operator to initiate some test action. (recommend 180 seconds)
VPIvpc	BITSTRING	PIXIT 6	The VPI value for the VPC for testing.
VPIvcc	BITSTRING	PIXIT 7	The VPI value for the VCC for testing.
VCIvcc	BITSTRING	PIXIT 7	The VCI value for the VCC for testing.
User_Cellpar	BOOLEAN	PIXIT 8	Can the IUT be forced to send an User Data cell on demand ?
Gen_OAM_LBpar	BOOLEAN	PIXIT 9	Can the IUT be forced to generate OAM Loopback cell on demand ?
Detailed Comments :			

Test Case Selection Expression Definitions		
Expression Name	**Selection Expression**	**Comments**
CONT_CELL	PHY_SYNCH	The physical layers for SONET and DS3 require a continuous stream of cells to be generated.
VP_SERV	VP_SERVpar	VP service
NO_VP_SERV	NOT(VP_SERVpar)	No VP service
VC_SERV	VC_SERVpar	VC service
NO_VC_SERV	NOT(VC_SERVpar)	No VC service
VC_SERV_F4	(VC_SERVpar AND VP_SERVpar) OR (VC_SERVpar AND NOT (VP_SERVpar) AND VC_F4_SUPpar)	Supports F4 flows in addition to supporting either 1) VC and VP services, or 2) VC service only (does not support VP service)
SEND_USER_CELL_VC	VC_SERVpar AND User_Cellpar	Support VC service and an user data cell can be generated on demand
SEND_USER_CELL_VP	VP_SERVpar AND User_Cellpar	Support VP service and an user data cell can be generated on demand
GEN_OAM_F4_LB	VP_SERVpar AND Gen_OAM_LBpar	Support VP service and an OAM Loopback cell can be generated on demand
GEN_OAM_F5_LB	VC_SERVpar AND Gen_OAM_LBpar	Support VC service and an OAM Loopback cell can be generated on demand
Detailed Comments :		

Test Suite Constant Declarations			
Constant Name	**Type**	**Value**	**Comments**
SEG_OAM_F4	BITSTRING	’0000000000000011’B	VCI = 3
END_OAM_F4	BITSTRING	’0000000000000100’B	VCI = 4
Invalid_OCT	BITSTRING	’1111’B	Invalid OAM Cell Type Field value
Invalid_OFT	BITSTRING	’1111’B	Invalid OAM Function Type Field value
Val_VCI	BITSTRING	’0000000000101000’B	Valid VCI=40, An arbitrarily chosen value.
Detailed Comments :			

Test Case Variable Declarations			
Variable Name	**Type**	**Value**	**Comments**
GFC_VAL	BITSTRING		Value of GFC field
Detailed Comments :			

PCO Declarations			
PCO Name	**PCO Type**	**Role**	**Comments**
LT_PCO	PHYSAP	LT	PHY Layer service access point(PHYSAP) on the lower tester
Detailed Comments :			

Timer Declarations			
Timer Name	**Duration**	**Unit**	**Comments**
T_Test	TESTtime	sec	A sufficient amount of time to complete each test.
T_NoResp	NORESPtime	sec	A sufficient amount of time to guarantee no response from the IUT.
T_Opr	TOPRtime	sec	Time allowed for tester operator intervention. Used in "Implecit Send" for test coordination.
T_LB	1	sec	Time within which the Loopback cell has to return
Detailed Comments :			

TTCN PDU Type Definition

PDU Name : CELL
PCO Type : PHYSAP
Comments :

Field Name	Field Type	Comments
GFC	BITSTRING[4]	Generic Flow Control
VPI	BITSTRING[8]	Virtual Path ID
VCI	BITSTRING[16]	Virtual Channel ID
PTI	BITSTRING[3]	Payload Type ID
CLP	BITSTRING[1]	Cell Loss Priority
HEC	OCTETSTRING[1]	Header Error Check
Payload	OCTETSTRING[48]	

Detailed Comments :

TTCN PDU Type Definition

PDU Name : OAM_LB
PCO Type : PHYSAP
Comments : Loopback Cell

Field Name	Field Type	Comments
GFC	BITSTRING[4]	Generic Flow Control
VPI	BITSTRING[8]	Virtual Path ID
VCI	BITSTRING[16]	Virtual Channel ID
PTI	BITSTRING[3]	Payload Type ID
CLP	BITSTRING[1]	Cell Loss Priority
HEC	OCTETSTRING[1]	Header Error Check
OAM_Cell_Type	BITSTRING[4]	
Function_Type	BITSTRING[4]	
Reserved	BITSTRING[7]	
Loopback_ID	BITSTRING[1]	
Correlation_Tag	OCTETSTRING[4]	
Loopback_Location	OCTETSTRING[16]	
Source_ID	OCTETSTRING[16]	
Unused	OCTETSTRING[8]	
CRC_10	OCTETSTRING[2]	

Detailed Comments :

TTCN PDU Type Definition

PDU Name : OAM_ER
PCO Type : PHYSAP
Comments : Alarm Surveillance cell

Field Name	Field Type	Comments
GFC	BITSTRING[4]	Generic Flow Control
VPI	BITSTRING[8]	Virtual Path ID
VCI	BITSTRING[16]	Virtual Channel ID
PTI	BITSTRING[3]	Payload Type ID
CLP	BITSTRING[1]	Cell Loss Priority
HEC	OCTETSTRING[1]	Header Error Check
OAM_Cell_Type	BITSTRING[4]	
Function_Type	BITSTRING[4]	
Failure_Type	OCTETSTRING[1]	
Failure_Location	OCTETSTRING[16]	
Unused	OCTETSTRING[28]	
CRC_10	OCTETSTRING[2]	

Detailed Comments :

III

Constraints Part

TTCN PDU Constraint Declaration

Constraint Name : CELL_UNASSIGNED
PDU Type : CELL
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	’00000000’B	
VCI	’0000000000000000’B	
PTI	?	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,’00000000’B,’0000000000000000’B,CELL.PTI,’0’B)	
Payload	?	

Detailed Comments :

TTCN PDU Constraint Declaration

Constraint Name : USER_CELL(VPI_val,VCI_val:BITSTRING)
PDU Type : CELL
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	?	
VPI	VPI_val	
VCI	VCI_val	
PTI	’0??’B	
CLP	?	
HEC	Valid_HEC(CELL.GFC,VPI_val,VCI_val,CELL.PTI,CELL.CLP)	
Payload	PadOctet(’00’O,48)	

Detailed Comments : Reception of user data cell with any congestion or SDU type

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F4_LB0(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	SEG_OAM_F4	
PTI	’0?0’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,SEG_OAM_F4,OAM_LB.PTI,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	?	
Loopback_ID	’0’B	
Correlation_Tag	?	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Reception Loopback F4

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F4_LB0_S(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	SEG_OAM_F4	
PTI	’010’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,SEG_OAM_F4,’010’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’0’B	
Correlation_Tag	PadOctet(’02’O,4)	
Loopback_Location	PadOctet(’FF’O,16)	
Source_ID	PadOctet(’FF’O,16)	
Unused	PadOctet(’6A’O,8)	
CRC_10	Valid_CRC	

Detailed Comments : Sending a Loopback F4 with Loopback_ID = 0

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F4_LB1(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	'0000'B	
VPI	VPI_val	
VCI	SEG_OAM_F4	
PTI	'000'B	
CLP	'0'B	
HEC	Valid_HEC('0000'B,VPI_val,SEG_OAM_F4,'000'B,'0'B)	
OAM_Cell_Type	'0001'B	
Function_Type	'1000'B	
Reserved	'0000000'B	
Loopback_ID	'1'B	
Correlation_Tag	PadOctet('01'O,4)	
Loopback_Location	PadOctet('FF'O,16)	
Source_ID	PadOctet('FF'O,16)	
Unused	PadOctet('6A'O,8)	
CRC_10	Valid_CRC	

Detailed Comments : Send Loopback segment F4

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F4_LB1_RES1(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	SEG_OAM_F4	
PTI	’000’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,SEG_OAM_F4,’000’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’1111111’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’01’O,4)	
Loopback_Location	PadOctet(’FF’O,16)	
Source_ID	PadOctet(’FF’O,16)	
Unused	PadOctet(’6A’O,8)	
CRC_10	Valid_CRC	

Detailed Comments : Send Loopback segment F4 with non−zero reserved bits

TTCN PDU Constraint Declaration		
Constraint Name : OAM_SEG_F4_RES0(VPI_val:BITSTRING) **PDU Type** : OAM_LB **Derivation Path** : **Comments** :		
Field Name	**Field Value**	**Comments**
GFC	’0000’B	
VPI	VPI_val	
VCI	SEG_OAM_F4	
PTI	’0?0’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,SEG_OAM_F4,OAM_LB.PTI,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	Verify this field
Loopback_ID	?	
Correlation_Tag	?	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	
Detailed Comments : Check seven unused bits in the loopback ID		

TTCN PDU Constraint Declaration		
Constraint Name : OAM_SEG_F4_CT(VPI_val:BITSTRING) **PDU Type** : OAM_LB **Derivation Path** : **Comments** :		
Field Name	**Field Value**	**Comments**
GFC	’0000’B	
VPI	VPI_val	
VCI	SEG_OAM_F4	
PTI	’0?0’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,SEG_OAM_F4,OAM_LB.PTI,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	?	
Loopback_ID	?	
Correlation_Tag	PadOctet(’01’O,4)	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	
Detailed Comments : Check correlation Tag		

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F4_LB0(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	END_OAM_F4	
PTI	’0?0’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,END_OAM_F4,OAM_LB.PTI,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	?	
Loopback_ID	’0’B	
Correlation_Tag	?	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Receive End_to_End loopback F4

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F4_LB0_S(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	END_OAM_F4	
PTI	’010’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,END_OAM_F4,’010’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’0’B	
Correlation_Tag	PadOctet(’02’O,4)	
Loopback_Location	PadOctet(’FF’O,16)	
Source_ID	PadOctet(’FF’O,16)	
Unused	PadOctet(’6A’O,8)	
CRC_10	Valid_CRC	

Detailed Comments : Sending an End_to_End loopback F4 with Loopbak_ID = 0

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F4_LB1(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	END_OAM_F4	
PTI	’000’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,END_OAM_F4,’000’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’02’O,4)	
Loopback_Location	PadOctet(’FF’O,16)	
Source_ID	PadOctet(’FF’O,16)	
Unused	PadOctet(’6A’O,8)	
CRC_10	Valid_CRC	

Detailed Comments : Send End_to_End F4 loopback cell

TTCN PDU Constraint Declaration		
Constraint Name : OAM_END_F4_CT(VPI_val:BITSTRING) **PDU Type** : OAM_LB **Derivation Path** : **Comments** :		
Field Name	**Field Value**	**Comments**
GFC	’0000’B	
VPI	VPI_val	
VCI	END_OAM_F4	
PTI	’0?0’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,END_OAM_F4,OAM_LB.PTI,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	?	
Loopback_ID	?	
Correlation_Tag	PadOctet(’02’O,4)	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	
Detailed Comments : Check End_to_End F4 loopback Correlation Tag		

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F5_LB0(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’100’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’100’B,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	?	
Loopback_ID	’0’B	
Correlation_Tag	?	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Reception segment F5 loopback cell

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F5_LB0_S(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’100’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’100’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’0’B	
Correlation_Tag	PadOctet(’04’O,4)	
Loopback_Location	PadOctet(’FF’O,16)	
Source_ID	PadOctet(’FF’O,16)	
Unused	PadOctet(’6A’O,8)	
CRC_10	Valid_CRC	

Detailed Comments : Sending a segment F5 loopback cell with Loopback_ID = 0

TTCN PDU Constraint Declaration		
Constraint Name : OAM_SEG_F5_LB1(VPI_val,VCI_val:BITSTRING) **PDU Type** : OAM_LB **Derivation Path** : **Comments** :		
Field Name	**Field Value**	**Comments**
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’100’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’100’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’03’O,4)	
Loopback_Location	PadOctet(’FF’O,16)	
Source_ID	PadOctet(’FF’O,16)	
Unused	PadOctet(’6A’O,8)	
CRC_10	Valid_CRC	
Detailed Comments : Send segment F5 loopback cell		

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F5_LB1_RES1(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’100’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’100’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’1111111’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’03’O,4)	
Loopback_Location	PadOctet(’FF’O,16)	
Source_ID	PadOctet(’FF’O,16)	
Unused	PadOctet(’6A’O,8)	
CRC_10	Valid_CRC	

Detailed Comments : Send segment F5 loopback cell with non−zero reserved bits

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F5_RES0(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	'0000'B	
VPI	VPI_val	
VCI	VCI_val	
PTI	'100'B	
CLP	'?'B	
HEC	Valid_HEC('0000'B,VPI_val,VCI_val,'100'B,OAM_LB.CLP)	
OAM_Cell_Type	'0001'B	
Function_Type	'1000'B	
Reserved	'0000000'B	Verify this field
Loopback_ID	?	
Correlation_Tag	?	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Check the seven unused bits in the loopback ID.

TTCN PDU Constraint Declaration		
Constraint Name : OAM_SEG_F5_CT(VPI_val,VCI_val:BITSTRING) **PDU Type** : OAM_LB **Derivation Path** : **Comments** :		
Field Name	**Field Value**	**Comments**
GFC	'0000'B	
VPI	VPI_val	
VCI	VCI_val	
PTI	'100'B	
CLP	'?'B	
HEC	Valid_HEC('0000'B,VPI_val,VCI_val,'100'B,OAM_LB.CLP)	
OAM_Cell_Type	'0001'B	
Function_Type	'1000'B	
Reserved	?	
Loopback_ID	?	
Correlation_Tag	PadOctet('03'O,4)	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	
Detailed Comments : Check segment F5 loopback correlation tag field		

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F5_CT(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	'0000'B	
VPI	VPI_val	
VCI	VCI_val	
PTI	'101'B	
CLP	'?'B	
HEC	Valid_HEC('0000'B,VPI_val,VCI_val,'101'B,OAM_LB.CLP)	
OAM_Cell_Type	'0001'B	
Function_Type	'1000'B	
Reserved	?	
Loopback_ID	?	
Correlation_Tag	PadOctet('03'O,4)	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Check end−to−end F5 loopback correlation tag field

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F5_LB0(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’101’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’101’B,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	?	
Loopback_ID	’0’B	
Correlation_Tag	?	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Reception End_to_End F5 loopback cell

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F5_LB0_S(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’101’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’101’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’0’B	
Correlation_Tag	PadOctet(’04’O,4)	
Loopback_Location	PadOctet(’FF’O,16)	
Source_ID	PadOctet(’FF’O,16)	
Unused	PadOctet(’6A’O,8)	
CRC_10	Valid_CRC	

Detailed Comments : Sending an End_to_End F5 loopback cell with Loopback_ID = 0

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F5_LB1(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’101’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’101’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’04’O,4)	
Loopback_Location	PadOctet(’FF’O,16)	
Source_ID	PadOctet(’FF’O,16)	
Unused	PadOctet(’6A’O,8)	
CRC_10	Valid_CRC	

Detailed Comments : Send End_to_End F5 loopback cell

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F4_INV_CRC(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	SEG_OAM_F4	
PTI	’000’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,SEG_OAM_F4,’000’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’00’O,4)	
Loopback_Location	PadOctet(’FF’O,16)	
Source_ID	PadOctet(’FF’O,16)	
Unused	PadOctet(’6A’O,8)	
CRC_10	Invalid_CRC	

Detailed Comments : Invalid CRC Field

TTCN PDU Constraint Declaration		
Constraint Name : OAM_SEG_F5_INV_CRC(VPI_val,VCI_val:BITSTRING) **PDU Type** : OAM_LB **Derivation Path** : **Comments** :		
Field Name	**Field Value**	**Comments**
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’100’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’100’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’00’O,4)	
Loopback_Location	PadOctet(’FF’O,16)	
Source_ID	PadOctet(’FF’O,16)	
Unused	PadOctet(’6A’O,8)	
CRC_10	Invalid_CRC	
Detailed Comments : Invalid CRC		

TTCN PDU Constraint Declaration

Constraint Name : OAM_VP_AIS(VPI_val:BITSTRING)
PDU Type : OAM_ER
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	'0000'B	
VPI	VPI_val	
VCI	END_OAM_F4	
PTI	'000'B	
CLP	'0'B	
HEC	Valid_HEC('0000'B,VPI_val,END_OAM_F4,'000'B,'0'B)	
OAM_Cell_Type	'0001'B	
Function_Type	'0000'B	
Failure_Type	'6A'O	
Failure_Location	PadOctet('6A'O,16)	
Unused	PadOctet('6A'O,28)	
CRC_10	Valid_CRC	

Detailed Comments :

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F4_INV_OCT(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	'0000'B	
VPI	VPI_val	
VCI	END_OAM_F4	
PTI	'000'B	
CLP	'0'B	
HEC	Valid_HEC('0000'B,VPI_val,END_OAM_F4,'000'B,'0'B)	
OAM_Cell_Type	Invalid_OCT	
Function_Type	'1000'B	
Reserved	'0000000'B	
Loopback_ID	'1'B	
Correlation_Tag	PadOctet('01'O,4)	
Loopback_Location	PadOctet('FF'O,16)	
Source_ID	PadOctet('FF'O,16)	
Unused	PadOctet('6A'O,8)	
CRC_10	Valid_CRC	

Detailed Comments : Send Loopback end−to−end F4 loopback cell with an invalid OAM Cell Type field.

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F4_INV_OFT(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	END_OAM_F4	
PTI	’000’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,END_OAM_F4,’000’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	Invalid_OFT	
Reserved	’0000000’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’01’O,4)	
Loopback_Location	PadOctet(’FF’O,16)	
Source_ID	PadOctet(’FF’O,16)	
Unused	PadOctet(’6A’O,8)	
CRC_10	Valid_CRC	

Detailed Comments : Send end−to−end F4 loopback cell with an invalid OAM Function Type field.

TTCN PDU Constraint Declaration

Constraint Name : OAM_VP_RDI(VPI_val:BITSTRING)
PDU Type : OAM_ER
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	END_OAM_F4	
PTI	’000’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,END_OAM_F4,’000’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’0001’B	
Failure_Type	’6A’O	
Failure_Location	PadOctet(’6A’O,16)	
Unused	PadOctet(’6A’O,28)	
CRC_10	Valid_CRC	

Detailed Comments :

TTCN PDU Constraint Declaration

Constraint Name : OAM_VC_AIS(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_ER
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’101’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’101’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’0000’B	
Failure_Type	’6A’O	
Failure_Location	PadOctet(’6A’O,16)	
Unused	PadOctet(’6A’O,28)	
CRC_10	Valid_CRC	

Detailed Comments :

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F5_INV_OCT(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’101’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’101’B,’0’B)	
OAM_Cell_Type	Invalid_OCT	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’04’O,4)	
Loopback_Location	PadOctet(’FF’O,16)	
Source_ID	PadOctet(’FF’O,16)	
Unused	PadOctet(’6A’O,8)	
CRC_10	Valid_CRC	

Detailed Comments : Send End_to_End F5 loopback cell with an invalid OAM Cell Type field.

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F5_INV_OFT(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’101’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’101’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	Invalid_OFT	
Reserved	’0000000’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’04’O,4)	
Loopback_Location	PadOctet(’FF’O,16)	
Source_ID	PadOctet(’FF’O,16)	
Unused	PadOctet(’6A’O,8)	
CRC_10	Valid_CRC	

Detailed Comments : Send End_to_End F5 loopback cell with an invalid OAM Function Type field.

TTCN PDU Constraint Declaration

Constraint Name : OAM_VC_RDI(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_ER
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’101’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’101’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’0001’B	
Failure_Type	’6A’O	
Failure_Location	PadOctet(’6A’O,16)	
Unused	PadOctet(’6A’O,28)	
CRC_10	Valid_CRC	

Detailed Comments :

IV

Dynamic Part

Test Case Dynamic Behaviour

Test Case Name : Ver_Gen_GFC0_VP
Group : General/
Purpose : Verify that the IUT encodes all GFC bits to '0' in a VPC.

Default :
Comments : Requires a VP connection. Ref. 3.3/PICS 3.5.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		<IUT!CELL>	USER_CELL(VPIvpc,Val_VCI)		Request that the IUT sends a general user data cell on VPC.
2		START T_Opr			
3		(GFC_VAL:='0000'B)			
4	LB1	LT_PCO?CELL	USER_CELL(VPIvpc,Val_VCI)		
5		[CELL.GFC=GFC_VAL]		P	
6		[CELL.GFC<>GFC_VAL]		F	
7		LT_PCO?CELL	CELL_UNASSIGNED		
8		GOTO LB1			
9		?TIMEOUT T_Opr		I	
10		LT_PCO?OTHERWISE		F	

Detailed Comments :
Selection Ref:SEND_USER_CELL_VP; For the VP connection, the VCI will be abitrarily set to the value of the 'Val_VCI'(It should be greater than 32)

Test Case Dynamic Behaviour

Test Case Name : Ver_Gen_GFC0_VC
Group : General/
Purpose : Verify that the IUT encodes all GFC bits to '0' in a VCC.

Default :
Comments : Requires a VC connection. Ref. 3.3/PICS 3.5.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		<IUT!CELL>	USER_CELL(VPIvcc,VCIvcc)		Request that the IUT sends a general user data cell on VCC.
2		START T_Opr			
3		(GFC_VAL:='0000'B)			
4	LB1	LT_PCO?CELL	USER_CELL(VPIvcc,VCIvcc)		
5		[CELL.GFC=GFC_VAL]		P	
6		[CELL.GFC<>GFC_VAL]		F	
7		LT_PCO?CELL	CELL_UNASSIGNED		
8		GOTO LB1			
9		?TIMEOUT T_Opr		I	
10		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref:SEND_USER_CELL_VC

Test Case Dynamic Behaviour

Test Case Name : Ver_Disc_OAM_Seg_VP_LB
Group : General/
Purpose :
Verify that if the IUT does not support VP level management, it will discard any cells received with VCI=3(i.e., segment F4 flows).

Default :
Comments : Requires a VP connections. Ref. 3.4.3/PICS 3.15.5

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_ER	OAM_VP_AIS(VPIvpc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: NO_VP_SERV

Test Case Dynamic Behaviour					
Test Case Name : Ver_Disc_OAM_End_VP_LB					
Group : General/					
Purpose : Verify that if the IUT does not support VP level management, it will discard any cells received with VCI=4 (i.e., End−to−end F4 flows).					
Default :					
Comments : Requires a VP connections. Ref. 3.4.3/PICS 3.15.5					
Nr	**Label**	**Behaviour Description**	**Constraints Ref**	**Verdict**	**Comments**
1		LT_PCO!OAM_LB	OAM_END_F4_LB1(VPIvpc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	
Detailed Comments : Selection Ref: NO_VP_SERV					

Test Case Dynamic Behaviour					
Test Case Name : Ver_Gen_Unass_Cell					
Group : Cell_Rate_Decoupling/					
Purpose : Verify that if the IUT has a physical layer that has synchronous cell time slot, it generates and adds unassigned cell to the assigned cell stream to be transmitted, transforming a non−continuous cell stream of assigned cells into a continuous stream of assigned and unassigned cells.					
Default :					
Comments : Requires a VP connection or a VC connection. Ref. 3.4.2/PICS 3.10.1					
Nr	**Label**	**Behaviour Description**	**Constraints Ref**	**Verdict**	**Comments**
1		START T_Test			
2		LT_PCO?CELL	CELL_UNASSIGNED	P	
3		?TIMEOUT T_Test		F	
4		LT_PCO?OTHERWISE		F	
Detailed Comments : Selection Ref: CONT_CELL. Physical layer requires a continuous stream of unassigned cells to be generated. The timing requirement in this case in not to check on the absolute rate, but just to restrict the time of the test case.					

Test Case Dynamic Behaviour

Test Case Name : Ver_OAM_F4_Coding
Group : Cell_Discrimination/VCI/
Purpose : Verify that if the IUT supports VP level management, it has the capability to identify and encode OAM F4 flow cells with VCI=3 or VCI=4 for a given VP.
Default :
Comments : Requires a VP connection. Ref. 3.4.3, 3.5.2/PICS 3.15.5

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F4_LB1(VPIvpc)		
2		START T_Test			
3	LB1	LT_PCO?OAM_LB	OAM_SEG_F4_LB0(VPIvpc)	P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_OAM_F5_Coding
Group : Cell_Discrimination/PTI/
Purpose : Verify that if the IUT supports VC management, it uses the proper coding for segment OAM F5 flow cells with proper PTI code.
Default :
Comments : Requires a VC connection. Ref. 3.4.4, 3.5.2/PICS 3.15.5

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F5_LB1(VPIvcc, VCIvcc)		
2		START T_Test			
3	LB1	LT_PCO?OAM_LB	OAM_SEG_F5_LB0(VPIvcc, VCIvcc)	P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Disc_OAM_Seg_F5
Group : Cell_Discrimination/PTI/
Purpose :
Verify that if the IUT does not support VC level management, it will ignore (discard) cells with PT code point 100 (Segment OAM F5 flow related).

Default :
Comments : Requires a VC connection. Ref. 3.4.4/PICS 3.6.8

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F5_LB1(VPIvcc, VCIvcc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	The IUT should not return anything

Detailed Comments : Selection Ref: NO_VC_SERV. In this case "ignore" is interpreted as "discard".

Test Case Dynamic Behaviour

Test Case Name : Disc_OAM_End_F5
Group : Cell_Discrimination/PTI/
Purpose :
Verify that if the IUT does not support VC level management, it will ignore (discard) cells with PT code point 101 (End−to−end OAM F5 flow related).

Default :
Comments : Requires a VC connection. Ref. 3.4.4/PICS 3.6.10

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_END_F5_LB1(VPIvcc, VCIvcc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	The IUT should not return anything except unassigned cell

Detailed Comments : Selection Ref: NO_VC_SERV. In this case "ignore" is interpreted as "discard".

Test Case Dynamic Behaviour

Test Case Name : Disc_F4_Inv_OCT
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT discards an OAM F4 cell which has an invalid OAM Cell Type field.

Default :
Comments : Requires a VP connection. Ref. 3.5.2/PICS 3.15.7

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_END_F4_INV_OCT(VPIvpc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	The IUT should not return anything

Detailed Comments : Selection Ref: VP_SERV.

Test Case Dynamic Behaviour

Test Case Name : Disc_F5_Inv_OCT
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT discards an OAM F5 cell which has an invalid OAM Cell Type field.

Default :
Comments : Requires a VC connection. Ref. 3.5.2/PICS 3.15.7

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_END_F5_INV_OCT(VPIvcc,VCIvcc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	The IUT should not return anything

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Disc_F4_Inv_OFT
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT discards an OAM F4 cell which has an invalid OAM Function Type field.

Default :
Comments : Requires a VP connection. Ref. 3.5.2/PICS 3.15.8

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_END_F4_INV_OFT(VPIvpc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	The IUT should not return anything

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Disc_F5_Inv_OFT
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT discards an OAM F5 cell which has an invalid OAM Function Type field.

Default :
Comments : Requires a VC connection. Ref. 3.5.2/PICS 3.15.8

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_END_F5_INV_OFT(VPIvcc,VCIvcc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	The IUT should not return anything

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Ign_F4_Inv_CRC
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT ignores a segment OAM F4 loopback cell with an invalid OAM CRC−10 Field.

Default :
Comments : Requires a VP connection. Ref. 3.5.2/PICS 3.15.6

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F4_INV_CRC(VPIvpc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref.: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ign_F5_Inv_CRC
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT ignores a segment OAM F5 loopback cell with an invalid OAM CRC−10 field.

Default :
Comments : Requires a VC connection. Ref. 3.5.2/PICS 3.15.6

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F5_INV_CRC(VPIvcc,VCIvcc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_F4_LB_Res0
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT sets all 7 reserved bits of the OAM F4 Loopback Indication field to ’0’B.

Default :
Comments : Requires a VP connection. Ref. 3.5.2/PICS 3.17.6

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F4_LB1(VPIvpc)		
2		START T_Test			
3	LB1	LT_PCO?OAM_LB	OAM_SEG_F4_RES0(VPIvpc)	P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_F5_LB_Res0
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT sets all 7 reserved bits of the OAM F5 Loopback Indication field to ’0’B.

Default :
Comments : Requires a VP connection. Ref. 3.5.2/PICS 3.17.6

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F5_LB1(VPIvcc, VCIvcc)		
2		START T_Test			
3	LB1	LT_PCO?OAM_LB	OAM_SEG_F5_RES0(VPIvcc, VCIvcc)	P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Disc_F4_LB_Res1
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT discards an OAM F4 loopback cell with the reserved bits not set to '0'B.

Default :
Comments : Requires a VP connection. Ref. 3.5.2, 3.5.3.2/PICS 3.17.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F4_LB1_RES1(VPIvpc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Disc_F5_LB_Res1
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT discards an OAM F5 loopback cell with the reserved bits not set to '0'B.

Default :
Comments : Requires a VC connection. Ref. 3.5.2, 3.5.3.2/PICS 3.17.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F5_LB1_RES1(VPIvcc, VCIvcc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_RDI
Group : M_plane/Fault_Management/Alarm_Surveilance/
Purpose : Verify that the IUT as an end point of a VP connection will send a VP–RDI in the upstream direction, after receiving a VP–AIS.

Default :
Comments : Requires a VP connection. Ref. 3.5.3.1/PICS 3.16.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_ER	OAM_VP_AIS(VPIvpc)		
2		START T_Test			
3	LB1	LT_PCO?OAM_ER	OAM_VP_RDI(VPIvpc)	P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VC_RDI
Group : M_plane/Fault_Management/Alarm_Surveilance/
Purpose : Verify that the IUT shall send a VC–RDI to the upstream direction (toward the public network) on the reception of a VC–AIS.

Default :
Comments : Requires a VC connection. Ref. 3.5.3.1/PICS 3.16.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_ER	OAM_VC_AIS(VPIvcc, VCIvcc)		
2		START T_Test			
3	LB1	LT_PCO?OAM_ER	OAM_VC_RDI(VPIvcc, VCIvcc)	P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Gen_End_F4_LB
Group : M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/
Purpose : Verify that the IUT can generate the End−to−end Loopback OAM F4 cell for the purpose of End−to−end connectivity verification.

Default :
Comments : Requires a VP connection. Ref. 3.5.3.2.1/PICS 3.17.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		<IUT!OAM_LB>	OAM_END_F4_LB1(VPIvpc)		
2		START T_Opr			
3	LB1	LT_PCO?OAM_LB	OAM_END_F4_LB1(VPIvpc)	P	
4		LT_PCO!OAM_LB	OAM_END_F4_LB0_S(VPIvpc)		
5		LT_PCO?CELL	CELL_UNASSIGNED		
6		GOTO LB1			
7		?TIMEOUT T_Opr		I	
8		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: GEN_OAM_F4_LB

Test Case Dynamic Behaviour

Test Case Name : Gen_End_F5_LB
Group : M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/
Purpose : Verify that the IUT can generate the End−to−end Loopback OAM F5 cell for the purpose of End−to−end connectivity verification.

Default :
Comments : Requires a VC connection. Ref. 3.5.3.2.1/PICS 3.17.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		<IUT!OAM_LB>	OAM_END_F5_LB1(VPIvcc,VCIvcc)		
2		START T_Opr			
3	LB1	LT_PCO?OAM_LB	OAM_END_F5_LB1(VPIvcc,VCIvcc)	P	
4		LT_PCO!OAM_LB	OAM_END_F5_LB0_S(VPIvcc,VCI vcc)		
5		LT_PCO?CELL	CELL_UNASSIGNED		
6		GOTO LB1			
7		?TIMEOUT T_Opr		I	
8		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: GEN_OAM_F5_LB

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_End_F4_LB
Group : M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/
Purpose :
Verify that if the IUT is an end point of a VPC and the Loopback Indication Field of received End−to−end OAM F4 loopback cell has '1'B, it will loopback within one second that OAM cell after decrement of the Loopback Indication Field of that cell of the received OAM cell.

Default :
Comments : Requires a VP connection. Ref. 3.5.3.2/PICS 3.17.3, 3.17.4

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_END_F4_LB1(VPIvpc)		
2		START T_LB			
3	LB1	LT_PCO?OAM_LB	OAM_END_F4_LB0(VPIvpc)	P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_LB		F	
7		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV_F4

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_End_F4_CT
Group : M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/
Purpose :
Verify that if the IUT is an end point of a VPC, it will return an end−to−end OAM F4 loopback cell with the same correlation tag as the original message.

Default :
Comments : Requires a VP connection. Ref. 3.5.3.2/PICS 3.15.11, 3.17.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_END_F4_LB1(VPIvpc)		
2		START T_Test			
3	LB1	LT_PCO?OAM_LB	OAM_END_F4_CT(VPIvpc)	P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV_F4

Test Case Dynamic Behaviour

Test Case Name : Disc_OAM_End_F4_LB0
Group : M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/
Purpose :
Verify that if the IUT receives an End−to−end OAM F4 cell with a Loopback Indication field as ’0’B, it will remove that OAM cell.

Default :
Comments : Requires a VP connection. Ref. 3.5.3.2.1/PICS 3.17.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_END_F4_LB0_S(VPIvpc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_OAM_End_F5_LB
Group : M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/
Purpose :
Verify that if the IUT is an end point of a VCC and the Loopback Indication Field of received End−to−end OAM F5 loopback cell has ’1’B, it will loopback within one second that OAM cell after decrement of the Loopback Indication Field of that cell.

Default :
Comments : Requires a VC connection. Ref. 3.5.3.2.1/PICS 3.17.3, 3.17.4

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_END_F5_LB1(VPIvcc, VCIvcc)		
2		START T_LB			
3	LB1	LT_PCO?OAM_LB	OAM_END_F5_LB0(VPIvcc, VCIvcc)	P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_LB		F	
7		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Disc_OAM_End_F5_LB0
Group : M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/
Purpose :
Verify that if the IUT receives an End−to−end OAM F5 cell with a Loopback Indocation field as ’0’B, it will remove that OAM cell.

Default :
Comments : Requires a VC connection. Ref. 3.5.3.2.1/PICS 3.17.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_END_F5_LB0_S(VPIvcc,VCIvcc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VC_End_F5_CT
Group : M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/
Purpose :
Verify that if the IUT is an end point of a VCC, it will return an End−to−end OAM F5 loopback cell with the same correlation tag as the original message.

Default :
Comments : Requires a VC connection. Ref. 3.5.3.2.1/PICS 3.15.11, 3.17.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_END_F5_LB1(VPIvcc, VCIvcc)		
2		START T_Test			
3	LB1	LT_PCO?OAM_LB	OAM_END_F5_CT(VPIvcc, VCIvcc)	P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Gen_Seg_F4_LB
Group : M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/
Purpose : Verify that the IUT can generate the UNI Loopback OAM F4 cell for the purpose of the UNI connectivity verification.

Default :
Comments : Requires a VP connection. Ref. 3.5.3.2.2/PICS 3.17.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		<IUT!OAM_LB>	OAM_SEG_F4_LB1(VPIvpc)		
2		START T_Opr			
3	LB1	LT_PCO?OAM_LB	OAM_SEG_F4_LB1(VPIvpc)	P	
4		LT_PCO!OAM_LB	OAM_SEG_F4_LB0_S(VPIvpc)		
5		LT_PCO?CELL	CELL_UNASSIGNED		
6		GOTO LB1			
7		?TIMEOUT T_Opr		I	
8		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref.: GEN_OAM_F4_LB

Test Case Dynamic Behaviour

Test Case Name : Gen_Seg_F5_LB
Group : M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/
Purpose : Verify that the IUT can generate the UNI Loopback OAM F5 cell for the purpose of the UNI connectivity verification.

Default :
Comments : Requires a VC connection. Ref. 3.5.3.2.2/PICS 3.17.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		<IUT!OAM_LB>	OAM_SEG_F5_LB1(VPIvcc,VCIvcc)		
2		START T_Opr			
3	LB1	LT_PCO?OAM_LB	OAM_SEG_F5_LB1(VPIvcc,VCIvcc)	P	
4		LT_PCO!OAM_LB	OAM_SEG_F5_LB0_S(VPIvcc,VCIvcc)		
5		LT_PCO?CELL	CELL_UNASSIGNED		
6		GOTO LB1			
7		?TIMEOUT T_Opr		I	
8		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref.: GEN_OAM_F5_LB

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_Seg_F4
Group : M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/
Purpose :
Verify that if the IUT is an end point of a VP Segment at the UNI and the Loopback Indication Field of received Segment OAM F4 Loopback cell has ’1’B, it will loop back that OAM cell after decrement of the Loopback Indication Field of that cell.

Default :
Comments : Requires a VP connection. Ref. 3.5.3.2.2/PICS 3.17.3, 3.17.4

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F4_LB1(VPIvpc)		
2		START T_LB			
3	LB1	LT_PCO?OAM_LB	OAM_SEG_F4_LB0(VPIvpc)	P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_LB		F	
7		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref.: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Disc_OAM_Seg_F4_LB0
Group : M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/
Purpose : Verify that if the IUT receives a Segment OAM F4 cell with a Loopback indication field as ’0’B, it will remove that OAM cell.

Default :
Comments : Requires a VP connection. Ref. 3.5.3.2.2/PICS 3.17.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F4_LB0_S(VPIvpc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VC_Seg_F5
Group : M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/
Purpose :
Verify that if the IUT is an end point of a VC Segment at the UNI and the Loopback Indication Field of received Segment OAM F5 Loopback cell has '1'B, it will loop back that OAM cell after decrement of the Loopback Indication Field of that cell.
Default :
Comments : Requires a VC connection. Ref. 3.5.3.2.2/PICS 3.17.3, 3.17.4

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F5_LB1(VPIvcc, VCIvcc)		
2		START T_LB			
3	LB1	LT_PCO?OAM_LB	OAM_SEG_F5_LB0(VPIvcc, VCIvcc)	P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_LB		F	
7		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Disc_OAM_Seg_F5_LB0
Group : M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/
Purpose : Verify that if the IUT receives a Segment OAM F5 cell with a Loopback Indication field as '0'B, it will remove that OAM cell.
Default :
Comments : Requires a VC connection. Ref. 3.5.3.2.2/PICS 3.17.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F5_LB0_S(VPIvcc,VCIvcc)		
2		START T_NoResp			
3	LB1	?TIMEOUT T_NoResp		P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_Seg_F4_CT
Group : M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/
Purpose :
Verify that if the IUT supports VP service, it will return a Segment OAM F4 loopback cell with the same correlation tag as the original message.

Default :
Comments : Requires a VP connection. Ref. 3.5.3.2.2/PICS 3.15.11, 3.17.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F4_LB1(VPIvpc)		
2		START T_Test			
3	LB1	LT_PCO?OAM_LB	OAM_SEG_F4_CT(VPIvpc)	P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VC_Seg_F5_CT
Group : M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/
Purpose :
Verify that if the IUT supports VC service, it will return a Segment OAM F5 loopback cell with the same correlation tag as the original message.

Default :
Comments : Requires a VC connection. Ref. 3.5.3.2.2/PICS 3.15.11, 3.17.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		LT_PCO!OAM_LB	OAM_SEG_F5_LB1(VPIvcc, VCIvcc)		
2		START T_Test			
3	LB1	LT_PCO?OAM_LB	OAM_SEG_F5_CT(VPIvcc, VCIvcc)	P	
4		LT_PCO?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		LT_PCO?OTHERWISE		F	

Detailed Comments : Selection Ref.: VC_SERV