# Information for incremental parameter for ER on "Transmission Terminal Equipment"

| Sl. No. | Essential Requirement | Corresponding GR/IR | Incremental Parameters in ER | Parameters pertaining to |
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| 1. | Transmission Terminal Equipment Variant 1: SDH Equipment | 1. STM-1 Synchronous Multiplexer TEC/GR/TX/SDH-004/04.JAN.2011 | There are no incremental parameters for interfaces covered in the GR. | Product variant |
| | | 2. STM-4 Synchronous Multiplexer for TM, ADM & Multi-ADM Applications- TEC/GR/TX/SDH-010/03.JAN.2011 | There are no incremental parameters for interfaces covered in the GR. | |
| | | 3. STM-16 Synchronous Multiplexer for TM, ADM & Multi-ADM Applications - TEC/GR/TX/SDH-008/03.JAN.2011 | There are no incremental parameters for interfaces covered in the GR. | |
| | | 4. STM-64 Synchronous Multiplexer at bit rates for (TM & ADM) for Metro Applications - TEC/GR/TX/SDH-007/02.JAN.2011 | There are no incremental parameters for interfaces covered in the GR. | |
| | | 5. Interface Requirements for interchange of STM-1, STM-4 and STM-16, STM-64 & STM-256 signals between different networks - TEC/IR/TX/DMX-006/04/MAR-18 | There are no incremental parameters for interfaces covered in the GR. | |
| | | 6. Interface Requirement for interchange of Digital Signals at 2, 8, 34, 45 & 140 Mb/s ports - TEC/IR/TX/DMX-007/02/SEP-12 | There are no incremental parameters for interfaces covered in the GR. | |
| | Transmission Terminal Equipment Variant 2: Multiplexing Equipment | 1. 2 Mb/ s Versatile Multiplexer- TEC/GR/TX/ANE-001/05.SEP.11 | There are no incremental parameters for interfaces covered in the GR. | Name of Interface |
| | | 2. 2 Mb/s PCM Multiplexing Equipment - GR/PCM-02/04.MAR.2009 | There are no incremental parameters for | |

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| | | | interfaces covered in the GR. | |
| | | 3. Interface Requirement for interchange of Digital Signals at 2, 8, 34, 45 & 140 Mb/s ports - TEC/IR/TX/DMX-007/02/SEP-12 | There are no incremental parameters for interfaces covered in the GR. | |
| | Transmission Terminal Equipment Variant 3: Digital Cross Connect | 1. SDH-based Digital Cross Connect system with 40G, 60G & 80G capacities GR/DXC-02/03.MAR.2009 | There are no incremental parameters for interfaces covered in the GR. | |
| | | 2. Optical-Electrical-Optical (O-E-O) based Digital Cross-Connect (DXC) Equipment with Automatic Switched Optical Network (ASON) Capability - GR/DXC-03/02.SEP.2008 | There are no incremental parameters for interfaces covered in the GR. | |
| | | 3. 64 Kb/s Cross Connect with 2048 Kb/s access Port - GR/DTC-01/03.AUG.2008 | There are no incremental parameters for interfaces covered in the GR. | |
| | | 4. Multi-Service Optical Transport Network (OTN) platform with DWDM bearer transport system for Metro and Core Network applications - TEC/GR/TX/OTN-001/02/DEC-17 | There are no incremental parameters for interfaces covered in the GR. | |
| | | 5. Interface Requirement for interchange of Digital Signals at 2, 8, 34, 45 & 140 Mb/s ports - TEC/IR/TX/DMX-007/02/SEP-12 | There are no incremental parameters for interfaces covered in the GR. | |
| | Transmission Terminal Equipment Variant 4: Dense Wavelength | 1. 40/80 Channel Dense Wavelength Division Multiplexing (DWDM) Equipment with Channel Bit-rates upto 10Gbps for Metro/Core Network Applications - TEC/GR/TX/WDM-010/01/DEC-16 | There are no incremental parameters for interfaces covered in the GR. | |

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| | Division Multiplexing (DWDM) Equipment | 2. 40/80 Channel Dense Wavelength Division Multiplexing (DWDM) Equipment with Channel Bit-rates upto 40Gbps for Core Network Applications - TEC/GR/TX/WDM-007/01/ APR-2010 | There are no incremental parameters for interfaces covered in the GR. | |
| | | 3. 40/80 Channel Dense Wavelength Division Multiplexing (DWDM) Equipment with Channel Bit-rates upto 100Gbps for Metro/Core Network Applications- TEC/GR/TX/WDM-009/01/MAR-16 | There are no incremental parameters for interfaces covered in the GR. | |
| | | 4. Interface Requirements for interchange of STM-1, STM-4 and STM-16, STM-64 signals between different networks - TEC/IR/TX/DMX-006/04/MAR-18 | There are no incremental parameters for interfaces covered in the GR. | |

**Note 1**: For EMI/EMC and Safety, latest standard issued by the Radio division has been included in the ER.

## Information for incremental parameter for ER on "PON family of Broadband equipment"

| S No | Essential Requirement | Corresponding GR/IR | Incremental parameter in ER | Parameters pertaining to | Remarks |
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| 1. | PON Family of Broadband Equipment | 1. 10 Gigabit Symmetric Passive Optical Network(XG-PON) Technology for FTTx based Broadband Applications (TEC/GR/FA/ XGS-001/01 OCT 2018)<br>2. FTTX based Broadband Access Applications using GPON technology with Mini-OLT (TEC/GR /FA/PON-002/02/ NOV-2018)<br>3. Wavelength Division Multiplexing Passive Optical Network (WDM-PDN) Technology for FTTx based Broadband (TEC/GR/FA/ WDM-PON-001/01 MAR 2017)<br>4. FTTH/FTTB/FTTC Broadband | Dual IP Layer Operation RFC 4213 - Address | Variant 1: PON ONT | No test is required, if Vendor submits test result/test report complying mentioned RFC of this test parameter in ER. |
| 2. | | | Dual IP Layer Operation RFC 4213 - DNS | Variant 1: PON ONT | |
| 3. | | | IPV4 Parameters Set-A | Variant 1: PON ONT | |
| 4. | | | IPV6 Extn Header Parameters | Variant 1: PON ONT | |
| 5. | | | IPV6 Header Parameters | Variant 1: PON ONT | |
| 6. | | | Dual IP Layer Operation RFC 4213 - Address | Variant 2: PON ONU | No test is required, if Vendor submits test result/test report complying mentioned RFC of this test parameter in ER. |
| 7. | | | Dual IP Layer Operation RFC 4213 - DNS | Variant 2: PON ONU | |
| 8. | | | IPV4 Parameters Set-A | Variant 2: PON ONU | |
| 9. | | | IPV6 Extn Header Parameters | Variant 2: PON ONU | |
| 10. | | | IPV6 Header Parameters | Variant 2: PON ONU | |
| 11. | | | Switch Fabric Throughput Capability OLT | Variant 3: PON OLT | |
| 12. | | | Protocol Test for GPON Int | GPON interface | No test is required, if Vendor submits test result/test report complying protocol test of interface |
| 13. | | | Protocol Test for NGPON2 Int | NGPON2 interface | No test is required, if Vendor submits test result/test |

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| | | Access Applications using GPON Technology with amendment dated 28.6.2017 (TEC/GR/FA/ PON-01/03.MAR 2017)<br>5. FTTH/FTTB/FTTC Broadband Access Applications Using EPON Technology (TEC/GR/FA/ EPN-001/02/SEP-19)<br>6. 10 Gigabit Passive Optical Network(XG-PON) Technology for FTTx based Broadband Applications (TEC/GR/FA/ XGA--001/02/NOV-2018)<br>7. 40-Gigabit-capablePassive Optical-Network (NG-PON2) technology for FTTX based broadband applications (TEC/GR/FA/ NG2- | | | report complying protocol test of interface |
| 14. | | | Protocol Test for WDMPON Int | WDMPON interface | No test is required, if Vendor submits test result/test report complying protocol test of interface |
| 15. | | | Protocol Test for XGPON Int | XGPON interface | No test is required, if Vendor submits test result/test report complying protocol test of interface |
| 16. | | | Protocol Test for XGSPON Int | XGSPON interface | No test is required, if Vendor submits test result/test report complying protocol test of interface |
| 17. | | | **Line test** | | **This test is remote loop test performed on DSL port of ONU by OLT** |
| 18. | | | Over Voltage Current Protection on 2W | Variant 1: PON ONT | **All 2W test parameters are applicable in case of DSL port are available at UNI side(User Network** |
| 19. | | | Over Voltage Current Protection on 2W | Variant 2: PON ONU | |
| 20. | | | Idle State Current for 2 wire Int | 2W interface | |
| 21. | | | Insulation Test for 2 wire Int | 2W interface | |
| 22. | | | Longitudinal Conversion | 2W interface | |

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| | | 001/01/MAR-20)-(***Under approval)*** | Loss for 2W Int | | **Interface)** |
| 23. | | | Maximum Loop Current for 2W Int | 2W interface | |
| 24. | | | Return Loss for 2W Int | 2W interface | |
| 25. | | | Link Speed and Autonegotiation Test GE | 10 100 1000 BASE-T Ethernet interface | |
| 26. | | | Link Speed and Autonegotiation Test FE | 10 100 BASE-T Ethernet interface | |
| 27. | | | Link Speed | 10 BASE-T Ethernet interface | |
| 28. | | | 2.4 GHz WiFi Radio Conformance | WiFi interface | |
| 29. | | | 5 GHz WiFi Radio Conformance | WiFi interface | |
| 30. | | | EIRP for Wifi Interface | WiFi interface | |
| 31. | | | Frequency for WiFi equipments | WiFi interface | |
| 32. | | | Input Jitter Tolerance for 2 Mbps Int | 2 Mbps - E1 interface | |
| 33. | | | Input Return Loss for 2 Mbps Int | 2 Mbps - E1 interface | |
| 34. | | | Nominal Bit Rate with Tolerance for 2 Mbps Int | 2 Mbps - E1 interface | |
| 35. | | | Output Jitter for 2 Mbps Int | 2 Mbps - E1 interface | |
| 36. | | | Pulse Mask for 2 Mbps Int | 2 Mbps - E1 interface | |
| 37. | | | Bit Rate for ADSL Int | ADSL interface | |
| 38. | | | Impulse Noise Protection for ADSL Int | ADSL interface | |
| 39. | | | Insulation Test for 2 wire Int | ADSL interface | |
| 40. | | | Line Port impedance for ADSLxInt | ADSL interface | |
| 41. | | | Loop resistance for ADSLx | ADSL interface | |
| 42. | | | PSD for ADSL Int | ADSL | |

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| | | | | interface | |
| 43. | | | Transmitted Power At ATU-C for ADSLxInt | ADSL interface | |
| 44. | | | Impulse Noise Protection for G.FAST Int | G.FAST Interface | |
| 45. | | | Insulation Test for G.FAST Int | G.FAST Interface | |
| 46. | | | Loop Resistance for G.FAST IntSLx | G.FAST Interface | |
| 47. | | | PPPoE for G.FAST Int | G.FAST Interface | |
| 48. | | | Profiles for G.FAST Int | G.FAST Interface | |
| 49. | | | PVC Support for G.FAST Int | G.FAST Interface | |
| 50. | | | Throughput Test for G.FAST Int | G.FAST Interface | |
| 51. | | | VPI-VCI Support for G.FAST Int | G.FAST Interface | |
| 52. | | | Profiles for G.HN Int | G.HN interface | |
| 53. | | | PSD for G.HN | G.HN interface | |
| 54. | | | Bit Rate for VDSLxInt | VDSL interface | |
| 55. | | | Insulation Test for 2 wire Int | VDSL interface | |
| 56. | | | Line Port impedance for VDSLxInt | VDSL interface | |
| 57. | | | Loop resistance for VDSLx | VDSL interface | |
| 58. | | | Profiles for VDSLx | VDSL interface | |
| 59. | | | PSD for VDSLxInt | VDSL interface | |
| 60. | | | Return Loss for VDSLx | VDSL interface | |
| 61. | | | Transmitted Power At ATU-C for VDSLxInt | VDSL interface | |
| 62. | | | RF Video Output Bandwidth | RF Video interface | |
| 63. | | | RF Video Output Level | RF Video interface | |
| 64. | | | RF Video Output Tilt | RF Video interface | |

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| 65. | | | Average Launch power for 1 GE Opt | 1 G Optical Ethernet interface | |
| 66. | | | Receiver Sensitivity 1 GE Opt | 1 G Optical Ethernet interface | |
| 67. | | | Wavelength for 1 GE Opt | 1 G Optical Ethernet interface | |
| 68. | | | Average Launch power for 10 GE Opt | 10 G Optical Ethernet interface | |
| 69. | | | Receiver Sensitivity 10 GE Opt | 10 G Optical Ethernet interface | |
| 70. | | | Wavelength for 10 GE Opt | 10 G Optical Ethernet interface | |
| 71. | | | Input Jitter Tolerance for STM-1 Opt | STM-1 Optical Interface | |
| 72. | | | Mean Launched Power for STM-1 Opt Int | STM-1 Optical Interface | |
| 73. | | | Nominal Bit Rate with Tolerance STM-1 Opt Int | STM-1 Optical Interface | |
| 74. | | | Operating Wavelength Range for STM-1 Opt Int | STM-1 Optical Interface | |
| 75. | | | Output Jitter for STM-1 Opt Int | STM-1 Optical Interface | |
| 76. | | | Receiver Overload for STM-1 Opt Int | STM-1 Optical Interface | |
| 77. | | | Receiver Sensitivity for STM-1 Opt Int | STM-1 Optical Interface | |