DIAMOND
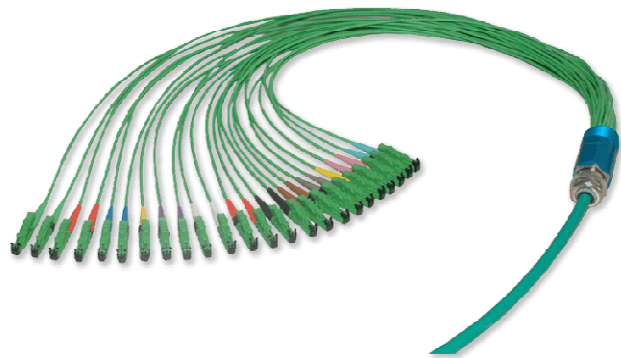**Test & Calibration Laboratory STS 333 / SCS 101**

Product Specification
Test Report

Fan-out SM 24 channels

Index

The present Test Report (TR) summarizes the measurements and tests performed to verify the design and the optical, mechanical and environmental performance of the fan-out SM 24 channels at the accredited test & calibration laboratory STS 333 / SCS 101 at Diamond SA, Losone. This current TR is a summary of the internal report no. 2915 performed at the test & calibration laboratory STS 333 / SCS 101 (www.sas.ch).

For additional information, please contact Diamond or your Diamond Sales Representative.

Insertion loss

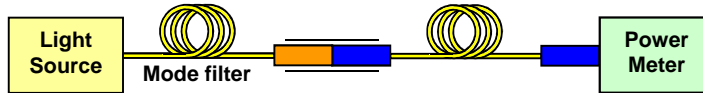**Methods:**   Method B according to IEC 61300-3-4

a) Reference measurement:

```
┌─────────┐   ⊙⊙⊙              ┌─────────┐
│  Light  │───⊙⊙⊙───▬▬───────│  Power  │
│ Source  │  Mode filter      │  Meter  │
└─────────┘                    └─────────┘
```

b) DUT measurement:

```
┌─────────┐   ⊙⊙⊙              ⊙⊙⊙          ┌─────────┐
│  Light  │───⊙⊙⊙───▬▬▬▬───⊙⊙⊙───▬▬───│  Power  │
│ Source  │  Mode filter                   │  Meter  │
└─────────┘                                 └─────────┘
```

Requirements: IL $_{Max}$ ≤ 0.40 dB

Samples:
- DUT: 2 fan-outs SM 24 channels terminated with Diamond E-2000^{TM} APC SM connectors
- Fibre / cable type: - 8.2/125/245/9500 μm, Diamond art. no. 1021642
                          - 8.2/125/245/2100 μm, Diamond art. no. 1029201
- Reference connectors: 1 Diamond E-2000^{TM} APC SM reference connector
- Mating adapter: 1 Diamond E-2000^{TM} SM mating adapter

Parameters:
- Wavelengths: 1310 nm / 1550 nm
- No. of measurements: 96

Remarks: The insertion loss refers to the attenuation of the complete fan-out and of the Diamond E-2000^{TM} APC SM connector on the input side

Results:

Statistics	Insertion loss IL against reference connector [dB]	
	at 1310 nm	at 1550 nm
Mean value	0.16	0.14
Standard deviation	0.06	0.04
Maximum value	0.35	0.24
Minimum value	0.07	0.07

Change of temperature

Methods: - Insertion loss measurement method B according to IEC 61300-3-4
- Active monitoring of attenuation according to IEC 61300-3-3
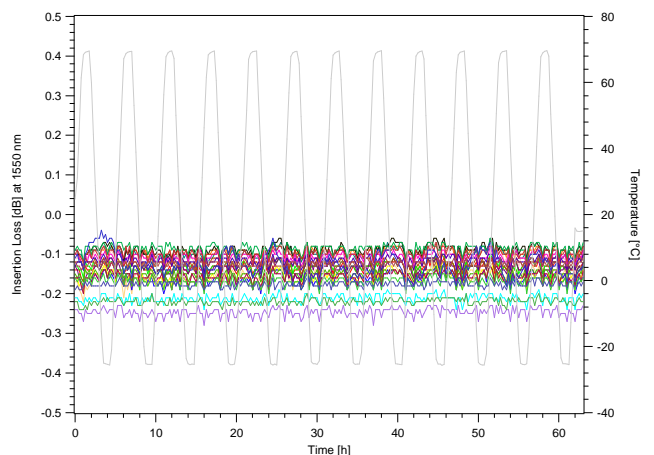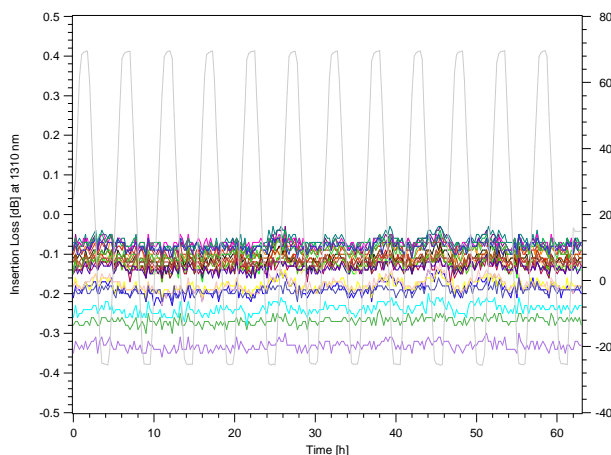- Change of temperature test according to IEC 61300-2-22

T, RH

Climatic chamber
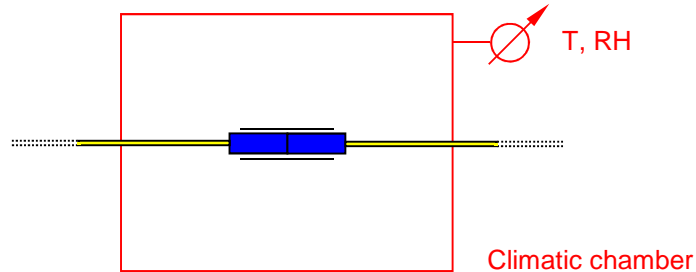
Requirements: $\Delta IL_{Max} \leq 0.20$ dB during test

Samples: - DUT: 1 fan-out SM 24 channels terminated with Diamond
E-2000™ APC SM connectors
- Fibre / cable type: - 8.2/125/245/9500 µm, Diamond art. no. 1021642
- 8.2/125/245/2100 µm, Diamond art. no. 1029201

Parameters: - Wavelengths: 1310 nm / 1550 nm
- Monitored channels: 24
- Upper cycling temperature: +70°C
- Lower cycling temperature: -25°C
- Relative humidity: Not controlled
- Dwell time at extreme temperatures: 1 h
- Variation of temperature at slopes: 1K/min
- Number of cycles: 12
- Duration: 62 h

Results:

Statistics	Variation of insertion loss ΔIL during test [dB]	
	at 1310 nm	**at 1550 nm**
Maximum value	0.11	0.15
Minimum value	0.05	0.03

Cable retention

Methods: - Insertion loss measurement method B according to IEC 61300-3-4
- Active monitoring of attenuation according to IEC 61300-3-3
- Cable retention test according to IEC 61300-2-4

Applied force

Fixing device
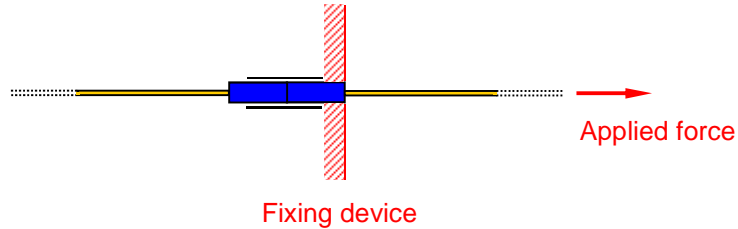
Requirements: $\Delta IL_{Max} \leq 0.20$ dB during test

Samples: - DUT: 2 fan-outs SM 24 channels terminated with Diamond E-2000[TM] APC SM connectors
- Fibre / cable type: - 8.2/125/245/9500 μm, Diamond art. no. 1021642
- 8.2/125/245/2100 μm, Diamond art. no. 1029201

Parameters: - Wavelengths: 1310 nm / 1550 nm
- Monitored channels: 24
- Applied force: 700 N
- Force direction: Longitudinal fan-out axis
- Duration of applied force: 2 min
- Force application distance: 30 cm

Remarks: Force applied on the 8.2/125/245/9500 μm Diamond art. no. 1021642 cable side

Results:

Sample no.	Channel no.	Insertion loss IL [dB]						Variation of insertion loss ΔIL [dB]	
		before test		during test		after test			
		at 1310 nm	at 1550 nm	at 1310 nm	at 1550 nm	at 1310 nm	at 1550 nm	at 1310 nm	at 1550 nm
1	1	0.02	0.02	0.01	0.02	0.00	0.02	0.02	0.00
	2	0.19	0.02	0.18	0.03	0.18	0.03	0.01	0.01
	3	0.02	0.03	0.02	0.04	0.01	0.04	0.01	0.01
	4	0.31	0.18	0.31	0.20	0.31	0.20	0.00	0.02
	5	0.01	0.04	0.01	0.05	0.01	0.05	0.00	0.01
	6	0.28	0.09	0.28	0.10	0.28	0.12	0.00	0.03
	7	0.16	0.14	0.15	0.15	0.15	0.15	0.01	0.01
	8	0.02	0.11	0.01	0.12	0.01	0.12	0.01	0.01
	9	0.08	0.15	0.08	0.16	0.08	0.16	0.00	0.01
	10	0.03	0.01	0.03	0.02	0.03	0.02	0.00	0.01
	11	0.11	0.08	0.10	0.09	0.10	0.09	0.01	0.01
	12	0.24	0.15	0.23	0.16	0.23	0.16	0.01	0.01
	13	0.34	0.42	0.32	0.43	0.32	0.42	0.02	0.01
	14	0.01	0.02	0.00	0.02	0.00	0.03	0.01	0.01
	15	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00
	16	0.04	0.03	0.03	0.03	0.03	0.03	0.01	0.00
	17	0.05	0.03	0.04	0.04	0.04	0.04	0.01	0.01
	18	0.10	0.11	0.10	0.11	0.10	0.11	0.00	0.00
	19	0.03	0.04	0.02	0.05	0.02	0.05	0.01	0.01
	20	0.03	0.04	0.02	0.02	0.02	0.02	0.01	0.02
	21	0.05	0.07	0.04	0.09	0.04	0.09	0.01	0.02
	22	0.07	0.10	0.06	0.11	0.06	0.11	0.01	0.01
	23	0.13	0.13	0.12	0.13	0.12	0.13	0.01	0.00
	24	0.03	0.07	0.02	0.04	0.02	0.04	0.01	0.03
Maximum value								0.02	0.03
Minimum value								0.00	0.00

Sample no.	Channel no.	Insertion loss IL [dB]						Variation of insertion loss ΔIL [dB]	
		before test		during test		after test			
		at 1310 nm	at 1550 nm	at 1310 nm	at 1550 nm	at 1310 nm	at 1550 nm	at 1310 nm	at 1550 nm
2	1	0.07	0.18	0.06	0.18	0.06	0.18	0.01	0.00
	2	0.10	0.14	0.09	0.14	0.09	0.14	0.01	0.00
	3	0.03	0.09	0.02	0.10	0.02	0.10	0.01	0.01
	4	0.11	0.16	0.09	0.16	0.09	0.16	0.02	0.00
	5	0.03	0.05	0.02	0.06	0.02	0.06	0.01	0.01
	6	0.36	0.14	0.36	0.15	0.36	0.14	0.00	0.01
	7	0.05	0.10	0.04	0.11	0.04	0.11	0.01	0.01
	8	0.09	0.10	0.08	0.11	0.08	0.11	0.01	0.01
	9	0.05	0.17	0.04	0.18	0.04	0.17	0.01	0.01
	10	0.03	0.12	0.03	0.14	0.03	0.14	0.00	0.02
	11	0.07	0.10	0.06	0.11	0.07	0.11	0.01	0.01
	12	0.16	0.21	0.16	0.22	0.16	0.21	0.00	0.01
	13	0.02	0.11	0.01	0.11	0.01	0.11	0.01	0.00
	14	0.04	0.02	0.04	0.03	0.04	0.03	0.00	0.01
	15	0.06	0.02	0.05	0.03	0.05	0.03	0.01	0.01
	16	0.08	0.12	0.07	0.10	0.07	0.10	0.01	0.02
	17	0.06	0.02	0.05	0.02	0.05	0.02	0.01	0.00
	18	0.10	0.14	0.09	0.15	0.09	0.14	0.01	0.01
	19	0.04	0.04	0.03	0.03	0.03	0.03	0.01	0.01
	20	0.04	0.04	0.03	0.03	0.03	0.03	0.01	0.01
	21	0.02	0.09	0.01	0.11	0.01	0.11	0.01	0.02
	22	0.09	0.17	0.07	0.17	0.07	0.17	0.02	0.00
	23	0.11	0.20	0.11	0.21	0.11	0.21	0.00	0.01
	24	0.04	0.08	0.03	0.09	0.03	0.09	0.01	0.01
Maximum value								0.02	0.02
Minimum value								0.00	0.00