TECHNICAL CODE

FREE SPACE OPTICS - SPECIFICATIONS

Developed by

Registered by

Registered date:

MCMC MTSFB TC TXXX:2025

Development of technical codes

The Communications and Multimedia Act 1998 ('the Act') provides for Technical Standards Forum designated under section 184 of the Act or the Malaysian Communications and Multimedia Commission ('the Commission') to prepare a technical code. The technical code prepared pursuant to section 185 of the Act shall consist of, at least, the requirement for network interoperability and the promotion of safety of network facilities.

Section 96 of the Act also provides for the Commission to determine a technical code in accordance with section 55 of the Act if the technical code is not developed under an applicable provision of the Act and it is unlikely to be developed by the Technical Standards Forum within a reasonable time.

In exercise of the power conferred by section 184 of the Act, the Commission has designated the Malaysian Technical Standards Forum Bhd ('MTSFB') as a Technical Standards Forum which is obligated, among others, to prepare the technical code under section 185 of the Act.

A technical code prepared in accordance with section 185 shall not be effective until it is registered by the Commission pursuant to section 95 of the Act.

For further information on the technical code, please contact:

Malaysian Communications and Multimedia Commission (MCMC)
MCMC Tower 1
Jalan Impact
Cyber 6
63000 Cyberjaya
Selangor Darul Ehsan
MALAYSIA

Tel : +60 3 8688 8000
Fax : +60 3 8688 1000
Email : stpd@mcmc.gov.my
Website: www.mcmc.gov.my

OR

Malaysian Technical Standards Forum Bhd (MTSFB)
Level 3A, MCMC Tower 2
Jalan Impact
Cyber 6
63000 Cyberjaya
Selangor Darul Ehsan
MALAYSIA

Tel : +60 3 8680 9950
Fax : +60 3 8680 9940
Email : support@mtsfb.org.my
Website: www.mtsfb.org.my

Contents

Committee representation

This technical code was developed by Communications Terminal Working Group of the Malaysian Technical Standards Forum Bhd (MTSFB), which consists of representatives from the following organisations:

International Islamic University Malaysia

Maxis Broadband Sdn Bhd

SIRIM Berhad

TM Technology Services Sdn Bhd

Universiti Teknologi Malaysia

YTL Communications Sdn Bhd

Foreword

This technical code for Free Space Optics (FSO) - Specifications ('Technical Code') was developed pursuant to Section 185 of the Communications and Multimedia Act 1998 (Laws of Malaysia Act 588) by the Communications Terminal Working Group of the Malaysian Technical Standards Forum Bhd (MTSFB).

This Technical Code was developed for the purpose of certifying communications equipment under the Communications and Multimedia (Technical Standards) Regulations 2000.

The equipment shall comply with all requirements within this Technical Code and MCMC MTSFB TC (Communications Equipment - Baseline requirements).

This Technical Code shall continue to be valid and effective from the date of its registration until it is replaced or revoked.

FREE SPACE OPTICS - SPECIFICATIONS

1. Scope

This Technical Code defines the minimum technical requirements for Free Space Optics (FSO) equipment intended for deployment in Malaysia.

It applies to all terrestrial FSO communication systems that use line-of-sight optical technology to provide a point-to-point communication link, operating at wavelengths of 850 nm (352.9412 THz), or 1550 nm (193.5484 THz) in accordance with MCMC Class Assignment.

2. Normative references

The following normative references are indispensable for the application of this Technical Code. For dated references, only the edition cited applies. For undated references, the latest edition of the normative references (including any amendments) applies.

IEC 60825-1: Safety of Laser Products – Part 1: Equipment classification and requirements

ANSI Z136.2: American National Standard for Safe Use of Optical Fiber Communication Systems Utilizing Laser Diode and LED Sources

MCMC Class Assignment

3. Abbreviation

For the purposes of this Technical Code, the following abbreviations apply.

FSO	Free Space Optics
EMC	Electromagnetic Compatibility

4. General requirements

4.1 Equipment operating requirements

The following foundational requirements shall be satisfied by all FSO equipment to ensure safety, regulatory compliance, and functional integrity before considering any advanced features:

a) The equipment shall operate within laser classes as per IEC 60825-1 or any equivalent standards.

b) FSO equipment shall not include controls that are external or easily accessible and allow its operation to be adjusted in a manner as specified in this Technical Code.

c) Configuration settings access shall be restricted to authorised personnel only, with safeguards in place to prevent unauthorised changes that could compromise safety or regulatory compliance.

d) The default operating settings of the FSO equipment shall be configured to operate only within the wavelengths specified in Table 1.

4.2 Baseline requirements

The baseline requirements for product marking, electrical safety, power supply and Electromagnetic Compatibility (EMC) shall adhere to the requirements outlined in MCMC MTSFB TC (Communications Equipment - Baseline Requirements).

5. Technical Requirements

The FSO shall be designed to operate within the specified wavelengths and comply with the maximum output power given in Table 1.

Table 1. Technical parameters for FSO equipment

Wavelength (nm)	Frequency (THz)	Max output power (mW)	Test reference
1550	193.548 4	650	IEC 60825-1 or ANSI Z136.2
850	352.941 2		
Note: Certification of all equipment is required in accordance with the aforementioned standards or any other relevant standards. The certifying agency will verify the relevancy of any standards through the certification process, which includes conducting a comprehensive suitability study and gap analysis subject to regulator's approval.			

Acknowledgements

Members of the Communications Terminal Working Group

Working Group Leaders

Ms Wan Zarina Wan Abdullah (Chair)	SIRIM Berhad
Ts Pang Chee Wai (Vice Chair)	Maxis Broadband Sdn Bhd
Assoc Prof Ir Dr Khaizuran Abdullah (Secretary)	International Islamic University Malaysia

Drafting Committee Members

Prof. Dr Razali bin Ngah (Draft lead)	Universiti Teknologi Malaysia
Ms Humairah Ahmad Nasir (Secretariat)	Malaysian Technical Standards Forum Bhd
Asst. Prof. Dr Norhanis Aida Mohd Nor	International Islamic University Malaysia
Assoc. Prof. Dr Suriza Ahmad Zabidi	International Islamic University Malaysia
Mr Mohd Yusofee Azam Bin Yaziz	SIRIM Berhad
Ms Wan Zarina Wan Abdullah	SIRIM Berhad
Ms Noor Aslinda Binti Hanaffiah	TM Technology Sdn Bhd
Mr Chua Tien Han	Universiti Teknologi Malaysia
Dr Marwan Hadri bin Azmi	Universiti Teknologi Malaysia
Mr Amzar Azfar Bin Zolkiflie	YTL Communications Sdn Bhd

Contributors

Professor Dr Angela Amphawan	Sunway University
Mr Mohd Johanis Mohd Jamil	TM Technology Sdn Bhd
Mr Muzairy Bin Mohamad	TM Technology Sdn Bhd
Assoc. Prof. Dr Norhudah binti Seman	Universiti Teknologi Malaysia
Dr. Nurul Ashikin binti Daud	Universiti Teknologi Malaysia
Dr. Mohd Rashidi bin Salim	Universiti Teknologi Malaysia
Assoc. Prof. Ir. Dr Rudzidatul Akmam Dziyauddin	Universiti Teknologi Malaysia
Mr Auto Yap Swee Wah	*Glocomp System (M) Sdn Bhd*
Mr Ong Yong Sheng	*Glocomp System (M) Sdn Bhd*
Mr Dinesh Kummaran	*Transcelestial*