

# Gemini Communication Ltd.

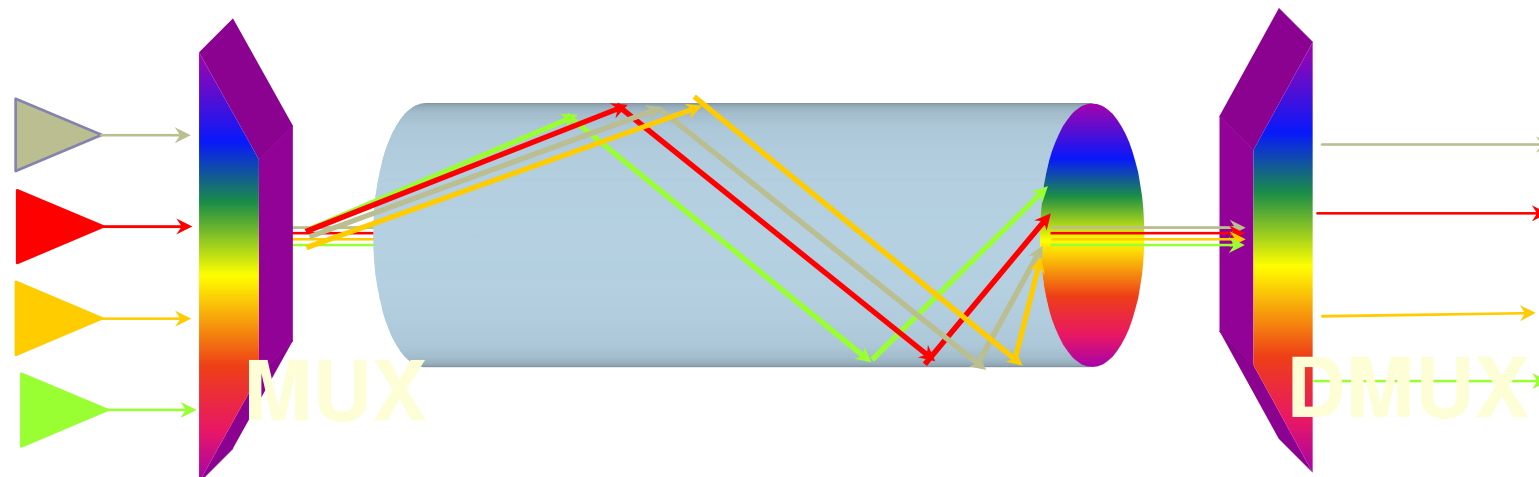
*Innovation & Leadership*

# BASICS OF DWDM

# WDM Basics - Introduction

## WDM – Wavelength Division Multiplexing

The ability to use different wavelengths in a single fiber, to split and to combine them.



## **Why DWDM ?**

- a) Overcome fiber exhaust / lack of fiber availability problems (Better utilization of available fiber)**
- b) Space & Power savings at intermediate stations**
- c) Easier capacity expansion**
- d) Cost effective transmission**
- e) No O-E-O conversion delays**
- f) Wave length leasing instead of Bandwidth leasing**

## **Any Disadvantages of this Technology ?**

**Yes of course...**

- a) Multi channel failure due to line failure**
- b) Requirements for more deliberate design of Dispersion management, gain profile management & launched power due to broader Wavelength range to be handled**

## **WDM Classification**

**WDM Classification is based on the Channel spacing between 2 Wave lengths**

**Channel spacing  $> 200\text{GHz}$  is called CWDM**

**Channel spacing  $> 100\text{ GHz}$  is called WDM**

**Channel spacing  $< 100\text{GHz}$  is called DWDM**

**Channel spacing  $< 25\text{GHz}$  is called UDWDM**

**100 GHz is equal to 0.8 nm**

# Infrared Spectrum

**O-Band**

**E-Band**

**S-Band**

**C-Band**

**L-Band**

1260-1360nm

1360-1460nm

1460-1530nm

1530-1565nm

1565-1625nm

**CWDM**

**CWDM**

**Future  
DWDM**

**DWDM**

**DWDM**

## **Wavelength allocation for DWDM (ITU-T G.692)**

**C-Band (1530 – 1562nm):**

**Also called conventional band or 1550 band**

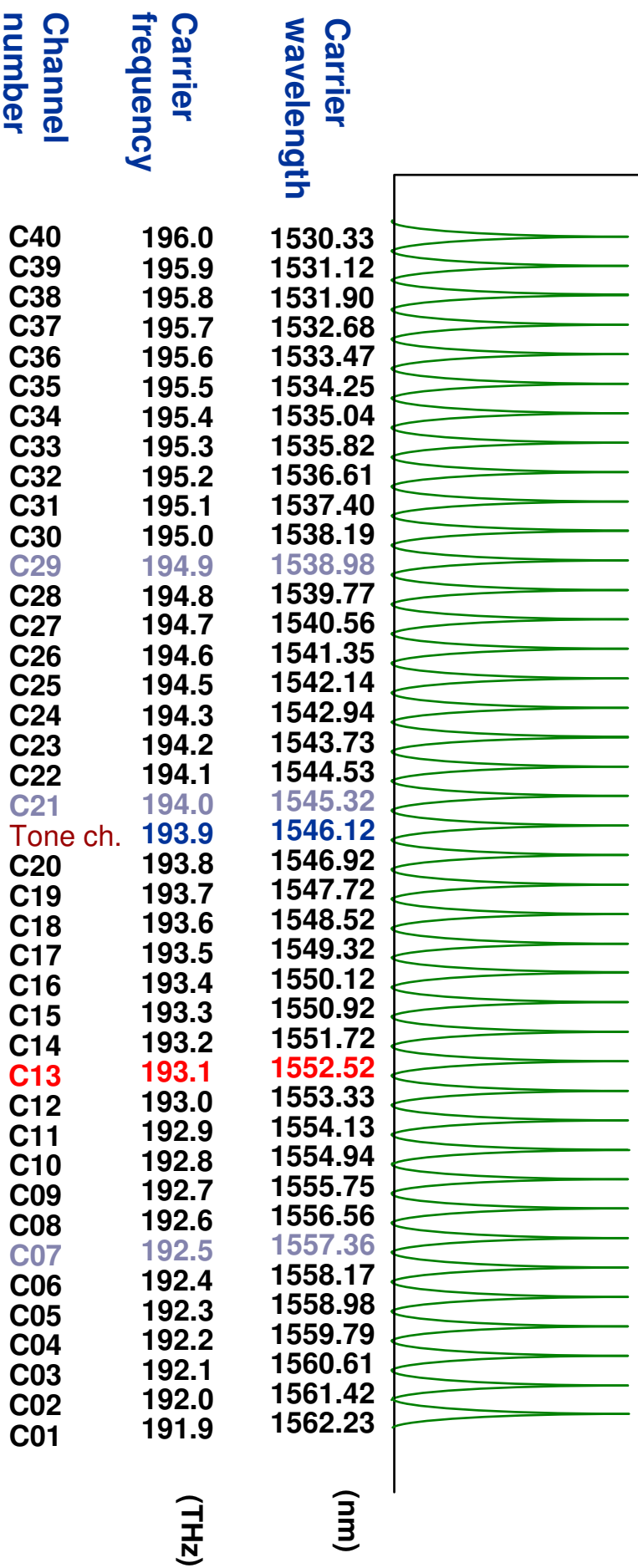
**L-Band (1574 – 1608nm):**

**Also called Long wavelength band or 1580nm band**

**The channel central frequencies are allocated in equal frequency spacing of 100 GHz or 0.1 THz.**

**All the channel central frequencies are anchored to the 193.1 THz reference. The channel central wavelength corresponding to the reference frequency is 1552.52 nm.**

# Wavelength allocation in C-Band



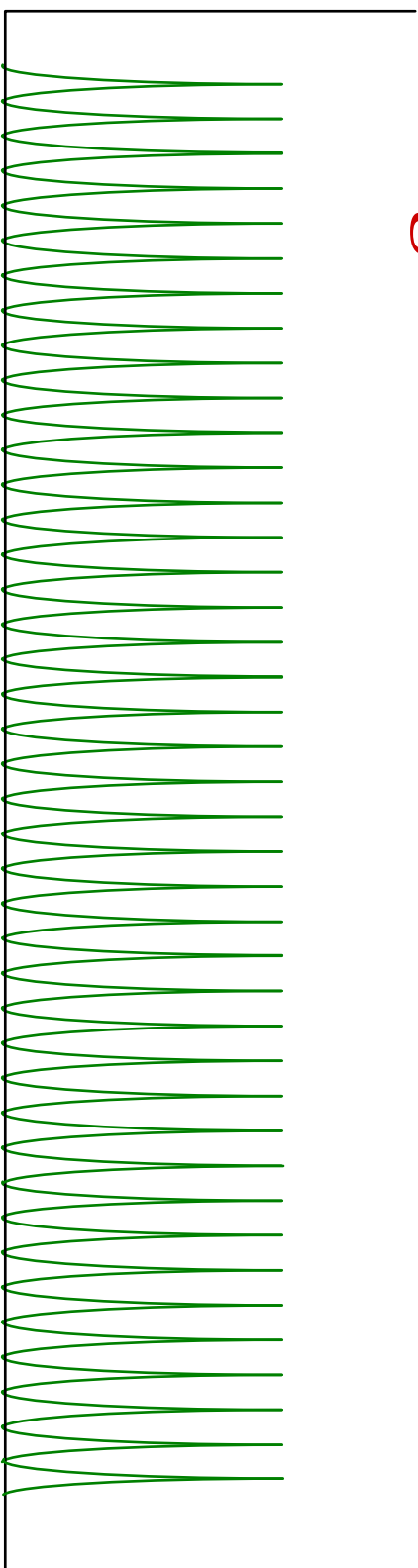
Note 1 : Optical carriers are allocated on ITU-T 100 GHz (0.1 THz) grid in Rec. G. 692.

2: Tone channel is dedicated for operation & maintenance support.

3. C13 is the Centre Wavelength

# Wavelength allocation in L-Band

Carrier wavelength	Carrier frequency	Channel number
1574.54	190.4	L01
1575.37	190.3	L02
1576.20	190.2	L03
1577.03	190.1	L04
1577.86	190.0	L05
1578.69	189.9	L06
1579.52	189.8	L07
1580.35	189.7	L08
1581.18	189.6	L09
1582.02	189.5	L10
1582.85	189.4	L11
1583.69	189.3	L12
1584.53	189.2	L13
1585.36	189.1	L14
1586.20	189.0	L15
1587.04	188.9	L16
1587.88	188.8	L17
1588.73	188.7	L18
1589.57	188.6	L19
1590.41	188.5	L20
1591.26	188.4	Tone ch.
1592.10	188.3	L21
1592.95	188.2	L22
1593.79	188.1	L23
1594.64	188.0	L24
1595.49	187.9	L25
1596.34	187.8	L26
1597.19	187.7	L27
1598.04	187.6	L28
1598.89	187.5	L29
1599.75	187.4	L30
1600.60	187.3	L31
1601.46	187.2	L32
1602.31	187.1	L33
1603.17	187.0	L34
1604.03	186.9	L35
1604.88	186.8	L36
1605.74	186.7	L37
1606.60	186.6	L38
1607.47	186.5	L39
1608.33	186.4	L40



**Note 1: Optical carriers are allocated on ITU-T 100 GHz (0.1 THz) grid in Rec. G. 692.**

**2: Tone channel is dedicated for operation & maintenance support.**

***Thank You***  
Contact : [info@gcl.in](mailto:info@gcl.in)