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10 - 0330209
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(43) 2001 02 05

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3 416

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14 102 - 1805

491 102 - 303

1 132 - 2002

359 101 - 901

468 104 - 303

(74)

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(54)

1530 1610nm
, 1580nm
1580nm

1550nm

3

1580nm ASE

1 가 (EDFA)
 2
 3 1
 4 2
 5 3
 6 4
 7a, 7b 7c

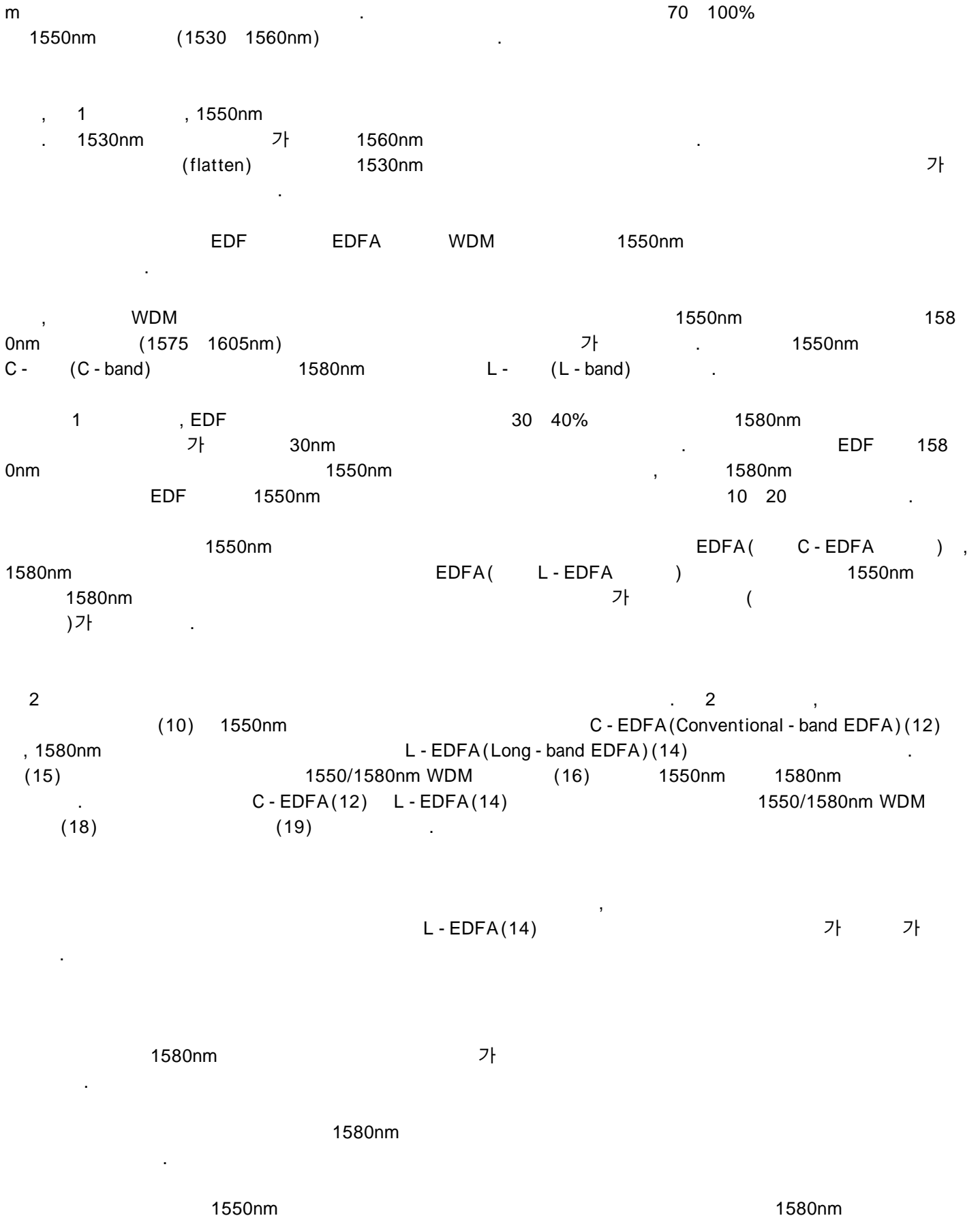
PTICAL Fiber Amplifier) , 1530 1610nm (O

ytterbium[70]) 가 (erbium: Er[68]), Pr(praseodymium[59]) Yb(stimulated emission) 가

(WDM: Wavelength Division Multiplexing) 1550nm (1530nm 1560n 가
 (Erbium Doped Fiber Amplifier: EDFA)가

1 가 (EDFA) (Er⁺³ ion) (ratio of population inversion) 가
 0%, 10%, 20%, ... 100% (EDF: Erbium Doped Fiber) 가

1 0% (ground state) , 가
 가 , 1530nm 100% , (excited state) 1530n



550nm , 1580nm 1580nm , 1550nm , 1580nm 1550nm 1580nm , 1550nm 가 1

80nm 가 1550nm 15 가

3 1 3 , 1550nm 1550nm 1 580nm (21) 1550/1580nm (22) WDM (22) 1550nm C - EDFA(32) , 1580nm L - EDFA(34) , C - EDFA(3 (backward ASE: Amplified Spontaneous Emission) L - EDFA(3 (optical circulator)(30) 가 C - EDFA(32) (30) WDM (22) C - EDFA(32) 1550nm 가 C - EDFA(32) C - EDFA(32) L - EDFA(34)

(30) 1 2 WDM (22) 1550nm WDM (36) L - E (22) 1580nm C - EDFA(32) L - EDFA(34) 1 (38) WDM (C - EDFA(32) L - EDFA(34) 2 (30) 3 (C - EDFA(32) 1550nm 2 (38) WDM (L - EDFA(34) 1580nm (24) 1550nm 1580nm (4) WDM (24) (25) 1550nm 1580nm WDM (24)

C - EDFA(32) L - EDFA(34) , 가 7a C - EDFA(32) L - EDFA(34) (LD: Laser Diode) (WSC: Wavelength Selective Coupler) EDF 가

C - EDFA(32) L - EDFA(34) 7b EDF 가 7c EDF 가

EDF 1550nm (spontaneous emission) EDF
 (ASE) L - EDFA(34) 3 C - EDFA
 (32) (30) 2 (30)
 3 L - EDFA(34)

C - EDFA(32) (30) L - EDFA(34)
 L - EDFA(34) 1580nm L - EDFA
 1550nm
 99 - 23777 (: -)
 1550nm (: seed beam) 1550nm L - EDFA
 L - EDFA 1550nm L -
 EDFA 99 - 23777
 L - EDFA 1550nm (-)
 3 C - EDFA

4 2 4
 , 2 WDM (22) 1550nm
 1 (40) 1 2 C - EDFA(42)
 C - EDFA(42) 1550nm 2 (48) WDM (46)
 24) WDM (22) 1580nm 1 (46)
 L - EDFA(44) L - EDFA(44) 1580nm 2 (4
 1) 2 3 WDM (24)

C - EDFA(42) 1 (40) 2 3
 (43) (43) , 1550
 nm (43) 2 L - EDFA(44)
 (Fabry - Perot) (Mach - Zehnder) (43)

4 (40, 41)
 (43) C - EDFA(42) (1550nm)
 L - EDFA(44)

5 (fiber grating) 3
 5 WDM (2
 2) 1550nm (50) 1 2 C - E
 DFA(52) C - EDFA(52) 2 (58) WDM
 (24)

C - EDFA(52) (50) 2 3
 (53) (53) 1550nm
 (50) 3 4 (50) 4 1550nm
 WDM (22) 1580nm WDM (51)
 L - EDFA(54) L - EDFA(54) 1580nm 1
 (56) WDM (24)

 5 (50) (53)
 WDM (51) C - EDFA(52)
 (1550nm) L - EDFA(54)

 5 C - EDFA(52) (53) W W
 DM (51) L - EDFA(54) WDM (51)
 , 4 2 (53)
 L - EDFA(54)

6 4 6
 , 4 WDM (22) 1550nm
 1 (61) C - EDFA(62) C - EDFA(62)
 (60) 1 2 C - EDFA(64)
 C - EDFA(64) 2 (65) WDM (24)

, WDM (22) 1580nm 3 (63)
 L - EDFA(66) L - EDFA(66) 1580nm
 (60) 3 4 L - EDFA(68) L - EDFA(68)
 1580nm 4 (67) WDM (24)

C - EDFA(64) (60) 2 3
 L - EDFA(66)

4) 6 C - EDFA(6
 L - EDFA(66)

6 4 5
 가

3 5

3 6 가

가
가
WDM (22) , 3 WDM 6 (24)

3 6
가
EDF
C - EDFA L - EDFA가 7a, 7b 7c
가 EDF (Al co - doped EDF) EDF, , EDFA EDF

550nm , 1550nm 1580nm 1580nm 1580nm 1

(57)

1.

1550nm 1580nm
1550nm 1580nm
1550nm 1580nm
1550nm 가 1580nm

2.

1 , 1550nm 1580nm 1580nm

3.

1550nm 1580nm
1550nm 1580nm
1550nm 1580nm
1550nm 1580nm

4.

3 , 1550nm 1580nm , 1550nm 1580nm 1550nm

5.

3 , 1550nm 1580nm

6.

5 ,

7.

1550nm 1580nm ,
1550nm 1580nm ,
1550nm 2 3 1550nm 1 2
1550nm 1 3 , 1550nm 1 ,
1 3 ,
1 2 1580nm 2 1580nm 2
3 2 , 3 1580nm
1550nm 2 3 1580nm

8.

1550nm 1580nm ,
1550nm 1580nm ,

1550nm 2 3 1550nm 1550nm 1 2
 1550nm 2 3 3 4 3
 4 1580nm 1580nm
 1550nm 1580nm
 9.
 1550nm 1580nm
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 1550nm 1580nm
 1550nm 1580nm

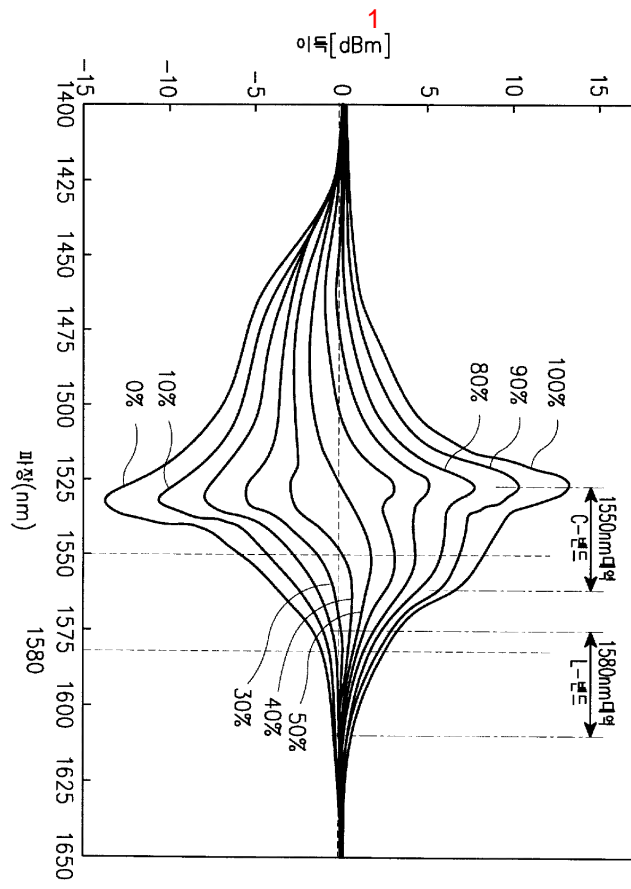
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9 1550nm 1580nm 1550nm 1550nm 1580nm

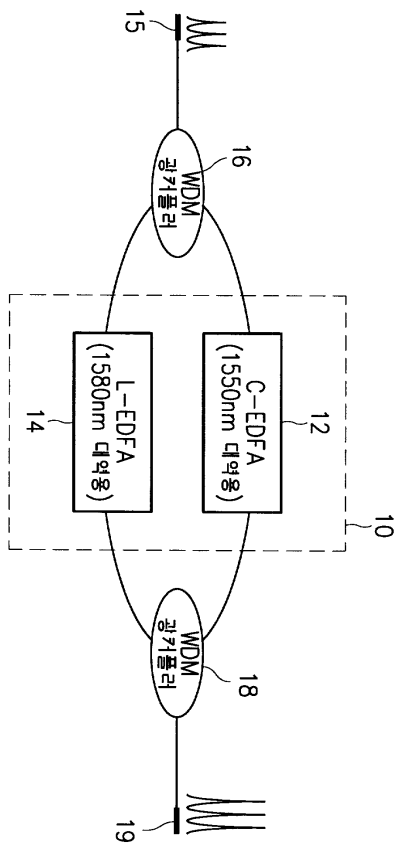
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1580nm

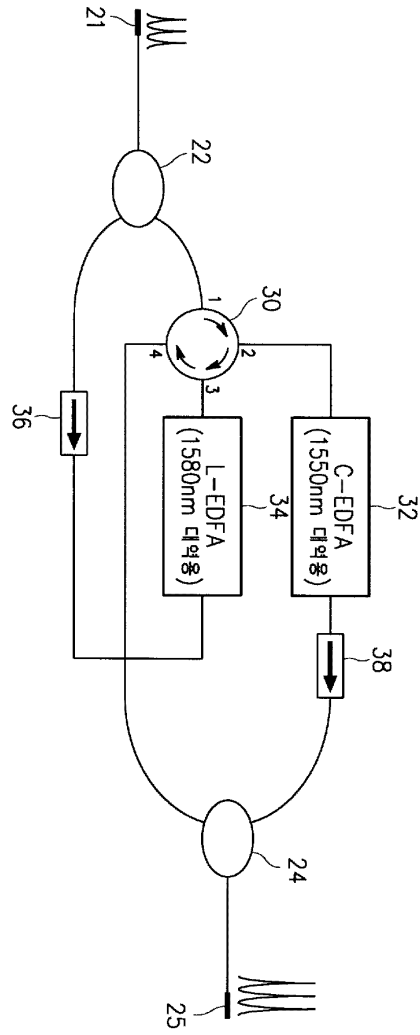
1550nm



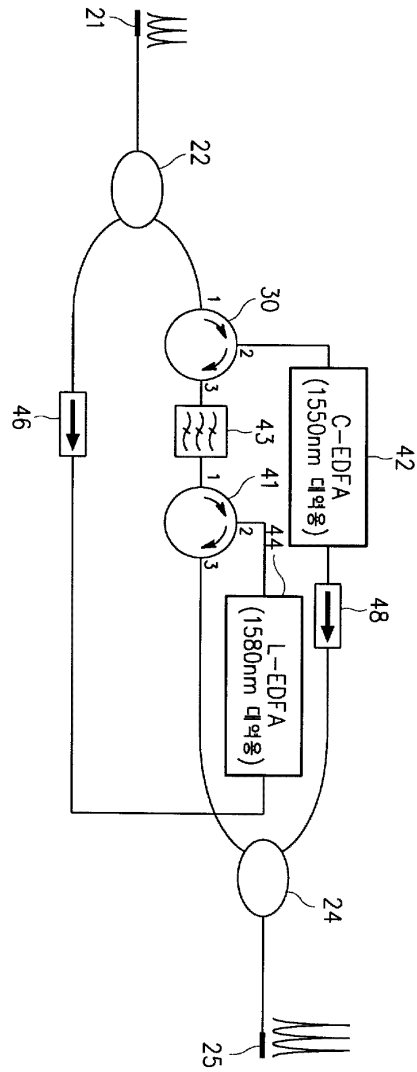
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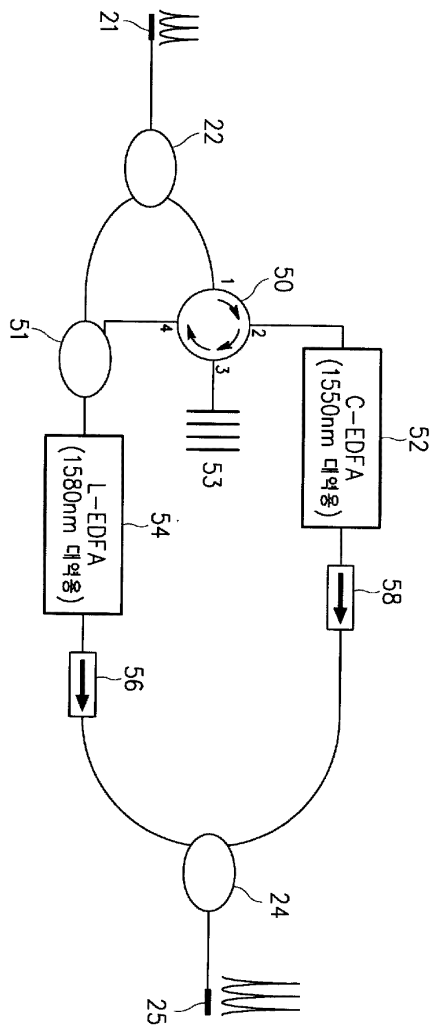
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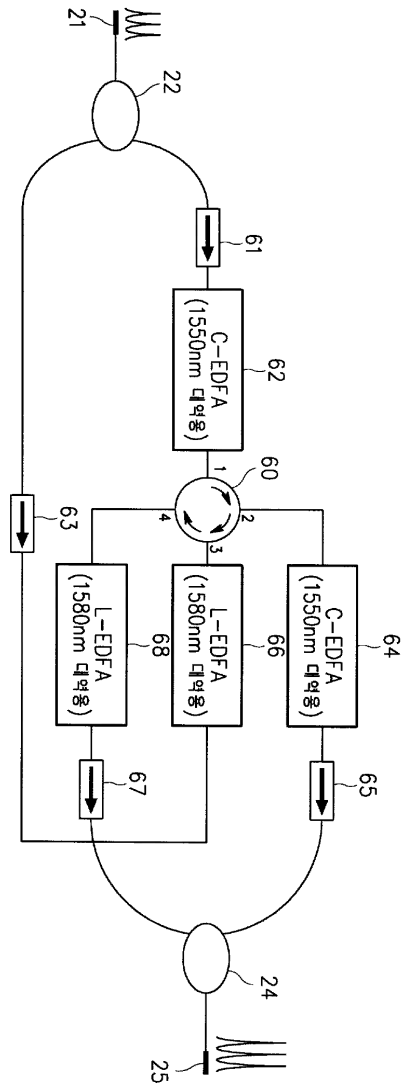
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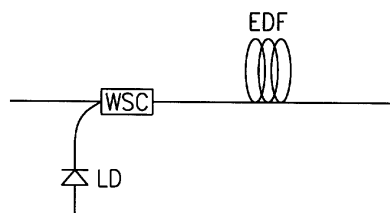
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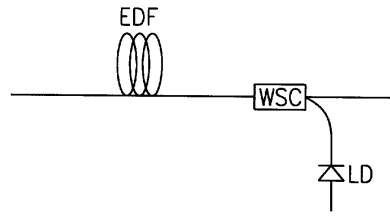
6



7a



7b



7c

