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(54) - -

· , - 1 ; IF L
O LO - 2 ; IF
가 , SOA , 가 ,
- -

5

, - , - , , WDM, MZM

2	RoF	WDM
3		-
4		
5		
6a	6b	SOA
7a	7b	SOA
		RF-

gain modulation, XGM) (semiconductor optical amplifier, 'SOA') - (cross-g
(all-optical) - (up-conversion)

1 (base station, 'BS') (Radio-on-fiber, 'RoF') ,
(central office, 'CO') 가

wavelength division multiplexing, 'WDM') (w

2 (Mach-Zenhdler Modulator, 'MZM')
WDM

(R. A. Griffin *et al.*, Crosstalk Reduction in an Optical mm-Wave/DWDM Overlay for Radio-Over-Fibre Distribution, in *Tech. Dig. MWP99*, pp. 131-134, 1999). MZM , MZM
가

(wavelength) (polarization)
5dB (insertion loss)
가 가

(optoelectronic mixng) HBT(heterobipolar transistor) 3 (three-terminal element)
, BS LO (signal source) BS 가
, BS (electrical local oscillator, 'LO')
(intermediate frequency, 'IF') (mixing)
HEMT(high electron mobility transistor)

(baseband) IF LO
가 (all-optical)
ction) , 3 , (photo-detector, 'PD') (nonlinear photo-dete
IF - (all-optical)

(M. Tsuchiya, *et al.*, Nonlinear Photodetection Scheme and Its System Applications to Fiber-Optic Millimeter-Wave Wireless Down-Links, *IEEE Trans on Microwave Theory and Techniques*, vol. 47, n o. 7, pp. 1342-1350, 1999).
LO (heterodyne) (electrical oscillator) (ex. optical PLL, injection locking)

z
r coupler) , SOA(58)
iable optical attenuator, VOA) SOA(58) 1GHz IF , IF 25GHz LO (peak) 가 (57, fiber (52, var

LO (54, Mach-Zenhdler Modulator) V
DSB-SC TLS(53, tunable laser source)
, Mach-Zender (54) 12.5GHz 25GHz LO
(12.5GHz) 가 EDFA(55, er-doped fiber
amplifier) Er (fiber) (optical amplifier) 가 LO
(mixing) 가 (carrier) (PD) +/- 1
(electrical modulation power) (optical carrier power

r) 9dB

IF LO SOA(58) SOA(58) SOA(58) (cross-
modulation) 25GHz LO 5 PD(59, photo detector) , SOA , RF-SA(60
, RF-spectrum analyzer) RF

6a 6b SOA(58) IF LO (optical spectrum) IF
LO 11nm 가 6a SOA () LO +/- 1
(sideband) 25GHz
, Mach-Zenhdler (54) 12.5GHz 가

6a 6b SOA(58) 16dB가 (optical gain)
6b IF LO XGM , LO 가 SOA
(-20 dB)

LO (LO) +/- 1 IF (IF) (cross-modulation) , IF
SOA +/- 1 XGM

7a 7b RF-

7b , - IF (7a)가 SOA(58) 25GHz LO 24GHz
LSB (lower sideband) 26GHz USB(upper sideband) - 7a 7
b 가 LSB USB (7b) IF (7a) 10 dB 가

gain) , SOA (gain) - (conversion
LO WDM IF(, baseband) RoF

LO WDM - , LO

RoF WDM WDM 가가 ,
 WDM ,
 LO CO BS , BS , BS LO
 (mixer)가 , BS

(57)

1. (SOA) (all-optical) - (up-conversion) ,

IF

1 ,

LO

2 ,

IF

LO

(cross-gain modulation

3

2.

1 ,

IF

DFB-LD

3.

1 ,

LO

DSB-SC

4.

1 ,

2

3

IF

LO

가

5.

IF ,

LO

IF

LO

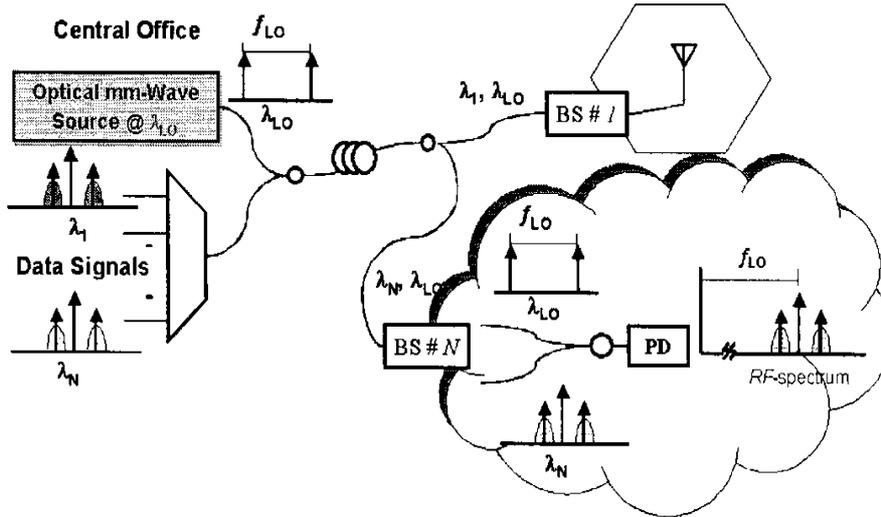
IF

LO

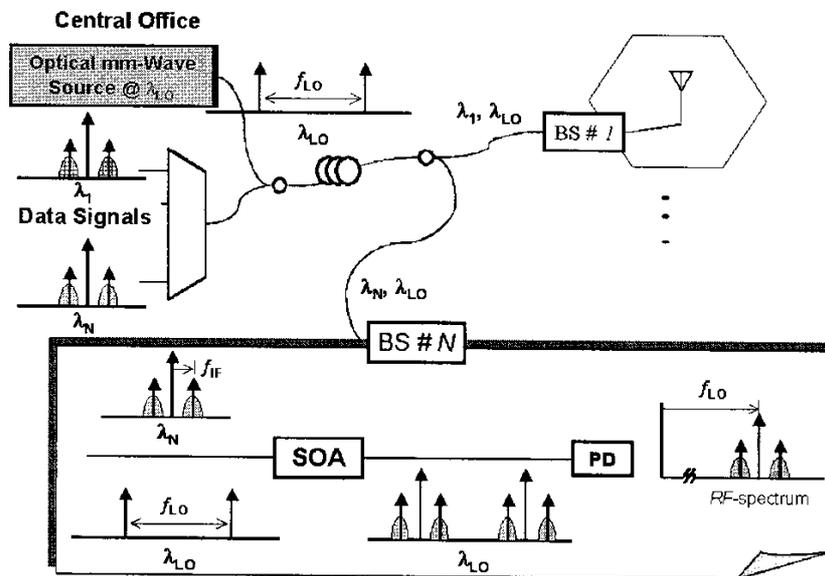
6.

5 ,

3



4



5

