



GTS SOLUTION Co., Ltd.

Make you connect to any where at any time
Innovative & cost effective solution
Complete solution for your RF System & Wireless



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MICROWAVE
MM/WAVE FRONT-END
RF SYSTEM & RF MODULE
OPTICAL TRANSCEIVER
DAS SYSTEM
CDMA,WCDMA,GSM,LTE,TDLTE
DMB,WIBRO
RF MONITERING SYSTEM



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• **Main Global Market : North America, Canada, Europe, Asia**



Product	Item	Frequency	Domestic	Overseas Country
RF System & Repeater	20W / CDMA,LTE	2G/4G	LGU+	
	10W / CDMA,LTE	2G/4G	LGU+	
	2W / WCDMA,LTE	3G/4G		Taiwan
	PICO / WCDMA,LTE	3G/4G		Taiwan
	BDA / UDA	VHF/UHF/700M/800M /900M		Canada
	35dBm DAS / LTE	700Mhz~2500Mhz		USA
	5G Front-end, Converter	28Ghz	KT	
Optic Repeater	20W / CDMA,LTE	2G/4G	LGU+	
	10W / CDMA,LTE	2G/4G	LGU+	
	5W / CDMA,,TE	2G/4G	LGU+	
RF Monitoring	Spectrum Analyzer	650Mhz-1000Mhz 1650Mhz-2750Mhz		Global DAS System
RF Module	TMA,LNA / IoT,Military	IoT, Military	Military	France
	Jamming HPA	800~2100MHz		Israel



RF System

RF Repeater

UTP Repeater

Optic Repeater (Multi band, DAS)

BDA (Bi-Directional Amplifier / Railway, Fire protection , FM, T-DMB)

RF Monitoring (Spectrum Analyzer)

Power Monitoring (Rectifier & BMS)

RF & Microwave

Power Amplifier (Wideband, High Power, High Frequency)

Low Noise Amplifier (GPS, Wideband , High Frequency)

Up/Down Converter (RF, Microwave & mmWave)

Optical Transceiver / Transmitter (2G,3G,4G,5G)

Microwave Detector (Ku band)

Passive Component (broadband Divider, Coupler)

W/G Component (Adaptor, Circulstor, Filter, Bend Section etc.)

Other

Mobile Communication H/O Jig

SDR Chip (ADI) 8 X 8 FEM

Categories of Products

(for GSM/CDMA/WCDMA/LTE/WIBRO,DMB)

RF Monitoring System Division

- W-CDMA NODE-B
- REMOTE MONITORING SYSTEM
- BEACON
- REPEATER MONITORING SYSTEM

RF Component Division

- RF Power Amplifier(2G,3G,4G,Jammer)
- Up/Down Converter
- Optical Transceiver / Transmitter
- Low Noise Amplifier (TMA)
- RF passive component
- High Power Broadband components
- MM / WAVE Front-End (5G)
- Microwave Module
- Wave Guide / BPF /Circulator

System Division

CDMA,WCDMA ,GSM, LTE

- Small / Pico Repeater
- Tunnel Application
- Subway Application
- In- Building Application
- Optic repeater(2G,3G,4G)
- RF repeater(2G,3G,4G)
- DAS System



Categories of Special Products

(for Military / Civil Requirement / Wave Guide)

1. Active & System			Frequency	Application
Military	1	x Band Up/Down Converter	8~9GHz/1~2GHz	Military Satellite
	2	Frequency Synthesizer	2~18GHz	Synthesizer
	3	10GHz LNA	NF: 0.5dB	Military Satellite
	4	Doppler Emulator	8~9GHz	X Band Satellite Emulator
	5	Antenna Matching Unit	2~30MHz	TICN(TMMR) 20W, 200W
	6	LNA/Power Amp Module	2GHz	TICN(LCTR)
	7	DRO	~12GHz	Electronic Warfare
Civil Requirement	1	Water Flowmeter	10GHz	Korea Water Resources
	2	Video Transmission Repeater	18GHz	Metropolitan Rapid Transit
	3	5G 28GHz Front-end, Converter	28GHz / 10GHz~40GHz	5G
	4	5G / Optic Module	6Ghz	5G

2. Passive			Frequency	
Wave Guide	1	Adaptor (N, SMA, K)	~ 40GHz	Adaptor
	2	Bend Section(H, E)		WR137 -WR28
	3	Filter, Combiner, Magic-T, OMT		

Categories of Products

(for GSM/CDMA/W-CDMA/LTE/WIBRO,DMB)

RF Monitoring System Division



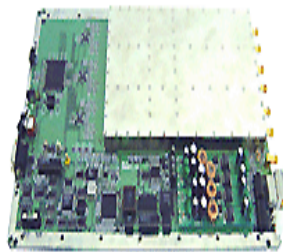
■ 2G,3G,RF Monitoring



■ LTE Repeater RF Monitoring



■ 2G,3G Repeater RF Monitoring



■ 2G,3G,RF Monitoring Board



■ DAS Spectrum Analyzer Module

Categories of Products

(for GSM/CDMA/W-CDMA/LTE/WIBRO,DMB)

RF Component Division



■ 2.6GHz TD LTE



■ 2.5~2.6GHz NB-IOT



■ 800,900 IOT LNA



■ 800,900 IOT TMA



■ 380~400MHz UHF LNA



■ LINE Amplifier



■ Active Splitter



■ BIAS-T & Power Multiplexer



■ 28GHz FRONT-END 5G대응



■ Multi-Band DR37dbm

Categories of Products

(for GSM/CDMA/W-CDMA/LTE/WIBRO,DMB)

RF Passive Component Division

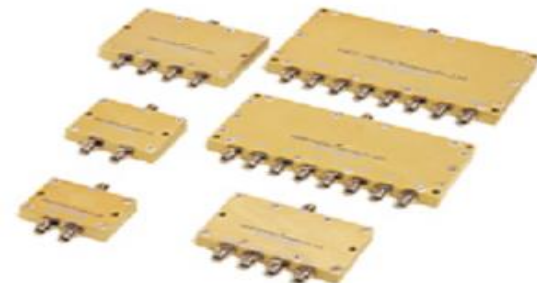
Directional Coupler

- Power Monitoring
- Low insertion loss
- High directivity
- High power operation
- Aluminum body & Compact size



Power Divider

- Cellular & PCS band operation
- Low insertion loss & Ripple
- Low V.S.W.R
- High isolation



RF Switch

- High isolation
- Short switching time
- High reliability
- Low insertion loss





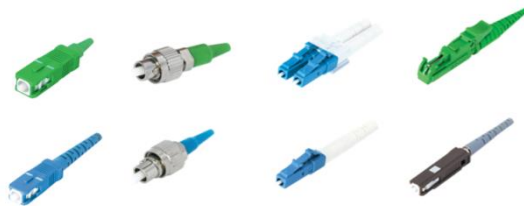
■ FC-APC Adaptor



■ SC-APC Adaptor



■ LC Type Adaptor



■ Patch Cord Connectors



■ Optical Patch Cord



■ Fixed Attenuator

- Other Products -

- 1 x 2~64 SPLITER MODULE
- 1or2 x N SPLITER MODULE / 900um,2mmcable)
- WDM / CWDM / DWDM
- SINGLE WINDOW COUPLER
- DUAL WINDOW COUPLER



FDF-Racktype

ODF-A-1

ODF-A-2

ODF-B-1

ODF-B-2



FDF-Wall type

ODF-C-1

ODF-C-2

OFS-1

OFS-2



Categories of Products

(for GSM/CDMA/W-CDMA/LTE/WIBRO,DMB)

System Division



■ 2G,3G,4G,5G Optic Repeater



■ 2G,3G,4G,5G RF Repeater



■ Small Repeater



■ 2G+4G Repeater



■ 재난망다표준 Gate way



■ Life-Line Repeater(LTE)



■ Life-Line Repeater(UHF)



■ UTP DAS System



■ Video Transmission Repeater 18GHZ

Categories of Products

Microwave Component Division



■ Termination



■ Coaxial Adaptors



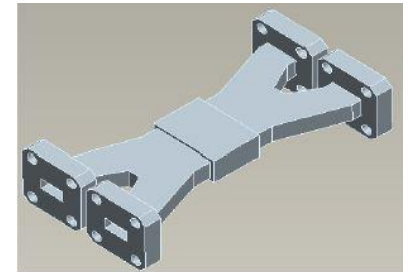
■ Assembly / Comparator



■ Magic-Tee



■ Filters

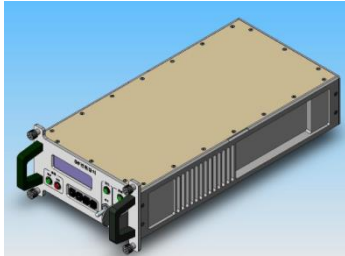


■ Short Slot Hybrid



Categories of Products

(Military RF Solution)



■ SHF Translation device



■ Synthesizer



■ Low Noise Amplifier



■ Up-Converter



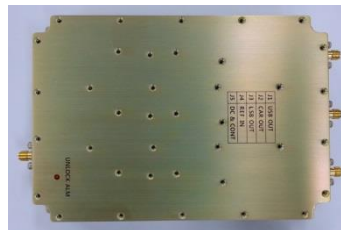
■ Antenna Matching Device



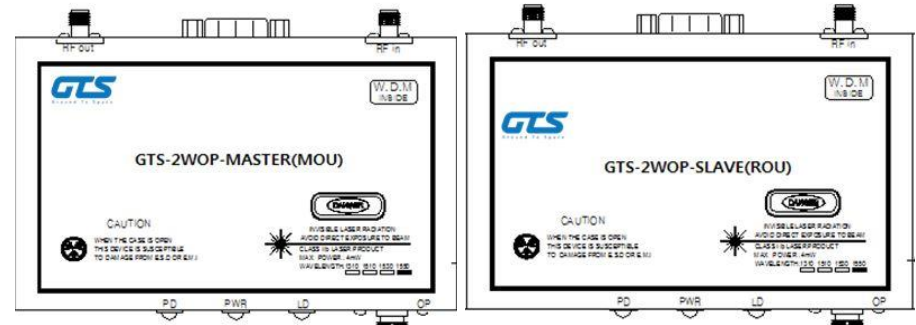
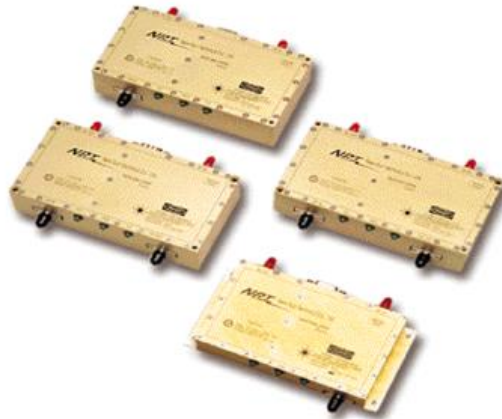
■ Antenna Matching Device



■ Low Noise Amplifier



■ Aviation Synthesizer



FEATURE

- DFB Laser Diode (With Isolator) (Optional)**
- High Isolation W.D.M**
- Low Noise floor & Low Back Reflection**
- High Sensitivity & High Dynamic Range**
- TX & RX Alarm Circuit**

APPLICATIONS

- Optically Wireless Communication System**
- Fiber Optic Repeater**
- CELLULAR, GSM,CDMA,WCDMA & LTE**
- Analog CATV & CCTV**
- Cable Booster (Subway, Tunnel)**



■ 28GHz FRONT-END 5G



■ 5G RF & OPTIC REPEATER

1. Specification

Item	Input		Output		비고
	DL	UL	DL	UL	
Frequency Band	1.8GHz	28GHz	28GHz	1.8GHz	
Duplex	2x2 MIMO				
Bandwidth	800MHz				
Input/Output Power	-10dBm	-30dBm	+15dBm	-10dBm	P1dB of PA: 30dBm
EVM			64QAM: <8%	64QAM: <8%	20MHz/TD-LTE 64QAM
In/Out VSWR	1.5 : 1				
In/Out Connector	SMA(F)	2.92mm(F)		SMA(F)	



Power Amplifier / GSM,CDMA,WCDMA,LTE,IOT,MILITARY

1. Specification

NO.	Item		SPEC	Remark
1	Frequency Range	Tx	2.675~2.695 GHz	
		Rx	2.550~2.570 GHz	
2	Gain		50dB / 24dB	Tx / Rx
3	Output Power		3Watt (34.5dBm avg)	LTE 20MHz
4	ACLR		47dBc@ ±20MHz / 50dBc@ ±40MHz	
5	Noise Figure		2.0dB 이하	
6	VSWR		1.3 : 1 이하	
7	DC input voltage		+24Vdc / +6Vdc	Tx / Rx
8	RF Connector		SMA (F)	



■ 2.6GHz TD LTE



Digital Multi Band DAS RF Module (USA)

1. Specification – 700M

NO.	Item	SPEC		Remark
1	Frequency Range	728~757MHz	698~716 / 776~787MHz	
2	Gain	35dB	18dB	Max
3	Pass Band Ripple	2dB p-p		
4	ACLR	55dBc		Min
5	Noise Figure	1.6dB		
6	VSWR	1.5 : 1		

2. Specification – 800M

NO.	Item	SPEC		Remark
1	Frequency Range	869~894MHz	824~849MHz	
2	Gain	34.5dB	18.5dB	Max
3	Pass Band Ripple	2dB p-p		
4	ACLR	55dBc		Min
5	Noise Figure	1.8dB		
6	VSWR	1.5 : 1		





Digital Multi Band DAS RF Module (USA)

3. Specification – 1900M

NO.	Item	SPEC		Remark
1	Frequency Range	1930~1995MHz	1850~1915MHz	
2	Gain	35.7dB	18.5dB	Max
3	Pass Band Ripple	3dB p-p		
4	ACLR	55dBc		Min
5	Noise Figure	3dB		
6	VSWR	1.5 : 1		

4. Specification – 2100M

NO.	Item	SPEC		Remark
1	Frequency Range	2110~2180MHz	1710~1780MHz	
2	Gain	33.2dB	17dB	Max
3	Pass Band Ripple	2dB p-p		
4	ACLR	55dBc		Min
5	Noise Figure	3.5dB		
6	VSWR	1.5 : 1		





Low Noise Amplifier (GSM,CDMA,WCDMA,LTE,IOT,TMA,MILITARY)

1. Specification – 866.5B / 915B

NO.	Item		SPEC	Remark
1	Frequency Range		863~870MHz / 902~928MHz	
2	Tx	Power	3W typ, 5W Max	
3		I/L	2dB	
4	Rx	Gain	21.5 ± 1.5dB	
5		Ripple	1dB p-p	
6		NF	5.0dB 이하	
7		OIP3	35dBm 이상	
8		P1 dB	20dBm 이상	
9	VSWR		1.4 : 1	



2. Specification – 868 / 905 / 922.7 - TMA

NO.	Item		SPEC	Remark
1	Tx	Frequency Range	869.525MHz / 905MHz / 922.3MHz ±100kHz	
2		Power	3W typ, 5W Max	
3		I/L	2dB	
4	Rx	Frequency Range	868.13MHz / 902.2MHz / 920.8MHz ±100kHz	
5		Gain	21.5 ± 1.5dB	
6		NF	6.0dB 이하	
7		OIP3	30dBm 이상	
8		P1 dB	20dBm 이상	
9	VSWR		1.4 : 1	





Low Noise Amplifier (GSM,CDMA,WCDMA,LTE,IOT,TMA,MILITARY)

1. Specification

NO.	Item	SPEC	Remark
1	Frequency Range	380 ~ 400MHz	
2	Gain	40 ± 0.2dB	
3	NF	1.3dB	
4	OIP3	35dBm	
5	P1 dB	20dBm	
6	VSWR	1.5 : 1	
7	DC Power Supply	12/+24Vdc	

NO.	Item	SPEC	Remark
1	Frequency Range	700 ~ 2500MHz	
2	Gain	40 ± 1dB	
3	NF	1.1~1.3dB	
4	OIP3	35dBm	
5	P1 Db	20dBm	
6	VSWR	1.5 : 1	
7	DC Power Supply	12/+24Vdc	

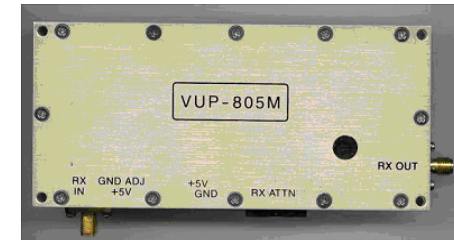
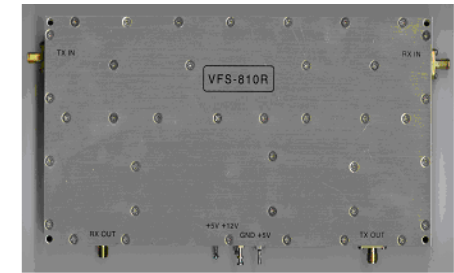




UP-DOWN / Converter (GSM,CDMA,WCDMA,LTE)

1. Specification

No.	Parameter	Specification	
1	Frequency Range	FWD : 870MHz ~ 880MHz REV : 825MHz ~ 835MHz	FWD : 870MHz ~ 880MHz REV : 825MHz ~ 835MHz
2	Gain	FWD : 12dB \pm 1dB REV : 12dB \pm 1dB	FWD : 12dB \pm 1dB REV : 12dB \pm 1dB
3.	Number of Channel	2FA	2FA
4	VSWR	1.5 : 1	1.5 : 1
5	In/Output Impedance	50 Ω	50 Ω
6	OIP ₃	24dBm	24dBm
7	Flatness	2dB (Max.)	2dB (Max.)
8	Input Voltage	DC+12V , DC+5V (Typ.)	DC+12V , DC+5V (Typ.)
9	Current	DC+12V ; 500mA (Typ.) DC+5V ; 1.6A (Typ.)	DC+12V ; 500mA (Typ.) DC+5V ; 1.6A (Typ.)
10	Attenuation Range	30dB / 1dB step \pm 1dB	30dB / 1dB step \pm 1dB
11	Delay Time	4 μ sec (Max.)	4 μ sec (Max.)
12	Selectivity	-3dB ; 4.0MHz (B/W) -40dB ; 5.5MHz (B/W)	-3dB ; 4.0MHz (B/W) -40dB ; 5.5MHz (B/W)

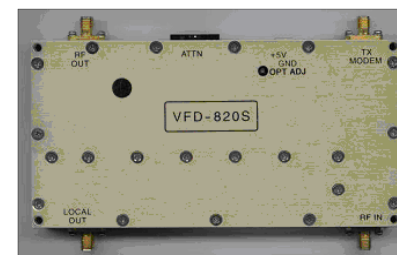
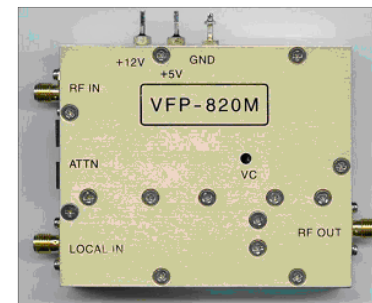




Forward pre Amplifier (GSM,CDMA,WCDMA,LTE)

1. Specification

No.	Parameter	Specification
1	Frequency Range	FWD : 870MHz ~ 880MHz
2	Gain	40dB \pm 1dB
3	VSWR	1.5 : 1
4	In/Output Impedance	50 Ω
5	OIP ₃	32dBm
6	Flatness	1dB (Max.)
7	Input Voltage	DC+12V, DC+5V (Typ.)
8	Current	12V : 50mA (Typ.) 5V : 300mA (Typ.)
9	Attenuation Range	40dB / 1dB step \pm 1dB





Reverse pre Amplifier (GSM,CDMA,WCDMA,LTE)

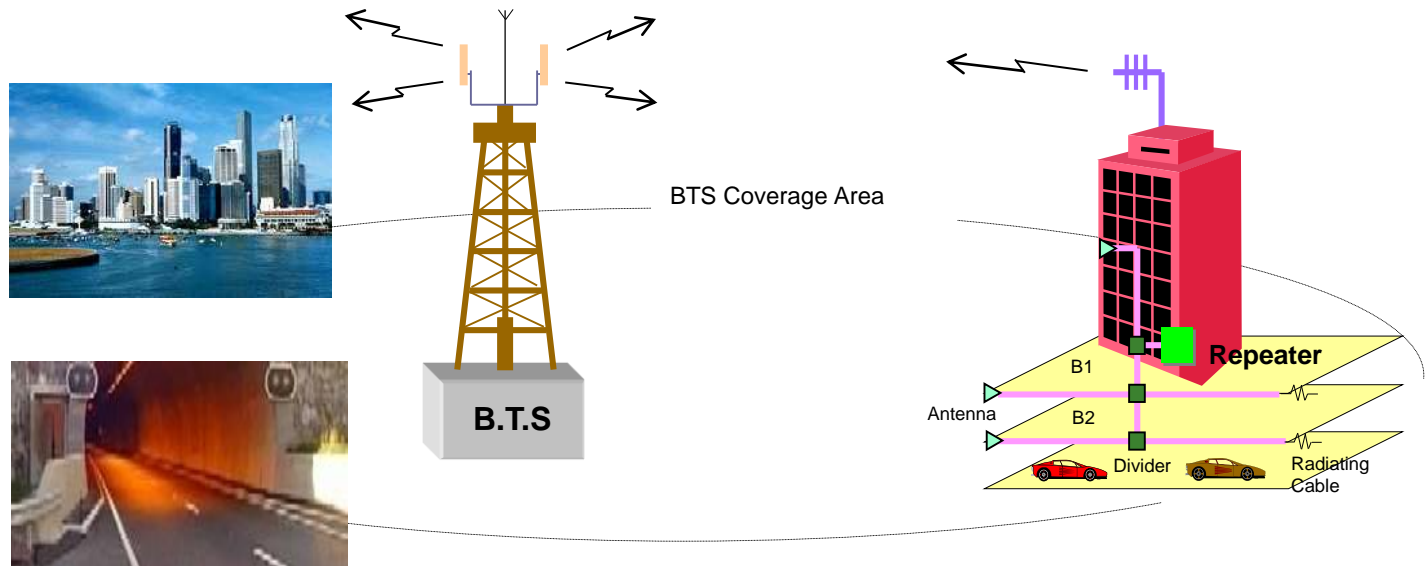
1. Specification

No.	Parameter	Specification
1	Frequency Range	REV : 825MHz ~ 835MHz
2	Gain	4dB \pm 1dB
3	VSWR	1.5 : 1
4	In/Output Impedance	50 Ω
5	OIP ₃	32dBm
6	Flatness	1dB (Max.)
7	Input Voltage	DC+5V (Typ.)
8	Current	300mA (Typ.)
9	Optic Adjust	25dB



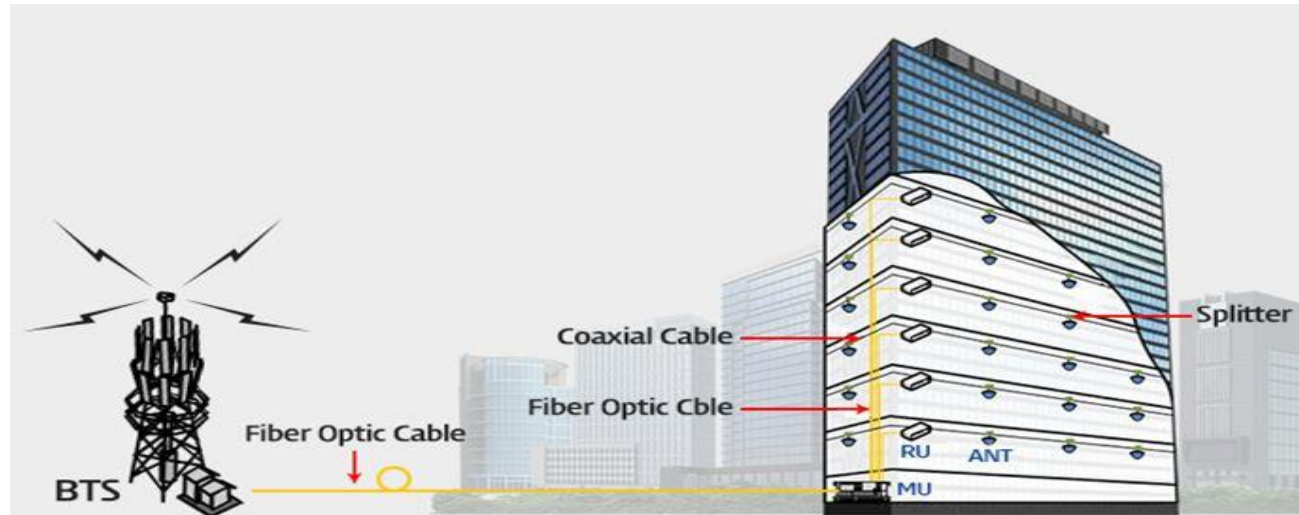


Pico Repeater is designed to cover indoor signal deficient areas such as shopping malls, underground subway station or parking lots. Dividers distribute radio frequency signals to antennas or radiating cable settled throughout a building or tunnel to provide clear and improved signal.



Installation areas:

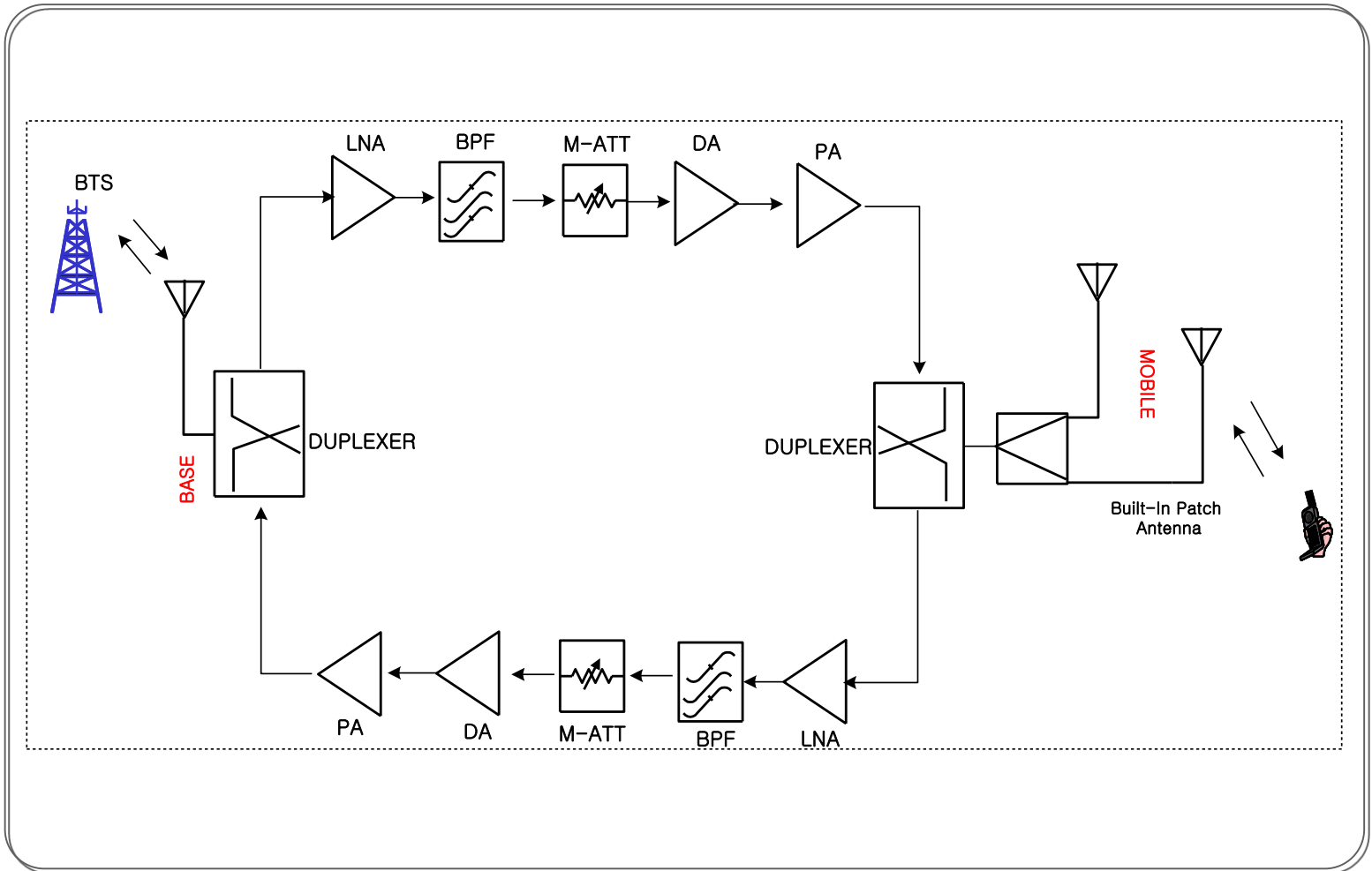
Shopping malls, Airports, Tunnels, Subway platforms
Underground parking lots, and other In-building areas



- Cost effective way to extend the base station coverage at indoor
- Low cost for installation
- Compact and simple design for easy installation and maintenance
- High reliability
- Automatically Gain and Output Level Control (AGC, ALC)
- Low power consumption
- Channel or Band selective (saw filter : optional feature)

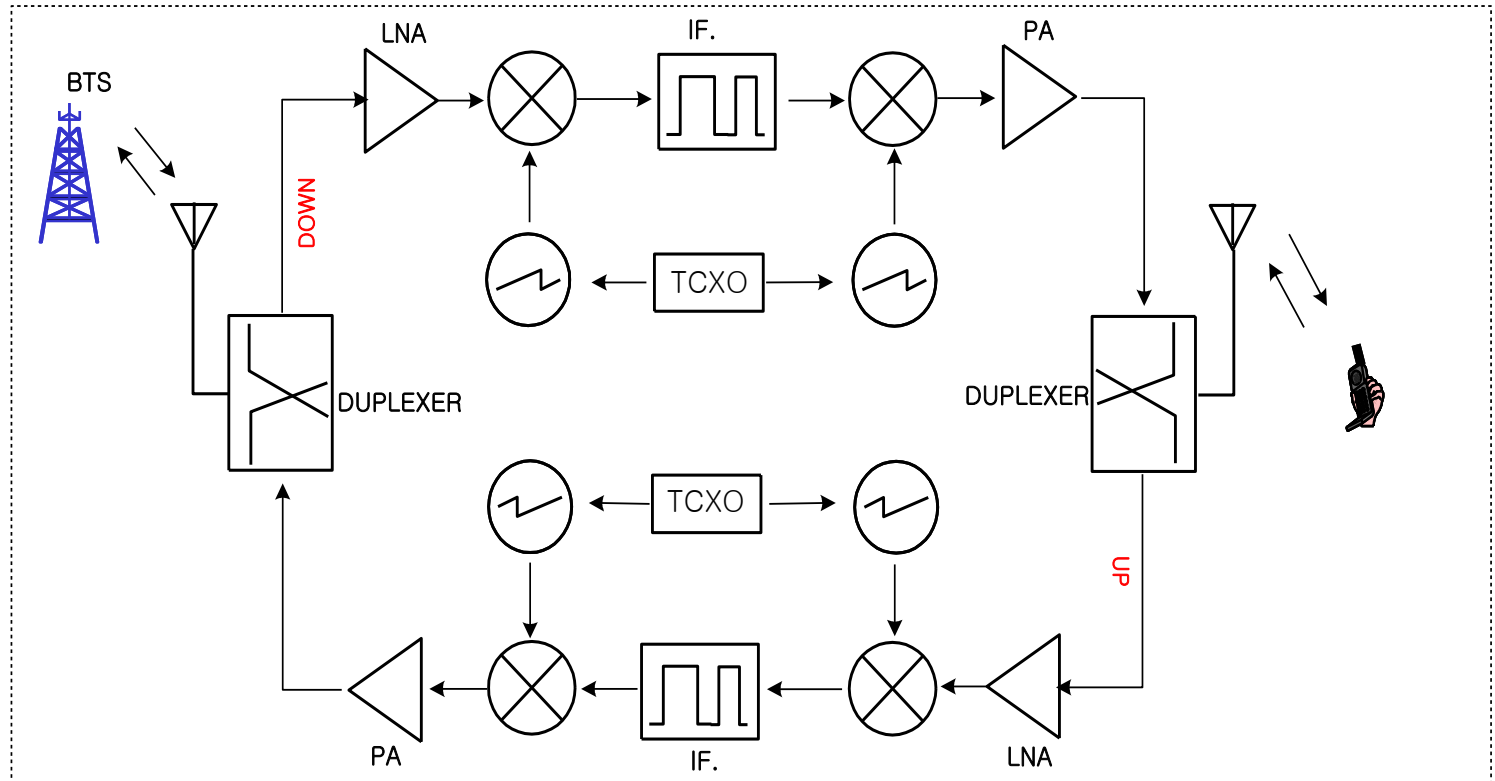


20dBm, 10dBm / GSM, GPRS, CDMA, WCDMA, LTE



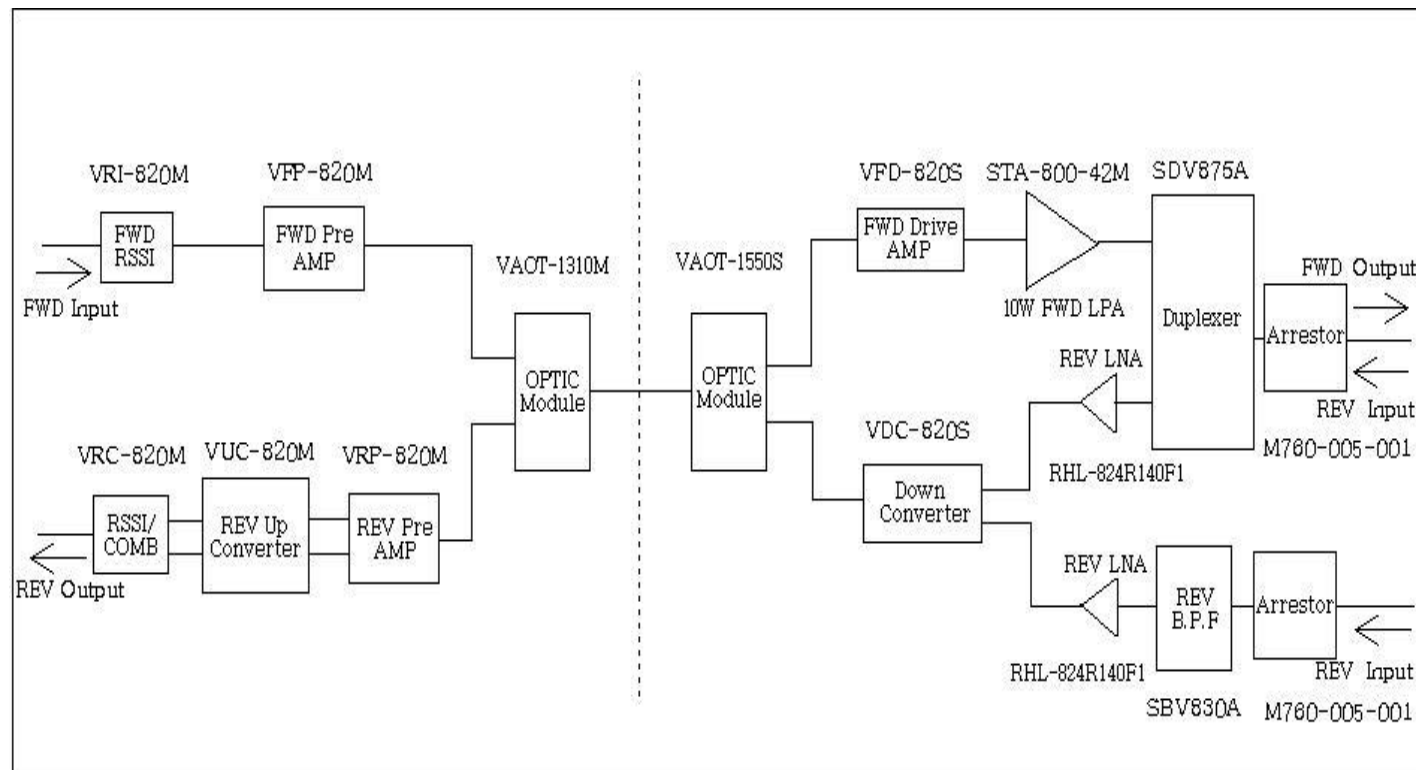


20W,2W,20dBm,10dBm / GSM,GPRS,CDMA,WCMA.LTE



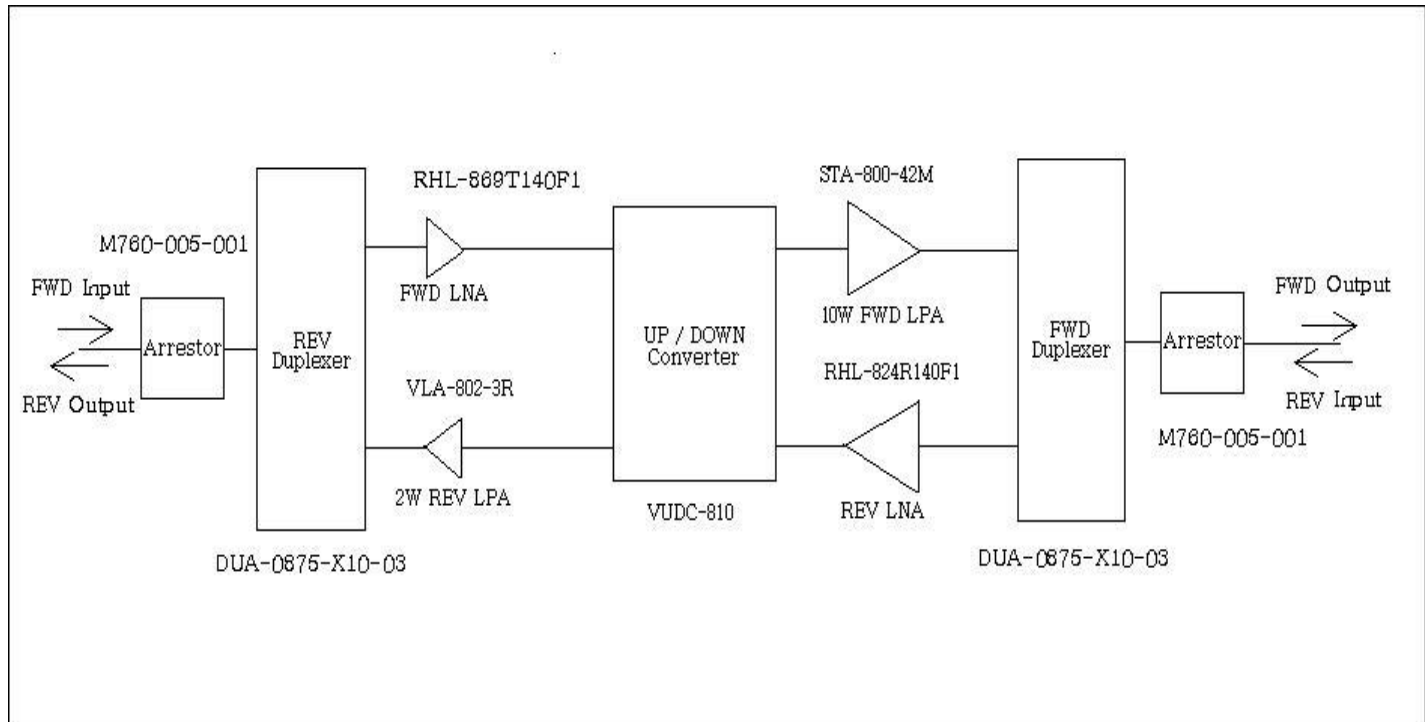


20W,10W,5W/ GSM,GPRS,CDMA,WCMA.LTE





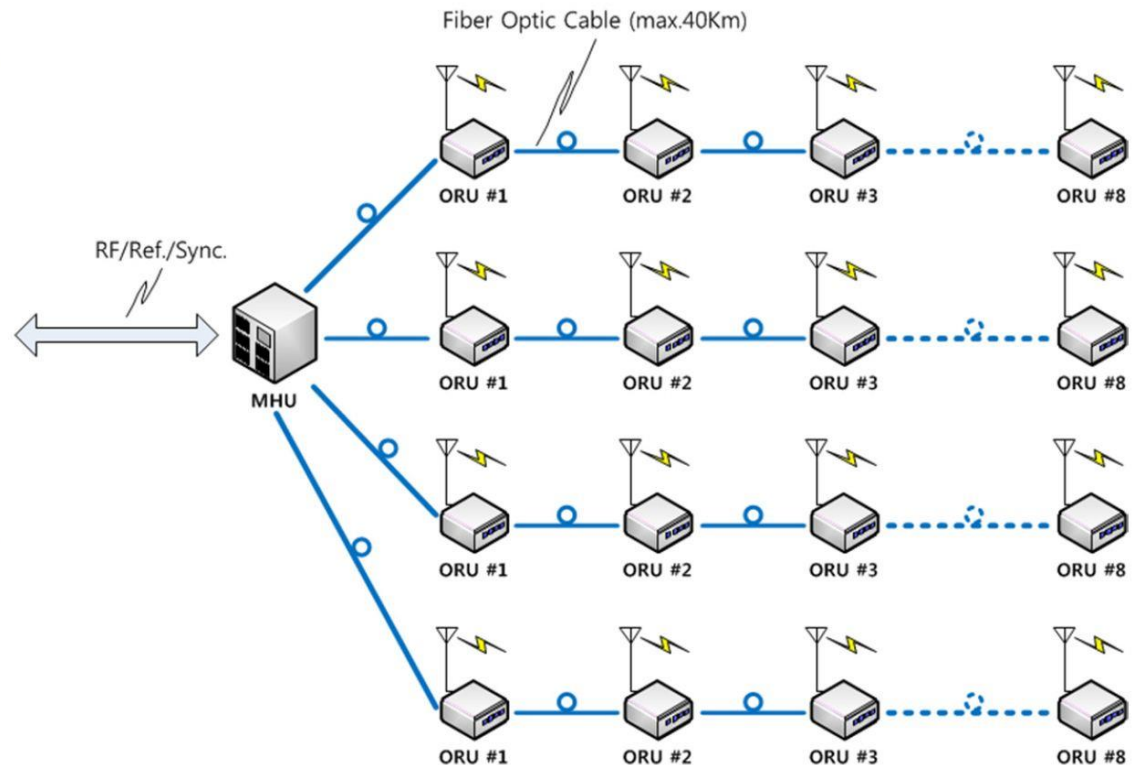
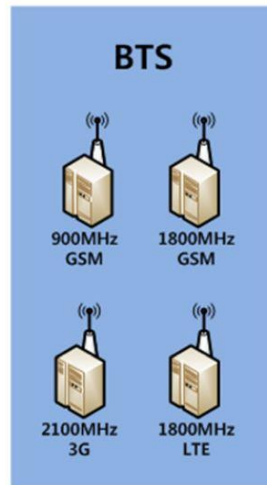
20W,2W,20dBm,10dBm / GSM,GPRS,CDMA,WCMA.LTE

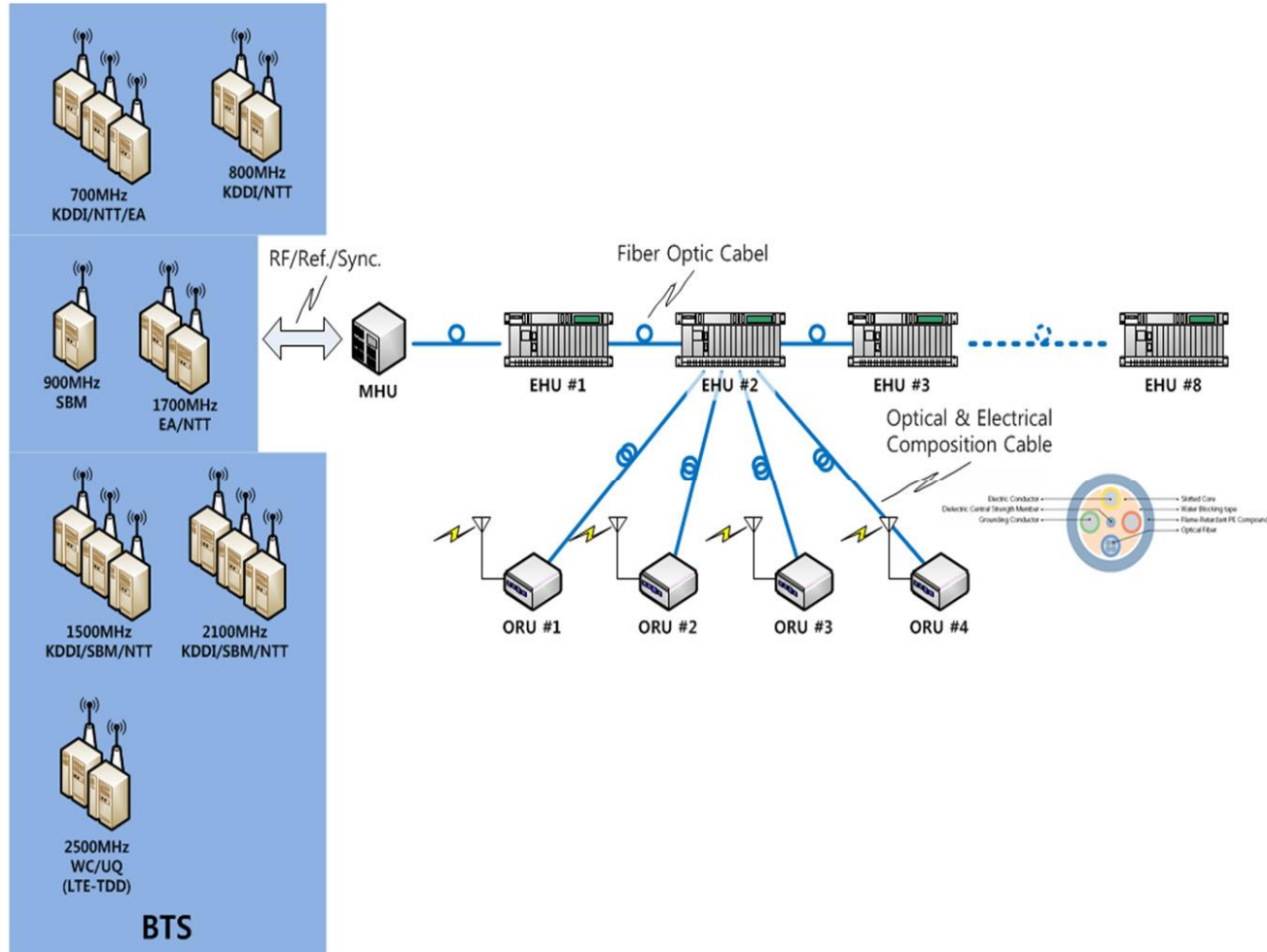




Multi Band / WCMA.LTE

Application







1. Description

Repeater for WCDMA,LTE interfaces signals from BTS or terminal in RF type and amplifies the signals, adjusting the level for transmission, for effective repeating in shadow areas. The purpose of this repeater is to expand service coverage by improving service quality in narrow shadow areas in buildings, basements, and homes that cannot be covered by BTS and other coverage expanding repeaters. Repeater is designed to be installed in narrow shadow areasts in indoors with a bracket. Also, it has various LED indicators on the front surface to make it easy for users to see the status. The LED indicators guarantee easy installation, operation, and customer service.



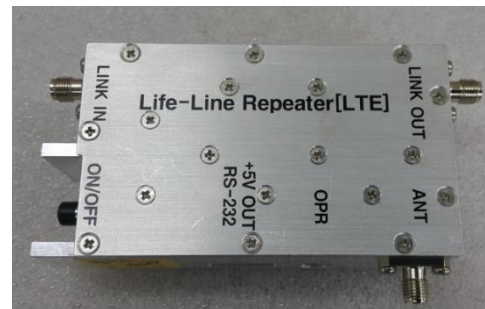
■3G+4G Repeater



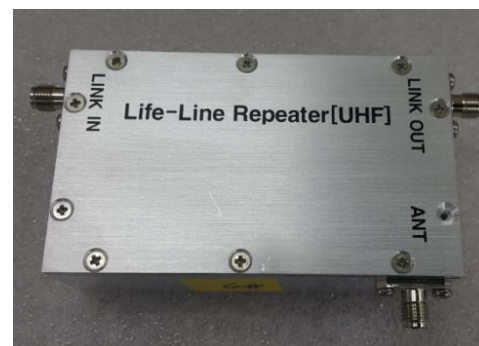
■WCDMA/LTE/LTE-A Repeater



■ Gate way



■ Life-Line Repeater(LTE)



■ Life-Line Repeater(UHF)



1. Description

- Single Tone (Noise) Detection
- Spectrum Display Function
- Power Measurement
- ACLR Measurement
- Spectrum Emission Mask(SEM)
- Occupied Bandwidth(OBW)
- Alarm Monitoring / Save





1. Description

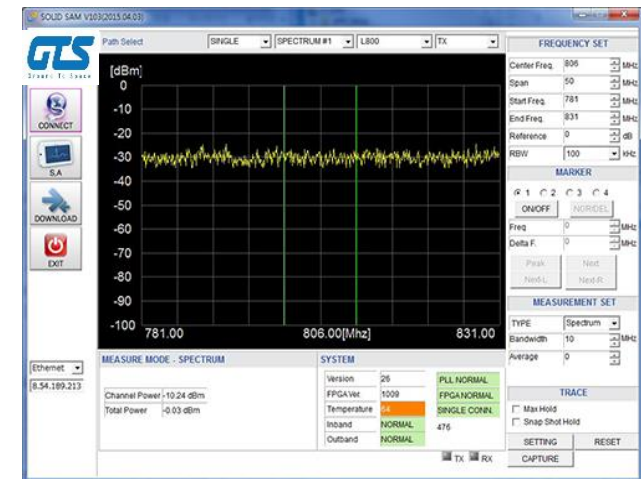
SMmodule receives the input signal of WIDE BAND and provides SPECTRUM measurement of the frequency-converted signal to the IF signal after passing through the band filter in the desired band and characterization of the main KPI of the protocol (CDMA, WCDMA, LTE, etc.) signal

* Main Function

- TX AND RX Signal Selection
- Different Band Width Filtering by Center Frequency
- Spectrum Measurement and Analysis
- Signal Analysis



Parameter		Value	Unit
Frequency range	RF	650~1000, 1650~2750	MHz
	IF	TBD 150MHz	
Input Power	TX BAND	0~-6dBm/Total	
	RX BAND	-20dBm/1 carrier	
Bandwidth	Maximum	25MHz @ 1sweep, 100MHz @ Multi sweep	MHz
	Minimum	1	MHz
Resolution Bandwidth		1KHz, 30kHz, 100kHz	kHz
Video Bandwidth		0.3kHz, 10kHz, 30kHz	kHz
Averaging		100	count
Measurement Speed		TBD	ms
Input variable Attenuator		>20	dB
Number of Point		501	point
Amplitude Accuracy		1	dBp-p
Frequency Accuracy		±25	ppm
SFDR		70	dB
Image Filter Rejection		40	dB
Received Sensitivity		-100 dBm@100kHz	dBm/Hz
Spurious Level		-75dBm@100kHz RBW	NON IMD / All Spur
Input VSWR		≤ 1.5	
Supply voltage		6	V
Current		3	A



Philosophy

" We'll open up the future as the customer and trust oriented company."





Thank you