

RF Repeater Solution

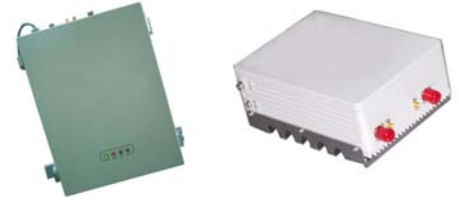
RF ICS Repeater (CDMA,UMTS(WCDMA))

◆ Feature

- Low cost, Easy & fast to install
- ICS
- Competitive Price
- LED Alarm, AGC, Auto shut Down
- LED Bars show input & Output Level
- USB Control(Bluetooth option)
- NMS (Using for Mobile Station)

◆ Application

- CDMA
- UMTS (WCDMA)



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	CDMA, UMTS, LTE		-
	Band	CDMA, UMTS, LTE Band		
Input Power range		-65dBm~-30dBm	-100dBm~-60dBm	According to customer requests, we can make it customized.
Gain		70dB~100dB	70dB~100dB	
Output Power		1W, 5W, 20W	+15dBm, +20dBm, +20dBm	
Gain control		30dB (step 1dB/error 1dB)		-
AGC		30dB(step 1dB)	-	-
ALC		15dB(step 1dB/error 1.5dB)	15dB(step 1dB/error 1.5dB)	-
Shut down		≥ Output power + 2~5dB		-
Pass Bandwidth Ripple		≤ 3 dB		-
VSWR		≤ 1:1.5		-
System Group Delay		≤ 7μs		-
Frequency Stability		≤ 0.01ppm		-
Noise Figure		-	≤ 6dB	-
Tx/Rx Isolation		≥ Gain + 15dB		-
In band Spurious		3GPP Standard		-
Out of band Gain		3GPP Standard		-
Spurious Emission mask		3GPP Standard		-
EVM/ROH		12.5%/0.98		-
PCDE		≤-35dB		@UMTS
Impedance		50Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

■ ICS Specification

Parameter	specification	Remark
Cancellation Window Size	0~6us	-
Feedback Carrier NO.	10Carrers	-
Isolation Measurement Range	60~120dB	-
Isolation Measurement Error	±2.0dB	-
ICS Performance	25dB	-
Doppler Spectrum	6Hz	-

RF Repeater Solution

RF DPD Repeater (CDMA,UMTS(WCDMA), LTE)

◆ Feature

- Low cost, Easy & fast to install
- Competitive Price
- LED Alarm, AGC, Auto shut Down
- LED Bars show input & Output Level
- USB Control(Bluetooth option)
- NMS (Using for Mobile Station)
- DPD

◆ Application

- CDMA
- UMTS (WCDMA)
- LTE



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	CDMA, UMTS, LTE		-
	Band	CDMA, UMTS, LTE Band		-
Input Power range		-65dBm~-35dBm	-100dBm~-60dBm	According to customer requests, we can make it customized.
Gain		55dB~95dB	55dB~95dB	
Output Power		10W, 40W	+20dBm, +20dBm	
Gain control		30dB (step 1dB/error 1dB)		-
AGC		30dB(step 1dB)	-	-
ALC		15dB(step 1dB/error 1.5dB)	15dB(step 1dB/error 1.5dB)	-
Shut down		≥ Output power + 2~5dB		-
Pass Bandwidth Ripple		≤ 3 dB		-
VSWR		≤ 1:1.5		-
System Group Delay		≤ 5μs		-
Frequency Stability		≤ 0.01ppm		-
Noise Figure		-	≤ 5dB	-
Tx/Rx Isolation		≥ Gain + 15dB		-
In band Spurious		3GPP Standard		-
Out of band Gain		3GPP Standard		-
Spurious Emission mask		3GPP Standard		-
EVM/ROH		12.5%/0.98		-
PCDE		≤-35dB		@UMTS
System Efficiency		≥30%		-
Impedance		50Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

■ Repeater LED Indicators

Type	Normal Status	Abnormal Status	Specification
Power LED	Green	OFF	Normal operating
Down Link Over power	OFF	Red	Down Link shut down
Up Link Over power	OFF	Red	up Link shut down
Temperature Alarm	OFF	Red	Internal temperature(TEMP) higher than +75℃ (Option)

RF Repeater Solution

RF DPD Repeater-Band Fixed (Tetra, GSM900, DCS1800)

◆ Feature

- Low cost, Easy & fast to install
- Competitive Price
- LED Alarm, AGC, Auto shut Down
- LED Bars show input & Output Level
- USB Control(Bluetooth option)
- NMS (Using for Mobile Station)
- Band Fixed
- DPD

◆ Application

- Tetra
- GSM900
- DCS1800



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	Tetra, GSM900, DCS1800		-
	Band	Tetra, GSM900, DCS1800Fixed Band		-
Input Power range		-65dBm~-35dBm	-100dBm~-60dBm	According to customer requests, we can make it customized.
Gain		55dB~85dB	55dB~85dB	
Output Power		1W, 5W, 15W	+15dBm, +20dBm, +20dBm,	
Gain control		30dB (step 1dB/error 1dB)		
ALC		15dB(step 1dB/error 1.5dB)	15dB(step 1dB/error 1.5dB)	-
Maximum Input			0dBm	Damage
Shut down		≥ Output power + 2~5dB		-
Pass Bandwidth Ripple		≤ 3 dB		-
VSWR		≤ 1:1.5		-
System Group Delay		≤ 5μs		-
Frequency Stability		≤ 0.01ppm		-
Noise Figure		-	≤ 5dB	-
Tx/Rx Isolation		≥ Gain + 15dB		-
IM & Spurious		≤-36dBm@GSM900/≤-30dBm@DCS1800		CW 2Tone 200KHz Spacing
Out of Band Gain		45dB@400KHz offset		-
		40dB@600KHz offset		-
		35dB @1MHz offset		-
		25dB @5MHz offset		-
System Efficiency		≥30%		-
Impedance		50Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

■ Repeater LED Indicators

Type	Normal Status	Abnormal Status	Specification
Power LED	Green	OFF	Normal operating
Down Link Over power	OFF	Red	Down Link shut down
Up Link Over power	OFF	Red	up Link shut down
Temperature Alarm	OFF	Red	Internal temperature(TEMP) higher than +75℃ (Option)

RF Repeater Solution

RF DPD Repeater-Band Selective (Tetra, GSM900, DCS1800)

◆ Feature

- Low cost, Easy & fast to install
- Competitive Price
- LED Alarm, AGC, Auto shut Down
- LED Bars show input & Output Level
- USB Control(Bluetooth option)
- NMS (Using for Mobile Station)
- Band Selective
- DPD

◆ Application

- Tetra
- GSM900
- DCS1800



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	Tetra, GSM900, DCS1800		-
	Band	0.5MHz ~ 15MHz		Band Selective
	Band Resolution	12.5KHz		Software control
Input Power range		-65dBm~-35dBm	-100dBm~-60dBm	According to customer requests, we can make it customized.
Gain		55dB~85dB	55dB~85dB	
Output Power		1W, 5W, 15W	+15dBm, +20dBm, +20dBm,	
Gain control		30dB (step 1dB/error 1dB)		-
ALC		15dB(step 1dB/error 1.5dB)	15dB(step 1dB/error 1.5dB)	-
Maximum Input		-	0dBm	Damage
Shut down		≥ Output power + 2~5dB		-
Pass Bandwidth Ripple		≤ 3 dB		-
VSWR		≤ 1:1.5		-
System Group Delay		≤ 5μs		-
Frequency Stability		≤ 0.01ppm		-
Noise Figure		-	≤ 5dB	-
Tx/Rx Isolation		≥ Gain + 15dB		-
IM & Spurious		≤-36dBm@GSM900/≤-30dBm@DCS1800		CW 2Tone 200KHz Spacing
Out of Band Gain			45dB@400KHz offset	-
			40dB@600KHz offset	-
			35dB @1MHz offset	-
			25dB @5MHz offset	-
System Efficiency		≥30%		-
Impedance		50Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

■ Repeater LED Indicators

Type	Normal Status	Abnormal Status	Specification
Power LED	Green	OFF	Normal operating
Down Link Over power	OFF	Red	Down Link shut down
Up Link Over power	OFF	Red	up Link shut down
Temperature Alarm	OFF	Red	Internal temperature(TEMP) higher than +75℃ (Option)

RF Repeater Solution

RF DPD Repeater-Channel Selective (Tetra, GSM900, DCS1800)

◆ Feature

- Low cost, Easy & fast to install
- Competitive Price
- LED Alarm, AGC, Auto shut Down
- LED Bars show input & Output Level
- USB Control(Bluetooth option)
- NMS (Using for Mobile Station)
- Channel Selective
- DPD

◆ Application

- Tetra
- GSM900
- DCS1800



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	Tetra, GSM900, DCS1800		-
	Channel Bandwidth	200kHz		-
	No. of Channels	1 ~ 4 Channel		Software control
Input Power range		-65dBm~-35dBm	-100dBm~-60dBm	According to customer requests, we can make it customized.
Gain		55dB~85dB	55dB~85dB	
Output Power		1W, 5W, 15W	+15dBm, +20dBm, +20dBm,	
Gain control		30dB (step 1dB/error 1dB)		-
ALC		15dB (step 1dB/error 1.5dB)	15dB (step 1dB/error 1.5dB)	
Maximum Input			0dBm	Damage
Shut down		≥ Output power + 2~5dB		-
Pass Bandwidth Ripple		≤ 3 dB		-
VSWR		≤ 1:1.5		-
System Group Delay		≤ 5μs		-
Frequency Stability		≤ 0.01ppm		-
Noise Figure		-	≤ 5dB	-
Tx/Rx Isolation		≥ Gain + 15dB		-
IM & Spurious		≤-36dBm@GSM900/≤-30dBm@DCS1800		CW 2Tone 200KHz Spacing
Out of Band Gain		45dB@400KHz offset		-
		40dB@600KHz offset		-
		35dB @1MHz offset		-
		25dB @5MHz offset		-
System Efficiency		≥30%		-
Impedance		50Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

■ Repeater LED Indicators

Type	Normal Status	Abnormal Status	Specification
Power LED	Green	OFF	Normal operating
Down Link Over power	OFF	Red	Down Link shut down
Up Link Over power	OFF	Red	up Link shut down
Temperature Alarm	OFF	Red	Internal temperature(TEMP) higher than +75℃ (Option)

RF Repeater Solution

RF APD Repeater (CDMA,UMTS(WCDMA), LTE)

◆ Feature

- Low cost, Easy & fast to install
- Competitive Price
- LED Alarm, AGC, Auto shut Down
- LED Bars show input & Output Level
- USB Control(Bluetooth option)
- NMS (Using for Mobile Station)
- APD

◆ Application

- CDMA
- UMTS (WCDMA)
- LTE



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	CDMA, UMTS, LTE		-
	Band	CDMA, UMTS, LTE Band		-
Input Power range		-65dBm~-35dBm	-100dBm~-60dBm	According to customer requests, we can make it customized.
Gain		55dB~95dB	55dB~95dB	
Output Power		5W, 15W	+20dBm, +20dBm	
Gain control		30dB (step 1dB/error 1dB)		-
AGC		30dB(step 1dB)	-	-
ALC		15dB(step 1dB/error 1.5dB)	15dB(step 1dB/error 1.5dB)	-
Shut down		≥ Output power + 2~5dB		-
Pass Bandwidth Ripple		≤ 3 dB		-
VSWR		≤ 1:1.5		-
System Group Delay		≤ 5μs		-
Frequency Stability		≤ 0.01ppm		-
Noise Figure		-	≤ 5dB	-
Tx/Rx Isolation		≥ Gain + 15dB		-
In band Spurious		3GPP Standard		-
Out of band Gain		3GPP Standard		-
Spurious Emission mask		3GPP Standard		-
EVM/ROH		12.5%/0.98		-
PCDE		≤-35dB		@UMTS
System Efficiency		≥30%		-
Impedance		50Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

■ Repeater LED Indicators

Type	Normal Status	Abnormal Status	Specification
Power LED	Green	OFF	Normal operating
Down Link Over power	OFF	Red	Down Link shut down
Up Link Over power	OFF	Red	up Link shut down
Temperature Alarm	OFF	Red	Internal temperature(TEMP) higher than +75℃ (Option)

■ Optic Repeater Solution

Digital Optic Repeater(CDMA,UMTS(WCDMA), LTE)

◆ Feature

- Easy Installation & Maintenance
- Low cost to extend cell coverage (Optic cable $\leq 80\text{Km}$)
- Sector Selection
- A max. of 8ROUs can be cascaded
- HPA&LPA used. / Digital Optic 3Sector Selection

◆ Application

- CDMA
- UMTS
- LTE
- Urban,,Subway, Rural



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	CDMA, UMTS, LTE		-
	Band	CDMA, UMTS, LTE Band		-
Input Power range		-65dBm~-35dBm	-100dBm~-60dBm	According to customer requests, we can make it customized.
Gain		50dB~80dB	40dB~70dB	
Output Power		5W, 15W, 40W	0dBm	
Gain control		30dB (step 1dB/error 1dB)		-
Shut down		\geq Output power + 2~5dB		-
Pass Bandwidth Ripple		$\leq 3\text{dB}$		-
VSWR		$\leq 1:1.5$		-
System Group Delay		$\leq 6\mu\text{s}$		-
Frequency Stability		$\leq 0.01\text{ppm}$		-
Noise Figure		-	$\leq 5\text{dB}$	Optic Loss $\leq 10\text{dBo}$
Tx/Rx Isolation		$\geq 95\text{dB}$		-
In band Spurious		3GPP Standard		-
Out of band Gain		3GPP Standard	-	-
Spurious Emission mask		3GPP Standard	-	-
EVM/ROH		7%/0.98		-
PCDE		$\leq -35\text{dB}$	@UMTS	-
Impedance		50 Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

◆ Optic specification

Item	Specification	
	Down Link	Up Link
Data Transmission	2.4Gbps	
Wavelength	1570 \pm 5mm	1510 \pm 5mm
Optic power	$\leq 0\text{ dBm}$	
Connector type	SC/APC	

◆ Repeater LED Indicators

Type	Normal Status	Abnormal Status	Specification	
			MHU	ROU
Power LED	Green	OFF	Normal operating	
Over power	OFF	Red	Up Link shut down	Down Link shut down
Optic status	Green	OFF	Normal Optic level	

■ Optic Repeater Solution

Digital Optic Repeater-Band Fixed (Tetra, GSM900, DCS1800)

◆ Feature

- Easy Installation & Maintenance
- Low cost to extend cell coverage (Optic cable $\leq 20\text{Km}$)
- Heat sink effective body structure
- A max. of 3ROUs can be cascaded
- HPA&LPA used.
- Digital Optic 3Sector Selection

◆ Application

- Tetra
- GSM900
- DCS1800
- Urban, Sub-urban, Rural



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	Tetra, GSM900, DCS1800		-
	Band	Tetra, GSM900, DCS1800Fixed Band		-
Input Power range		-37dBm ~ -7dBm	$\leq -65\text{dBm}$	According to customer requests, we can make it customized.
Gain		50dB~80dB	40dB~70dB	
Output Power		200mW, 3W, 10W	+0dBm	
UL Maximum Input		0dBm		Damage
Gain control		30dB (step 1dB/error 1dB)		-
Shut down		\geq Output power + 2~5dB		-
Pass Bandwidth Ripple		$\leq 3\text{dB}$		-
VSWR		$\leq 1:1.5$		-
System Group Delay		$\leq 6\mu\text{s}$		-
Frequency Stability		$\leq 0.01\text{ppm}$		-
Noise Figure		-	$\leq 5\text{dB}$	Optic Loss $\leq 10\text{dBo}$
Tx/Rx Isolation		$\geq 95\text{dB}$		-
IM & Spurious		$\leq -36\text{dBm}@GSM900/\leq -30\text{dBm}@DCS1800$		CW 2Tone 200KHz Spacing
Out of Band Gain	45dB@400KHz offset			-
	40dB@600KHz offset			-
	35dB @1MHz offset			-
	25dB @5MHz offset			-
Impedance		50 Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

◆ Optic specification

Item	Specification	
	Down Link	Up Link
Data Transmission	2.4Gbps	
Wavelength	1570 \pm 5mm	1510 \pm 5mm
Optic power	$\leq 0\text{ dBm}$	
Connector type	SC/APC	

◆ Repeater LED Indicators

Type	Normal Status	Abnormal Status	Specification	
			MHU	ROU
Power LED	Green	OFF	Normal operating	
Over power	OFF	Red	Up Link shut down	Down Link shut down
Optic status	Green	OFF	Normal Optic level	

■ Optic Repeater Solution

Digital Optic Repeater -Band Selective (Tetra, GSM900, DCS1800)

◆ Feature

- Easy Installation & Maintenance
- Low cost to extend cell coverage (Optic cable $\leq 20\text{Km}$)
- Heat sink effective body structure
- A max. of 3ROUs can be cascaded
- HPA&LPA used.
- Digital Optic 3Sector Selection

◆ Application

- Tetra
- GSM900
- DCS1800
- Urban, Sub-urban, Rural



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	Tetra, GSM900, DCS1800		-
	Band	0.5MHz ~ 15MHz		Band Selective
	Band Resolution	12.5KHz		Software control
Input Power range		-37dBm ~ -7dBm	$\leq -65\text{dBm}$	According to customer requests, we can make it customized.
Gain		50dB~80dB	40dB~70dB	
Output Power		200mW, 3W, 10W	+0dBm	
UL Maximum Input		0dBm		Damage
Gain control		30dB (step 1dB/error 1dB)		
Shut down		\geq Output power + 2~5dB		-
Pass Bandwidth Ripple		$\leq 3\text{dB}$		-
VSWR		$\leq 1:1.5$		-
System Group Delay		$\leq 6\mu\text{s}$		-
Frequency Stability		$\leq 0.01\text{ppm}$		-
Noise Figure		-	$\leq 5\text{dB}$	Optic Loss $\leq 10\text{dBo}$
Tx/Rx Isolation		$\geq 95\text{dB}$		-
IM & Spurious		$\leq -36\text{dBm}@GSM900/\leq -30\text{dBm}@DCS1800$		CW 2Tone 200KHz Spacing
Out of Band Gain	45dB@400KHz offset			-
	40dB@600KHz offset			-
	35dB @1MHz offset			-
	25dB @5MHz offset			-
Impedance		50 Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

◆ Optic specification

Item	Specification	
	Down Link	Up Link
Data Transmission	2.4Gbps	
Wavelength	1570 \pm 5mm	1510 \pm 5mm
Optic power	$\leq 0\text{ dBm}$	
Connector type	SC/APC	

◆ Repeater LED Indicators

Type	Normal Status	Abnormal Status	Specification	
			MHU	ROU
Power LED	Green	OFF	Normal operating	
Over power	OFF	Red	Up Link shut down	Down Link shut down
Optic status	Green	OFF	Normal Optic level	

■ Optic Repeater Solution

Digital Optic Repeater - Channel Selective (Tetra, GSM900, DCS1800)

◆ Feature

- Easy Installation & Maintenance
- Low cost to extend cell coverage (Optic cable $\leq 20\text{Km}$)
- Heat sink effective body structure
- A max. of 3ROUs can be cascaded
- HPA&LPA used.

◆ Application

- Tetra
- GSM900
- DCS1800
- Urban, Sub-urban, Rural



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	Tetra, GSM900, DCS1800		-
	Channel Bandwidth	200kHz		-
	No. of Channels	1 ~ 4 Channel		Software control
Input Power range		-37dBm ~ -7dBm	$\leq -65\text{dBm}$	According to customer requests, we can make it customized.
Gain		50dB~80dB	40dB~70dB	
Output Power		200mW, 3W, 10W	+0dBm	
UL Maximum Input		0dBm		Damage
Gain control		30dB (step 1dB/error 1dB)		
Shut down		\geq Output power + 2~5dB		-
Pass Bandwidth Ripple		$\leq 3\text{dB}$		-
VSWR		$\leq 1:1.5$		-
System Group Delay		$\leq 6\mu\text{s}$		-
Frequency Stability		$\leq 0.01\text{ppm}$		-
Noise Figure		-	$\leq 5\text{dB}$	Optic Loss $\leq 10\text{dBo}$
Tx/Rx Isolation		$\geq 95\text{dB}$		-
IM & Spurious		$\leq -36\text{dBm}@GSM900/\leq -30\text{dBm}@DCS1800$		CW 2Tone 200KHz Spacing
Out of Band Gain	45dB@400KHz offset			-
	40dB@600KHz offset			-
	35dB @1MHz offset			-
	25dB @5MHz offset			-
Impedance		50 Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

◆ Optic specification

Item	Specification	
	Down Link	Up Link
Data Transmission	2.4Gbps	
Wavelength	1570 \pm 5mm	1510 \pm 5mm
Optic power	$\leq 0\text{ dBm}$	
Connector type	SC/APC	

◆ Repeater LED Indicators

Type	Normal Status	Abnormal Status	Specification	
			MHU	ROU
Power LED	Green	OFF	Normal operating	
Over power	OFF	Red	Up Link shut down	Down Link shut down
Optic status	Green	OFF	Normal Optic level	

■ Optic Repeater Solution

Digital Optic DPD Repeater (CDMA,UMTS(WCDMA), LTE)

◆ Feature

- Easy Installation & Maintenance
- Low cost to extend cell coverage (Optic cable $\leq 80\text{Km}$)
- Sector Selection
- A max. of 8ROUs can be cascaded
- DPD
- Digital Optic 3Sector Selection

◆ Application

- CDMA
- UMTS
- LTE
- Urban, Subway, Rural



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	CDMA, UMTS, LTE		-
	Band	CDMA, UMTS, LTE Band		-
Input Power range		-65dBm~-35dBm	-100dBm~-60dBm	According to customer requests, we can make it customized.
Gain		50dB~80dB	40dB~70dB	
Output Power		10W, 40W	0dBm	
Gain control		30dB (step 1dB/error 1dB)		-
Shut down		\geq Output power + 2~5dB		-
Pass Bandwidth Ripple		$\leq 3\text{dB}$		-
VSWR		$\leq 1:1.5$		-
System Group Delay		$\leq 6\mu\text{s}$		-
Frequency Stability		$\leq 0.01\text{ppm}$		-
Noise Figure		-	$\leq 5\text{dB}$	Optic Loss $\leq 10\text{dB}$
Tx/Rx Isolation		$\geq 95\text{dB}$		-
In band Spurious		3GPP Standard		-
Out of band Gain		3GPP Standard	-	-
Spurious Emission mask		3GPP Standard	-	-
EVM/ROH		7%/0.98		-
PCDE		$\leq -35\text{dB}$	@UMTS	-
System Efficiency		$\geq 30\%$		-
Impedance		50 Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

◆ Optic specification

Item	Specification	
	Down Link	Up Link
Data Transmission	2.4Gbps	
Wavelength	1570 \pm 5mm	1510 \pm 5mm
Optic power	$\leq 0\text{ dBm}$	
Connector type	SC/APC	

◆ Repeater LED Indicators

Type	Normal Status	Abnormal Status	Specification	
			MHU	ROU
Power LED	Green	OFF	Normal operating	
Over power	OFF	Red	Up Link shut down	Down Link shut down
Optic status	Green	OFF	Normal Optic level	

■ Optic Repeater Solution

Digital Optic DPD Repeater-Band Fixed (Tetra, GSM900, DCS1800)

◆ Feature

- Easy Installation & Maintenance
- Low cost to extend cell coverage (Optic cable $\leq 80\text{Km}$)
- Sector Selection
- A max. of 8ROUs can be cascaded
- DPD
- Digital Optic 3Sector Selection
- Band Fixed

◆ Application

- Tetra
- GSM900
- DCS1800
- Urban, Subway, Rural



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	Tetra, GSM900, DCS1800		-
	Band	Tetra, GSM900, DCS1800Fixed Band		-
Input Power range		-37dBm ~ -7dBm	$\leq -65\text{dBm}$	According to customer requests, we can make it customized.
Gain		50dB~80dB	40dB~70dB	
Output Power		1W, 5W, 15W	+0dBm	
UL Maximum Input		0dBm		Damage
Gain control		30dB (step 1dB/error 1dB)		
Shut down		\geq Output power + 2~5dB		-
Pass Bandwidth Ripple		$\leq 3\text{dB}$		-
VSWR		$\leq 1:1.5$		-
System Group Delay		$\leq 6\mu\text{s}$		-
Frequency Stability		$\leq 0.01\text{ppm}$		-
Noise Figure		-	$\leq 5\text{dB}$	Optic Loss $\leq 10\text{dBo}$
Tx/Rx Isolation		$\geq 95\text{dB}$		-
IM & Spurious		$\leq -36\text{dBm}@GSM900/\leq -30\text{dBm}@DCS1800$		CW 2Tone 200KHz Spacing
Out of Band Gain	45dB@400KHz offset			-
	40dB@600KHz offset			-
	35dB @1MHz offset			-
	25dB @5MHz offset			-
System Efficiency		$\geq 30\%$		-
Impedance		50 Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

◆ Optic specification

Item	Specification	
	Down Link	Up Link
Data Transmission	2.4Gbps	
Wavelength	1570 \pm 5mm	1510 \pm 5mm
Optic power	$\leq 0\text{ dBm}$	
Connector type	SC/APC	

◆ Repeater LED Indicators

Type	Normal Status	Abnormal Status	Specification	
			MHU	ROU
Power LED	Green	OFF	Normal operating	
Over power	OFF	Red	Up Link shut down	Down Link shut down
Optic status	Green	OFF	Normal Optic level	

■ Optic Repeater Solution

Digital Optic DPD Repeater -Band Selective (Tetra, GSM900, DCS1800)

◆ Feature

- Easy Installation & Maintenance
- Low cost to extend cell coverage (Optic cable $\leq 80\text{Km}$)
- Sector Selection
- A max. of 8ROUs can be cascaded
- DPD
- Digital Optic 3Sector Selection / Band Selective

◆ Application

- Tetra
- GSM900
- DCS1800
- Urban, Subway, Rural



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	Tetra, GSM900, DCS1800		-
	Band	0.5MHz ~ 15MHz		Band Selective
	Band Resolution	12.5KHz		Software control
Input Power range		-37dBm ~ -7dBm	$\leq -65\text{dBm}$	According to customer requests, we can make it customized.
Gain		50dB~80dB	40dB~70dB	
Output Power		1W, 5W, 15W	+0dBm	
UL Maximum Input		0dBm		Damage
Gain control		30dB (step 1dB/error 1dB)		-
Shut down		\geq Output power + 2~5dB		-
Pass Bandwidth Ripple		$\leq 3\text{dB}$		-
VSWR		$\leq 1:1.5$		-
System Group Delay		$\leq 6\mu\text{s}$		-
Frequency Stability		$\leq 0.01\text{ppm}$		-
Noise Figure		-	$\leq 5\text{dB}$	Optic Loss $\leq 10\text{dBo}$
Tx/Rx Isolation		$\geq 95\text{dB}$		-
IM & Spurious		$\leq -36\text{dBm}@GSM900/\leq -30\text{dBm}@DCS1800$		CW 2Tone 200KHz Spacing
Out of Band Gain			45dB@400KHz offset	-
			40dB@600KHz offset	-
			35dB @1MHz offset	-
			25dB @5MHz offset	-
System Efficiency		$\geq 30\%$		-
Impedance		50 Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

◆ Optic specification

Item	Down Link	Up Link
Data Transmission		2.4Gbps
Wavelength	1570 \pm 5nm	1510 \pm 5nm
Optic power		$\leq 0\text{ dBm}$
Connector type		SC/APC

◆ Repeater LED Indicators

Type	Normal Status	Abnormal Status	Specification	
			MHU	ROU
Power LED	Green	OFF	Normal operating	
Over power	OFF	Red	Up Link shut down	Down Link shut down
Optic status	Green	OFF	Normal Optic level	

■ Optic Repeater Solution

Digital Optic DPD Repeater -Channel Selective (Tetra, GSM900, DCS1800)

◆ Feature

- Easy Installation & Maintenance
- Low cost to extend cell coverage (Optic cable $\leq 80\text{Km}$)
- Sector Selection
- A max. of 8ROUs can be cascaded
- DPD
- Digital Optic 3Sector Selection
- Channel Selective

◆ Application

- Tetra
- GSM900
- DCS1800
- Urban, Subway, Rural



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	Tetra, GSM900, DCS1800		-
	Channel Bandwidth	200kHz		-
	No. of Channels	1 ~ 4 Channel		Software control
Input Power range		-37dBm ~ -7dBm	$\leq -65\text{dBm}$	According to customer requests, we can make it customized.
Gain		50dB~80dB	40dB~70dB	
Output Power		1W, 5W, 15W	+0dBm	
UL Maximum Input		0dBm		Damage
Gain control		30dB (step 1dB/error 1dB)		
Shut down		\geq Output power + 2~5dB		-
Pass Bandwidth Ripple		$\leq 3\text{dB}$		-
VSWR		$\leq 1:1.5$		-
System Group Delay		$\leq 6\mu\text{s}$		-
Frequency Stability		$\leq 0.01\text{ppm}$		-
Noise Figure		-	$\leq 5\text{dB}$	Optic Loss $\leq 10\text{dBo}$
Tx/Rx Isolation		$\geq 95\text{dB}$		-
IM & Spurious		$\leq -36\text{dBm}@GSM900/\leq -30\text{dBm}@DCS1800$		CW 2Tone 200KHz Spacing
Out of Band Gain	45dB@400KHz offset			-
	40dB@600KHz offset			-
	35dB @1MHz offset			-
	25dB @5MHz offset			-
System Efficiency		$\geq 30\%$		-
Impedance		50 Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

◆ Optic specification

Item	Down Link	Up Link
Data Transmission	2.4Gbps	
Wavelength	1570 \pm 5nm	1510 \pm 5nm
Optic power	$\leq 0\text{ dBm}$	
Connector type	SC/APC	

◆ Repeater LED Indicators

Type	Normal Status	Abnormal Status	Specification	
			MHU	ROU
Power LED	Green	OFF	Normal operating	
Over power	OFF	Red	Up Link shut down	Down Link shut down
Optic status	Green	OFF	Normal Optic level	

■ Optic Repeater Solution

Digital Optic APD Repeater (CDMA,UMTS(WCDMA), LTE)

◆ Feature

- Easy Installation & Maintenance
- Low cost to extend cell coverage (Optic cable $\leq 80\text{Km}$)
- Sector Selection
- A max. of 8ROUs can be cascaded
- APD
- Digital Optic 3Sector Selection

◆ Application

- CDMA
- UMTS
- LTE
- Urban, Sub-urban, Rural



◆ Standard Specification (High & Middle Power)

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	CDMA, UMTS, LTE		
	Band	CDMA, UMTS, LTE Band		
Input Power range		-65dBm~-35dBm	-100dBm~-60dBm	According to customer requests, we can make it customized.
Gain		50dB~80dB	40dB~70dB	
Output Power		5W, 15W	0dBm	
Gain control		30dB (step 1dB/error 1dB)		-
Shut down		\geq Output power + 2~5dB		-
Pass Bandwidth Ripple		$\leq 3\text{dB}$		-
VSWR		$\leq 1:1.5$		-
System Group Delay		$\leq 6\mu\text{s}$		-
Frequency Stability		$\leq 0.01\text{ppm}$		-
Noise Figure		-	$\leq 5\text{dB}$	Optic Loss $\leq 10\text{dB}$
Tx/Rx Isolation		$\geq 95\text{dB}$		-
In band Spurious		3GPP Standard		-
Out of band Gain		3GPP Standard	-	-
Spurious Emission mask		3GPP Standard	-	-
EVM/ROH		7%/0.98		
PCDE		$\leq -35\text{dB}$	@UMTS	
System Efficiency		$\geq 28\%$		
Impedance		50 Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

◆ Optic specification

Item	Specification	
	Down Link	Up Link
Data Transmission	2.4Gbps	
Wavelength	1570 \pm 5mm	1510 \pm 5mm
Optic power	$\leq 0\text{ dBm}$	
Connector type	SC/APC	

◆ Repeater LED Indicators

Type	Normal Status	Abnormal Status	Specification	
			MHU	ROU
Power LED	Green	OFF	Normal operating	
Over power	OFF	Red	Up Link shut down	Down Link shut down
Optic status	Green	OFF	Normal Optic level	

■ Digital Repeater Solution

Digital Hybrid Repeater (CDMA,UMTS(WCDMA), LTE)

◆ Feature

- Easy Installation & Maintenance
- Optic & UTP Dispersion possible (Optic cable $\leq 20\text{Km}$, UTP 150m)
- A max. of 64 Remotes can be cascaded
- UTP HUB available

◆ Application

- CDMA
- UMTS
- LTE
- Urban Area, Subway Indoor



◆ Standard Specification

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	CDMA, UMTS, LTE		
	Band	CDMA, UMTS, LTE Band		
Input Power range		-65dBm~35dBm	-100dBm~-60dBm	According to customer requests, we can make it customized.
Gain		40dB~70dB	30dB~60dB	
Output Power		200mW, 1W, 5W	0dBm	
Gain control		30dB (step 1dB/error 1dB)		-
Shut down		\geq Output power + 2~5dB		-
Pass Bandwidth Ripple		$\leq 3\text{dB}$		-
VSWR		$\leq 1:1.5$		-
System Group Delay		$\leq 6\mu\text{s}$		-
Frequency Stability		$\leq 0.01\text{ppm}$		-
Noise Figure		-	$\leq 5\text{dB}$	Optic Loss $\leq 10\text{dB}$
Tx/Rx Isolation		$\geq 95\text{dB}$		-
In band Spurious		3GPP Standard		-
Out of band Gain		3GPP Standard	-	-
Spurious Emission mask		3GPP Standard	-	-
EVM/ROH		7%/0.98		
PCDE		$\leq -35\text{dB}$	@UMTS	
Impedance		50 Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

◆ Optic specification

Item	Specification	
	Down Link	Up Link
Data Transmission	1Gbps	
Wavelength	1310 \pm 5mm	1530, 1550, 1570 \pm 5mm
Optic power	$\leq 0\text{ dBm}$	
Connector type	SC/APC	

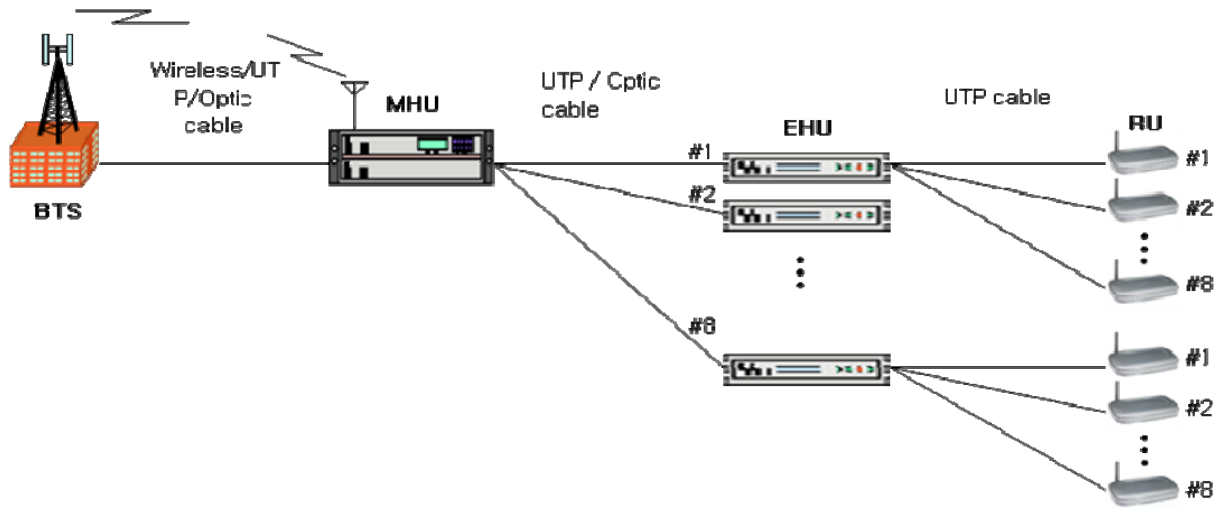
◆ UTP specification

Item	Specification
Data Transmission	1.2Gbps /150m
UTP Cable	More than CAT 5
Transmission Method	Gigabit Internet
Connector type	RJ45

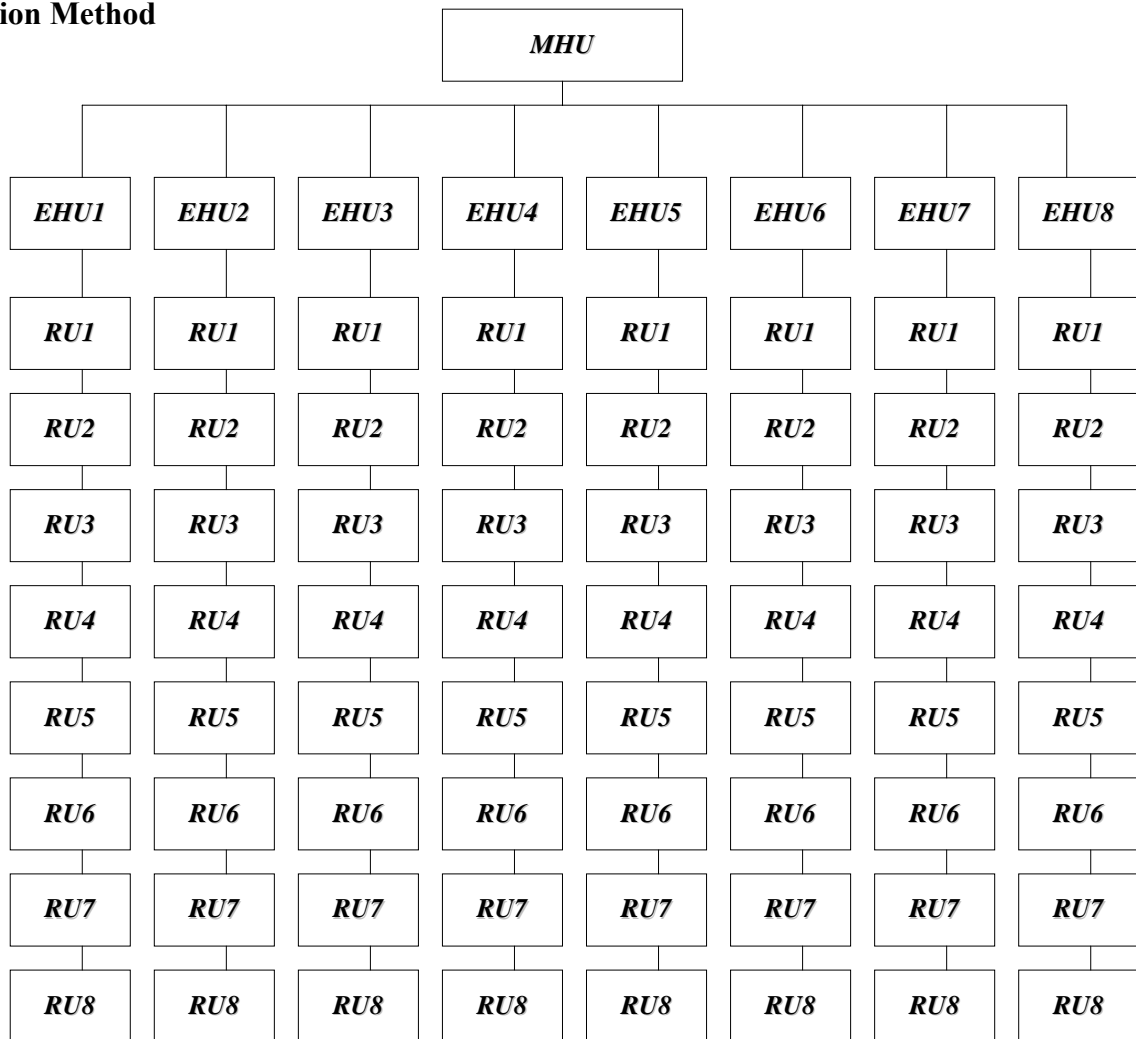
Digital Repeater Solution

Digital Hybrid Repeater (CDMA,UMTS(WCDMA), LTE)

System Application



Dispersion Method



■ Digital Repeater Solution

Digital Hybrid Repeater _Band Fixed (Tetra/ GSM900/ DCS1800)

◆ Feature

- Easy Installation & Maintenance
- Optic & UTP Dispersion possible
(Optic cable $\leq 20\text{Km}$, UTP 150m)
- A max. of 64 Remotes can be cascaded
- UTP HUB available

◆ Application

- CDMA
- UMTS
- LTE
- Urban Area, Subway
Indoor



◆ Standard Specification

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	Tetra, GSM900, DCS1800		-
	Band	Tetra, GSM900, DCS1800 Fixed Band		-
Input Power range		-65dBm~-35dBm	-100dBm~-60dBm	According to customer requests, we can make it customized.
Gain		40dB~70dB	30dB~60dB	
Output Power		200mW, 1W	0dBm	
Gain control		30dB (step 1dB/error 1dB)		
ALC		15dB(step 1dB/error 1.5dB)	15dB(step 1dB/error 1.5dB)	-
Maximum Input			0dBm	Damage
Shut down		\geq Output power + 2~5dB		-
Pass Bandwidth Ripple		≤ 3 dB		-
VSWR		$\leq 1:1.5$		-
System Group Delay		$\leq 5\mu\text{s}$		-
Frequency Stability		$\leq 0.01\text{ppm}$		-
Noise Figure		-	$\leq 5\text{dB}$	-
Tx/Rx Isolation		\geq Gain + 15dB		-
IM & Spurious		$\leq -36\text{dBm}@GSM900/\leq -30\text{dBm}@DCS1800$		CW 2Tone 200KHz Spacing
Out of Band Gain		45dB@400KHz offset		
		40dB@600KHz offset		
		35dB @1MHz offset		
		25dB @5MHz offset		
Impedance		50 Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

◆ Optic specification

Item	Specification	
	Down Link	Up Link
Data Transmission	1Gbps	
Wavelength	1310 \pm 5mm	1530, 1550, 1570 \pm 5mm
Optic power	≤ 0 dBm	
Connector type	SC/APC	

◆ UTP specification

Item	Specification
Data Transmission	1.2Gbps /150m
UTP Cable	More than CAT 5
Transmission Method	Gigabit Internet
Connector type	RJ45

■ Digital Repeater Solution

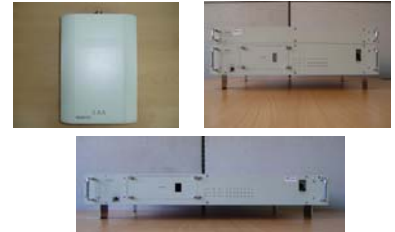
Digital Hybrid Repeater -Band Selective (Tetra/ GSM900/ DCS1800)

◆ Feature

- Easy Installation & Maintenance
- Optic & UTP Dispersion possible (Optic cable ≤20Km, UTP 150m)
- A max. of 64 Remotes can be cascaded
- UTP HUB available

◆ Application

- CDMA
- UMTS
- LTE
- Urban Area, Subway Indoor



◆ Standard Specification

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	Tetra, GSM900, DCS1800		-
	Band	Tetra, GSM900, DCS1800 Fixed Band		
Input Power range		-65dBm~-35dBm	-100dBm~-60dBm	According to customer requests, we can make it customized.
Gain		40dB~70dB	30dB~60dB	
Output Power		200mW, 1W	0dBm	
Gain control		30dB (step 1dB/error 1dB)		
ALC		15dB(step 1dB/error 1.5dB)	15dB(step 1dB/error 1.5dB)	-
Maximum Input			0dBm	Damage
Shut down		≥ Output power + 2~5dB		-
Pass Bandwidth Ripple		≤ 3 dB		-
VSWR		≤ 1:1.5		-
System Group Delay		≤ 6μs		-
Frequency Stability		≤ 0.01ppm		-
Noise Figure		-	≤ 5dB	-
Tx/Rx Isolation		≥ Gain + 15dB		-
IM & Spurious		≤-36dBm@GSM900/≤-30dBm@DCS1800		CW 2Tone 200KHz Spacing
Out of Band Gain		45dB@400KHz offset		
		40dB@600KHz offset		
		35dB @1MHz offset		
		25dB @5MHz offset		
Impedance		50Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

◆ Optic specification

Item	Specification	
	Down Link	Up Link
Data Transmission	1Gbps	
Wavelength	1310 ± 5mm	1530, 1550, 1570 ± 5mm
Optic power	≤ 0 dBm	
Connector type	SC/APC	

◆ UTP specification

Item	Specification
Data Transmission	1.2Gbps /150m
UTP Cable	More than CAT 5
Transmission Method	Gigabit Internet
Connector type	RJ45

■ Digital Repeater Solution

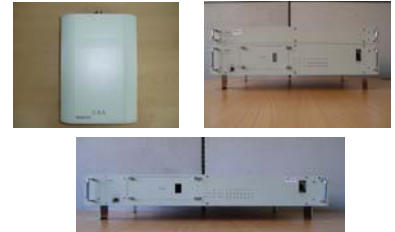
Digital Hybrid Repeater -Channel Selective (Tetra/ GSM900 / DCS1800)

◆ Feature

- Easy Installation & Maintenance
- Optic & UTP Dispersion possible (Optic cable ≤20Km, UTP 150m)
- A max. of 64 Remotes can be cascaded
- UTP HUB available

◆ Application

- CDMA
- UMTS
- LTE
- Urban Area, Subway Indoor



◆ Standard Specification

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	Tetra, GSM900, DCS1800		-
	Band	Tetra, GSM900, DCS1800 Fixed Band		
Input Power range		-65dBm~-35dBm	-100dBm~-60dBm	According to customer requests, we can make it customized.
Gain		40dB~70dB	30dB~60dB	
Output Power		200mW, 1W	0dBm	
Gain control		30dB (step 1dB/error 1dB)		
ALC		15dB(step 1dB/error 1.5dB)	15dB(step 1dB/error 1.5dB)	-
Maximum Input			0dBm	Damage
Shut down		≥ Output power + 2~5dB		-
Pass Bandwidth Ripple		≤ 3 dB		-
VSWR		≤ 1:1.5		-
System Group Delay		≤ 6μs		-
Frequency Stability		≤ 0.01ppm		-
Noise Figure		-	≤ 5dB	-
Tx/Rx Isolation		≥ Gain + 15dB		-
IM & Spurious		≤-36dBm@GSM900/≤-30dBm@DCS1800		CW 2Tone 200KHz Spacing
Out of Band Gain		45dB@400KHz offset		
		40dB@600KHz offset		
		35dB @1MHz offset		
		25dB @5MHz offset		
Impedance		50Ω		-
In/out connector		N type Female		-
Input Voltage		AC 110/220V, 50/60 Hz		-

◆ Optic specification

Item	Specification	
	Down Link	Up Link
Data Transmission	1Gbps	
Wavelength	1310 ± 5mm	1530, 1550, 1570 ± 5mm
Optic power	≤ 0 dBm	
Connector type	SC/APC	

◆ UTP specification

Item	Specification
Data Transmission	1.2Gbps /150m
UTP Cable	More than CAT 5
Transmission Method	Gigabit Internet
Connector type	RJ45

System Monitoring Solution

RF Spectrum Supervisor -(CDMA,UMTS(WCDMA), LTE)

◆ Feature

- Easy Installation & Maintenance
- BTS & Repeater Monitoring
- 19' 1U or 2U System
- RF Spectrum
- RF Measurement

◆ Application

- CDMA
- UMTS
- BTS & Repeater
- Analog Optic Distributers



◆ Standard Specification

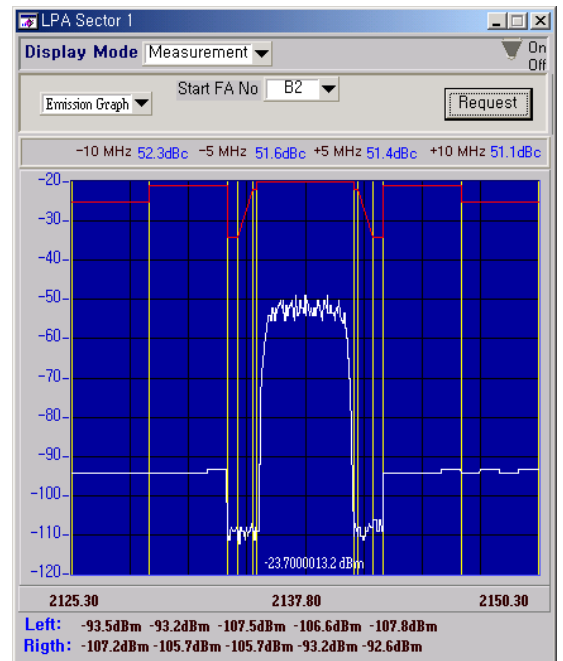
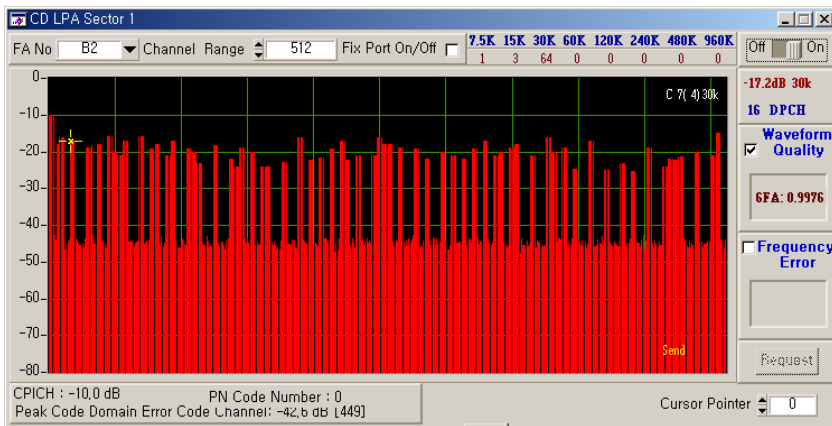
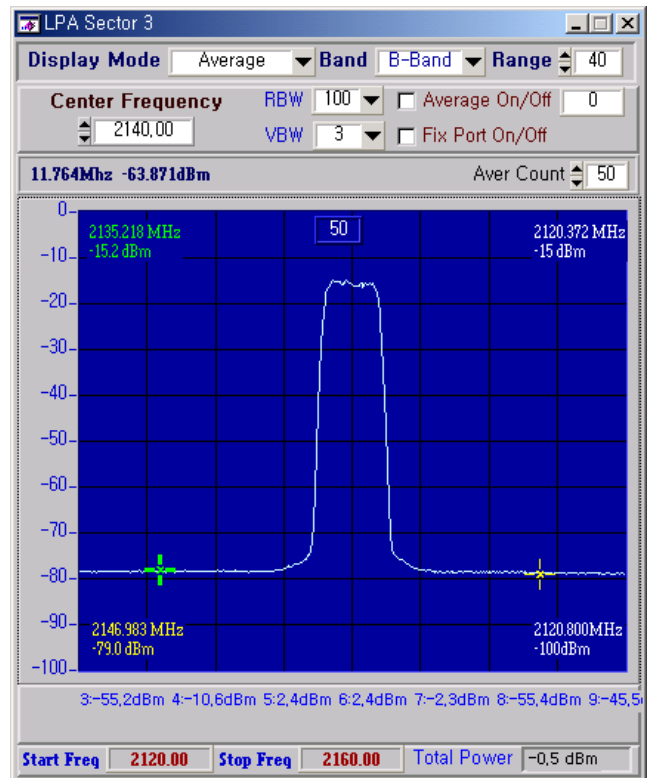
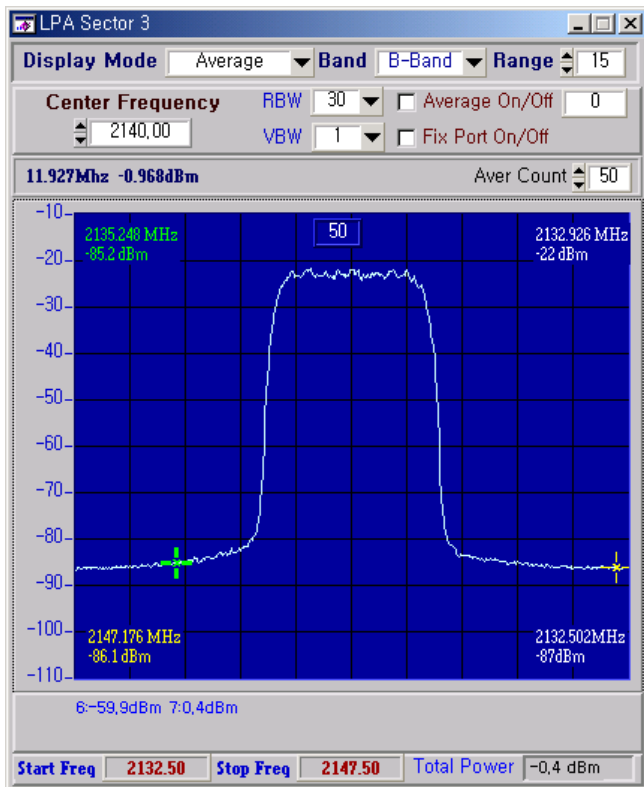
Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	CDMA, UMTS, LTE		-
	Band	CDMA, UMTS, LTE Band		-
Input Power range		-30dBm~10dBm	-80dBm~-40dBm	-
Input Port Number		3Port @3sector	6Port @3sector	-
NMS Communication		Ethernet @ 10Mbps, TCP/IP		DHCP Support
Reference Clock		Internal 10MHz @ ±1ppm		-
VSWR		≤ 1:1.5		-
Measurement		±2dB		-
Input Port Isolation		More than 55dB		-
Signal to noise ratio		50dBc min.	10dBc min.@ -80dBm 20dBc min.@ -70dBm 30dBc min.@ -60dBm 40dBc min.@ -50dBm min.	-
RBW Setting Range		30KHz fixed		-
VBW Setting Range		1KHz fixed		-
Number of data point		500		-
Signal Peak to Peak level		Less than 10dBc		-
Average capability		1~ 100		-
1port Response Time		Less than 400 ms @ Less than SPAN 30MHz		-
In/out connector		SMA type Female		-
Input Voltage		Less than 2 A @27V		-

◆ Functions

Spectrum Analyzer Function	Power Measurement Possible	Others
Normal marker	Channel power Total power	Spectrum emission mask Measurement
Delta marker		Average Function
Peak search		Channel Fix Function ACLR Measurement Function

System Monitoring Solution

RF Spectrum Supervisor -(CDMA,UMTS(WCDMA), LTE)



System Monitoring Solution

RF Spectrum Supervisor -(Tetra, GSM900, DCD1800)

◆ Feature

- Easy Installation & Maintenance
- BTS & Repeater Monitoring
- 19' 1U or 2U System
- RF Spectrum
- RF Measurement

◆ Application

- Tetra
- GSM900
- DCS1800
- BTS & Repeater
- Analog Optic Distributers



◆ Standard Specification

Parameter		specification		Remark
		Down Link	Up Link	
Frequency	Range	Tetra, GSM900, DCS1800		-
	Band	Tetra, GSM900, DCS1800LTE Band		-
Input Power range		-30dBm~10dBm	-80dBm~-40dBm	-
Input Port Number		3Port @3sector	6Port @3sector	-
NMS Communication		Ethernet @ 10Mbps, TCP/IP		DHCP Support
Reference Clock		Internal 10MHz @ ±1ppm		-
VSWR		≤ 1:1.5		-
Measurement		±2dB		-
Input Port Isolation		55dB min.		-
Signal to noise ratio		50dBc min.	10dBc min.@ -80dBm 20dBc min.@ -70dBm 30dBc min.@ -60dBm 40dBc min.@ -50dBm min.	-
RBW Setting Range		1KHz Fixed		-
VBW Setting Range		1KHz Fixed		-
Number of data point		500		-
Signal Peak to Peak level		Less than 10dBc		-
Average capability		1~ 100		-
1port Response Time		Less than 400 ms @ Less than SPAN 30MHz		-
In/out connector		SMA type Female		-
Input Voltage		Less than 2 A @27V		-

◆ Functions

Spectrum Analyzer Function	Power Measurement Function	Others
Normal marker Delta marker Peak search	Channel power Total power	Spectrum emission mask Measurement Average Function Channel Fix Function ACLR Measurement Function