2021 KOREA MURATA WEBINAR

RF Products

1. 신규Application의 설명 & muRata의 RF Item의 소개
   - Base Station
   - Repeater
   - CPE
   - Router
   - UWB
2. muRata가 제공하는 가치



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신규 Application의 설명

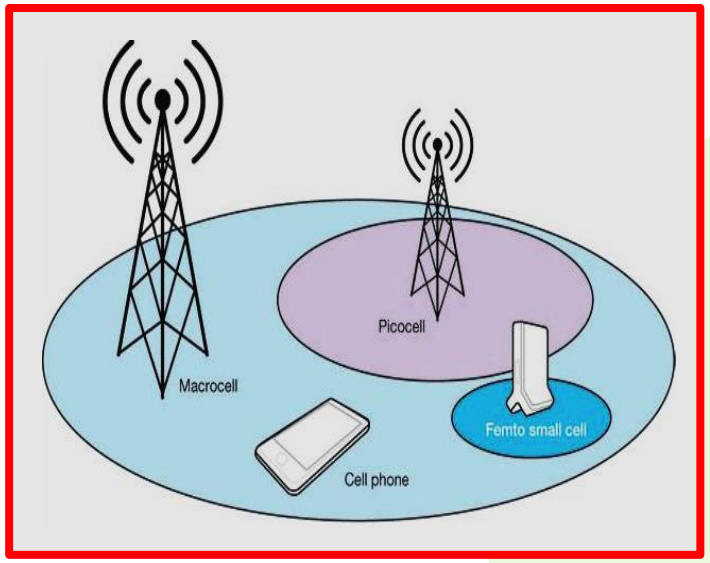
& muRata의 RF Item의 소개

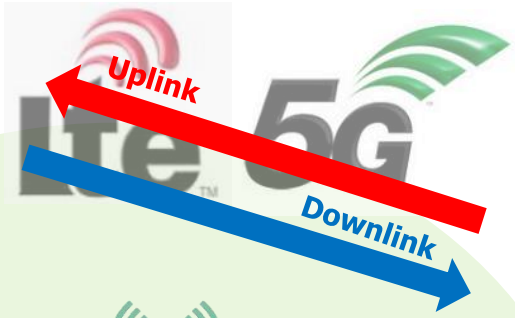
- Base Station
- Repeater
- CPE
- Router
- UWB

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About Mobile Communication

Base Station







CPE Repeater





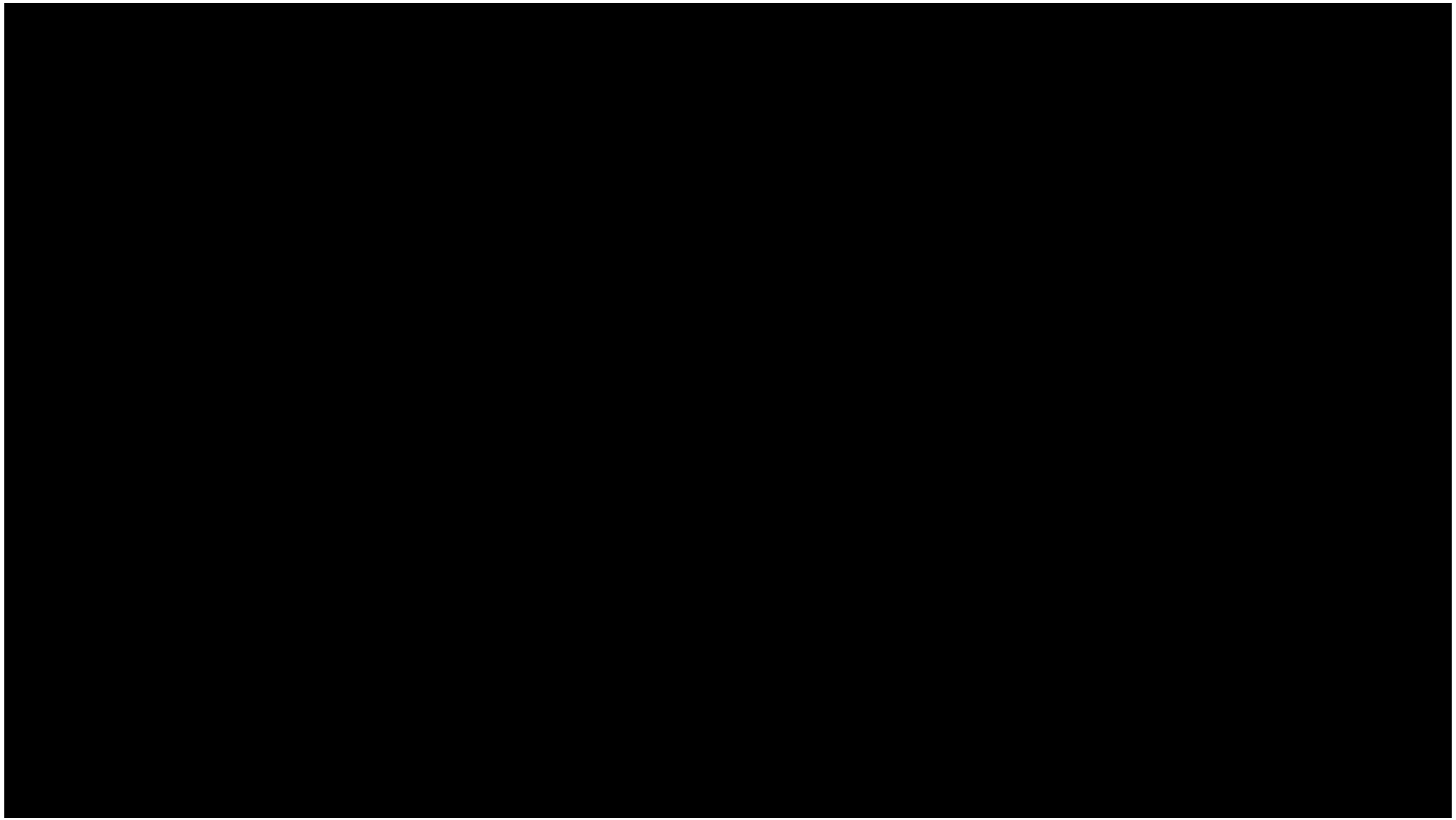
UWB Router

User Equipment



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About Mobile Communication

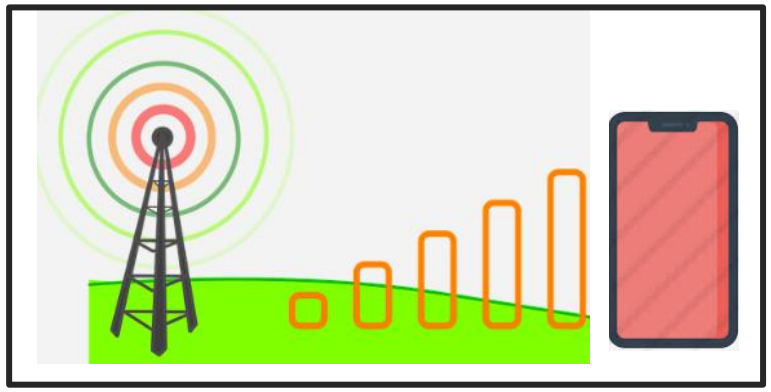


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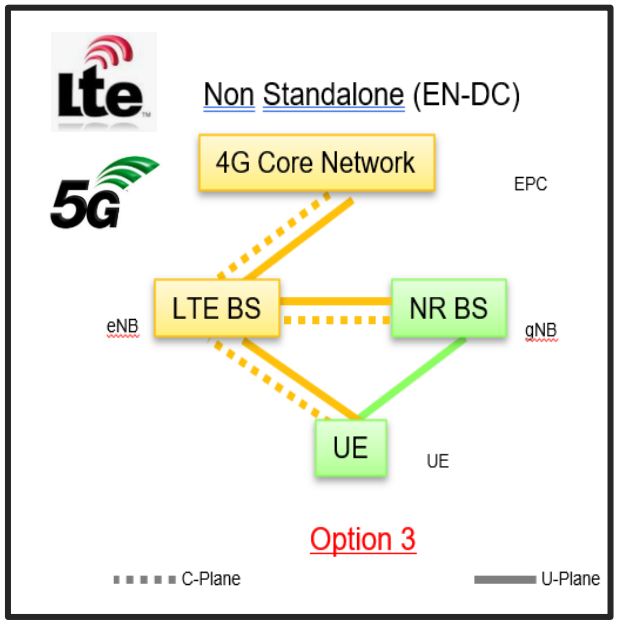
Base Station

기지국 (Base Station)

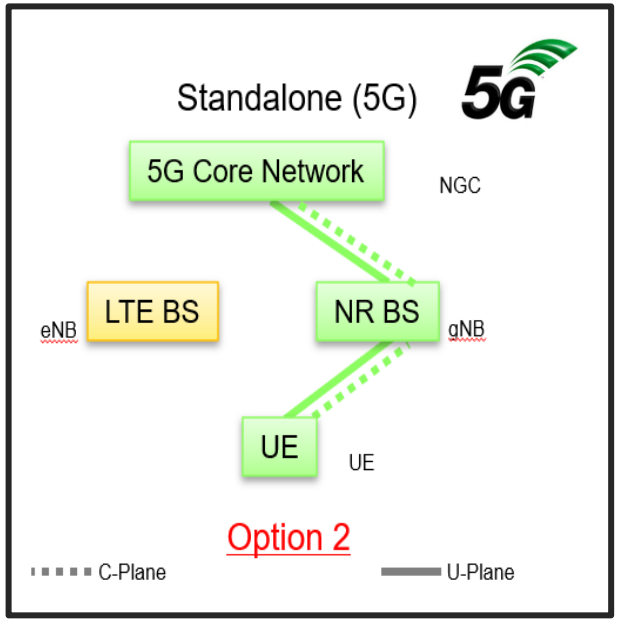
무선 통신을 위해 Network와 UE(단말)을 연결해주는 설비



LTE → LTE/5G(EN-DC) → 5G



NSA 통신 시스템



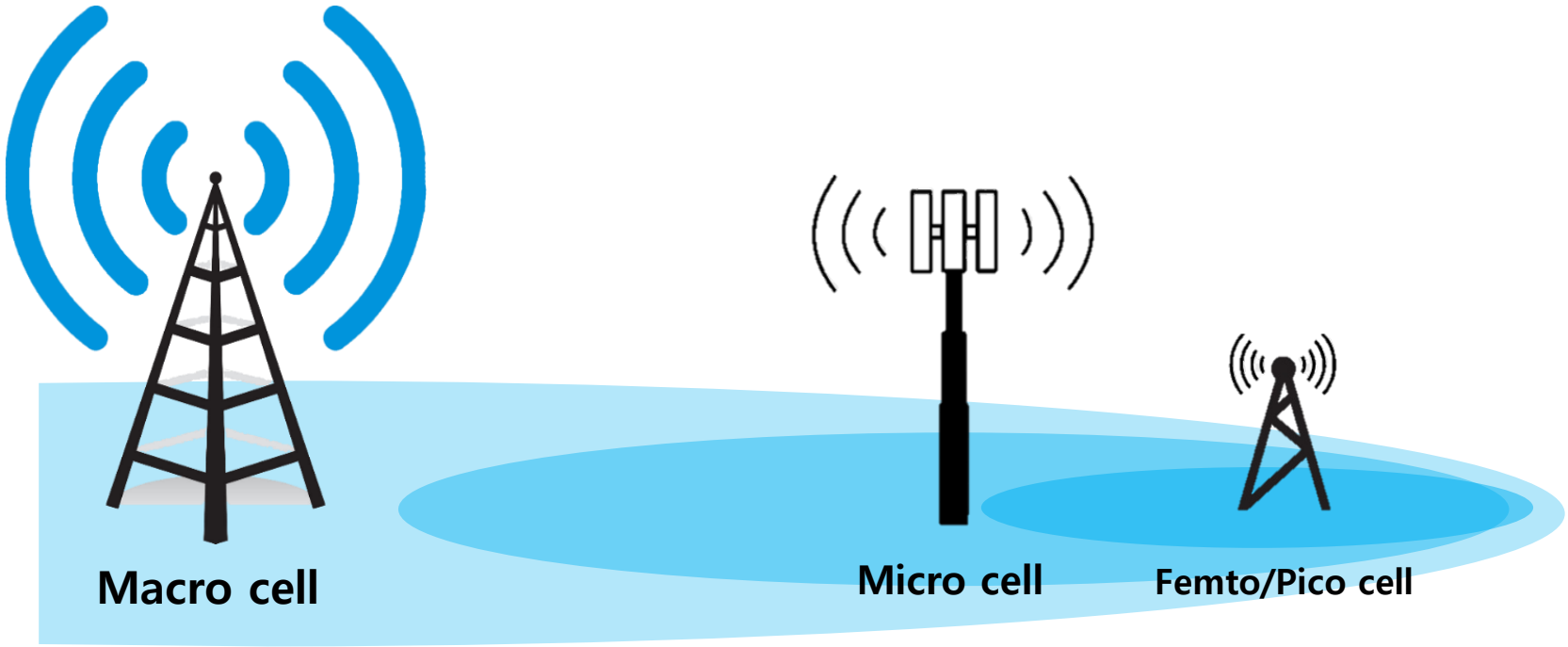
SA 통신 시스템

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Base Station

Base Station의 종류

- Coverage, 송신 전력, User 수에 의해 구분
- Macro Cell 이외는 Small Cell이라고 칭하며 Micro Cell, Pico Cell, Femto Cell 등으로 분류



Cell 종류

Macro Cell

Small Cell

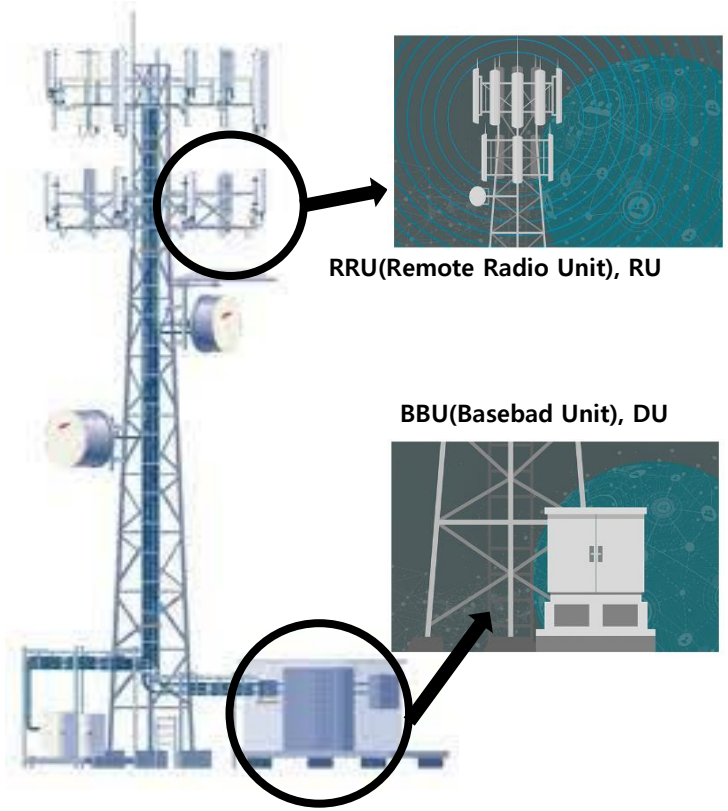
- Micro Cell
- Pico Cell
- Femto Cell

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Base Station

기지국의 구성

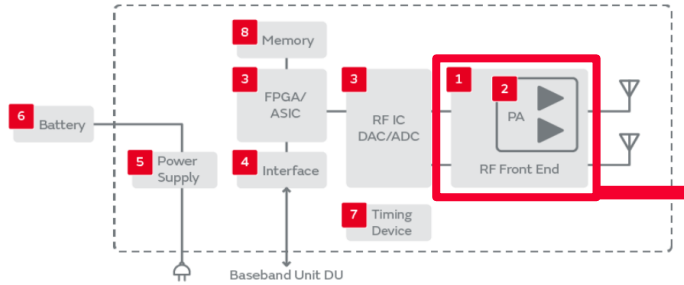
- RRU(Remote Radio Unit)
- BBU(Base Band Unit)



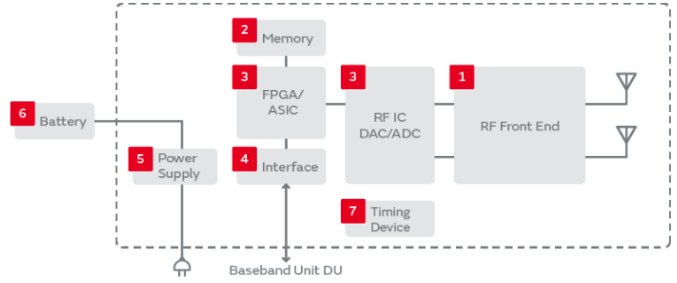
RRU(Remote Radio Unit), RU

BBU(Basebad Unit), DU

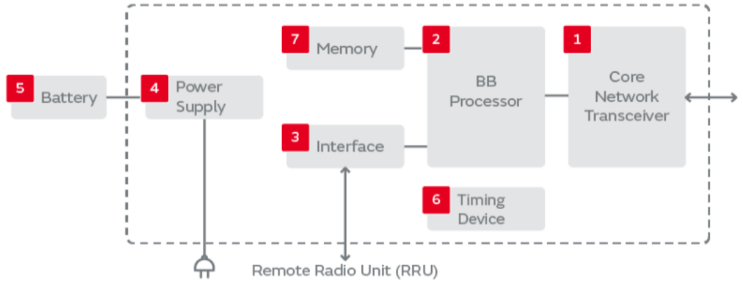
RRU @Sub6



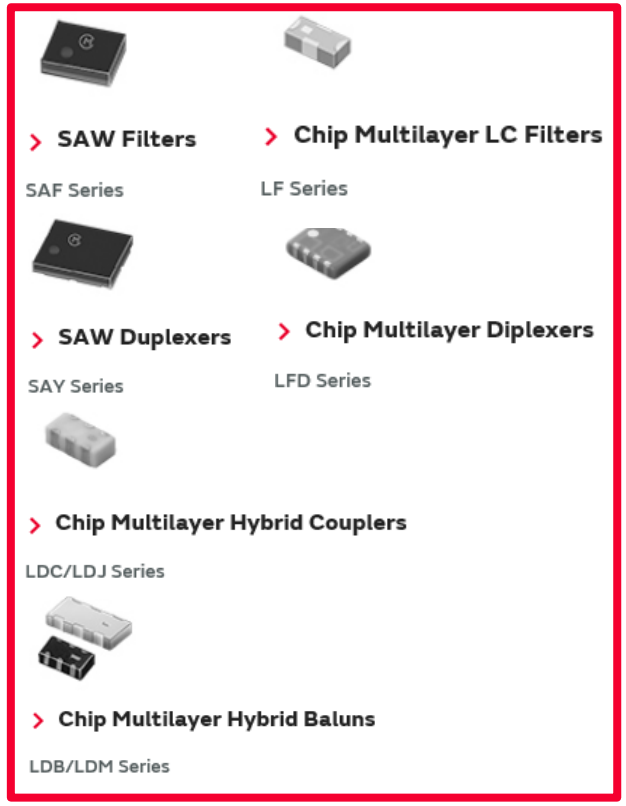
RRU @mmWave



BBU = DU/CU



RF 수요 & Murata Line up

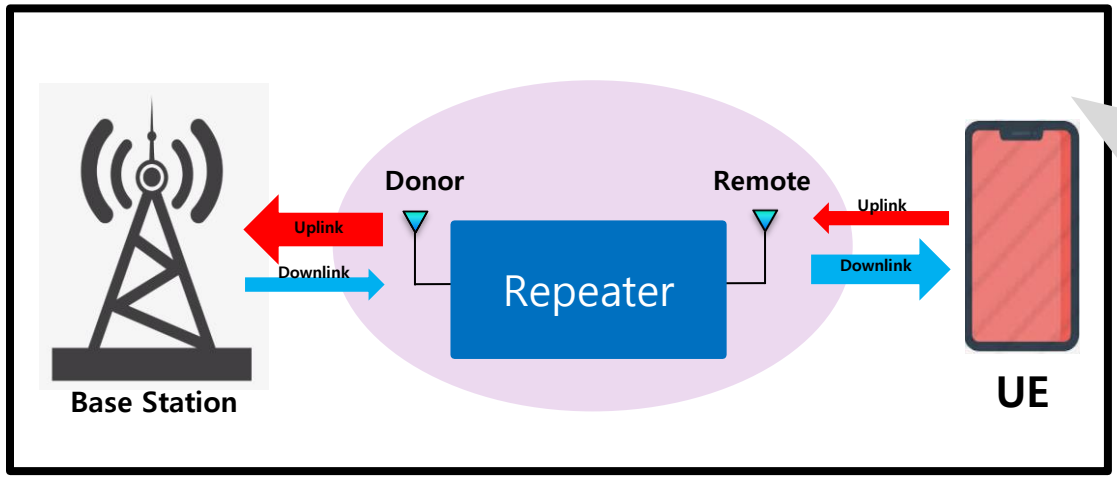


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Repeater

중계기 (Repeater)

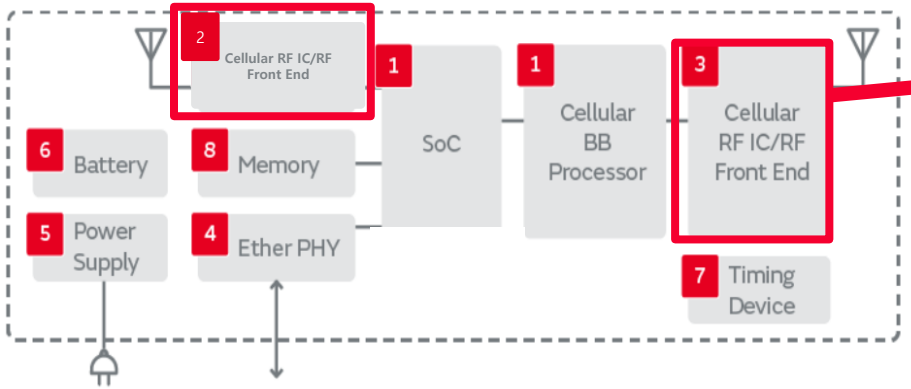
BS(Base Station)으로부터 나오는 신호를 받아 증폭(재전송)시켜 UE로 전달해주는 역할을 하는 장치



- Uplink : UE에서 보내는 Tx, BS에서 받는 Rx.
- Downlink : UE에서 받는 Rx, BS에서 보내는 Tx.
- Donor : Repeater, BS 사이에서 이뤄지는 무선통신부.
- Remote : Repeater, UE 사이에서 이뤄지는 무선통신부.

<Repeater의 구성>

1. 전원부
2. IC 부
3. Donor
4. Remote



RF 수요 & Murata Line up



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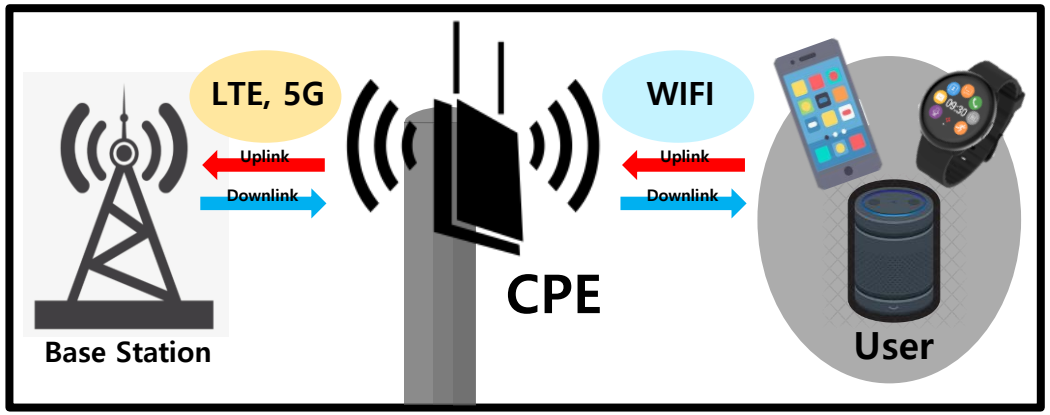
CPE(Customer-premises equipment)

CPE for FWA

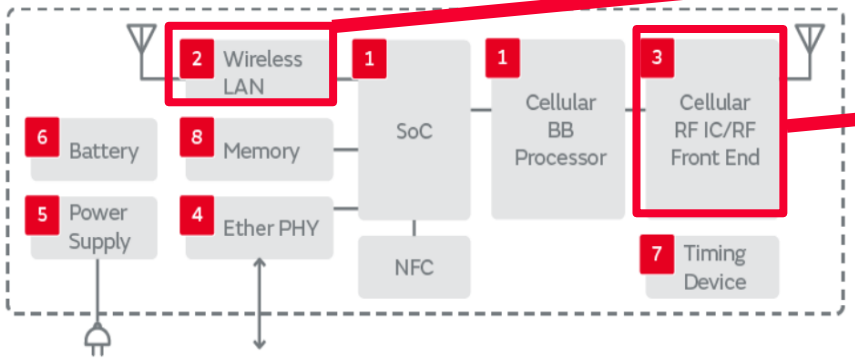
(Fixed Wireless Access)

기지국으로부터의 Cellular신호를 받아 WIFI를 통해 User에게 전달해주는 장치

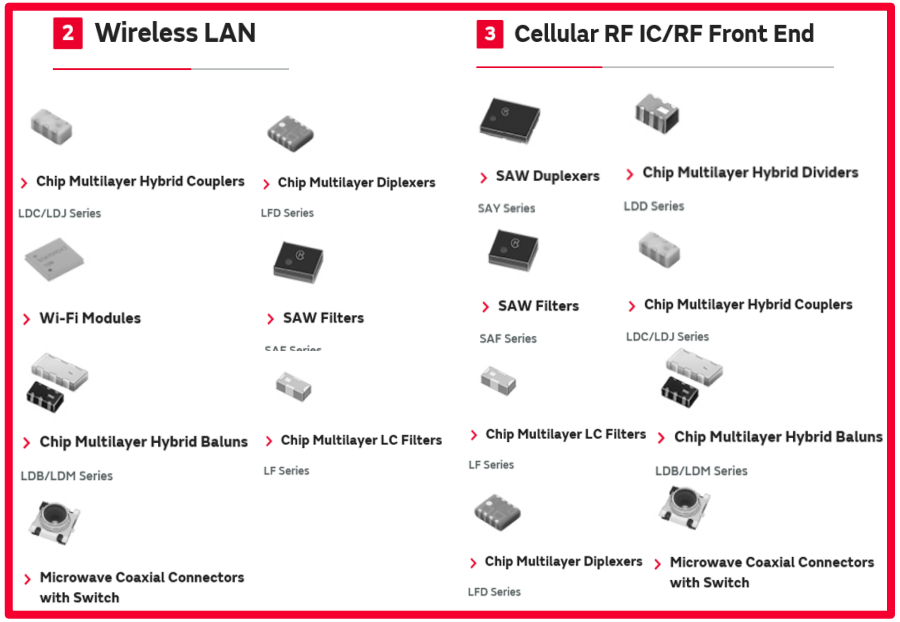
주로 실외에 고정형으로 설치되어 무선통신을 가능하게 하는 역할



<CPE의 구성>



RF 수요 & Murata Line up

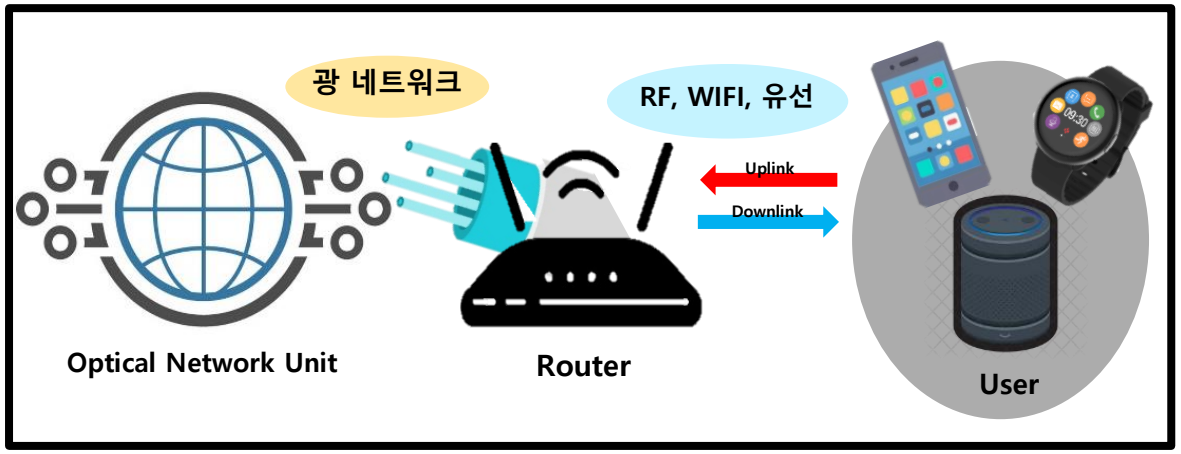


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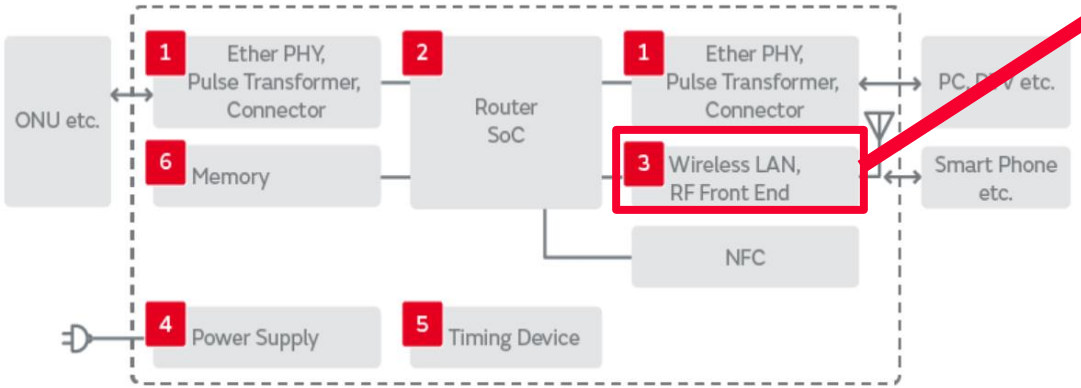
Home router

Home router

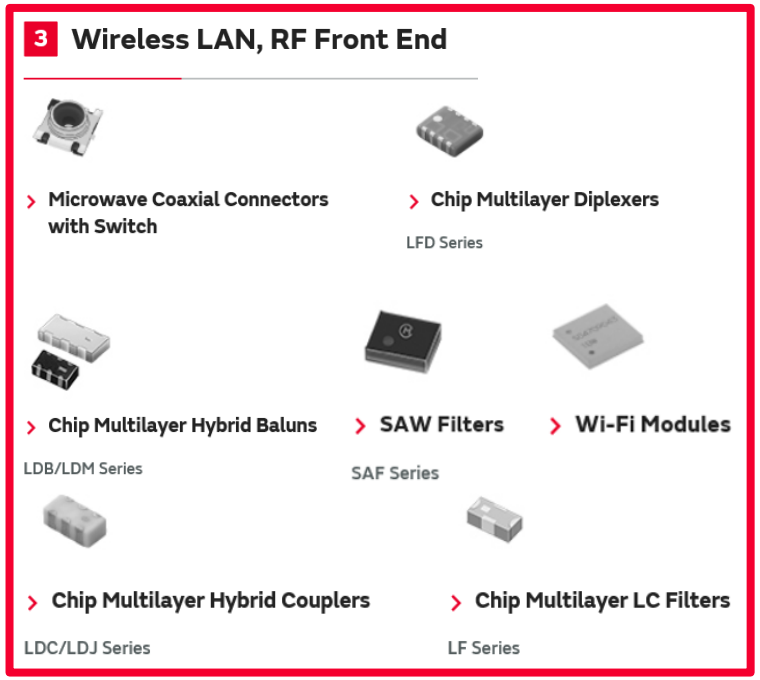
광통신으로부터의 신호를 WIFI, 유선통신 등을 통해 User에게 전달해주는 장치



<Router의 구성>



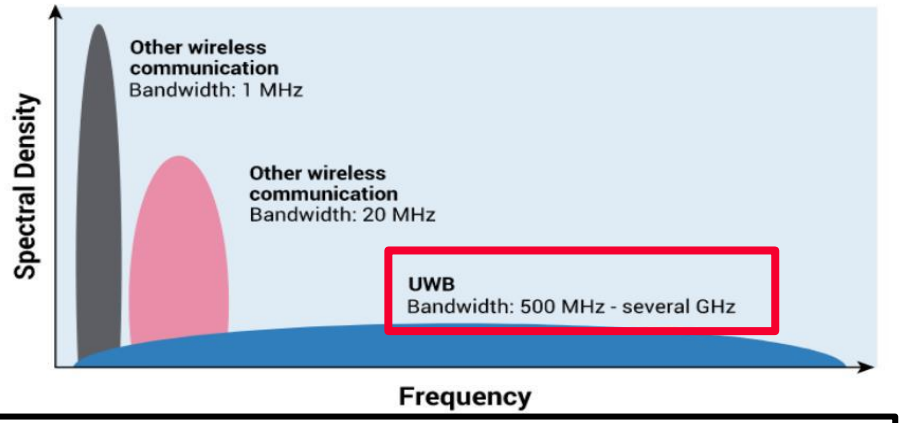
RF 수요 & Murata Line up



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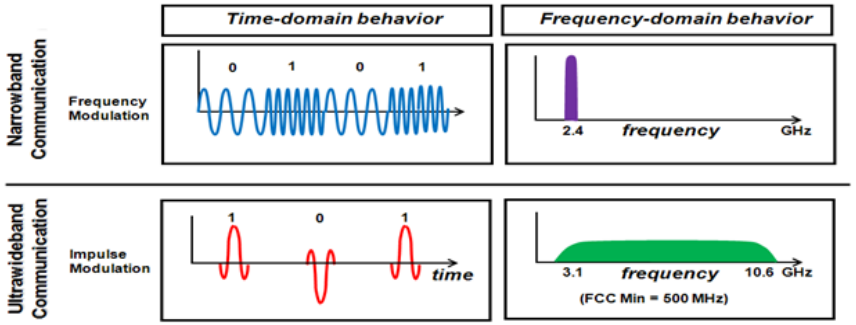
UWB
(Ultra Wide Band)

초 광대역 고주파수에서 전파를 통해 작동하는 단거리 무선 통신

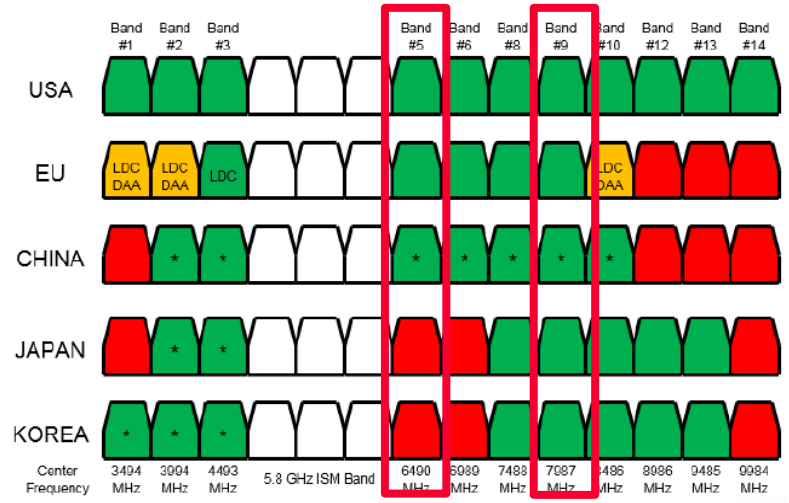


- **High speed** → **Real Time Tracking 가능**
- **넓은 대역폭(500 MHz)** → 대응Coverage↑
- **저전력** → 배터리전력소모↓、인체영향↓

- 약 3GHz~10GHz에서 15개의 Channel로 구성
- Ch.5, Ch.9 등을 중심으로 점차 확산되고 있는 추세



<UWB의 대역 & Signal>



<UWB Channel>

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UWB의 활용 범위

분야 / 특성	Smart phone	Smart City &Mobility	Customer	Smart Retail	Industry &Health care
Hands-Free 서비스	진입 엑세스 체크 제한 구역 보안	스마트 주차 Keyless	Logical Access control	무인 매장 Access	제한구역 Access
위치 기반 서비스	긴급 시 작업자 소집	Sharing 서비스 (Car, Bike, ...)	AR 게이밍	Foot behavior 분석 Shopping 분석	물류 추적 기능 Smart Farm
다중 Pairing 서비스	스마트 회의 핸드폰 찾기	드론 딜리버리	VR group play	소비자 타겟 마케팅	핸드폰 및 장비찾기 환자 실시간 monitoring







출처 : Mitsubishi Motors

2

Cellular RF IC / RF Front End

RF 수요 & Murata Line up



› **Chip Multilayer LC Filters**

LF Series



› **Chip Multilayer Diplexers**

LFD Series



› **Chip Multilayer Hybrid Couplers**

LDC/LDJ Series

- **UWB Module**
- **RF Switch**

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muRata가 제공하는 가치

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muRata가 제공하는 가치

1. 고객 맞춤형 ITEM 제안

- 대체품 추천

  : 고객이 요구하는 조건사항과 spec에 맞춰 최적의 대체 상품을 추천

- Murata item 제안

  : 기술 대응 가능 item 및 신기술 update item 제안

2. 성능 최적화&기술Issue 분석 및 대응

- Matching 지원

  : 손실 없는 무선통신환경을 위해 상품의 impedance 최적화

- 기술 issue 대응

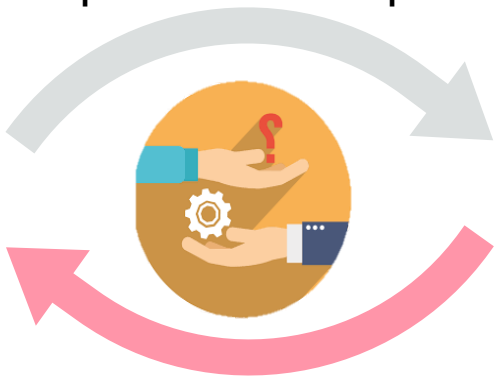
  : 무선통신관련 기술 issue(Desense, 성능열화) 분석, 검토하여 성능개선

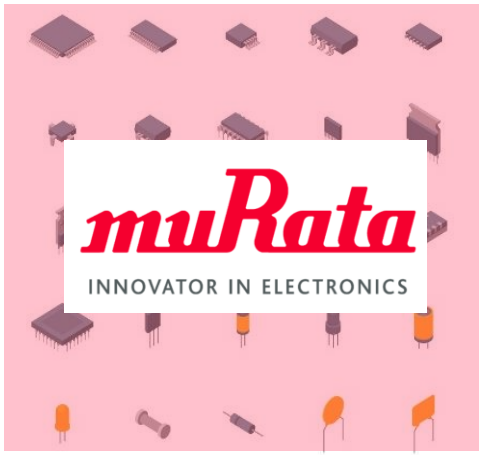
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muRata가 제공하는 가치

1. 고객 맞춤형 ITEM 제안







- **대체품 추천**

  : 고객이 요구하는 조건사항, spec에 맞춰 최적의 대체 상품을 추천

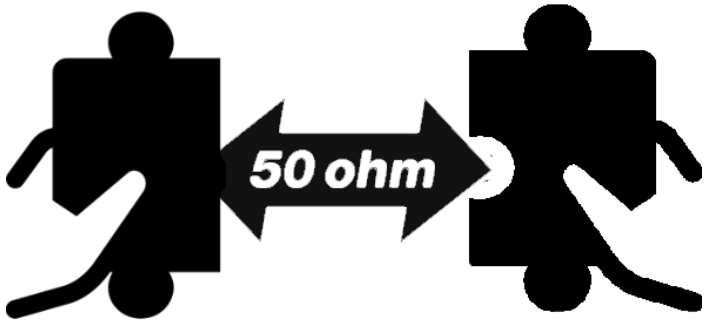
- **Murata item 제안**

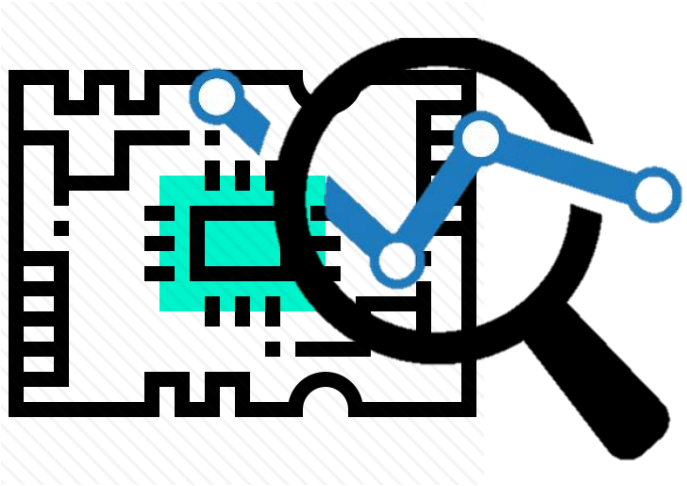
  : 기술 대응 가능한 item, 기술 update item 제안

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muRata가 제공하는 가치

2. 성능 최적화&기술Issue 분석 및 대응





- **Matching 지원**

  : 손실 없는 무선통신환경을 위해 상품의 impedance 최적화, 50Ω matching

- **기술 issue 대응**

  : 무선통신관련 기술 issue (성능열화, Desense, Layout guide제공 등) 분석, 검토하여 성능개선 지원

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기술 issue 대응 – A사 사례

M2M module내 Band1,3에서 1~3dB가량 Desense가 발생합니다!



Desense issue 해결 도와주세요!

네! Desense를 해결해드리겠습니다!

현재 Board 상황과 조건을 말해주세요.



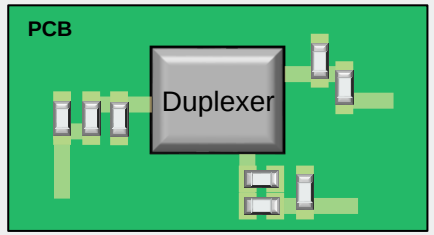
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기술 issue 대응 사례

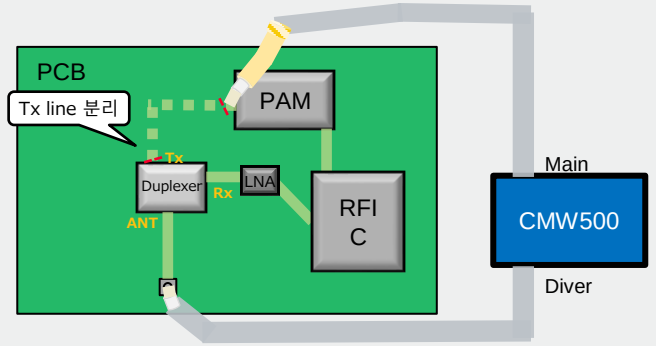
- 상황 : A사의 M2M module내 Band3에서 2~3dB Desense가 발생
- 방안 : Murata상품으로 대체하여 성능 확인 및 Desense의 원인 검토

검토내용

1. Active matching : 신호 line의 L,C소자의 value를 변경하면서 Rx감도치를 향상



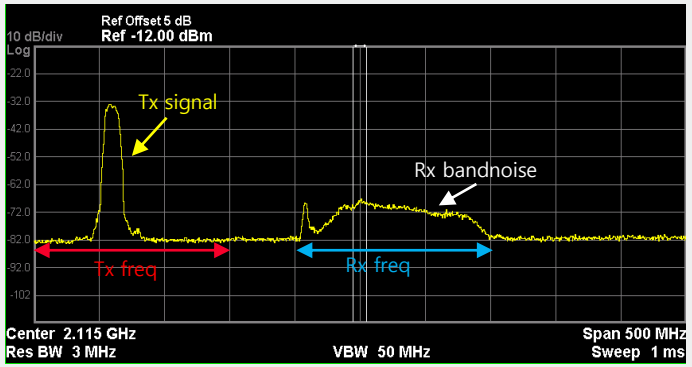
2. Desense route 확인 : Tx line이외의 Desense route가 있는지 확인



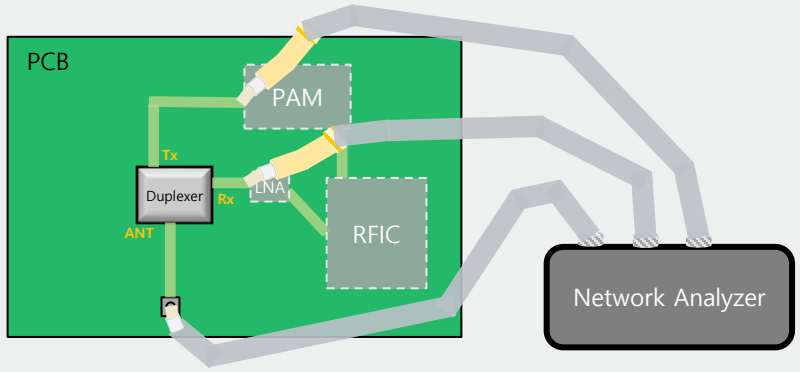
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기술 issue 대응 사례

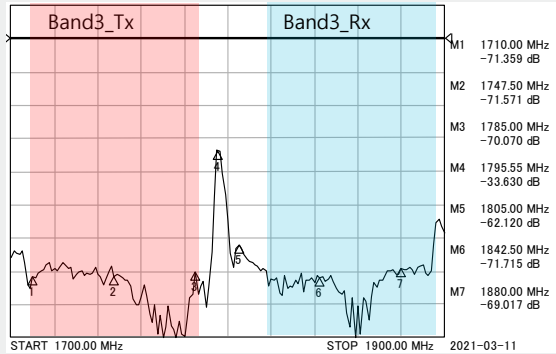
3. Rx bandnoise 확인 : PA에 의해 증폭되는 Rx bandnoise를 측정해 Desense의 원인인지 확인



4. Board의 isolation확인 : PCB보드 자체의 isolation특성을 확인



Band3 S32



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마무리

muRata가 제공하는 가치

1. 고객 맞춤형 ITEM 제안
   - 대체품 추천
   - Murata item 제안

2. 성능 최적화&기술Issue 분석 및 대응
   - Matching 지원
   - 기술 issue 대응

muRata는 **고객을 위한** **해결책 제공**을 위해

고객 맞춤형 item 제안 뿐 아니라 기술지원과 issue대응까지 제공

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Thank you

감사합니다.