

The feasibility study on higher frequency band for EPoC FDD downstream

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- ✓ In the last Geneva meeting, the following motion was passed.

For an FDD system, the EPoC standard shall support operation over the following frequency ranges:

Downstream: 54 MHz to at least 1212 MHz

Upstream: 10 MHz to at least 234 MHz

Actual frequencies in use on the coax will depend on the diplexer, region, etc. [Downstream operation above 1212 MHz to 2610 MHz is for further study.](#)

- ✓ The objective of this presentation is to show the results of CNR estimation in a 2.6 GHz band by using the parameters of commercially available products.
- ✓ Please note that
 - We understand the primary FDD DS frequency band should be up to 1.2 GHz from economical perspectives,
 - We only need an option of up to 2.6 GHz FDD DS band in case there is no available band for EPoC in less than 1.2 GHz.

- ✓ In order to study the feasibility of a higher frequency band for EPoC, the expected CNR was calculated by using the parameters of commercially available products in a typical MDU network model in Japan.

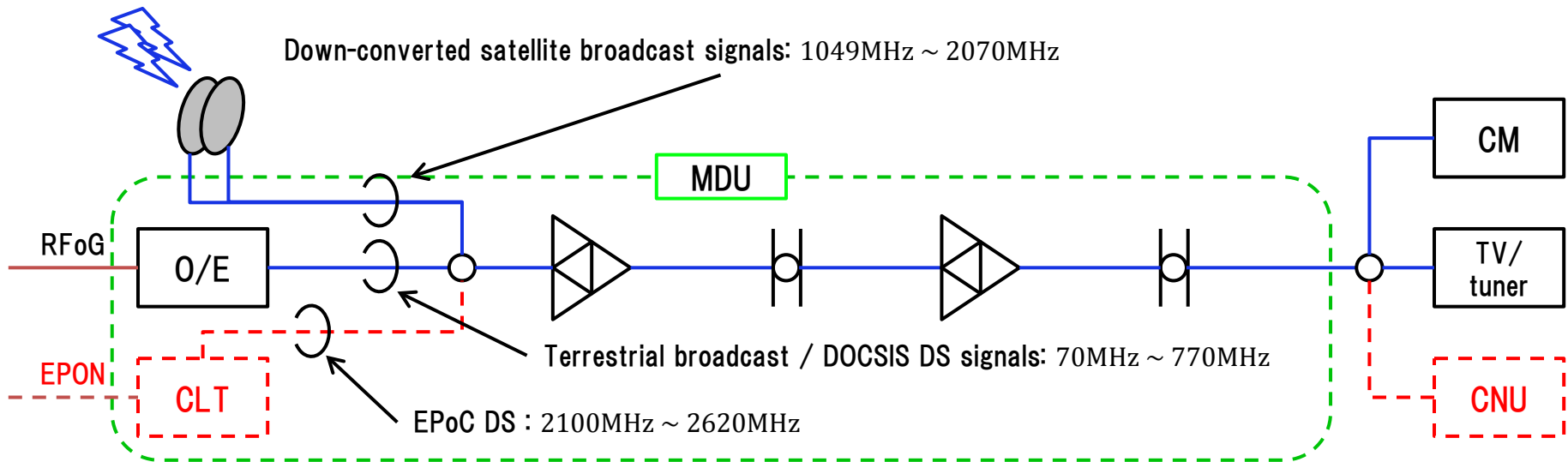
- ✓ As the result, it was found that a higher frequency band up to 2.6GHz is applicable to EPoC. The estimated CNR was 38 dB, while the required one is 35 dB.

- ✓ The followings are planned for further study :
 - (1) measure the frequency response of the model in our lab,
 - (2) evaluate the feasibility by filling up channel model table,
 - (3) reconsider the DS operation above 1.2 GHz to 2.6 GHz in the standard.

Typical use case of higher frequency band

- ✓ EPoC is considered to be mainly used in MDUs as FTTB + EPoC systems.
- ✓ A typical MDU network model in Japan is illustrated in [adhoc_eval_uematsu_01_0513.pdf](#).
- ✓ A 2.1GHz ~ 2.6GHz frequency band in coax-based networks is reserved for the future extension of satellite broadcasting. No specific usage plan of this band has been announced.

Network model (N+2)



Expected CNR at higher frequency band

The estimated CNR at a 2.6 GHz frequency band is shown in the following table, which are derived from the specifications of commercially available products.

| Bandwidth (MHz) | CNR(*) @ 2.6 GHz (dB) |
|--------------------------------|-----------------------|
| 28.9 (CS digital broadcasting) | 45.8 |
| 6 | 53.0 |
| 12 | 50.0 |
| 96 | 41.0 |
| 192 | 38.0 |

(*) CNR is calculated based on thermal noise. (Not including the distortion due to reflection, interference, etc.)

As required CNR for 4096 QAM is about 35 dB from [dai_01a_1012.pdf](#), a 2.6 GHz band is considered to be applicable for EPoC.

