

**SITUATION**

DBS signals originating from a video server are shared on a coax MoCA network. IP and CATV signals may also be needed on the coax network.

**SOLUTION**

Diplexers provide frequency selective splitting or combining for signal INTEGRATION or ISOLATION with minimal insertion loss.

**RELATED CONSIDERATIONS**

**SONORA** offers multi-plexers with (1) input split to (2) output bands. Used in reverse, (2) inputs may be combined to single multiple frequency band output.

**SONORA** multiplexers are for specific MoCA bands. Check with your sales representative to identify the model required for your application

**FEATURES**

- *Wide bandwidth* ..... 7 to 3000 MHz
- *MoCA band F* ..... used by DISH
- *DC passing* ..... DBS to COMBINED
- *CATV band pass* ..... 7 to 875 MHz
- *Dual Green Ground Screws* ..... 10 gauge copper

**APPLICATION NOTES**

**MoCA F** multi-plexers integrate or isolate two frequency bands of CATV (7 to 42 MHz & 54 to 875 MHz) and three bands of DBS: 22 kHz, 675 to 875 MHz and 950 to 3500 MHz.

Receivers communicate with switches using 22 kHz DiSEqC signals. **DBS** video servers and clients communicate in the 675 to 875 MHz MoCA F-band.

In home applications, MoCA networks need to be INTEGRATED. In MDU applications, MoCA networks from multiple apartments need to be ISOLATED.

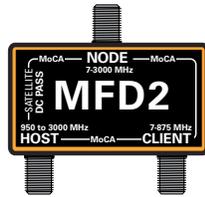
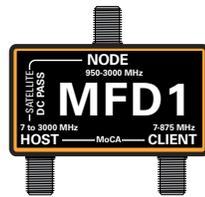


**DESCRIPTION**

MoCA diplexers integrate or isolate MoCA signals on DBS, OTA and CATV coax networks.

Models **MFD1** and **MEFD1** are ISOLATORS. MoCA passes from HOST to CLIENT and not to the DBS source.

Model **MFD2**, **MH4** & **MH6** are bi-directional INTEGRATORS. MoCA passes from any port to every other port. Every port is an input and every port is an output.



| Parameter                   | Unit | MFD1 Isolator   | MFD2 Integrator | MEFD1 Isolator  | MEFD6 Isolator  |
|-----------------------------|------|-----------------|-----------------|-----------------|-----------------|
| <b>PORTS</b>                |      | (3)             | (3)             | (3)             | (3)             |
| <b>NODE (COMBINED)</b>      | kHz  | DC & 22         | DC& 22          | DC & 22         | DC & 22         |
|                             | MHz  | 2 & 950 -3000   | 2 & 950 -3000   | 2.3 & 950 -3000 | 2.3, 475 -3000  |
| <b>CLIENT (CATV)</b>        | MHz  | 7 - 875         | 7 - 875         | 7 - 875         | 7 - 400         |
| <b>HOST (DBS)</b>           | kHz  | DC & 22         | DC & 22         | DC & 22         | DC & 22         |
|                             | MHz  | 2 -3000         | 2 -3000         | 2.3, 950 -3000  | 2.3, 475 -3000  |
| <b>HOST to CLIENT</b>       |      |                 |                 |                 |                 |
| 2.3 MHz                     | dB   | > 14            | > 12            | > 60            | > 60            |
| 15 to 42 MHz                | dB   | < 2.0           | < 7.0           | < 1.5           | > 50            |
| 54 to 400 MHz               | dB   | < 1.0           | < 7.0           | < 1.0           | < 1.0           |
| 475 to 875 MHz              | dB   | < 2.0           | < 7.0           | < 1.5           | > 40            |
| 950 to 3500 MHz             | dB   | > 35            | > 40            | > 40            | > 40            |
| <b>HOST to NODE</b>         |      |                 |                 |                 |                 |
| 2.3 MHz                     | dB   | < 3             | < 7             | < 2.5           | < 2.0           |
| 15 to 42 MHz                | dB   | > 26            | < 4             | > 60            | > 50            |
| 54 to 400 MHz               | dB   | > 45            | < 4             | > 60            | > 60            |
| 475 to 875 MHz              | dB   | > 35            | > 35            | > 50            | < 6             |
| 950 to 3000 MHz             | dB   | < 2.5           | < 2.0           | < 2.5           | < 3.0           |
| 3500 MHz                    | dB   | < 4.0           | < 4.0           | < 4.0           | < 4.0           |
| <b>NODE to CLIENT(CATV)</b> |      |                 |                 |                 |                 |
| 2.3 MHz                     | dB   | > 10            | > 10            | > 60            | > 60            |
| 15 to 42 MHz                | dB   | > 25            | < 7             | > 50            | < 1.0           |
| 54 to 400 MHz               | dB   | > 50            | < 7             | > 50            | < 1.0           |
| 475 to 875 MHz              | dB   | > 50            | < 7             | > 60            | > 50            |
| 950 to 3500 MHz             | dB   | > 50            | > 40            | > 60            | > 45            |
| <b>Flatness</b>             |      |                 |                 |                 |                 |
| CLIENT 7 to 875 MHz         | dB   | 1.5             | 1.5             | 1.5             | 1.5             |
| CLIENT Any 6 MHz band       | dB   | 0.2             | 0.2             | 0.2             | 0.2             |
| DBS Any 25 MHz band         | dB   | 0.5             | 0.5             | 0.5             | 0.5             |
| <b>DC Power pass</b>        |      |                 |                 |                 |                 |
| HOST to NODE                | Amp  | 2 (max)         | 2 (max)         | 2 (max)         | 2 (max)         |
| <b>Dimensions L x W x H</b> | Inch | 2.0 x 2.3 x 0.7 | 2.0 x 2.3 x 0.7 | 1.4 x 2.8 x 1.1 | 1.4 x 2.8 x 1.1 |

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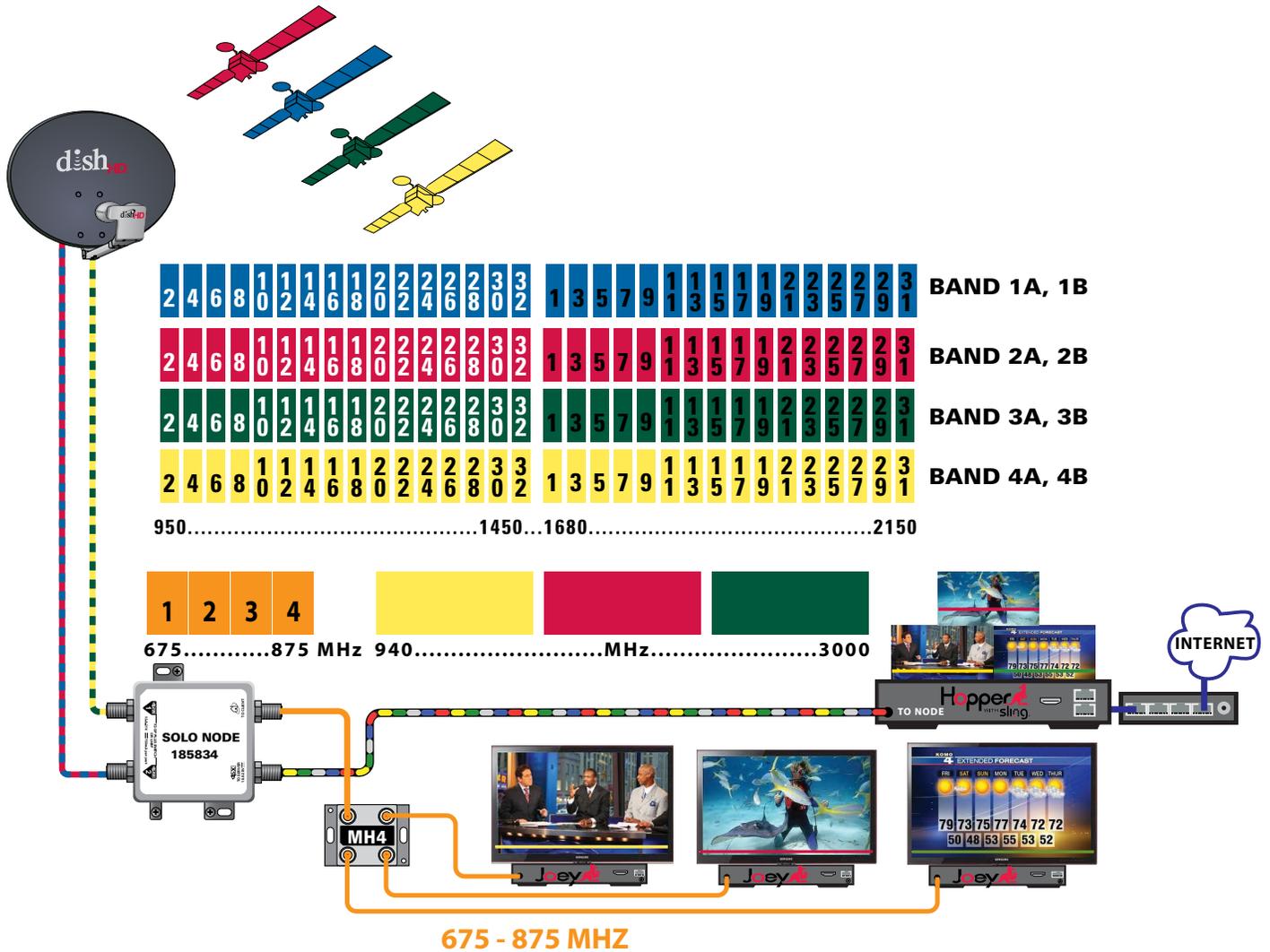
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DISH® uses band stacking switch technology. Instead of switching an entire 1000 MHz LNB band to a receiver, a switch in the LNB allows the receiver to select any two 500 MHz bands. An external stacker stacks a third 500 MHz band above the other two bands.

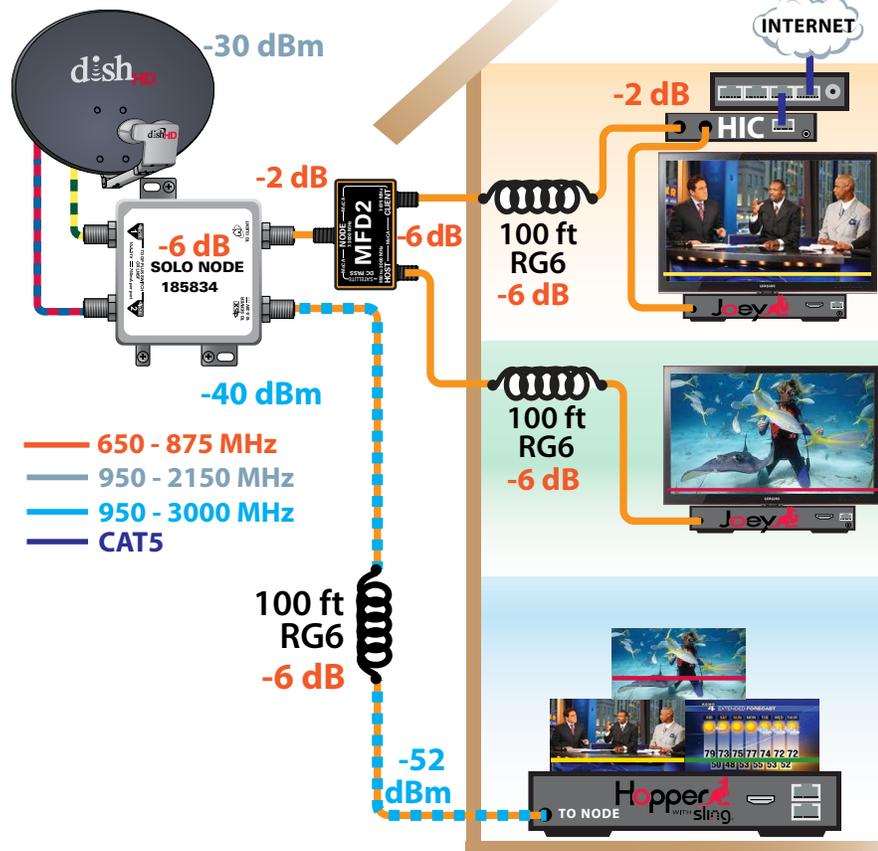
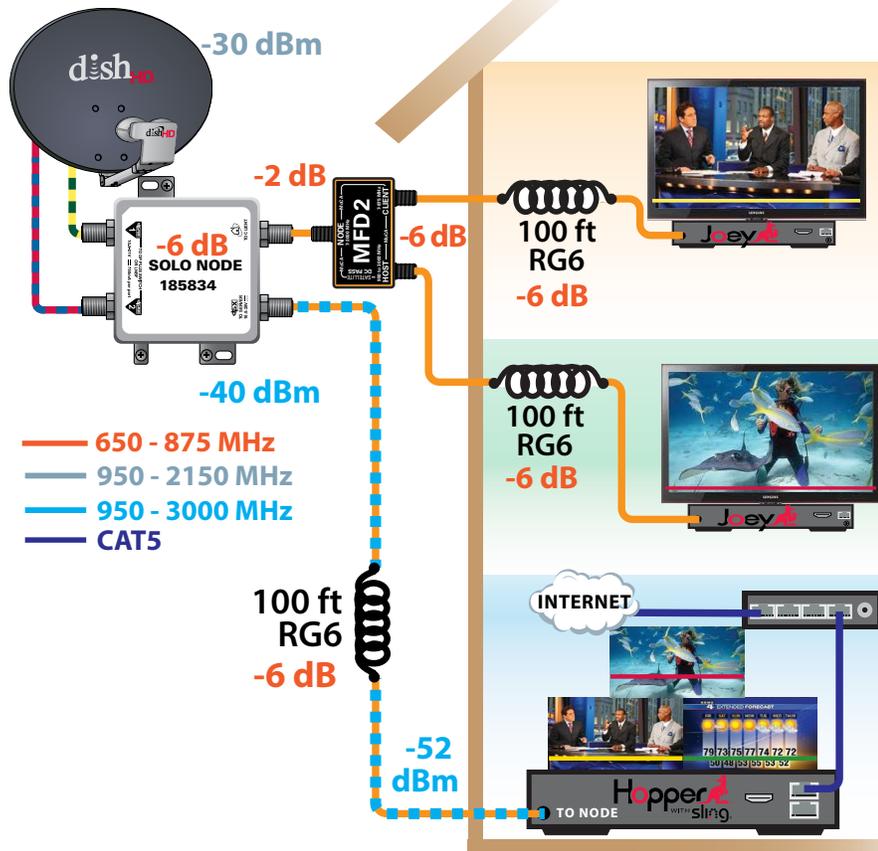
The HOPPER® is a three tuner video server. It communicates with Joey® clients in the MoCA F band.

The HOPPER® communicates the program selection to the Solo Node® stacker and switched LNBS via a 22 kHz DiSEqC return band. The DiSEqC controls both the LNB band selection and the Band Stack selection.

Multimedia over Coax Alliance (MoCA) provides multiple room viewing of programs stored on the DVR. Clients may take control of a video server tuner to receive 675 to 875 MHz MoCA F band live programs.

Internet access is provided by a router connected to the HOPPER®.





**SITUATION:** A homeowner subscribes to **DISH®** and the system the system requires (3) rooms. Running coax from the dish location to each room is the easiest installation method.

**At the Dish:** Two coax cables to the SOLO NODE provide (3) polarities that are stacked to the 950 to 3000 MHz band. The SOLO NODE "CLIENT" output is split with model **MFD2**.

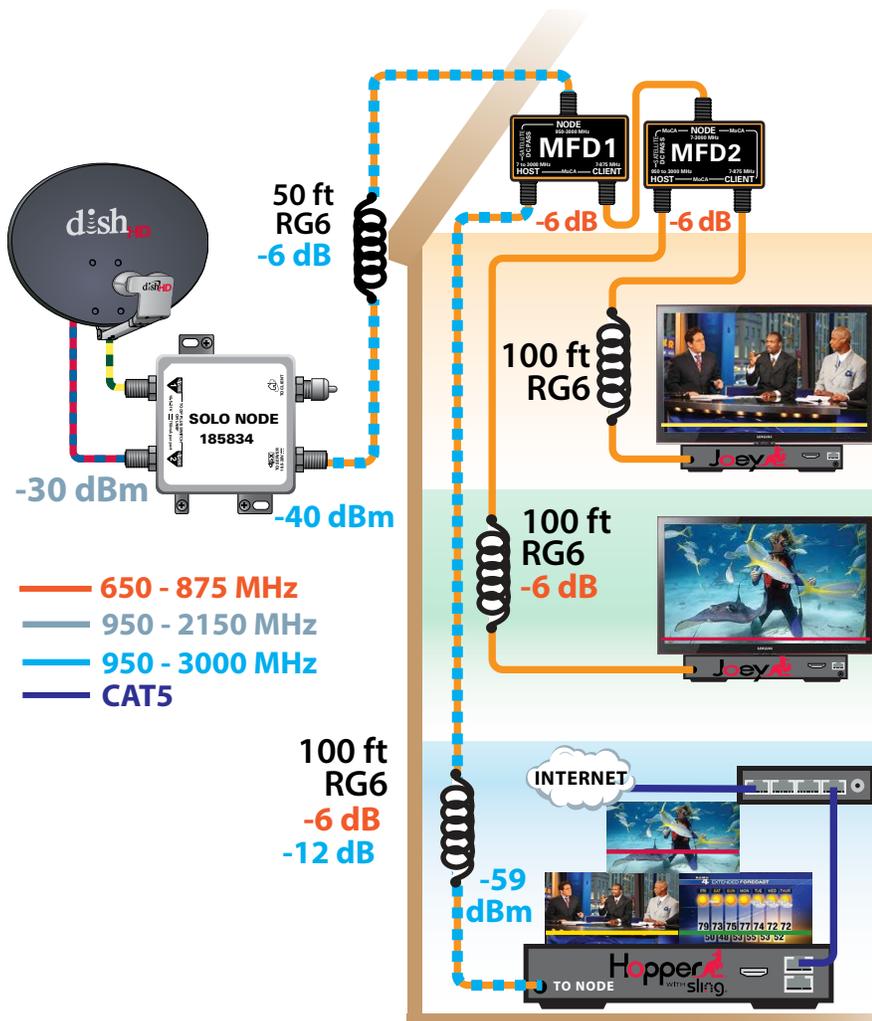
The **HOPPER®** receives (3) polarities for up to (3) tuners. A minimum of one tuner is available locally. The other (2) tuners are available to the **JOEY®**s in the MoCA band F.

The total MoCA loss from **HOPPER®** to **JOEY®** is 20 dB. Each **JOEY®** can see the other within 18 dB.

**SITUATION:** The internet is available only at a JOEY location.

Model HIC (**HOPPER®** Internet Converter) bridges the internet to the MoCA F band making it available to the **HOPPER®**.

The total MoCA loss from **HOPPER®** to **JOEY®** is 22 dB. Each **JOEY®** can see the other within 20 dB. (12 dB RG6, 6 dB **MFD2**, 2 dB **HIC**)



**SITUATION:** A homeowner subscribes to **DISH®** and the system the system requires (3) rooms. Homerun wiring exists in the attic or IDF closet that is accesible by the installer.

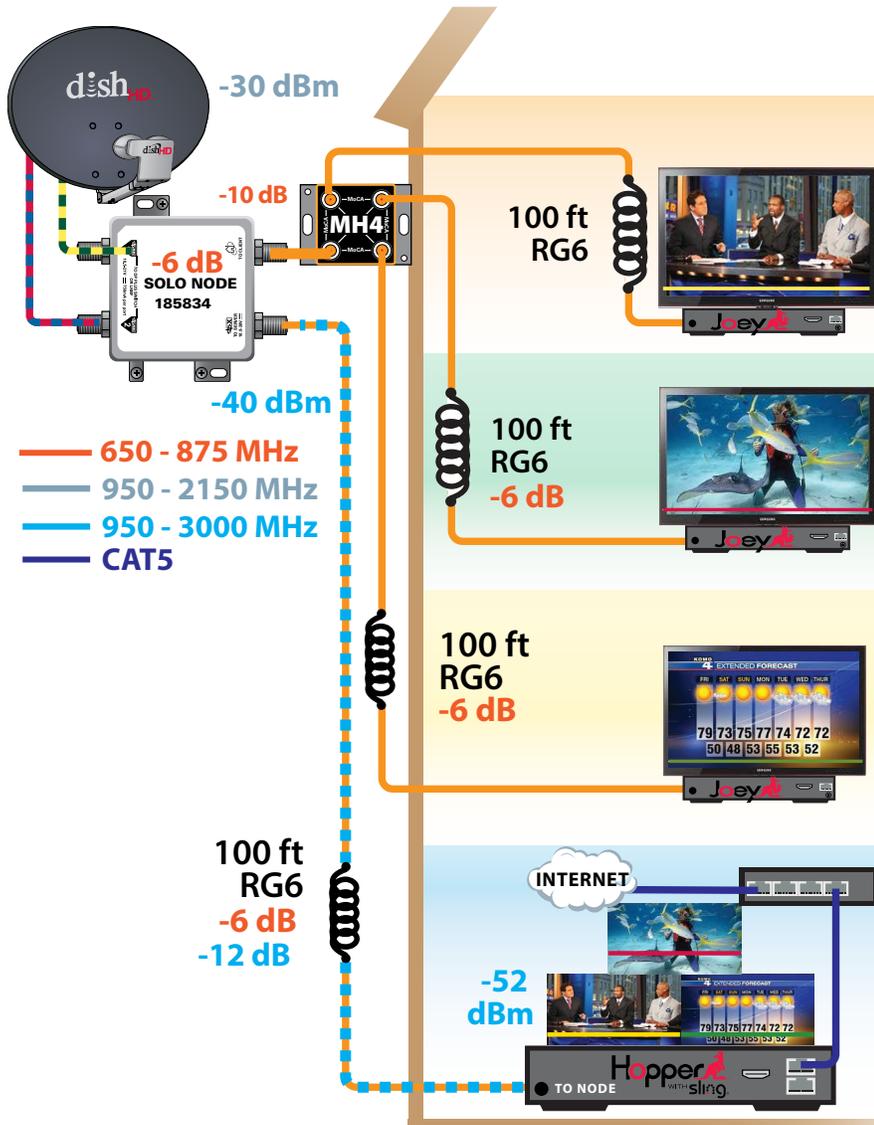
**At the Dish:** Two coax cables to the SOLO NODE provide (3) polarities that are stacked to the 950 to 3000 MHz band.

**At the IDF:** The SOLO NODE “TO HOST” output is split with model **MFD1**. The **HOPPER®** receives (3) polarities for up to (3) tuners from the HOST port of the **MFD1**. Model **MFD2** splits the MoCA signal to the (2) **JOEY®**s.

The total 3 GHz DBS loss from the SOLO NODE to the **HOPPER®** is 19 dB. The SOLO NODE has 10 dB conversion loss so the starting level is -40 dBm. Each of the **MFD1** and **MFD2** units have 1 dB insertion loss. The 100 foot of RG-6 has 12 dB loss @ 3000 MHz.

The total MoCA loss from **HOPPER®** to **JOEY®** is 24 dB. (12 dB RG6 + 6 dB **MFD1** + 6 dB **MFD2**)

Each **JOEY®** can see the other within 18 dB. (12 dB RG6 + 6 dB loss in the **MFD2**).



**SITUATION:** A homeowner subscribes to **DISH®** and the system the system requires (4) rooms. Homerun wiring exists in the attic of IDF that is accesible by the installer.

**At the Dish:** Two coax cables to the SOLO NODE provide (3) polarities that are stacked to the 950 to 3000 MHz band.

The SOLO NODE "TO HOST" output is home-runned to the **HOPPER®** which receives (3) polarites for up to (3) tuners. Note that the (3) **JOEY®s** will use all the tuners if each is active.

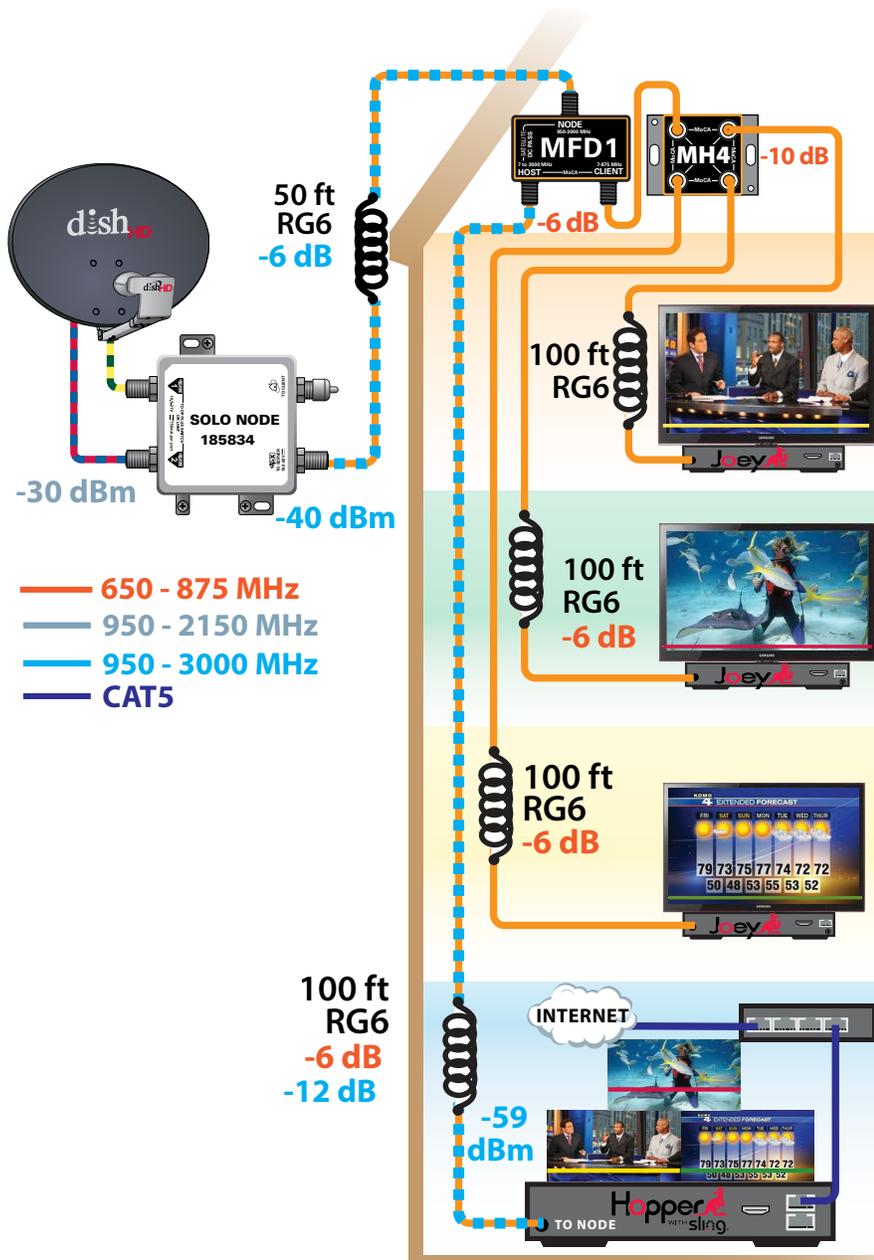
The TO CLIENT ouput of the SOLO NODE is split with model **MH4** to (3) **JOEY®s**.

The total 3 GHz DBS loss from the SOLO NODE to the HOPPER® is 12 dB. The SOLO NODE has 10 dB conversion loss so the starting level is -40 dBm. The **HOPPER®** input is -52 dBm.

The **MH4** has 10 dB insertion loss port to port. Compare this to a 4-way splitter that has 10 dB loss from input to ouput but 20 dB loss from any output to any other output.

The total MoCA loss from **HOPPER®** to any **JOEY®** is 28 dB. (12 dB RG6 + 10 dB loss in the **MH4** and 6 dB in the SOLO NODE)

Each **JOEY®** can see the other within 22 dB. (12 dB RG6 + 10 dB loss in the **MH4**). If a 4-way splitter were used in place of the **MH4**, the loss increases to 32 dB.



**SITUATION:** A homeowner subscribes to **DISH®** and the system the system requires (4) rooms. Homerun wiring exists in the attic or IDF closet that is accesible by the installer.

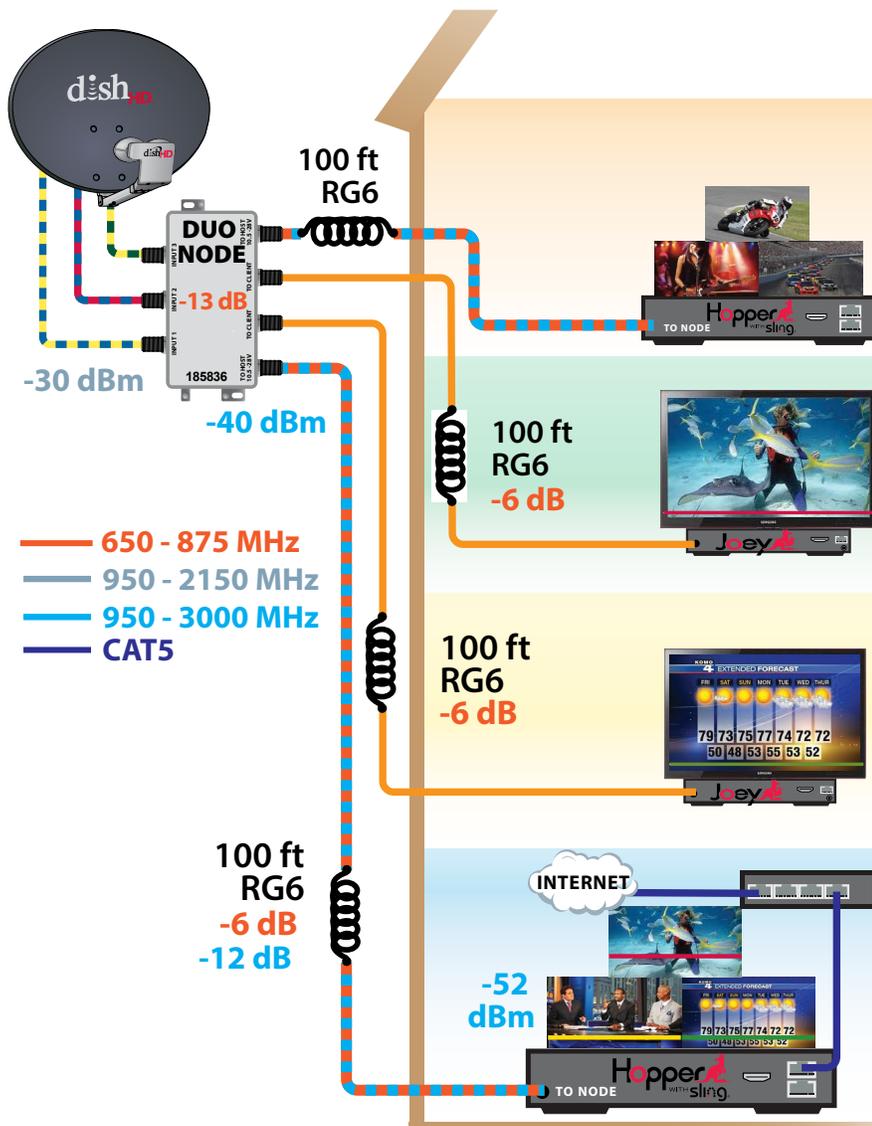
**At the Dish:** Two coax cables to the SOLO NODE provide (3) polarities that are stacked to the 950 to 3000 MHz band.

**At the IDF:** The SOLO NODE "TO HOST" output is split with model **MFD1**. The **HOPPER®** receives (3) polarities for up to (3) tuners from the HOST port of the **MH4**. Model **MH4** splits the MoCA signal to the (3) **JOEY®**s.

The total 3 GHz DBS loss from the SOLO NODE to the **HOPPER®** is 19 dB. The SOLO NODE has 10 dB conversion loss so the starting level is -40 dBm. The **MFD1** has 1 dB insertion loss at 3 GHz.

The **MFD1** has 6 dB insertion loss to the CLIENT. The **MH4** has 10 dB insertion loss port to port. The total MoCA loss from **HOPPER®** to any **JOEY®** is 24 dB. (12 dB RG6 + 6 dB + 10 dB loss in the **MFD1** and **MH4**)

Each **JOEY®** can see the other within 22 dB. (12 dB RG6 + 10 dB loss in the **MH4**). Using a 4-way in place of the **MH4** would increase the loss to 32 dB.



**SITUATION:** A homeowner subscribes to **DISH**® and the system the system requires (4) rooms. Running coax from the dish location to each room is the easiest installation method. Additional tuners are requested beyond the (3) in a single **HOPPER**®.

**At the Dish:** Two coax cables to the DUO NODE provide (6) polarities that are stacked in (2) bands of 950 to 3000 MHz.

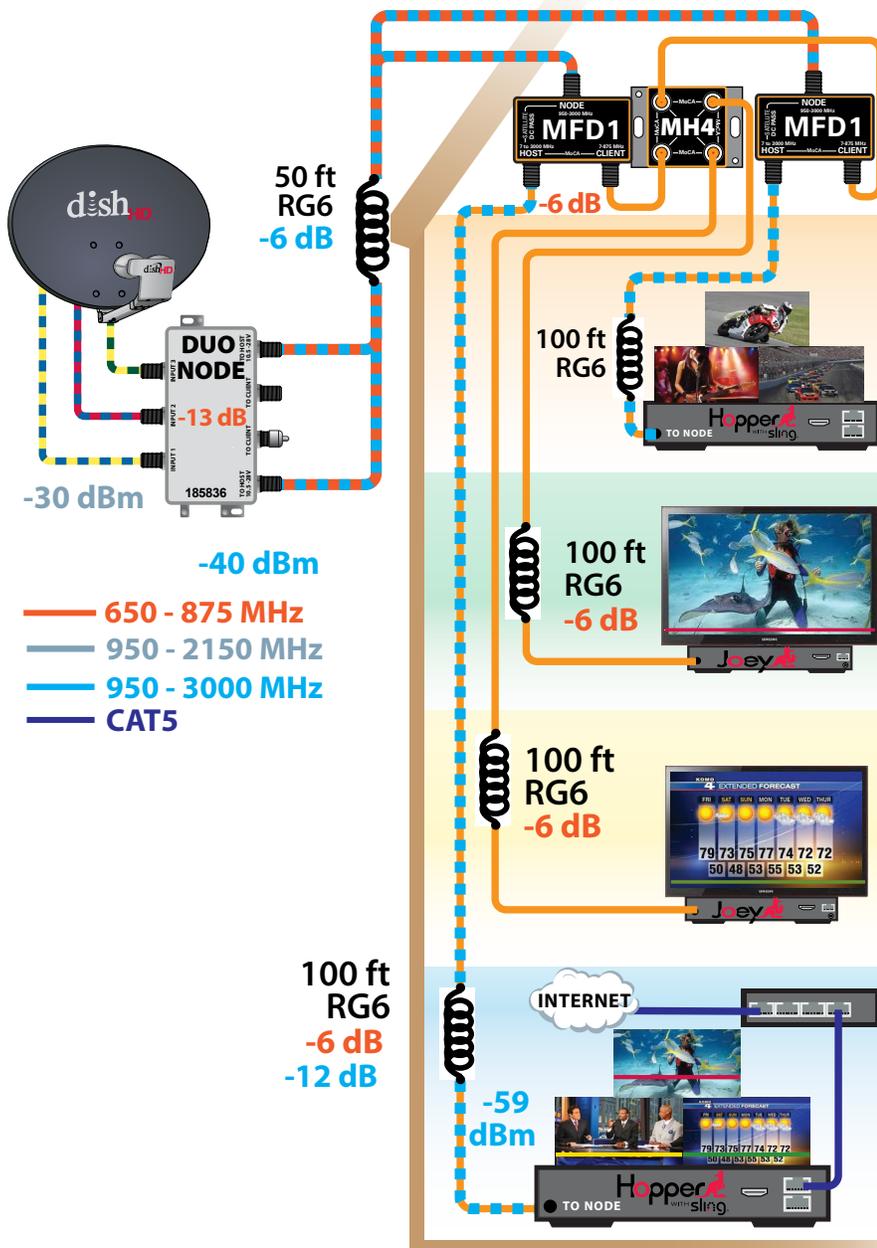
One DUO NODE "TO HOST" output is home-runned to the first **HOPPER**® which receives (3) polarities for up to (3) tuners. One DUO NODE "TO HOST" output is home-runned to the second **HOPPER**® which receives (3) polarities for up to (3) tuners.

One "TO CLIENT" output of the DUO NODE is home-runned to the first **JOEY**®. One "TO CLIENT" output of the DUO NODE is home-runned to the second **JOEY**®.

The total 3 GHz DBS loss from the DUO NODE to the **HOPPER**®s is 12 dB. The DUO NODE has 10 dB conversion loss so the starting level is -40 dBm. The **HOPPER**® inputs are -52 dBm.

The DUO NODE has 13 dB insertion loss port to port in the MoCA band. The total MoCA loss from **HOPPER**® to any **JOEY**® is 25 dB. (12 dB RG6 + 13 dB loss in the **DUO NODE**)

Each **JOEY**® can see the other within 25 dB. (12 dB RG6 + 13 dB loss in the **DUO NODE**).



**SITUATION:** A homeowner subscribes to **DISH®** and the system requires (4) rooms. Homerun wiring exists in the attic or IDF closet that is accessible by the installer. Additional tuners are requested beyond the (3) in a single **HOPPER®**.

**At the Dish:** Two coax cables to the DUO NODE provide (6) polarities that are stacked in (2) bands of 950 to 3000 MHz.

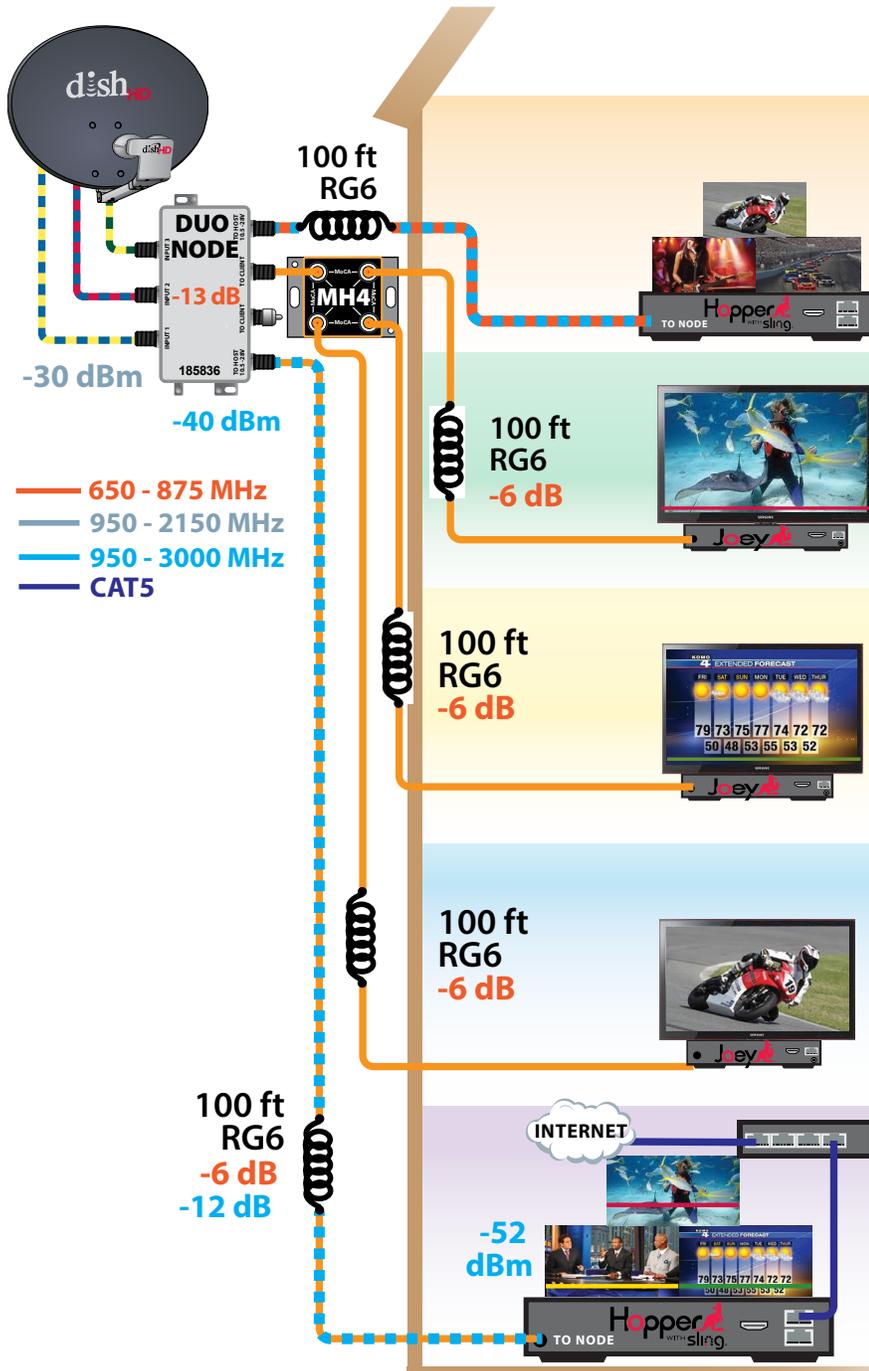
**At the IDF:** The DUO NODE “TO HOST” outputs are split with model **MFD1**. The first **HOPPER®** which receives (3) polarities for up to (3) tuners. The second **HOPPER®** which receives (3) polarities for up to (3) tuners.

Model **MH4** combines the MoCA signals from the two **HOPPER®** and splits the MoCA to the (2) **JOEY®**s.

The total 3 GHz DBS loss from the DUO NODE to the **HOPPER®**s is 19 dB. (18 dB RG6 + 1dB loss in **MFD1**)  
 The DUO NODE has 10 dB conversion loss so the starting level is -40 dBm.

The **MFD1** has 6 dB insertion loss to the CLIENT. The **MH4** has 10 dB insertion loss port to port. The total MoCA loss from any **HOPPER®** to any **JOEY®** is 24 dB. (12 dB RG6 + 6 dB in the **MFD1** + 10 dB loss and **MH4**)

Each **JOEY®** can see the other within 22 dB. (12 dB RG6 + 10 dB loss in the **MH4**). Using a 4-way in place of the **MH4** would increase the loss to 32 dB.



**SITUATION:** A homeowner subscribes to **DISH**® and the system requires (5) rooms. Running coax from the dish location to each room is the easiest installation method. Additional tuners are requested in addition to the (3) in a single **HOPPER**®.

**At the Dish:** Two coax cables to the DUO NODE provide (6) polarities that are stacked in (2) bands of 950 to 3000 MHz.

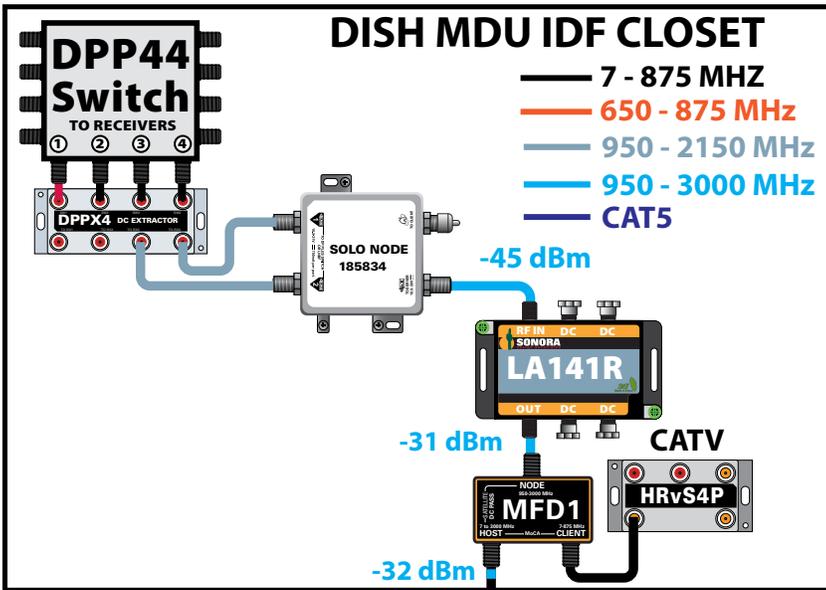
One DUO NODE "TO HOST" output is home-run to the first **HOPPER**® which receives (3) polarities for up to (3) tuners. One DUO NODE "TO HOST" output is home-run to the second **HOPPER**® which receives (3) polarities for up to (3) tuners.

One "TO CLIENT" output is terminated. The other of is connected to model **MH4**. Model **MH4** splits the MoCA signals from the two **HOPPER**® and splits the MoCA to the (3) **JOEY**®s.

The total 3 GHz DBS loss from the DUO NODE to the **HOPPER**®s is 12 dB. The DUO NODE has 10 dB conversion loss so the starting level is -40 dBm. The **HOPPER**® inputs are -52 dBm.

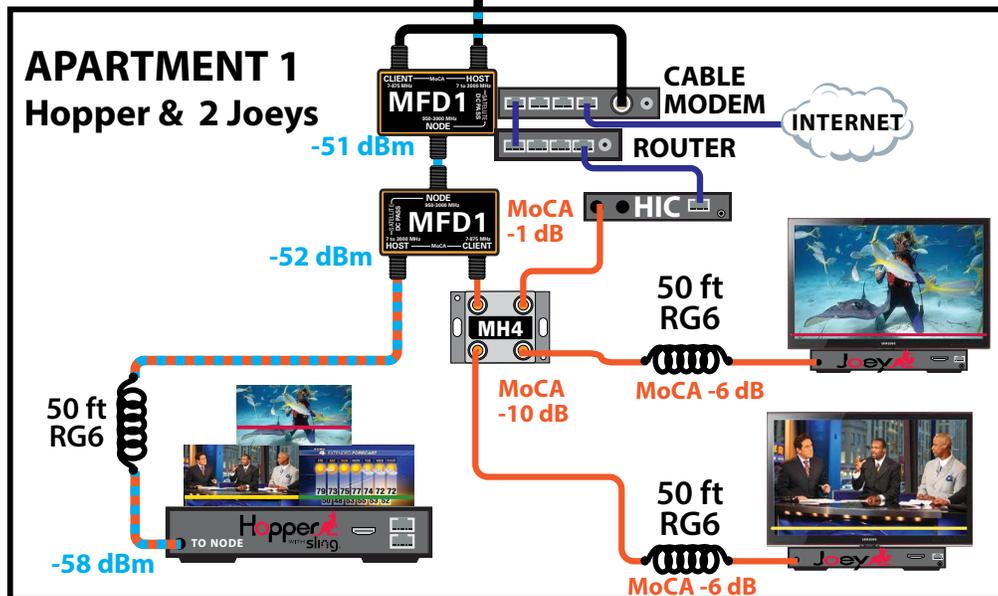
The DUO NODE has 13 dB insertion loss port to port in the MoCA band. Model **MH4** has 10 dB port to port loss. The total MoCA loss from **HOPPER**® to any **JOEY**® is 35 dB. (12 dB RG6 + 13 dB loss in the **DUO NODE** + 10 dB loss in the **MH4**)

Each **JOEY**® can see the other within 35 dB. (12 dB RG6 + 13 dB loss in the **DUO NODE** + 10 dB loss in the **MH4**).



**SITUATION:** An apartment building needs both **DISH®** and CATV signals to each apartment. Within the apartment is a **DISH® HOPPER® / Joey** system.

**SOLUTION:** At the IDF, CATV signals in the 54 to 860 MHz forward and 7 to 42 MHz return are **INTEGRATED** with DISH signals with Model **MEFD1**.



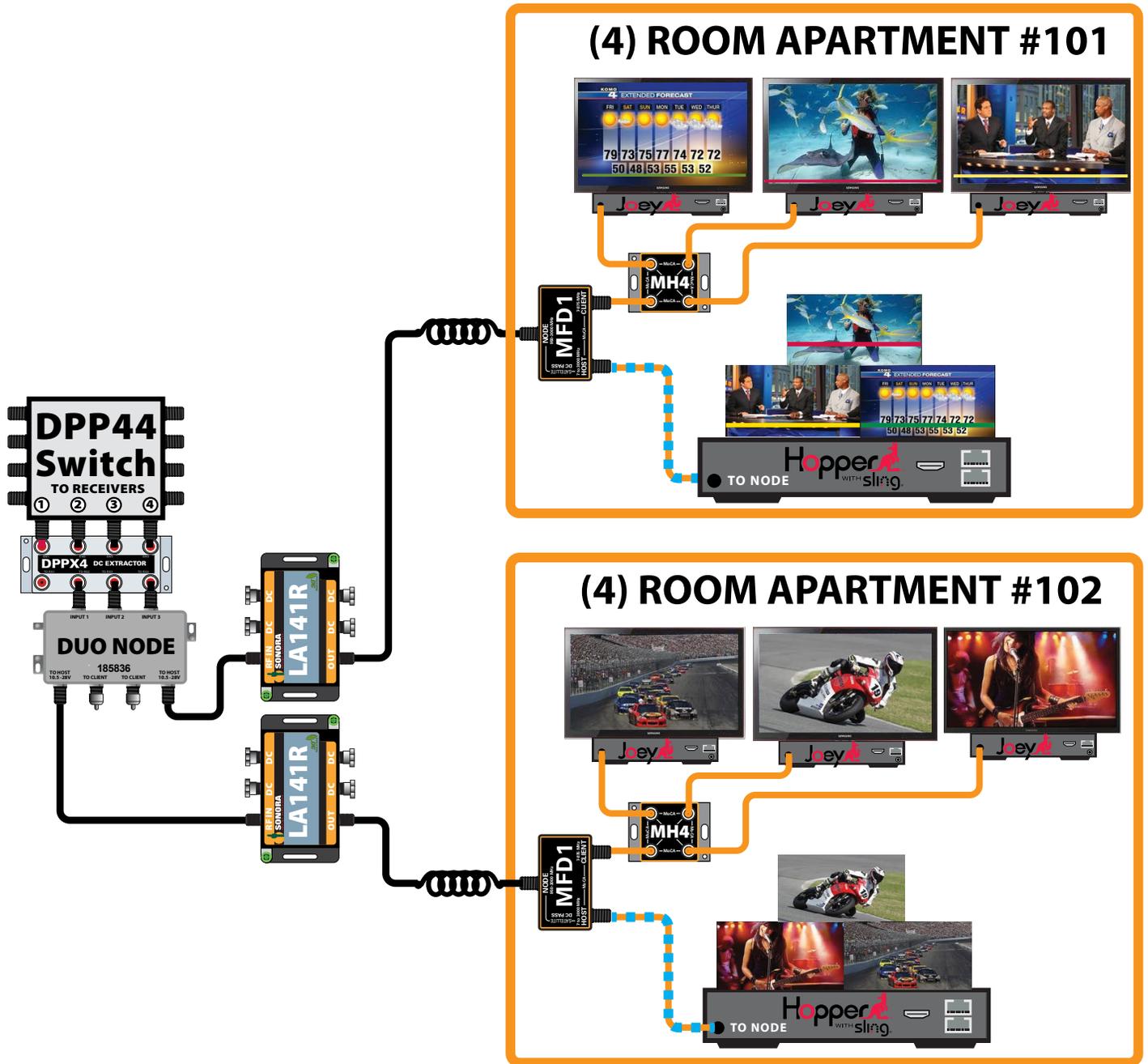
**At the IDF:** Splitter **HRvS4P** feeds CATV to the **MFD1** diplexers. The SOLO NODE signal is amplified by model **LA141R** since cable loss at 3 GHz is 12 dB per 100 feet.

**Inside each Apartment:** MoCA and CATV signals **CAN NOT** share the same coax. Filtering is required to keep the MoCA signals within the apartment and **ISOLATED** from the CATV signals.

Model **MFD1** **ISOLATES** the CATV signals to feed the Cable Modem. Cable Modem 7 to 42 MHz return signals pass back to the IDF closet. MoCA 675 to 875 MHz is blocked from mixing with CATV 54 to 860 MHz signals by 70 dB with the (2) **MFD1** diplexers.

**Internet access** to the HOPPER® is provided by the **HIC** connected between the router and model **MH4** MoCA hub. The Joeyes communicate in the MoCA F band through the **MH4**.

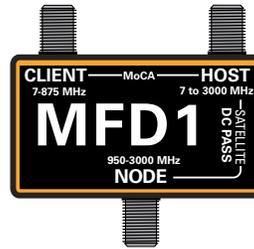




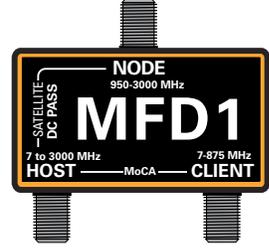
Model **MFD1** ISOLATES MoCA F band and DBS signals.



## SEPARATOR



## COMBINER



### HOST to CLIENT

- 7 to 875 MHz..... Passes
- 950 to 3500 MHz..... **ISOLATES > 35 dB**

### HOST to NODE

- 22 kHz..... Passes
- 42 to 700 MHz..... **ISOLATES > 45 dB**
- 700 to 875 MHz..... **ISOLATES > 35 dB**
- 950 to 3500 MHz..... Passes

### NODE to CLIENT

- 15 to 42 MHz..... **ISOLATES > 25 dB**
- 950 to 3500 MHz..... **ISOLATES > 50 dB**

| Parameter                    | Unit   | MFD1 Isolator                    |
|------------------------------|--------|----------------------------------|
| <b>PORTS</b>                 |        | (3)                              |
| <b>NODE</b>                  | kHz    | DC & 22                          |
|                              | MHz    | 2 & 950 -3000                    |
| <b>CLIENT</b>                | MHz    | 7 - 875                          |
| <b>HOST</b>                  | kHz    | DC & 22                          |
|                              | MHz    | 2 -3000                          |
| <b>HOST to CLIENT</b>        |        |                                  |
| 2.3 MHz                      | dB     | > 14                             |
| 7 MHz                        | dB     | < 2.5                            |
| 15 to 42 MHz                 | dB     | < 2.0                            |
| 54 to 875 MHz                | dB     | < 2.0                            |
| 950 to 3500 MHz              | dB     | > 35                             |
| <b>HOST to NODE</b>          |        |                                  |
| 22 kHz                       | ohm    | < 1                              |
| 2.3 MHz                      | dB     | < 3                              |
| 7 MHz                        | dB     | > 16                             |
| 15 MHz                       | dB     | > 26                             |
| 42 to 700 MHz                | dB     | > 45                             |
| 700 to 875 MHz               | dB     | > 35                             |
| 950 MHz                      | dB     | < 2.5                            |
| 960 to 3000 MHz              | dB     | <1.0                             |
| 3500 MHz                     | dB     | < 4.0                            |
| <b>NODE to CLIENT</b>        |        |                                  |
| 2.3 MHz                      | dB     | > 10                             |
| 7 MHz                        | dB     | > 14                             |
| 15 MHz                       | dB     | > 25                             |
| 42 MHz to 3500 MHz           | dB     | > 50                             |
| <b>Return Loss</b>           |        |                                  |
| CLIENT 15 to 42 MHz          | dB     | >10                              |
| CLIENT 54 to 875 MHz         | dB     | >12                              |
| NODE 950 to 3000 MHz         | dB     | >12                              |
| HOST 54 to 3000 MHz          | dB     | >12                              |
| <b>Flatness</b>              |        |                                  |
| CLIENT 7 to 875 MHz          | dB     | 1.5                              |
| CLIENT Any 6 MHz band        | dB     | 0.2                              |
| DBS Any 25 MHz band          | dB     | 0.5                              |
| <b>DC Power pass</b>         |        |                                  |
| HOST to NODE                 | Amp    | 2 (max)                          |
| <b>Dimensions</b> L x W x H  | Inch   | 2.0 x 2.3 x 0.7                  |
| <b>Grounding Block</b>       | (2) ea | NEC 2008 250.126 10 gauge copper |
| <b>Operating Temperature</b> | °C     | -34 to + 60                      |

Frequency response of the **NODE** to **HOST** port overlaid with the **HOST** to **CLIENT** port (markers).

**MEFD1 ISOLATES MoCA E&F and DBS signals** plus provides high isolation of the 2.3 MHz FSK and CATV sub-band signals.

Based on the **MFD1** but with

- 2.3 MHz passing HOST to NODE
- 2.3 MHz isolation HOST to CLIENT
- Increased Host to CLIENT MoCA Isolation



**HOST to CLIENT**

- **2.3 MHz..... ISOLATES > 60 dB**
- **7 to 875 MHz..... ISOLATES > 50 dB**
- **950 to 3000 MHz..... ISOLATES > 45 dB**

**HOST to NODE**

- **2.3 MHz..... Passes**
- **7 to 475 MHz..... ISOLATES > 40 dB**
- **475 to 875 MHz..... ISOLATES > 60 dB**
- **950 to 2150 MHz..... Passes**

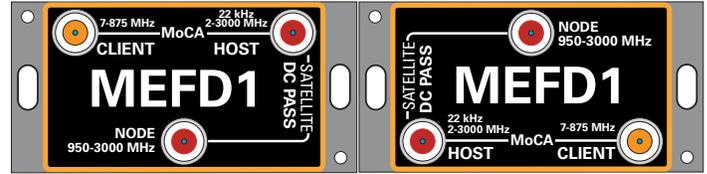
**NODE to CLIENT**

- **2.3 MHz..... ISOLATES > 60 dB**
- **7 to 875 MHz..... Passes**
- **950 to 3000 MHz..... ISOLATES >45 dB**

Frequency response of the **HOST to NODE** port (markers) overlaid with the **HOST to CLIENT** port.

**SEPARATOR**

**COMBINER**



| Parameter                    | Unit   | MEFD1                               |
|------------------------------|--------|-------------------------------------|
| <b>PORTS</b>                 |        | (3)                                 |
| NODE PORT                    | kHz    | DC & 22                             |
|                              | MHz    | 2.3 & 950 -3000                     |
| CLIENT PORT                  | MHz    | 7 - 875                             |
| HOST PORT                    | kHz    | DC & 22                             |
|                              | MHz    | 2.3, 950 -3000                      |
| <b>HOST to CLIENT</b>        |        |                                     |
| 2.3 MHz                      | dB     | > 60                                |
| 7 to 42 MHz                  | dB     | < 1.5                               |
| 54 to 806 MHz                | dB     | < 1.0                               |
| 806 to 875 MHz               | dB     | < 1.5                               |
| 950 to 3000 MHz              | dB     | > 40                                |
| <b>HOST to NODE</b>          |        |                                     |
| 2.3 MHz                      | dB     | < 2.5                               |
| 7 to 806 MHz                 | dB     | > 60                                |
| 806 to 875 MHz               | dB     | > 50                                |
| 950 to 3000 MHz              | dB     | < 2.5                               |
| <b>NODE to CLIENT</b>        |        |                                     |
| 2.3 MHz                      | dB     | > 60                                |
| 7 to 42 MHz                  | dB     | > 50                                |
| 54 to 400 MHz                | dB     | > 45                                |
| 475 to 700 MHz               | dB     | > 60                                |
| 940 to 2150 MHz              | dB     | > 45                                |
| <b>Return Loss</b>           |        |                                     |
| CLIENT 7 to 42 MHz           | dB     | >10                                 |
| CLIENT 54 to 875 MHz         | dB     | >12                                 |
| NODE 950 to 2150 MHz         | dB     | >10                                 |
| <b>Flatness</b>              |        |                                     |
| CLIENT 54 to 875 MHz         | dB     | 1.5                                 |
| CLIENT Any 6 MHz band        | dB     | 0.2                                 |
| NODE Any 25 MHz band         | dB     | 0.5                                 |
| <b>DC Power pass</b>         |        |                                     |
| (HOST to NODE)               | Amp    | 2 (max)                             |
| <b>Dimensions L x W x H</b>  | Inch   | 1.4 x 2.8 x 1.1                     |
| <b>Grounding Block</b>       | (2) ea | NEC 2008 250.126<br>10 gauge copper |
| <b>Environmental</b>         |        | Indoor Only                         |
| <b>Operating Temperature</b> | °C     | -34 to + 60                         |

Model **MEFD6** is a 3 port device that **ISOLATES MoCA E & F, CATV and DBS+MoCA** signals.



**COMBINED to the CATV port:**

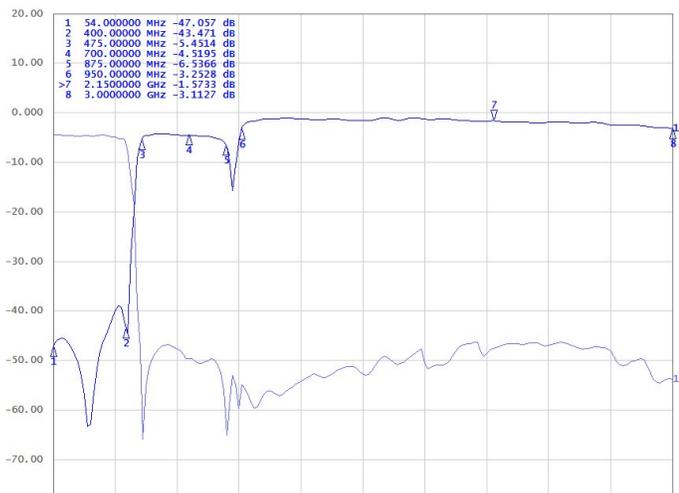
- 2.3 MHz..... **ISOLATES > 60 dB**
- 7 to 400 MHz..... **Passes < 6 dB**
- 475 to 875 MHz..... **ISOLATES >40 dB**
- 940 to 3000 MHz..... **ISOLATES >45 dB**

**COMBINED to the DBS+MoCA port:**

- 22 kHz & 2.3 MHz..... **Passes**
- 7 to 400 MHz..... **ISOLATES > 50 dB**
- 475 to 875 MHz..... **Passes < 6 dB**
- 940 to 3000 MHz..... **Passes < 2 dB**

**DBS+MoCA to the CATV port:**

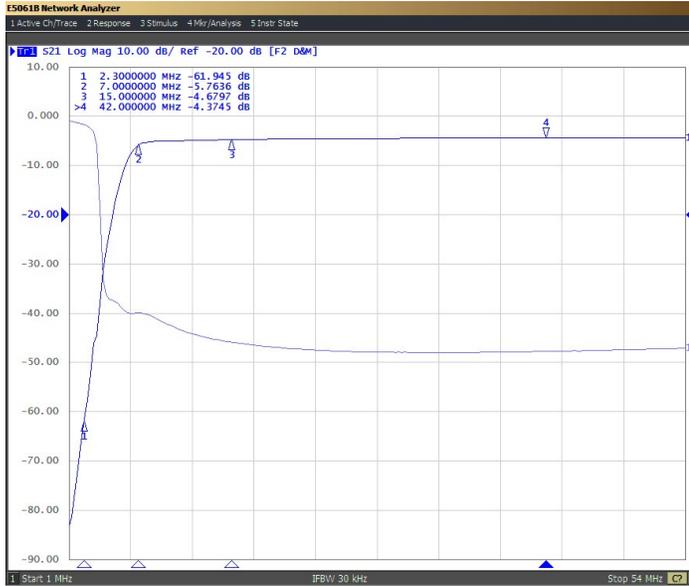
- 2.3 MHz..... **ISOLATES > 60 dB**
- 7 to 400 MHz..... **ISOLATES > 45 dB**
- 475 to 806 MHz..... **ISOLATES > 50 dB**
- 940 to 3000 MHz..... **ISOLATES > 45 dB**



**COMBINED to the DBS+MoCA (markers)**

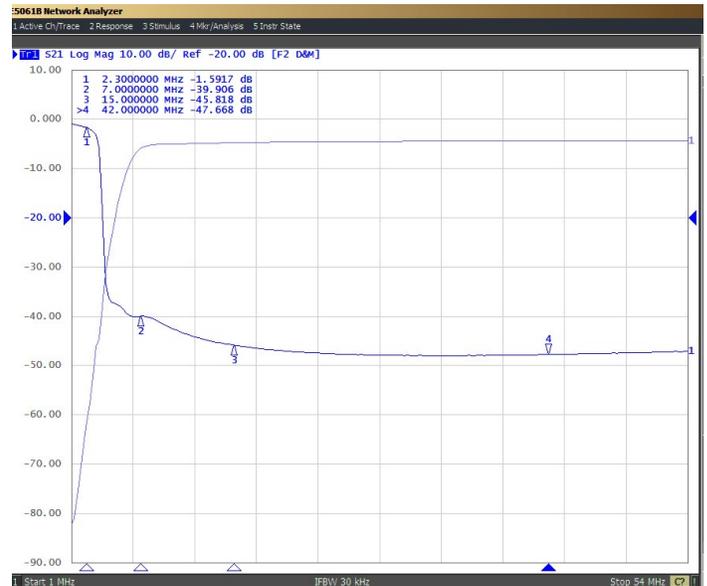
Overlaid on **COMBINED to the CATV**

| Parameter                    | Unit   | MEFD6                               |
|------------------------------|--------|-------------------------------------|
| <b>PORTS</b>                 |        | (3)                                 |
| COMBINED PORT                | MHz    | 2 -2150                             |
| CATV PORT                    | MHz    | <b>7 - 400</b>                      |
| DBS+ MoCA PORT               | kHz    | 22                                  |
|                              | MHz    | 2.3, 940 -3000                      |
|                              | MHz    | <b>&amp; 475 -875</b>               |
| <b>COMBINED to CATV</b>      |        |                                     |
| 2.3 MHz                      | dB     | <b>&gt; 60</b>                      |
| 7 to 42 MHz                  | dB     | < 6                                 |
| 54 to 400 MHz                | dB     | < 6                                 |
| 475 to 875 MHz               | dB     | <b>&gt; 45</b>                      |
| 940 to 3000 MHz              | dB     | <b>&gt; 45</b>                      |
| <b>COMBINED to DBS+MoCA</b>  |        |                                     |
| 2.3 MHz                      | dB     | < 2.0                               |
| 7 to 42 MHz                  | dB     | <b>&gt; 45</b>                      |
| 54 to 400 MHz                | dB     | <b>&gt; 45</b>                      |
| 475 to 875 MHz               | dB     | < 5.5                               |
| 940 to 3000 MHz              | dB     | < 2.0                               |
| <b>DBS to CATV to SWM</b>    |        |                                     |
| 2.3 MHz                      | dB     | <b>&gt; 60</b>                      |
| 7 to 42 MHz                  | dB     | <b>&gt; 50</b>                      |
| 54 to 400 MHz                | dB     | <b>&gt; 45</b>                      |
| 475 to 806 MHz               | dB     | <b>&gt; 50</b>                      |
| 940 to 2150 MHz              | dB     | <b>&gt; 45</b>                      |
| <b>Return Loss</b>           |        |                                     |
| CATV 7 to 42 MHz             | dB     | >10                                 |
| CATV 54 to 806 MHz           | dB     | >12                                 |
| SWM 2.3 MHz                  | dB     | >12                                 |
| SWM 940 to 3000 MHz          | dB     | >10                                 |
| <b>Flatness</b>              |        |                                     |
| CATV 7 to 400 MHz            | dB     | 1.5                                 |
| CATV Any 6 MHz band          | dB     | 1.5                                 |
| SWM Any 25 MHz band          | dB     | 0.5                                 |
| <b>DC Power pass</b>         |        |                                     |
| (DBS to COMBINED)            | Amp    | 2 (max)                             |
| <b>Dimensions</b> L x W x H  | Inch   | 1.4 x 2.8 x 1.1                     |
| <b>Grounding Block</b>       | (2) ea | NEC 2008 250.126<br>10 gauge copper |
| <b>Environmental</b>         |        | Indoor Only                         |
| <b>Operating Temperature</b> | °C     | -34 to + 60                         |



### 1 MHz to 42 MHz, Combined to CATV PORT

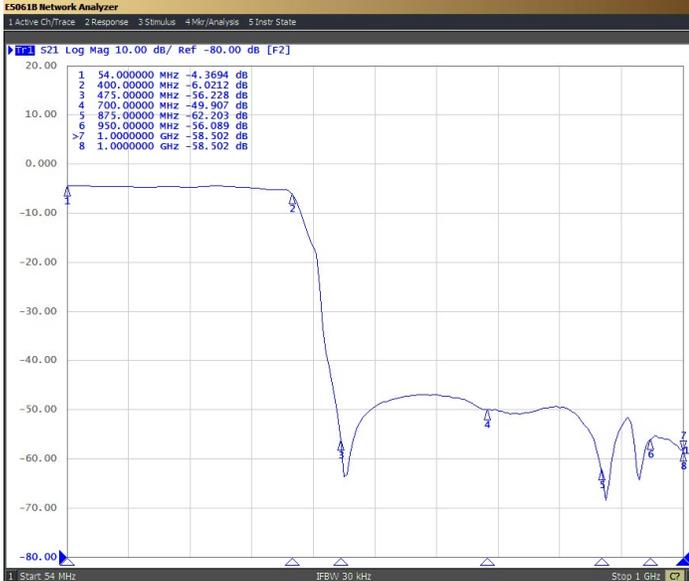
- 1 = 2.3 MHz = - 61 dB
- 2 = 7 MHz = - 5.7 dB
- 3 = 15 MHz = - 4.7 dB
- 4 = 42 MHz = - 4.4 dB



### 1 MHz to 42 MHz, Combined to DBS PORT

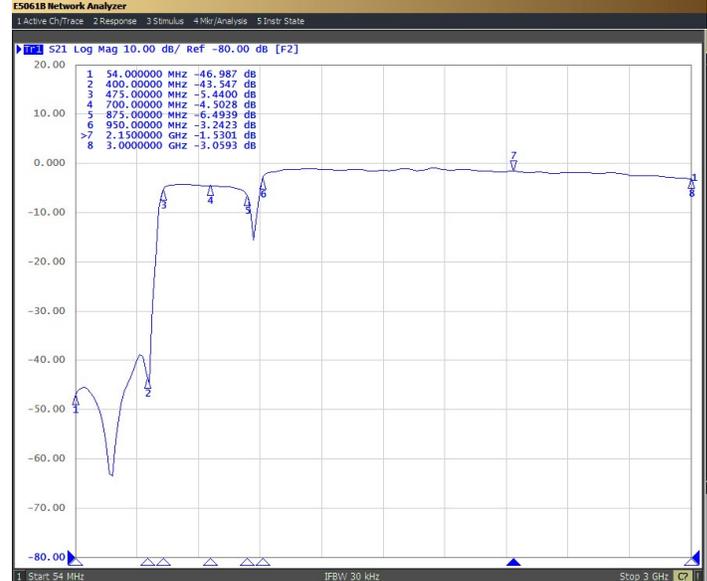
- 1 = 2.3 MHz = - 1.6 dB
- 2 = 7 MHz = - 40 dB
- 3 = 15 MHz = - 45 dB

Overlay "Combined to DBS+MoCA" and "Combined to CATV"



### 54 MHz to 2.2 GHz, Combined to CATV Port

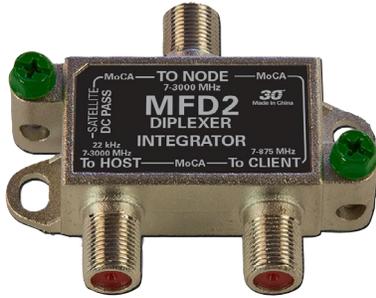
- 1 = 54 MHz = - 4.3 dB
- 2 = 400 MHz = - 6.0 dB
- 3 = 475 MHz = - 56 dB
- 4 = 700 MHz = - 49 dB
- 5 = 875 MHz = - 62 dB
- 6 = 950 MHz = - 56 dB



### 54 MHz to 3.0 GHz, Combined to DBS+ MOCA Port

- 2 = 400 MHz = - 43 dB
- 3 = 475 MHz = - 5.5 dB
- 4 = 625 MHz = - 4.5 dB
- 5 = 875 MHz = - 6.5 dB
- 6 = 950 MHz = - 3.2 dB
- 7 = 3000 MHz = - 3.0 dB

Model **MFD2** INTEGRATES MoCA F band and DBS signals.



**HOST to CLIENT**

- 7 to 875 MHz..... Passes
- 950 to 3500 MHz..... **ISOLATES > 40 dB**

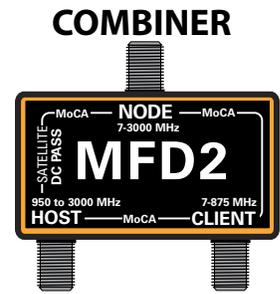
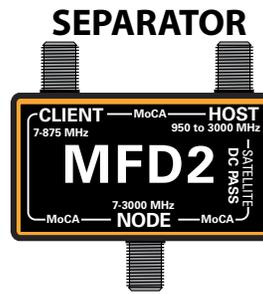
**HOST to NODE**

- 22 kHz..... Passes
- 7 to 875 MHz..... Passes
- 950 to 3500 MHz..... Passes

**NODE to CLIENT**

- 7 to 875 MHz..... Passes
- 950 to 3500 MHz..... **ISOLATES > 40 dB**

Frequency response of the **NODE to HOST** port overlaid with the **HOST to CLIENT** port (markers).



| Parameter                    | Unit   | MFD2 Integrator                  |
|------------------------------|--------|----------------------------------|
| <b>PORTS</b>                 |        | (3)                              |
| <b>NODE</b>                  | kHz    | DC & 22                          |
|                              | MHz    | 2 & 950 -3000                    |
| <b>CLIENT</b>                | MHz    | 7 - 875                          |
| <b>HOST</b>                  | kHz    | DC & 22                          |
|                              | MHz    | 2 -3000                          |
| <b>HOST to CLIENT</b>        |        |                                  |
| 7 MHz                        | dB     | < 12                             |
| 15 to 42 MHz                 | dB     | < 7.0                            |
| 54 to 875 MHz                | dB     | < 7.0                            |
| 950 to 3500 MHz              | dB     | <b>&gt; 40</b>                   |
| <b>HOST to NODE</b>          |        |                                  |
| 22 kHz                       | ohm    | < 1                              |
| 7 MHz                        | dB     | < 10                             |
| 15 MHz                       | dB     | < 4                              |
| 42 to 700 MHz                | dB     | < 4                              |
| 700 to 875 MHz               | dB     | < 3.5                            |
| 950 MHz                      | dB     | < 2.5                            |
| 960 to 3000 MHz              | dB     | < 2.0                            |
| 3500 MHz                     | dB     | < 4.0                            |
| <b>NODE to CLIENT</b>        |        |                                  |
| 2.3 MHz                      | dB     | <b>&gt; 10</b>                   |
| 7 MHz                        | dB     | < 12                             |
| 15 to 875 MHz                | dB     | < 6.5                            |
| 950 MHz                      | dB     | <b>&gt; 40</b>                   |
| 1000 to 3500 MHz             | dB     | <b>&gt; 50</b>                   |
| <b>Return Loss</b>           |        |                                  |
| CLIENT 15 to 42 MHz          | dB     | >10                              |
| CLIENT 54 to 875 MHz         | dB     | >12                              |
| NODE 950 to 3000 MHz         | dB     | >12                              |
| HOST 54 to 3000 MHz          | dB     | >12                              |
| <b>Flatness</b>              |        |                                  |
| CLIENT 7 to 875 MHz          | dB     | 1.5                              |
| CLIENT Any 6 MHz band        | dB     | 0.2                              |
| DBS Any 25 MHz band          | dB     | 0.5                              |
| <b>DC Power pass</b>         |        |                                  |
| HOST to NODE                 | Amp    | 2 (max)                          |
| <b>Dimensions</b> L x W x H  | Inch   | 2.0 x 2.3 x 0.7                  |
| <b>Grounding Block</b>       | (2) ea | NEC 2008 250.126 10 gauge copper |
| <b>Operating Temperature</b> | °C     | -34 to + 60                      |

Revised Apr 1 2015

Model **MEFD6** is a 3 port device that **ISOLATES MoCA E & F, CATV and DBS+MoCA** signals.



### COMBINED to CATV

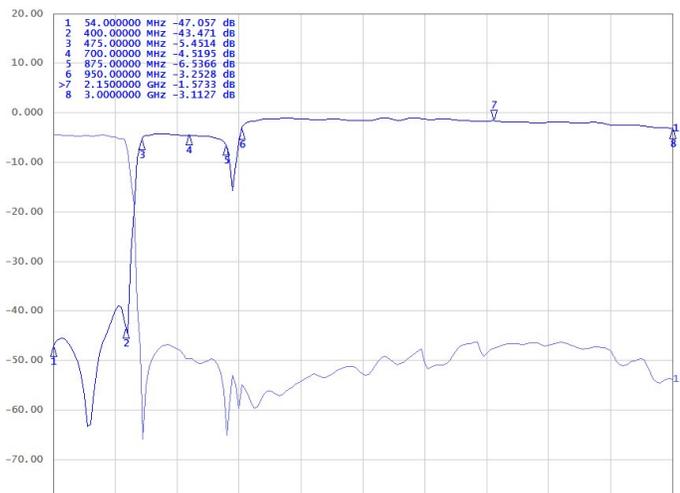
- 2.3 MHz..... **ISOLATES > 60 dB**
- 7 to 400 MHz..... **Passes < 6 dB**
- 475 to 875 MHz..... **ISOLATES >40 dB**
- 950 to 3000 MHz..... **ISOLATES >45 dB**

### COMBINED to NODE DBS

- 22 kHz & 2.3 MHz..... **Passes**
- 7 to 400 MHz..... **ISOLATES > 50 dB**
- 475 to 875 MHz..... **Passes < 6 dB**
- 950 to 3000 MHz..... **Passes < 2 dB**

### DBS NODE to CATV

- 2.3 MHz..... **ISOLATES > 60 dB**
- 7 to 400 MHz..... **ISOLATES > 45 dB**
- 475 to 806 MHz..... **ISOLATES > 50 dB**
- 950 to 3000 MHz..... **ISOLATES > 45 dB**



**COMBINED to the DBS+MoCA (markers)**  
Overlaid on **COMBINED to the CATV**

### COMBINER

### SEPARATOR



| Parameter                                 | Unit   | MEFD6                               |
|---|--------|-------------------------------------|
| <b>PORTS</b>                              |        | (3)                                 |
| <b>COMBINED</b>                           | MHz    | 2-2150                              |
| <b>CATV</b>                               | MHz    | <b>7 - 400</b>                      |
| <b>NODE DBS</b>                           | kHz    | 22                                  |
|   | MHz    | 2.3, 950 -3000                      |
|   | MHz    | <b>&amp; 475 -875</b>               |
| <b>COMBINED to CATV</b>                   |        |                                     |
| 2.3 MHz                                   | dB     | <b>&gt; 60</b>                      |
| 7 to 400 MHz                              | dB     | <b>&lt; 6</b>                       |
| 475 to 3000 MHz                           | dB     | <b>&gt; 45</b>                      |
| <b>COMBINED to NODE DBS</b>               |        |                                     |
| 2.3 MHz                                   | dB     | <b>&lt; 2.0</b>                     |
| 7 to 400 MHz                              | dB     | <b>&gt; 45</b>                      |
| 475 to 875 MHz                            | dB     | <b>&lt; 5.5</b>                     |
| 950 to 3000 MHz                           | dB     | <b>&lt; 2.0</b>                     |
| <b>NODE DBS to CATV</b>                   |        |                                     |
| 2.3 MHz                                   | dB     | <b>&gt; 60</b>                      |
| 7 to 42 MHz                               | dB     | <b>&gt; 50</b>                      |
| 54 to 400 MHz                             | dB     | <b>&gt; 45</b>                      |
| 475 to 806 MHz                            | dB     | <b>&gt; 50</b>                      |
| 950 to 2150 MHz                           | dB     | <b>&gt; 45</b>                      |
| <b>Return Loss</b>                        |        |                                     |
| CATV 7 to 42 MHz                          | dB     | <b>&gt;10</b>                       |
| CATV 54 to 400 MHz                        | dB     | <b>&gt;12</b>                       |
| SWM 2.3 MHz                               | dB     | <b>&gt;12</b>                       |
| DBS 950 to 3000 MHz                       | dB     | <b>&gt;10</b>                       |
| <b>Flatness</b>                           |        |                                     |
| CATV 7 to 400 MHz                         | dB     | 1.5                                 |
| CATV Any 6 MHz band                       | dB     | 0.2                                 |
| DBS Any 25 MHz band                       | dB     | 0.5                                 |
| <b>DC Power pass</b><br>(DBS to COMBINED) | Amp    | 2 (max)                             |
| <b>Dimensions</b> L x W x H               | Inch   | 1.4 x 2.8 x 1.1                     |
| <b>Grounding Block</b>                    | (2) ea | NEC 2008 250.126<br>10 gauge copper |
| <b>Environmental</b>                      |        | Indoor Only                         |
| <b>Operating Temperature</b>              | °C     | -34 to + 60                         |

Revised Apr 1 2015

Model **MEFD6** is a 3 port device that **ISOLATES MoCA E & F, CATV** and **DBS+MoCA** signals.

**MH4**

- **2.3 MHz..... ISOLATES > 60 dB**
- **7 to 400 MHz..... Passes < 6 dB**
- **475 to 875 MHz..... ISOLATES >40 dB**
- **950 to 3000 MHz..... ISOLATES >45 dB**

| Parameter                    | Unit | MH4              | MH6              |
|------------------------------|------|------------------|------------------|
| <b>PORTS</b>                 |      | (3)              | (6)              |
| <b>PORT to PORT</b>          | MHz  | 2 -3000          | 2 -3000          |
| <b>PORT to PORT</b>          |      |                  |                  |
| 2.3 MHz                      | dB   | < 10             | < 14             |
| 7 to 700 MHz                 | dB   | < 10             | < 14             |
| 700 to 875 MHz               | dB   | < 10.5           | < 14.5           |
| 950 to 2150 MHz              | dB   | < 10.5           | < 14.5           |
| 3000 MHz                     | dB   | < 11.0           | < 14.5           |
| <b>Return Loss</b>           |      |                  |                  |
| 2 to 700 MHz                 | dB   | >20              | >20              |
| 700 to 2150 MHz              | dB   | >12              | >17              |
| 2150 to 3000 MHz             | dB   | >10              | >14              |
| <b>Flatness</b>              |      |                  |                  |
| 2 to 3000 MHz                | dB   | 1.0              | 1.0              |
| Any 6 MHz band               | dB   | 0.1              | 0.1              |
| Any 25 MHz band              | dB   | 0.2              | 0.2              |
| <b>DC Power pass</b>         | Amp  | DC Block         | DC Block         |
| <b>Dimensions L x W x H</b>  | Inch | 1.4 x 2.8 x 1.1  | 1.4 x 2.8 x 1.1  |
| <b>Grounding Block</b>       |      | 2 ea             | 2 ea             |
| <b>Environmental</b>         |      | Indoor / Lockbox | Indoor / Lockbox |
| <b>Operating Temperature</b> | °C   | -34 to + 60      | -34 to + 60      |

**COMBINED** to the **DBS+MoCA (markers)**

Overlaid on **COMBINED** to the **CATV**