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D4DIPL1: DOCSIS4.0 FDD multi-band programmable diplexer

Preliminary Product description V1.0 June 2025

DESCRIPTION

D4DIPL1 provides a set of six wideband, high performance diplexer profiles designed to meet the critical requirements of DOCSIS4.0 multi-band specification.

Six diplexers are implemented to meet the different band split options defined by the extended frequency specification of DOCSIS4.0 (FDD) making it a versatile choice for Cable networks.

Each of the diplexer profiles can be selected between RF common port and RF High pass (HPF) and Low pass (LPF) output port using a simple User Interface from a USB control.

D4DIPL1 is designed to be used with RF frequency plans up to 1.8GHz

SPECIFICATION

- Full Support DOCSIS 4.0 band-splits
- 75ohm F-connector RF coaxial ports
- High Pass Filter up to 2GHz
- Excellent Return Loss, > 16dB
- Low Insertion Loss, < 1dB
- High Rejection, > 42 dB

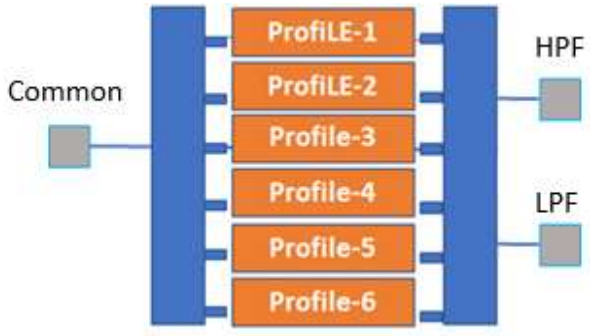
APPLICATION

DOCSIS4.0 Extended frequency specification, combining or separating upstream and downstream signals using 2-way High Pass and Low Pass filter.

OVERVIEW



Dimensions :
5.875" (L) x 3.375" (W) x 1.75" (D)



6 programmable Frequency range profiles

Profile1: 85/108-1800
(frequency range: 5-85MHz / 108-1800MHz)
Profile2: 204/258-1800
(frequency range: 5-204MHz / 258-1800MHz)
Profile3: 300/378-1800
(frequency range: 5-300MHz / 378-1800MHz)
Profile4: 396/488-1800
(frequency range: 5-396MHz / 488-1800MHz)
Profile5: 492/588-1800
(frequency range: 5-492MHz / 588-1800MHz)
Profile6: 684/804-1800
(frequency range: 5-684MHz / 804-1800MHz)

ELECTRICAL SPECIFICATIONS

PROFILE1: 85/108-1800 (frequency range: 5-85MHz / 108-1800MHz)

Low-Band (5~85 MHz)

Parameter	Frequency Range (MHz)	Min.	Typ.	Max.
Insertion Loss (dB)	5 - 85	—	0.5	2.2
Return Loss (dB)	5 - 85	14	20	—
Rejection (dB)	108 - 1800	50	60	—
Impedance (Ω)	—	—	75	—

High-Band (108~1800 MHz)

Parameter	Frequency Range (MHz)	Min.	Typ.	Max.
Insertion Loss (dB)	108 - 1800	—	0.5	2.2
Return Loss (dB)	108 - 1000	13	16	—
Return Loss (dB)	1001 - 1800	12	15	—
Rejection (dB)	5 - 85	48	52	—
Impedance (Ω)	—	—	75	—

PROFILE2: 204/258-1800 (frequency range: 5-204MHz / 258-1800MHz)

Low-Band (5~204 MHz)

Parameter	Frequency Range (MHz)	Min.	Typ.	Max.
Insertion Loss (dB)	5 - 204	—	0.8	1.5
Return Loss (dB)	5 - 204	14	18	—
Rejection (dB)	258 - 1800	50	60	—
Impedance (Ω)	—	—	75	—

High-Band (258~1800 MHz)

Parameter	Frequency Range (MHz)	Min.	Typ.	Max.
Insertion Loss (dB)	258 - 1800	—	1.0	1.8
Return Loss (dB)	258 - 1000	13	16	—
Return Loss (dB)	1001 - 1800	12	15	—
Rejection (dB)	5 - 204	—	60	—
Impedance (Ω)	—	—	75	—

PROFILE3: 300/378-1800 (frequency range: 5-300MHz / 378-1800MHz)

Low-Band (5~300 MHz)

Parameter	Frequency Range (MHz)	Min.	Typ.	Max.
Insertion Loss (dB)	5 – 300	—	1.0	2.0
Return Loss (dB)	5 – 300	14	20	—
Rejection (dB)	378 - 1800	50	55	—
Impedance (Ω)	—	—	75	—

High-Band (378~1800 MHz)

Parameter	Frequency Range (MHz)	Min.	Typ.	Max.
Insertion Loss (dB)	378 - 1800	—	1.0	2.0
Return Loss (dB)	378 - 1000	13	16	—
Return Loss (dB)	1001 - 1800	12	15	—
Rejection (dB)	5 - 300	50	55	—
Impedance (Ω)	—	—	75	—

PROFILE4: 396/488-1800 (frequency range: 5-396MHz / 488-1800MHz)

Low-Band (5~396 MHz)

Parameter	Frequency Range (MHz)	Min.	Typ.	Max.
Insertion Loss (dB)	5 - 396	—	1.0	2.0
Return Loss (dB)	5 - 396	14	20	—
Rejection (dB)	488 - 1800	50	55	—
Impedance (Ω)	—	—	75	—

High-Band (488~1800 MHz)

Parameter	Frequency Range (MHz)	Min.	Typ.	Max.
Insertion Loss (dB)	488 - 1800	—	1.0	2.0
Return Loss (dB)	488 - 1000	13	16	—
Return Loss (dB)	1001 - 1800	12	15	—
Rejection (dB)	5 - 396	45	50	—
Impedance (Ω)	—	—	75	—

PROFILE5: 492/588-1800 (frequency range: 5-492MHz / 588-1800MHz)

Low-Band (5~492 MHz)

Parameter	Frequency Range (MHz)	Min.	Typ.	Max.
Insertion Loss (dB)	5 – 492	—	1.0	2.0
Return Loss (dB)	5 – 492	14	20	—
Rejection (dB)	588 - 1800	50	55	—
Impedance (Ω)	—	—	75	—

High-Band (588~1800 MHz)

Parameter	Frequency Range (MHz)	Min.	Typ.	Max.
Insertion Loss (dB)	588 - 1800	—	1.0	2.0
Return Loss (dB)	588 - 1000	13	16	—
Return Loss (dB)	1001 - 1800	12	15	—
Rejection (dB)	5 - 492	45	50	—
Impedance (Ω)	—	—	75	—

PROFILE6: 684/804-1800 (frequency range: 5-684MHz / 804-1800MHz)

Low-Band (5~684 MHz)

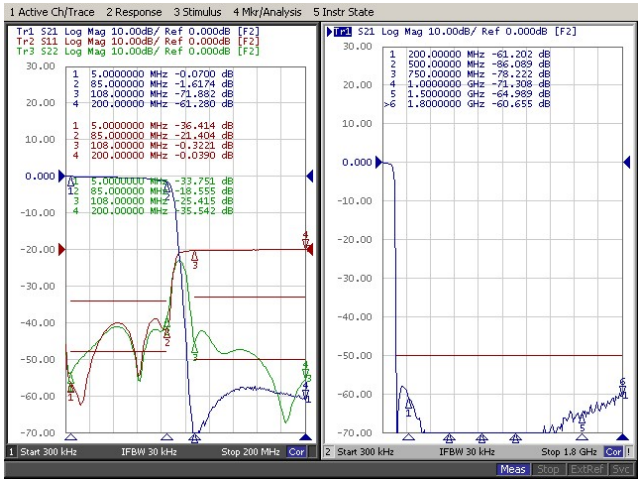
Parameter	Frequency Range (MHz)	Min.	Typ.	Max.
Insertion Loss (dB)	5 - 684	—	1.0	2.0
Return Loss (dB)	5 - 684	14	20	—
Rejection (dB)	804 - 1800	50	55	—
Impedance (Ω)	—	—	75	—

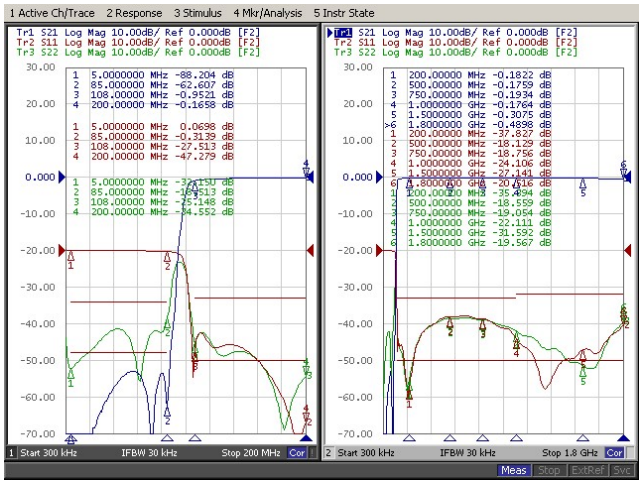
High-Band (804~1800 MHz)

Parameter	Frequency Range (MHz)	Min.	Typ.	Max.
Insertion Loss (dB)	804 - 1800	—	1.0	2.0
Return Loss (dB)	804 - 1800	—	12	15
Rejection (dB)	5 - 684	45	50	—
Impedance (Ω)	—	—	75	—

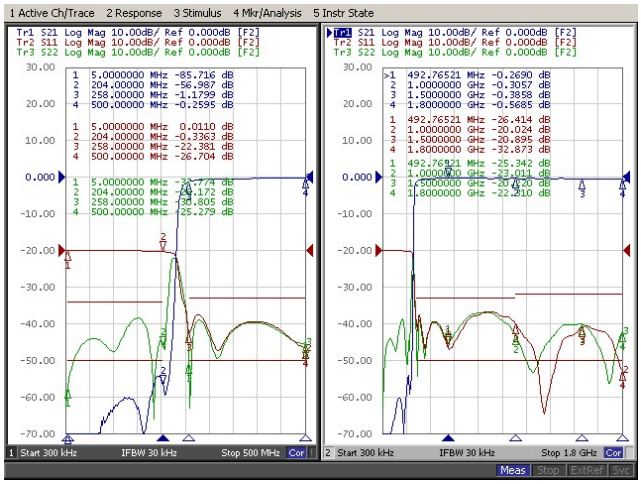
CHARACTERIZATION / MEASUREMENT PLOTS

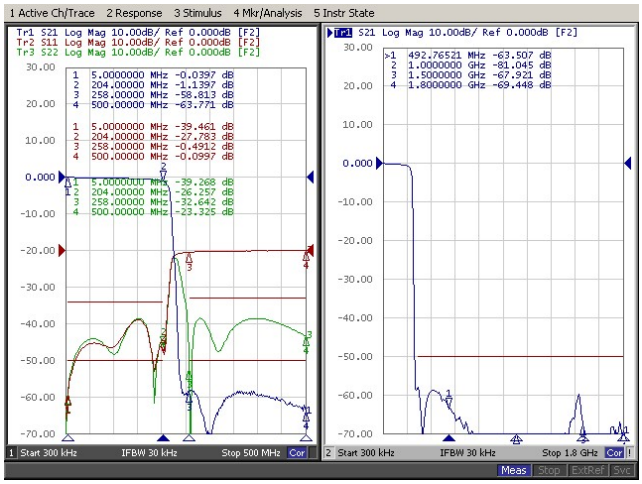
PROFILE1: 85/108-1800 (frequency range: 5-85MHz / 108-1800MHz)



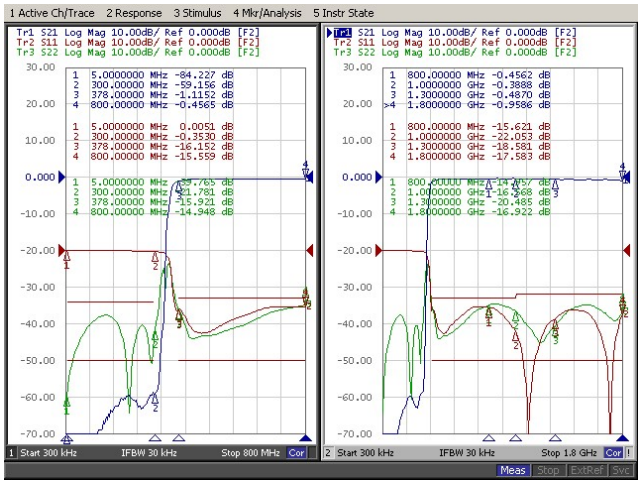


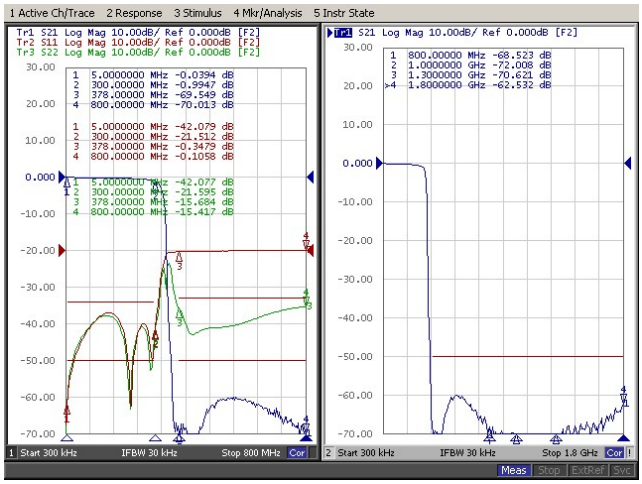
PROFILE2: 204/258-1800 (frequency range: 5-204MHz / 258-1800MHz)



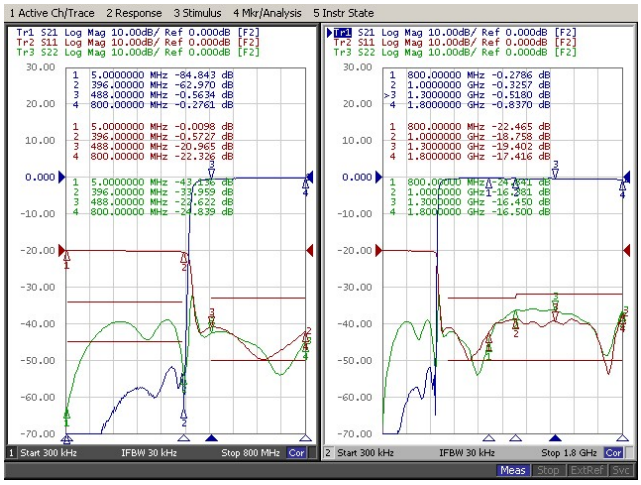


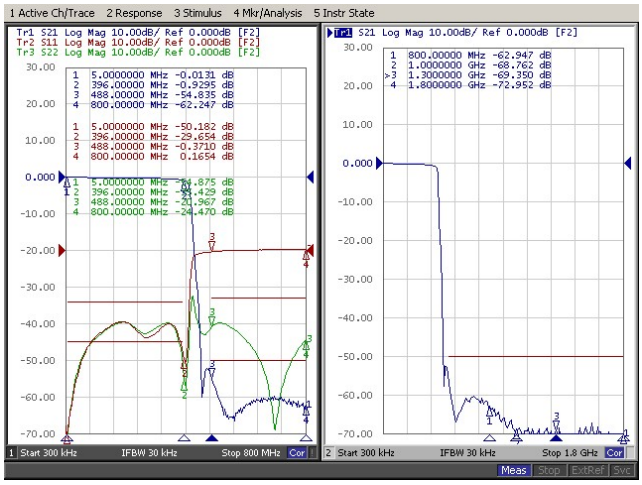
PROFILE3: 300/378-1800 (frequency range: 5-300MHz / 378-1800MHz)



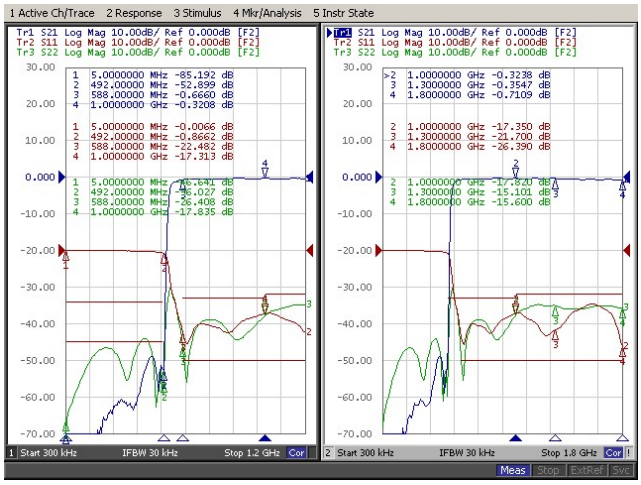


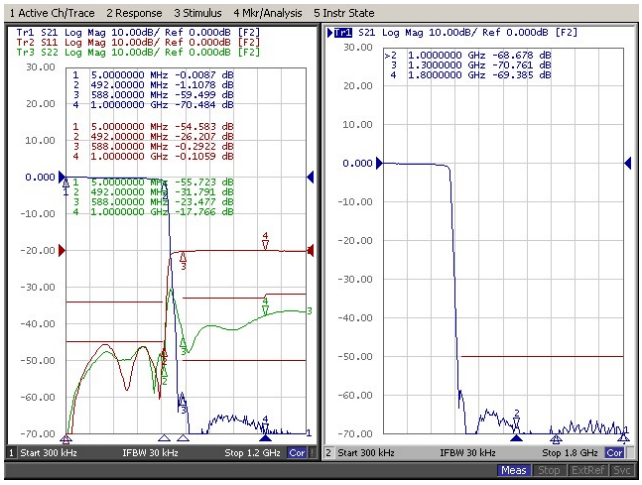
PROFILE4: 396/488-1800 (frequency range: 5-396MHz / 488-1800MHz)



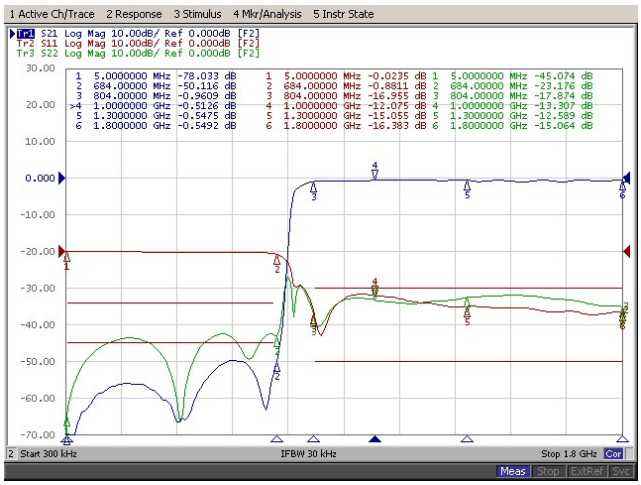


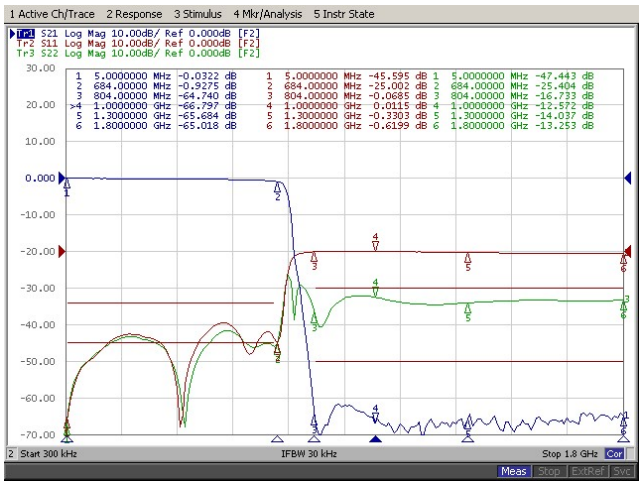
PROFILE5: 492/588-1800 (frequency range: 5-492MHz / 588-1800MHz)





PROFILE6: 684/804-1800 (frequency range: 5-684MHz / 804-1800MHz)





For any question, feedback, customization, or access to other DOCSIS4.0 test features, please contact www.ePIDoX.solutions

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