Cisco 1.25 GHz Surge-Gap Flexible Solutions Taps with Power Distribution Tap Port

The Cisco® 1.25 GHz Surge-Gap Flexible Solutions Taps with Power Distribution Tap Port (FST-P) are the latest products designed for the DOCSIS® 3.1 evolution of hybrid fiber-coaxial (HFC) networks. DOCSIS 3.1 technology allows cable operators to fully and efficiently use their broadband networks to provide the services that subscribers demand. As part of DOCSIS 3.1 support, the broadband operating frequency range has been increased to cover the entire 5 MHz to 1.218 GHz spectrum. With the addition of a power-distributing tap port, other network devices can be served through a simple tap connection.

These products are also fully compatible with orthogonal frequency-division multiplexing (OFDM) signaling requirements. These new capabilities can contribute to higher customer revenue by allowing increased bandwidth across a network and the ability to extend network powering so new and improved services, such as wireless network devices, can be provided. The taps (Figure 1) offer best-in-class performance along with added flexibility in system design. This flexibility is achieved using three types of optional plug-ins that are ideal for higher output, deep-fiber architectures.

Optional Plug-Ins

- Reverse attenuators are available in 0-, 3-, 6-, 9-, and 12-dB values. The attenuators increase the reverse path tap loss with only a minimal effect on forward tap loss. By selectively adding reverse attenuation to reduce reverse tap values, reverse path tap losses can be more similar across the various values of taps used in an HFC network. This approach allows the range of RF levels transmitted from closed-loop customer premises equipment (CPE) to be narrowed, which helps improve the reliability of upstream transmissions.
- Forward equalizers used in Cisco 1.25 GHz Surge-Gap FST products are available in 2-, 3-, 4-, 6-, 8-, 9-, 10-, 12-, 14-, 15-, 16-, 18-, 20-, and 22 dB values. The forward EQs increase the forward path tap loss in a standard cable-tilted fashion, with greater loss at lower frequencies than at higher frequencies. The plug-in forward EQ allows optimization of tap output levels at tap locations near the end of the feeder line.
- Forward inverse equalizers used in Cisco 1.25 GHz Surge-Gap FST products are available in 2-, 3-, 4-, 6-, 8-, 9-, 10-, 12-, 15-, 18-, and 21dB values. The inverse equalizers increase the forward path tap loss in a down-tilted fashion, with greater loss at higher frequencies than at lower frequencies, and they have only a minimal effect on reverse tap loss. The plug-in forward inverse equalizer allows tap output levels to be optimized at tap locations with high-level forward RF signals and significant up-tilt (typically, they are tap locations closest to nodes and amplifiers).

Cisco 1.25 GHz Surge-Gap FST products all have IEEE-compliant 6-kV surge protection, providing significantly improved protection against voltage transients in lightning strike areas and locations with unreliable power networks. In addition, the new tap products offer the same AC/RF bypass switch capabilities of previous Cisco tap products, allowing the tap faceplate to be removed without interrupting service to downstream customers. The taps pass up to 12A of current, so operators can access power at locations within the HFC plant where additional power is needed.

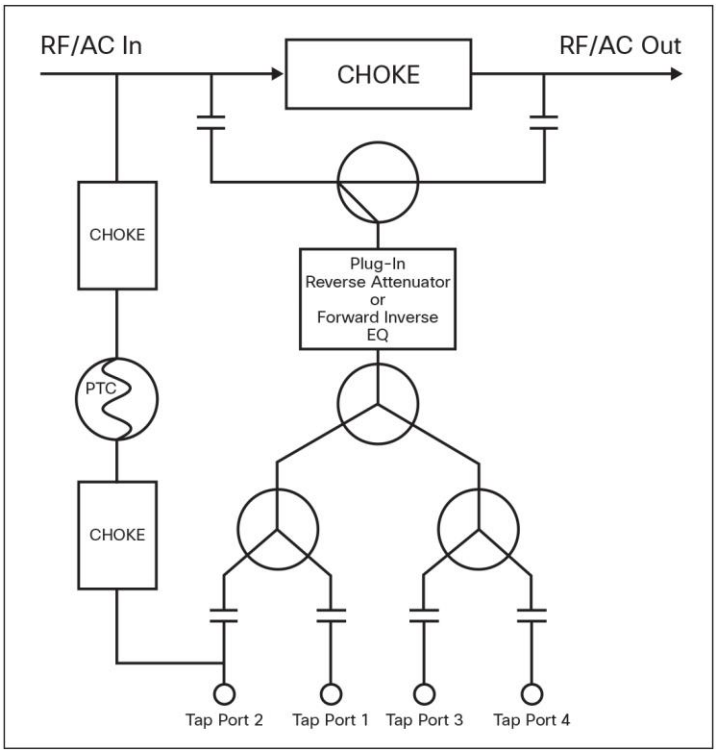
Features

- Expanded frequency range handles DOCSIS 3.1 requirements of 1.218 GHz and OFDM signaling.
- Optional plug-in reverse attenuators, forward equalizers, and forward inverse equalizers offer design flexibility.
- Choice of 2-, 4-, and 8-way full profile versions.
- 6-kV combination wave surge protection for both tap and through ports, with a rugged design that helps the products continue operating after surges that would typically damage products and interrupt service.
- 12A through current rating.
- 1.5A current distribution through a safe and easily identifiable tap port.
- AC/RF bypass switch that avoids interruption to the rest of the network during faceplate removal.
- Backward-compatible faceplates that support economical faceplate upgrades into existing backhousings.
- Powder coating for superior environmental protection.
- Sealed and swaged extended F-ports that resist moisture.
- Nickel-plated brass F-ports that provide a corrosion-resistant drop interface.
- Component covers for additional protection of faceplate circuitry during maintenance.
- Versatile housing design that permits overhead, pedestal, or multiple dwelling unit (MDU) mounting schemes.

Figure 1. Cisco 1.25 GHz Surge-Gap Flexible Solutions Taps with Power Distribution Port

Block Diagram

Figure 2. Block Diagram Cisco 1.25 GHz Surge-Gap Flexible Solutions Taps with Power Distribution Port (4-Way Tap Example)



Specifications

Tables 1 through 11 provide product specifications for the Cisco 1.25 GHz Surge-Gap Flexible Solutions Taps.

Table 1. General Specifications

Item	Value		
	Frequency (MHz)	**Specifications**	
Power passing	-	12A	
Current carrying capability		1.5A (note 5)	
Tap-tap isolation (note 1)	5 to 10	20 dB	
	11 to 85	24 dB	
	86 to 204	26 dB	
	205 to 750	22 dB	
	751 to 1250	20 dB	
In-out return loss (note 2)	5 to 1000	2-way and 4-way	18 dB
		8-way	17 dB
	1001 to 1250	16 dB	

Unless otherwise noted, specifications reflect typical performance and are referenced to 68°F (20°C). Specifications are based on measurements made in accordance with SCTE and ANSI standards (where applicable), using standard frequency assignments.

Item	Value		
Tap port return loss (note 3)	5 to 50	2-way and 4-way	18 dB
		8-way	17 dB
	51 to 1000	18 dB	
	1001 to 1250	16 dB	
Hum modulation at 10A	5 to 450	70 dBc	
	451 to 750	65 dBc	
	751 to 1250	55 dBc	
Electromagnetic interface (EMI) shielding (minimum) (note 4)	5 to 1250	–110 dB min	

Note: The specifications above show typical tap measurements with plug-ins installed. A few deviations to these general specifications are noted in the following list:

Note 1: For the 2-way 8-dB and 11-dB taps, the tap-tap isolation of from 5 to 750 MHz is 17 dB, and the tap-tap isolation from 751 to 1250 MHz is 14 dB.

Note 2: For 2-way 4 dB with forward equalizer, the input return loss is 15 dB.
For 2-way 8 dB and 11 dB, the input return loss is 16 dB and 15 dB, respectively.
For 4-way 14 dB, the through return loss is 15 dB.

Note 3: For 2-way 8 dB and 11 dB, the tap port return loss is 12 dB and 14 dB, respectively.

Note 4: Tested per ANSI/SCTE 48-1 2015.

Note 5: On designated tap port (port 3 on 2-way tap, port 2 on 4-way tap, port 1 on 8-way tap).

All return loss and isolation specifications noted in the list are typical performance specs. Worst-case specs would degrade no more than 1 dB for any given spec.

Table 2. AC/RF Bypass Switch Performance

Item	Value
System open circuit time	0 ms
Contact resistance (maximum)	10 megaohms
Through current capacity	12A
Voltage capacity	90 VAC
RF frequency range	5 to 1250 MHz
Insertion loss and return loss	See loss table.
Operating temperature	–40 to 60ºC

Table 3. AC/RF Bypass Switch Insertion Loss and Return Loss Table

Item	Value					
AC/RF Bypass	**5 MHz**	**500 MHz**	**750 MHz**	**870 MHz**	**1 GHz**	**1.25 GHz**
Short circuited **Insertion loss (dB)**	0.02 maximum <0.01 mean	0.6 maximum 0.4 mean	0.8 maximum 0.5 mean	0.7 maximum 0.4 mean	0.7 maximum 0.5 mean	0.7 maximum 0.5 mean
Short circuited **Return loss (dB)**	45 minimum 50 mean	16 minimum 16.5 mean	16 minimum 16.5 mean	18 minimum 18.5 mean	21 minimum 22 mean	21 minimum 22 mean

Unless otherwise noted, specifications reflect typical performance and are referenced to 68°F (20°C). Specifications are based on measurements made in accordance with SCTE and ANSI standards (where applicable), using standard frequency assignments.

Table 4. Mechanical, Environmental, and Compliance Specifications

Item	Value
Mechanical	
Water and dust ingress rating	IP68
Standard tap **Dimensions (H x W x D)**	2-way and 4-way 3.6 x 3.6 x 3.0 in.
Full profile tap **Dimensions (H x W x D)**	2-way, 4-way, and 8-way 4.25 x 5.50 x 3.0 in.
Standard tap **Weight**	2-way: 0.30 kg, 0.66 lb 4-way: 0.31 kg, 0.68 lb
Full profile tap **Weight**	2-way: 0.45 kg, 0.99 lb 4-way: 0.46 kg, 1.01 lb 8-way: 0.48 kg, 1.06 lb
Bolt torque requirements	Center conductor seizure: • 15 to 20 lb-in (1.7 to 2.3 Nm) Housing closure: • 50 to 60 lb-in (5.6 to 6.8 Nm) Port plugs: • 50 to 60 lb-in (5.6 to 6.8 Nm)
Surge resistance: • Input/output ports • Tap ports ◦ (combination wave)	 6 kV 6 kV
Environmental	
Operating temperature	–40 to 60°C –40 to 140°F
Standards Compliance	
Mechanical	ANSI/SCTE 01 1996: F-port interface specification SCTE IPS-SP-500: entry port interface specification
Emissions	FCC - Part 76, Subpart K EN 50083-2/A1: 1998
Environmental	ASTM G 53: weathering specification ASTM B 117: salt spray specification ASTM D 31: chip resistance specification EN 60529: 1992 (IP test) Bellcore GR-63-CORE: vibration/transportation ANSI/EEEE C62.41: lightning
Electrical safety	UL/CSA 60950-1

Unless otherwise noted, specifications reflect typical performance and are referenced to 68°F (20°C). Specifications are based on measurements made in accordance with SCTE and ANSI standards (where applicable), using standard frequency assignments.

Table 5. RF Section Specifications for 2-Way Surge Gap Flexible Solution Tap (STD and FP)

Item	Value															
	Type	**4**		**8**		**11**		**14**		**17**		**20**		**23**		**26**	
	Freq.	**Typ.**	**Max.**	**Typ.**	**Max.**	**Typ.**	**Max.**	**Typ.**	**Max.**	**Typ.**	**Max.**	**Typ.**	**Max.**	**Typ.**	**Max.**	**Typ.**	**Max.**
Insertion loss (dB) (in-out)	5	–	–	2.7	3.0	1.7	2.0	1.1	1.2	0.9	1.1	0.6	0.8	0.5	0.7	0.5	0.6
	40	–	–	2.0	2.2	1.2	1.4	0.7	0.9	0.5	0.8	0.4	0.7	0.3	0.5	0.3	0.6
Standard profile taps	55	–	–	1.9	2.2	1.2	1.4	0.7	0.9	0.5	0.8	0.4	0.7	0.3	0.6	0.3	0.6
	70	–	–	2.0	2.2	1.2	1.4	0.7	0.9	0.5	0.8	0.4	0.7	0.3	0.6	0.3	0.6
	86	–	–	2.0	2.3	1.2	1.5	0.7	1.0	0.5	0.8	0.4	0.7	0.3	0.6	0.3	0.6
	102	–	–	2.0	2.3	1.2	1.5	0.7	1.0	0.5	0.8	0.4	0.7	0.4	0.6	0.4	0.6
	204	–	–	2.3	2.5	1.4	1.7	1.0	1.3	0.7	1.0	0.6	0.8	0.5	0.7	0.5	0.7
	258	–	–	2.4	2.7	1.6	1.8	1.1	1.3	0.8	1.1	0.7	1.0	0.6	0.9	0.6	0.9
	550	–	–	3.0	3.5	2.0	2.3	1.3	1.6	1.1	1.4	1.0	1.2	0.9	1.2	0.9	1.2
	650	–	–	3.3	3.8	2.1	2.7	1.4	1.7	1.1	1.5	1.0	1.3	0.9	1.3	0.9	1.3
	750	–	–	3.5	4.0	2.2	2.9	1.5	1.8	1.2	1.6	1.1	1.4	1.0	1.4	1.0	1.4
	870	–	–	3.7	4.3	2.5	3.1	1.6	2.1	1.3	1.8	1.2	1.7	1.1	1.5	1.2	1.6
	1000	–	–	4.3	4.8	3.0	3.7	2.0	2.5	1.5	2.0	1.5	1.9	1.3	1.8	1.3	1.8
	1218	–	–	4.5	5.0	3.3	4.0	2.4	2.9	1.8	2.3	1.8	2.3	1.7	2.1	1.7	2.1
	1250	–	–	4.6	5.1	3.4	4.1	2.6	3.0	1.9	2.4	1.9	2.4	1.8	2.2	1.8	2.2
	Freq.	**4**		**8**		**11**		**14**		**17**		**20**		**23**		**26**	
Tap loss (dB); tolerance ±1.5 dB	5	4.0		8.5		11.0		14.0		16.5		19.5		22.5		25.5	
	40	4.0		8.5		11.0		14.0		17.0		20.0		23.0		26.0	
	55	4.0		8.5		11.0		14.0		17.0		20.0		23.0		26.0	
	70	4.0		8.5		11.0		14.0		17.0		20.0		23.0		26.0	
	86	4.0		8.5		11.0		14.0		17.0		20.0		23.0		26.0	
	102	4.0		8.5		11.0		14.0		17.0		20.0		23.0		26.0	
	204	4.0		8.5		11.0		14.0		17.0		20.0		23.0		26.0	
	258	4.0		8.5		11.0		14.0		17.0		20.0		23.0		26.0	
	550	4.0		8.5		11.0		14.0		17.0		20.0		23.0		26.0	
	650	4.0		8.5		11.0		14.0		17.0		20.0		23.0		26.0	
	750	4.0		8.5		11.0		14.0		17.0		20.0		23.0		26.0	
	870	4.0		8.5		11.0		14.0		17.0		20.0		23.0		26.0	
	1000	4.5		8.5		11.0		14.0		17.0		20.0		23.0		26.0	
	1218	4.5		9.5		11.0		14.0		17.0		20.0		23.0		26.0	
	1250	4.5		9.5		11.5		14.5		17.0		20.0		23.0		26.0	

Unless otherwise noted, specifications reflect typical performance and are referenced to 68°F (20°C). Specifications are based on measurements made in accordance with SCTE and ANSI standards (where applicable), using standard frequency assignments.

Item	Value								
	Freq.	**4**	**8**	**11**	**14**	**17**	**20**	**23**	**26**
Out-tap isolation (dB) (min.)	5 to 10	–	18	19	21	23	25	27	33
	11 to 85	–	23	25	26	30	32	34	36
	86 to 204	–	23	25	26	30	32	34	36
	205 to 550	–	23	25	26	30	32	34	36
	551 to 650	–	23	25	26	30	32	34	36
	651 to 750	–	21	23	24	28	29	32	34
	751 to 870	–	21	21	23	26	28	30	32
	871 to 1000	–	20	20	21	24	26	27	30
	1000 to 1250	–	20	19	20	22	23	23	25

Table 6. RF Section Specifications for 4-Way Surge Gap Flexible Solutions Tap (STD and FP)

Item	Value														
	Type	**8**		**11**		**14**		**17**		**20**		**23**		**26**	
	Freq.	**Typ.**	**Max**	**Typ.**	**Max**	**Typ.**	**Max**	**Typ.**	**Max**	**Typ.**	**Max**	**Typ.**	**Max**	**Typ.**	**Max**
Insertion loss (dB) (in-out), standard profile taps	5	–	–	2.5	2.9	1.5	2.0	0.9	1.3	0.7	0.9	0.4	0.7	0.4	0.7
	40	–	–	2.1	2.3	1.1	1.5	0.6	1.0	0.5	0.6	0.3	0.6	0.4	0.7
	55	–	–	2.1	2.4	1.1	1.5	0.7	1.0	0.5	0.7	0.3	0.6	0.4	0.7
	70	–	–	2.1	2.4	1.1	1.5	0.7	1.1	0.5	0.7	04	0.7	0.4	0.7
	86	–	–	2.2	2.4	1.2	1.6	0.7	1.2	0.5	0.8	0.4	0.7	0.5	0.7
	102	–	–	2.2	2.5	1.2	1.7	0.8	1.2	0.6	0.8	0.4	0.7	0.5	0.8
	204	–	–	2.4	2.7	1.4	1.8	1.0	1.3	0.7	0.9	0.6	0.9	0.7	0.9
	258	–	–	2.5	2.9	1.5	1.9	1.1	1.4	0.8	1.0	0.7	1.0	0.8	1.0
	550	–	–	3.3	3.7	2.2	2.6	1.4	1.9	1.2	1.5	1.0	1.4	1.1	1.4
	650	–	–	3.6	3.9	2.3	2.7	1.5	1.9	1.3	1.5	1.0	1.4	1.1	1.4
	750	–	–	4.0	4.4	2.5	2.9	1.6	2.0	1.4	1.6	1.1	1.5	1.2	1.5
	870	–	–	4.3	4.7	2.9	3.2	1.8	2.2	1.6	1.9	1.2	1.6	1.2	1.6
	1000	–	–	4.5	4.9	3.2	3.5	2.1	2.4	1.7	2.1	1.4	1.7	1.3	1.7
	1218	–	–	4.8	5.2	3.7	4.0	2.8	3.1	2.0	2.5	1.8	2.2	1.6	2.1
	1250	–	–	4.9	5.3	4.0	4.3	2.9	3.2	2.1	2.7	1.9	2.3	1.9	2.3
	Freq.	**8**		**11**		**14**		**17**		**20**		**23**		**26**	
Tap loss (dB); tolerance ±1.5 dB	5	8.0		12.0		14.5		16.5		19.5		22.5		26.0	
	40	8.0		12.0		14.5		17.0		20.0		23.0		26.0	
	55	8.0		12.0		14.5		17.0		20.0		23.0		26.0	
	70	8.0		12.0		14.5		17.0		20.0		23.0		26.0	
	86	8.0		12.0		14.5		17.0		20.0		23.0		26.0	

Unless otherwise noted, specifications reflect typical performance and are referenced to 68°F (20°C). Specifications are based on measurements made in accordance with SCTE and ANSI standards (where applicable), using standard frequency assignments.

Item	Value							
	102	8.0	12.0	14.5	17.0	20.0	23.0	26.0
	204	8.0	12.0	14.5	17.0	20.0	23.0	26.0
	258	8.0	12.0	14.5	17.0	20.0	23.0	26.0
	550	8.0	12.0	14.5	17.0	20.0	23.0	26.0
	650	8.0	12.0	14.5	17.0	20.0	23.0	26.0
	750	8.0	12.0	14.5	17.0	20.0	23.0	26.0
	870	8.0	12.0	14.5	17.0	20.0	23.0	26.0
	1000	8.0	12.5	14.5	17.0	20.0	23.0	26.0
	1218	8.5	13.0	15.0	17.0	20.0	23.0	26.0
	1250	8.5	13.0	15.0	17.0	20.0	23.0	26.5
	Freq.	**8**	**11**	**14**	**17**	**20**	**23**	**26**
Out-tap isolation (dB) (min.)	5 to 10	–	20	21	23	25	27	33
	11 to 85	–	25	28	30	29	33	39
	86 to 204	–	25	28	30	29	33	39
	205 to 550	–	25	28	30	29	33	39
	551 to 650	–	23	28	30	29	33	37
	651 to 750	–	23	26	28	27	31	33
	751 to 870	–	21	24	25	25	27	31
	871 to 1000	–	20	22	23	23	25	27
	1000 to 1250	–	20	20	21	21	23	25

Table 7. RF Section Specifications for 8-Way Full Profile Surge Gap Flexible Solution Tap

Item	Value											
	Type	**11**		**14**		**17**		**20**		**23**		**26**	
	Freq.	**Typ.**	**Max**	**Typ.**	**Max**	**Typ.**	**Max**	**Typ.**	**Max**	**Typ.**	**Max**	**Typ.**	**Max**
Insertion loss (dB) (in-out)	5	–	–	2.7	3.0	1.7	2.0	1.0	1.2	0.7	1.0	0.4	0.7
	40	–	–	2.0	2.3	1.2	1.5	0.8	1.0	0.5	0.8	0.3	0.6
	55	–	–	2.0	2.3	1.2	1.5	0.8	1.0	0.5	0.8	0.3	0.6
	70	–	–	2.1	2.4	1.3	1.6	0.8	1.0	0.5	0.8	0.3	0.7
	86	–	–	2.1	2.4	1.3	1.6	0.8	1.0	0.5	0.8	0.4	0.7
	102	–	–	2.1	2.5	1.3	1.7	0.9	1.0	0.6	0.9	0.4	0.7
	204	–	–	2.4	2.7	1.5	1.9	1.1	1.2	0.8	1.0	0.6	0.9
	258	–	–	2.5	2.8	1.7	1.9	1.2	1.3	0.9	1.1	0.7	1.1

Unless otherwise noted, specifications reflect typical performance and are referenced to 68°F (20°C). Specifications are based on measurements made in accordance with SCTE and ANSI standards (where applicable), using standard frequency assignments.

Item	Value											
	550	–	–	3.2	3.6	2.2	2.7	1.5	1.9	1.2	1.7	1.0	1.4
	650	–	–	3.5	3.9	2.4	2.9	1.6	2.0	1.3	1.8	1.0	1.4
	750	–	–	3.7	4.1	2.6	3.1	1.7	2.1	1.4	1.9	1.1	1.5
	870	–	–	3.8	4.3	2.8	3.3	1.9	2.4	1.5	2.0	1.2	1.7
	1000	–	–	4.1	4.5	3.0	3.5	2.1	2.6	1.7	2.2	1.4	1.9
	1218	–	–	4.2	4.7	3.3	3.8	2.5	3.0	2.0	2.5	1.9	2.4
	1250	–	–	4.4	4.9	3.4	3.9	2.7	3.2	2.2	2.7	2.0	2.5
	Freq.	**11**		**14**		**17**		**20**		**23**		**26**	
Tap loss (dB); tolerance ±1.5 dB	5	11.0		16.0		18.0		20.5		22.5		26.0	
	40	11.0		16.0		18.0		20.5		23.0		26.0	
	55	11.0		16.0		18.0		20.5		23.0		26.0	
	70	11.0		16.0		18.0		20.5		23.0		26.0	
	86	11.0		16.0		18.0		20.5		23.0		26.0	
	102	11.0		16.0		18.0		20.5		23.0		26.0	
	204	11.0		16.0		18.0		20.5		23.0		26.0	
	258	11.0		16.0		18.0		20.5		23.0		26.0	
	550	11.0		16.0		18.0		20.5		23.0		26.0	
	650	11.0		16.0		18.0		20.5		23.0		26.0	
	750	11.0		16.0		18.0		20.5		23.0		26.0	
	870	11.0		16.0		18.0		20.5		23.0		26.0	
	1000	11.5		16.0		18.0		20.5		23.0		26.0	
	1218	12.5		17.1		18.7		20.5		23.0		26.0	
	1250	12.5		17.5		18.9		20.8		23.5		26.0	
	Freq.	**11**		**14**		**17**		**20**		**23**		**26**	
Out-tap isolation (dB) (min.)	5 to 10	–		22		24		25		26		33	
	11 to 85	–		27		28		28		31		36	
	86 to 204	–		27		28		28		31		36	
	205 to 550	–		27		28		28		31		36	
	551 to 650	–		27		28		28		31		33	
	651 to 750	–		27		28		28		31		33	
	751 to 870	–		24		25		25		27		27	
	871 to 1000	–		23		23		23		27		27	
	1000 to 1250	–		22		23		23		23		25	

Note: Tap loss tolerances above are with 0-dB reverse attenuator installed. For changes to listed tap losses with other values of reverse attenuators or with forward equalizer or forward inverse equalizer installed, refer to “Reverse Attenuator Loss Table” (Tables 8 and 9) or “Forward Equalizer and Forward Inverse Equalizer Loss Tables.” (Tables 10 and 11)

Note: Unless otherwise noted, specifications reflect typical performance and are referenced to 68°F (20°C). Specifications are based on measurements made in accordance with SCTE and ANSI standards (where applicable), using standard frequency assignments.

Reverse Attenuator Loss

Table 8. Plug-In Reverse Attenuator Loss 42/54 MHz Split

Tap Loss Tolerance (dB)		Reverse Attenuator Used				
Tap loss increase (dB); tolerance +/–.3 dB	Freq. (MHz)	0 dB	3 dB	6 dB	9 dB	12 dB
	5–42	–	3.0	6.0	9.0	12.0
	54	–	0.8	0.8	0.8	0.8
	550	–	0.8	0.8	0.8	0.8
	750	–	0.8	0.8	0.8	0.8
	870	–	0.8	0.8	0.8	0.8
	1000	–	0.8	0.8	0.8	0.8
	1218	–	0.8	0.8	0.8	0.8
	1250	–	0.8	0.8	0.8	0.8

Table 9. Plug-In Reverse Attenuator Loss 85/102 MHz Split

Tap Loss Tolerance (dB)		Reverse Attenuator Used				
Tap loss increase (dB); tolerance +/–.3 dB	Freq. (MHz)	0 dB	3 dB	6 dB	9 dB	12 dB
	5–85	–	3.0	6.0	9.0	12.0
	102	–	0.8	0.8	0.8	0.8
	550	–	0.8	0.8	0.8	0.8
	750	–	0.8	0.8	0.8	0.8
	870	–	0.8	0.8	0.8	0.8
	1000	–	0.8	0.8	0.8	0.8
	1218	–	0.8	0.8	0.8	0.8
	1250	–	0.8	0.8	0.8	0.8

Note: Tap loss tolerances shown on previous pages are with 0-dB reverse attenuator installed. The “Reverse Attenuator Loss Table” (Tables 8 and 9shows the additional tap loss incurred when using the plug-in reverse attenuators.

Note: Unless otherwise noted, specifications reflect typical performance and are referenced to 68°F (20°C). Specifications are based on measurements made in accordance with SCTE/ANSI standards (where applicable), using standard frequency assignments.

Forward Equalizers

Table 10. Plug-In Forward Equalizer Loss Table

Tap Loss Tolerance (dB)		Forward Equalizer Used													
Tap loss increase (dB); tolerance +/–.3 dB	Freq. (MHz)	2 dB	3 dB	4 dB	6 dB	8 dB	9 dB	10 dB	12 dB	14 dB	15 dB	16 dB	18 dB	20 dB	22 dB
	5	2.6	3.6	4.5	6.5	8.3	9.3	12.1	12.1	14.0	15.0	15.9	17.7	19.6	21.5
	40	2.4	3.3	4.1	5.9	7.4	8.4	9.1	10.9	12.5	13.4	14.2	15.9	17.5	19.2
	55	2.3	3.3	4.0	5.7	7.3	8.2	8.9	10.6	12.2	13.1	13.8	15.4	17.1	18.7
	70	2.3	3.2	3.9	5.5	7.1	8.0	8.6	10.3	11.8	12.7	13.4	15.0	16.6	18.2
	86	2.2	3.1	3.8	5.4	6.9	7.7	8.41	10.1	11.5	12.4	13.0	14.6	16.1	17.7
	102	2.2	3.0	3.7	5.3	6.7	7.5	8.19	9.8	11.2	12.0	12.7	14.2	15.7	17.2

Tap Loss Tolerance (dB)		Forward Equalizer Used													
	204	2.0	2.7	3.3	4.6	5.8	6.5	7.07	8.4	9.6	10.4	10.9	12.2	13.4	14.8
	258	1.9	2.6	3.1	4.3	5.4	6.1	6.58	7.9	8.9	9.6	10.1	11.3	12.5	13.6
	550	1.5	1.9	2.2	3.1	3.3	4.2	4.45	5.3	5.9	6.4	6.7	7.4	8.2	8.9
	650	1.3	1.7	2.0	2.7	3.2	3.6	3.83	4.6	5.1	5.5	5.7	6.3	7.0	7.6
	750	1.2	1.6	1.7	2.3	2.7	3.1	3.25	3.9	4.3	4.6	4.8	5.3	5.8	6.3
	870	1.1	1.4	1.5	2.0	2.2	2.5	2.59	3.1	3.4	3.6	3.7	4.1	4.5	4.9
	1000	0.9	1.2	1.2	1.5	1.7	1.9	1.92	2.3	2.4	2.6	2.7	2.9	3.1	3.4
	1218	0.7	0.9	0.8	0.9	0.8	0.9	0.85	1.0	0.9	1.0	0.9	1.0	1	1.0
	1250	0.7	0.8	0.7	0.8	0.7	0.8	0.7	0.8	0.7	0.8	0.7	0.7	0.7	0.7

Table 11. Plug-In Forward Inverse Equalizer Loss Table

Tap Loss Tolerance (dB)			Forward Inverse Equalizer Used									
Tap loss increase (dB); tolerance +/–.3 dB	**Freq. (MHz)**	**2 dB**	**3 dB**	**4 dB**	**6 dB**	**8 dB**	**9 dB**	**10 dB**	**12 dB**	**15 dB**	**18 dB**	**21 dB**
	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	40	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	70	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5
	86	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7
	102	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.8	0.9	1.1
	204	0.7	0.8	0.8	0.9	1.2	1.3	1.5	1.9	2.6	3.1	4.0
	258	0.9	1.1	1.2	1.3	1.8	1.9	2.5	2.7	3.6	4.3	5.2
	550	1.3	2.0	1.5	3.3	4.8	4.9	6.3	7.2	9.0	11.0	12.8
	650	1.4	2.2	2.8	3.8	5.5	5.8	6.9	8.4	10.4	12.4	14.4
	750	1.5	2.4	3.0	4.4	6.0	6.5	7.5	9.3	11.5	13.4	15.6
	870	1.6	2.6	3.2	5.0	6.5	7.5	8.1	10.3	12.7	14.6	17.0
	1000	1.8	2.8	3.5	5.5	7.0	8.1	8.8	11.2	13.7	15.8	18.5
	1218	2.0	2.95	3.9	5.9	7.9	8.9	9.9	11.9	14.9	17.7	20.7
	1250	2.0	3.0	4.0	6.0	8.0	9.0	10.0	12.0	15.0	18.0	21.0

Note: Tap loss tolerances shown on previous pages are with 0-dB reverse attenuator installed. The “Forward Equalizer Loss Table” and “Forward Inverse Equalizer Loss Table” (Tables 10 and 11) show the additional tap loss incurred when using the plug-in forward equalizers and forward inverse equalizers.

Note: Unless otherwise noted, specifications reflect typical performance and are referenced to 68°F (20 °C). Specifications are based on measurements made in accordance with SCTE/ANSI standards (where applicable), using standard frequency assignments.

Ordering Information

To place an order, visit the Cisco Ordering homepage and refer to the ordering information provided in Tables 12 through 16.

Table 12. Cisco Surge-Gap Full Profile Flexible Solutions Taps with Power Distribution Port

Product Description	Part Number
Full Profile Flexible Solutions Taps	
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 2-way, 4 dB w/PDP	SG-FST-2-04-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 2-way, 8 dB w/PDP	SG-FST-2-08-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 2-way, 11 dB w/PDP	SG-FST-2-11-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 2-way, 14 dB w/PDP	SG-FST-2-14-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 2-way, 17 dB w/PDP	SG-FST-2-17-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 2-way, 20 dB w/PDP	SG-FST-2-20-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 2-way, 23 dB w/PDP	SG-FST-2-23-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 2-way, 26 dB w/PDP	SG-FST-2-26-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 4-way, 8 dB w/PDP	SG-FST-4-08-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 4-way, 11 dB w/PDP	SG-FST-4-11-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 4-way, 14 dB w/PDP	SG-FST-4-14-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 4-way, 17 dB w/PDP	SG-FST-4-17-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 4-way, 20 dB w/PDP	SG-FST-4-20-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 4-way, 23 dB w/PDP	SG-FST-4-23-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 4-way, 26 dB w/PDP	SG-FST-4-26-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 8-way, 11 dB w/PDP	SG-FST-8-11-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 8-way, 14 dB w/PDP	SG-FST-8-14-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 8-way, 17 dB w/PDP	SG-FST-8-17-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 8-way, 20 dB w/PDP	SG-FST-8-20-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 8-way, 23 dB w/PDP	SG-FST-8-23-FP-P
Cisco Full Profile Flexible Solutions Tap, 1.25 GHz, 8-way, 26 dB w/PDP	SG-FST-8-26-FP-P
Full Profile Flexible Solutions Taps: Surge Gap Face Plates	
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 2-way, 4 dB w/PDP	SG-FST-2-04-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 2-way, 8 dB w/PDP	SG-FST-2-08-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 2-way, 11 dB w/PDP	SG-FST-2-11-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 2-way, 14 dB w/PDP	SG-FST-2-14-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 2-way, 17 dB w/PDP	SG-FST-2-17-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 2-way, 20 dB w/PDP	SG-FST-2-20-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 2-way, 23 dB w/PDP	SG-FST-2-23-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 2-way, 26 dB w/PDP	SG-FST-2-26-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 4-way, 8 dB w/PDP	SG-FST-4-08-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 4-way, 11 dB w/PDP	SG-FST-4-11-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 4-way, 14 dB w/PDP	SG-FST-4-14-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 4-way, 17 dB w/PDP	SG-FST-4-17-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 4-way, 20 dB w/PDP	SG-FST-4-20-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 4-way, 23 dB w/PDP	SG-FST-4-23-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 4-way, 26 dB w/PDP	SG-FST-4-26-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 8-way, 11 dB w/PDP	SG-FST-8-11-FFP-P

Product Description	Part Number
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 8-way, 14 dB w/PDP	SG-FST-8-14-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 8-way, 17 dB w/PDP	SG-FST-8-17-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 8-way, 20 dB w/PDP	SG-FST-8-20-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 8-way, 23 dB w/PDP	SG-FST-8-23-FFP-P
Cisco Full Profile Flexible Solutions Tap, Faceplate, 1.25 GHz, 8-way, 26 dB w/PDP	SG-FST-8-26-FFP-P

Table 13. Plug-In Reverse Attenuators for 42/54 MHz Split

Product Description	Part Number
0 dB FST Reverse Attenuator (factory installed in each unit)	–
3 dB FST Reverse Attenuator	SG-FST-RA-4254-03
6 dB FST Reverse Attenuator	SG-FST-RA-4254-06
9 dB FST Reverse Attenuator	SG-FST-RA-4254-09
12 dB FST Reverse Attenuator	SG-FST-RA-4254-12

Table 14. Plug-In Reverse Attenuators for 85/102 MHz Split

Product Description	Part Number
0 dB FST Reverse Attenuator (factory installed in each unit)	–
3 dB FST Reverse Attenuator	SG-FST-RA-85102-03
6 dB FST Reverse Attenuator	SG-FST-RA-85102-06
9 dB FST Reverse Attenuator	SG-FST-RA-85102-09
12 dB FST Reverse Attenuator	SG-FST-RA-85102-12

Table 15. Plug-In Forward Equalizers

Product Description	Part Number
2 dB FST Forward EQ	SG-FST-FEQ-02
3 dB FST Forward EQ	SG-FST-FEQ-03
4 dB FST Forward EQ	SG-FST-FEQ-04
6 dB FST Forward EQ	SG-FST-FEQ-06
8 dB FST Forward EQ	SG-FST-FEQ-08
9 dB FST Forward EQ	SG-FST-FEQ-09
10 dB FST Forward EQ	SG-FST-FEQ-10
12 dB FST Forward EQ	SG-FST-FEQ-12
14 dB FST Forward EQ	SG-FST-FEQ-14
15 dB FST Forward EQ	SG-FST-FEQ-15
16 dB FST Forward EQ	SG-FST-FEQ-16
18 dB FST Forward EQ	SG-FST-FEQ-18
20 dB FST Forward EQ	SG-FST-FEQ-20
22 dB FST Forward EQ	SG-FST-FEQ-22

Table 16. Plug-In Forward Inverse Equalizers

Product Description	Part Number
2 dB FST Inverse EQ	SG-FST-INVEQ-02
3 dB FST Inverse EQ	SG-FST-INVEQ-03
4 dB FST Inverse EQ	SG-FST-INVEQ-04
6 dB FST Inverse EQ	SG-FST-INVEQ-06
8 dB FST Inverse EQ	SG-FST-INVEQ-08
9 dB FST Inverse EQ	SG-FST-INVEQ-09
10 dB FST Inverse EQ	SG-FST-INVEQ-10
12 dB FST Inverse EQ	SG-FST-INVEQ-12
15 dB FST Inverse EQ	SG-FST-INVEQ-15
18 dB FST Inverse EQ	SG-FST-INVEQ-18
21 dB FST Inverse EQ	SG-FST-INVEQ-21

Cisco Capital

Financing to Help You Achieve Your Objectives

Cisco Capital® can help you acquire the technology you need to achieve your objectives and stay competitive. We can help you reduce capital expenditures (CapEx), accelerate your growth, and optimize your investment dollars and ROI. Cisco Capital financing gives you flexibility in acquiring hardware, software, services, and complementary third-party equipment. And there's just one predictable payment. Cisco Capital is available in more than 100 countries. Learn more.

For More Information

Cisco 1.25 GHz Surge-Gap Flexible Solutions Tap products offer one of the industry's most complete ranges of high-performance components. For additional information, contact your Cisco account manager or Cisco system engineer.

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

Printed in USA C78-737577-00 08/16