Surface Mount Chip Equalizers

DC-40 GHZ

CEX Series is an easy-to-implement, surface mount platform solution for gain variation over frequency

CEX Series offers a wide array of SMT chip equalizers optimized for gain variation over frequency. Various configuration options including frequency band, slope direction and slope magnitude are available to support multiple markets and applications.

CEX series offers various compensation options from DC-40 GHz with multiple frequency bands and slope characteristics. The chip equalizers are designed for surface mount (SMT) applications and are manufactured using robust thick and thin film process technology. They are also lead free, RoHS compliant and are available in tape and reel packaging for high volume pick and place applications.

CEX series includes high frequency chip equalizers that have a slope compensation range at 1-4 db, a slope linearity at ±0.25 dB, a typical Voltage Standing Wave Ratio at 1.5:1 and a low insertion loss at 1 – 1.25 dB Max. Electrical and thermal performance have passed through simulation analysis and real-life tests to ensure the series qualification.

Features and Benefits

- Configurable design approach providing optimized solutions for gain variation over frequency.
- Multiple slope options (1-4 dB) and excellent slope linearity (±0.25 dB or better).
- Frequency offering up to 40 GHz supporting a wide array of markets and applications.
- Proven thin and thick film process technology ensuring high performance in harsh environments
- Size, weight and power optimized for each unique design.

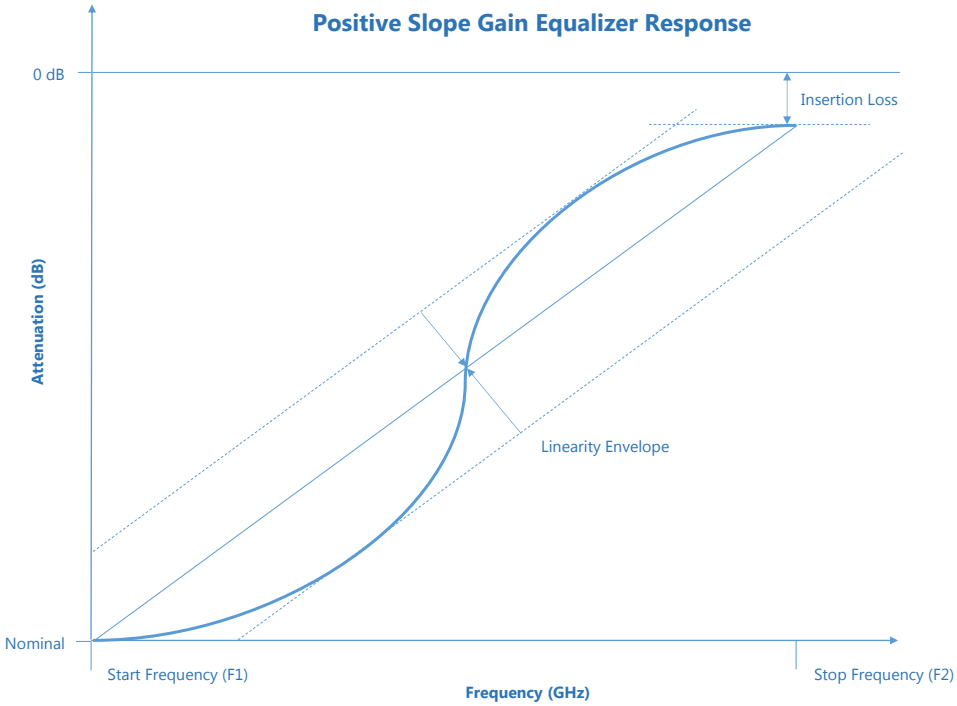
Applications

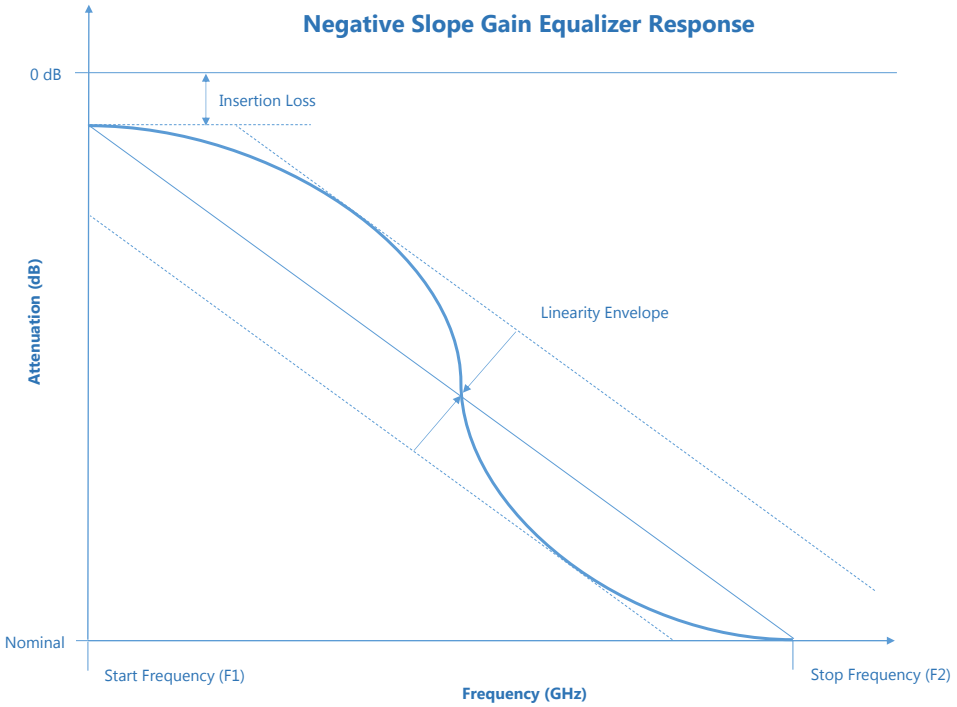
- Amplifier Circuits
- Transmit/Receive Modules
- Up/Down Converters
- Instrumentation
- Radar
- Broadcast

Technical Characteristics

Chip Equalizer Capabilities	CEXXXXXXXXSMTF (Standard Equalizer)	CEHFXXXXXXXXSMTF (High Frequency)
Electrical		
Nominal Impedance	50 ohms	50 Ohms ± 10%
Operating Frequency *See Table For Currently Available Values	Up to 10 GHz	Up To 40 GHz (in customizable bandwidth 20%)
Slope	1-4 dB	1-4 dB
Slope Linearity	± 0.25 dB	±0.25 dB Minimum
Insertion Loss	1.25 dB Max	0.5 dB Typical, 1.0 dB Max
VSWR	1 dB Slope: 1.3:1 Max 2 dB Slope: 1.5:1 Max 3 dB Slope: 1.8:1 Max 4 dB Slope: 1.8:1 Min	1.50:1 Typical, 1.70:1 Max
Input Power CW	0.25 Watts	200 mW
Peak Power	-	2.0 Watts Max (Based on 10 µS pulse width and 1.0% Duty Cycle)
Environmental		
Operating Temperature	-55°C to +150°C	
Storage Temperature	-65° to +150°C	
Moisture Sensitivity Level	1 - Unlimited	
Mechanical		
Configuration	Surface Mount	
Package Size	Varies based on Slope and Frequency Requirements	
Substrate Material	Alumina (Al2O3)	
Terminal Material	Thick Film, Nickel Barrier, Solderable Silver Plating	Thin Film Solderable Gold
Ground Plane Material	Thick Film, Nickel Barrier, Solderable Silver Plating	Thin Film Solderable Platinum
Resistive Element	Thin Film Nickel Chromium (NiCr)	Thin Film Tantalum Nitride (TaN)
Marking		
Unit Marking	Part Mark Code, based on slope and frequency	None
Quality Assurance		
	Sample visual and mechanical inspection - 1.0 AQL per mechanical drawing requirements. Periodic electrical inspection performed for commercial grade products. High reliability tested products are available.	
Packaging		
Standard Packaging	Waffle Pack or Tape and Reel	

Electrical


Positive Slope Gain Equalizer Response
0 dB
Insertion Loss
Attenuation (dB)
Linearity Envelope
Nominal
Start Frequency (F1)
Stop Frequency (F2)
Frequency (GHz)


Negative Slope Gain Equalizer Response
0 dB
Insertion Loss
Attenuation (dB)
Linearity Envelope
Nominal
Start Frequency (F1)
Stop Frequency (F2)
Frequency (GHz)

Available Values

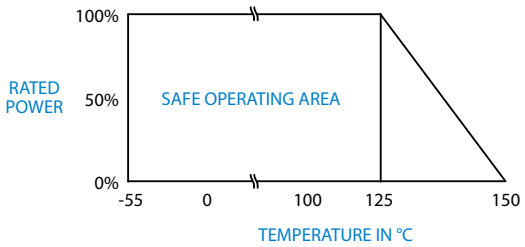
Standard Equalizer Values

Part Number	SLOPE (dB) Negative	Part Mark Code	Start Frequency (GHz)	Stop Frequency (GHz)	ΔF (GHz)
CE 1 015 P 029 SMTF	1	140	1.5	2.9	1.4
CE 1 015 P 035 SMTF	1	130	1.5	3.5	2
CE 1 020 P 040 SMTF	1	127	2	4	2
CE 1 025 P 045 SMTF	1	125	2.5	4.5	2
CE 1 030 P 055 SMTF	1	120	3	5.5	2.5
CE 1 035 P 070 SMTF	1	115	3.5	7	3.5
CE 1 040 P 075 SMTF	1	112	4	7.5	3.5
CE 1 050 P 095 SMTF	1	110	5	9.5	4.5
CE 2 007 P 028 SMTF	2	240	0.7	2.8	2.1
CE 2 010 P 030 SMTF	2	235	1	3	2
CE 2 010 P 035 SMTF	2	230	1	3.5	2.5
CE 2 010 P 040 SMTF	2	227	1	4	3
CE 2 015 P 045 SMTF	2	225	1.5	4.5	3
CE 2 020 P 055 SMTF	2	220	2	5.5	3.5
CE 2 020 P 065 SMTF	2	215	2	6.5	4.5
CE 2 025 P 070 SMTF	2	212	2.5	7	4.5
CE 2 030 P 090 SMTF	2	210	3	9	6
CE 3 005 P 027 SMTF	3	340	0.5	2.7	2.2
CE 3 008 P 035 SMTF	3	330	0.8	3.5	2.7
CE 3 010 P 030 SMTF	3	332	1	3	2
CE 3 010 P 040 SMTF	3	327	1	4	3
CE 3 010 P 045 SMTF	3	325	1	4.5	3.5
CE 3 015 P 055 SMTF	3	320	1.5	5.5	4
CE 3 015 P 065 SMTF	3	315	1.5	6.5	5
CE 3 015 P 070 SMTF	3	312	1.5	7	5.5
CE 3 020 P 090 SMTF	3	310	2	9	7
CE 4 010 P 030 SMTF	4	426	1	3	2
CE 3 005 N 027 SMTF	3	340	0.5	2.7	2.2

High Frequency Equalizer Values

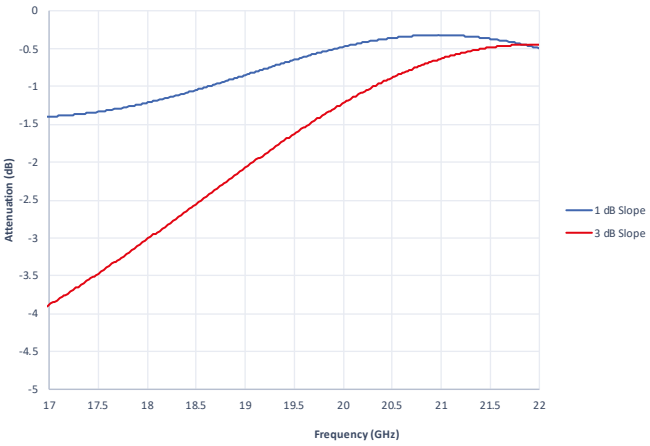
CEHF 1 170 P 220 SMTF	1	N/A	17	22	5
CEHF 3 170 P 220 SMTF	3	N/A	17	22	5
CEHF 1 270 P 320 SMTF	1	N/A	27	32	5
CEHF 3 270 P 320 SMTF	3	N/A	27	32	5

Power Derating Curve

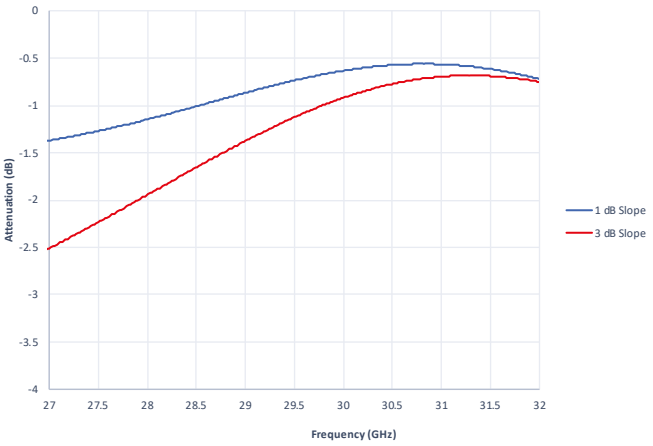


Typical Data

High Frequency Chip Equalizer Band 1

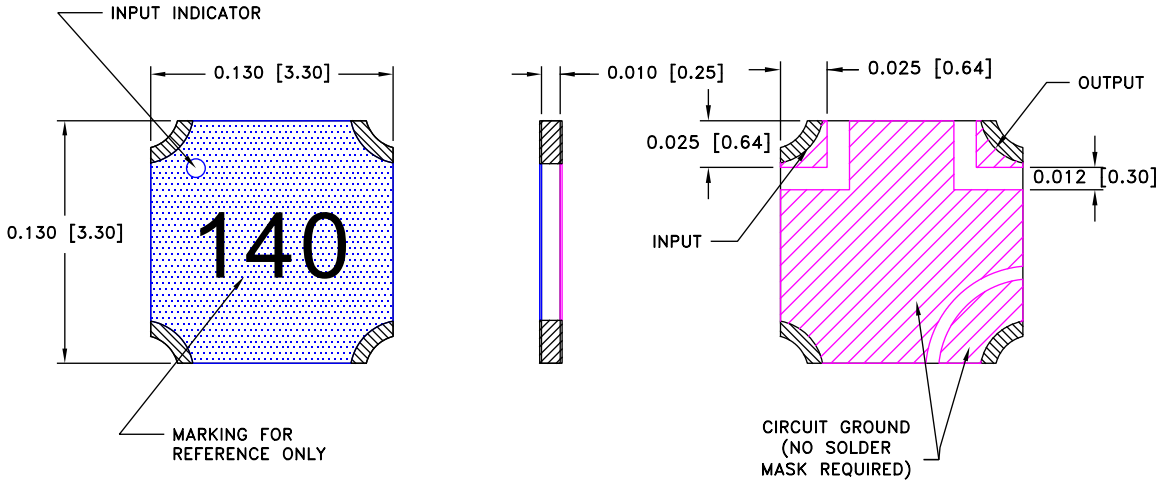


High Frequency Chip Equalizer Band 3

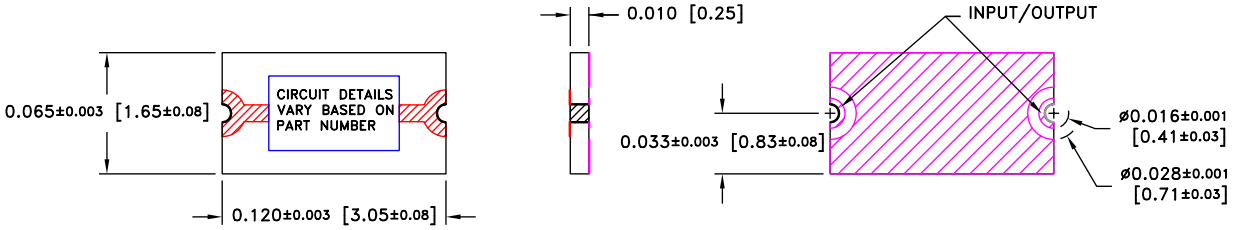


Mechanical

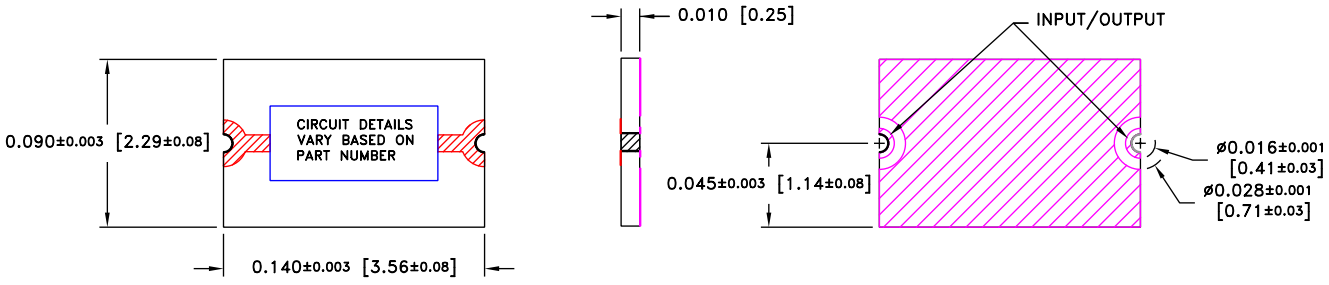
Standard Series



High Frequency Band 1 Series



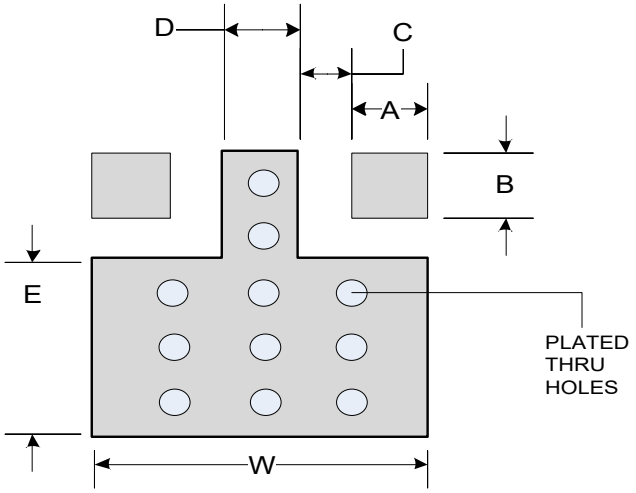
High Frequency Band 3 Series



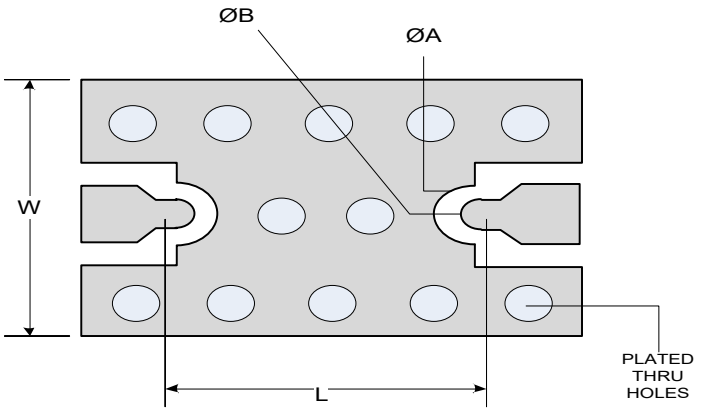
Unless otherwise specified, tolerance: X.XXX = ±0.01" X.XXX = ±0.001"

Suggested Mounting Footprint

	Inches						Millimeters					
Part Number	A	B	C	D	E	W	A	B	C	D	E	W
CEXXXXXXXXSMTF	0.030	0.030	0.012	0.056	0.093	0.140	0.76	0.76	0.30	1.42	2.36	3.56



	Inches				Millimeters			
Part Number	A	B	L	W	A	B	L	W
CEHFX170X220SMTF (17-22 GHz)	0.016	0.028	0.140	0.095	0.41	0.71	3.56	2.41
CEHFX270X320SMTF (27-32 GHz)	0.016	0.028	0.120	0.070	0.41	0.71	3.05	1.78



How To Order

Specify Model Number: **CE XX X XXX X XXX SMTF**

CE						SMT	F
1	2	3	4	5	6	7	8

1 Series Name	CE Series
2 Frequency	Standard HF High Frequency
3 Slope	dB
4 Start Frequency F1	(XX.X GHz)
5 Slope Direction	N Negative P Positive
6 Stop Frequency F2	(XX.X GHz)
7 SMT	SMT Surface Mount
8 Terminal Finish	F RoHS Compliant

Global
Support

Americas

- Costa Mesa, CA
  +1 714 371 1100
  info.us@smithsinterconnect.com
- Milpitas, CA
  +1 408 957 9607 x-1125
  info.us@smithsinterconnect.com
- Stuart, FL
  +1 772 286 9300
  info.us@smithsinterconnect.com
- Kirkland, QC, Canada
  +1 514 842 5179
  info.us@smithsinterconnect.com
- Hudson, MA
  +1 978 568 0451
  info.us@smithsinterconnect.com
- Northampton, MA
  +1 413 582 9620
  info.northampton@smithsinterconnectinc.com
- Tampa, FL
  + 1 813 901 7200
  info.tampa@smithsinterconnectinc.com
- Kansas City, KS
  +1 913 342 5544
  info.us@smithsinterconnect.com
- Salisbury, MD
  +1 800 780 2169
  info.us@smithsinterconnect.com
- Thousand Oaks, CA
  +1 805 267 0100
  info.thousandoaks@smithsinterconnectinc.com

Europe

- Deggendorf, Germany
  +49 991 250 120
  info.de@smithsinterconnect.com
- Genova, Italy
  +39 0 10 60361
  info.it@smithsinterconnect.com
- Dundee, UK
  +44 1382 427 200
  info.dundee@smithsinterconnect.com
- Rouen, France
  +33 2 32 96 91 76
  info.fr@smithsinterconnect.com
- Elstree, UK
  +44 20 8236 2400
  info.uk@smithsinterconnect.com

Asia

- Bangalore, India
  +91 080 4241 0529
  info.in@smithsinterconnect.com
- Singapore
  +65 6846 1655
  info.asia@smithsinterconnect.com
- Mianyang, China
  +86 816 231 5566
  HSICSR@hf-smiths.com
- Suzhou, China
  +86 512 6273 1188
  info.asia@smithsinterconnect.com
- Shanghai, China
  +86 21 2283 8008
  info.asia@smithsinterconnect.com

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