Features

- Substrates - BeO, AlN, Alumina and CVD Diamond
- Commercial and High Reliability Product Lines
- Frequency Range from DC to 50 GHz
- Attenuation Values from 0 to 30 dB
- Space and Military Qualified
- Surface Mount, Wire-Bondable and Coaxial Configurations

Benefits

- Small Footprint
- Totally Passive
- Power Handling up to 400 Watts
- Several Metallization Options Available, Including a RoHS Compliant Version

Applications

- Circulators
- High Power Amplifiers
- Receivers
- Filters
- Isolators
- Signal Sampling
- Interstage Isolation
- Impedance Matching

For our **CVD Diamond Attenuators** *see* **Diamond Rf Resistives®** *on pages 65 to 74*

We are the world leader in fixed attenuators from DC through Q band. Fixed attenuators are available in 0.1 to 400 watt versions, covering DC to 50 GHz applications and offered in 0 to 30 dB values. Our attenuators are available in many package styles including chip, tab & cover, flange and coaxial models for use in both low and high power applications. These products are available in standard commercial product as well as high reliability versions.

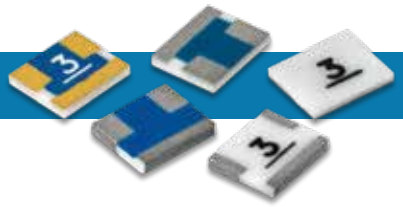
Quick Selector Chart

Series	Frequency (GHz)	Power (Watts)	Footprint mm [inches]		Page
TS03	DC - 12.4	2	3.10 x 3.68	[0.122 x 0.145]	18
TS04	DC - 6.0	1	3.18 x 2.54	[0.125 x 0.100]	23
TS05	DC - 18.0	0.1	1.52 x 1.91	[0.060 x 0.075]	19
TS06	DC - 20.0	0.2	0.89 x 1.65	[0.035 x 0.065]	24
TS07	DC - 6.0	0.1	2.03 x 1.27	[0.080 x 0.050]	23
TS09	DC - 20.0	0.2	1.78 x 1.52	[0.070 x 0.060]	22
KFA	16.0 - 36.0	0.2	3.05 x 1.65	[0.120 x 0.065]	20
QFA	36.0 - 50.0	0.2	3.05 x 1.65	[0.120 x 0.065]	21
HPCA	DC - 2.5	20	6.22 x 6.22	[0.245 x 0.245]	25
83 Chip	DC - 18.0	120*	Various	Various	26-27
Tab & Cover	DC - 4.0	250*	Various	Various	28-30
Flange	DC - 4.0	400*	Various	Various	31-33
42 Coaxial	DC - 18.0	2	Various	Various	36
HR03	DC - 12.4	2	3.10 x 3.68	[0.122 x 0.145]	35
HR05	DC - 18.0	0.1	1.52 x 1.91	[0.060 x 0.075]	34

* *Maximum Power*

TS03 (12.4 GHz)

Chip Attenuator

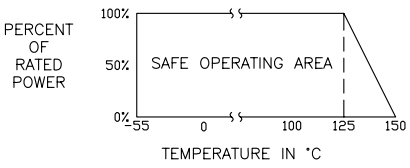


EMC Technology's TS03 chip attenuators have a rated input power of 2 watts with attenuation values from 0 dB to 20 dB and work from DC to 12.4 GHz. These chip devices are available with several metallization styles and plating options including RoHS compliant lead free silver over nickel finish, solder plate, or fused solder finish for easy reflow processing.

Specifications

Size	3.10mm x 3.68mm [0.122in x 0.145in]
Impedance	50 Ohms
Frequency Range	Planar Series DC to 12.4 GHz W Series DC to 8 GHz
VSWR (Typical)	1.30
Power Rating	2.0 Watts
Operating Temperature	-55˚C to 150˚C
Substrate	Alumina
Resistive Material	Thick Film
Terminal Material	Thick Film, Nickel Barrier with Solder Plated or RoHS, Gold and Wire Bondable Options Available

Power Rating and Derating



Part Numbering Code

T S 0 3 2 0 W 1 S

CHIP ATTENUATOR
TS = Standard
HR = High Reliabilty Testing
TT = Available in 1/2 dB steps

TOP PLATE
0 = No Top Plate

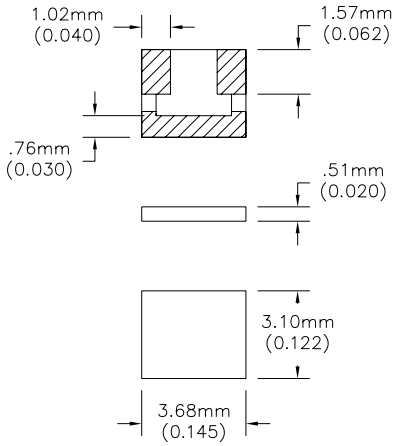
CHIP SIZE
3 = .122 x .145

ATTENUATION VALUE
in 1 dB increments
(00 through 20)

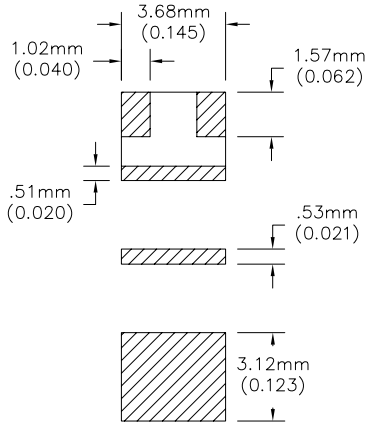
MOUNTING STYLE
(blank) = Planar
W1 = Wrap-around Ground
W3 = Wrap-around, All Terms
WB1 = Wrap-around Wire Bondable

ENVIRONMENTAL COMPLIANCE
(blank) = Sn60Pb40
S = Pretinning
G = GOLD
F = RoHS
(Not available on WB1 or G)

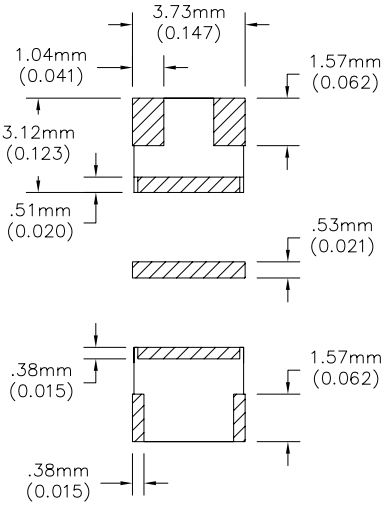
TS03 Planar Series

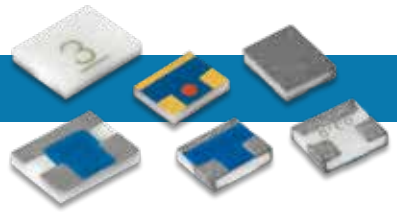


TS03 Single Wrap Series

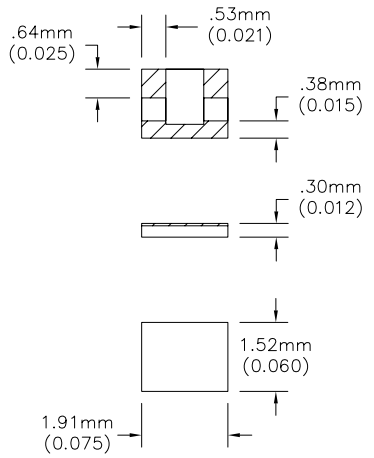


TS03 Triple Wrap Series

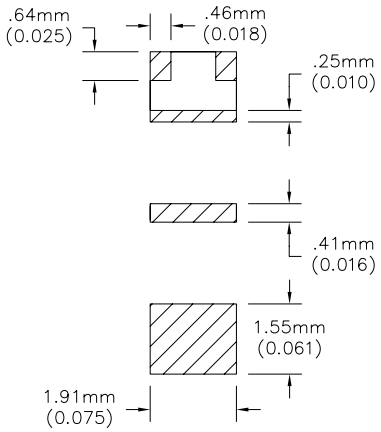




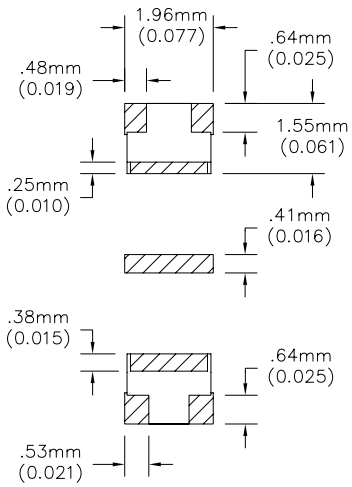
TS05 Planar Series



TS05 Single Wrap Series



TS05 Triple Wrap Series

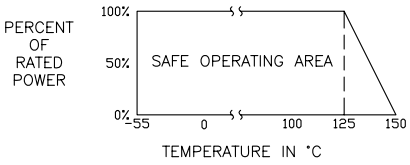


EMC Technology's TS05 series chip attenuators feature DC - 18 GHz operating frequency range with power handling capability of 100 milliwatts. Standard attenuation values range from 0 to 20 dB. These chip devices are available with several metallization styles and plating options including RoHS compliant lead free silver over nickel finish, solder plate, or fused solder finish for easy reflow processing.

Specifications

Size	1.52mm x 1.91mm [0.060in x 0.075in]
Impedance	50 Ohms
Frequency Range	Planar Series DC to 18 GHz W Series DC to 12.4 GHz
VSWR (Typical)	1.30
Power Rating	100 Milliwatts
Operating Temperature	-55°C to 150°C
Substrate	Alumina
Resistive Material	Thin Film
Terminal Material	Thick Film, Nickel Barrier with Solder Plated or RoHS, Gold and Wire Bondable options available

Power Rating and Derating



Part Numbering Code

T S | 0 | 5 | 2 0 | W 1 | S

CHIP ATTENUATOR
TS = Standard
HR = High Reliabilty Testing
TT = Available in 1/2 dB steps

TOP PLATE
0 = No Top Plate

CHIP SIZE
5 = .060 x .075

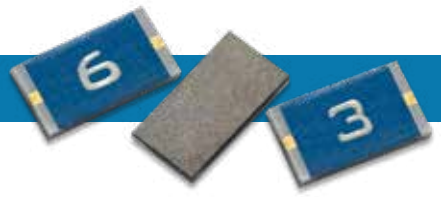
ATTENUATION VALUE
in 1 dB increments
(00 through 20)

MOUNTING STYLE
(blank) = Planar
W1 = Wrap-around Ground
W3 = Wrap-around, All Terms
WB1 = Wrap-around Wire Bondable

ENVIRONMENTAL COMPLIANCE
(blank) = Sn60Pb40
S = Pretinning
G = Gold
F = RoHS
(Not available on WB1 or G)

KFA (36.0 GHz)

K-Band Attenuator

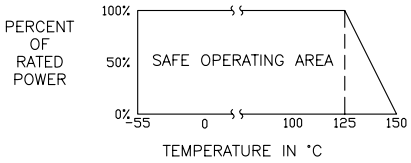


EMC Technology's KFA series fixed attenuators are footprint-compatible with KTVA and operate from 16 to 36 GHz. Standard attenuation values from 1 to 10 dB are available. The KFA is also available for high-reliability applications under the HRKFA part number with Group A, B and C testing according to Mil-PRF-55342. This attenuator is available with wire-bondable gold terminals and a platinum silver, solder attachable ground plane.

Specifications

Size	3.05mm x 1.65mm [0.120in x 0.065]
Impedance	50 Ohms
Frequency Range	16 to 36 GHz
VSWR (Typical)	1.35
Power Rating	200 Milliwatts
Operating Temperature	-55°C to 150°C
Substrate	Alumina
Resistive Material	Thin Film
Terminal Material	Thick Film, Bondable Gold or Lead Free Finish

Power Rating and Derating

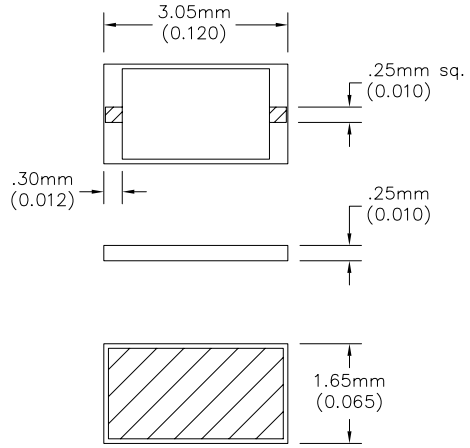


Part Numbering Code

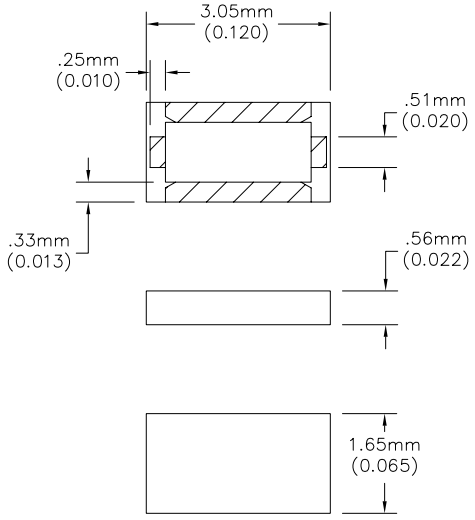
K F A X X . 0 0 – 5 S M T F

- K F A — SERIES
- X X . 0 0 — ATTENUATION VALUE (00 - 10 dB)
- 5 — FREQUENCY RANGE: 5 = 18 - 27 GHz; 6 = 27 - 36 GHz
- S M T — MOUNTING STYLE: (blank) = Wire Bondable; SMT = Surface Mount
- F — ENVIRONMENTAL COMPLIANCE: RoHS

KFA Wire Bond Series

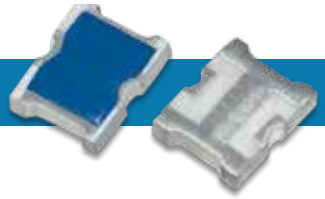


KFA Surface Mount Series



TS09 (20.0 GHz)

Chip Attenuator

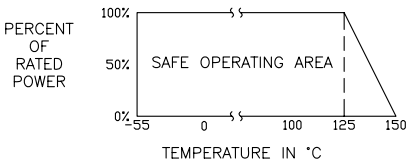


EMC Technology's TS09 chip attenuators offer rated input power of 200 milliwatts with attenuation values from 0 dB to 10 dB at DC - 20 GHz. This product is available with various metallization styles and plating options including RoHS compliant silver over nickel, solder plated tin/lead, solder fused for easy reflow processing. The WB2 style uses thick film wire-bondable gold terminals.

Specifications

Size	1.52mm x 1.78mm [0.060in x 0.070in]
Impedance	50 Ohms
Frequency Range	DC to 20 GHz
VSWR (Typical)	1.40
Power Rating	200 Milliwatts
Operating Temperature	-55°C to 150°C
Substrate	Alumina
Resistive Material	Thick Film
Terminal Material	Thick Film, Bondable Gold or Lead Free

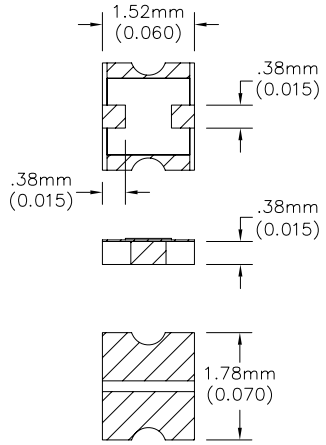
Power Rating and Derating



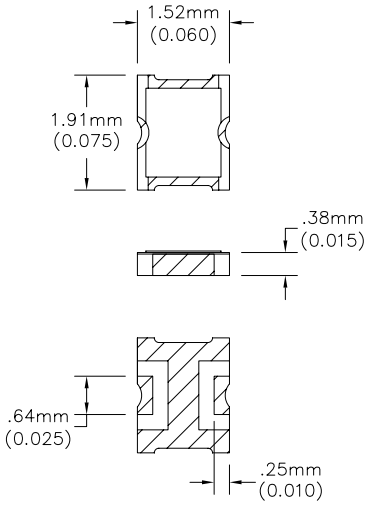
Part Numbering Code

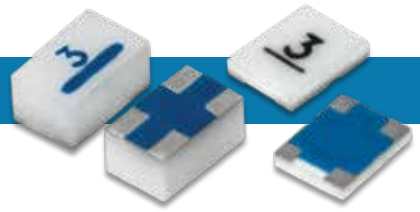
T S	0	9	1 0	S M T	F
CHIP ATTENUATOR TS = Standard	TOP PLATE 0 = No Top Plate	CHIP SIZE 9 = .075 x .060	ATTENUATION VALUE in 1 dB increments (00 through 10)	MOUNTING STYLE SMT = Wrap-around, All Terms WB2 = Wire Bondable Gold	ENVIRONMENTAL COMPLIANCE (blank) = Sn60Pb40 S = Pretinning F = RoHS

TS09 Double Wrap Wire Bond Series

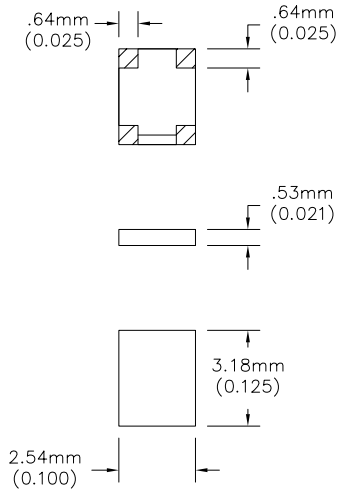


TS09 Surface Mount Series

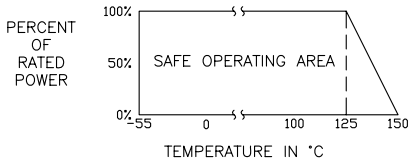




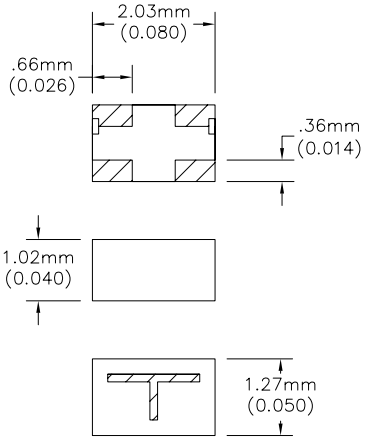
TS04 Planar Series



Power Rating and Derating



TS07 Planar Series



The TS04 series chip attenuators are designed for operation in commercial wireless spectrum and perform optimally in narrow band applications with low input power requirements up to 1 watt. Plating options include RoHS compliant lead free silver over nickel finish, SN62 solder plating or fused solder finish for easy reflow processing.

Specifications	TS04	TS07
Size	3.18mm x 2.54mm [0.125in x 0.100in]	2.03mm x 1.27mm [0.080in x 0.050in]
Impedance	50 Ohms	50 Ohms
Frequency Range	DC to 6 GHz	DC to 6 GHz
VSWR (Typical)	1.35	1.5
Power Rating	1.0 Watts	100 Milliwatts
Operating Temperature	-55°C to 150°C	-55°C to 150°C
Substrate	Alumina	Alumina
Resistive Material	Thick Film	Thick Film
Terminal Material	Thick Film, Nickel Barrier, Solder Plated or RoHS,	Thick Film, Lead Free Finish

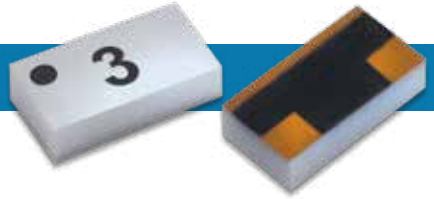
The TS07XX(F) is an SMT fixed attenuator and is suitable for all Telecom and WiMax applications. This conveniently sized 0805 chip attenuator has excellent frequency response from DC to 6 GHz. The TS07 series is available in attenuation values of 0 through 10 dB in one dB increments and operates within a temperature range of -55 to +125 ºC. This cost effective attenuator can handle 100 milliwatts of input power and is packaged on 1,000 piece reels for high volume, pick and place assembly. All values are RoHS compliant.

Part Numbering Code

T S	0	4/7	1 0	S
CHIP ATTENUATOR TS = Standard	TOP PLATE 0 = No Top Plate	CHIP SIZE 4 = .100 x .125 7 = .080 x .050	ATTENUATION VALUE in 1 dB increments (00 through 10 - TS04 & TS07) (20 = 20 dB - TS04 only)	ENVIRONMENTAL COMPLIANCE (blank) = Sn60Pb40 S = Pretinning F = RoHS

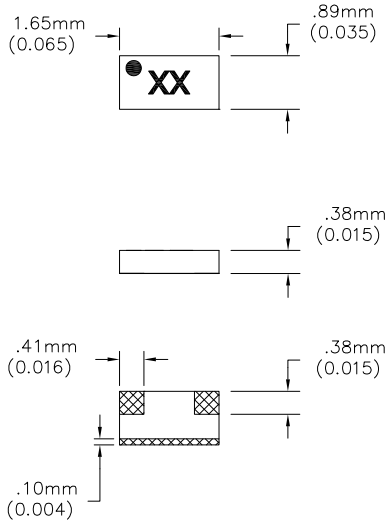
TS06 (DC-20 GHz)

Chip Attenuator



EMC Technology's trailblazing research and development in resistive technology over the last five decades have culminated in yet another advanced fixed attenuator series. Our latest TS06 series is compact in size and excellent in frequency response. Featuring a space-saving 0603 footprint without sacrificing power handling capability, the TS06 series is the best performer among our existing small-signal fixed attenuators in terms of attenuation accuracy and VSWR. TS06 series is the most ideal and balanced solution for designers needing a sub-20 GHz fixed attenuator in their space, defense, and commercial wireless applications.

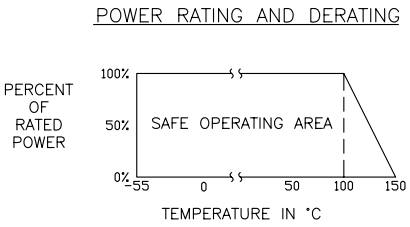
TS06 Single Wrap Series



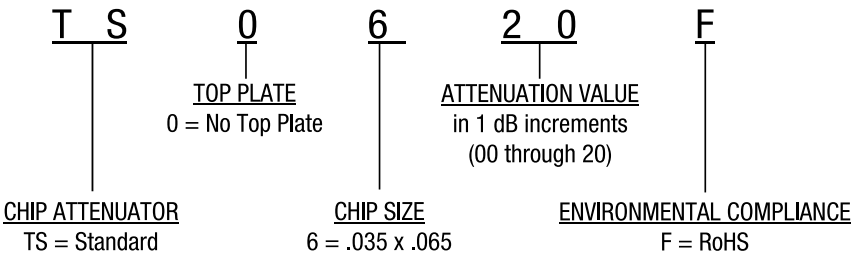
Specifications

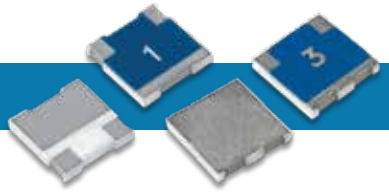
Size	0.89mm x 1.65mm [0.035in x 0.065in]
Impedance	50 Ohms
Frequency Range	DC to 20 GHz
VSWR (Typical)	1.40
Power Rating	200 Milliwatts
Operating Temperature	-55°C to 150°C
Substrate	Alumina
Resistive Material	Thin Film
Terminal Material	Thin Film

Power Rating and Derating

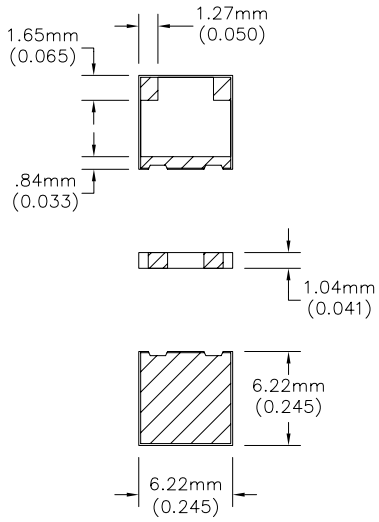


Part Numbering Code

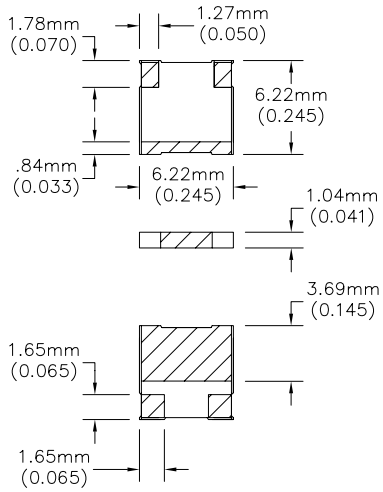




HPCA Single Wrap Series



HPCA Triple Wrap Series

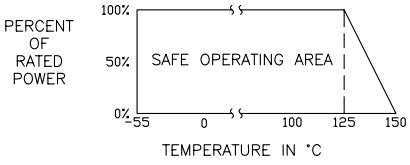


The HPCA high power chip attenuators are manufactured using thick film process and offer input power of 20 watts with attenuation values from 0 dB to 20 dB. They are designed to work from DC to 2.5 Ghz. These chip devices are available with triple wrap and single wrap metallization styles and include solder finish, fused solder and RoHS compliant lead-free silver over nickel finish.

Specifications

Size	6.22mm x 6.22mm [0.245in x 0.245in]
Impedance	50 Ohms
Frequency Range	DC to 2.5 GHz
VSWR (Typical)	1.35
Power Rating	20 Watts
Operating Temperature	-55°C to 150°C
Substrate	BeO
Resistive Material	Thick Film
Terminal Material	Thick Film, Nickel Barrier, Solder Plated or Lead Free

Power Rating and Derating



Part Numbering Code

H P C A — CHIP ATTENUATOR
HPCA = High Power Chip Attenuator

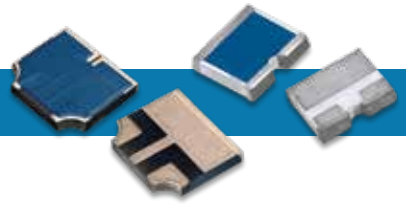
5 4 — CHIP SIZE
54 = .250 x .250

1 0 . 0 0 — ATTENUATION VALUE
in 1 dB increments (00 through 20)

INTERNAL CODE

W 3 — MOUNTING STYLE
W1 = Wrap-around Ground
W3 = Wrap-around, All Terms

S — ENVIRONMENTAL COMPLIANCE
(blank) = Sn60Pb40
S = Pretinning
F = RoHS



Part Numbering Code

8 3 – 7 0 2 7 – 1 0 . 0 0 F

STYLE
8 = Chip / Power Pak

TYPE
3 = Attenuator

PLATING OPTION
– = Tin Lead[1/]
A = Silver Nickel
B = Silver Copper
M = Non-Magnetic
P = Low-PIM

SUBSTRATE MATERIAL
7 = Aluminum Nitride
8 = Alumina
3 = Beryllium Oxide

DESCRIPTION
Random Numbers

ATTENUATION
Value in dB

ENVIRONMENTAL COMPLIANCE
F = RoHS Compliant

[1/] *Not RoHS Compliant*

Product Information Table

Power	Frequency	VSWR	L		W		H		Part Series #	Figure #
	GHz	Max:1	mm [inches]							
5	3.0	1.50	4.44	[0.175]	5.08	[0.200]	1.02	[0.040]	83 3995*	1
5	2.0	1.30	3.81	[0.150]	4.45	[0.175]	1.02	[0.040]	83 8999*	1
7	3.0	1.35	5.97	[0.235]	2.87	[0.113]	0.64	[0.025]	83 8054*	3
10	3.0	1.50	6.35	[0.250]	6.35	[0.250]	1.02	[0.040]	83 7999*	1
10	2.0	1.35	5.08	[0.200]	2.54	[0.100]	1.02	[0.040]	83 7014*	3
10	3.0	1.50	6.35	[0.250]	6.35	[0.250]	1.02	[0.040]	83 3999*	1
20	3.0	1.50	9.53	[0.375]	9.53	[0.375]	1.02	[0.040]	83 7027*	1
20	6.0	1.40	5.08	[0.200]	4.45	[0.175]	0.64	[0.025]	83 7044*	1
25	2.0	1.40	9.53	[0.375]	9.53	[0.375]	1.02	[0.040]	83 3998*	1
20	3.0	1.22	5.08	[0.200]	2.54	[0.100]	0.38	[0.015]	83 7046*	3
50	3.0	1.22	6.35	[0.250]	6.35	[0.250]	0.64	[0.025]	83 7047*	2
75	2.4	1.25	7.62	[0.250]	6.35	[0.250]	1.02	[0.040]	83 7012* /2	3
120	2.4	1.20	5.84	[0.230]	8.89	[0.350]	1.02	[0.040]	83 7026*	2

** is a place holder. See part number configurations to complete the part number.*

/2 only available in 30dB

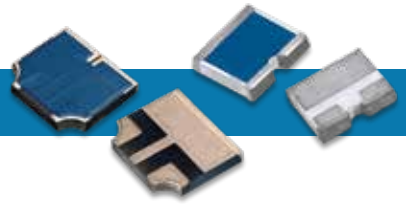


Figure 1

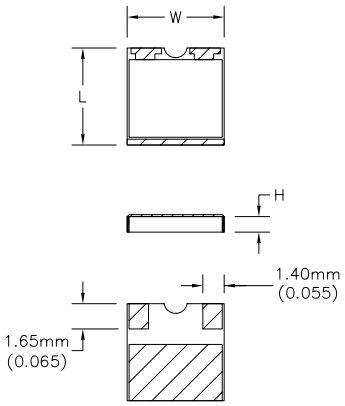


Figure 2

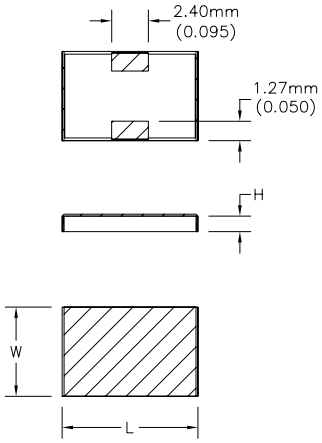
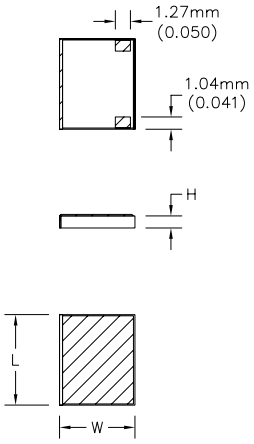


Figure 3

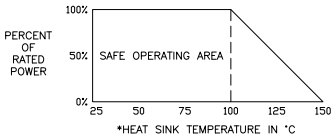


The 83 series surface mount chip attenuators are designed for direct installation on printed circuit boards and manufactured using thin film process. Edge metallization on two sides forms the solder fillets for stronger attachment, easier inspection, and increased heat removal area. The devices are available in Alumina, Aluminum Nitride (AlN) or BeO. RoHS-compliant versions are available.

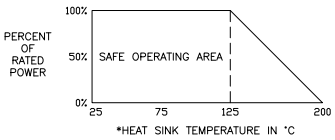
Specifications

Impedance	50 Ohms
Frequency Range	DC to 18 GHz
VSWR (Typical)	1.30
Power Rating	5 - 120 Watts
Operating Temperature	-55°C to 150°C
Substrate	Alumina, BeO and AlN
Resistive Material	Thin Film
Terminal Material	Thick Film, Nickel Barrier, Solder Plated or RoHS, Gold and Wire Bondable Options Available

Power Rating and Derating



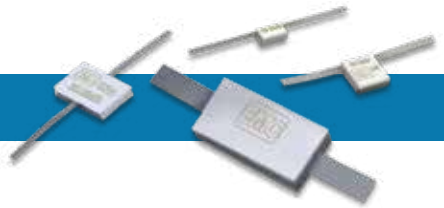
Alternative Derating Available Upon Request



**The heat sink is defined as the surface that the Component is attached to, ie. chassis or printed circuit board.*

83 Series Tab & Cover

Power Pack Attenuator



Part Numbering Code

8 3 – 7 0 0 6 T C – 2 0 . 0 0 F

- **STYLE**: 8 = Chip / Power Pak
- **TYPE**: 3 = Attenuator
- **PLATING OPTION**: – = Tin Lead[1/], A = Silver Nickel, B = Silver Copper
- **SUBSTRATE MATERIAL**: 7 = Aluminum Nitride, 8 = Alumina, 1, 3 = Beryllium Oxide
- **DESCRIPTION**: Random Numbers
- **MOUNTING**: TC = Tab & Cover
- **ATTENUATION**: Value in dB
- **ENVIRONMENTAL COMPLIANCE**: F = RoHS Compliant

[1/] *Not RoHS Compliant*

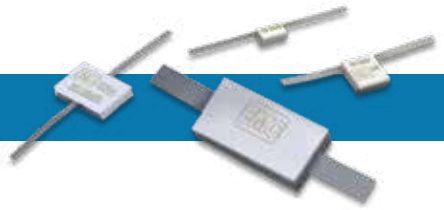
Product Information Table

Power	Freq	VSWR	Substrate	L		W		H		I		Part Number*	Figure #
	GHz	Max		mm [inches]									
10	4.0	1.35	BeO	5.08	[0.200]	2.54	[0.100]	2.16	[0.085]	1.02	[0.040]	83 3005TC*	1
20	4.0	1.50	BeO	6.35	[0.250]	6.35	[0.250]	2.16	[0.085]	1.52	[0.060]	83 1001TC*	1
20	4.0	1.50	BeO	5.08	[0.200]	2.54	[0.100]	2.16	[0.085]	1.02	[0.040]	83 3001TC*	1
50	2.5	1.40	BeO	9.53	[0.375]	9.53	[0.375]	2.16	[0.085]	1.52	[0.060]	83 3021TC*	1
50	2.0	1.25	BeO	6.35	[0.250]	9.53	[0.375]	1.02	[0.040]	1.02	[0.040]	83 1996TC* /2	3
70	2.8	1.25	AlN	6.35	[0.250]	9.53	[0.375]	2.16	[0.085]	1.02	[0.040]	83 7009TC* /1	1
70	2.0	1.35	BeO	9.53	[0.375]	9.53	[0.375]	2.16	[0.085]	1.52	[0.060]	83 3997TC* /2	4
75	2.0	1.20	AlN	6.35	[0.250]	9.53	[0.375]	2.16	[0.085]	1.02	[0.040]	83 7011TC* /1 /2	2
100	2.3	1.20	AlN	5.84	[0.230]	8.89	[0.350]	2.16	[0.085]	1.02	[0.040]	83 7023TC*	5
100	2.3	1.15	AlN	5.84	[0.230]	8.89	[0.350]	2.16	[0.085]	1.02	[0.040]	83 7017TC*	6
100	3.0	1.30	AlN	6.35	[0.250]	9.53	[0.375]	2.16	[0.085]	1.02	[0.040]	83 7006TC*	5
100	0.8	1.25	BeO	12.70	[0.500]	12.70	[0.500]	2.16	[0.085]	1.52	[0.060]	83 1003TC*	1
150	1.0	1.50	BeO	9.53	[0.375]	9.53	[0.375]	2.16	[0.085]	1.52	[0.060]	83 1006TC*	1
150	2.2	1.40	AlN	6.35	[0.250]	9.53	[0.375]	2.16	[0.085]	1.02	[0.040]	83 7034TC*	6
150	3.0	1.30	AlN	7.62	[0.300]	11.43	[0.450]	1.91	[0.075]	1.02	[0.040]	83 7008TC* /1 /2	3
150	2.0	1.30	BeO	6.35	[0.250]	9.53	[0.375]	2.16	[0.085]	1.02	[0.040]	83 3016TC* /1 /2	5
150	1.0	1.50	BeO	9.53	[0.375]	9.53	[0.375]	2.16	[0.085]	1.52	[0.060]	83 3006TC* /1 /2	1
250	1.0	1.25	BeO	12.70	[0.500]	12.70	[0.500]	2.16	[0.085]	1.52	[0.060]	83 3994TC* /1 /2	4

** is a place holder. See part number configurations to complete the part number.*

/1 only available in 20dB

/2 only available in 30dB



83 Series Tab & Cover

Power Pack Attenuator

Figure 1

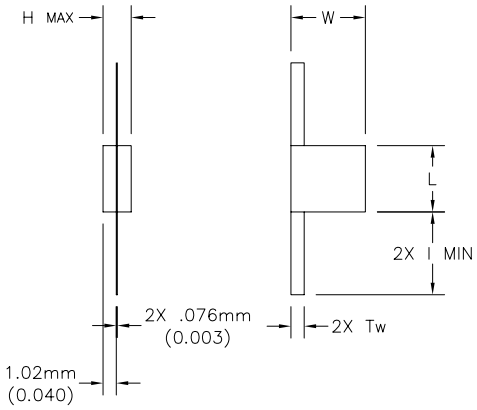
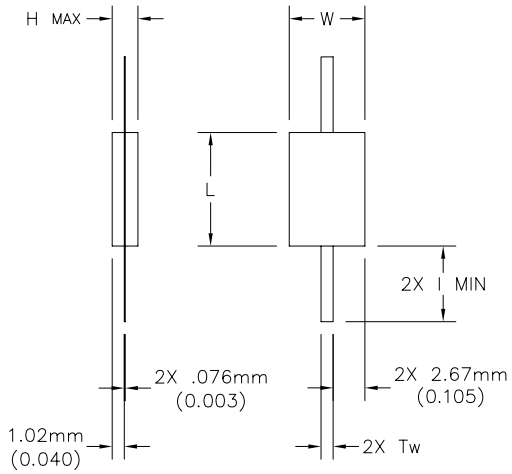


Figure 2



Tab & Cover devices are flangeless with protective ceramic covers and tab contacts, offering the highest performance available of any package style component. They are designed for direct solder attachment to a heat sink for excellent heat transfer. The tab and cover attenuators have attenuation range from 1 dB to 30 dB. Typical attenuation tolerance for values between 1-10 db is +/- 0.5 dB and 11-30 dB is +/- 1.0 dB (may vary for certain products please refer to drawing). All devices are made compliant to RoHS.

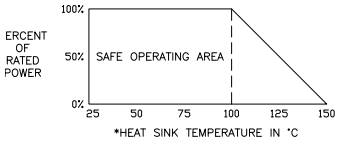
Features

- Substrates - BeO, AlN, and Alumina
- Highest Performance
- Direct Attachment
- Attenuation Values from 0 to 30 dB
- Single Tab and Double Tab Configurations
- Many Finishes Available

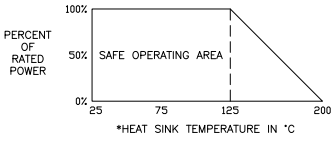
Specifications

Impedance	50 Ohms
Frequency Range	DC to 4 GHz
Attenuation Accuracy	±0.5 dB
VSWR (Typical)	1.30 @ 1 GHz
Power Rating	10 - 250 Watts
Operating Temperature	-55°C to 150°C
Substrate	Alumina, BeO or AlN
Resistive Material	Thin Film
Tab Contact	Different Finishes Available

Power Rating and Derating



Alternative Derating Available Upon Request



**The heat sink is defined as the surface that the Component is attached to, ie. chassis or printed circuit board.*

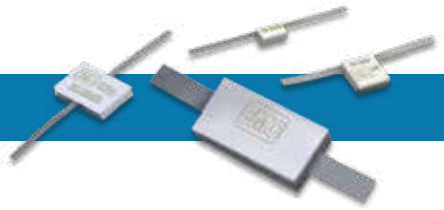


Figure 3

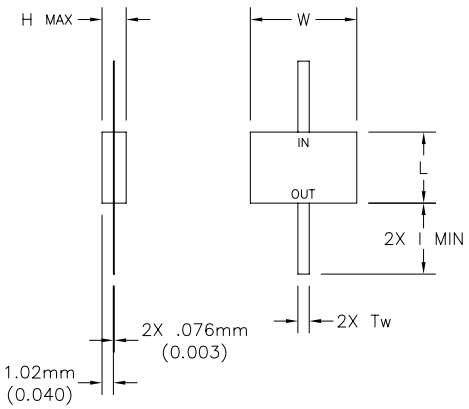


Figure 4

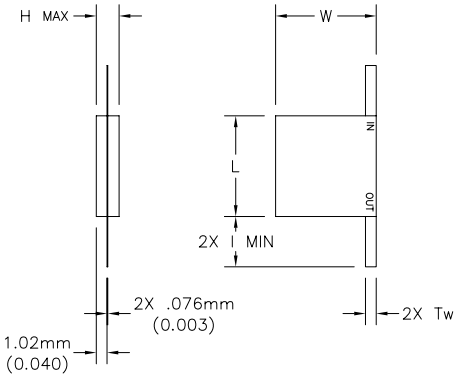


Figure 5

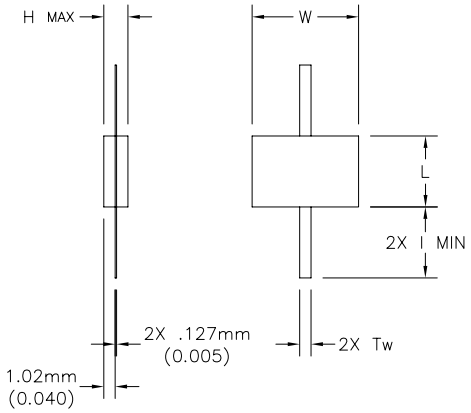
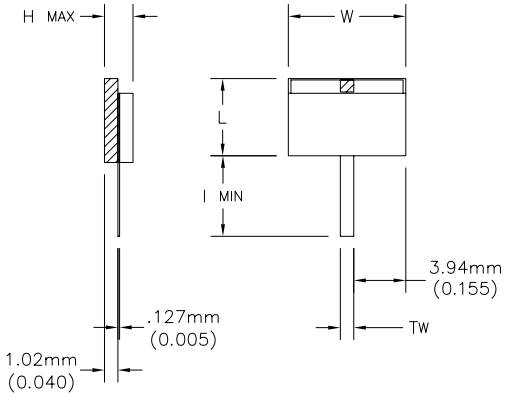


Figure 6



Part Numbering Code

3	3	–	7	XXX – XX.XX	F
STYLE	TYPE	PLATING OPTION	SUBSTRATE MATERIAL	DESCRIPTION / ATTENUATION	ENVIRONMENTAL COMPLIANCE

STYLE
3 = High Power Flange

TYPE
3 = Attenuator

PLATING OPTION
– = Tin Lead[1/]
A = Silver Nickel
B = Silver Copper

SUBSTRATE MATERIAL
7 = Aluminum Nitride
1 = Beryllium Oxide

DESCRIPTION
Random Numbers

ATTENUATION
Value in dB

ENVIRONMENTAL COMPLIANCE
F = RoHS Compliant

[1/] *Not RoHS Compliant*

Product Information Table

Power	Freq	VSWR	Substrate	L		W		H		TW		Part Number*	Figure #
	GHz	Max		mm [inches]									
10	2.7	1.15	AlN	5.08	[0.200]	7.62	[0.300]	3.81	[0.150]	1.02	[0.040]	33 7003*	1
10	0.9	1.25	BeO	5.08	[0.200]	7.62	[0.300]	3.81	[0.150]	1.02	[0.040]	33 1041*	1
10	4.0	1.35	BeO	5.08	[0.200]	12.70	[0.500]	3.81	[0.150]	1.02	[0.040]	33 1017*	2
10	4.0	1.35	BeO	5.08	[0.200]	7.62	[0.300]	3.81	[0.150]	1.02	[0.040]	33 1005*	1
20	4.0	1.50	BeO	6.35	[0.250]	13.08	[0.515]	3.81	[0.150]	1.52	[0.060]	33 1001*	3
50	2.5	1.40	BeO	9.53	[0.375]	24.77	[0.975]	5.33	[0.210]	1.52	[0.060]	33 1021*	4
50	2.0	1.40	AlN	9.53	[0.375]	24.77	[0.975]	5.33	[0.210]	1.50	[0.059]	33 7002* /1	4
50	2.0	1.40	AlN	9.53	[0.375]	24.77	[0.975]	5.33	[0.210]	1.52	[0.060]	33 7001* /1	4
50	1.0	1.20	BeO	9.53	[0.375]	24.77	[0.975]	5.33	[0.210]	1.52	[0.060]	33 1002*	4
75	2.2	1.20	AlN	9.53	[0.375]	22.10	[0.870]	3.81	[0.150]	1.02	[0.040]	33 7005*	5
75	1.0	1.30	BeO	9.53	[0.375]	22.10	[0.870]	3.81	[0.150]	1.02	[0.040]	33 1009*	5
100	2.5	1.20	AlN	5.84	[0.230]	20.32	[0.800]	3.81	[0.150]	1.02	[0.040]	33 7023*	7
100	3.0	1.30	AlN	6.48	[0.255]	20.83	[0.820]	4.06	[0.160]	1.02	[0.040]	33 7004*	8
100	0.8	1.25	BeO	12.70	[0.500]	31.75	[1.250]	5.33	[0.210]	1.52	[0.060]	33 1003*	6
100	2.5	1.20	AlN	5.84	[0.230]	20.32	[0.800]	3.81	[0.150]	1.02	[0.040]	33 7023*	7
150	1.0	1.50	BeO	9.53	[0.375]	24.77	[0.975]	5.33	[0.210]	1.52	[0.060]	33 1006*	4
200	0.5	1.50	BeO	26.42	[1.040]	48.26	[1.900]	6.22	[0.245]	6.35	[0.250]	33 1004*	9
250	1.0	1.25	BeO	12.70	[0.500]	31.75	[1.250]	5.33	[0.210]	1.52	[0.060]	33 1042* /2	6
250	1.0	1.25	BeO	12.70	[0.500]	31.75	[1.250]	5.33	[0.210]	1.52	[0.060]	33 1052*	6
400	1.0	1.30	BeO	12.70	[0.500]	31.75	[1.250]	5.33	[0.210]	1.52	[0.060]	33 1050*	10

** is a place holder. See part number configurations to complete the part number.*

/1 only available in 20 dB

/2 only available in 30 dB

"I min" dimension = 3.18 mm [0.125]

33 Series Flange

High Power Attenuator

Figure 1

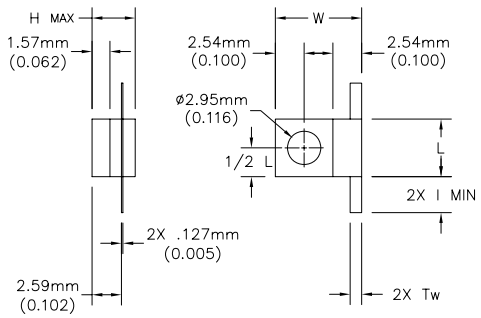
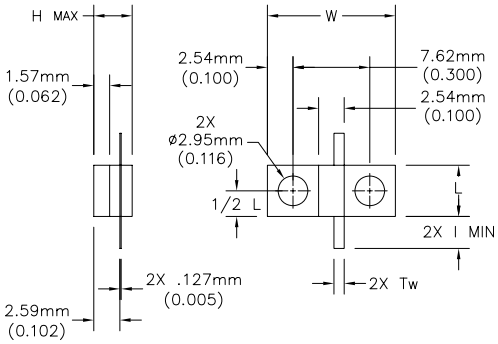


Figure 2

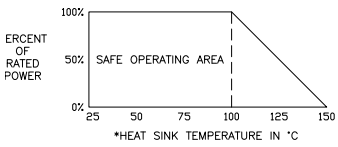


High power flange mount components offer high performance and the convenience of bolt-on installation. Flange attenuators have an attenuation range from 1 to 30 dB. Typical attenuation tolerance for values between 1-10 dB is +/- 0.5 dB and between 11-30 dB is +/- 1.0 dB (may vary for certain products, please refer to drawing). Maximum power rating of up to 400 watts can be achieved on a single device. All devices can be made RoHS compliant and available in Aluminum Nitride (AlN) or BeO.

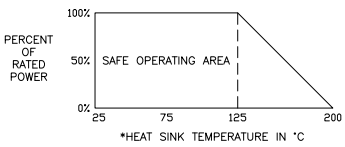
Specifications

Impedance	50 Ohms
Frequency Range	DC to 4 GHz
VSWR (Typical)	1.30
Power Rating	10 to 400 Watts
Operating Temperature	-55°C to 150°C
Substrate	BeO or AlN
Resistive Material	Nichrome
Tab Contact	Different Finishes Available
Cover	Alumina
Flange	Copper, Nickel Plated

Power Rating and Derating



Alternative Derating Available Upon Request



**The heat sink is defined as the surface that the Component is attached to, ie. chassis or printed circuit board.*

Figure 3

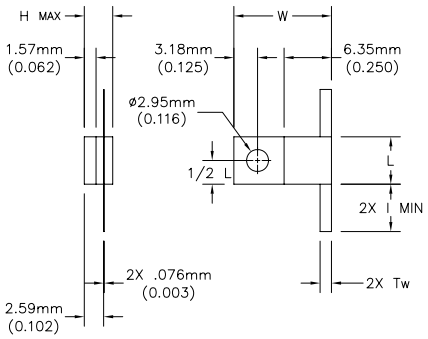


Figure 4

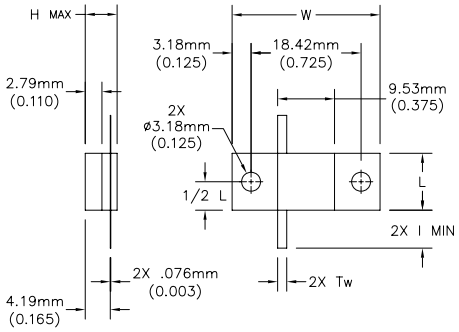


Figure 5

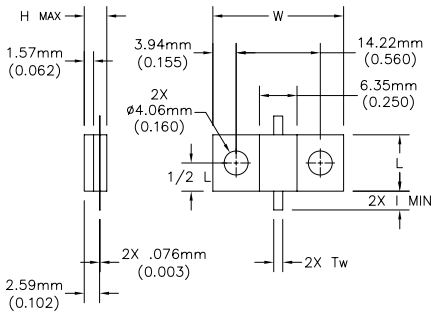


Figure 6

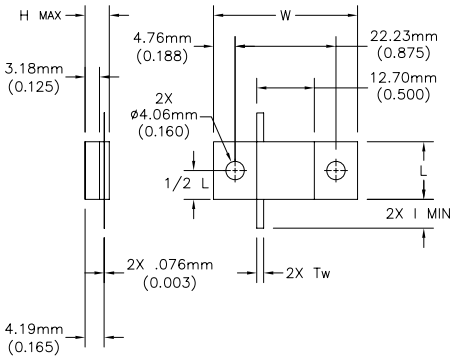


Figure 7

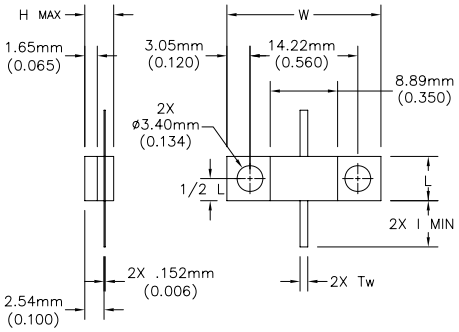


Figure 8

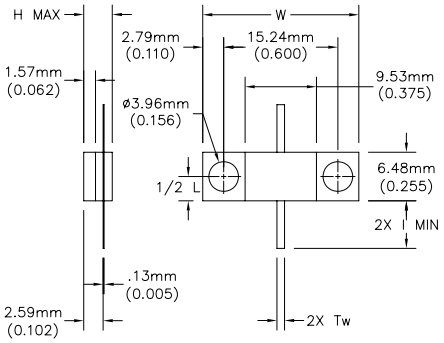


Figure 9

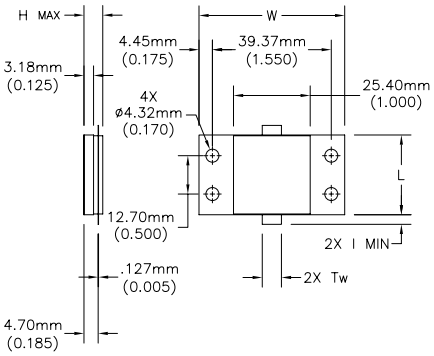
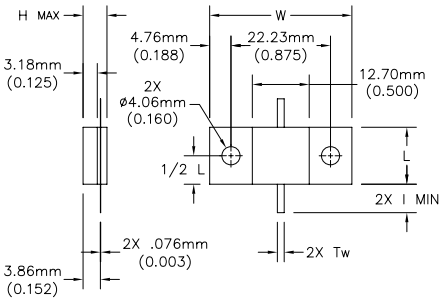
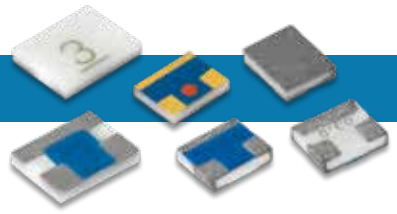


Figure 10



HR05 (18.0 GHz)

High Reliability Chip Attenuator

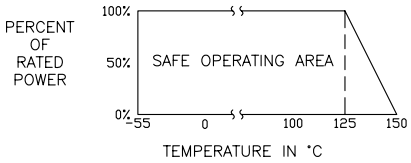


EMC Technology's miniature size attenuators with extended broadband frequency operation from DC to 18 GHz are available tested based on Mil-PRF-55342 for high reliability applications. Simply choose the testing level you require by selecting Group A, B, or C. The product is rated for 100 milliwatts of input power with attenuation values from 0 dB to 20 dB. The space-approved thin film tantalum nitride (TaN) resistive elements offer superior electrical performance and mechanical integrity. The devices are shipped in serialized waffle packaging with tested samples marked and packaged separately and includes serialized test data.

Specifications

Size	1.52mm x 1.91mm [0.060in x 0.075in]
Impedance	50 Ohms
Frequency Range	Planar Series DC to 18 GHz W Series DC to 12.4 GHz
VSWR (Typical)	1.30
Power Rating	100 Milliwatts
Operating Temperature	-55°C to 150°C
Substrate	Alumina
Resistive Material	Thin Film
Terminal Material	Thick Film, Nickel Barrier with Solder Plated or RoHS, Gold and Wire Bondable options available

Power Rating and Derating



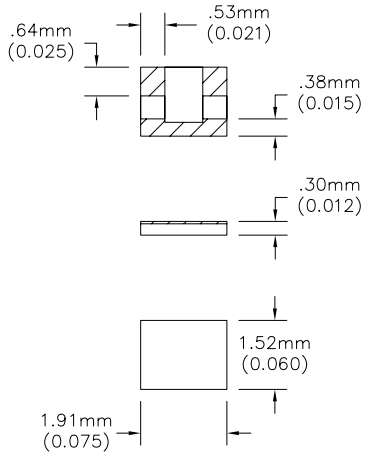
Part Numbering Code

H R | 0 | 5 | 2 0 | A | W 3 | S

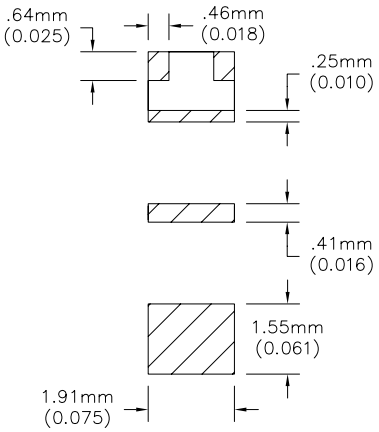
- **CHIP ATTENUATOR**: HR = High Reliabilty Series
- **TOP PLATE**: 0 = No Top Plate
- **CHIP SIZE**: 5 = .060 x .075
- **ATTENUATION VALUE**: in 1 dB increments (00 through 20)
- **TESTING**: A = Group A, B = Group B, C = Group C
- **MOUNTING STYLE**: (blank) = Planar, W1 = Wrap-around Ground, W3 = Wrap-around, All Terms, WB1 = Wrap-around Wire Bondable
- **ENVIRONMENTAL COMPLIANCE**: (blank) = Sn60Pb40, S = Pretinning, G = Gold, F = RoHS (Not available on WB1 or G)

See page 105 for test plan.

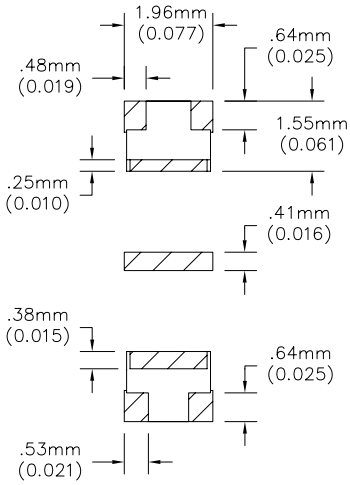
HR05 Planar Series

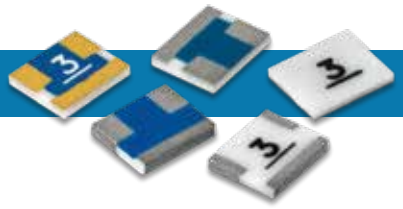


HR05 Single Wrap Series

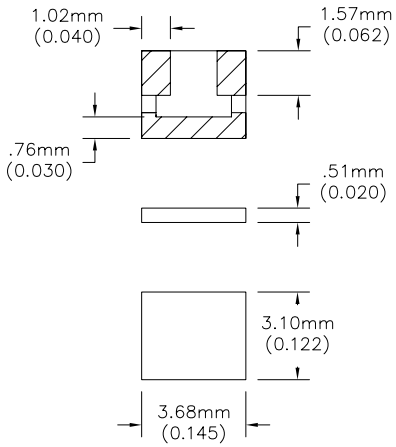


HR05 Triple Wrap Series

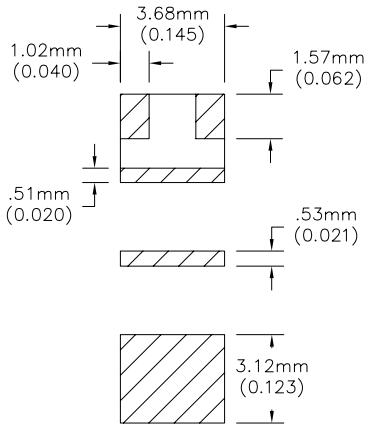




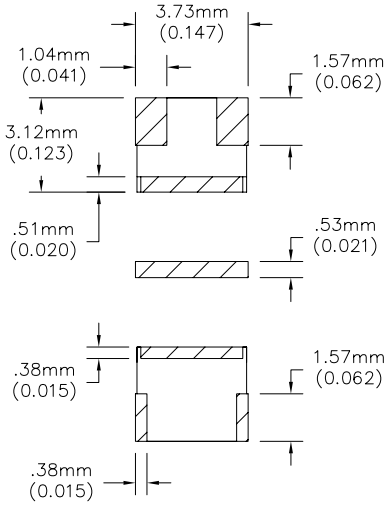
HR03 Planar Series



HR03 Single Wrap Series



HR03 Triple Wrap Series

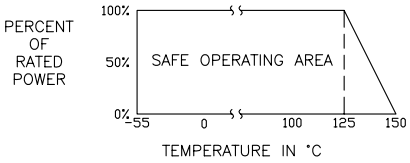


EMC Technology's attenuators are available tested based on Mil-PRF-55342 for high reliability applications. Simply choose the testing level you require by selecting Group A, B, or C. The product is rated for 2 watts input power with attenuation values from 0 dB to 20 dB and a maximum operating frequency of 12.4 GHz. The space-approved thin film tantalum nitride (TaN) resistive elements offer superior electrical performance and mechanical integrity. The devices are shipped in serialized waffle packaging with tested samples marked and packaged separately and includes serialized test data.

Specifications

Size	3.10mm x 3.68mm [0.122in x 0.145in]
Impedance	50 Ohms
Frequency Range	Planar Series DC to 12.4 GHz W Series DC to 8 GHz
VSWR (Typical)	1.30
Power Rating	2.0 Watts
Operating Temperature	-55˚C to 150˚C
Substrate	Alumina
Resistive Material	Thick Film
Terminal Material	Thick Film, Nickel Barrier with Solder Plated or RoHS, Gold and Wire Bondable Options Available

Power Rating and Derating



Part Numbering Code

H R | 0 | 3 | 2 0 | A | W 3 | S

- H R — CHIP ATTENUATOR: HR = High Reliabilty Series
- 0 — TOP PLATE: 0 = No Top Plate
- 3 — CHIP SIZE: 3 = .122 x .145
- 2 0 — ATTENUATION VALUE: in 1 dB increments (00 through 20)
- A — TESTING: A = Group A, B = Group B, C = Group C
- W 3 — MOUNTING STYLE: (blank) = Planar, W1 = Wrap-around Ground, W3 = Wrap-around, All Terms, WB1 = Wrap-around Wire Bondable
- S — ENVIRONMENTAL COMPLIANCE: (blank) = Sn60Pb40, S = Pretinning, G = Gold, F = RoHS (Not available on WB1 or G)

See page 101 for test plan.