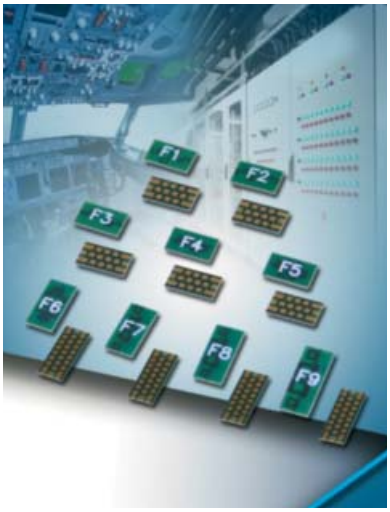
Multilayer Organic (MLO®)

Low Pass Filter



The MLO® Low Pass Filters are low profile passive devices with best in class performance based on AVX's patented multilayer organic high density interconnect technology. The MLO® low pass filters utilize high dielectric constant and low loss materials to realize high Q passive printed elements, such as inductors and capacitors, in a multilayer stack. This results in a 50Ω Low Pass Filter design. MLO® Low Pass Filters can support both a variety of frequency bands and multiple wireless standards, and are less than 1.0mm in thickness. All filters are expansion matched to most organic PCB materials, thereby resulting in improved reliability over standard Si and ceramic devices.

FEATURES

- Wide Frequency Range
- Excellent Isolation
- Low Loss
- Expansion matched to PCB
- 50Ω Impedance
- Surface Mountable
- RoHS Compliant

APPLICATIONS

- Mobile Communication
- GPS
- Vehicle location systems
- Wireless LANs
- Satellite Receivers
- Instrumentation

LAND GRID ARRAY ADVANTAGES

- Inherent Low Profile
- Excellent Solderability
- Low Parasitics
- Better Heat Dissipation

HOW TO ORDER

LP	0B	A	1330	A	7	00
Series Low Pass Filters	**Case Size** 0A – 2616 0B – 3116 0C – 3416 0D – 4016 0F - 5021	**Type**	**Frequency in MHz**	**Standard Testing**	**Termination** 7 = Gold	**Product Code** 00 = Standard

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

For RoHS compliant products, please select correct termination style.

QUALITY INSPECTION

Finished Parts are 100% electrically tested

TERMINATION

All finishes are compatible with automatic soldering technologies: Pb free reflow, wave soldering, vapor phase, and manual soldering.

OPERATING TEMPERATURE

-55°C to +85°C

Multilayer Organic (MLO®)

Low Pass Filter

ELECTRICAL SPECIFICATIONS

Part Number	IL < 1.2dB Passband DC - f_0 (GHz)	Typical 3dB (GHz)	20dB Rejection		30dB Rejection		40dB Rejection		Power (W)
			Min (GHz)	Max (GHz)	Min (GHz)	Max (GHz)	Min (GHz)	Max (GHz)	
LP0DA0410A700	0.41	0.49	0.55	9.00	0.57	5.06	0.58	4.28	4
LP0CA0550A700	0.55	0.66	0.77	9.00	0.79	9.00	0.81	6.22	4
LP0FA0600A700	0.60	0.77	0.88	9.00	0.91	9.00	0.94	9.00	4
LP0BA0790A700	0.79	0.94	1.05	9.00	1.08	9.00	1.10	7.69	4
LP0BA0960A700	0.96	1.13	1.28	4.61	1.32	4.34	1.36	3.57	4
LP0BA1010A700	1.01	1.22	1.36	4.64	1.40	4.35	1.44	3.60	4
LP0BA1030A700	1.03	1.30	1.52	9.00	1.60	6.47	1.68	6.34	4
LP0BA1220A700	1.22	1.37	1.50	9.00	1.53	5.72	1.63	5.64	4
LP0BA1330A700	1.33	1.52	1.67	9.00	1.69	6.10	1.75	6.00	4
LP0BA1390A700	1.39	1.57	1.73	9.00	1.76	6.15	1.84	6.05	4
LP0AA1610A700	1.61	1.80	2.08	9.00	2.18	9.00	2.26	8.73	4
LP0DA1780A700	1.78	1.96	2.12	9.00	2.15	5.93	2.32	4.85	4
LP0DA1800A700	1.80	2.02	2.16	6.48	2.21	6.07	2.38	5.00	4
LP0DA1810A700	1.81	2.04	2.20	9.00	2.26	6.13	2.43	4.95	4
LP0DA1840A700	1.84	2.04	2.20	9.00	2.23	6.21	2.39	5.01	4
LP0DA1880A700	1.88	2.05	2.19	9.00	2.25	6.39	2.42	5.24	4
LP0DA1890A700	1.89	2.13	2.33	9.00	2.35	8.82	2.52	6.68	4
LP0DA1950A700	1.95	2.20	2.46	9.00	2.49	9.00	2.51	6.96	4
LP0DA2100A700	2.10	2.35	2.58	9.00	2.63	9.00	2.67	5.22	4
LP0DA2140A700	2.14	2.38	2.60	9.00	2.67	9.00	2.69	5.34	4
LP0DA2160A700	2.16	2.39	2.62	9.00	2.65	9.00	2.70	5.39	4
LP0DA2190A700	2.19	2.41	2.68	6.50	2.73	6.50	2.76	6.50	4
LP0DA2200A700	2.20	2.48	2.72	9.00	2.75	9.00	2.82	5.31	4
LP0DA2210A700	2.21	2.60	2.89	9.00	2.92	9.00	2.95	8.59	4
LP0DA2260A700	2.26	2.50	2.76	9.00	2.81	9.00	2.85	5.44	4
LP0AA2300A700	2.30	2.56	2.96	9.00	3.08	9.00	3.20	9.00	4
LP0AA3160A700	3.16	3.47	4.14	9.00	4.28	9.00	4.38	9.00	4
LP0AA4370A700	4.37	4.84	5.61	9.00	5.93	9.00	6.20	9.00	4
LP0AA6160A700	6.16	7.09	8.17	9.00	8.45	9.00	8.67	9.00	4

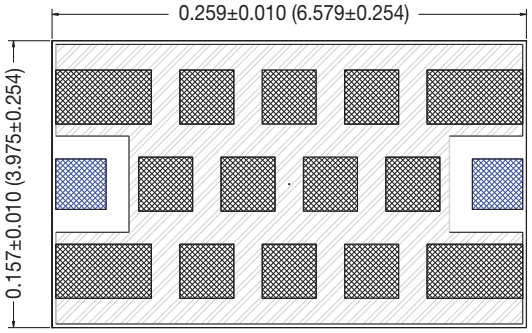
Letter	C	E	K
Max. Thickness	0.022 (0.56)	0.028 (0.71)	0.040 (1.02)

Inches (mm)

Multilayer Organic (MLO®)

LP0AA1610A700

DIMENSIONS A Inches (mm)

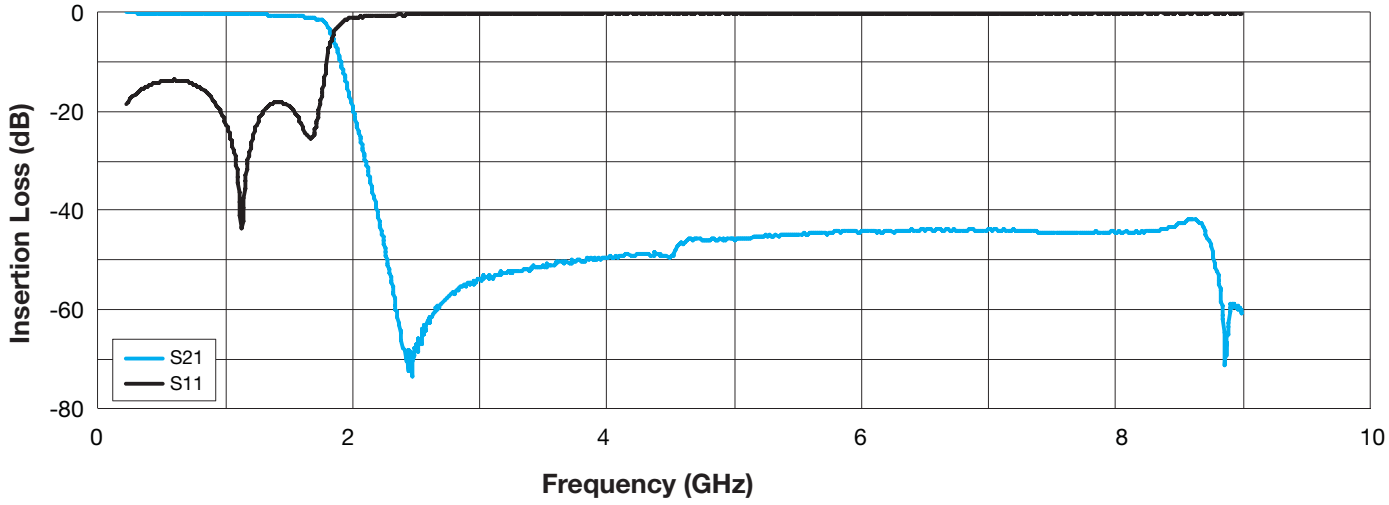


Bottom View

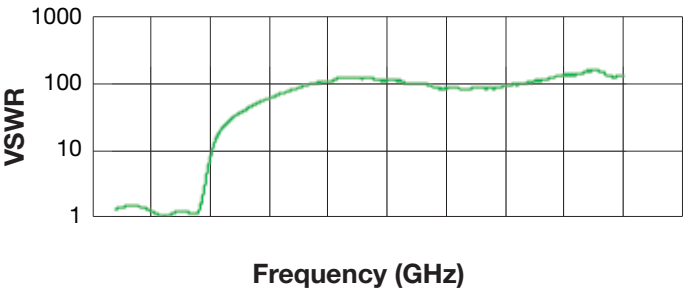
Side View

Passband		
DC - 1.61 GHz	1.2 dB	Max
DC - 1.61 GHz	0.89 dB	Typ
3dB	1.80 GHz	Typ
VSWR	1.14:1	Typ
Stopband		
20 dB	2.08 - 9.00 GHz	Min
30 dB	2.18 - 9.00 GHz	Min
40 dB	2.26 - 8.73 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



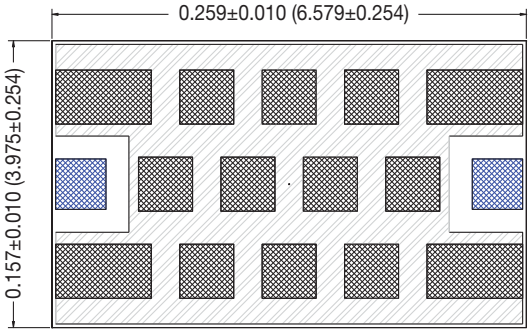
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.33	-0.49	1.25	-19.16
1.65	-0.99	1.12	-25.24
1.74	-1.47	1.24	-19.54
1.77	-1.91	1.46	-14.58
1.78	-2.11	1.57	-13.06
1.80	-2.51	1.81	-10.84
2.01	-20.53	15.70	-1.11
2.11	-30.30	22.17	-0.78
2.19	-40.16	26.51	-0.66
7.00	-44.00	93.61	-0.19
8.46	-43.15	106.64	-0.16

Multilayer Organic (MLO®)

LP0AA2300A700

DIMENSIONS A Inches (mm)

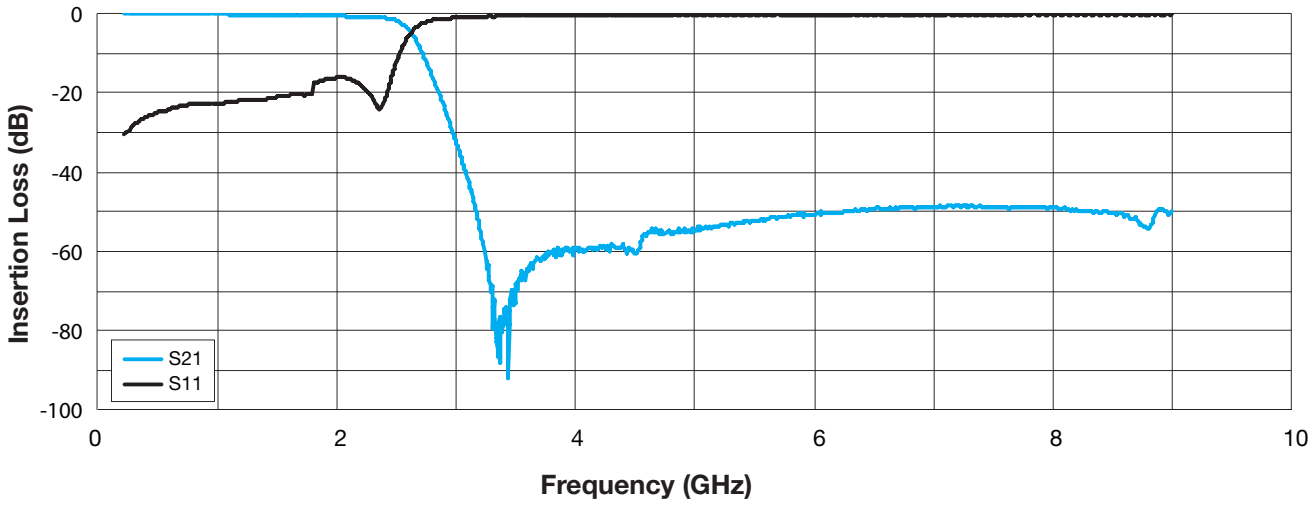


Bottom View

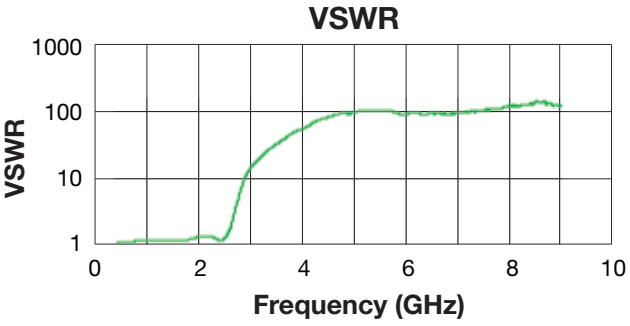
Passband		
DC - 2.30 GHz	1.2 dB	Max
DC - 2.30 GHz	0.83 dB	Typ
3dB	2.56 GHz	Typ
VSWR	1.30:1	Typ
Stopband		
20 dB	2.96 - 9.00 GHz	Min
30 dB	3.08 - 9.00 GHz	Min
40 dB	3.20 - 9.00 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Side View

Typical Frequency Response



VSWR



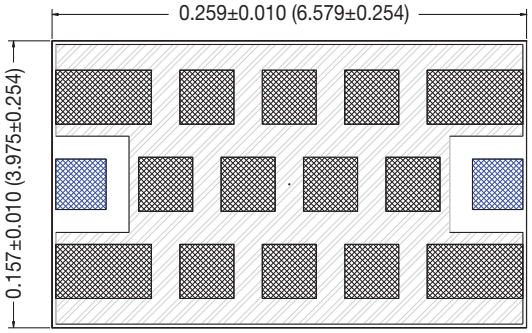
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.90	-0.49	1.35	-16.58
2.38	-0.98	1.14	-23.76
2.47	-1.49	1.44	-14.95
2.51	-1.99	1.76	-11.19
2.54	-2.44	2.07	-9.16
2.56	-2.96	2.38	-7.80
2.86	-20.10	12.83	-1.36
2.98	-30.28	17.18	-1.01
3.08	-40.34	20.96	-0.83
7.00	-48.32	105.93	-0.16
8.00	-49.04	70.75	-0.25

Multilayer Organic (MLO®)

LP0AA3160A700

DIMENSIONS A Inches (mm)

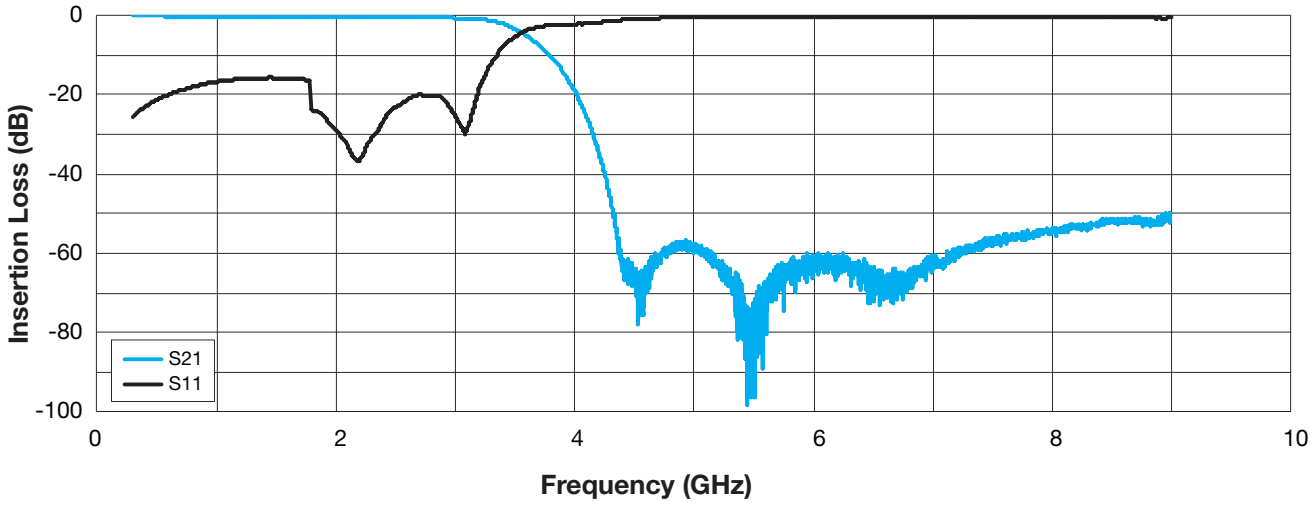


Bottom View

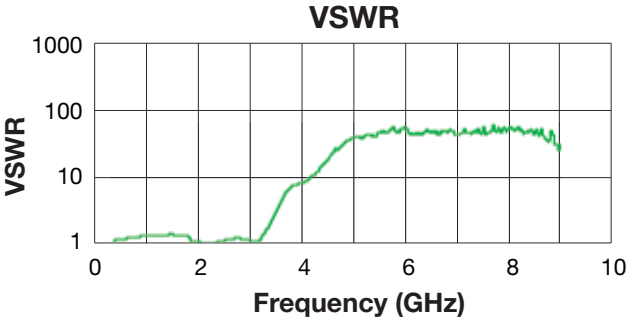
Side View

Passband		
DC - 3.16 GHz	1.2 dB	Max
DC - 3.16 GHz	0.83 dB	Typ
3dB	3.47 GHz	Typ
VSWR	1.17:1	Typ
Stopband		
20 dB	4.14 - 9.00 GHz	Min
30 dB	4.28 - 9.00 GHz	Min
40 dB	4.38 - 9.00 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



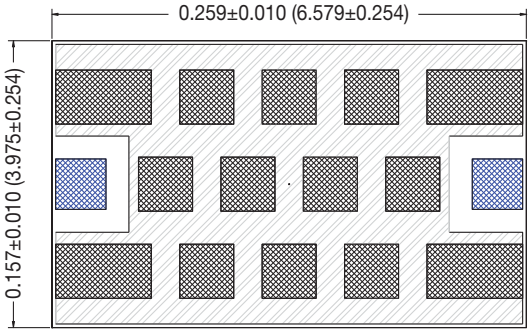
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
2.69	-0.49	1.22	-20.02
3.23	-1.00	1.37	-16.22
3.33	-1.50	1.80	-10.88
3.39	-1.98	2.26	-8.25
3.44	-2.50	2.68	-6.81
3.47	-2.99	3.06	-5.89
4.02	-20.01	8.21	-2.13
4.15	-30.03	9.94	-1.75
4.25	-40.16	11.87	-1.47
7.00	-63.71	49.89	-0.35
8.00	-54.05	64.65	-0.27

Multilayer Organic (MLO®)

LP0AA4370A700

DIMENSIONS A Inches (mm)

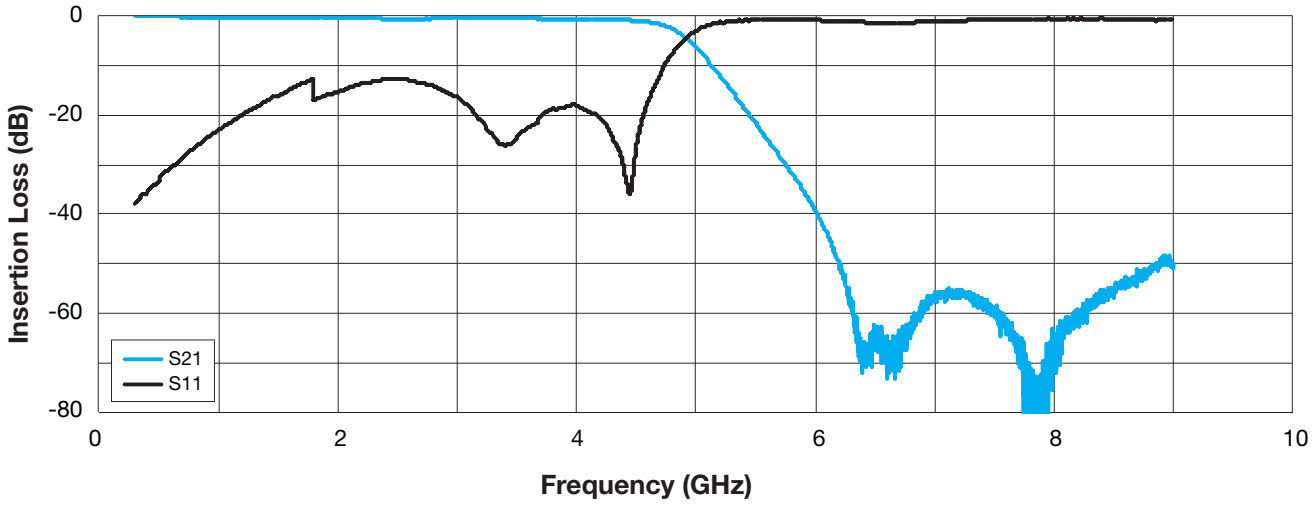


Bottom View

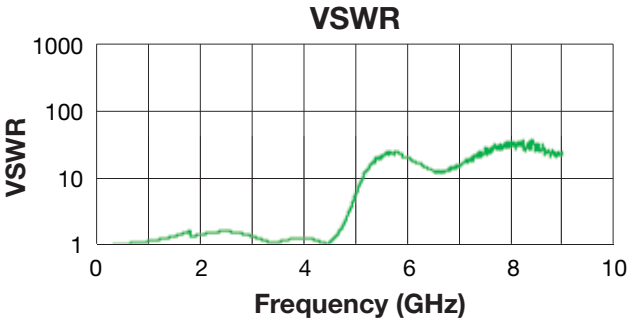
Passband		
DC - 4.37 GHz	1.2 dB	Max
DC - 4.37 GHz	0.81 dB	Typ
3dB	4.84 GHz	Typ
VSWR	1.08:1	Typ
Stopband		
20 dB	5.61 - 9.00 GHz	Min
30 dB	5.93 - 9.00 GHz	Min
40 dB	6.20 - 9.00 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Side View

Typical Frequency Response



VSWR



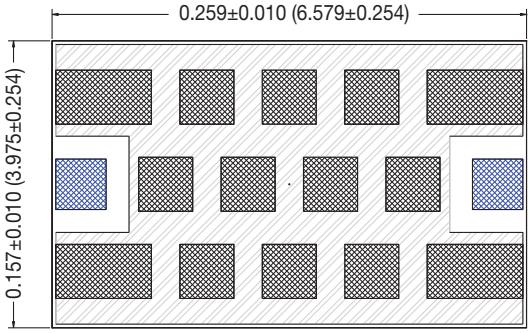
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
2.33	-0.50	1.57	-13.06
4.51	-0.99	1.12	-24.97
4.67	-1.49	1.56	-13.15
4.74	-2.00	1.98	-9.67
4.79	-2.49	2.37	-7.81
4.84	-3.08	2.85	-6.36
5.45	-20.03	19.56	-0.89
5.75	-30.07	24.49	-0.71
6.02	-40.14	20.08	-0.87
7.00	-57.25	15.85	-1.10
8.00	-69.96	35.08	-0.50

Multilayer Organic (MLO®)

LP0AA6160A700

DIMENSIONS A Inches (mm)

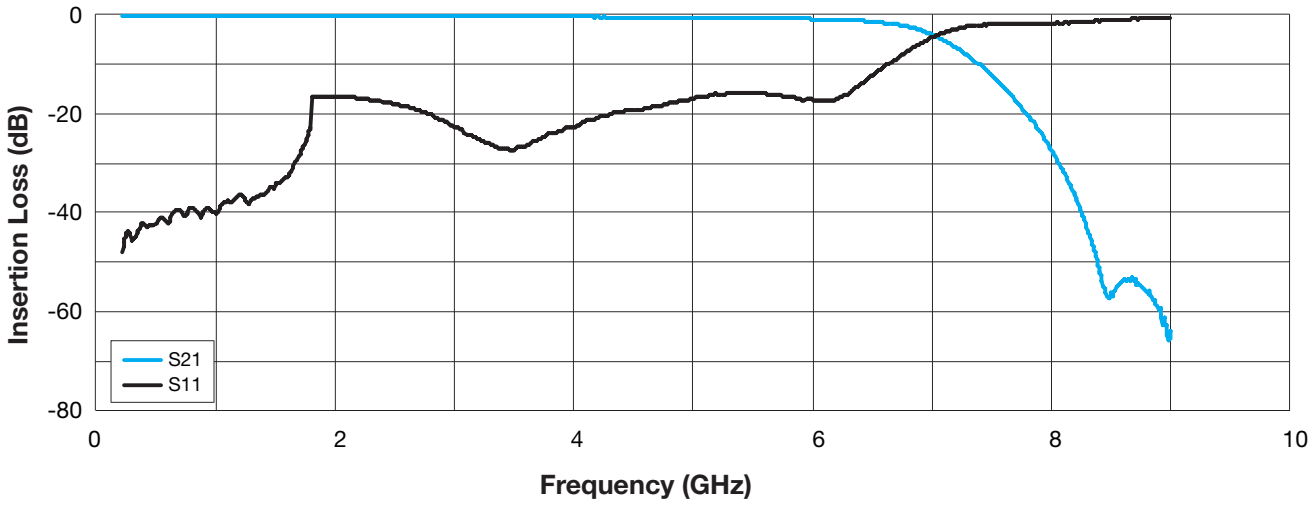


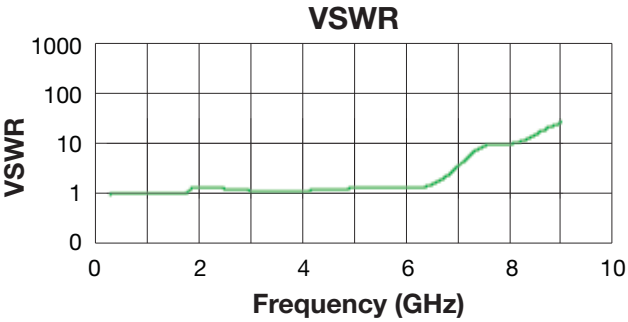
Bottom View

Passband		
DC - 6.16 GHz	1.2 dB	Max
DC - 6.16 GHz	0.98 dB	Typ
3dB	7.09 GHz	Typ
VSWR	1.46:1	Typ
Stopband		
20 dB	8.17 - 9.00 GHz	Min
30 dB	8.45 - 9.00 GHz	Min
40 dB	8.67 - 9.00 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Side View

Typical Frequency Response





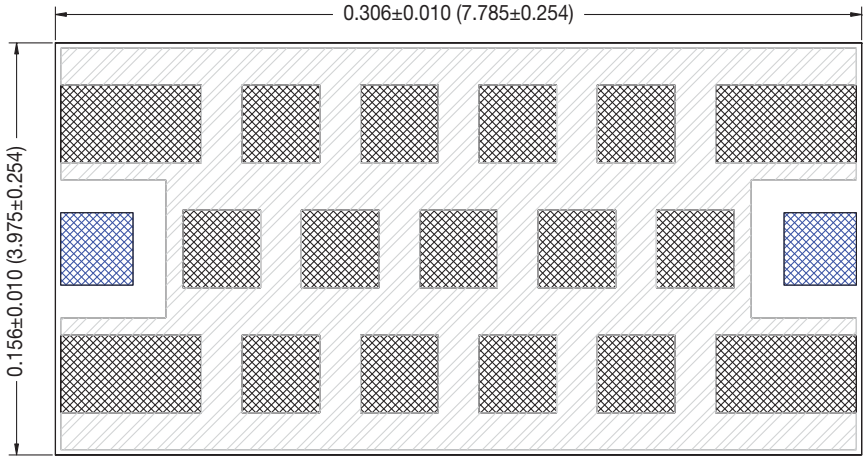
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
5.74	-0.49	1.45	-14.75
6.35	-1.00	1.31	-17.49
6.71	-1.49	1.30	-17.64
6.90	-1.87	1.34	-16.66
7.01	-2.34	1.38	-15.99
7.09	-2.79	1.39	-15.82
7.93	-20.04	4.02	-4.41
8.21	-30.77	11.74	-1.48
8.42	-40.37	34.92	-0.50
8.60	-39.99	87.48	-0.20
8.80	-29.94	193.20	-0.09

Multilayer Organic (MLO®)

LP0BA0790A700

DIMENSIONS B Inches (mm)

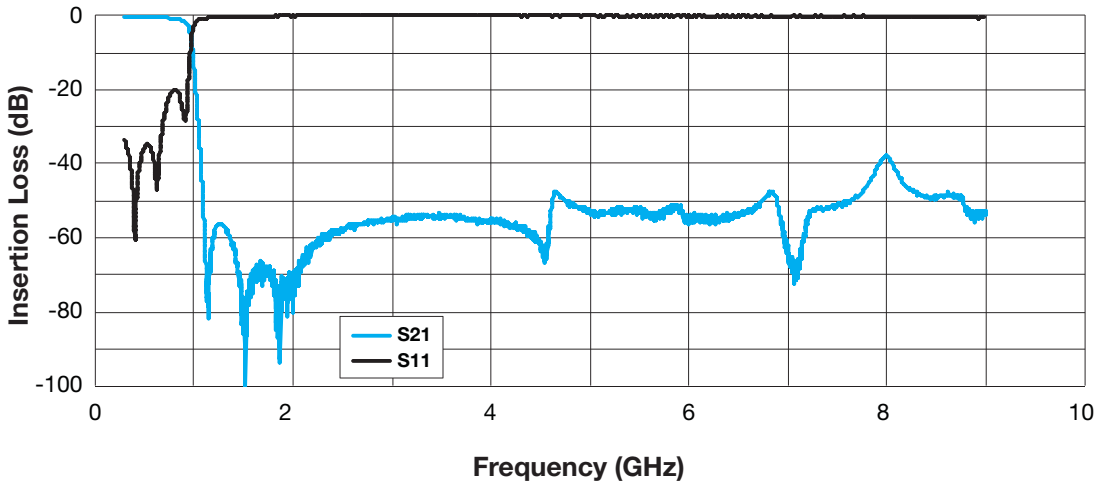


Bottom View

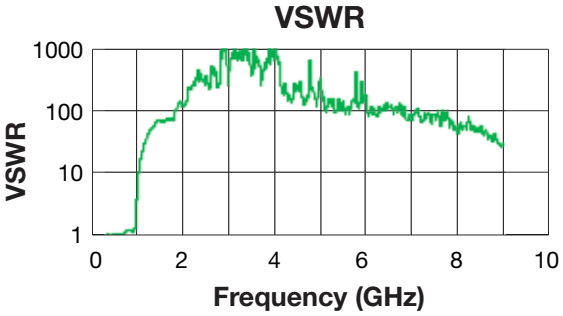
Side View

Passband		
DC - 0.79 GHz	1.2 dB	Max
DC - 0.79 GHz	0.88 dB	Typ
3dB	0.94 GHz	Typ
VSWR	1.22:1	Typ
Stopband		
20 dB	1.05 - 9.00 GHz	Min
30 dB	1.08 - 9.00 GHz	Min
40 dB	1.10 - 7.69 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



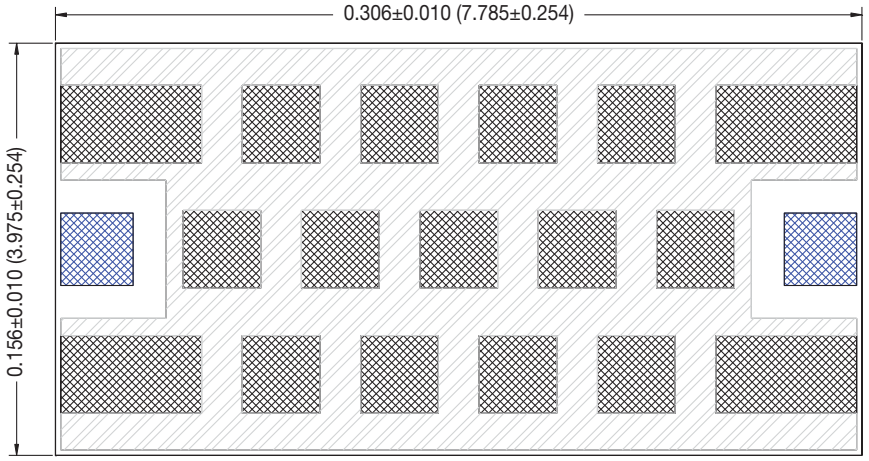
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
0.64	-0.50	1.02	-41.24
0.82	-0.99	1.22	-20.06
0.89	-1.50	1.10	-26.45
0.92	-1.99	1.08	-28.04
0.93	-2.46	1.17	-21.98
0.94	-2.94	1.33	-17.01
1.02	-20.06	9.33	-1.87
1.04	-30.07	13.50	-1.29
1.07	-40.04	17.85	-0.97
7.92	-39.96	44.77	-0.39
8.00	-37.96	47.49	-0.37

Multilayer Organic (MLO®)

LP0BA0960A700

DIMENSIONS B Inches (mm)



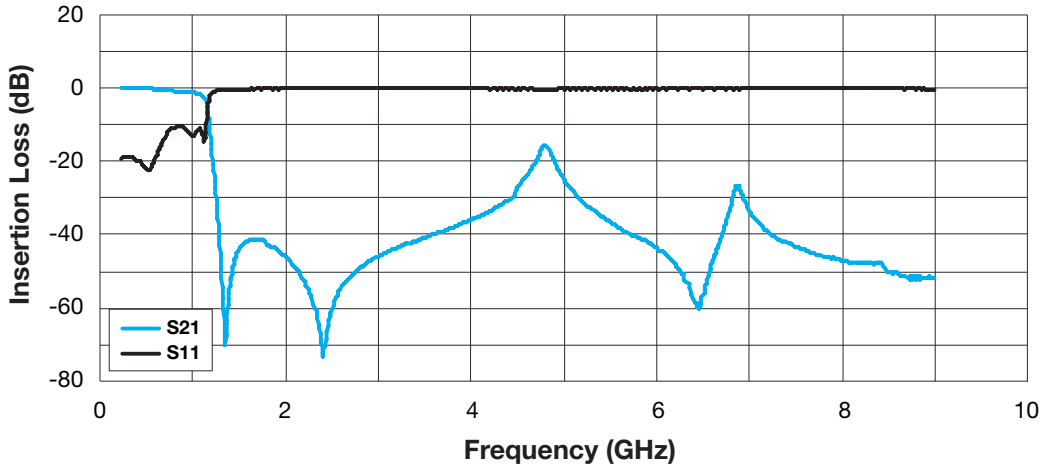
Bottom View

Side View

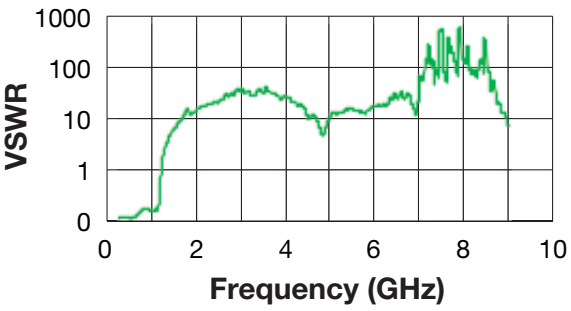
<0.022 (0.559)

Passband		
DC - 0.96 GHz	1.2 dB	Max
DC - 0.96 GHz	0.95 dB	Typ
3dB	1.13 GHz	Typ
VSWR	1.64:1	Typ
Stopband		
20 dB	1.28 - 4.61 GHz	Min
30 dB	1.32 - 4.34 GHz	Min
40 dB	1.36 - 3.57 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



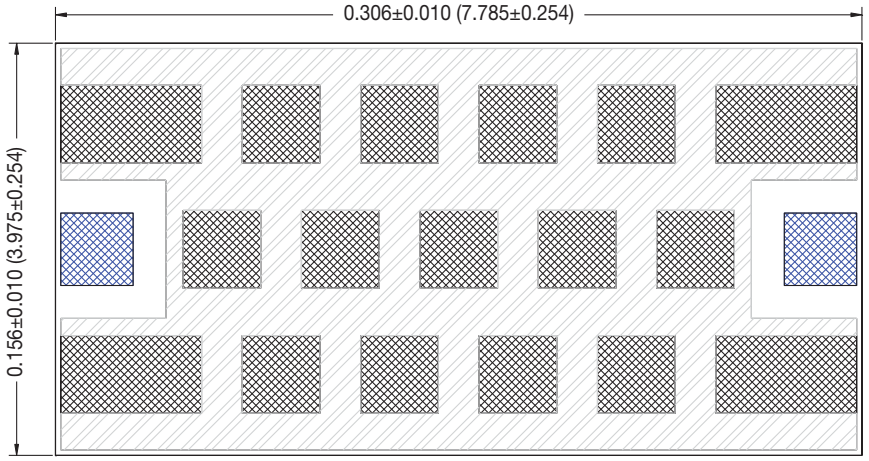
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
0.72	-0.50	1.64	-12.35
0.98	-0.99	1.59	-12.82
1.05	-1.46	1.72	-11.51
1.11	-1.98	1.56	-13.18
1.12	-2.39	1.46	-14.60
1.13	-2.66	1.53	-13.61
1.22	-21.14	15.68	-1.11
1.25	-30.35	24.06	-0.72
1.28	-40.87	29.04	-0.60
3.58	-39.99	416.11	-0.04
4.69	-19.96	102.34	-0.17

Multilayer Organic (MLO®)

LP0BA1010A700

DIMENSIONS B Inches (mm)



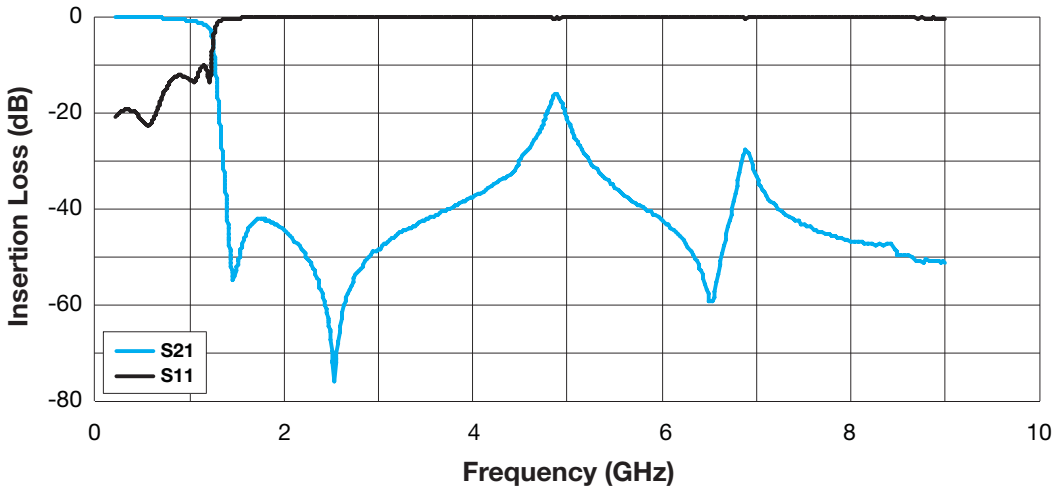
Bottom View

Side View

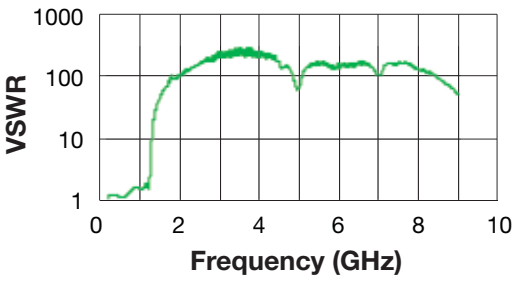
<0.022 (0.559)

Passband		
DC - 1.01 GHz	1.2 dB	Max
DC - 1.01 GHz	0.81 dB	Typ
3dB	1.22 GHz	Typ
VSWR	1.58:1	Typ
Stopband		
20 dB	1.36 - 5.00 GHz	Min
30 dB	1.40 - 4.35 GHz	Min
40 dB	1.44 - 3.60 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



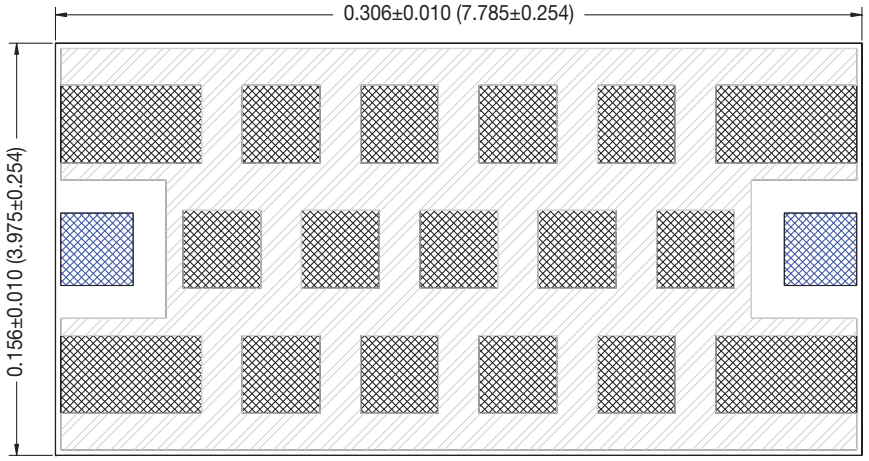
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
0.81	-0.49	1.55	-19.66
1.05	-0.95	1.54	-19.42
1.12	-1.40	1.80	-19.37
1.21	-2.25	1.50	-19.38
1.22	-2.46	1.58	-19.38
1.32	-19.14	1.60	-19.38
1.35	-30.16	8.09	-19.38
1.40	-40.58	12.80	-19.42
3.75	-40.21	22.79	-13.03
4.49	-30.18	76.10	-0.74
4.79	-20.04	29.36	-0.36

Multilayer Organic (MLO®)

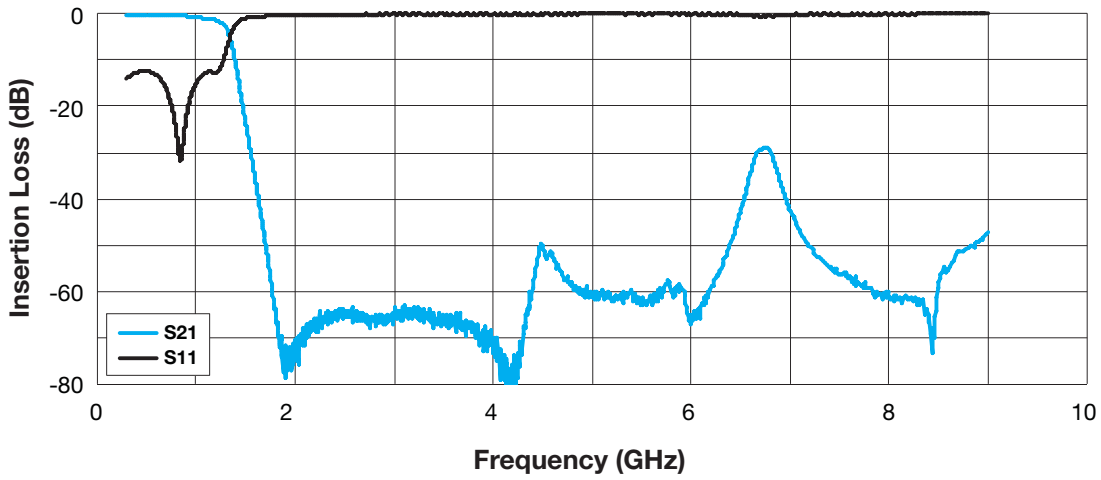
LP0BA1030A700

DIMENSIONS B Inches (mm)

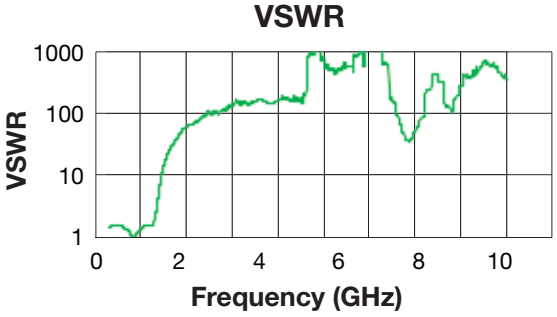


Passband		
DC - 1.03 GHz	1.2 dB	Max
DC - 1.03 GHz	0.86 dB	Typ
3dB	1.30 GHz	Typ
VSWR	1.58:1	Typ
Stopband		
20 dB	1.52 - 9.00 GHz	Min
30 dB	1.60 - 6.47 GHz	Min
40 dB	1.68 - 6.34 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



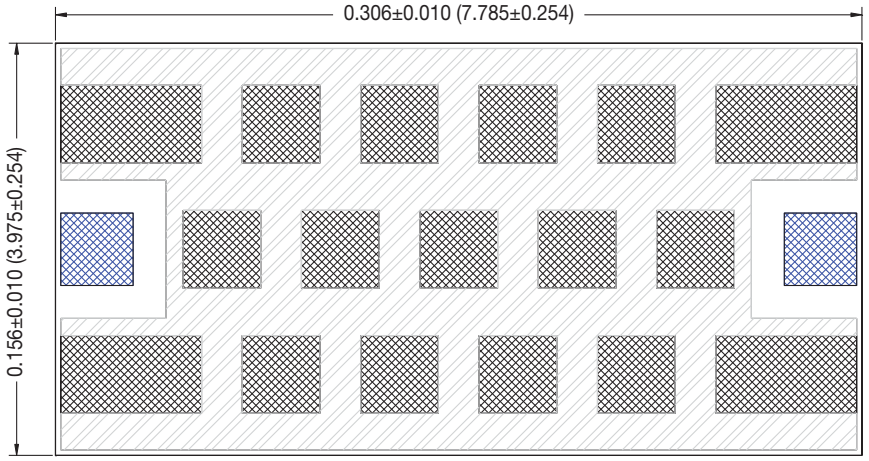
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
0.88	-0.50	1.12	-25.03
1.08	-1.00	1.60	-12.72
1.22	-1.50	1.62	-12.49
1.26	-1.98	1.79	-10.99
1.28	-2.50	2.03	-9.38
1.30	-2.98	2.27	-8.20
1.47	-20.01	14.01	-1.24
1.55	-30.22	20.21	-0.86
1.63	-40.19	26.93	-0.65
6.54	-39.80	65.79	-0.26
6.67	-29.85	38.58	-0.45

Multilayer Organic (MLO®)

LP0BA1220A700

DIMENSIONS B Inches (mm)



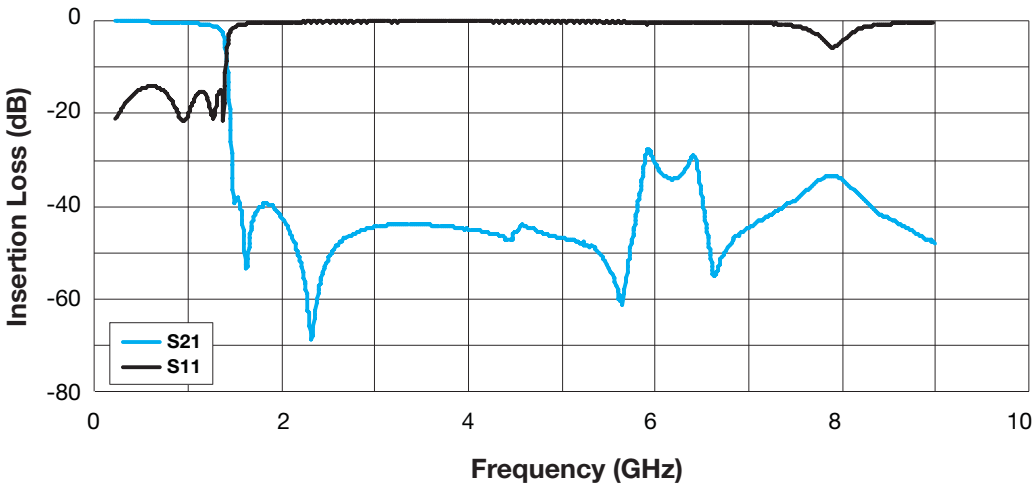
Bottom View

Side View

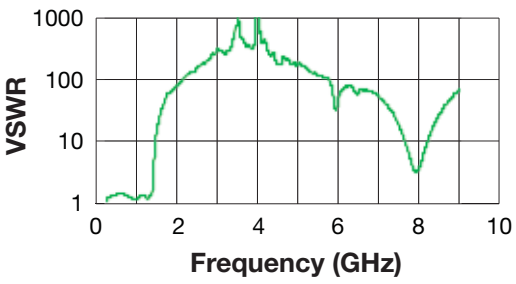
<0.022 (0.559)

Passband		
DC - 1.22 GHz	1.2 dB	Max
DC - 1.22 GHz	0.81 dB	Typ
3dB	1.37 GHz	Typ
VSWR	1.30:1	Typ
Stopband		
20 dB	1.50 - 9.00 GHz	Min
30 dB	1.53 - 5.72 GHz	Min
40 dB	1.63 - 5.64 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



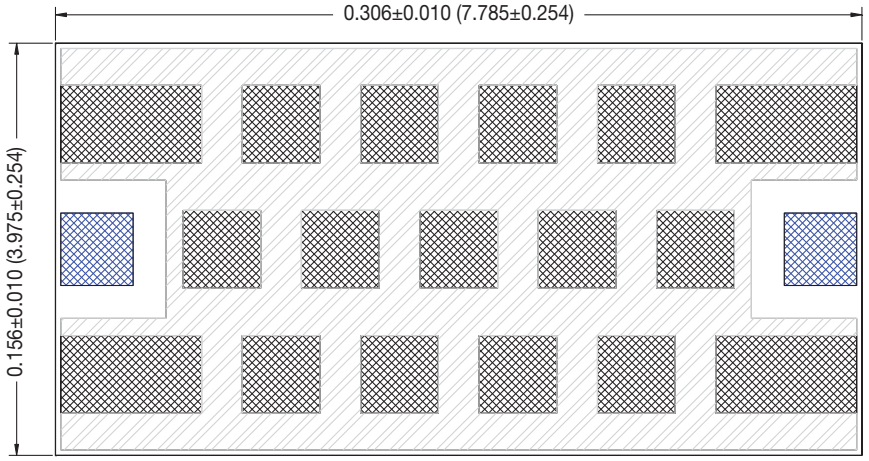
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.10	-0.49	1.39	-15.74
1.26	-0.99	1.19	-21.05
1.31	-1.42	1.31	-17.39
1.34	-1.98	1.45	-14.68
1.36	-2.39	1.41	-15.37
1.37	-2.75	1.31	-17.50
1.45	-21.16	7.77	-2.25
1.47	-31.08	11.07	-1.57
1.56	-40.32	24.39	-0.71
5.81	-39.67	99.48	-0.18
5.90	-29.48	29.91	-0.58

Multilayer Organic (MLO®)

LP0BA1330A700

DIMENSIONS B Inches (mm)

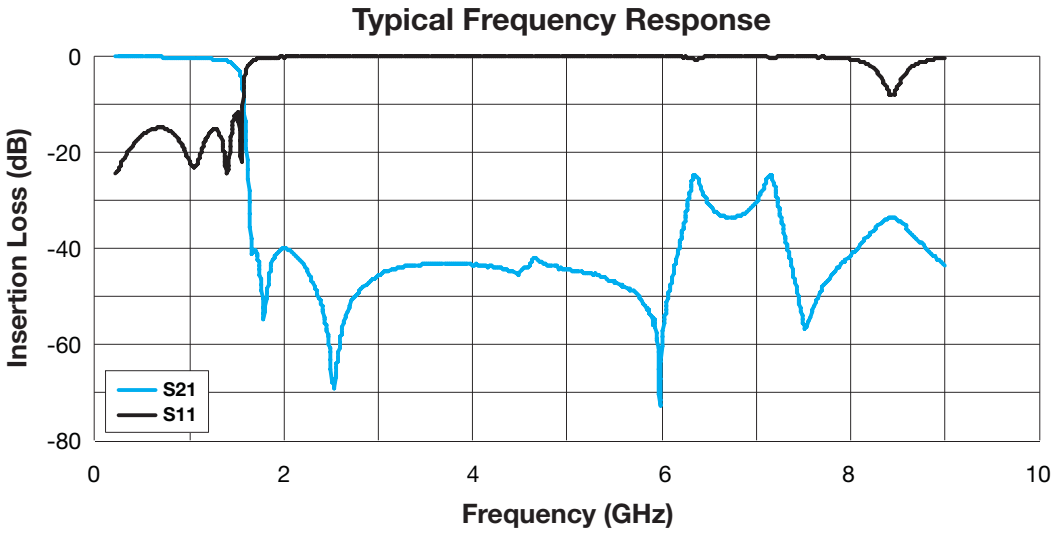


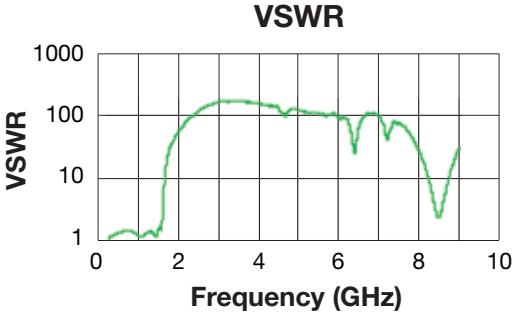
Bottom View

Side View

<0.022 (0.559)

Passband		
DC - 1.33 GHz	1.2 dB	Max
DC - 1.33 GHz	0.91 dB	Typ
3dB	1.52 GHz	Typ
VSWR	1.3:1	Typ
Stopband		
20 dB	1.67 - 9.00 GHz	Min
30 dB	1.69 - 6.10 GHz	Min
40 dB	1.75 - 6.00 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max





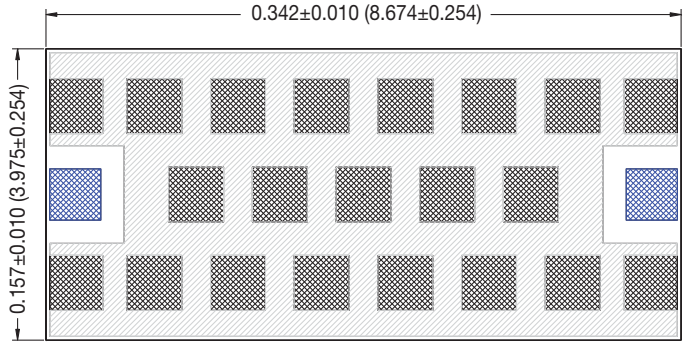
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.13	-0.50	1.24	-19.61
1.40	-1.00	1.13	-24.72
1.44	-1.45	1.34	-16.82
1.47	-1.91	1.57	-13.11
1.50	-2.45	1.72	-11.59
1.52	-2.99	1.60	-12.77
1.61	-21.48	8.09	-2.16
1.64	-30.41	12.80	-1.36
1.70	-40.03	22.79	-0.76
6.20	-39.87	76.10	-0.18
6.30	-29.59	29.36	-0.59

Multilayer Organic (MLO®)

LP0BA1390A700

DIMENSIONS C Inches (mm)

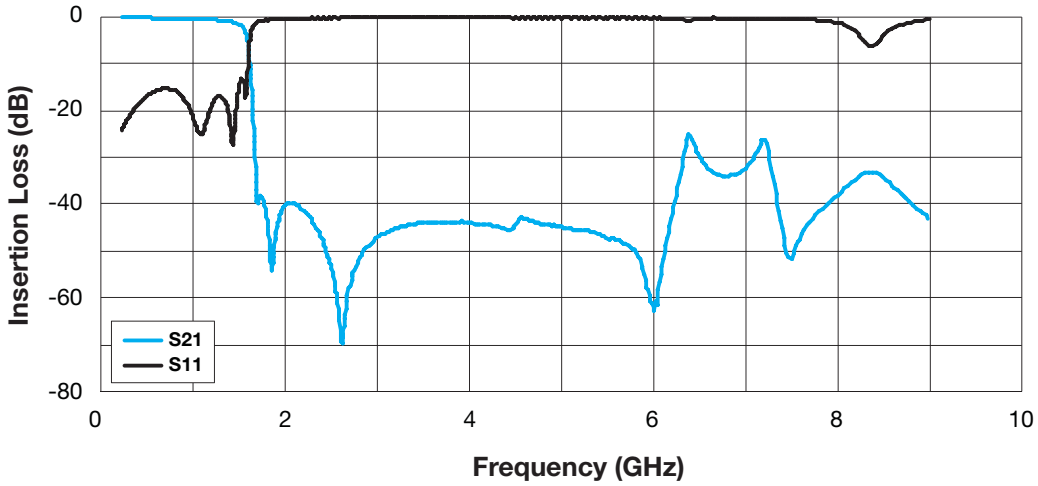


Bottom View

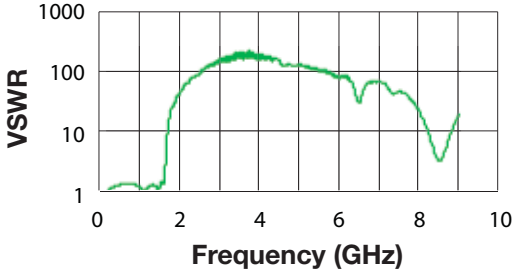
Side View

Passband		
DC - 1.39 GHz	1.2 dB	Max
DC - 1.39 GHz	0.95 dB	Typ
3dB	1.57 GHz	Typ
VSWR	1.21:1	Typ
Stopband		
20 dB	1.73 - 9.00 GHz	Min
30 dB	1.76 - 6.15 GHz	Min
40 dB	1.84 - 6.05 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



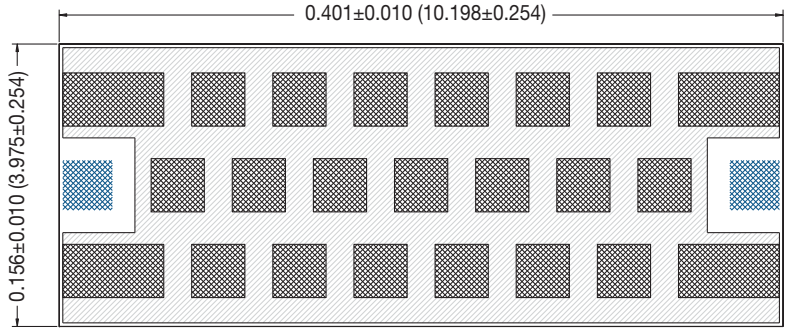
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.20	-0.50	1.25	-19.16
1.45	-0.99	1.10	-26.64
1.51	-1.73	1.46	-14.54
1.54	-2.19	1.57	-13.11
1.56	-2.66	1.48	-14.28
1.66	-20.88	8.85	-1.97
1.71	-30.16	17.57	-0.99
1.73	-38.35	19.73	-0.88
3.75	-43.91	102.87	-0.17
6.30	-33.71	40.72	-0.43
6.40	-25.42	23.84	-0.73

Multilayer Organic (MLO®)

LP0CA0550A700

DIMENSIONS D Inches (mm)

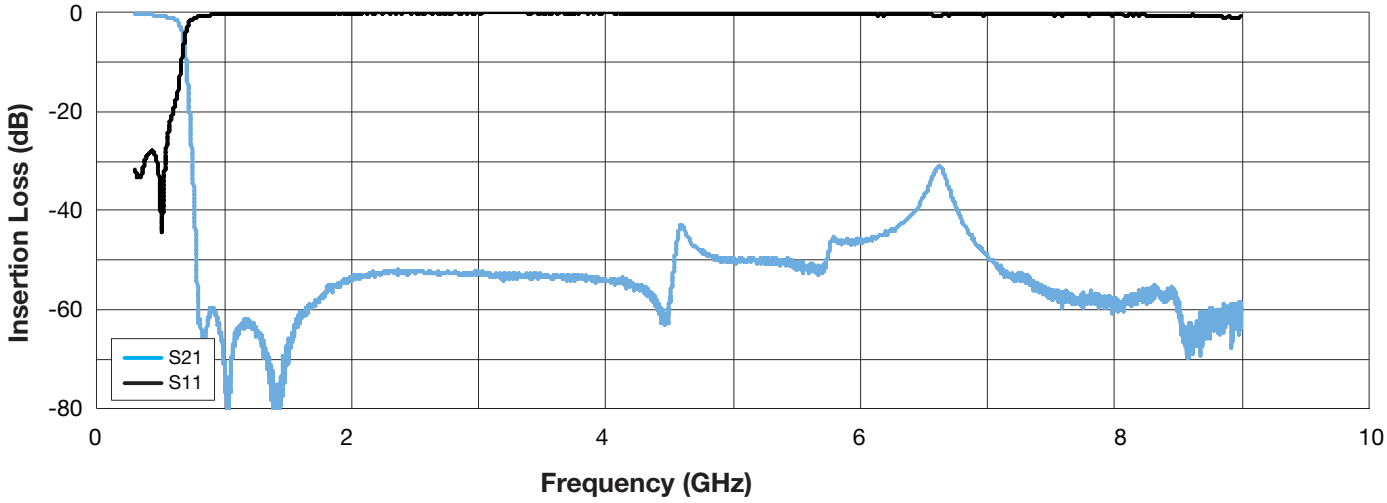


Bottom View

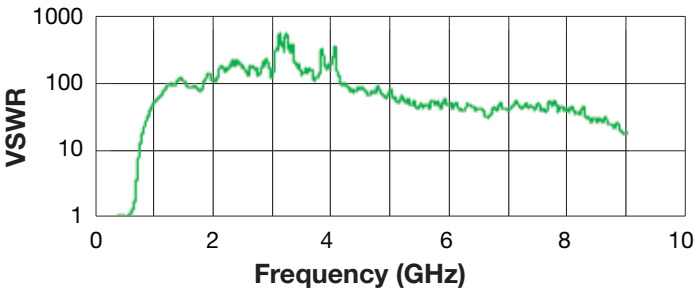
Side View

Passband		
DC - 0.55 GHz	1.2 dB	Max
DC - 0.55 GHz	0.78 dB	Typ
3dB	0.66 GHz	Typ
VSWR	1.12:1	Typ
Stopband		
20 dB	0.77 - 9.00 GHz	Min
30 dB	0.79 - 9.00 GHz	Min
40 dB	0.81 - 6.22 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



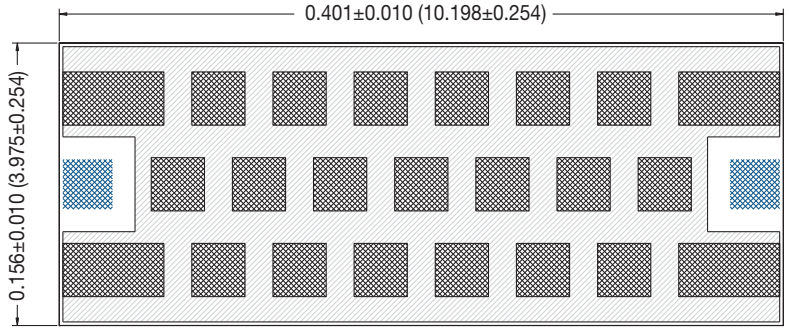
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
0.44	-0.50	1.08	-27.86
0.57	-1.00	1.16	-22.71
0.62	-1.49	1.28	-18.18
0.64	-1.97	1.41	-15.36
0.65	-2.46	1.57	-13.06
0.66	-2.93	1.75	-11.29
0.73	-20.04	8.77	-1.99
0.75	-30.08	12.21	-1.43
0.77	-40.62	14.72	-1.18
6.43	-39.98	45.15	-0.39
8.00	-59.19	43.68	-0.40

Multilayer Organic (MLO®)

LP0DA0410A700

DIMENSIONS D Inches (mm)

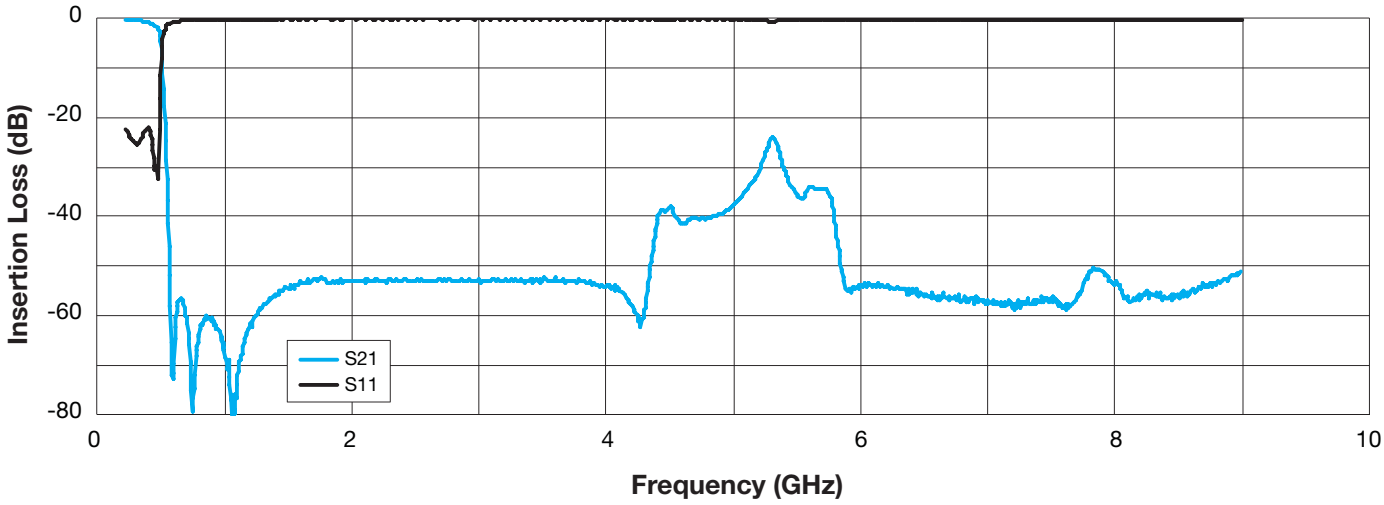


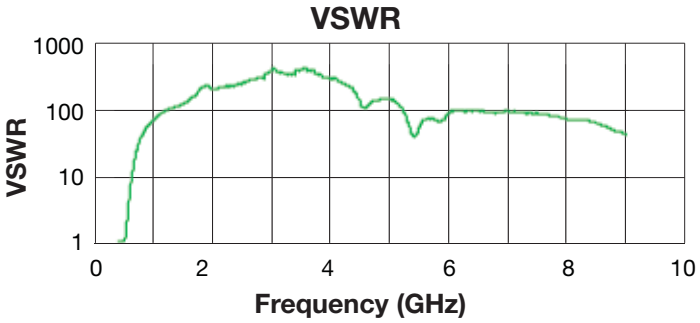
Bottom View

Side View

Passband		
DC - 0.41 GHz	1.2 dB	Max
DC - 0.41 GHz	0.87 dB	Typ
3dB	0.49 GHz	Typ
VSWR	1.18:1	Typ
Stopband		
20 dB	0.55 - 9.00 GHz	Min
30 dB	0.57 - 5.06 GHz	Min
40 dB	0.58 - 4.28 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response





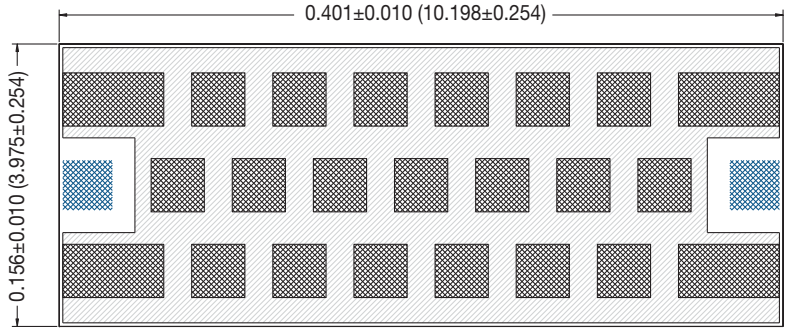
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
0.34	-0.48	1.13	-24.53
0.42	-0.96	1.14	-23.51
0.46	-1.28	1.07	-29.87
0.47	-1.86	1.06	-30.20
0.48	-2.07	1.05	-32.42
0.49	-2.79	1.16	-22.59
0.53	-21.14	8.32	-2.10
0.55	-32.63	12.23	-1.42
0.56	-41.37	14.81	-1.18
4.41	-39.91	75.87	-0.23
5.22	-29.78	77.26	-0.23

Multilayer Organic (MLO®)

LP0DA1780A700

DIMENSIONS D Inches (mm)

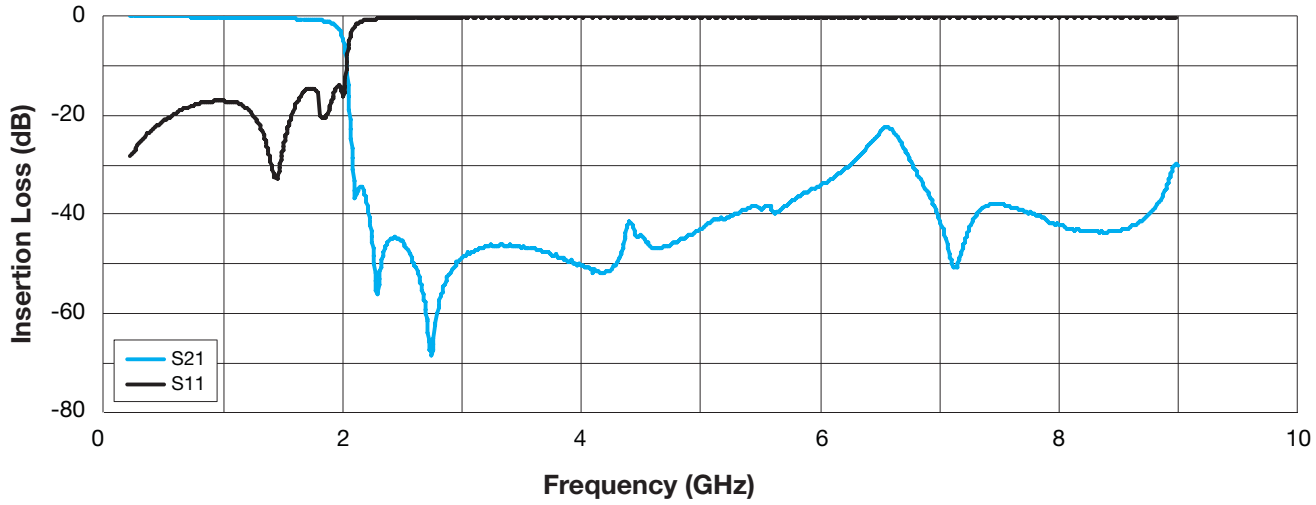


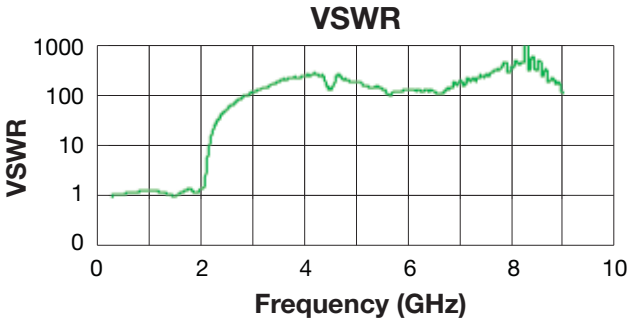
Bottom View

Side View

Passband		
DC - 1.78 GHz	1.2 dB	Max
DC - 1.78 GHz	0.82 dB	Typ
3dB	1.96 GHz	Typ
VSWR	1.31:1	Typ
Stopband		
20 dB	2.12 - 9.00 GHz	Min
30 dB	2.15 - 5.93 GHz	Min
40 dB	2.32 - 4.85 GHz	Min
Dimension		
Thickness	<0.040 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response





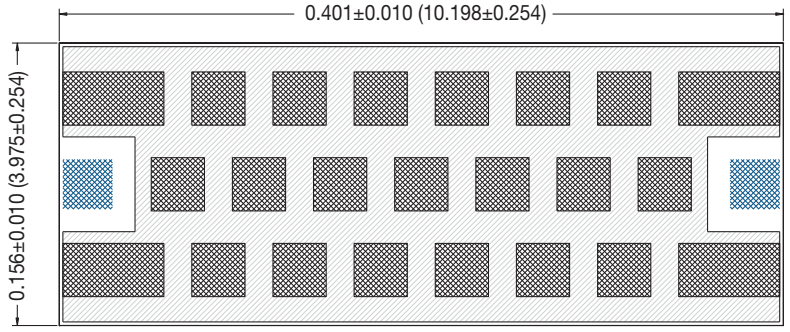
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.62	-0.49	1.31	-17.40
1.85	-0.98	1.21	-20.44
1.91	-1.48	1.35	-16.52
1.94	-1.94	1.47	-14.45
1.96	-2.48	1.52	-13.73
1.98	-2.85	1.51	-13.88
2.06	-21.04	4.29	-4.13
2.09	-30.86	7.39	-2.37
2.22	-40.46	26.24	-0.66
5.00	-42.90	100.23	-0.17
6.25	-29.96	106.15	-0.16

Multilayer Organic (MLO®)

LP0DA1800A700

DIMENSIONS D Inches (mm)

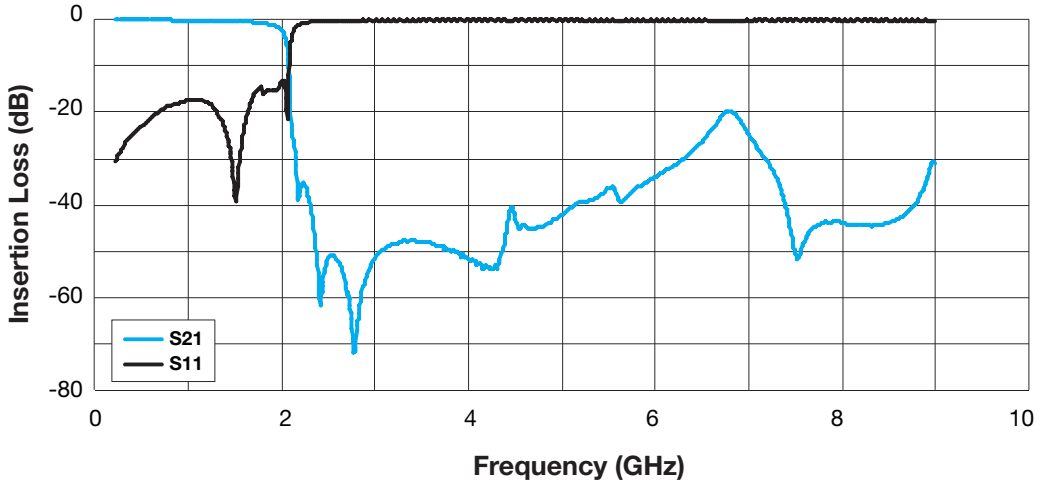


Bottom View

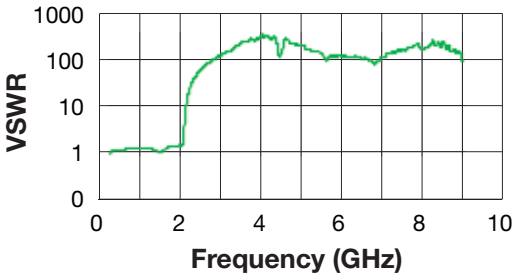
Side View

Passband		
DC - 1.80 GHz	1.2 dB	Max
DC - 1.80 GHz	0.80 dB	Typ
3dB	2.02 GHz	Typ
VSWR	1.42:1	Typ
Stopband		
20 dB	2.16 - 6.48 GHz	Min
30 dB	2.21 - 6.07 GHz	Min
40 dB	2.38 - 5.00 GHz	Min
Dimension		
Thickness	<0.040 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



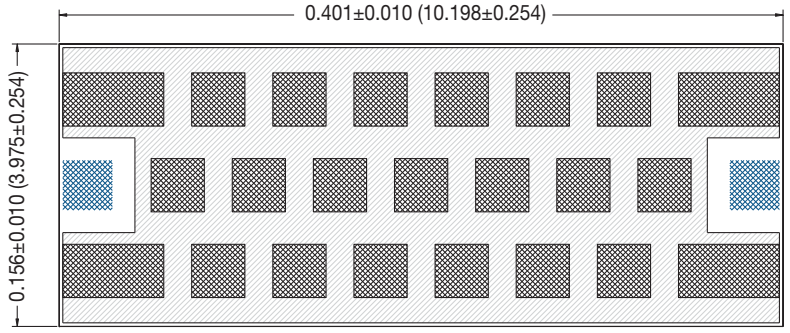
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.66	-0.49	1.28	-18.25
1.87	-0.99	1.42	-15.17
1.95	-1.48	1.43	-14.99
1.98	-1.91	1.50	-13.97
2.00	-2.41	1.56	-13.21
2.02	-2.97	1.57	-13.11
2.10	-20.35	3.51	-5.09
2.15	-31.48	11.07	-1.57
2.31	-40.59	36.30	-0.48
5.15	-39.90	165.33	-0.11
6.76	-19.93	55.01	-0.32

Multilayer Organic (MLO®)

LP0DA1810A700

DIMENSIONS D Inches (mm)

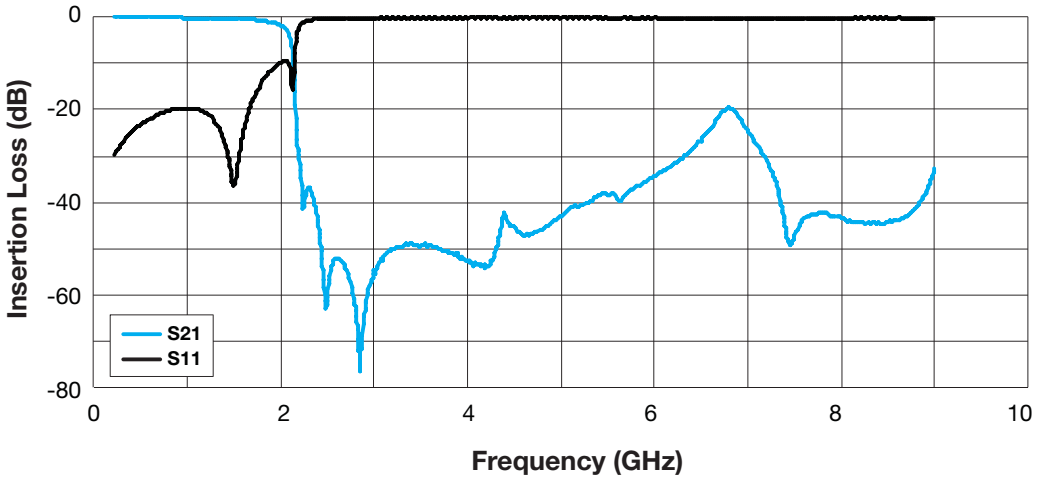


Bottom View

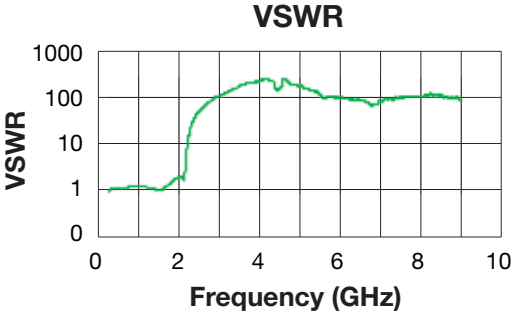
Side View

Passband		
DC - 1.81 GHz	1.2 dB	Max
DC - 1.81 GHz	0.79 dB	Typ
3dB	2.04 GHz	Typ
VSWR	1.67:1	Typ
Stopband		
20 dB	2.20 - 9.00 GHz	Min
30 dB	2.36 - 6.13 GHz	Min
40 dB	2.43 - 4.95 Ghz	Min
Dimension		
Thickness	<0.040 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



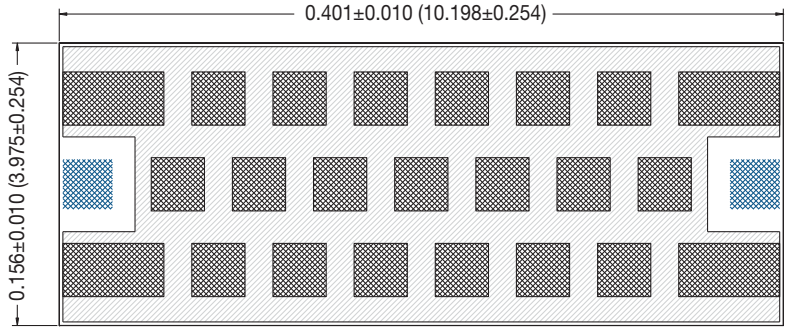
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.70	-0.50	1.52	-13.69
1.87	-0.99	1.20	-20.78
1.96	-1.47	1.35	-16.46
2.01	-1.99	1.24	-19.27
2.05	-2.37	1.23	-19.86
2.07	-2.90	1.41	-15.37
2.16	-20.67	11.76	-1.48
2.20	-31.02	16.52	-1.05
2.36	-40.20	21.68	-0.80
5.29	-39.78	71.12	-0.24
6.32	-29.91	71.09	-0.24

Multilayer Organic (MLO®)

LP0DA1840A700

DIMENSIONS D Inches (mm)

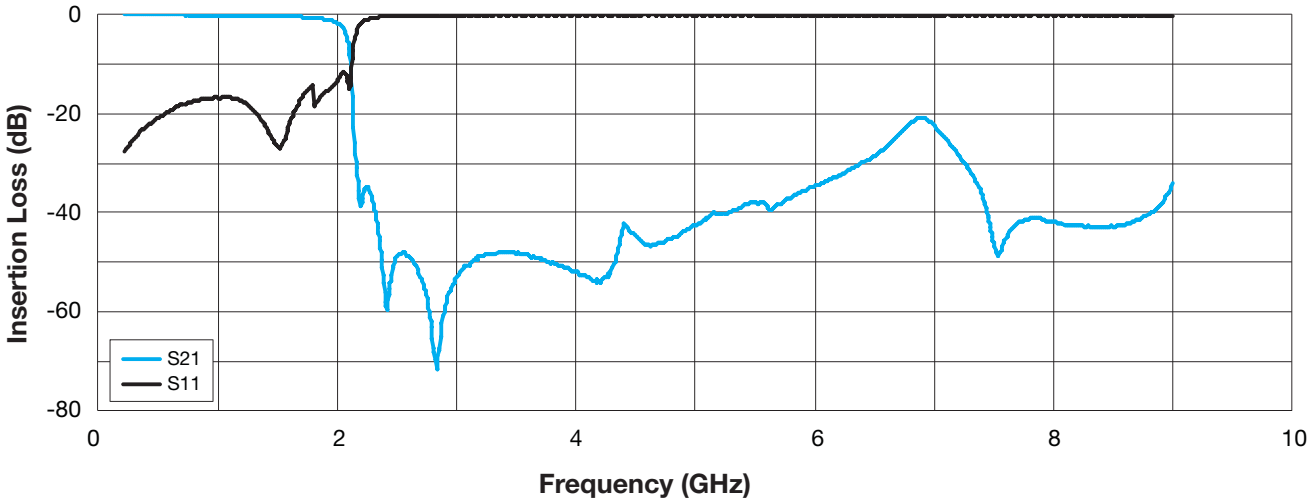


Bottom View

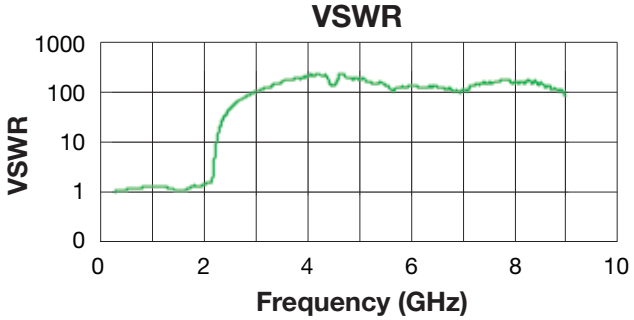
Side View

Passband		
DC - 1.84 GHz	1.2 dB	Max
DC - 1.84 GHz	0.74 dB	Typ
3dB	2.04 GHz	Typ
VSWR	1.39:1	Typ
Stopband		
20 dB	2.20 - 9.00 GHz	Min
30 dB	2.23 - 6.21 GHz	Min
40 dB	2.39 - 5.01 GHz	Min
Dimension		
Thickness	<0.040 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



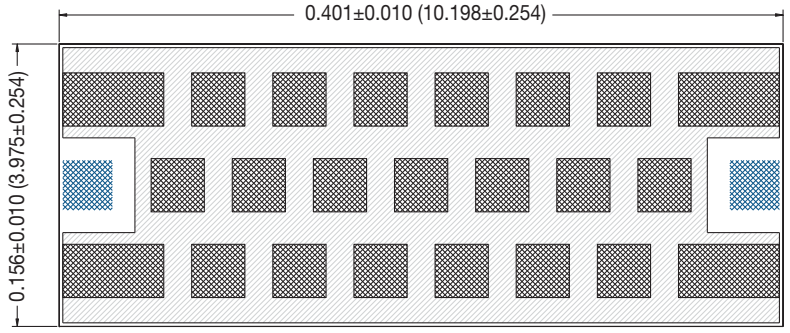
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.69	-0.50	1.32	-17.32
1.91	-0.98	1.40	-15.51
1.98	-1.47	1.50	-13.94
2.01	-1.91	1.60	-12.74
2.04	-2.48	1.69	-11.86
2.05	-2.81	1.70	-11.74
2.14	-22.89	2.97	-6.08
2.16	-30.94	5.32	-3.30
2.32	-40.02	28.54	-0.61
5.16	-39.97	301.66	-0.06
6.40	-29.89	234.38	-0.07

Multilayer Organic (MLO®)

LP0DA1880A700

DIMENSIONS D Inches (mm)

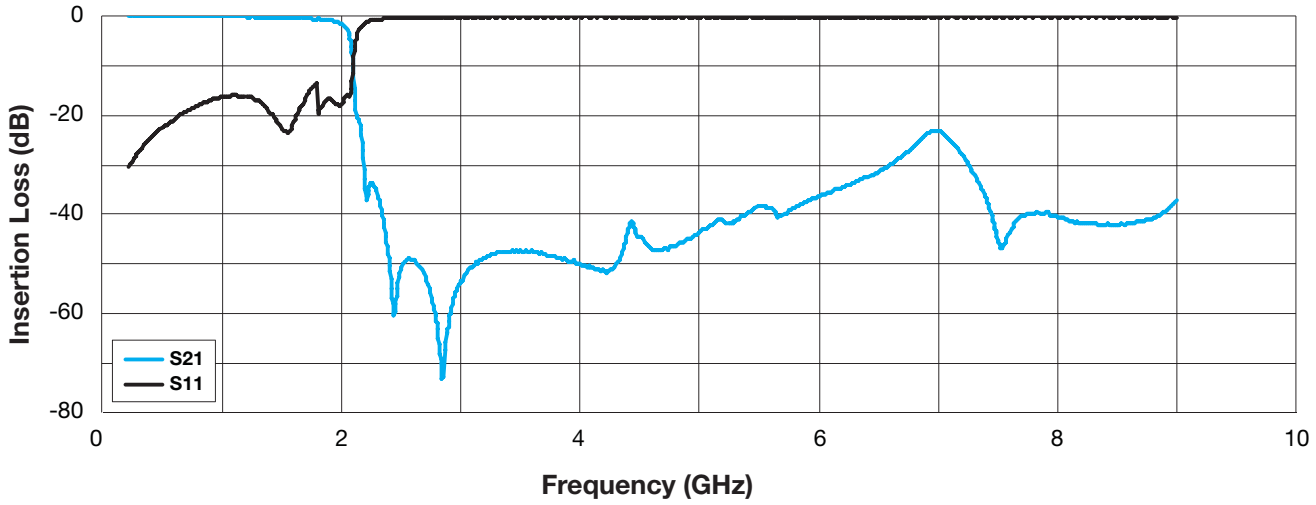


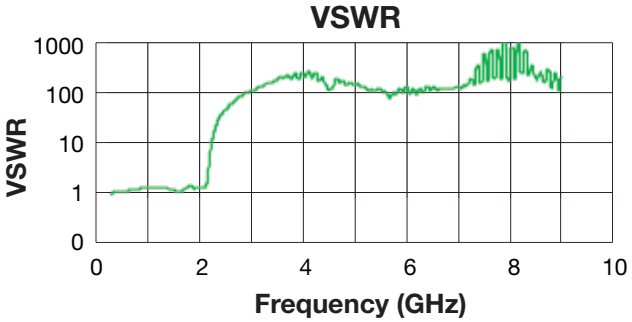
Bottom View

Side View

Passband		
DC - 1.88 GHz	1.2 dB	Max
DC - 1.88 GHz	0.75 dB	Typ
3dB	2.05 GHz	Typ
VSWR	1.43:1	Typ
Stopband		
20 dB	2.19 - 9.00 GHz	Min
30 dB	2.25 - 6.39 GHz	Min
40 dB	2.42 - 5.24 GHz	Min
Dimension		
Thickness	<0.040 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response





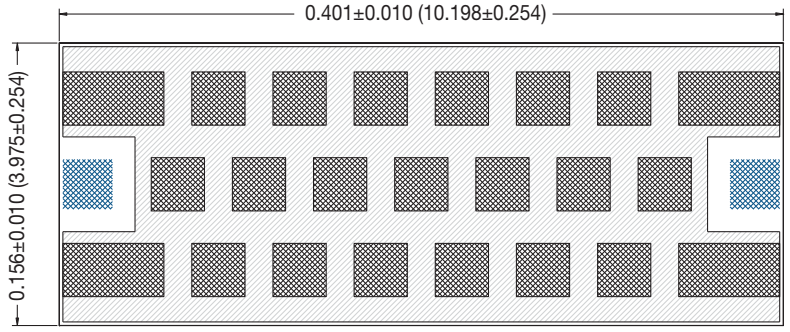
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.74	-0.49	1.45	-14.75
1.95	-1.00	1.31	-17.49
2.00	-1.49	1.30	-17.64
2.02	-1.87	1.34	-16.66
2.04	-2.34	1.38	-15.99
2.05	-2.79	1.39	-15.82
2.13	-20.04	4.02	-4.41
2.19	-30.77	11.74	-1.48
2.35	-40.37	34.92	-0.50
5.40	-39.99	87.48	-0.20
6.59	-29.94	193.20	-0.09

Multilayer Organic (MLO®)

LP0DA1890A700

DIMENSIONS D Inches (mm)

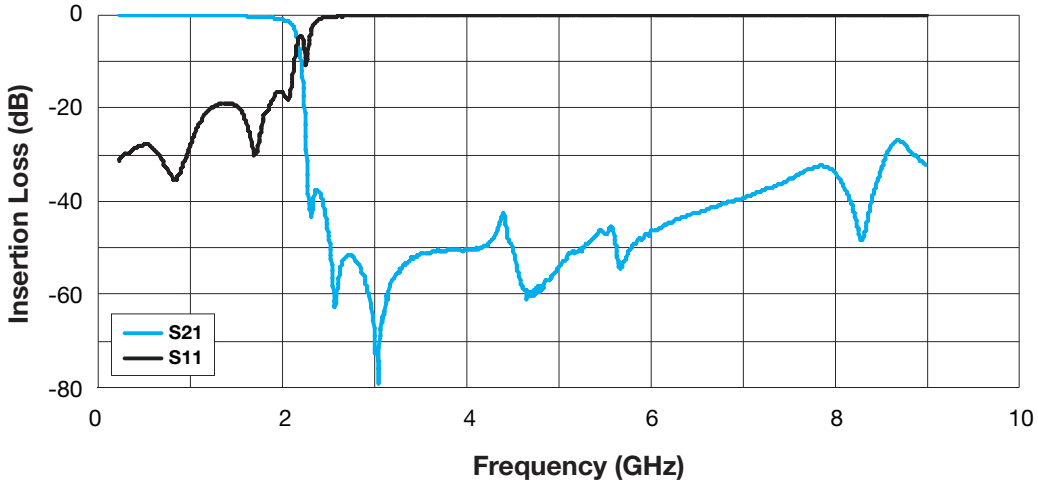


Bottom View

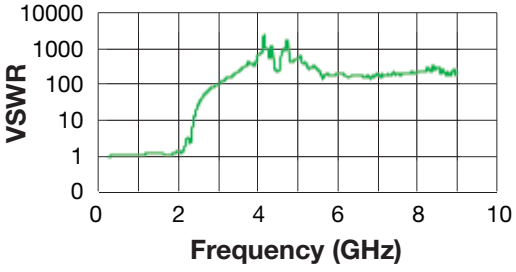
Side View

Passband		
DC - 1.89 GHz	1.2 dB	Max
DC - 1.89 GHz	0.78 dB	Typ
3dB	2.13 GHz	Typ
VSWR	1.62:1	Typ
Stopband		
20 dB	2.33 - 9.00 GHz	Min
30 dB	2.35 - 8.82 GHz	Min
40 dB	2.52 - 6.68 GHz	Min
Dimension		
Thickness	<0.028 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



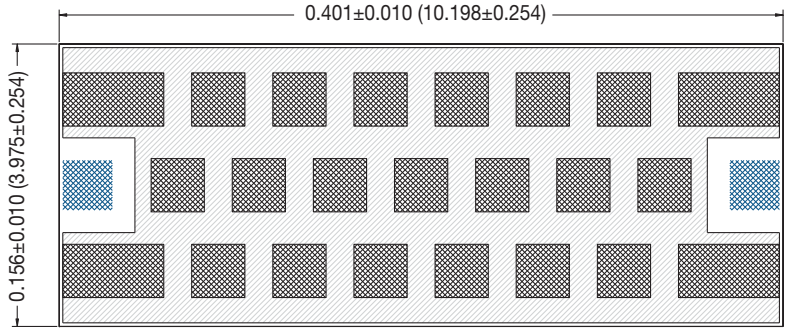
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.79	-0.49	1.15	-22.93
1.98	-0.99	1.36	-16.38
2.07	-1.47	1.28	-18.34
2.10	-1.92	1.41	-15.45
2.12	-2.49	1.68	-11.93
2.13	-2.69	1.77	-11.09
2.25	-21.30	2.27	-8.24
2.27	-31.62	1.85	-10.52
2.45	-40.47	24.00	-0.72
6.89	-39.98	84.74	-0.21
8.00	-33.80	93.88	-0.19

Multilayer Organic (MLO®)

LP0DA1950A700

DIMENSIONS D Inches (mm)



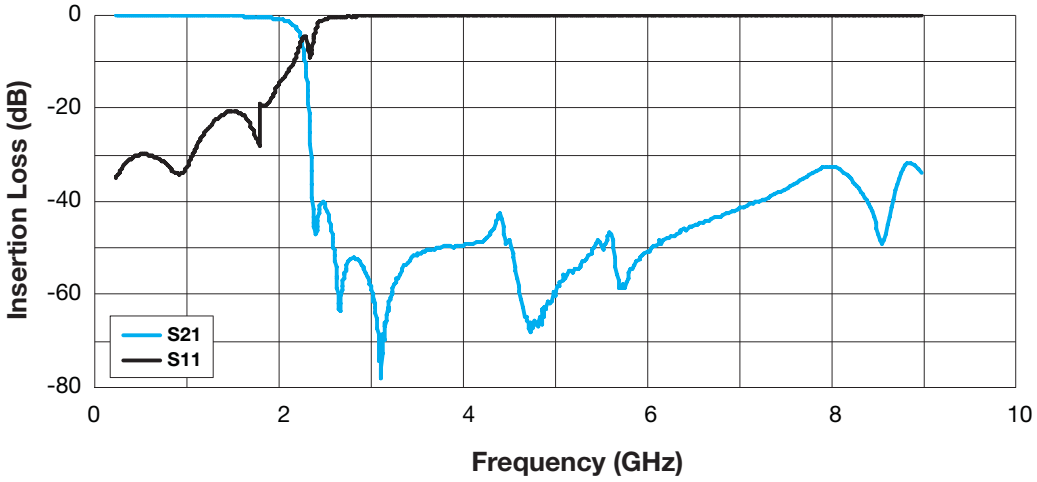
Bottom View

Side View

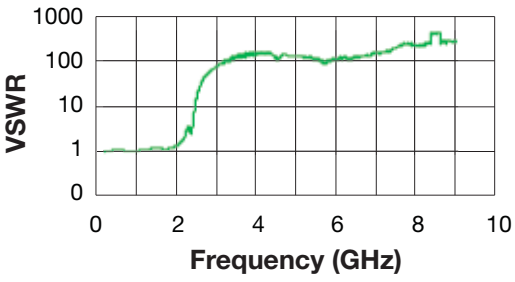
<0.022 (0.559)

Passband		
DC - 1.95 GHz	1.2 dB	Max
DC - 1.95 GHz	0.78 dB	Typ
3dB	2.2 GHz	Typ
VSWR	1.68:1	Typ
Stopband		
20 dB	2.46 - 9.00 GHz	Min
30 dB	2.49 - 9.00 GHz	Min
40 dB	2.51 - 6.97 GHz	Min
Dimension		
Thickness	<0.028 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



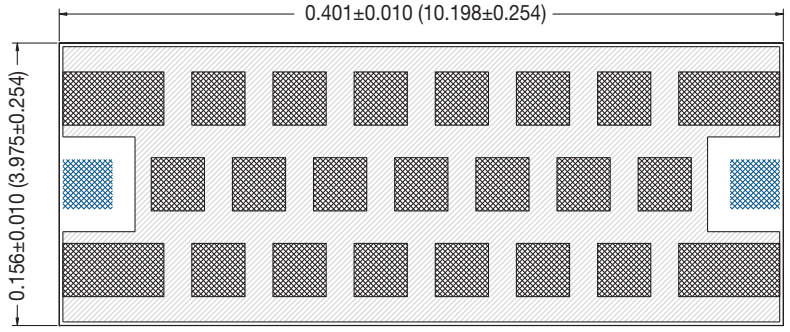
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.80	-0.44	1.08	-28.02
2.01	-0.99	1.45	-14.66
2.11	-1.51	1.68	-11.91
2.16	-1.99	1.85	-10.49
2.18	-2.41	2.04	-9.34
2.20	-2.97	2.26	-8.24
2.33	-20.98	2.28	-8.16
2.35	-30.42	2.07	-9.17
2.37	-41.60	3.01	-6.00
7.23	-39.82	142.82	-0.12
8.00	-32.55	97.91	-0.18

Multilayer Organic (MLO®)

LP0DA2100A700

DIMENSIONS D Inches (mm)

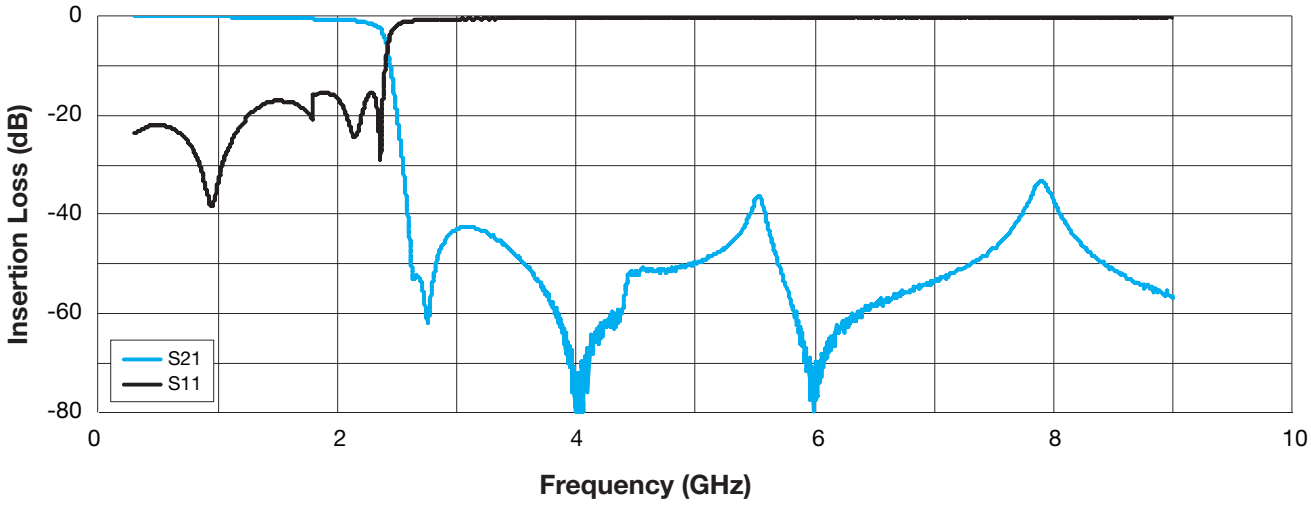


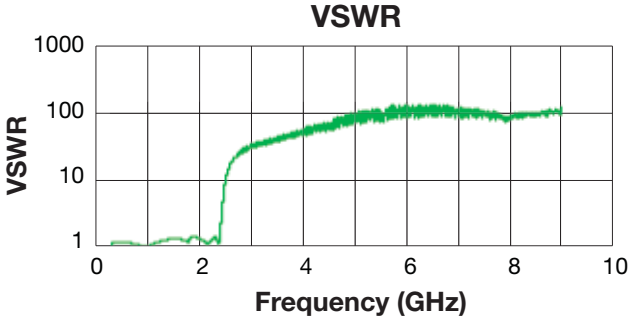
Bottom View

Side View

Passband		
DC - 2.10 GHz	1.2 dB	Max
DC - 2.10 GHz	0.77 dB	Typ
3dB	2.35 GHz	Typ
VSWR	1.19:1	Typ
Stopband		
20 dB	2.58 - 9.00 GHz	Min
30 dB	2.63 - 9.00 GHz	Min
40 dB	2.67- 5.22 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response





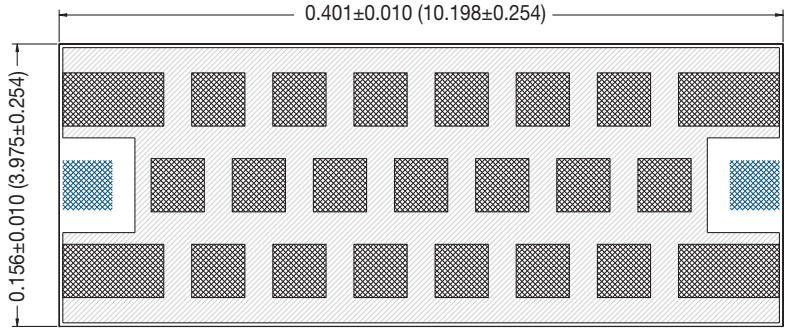
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.80	-0.50	1.38	-15.84
2.19	-0.99	1.17	-21.97
2.27	-1.49	1.40	-15.64
2.33	-2.00	1.31	-17.54
2.36	-2.50	1.08	-27.94
2.37	-2.99	1.19	-21.33
2.50	-20.02	9.91	-1.76
2.55	-30.16	14.51	-1.20
2.59	-40.10	17.18	-1.01
5.46	-40.00	101.97	-0.17
8.00	-37.42	90.85	-0.19

Multilayer Organic (MLO®)

LP0DA2140A700

DIMENSIONS D Inches (mm)

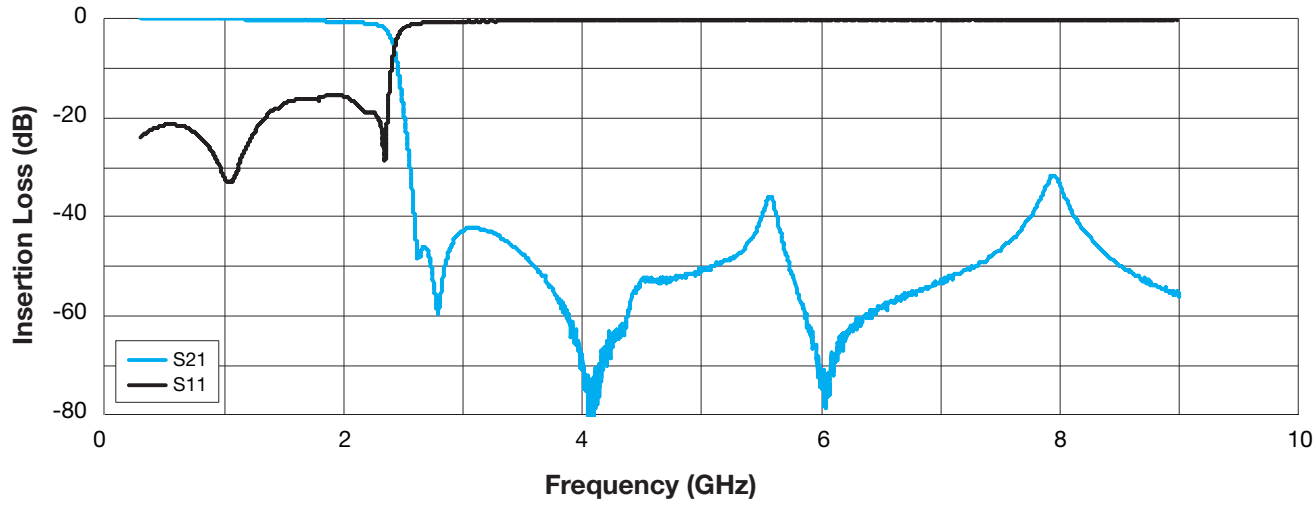


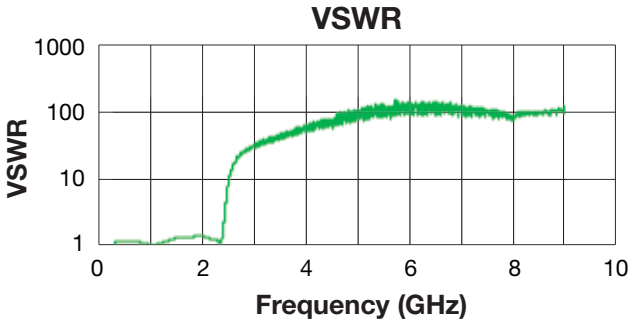
Bottom View

Side View

Passband		
DC - 2.14 GHz	1.2 dB	Max
DC - 2.14 GHz	0.81 dB	Typ
3dB	2.38 GHz	Typ
VSWR	1.14:1	Typ
Stopband		
20 dB	2.60 - 9.00 GHz	Min
30 dB	2.67 - 9.00 GHz	Min
40 dB	2.69 - 5.34 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response





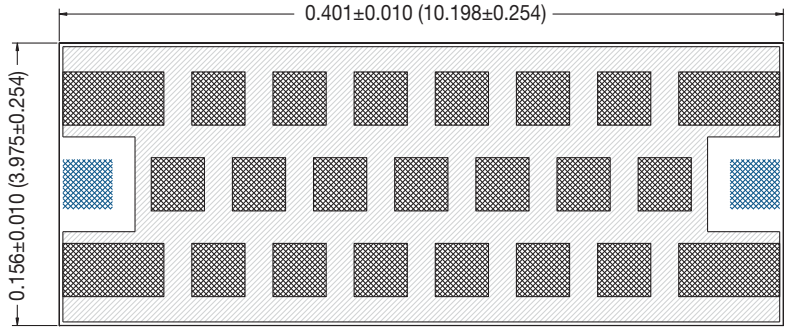
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.84	-0.49	1.39	-15.72
2.21	-0.99	1.25	-19.03
2.30	-1.50	1.21	-20.60
2.34	-1.98	1.08	-28.83
2.37	-2.49	1.22	-20.11
2.38	-2.98	1.43	-15.09
2.51	-20.09	9.95	-1.75
2.56	-30.21	13.92	-1.25
2.59	-40.23	16.57	-1.05
5.50	-39.98	138.16	-0.13
8.00	-33.57	90.11	-0.19

Multilayer Organic (MLO®)

LP0DA2160A700

DIMENSIONS D Inches (mm)

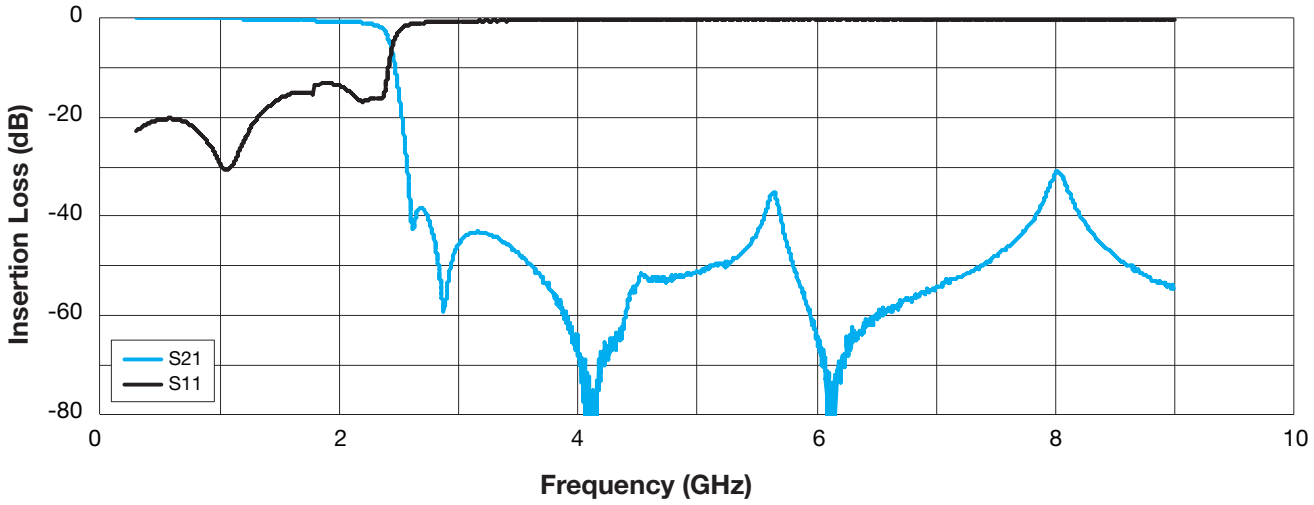


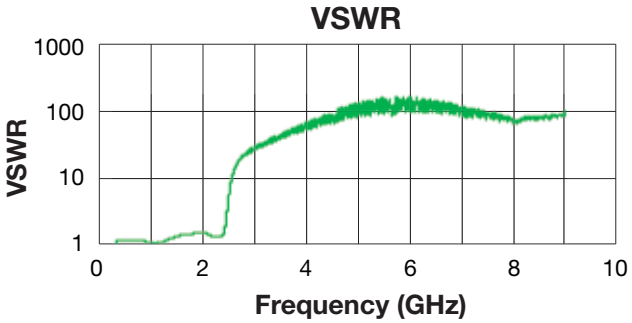
Bottom View

Side View

Passband		
DC - 2.16 GHz	1.2 dB	Max
DC - 2.16 GHz	0.82 dB	Typ
3dB	2.39 GHz	Typ
VSWR	1.36:1	Typ
Stopband		
20 dB	2.62 - 9.00 GHz	Min
30 dB	2.65 - 9.00 GHz	Min
40 dB	2.70 - 5.39 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response





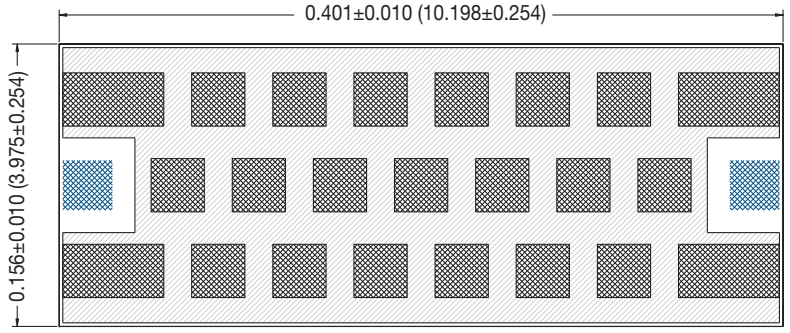
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.80	-0.44	1.41	-15.46
2.23	-1.00	1.34	-16.66
2.31	-1.49	1.38	-16.03
2.35	-2.00	1.36	-16.24
2.38	-2.49	1.42	-15.15
2.39	-2.95	1.55	-13.38
2.53	-20.10	8.83	-1.98
2.57	-30.31	11.82	-1.47
2.60	-40.07	14.46	-1.20
5.56	-39.82	124.35	-0.14
8.00	-31.19	70.48	-0.25

Multilayer Organic (MLO®)

LP0DA2190A700

DIMENSIONS D Inches (mm)



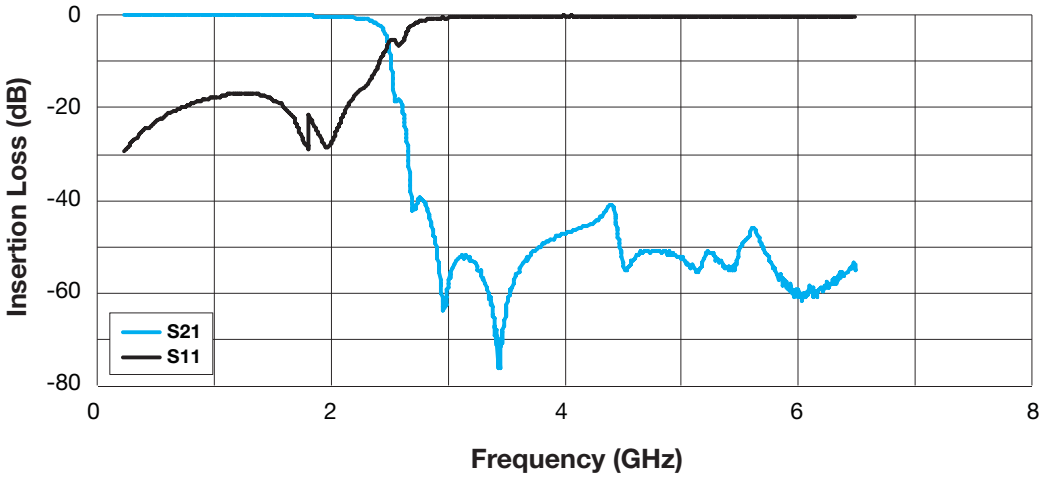
Bottom View

Side View

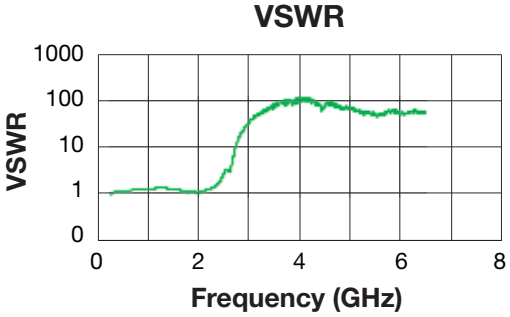
<0.022 (0.559)

Passband		
DC - 2.19 GHz	1.2 dB	Max
DC - 2.19 GHz	0.60 dB	Typ
3dB	2.41 GHz	Typ
VSWR	1.40:1	Typ
Stopband		
20 dB	2.68 - 6.50 GHz	Min
30 dB	2.73 - 6.50 GHz	Min
40 dB	2.76 - 6.50 GHz	Min
Dimension		
Thickness	<0.040 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



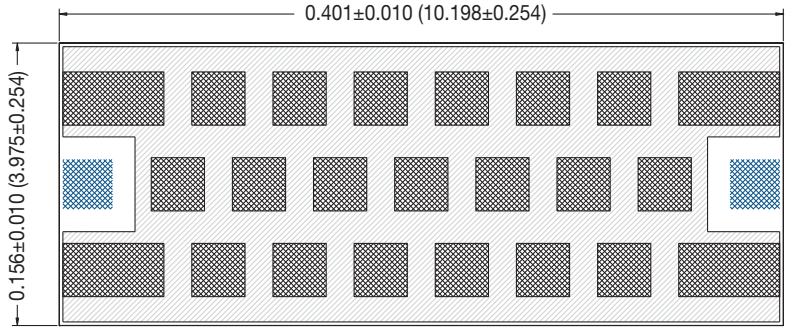
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
2.12	-0.49	1.28	-18.30
2.29	-0.93	1.43	-15.07
2.36	-1.48	1.63	-12.45
2.39	-1.91	1.80	-10.86
2.41	-2.45	1.98	-9.63
2.43	-2.89	2.14	-8.81
2.60	-20.45	3.24	-5.55
2.65	-30.36	5.66	-3.10
2.68	-40.94	8.00	-2.18
5.00	-52.11	55.73	-0.31
6.00	-59.11	58.69	-0.30

Multilayer Organic (MLO®)

LP0DA2200A700

DIMENSIONS D Inches (mm)

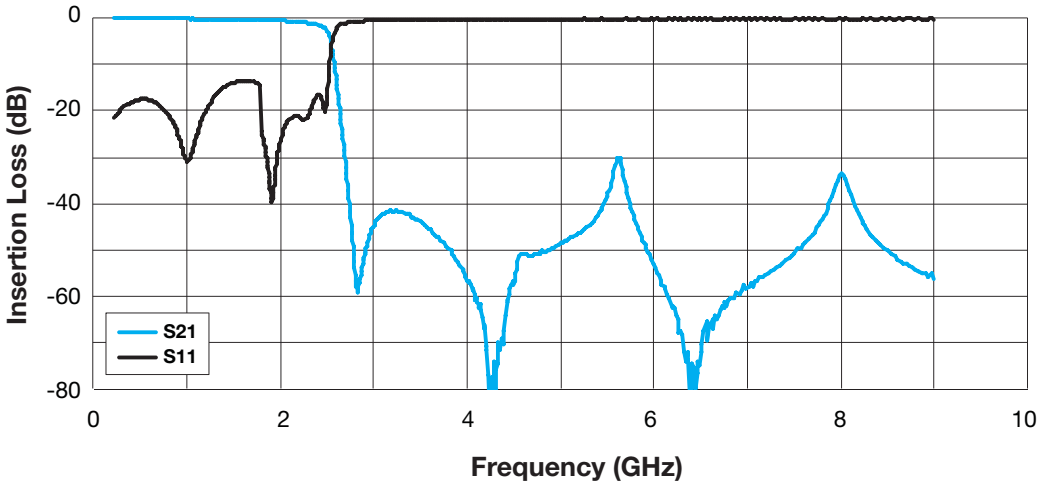


Bottom View

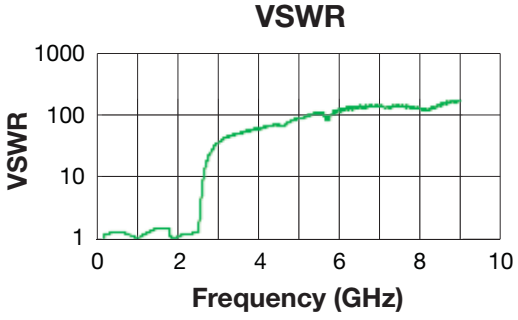
Side View

Passband		
DC - 2.20 GHz	1.2 dB	Max
DC - 2.20 GHz	0.81 dB	Typ
3dB	2.48 GHz	Typ
VSWR	1.25:1	Typ
Stopband		
20 dB	2.72 - 9.00 GHz	Min
30 dB	2.75 - 9.00 GHz	Min
40 dB	2.82 - 5.31 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



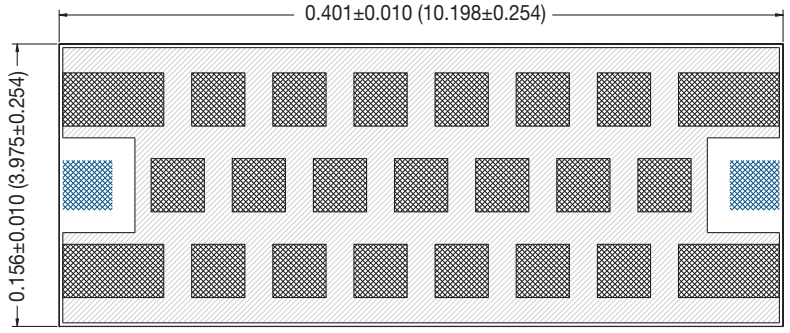
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
2.02	-0.50	1.12	-25.28
2.30	-0.99	1.20	-20.78
2.40	-1.47	1.35	-16.46
2.46	-1.99	1.24	-19.27
2.48	-2.37	1.23	-19.86
2.50	-2.90	1.41	-15.37
2.64-	-20.67	11.76	-1.48
2.70	-31.02	16.52	-1.05
2.74	-40.20	21.68	-0.80
5.47	-39.78	71.12	-0.24
5.62	-29.91	71.09	-0.24

Multilayer Organic (MLO®)

LP0DA2210A700

DIMENSIONS D Inches (mm)

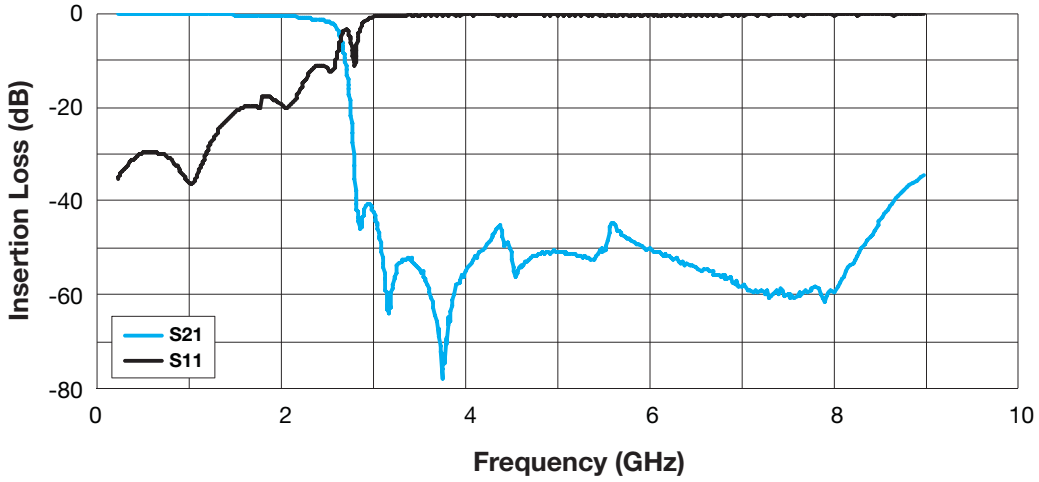


Bottom View

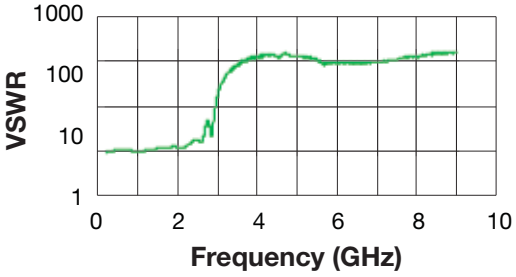
Side View

Passband		
DC - 2.21 GHz	1.2 dB	Max
DC - 2.21 GHz	0.81 dB	Typ
3dB	2.60 GHz	Typ
VSWR	1.76:1	Typ
Stopband		
20 dB	2.89 - 9.00 GHz	Min
30 dB	2.92 - 9.00 GHz	Min
40 dB	2.95 - 8.59 GHz	Min
Dimension		
Thickness	<0.028 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



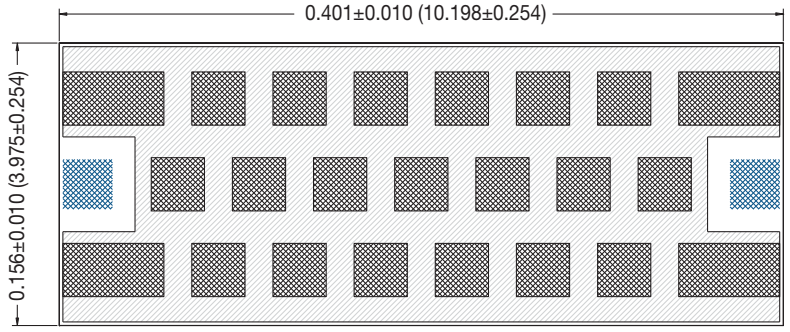
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
1.20	-0.50	1.25	-19.16
1.45	-0.99	1.10	-26.64
1.51	-1.73	1.46	-14.54
1.54	-2.19	1.57	-13.11
1.56	-2.66	1.48	-14.28
1.66	-20.88	8.85	-1.97
1.71	-30.16	17.57	-0.99
1.73	-38.35	19.73	-0.88
3.75	-43.91	102.87	-0.17
6.30	-33.71	40.72	-0.43
6.40	-25.42	23.84	-0.73

Multilayer Organic (MLO®)

LP0DA2260A700

DIMENSIONS D Inches (mm)

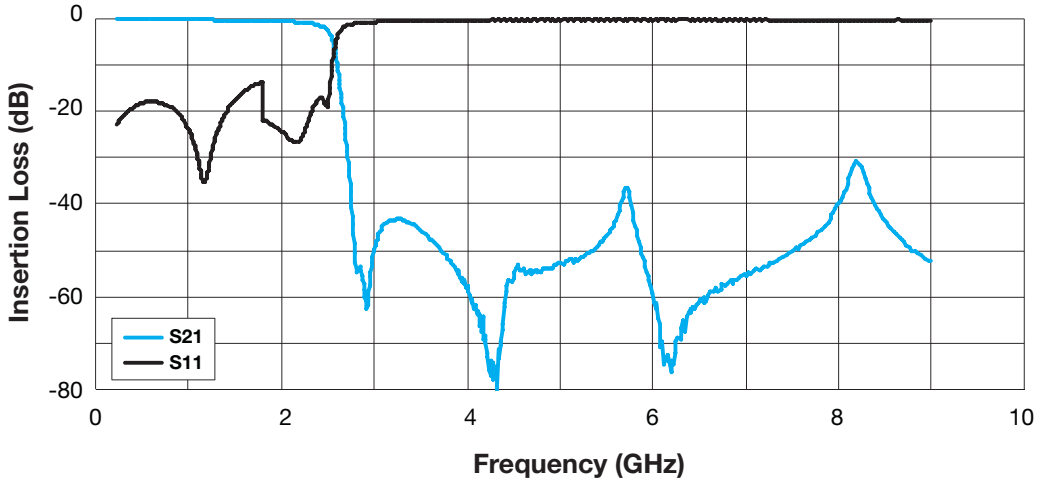


Bottom View

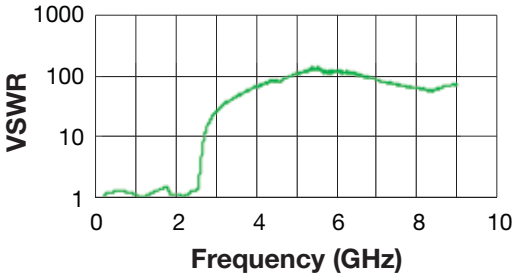
Side View

Passband		
DC - 2.26 GHz	1.2 dB	Max
DC - 2.26 GHz	0.81 dB	Typ
3dB	2.50 GHz	Typ
VSWR	1.09:1	Typ
Stopband		
20 dB	2.76 - 9.00 GHz	Min
30 dB	2.81 - 9.00 GHz	Min
40 dB	2.85 - 5.44 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



VSWR



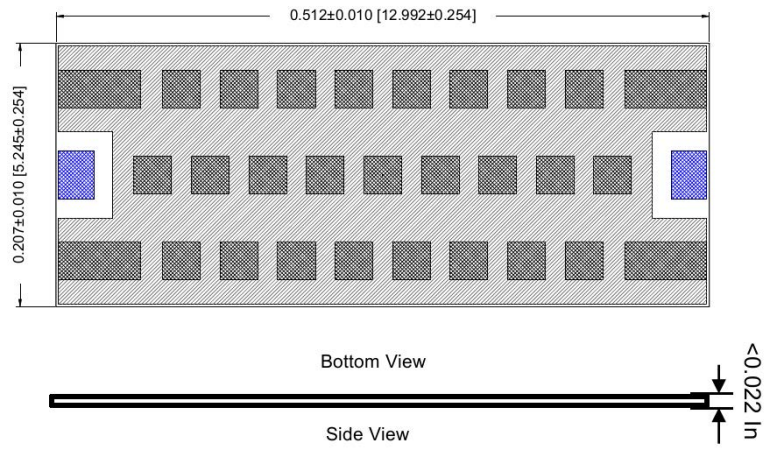
TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
2.03	-0.50	1.12	-24.89
2.33	-0.99	1.10	-26.64
2.42	-1.73	1.46	-14.54
2.48	-2.19	1.57	-13.11
2.50	-2.66	1.48	-14.28
2.52	-20.88	8.85	-1.97
2.66	-30.16	17.57	-0.99
2.72	-38.35	19.73	-0.88
2.76	-43.91	102.87	-0.17
5.66	-33.71	40.72	-0.43
8.00	-25.42	23.84	-0.73

Multilayer Organic (MLO®)

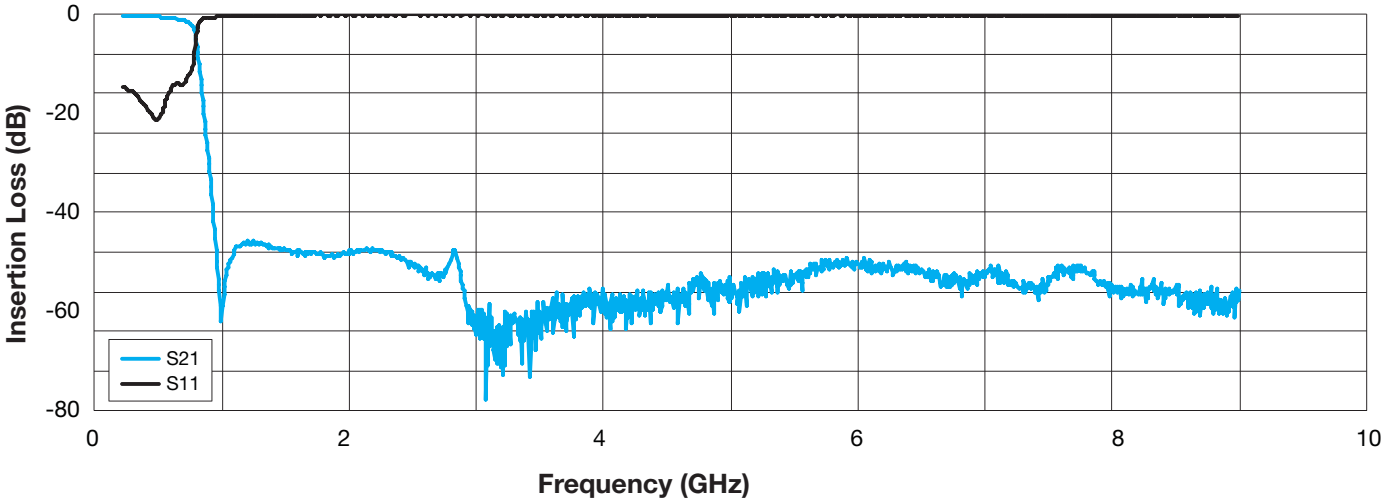
LP0FA0600A700

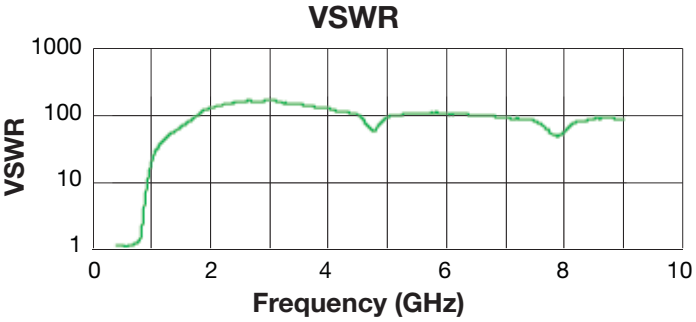
DIMENSIONS F Inches (mm)



Passband		
DC - 0.60 GHz	1.2 dB	Max
DC - 0.60 GHz	0.90 dB	Typ
3dB	0.77 GHz	Typ
VSWR	1.24:1	Typ
Stopband		
20 dB	0.88 - 9.00 GHz	Min
30 dB	0.91 - 5.06 GHz	Min
40 dB	0.94 - 9.00 GHz	Min
Dimension		
Thickness	<0.022 Inches	Max
Power		
Power	4 Watts	Max

Typical Frequency Response



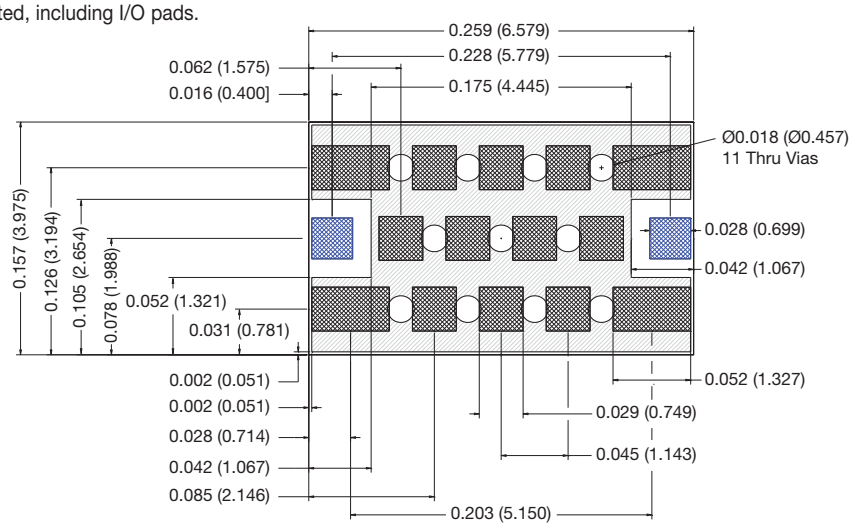


TYPICAL PERFORMANCE AT 25ºC

Frequency (GHz)	Insertion Loss (dB)	VSWR (:1)	Return Loss (dB)
0.44	-0.50	1.12	-24.76
0.62	-0.99	1.29	-17.88
0.70	-1.49	1.30	-17.60
0.74	-1.92	1.40	-15.48
0.76	-2.40	1.47	-14.39
0.77	-2.79	1.54	-13.43
0.85	-21.56	13.63	-1.28
0.88	-30.56	18.45	-0.94
0.91	-41.71	23.40	-0.74
7.00	-65.37	140.04	-0.12
8.00	-68.67	68.35	-0.25

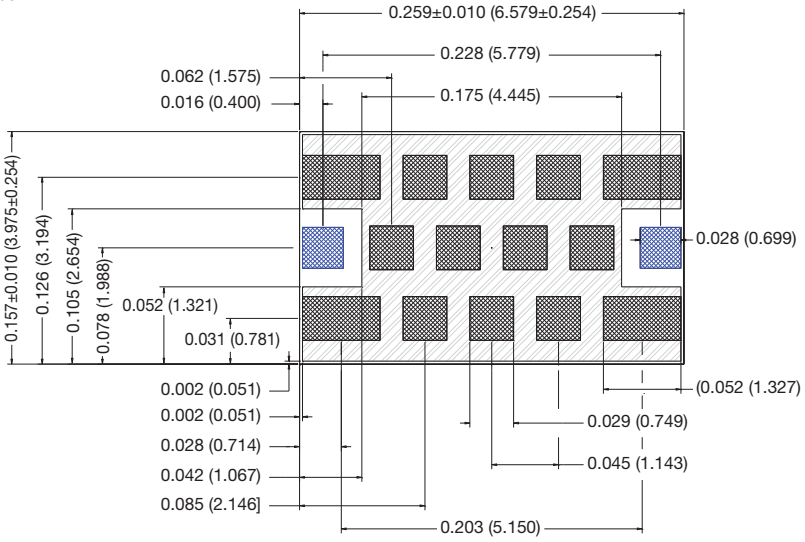
MECHANICAL SPECIFICATIONS – FOOTPRINT A

Dimensions in inches (mm)
Tolerances are ±0.002 (0.05), unless noted.
All contact areas are gold plated, including I/O pads.



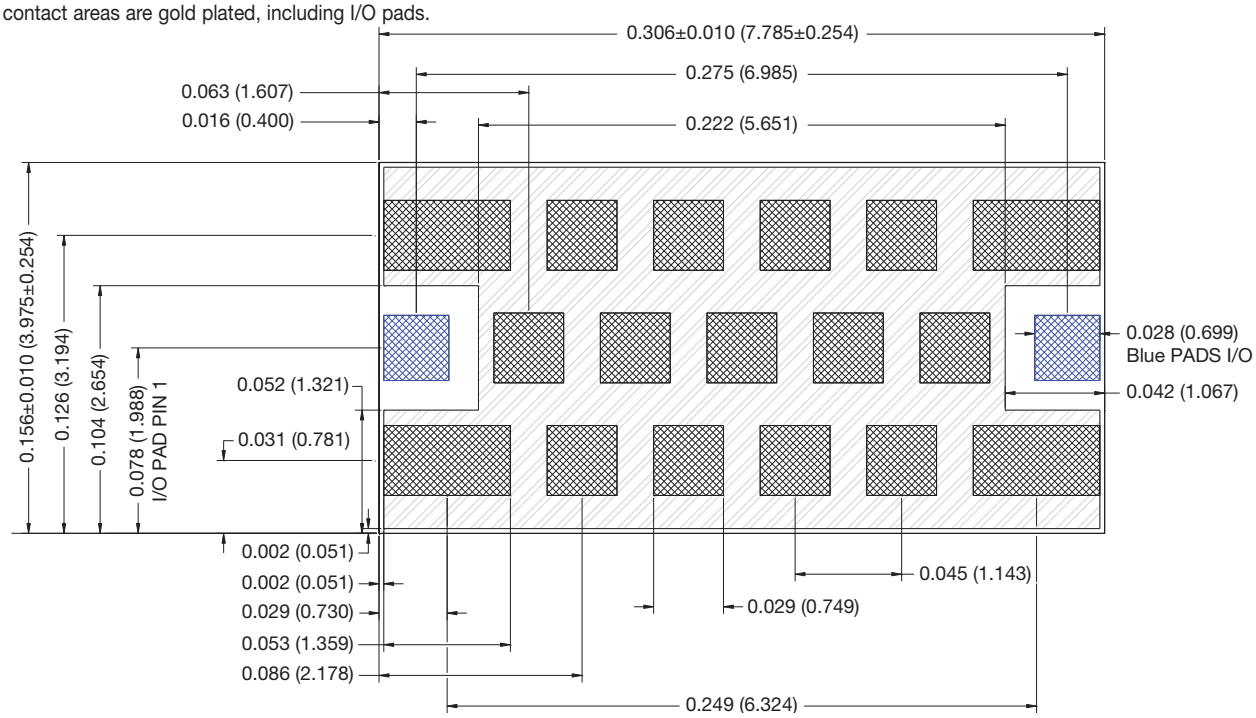
RECOMMENDED PCB LAYOUT – FOOTPRINT A

Dimensions in inches (mm).
Line width should be designed to match 50ohm characteristic impedance, depending on PCB material and thickness.
Grounding is solid copper under solder mask, with solder mask defined pads for ground openings. I/O pads are not shorted to ground.
DXF Files available upon request.



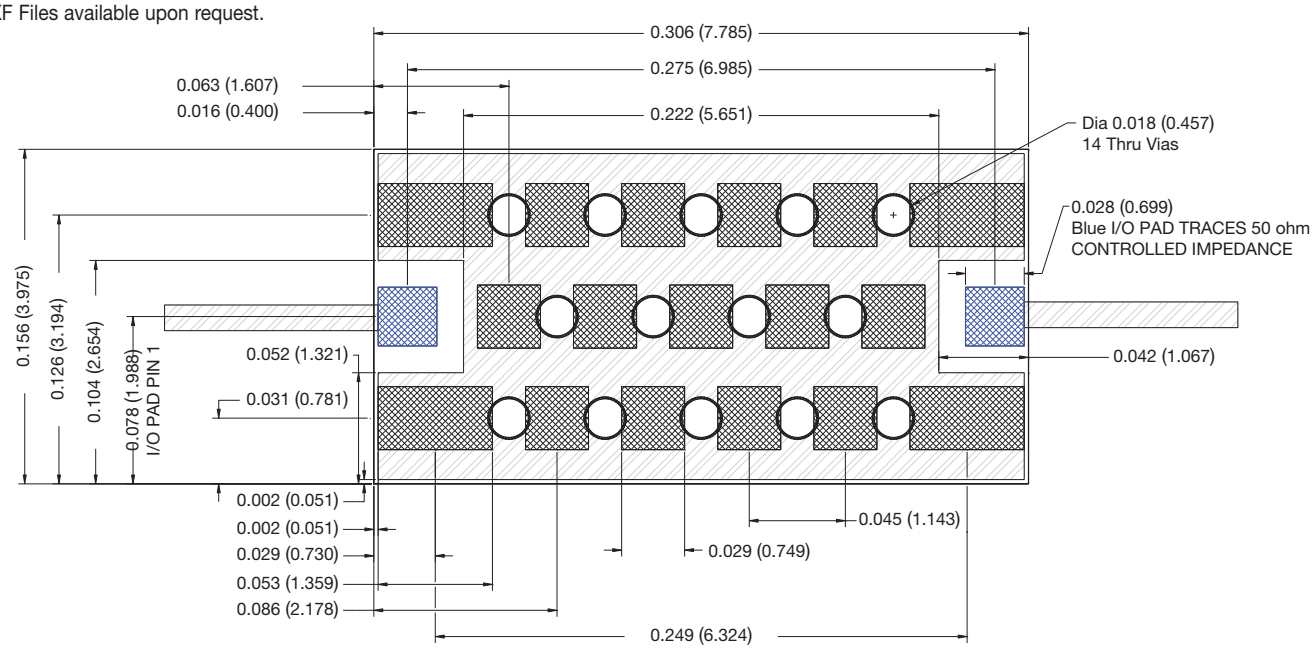
MECHANICAL SPECIFICATIONS – FOOTPRINT B

Dimensions in inches (mm)
Tolerances are ±0.002 (0.05), unless noted.
All contact areas are gold plated, including I/O pads.



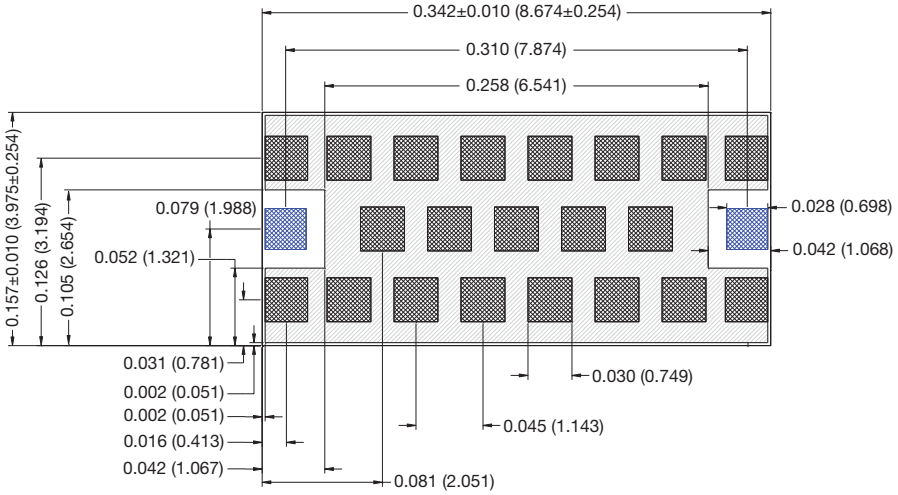
RECOMMENDED PCB LAYOUT – FOOTPRINT B

Dimensions in inches (mm).
Line width should be designed to match 50ohm characteristic impedance, depending on PCB material and thickness.
Grounding is solid copper under solder mask, with solder mask defined pads for ground openings. I/O pads are not shorted to ground.
DXF Files available upon request.



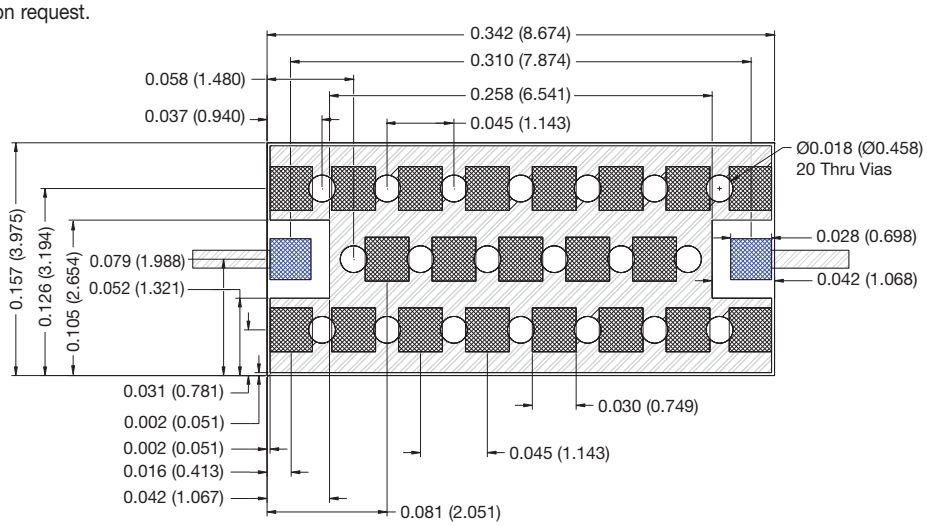
MECHANICAL SPECIFICATIONS – FOOTPRINT C

Dimensions in inches (mm)
Tolerances are ±0.002 (0.05), unless noted.
All contact areas are gold plated, including I/O pads.



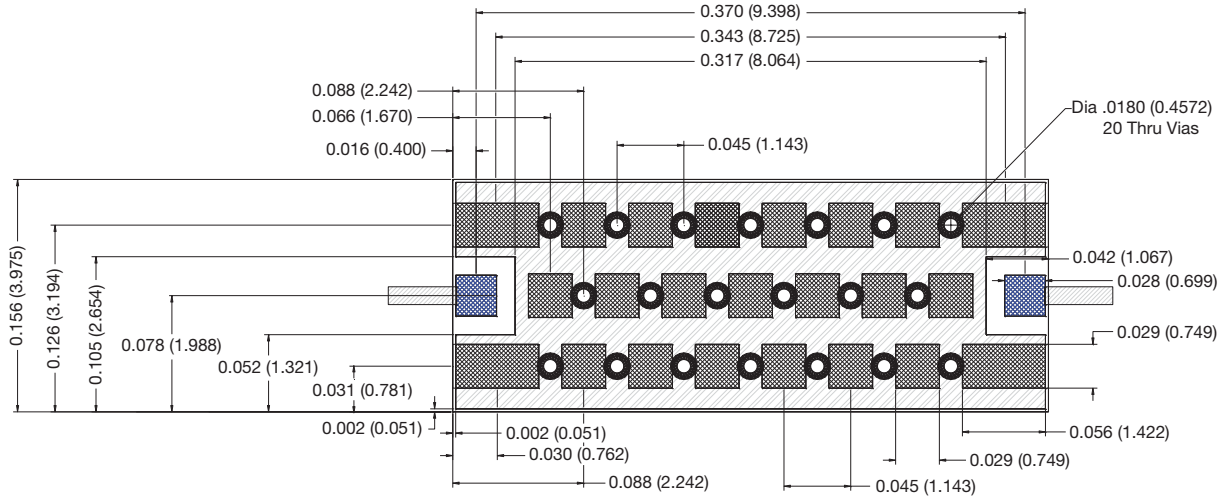
RECOMMENDED PCB LAYOUT – FOOTPRINT C

Dimensions in inches (mm).
Line width should be designed to match 50ohm characteristic impedance, depending on PCB material and thickness.
Grounding is solid copper under solder mask, with solder mask defined pads for ground openings. I/O pads are not shorted to ground.
DXF Files available upon request.



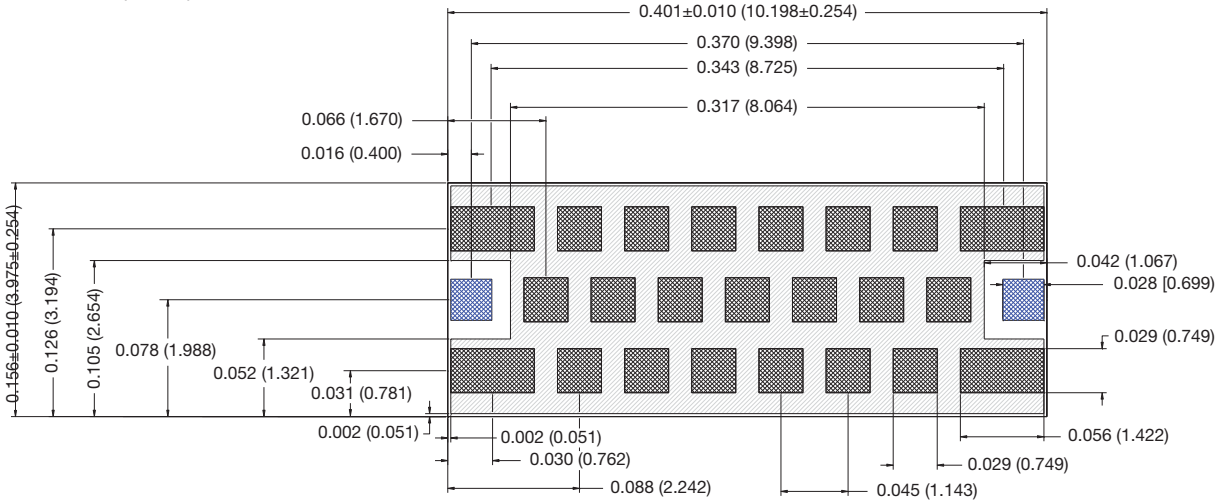
MECHANICAL SPECIFICATIONS – FOOTPRINT D

Dimensions in inches (mm)
Tolerances are ±0.002 (0.05), unless noted.
All contact areas are gold plated, including I/O pads.

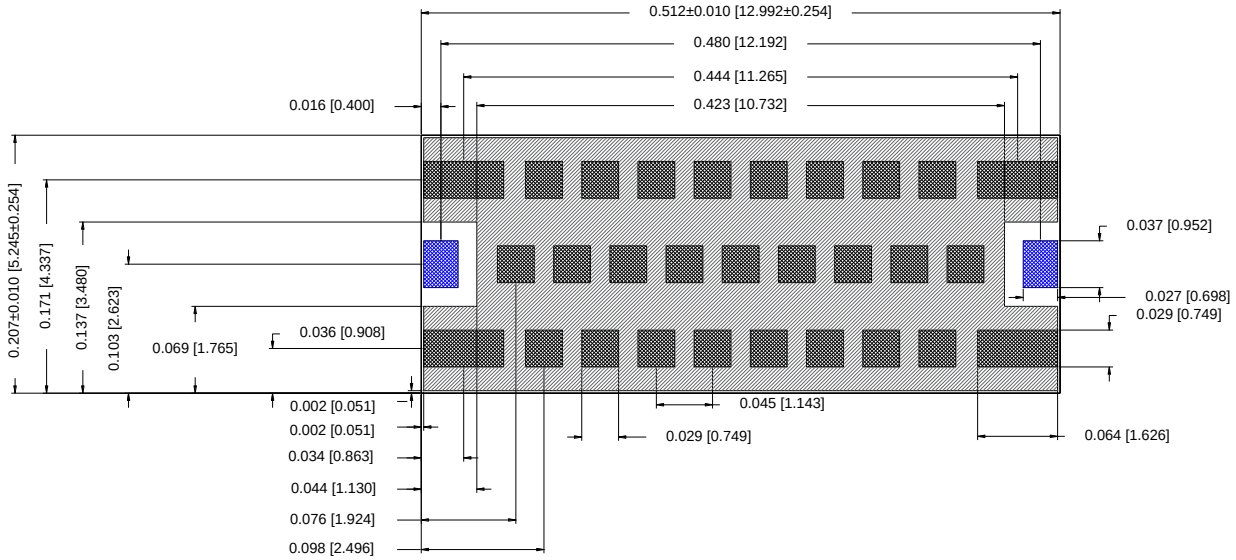


RECOMMENDED PCB LAYOUT – FOOTPRINT D

Dimensions in inches (mm).
Line width should be designed to match 50ohm characteristic impedance, depending on PCB material and thickness.
Grounding is solid copper under solder mask, with solder mask defined pads for ground openings. I/O pads are not shorted to ground.
DXF Files available upon request.

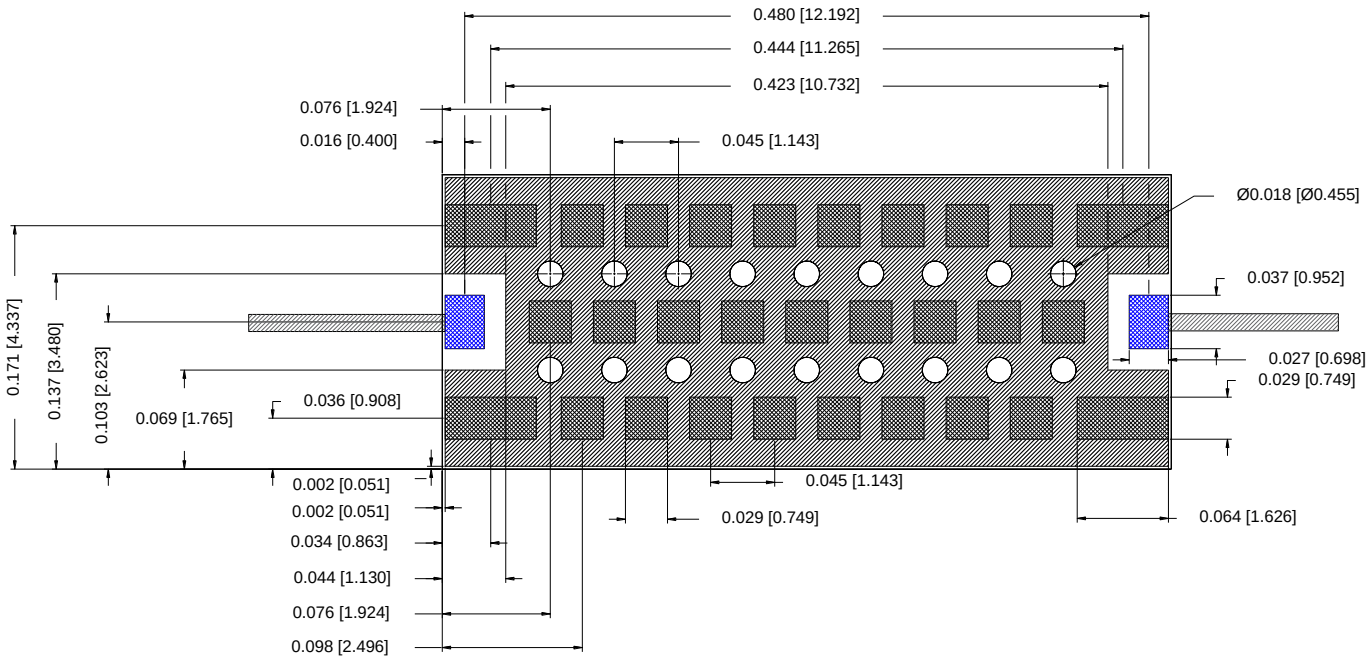


MECHANICAL SPECIFICATIONS – FOOTPRINT F



Dimensions in inches [mm]
Tolerances are +/-0.002 [0.05], unless noted.
All contact areas are gold plated, including I/O pads.

RECOMMENDED PCB LAYOUT – FOOTPRINT F



Dimensions in inches [mm].
Line width should be designed to match 50 ohm characteristic impedance, depending on PCB material and thickness.
Grounding is solid copper under solder mask, with solder mask defined pads for ground openings. I/O pads are not shorted to ground.
DXF Files available upon request.

MOUNTING RECOMMENDATIONS

AUTOMATED SMT ASSEMBLY

The following section describes the guidelines for automated SMT assembly of MLO® RF devices which are typically Land Grid Array (LGA) packages or side termination SMT pacages.

Control of solder and solder paste volume is critical for surface mount assembly of MLO® RF devices onto the PCB. Stencil thickness and aperture openings should be adjusted according to the optimal solder volume. The following are general recommendations for SMT mounting of MLO® devices onto the PCB.

SMT REFLOW PROFILE

Common IR or convection reflow SMT processes shall be used for the assembly. Standard SMT reflow profiles, for eutectic and Pb free solders, can be used to surface mount the MLO® devices onto the PCB. In all cases, a temperature gradient of 3°C/sec, or less, should be maintained to prevent warpage of the package and to ensure that all joints reflow properly. Additional soak time and slower preheating time may be required to improve the out-gassing of solder paste. In addition, the reflow profile depends on the PCB density and the type of solder paste used. Standard no-clean solder paste is generally recommended. If another type of flux is used, complete removal of flux residual may be necessary. Example of a typical lead free reflow profile is shown below.

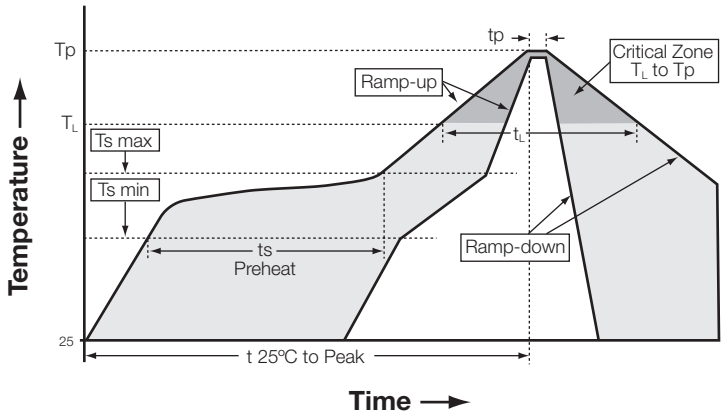


Figure A. Typical Lead Free Profile and Parameters

Profile Parameter	Pb free, Convection, IR/Convection
Ramp-up rate (Tsmax to Tp	3ºC/second max.
Preheat temperature (Ts min to Ts max)	150ºC to 200ºC
Preheat time (ts)	60 – 180 seconds
Time above T_L, 217ºC (t_L)	60 – 120 seconds
Peak temperature (Tp)	260°C
Time within 5ºC of peak temperature (tp)	10 – 20 seconds
Ramp-down rate	4ºC/second max.
Time 25ºC to peak temperature	6 minutes max.