

# WIRE BONDABLE VERTICAL ELECTRODE CAPACITORS

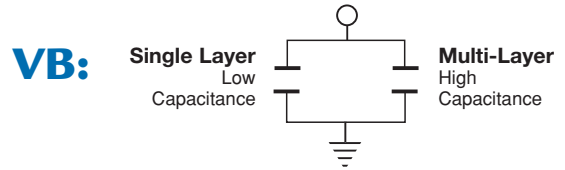
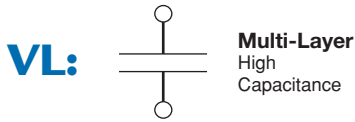
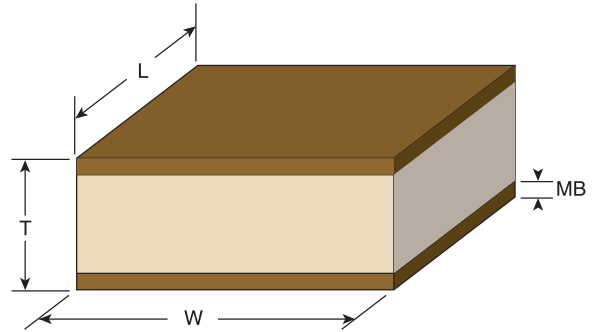
## PRESIDIO ADVANTAGE

### VL SERIES

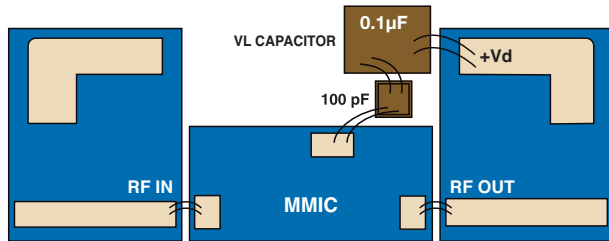
- Wire Bondable Bypass Capacitors for MMIC's

### VB SERIES

- Wire Bondable Integrated Broadband Bypass Capacitors for MMIC's up to Millimeter Frequencies
- Low Profile

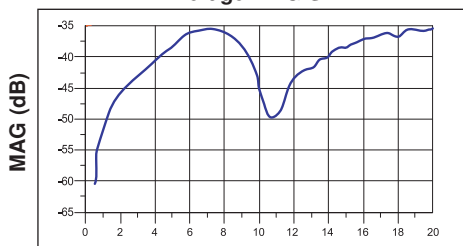


### VL SERIES

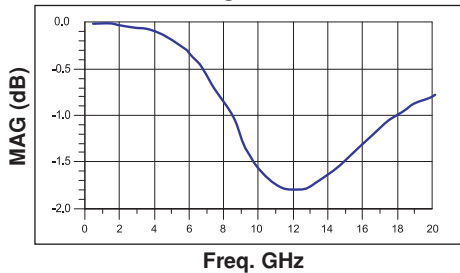


MVL4080X104MGH5C-\_\* (Bond Wires Included)

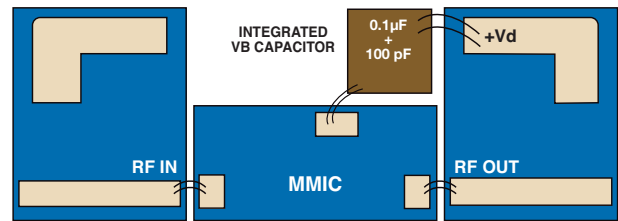
Data in Shunt  
Average MAG S21



Average MAG S11

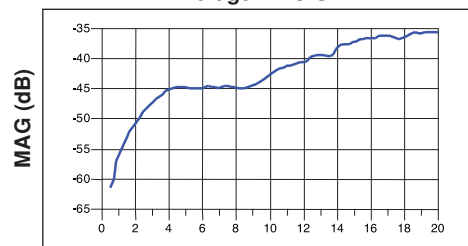


### VB SERIES

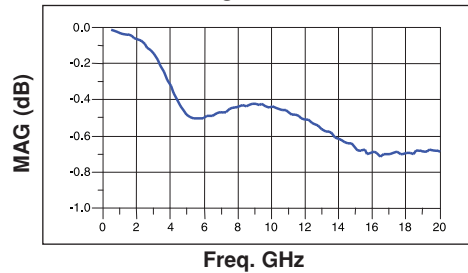


MVB4080X104ZGH5C3\_\* (Bond Wires Included)

Data in Shunt  
Average MAG S21



Average MAG S11



## GLOBAL PART NUMBER EXAMPLE (How to Order)

<b>M</b>	<b>VB</b>	<b>3030</b>	<b>X</b>	<b>103</b>	<b>M</b>	<b>G</b>	<b>H</b>	<b>5</b>	<b>C</b>	<b>1</b>	<b>*</b>
Test Code	VB = Vertical Broadband VL = Vertical Layer	Size (Pg. 9)	Dielectric	Capacitance	Capacitance Tolerance	Voltage	Termination	Packaging	RoHS Compliant	VB – Special Code VL – Hyphen Required	Design-In Code (See Page 14)

### Test Codes, Dielectric Codes and Specifications

				FIT* 85° C	FIT* 100° C	Commercial Space	Similar -55681	Similar -123	Mil-PRF-38534 Rev. L Class H	Class K	Cust. Spec.
TEST CODES:				M	N	J	C	S	H	K	D
Upgradable to Codes:				H, C	H, C, S, K						
ELECTRICAL SPECIFICATIONS	X7R Dielectric Code X	Y5V Dielectric Code Y	Testing Method	Test Samples		Test Samples	Test Samples		Test Samples		
Temperature Coefficient Limits	± 20%	+ 22%, -82%	Presidio Specification								
Temperature Coefficient Limit Cycle	-55° to +125° C	-30° to +85° C	Presidio Specification								
Capacitance	1 kHz, 1.0 V AC RMS	1 kHz, 1.0 V AC RMS	MIL-STD-202 Meth. 305	100%	100%	100%	100%	100%	10	100%	
Dissipation Factor, maximum	5% max.	19% max.	Presidio Specification	100%	100%	100%	100%	100%	10	100%	
Dielectric Withstanding Voltage (DWV)	250% of WVDC	250% of WVDC	MIL-STD-202 Meth. 301	1% AQL	1% AQL	1% AQL	100%	100%	10	100%	
Insulation Resistance @ +25° C at WVDC	1000 MΩ - μF	50 MΩ - μF	MIL-STD-202 Meth. 302	1% AQL	1% AQL	1% AQL	100%	100%	10	100%	
Insulation Resistance @ +125° C at WVDC	100 MΩ - μF	Not Applicable	MIL-STD-202 Meth. 302				1% AQL	100%		100%	
Aging Effects	2.5% typ./decade hr.	5% typ./decade hr.	Presidio Specification								
VISUAL & MECHANICAL SPECIFICATIONS											
Visual, Workmanship			Presidio Specification	100%	100%	100%	100%	100%	22	100%	
Element Electrical			Measure & Record						10	25/80/125	
Wire Bond Evaluation	3 grams, 0.001" dia. Au wire		STD-883 Method 2011						10	10	
Shear Strength, minimum	Size dependent	Size dependent	STD-883 Method 2019						10	10	
Physical Dimensions	See Page 9	See Page 9	Presidio Specification						20	20	
Prohibited Material Inspection			MIL-STD-1580								5
Acoustic Imaging			ECIA EIA-469								100%
Metalization, minimum	100 μin (2.5 μm)	100 μin (2.5 μm)	Presidio Specification								
ENVIRONMENTAL TESTS, LEVEL I (TEST CODE C)											
Voltage Conditioning	100 Hours	100 Hours	MIL-STD-202 Meth. 108, A						100%		
ENVIRONMENTAL TESTS, LEVEL II (TEST CODE S)											
Thermal Shock & Voltage Conditioning	20 cycles/168 hr. min.	Not Applicable	MIL-STD-202 Meth. 107						100%		100%
Destructive Physical Analysis Report		Not Applicable	EIA-469 +MIL-PRF-123						Included		Included
Temperature Coeff. of Capacitance, 0 Volt	± 20%	Not Applicable	Presidio Specification						12		
Life Test	1000 Hours Each Lot	Not Applicable	MIL-STD-202 Meth. 108						25 min.		25/80/125
Humidity, Steady State, Low Voltage	240 hours min.	Not Applicable	MIL-STD-202 Meth. 103, A						12		12
RoHS Compliant, Yes or No	Specify	Not Applicable									

\*FIT (Failure In Time) per billion hours. Calculations are based on assumed continuous operating temperatures 85° C and 100° C

-3dB CUT OFF FREQUENCY	
pF	kHz
330,000	< 10
180,000	10
100,000	16
68,000	25
47,000	35
43,000	40
30,000	55
22,000	75
20,000	80
15,000	105
10,000	160
8,200	195
4,700	340

#### Capacitance Codes

**First Two Digits** = Significant figures of capacitance in picofarads  
**Third Digit** = Additional number of zeros  
**Example:** 100 = 10 pF  
 102 = 1,000 pF  
 104 = 100,000 pF

#### Working Voltage (See Page 9)

Code	WVDC	Code	WVDC
3	100	G	16
2	50	F	12
1	25	E	10
		C	6.3

#### Termination

VL/VB	Description
H	99.8% Au Top and Bottom Suitable for Conductive Epoxy
U	100% Au Top and Bottom Oxide Free Surface Suitable for Conductive Epoxy
K	99.8% Au Top, PdAg Bottom Conductive Epoxy or Solder

100 Microinches minimum thickness on both sides

#### Capacitance Tolerance

Code	Tol.
M	± 20%
Z	-20%, +80% for all Y5V dielectric

#### Packaging

5 = Waffle Pack (standard)  
 F = Grip Ring, 6.0" diameter standard

#### RoHS

Code	Compliant
N	No
R	Legacy, ended 2012
C	Yes, started January 2013

#### Special Code

VB Series: Single Layer Capacitance Value:  
 1 = 100 pF  
 3 = 1800 pF  
 VL Series: Hyphen Required



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# SELECTION TABLE: VERTICAL ELECTRODE CAPACITORS – WIRE BONDABLE

Size Code	L inch (mm)	W inch (mm)	T Max. inch (mm)	MB Max. inch (mm)	Working Voltage (WVDC) Max.	Capacitance (pF)	INDUSTRIAL & MILITARY Test Code M		SPACE EM: Test Code N FM: Test Code J, S or K		Performance Curves	S2P Files "VB"	
							X7R (pF)	Y5V (pF)	X7R (pF)	VB SERIES PART NUMBER			VL SERIES PART NUMBER
2020	0.020 (0.508) ± 0.003 (0.076)	0.020 (0.508) ± 0.003 (0.076)	0.015 (0.381)	0.003 (0.076)	100	Max:	390				MVL2020X391M3 *5C-*		
					50	Max:	1,000		1,000		MVL2020X102M2 *5C-*		
					25	Max:	2,700				MVL2020X272M1 *5C-*		
					16	Max:	5,100				MVL2020X512MG *5C-*		
					10	Max:	10,000				MVL2020X103ME *5C-*		
					6.3	Max:					LVB2020X103MC *5C1*		
2040	0.020 (0.508) ± 0.003 (0.076)	0.040 (1.016) ± 0.004 (0.102)	0.017 (0.432)	0.005 (0.127)	100	Max:	1,000		1,000	MVB2040X102M3 *5C1*	MVL2040X102M3 *5C-*		
					50	Max:	2,200			MVB2040X222M2 *5C1*	MVL2040X222M2 *5C-*		
					25	Max:	5,100			MVB2040X512M1 *5C1*	MVL2040X512M1 *5C-*		
					16	Max:	10,000			MVB2040X103MG *5C1*	MVL2040X103MG *5C-*		
					10	Max:	22,000			MVB2040X223ME *5C1*	MVL2040X223ME *5C-*		
2741	0.027 (0.686) ± 0.004 (0.102)	0.041 (1.041) ± 0.004 (0.102)	.033 (0.838)	0.005 (0.127)	16	Max:	100,000			MVB2741X104MG *5C1*	MVL2741X104MG *5C-*		
3030	0.030 (0.762) ± 0.003 (0.076)	0.030 (0.762) ± 0.003 (0.076)	0.022 (0.559)	0.005 (0.127)	100	Max:	4,700			MVB3030X472M3 *5C1*	MVL3030X472M3 *5C-*		
					50	Max:	10,000			MVB3030X103M2 *5C1*	MVL3030X103M2 *5C-*		
					50	Max:			6,800		NVL3030X682M2 *5N-*		
					25	Max:	15,000			MVB3030X153M1 *5C1*	MVL3030X153M1 *5C-*		
					16	Max:	22,000			MVB3030X223MG *5C1*	MVL3030X223MG *5C-*		
					16	Nominal	10,000		10,000	MVB3030X103MG *5C1*	NVL3030X103MG *5N-*	<a href="#">PDE</a>	<a href="#">WEB</a>
					16	Max:			100,000		MVL3030Y104ZG *5C-*		
					10	Max:	43,000			MVB3030X433ME *5C1*	MVL3030X433ME *5C-*		
3060	0.030 (0.762) ± 0.003 (0.076)	0.060 (1.524) ± 0.004 (0.102)	0.017 (0.432)	0.005 (0.127)	100	Max:	8,200			MVB3060X822M3 *5C1*	MVL3060X822M3 *5C-*		
					50	Max:	20,000			MVB3060X203M2 *5C1*	MVL3060X203M2 *5C-*		
					25	Max:	30,000			MVB3060X303M1 *5C1*	MVL3060X303M1 *5C-*		
					16	Max:	47,000			MVB3060X473MG *5C1*	MVL3060X473MG *5C-*		
					10	Max:	100,000		100,000 (VL)	MVB3060X104ME *5C1*	MVL3060X104ME *5C-*		
4040	0.040 (1.016) ± 0.004 (0.102)	0.040 (1.016) ± 0.004 (0.102)	0.025 (0.635)	0.005 (0.127)	100	Max:	8,200			MVB4040X822M3 *5C1*	MVL4040X822M3 *5C-*		
					50	Max:	20,000			MVB4040X203M2 *5C1*	MVL4040X203M2 *5C-*		
					50	Max:			10,000	NVB4040X103M2 *5N1*	NVL4040X103M2 *5N-*		
					25	Max:	30,000			MVB4040X303M1 *5C1*	MVL4040X303M1 *5C-*		
					16	Max:	47,000		47,000 (VL)	MVB4040X473MG *5C1*	MVL4040X473MG *5C-*		
					10	Max:	100,000			MVB4040X104ME *5C1*	MVL4040X104ME *5C-*		
3080	0.030 (0.762) ± 0.003 (0.076)	0.080 (2.032) ± 0.004 (0.102)	0.025 (0.635)	0.005 (0.127)	50	Max:	15,000				MVL3080X153M2 *5C-*		
					16	Max:	100,000				MVL3080X104MG *5C-*		
4080	0.042 (1.067) ± 0.004 (0.102)	0.083 (2.108) ± 0.004 (0.102)	VB 0.017 (0.432) VL 0.025 (0.635)	0.005 (0.127)	100	Max:	15,000			MVB4080X153M3 *5C1*	MVL4080X153M3 *5C-*		
					50	Max:	30,000		10,000 (VL)	MVB4080X303M2 *5C1*	MVL4080X303M2 *5C-*		
					25	Max:	68,000			MVB4080X683M1 *5C1*	MVL4080X683M1 *5C-*		
					16	Max:	100,000			MVB4080X104MG *5C3*	MVL4080X104MG *5C-*	<a href="#">PDE</a>	<a href="#">WEB</a>
5080	0.050 (1.270) ± 0.004 (0.102)	0.083 (2.108) ± 0.004 (0.102)	0.025 (0.635)	0.005 (0.127)	100	Max:	30,000			MVB5080X303M3 *5C1*	MVL5080X303M3 *5C-*		
					50	Max:	68,000		68,000 (VL)	MVB5080X683M2 *5C1*	MVL5080X683M2 *5C-*		
					25	Max:			100,000		NVL5080X104M1 *5N-*		
					16	Max:	180,000			MVB5080X184MG *5C1*	MVL5080X184MG *5C-*		
					12	Max:			100,000	NVB5080X104MF *5N3*			
					10	Max:	220,000			MVB5080X224ME *5C1*	MVL5080X224ME *5C-*		

\* Insert codes for termination (Page 8) and design-in location (Page 14)



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# A WORD TO THE DESIGN ENGINEER

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## UNITED STATES

USA	Code	USA	Code
Alabama	G	Nebraska	P
Alaska	P	Nevada, North	B
Arizona	D	Nevada, South	C
Arkansas	P	New Hampshire	L
California, North	B	New Jersey	J
California, South	C	New Mexico	D
Colorado	E	New York, Metro	J
Connecticut	L	New York, Upstate	K
Delaware	I	North Carolina	G
District of Columbia	H	North Dakota	O
Florida	G	Ohio	M
Georgia	G	Oklahoma	P
Hawaii	P	Oregon	A
Idaho	A	Pennsylvania	I
Illinois	N	Rhode Island	L
Indiana	M	South Carolina	G
Iowa	O	South Dakota	O
Kansas	P	Tennessee	G
Kentucky	M	Texas	F
Louisiana	P	Utah	E
Maine	L	Vermont	L
Maryland	H	Virginia	H
Massachusetts	L	Washington	A
Michigan	N	West Virginia	P
Minnesota	O	Wisconsin, East	N
Mississippi	G	Wisconsin, West	O
Missouri	N	Wyoming	E
Montana	A		

## OUTSIDE THE UNITED STATES

Americas	Code	Europe	Code
Canada	R	Austria	3
Mexico	R	Belgium	1
Caribbean	R	Denmark	5
Central America	R	Finland	5
South America	R	France	2
		Germany	3
		Ireland	6
		Italy	4
		Luxembourg	1
		Netherlands	1
		Norway	5
		Sweden	5
		Switzerland	3
		United Kingdom	6
		Other European Countries	7
		<b>Other</b>	
		India	2
		Israel	8
		Rest of World	9

