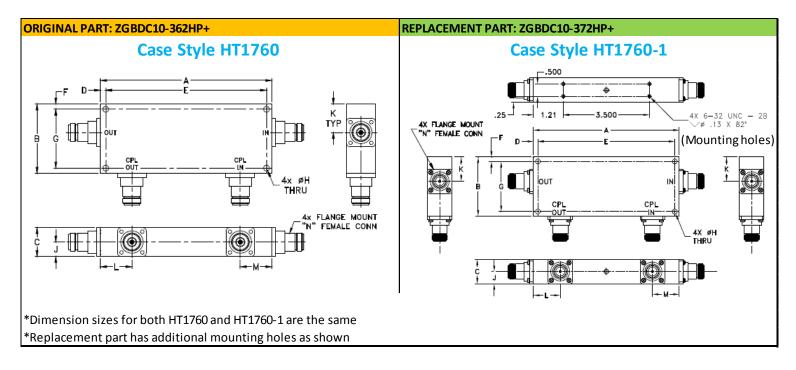


REPLACEMENT PART REFERENCE GUIDE, ZGBDC10-362HP+ AN-30-012

ORIGINAL PART:	ZGBDC10-362HP+	
REPLACEMENT PART:	ZGBDC10-372HP+	

Replacement Part has been judged by Mini-Circuits Engineering as a suitable replacement to Original Parta

MECHANICAL DIMENSIONS





CONCLUSION:

1) FORM-FIT-FUNCTIONAL ANALYSIS_a:

The Replacement Part is Form, Fit compatible.

Parameter		Original Part	Replacement Part	
Frequency (MHz)		380-3600	380-3700	
	(380-600 MHz)	1.75 Max	1.25 Max	
Coupling Flatness (±)	(600-2700 MHz)	1.2 Max	0.6 Max	
	(2700-3600 MHz)	1.2 Max	0.5 Max	
Insertion Loss (dB)	(380-600 MHz)	0.25 Max	0.20 Max	
	(600-2700 MHz)	0.40 Max	0.30 Max	
	(2700-3600 MHz)	0.50 Max	0.35 Max	
Directivity (dB)	(600-2700 MHz)	14.0 Min	15.0 Min	
	(2700-3600 MHz)	13.6 Min	14.0 Min	
Weatherproof		IP67	None	

Following is a summary of changes/improvements in the

Specification:

For typical performance and Graphs: See paragraphs 2 and 3

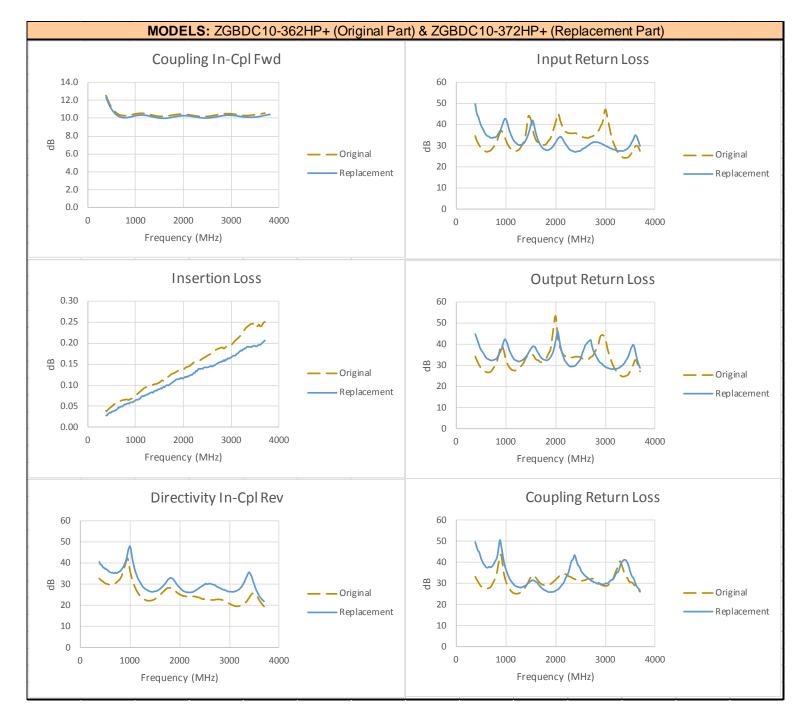


2) <u>TYPICAL PERFORMANCE COMPARISON AT ROOM TEMPERATURE:</u>

MODEL: ZGBDC10-362HP+ (RF Parameters)

For typical performance and Graphs: See paragraphs 2 and 3

Coupling (dB) 10 Nin Ave Min Ave Min Ave Min Ave Min Coupling (dB) 380 600 10.4 11.6 12.6 10.0 11.0 12.4 Coupling (dB) 2700 3600 10.0 10.5 10.9 9.7 10.2 10.6 2700 3600 0.95 0.97 0.99 0.96 0.99 1.0.2 10.6 Coupling Flatness (+/-) 380 600 0.95 0.97 0.99 0.96 0.99 1.0.2 0.16 Store (dB) 380 600 0.11 0.13 0.16 0.10 0.12 0.15 Insertion Loss (dB) 380 600 0.04 0.05 0.08 0.03 0.04 0.05 Directivity (dB) 380 600 2.700 3700 - - 0.15 0.18 0.22 Directivity (dB) 380 600 28.3 32.3 39.7 29.	RF Parameters	Frequency (MHz)		Original Design @ 10 Units			Replacement Design @ 10 Units		
Coupling (dB) 600 2700 2700 3600 9.9 10.0 10.4 10.5 10.8 10.9 9.5 9.7 10.1 10.2 10.6 10.6 Coupling Flatness (+/-) 380 600 600 2700 2700 0.17 0.20 0.17 0.99 0.26 0.96 0.17 0.99 0.26 0.96 0.17 0.99 0.26 0.96 0.17 0.91 0.22 0.17 0.21 0.17 0.21 0.15 0.27 0.15 0.15 Insertion Loss (dB) 380 600 600 2700 0.04 0.05 0.08 0.03 0.04 0.05 Directivity (dB) 380 600 600 2700 2700 3600 0.23 0.28 0.33 0.15 0.18 0.22 Directivity (dB) 380 600 2700 17.7 20.7 33.3 15.7 24.6 37.9 Return Loss Input (dB) 380 600 25.3 33.0 46.4 33.4 41.8 51.5 380 600 25.1 32.6 43.3 24.7 34.6 60.5 2700 3600 23.7 22.4 55.3		From	То	Min	Ave	Max	Min	Ave	Max
Coupling (ds) 2700 3600 10.0 10.5 10.9 9.7 10.2 10.6 Coupling Flatness (+/-) 380 600 0.95 0.97 0.99 0.96 0.99 1.02 10.6 Coupling Flatness (+/-) 380 600 2700 3700 - - - 9.7 10.2 10.6 Section Loss (dB) 380 600 0.95 0.97 0.99 0.96 0.99 1.02 0.27 Bisertion Loss (dB) 380 600 0.04 0.13 0.16 0.11 0.13 0.16 Directivity (dB) 380 600 28.3 32.3 39.7 29.9 37.7 49.7 Directivity (dB) 380 600 25.3 33.0 46.4 33.4 11.8 29.0 56.2 2700 3700 - - - 15.6 24.1 37.9 2700 3700 - - - 15.6 24.1	Coupling (dB)	380	600	10.4	11.6	12.6	10.0	11.0	12.4
2700 3600 10.0 10.5 10.9 9.7 10.2 10.6 2700 3700 - - - 9.7 10.2 10.6 Coupling Flatness (+/-) 380 600 0.95 0.97 0.99 0.96 0.99 1.02 Section Loss (dB) 2700 3600 0.11 0.13 0.16 0.10 0.12 0.15 Insertion Loss (dB) 380 600 0.04 0.05 0.08 0.03 0.04 0.05 Insertion Loss (dB) 380 600 0.04 0.05 0.08 0.03 0.04 0.05 Directivity (dB) 380 600 22700 3700 - - - 0.15 0.18 0.22 Directivity (dB) 380 600 28.3 32.3 39.7 29.9 37.7 49.7 2700 3600 17.7 26.0 43.4 19.8 29.0 56.2 2700 3700 - - - 15.6 24.1 37.9 Return Loss Input		600	2700	9.9	10.4	10.8	9.5	10.1	10.6
Coupling Flatness (+/-) 380 2700 2700 2700 3800 2700 600 3800 3700 0.95 0.17 0.99 0.25 0.96 0.17 0.99 0.17 0.21 0.21 0.27 Insertion Loss (dB) 380 600 600 2700 2700 3700 0.04 0.05 0.08 0.03 0.04 0.05 Insertion Loss (dB) 380 600 600 2700 2700 0.07 0.16 0.24 0.04 0.01 0.16 Directivity (dB) 380 600 600 2700 28.3 17.7 28.3 2700 39.7 29.9 17.7 37.7 49.7 Breturn Loss Input (dB) 380 2700 600 2700 25.3 17.7 33.0 15.7 44.6 24.6 37.9 Return Loss Input (dB) 380 2700 600 2700 23.7 32.4 55.3 22.7 30.5 62.7 2700 3700 - - - 27.7 30.5 62.7 2700 3600 25.3 33.0 - 46.4 33.4 41.8 51.5 80 600 2700 23.6 33.3 54.3 24.7 34.6		2700	3600	10.0	10.5	10.9	9.7	10.2	10.6
Coupling Flatness (+/-) 600 2700 2700 3600 0.17 0.11 0.20 0.13 0.25 0.16 0.17 0.10 0.21 0.12 0.27 0.15 Insertion Loss (dB) 380 600 600 0.04 0.05 0.08 0.03 0.04 0.05 Insertion Loss (dB) 380 600 0.07 0.16 0.24 0.04 0.10 0.16 Directivity (dB) 380 600 28.3 32.3 39.7 29.9 37.7 49.7 2700 3700 - - - 0.15 0.18 0.22 Directivity (dB) 380 600 28.3 32.3 39.7 29.9 37.7 49.7 2700 3700 - - - 15.6 24.1 37.9 2700 3700 - - - 15.6 24.1 37.9 2700 3700 - - - 15.6 24.1 37.9 2700 3700 - - - <td>2700</td> <td>3700</td> <td>-</td> <td>-</td> <td>-</td> <td>9.7</td> <td>10.2</td> <td>10.6</td>		2700	3700	-	-	-	9.7	10.2	10.6
Coupling Flatness (+/-) 600 2700 2700 3600 0.17 0.11 0.20 0.13 0.25 0.16 0.17 0.10 0.21 0.12 0.27 0.15 Insertion Loss (dB) 380 600 600 0.04 0.05 0.08 0.03 0.04 0.05 Insertion Loss (dB) 380 600 0.07 0.16 0.24 0.04 0.10 0.16 Directivity (dB) 380 600 28.3 32.3 39.7 29.9 37.7 49.7 2700 3700 - - - 0.15 0.18 0.22 Directivity (dB) 380 600 28.3 32.3 39.7 29.9 37.7 49.7 2700 3700 - - - 15.6 24.1 37.9 2700 3700 - - - 15.6 24.1 37.9 2700 3700 - - - 15.6 24.1 37.9 2700 3700 - - - <td rowspan="2"></td> <td>380</td> <td>600</td> <td>0.95</td> <td>0.97</td> <td>0.99</td> <td>0.96</td> <td>0.99</td> <td>1.02</td>		380	600	0.95	0.97	0.99	0.96	0.99	1.02
2700 3600 0.11 0.13 0.16 0.10 0.12 0.13 2700 3700 0.110.130.16Insertion Loss (dB) 380 600 0.04 0.05 0.08 0.03 0.04 0.05 2700 3600 0.23 0.28 0.33 0.15 0.18 0.22 2700 3700 0.15 0.18 0.22 2700 3700 0.15 0.18 0.22 2700 3700 0.15 0.18 0.22 2700 3700 0.15 0.18 0.22 2700 3700 17.7 26.0 43.4 19.8 29.0 56.2 2700 3600 17.2 20.7 33.4 11.8 29.0 56.2 2700 3700 15.6 24.1 37.9 2700 3700 15.6 24.1 37.9 2700 3600 23.7 32.4 55.3 22.7 30.5 62.7 2700 3600 25.1 32.6 43.3 33.6 41.0 57.8 Return Loss Output (dB) 380 600 25.1 32.6 43.3 33.6 41.0 57.8 2700 3700 23.1 31.3 58.5 2700 3		600	2700	0.17	0.20		0.17	0.21	0.27
Insertion Loss (dB) 380 600 2700 2700 3600 0.04 0.07 0.05 0.16 0.08 0.24 0.03 0.04 0.04 0.04 0.05 0.16 Directivity (dB) 380 600 2700 2700 17.7 26.0 43.4 19.8 29.0 56.2 Directivity (dB) 380 600 2700 2700 17.7 26.0 43.4 19.8 29.0 56.2 2700 3700 - - - 15.6 24.1 37.9 2700 3700 - - - 15.6 24.1 37.9 2700 3700 - - - 15.6 24.1 37.9 Return Loss Input (dB) 380 600 25.3 33.0 46.4 33.4 41.8 51.5 2700 3700 - - - 27.7 30.5 62.7 2700 3600 25.3 33.0 46.4 33.4 41.8 51.5 2700 3700 -	Coupling Flatness (+/-)	2700	3600	0.11	0.13	0.16	0.10	0.12	0.15
Insertion Loss (dB) $600 \\ 2700 \\ 2700 \\ 3600 \\ 2700 \\ 3700 \\ 2700 \\ 3700 \\ 2700 \\ 3700 \\ 2700 \\ 3700 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\$		2700	3700	-	-	-	0.11	0.13	0.16
Insertion Loss (dB) $600 \\ 2700 \\ 2700 \\ 3600 \\ 2700 \\ 3700 \\ 2700 \\ 3700 \\ 2700 \\ 3700 \\ 2700 \\ 3700 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\$	Insertion Loss (dB)	380	600	0.04	0.05	0.08	0.03	0.04	0.05
Insertion Loss (dB) 2700 3600 0.23 0.28 0.33 0.15 0.18 0.22 Directivity (dB) 380 600 28.3 32.3 39.7 29.9 37.7 49.7 Directivity (dB) 600 2700 17.7 26.0 43.4 19.8 29.0 56.2 Z700 3600 17.2 20.7 33.3 15.7 24.6 37.9 Z700 3700 - - - - 15.6 24.1 37.9 Return Loss Input (dB) 380 600 25.3 33.0 46.4 33.4 41.8 51.5 Return Loss Input (dB) 380 600 25.1 32.4 55.3 22.7 30.5 62.7 2700 3700 - - - - 22.7 30.5 62.7 Return Loss Input (dB) 380 600 25.1 32.6 43.3 33.6 41.0 57.8 Return Loss Output (dB) 380 600 22.0 32.6 43.3 23.2 25.8 34.1 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
2700 3700 - - - 0.15 0.18 0.22 Directivity (dB) 380 600 28.3 32.3 39.7 29.9 37.7 49.7 Directivity (dB) 2700 3600 17.7 26.0 43.4 19.8 29.0 56.2 2700 3600 17.2 20.7 33.3 15.7 24.6 37.9 Return Loss Input (dB) 380 600 25.3 33.0 46.4 33.4 41.8 51.5 Return Loss Input (dB) 380 600 25.3 33.0 46.4 33.4 41.8 51.5 380 600 2700 23.6 33.3 54.3 24.7 34.6 60.5 2700 3600 23.7 32.4 55.3 22.7 30.5 62.7 2700 3600 25.1 32.6 43.3 33.6 41.0 57.8 Return Loss Output (dB) 380 600 22.0 32.4									
Directivity (dB) $\begin{array}{cccccccccccccccccccccccccccccccccccc$									
Directivity (dB) $\begin{array}{cccccccccccccccccccccccccccccccccccc$		380	600	28.3	32.3	39.7	29.9	37.7	49.7
Directivity (dB) 2700 3600 17.2 20.7 33.3 15.7 24.6 37.9 Return Loss Input (dB) 380 600 25.3 33.0 46.4 33.4 41.8 51.5 Return Loss Input (dB) 380 600 22.3 33.3 54.3 24.7 34.6 60.5 2700 3600 23.7 32.4 55.3 22.7 30.5 62.7 2700 3600 25.1 32.6 43.3 33.6 41.0 57.8 Return Loss Output (dB) 380 600 25.1 32.6 43.3 33.6 41.0 57.8 2700 3600 22.0 32.4 53.2 25.8 34.1 57.5 2700 3600 22.0 32.4 53.2 25.8 34.1 57.5 380 600 22.0 32.4 53.2 25.8 34.1 57.5 2700 3700 $ 23.1$ 31.3 58.5 380 600 2700 22.0 32.0 55.3 25.5 33.8 41.0 55.5 380 600 2700 23.0 32.0 55.3 25.5 33.8 54.1									
Return Loss Input (dB) 2700 3700 $ 15.6$ 24.1 37.9 Return Loss Input (dB) 380 600 25.3 33.0 46.4 33.4 41.8 51.5 2700 2700 23.6 33.3 54.3 24.7 34.6 60.5 2700 3600 23.7 32.4 55.3 22.7 30.5 62.7 2700 3700 $ 22.7$ 30.9 63.9 Return Loss Output (dB) 380 600 25.1 32.6 43.3 33.6 41.0 57.8 2700 3600 2700 22.0 32.4 53.2 25.8 34.1 57.5 2700 3600 2700 22.0 30.6 50.2 24.4 31.2 55.3 2700 3600 27.0 22.0 30.6 50.2 24.4 31.2 55.3 2700 3700 $ 23.1$ 31.3 58.5 33.8 41.0 55.5 53.8 380 600 2700 23.0 32.0 55.3 25.5 33.8 54.1	Directivity (dB)								
Return Loss Input (dB)									
Return Loss Input (dB)		380	600	25.3	33.0	46.4	33.4	41.8	51.5
Return Loss Input (dB) 2700 3600 2700 23.7 32.4 $ 55.3$ $ 22.7$ $ 30.5$ 22.7 62.7 30.9 Return Loss Output (dB) 380 600 2700 600 2700 25.1 22.0 32.6 32.4 43.3 53.2 33.6 25.8 41.0 57.8 25.8 Return Loss Output (dB) 380 600 2700 22.0 22.0 32.4 53.2 53.2 25.8 25.8 24.4 34.1 57.5 Return Loss Output (dB) 380 600 2700 26.4 23.0 33.4 32.0 51.4 55.3 33.8 25.5 41.0 33.8 55.5 33.8 Return Loss Couping (dB) 600 2700 26.4 23.0 33.4 32.0 51.4 55.3 33.8 25.5 41.0 33.8 55.5 53.8									
Return Loss Output (dB) 2700 3700 $ 22.7$ 30.9 63.9 Return Loss Output (dB) 380 600 25.1 32.6 43.3 33.6 41.0 57.8 2700 2700 22.0 32.4 53.2 25.8 34.1 57.5 2700 3600 22.0 30.6 50.2 24.4 31.2 55.3 2700 3700 $ 23.1$ 31.3 58.5 Return Loss Couping (dB) 600 2700 23.0 32.0 55.3 25.5 33.8 41.0 55.5	Return Loss Input (dB)								
Return Loss Output (dB) 600 2700 22.0 32.4 53.2 25.8 34.1 57.5 2700 3600 22.0 30.6 50.2 24.4 31.2 55.3 2700 3700 - - - - 23.1 31.3 58.5 380 600 26.4 33.4 51.4 33.8 41.0 55.5 8eturn Loss Couping (dB) 600 2700 23.0 32.0 55.3 25.5 33.8 54.1									
Return Loss Output (dB) 600 2700 22.0 32.4 53.2 25.8 34.1 57.5 2700 3600 22.0 30.6 50.2 24.4 31.2 55.3 2700 3700 - - - - 23.1 31.3 58.5 380 600 26.4 33.4 51.4 33.8 41.0 55.5 800 2700 23.0 32.0 55.3 25.5 33.8 54.1	Return Loss Output (dB)	380	600	25.1	32.6	43.3	33.6	41.0	57.8
Return Loss Output (dB) 2700 3600 22.0 30.6 50.2 24.4 31.2 55.3 2700 3700 - - - - 23.1 31.3 58.5 380 600 26.4 33.4 51.4 33.8 41.0 55.5 600 2700 23.0 32.0 55.3 25.5 33.8 54.1									
2700 3700 - - 23.1 31.3 58.5 380 600 26.4 33.4 51.4 33.8 41.0 55.5 600 2700 23.0 32.0 55.3 25.5 33.8 54.1									
Return Loss Couping (dB) 600 2700 23.0 32.0 55.3 25.5 33.8 54.1									
Return Loss Couping (dB) 600 2700 23.0 32.0 55.3 25.5 33.8 54.1	Return Loss Couping (dB)	380	600	26.4	33.4	51.4	33.8	41.0	55.5
Return Loss (Couping (dB)									
		2700	3600	22.7	30.6	52.3	22.7	30.0	49.2
2700 3700 22.8 29.7 49.2									



3) **<u>TYPICAL PERFORMANCE GRAPHS AT ROOM TEMPERATURE</u>:</u>**

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