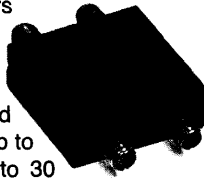


# Aluminum Cased Connectorized Components

## 3 dB 90° & 180° HYBRID COUPLERS

3 dB Hybrid couplers split power equally between two output ports. There are 90 degree and 180 degree versions providing a fixed phase difference between the two outputs. These couplers are constructed using strip transmission line in solid aluminum housings. Connectors are of passivated stainless steel with gold plated contacts. These couplers meet MIL-E-5400 Class 3 requirements. Units are available in the frequency range of .062 to 18 GHz in octave and multi-octave frequency coverage. Standard models have power handling capability up to 1500 watts at frequencies of 30 MHz, to 30 watts at 18 GHz. High power models are rated at greater than 1 kw at 500 MHz.



**DIRECTIONAL COUPLERS** Directional couplers are available as "In-Line" or "H" Style. In-line designs can be inserted in a transmission line path with a coupled output at right angles. "H" Styles provide the coupler output at 180 degrees. Coupling values from 6 to 20 dB at frequencies from 1 to 18 GHz are available. These couplers are constructed using strip transmission line in solid aluminum housings. Connectors are of passivated steel with gold plated contacts. These couplers meet MIL-E-5400 Class 3 requirements.



**POWER DIVIDERS** Output signals are equal in amplitude and phase. Models cover the frequency range to 18 GHz and are available in 2, 3, 4 and 8-way versions. Power handling of 2-way standard splitters is 10 watts when the outputs are terminated in a VSWR of 1.2:1 or less. Octave and multi-octave frequency coverage is available. Construction consists of printed circuits on teflon-glass substrates contained in an aluminum housing with stainless steel connectors. Various connectors are available dependent on the model number selected. The units meet MIL-E-5400 Class 3 requirements.



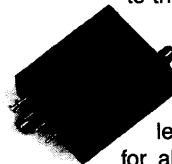
**MIXERS** Balanced mixers featuring low conversion loss and good VSWR. The Orthoquad design provides both good match and high isolation between the LO and RF ports. Double balanced mixers provide high isolation and good conversion loss and also wider ranges or frequencies for RF, LO and IF. Quadratures mixers provide two IF outputs that are equal in amplitude and 90° offset from one another. Image rejection mixers are available with internal 90° IF couplers that provide cancellation of the image frequency term. Some models are available in biased versions that allow DC bias current to make up for low local oscillator power. Bias can also be used for optimizing mixer parameters including conversion loss and intercept point. Stripline construction with stainless steel connectors and Schottky diodes are standard.



**MODULATORS** Output signals are equal in amplitude and phase. Models cover the frequency range to 18GHz and are available in 2, 3, 4 and 8-way versions. Power handling of 2-way standard splitters is 10 watts when the outputs are terminated in a VSWR of 1.2:1 or less. Octave and multi-octave frequency coverage is available. Construction consists of printed circuits on teflon-glass substrates contained in a aluminum housing with stainless steel connectors. Various connectors are available dependent on the model number selected. The units meet MIL-E-5400 Class 3 requirements.



**ATTENUATORS** Linearized and current controlled attenuators are available. The linearized series has an input control sensitivity of 6 dB/volt where the attenuation is linearly related to the control voltage. The attenuators are also available with control of current to diodes without the linearizing circuit. All units are absorptive type providing good input and output VSWR. Switching speed is less than 650 nsec. Power rating is 0.4 watts for all units. Units are available to 12.4 GHz. Units are constructed using stripline technology meeting MIL-E-5400 Class 3 requirements.



## PHASE DISCRIMINATORS (CORRELATORS)

Phase discriminators accept two RF signals of the same frequency and produce outputs proportional to the amplitude of the inputs and relative phase between them. On the 20750 series, signal voltages are available for video viewing or processing. The 2A0750 series detector outputs are combined and amplified in an AC coupled amp. The video outputs from either series can be used to provide a polar oscilloscope display where the radius is proportional to signal strength and angular deflection is proportional to relative phase between the input signals.



- Item 1. Full Electrical Performance Test per ATP.
- Item 2. Sine Vibration per MIL-STD-202F, Method 204D, Test Condition G, 10 to 2000 Hz, 30G Peak, 4 hours/axis.
- Item 3. Electrical Performance Test.
- Item 4. Random Vibration per MIL-STD-202F, Method 214, Test Condition I, E, 0.2 Gz/Hz, 16.4 g RMS overall, 15 minutes/axis.
- Item 5. Electrical Performance Test.
- Item 6. Shock per MIL-STD-202F, Method 213B, Test Condition J, 30g Peak, 11 msec, Half Sine, 3 blows each direction of each axis, non-operating.
- Item 7. Electrical Performance Test.
- Item 8. Thermal Shock per MIL-STD-202F, Method 107D, Test Condition B, non-operating.

**(Except temperature extremes are -55 and +125 Degree Celsius and number of cycles are 10 with a 30 minute dwell at extremes.)**

- Item 9. Electrical Performance Test.
- Item 10. Barometric Pressure per MIL-STD-202F, Method 105C, Test Condition D, 1000,000 Ft., non-operating.
- Item 11. Electrical Performance Test.
- Item 12. Salt Spray per MIL-STD-202F, Method 101D, Test Condition A, 96 hours, non-operating.
- Item 13. Electrical Performance Test.
- Item 14. Moisture Resistance per MIL-STD-810C, Method 507, Procedure I, 10 days, non-operating.
- Item 15. Final Electrical Performance Test per ATP.

**Note: Testing is done Per QTP 99023.**

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3 dB, 90°

Model	Freq.	Isol.	Ins. Loss	VSWR	Amp. Balance	Phase Balance	Power Max
	MHz	dB Min./Typ.	dB Max.	Max:1	dB Max	deg Max	Watts (Avg/CW)
10540-3	30 - 76	20/25	0.50	1.20	±0.75	±5.0	800
10011-3	62 - 125	21/30	0.45	1.25	±0.50	±2.0	600
1A1120-3	100 - 500	16/23	0.50	1.35	±0.80	±5.0	200
10012-3	125 - 250	21/30	0.30	1.25	±0.50	±2.0	300
10010-3	225 - 400	23/30	0.30	1.20	±0.50	±2.0	250
10013-3	250 - 500	23/30	0.30	1.20	±0.50	±2.0	200
10023-3	250 - 1000	20/23	0.50	1.30	±0.75	±3.0	200
10014-3	500 - 1000	23/30	0.30	1.20	±0.50	±2.0	200
1A0024-3	500 - 2000	17/21	0.60	1.45	±0.80	±5.0	100
1B0024-3	500 - 3000	16/21	1.20	1.65	±0.80	±5.0	100
10574-3	500 - 1000	22/28	0.30	1.29	±0.50	±2.0	200
10024-3	500 - 1500	18/21	0.60	1.40	±0.50	±5.0	150
1C0680-3	700 - 1400	18/29	0.30	1.25	±0.50	±2.0	150
1A0004-3	800 - 1000	21	0.30	1.20	±0.35	±3.0	200
1A0504-3	800 - 1000	21	0.30	1.20	±0.35	±3.0	200
1B0680-3	950 - 1225	20/29	0.30	1.25	±0.30	±2.0	200
10575-3	1000 - 2000	20/27	0.30	1.33	±0.50	±2.0	150
10015-3	1000 - 2000	23/30	0.30	1.25	±0.50	±2.0	150
1H0565-3	1000 - 2000	25/30	0.30	1.20	±0.50	±2.0	150
10025-3	1000 - 4000	15/19	0.50	1.50	±0.75	±5.0	100
1J0560-3	1300 - 2600	23/28	0.30	1.25	±0.50	±2.0	100
10040-3	1400 - 2800	20/28	0.30	1.25	±0.50	±2.0	100
1A0005-3	1500 - 2000	20	0.30	1.25	±0.35	3.0	150
1A0505-3	1500 - 2000	20	0.30	1.25	±0.35	3.0	150
1A0310-3	1500 - 10000	15/18	1.20	1.60	±1.00	±5.0	80
	10000 - 12000	12/18	1.20	1.80	±1.00	±5.0	80
10016-3	2000 - 4000	20/29	0.30	1.30	±0.50	±2.0	100
10576-3	2000 - 4000	19/26	0.40	1.35	±0.50	±3.0	100
1H0566-3	2000 - 4000	23/28	0.30	1.25	±0.50	±2.0	100
10300-3	2000 - 6000	16/21	0.50	1.50	±0.75	±5.0	90
10310-3	2000 - 11000	15/20	1.20	1.65	±1.00	±5.0	80
1A0006-3	2400 - 2800	19	0.35	1.30	±0.35	3.0	100
1A0506-3	2400 - 2800	19	0.35	1.30	±0.35	3.0	100
1H0560-3	2600 - 5200	18/22	0.30	1.25	±0.50	±2.0	90
10017-3	4000 - 8000	18/21	0.60	1.35	±0.50	±4.0	80
1H0567-3	4000 - 8000	18/22	0.35	1.30	±0.50	±3.0	80
10577-3	4000 - 8000	16/20	0.50	1.48	±0.50	±5.0	80
10029-3	4500 - 18000	16	1.30	1.58	±0.60	±7.0	60
1E0018-3	7000 - 11000	17	0.50	1.45	±0.50	±6.0	70

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### 3 dB, 90° (cont'd)

Model	Freq. Loss	Isol.	Ins. Balance	VSWR Balance	Amp. Type	Phase	Power Max
	MHz	dB Min./Typ.	dB Max.	Max:1	dB Max	deg Max	Watts (Avg/CW)
1J0770-3	7500 - 18000	14/18	0.80	1.50	±0.65	±7.0	60
10018-3	8000 - 12400	16/22	0.60	1.50	±0.50	±6.0	70
1H0568-3	8000 - 12400	18/22	0.50	1.35	±0.40	±3.0	70
10019-3	12400 - 18000	12/15	1.20	1.79	±0.50	±9.0	60
1H0569-3	12400 - 18000	14/16	0.80	1.50	±0.40	±5.0	60

### 3 dB, 180°

Model	Freq.	Isol.	Ins. Loss	VSWR	Amp. Balance	Phase Balance	Power Max
	MHz	dB Min./Typ.	dB Max.	Max:1	dB Max	deg Max	Watts (Avg/CW)
30054	500 - 1000	20/24	0.60	1.25	±0.50	±8.0	200
30110	600 - 1200	18/25	0.60	1.27	±0.50	±8.0	200
30055	1000 - 2000	18/22	0.60	1.35	±0.50	±6.0	150
3A0055	1000 - 2000	20/25	0.60	1.35	±0.20	±8.0	150
3A0200	1300 - 2600	20/23	0.60	1.40	±0.40	±8.0	100
30100	1900 - 2300	20/23	0.60	1.40	±0.30	±6.0	100
30056	2000 - 4000	15/18	0.65	1.60	±0.50	±10.0	100
3A0056	2000 - 4000	20/23	0.60	1.50	±0.40	±8.0	100
30057	4000 - 8000	15/18	0.60	1.90	±0.50	±10.0	80
30070	6000 - 18000	15/20	2.20	1.90	±0.50	±10.0	60
30160	7000 - 11000	15/18	1.20	1.80	±0.50	±10.0	70
30058	8000 - 12400	12/18	1.60	2.00	±0.50	±10.0	70
30060	8000 - 18000	15/18	1.50	2.60	±0.60	±15.0	60

### H - Style

Model	Freq.	Coupling	Ins. Loss	VSWR	Freq. Sens.	Direct.	Max CW Power
	MHz	dB Mean	dB Max.	Max:1	dB Max	dB Min/Typ	Forward / Backward
1F0625-6	1000 - 2000	6.0±0.8	0.40	1.23	±0.80	20/25	20/2
1F0625-10	1000 - 2000	10.0±0.8	0.40	1.23	±0.80	20/25	50/5
1F0625-20	1000 - 2000	20.0±1.5	0.40	1.23	±1.25	17/22	100/50
1F0626-6	2000 - 4000	6.0±0.8	0.40	1.25	±0.80	20/25	20/2
1F0626-10	2000 - 4000	10.0±0.8	0.40	1.25	±0.80	20/25	50/5

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## H - Style (cont'd)

Model	Freq.	Coupling	Ins. Loss	VSWR	Freq. Sens.	Direct.	Max CW Power
	MHz	dB Mean	dB Max.	Max:1	dB Max	dB Min/Typ	Forward / Backward
1F0626-20	2000 - 4000	20.0±1.5	0.40	1.25	±1.25	18/23	100/50
1F0627-6	4000 - 8000	6.0±0.8	0.40	1.25	±0.80	15/20	20/2
1F0627-10	4000 - 8000	10.0±0.8	0.40	1.25	±0.80	15/20	50/5
1F0627-20	4000 - 4000	20.0±1.5	0.40	1.25	±1.25	15/20	100/50
1F0628-6	8000 - 12400	6.0±0.8	0.50	1.35	±0.60	18/23	20/2
1F0628-10	8000 - 12400	10.0±0.8	0.50	1.35	±0.75	18/23	50/5
1F0628-20	8000 - 12400	20.0±1.5	0.50	1.35	±0.80	15/20	100/50
1F0629-6	12400 - 18000	6.0±0.8	0.60	1.50	±0.60	14/19	20/2
1F0629-10	12400 - 18000	10.0±0.8	0.60	1.50	±0.80	14/19	50/5
1F0629-20	12400 - 18000	20.0±1.5	0.60	1.50	±0.80	14/19	100/50

## In Line - Style

Model	Freq.	Coupling	Ins. Loss	VSWR	Freq. Sens.	Direct.	Max CW Power
	MHz	dB Mean	dB Max.	Max:1	dB Max	dB Min/Typ	Forward / Backward.
10011-6	62.5 - 125	6.0±0.8	0.40	1.15	±0.80	20/25	20/2
10011-10	62.5 - 125	10.0±0.8	0.40	1.15	±0.80	20/25	50/5
10011-20	62.5 - 125	20.0±1.0	0.40	1.15	±0.80	17/22	100/50
10011-30	62.5 - 125	30.0±1.5	0.40	1.15	±0.80	15/20	100/100
10012-6	125 - 250	6.0±0.8	0.30	1.15	±0.80	20/25	20/2
10012-10	125 - 250	10.0±0.8	0.30	1.15	±0.80	20/25	50/5
10012-20	125 - 250	20.0±1.0	0.30	1.15	±0.80	17/22	100/50
10012-30	125 - 250	30.0±1.5	0.30	1.15	±0.80	15/20	100/100
10010-6	225 - 400	6.0±0.8	0.30	1.15	±0.80	20/25	20/2
10010-10	225 - 400	10.0±0.8	0.30	1.15	±0.80	20/25	50/5
10010-20	225 - 400	20.0±1.0	0.30	1.15	±0.80	17/22	100/50
10010-30	225 - 400	30.0±1.5	0.30	1.15	±0.80	15/20	100/100
10013-6	250 - 500	6.0±0.8	0.30	1.15	±0.80	20/25	20/2
10013-10	250 - 500	10.0±0.8	0.30	1.15	±0.80	20/25	50/5
10013-20	250 - 500	20.0±1.0	0.30	1.15	±0.80	17/22	100/50
10013-30	250 - 500	30.0±1.5	0.30	1.15	±0.80	15/20	100/100
10014-6	500 - 1000	6.0±0.8	0.30	1.20	±0.80	20/25	20/2
10014-10	500 - 1000	10.0±0.8	0.30	1.20	±0.80	20/25	50/5
10014-20	500 - 1000	20.0±1.0	0.30	1.20	±0.80	17/22	100/50
10014-30	500 - 1000	30.0±1.5	0.30	1.20	±0.90	15/20	100/100
10870-10	500 - 2000	10.0±0.8	0.50	1.25	±0.90	17/22	50/5

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## In Line - Style (cont'd)

Model	Freq.	Coupling	Ins. Loss	VSWR	Freq. Sens.	Direct.	Max CW Power
	MHz	dB Mean	dB Max.	Max:1	dB Max	dB Min/Typ	Forward / Backward.
1C0870-20	500 - 4000	20.0±1.5	0.50	1.30	±1.50	17/20	100/50
1A0004-10	800 - 1000	10.0±1.0	0.20	1.15	±0.15	18	200/200
1A0004-20	800 - 1000	20.0±1.5	0.20	1.15	±0.15	18	200/200
1A0004-30	800 - 1000	30.0±2.0	0.20	1.15	±0.12	16	200/200
1A0504-10	800 - 1000	10.0±1.0	0.20	1.15	±0.15	18	200/200
1A0504-20	800 - 1000	20.0±1.5	0.20	1.15	±0.15	18	200/200
1A0504-30	800 - 1000	30.0±2.0	0.20	1.15	±0.15	16	200/200
10930-6	800 - 1600	6.0±0.8	0.30	1.20	±0.80	20/25	20/2
10930-10	800 - 1600	10.0±0.8	0.30	1.20	±0.80	20/25	50/5
10615-6	1000 - 2000	6.0±0.8	0.30	1.20	±0.80	20/25	20/2
10615-10	1000 - 2000	10.0±0.8	0.30	1.20	±0.80	20/25	50/5
10615-20	1000 - 2000	20.0±1.0	0.30	1.20	±0.80	20/25	100/50
10615-30	1000 - 2000	30.0±1.5	0.30	1.20	±0.80	15/20	100/100
10860-6	1000 - 4000	5.5±0.7	0.80	1.40	±0.80	18/20	20/2
1A0005-10	1500 - 2000	10.0±1.0	0.25	1.17	±0.25	18/22	150/150
1A0005-20	1500 - 2000	20.0±1.5	0.25	1.17	±0.25	18/20	150/150
1A0005-30	1500 - 2000	30.0±2.0	0.25	1.17	±0.25	16/20	150/150
1A0505-10	1500 - 2000	10.0±1.0	0.25	1.17	±0.25	18	150/150
1A0505-20	1500 - 2000	20.0±1.5	0.25	1.17	±0.25	18	150/150
1A0505-30	1500 - 2000	30.0±2.0	0.25	1.17	±0.25	16	150/150
10616-6	2000 - 4000	6.0±0.8	0.45	1.25	±0.80	18/22	20/2
10616-10	2000 - 4000	10.0±0.8	0.45	1.25	±0.80	18/22	50/5
10616-20	2000 - 4000	20.0±1.0	0.45	1.25	±0.80	18/22	100/50
10616-30	2000 - 4000	30.0±2.0	0.45	1.25	±0.80	15/20	100/100
1A0006-10	2400 - 2800	10.0±1.0	0.30	1.12	±0.20	18	100/100
1A0006-20	2400 - 2800	20.0±1.5	0.30	1.12	±0.20	18	100/100
1A0006-30	2400 - 2800	30.0±2.0	0.30	1.12	±0.12	15	100/100
1A0506-10	2400 - 2800	10.0±1.0	0.30	1.12	±0.20	18	100/100
1A0506-20	2400 - 2800	20.0±1.5	0.30	1.12	±0.20	18	100/100
1A0506-30	2400 - 2800	30.0±2.0	0.30	1.12	±0.12	15	100/100
10610-6	2600 - 5200	6.0±0.8	0.50	1.25	±0.80	18/23	20/2
10610-10	2600 - 5200	10.0±0.8	0.50	1.25	±0.80	17/22	50/5
10610-20	2600 - 5200	20.0±1.5	0.50	1.25	±0.80	16/21	100/50
1G0617-6	4000 - 8000	6.0±0.8	0.50	1.35	±0.80	18/23	20/2
1G0617-10	4000 - 8000	10.0±0.8	0.50	1.35	±0.80	18/23	50/5
1G0617-20	4000 - 8000	20.0±1.0	0.50	1.35	±1.00	18/23	100/50
1G0618-6	8000 - 12400	6.0±0.8	0.60	1.45	±0.50	15/20	20/2
1G0618-10	8000 - 12400	10.0±0.8	0.60	1.45	±0.60	15/20	50/5
1G0618-20	8000 - 12400	20.0±1.0	0.60	1.45	±0.80	15/20	100/50

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## In Line - Style (cont'd)

Model	Freq.	Coupling	Ins. Loss	VSWR	Freq. Sens.	Direct.	Max CW Power
	MHz	dB Mean	dB Max.	Max:1	dB Max	dB Min/Typ	Forward / Backward.
1G0619-6	12400 - 18000	6.0±1.0	0.80	1.79	±.50	12/19	20/2
1G0619-10	12400 - 18000	10.0±1.0	0.80	1.79	±0.60	12/18	50/5
1G0619-20	12400 - 18000	20.0±1.0	0.80	1.79	±0.75	12/17	100/50

## 2 Way, In Phase

Model	Freq.	Isol.	Ins. Loss	VSWR	Amp. Balance	Phase Balance	Max Input Power
	MHz	dB Min./Typ.	dB Max.	Max in/ Max out:1.0	dB Max	deg Max	Watts (Avg/CW)
40262	125 - 250	20	0.30	1.20/1.20	0.40	2	10
40260	225 - 400	20	0.30	1.20/1.20	0.40	2	10
40263	250 - 500	20	0.30	1.20/1.20	0.40	2	10
40264	500 - 1000	20	0.30	1.20/1.20	0.40	4	10
4J0264	500 - 1000	20	0.30	1.20/1.20	0.40	4	10
42000	500 - 2000	20	0.50	1.30/1.20	0.40	2	10
41620	500 - 3000	15	0.75	1.60/1.60	0.40	8	10
41180	700 - 1400	20	0.30	1.25/1.25	0.40	6	10
40255	1000 - 2000	20	0.30	1.30/1.30	0.40	4	10
40265	1000 - 2000	20	0.30	1.25/1.25	0.40	6	10
4J0265	1000 - 2000	20	0.30	1.25/1.25	0.40	6	10
40710	1000 - 2600	18	0.50	1.30/1.20	0.40	8	10
42010	1000 - 4000	18	0.50	1.35/1.25	0.40	3	10
	1000 - 2000	14	0.40	1.70/1.70	0.40	8	10
40510	2000 - 11000	15	1.20	1.70/1.70	0.40	10	10
	11000 - 12400	12	1.30	1.90/1.90	0.40	10	10
4E0265	1500 - 3000	20	0.30	1.25/1.25	0.40	6	10
40256	2000 - 4000	20	0.30	1.30/1.30	0.40	6	10
40266	2000 - 4000	20	0.30	1.30/1.30	0.40	6	10
4J0266	2000 - 4000	20	0.30	1.30/1.30	0.40	6	10
	2000 - 4000	20	0.40	1.35/1.25	0.40	4	10
42020	4000 - 8000	18	0.70	1.43/1.33	0.40	6	10
	2000 - 4000	18	0.50	1.30/1.25	0.40	5	10
	4000 - 8000	18	0.80	1.33/1.33	0.60	6	10
42100	8000 - 12400	17	1.00	1.38/1.38	0.70	7	10
	12400 - 18000	16	1.50	1.50/1.50	0.80	8	10

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## 2 Way, In Phase (cont'd)

Model	Freq.	Isol.	Ins. Loss	VSWR	Amp. Balance	Phase Balance	Max Input Power
	MHz	dB Min.	dB Max.	Max in/Max out:1	dB Max	deg Max	Watts (Avg/CW)
41130	2000 - 4000	15	0.60	1.60/1.60	0.40	6	10
	4000 - 8000	15	0.80	1.60/1.60	0.40	8	10
	8000 - 12400	15	1.20	1.80/1.80	0.70	10	10
	12400 - 18000	15	1.20	2.00/2.00	0.80	12	10
40330	2500 - 5000	16	0.50	1.79/1.33	0.30	8	10
	5000 - 10000	15	1.00	1.92/1.38	0.40	10	10
4A0256	3600 - 4300	20	0.30	1.37/1.30	0.20	2	10
4A0266	3700 - 4200	18	0.30	1.40/1.40	0.20	6	10
40257	4000 - 8000	18	0.70	1.60/1.60	0.40	6	10
40267	4000 - 8000	18	0.70	1.60/1.60	0.40	6	10
4J0267	4000 - 8000	18	0.70	1.60/1.60	0.40	6	10
42030	4000 - 12000	18	0.60	1.50/1.40	0.40	8	10
4A0257	5700 - 6500	20	0.30	1.40/1.37	0.20	2	10
42040	6000 - 16000	17	0.80	1.58/1.58	0.50	10	10
	16000 - 18000	17	1.20	1.79/1.79	0.50	10	10
41640	7000 - 11000	16	0.70	1.80/1.80	0.40	8	10
41690	7000 - 12400	17	0.80	1.92/1.92	0.40	8	10
	12400 - 18000	15	1.20	2.00/2.00	0.50	10	10
40268	8000 - 12400	16	0.70	1.80/1.80	0.40	8	10
40269	12400 - 18000	14	1.10	2.00/2.00	0.50	10	10

## 3 Way, In Phase

Model	Freq.	Isol.	Ins. Loss	VSWR	Amp. Balance	Phase Balance	Max Input Power
	MHz	dB Min.	dB Max.	Max in/Max out:1	dB Max	deg Max	Watts (Avg/CW)
43000	500 - 600	16	0.50	1.60/1.50	0.30	3	10
	600 - 2000	18	0.50	1.30/1.50	0.20	3	10
43020	2000 - 6000	17	0.50	1.40/1.50	0.30	6	10
43040	6000 - 12000	17	0.70	1.50/1.50	0.40	6	10
	12000 - 18000	12	1.00	1.50/1.90	0.60	9	10

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## 4 Way, In Phase

Model	Freq.	Isol.	Ins. Loss	VSWR	Amp. Balance	Phase Balance	Max Input Power
	MHz	dB Min.	dB Max.	Max in/Max out:1	dB Max	deg Max	Watts (Avg/CW)
40274	500 - 1000	20	0.60	1.30/1.30	0.60	6	17
41720	500 - 2000	16	0.90	1.70/1.70	0.60	10	17
44000	500 - 2000	20	1.00	1.50/1.30	0.60	6	17
40275	1000 - 2000	20	0.60	1.35/1.35	0.60	6	17
44010	1000 - 4000	18	1.00	1.50/1.35	0.60	6	17
40276	2000 - 4000	18	0.60	1.35/1.35	0.60	6	17
44020	2000 - 8000	16	1.20	1.55/1.45	0.60	6	17
	2000 - 4000	17	1.10	1.70/1.24	0.40	5	17
	4000 - 8000	16	1.30	1.85/1.31	0.60	8	17
44100	8000 - 12400	15	1.90	2.08/1.51	0.70	12	17
	12400 - 15000	14	2.30	2.10/1.92	0.80	14	17
	15000 - 18000	13	2.70	2.10/1.92	0.80	14	17
41280	2600 - 5200	18	0.60	1.35/1.35	0.60	6	17
4A0456	3600 - 4300	20	0.50	1.37/1.30	0.20	3	17
4A1280	3700 - 4200	20	0.50	1.35/1.35	0.40	6	17
40277	4000 - 8000	18	1.00	1.70/1.70	0.60	8	17
44030	4000 - 12000	16	1.20	1.65/1.45	0.60	10	17
4A0457	5700 - 6500	20	0.50	1.40/1.30	0.30	4	17
44040	6000 - 18000	17	1.60	1.70/1.50	0.60	12	17
4A0279	7000 - 18000	14	2.00	2.00/2.00	1.00	15	17
40278	8000 - 12400	16	1.20	1.85/1.85	0.80	12	17
40279	12400 - 18000	14	2.00	2.00/2.00	0.80	15	17

## 8 Way, In Phase

Model	Freq.	Isol.	Ins. Loss	VSWR	Amp. Balance	Phase Balance	Max Input Power
	MHz	dB Min.	dB Max.	Max in/Max out:1	dB Max	deg Max	Watts (Avg/CW)
40283	250 - 500	18	1.00	1.50/1.50	0.80	6	25
40370	800 - 1600	18	1.00	1.50/1.50	0.80	6	25
40285	1000 - 2000	20	1.00	1.50/1.50	0.80	10	25
4A0286	2000 - 4000	18	1.00	1.60/1.60	0.80	10	25
	2000 - 12000	13	3.00	2.50/2.50	1.00	20	24
41730	12000 - 15000	13	4.00	2.50/2.50	1.20	20	25
	15000 - 18000	10	4.00	2.50/2.50	1.50	20	25
40660	2600 - 5200	18	1.00	1.60/1.60	0.80	10	25

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## 8 Way, In Phase

Model	Freq.	Isol.	Ins. Loss	VSWR	Amp. Balance	Phase Balance	Max Input Power
	MHz	dB Min.	dB Max.	Max in/Max out:1	dB Max	deg Max	Watts (Avg/CW)
4A0856	3600 - 4300	20	0.80	1.58/1.38	0.30	5	25
40287	4000 - 8000	17	2.00	2.00/1.50	1.00	12	25
4A0857	5700 - 6500	20	0.80	1.40/1.30	0.40	6	25
40288	7000 - 12400	15	2.00	2.00/2.00	1.00	16	25
40590	9500 - 10500	18	1.60	1.90/1.90	0.80	14	25

## Mixers, Balanced

Model	Freq.	Isol.	Conv. Loss	VSWR	Noise Figure	*IF Frequency	Bias
	MHz	dB Min./Typ.	dB Max.	Max /Typ:1	dB Max	MHz	
70115	1000 - 2000	6/10	7.0/6.0	1.5/1.2	8.0/7.0	DC-250	NO
7H0115	1000 - 2000	6/10	8.0/6.5	1.5/1.2	8.5/7.5	5-250	YES
70140	1300 - 2600	6/10	7.0/6.0	1.6/1.3	8.0/7.0	DC-500	NO
70116	2000 - 4000	6/10	7.0/6.0	1.6/1.3	8.0/7.0	DC-600	NO
7H0116	2000 - 4000	6/10	7.5/6.5	1.6/1.3	8.5/7.5	5-600	YES
70340	2600 - 5200	6/10	7.0/6.0	1.7/1.3	8.0/7.0	DC-800	NO
70117	4000 - 8000	6/10	7.5/6.5	1.9/1.4	8.5/7.5	DC-900	NO
7H0117	4000 - 8000	6/10	9.0/8.0	1.9/1.4	10.0/9.0	5-900	YES
70540	5200 - 10400	6/10	7.5/6.5	2.0/1.5	8.5/7.5	DC-1100	NO
7H0540	5200 - 10400	6/10	8.5/7.5	2.0/1.5	9.5/7.5	5-1100	YES
7G0118	8000 - 12400	6/10	7.5/6.5	2.0/1.65	8.5/7.5	DC-1200	NO
7H0118	8000 - 12400	6/10	8.5/7.5	2.0/1.65	9.5/8.5	5-1200	YES
7H0160	8000 - 16000	6/10	8.5/7.5	2.5/1.7	9.5/8.5	5-1200	YES
70119	12400 - 18000	6/10	8.0/7.0	2.5/1.7	9.0/8.0	DC-1400	NO

\*Upper IF Frequency is the -3dB Response Point

## Mixers, OrthoQuad®

Model	Freq.	Isol.	Conv. Loss	VSWR	Noise Figure	*IF Frequency	Bias
	MHz	dB Min./Typ.	dB Max.	Max/Typ:1	dB Max	MHz	
7A0124	500 - 1000	20/25	7.5/6.5	1.6/1.2	8.5/7.50	DC-150	NO
7A0125	1000 - 2000	20/30	8.0/6.5	1.5/1.2	8.5/7.5	DC-150	NO
7A0126	2000 - 4000	20/30	7.5/6.5	1.6/1.25	8.5/7.5	DC-400	NO
7W0126	2000 - 4000	18/25	8.5/7.5	1.9/1.3	9.5/8.5	5-400	YES
7A0127	4000 - 8000	20/25	8.5/7.5	1.8/1.25	9.0/8.0	DC-400	NO

\*Upper IF Frequency is the -3dB Response Point

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## Mixers, OrthoQuad® (cont'd)

Model	Freq.	Isol.	Conv.	VSWR	Noise	*IF	Bias
	MHz	dB Min./Typ.	dB Max./Typ.	Loss	Figure	Frequency	
				Max/Typ:1	dB Max./Typ.	MHz	
7W0127	4000 - 8000	18/23	9.0/8.0	1.90/6.50	10.0/9.0	5-400	YES
7A0128	8000 - 12400	18/25	8.5/7.5	1.85/1.35	9.5/8.0	DC-400	NO
7W0128	8000 - 12400	18/23	9.5/8.0	1.90/1.50	10.5/9.0	5-400	YES
7A0129	12000 - 18000	14/20	9.5/8.0	2.20/1.70	9.5/8.5	DC-400	NO
7W0129	12400 - 18000	15/20	10.0/9.0	2.10/1.80	11.0/10.0	5-400	YES

\*Upper IF Frequency is the -3dB Response Point

## Mixers, Double Balanced

Model	Freq.	Isol.	Conv.	VSWR	*IF	**RF	LO
	MHz	dB Min./Typ.	Loss	Typ:1	Frequency	Power	Power
			dB Max./Typ.		MHz	Input dBm	dBm Nom.
73125	900 - 3000	18/28	9.0/6.5	3.0	DC-1000	4	12
75125	900 - 3000	18/28	9.0/7.0	3.0	DC-1000	10	18
74125	1000 - 4000	38/55	8.5/7.0	3.0	DC-1000	4	12
76125	1400 - 4000	38/55	9.0/7.0	3.0	DC-1000	10	18
73126	1500 - 5000	18/28	8.5/7.0	3.5	DC-1500	4	12
73127	2500 - 10000	18/23	8.5/7.0	2.5	DC-1800	4	12
74127	2500 - 10000	28/40	8.5/7.0	4.0	DC-1500	4	12
75127	2500 - 10000	16/28	9.0/7.5	4.0	DC-1800	10	18
76127	2500 - 10000	28/40	9.0/7.0	4.0	DC-1500	10	18
73128	4500 - 12000	15/23	9.0/8.0	4.5	DC-4000	4	12
74129	5000 - 18000	25/36	11.0/9.0	4.5	DC-2500	4	12
76129	5000 - 18000	28/38	10.5/8.0	4.5	DC-2500	10	18
73129	8000 - 18000	15/23	10.0/9.0	4.5	DC-4000	4	12
75129	8000 - 18000	15/23	10.5/9.5	4.5	DC-4000	10	18

\*Upper IF Frequency is the -3dB Response Point \*\*One dB Compression Point

## Mixers, Quadrature IF

Model	Freq.	Isol.	Conv.	VSWR	*IF	IF	IF
	MHz	dB Min./Typ.	Loss	RF	Freq.	Amp.Bal	Phase Bal.
			dB Max./Typ.	Max/Typ:1	MHz	dB	Degrees
250125	1000 - 2000	19/25	12/10	1.67/1.40	DC-250	±1.0	±10.0
250126	2000 - 4000	19/25	12/10	1.80/1.50	DC-400	±1.0	±10.0
250127	4000 - 8000	19/25	12/10	2.00/1.67	DC-400	±1.2	±10.0
250270	7500 - 18000	15/19	13/10	2.50/1.67	DC-400	±1.8	±12.0
250128	8000 - 12400	18/25	13/10	1.92/1.50	DC-600	±1.5	±15.0
250129	12000 - 18000	16/20	14/11	2.10/1.50	DC-600	±1.8	±15.0

\*Upper IF Frequency is the -3dB Response Point

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## Mixers, Image Rejection

Model	Freq.	Isol.	Conv.	IF Output	RF VSWR	LO VSWR	Image Rejection
	MHz	dB Min./Typ.	dB Max./Typ.	MHz	Typ: 1	Max/Typ: 1	dB min/typ
150015-60	1000 - 2000	14/20	8.5/7.0	40-80	2.0/1.4	2.5/1.5	15/20
150016-60	2000 - 4000	14/20	8.5/7.0	40-80	2.0/1.5	2.5/1.6	15/20
150017-60	4000 - 8000	14/20	9.0/7.5	40-80	2.0/1.6	2.5/1.7	15/20
150018-60	8000 - 12400	14/20	9.5/8.0	40-80	2.0/1.6	2.5/1.7	15/20
150019-60	12400 - 18000	11/17	10.5/8.5	40-80	2.5/1.7	3.0/1.8	13/18

## Modulators, Balanced

Model	Freq.	*IF Input	Conversion Loss	Carrier Suppression	RF VSWR
	MHz	MHz	dB Max./Typ.	dB Min./Typ:	Max/Typ: 1
70664	500 - 1000	DC-150	8.0/6.5	16/21	1.5/1.2
70665	1000 - 2000	DC-250	8.0/6.5	16/21	1.5/1.2
70666	2000 - 4000	DC-250	8.0/6.5	16/21	1.6/1.2
70667	4000 - 8000	DC-400	8.5/7.5	15/20	1.7/1.25
70668	8000 - 12400	DC-400	9.5/8.5	15/20	1.8/1.35
70669	12400 - 18000	DC-600	10.5/9.0	12/18	2.2/1.5

\*Upper IF Frequency is the -3dB Response Point

## Modulators, Single Sideband

Model	Freq.	*IF Input	Conversion Loss	Carrier Suppress.	Sideband Suppress.
	MHz	MHz	dB Max./Typ.	Min./Typ: dB	Min/Typ: dB
90334-DC	500-1000	DC-250	9.0/7.5	18/22	18/25
90335-DC	1000-2000	DC-250	9.0/7.5	18/22	18/25
90336-DC	2000-4000	DC-400	9.0/7.5	15/20	18/25
90337-DC	4000-8000	DC-600	9.0/7.5	15/20	18/25
9B0420-DC	7000-16000	DC-1000	13.0/10.0	10/16	12/18
90338-DC	8000-12400	DC-600	11.0/9.0	12/16	17/22
90339-DC	12400-18000	DC-600	12.0/9.5	10/15	12/17

\*Upper IF Frequency is the -3dB Response Point

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## Modulators, Quadrature

Model	Freq.	RF VSWR	Conversion Loss	Phase Accuracy	*Bandwidth
	MHz	Max/Typ: 1	dB Max./Typ	Degrees	GHz
260015	1000 - 2000	2.0/1.6	9.0/7.0	±10	DC-0.25
260016	2000 - 4000	2.0/1.6	9.0/7.0	±10	DC-0.50
260017	4000 - 8000	2.0/1.7	9.5/7.5	±10	DC-0.50
260270	7500 - 18000	3.0/1.8	12.0/10.0	±15	DC-1.00
260018	8000 - 12400	2.5/1.7	11.0/9.0	±12	DC-0.80
260019	12400 - 18000	2.0/1.8	12.0/10.0	±15	DC-1.00

\*Upper IF Frequency is the -3dB Response Point

## PIN, Attenuators

Model	Freq.	Dyn. Range	Ins. Loss	Flatness *	Linear.	Speed	VSWR Max
Linearized Current	MHz	dB Min.	dB Max.	dB Max.	dB Max.	nanosec.	In. Loss/Atten:1
61525/61535	1000 - 2000	60	1.50	±2.5	±3	650	1.4/1.65
61526/61536	2000 - 4000	60	1.90	±2.5	±3	650	1.7/1.65
61527/61537	4000 - 8000	60	2.20	±2.5	±3	650	1.8/1.90
61528/61538	8000 - 12400	60	2.80	±2.5	±3	650	1.9/2.10

\*Specified to 45dB, Add ±1.5dB to 60dB

## Phase Discriminators

Model	Freq.	Phase	Tangential Accuracy	VSWR Sensitivity	
w/o Video Amp	w/ Video Amp	MHz	Degrees Max.	dB m	Max : 1
20755	2A0755	1000 - 2000	±6	-43	1.5
20756	2A0756	2000 - 4000	±7	-43	1.8
20757	2A0757	4000 - 8000	±8	-43	2.0
20758	2A0758	8000 - 12400	±10	-41	3.0

## Video Amplifier Specs

Model	Video Bandwidth	Voltage Gain	Output Noise	Rise Time	Delay Time	Satur. Output	Output Imped.
2A075X	1KHz to 10MHz min	Nominal 200	10mV rms max	35 ns max	50 ns max	4V p-p nominal	50Ω nominal

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