

# 3 dB Hybrid Couplers

## 203X Series

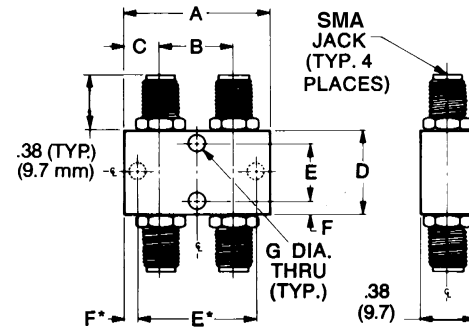
V3.00

### Features

- 90° Quadrature Phase
- Frequency Range: .06 to 18 GHz
- Temperature Range: -65° to +125°C
- Meets MIL-E-5400 Environments
- Non-crossover Versions Available

### Description

3dB quadrature mini-hybrids are the ultimate in compact, rugged high stress environment components. The crossover feature of the location of both outputs on one side allows simplicity in system or subsystem design. Multi-octave coverage of the complete frequency spectrum, along with high isolation performance, qualifies them as an asset to any system.



All dimensions are  $\pm .020$  except mounting diameters ( $\pm .005$ ) and mounting hole location ( $\pm .010$ ).

### 90° Crossover Electrical Specifications

PART NO.	CASE STYLE	FREQUENCY RANGE (GHz)	AMPLITUDE BALANCE (dB)	INSERTION LOSS max. (dB)	ISOLATION min. (dB)	VSWR (max.)	POWER	
							AVG. (W)	PK. (kW)
2032-6344-00	3	1.0-2.0	$\pm 0.5$	.20	22	1.20	30	3
2032-6345-00	4	2.0-4.0	$\pm 0.5$	.25	22	1.25	30	3
2032-6347-00	5	4.0-8.0	$\pm 0.5$	.30	20	1.25	30	3
2032-6348-00	5	8.0-12.4	$\pm 0.5$	.50	18	1.35	30	3
2032-6349-00	5	12.4-18.0	$\pm 0.5$	.50	18	1.45	30	3
2032-6350-00	6	.5-2.0	$\pm 0.5$	.60	24	1.20	30	3
2032-6352-00	7	2.0-8.0	$\pm 0.5$	.50	20	1.30	30	3
2032-6354-00	8	4.0-12.4	$\pm 0.5$	.60	20	1.25	50	3
2032-6371-00	10	2.0-18.0	$\pm 1.0$	.60***	20****	1.45	50	3
2032-6374-00	5	6.5-18.0	$\pm 0.5$	.60	18	1.35	30	3
2032-6375-00	11	4.0-18.0	$\pm 0.5$	1.0	18	1.45	100	5

MULTI-OCTAVE  
HIGH POWER

\*These dimensions apply only to part nos. 2032-6350-00 and 2032-6354-00.  
 \*\*Insertion loss is 0.8dB from 8.0 to 12.4 GHz.  
 \*\*\*Insertion loss is 1.2dB from 6.0 to 12.4 GHz and 1.5dB from 12.4 to 18.0 GHz.  
 \*\*\*\*Isolation is 15dB from 12.4 to 18.0 GHz.

### 90° Crossover Mechanical Specifications

CASE STYLE	SIZE. INCHES (mm)							WEIGHT	
	A	B	C	D	E	F	G	oz.	g
3	1.78 (45.2)	1.28 (32.5)	.25 (6.35)	.50 (12.7)	.31 (7.9)	.09 (2.4)	.104 (2.6)	.84	24
4	1.16 (29.4)	.66 (16.7)						.65	19
5	1.0 (25.4)	.50 (12.7)	.29 (7.3)	.70 (17.9)	5.42 (137.7)	.08 (2.0)	.093 (2.4)	.60	17
6	5.58 (141.7)	5.0 (127)						2.35	67
7	1.71 (43.4)	1.21 (30.7)						.50 (12.7)	.31 (7.9)
8	1.72 (43.7)	1.22 (31)	.25 (6.33)	1.07 (27.2)	.58 (14.7)	.57 (14.5)	.104 (2.6)	1.40	40
10	1.88 (47.6)	1.41 (35.9)	.23 (5.7)	1.3 (33)	1.06 (26.9)	.12 (3.1)	.14 (3.6)	1.76	50
11	1.50 (38.1)	1.00 (25.4)	.25 (6.4)	1.10 (28.0)	.90 (23.0)	.10 (2.5)	.104 (2.6)	1.41	40

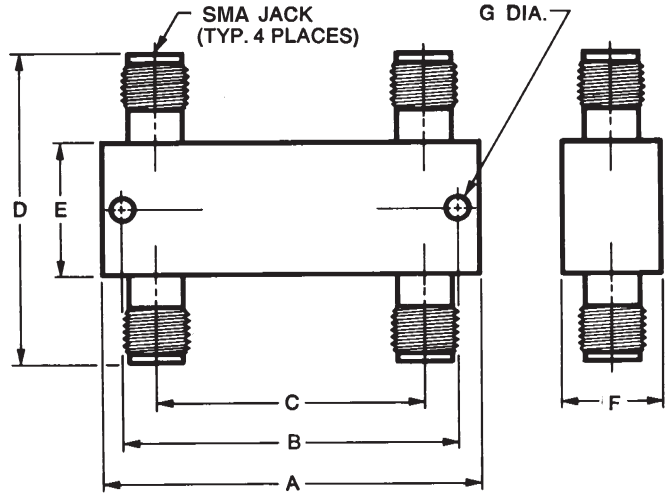
**Features**

- Air Dielectric
- Non-Crossover Design
- 90° Quadrature Phase
- Frequency Range: 1.0 to 18 GHz
- Temperature Range: -50° to +110°C
- Meets MIL-E-5400 and MIL-E-16400 Environments
- MIL-C-15370/8 Equivalent

**Description**

These 3dB coaxial hybrids are ultra-compact. A signal applied into any terminal appears at both outputs with one-half the amplitude and shifted 90 degrees out of phase.

The units mount four SMA jack, low VSWR connectors. These couplers may be used in mixers, duplexers and other applications requiring equal power division.



All dimensions are ± .020 except mounting diameters (± .005) and mounting hole location (± .010).

**90° Non-Crossover Electrical Specifications**

PART NO.	MODEL NO.	CASE STYLE	FREQUENCY RANGE (GHz)	AMPLITUDE BALANCE (dB)	INSERTION LOSS max.(dB)	ISOLATION min.(dB)	VSWR (max.)	POWER	
								AVG. (W)	PK. (kW)
2035-6364-00	20153-3	1	1.0-2.0	± 0.4	0.20	20	1.25	50	3
2035-6365-00	20154-3	2	2.0-4.0	± 0.5	0.20	18	1.25	50	3
2035-6366-00	201545-3	3	2.6-5.2	± 0.5	0.20	18	1.25	50	3
2035-6367-00	20155-3	4	4.0-8.0	± 0.5	0.30	18	1.25	50	3
2035-6368-00	20156-3	5	8.0-12.4	± 0.5	0.35	15	1.30	50	3
2035-6369-00	20157-3	5	12.4-18.0	± 0.5	0.35	15	1.35	50	3

**90° Non-Crossover Mechanical Specifications**

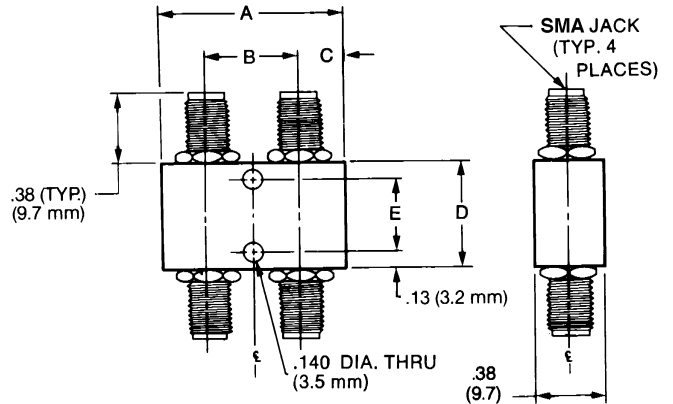
CASE STYLE	SIZE. INCHES (mm)							WEIGHT	
	A	B	C	D	E	F	G	oz.	g
1	2.55 (64.8)	2.39 (60.8)	1.97 (50.1)	1.16 (29.5)	.50 (12.7)	.38 (9.7)	.093 (2.4)	1.80	52
2	1.69 (42.7)	1.52 (38.7)	1.11 (28.2)					1.10	32
3	1.41 (35.6)	1.24 (31.5)	.82 (20.8)					0.99	28
4	1.13 (28.7)	.97 (24.7)	.55 (14)					0.89	26
5	1.08 (27.4)	.92 (23.4)	.50 (12.7)					1.28 (32.5)	.63 (15.9)

**Features**

- Crossover Design
- 0° or 180° Phase Difference
- High Isolation
- Low VSWR
- Multi-Octave Frequency Range
- Temperature Range: -65° to +125°C
- Meets MIL-E-5400 and MIL-E-16400 Environments

**Description**

These 3dB 180° mini-hybrids are highly reliable rugged stripline-constructed units that can be used either to divide or combine R.F. power. A signal incident at the sum ( $\Sigma$ ) port will yield in-phase amplitude balanced signals at the output ports. Conversely, a signal applied to the difference ( $\Delta$ ) port will yield amplitude balanced and 180° out of phase signals at the output ports.



All dimensions are ± .020 except mounting diameters (± .005) and mounting hole location (± .010).

**180° Crossover Electrical Specifications**

PART NO.	CASE STYLE	FREQUENCY RANGE (GHz)	AMPLITUDE BALANCE (dB)	INSERTION LOSS max. (dB)	ISOLATION min. (dB)	VSWR (max.)	PHASE BALANCE (DEGREES)	POWER	
								AVG. (W)	PK. (kW)
2031-6330-00	1	0.5-1.0	±0.5	0.4	25	1.30	±4	30	3
2031-6331-00	2	1.0-2.0	±0.5	0.5	25	1.35	±4	30	3
2031-6332-00	3	2.0-4.0	±0.5	0.7	22	1.35	±5	30	3
2031-6333-00	4	2.6-5.2	±0.5	0.7	20	1.35	±5	30	3
2031-6334-00	4	4.0-8.0	±0.5	0.7	20	1.35	±6	30	3
2031-6335-00	7	8.0-12.4	±0.5	0.8	17	1.45	±6	30	3
2031-6336-00	7	12.4-18.0	±0.6	1.2	12	1.70	±6	30	3
2031-6338-00	6	4.0-12.4	±0.6	1.0	17	1.50	±8	30	3
2031-6339-00	7	7.0-18.0	±0.6	1.2	14	1.70	±8	20	2

➤ MULTI-OCTAVE

**180° Crossover Mechanical Specifications**

CASE STYLE	SIZE, INCHES (mm)					WEIGHT	
	A	B	C	D	E	oz.	g
1	3.25 (82.6)	2.5 (63.5)	.50 (12.7)	1.25 (31.8)	1.0 (25.4)	2.8	70
2	2.0 (50.8)	1.25 (31.8)				2.0	47
3	1.44 (36.5)	.69 (17.5)	.38 (9.7)	1.0 (25.4)	.75 (19.1)	1.5	38
4	1.25 (31.8)	.50 (12.7)				1.5	38
6	1.5 (38.1)	.75 (19.1)	.38 (9.7)	1.0 (25.4)	.75 (19.1)	1.2	34
7	1.25 (31.8)	.50 (12.7)				1.1	31