



COAXIAL QUADRATURE HYBRIDS, COUPLERS, DIVIDERS & COMBINERS

DATA
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No. T35E
1 of 4

COXIAL QUADRATURE HYBRIDS — 504 SERIES

- HIGH POWER
- SMALL SIZE
- LEVEL POWER SPLIT

DESCRIPTION

MEC offers a full line of coaxial hybrids, couplers, dividers and combiners in the most popular frequency bands and power levels.

The 504-series consists of the four-port hybrid or 3-dB coupler which, in its most common use, divides an input signal incident at J1 into two equal signals at J2 and J3, with the fourth or “isolated” port J4 receiving a negligible fraction of input power. Also, the split signals are in quadrature phase relation with the direct or “thru” output phase delayed i.e. shifted by -90° relative to the “coupled” output.

Used in reverse, these hybrids may also combine two signals fed at J2 and J3 into either port J1 or J4 depending on whether the phase of J2 relative to J3 is -90° or $+90^\circ$ respectively. This characteristic is invaluable in power combing and in switching networks.

While most hybrids of this type are mass-produced using stripline PC-board dielectric and photo-etching techniques, MEC hybrids have lower loss dielectric materials and more rugged internal circuitry resulting in much lower insertion loss, higher power handling and greater stability over temperature extremes.

Due to their outstanding electrical characteristics and superior construction, MEC’s coaxial hybrids have been selected for the harshest environments of ECM systems onboard many of the most advanced military aircraft. They exceed the requirements of MIL-E-5400 for non-conditioned compartments and have undergone extensive qualification testing including high power, temperature, altitude, vibration, shock, humidity, salt-spray, sand and dust.

504-Series hybrids are available with many options including internal terminations, pressure sealing, higher power versions and a large assortment of coaxial connectors and mechanical configurations. They may also be networked together into integral N-way divider/combiner assemblies for high power summing and phased-array applications.

Coaxial connectors are passivated stainless steel and solidly anchored into an aluminum body. Finish is chromate conversion per MIL-C-5541, Class 3 and paint is gray epoxy enamel.



P 504



E 504-8-T



EJ 504-2-T



EG 504-8-SC-P



EG 504-104



G 501

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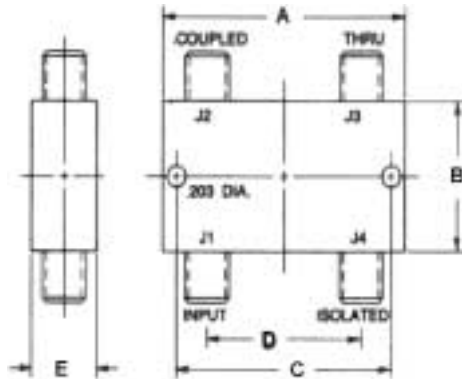


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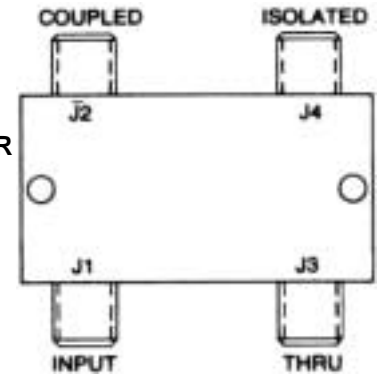
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COAXIAL QUADRATURE HYBRIDS — 504 SERIES

CROSSOVER
(STYLE I)



NON
CROSSOVER
(STYLE II)



SPECIFICATONS

BAND	MODEL NUMBER	FREQUENCY RANGE (GHz)	COUPLING LIMITS (dB)	VSWR (MAX.) (dB)	ISOLATION (MIN.) (dB)	INPUT POWER		STYLE	DIMENSIONS (INCHES)				
						AVE (W)	PEAK (KW)		A	B	C	D	E*
SUB OCTAVE	W504	7.0-11.0	3.1 ± .5	1.45	17	100	5	M15370/8-007	1.280	1.280	—	.625	.50
	X504	8.0-12.4		1.30	15	50	1	M15370/8-005	1.108	.655	.922	.50	.375
	P504	12.4-18.0		1.35	15	50	1	M15370/8-006	1.108	.655	.922	.50	.375
OCTAVE 2 TO 1	L504	1.0-2.0	3.1 ± .2	1.20	23	400	6	I	2.30	1.00	—	1.36	.75
	E503		3.1 ± .5	1.25	18	50	1	M15370/8-003	1.718	.53	1.525	1.105	.375
	E504 E504-4 E504-8	2.0-4.0	3.3 ± .3	1.20	23	200	6	I	2.75	1.12	2.40	1.75	.75 max
	E504A E504A4 E504A8					2.5-5.5							
	G504 G504-4	4.0-8.0	3.4 ± .5	1.35	18		100	4	I	1.98	1.60	1.60	1.00
	IJ504 UJ504-4					8.0-16.0	1.4 (N) 1.5(TNC)						
	IJ504A IJ504A4	7.6-18.0	1.5(N) 1.6(TNC)	15	100			4	I,II	2.75	1.12	2.40	1.75
	EG504 EG504-8	2.0 – 8.0			3.4 ± .6	1.5	15						
GJ504-1 GJ504-4	4.5 – 18.0	3.4 ± .7	1.5	15				50	2	I,II	3.0	1.2	N/A
EJ504 EJ504-2	2.0 – 18.0				3.2 ± .6	1.4	17	200					
U-504	.2 – 2.0												

*Body Thickness depends connector required.

CONNECTOR SPECIFICATONS (Applicable to pages 1-4)

CONNECTOR TYPE	FEMALE SUFFIX	MALE SUFFIX	MAX. FREQUENCY (GHz)	POWER (W) at MAX FREQUENCY
SC	—SC	—SCM	8	800
TNC	—T	—TM	18	400
N	—N	—NM	18	300
SMA	—3	—3M	26	50
APC-7	—7		18	10

ORDERING INFORMATION

- Select Model number based on band required.
- To specify connectors, add suffixes to model number from table. Also note max. frequency and power limits shown.
- To specify pressure port, add suffix -P.
- Other frequency bands, mounting provisions, and package arrangements available upon request.

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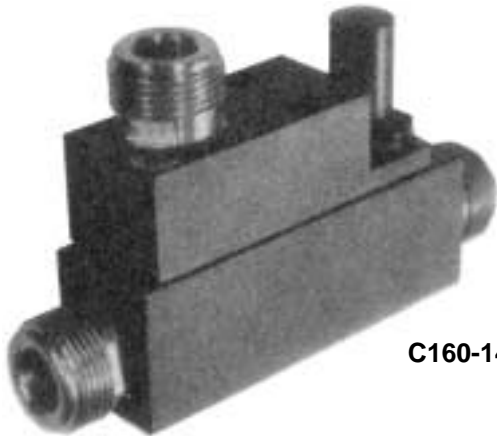
COAXIAL DIRECTIONAL COUPLERS — C600 SERIES

For applications requiring unequal power splitting, MEC offers its C600-Series of coaxial directional couplers. These are well suited for power sampling, frequency and gain control loops, or to provide a loosely coupled path for system test and diagnostic signal injection.

The mainline is usually straight through with one or more independent coupled ports located on one or both sides. Each may have its own coupling direction and level, typically in the -10 to -60 dB ranges.

Unlike non-directional power samplers, the C600 couplers have directivity typically 15 to 25 dB which assures coupling accuracy in the desired direction and reduced errors caused by signals propagating in the reverse direction such as those due to mismatches in the main transmission lines being sampled.

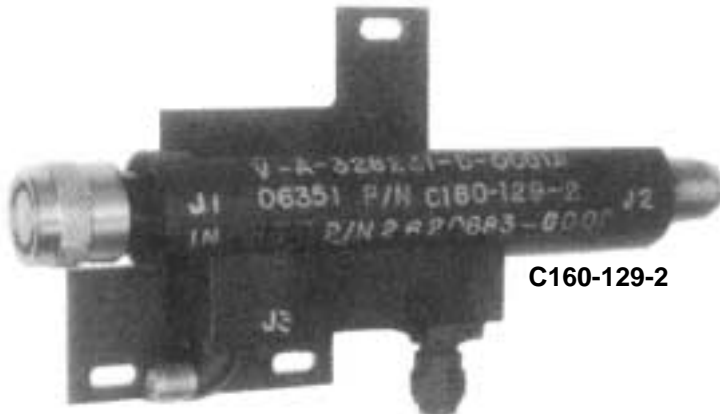
Below are some examples of C600 couplers, MEC would be happy to customize one for your application.



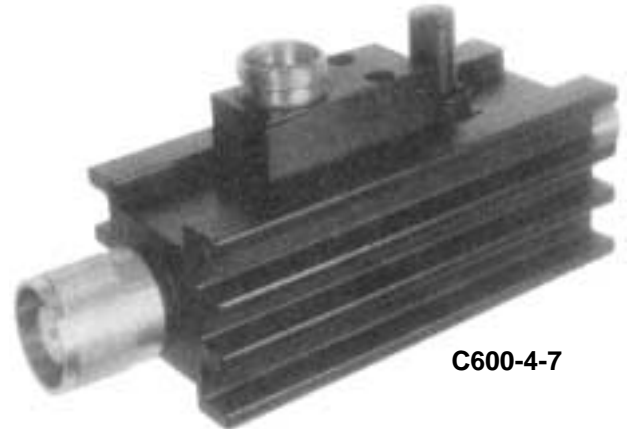
C160-142N



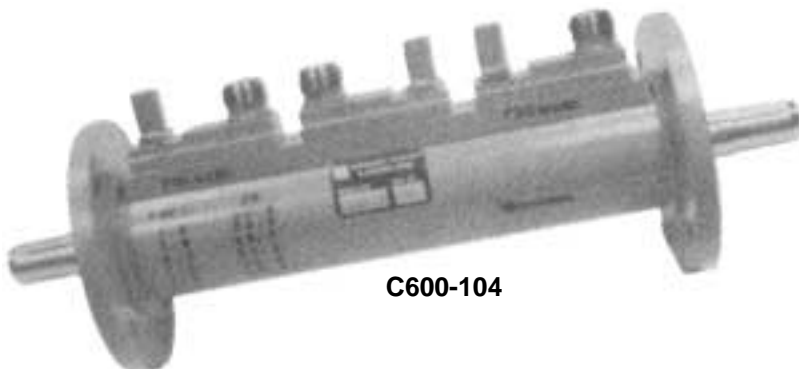
EG-550



C160-129-2



C600-4-7



C600-104



C600-101

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COAXIAL POWER DIVIDERS & COMBINERS

Multi-port dividers and combiners are a specialty at MEC. These usually require networking several couplers along with internal terminations and phase matching structures into an integrated assembly.

Besides quadrature couplers, MEC has used Wilkinson power dividers, rat-race ring hybrids and other types of splitters depending on the frequency, bandwidth, power, isolation, phase and space requirements.

MEC would be happy to analyze your specific application, discuss trade-offs, and recommend the most appropriate design.



EG519
Unequal Power Divider
2-8 GHz



E-507
Wilkinson



EG518
4-Way Power
Combiner/Divider



IJ 504-107
Divider



L 507
Wilkinson

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