

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: [mail@panatron.com](mailto:mail@panatron.com), URL: <http://www.panatron.com>

## RIGID RECTANGULAR WAVEGUIDES AND FLANGES

EIA Equiv.	Frequency Range GHz	Material	Inside Dimension	Outside Dimension	Cover Flange Type	Choke Flange Type	Contact Flange Type	Non-Press. Contact Flange Type	Press. Contact Flange	
WR284	2.60-3.95	Copper Bronze	2.84x1.34	3x1.5	UG53/U	UG548/U	UG65/U UG66/U	UG1479/U CMR284 UG1475/U	Grooved UG1348/U CPR284G UG1352/U	Flat Face UG1724/U CPR284F UG1728/U
WR187	3.95-5.85	Copper Bronze	1.872x.872	2x1	UG149A/U	UG148C/U		CMR187 UG1476/U	CPR187G UG1356/U	CPR187F UG1732/U
WR137	5.85-8.20	Copper Bronze	1.372x.622	1.5x.75	UG344/U	UG3438/U	UG150/U	CMR137 UG1477/U	CPR137G UG1358/U	CPR137F UG1734/U
WR112	7.05-10.00	Copper Bronze	1.122x.497	1.25x.625	UG51/U	UG528/U		CMR112 UG1478/U	CPR112G UG1360/U	CPR112F UG1736/U
WR90	8.20-12.4	Copper Bronze	.9x.4	1x.5	UG39/U	UG408/U		CMR90	CPR90G	CPR90F
WR42	18-26.5	Copper Bronze	.42x.17	.5x.25	UG595/U	UG596A/U	UG425/U			
WR42	18-26.5	Silver	.42x.17	.5x.25	UG595/U	UG596A/U	UG425/U			
WR90	8.2-12.4	1100 Al 6061 Al	.9x.4	1x.5	UG135/U	UG136B/U		UG1483/U CMR90	UG1361/U CPR90G	UG1737/U CPR90F
WR112	7.05-10	1100 Al 6061 Al	1.122x.497	1.25x.625	UG138/U	UG137B/U		CMR112 UG1484/U	UG1359/U CPR112G	UG1735/U CPR112F
WR284	2.6-3.95	1100 Al 6061 Al	2.84x1.34	3x1.5	UG584/U	UG585A/U		UG1484/U CMR284	UG1349/U CPR284G	UG1725/U CPR284F
WR62	12.4-18	Copper Bronze	.622x.311	.702x.391	UG419/U	UG541A/U				
WR187	3.95-5.85	1100 Al 6061 Al	1.872x.872	2x1	UG407/U	UG406B/U		UG1480/U CMR187	UG1353/U CPR187G	UG1729/U CPR187F
WR187	3.95-5.85	1100 Al 6063/6061Al	1.872x.872	2.172x1.172	UG407/U Modified	UG406B/U				

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: [mail@panatron.com](mailto:mail@panatron.com), URL: <http://www.panatron.com>

EIA Equiv.	Frequency Range GHz	Material	Inside Dimension	Outside Dimension	Cover Flange Type	Choke Flange Type	Contact Flange Type	Non-Press. Contact Flange Type	Press. Contact Flange
WR28	26.5-40	Silver	.28x.14	.36x.22	UG599/U	UG600A/U	UG381/U		UG1343/U
WR22	33-50	Silver	.224x.112	.304x.192	UG383/U		UG1521/U		UG1344/U
WR15	50-75	Silver	1.48x.074	.228x.154	UG385/U		UG1523/U		UG1345/U
WR12	60-90	Silver	.122x.061	.202x.141	UG387/U		UG1522/U		UG1357/U
WR650	1.12-1.7	1100 Al	6.5x3.25	6.66x3.41			UG418A/U	UG1481/U	CPR137G
WR430	1.7-2.6	6061 Al	4.3x2.15	4.46x2.31			UG418B/U	CMR137	UG1716/U
WR430	1.7-2.6	Copper					UG435A/U		UG1711/U
WR430	1.7-2.6	Bronze	4.3x2.15	4.46x2.31			UG437A/U		UG1733/U
WR137	5.85-8.2	1100 Al	1.372x.622	1.5x.75	UG441/U	UG440B/U	UG438B/U		UG1373/U
WR62	12.4-18	6061 Al	.622x.311	.702x.391	UG419/U	UG541A/U			CPR137F
WR284	2.6-3.95	Silver	2.84x1.004	3x1.164					
WR137	5.85-8.2	Copper	1.372x.487	1.5x.615			UG509/U		
WR340	2.1-3	Bronze	3.4x1.7	3.56x1.86			UG510/U		
WR340	2.1-3	Copper	3.4x1.7	3.56x1.86			UG511/		
WR340	2.1-3	Bronze	3.4x1.7	3.56x1.86			UG512/U		UG1346/U
WR42	18-26.5	1100 Al	.42x.17	.5x.25	UG597/U	UG598A/U	UG553/U		UG1347/U
WR28	26.5-40	6061 Al	.28x.14	.36x.22			UG554/U		
WR22	33-50	1100 Al	.224x.112	.304x.192					
WR15	50-75	Bronze	.148x.074	.228x.154					
WR12	60-90	Copper	.122x.061	.202x.141					
WR5	140-220	Bronze	.051x.0255	.111x.0855					

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: [mail@panatron.com](mailto:mail@panatron.com), URL: <http://www.panatron.com>

EIA Equiv.	Frequency Range GHz	Material	Inside Dimension	Outside Dimension	Cover Flange Type	Choke Flange Type	Contact Flange Type	Non-Press. Contact Flange Type	Press. Contact Flange
WR6	110-170	Copper Bronze	.065x.0325	.125x.0925			UG1525/U		
WR4	170-260	Copper Bronze	.043x.0215	.103x.0815			UG1526/U		
WR8	90-140	Copper Bronze	.08x.04	.14x.1	UG387/U Modified		UG1527/U		
WR3	220-325	Copper Bronze	.034x.017	.094x.077					
WR102	7-11	Bronze	1.02x.510	1.148x.638	UG1493/U	UG1494/U			
WR510	1.45-2.2	Aluminum Copper Bronze	5.1x2.55	5.26x2.71					UG1718/U
WR510	1.45-2.2	1100 Al 6061 Al	5.1x2.55	5.26x2.71					UG1719/U
WR229	3.3-4.9	Copper Bronze	2.29x1.145	2.418x1.273					UG1350/U
WR229	3.3-4.9	1100 Al 6061 Al	2.29x1.145	2.418x1.273					UG1351/U
WR159	4.9-7.05	Copper Bronze	1.59x.795	1.718x.923				CMR229	UG1354/U
WR159	4.9-7.05	1100 Al 6061 Al	1.59x.795	1.718x.923				CMR229	UG1730/U CPR159G UG1355/U CPR159F CPR159G
WR75	10-15	Copper Bronze	.75x.375	.85x.475	WR75	WR75		CMR159	UG1727/U
WR75	10-15	1100 Al 6061 Al	.75x.375	.85x.475	WR75	WR75		CMR159	UG1354/U CPR159G UG1355/U CPR159F CPR159G
WR62	12.4-18	1100 Al 6061 Al	.622x.311	.702x.391	UG1665/U	UG1666/U			
WR51	15-22	1100 Al 6061 Al	.51x.255	.59x.335	WR51	WR51			
WR51	15-22	Copper Bronze	.51x.255	.59x.335	WR51	WR51			

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: [mail@panatron.com](mailto:mail@panatron.com), URL: <http://www.panatron.com>

EIA Equiv.	Frequency Range GHz	Material	Inside Dimension	Outside Dimension	Cover Flange Type	Choke Flange Type	Contact Flange Type	Non-Press. Contact Flange Type	Press. Contact Flange
WR34	22-33	Copper Bronze 1100 Al 6061 Al	.34x.17	.42x.25	UG1530/U				
WR34	22-33	1100 Al 6061 Al	.34x.17	.42x.25	UG1530/U				
WR34	22-33	Silver	.34x.17	.42x.25	UG1530/U				
WR19	40-60	Copper Bronze	.188x.094	.268x.174	UG383/U Modified		UG1529/U		
WR10	75-110	Copper Bronze	.1x.05	.18x.13	UG387/U Modified		UG1528/U		
WR284	2.6-3.95	1100 Al 6061 Al 6063 Al	2.84x1.34	3.238x1.738	UG584/U Modified	UG585A/U Modified			Special Special

We can design and build to your specifications. We can repair too!

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: <http://www.panatron.com>

## *SPECIFICATIONS CHECKLISTS*

- AMPLIFIERS
- ATTENUATORS/SWITCHES
- DIGITAL STEP ATTENUATORS
- DIRECTIONAL COUPLERS
- FREQUENCY MIXERS
- FIXED ATTENUATORS
- FREQUENCY DOUBLERS
- FILTERS
- LIMITERS
- PHASE DETECTORS
- POWER SPLITTER/COMBINERS
- SWITCHES/SWITCHES WITH DRIVERS
- TRANSFORMERS

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: <http://www.panatron.com>

## Amplifiers

If your particular requirements are not met with a PANATRON catalog item, please complete the check list below and mail, phone, or fax it to PANATRON, INC., Applications Engineering. Please type or print clearly.

**Application:**  Industrial/ Commercial  Military  Space  Other: \_\_\_\_\_

**Electrical:** Frequency range \_\_\_\_\_ MHz **NOTES:**

Gain (min.) \_\_\_\_\_ dB

Gain flatness  $\pm$  \_\_\_\_\_  $\pm$ dB over \_\_\_\_\_ MHz

Isolation (out-in) min. \_\_\_\_\_ dB

Power output, 1 dB compression, \_\_\_\_\_ dBm

Noise Figure, Typical \_\_\_\_\_ dB

Supply Voltage \_\_\_\_\_ volts DC

Current, max. \_\_\_\_\_ mA

Intercept point 2-tone, 3rd order \_\_\_\_\_ dBm typ

2-tone, \_\_\_\_\_ order \_\_\_\_\_ dBm typ

VSWR or return loss (dB)  50 ohms  75 ohms  Other

**Diagram of application:**

Input \_\_\_\_\_ Output \_\_\_\_\_

Max RF input without damage, with load \_\_\_\_\_ dBm,  
no load \_\_\_\_\_ dBm.

Operating Temperature: \_\_\_\_\_ °C

## **Mechanical:**

Coaxial Connector:  BNC  TNC  SMA  Type N  Type F \_\_\_\_\_ Other

## **Special Requirements:** \_\_\_\_\_

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_ Department: \_\_\_\_\_

Company Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ jlt-094.doc

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: <http://www.panatron.com>

## Attenuators / Switches

If your particular requirements are not met with a PANATRON catalog item, please complete the check list below and mail, phone, or fax it to PANATRON, INC., Applications Engineering. Please type or print clearly.

**Application:**  Industrial/ Commercial  Military  Space  Other: \_\_\_\_\_

**Electrical:** Frequency Range \_\_\_\_\_ MHz **NOTES:**

Control Current \_\_\_\_\_ mA max.

Insertion loss, @mA \_\_\_\_\_, \_\_\_\_\_ dB max.

@mA \_\_\_\_\_, \_\_\_\_\_ dB, \_\_\_\_\_  $\pm$ dB

@mA \_\_\_\_\_, \_\_\_\_\_ dB, \_\_\_\_\_  $\pm$ dB

@mA \_\_\_\_\_, \_\_\_\_\_ dB, \_\_\_\_\_  $\pm$ dB

Isolation (input to control) \_\_\_\_\_ dB min.

VSWR or return loss (dB)

Input \_\_\_\_\_ Output \_\_\_\_\_

\_\_\_ 50 ohms \_\_\_ 75 ohms \_\_\_\_\_ Other

Bi-phase (+ to -) control current, \_\_\_\_\_ mA

$\Delta$ amp \_\_\_\_\_  $\Delta$  phase, 180° +/- \_\_\_\_\_ degrees

Switching time \* \_\_\_\_\_  $\mu$ sec max.

Rise time \_\_\_\_\_  $\mu$ sec max.

Max. RF input power \_\_\_\_\_ dBm, Operating Temperature \_\_\_\_\_ °C

- 50% control to 90% RF (on) to 10% RF (off)

## **Mechanical:**

Coaxial Connector:  BNC  TNC  SMA  Type N  Type F \_\_\_\_\_ Other

## **Special Requirements:** \_\_\_\_\_

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_ Department: \_\_\_\_\_

Company Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

jlt-099.doc

**Diagram of Application:**

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: <http://www.panatron.com>

## Digital Step Attenuators

If your particular requirements are not met with a PANATRON catalog item, please complete the check list below and mail, phone, or fax it to PANATRON, INC., Applications Engineering. Please type or print clearly.

**Application:**  Industrial/ Commercial  Military  Space  Other: \_\_\_\_\_

**Electrical:** Frequency range \_\_\_\_\_ MHz **NOTES:**

Primary Attenuation Steps \_\_\_\_\_ dB

Step Accuracy (Primary) \_\_\_\_\_ ±dB

Thru Loss \_\_\_\_\_ dB

VSWR or return loss (dB)  50 ohms  75 ohms  Other

**Diagram of application:**

Input \_\_\_\_\_ Output \_\_\_\_\_

Supply Voltage \_\_\_\_\_ V

Supply Current \_\_\_\_\_ mA

LOGIC:  TTL  CMOS \_\_\_\_\_ Other

Rise time / Fall time: \_\_\_\_\_ μsec

Delay time (50% TTL to 90% RF) \_\_\_\_\_ μsec

## **Mechanical:**

Coaxial Connector:  BNC  TNC  SMA  Type N  Type F \_\_\_\_\_ Other

**Special Requirements:** \_\_\_\_\_  
\_\_\_\_\_

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_ Department: \_\_\_\_\_

Company Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ jlt-093.doc

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: <http://www.panatron.com>

## Directional Couplers

If your particular requirements are not met with a PANATRON catalog item, please complete the check list below and mail, phone, or fax it to PANATRON, INC., Applications Engineering. Please type or print clearly.

**Application:**  Industrial/ Commercial  Military  Space  Other: \_\_\_\_\_

**Electrical:** Frequency range \_\_\_\_\_ MHz **NOTES:**

Coupling avg. \_\_\_\_\_ db, Tol.  $\pm$  \_\_\_\_\_ dB

Coupling flatness max.  $\pm$  \_\_\_\_\_ dB

Mainline insertion loss max. \_\_\_\_\_ dB

Directivity min. \_\_\_\_\_ dB

Max. input power \_\_\_\_\_ watt

VSWR or return loss (dB)  50 ohms  75 ohms  Other

**Diagram of application:**

Input \_\_\_\_\_ Output \_\_\_\_\_ Coupled \_\_\_\_\_

Operating Temperature: \_\_\_\_\_ °C

## **Mechanical:**

Coaxial Connector:  BNC  TNC  SMA  Type N  Type F \_\_\_\_\_ Other

## **Special Requirements:** \_\_\_\_\_

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_ Department: \_\_\_\_\_

Company Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ jlt-091.doc

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: http://www.panatron.com

## Frequency Mixers

### Application

Space \_\_\_\_\_ Military \_\_\_\_\_ Industrial \_\_\_\_\_ Commercial \_\_\_\_\_

Description: \_\_\_\_\_

Parameters important for application: \_\_\_\_\_

## Electrical

### FREQUENCY RANGE

Lo \_\_\_\_\_ RF \_\_\_\_\_ IF \_\_\_\_\_

LEVEL MIXER: *Dynamic range parameters* (choose the most critical for your application)

1. Maximum RF input level anticipated \_\_\_\_\_
2. Percent distortion acceptable \_\_\_\_\_
3. Intercept point \_\_\_\_\_
4. Two-tone, 3rd order IM \_\_\_\_\_ dB at \_\_\_\_\_ dBm, RF input each tone
5. RF input at 1 dB compression level \_\_\_\_\_
6. LO power available \_\_\_\_\_
7. none of the above specified \_\_\_\_\_

### CONVERSION LOSS, maximum

- a) \_\_\_\_\_ dB over \_\_\_\_\_ MHz
- b) Flatness over frequency \_\_\_\_\_ dB
- c) Changes over temperature \_\_\_\_\_ dB over \_\_\_\_\_ °C
- d) Unit-to-unit variation \_\_\_\_\_ dB

NOISE FIGURE, maximum \_\_\_\_\_ dB over \_\_\_\_\_ MHz

### ISOLATION, minimum

LO-RF \_\_\_\_\_ dB over \_\_\_\_\_ MHz

LO-IF \_\_\_\_\_ dB over \_\_\_\_\_ MHz

RF-IF \_\_\_\_\_ dB over \_\_\_\_\_ MHz

### VSWR OR RETURN LOSS

Impedance \_\_\_\_\_

LO port \_\_\_\_\_ RF port \_\_\_\_\_ IF port \_\_\_\_\_

### HARMONIC INTERMODULATION REQUIREMENTS

X LO by \_\_\_\_\_ X RF \_\_\_\_\_ dB below IF

### REPLACEMENT FOR EXISTING MODEL

Manufacturer \_\_\_\_\_ Model \_\_\_\_\_

SPECIAL REQUIREMENTS: \_\_\_\_\_

## Package

### PINS

Hermetic seal required? \_\_\_ Yes \_\_\_ No

Small size important? \_\_\_ Yes \_\_\_ No

Max. size Requirement: L \_\_\_ " W \_\_\_ " H \_\_\_ "

### Configuration

Plug-in \_\_\_\_\_ Flat pack \_\_\_\_\_

Surface Mount \_\_\_\_\_

### CONNECTORS

BNC \_\_\_ SMA \_\_\_ N \_\_\_ TNC \_\_\_

### Connector Orientation

all in one face \_\_\_\_\_ T Configuration \_\_\_\_\_

Other \_\_\_\_\_

Mounting Requirements \_\_\_\_\_

thru hole \_\_\_ tapped hole \_\_\_ flange \_\_\_

## Environmental & Reliability

### TEMPERATURE RANGE

Operating \_\_\_\_\_ Storage \_\_\_\_\_

MIL-SPEC \_\_\_\_\_ Group A \_\_\_ , B \_\_\_ , C \_\_\_

### SCREENING REQUIRED

Test \_\_\_\_\_ Conditions \_\_\_\_\_ MIL-STD \_\_\_\_\_

Vibration \_\_\_\_\_

Shock \_\_\_\_\_

Temp. Shock \_\_\_\_\_

Burn-In \_\_\_\_\_

Other \_\_\_\_\_

### DATA REQUIREMENTS

Lot data \_\_\_\_\_

Unit data \_\_\_\_\_

Other \_\_\_\_\_

jlt-101.doc

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: <http://www.panatron.com>

## **Fixed Attenuators**

If your particular requirements are not met with a PANATRON catalog item, please complete the check list below and mail, phone, or fax it to PANATRON, INC., Applications Engineering. Please type or print clearly.

**Application:**  Industrial/ Commercial  Military  Space  Other: \_\_\_\_\_

**Electrical:** Frequency range \_\_\_\_\_ MHz **NOTES:**

Attenuation \_\_\_\_\_ db, Tol.  $\pm$  \_\_\_\_\_ dB

Attenuation flatness max.  $\pm$  \_\_\_\_\_ dB

Over frequency \_\_\_\_\_ MHz

Max. input power \_\_\_\_\_ watt

VSWR or return loss (dB)  50 ohms  75 ohms  Other

**Diagram of application:**

Input \_\_\_\_\_ Output \_\_\_\_\_

Operating Temperature: \_\_\_\_\_ °C

## **Mechanical:**

Coaxial Connector:  BNC  TNC  SMA  Type N  Type F \_\_\_\_\_ Other

**Special Requirements:** \_\_\_\_\_

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_ Department: \_\_\_\_\_

Company Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ jlt-092.doc

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: <http://www.panatron.com>

## Frequency Doublers

If your particular requirements are not met with a PANATRON catalog item, please complete the check list below and mail, phone, or fax it to PANATRON, INC., Applications Engineering. Please type or print clearly.

**Application:**  Industrial/ Commercial  Military  Space  Other: \_\_\_\_\_

**Electrical:** RF Input Frequency range \_\_\_\_\_ MHz **NOTES:**

RF Input power max. \_\_\_\_\_ dBm, min. \_\_\_\_\_ dBm

Max. Conversion loss \_\_\_\_\_ dB

Rejection of fundamental at output \_\_\_\_\_ dB min., relative to 2nd harmonic

Rejection of 3rd harmonic at output \_\_\_\_\_ dB min., relative to 2nd harmonic

Rejection of 4th harmonic at output \_\_\_\_\_ dB min., relative to 2nd harmonic

VSWR or return loss (dB)  50 ohms  75 ohms  other

Input \_\_\_\_\_ Output \_\_\_\_\_

Max. input (without damage) \_\_\_\_\_ dBm, Operating Temperature: \_\_\_\_\_ °C

### Diagram of application:

### Mechanical:

Coaxial Connector:  BNC  TNC  SMA  Type N  Type F \_\_\_\_\_ Other

### Special Requirements:

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_ Department: \_\_\_\_\_

Company Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ jlt-096.doc

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: <http://www.panatron.com>

## Coax Filters

If your particular requirements are not met with a PANATRON catalog item, please complete the check list below and mail, phone, or fax it to PANATRON, INC., Applications Engineering. Please type or print clearly.

**Application:**  Industrial/ Commercial  Military  Space  Other: \_\_\_\_\_

**Electrical:**  Low Pass  High Pass  Band Pass **NOTES:**

Passband \_\_\_\_\_ MHz

Passband insertion loss \_\_\_\_\_ dB max.

Stopband \_\_\_\_\_ dB min. at \_\_\_\_\_ MHz  
\_\_\_\_\_ dB min. at \_\_\_\_\_ MHz  
\_\_\_\_\_ dB min. at \_\_\_\_\_ MHz  
\_\_\_\_\_ dB min. at \_\_\_\_\_ MHz

Passband VSWR \_\_\_\_\_ max.

or return loss \_\_\_\_\_ dB min.

Impedance  50 ohms  75 ohms \_\_\_\_\_ Other

Power input \_\_\_\_\_ dBm max.

Group delay (passband) \_\_\_\_\_ ns max.

Group delay variation (for flat delay)

DC-fco \_\_\_\_\_ ns max.

\_\_\_\_\_ ns max.

\_\_\_\_\_ ns max.

Operating Temperature \_\_\_\_\_ °C

## **Mechanical:**

Coaxial Connector:  BNC  TNC  SMA  Type N  Type F \_\_\_\_\_ Other

## **Special Requirements:** \_\_\_\_\_

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_ Department: \_\_\_\_\_

Company Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ jlt-090.doc

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: <http://www.panatron.com>

## Waveguide Filters

If your particular requirements are not met with a PANATRON catalog item, please complete the check list below and mail, phone, or fax it to PANATRON, INC., Applications Engineering. Please type or print clearly.

**Application:**  Industrial/ Commercial  Military  Space  Other: \_\_\_\_\_

**Electrical:**  Low Pass  High Pass  Band Pass **NOTES:**

Center or cutoff frequency: \_\_\_\_\_

1dB or 3dB BW or cutoff \_\_\_\_\_

VSWR \_\_\_\_\_

Passband \_\_\_\_\_ to \_\_\_\_\_

I.L. @ Center Frequency or in Passband \_\_\_\_\_

Rejection: \_\_\_\_\_ dB @ \_\_\_\_\_

Phase Linearity:  $\pm$  \_\_\_\_\_ degrees.

Rejection: \_\_\_\_\_ dB @ \_\_\_\_\_

Frequency Range: \_\_\_\_\_

Rejection: \_\_\_\_\_ dB @ \_\_\_\_\_

Phase Match:  $\pm$  \_\_\_\_\_

Rejection: \_\_\_\_\_ dB @ \_\_\_\_\_

Frequency Range: \_\_\_\_\_

Package Style: \_\_\_\_\_

Package Dimensions: \_\_\_\_\_

Connectors: IN: \_\_\_\_\_ OUT: \_\_\_\_\_ Mounting (check one)  Yes,  No

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_ Department: \_\_\_\_\_

Company Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

**Diagram of application:**

jlt-090a.doc

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: <http://www.panatron.com>

## Limiters

If your particular requirements are not met with a PANATRON catalog item, please complete the check list below and mail, phone, or fax it to PANATRON, INC., Applications Engineering. Please type or print clearly.

**Application:**  Industrial/ Commercial  Military  Space  Other: \_\_\_\_\_

**Electrical:** Frequency \_\_\_\_\_ MHz **NOTES:**

Input power, min. \_\_\_\_\_ dBm, max. \_\_\_\_\_ dBm

Power output \_\_\_\_\_ dBm, Tol.  $\pm$  \_\_\_\_\_ dB

Control current \_\_\_\_\_ mA

Impedance  50 ohms  75 ohms

Limiting:

Input range \_\_\_\_\_ to \_\_\_\_\_ dBm

Output amplitude change \_\_\_\_\_ dB max.

Output phase change \_\_\_\_\_ deg. max.

Max. input (without damage) \_\_\_\_\_ dBm, Operating Temperature: \_\_\_\_\_ °C

**Diagram of application:**

## **Mechanical:**

Coaxial Connector:  BNC  TNC  SMA  Type N  Type F \_\_\_\_\_ Other

**Special Requirements:** \_\_\_\_\_

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_ Department: \_\_\_\_\_

Company Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

jlt-098.doc

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: <http://www.panatron.com>

## Phase Detectors

If your particular requirements are not met with a PANATRON catalog item, please complete the check list below and mail, phone, or fax it to PANATRON, INC., Applications Engineering. Please type or print clearly.

**Application:**  Industrial/ Commercial  Military  Space  Other: \_\_\_\_\_

**Electrical:** Frequency range LO/RF ports \_\_\_\_\_ MHz **NOTES:**

Output port \_\_\_\_\_ MHz

LO power level \_\_\_\_\_ dBm

RF power level \_\_\_\_\_ dBm

Max DC output voltage required \_\_\_\_\_ mV

Polarity (for 2 in-phase input signals), Pos. \_\_\_\_\_, Neg. \_\_\_\_\_

Max DC offset Voltage \_\_\_\_\_ mV

Impedance

RF/LO  50 ohms  75 ohms

Output  500 ohms  50 ohms  75 ohms

For external output load

500 ohms  50 ohms  75 ohms  Other

Isolation, min. LO-RF \_\_\_\_\_ dB

**Diagram of application:**

## **Mechanical:**

Coaxial Connector:  BNC  TNC  SMA  Type N  Type F  Other

**Special Requirements:** \_\_\_\_\_

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_ Department: \_\_\_\_\_

Company Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

jlt-097.doc

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: <http://www.panatron.com>

## **Power Splitter / Combiners**

If your particular requirements are not met with a PANATRON catalog item, please complete the check list below and mail, phone, or fax it to PANATRON, INC., Applications Engineering. Please type or print clearly.

**Application:**  Industrial/ Commercial  Military  Space  Other: \_\_\_\_\_

**Electrical:** Frequency range \_\_\_\_\_ MHz **NOTES:**

No. of way \_\_\_\_\_,  Splitter  Combiner

Phase:  0°  90°  180° \_\_\_\_\_ °

Phase unbalance \_\_\_\_\_ deg. max.

Amplitude Unbalance \_\_\_\_\_ dB max.

Isolation between parts \_\_\_\_\_ dB min.

VSWR or return loss (dB)  50 ohms  75 ohms  Other Input \_\_\_\_\_ Output \_\_\_\_\_

No. Way	2	3	4	5	6	8	10	12	16	24	48
Insertion Loss dB	3	4.8	6	7	7.8	9	10	10.8	12	13.8	16.8
Ideal											

Insertion Loss (above ideal) \_\_\_\_\_ dB max.

**Diagram of application:**

Internal load dissipation \_\_\_\_\_ watt

Max. power rating \_\_\_\_\_ watt

Operating Temperature: \_\_\_\_\_ °C

### **Mechanical:**

Coaxial Connector:  BNC  TNC  SMA  Type N  Type F \_\_\_\_\_ Other

### **Special Requirements:** \_\_\_\_\_

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_ Department: \_\_\_\_\_

Company Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

jlt-095.doc

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: <http://www.panatron.com>

## Switches / Switches with Drivers

If your particular requirements are not met with a PANATRON catalog item, please complete the check list below and mail, phone, or fax it to PANATRON, INC., Applications Engineering. Please type or print clearly.

**Application:**  Industrial/ Commercial  Military  Space  Other: \_\_\_\_\_

**Electrical:** Type:  SPST  SPDT  SP3T  SP4T  OTHER \_\_\_\_\_  
 With driver,  Without driver

Frequency Range \_\_\_\_\_ MHz Power input Max. \_\_\_\_\_ dB

Insertion loss max. \_\_\_\_\_ dB Isolation (in-out) min. \_\_\_\_\_ dB

VSWR or return loss (dB)  50 ohms  75 ohms  other, input \_\_\_\_\_ output \_\_\_\_\_

Switching Time\*   $\mu$ sec. Rise time   $\mu$ sec.

**Diagram of application:**

Supply current (for driver) \_\_\_\_\_ mA

Supply voltage (for driver) \_\_\_\_\_ mA

Control voltage  Vmax. Current  mA

Logic:  TTL  CMOS  not applicable

Operating temperature \_\_\_\_\_ °C

\*50% control to 90% RF (on) to 10% RF (off)

### NOTES:

### Mechanical:

Coaxial Connector:  BNC  TNC  SMA  Type N  Type F \_\_\_\_\_ Other

### Special Requirements:

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_ Department: \_\_\_\_\_

Company Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

jlt-102.doc

# PANATRON, INC.

P.O. Box 8010, Rancho Cucamonga, CA., 91701-0010

Phone: (909) 629-0748 FAX: (909) 620-0378

E-mail: mail@panatron.com, URL: <http://www.panatron.com>

## Transformers

If your particular requirements are not met with a PANATRON catalog item, please complete the check list below and mail, phone, or fax it to PANATRON, INC., Applications Engineering. Please type or print clearly.

**Application:**  Industrial/ Commercial  Military  Space  Other: \_\_\_\_\_

**Electrical:** Frequency Range \_\_\_\_\_ MHz **Diagram of application:**

Schematic:  A  B  C  D  E  F

Impedance: Primary \_\_\_\_\_ ohms, Secondary \_\_\_\_\_ ohms

VSWR or return loss (dB) Primary \_\_\_\_\_ Secondary \_\_\_\_\_

Bandwidth:

1. dB \_\_\_\_\_ MHz to \_\_\_\_\_ MHz

2. dB \_\_\_\_\_ MHz to \_\_\_\_\_ MHz

3. dB \_\_\_\_\_ MHz to \_\_\_\_\_ MHz

Amplitude unbalance \_\_\_\_\_ dB

Phase unbalance \_\_\_\_\_ dB

DC current through windings: Primary \_\_\_\_\_ mA, Secondary \_\_\_\_\_ mA

Through center tap? Primary: Y N , Secondary: Y N

Insulation Resistance: Primary to secondary \_\_\_\_\_ ohms

Dielectric withstanding voltage \_\_\_\_\_ V.  DC  AC

Operating Temperature: \_\_\_\_\_ °C

## **Mechanical:**

Coaxial Connector:  BNC  TNC  SMA  Type N  Type F \_\_\_\_\_ Other

## **Special Requirements:** \_\_\_\_\_

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Company: \_\_\_\_\_ Department: \_\_\_\_\_

Company Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

jlt-087.doc