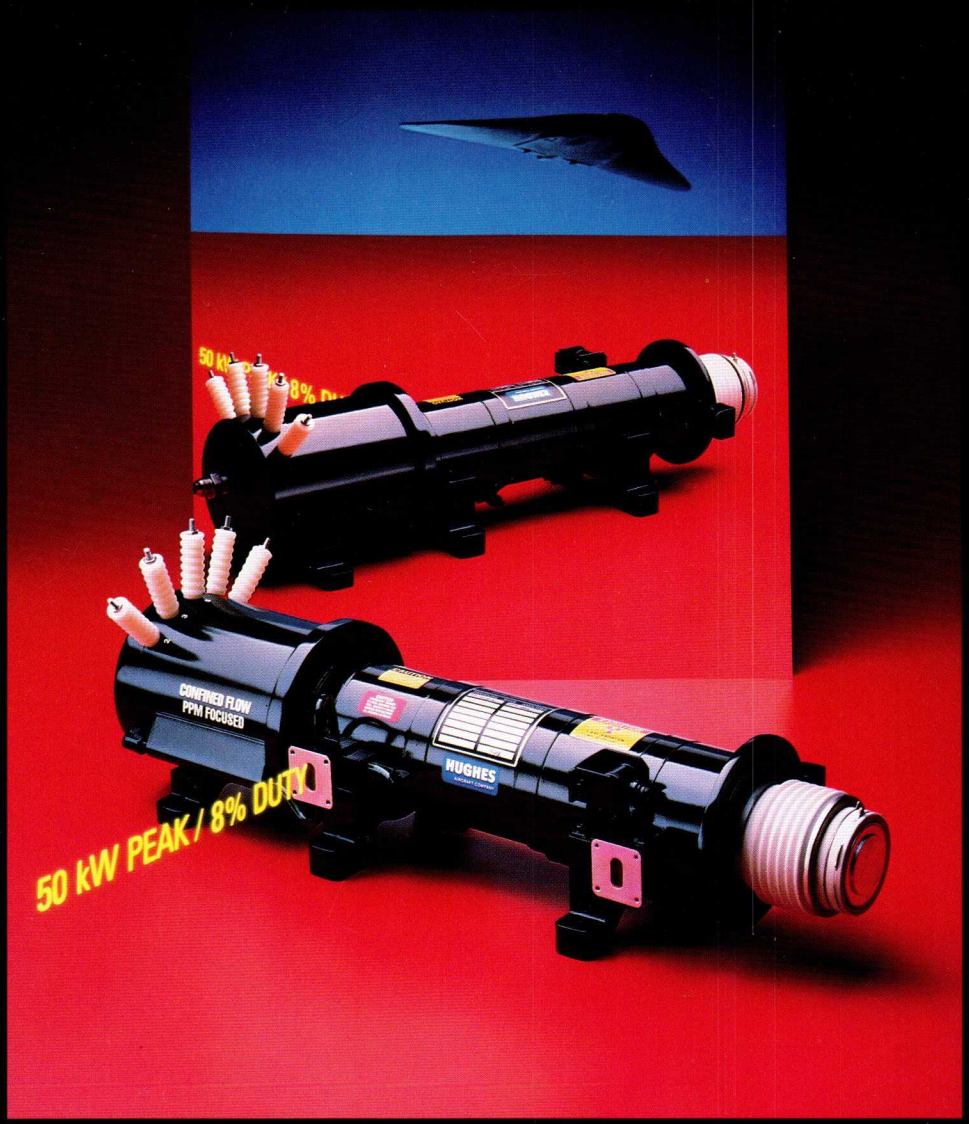
HUGHES

ELECTRON DYNAMICS DIVISION

TWT AND TWTA LISTING



Hughes Mission

Our mission is to creatively advance and apply electronics-based technology to products and services for the defense, space, and commercial markets. We are committed to understanding the needs of our customers and providing products and services of the highest quality which are inherently simple and cost-effective solutions to these needs.

On the Cover

The Hughes traveling-wave tube shown on the cover, a periodic permanent magnet (PPM)-focused, X-band coupled-cavity TWT, is just one example of the innovative traveling-wave tubes and traveling-wave tube amplifiers that have made Hughes Electron Dynamics Division an industry leader.

Hughes TWT and TWTA Capabilities

THE TRADITION

For over a quarter of a century, the Electron Dynamics Division of Hughes Aircraft Company has been recognized as the industry-leading manufacturer of innovative traveling-wave tubes (TWTs) and traveling-wave tube amplifiers (TWTAs).

The breadth of application experience and the performance characteristics of the Hughes TWT/TWTA products are unmatched

LEADING THE WAY

Hughes' products have both supported and anticipated the major developments occurring in all TWT/TWTA applications.

The Hughes family of helix TWTs has a long tradition of proven performance over a wide range of military applications. These include X- and Ka-band lightweight airborne radars, satellite uplinks at 45 GHz, high-duty cycle efficient missile seekers and broadband high-duty cycle ECM. Recent circuit developments now allow us to also offer ring-bar and folded-helix devices for new high-power seekers and wide-band radars.

In space applications, Hughes has answered the continuing need for longer life, reduced weight and higher efficiency. Recent technology innovations include materials and processes for improved multi-stage depressed collectors yielding lightweight TWTs with efficiencies in excess of 60%, and simplified electronic power conditioner (EPC) topologies which raise the EPC efficiency while reducing the weight. These improvements, providing TWTA efficiencies in excess of 50%, will maintain the TWTA as the preferred power amplifier for future space applications.

In radar and communications, Hughes has developed a broad line of coupled-cavity TWTs capable of producing hundreds of kilowatts of peak power with bandwidths of 30% or more. Hughes is the industry-wide leader in developing lightweight PPM-focused TWTs. In applications that still require solenoid focusing, the windings are wrapped directly on the TWT body to minimize size, weight and power consumption. Hughes has also developed transmit-receive limiter switches for high pulse-repetition radar that can handle powers on the order of 50 kW, with an insertion loss of less than 0.5 dB and recovery time of less than 5 nanoseconds.

In communications, Hughes offers a wide range of TWTAs plus redundant and power-combined subsystems for satellite ground terminals. These highly reliable ground terminal amplifiers feature high mean-time-between-failure (MTBF) and offer more than just a TWT and power supply. They are an integrated subsystem, designed specifically to meet ground terminal requirements.

In instrumentation, Hughes offers fully self-contained TWTAs which cover the frequency range from 1 to 50 GHz, with power outputs to 100 W. These small, lightweight units include a low-ripple, highly-regulated switching power supply, integral cooling, automatic recycle and TWT protective features. The units are offered with a number of options, including an IEEE-488 data bus interface.

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For Complete Details

Summary specifications for all of these Hughes TWT/TWTA products are given on the following pages. For complete details, contact your nearest Hughes Electron Dynamics Division branch office or write to:
Hughes Aircraft Company, Electron Dynamics Division, P. O. Box 2999, Torrance, CA 90509-2999. Phone (213) 517-6000.

Table A—PULSED RADAR and ECM TWTs

	Model Number	Frequency Range (GHz)	Minimum Power Output (kW)	Duty Cycle	Saturated Gain (dB)	Cathode Voltage Ek (kV)	Cathode Current Ik (A)	Dimensions L x W x H (inches)
S-Band	• 555H	2.0–4.5	1.25	0.04	33	-8.0	2.1	17.5 x 2.5 dia
	589H	2.7–3.1	125.0	0.06	50	-45.0	18.0	58.0 x 6.0 dia
	584H	2.8–3.0	300.0	0.025	21	-59.0	26.0	41.0 x 6.0 dia
	587H	2.9–3.1	140.0	0.06	50	-44.0	18.0	56.0 x 6.0 dia
	588H	2.9–3.2	125.0	0.08	50	-45.0	17.0	57.0 x 6.0 dia
	• 559H	3.1–3.5	125.0	0.06	50	-44.0	18.0	52.0 x 6.0 dia
	• 8529H	3.1–3.6	125.0	0.09	50	-45.0	19.0	55.5 x 6.0 dia
	595H	3.1–3.6	220.0	0.03	21	-51.5	23.0	33.0 x 14.5 x 9.5
C-Band	• 641H	4.0–8.0	1.25	0.04	30	-9.75	1.8	14.5 x 2.75 dia
	• 679H	5.25–5.75	16.0	0.015	50	-24.0	4.5	30.0 x 9.3 x 7.5
	695H	5.25–5.75	250.0	0.05	46	-53.0	18.0	44.0 x 15.0 x 15.0
	• 621H	5.25–5.85	60.0	0.035	50	-37.0	11.5	35.5 x 6.7 x 8.7
	680H	5.25–5.85	100.0	0.10	46	-41.0	12.0	37.5 x 15.0 x 11.5
	683H	5.25–5.85	165.0	0.07	46	-48.0	16.0	38.0 x 15.0 x 11.5
	• 676H	5.4–5.9	12.0	0.03	45	-24.0	4.0	27.0 x 8.75 x 8.0
	675H	5.4–5.9	15.0	0.02	50	-24.0	4.0	27.0 x 8.75 x 8.0
	• 622H	5.44–5.85	75.0	0.025	50	-38.0	11.0	29.0 x 3.3 x 7.5
	694H	5.45–5.8	165.0	0.035	50	-49.0	17.0	34.5 x 12.0 dia
X-Band	• 8790H	7.5–11.5	1.0	0.28	40	-11.00	0.55	13.0 x 2.3 x 2.9
	8726H	7.9–8.4	20.0	0.06	50	-25.5	5.6	23.9 x 5.0 dia
	751H/103	7.9–8.4	40.0	0.014	50	-32.0	7.5	22.0 x 5.5 dia
	18711H	8.4–9.0	8.0	0.06	52	-18.0	3.3	18.7 x 5.1 dia
	18712H	8.4–9.0	12.0	0.08	53	-19.5	3.3	14.5 x 3.8 dia
	308H111	8.5–9.5	12.0	0.025	53	-24.0	3.5	22.4 x 5.3 dia
	8753H	8.5–9.6	120.0	0.04	48	-48.0	17.0	31.0 x 7.5 dia
	8784H	8.5–9.6	120.0	0.04	48	-48.0	17.0	31.0 x 7.0 dia
	• 18703H	8.5–10.3	3.0	0.10	45	-12.0	1.9	15.0 x 2.75 x 2.80
	• 18704H	8.5–10.3	3.5	0.10	48	-12.0	1.8	15.0 x 2.75 x 2.80
	8718H	8.6–9.4	35.0	0.012	52	-30.0	7.8	20.0 x 4.5 dia
	• 308HC	8.6–9.5	20.0	0.01	46	-25.0	6.3	18.5 x 4.6 dia
	• 308HA	8.6–9.6	30.0/40.0	0.01	49	-31.5	7.5	19.4 x 4.2 dia
	• 751H	8.8–9.7	50.0	0.01	52	-32.0	7.6	20.5 x 5.5 dia
	• 760H	8.9–9.9	40.0	0.01	42	-30.0	8.0	16.5 x 5.5 dia
	8716H	9.0–9.2	120.0	0.0025	50	-43.0	13.5	24.0 x 5.0 dia
	• 756H	9.0–9.8	9.0	0.5	54	-18.0	2.5	21.0 x 6.0 x 8.0
	• 750H	9.0–10.0	25.0	0.01	47	-24.0	5.5	18.5 x 5.0 dia
	8768H	9.0–10.0	35.0	0.25	52	-30.0	6.0	27.0 x 8.1 x 11.2
	8709H	9.2–9.4	26.0	0.012	47	-25.0	6.0	20.5 x 5.0 dia
	8777H	9.3–9.9	50.0	0.02	50	-33.5	7.7	23.5 x 5.5 dia
	• 8708H	9.4–10.0	26.0	0.012	47	-26.0	6.0	22.3 x 5.0 dia
	18705H	9.45–10.05	50.0	0.01	53	-31.5	8.0	18.0 x 3.0 dia
	8743H	9.55–9.85	1.25	0.45	50	-11.8	0.8	16.6 x 4.0 x 6.9
	• 781H	9.55–9.85	3.0	0.5	50	-12.0	1.2	16.0 x 6.0 x 7.5
	8725H	9.7–9.9	15.0	0.012	58	-23.0	4.0	18.0 x 3.3 dia
	8791H	9.7–9.9	15/1.5	0.03/0.45	60/22	-26.0	3.0/0.70	24.0 x 6.0 dia
	8741H	10.0–10.3	4.0	0.20	33	-22.0	0.7	15.7 x 4.7 dia
X/Ku-Band	• 687H	6.5–18.0	0.3	0.50	30	-11.0	0.50	17.0 x 2.5 x 2.8
	• 18714H	7.5–18.0	1.5	0.06	49	-11.0	1.7	14.0 x 3.25 x 1.7
	18714HS	7.5–18.0	1.0	0.06	43	-11.0	1.4	14.0 x 3.25 x 1.7
Ku-Band	862H	14.0–18.0	5.0	0.05	36	-31.0	2.0	20.0 x 4.0 dia
	• 866H	15.7–17.7	10.0	0.5	33	-30.0	3.4	30.0 x 7.0 dia
	• 605H	16.0–16.5	100.0	0.005	50	-62.0	8.0	19.0 x 4.0 dia
	• 838H	16.0–16.5	100.0	0.005	53	-63.0	7.7	19.0 x 4.0 dia
	• 854H	16.0–16.5	100.0	0.03	53	-65.0	8.1	20.0 x 6.0 dia
	• 835H	16.0–16.5	200.0	0.01	60	-85.0	13.0	27.0 x 6.0 dia
	8813H	16.1–16.6	12.0	0.05	52	-30.0	2.0	16.5 x 4.0 dia
	8815H	16.2–16.8	45.0	0.001	53	-37.0	6.0	15.0 x 3.6 x 3.4
	8840H	16.5–17.0	120.0	0.0175	53	-67.0	8.5	20.0 x 6.0 dia
	• 897H	17.5–18.0	5.0	0.5	50	-19.0	2.4	21.0 x 6.0 dia
mm-wave	• 8900H	32.0–35.0	0.08	0.20	43	-13.5	0.09	17.2 x 3.3 x 2.4
	• 8907H	33.0–35.0	0.13	CW	50	-13.5	0.135	17.24 x 3.30 x 2.43
	• 8910H	33.0–36.0	4.0	0.05	50	-37.0	1.1	18.0 x 4.0 dia
	• 982H	93.0–95.0	0.1	0.5	50	-22.0	0.088	16.0 x 4.0 dia

• Data sheet available for this model

Dimensions L x W x H (cm)	Weight (lbs.)	Weight (kg)	Focusing	Modulation Control	Cooling	Tube Type	Model Number	
44.45 x 6.35 dia	10.0	4.55	PPM	G	FA	H	• 555H	**S-Band**
147.32 x 15.24 dia	205.0	93.18	PPM	SG	L	CC	589H	
104.14 x 15.24 dia	150.0	68.18	PPM	SG	L	CC	584H	
142.24 x 15.24 dia	195.0	88.64	PPM	SG	L	CC	587H	
144.78 x 15.24 dia	200.0	90.9	PPM	SG	L	CC	588H	
132.08 x 15.24 dia	140.0	63.64	PPM	SG/IA	L	CC	• 559H	
140.97 x 15.24 dia	150.0	68.18	PPM	SG/IA	L	CC	• 8529H	
84.0 x 37.0 x 24.0	100.0	46.0	PPM	SG	L	CC	595H	
36.83 x 6.99 dia	10.0	4.55	PPM	G	SC	H	• 641H	**C-Band**
76.2 x 23.62 x 19.05	62.0	28.18	PPM	SG	FA	CC	• 679H	
111.76 x 38.1 x 38.1	200.0	90.9	IS	SG/IA	L	CC	695H	
90.17 x 17.02 x 22.1	50.0	22.7	PPM	SG	L	CC	• 621H	
92.25 x 38.1 x 29.21	165.0	75.0	IS	SG/IA	L	CC	680H	
96.52 x 38.1 x 29.21	170.0	77.27	IS	SG/IA	L	CC	683H	
68.4 x 22.23 x 20.32	55.0	24.97	PPM	SG	FA	CC	• 676H	
68.4 x 22.23 x 20.32	55.0	24.97	PPM	SG	FA	CC	675H	
73.66 x 8.38 x 19.05	40.0	18.18	PPM	CP	L	CC	• 622H	
87.63 x 30.48 dia	200.0	90.9	SOL	SG	L	CC	694H	
33.02 x 5.84 x 7.37	4.0	1.82	PPM	G	C	H	• 8790H	**X-Band**
60.7 x 12.7 dia	32.0	14.5	PPM	SG	FC77	CC	8726H	
55.88 x 13.97 dia	30.0	13.64	PPM	SG	L	CC	751H/103	
47.5 x 13.0 dia	23.0	10.5	PPM	SG	L	CC	18711H	
36.8 x 9.7 dia	27.0	12.3	PPM	SG	L	CC	18712H	
56.9 x 13.5 dia	22.5	10.2	PPM	SG	FA	CC	308H111	
78.74 x 19.05 dia	68.0	31.0	IS	SG/IA	L	CC	8753H	
78.74 x 17.78 dia	78.0	35.5	IS	SG/IA	L	CC	8784H	
38.1 x 6.99 x 7.11	6.0	2.73	PPM	G	C	H	• 18703H	
38.1 x 6.99 x 7.11	6.0	2.73	PPM	SG	C	H	• 18704H	
50.8 x 11.43 dia	26.0	11.82	PPM	SG	FA	CC	8718H	
47.0 x 11.68 dia	21.0	9.55	PPM	SG	FA	CC	• 308HC	
49.28 x 10.67 dia	26.5	12.0	PPM	SG	FA	CC	• 308HA	
52.1 x 14.0 dia	25.0	11.36	PPM	SG	L	CC	• 751H	
41.91 x 13.97 dia	22.0	10.0	PPM	CP	L	CC	• 760H	
60.96 x 12.7 dia	35.0	15.91	PPM	CP	FA	CC	8716H	
53.34 x 15.24 x 20.32	45.0	20.45	IS	SG	L	CC	• 756H	
46.99 x 12.7 dia	26.0	11.82	PPM	CP	FA	CC	• 750H	
68.58 x 20.57 x 28.45	125.0	56.82	IS	SG	L	CC	8768H	
52.07 x 12.7 dia	26.0	11.82	PPM	SG	FA	CC	8709H	
60.5 x 14.0 dia	32.0	14.55	PPM	SG	L	CC	8777H	
56.64 x 12.7 dia	26.0	11.82	PPM	SG	FA	CC	• 8708H	
45.7 x 7.6 dia	12.0	5.45	PPM	SG	L	CC	18705H	
42.16 x 10.16 x 17.53	13.0	5.91	PPM	SG	L	CC	8743H	
40.64 x 15.24 x 19.05	37.0	16.82	IS	SG	L	CC	• 781H	
45.72 x 8.38 dia	10.0	4.55	PPM	SG	FA	CC	8725H	
60.96 x 15.24 dia	27.0	12.27	PPM	SG	L	CC	8791H	
39.88 x 11.94 dia	17.0	7.73	PPM	SG	L	CC	8741H	
43.18 x 6.35 x 7.1	6.0	2.72	PPM	SG	C	H	• 687H	**X/Ku-Band**
35.56 x 8.3 x 4.32	4.0	1.82	PPM	G	C	H	• 18714H	
35.56 x 8.3 x 4.32	4.0	1.82	PPM	SG	C	H	18714HS	
50.8 x 10.16 dia	15.0	6.82	PPM	SG	L	CC	862H	**Ku-Band**
76.2 x 17.78 dia	65.0	29.55	IS	A	L	CC	• 866H	
48.26 x 10.16 dia	20.0	9.09	PPM	CP	L	CC	• 605H	
48.26 x 10.16 dia	20.0	9.09	PPM	SG	L	CC	• 838H	
50.8 x 15.24 dia	45.0	20.45	IS	SG	L	CC	• 854H	
68.58 x 15.24 dia	30.0	13.64	PPM	SG	L	CC	• 835H	
41.91 x 10.16 dia	14.0	6.36	PPM	SG	L	CC	8813H	
38.1 x 9.14 x 8.64	11.0	5.0	PPM	CP	C	CC	8815H	
50.8 x 15.24 dia	45.0	20.45	IS	CP	L	CC	8840H	
53.34 x 15.24 dia	45.0	20.45	IS	SG	L	CC	• 897H	
43.69 x 8.38 x 6.10	5.5	2.5	PPM	G	C	H	• 8900H	**mm-wave**
43.79 x 8.38 x 6.17	5.0	2.3	PPM	G	C	H	• 8907H	
45.72 x 10.16 dia	17.0	7.73	PPM	SG	FA/L	CC	• 8910H	
40.64 x 10.16 dia	12.0	5.45	PPM	AG	FA/L	CC	• 982H	

Table B—CW RADAR and ECM TWTs

	Model Number	Frequency Range (GHz)	Minimum Power Output (kW)	Duty Cycle	Saturated Gain (dB)	Cathode Voltage Ek (kV)	Cathode Current Ik (A)	Dimensions L x W x H (inches)
X-Band	• 8713H	7.5–10.0	1.0	CW	40.0	-9.8	1.2	24.0 x 5.0 dia
	8762H	9.2–10.2	5.0	CW	40.0	-18.6	1.4	23.4 x 7.8 x 8.7
	759H	10.0–10.2	0.7	CW	40.0	-16.0	0.25	14.2 x 2.0 dia
	18713H	10.2–10.7	10.0	CW	52.0	-20.0	2.7	26.5 x 10.0 x 9.2
mm-wave	• 8902H	32.0–37.0	0.04	CW	40.0	-13.5	0.07	17.2 x 3.3 x 2.4
	• 8906H	33.0–50.0	0.01	CW	30.0	-13.0	0.04	13.90 x 2.80 x 3.0

Table C—COMMUNICATION TWTs

	Model Number	Frequency Range (GHz)	Minimum Power Output (kW)	Duty Cycle	Saturated Gain (dB)	Cathode Voltage Ek (kV)	Cathode Current Ik (A)	Dimensions L x W x H (inches)
C-Band	• 670HA	5.925–6.425	0.050	CW	45	-3.6	0.095	11.2 x 2.0 x 2.4
	• 677H	5.925–6.425	0.125	CW	40	-6.0	0.170	17.0 x 3.0 x 2.9
	• 662HA	5.925–6.425	0.400	CW	40	-8.2	0.420	22.1 x 4.2 x 3.4
X-Band	• 8760H	7.9–8.4	0.6-1.2	CW	40	-13.2	0.72	26.0 x 6.3 dia
	▲ 8796H	7.9–8.4	2.25	CW	50	-15.0	0.9	22.5 x 5.0 x 5.0
	• 767H	7.9–8.4	3.0	CW	35	-13.4	1.48	21.0 x 6.1 dia
	• 792H	7.9–8.4	5.0	CW	35	-13.4	2.05	21.0 x 6.1 dia
	▲ 8723H	7.9–8.4	12.0	CW	38	-22.0	2.7	27.0 x 6.8 dia
	751H/103	7.9–8.4	40.0	0.014	50	-32.0	7.5	22.0 x 5.5 dia
Ku-Band	848HA*	14.0–14.5	0.020	CW	50	-3.7	0.060	10.0 x 2.0 x 2.3
	848HB*	14.0–14.5	0.025	CW	40	-4.0	0.070	10.0 x 2.0 x 2.3
	896H*	14.0–14.5	0.075	CW	40	-8.0	0.08	14.0 x 3.0 x 2.7
	881H/129*	14.0–14.5	0.275	CW	42	-8.7	0.3	21.6 x 5.2 x 3.1
	885H*	14.0–14.5	0.315	CW	42	-9.2	0.3	21.6 x 5.2 x 3.1
	• 876H	14.0–14.5	0.700	CW	43	-16.0	0.4	21.6 x 4.8 x 6.2
	• 870H	14.0–14.5	5.0	CW	35	-19.0	1.7	30.0 x 7.0 dia
	885HK	17.3–18.1	0.200	CW	35	-9.2	0.3	21.6 x 5.2 x 3.1
	896HK	17.3–18.1	0.40	CW	40	-8.0	0.08	14.0 x 3.0 x 2.7
Ka-Band	• 8904H	27.0–30.0	0.06	CW	45	-13.5	0.075	17.24 x 3.3 x 2.43
	• 8908H	27.0–30.0	0.12	CW	50	-13.5	0.110	17.24 x 3.3 x 2.43
	• 914H	30.0–31.0	0.2	CW	35	-16.0	0.070	18.0 x 4.0 dia
	933H	30.0–31.0	2.0	CW	35	-26.0	0.6	20.0 x 6.5 dia
	913H	36.5–38.5	0.1	CW	45	-16.0	0.070	18.0 x 4.0 dia
Q-Band	944H	42.0–42.5	0.1	CW	44	-14.5	0.046	17.0 x 5.0 x 5.0
	• 8905H	42.0–45.0	0.08	CW	50	-13.0	0.080	13.90 x 2.80 x 3.0
	8901HA	42.0–46.0	0.030	CW	40	-13.5	0.045	13.9 x 2.8 x 3.0
	• 8901H	42.0–46.0	0.030	CW	40	-13.0	0.050	14 x 2.8 x 3.0
	915H	43.5–45.5	0.25	CW	50	-22.5	0.090	18.0 x 4.0 dia
	▲ 948H	43.5–45.5	1.0	CW	50	-27.0	0.34	20.0 x 6.6 x 4.0
V-Band	▲ 964H	59.0–61.0	0.2	CW	50	-25.0	0.18	18.0 x 4.0 x 4.0
	▲ 962H	60.0–62.0	0.03	CW	50	-18.0	0.042	17.0 x 4.0 x 4.0
	▲ 961H	61.5–64.0	0.075	CW	50	-19.7	0.070	20.0 x 6.0 dia

Table D—COMMUNICATION POWER AMPLIFIERS

	Amplifier Model Number	Frequency Range (GHz)	Minimum HPA Power Output (W)	Rated Power Gain (dB)	Input Voltage (50/60 Hz)	Dimensions W x H x L (inches)
C-Band	• 9040HA02	5.925–6.425	40.0	43.0	120/220 VAC	19.0 x 3.5 x 19.5
	• 9210HA02	5.925–6.425	110.0	60.0	120/220 VAC; 48 VDC	19.0 x 5.25 x 24.0
	• 9240HA02	5.925–6.425	350.00	70.0	120/220 VAC; 208 VAC 3ϕ	19.0 x 21.0 x 24.0
Ku-Band	• 9020HA04	14.0–14.5	17.00	48.00	120/220 VAC	19.0 x 3.5 x 19.5
	• 9025HA04	14.0–14.5	21.0	40.0	120/220 VAC	19.0 x 3.5 x 19.5
	• 9075H04	14.0–14.5	60.0	62.0	120/220 VAC	19.0 x 5.2 x 19.5
	• 9225HA04	14.0–14.5	250.0	62.0	120/220 VAC; 208 VAC 3ϕ	19.0 x 21.0 x 24.0
	• 9231HA04	14.0–14.5	275.0	62.0	120/220 VAC; 208 VAC 3ϕ	19.0 x 21.0 x 24.0
	9745HA04	14.0–14.5	450.00	62.0	120/220 VAC; 208 VAC 3ϕ	19.0 x 52.5 x 26.0
	9040HA05	17.3–18.1	40.0	40.0	120/220 VAC	19.0 x 5.2 x 19.5
	9200HA05	17.3–18.1	200.0	35.0	120/220 VAC; 208 VAC 3ϕ	19.0 x 21.0 x 24.0
Ka-Band	• 8060H18	27.0–30.0	60.0	45.0	120/220 VAC	19.0 x 7.0 x 24.0
	• 8100H18	27.0–30.0	100.0	50.0	120/220 VAC	19.0 x 7.0 x 24.0
Q-Band	• 8060H22	42.0–45.0	60.0	50.0	120/220 VAC	19.0 x 7.0 x 24.0
	• 8030H22	42.0–46.0	30.0	40.0	120/220 VAC	19.0 x 7.0 x 24.0
	• 1608H	43.5–45.5	200.0	49.0	208 VAC 3ϕ	19.0 x 18.0 x 22.0

• Data sheet available for this model
* Data sheet available for this model—listed under amplifier's model number
▲ Under development

Dimensions L x W x H (cm)	Weight (lbs.)	Weight (kg)	Focusing	Modulation Control	Cooling	Tube Type	Model Number	
60.96 x 12.7 dia	57.0	25.41	SOL	A	L	CC	• 8713H	X-Band
59.44 x 19.81 x 22.10	45.0	20.45	IS	A	L	CC	8762H	
36.07 x 5.08 dia	7.5	3.41	PPM	CP	L	CC	759H	
67.3 x 25.4 x 23.4	80.0	36.3	IS	A	L	CC	18713H	
43.69 x 8.38 x 6.10	5.5	2.5	PPM	G	C	H	• 8902H	mm-wave
35.31 x 7.11 x 7.62	5.0	2.3	PPM	G	C	H	• 8906H	

Dimensions L x W x H (cm)	Weight (lbs.)	Weight (kg)	Focusing	Modulation Control	Cooling	Tube Type	Model Number	
28.45 x 5.08 x 6.1	4.0	1.82	PPM	A	C	H	• 670HA	C-Band
43.18 x 7.62 x 7.37	7.5	3.41	PPM	A	C	H	• 677H	
56.13 x 10.67 x 8.64	10.0	4.55	PPM	A	FA	H	• 662HA	
66.04 x 16.0 dia	40.0	18.18	PPM	A	FA	CC	• 8760H	X-Band
57.2 x 12.7 x 12.7	35.0	15.9	PPM	A	FA	CC	▲8796H	
53.34 x 15.49 dia	68.0	30.91	IS	A	L	CC	• 767H	
53.34 x 15.49 dia	65.0	29.55	IS	A	L	CC	• 792H	
68.58 x 17.27 dia	120.0	54.55	IS	A	L	CC	▲8723H	
55.88 x 13.97 dia	30.0	13.64	PPM	SG	L	CC	751H/103	
25.4 x 5.08 x 5.84	3.0	1.36	PPM	A	C	H	848HA*	Ku-Band
25.4 x 5.08 x 5.84	3.0	1.36	PPM	A	C	H	848HB*	
35.56 x 7.62 x 6.86	7.5	3.41	PPM	A	C	H	896H*	
54.86 x 13.21 x 7.87	11.0	5.0	PPM	A	FA	H	881H/129*	
54.86 x 13.21 x 7.87	11.0	5.0	PPM	A	FA	H	885H*	
54.86 x 12.19 x 15.75	28.0	12.73	PPM	A	FA	CC	• 876H	
76.20 x 17.78 dia	65.0	29.55	IS	A	L	CC	• 870H	
54.86 x 13.21 x 7.87	11.0	5.0	PPM	A	FA	H	885HK	
35.56 x 7.62 x 6.86	7.5	3.41	PPM	A	C	H	896HK	
43.79 x 8.38 x 6.17	5.0	2.3	PPM	G	C	H	• 8904H	Ka-Band
43.79 x 8.38 x 6.17	5.0	2.3	PPM	G	C	H	• 8908H	
45.72 x 10.16 dia	15.0	6.82	PPM	A	FA	CC	• 914H	
50.8 x 16.51 dia	55.0	25.0	IS	A	L	CC	933H	
45.72 x 10.16 dia	15.0	6.82	PPM	A	FA	CC	913H	
43.18 x 12.70 x 12.70	15.0	6.82	PPM	CP	FA	CC	944H	Q-Band
35.31 x 7.11 x 7.62	5.0	2.3	PPM	G	C	H	• 8905H	
35.31 x 7.11 x 7.62	5.0	2.27	PPM	G	C	H	8901HA	
35.56 x 7.11 x 7.62	5.5	2.5	PPM	G	C	H	• 8901H	
45.72 x 10.16 dia	16.0	7.27	PPM	A	L/FA	CC	915H	
50.8 x 16.76 x 10.16	47.0	21.36	IS	A	L	CC	▲948H	
45.72 x 10.16 x 10.16	14.0	6.36	PPM	A	C	CC	▲964H	V-Band
43.18 x 10.16 x 10.16	14.0	6.36	PPM	A	C	CC	▲962H	
50.8 x 15.24 dia	18.0	8.18	PPM	A	C	CC	▲961H	

Dimensions W x H x L (cm)	Weight (lbs.)	Weight (kg)	TWT Model Number	Type	Amplifier Model Number	
48.26 x 8.89 x 49.53	30.0	13.64	670HA	Power Amplifier	• 9040HA02	C-Band
48.26 x 13.34 x 61.0	40.0	18.2	677H	Power Amplifier	• 9210HA02	
48.26 x 53.34 x 60.96	150.0	68.18	662H	Power Amplifier	• 9240HA02	
48.26 x 8.89 x 49.53	30.0	13.64	848HA	Power Amplifier	• 9020HA04	Ku-Band
48.26 x 8.89 x 49.53	30.0	13.64	848HB	Power Amplifier	• 9025HA04	
48.26 x 13.21 x 49.53	40.0	18.18	896H	Power Amplifier	• 9075H04	
48.26 x 53.34 x 60.96	145.0	65.90	881H/129	Power Amplifier	• 9225HA04	
48.26 x 53.34 x 60.96	145.0	65.90	885H	Power Amplifier	• 9231HA04	
48.26 x 133.25 x 66.04	340.0	154.55	885H	Power Combined Subsystem	9745HA04	
48.26 x 13.21 x 49.53	40	18.18	896HK	Power Amplifier	9040HA05	
48.26 x 53.34 x 60.96	135	61.36	885HK	Power Amplifier	9200HA05	
48.26 x 17.78 x 60.96	50.0	22.73	8904H	Power Amplifier	• 8060H18	Ka-Band
48.26 x 17.78 x 60.96	50.0	22.73	8908H	Power Amplifier	• 8100H18	
48.26 x 17.78 x 60.96	50.0	22.73	8905H	Power Amplifier	• 8060H22	Q-Band
48.26 x 17.78 x 60.96	50.0	22.73	8901H	Power Amplifier	• 8030H22	
48.26 x 45.72 x 55.88	90.0	40.91	915H	Power Amplifier	• 1608H	

Table E—SPACE CW TWTs[1]

	Model Number	Frequency Range (GHz)	Power (W)	Saturated Gain (dB)	Cathode Voltage Ek (kV)	Cathode Current Ik (A)
L-Band	• 291H[2]	1.5–1.6	7.0/26.0/60.0	22/33/47	-2.63	0.014/0.027/0.057
	• 8537H	1.5–1.6	82.0	42	-3.38	0.075
S-Band	• 278H	2.0–2.1	26.0	44	-2.4	0.046
	• 8281H	2.0–2.3	300.0	35	4.9	0.170
	297H	2.557–2.633	50.0	47	-2.4	0.058
C-Band	• 8526H	3.6–4.2	16.0	49.0	-1.80	0.046
	• 8535H	3.6–4.2	26.0	50	-3.2	0.039
	• 8510H	3.7–4.2	7.5	58	-1.4	0.030
	• 8511H	3.7–4.2	9.5	58	-1.6	0.035
	• 8514H	3.7–4.2	9.0	56.0	-1.4	0.032
	• 8520H	3.7–4.2	8.2	56	-1.4	0.032
	• 8524H	3.7–4.2	10.0	46.7	-1.56	0.036
	• 8525H	3.7– 4.2	13.5	48.7	-1.76	0.044
	• 8530H	3.7–4.2	7.0	56	-1.3	0.029
	• 8531H	3.7–4.2	10.5	56	-1.5	0.036
	• 8513H	3.8–4.1	5.5	56	-1.25	0.024
X-Band	8293H*	7.175–7.455	40.0	50.5	-4.0	0.057
	298HB*	7.25–7.75	10.0	49	-2.5	0.028
Ku-Band	• 8527H	10.9–11.69	9.0	55	-3.1	0.023
	• 8804H	10.9–12.8	50	55.5	-5.8	0.051
	8516H*	11.7–12.2	16.0	55	-3.6	0.036
	8517H*	11.7–12.2	20.0	56	-4.0	0.036
	8518H*	11.7–12.2	27.0	56	-4.7	0.043
	8533H*	11.7–12.2	40.0	56	-5.8	0.055
	• 8534H	11.7–12.2	19.4	56	-3.6	0.033
	• 8804HB	11.7–12.2	55.0	56.5	-5.9	0.052
	• 8805H	11.7–12.2	41	55.5	-5.3	0.046
	• 899H[3]	11.7–12.7	200-260	45	-9.0	0.160
	• 8806H	12.2–12.7	19.4	59	-3.6	0.031
	• 8522H	12.25–12.75	12.0	52	-3.08	0.027
	• 8850H	12.25–12.75	50.0	56	-5.8	0.051
	• 8523H	12.6–12.75	30.0	57.5	-4.8	0.047
	8296H[3,4]	13.95–14.05	100.0	45	-8.1	0.056
	• 286HM	14.4–15.4	20.0	51	-4.2	0.041
	8294H[3,4]	14.52–14.68	100.0	40	-8.0	0.056
	• 874H	14.8–15.15	50.0	42	-7.0	0.065
K-Band	• 918HA	17.7–21.2	10/70	44/28	-10.0	0.065/0.030
	• 292HA	18.3–21.3	4.0	52	-4.2	0.017
	950H[2]	19.0–23.0	3.5/7.0/15/30	55	-6.75	0.05
	• 927H	19.6–21.2	25	50	-5.2	0.045
mm-wave	• 950HA	22.0–32.0	10.0	46	-6.0	0.030
	254H	29.0–31.0	2.0	42	-5.5	0.007
	251H	30.0–32.0	3.0	43	-5.4	0.012
	▲990H	59.0–63.0	15.0	40	-15.1	0.022

Table F—SPACE CW TWTAs

	Amplifier Model Number	Frequency Range (GHz)	Power Output (W)	Saturated Gain (dB)	Input Voltage (Vdc)	Dimensions L x W x H (inches)
L-Band	• 1673H	1.5–1.6	82.0	42	27-43	14.1 x 3.3 x 4.5
S-Band	• 1266H	2.0–2.1	26.0	44	22-42	13.7 x 3.0 x 4.0‡
	• 1272HA	2.5–2.7	50.0	47	23-42	14.0 x 6.0 x 5.0
C-Band	• 1264H	3.7–4.2	5.5	55	22-40	13.23 x 4.3 x 3.2
	• 1650H	3.7–4.2	4.5	56	25.5-42.5	13.4 x 3.95 x 4.21
	• 1651H	3.7–4.2	8.5	55	26.5-42.5	13.4 x 3.95 x 4.21
	• 1652H	3.7–4.2	16.0	63	22.5-36	10.0 x 2.0 x 3.5‡
X-Band	• 1656H	7.25–7.75	10.0	52	24-32	13.6 x 4.5 x 5.0
	• 1658HB	7.25–7.75	40.0	50.5	24-32	15.15 x 6.1 x 4.7
	• 1669H	7.27–7.4	40.0	53	26.5-42.5	14.2 x 6.5 x 5.4
Ku-Band	• 1672H/1674H	10.9–12.8	50.0	55	27-43	14.1 x 3.3 x 4.5
	• 1653H	11.7–12.2	16.0	55	22.5-36	13.0 x 3.0 x 4.0‡
	• 1654H	11.7–12.2	20.0	56	22.5-35.5	13.0 x 3.0 x 4.0‡
	• 1655H	11.7–12.2	27.0	56	22.5-35.5	13.75 x 3.0 x 4.2‡
	• 1661H	11.7–12.2	40.0	56	24-35.5	14.4 x 3.32 x 4.4‡
	1662H	11.7–12.7	200-260	50	100 or 42	17.8 x 12.0 x 5.2
	1256H	13.25–13.75	2000§	43	24-33	16.25 x 6.75 x 6.25‡
K-Band	• 1666H	19.5–21.5	25.0	50.0	22-34	15.0 x 4.0 x 3.5
mm-wave	1254H	30.0–32.0	3.0	43	28-29.6	13.25 x 4.4 x 3.4

• Data sheet available for this model
* Data sheet available for this model—listed under amplifier's model number
▲ Under development

[1] All models are PPM focused and conduction cooled unless otherwise noted
[2] Multi-power levels
[3] Radiation cooling
[4] Aperture grid

Dimensions L x W x H (inches)	Dimensions L x W x H (cm)	Weight (lbs.)	Weight (kg)	Tube Type	Model Number	
20.2 x 4.3 x 2.7	51.31 x 10.92 x 6.86	9.0	4.09	H	• 291H[2]	**L-Band**
23.6 x 3.2 x 3.98	59.99 x 8.13 x 10.1	5.75	2.6	H	• 8537H	
17.5 x 2.25 x 2.5	44.45 x 5.72 x 6.35	5.0	2.27	H	• 278H	**S-Band**
22.0 x 7.5 x 4.3	55.88 x 19.05 x 10.92	12.0	5.45	H	• 8281H	
14.0 x 2.5 x 3.2	35.56 x 6.35 x 8.13	4.2	1.91	H	297H	
15.92 x 2.87 x 3.5	40.44 x 7.29 x 8.89	2.11	0.96	H	• 8526H	**C-Band**
17.75 x 3.10 x 2.84	45.09 x 7.87 x 7.21	2.4	1.09	H	• 8535H	
14.0 x 2.0 x 2.0	35.56 x 5.08 x 5.08	1.8	0.82	H	• 8510H	
14.0 x 2.0 x 2.0	35.56 x 5.08 x 5.08	1.8	0.82	H	• 8511H	
15.5 x 2.5 x 3.25	39.37 x 6.35 x 8.25	2.0	0.91	H	• 8514H	
15.5 x 2.5 x 3.25	39.37 x 6.35 x 8.25	2.0	0.91	H	• 8520H	
15.35 x 2.87 x 3.5	38.99 x 7.29 x 8.89	1.9	0.86	H	• 8524H	
15.35 x 2.87 x 3.5	38.99 x 7.29 x 8.89	2.03	0.92	H	• 8525H	
15.5 x 2.5 x 3.25	39.37 x 6.35 x 8.25	2.0	0.91	H	• 8530H	
15.5 x 2.5 x 3.25	39.37 x 6.35 x 8.25	2.0	0.91	H	• 8531H	
12.4 x 2.04 x 2.32	31.50 x 5.18 x 5.89	1.34	0.61	H	• 8513H	
14.52 x 3.0 x 3.9	36.88 x 7.62 x 9.91	4.0	1.82	H	8293H*	**X-Band**
11.0 x 2.18 x 3.0	27.9 x 5.54 x 7.62	1.87	0.85	H	298HB*	
12.25 x 3.0 x 2.46	31.12 x 7.62 x 6.25	1.89	0.86	H	• 8527H	**Ku-Band**
14.1 x 3.0 x 2.5	35.82 x 7.62 x 6.35	2.31	1.05	H	• 8804H	
12.0 x 2.5 x 2.5	30.48 x 6.35 x 6.35	1.8	0.818	H	8516H*	
12.0 x 2.5 x 2.5	30.48 x 6.35 x 6.35	1.8	0.818	H	8517H*	
13.7 x 2.2 x 2.78	34.80 x 5.59 x 7.06	2.0	0.91	H	8518H*	
13.84 x 3.4 x 2.5	35.15 x 8.64 x 6.35	2.2	1.0	H	8533H*	
12.25 x 3.0 x 2.35	31.12 x 7.62 x 5.97	1.936	0.88	H	• 8534H	
14.5 x 3.0 x 2.5	36.83 x 7.62 x 6.35	2.7	1.23	H	• 8804HB	
13.5 x 3.5 x 2.5	34.29 x 8.89 x 6.35	2.31	1.05	H	• 8805H	
20.0 x 5.51 x 5.23	50.8 x 14.0 x 13.28	9.0	4.1	H	• 899H[3]	
12.25 x 3.0 x 2.35	31.12 x 7.62 x 5.97	1.9	0.86	H	• 8806H	
12.25 x 3.0 x 2.46	31.12 x 7.62 x 6.25	1.89	0.86	H	• 8522H	
14.1 x 3.0 x 2.5	35.82 x 7.62 x 6.35	2.31	1.05	H	• 8850H	
13.53 x 3.50 x 2.70	34.36 x 8.89 x 6.86	2.1	0.95	H	• 8523H	
21.0 x 6.0 dia	53.34 x 15.24 dia	14.6	6.64	CC	8296H[3,4]	
12.75 x 2.93 x 2.5	32.39 x 7.44 x 6.35	2.53	1.15	H	• 286HM	
21.0 x 6.0 dia	53.34 x 15.24 dia	14.6	6.64	CC	8294H[3,4]	
14.0 x 3.5 x 2.77	35.56 x 8.89 x 7.04	4.5	2.0	H	• 874H	
18.8 x 5.2 x 4.4	47.75 x 13.21 x 11.18	7.0	3.18	H	• 918HA	**K-Band**
13.35 x 3.05 x 2.73	33.91 x 7.74 x 6.93	1.75	0.79	H	• 292HA	
13.5 x 3.0 x 3.0	34.29 x 7.62 x 7.62	2.0	0.91	H	950H[2]	
16.0 x 4.0 x 4.0	40.64 x 10.16 x 10.16	3.0	1.36	H	• 927H	
13.5 x 3.0 x 3.0	34.29 x 7.62 x 7.62	2.0	0.91	H	• 950HA	**mm-wave**
10.0 x 1.9 x 1.9	24.50 x 4.83 x 4.83	1.2	0.55	H	254H	
12.4 x 2.5 x 2.0	31.50 x 6.35 x 5.08	1.8	0.82	H	251H	
14.0 x 3.0 x 3.0	35.56 x 7.62 x 7.62	5.0	2.27	H	▲990H	

Dimensions L x W x H (cm)	Weight (lbs.)	Weight (kg)	TWT Model Number**	Amplifier Model Number	
35.9 x 8.4 x 11.4	5.3	2.4	8537H	• 1673H	**L-Band**
34.93 x 7.62 x 10.16	7.5	3.41	278H	• 1266H	**S-Band**
35.56 x 15.24 x 12.70	9.0	4.09	297H	• 1272HA	
33.60 x 10.92 x 8.13	3.0	1.36	230H	• 1264H	**C-Band**
34.04 x 10.03 x 10.7	3.1	1.41	244H	• 1650H	
34.04 x 10.03 x 10.7	3.3	1.5	249H	• 1651H	
25.4 x 5.08 x 8.89	4.5	2.05	8518H	• 1652H	
34.54 x 11.43 x 12.7	7.0	3.18	298HB	• 1656H	**X-Band**
38.48 x 15.49 x 11.94	12.51	5.69	8293H	• 1658HB	
36.1 x 16.51 x 13.72	9.0	4.1	8293H	• 1669H	
35.9 x 8.4 x 11.4	7.6	3.45	8804H	• 1672H/1674H	**Ku-Band**
33.02 x 7.62 x 10.16	5.88	2.67	8516H	• 1653H	
33.02 x 7.62 x 10.16	5.85	2.66	8517H	• 1654H	
34.93 x 7.62 x 10.67	6.9	3.14	8518H	• 1655H	
36.58 x 8.43 x 11.18	7.4	3.36	8533H	• 1661H	
45.21 x 30.48 x 13.21	23.0	10.5	899HA	1662H	
41.28 x 17.15 x 15.88	30.0	13.64	853H	1256H	
38.1 x 10.16 x 8.89	10.8	4.91	927H	• 1666H	**K-Band**
33.66 x 11.18 x 8.64	5.5	2.50	251H	1254H	**mm-wave**

** Helix TWTs
§ Pulsed
‡ Power supply dimension only

Table G—HIGH-POWER MILLIMETER-WAVE AMPLIFIERS

Amplifier Model Number	Frequency Range (GHz)	Power Output (W)	Saturated Gain (dB)	Input Voltage	Dimensions L x W x H (inches)
1604H	32.0–35.0	80.0[1]	43.0	115 VAC; 400 Hz; 3 ϕ	20.0 x 15.0 x 8.0
1601H	33.0–36.0	3500.0[2]	45.0	208 VAC; 400 Hz; 3 ϕ	21.0 x 19.0 x 13.0
• 1608H	43.5–45.5	200.0	49.0	208 VAC; 60 Hz; 3 ϕ	19.0 x 18.0 x 22.0

Table H—INSTRUMENTATION AMPLIFIERS

	Amplifier Model Number	Frequency Range (GHz)	Power Output (W)	Rated Power Gain (dB)	Dimensions L x W x H (inches)	Dimensions L x W x H (cm)
L-Band	• 8010H09	1.0–2.0	10.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8020H09	1.0–2.0	20.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
L/S-Band	• 8020H10	1.4–2.4	20.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
S-Band	• 8010H01	2.0–4.0	10.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8020H01	2.0–4.0	20.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
S/C-Band	• 8010H19	2.0–8.0**	10.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8010H13	3.0–8.0	10.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
C-Band	• 8010H02	4.0–8.0	10.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8020H02	4.0–8.0	20.0	35.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8030H02	4.0–8.0	30.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8100H02	4.0–8.0	100.0*	30.0	24.0 x 16.85 x 5.25	60.96 x 42.8 x 13.34
C/X-Band	• 8010H16	3.9–11.7	10.0	30.0*	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8010H06	4.0–10.5	10.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8010H07	6.5–13.5	10.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
X-Band	• 8010H03	8.0–12.4	10.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8020H03	8.0–12.4	20.0	35.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8030H03	8.0–12.4	30.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
X/Ku-Band	• 8010H17	7.0–16.3	10.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8010H15	8.0–18.0	10.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8020H15	8.0–18.0	20.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
Ku-Band	• 8010H04	12.4–18.0	10.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8020H04	12.4–18.0	20.0	35.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
K-Band	• 8001H11	18.0–26.5	1.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8010H11	18.0–26.5	10.0	40.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
Ka-Band	• 8001H12	26.5–40.0	1.0	30.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8010H12	26.5–40.0	10.0	40.0	19.35 x 16.85 x 3.5	49.15 x 42.8 x 8.89
	• 8040H21	32.0–37.0	40.0	40.0	19.35 x 16.85 x 7.0	49.15 x 42.8 x 17.78
	• 8100H21	33.0–35.0	100.0	50.0	19.35 x 16.85 x 7.0	49.15 x 42.8 x 17.78
Q-Band	• 8010H23	33.0–50.0	10.0	37.0	19.35 x 16.85 x 7.0	49.15 x 42.8 x 17.78
	• 8060H22	42.0–45.0	60.0	50.0	19.35 x 16.85 x 7.0	49.15 x 42.8 x 17.78
	• 8030H22	42.0–46.0	20.0	40.0	19.35 x 16.85 x 5.25	49.15 x 42.8 x 13.34

Table I—KLYSTRONS

	Model Number	Frequency Range (GHz)	Power Output (kW)	Duty Cycle	Saturated Gain (dB)	Cathode Voltage Ek (kV)	Cathode Current Ik (A)	Dimensions L x W x H (inches)
X-Band	• 173H	9.2–9.4	0.1	0.33	30.0	-3.0	0.15	5.0 x 3.5 x 3.5
	8710H	9.2–9.4	0.1	0.33	40.0	-3.0	0.15	5.0 x 3.5 x 3.5
	• 8767H	10.5–11.7	0.040	CW	40.0	-2.2	0.12	6.0 x 3.9 x 5.5
Ku-Band	• 8781H	12.15–13.25	0.040	CW	40.0	-2.2	0.12	6.0 x 3.9 x 5.5
K-Band	• 929H	17.7–19.7	0.040	CW	40.0	-3.0	0.12	6.0 x 3.9 x 5.5

Table J—MULTIPACTOR

	Model Number	Frequency Range (GHz)	Duty Cycle	Cathode Voltage Ek (kV)	Cathode Current Ik (A)	Dimensions L x W x H (inches)
X-Band	• 8742H	9.0–10.2	multipactor	-0.15	0.0001	4.7 x 2.5 x 3.7

• Data sheet available for this model
[1]Peak power, 20% duty
[2]Peak power, 5% duty

Notes for Table H Only:
Each amplifier comprises a PPM-focused, metal-ceramic TWT and solid state switchmode, air cooled power supply in a 19-inch instrument case.
Options: See data sheets.
Warranty: One year regardless of operating hours.
* Slightly lower at band edges **Under development at time of publication

Dimensions L x W x H (cm)	Weight (lbs.)	Weight (kg)	TWT Model Number	Amplifier Model Number
50.8 x 38.1 x 20.32	40.0	18.18	8900H	1604H
53.34 x 48.26 x 33.02	160.0	72.73	921H	1601H
48.26 x 45.72 x 55.88	150.0	68.18	915H	• 1608H

Weight (lbs.)	Weight (kg)	STD Connectors in/out	Input Voltage (50/60 Hz)	TWT Model Number	Amplifier Model Number	
26.0	11.82	N	115/220 VAC	417H	• 8010H09	**L-Band**
26.0	11.82	N	115/220 VAC	418H	• 8020H09	
20.0	9.1	N	115/220 VAC	419H	• 8020H10	**L/S-Band**
20.0	9.1	N	115/220 VAC	564H	• 8010H01	**S-Band**
20.0	9.1	N	115/220 VAC	568H	• 8020H01	
20.0	9.1	N	115/220 VAC	8582H	• 8010H19	**S/C-Band**
20.0	9.1	N	115/220 VAC	646H	• 8010H13	
20.0	9.1	N	115/220 VAC	648H	• 8010H02	**C-Band**
20.0	9.1	N	115/220 VAC	640H	• 8020H02	
20.0	9.1	N	115/220 VAC	670HB	• 8030H02	
40.0	18.18	N	115/220 VAC	677HB	• 8100H02	
20.0	9.1	N	115/220 VAC	664H	• 8010H16	**C/X-Band**
20.0	9.1	N	115/220 VAC	648HDS	• 8010H06	
20.0	9.1	N	115/220 VAC	771HDS	• 8010H07	
20.0	9.1	N	115/220 VAC	771H	• 8010H03	**X-Band**
20.0	9.1	N	115/220 VAC	783H	• 8020H03	
20.0	9.1	N	115/220 VAC	18707H	• 8030H03	
20.0	9.1	N	115/220 VAC	785HD	• 8010H17	**X/Ku-Band**
20.0	9.1	N	115/220 VAC	846H	• 8010H15	
20.0	9.1	N	115/220 VAC	889H	• 8020H15	
20.0	9.1	N/WR-62	115/220 VAC	848H	• 8010H04	**Ku-Band**
20.0	9.1	N/WR-62	115/220 VAC	856H	• 8020H04	
20.0	9.1	WR-42	115/220 VAC	911H	• 8001H11	**K-Band**
20.0	9.1	WR-42	115/220 VAC	991H	• 8010H11	
20.0	9.1	WR-28	115/220 VAC	912H	• 8001H12	**Ka-Band**
20.0	9.1	WR-28	115/220 VAC	992H	• 8010H12	
50.0	22.73	WR-28	115/220 VAC	8902H	• 8040H21	
50.0	22.73	WR-28	115/220 VAC	8907H	• 8100H21	
50.0	22.73	WR-22	115/220 VAC	8906H	• 8010H23	**Q-Band**
50.0	22.73	WR-22	115/220 VAC	8905H	• 8060H22	
50.0	22.73	WR-22	115/220 VAC	8901H	• 8030H22	

Dimensions L x W x H (cm)	Weight (lbs.)	Weight (kg)	Focusing	Modulation Control	Cooling	Model Number	
12.7 x 8.89 x 8.89	4.5	2.05	PM	CP	L	• 173H	**X-Band**
12.7 x 8.89 x 8.89	4.5	2.05	PM	G	FA	8710H	
15.24 x 9.91 x 13.97	7.25	3.30	PM	CP	C	• 8767H	
15.24 x 9.91 x 13.97	7.25	3.30	PM	CP	C	• 8781H	**Ku-Band**
15.24 x 9.91 x 13.97	7.25	3.30	PM	CP	C	• 929H	**K-Band**

Dimensions L x W x H (cm)	Weight (lbs.)	Weight (kg)	Cooling	Model Number	
11.94 x 6.35 x 9.40	2.5	1.14	L	• 8742H	**X-Band**

CROSS INDEX MODELS

Model	Table	Bandwidth	Page
173H	I	X	8
251H	E	MMW	6
254H	E	MMW	6
278H	E	S	6
286HM	E	Ku	6
291H	E	L	6
292HA	E	K	6
297H	E	S	6
298HB	E	X	6
308H111	A	X	2
308HA	A	X	2
308HC	A	X	2
555H	A	S	2
559H	A	S	2
584H	A	S	2
587H	A	S	2
588H	A	S	2
589H	A	S	2
595H	A	S	2
605H	A	Ku	2
621H	A	C	2
622H	A	C	2
641H	A	C	2
662HA	C	C	4
670HA	C	C	4
675H	A	C	2
676H	A	C	2
677H	C	C	4
679H	A	C	2
680H	A	C	2
683H	A	C	2
687H	A	X/Ku	2
694H	A	C	2
695H	A	C	2
750H	A	X	2
751H	A	X	2
751H/103	A/C	X	2/4
756H	A	X	2
759H	B	X	4
760H	A	X	2
767H	C	X	4
781H	A	X	2
792H	C	X	4
835H	A	Ku	2
838H	A	Ku	2
848HA	C	Ku	4
848HB	C	Ku	4
854H	A	Ku	2
862H	A	Ku	2
866H	A	Ku	2
870H	C	Ku	4
874H	E	Ku	6
876H	C	Ku	4
881H/129	C	Ku	4
885H	C	Ku	4
885HK	C	Ku	4
896H	C	Ku	4
896HK	C	Ku	4
897H	A	Ku	2
899H	E	Ku	6
913H	C	Ka	4
914H	C	Ka	4
915H	C	Q	4
918HA	E	K	6
927H	E	K	6
929H	I	K	8
933H	C	Ka	4
944H	C	Q	4
948H	C	Q	4
950H	E	K	6
950HA	E	MMW	6
961H	C	V	4
962H	C	V	4
964H	C	V	4
982H	A	MMW	2
990H	E	MMW	6
1254H	F	MMW	6
1256H	F	Ku	6
1264H	F	C	6
1266H	F	S	6
1272HA	F	S	6
1601H	G		8
1604H	G		8
1608H	D/G	Q	4/8
1650H	F	C	6
1651H	F	C	6
1652H	F	C	6
1653H	F	Ku	6
1654H	F	Ku	6
1655H	F	Ku	6
1656H	F	X	6
1658HB	F	X	6
1661H	F	Ku	6
1662H	F	Ku	6
1666H	F	K	6
1669H	F	X	6
1672H/1674H	F	Ku	6
1673H	F	L	6
8001H11	H	K	8
8001H12	H	Ka	8
8010H01	H	S	8
8010H02	H	C	8
8010H03	H	X	8
8010H04	H	Ku	8
8010H06	H	C/X	8
8010H07	H	C/X	8
8010H09	H	L	8
8010H11	H	K	8

SYMBOLS

A = anode
AG = aperture grid
C = conduction
CP = cathode pulse
CR = conduction radiation
FA = forced air
G = high mu grid
IA = isolated anode
IS = integral solenoid
L = liquid
MA = mod anode
PM = permanent magnet
PPM = periodic-permanent magnet
SC = self-contained
SG = shadow grid
SOL = solenoid
V = vapor phase

Model	Table	Bandwidth	Page
8010H12	H	Ka	8
8010H13	H	S/C	8
8010H15	H	X/Ku	8
8010H16	H	C/X	8
8010H17	H	X/Ku	8
8010H19	H	S/C	8
8010H23	H	Q	8
8020H01	H	S	8
8020H02	H	C	8
8020H03	H	X	8
8020H04	H	Ku	8
8020H09	H	L	8
8020H10	H	L/S	8
8020H15	H	X/Ku	8
8030H02	H	C	8
8030H03	H	X	8
8030H22	D/H	Q	4/8
8040H21	H	Ka	8
8060H18	D	Ka	4
8060H22	D/H	Q	4/8
8100H02	H	C	8
8100H18	D	Ka	4
8100H21	H	Ka	8
8281H	E	S	6
8293H	E	X	6
8294H	E	Ku	6
8296H	E	Ku	6
8510H	E	C	6
8511H	E	C	6
8513H	E	C	6
8514H	E	C	6
8516H	E	Ku	6
8517H	E	Ku	6
8518H	E	Ku	6
8520H	E	C	6
8522H	E	Ku	6
8523H	E	Ku	6
8524H	E	C	6
8525H	E	C	6
8526H	E	C	6
8527H	E	Ku	6
8529H	A	S	2
8530H	E	C	6
8531H	E	C	6
8533H	E	Ku	6
8534H	E	Ku	6
8535H	E	C	6
8537H	E	L	6
8708H	A	X	2
8709H	A	X	2
8710H	I	X	8
8713H	B	X	4
8716H	A	X	2
8718H	A	X	2
8723H	C	X	4
8725H	A	X	2
8726H	A	X	2
8741H	A	X	2
8742H	J	X	8
8743H	A	X	2
8753H	A	X	2
8760H	C	X	4
8762H	B	X	4
8767H	I	X	8
8768H	A	X	2
8777H	A	X	2
8781H	I	Ku	8
8784H	A	X	2
8790H	A	X	2
8791H	A	X	2
8796H	C	X	4
8804H	E	Ku	6
8804HB	E	Ku	6
8805H	E	Ku	6
8806H	E	Ku	6
8813H	A	Ku	2
8815H	A	Ku	2
8840H	A	Ku	2
8850H	E	Ku	6
8900H	A	MMW	2
8901H	C	Q	4
8901HA	C	Q	4
8902H	B	MMW	4
8904H	C	Ka	4
8905H	C	Q	4
8906H	B	MMW	4
8907H	A	MMW	2
8908H	C	Ka	4
8910H	A	MMW	2
9020HA04	D	Ku	4
9025HA04	D	Ku	4
9040HA02	D	C	4
9040HA05	D	Ku	4
9075H04	D	Ku	4
9200HA05	D	Ku	4
9210HA02	D	C	4
9225HA04	D	Ku	4
9231HA04	D	Ku	4
9240HA02	D	C	4
9745HA04	D	Ku	4
18703H	A	X	2
18704H	A	X	2
18705H	A	X	2
18711H	A	X	2
18712H	A	X	2
18713H	B	X	4
18714H	A	X/Ku	2
18714HS	A	X/Ku	2

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