

## Horizontal Polarization AZIMUTH PATTERN

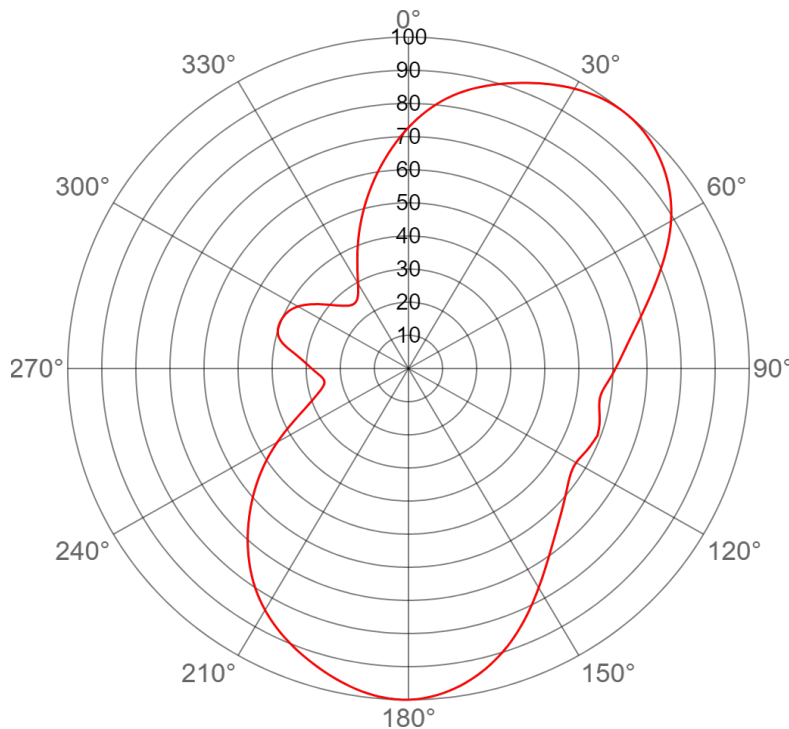


Exhibit No.

Date **4 May 2018**

Call Letters **K39AA**

Channel **35**

Antenna Type **TLP-16TLP**

Location **Ninilchick AK**

Customer

Gain **2.0 (3.01 dB)**
**Calculated**

Drawing # **TLP-J**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	0.728	36	0.996	72	0.752	108	0.588	144	0.701	180	1.000	216	0.780	252	0.292	288	0.402	324	0.257
1	0.741	37	0.998	73	0.741	109	0.589	145	0.711	181	1.000	217	0.768	253	0.284	289	0.402	325	0.260
2	0.755	38	0.999	74	0.731	110	0.591	146	0.721	182	0.999	218	0.756	254	0.277	290	0.402	326	0.265
3	0.767	39	1.000	75	0.720	111	0.588	147	0.732	183	0.998	219	0.744	255	0.271	291	0.401	327	0.271
4	0.780	40	1.000	76	0.710	112	0.586	148	0.742	184	0.996	220	0.731	256	0.265	292	0.401	328	0.279
5	0.792	41	0.999	77	0.700	113	0.584	149	0.753	185	0.994	221	0.718	257	0.260	293	0.399	329	0.287
6	0.803	42	0.998	78	0.691	114	0.582	150	0.764	186	0.991	222	0.705	258	0.256	294	0.397	330	0.296
7	0.814	43	0.997	79	0.682	115	0.580	151	0.776	187	0.988	223	0.692	259	0.252	295	0.395	331	0.307
8	0.825	44	0.994	80	0.673	116	0.577	152	0.787	188	0.984	224	0.678	260	0.250	296	0.392	332	0.318
9	0.834	45	0.991	81	0.665	117	0.574	153	0.799	189	0.980	225	0.664	261	0.250	297	0.389	333	0.330
10	0.844	46	0.988	82	0.657	118	0.572	154	0.810	190	0.975	226	0.650	262	0.251	298	0.385	334	0.342
11	0.852	47	0.984	83	0.650	119	0.570	155	0.822	191	0.970	227	0.637	263	0.252	299	0.380	335	0.355
12	0.861	48	0.979	84	0.643	120	0.568	156	0.834	192	0.965	228	0.623	264	0.255	300	0.374	336	0.369
13	0.869	49	0.974	85	0.637	121	0.568	157	0.845	193	0.960	229	0.608	265	0.259	301	0.368	337	0.383
14	0.876	50	0.969	86	0.630	122	0.569	158	0.856	194	0.954	230	0.594	266	0.263	302	0.361	338	0.397
15	0.883	51	0.963	87	0.624	123	0.571	159	0.867	195	0.948	231	0.580	267	0.268	303	0.354	339	0.412
16	0.890	52	0.957	88	0.619	124	0.573	160	0.878	196	0.942	232	0.566	268	0.273	304	0.346	340	0.427
17	0.897	53	0.950	89	0.613	125	0.577	161	0.888	197	0.936	233	0.551	269	0.279	305	0.338	341	0.442
18	0.904	54	0.943	90	0.608	126	0.581	162	0.898	198	0.930	234	0.536	270	0.284	306	0.330	342	0.457
19	0.911	55	0.935	91	0.602	127	0.585	163	0.908	199	0.924	235	0.521	271	0.290	307	0.322	343	0.472
20	0.917	56	0.927	92	0.597	128	0.590	164	0.917	200	0.918	236	0.506	272	0.295	308	0.314	344	0.487
21	0.923	57	0.919	93	0.592	129	0.595	165	0.926	201	0.911	237	0.491	273	0.301	309	0.306	345	0.502
22	0.930	58	0.910	94	0.586	130	0.601	166	0.934	202	0.905	238	0.475	274	0.308	310	0.299	346	0.518
23	0.936	59	0.900	95	0.581	131	0.606	167	0.942	203	0.898	239	0.460	275	0.315	311	0.291	347	0.533
24	0.942	60	0.890	96	0.576	132	0.612	168	0.950	204	0.890	240	0.444	276	0.323	312	0.285	348	0.548
25	0.948	61	0.879	97	0.573	133	0.618	169	0.957	205	0.883	241	0.428	277	0.331	313	0.278	349	0.564
26	0.954	62	0.868	98	0.570	134	0.624	170	0.964	206	0.875	242	0.413	278	0.340	314	0.273	350	0.579
27	0.960	63	0.857	99	0.569	135	0.630	171	0.970	207	0.868	243	0.397	279	0.351	315	0.268	351	0.594
28	0.965	64	0.845	100	0.569	136	0.637	172	0.975	208	0.859	244	0.382	280	0.361	316	0.263	352	0.609
29	0.970	65	0.834	101	0.570	137	0.644	173	0.981	209	0.851	245	0.368	281	0.371	317	0.259	353	0.625
30	0.975	66	0.822	102	0.572	138	0.651	174	0.985	210	0.842	246	0.355	282	0.380	318	0.256	354	0.640
31	0.980	67	0.810	103	0.575	139	0.658	175	0.989	211	0.833	247	0.342	283	0.387	319	0.254	355	0.655
32	0.984	68	0.798	104	0.578	140	0.666	176	0.993	212	0.823	248	0.330	284	0.392	320	0.253	356	0.670
33	0.987	69	0.786	105	0.581	141	0.674	177	0.995	213	0.813	249	0.319	285	0.396	321	0.252	357	0.685
34	0.991	70	0.775	106	0.583	142	0.683	178	0.997	214	0.803	250	0.309	286	0.399	322	0.253	358	0.699
35	0.994	71	0.763	107	0.586	143	0.692	179	0.999	215	0.792	251	0.300	287	0.401	323	0.254	359	0.713

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## ELEVATION PATTERN

Exhibit No.

Date

**4 May 2018**

Call Letters

**K39AA**

Channel

**35**

Antenna Type

**TLP-16TLP**

Location

**Ninilchick AK**

Customer

RMS Gain at Main Lobe

**15.5 (11.90 dB)**

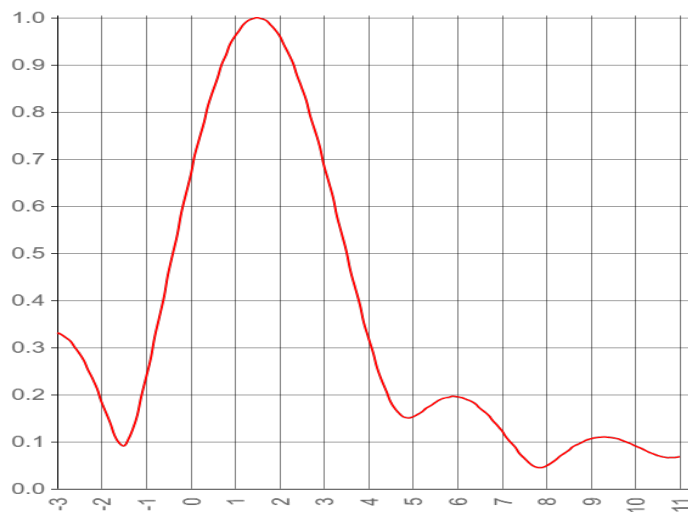
Beam Tilt

**1.5 Degrees**

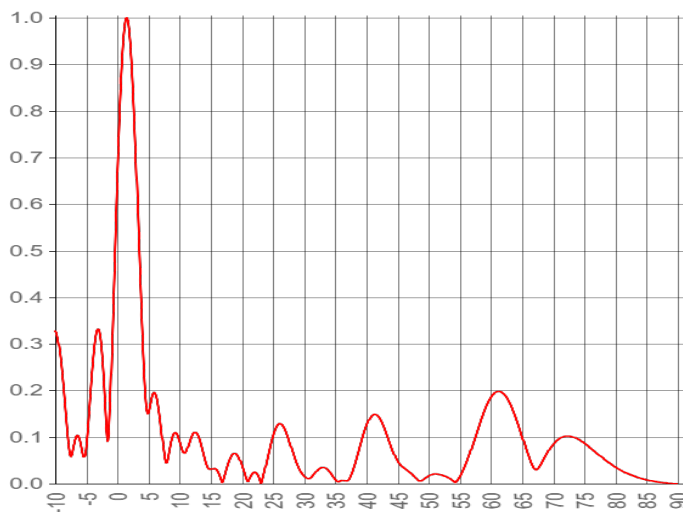
RMS Gain at Horizontal

**6.9 (8.40 dB)**

Drawing #

**16L155150**
**Calculated**


Degrees below horizontal



Degrees below horizontal

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10	0.329	10	0.091	30	0.016	50	0.017	70	0.085
-9	0.255	11	0.068	31	0.012	51	0.021	71	0.097
-8	0.104	12	0.104	32	0.027	52	0.019	72	0.102
-7	0.081	13	0.102	33	0.035	53	0.014	73	0.101
-6	0.094	14	0.056	34	0.027	54	0.005	74	0.095
-5	0.082	15	0.031	35	0.009	55	0.015	75	0.087
-4	0.253	16	0.028	36	0.007	56	0.044	76	0.076
-3	0.331	17	0.008	37	0.007	57	0.081	77	0.065
-2	0.187	18	0.050	38	0.036	58	0.121	78	0.055
-1	0.235	19	0.065	39	0.082	59	0.158	79	0.045
0	0.668	20	0.039	40	0.124	60	0.185	80	0.036
1	0.960	21	0.005	41	0.147	61	0.198	81	0.028
2	0.961	22	0.025	42	0.143	62	0.193	82	0.021
3	0.690	23	0.004	43	0.115	63	0.173	83	0.016
4	0.320	24	0.049	44	0.078	64	0.141	84	0.012
5	0.152	25	0.103	45	0.048	65	0.101	85	0.008
6	0.195	26	0.129	46	0.034	66	0.061	86	0.006
7	0.122	27	0.114	47	0.024	67	0.032	87	0.003
8	0.048	28	0.074	48	0.012	68	0.041	88	0.002
9	0.106	29	0.037	49	0.008	69	0.065	89	0.001

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## Mechanicals

Exhibit No.

Date **4 May 2018**

Call Letters **K39AA**

Channel **35**

Antenna Type **TLP-16TLP**

Location **Ninilchick AK**

Customer

## Preliminary Specifications

### Side Mounted

#### Mechanical Specification without ice TIA-222-G

Basic Wind Speed 90 mph

Structure Class II

Exposure Category C

Topography Category 1

### Mechanical Specifications

Height less Lightning Protector	(H2)	29.7 ft (9.0 m)
Center of Radiation	(H3)	14.8 ft (4.5 m)
Effective Projected Area	(EPA)s	57.0 ft <sup>2</sup> (17.4 m <sup>2</sup> )
Weight	W	268.5 lbs



Dielectric's TLP Series antenna is designed for single channel, low wind load, horizontal, circular or elliptically polarized operation.

## Dielectric Advantages

- Operating Range: 6 MHz band within 470-860 MHz
- Pattern optimization available – factory test using location and orientation on supporting tower to minimize tower effects. Might require custom mounts.
- Suitable for analog or DTV applications
- DTV ERPs up to 1300 kW
- 17 different standard azimuth patterns available
- 4 standard elevation gains available
- Available horizontally, elliptically or circularly polarized
- Low VSWR, < 1.1:1 over operating channel
- Slot covers provide ice protection
- Standard mounting brackets included
- 1-5/8" EIA input standard, 3-1/8" EIA available
- Custom azimuth and elevation patterns available

## Specifications

### Maximum Input Power Rating

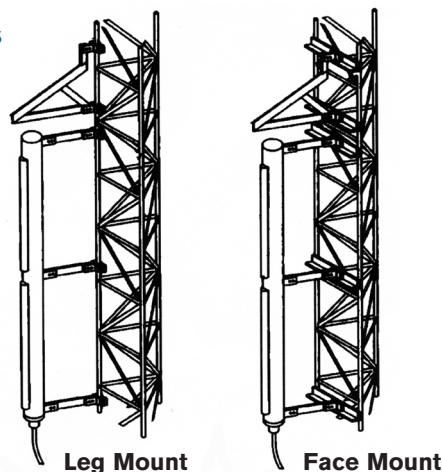
DTV (Average) / NTSC (peak)\*

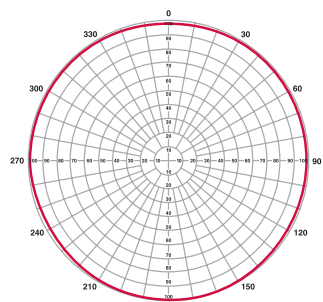
Antenna	Standard		Custom		Special	
	Ch. 14	Ch. 69	Ch. 14	Ch. 69	Ch. 14	Ch. 69
TLP-8	5.0/8.6	5.0/6.4	—	—	—	—
TLP-16	4.0/6.1	3.0/4.5	8.0/13.0	7.0/9.7	8.0/24.0	8.0/24.0
TLP-24	4.9/7.0	3.7/5.3	8.8/15.0	7.9/11.3	11.6/35.0	11.6/24.0
TLP-32	7.0/10.0	5.2/7.5	12.5/21.4	11.2/16.1	11.6/35.0	11.6/24.0

Input: 1-5/8" EIA on Standard, 3-1/8" EIA on Custom and Special

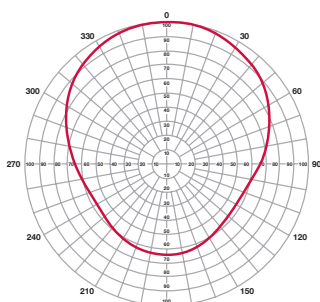
\*NTSC: Peak Sync + 10% aural

## Mounting Options

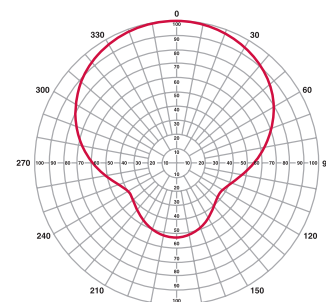




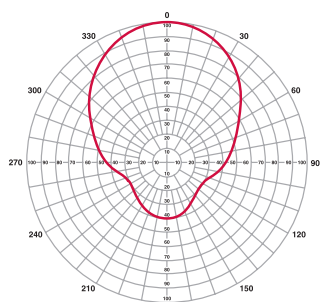
**TLP-A**  
Azimuth Gain=1.0



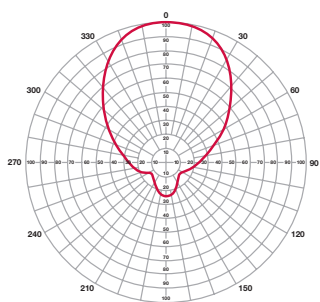
**TLP-B**  
Azimuth Gain=1.7



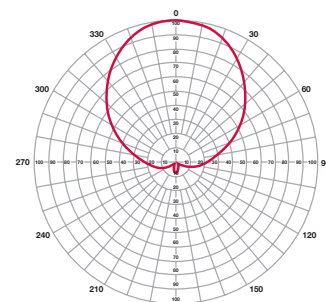
**TLP-C**  
Azimuth Gain=2.1



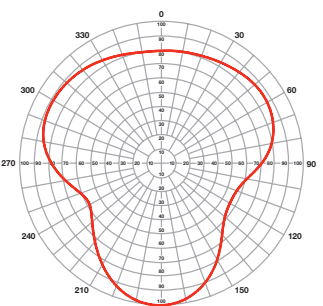
**TLP-D**  
Azimuth Gain=2.9



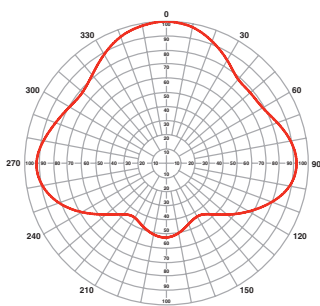
**TLP-E**  
Azimuth Gain=3.9



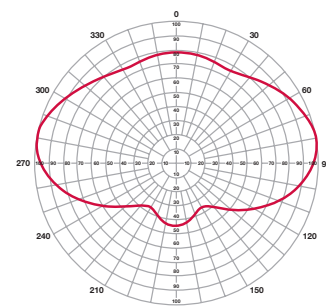
**TLP-F**  
Azimuth Gain=3.6



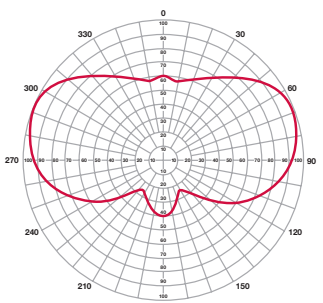
**TLP-G**  
Azimuth Gain=1.6



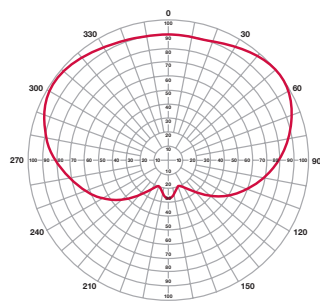
**TLP-H**  
Azimuth Gain=1.7



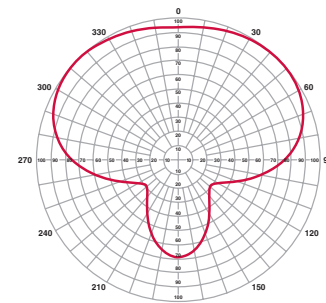
**TLP-I**  
Azimuth Gain=1.8



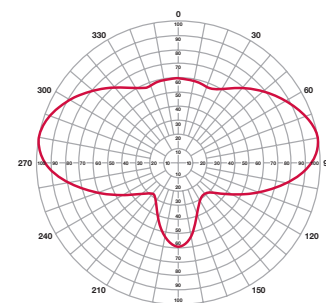
**TLP-J**  
Azimuth Gain=2.0



**TLP-M**  
Azimuth Gain=1.9

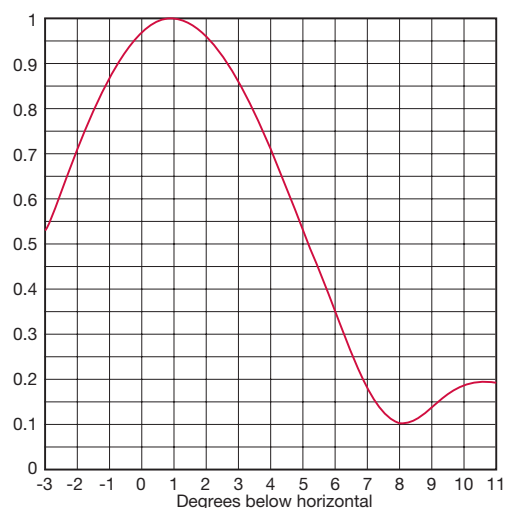


**TLP-N**  
Azimuth Gain=1.7

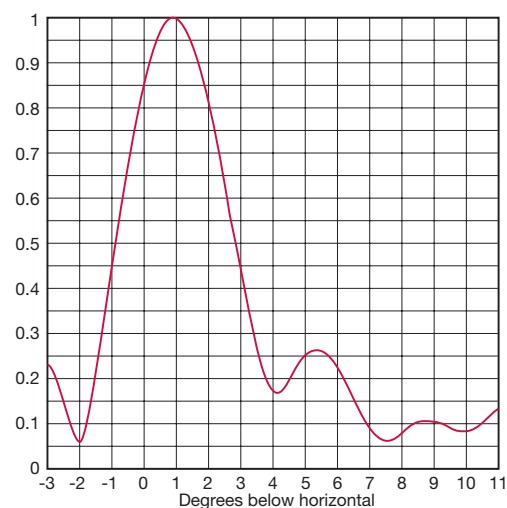


**TLP-O**  
Azimuth Gain=2.2

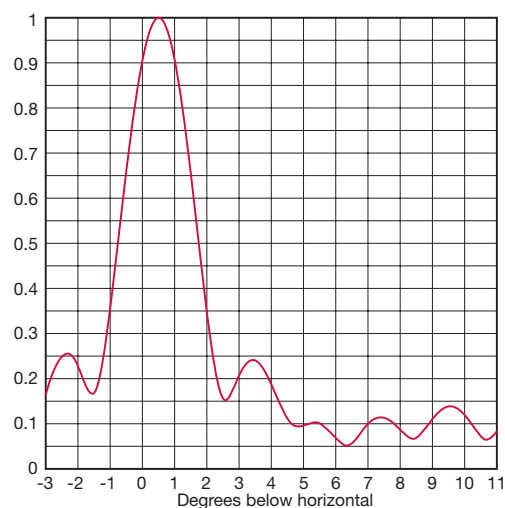
# Elevation Patterns, TLP UHF Antenna



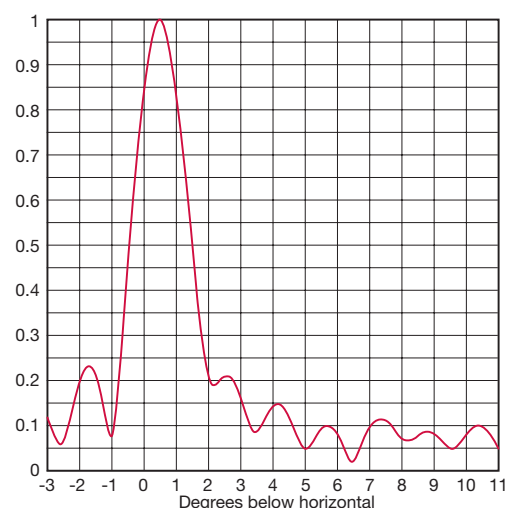
**TLP-8**



**TLP-16**



**TLP-24**



**TLP-32**

Custom beam tilts available to meet your specific requirements.  
 Please contact Dielectric for more information.



## Antenna Specifications, TLP UHF Antenna

The tables reflect minimum values for 860 MHz and maximum for 470 MHz. For other frequencies the height (H), weight (W) and windload (WL) can be interpolated using formula:  $H, W, \text{ or } WL \text{ at } f = \text{MAX} - (f-860) * (\text{MIN}-\text{MAX})/390$

Center of radiation is one half of the Height:  $C/R = 0.5 * H$

- For circular polarization divide Peak gain by 2 (subtract 3dB)
- For elliptical polarization contact factory
- Peak gain is relative to half wave dipole

Antenna Type	Azimuth Pattern	Peak Power Gain Ratio	Gain (dBd)	Height (ft)	Weight (lb)	Windload <sup>1</sup> (lb)
TLP-8A	TLP-A	8.0	9.0	10.5 to 17.8	65 to 105	190 to 320
TLP-8B	TLP-B	13.6	11.3		45 to 70	180 to 300
TLP-8C	TLP-C	16.8	12.3		50 to 85	310 to 760
TLP-8D	TLP-D	23.2	13.7		50 to 85	300 to 710
TLP-8E	TLP-E	31.2	14.9		65 to 135	370 to 910
TLP-8F	TLP-F	28.8	14.6		60 to 110	260 to 530
TLP-8G	TLP-G	12.8	11.1		55 to 100	180 to 310
TLP-8H	TLP-H	13.6	11.3		50 to 85	260 to 530
TLP-8I	TLP-I	14.4	11.6		50 to 85	260 to 530
TLP-8J	TLP-J	16.0	12.0		50 to 95	380 to 980
TLP-8M	TLP-M	15.2	11.8	22.2 to 37.5	50 to 85	260 to 610
TLP-8N	TLP-N	13.6	11.3		50 to 85	210 to 580
TLP-8O	TLP-O	17.6	12.4		55 to 100	370 to 630
TLP-16A	TLP-A	16.0	12.0		150 to 230	435 to 700
TLP-16B	TLP-B	27.2	14.3		110 to 160	410 to 650
TLP-16C	TLP-C	33.6	15.3		120 to 190	680 to 1580
TLP-16D	TLP-D	46.4	16.7		120 to 190	660 to 1480
TLP-16E	TLP-E	62.4	18.0		150 to 290	800 to 1880
TLP-16F	TLP-F	57.6	17.6		140 to 240	580 to 1120
TLP-16G	TLP-G	25.6	14.1		130 to 220	420 to 680
TLP-16H	TLP-H	27.2	14.3		120 to 190	580 to 1120
TLP-16I	TLP-I	28.8	14.6	33.8 to 57.3	120 to 190	580 to 1120
TLP-16J	TLP-J	32.0	15.1		120 to 210	820 to 2020
TLP-16M	TLP-M	30.4	14.8		120 to 190	580 to 1280
TLP-16N	TLP-N	27.2	14.3		120 to 190	480 to 1220
TLP-16O	TLP-O	35.2	15.5		130 to 220	800 to 1320
TLP-24A	TLP-A	23.0	13.6		225 to 345	675 to 1070
TLP-24B	TLP-B	39.1	15.9		170 to 245	635 to 1000
TLP-24C	TLP-C	48.3	16.8		185 to 290	1040 to 2390
TLP-24D	TLP-D	66.7	18.2		185 to 290	1010 to 2240
TLP-24E	TLP-E	89.7	19.5		230 to 440	1220 to 2840
TLP-24F	TLP-F	82.8	19.2		215 to 365	890 to 1700
TLP-24G	TLP-G	36.8	15.7		200 to 335	650 to 1040
TLP-24H	TLP-H	39.1	15.9		185 to 290	890 to 1700
TLP-24I	TLP-I	41.4	16.2		185 to 290	890 to 1700
TLP-24J	TLP-J	46.0	16.6	45.5 to 77.1	185 to 320	1250 to 3050
TLP-24M	TLP-M	43.7	16.4		185 to 290	890 to 1940
TLP-24N	TLP-N	39.1	15.9		185 to 290	740 to 1850
TLP-24O	TLP-O	50.6	17.0		200 to 235	1220 to 2000
TLP-32A	TLP-A	31.0	14.9		300 to 460	930 to 1450
TLP-32B	TLP-B	52.7	17.2		220 to 480	760 to 1200
TLP-32C	TLP-C	65.1	18.1		240 to 380	1360 to 3160
TLP-32D	TLP-D	89.9	19.5		240 to 380	1320 to 2960
TLP-32E	TLP-E	120.9	20.8		300 to 580	1600 to 3760
TLP-32F	TLP-F	111.6	20.5		280 to 480	1160 to 2240
TLP-32G	TLP-G	49.6	17.0		260 to 440	840 to 1360
TLP-32H	TLP-H	52.7	17.2		240 to 380	1160 to 2240
TLP-32I	TLP-I	55.8	17.5		240 to 380	1160 to 2240
TLP-32J	TLP-J	62.0	17.9		240 to 420	1640 to 4040
TLP-32M	TLP-M	58.9	17.7		240 to 380	1160 to 2560
TLP-32N	TLP-N	52.7	17.2		240 to 380	690 to 2440
TLP-32O	TLP-O	68.2	18.3		260 to 440	1600 to 2640

<sup>1</sup> Windload at 50/33 lb/ft<sup>2</sup> per EIA RS-222C