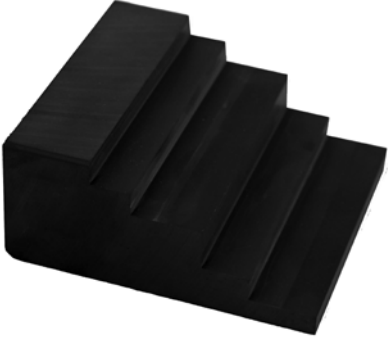



# TL-XXXX

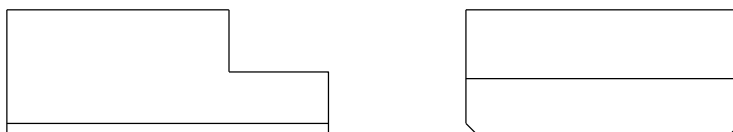
Step Loads	Tongue Loads
	

High Power Step and Tongue loads come in both low and high power versions. The low power versions use an iron loaded lossy material and the high power versions are made from silicon carbide. Because of the small size of these parts, it is difficult for these to operate at very high powers unless high operating temperatures within the assembly can be realized. Typical power levels of silicon carbide Step or Tongue loads range from 2 to 100 watts depending on the waveguide size, mounting technique and cooling system employed by user.

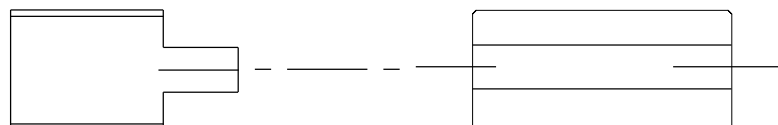
They are typically used for low bandwidth applications where good performance is required over narrow frequency bands. Typical performance for a single step or tongue load is 1.10:1 over 10% waveguide band. Increased performance can be obtained by adding additional steps, however this causes the length to increase as well. These parts are used when space is a concern and the system has a defined frequency band.

Thorndike designs and manufactures hundreds of different Step loads ranging in frequency from 1 - 40 GHz, covering waveguide sizes from WR-650 to WR-22.

### STEP LOAD



### TONGUE LOAD



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**TL-XXXX Tongue Load/Step Load-Low Power**

WR-	P/N	FREQ	VSWR	LENGTH
340	TL005	2.2-2.6	1.10	2.25
284	TL018	2.7-3.1	1.10	2.40
284	TL020	2.7-2.9	1.10	2.40
284	TL022HH	2.9-3.1	1.10	2.5
284	TL040	2.9-3.1	1.10	2.00
284	TLD031	2.9-4.0	1.06	1.25
284	TL041	2.9-3.1	1.10	1.92
229	TL060	3.2-3.5	1.10	1.35
229	TL061	4.25-4.55	1.10	1.60
229	TL064	3.4-4.2	1.10	1.68
229	TL064HH	3.4-4.2	1.20	1.25
229	TL065	3.5-4.2	1.06	1.9
229	TLD064	3.5- 5.1	1.10	0.98
229	TL063	3.4-4.4	1.10	2.50
229	TLD059	3.10-3.50	1.2	.95
187	TLD080	4.2-5.8	1.10	0.85
187	TL085	4.2-5.2	1.10	1.75
187	TL086	4.4-5.1	1.08	1.50
187	TL090	4.4-5.1	1.06	2.35
187	TL105	4.9-5.2	1.06	1.25
187	TL120	5.4-6.0	1.07	1.30
187	TL120	5.4-6.0	1.10	1.30
187	TL125	5.4-5.9	1.12	1.50
159	TL145	4.9-7.05	1.15	1.80
137	TL202	5.9-6.45	1.08	1.04
137	TL185	5.45-5.90	1.05	1.25
137	TL190M	5.9-6.5	1.08	1.25
137	TL192	5.86-6.47	1.07	1.33
137	TL192	5.9-6.5	1.05	1.25
137	TL213HP	5.85-6.45	1.06	1.00
137	TL225	7.125-7.75	1.06	0.87
137	TL200	5.9-6.50	1.08	1.00
137	TL205	5.925-6.425	1.06	.690
137	TL206	5.9-6.5	1.06	1.25
137	TL180	5.45-5.82	1.10	1.00
137	TL220	6.1-7.2	1.10	1.20
137	TL230	6.4 - 7.2	1.15	.77
137	TLD208	5.85-6.45	1.10	0.50
137	TL232	5.8-7.4	1.12	0.83
137	TL220	6.2-7.0	1.06	1.20
112	TL325	7.9-8.4	1.06	.800
112	TLD700	12.75-14.5	1.10	0.310

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**TL-XXXX Tongue Load/Step Load-Low Power**

WR-	P/N	FREQ	VSWR	LENGTH
112	TL320	7.75-8.4	1.10	.895
112	TL325B	7.9-8.4	1.10	0.80
112	TL341	8.4-9.6	1.12	1.30
112	TL342	8.5-9.6	1.10	1.26
112	TL345	8.4-9.8	1.07	0.75
112	TL300	7.1-7.75	1.10	1.00
90	TL400	8.55-10.4	1.10	1.00
90	TL442HHM	8.70-9.10	1.10	0.80
90	TL442HH	8.8-9.0	1.04	1.25
90	TL442	8.7-9.2	1.05	1.50
90	TL442	8.7-10.2	1.10	0.65
90	TL435	8.5-9.6	1.10	.572
90	TL430	9.4-10.7	1.12	.800
90	TL422	9.325-9.425	1.10	0.585
90	TL422	8.5 -9.6	1.15	0.585
90	TL422	8.2-12.4	1.50	0.585
90	TL405	8.6-9.6	1.10	0.63
90	TLD350	8.3-9.5	1.20	.630
90	TL395	9.0-10.5	1.05	.875
90	TL390	9.1-9.5	1.05	.60
90	TL384HH	9.4-9.9	1.10	.600
90	TL482	10.1-10.4	1.05	.60
90	TL382M	8.5-9.6	1.12	.350
90	TL382	8.5-9.6	1.10	.375
90	TL375	9.0-10.7	1.10	.50
90	TL360	8.8-9.6	1.08	.800
90	TL356	8.2-9.2	1.10	.410
90	TL421	9.34-9.80	1.06	.500
90	TLD383	8.8-9.5	1.08	.400
90	TL425	9.3 -9.5	1.065	0.800
90	TL445	10.0-10.3	1.05	0.75
90	TLD384	9.4-9.9	1.05	.380
90	TL780	10.7-11.7	1.05	.850
90	TL535B	9.9-10.3	1.05	.800
90	TL535	9.9-10.3	1.05	.800
90	TL531	9.8-10.6	1.05	.880
90	TL500	10.1-11.7	1.10	.850
90	TL490	9.5-11.0	1.10	0.75
90	TL486	9.9-10.35	1.05	.850
90	TL485B	9.9-10.3	1.05	.800
90	TL485	9.9-10.3	1.05	.800
90	TL450	9.1-9.7	1.05	.600

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**TL-XXXX Tongue Load/Step Load-Low Power**

WR-	P/N	FREQ	VSWR	LENGTH
90	TL500	10.1-11.7	1.10	.850
90	TL447HH	9.0-10.0	1.15	0.310
75	TL525	11.5-12.5	1.12	.550
75	TL545	10.5-14.5	1.15	.700
75	TL546	11.7-12.2	1.05	.550
75	TL548	12.4-13.6	1.07	.575
75	TL549	12.6-14.50	1.08	.800
75	TL580	13-14.8	1.10	.50
75	TL560	14.0-14.5	1.08	.500
75	TL527	11.7-13.3	1.10	.550
75	TL540	10.9-11.7	1.07	0.60
62	TL660	15.8- 17.1	1.06	.55
62	TL622	15-17	1.10	.275
62	TL640HH	14.75-15.25	1.08	.500
62	TL640	14.0-16.0	1.10	.400
62	TL660M	15.8 -17.1	1.06	0.75
62	TL625	13.7-15.0	1.10	.780
62	TLD620	13.0-14.5	1.07	.388
62	TL620	13.275-13.38	1.05	.800
62	TLD618B	11.7-15.3	1.25	.388
62	TL630	13.6-15.1	1.10	0.475
62	TL662	16.5-17.5	1.10	.330
62	TLD619	12.6-13.6	1.10	.380
62	TLD623	14-15.5	1.10	.340
62	TLD618	12.4-14.2	1.10	.400
62	TL661	17.0-18.5	1.10	.510
51	TL665HH	15.75-16.25	1.10	0.40
51	TL665	16-17	1.07	.427
51	TL666	17.0-18.6	1.10	.50
51	TL667	14.8-16.2	1.10	0.50
51	TL686	19.5 - 21.5	1.07	0.375
51	TL687	21-21.25	1.05	0.50
51	TL684	17.7 -20.0	1.10	0.375
42	TL695	19.9-21.7	1.10	.45
42	TL696	20 - 22	1.15	0.50
42	TL697	19.2 -21.2	1.10	0.40
42	TL690	21.0-23.0	1.07	.75
42	TL680	23-26.5	1.10	.400
34	TL851	21-24	1.10	.31
34	TL850	24.5-26.5	1.15	.45
34	TL853	20.2 -21.2	1.07	0.37
28	TL813	29.4 -31.1	1.15	0.22

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**TL-XXXX Tongue Load/Step Load-Low Power**

WR-	P/N	FREQ	VSWR	LENGTH
28	TL806	27.5-29.5	1.15	.220
28	TL805	35-36	1.10	.40
28	TL803	27.5-31.3	1.15	0.22
28	TL802	28-31	1.10	.450
28	TL801	27-31	1.15	.300
28	TL800B	30.875-31.825	1.04	.340
28	TL800	30-32.5	1.10	.275
28	TL900	37-40	1.15	.220
22	TL950	37-40	1.15	.250



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**TL-XXX Tongue Load/Step Load-High Power**

WR-	P/N	FREQ	VSWR	LENGTH
650	TL001HPC	1.25 -1.45	1.20	7.00
340	TL005HPC	2.3 - 2.4	1.10	3.25
284	TL030HPC	3.1-3.5	1.10	1.65
284	TL041HPC	2.9 -3.3	1.10	4.00
284	TL045HPC	2.7-2.9	1.10	3.00
284	TL040HPC	2.9-3.1	1.10	2.60
284	TL037HPC	2.851 - 2.861	1.15	2.50
284	TL038HPC	2.8 -2.9	1.30	2.00
284	TL035HPC	3.1-3.7	1.15	2.75
284	TL025HPC	2.85-3.15	1.50	3.25
284	TL018HHPC	2.7-3.1	1.20	2.25
284	TL010HPC	3.65-3.75	1.08	3.40
187	TL090HPC	4.4 -5.0	1.07	1.75
187	TL100HPC	4.8-6.0	1.10	2.00
187	TL089HPC	4.0 -4.5	1.10	1.90"
187	TL092HPC	4.4 -5.0	1.07	1.690
159	TL155HPC	5.85-6.5	1.10	1.25
159	TL160HPC	5.8 - 8.0	1.10	1.25
159	TL156HPC	5.7-6.0	1.10	1.50
159	TL150HPC	4.9-5.3	1.15	1.60
159	TL153HPC	5.2 -5.7	1.10	1.80
137	TL180HPC	5.45-6.5	1.10	1.75
137	TL187HPC	5.84 - 6.7	1.075	2.00
137	TL209HPC	5.85-6.45	1.15	1.40
137	TL204HPC	6.425-8.2	1.30	1.00
137	TL204HPC	5.85-6.425	1.15	1.00
137	TL203HPC	5.8-6.1	1.10	1.00
137	TL202HPC	5.85 - 7.00	1.20	1.17
137	TL200HPC	5.8 - 6.5	1.10	.850
137	TL199HPC	5.9 - 6.4	1.10	1.00
137	TL201HPC	5.85-7.00	1.08	1.40
137	TL205HPC	7.0 -7.4	1.10	1.75
137	TL181HPC	5.725 -6.725	1.15	2.2
137	TL217HPC	6.5 -8.0	1.15	1.30
137	TL183HPC	5.73-6.73	1.15	1.8
137	TL211HPC	5.35-5.45	1.14	1.00
112	TL346HPC	8.5-11.0	1.08	1.50
112	TL330HPC	7.4-7.75	1.07	0.90
112	TL326HPC	7.9-8.4	1.06	1.00
112	TL322HPC	7.5- 8.5	1.08	1.00
112	TL320HPC	7.7-8.4	1.10	.895
112	TL310HPC	7.7-8.4	1.10	.650

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**TL-XXXX** Tongue Load / Step Load - High Power

WR-	P/N	FREQ	VSWR	LENGTH
112	TL295HPC	7.05-8.9	1.15	1.00
112	TL344HPC	7.1 -8.7	1.10	1.30
112	TL345HPC	7.5 -10.0	1.08	1.50
112	TL340HPC	8.5 - 9.6	1.08	1.00
90	TL450HHPC	9.2 -10.2	1.15	1.00
90	TL456HPC	9.38 -9.44	1.06	0.625
90	TL777HPC	10.0-10.25	1.06	.60
90	TL776HPC	9.9-10.3	1.08	1.00
90	TL775HPC	10.0-10.6	1.10	1.30
90	TL500HPC	9.5-12.4	1.10	.850
90	TL458HPC	9.2-9.5	1.08	1.00
90	TL447HPC	9.0 -10.1	1.15	0.95
90	TL450HPC	9.0- 10.0	1.10	0.75
90	TL487HPC	9.7-10.7	1.10	1.24
90	TL447HHPC	9.10 -10	1.10	1.25
90	TL447HPC	9.0-10.0	1.20	0.500
90	TL444HHPC	8.4 - 9.3	1.15	1.00
90	TL436HPC	8.5-9.6	1.10	0.75
90	TL421HPC	9.2 -9.6	1.10	0.65
90	TL384HPC	9.4-9.9	1.08	.900
90	TL360HPC	8.8-9.4	1.10	0.75
90	TL455HPC	9.2-9.5	1.10	.680
90	TL371HPC	8.5 - 9.6	1.10	0.76
90	TL457HPC	9.4-10.0	1.12	.630
90	TL778HPC	9.35 -10.15	1.15	0.80
90	TL438HPC	9.0 -11.0	1.20	1.30
75	TL530HPC	10.5-12.2	1.10	.680
75	TL532HPC	10.5 -13.5	1.10	1.25
75	TL580HPC	13.75-15.0	1.10	.650
75	TL600HPC	11.6-12.3	1.10	.750
75	TL579HPC	12.75 -13.25	1.15	0.45
75	TL587HPC	12.5 -14.75	1.10	0.68
75	TL581HPC	13.75 - 14.5	1.08	0.65
75	TL533HPC	10.7 -12.75	1.10	0.76
75	TL529HPC	10.7 -12.4	1.10	.750
75	TL582HPC	13.7 - 14.5	1.15	0.45
75	TL534HPC	10.9 - 12.8	1.10	0.90
75	TL590FB-HPC	10-15	1.10	1.07
75	TL540HPC	10.9 -11.7	1.12	0.60
75	TL586HPC	12.5 -14.75	1.10	.680
62	TL618HPC	12.5 -13.5	1.15	0.75
62	TL621HPC	13.4 - 13.8	1.10	.700

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## TL-XXXX Tongue Load/Step Load-High Power

WR-	P/N	FREQ	VSWR	LENGTH
62	TL623HPC	13.75-14.5	1.10	.500
62	TL624HPC	14.0-14.5	1.06	0.650
62	TL625HPC	14.0-14.5	1.06	.650
62	TL626HPC	14.4 -15.4	1.10	0.63
62	TL650HPC	15.4-15.7	1.06	0.55
62	TL651HPC	17-18	1.10	.500
62	TL655HPC	15.0-17.0	1.07	.520
62	TL627HPC	12.5-14.75	1.15	0.90
51	TL670HPC	17.3-20.2	1.10	0.60
51	TL686HPC	20.5- 21.5	1.07	0.40
51	TL685HPC	20.2-22.0	1.10	1.00
51	TL666HPC	16.8-18.6	1.07	.55
42	TL690HPC	21-23	1.10	.50
34	TL852HPC	27.5 - 31	1.10	0.5
28	TL803HPC	29 -31	1.15	0.35
28	TL810HPC	27.5 - 29.5	1.15	0.35
28	TL823HPC	25.5 - 27.5	1.15	0.60
28	TL799HPC	27.5 -31.0	1.50	0.30
28	TL805HPC	35-36	1.10	.230
28	TL802HPC	29 - 31.5	1.20	.35
22	TL960HPC	43.5 -45.5	1.15	0.27



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