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INCH-POUND

MIL-DTL-287/3F
14 April 2009
SUPERSEDING
MIL-DTL-287/3E
4 December 1998

DETAIL SPECIFICATION SHEET

WAVEGUIDE ASSEMBLIES, FLEXIBLE, TWISTABLE, CLASS 1

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the waveguide assemblies described herein shall consist of this specification sheet and MIL-DTL-287.

REQUIREMENTS: See table I.

Part or Identifying Number (PIN): See table I.

First article approval by similarity: First article approval obtained for one waveguide assembly shall, with acquiring activity approval, enable first article approval for other waveguide assemblies as specified in table II.

Cross reference information: See table III.

Substitution data: See table IV.

AMSC N/A

FSC 5985

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TABLE I. Flexible, twistable waveguide assemblies.

Group number	PIN M287/3-1/	TE_{10} mode frequency range (GHz)	Minimum centerline bending radius (inch)		Repeated twist (degrees/ft)		Insertion loss (dB/ft)	Axial twist (degrees /ft)	Pressur-ization lb_f/in^2 gage	VSWR 2/ (max) at			
			E plane	H plane	400 cycles	$1x10^5$ cycles				12”	24”	36”	>36”
I	01-XXXX	1.12 - 1.70	24.12	48.08	5.0	1.5	0.005	10	2	1.05	1.06	1.07	1.10
	02-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	60-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
I	03-XXXX	1.70 - 2.60	12.39	25.95	7.50	2.25	0.01	15	4	1.06	1.07	1.08	“
	04-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	61-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
I	05-XXXX	2.20 - 3.30	11.14	19.64	11.0	3.3	0.015	22	5	“	“	“	“
	06-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	62-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
I	07-XXXX	2.60 - 3.95	6.88	14.38	14.5	4.5	0.02	28	15	1.08	1.09	1.10	1.12
	08-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	09-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	10-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	11-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	12-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	13-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	14-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	63-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
II	15-XXXX	3.95 - 5.85	4.94	12.04	25.0	7.5	0.05	50	30	“	“	“	“
	16-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	17-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	18-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	19-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	20-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	21-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	22-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	64-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
II	23-XXXX	5.85 - 8.20	3.88	9.25	35.0	10.5	0.08	70	“	“	“	“	“
	24-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	25-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	26-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	27-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	28-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	29-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	30-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	65-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
II	31-XXXX	7.05 - 10.0	3.57	8.38	42.5	12.75	“	85	“	1.12	1.14	1.15	1.18
	32-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	33-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	34-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	35-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	36-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	37-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	38-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	66-XXXX	“	“	“	“	“	“	“	“	“	“	“	“

See footnotes at end of table.

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TABLE I. Flexible, twistable waveguide assemblies - Continued.

Flexure (degrees/ft) $1x10^5$ cycles		Jacket material	Retention force (lb_f)	Operating temperature range	Mates with standard rigid waveguide	Flanges		
E plane	H plane			-55°C to	M85/1-	Flange 1 M3922/( )	Flange 2 M3922/( )	Material 3/
4.5	2.2	Neoprene	N/A	+100°C	017	58-007 (contact)	58-007 (contact)	CU
4.5	2.2	"	"	"	018	58-008 (contact)	58-008 (contact)	AL
4/	4/	"	"	"	017	58-007 (contact)	58-007 (contact)	CU
7.50	3.6	"	"	"	031	58-009 (contact)	58-009 (contact)	CU
7.50	3.6	"	"	"	029	58-010 (contact)	58-010 (contact)	AL
4/	4/	"	"	"	031	58-009 (contact)	58-009 (contact)	CU
9.0	5.25	"	"	"	037	58-011 (contact)	58-011 (contact)	CU
9.0	5.25	"	"	"	035	58-012 (contact)	58-012 (contact)	AL
4/	4/	"	"	"	037	58-011 (contact)	58-011 (contact)	CU
13.3	6.4	"	"	"	043	64-001 (contact)	64-001 (contact)	CU
"	"	"	"	"	041	64-002 (contact)	64-002 (contact)	AL
"	"	"	"	"	043	56-001 (cover)	56-001 (cover)	CU
"	"	"	"	"	041	56-002 (cover)	56-002 (cover)	AL
"	"	"	"	"	043	61-002 (choke)	56-001 (cover)	CU
"	"	"	"	"	041	61-001 (choke)	56-002 (cover)	AL
"	"	"	"	"	043	61-002 (choke)	61-002 (choke)	CU
"	"	"	"	"	041	61-001 (choke)	61-001 (choke)	AL
4/	4/	"	"	"	043	61-002 (choke)	56-001 (cover)	CU
18.7	7.6	"	"	"	055	63-001 (contact)	63-001 (contact)	CU
"	"	"	"	"	053	63-005 (contact)	63-005 (contact)	AL
"	"	"	"	"	055	57-002 (cover)	57-002 (cover)	CU
"	"	"	"	"	053	57-001 (cover)	57-001 (cover)	AL
"	"	"	"	"	055	62-002 (choke)	57-002 (cover)	CU
"	"	"	"	"	053	62-001 (choke)	57-001 (cover)	AL
"	"	"	"	"	055	62-002 (choke)	62-002 (choke)	CU
"	"	"	"	"	053	62-001 (choke)	62-001 (choke)	AL
4/	4/	"	"	"	055	63-001 (contact)	63-001 (contact)	CU
24.0	10.2	"	"	"	067	63-002 (contact)	63-002 (contact)	CU
"	"	"	"	"	065	63-006 (contact)	63-006 (contact)	AL
"	"	"	"	"	067	55-001 (cover)	55-001 (cover)	CU
"	"	"	"	"	065	55-002 (cover)	55-002 (cover)	AL
"	"	"	"	"	067	60-001 (choke)	55-001 (cover)	CU
"	"	"	"	"	065	60-002 (choke)	55-002 (choke)	AL
"	"	"	"	"	067	60-001 (choke)	60-001 (choke)	CU
"	"	"	"	"	065	60-002 (choke)	60-002 (choke)	AL
4/	4/	"	"	"	067	63-002 (contact)	63-002 (contact)	CU
26.1	11.1	"	"	"	073	63-003 (contact)	63-003 (contact)	CU
"	"	"	"	"	071	63-007 (contact)	63-007 (contact)	AL
"	"	"	"	"	073	53-002 (cover)	53-002 (cover)	CU
"	"	"	"	"	071	53-004 (cover)	53-004 (cover)	AL
"	"	"	"	"	073	59-007 (choke)	53-002 (cover)	CU
"	"	"	"	"	071	59-009 (choke)	53-004 (cover)	AL
"	"	"	"	"	073	59-007 (choke)	59-007 (choke)	CU
"	"	"	"	"	071	59-007 (choke)	59-009 (choke)	AL
4/	4/	"	"	"	073	63-003 (contact)	63-003 (contact)	CU

See footnotes at end of table.

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TABLE I. Flexible, twistable waveguide assemblies - Continued.

Group number	PIN M287/3-1/	TE_{10} mode frequency range (GHz)	Minimum centerline bending radius (inch)		Repeated twist (degrees/ft)		Insertion loss (dB/ft)	Axial twist (degrees /ft)	Pressur-ization lb_f/in^2 gage	VSWR 2/ (max) at			
			E plane	H plane	400 cycles	$1x10^5$ cycles				12”	24”	36”	>36”
II	39-XXXX	8.20 - 12.40	3.38	7.51	47.5	14.25	0.1	95	30	1.14	1.15	1.16	1.19
	40-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	41-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	42-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	43-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	44-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	45-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	46-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	67-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
III	47-XXXX	12.4 - 18.00	2.75	5.75	60.0	18.0	0.25	120	“	1.13	“	1.19	1.24
	48-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	49-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	50-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	51-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	52-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	53-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	68-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
III	54-XXXX	18.0 - 26.5	2.33	4.5	82.5	24.25	0.35	165	“	1.14	1.16	1.20	1.25
	55-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	56-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	57-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	58-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	59-XXXX	“	“	“	“	“	“	“	“	“	“	“	“
	69-XXXX	“	“	“	“	“	“	“	“	“	“	“	“

See footnotes at end of table.

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TABLE I. Flexible, twistable waveguide assemblies - Continued.

Flexure (degrees/ft) $1x10^5$ cycles		Jacket material	Retention force (lb_f)	Operating temperature range	Mates with standard rigid waveguide	Flanges		
E plane	H plane			-55°C to	M85/1-	Flange 1 M3922/( )	Flange 2 M3922/( )	Material 3/
27.5	12.3	Neoprene	N/A	+100°C	079	63-004 (contact)	63-004 (contact)	CU
"	"	"	"	"	077	63-008 (contact	63-008 (contact)	AL
"	"	"	"	"	079	53-001 (cover)	53-001 (cover)	CU
"	"	"	"	"	077	53-003 (cover)	53-003 (cover)	AL
"	"	"	"	"	079	59-006 (choke)	53-001 (cover)	CU
"	"	"	"	"	077	59-008 (choke)	53-003 (cover)	AL
"	"	"	100	"	079	59-006 (choke)	59-006 (choke)	CU
"	"	"	100	"	077	59-008 (choke)	59-008 (choke)	AL
4/	4/	"	N/A	"	079	63-004 (contact)	63-004 (contact)	CU
33.7	16.2	"	"	"	089	53-005 (cover)	53-005 (cover)	CU
"	"	"	"	"	090	53-006 (cover)	53-006 (cover)	AL
"	"	"	"	"	089	59-001 (choke)	53-005 (cover)	CU
"	"	"	"	"	090	59-002 (choke)	53-006 (cover)	AL
"	"	"	"	"	089	59-001 (choke)	59-001 (choke)	CU
"	"	"	"	"	090	59-002 (choke)	59-002 (choke)	AL
"	"	Plastic	"	+65°C	089	53-005 (cover)	53-005 (cover)	CU
4/	4/	Neoprene	"	+100°C	089	53-005 (cover)	53-005 (cover)	CU
45.0	22.5	"	"	"	102	54-001 (cover)	54-001 (cover)	CU
"	"	"	"	"	103	54-002 (cover)	54-002 (cover)	AL
"	"	"	"	"	102	59-003 (choke)	54-001 (cover)	CU
"	"	"	"	"	103	59-004 (choke)	54-002 (cover)	AL
"	"	"	"	"	102	59-003 (choke)	59-003 (choke)	CU
"	"	"	"	"	103	59-004 (choke)	59-004 (choke)	AL
4/	4/	"	"	"	102	54-001 (cover)	54-001 (cover)	CU

1/ The PIN shall be the number shown and a four-digit number indicating the nominal relaxed length in inches.
2/ The VSWR value for any length between the lengths specified shall be the next higher value (e.g., for a 15-inch length of M287/03-01, the VSWR would be 1.06:1).
3/ CU = copper alloy, AL = aluminum alloy.
4/ These assemblies are constructed from beryllium copper and the flexure cycle is 10^6 rather than 10^5. All other characteristics are as listed.

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TABLE II. Grouping for first article approval.

Group number	First article approved dash number	Dash numbers of first articles approved by similarity, with procuring activity approval
I	04	01, 02, 03, 05, 06, 07, 08, 09, 10, 11, 12, 13, and 14
I	61	60, 62, and 63
II	24	15 through 23 and 25 through 46
II	65	64, 66, and 67
III	47	48 through 53
III	55	54, 56 through 59
III	69	68

TABLE III. Cross reference (type designation to PIN).

Type designation	PIN M287/3- ( )
FG650AEEB	01
FG430AEEB	03
FG340AEEB	05
FG284AEEB	07
FG187AEEB	15
FG137AEEB	22
FG112AEEB	31
FG090AEEB	39
FG650AEEA	02
FG430AEEA	04
FG340AEEA	06
FG284AEEA	08
FG187AEEA	16
FG137AEEA	24
FG112AEEA	32
FG090AEEA	40
FG284ACCB	11
FG187ACCB	19
FG137ACCB	27
FG112ACCB	35
FG090ACCB	43
FG062ACCB	49

Type designation	PIN M287/3- ( )
FG042ACCB	56
FG284ACCA	12
FG187ACCA	20
FG137ACCA	28
FG112ACCA	36
FG090ACCA	44
FG062ACCA	50
FG042ACCA	57
FG284ADDB	09
FG187ADDB	17
FG137ADDB	25
FG112ADDB	33
FG090ADDB	41
FG062ADDB	47
FG042ADDB	54
FG284ADDA	10
FG187ADDA	18
FG137ADDA	26
FG112ADDA	34
FG090ADDA	42
FG062ADDA	48
FG042ADDA	55

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TABLE IV. Substitution data. 1/

Dash number	Manufacturer's code (CAGE)	Manufacturer's PIN
01	80006	AT2B650
01	06351	TL-105064
01	54647	MTP360300
02	80006	AT6B650
02	06351	TL-102065
02	54647	MTP360301
03	80006	AT2B430
03	06351	TL-94158
03	54647	MTP360302
04	80006	AT6B430
04	06351	TL-94154
04	54647	MTP360303
05	80006	AT2B340
05	54647	MTP360304
06	80006	AT6B340
06	54647	MTP360305
07	80006	AT12B284
07	06351	TL-86161
07	54647	MTP360306
08	80006	AT16B284
08	06351	TL86162
08	54647	MTP360307
09	80006	AT2B284
09	06351	TL-86164
09	54647	MTP360308
10	80006	AT6B284
10	06351	TL-86165
10	54647	MTP360309
11	80006	AT3B284
11	06351	TL-86150
11	54647	MTP360310
12	80006	AT7B284
12	06351	TL-86163
12	54647	MTP360311
13	80006	AT4B284
13	54647	MTP360312
14	80006	AT8B284
14	54647	MTP360313
15	80006	AT12B187
15	06351	TL-78173
15	54647	MTP360314
16	80006	AT16B187
16	06351	TL-78174
16	54647	MTP360315
17	80006	AT2B187
17	06351	TL-78175
17	54647	MTP360316
18	80006	AT6B187
18	06351	TL-78176
18	54647	MTP360317
19	80006	AT3B187
19	06351	TL-78167
19	54647	MTP360318
20	80006	AT7B187
20	06351	TL-78172
20	54647	MTP360319
21	80006	AT4B187
21	54647	MTP360320

Dash number	Manufacturer's code (CAGE)	Manufacturer's PIN
28	80006	AT-7B137
28	06351	TL-72315
28	54647	MTP360327
29	80006	AT4B137
29	54647	MTP360328
30	80006	AT8B137
30	54647	MTP360329
31	80006	AT12B112
31	06351	TL-68223
31	54647	MTP360330
32	80006	AT16B112
32	06351	TL-68224
32	54647	MTP360331
33	80006	AT2B112
33	06351	TL-68216
33	54647	MTP360332
34	80006	AT6B112
34	06351	TL-68205
34	54647	MTP360333
35	80006	AT3B112
35	06351	TL-68213
35	54647	MTP360334
36	80006	AT7B112
36	06351	TL-68208
36	54647	MTP360335
37	80006	AT4B112
37	54647	MTP360336
38	80006	AT8B112
38	54647	MTP360337
39	80006	AT12B090
39	06351	TL-64449
39	54647	MTP360338
40	80006	AT16B090
40	06351	TL-64450
40	54647	MTP360339
41	80006	AT2B090
41	06351	TL-64445
41	54647	MTP360340
42	80006	AT6B090
42	06351	TL-64451
42	54647	MTP360341
43	80006	AT3B090
43	06351	TL-64443
43	54647	MTP360342
44	80006	AT7B090
44	06351	TL-64444
44	54647	MTP360342
47	80006	AT2B062
47	06351	TL-57108
47	54647	MTP360346
48	80006	AT6B062
48	06351	TL-57110
48	54647	MTP360347
49	80006	AT3B062
49	06351	TL-57109
49	54647	MTP360348
50	80006	AT7B062
50	06351	TFT-57067
50	54647	MTP360349

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TABLE IV. Substitution data. 1/ - continued

Dash number	Manufacturer's code (CAGE)	Manufacturer's PIN
22	80006 54647	AT8B187 MTP360321
23 23	80006 06351 54647	AT12B137 TL-72312 MTP360322
24 24	80006 06351 54647	AT16B137 TL-72313 MTP360323
25 25	80006 06351 54647	AT2B137 TL-72316 MTP360324
26 26	80006 06351 54647	AT6B137 TL-72317 MTP360325
27 27 27	80006 06351 54647	AT3B137 TL-72314 MTP360326

Dash number	Manufacturer's code (CAGE)	Manufacturer's PIN
51 51	80006 54647	AT4B062 MTP360350
52 52	80006 54647	AT8B062 MTP360351
53	80006	AT2B062
54	54647	MTP360352
55	54647	MTP360353
56	54647	MTP360354
57	54647	MTP360355
58	54647	MTP360356
59	54647	MTP360357

1/ Assemblies covered by this specification sheet are substitutable for the manufacturer's PINs shown. This information in no way implies that the manufacturer's part is substitutable for the military part.

80006

Airtron Division
Litton Systems Incorporated
200 East Hanover Avenue
Morris Plains, NJ 07950-2442

06351

Microwave Engineering Corporation
1551 Osgood Street
North Andover, MA 01845-1012

54647

Microtech, Inc.
1425 Highland Ave.
Cheshire, CT 06410-1216
USA
http//www.microtech-inc.com

Referenced documents. This document only references MIL-DTL-287.

Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodians:
Army - CR
Navy - EC
Air Force - 85
DLA-CC

Preparing activity:
DLA - CC

(Project 5985-2009-015)

Review activities:
Army - AR, AV, MI
Navy - AS, CG, MC, OS
Air Force - 19, 99

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at http://assist.daps.dla.mil.