Microwave Tuning Elements

Knowles Microwave Tuning Elements with the self-locking, constant torque drive mechanism, require no external locking devices and permit “one hand” tuning with virtually no dynamic tuning noise which could otherwise imperil associated solid state devices under “power on” conditions. This self-locking feature and high tuning resolutions assure unparalleled control over the most critical of complex circuit tuning adjustments. In many instances, the use of Knowles Tuning Elements has halved technical tuning time.

DESCRIPTION

- Variable reactance for microwave circuits
- Available with mounting bushing and/or individual tuning rotor
- High resolution tuning
- Exceeds MIL-PRF-14409 vibration requirements

FEATURES

- Self-locking torque mechanism, no lock nuts required
- Gold and chromate finish
- Available in metallic, dielectric and resistive versions

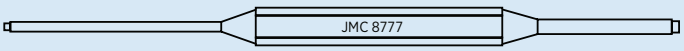
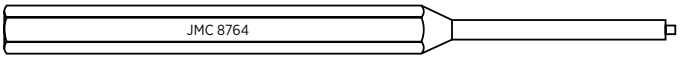
APPLICATIONS

- Combine applications
- Interdigital applications
- Impedance transformers
- Impatt and Gunn oscillators
- Microstrip and stripline circuits
- Attenuators
- Coaxial structures
- Waveguide circuitry

Contact factory for “Microwave Product Application Guide” brochure.

Tap Part Number	Thread (UNS-2)	Recommended Tap Drill
7054	.086-56	#51 (.067)
7059	.156-64	9/64 (.1406)
7060	.120-80	#36 (.1065)
7061	.190-64	#17 (.173)
7062	.234-64	7/32 (.2187)
7063	.250-64	15/64 (.2344)
7064	.094-80	#45 (.082)

RECOMMENDED TUNING TOOL

Tuning Element	Diameter	Johanson Part Number	
Microwave Type	.078/.130	8777	
Microwave Type	.130	8764	

Note: The use of a Knowles tuning tool is recommended, improper screw driver size will cause internal thread damage.

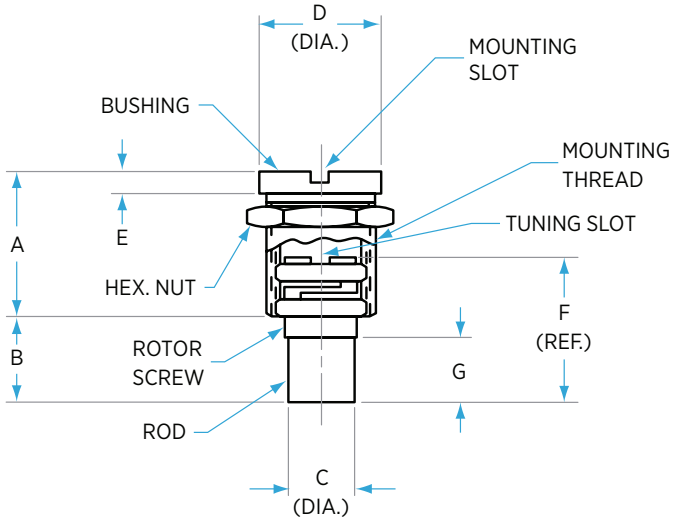
Dielectric Tuning Elements

DIELECTRIC

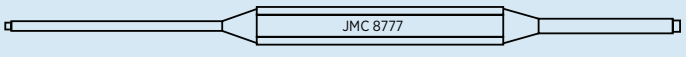
Part Number	Dimensions							Mounting			
	A	B	C	D	E	F	G	ROD MAT'L	THD. (UNS-2A)	Tuning Torque (oz. in)	Slot
6933-4	0.240	0.168	0.062	0.135	0.035	0.260	0.138	Sapphire	0.120-80	0.3 to 3.0	0.015W x 0.020DP
6933-5		0.130	0.035			0.222	0.100				
6934-3	0.359	1.205	0.152	0.267	0.145	1.309	1.175	Alumina	0.234-64	1 to 5	0.031W x 0.020DP
6934-4		1.105				1.209	1.075				
6934-5		0.905				1.009	0.875				
6934-6	0.219	0.115	0.152	0.267	0.035	0.219	0.085	Sapphire	0.234-64	1 to 5	0.031W x 0.025DP
6935-10	0.359	0.265			0.145	0.369	0.235				
6935-11	0.359	0.265	0.152	0.267	0.144	0.369	0.235	Alumina	0.234-64	1 to 5	0.031W x 0.025DP
6935-12	0.360	0.525		0.265	0.145	0.643	0.495				

RESISTIVE

Part Number	Dimensions							Mounting			
	A	B	C	D	E	F	G	ROD MAT'L	THD. (UNS-2A)	Torque (oz. in)	Slot
6950-2	0.240	0.168	0.062	0.135	0.035	0.260	0.138	Eccosorb	0.120-80	0.3 to 3.0	0.015W x 0.020DP
6950-3		0.130	0.078			0.222	0.100				
6952-1	0.360	0.250	0.152	0.265	0.145	0.368	0.220		0.234-64	1 to 5	0.031W x 0.025DP
6952-2	0.359	0.185		0.267	0.144	0.289	0.155				



RECOMMENDED TUNING TOOL

Tuning Element	Diameter	Johanson Part Number	
Dielectric & Resistive Type	.078/.130	8777	

Note: The use of a Knowles tuning tool is recommended, improper screw driver size will cause internal thread damage.

Metallic Tuning Elements

METALLIC

Part Number	Fig.	Dimensions A	B	C	D	E	F	G	Mounting THD. (UNS-2A)	Tuning Torque (oz. in)	Slot
6924-9	1	0.240	0.148	0.072	0.135	0.035	0.240	0.035 W x 0.156 A/F	0.120-80	0.3 to 3.0	0.015 W x 0.020 DP
6924-10		0.120	0.075				0.167				
6924-11		0.240									
6924-12		0.120	0.030				0.122				
6925-4		0.250	0.148	0.125	0.210	0.037	0.250	0.035 W x 0.218 A/F	0.190-64	0.4 to 4.0	0.031 W x 0.020 DP
6925-5		0.125	0.023				0.125				
6926-13		0.210	0.106	0.160	0.267	0.035	0.210	0.040 W x 0.281 A/F	0.234-64	1.0 to 5.0	0.031 W x 0.025 DP
6926-17			0.180				0.284				
6927-2		0.360	0.250		0.264	0.144	0.360				
6927-3			0.255				0.374				
6928-6		0.450	0.345		0.267	0.240	0.450				
6929-2		0552	0.450	0.125	0.210	0.042	0.552	0.035 W x 0.22 A/F	0.190-64	0.4 to 4.0	0.031 W x 0.020 DP
6965-1		0.720	0.500	0.345	0.531	0.040	0.720	0.078 W x 0.56 A/F	0375-64	1.0 to 8.0	0.031 W x 0.030 DP

LC TYPE

Part Number	Fig.	Dimensions A	B	C	D	E	F	G	Mounting THD. (UNS-2A)	Tuning Torque (oz. in)	Slot
6939-2	2	0.482	0.148	0.072	0.187	0.047	0.240	0.232	0.156-64	0.3 to 3.0	0.030 W x 0.025 DP
6940-1		0.555	0.450	0.125	0.265	0.045	0.552	0.230	0.234-64	0.4 to 4.0	
6941-1		1.230	0.350	0.160	0.280	0.047	0.450		0.250-64	1.0 to 5.0	

FIGURE 1

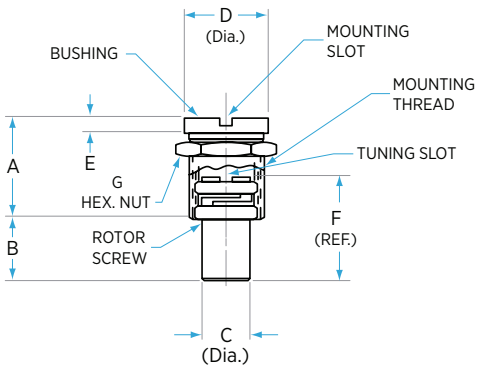
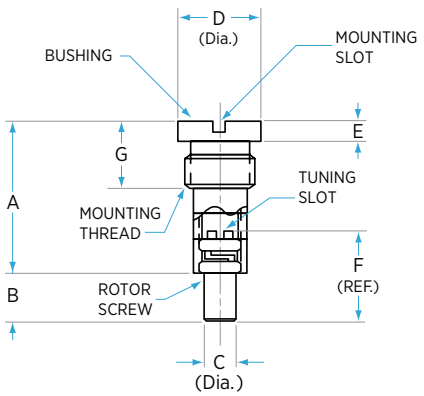
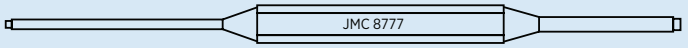


FIGURE 2



RECOMMENDED TUNING TOOL

Tuning Element	Diameter	Johanson Part Number	
Metallic & LC Type	.078/.130	8777	

Note: The use of a Knowles tuning tool is recommended, improper screw driver size will cause internal thread damage.

Tuning Screw Torque Bushings

Posi-torque Bushings are precision devices designed for applications requiring precision, low loss high resolution tuning.

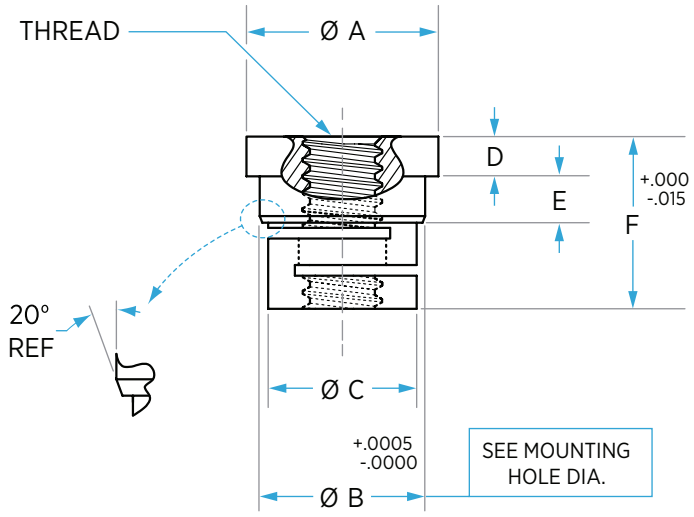
The self-locking, constant torque drive mechanism eliminates the need for locking nuts and assures stable, noise free adjustment in RF to Microwave frequencies.

Posi-Torque Bushings are universal and can be used with standard SI and US customary screws.

METAL FIGURE 1

Part No.	A	B	C	D	E	F	Thread	Mounting Hole (dia.)
LB1020-1	.145	.1247	.112	.030	.035	.130	#0(.060)-80	.1240/.1242
LB1021-1	.175	.1552	.140	.030	.035	.150	#2(.086)-56	1545/1547
LB1021-2	-	.1552	.140	-	.035	.130	#2(.086)-56	1545/1547
LB1022-1	.300	.2697	.250	.035	.090	.300	#4(.112)-40	.2690/.2692
LB1023-1	.330	.2997	.280	.035	.100	.335	#6(.138)-32	.2690/.2692
LB1023-2	-	.2997	.280	-	.100	300	#6(.138)-32	.2690/.2692
LB1024-1	.380	.3497	.330	.035	.100	.335	#10(.190)-32	.3490/3492
LB1025-1	.440	.4097	.390	.035	.100	.335	¼(.250)-28	.4090/4092
LB1025-2	-	.4097	.390	-	.100	.300	¼(.250)-28	.4090/4092
LB1026-1	.350	.3197	.300	.035	.100	.335	#8(.164)-32	.3190/3192

FIGURE 1



Tuning Rotors

METALLIC

Part Number	Fig.	Dimensions A	B	C	D	Mounting THD. (UNS-2A)	Tap P/N	ROD Material	Slot
L6316-1	1	0.165	0.075	0.072	0.018	0.120-80	7060	Brass	0.015 W x 0.090
L6316-2	2	0.223	0.155	-	0.020				
L6994-2		0.175	0.090	-		0.086-56	7054		0.015 W x 0.060
L6995-0	1	0.122	0.030	0.072		0.094-80	7064		
L6995-1		0.167	0.075						
L6995-2		0.240	0.148						
L6995-22		0.217	0.125						
L6996-1		0.250	0.148	0.125	0.010	0.156-64	7059		0.020 W x 0.120
L6996-5		0.295	0.193						
L6996-6		0.180	0.078						
L6997-0		0.554	0.450	0.160		0.190-64	7061		0.020 W x 0.145
L6997-2		0.360	0.256						
L6997-17		0.146	0.042						

LC TYPE

Part Number	Fig.	Dimensions A	B	C	D	Mounting THD. (UNS-2A)	Tap P/N	ROD Materual	Slot
6930-3	3	0.475	0.345	0.152	0.010	0.190-64	7061	ALUMINA	0.020 W x 0.145
6930-5		0.625	0.495						
6930-7		0.884	0.750						
6930-17		0.674	0.490	0.061	0.020				
6930-20		0.850	0.716	0.152	0.010				
6930-21		0.379	0.195	0.061	0.020				

FIGURE 1

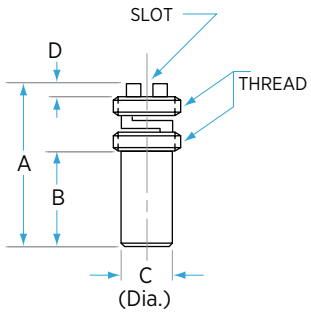


FIGURE 2

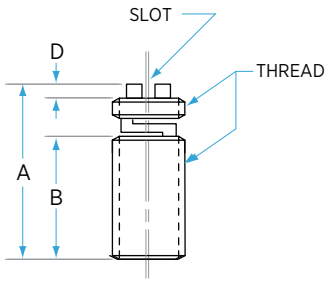
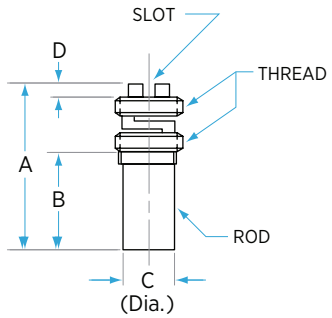


FIGURE 3



Dyna-Trim™ Dielectric Resonator Tuners

4000 SERIES

Part Number	Fig.	Dimensions A	B	C	D	E	F	G	NOM. FREQ. (GHz)
4003-1	1	0.360	0.245	0.320	0.02 W x 0.23	0.08 x 0.41	0.375-64	0.06 x 0.44	6
4005-1		0.335	0.150	0.210	0.02 W x 0.14	0.08 x 0.28	0.250-64	0.060 x 0.31	10
4007-4		0.270	0.084	0.130	0.15 W x 0.09	0.06 x 0.22	0.190-64	0.035 x 0.22	18

4010 SERIES

Part Number	Fig.	A	Rod Material	Disk Material	NOM. FREQ. (GHz)
4010-1	2	0.970	INVAR	BRASS	2
4011-1		0.750			3
4012-1		0.500			4
4012-2		0.625			
4014-1		0.250	INVAR (one-piece construction)		9

FIGURE 1

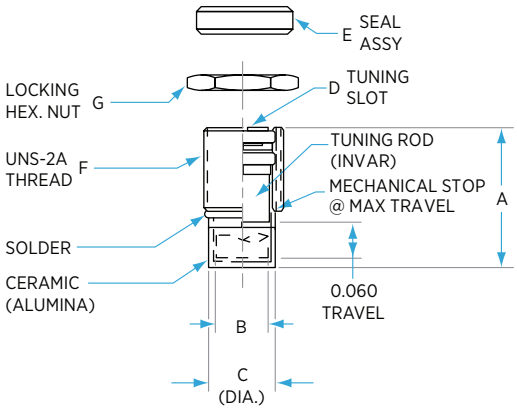


FIGURE 2