



**Performance
Testing**

SMT Spacer

**WA-SMSI, WA-SMST, WA-SMSE, WA-SMSR,
WA-SMSSR, WP-SMRA & WA-EXRV**

Checkmate.
SMT Spacer wins!

A close-up photograph of several metallic SMT spacers of various sizes and shapes. They are arranged on a dark, reflective surface that resembles a chessboard. The lighting is dramatic, highlighting the metallic texture and the precision of the components.

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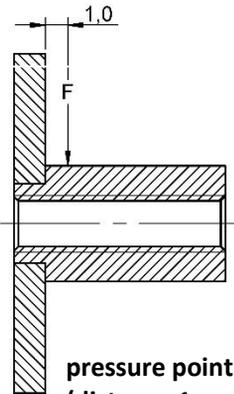
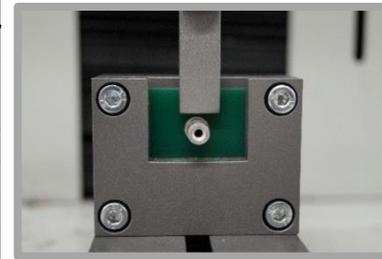
Shear Force

Distance pressure point 1mm

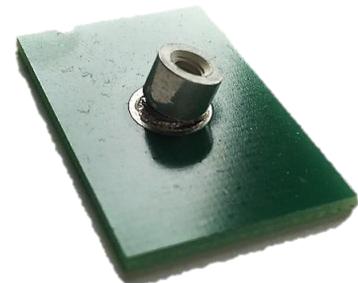


Performance Testing with lead-free solder paste

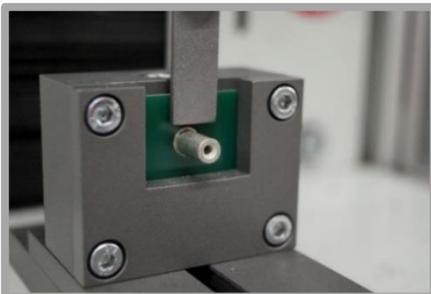
Test Sample	Shear Force (in N)					
	9771xxx360	9774xxx592	9774xxx482 9774xxx982	9774xxx360 9774xxx960	9774xxx151 9774xxx951	9774xxx243 9774xxx943
	external Thread M3	internal Thread M5	internal Thread M4 / Through Hole Ø4.5	internal Thread M3 / Through Hole Ø3.3	internal Thread M2.5 / Through Hole Ø2.7	internal Thread M2 / Through Hole Ø2.25
1	665	1222	882	529	353	174
2	563	1034	973	540	411	184
3	564	1203	850	699	449	245
4	652	1077	865	706	405	203
5	632	1028	926	645	393	188
6	762	1035	923	630	386	250
7	799	982	1000	613	431	211
8	654	974	956	520	445	173
9	686	982	944	565	413	212
10	669	994	1083	711	440	214
11	715	977	984	697	481	203
12	678	941	954	596	425	190
13	812	949	848	726	392	225
14	700	885	860	451	428	229
15	602	1122	866	763	408	196
16	702	1263	882	625	444	228
17	570	1139	1024	525	449	190
18	772	1007	1054	713	450	223
19	634	1233	1007	569	419	228
20	729	1072	1031	760	411	198
21	614	968	918	606	477	237
22	668	1260	998	721	355	203
23	604	1126	1007	471	370	247
24	631	1203	850	573	461	223
25	727	1251	914	682	473	241
26	647	1289	836	506	407	248
27	732	1108	985	716	372	253
28	804	1247	933	604	444	252
29	657	1163	978	501	387	184
30	676	1148	942	681	434	211
Min.	563	885	836	451	353	173
Max.	812	1289	1083	763	481	253
Average	677	1096	942	621	420	215



pressure point Shearforce (distance 1mm)



Test PCB for the Checking fixture Shearforce



Checking fixture Shearforce

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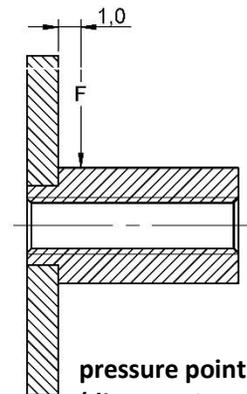
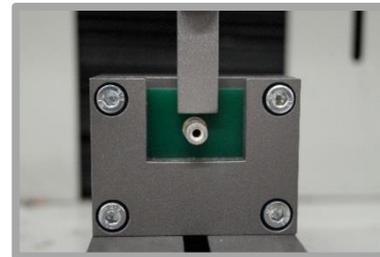
Shear Force M1.6

Distance pressure point 1mm

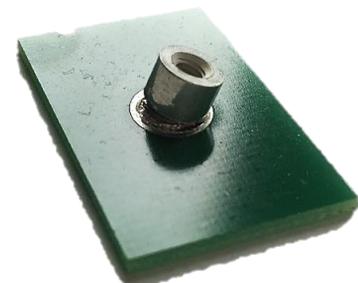


Performance Testing with lead-free solder paste

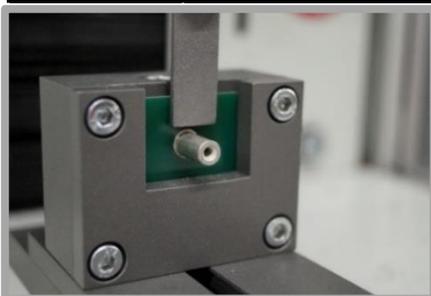
Test Sample	Shear Force (in N)		
	9774xxx633 9773xxx6334	9773xxx6332	9773xxx6330
	with internal Thread M1.6	with internal Thread M1.6 with Pin	with internal Thread M1.6 Bottom closed
1	154	217	233
2	164	191	152
3	158	180	206
4	172	174	168
5	177	196	162
6	167	182	176
7	167	199	172
8	166	216	175
9	152	164	163
10	163	181	219
11	169	177	165
12	194	195	175
13	165	188	162
14	182	207	163
15	148	154	178
16	187	171	162
17	158	153	171
18	161	185	184
19	153	212	177
20	172	153	163
21	127	175	178
22	145	175	177
23	150	161	170
24	153	158	177
25	147	183	166
26	151	228	188
27	171	199	171
28	143	151	163
29	147	175	191
30	163	176	234
Min.	127	151	152
Max.	194	228	234
Average	161	183	178



pressure point Shearforce
(distance 1mm)



Test PCB for the
Checking fixture Shearforce



Checking fixture Shearforce

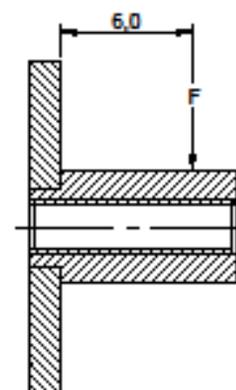
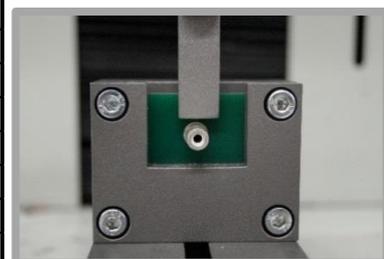
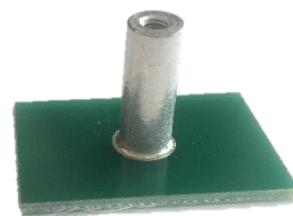
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Shear Force

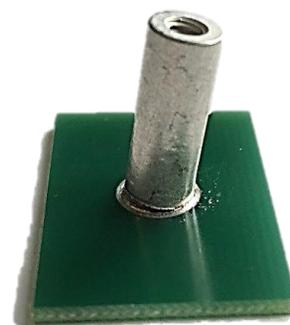
Distance pressure point 6mm



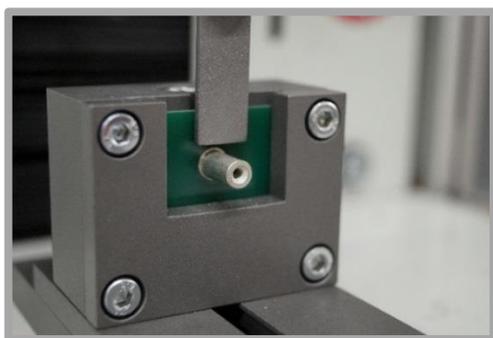
Performance Testing with lead-free solder paste					
Test Sample	Shear Force (in N)				
	9771xxx360	9774xxx482 9774xxx982	9774xxx360 9774xxx960	9774xxx151 9774xxx951	9774xxx243 9774xxx943
	external Thread M3	internal Thread M4 / Through Hole Ø4.5	internal Thread M3 / Through Hole Ø3.3	internal Thread M2.5 / Through Hole Ø2.7	internal Thread M2 / Through Hole Ø2.25
1	372	335	205	164	139
2	360	357	179	175	132
3	285	339	197	144	117
4	362	324	196	152	122
5	340	323	200	159	153
6	365	330	225	139	150
7	345	315	167	145	143
8	384	305	188	145	126
9	330	311	202	160	120
10	282	330	176	153	114
11	340	316	189	151	131
12	320	306	212	148	146
13	330	298	191	146	121
14	290	321	186	150	155
15	295	315	221	135	152
16	340	310	202	150	124
17	300	299	219	160	124
18	350	294	200	163	138
19	300	302	200	141	130
20	320	324	220	144	138
21	334	308	174	140	137
22	330	304	226	145	123
23	385	302	221	140	146
24	290	291	203	184	124
25	314	305	224	182	153
26	280	302	192	142	153
27	320	343	203	172	119
28	350	300	181	139	136
29	290	282	162	136	153
30	330	295	178	203	133
Min.	280	282	162	135	114
Max.	385	357	226	203	155
Average	328	313	198	154	135



pressure point Shearforce (distance 6mm)



Test PCB for the Checking fixture Shearforce



Checking fixture Shearforce

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Shear Force WP-SMRA (in screw direction)

90° SMD with Pins

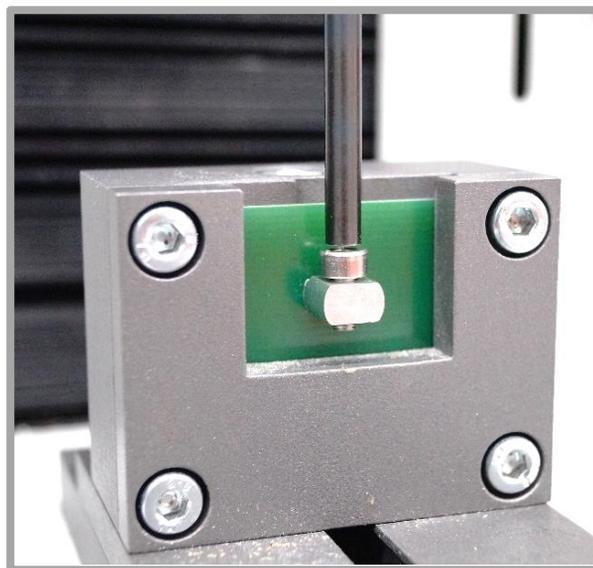


Performance Testing with lead-free solder paste	
Test Sample	Shear Force (in N)
	746631x
1	300
2	249
3	250
4	292
5	306
6	226
7	229
8	269
9	267
10	223
11	236
12	230
13	261
14	239
15	255
16	248
17	252
18	268
19	264
20	267
21	268
22	235
23	252
24	263
25	231
26	283
27	284
28	264
29	261
30	236
Min.	223
Max.	306
Average	257

Screw fixed with distances of one thread lead (0,5mm).
The Pull Strength is acting on the thread not on the part itself



Checking fixture Pull Strength



Test PCB for the
Checking fixture Pull Strength

Shear Force WP-SMRA (in screw direction)



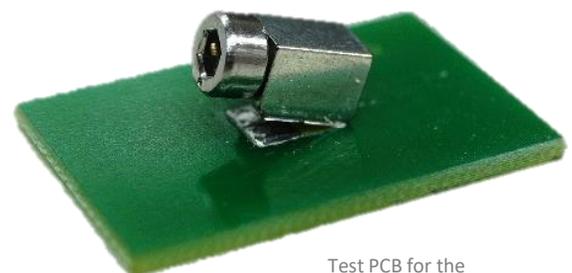
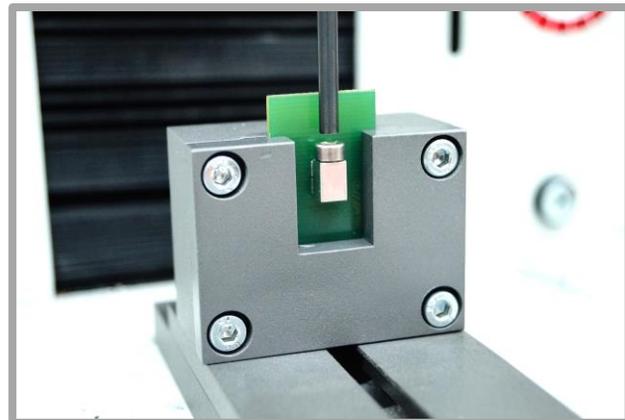
90° SMD Block

Performance Testing with lead-free solder paste	
Test Sample	Shear Force (in N)
	746630x
1	629
2	654
3	588
4	636
5	677
6	548
7	635
8	580
9	682
10	683
11	578
12	673
13	524
14	672
15	662
16	538
17	633
18	672
19	614
20	667
21	694
22	651
23	654
24	659
25	649
26	605
27	687
28	728
29	704
30	681
Min.	524
Max.	728
Average	642

Srew fixed with distances of one thread lead (0,5mm).
The Pull Strength is acting on the thread not on the part itself



Checking fixture Pull Strength



Test PCB for the
Checking fixture Pull Strength

Pull Strength



Performance Testing with lead-free solder paste

Pull Strength (in N)

Test Sample	9771xxx360	9774xxx592	9774xxx482 9774xxx982	9774xxx360 9774xxx960	9774xxx151 9774xxx951	9774xxx243 9774xxx943
	external Thread M3	internal Thread M5	internal Thread M4 / Through Hole Ø4.5	internal Thread M3 / Through Hole Ø3.3	internal Thread M2.5 / Through Hole Ø2.7	internal Thread M2 / Through Hole Ø2.25
	1	500	771	684	530	339
2	450	684	663	350	357	380
3	580	599	513	540	316	363
4	600	778	675	450	303	353
5	620	678	635	480	286	360
6	630	654	569	340	427	244
7	570	724	544	500	244	274
8	690	678	608	400	348	405
9	710	799	525	340	352	256
10	800	675	637	350	329	330
11	550	634	685	350	449	337
12	620	780	655	320	427	246
13	610	687	604	440	381	289
14	650	740	591	350	335	414
15	630	728	618	450	324	404
16	500	760	640	500	243	258
17	620	592	679	380	328	254
18	610	714	602	340	279	405
19	520	641	688	350	491	246
20	630	677	679	350	368	313
21	570	719	680	450	336	402
22	640	691	611	340	278	459
23	600	678	551	500	346	201
24	700	656	587	380	331	182
25	780	789	646	430	276	179
26	780	604	605	360	195	274
27	640	707	642	470	323	441
28	740	639	579	420	373	452
29	620	641	617	440	313	222
30	650	718	647	380	205	248
Min.	450	592	513	320	195	179
Max.	800	799	688	540	491	470
Average	627	695	622	409	330	322



Checking fixture Pull Strength



Pull Strength M1.6



Performance Testing with lead-free solder paste			
Test Sample	Pull Strength (in N)		
	9774xxx633 9773xxx6334	9773xxx6332	9773xxx6330
	with internal Thread M1.6	with internal Thread M1.6 with Pin	with internal Thread M1.6 Bottom closed
1	306	380	326
2	332	421	393
3	300	250	309
4	292	305	304
5	277	446	420
6	262	284	301
7	283	222	410
8	277	262	391
9	245	270	317
10	293	409	323
11	281	380	357
12	327	267	343
13	315	373	409
14	281	415	328
15	280	367	302
16	296	315	299
17	297	317	413
18	258	399	367
19	322	276	390
20	324	310	394
21	296	262	343
22	307	235	317
23	277	250	304
24	322	373	420
25	292	367	323
26	299	393	381
27	342	280	413
28	307	344	371
29	262	235	367
30	336	241	353
Min.	245	222	299
Max.	342	446	420
Average	296	322	356



Checking fixture Pull Strength



The Data is only for reference. The performance always depends on the application. The parts are tested under laboratory conditions and after the specification of Würth Elektronik eiSos. We would be pleased to provide you samples for testing.

Pull Strength WA-SMSR



Performance Testing with lead-free solder paste

Test Sample	Pull Strength (in N)
	9775xxx360 / 9775xxx960
1	394
2	493
3	501
4	526
5	454
6	420
7	489
8	532
9	476
10	494
11	485
12	489
13	425
14	443
15	493
16	539
17	487
18	535
19	507
20	418
21	488
22	532
23	489
24	513
25	510
26	455
27	504
28	473
29	448
30	473
Min.	394
Max.	539
Average	483



Test PCB for the Checking fixture Pull Strength



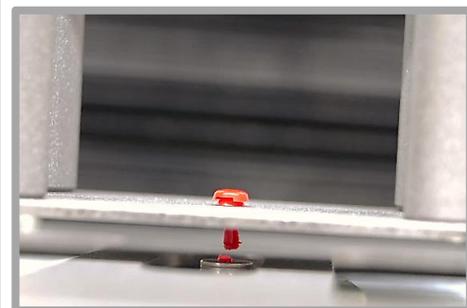
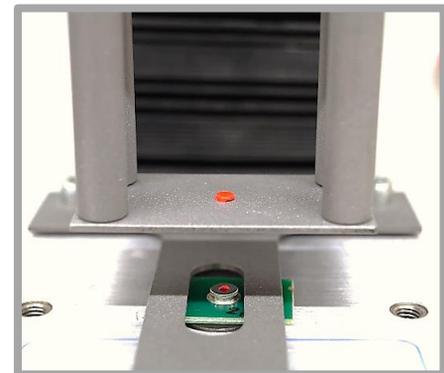
Checking fixture Pull Strength

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Extraction Force WA-SMSSR



Performance Testing with lead-free solder paste			
Test Sample	Extraction Force (in N)		
	Snap Rivet 7009776		
	PCB Thickness 1,0mm	PCB Thickness 1,6mm	PCB Thickness 2,0mm
1	82	95	95
2	83	96	98
3	80	93	99
4	77	97	99
5	79	94	99
6	80	98	91
7	77	94	98
8	79	93	93
9	76	92	98
10	78	95	97
11	77	99	96
12	78	95	95
13	79	95	91
14	82	95	92
15	77	93	96
16	76	94	92
17	81	94	95
18	78	91	94
19	80	92	99
20	82	93	91
21	76	98	93
22	78	95	94
23	77	91	95
24	80	98	91
25	81	92	93
26	76	92	96
27	81	95	94
28	81	92	94
29	77	95	91
30	79	91	97
Min.	76	91	91
Max.	83	99	99
Average	79	94	95



The Snap Rivet is only qualified for one-time use.

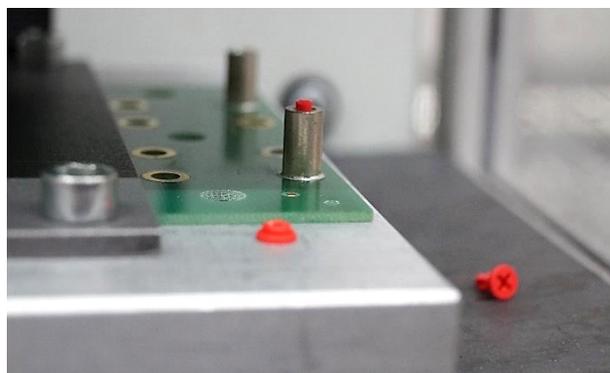
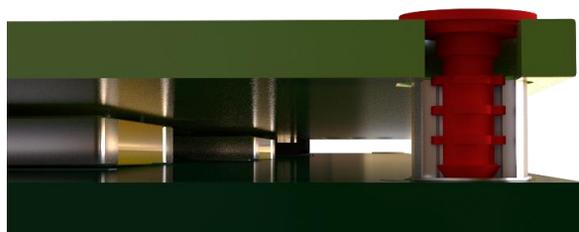
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Extraction Force WA- EXRV



Performance Testing with lead-free solder paste

Test Sample	Extraction Force (in N)
	Mounting Button 7009774x360
	PCB Thickness 1,6mm
1	69
2	73
3	81
4	80
5	85
6	83
7	95
8	80
9	92
10	68
11	93
12	80
13	75
14	80
15	90
16	90
17	75
18	80
19	81
20	76
21	81
22	81
23	77
24	79
25	76
26	78
27	77
28	78
29	79
30	82
Min.	68
Max.	95
Average	80



The Mounting Button is only qualified for one-time use. The Mounting Button is used with our SMT Spacer with internal Thread M3.

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Breaking Torque



Performance Testing with lead-free Solder paste

Test Sample	Breaking Torque											
	9771xxx360		9774xxx592		9774xxx482 9774xxx982		9774xxx360 9774xxx960		9774xxx151 9774xxx951		9774xxx243 9774xxx943	
	external Thread M3		internal Thread M5		internal Thread M4 Through Hole Ø4.5		internal Thread M3 Through Hole Ø3.3		internal Thread M2.5 Through		internal Thread M2 Through Hole Ø2.25	
	Nm	Point of breaking	Nm	Point of breaking	Nm	Point of breaking	Nm	Point of breaking	Nm	Point of breaking	Nm	Point of breaking
1	1,2	Thread	8,9	Solder Joint	3,9	Solder Joint	1,8	Solder Joint	1,0	Solder Joint	0,7	Solder Joint
2	1,1	Thread	9,2	Solder Joint	4,4	Solder Joint	1,9	Solder Joint	1,1	Solder Joint	0,8	Screw
3	1,3	Thread	8,5	Solder Joint	3,8	Solder Joint	1,8	Solder Joint	0,9	Solder Joint	0,7	Solder Joint
4	1,3	Thread	10,0	Solder Joint	4,0	Solder Joint	1,9	Solder Joint	1,1	Solder Joint	0,7	Solder Joint
5	1,3	Thread	8,2	Solder Joint	3,9	Solder Joint	2,1	Solder Joint	1,2	Solder Joint	0,7	Solder Joint
6	1,1	Thread	8,8	Solder Joint	3,8	Solder Joint	1,9	Solder Joint	1,0	Solder Joint	0,7	Screw
7	1,2	Thread	8,0	Solder Joint	3,8	Solder Joint	1,6	Solder Joint	1,1	Solder Joint	0,6	Solder Joint
8	1,3	Thread	8,0	Solder Joint	4,1	Solder Joint	1,9	Solder Joint	1,2	Solder Joint	0,7	Screw
9	1,3	Thread	9,2	Solder Joint	4,1	Solder Joint	2,1	Solder Joint	1,1	Solder Joint	0,7	Solder Joint
10	1,1	Thread	7,8	Solder Joint	3,8	Solder Joint	1,7	Solder Joint	1,1	Solder Joint	0,7	Solder Joint
11	1,2	Thread	8,9	Solder Joint	3,7	Solder Joint	2,0	Solder Joint	1,1	Solder Joint	0,7	Solder Joint
12	1,4	Thread	8,3	Solder Joint	3,6	Solder Joint	1,8	Solder Joint	1,0	Solder Joint	0,7	Solder Joint
13	1,4	Thread	9,0	Solder Joint	4,0	Solder Joint	1,7	Solder Joint	1,1	Solder Joint	0,8	Solder Joint
14	1,3	Thread	10,2	Solder Joint	3,7	Solder Joint	1,8	Solder Joint	1,0	Solder Joint	0,7	Solder Joint
15	1,4	Thread	8,9	Solder Joint	3,8	Solder Joint	1,8	Solder Joint	1,0	Solder Joint	0,8	Solder Joint
16	1,2	Thread	8,1	Solder Joint	4,0	Solder Joint	1,6	Solder Joint	1,2	Solder Joint	0,7	Screw
17	1,1	Thread	8,4	Solder Joint	3,9	Solder Joint	2,1	Solder Joint	0,9	Solder Joint	0,7	Solder Joint
18	1,2	Thread	8,1	Solder Joint	3,9	Solder Joint	1,7	Solder Joint	1,0	Solder Joint	0,7	Screw
19	1,1	Solder	8,8	Solder Joint	3,6	Solder Joint	1,7	Solder Joint	1,0	Solder Joint	0,7	Solder Joint
20	1,3	Thread	8,2	Solder Joint	3,8	Solder Joint	1,9	Solder Joint	1,0	Solder Joint	0,7	Solder Joint
21	1,2	Thread	9,0	Solder Joint	4,1	Solder Joint	1,7	Solder Joint	1,2	Solder Joint	0,7	Solder Joint
22	1,2	Thread	8,9	Solder Joint	3,5	Solder Joint	1,6	Solder Joint	1,2	Solder Joint	0,7	Solder Joint
23	1,4	Thread	9,1	Solder Joint	3,7	Solder Joint	1,6	Solder Joint	1,8	Solder Joint	0,7	Solder Joint
24	1,4	Thread	7,9	Solder Joint	3,8	Solder Joint	1,7	Solder Joint	1,1	Solder Joint	0,8	Solder Joint
25	1,4	Thread	9,3	Solder Joint	3,8	Solder Joint	1,8	Solder Joint	1,1	Solder Joint	0,7	Solder Joint
26	1,4	Thread	8,1	Solder Joint	3,9	Solder Joint	1,6	Solder Joint	1,0	Solder Joint	0,7	Solder Joint
27	1,1	Thread	8,7	Solder Joint	4,2	Solder Joint	1,9	Solder Joint	1,2	Solder Joint	0,7	Screw
28	1,2	Thread	8,8	Solder Joint	4,0	Solder Joint	1,6	Solder Joint	1,0	Solder Joint	0,7	Screw
29	1,4	Thread	9,4	Solder Joint	3,6	Solder Joint	1,7	Solder Joint	1,1	Solder Joint	0,7	Screw
30	1,2	Thread	8,7	Solder Joint	3,7	Solder Joint	1,9	Solder Joint	1,1	Solder Joint	0,7	Solder Joint
Min.	1,1		7,8		3,5		1,6		0,9		0,6	
Max.	1,4		10,2		4,4		2,1		1,8		0,8	
Average	1,3		8,7		3,9		1,8		1,1		0,7	



Digital torque wrench for Breaking Torque



Test assembly according to **DIN 267/ Part 25**. Using metric screws with property class 12.9 and hexagonal recess according to DIN 912.

The Data is only for reference. The performance always depends on the application. The parts are tested under laboratory conditions and after the specification of Würth Elektronik eiSos. We would be pleased to provide you samples for testing.

Breaking Torque M1.6

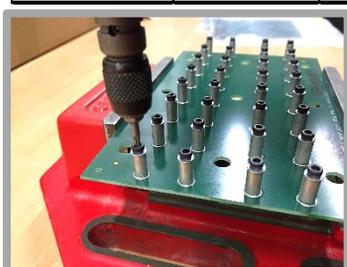


Performance Testing with lead-free solder paste

Test Sample	Breaking Torque					
	9774xxx633 9773xxx6334		9773xxx6332		9773xxx6330	
	with internal Thread M1.6		with internal Thread M1.6 with Pin		with internal Thread M1.6 Bottom closed	
	Nm	Point of breaking	Nm	Point of breaking	Nm	Point of breaking
1	0,22	Solder Joint	0,29	Screw	0,26	Solder Joint
2	0,26	Solder Joint	0,24	Solder Joint	0,26	Solder Joint
3	0,30	Solder Joint	0,25	Solder Joint	0,31	Solder Joint
4	0,25	Solder Joint	0,22	Solder Joint	0,26	Solder Joint
5	0,33	Solder Joint	0,23	Solder Joint	0,27	Solder Joint
6	0,25	Solder Joint	0,27	Solder Joint	0,30	Solder Joint
7	0,28	Solder Joint	0,28	Solder Joint	0,29	Solder Joint
8	0,31	Solder Joint	0,22	Solder Joint	0,26	Solder Joint
9	0,27	Solder Joint	0,32	Solder Joint	0,31	Solder Joint
10	0,29	Solder Joint	0,25	Solder Joint	0,23	Solder Joint
11	0,32	Solder Joint	0,30	Solder Joint	0,31	Solder Joint
12	0,25	Solder Joint	0,28	Solder Joint	0,25	Solder Joint
13	0,31	Solder Joint	0,25	Solder Joint	0,29	Solder Joint
14	0,25	Solder Joint	0,28	Screw	0,29	Solder Joint
15	0,29	Solder Joint	0,24	Screw	0,27	Solder Joint
16	0,33	Solder Joint	0,23	Screw	0,25	Solder Joint
17	0,30	Solder Joint	0,23	Solder Joint	0,34	Solder Joint
18	0,30	Solder Joint	0,24	Screw	0,33	Solder Joint
19	0,32	Solder Joint	0,31	Solder Joint	0,29	Solder Joint
20	0,32	Solder Joint	0,27	Solder Joint	0,32	Solder Joint
21	0,24	Solder Joint	0,25	Solder Joint	0,27	Solder Joint
22	0,32	Solder Joint	0,26	Solder Joint	0,28	Solder Joint
23	0,31	Solder Joint	0,30	Solder Joint	0,35	Solder Joint
24	0,22	Solder Joint	0,24	Solder Joint	0,31	Solder Joint
25	0,22	Solder Joint	0,24	Solder Joint	0,26	Solder Joint
26	0,28	Solder Joint	0,28	Solder Joint	0,25	Solder Joint
27	0,30	Solder Joint	0,31	Solder Joint	0,25	Solder Joint
28	0,29	Solder Joint	0,27	Solder Joint	0,29	Solder Joint
29	0,25	Solder Joint	0,29	Solder Joint	0,34	Solder Joint
30	0,27	Solder Joint	0,26	Screw	0,25	Solder Joint
Min.	0,22		0,22		0,23	
Max.	0,33		0,32		0,35	
Average	0,28		0,26		0,28	



Digital torque wrench for Breaking Torque



Test assembly according to DIN 267/ Part 25. Using metric screws with property class 12.9 and hexagonal recess according to DIN 912.

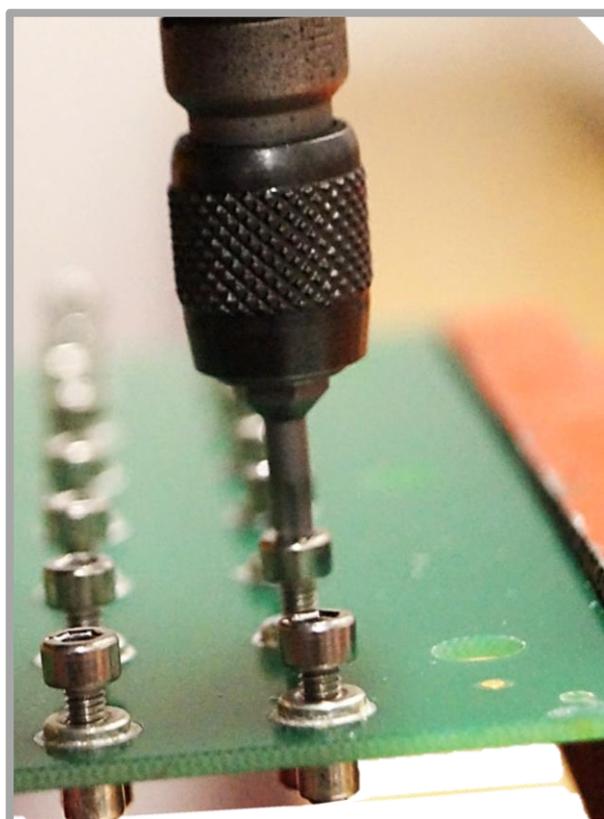
The Data is only for reference. The performance always depends on the application. The parts are tested under laboratory conditions and after the specification of Würth Elektronik eiSos. We would be pleased to provide you samples for testing.

Breaking Torque

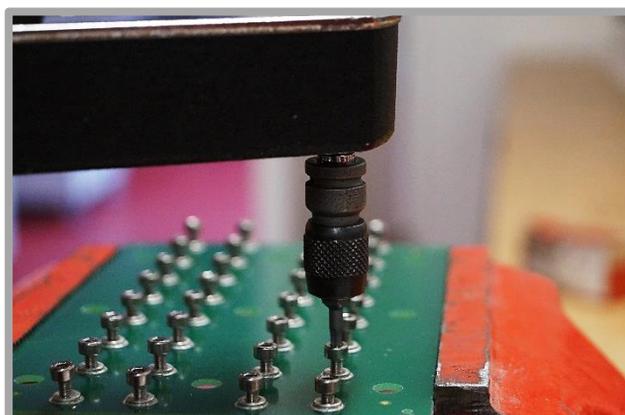
WA-SMSR



Performance Testing with lead-free solder paste		
Test Sample	Breaking Torque (in Nm)	
	9775xxx360 / 9775xxx960	
	Nm	Point of breaking
1	1,6	Solder Joint
2	1,4	Solder Joint
3	1,7	Solder Joint
4	1,5	Solder Joint
5	1,6	Solder Joint
6	1,5	Solder Joint
7	1,6	Solder Joint
8	1,3	Solder Joint
9	1,8	Solder Joint
10	1,6	Solder Joint
11	1,8	Solder Joint
12	1,5	Solder Joint
13	1,7	Solder Joint
14	1,7	Solder Joint
15	1,6	Solder Joint
16	1,4	Solder Joint
17	1,5	Solder Joint
18	1,7	Solder Joint
19	1,8	Solder Joint
20	1,6	Solder Joint
21	1,7	Solder Joint
22	1,6	Solder Joint
23	1,8	Solder Joint
24	1,7	Solder Joint
25	1,8	Solder Joint
26	1,6	Solder Joint
27	1,7	Solder Joint
28	1,6	Solder Joint
29	1,7	Solder Joint
30	1,6	Solder Joint
Min.	1,3	
Max.	1,8	
Average	1,6	



Digital torque wrench for Breaking Torque



Test assembly according to **DIN 267/ Part 25**. Using metric screws with property class 12.9 and hexagonal recess according to DIN 912.

The Data is only for reference. The performance always depends on the application. The parts are tested under laboratory conditions and after the specification of Würth Elektronik eiSos. We would be pleased to provide you samples for testing.

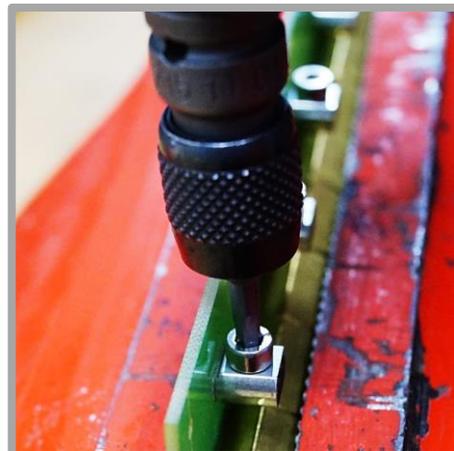
Breaking Torque

WP-SMRA



Performance Testing with lead-free solder paste

Test Sample	Breaking Torque (in Nm)			
	746630x		746631x	
	Nm	Point of breaking	Nm	Point of breaking
1	1,5	Solder Joint	1,0	Solder Joint
2	1,5	Solder Joint	1,1	Solder Joint
3	1,4	Solder Joint	0,9	Solder Joint
4	1,4	Solder Joint	1,2	Solder Joint
5	1,2	Solder Joint	1,3	Solder Joint
6	1,2	Solder Joint	1,2	Solder Joint
7	1,4	Solder Joint	1,3	Solder Joint
8	1,4	Solder Joint	1,0	Solder Joint
9	1,4	Solder Joint	0,9	Solder Joint
10	1,3	Solder Joint	1,2	Solder Joint
11	1,2	Solder Joint	1,1	Solder Joint
12	1,0	Solder Joint	1,2	Solder Joint
13	1,3	Solder Joint	1,1	Solder Joint
14	1,4	Solder Joint	1,1	Solder Joint
15	1,4	Solder Joint	1,1	Solder Joint
16	1,1	Solder Joint	0,9	Solder Joint
17	1,1	Solder Joint	0,8	Solder Joint
18	1,3	Solder Joint	1,0	Solder Joint
19	1,5	Solder Joint	1,2	Solder Joint
20	1,4	Solder Joint	1,0	Solder Joint
21	1,2	Solder Joint	1,1	Solder Joint
22	1,3	Solder Joint	0,7	Solder Joint
23	1,2	Solder Joint	1,0	Solder Joint
24	1,6	Solder Joint	0,7	Solder Joint
25	1,5	Solder Joint	1,1	Solder Joint
26	1,5	Solder Joint	1,2	Solder Joint
27	1,4	Solder Joint	1,1	Solder Joint
28	1,2	Solder Joint	1,1	Solder Joint
29	0,9	Solder Joint	0,8	Solder Joint
30	0,8	Solder Joint	0,9	Solder Joint
Min.	0,8		0,7	
Max.	1,6		1,3	
Average	1,3		1,0	

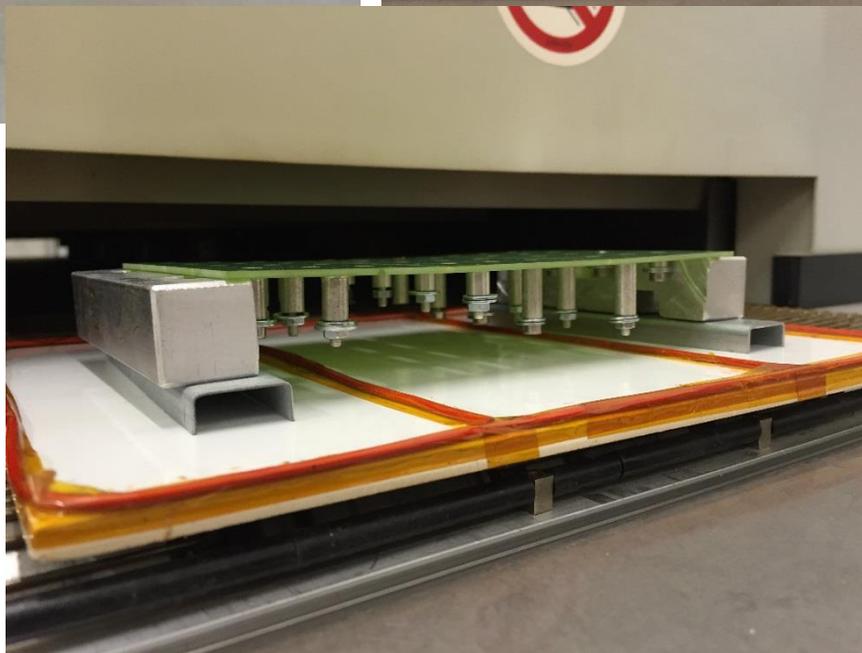
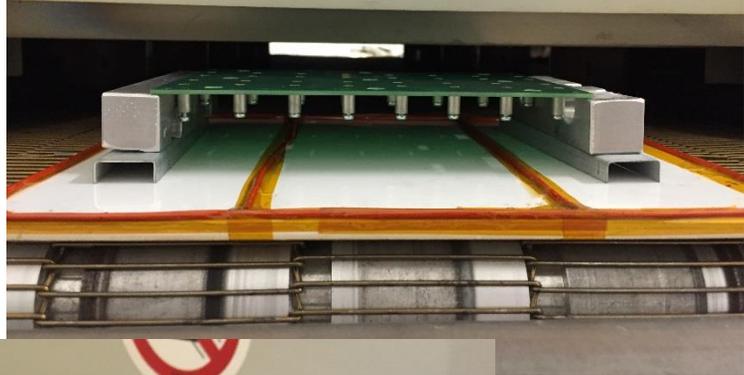


Test assembly according to **DIN 267/ Part 25**. Using metric screws with property class 12.9 and hexagonal recess according to DIN 912.

The Data is only for reference. The performance always depends on the application. The parts are tested under laboratory conditions and after the specification of Würth Elektronik eiSos. We would be pleased to provide you samples for testing.

Additional Test

second reflow process with upside down circuit board



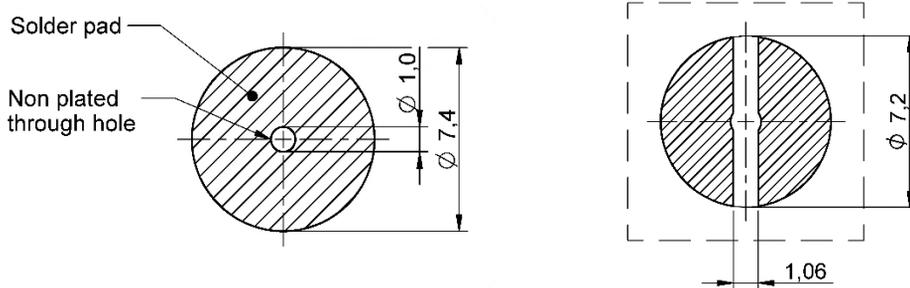
The Data is only for reference. The performance always depends on the application. The parts are tested under laboratory conditions and after the specification of Würth Elektronik eiSos. We would be pleased to provide you samples for testing.

Land Pattern & Stencil Suggestion



WA-SMSE

M3



WA-SMSI / WA-SMST

M3

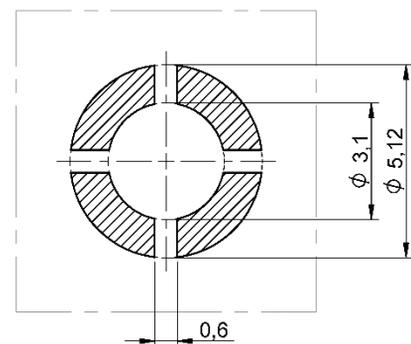
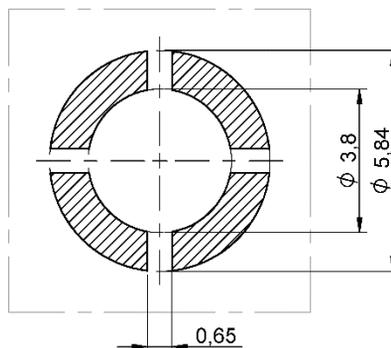
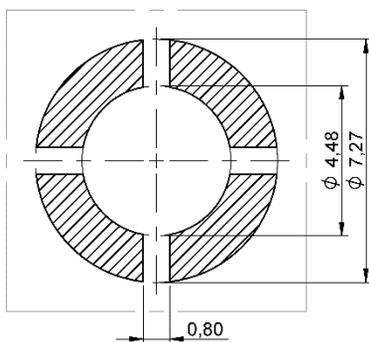
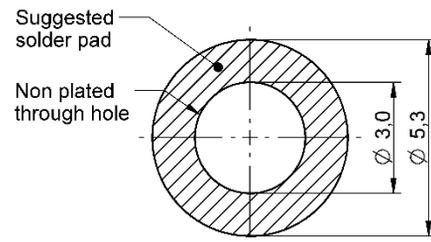
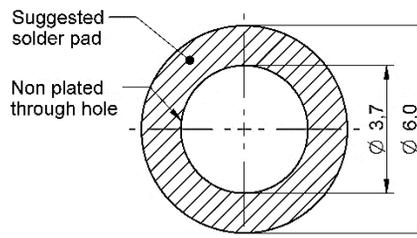
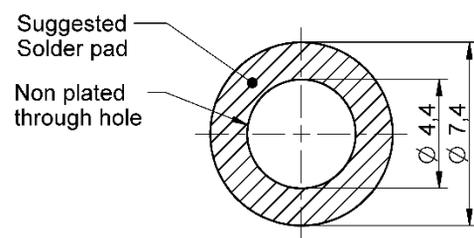
Through Hole 3.3mm

M2.5

Through Hole 2.7mm

M2

Through Hole 2.25mm



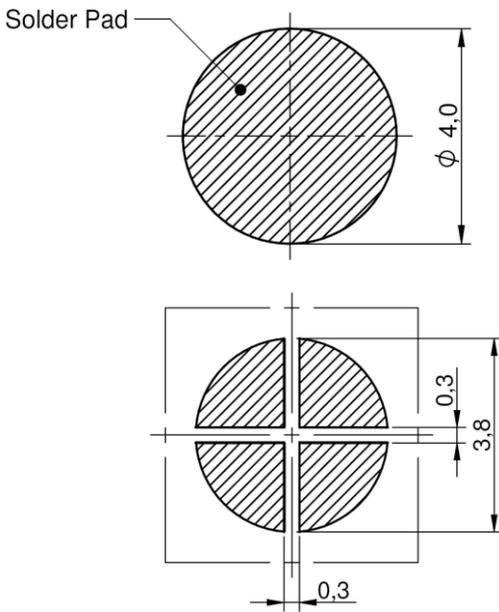
- The Drill Hole in the circuit board for the alignment pin and the screw must not be through-contacted.

Land Pattern & Stencil Suggestion

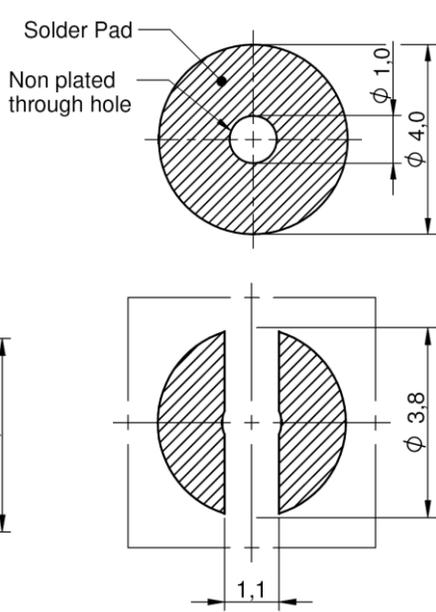


WA-SMSI / WA-SMST

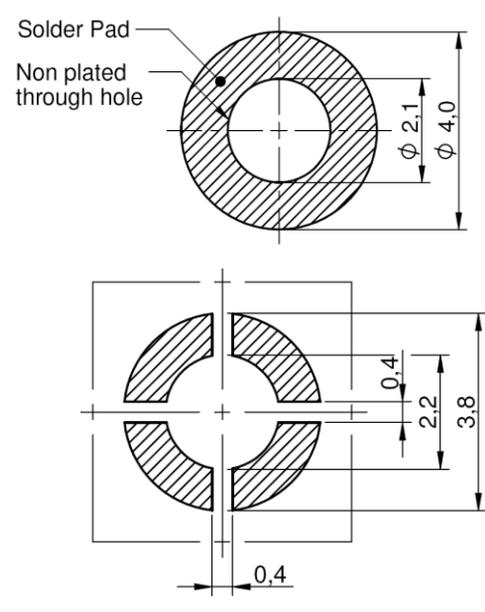
M1.6
Bottom closed



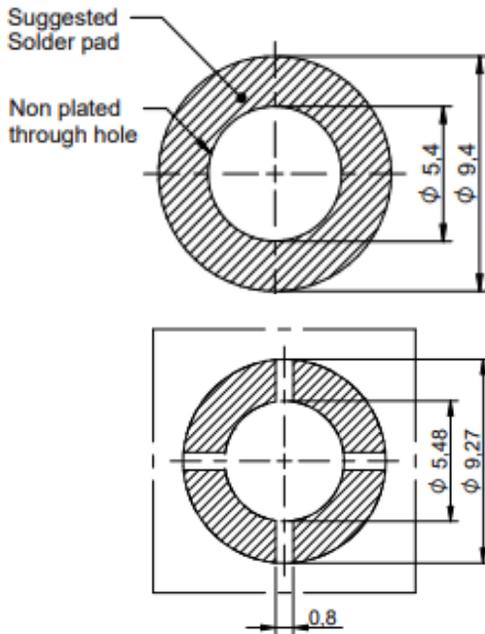
M1.6
With Pin



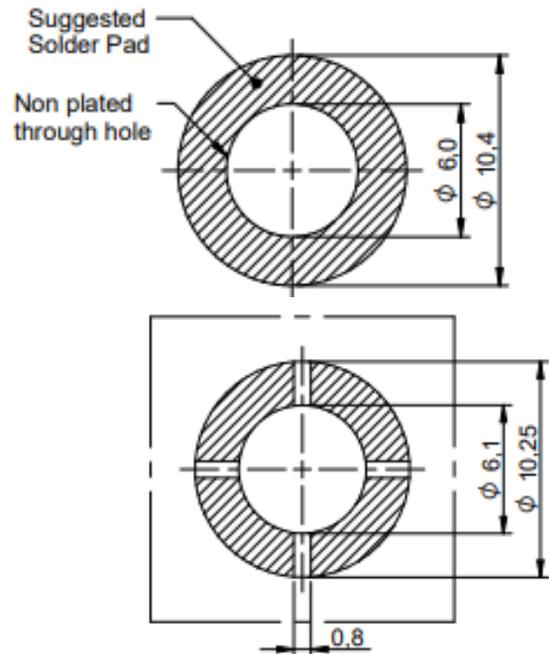
M1.6



M4
Through Hole 4.5mm



M5



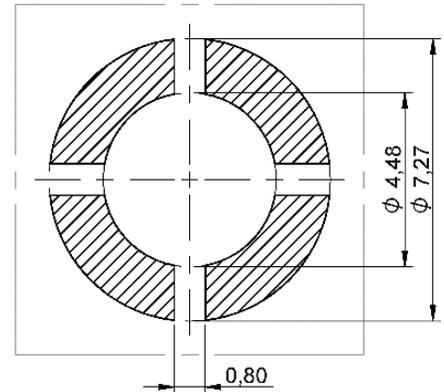
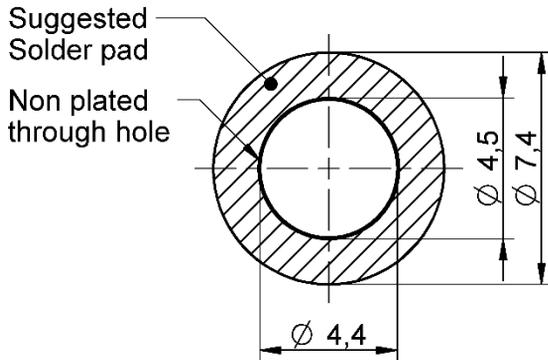
- The Drill Hole in the circuit board for the alignment pin and the screw must not be through-contacted.

Land Pattern & Stencil Suggestion



WA-SMSR

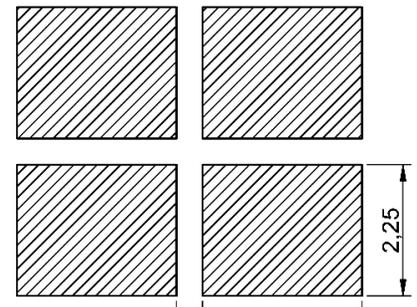
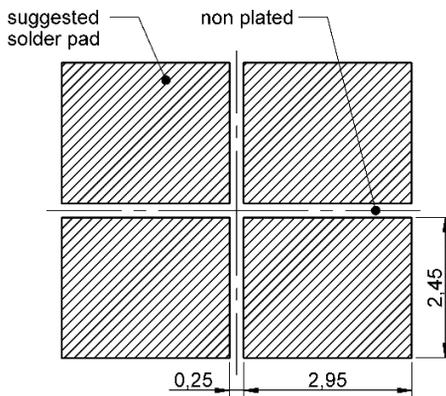
M3
Through Hole 3.2mm



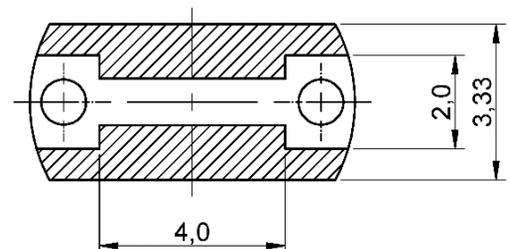
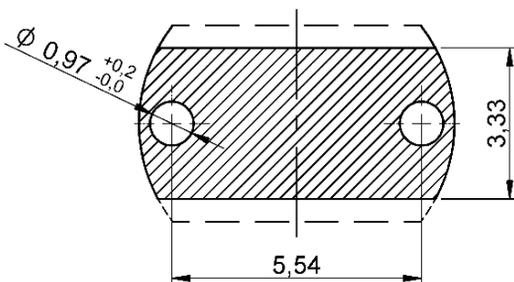
WP-SMRA

M3
Through Hole 3.3mm

746630x:



746631x:



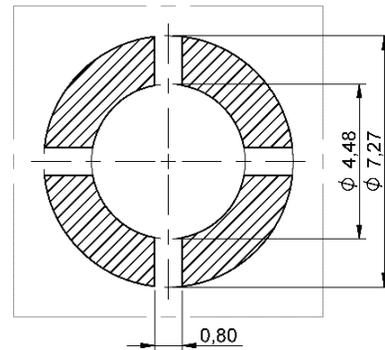
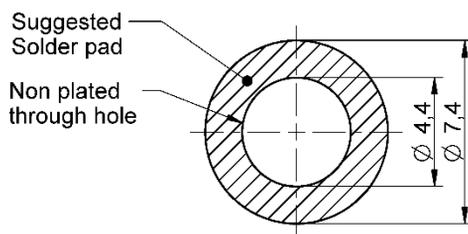
- The Drill Hole in the circuit board for the alignment pin and the screw must not be through-contacted.

Land Pattern & Stencil Suggestion



WA-SMSSR

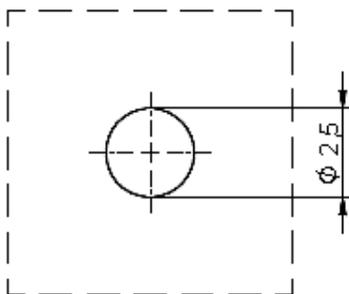
9776xxx960



Drilling in Panel

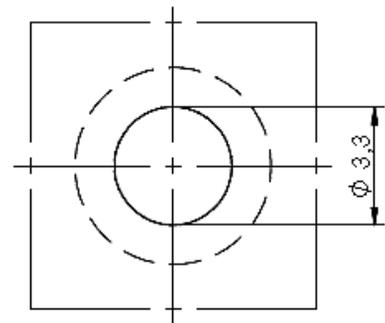
WA-SMSSR

7009776



WA-EXRV

7009774x360



- The Drill Hole in the circuit board for the alignment pin and the screw must not be through-contacted.

Our Requirements for SMD Spacer



✓ Five Time Reflow Test

- J-STD-020D

✓ Solderability

- JESD22-B102

✓ Thermal Shock

- **MIL-STD-202, Method 107**
 - Temperature -55°C to 150°C
 - Dwell time 30 minutes
 - Cycles: 500
 - Transfer time max. 20s.

✓ Vibration Test

- **MIL-STD-202, Method 204**
 - 10g's for 20minutes
 - 12 cycles each of 3 orientations
 - 15-2000Hz

✓ Moisture Resistance

- **MIL-STD-202, Method 106**
 - Temperature: 65°C
 - Humidity: 95%
 - Duration: 500h

✓ RoHS & REACH Compliant

Conditions:

- | | |
|------------------------|--|
| ▪ Oven: | Solano RO 500 |
| ▪ Soldering profile: | IPC/JEDEC J-STD-020D |
| ▪ Highest Temperature: | 305 °C |
| ▪ PCB | Thickness 1,55mm, double Layer FP-4 |
| ▪ PCB Surface: | 35µ Cu, NiAu-finish |
| ▪ Solder Paste: | Keatin: Alloy Sn96,5AG3CU0,5/Metall 88% |
| ▪ Stencil thickness: | 150 µm |
| ▪ Vias: | None |
| ▪ Spokes: | WA-SMSE – 2-spoke stencil
WA-SMSI / WA-SMST / WA-SMSSR – 4-spoke stencil
WA-SMSR – 4-spoke stencil
WP-SMRA 746630x – 4-spoke stencil
WP-SMRA 746631x-2-spoke stencil |