

产品手册



Amkor
Technology®

2022
amkor.com

创造未来

作为全球半导体封装、设计和测试外包服务业中最大的独立供应商之一，Amkor 帮助让“新一代”产品变为现实。



设计



封装



测试

Amkor Technology

的成绩

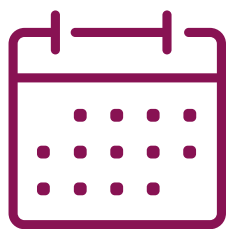
足迹遍布全球 **11** 个国家



12 个销售和客户服务中心



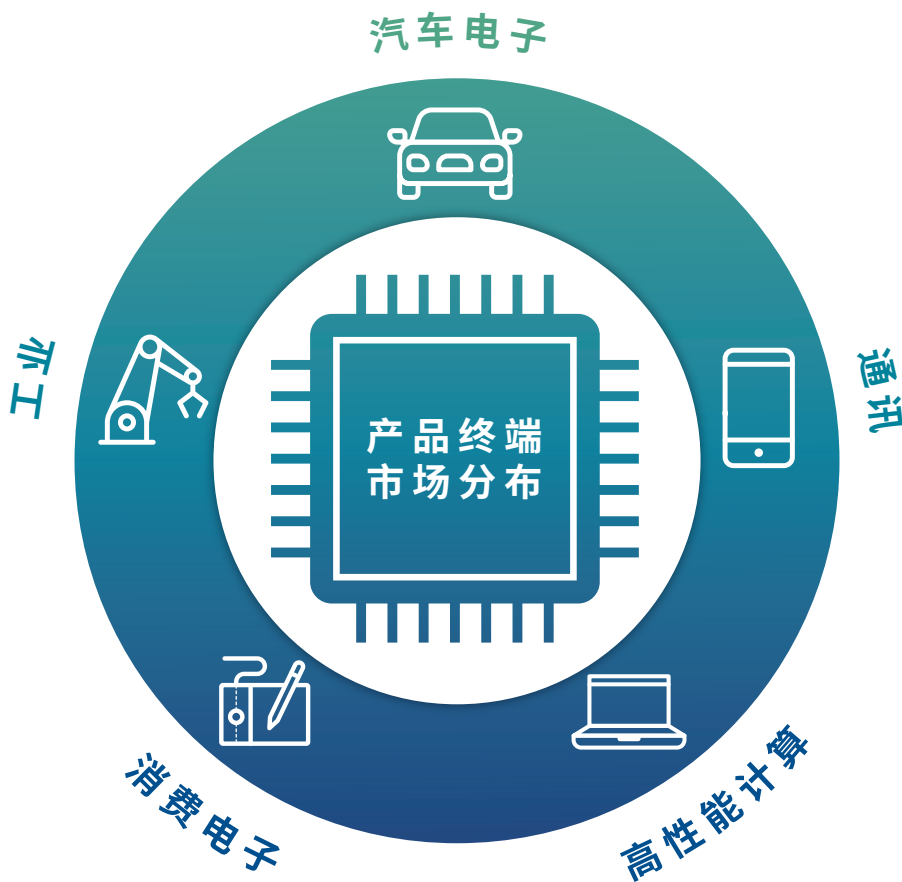
19 家封装工厂



成立于
1968年



全球员工人数超过
3万



1100
万平方英尺的生产面积

3 顶级一站式服务



设计



封装



测试



3,162
专利



61 亿美元净销售额*

*根据2021年财报披露

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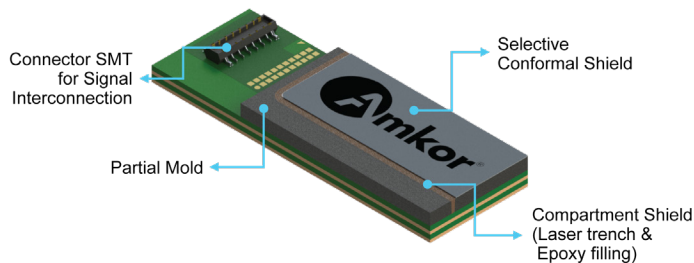
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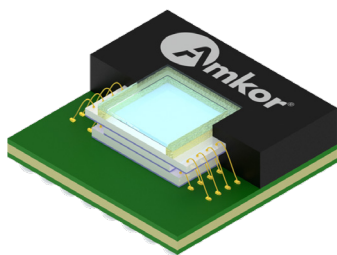
技术开发

AiP/AoP



Amkor 的尖端 AiP 和 AoP 技术已经完成部署，可为智能手机和其他移动设备提供完全集成的 5G NR 毫米波 (mmWave) 和 sub-6 GHz RF 模块。此类毫米波天线模块以非常紧凑的尺寸支持多频谱波段，适合集成到移动设备当中。除了其各种系统级封装 (SiP) 能力和 AiP/AoP 技术，Amkor 还开发了一套功能强大的工具组合，以便将电路密度最大化，并满足 5G 应用产品化所需的复杂的封装形式，例如，双面封装，晶片嵌入式基板，薄膜 RDL 和电介质，以及各种类型的 RF 屏蔽等。该工具组合整合了 Amkor 在 RF 和天线封装设计领域专长，使 Amkor 具有独特的优势，更好地为需要将与多个 IC 和 5G 网络的先进封装及测试技术集成相关挑战和高投资外包出去的客户提供服务。随着对支持 5G 的封装的需求快速成长，Amkor 已经着手并成功地实施 AiP 和 AoP 技术。

光学传感器

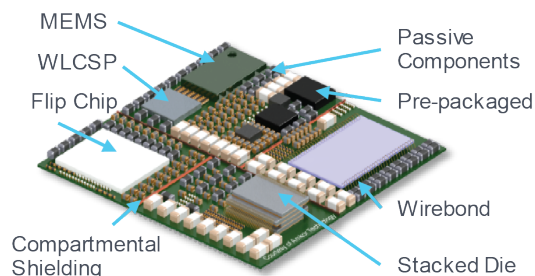


Amkor 是光学传感器封装技术的全球领袖，也是最大的传感器封装外包提供商。随着当今社会科技的进步，我们日益依赖于光学传感器的发展，以应对未来可靠、高速的传感器应用。光学传感器可以将各种波长的光转化为电信号以优化传感器应用。

环境、红外线 (IR) 和紫外线 (UV) 是光学传感器检测的部分例子，可以用它们打造出自动驾驶汽车、显示屏指纹扫描、安全面部识别和众多其他应用。由于我们越来越依赖科技为我们感知外部的世界，多种传感器的整合对于打造可靠的传感器系统而言亦至关重要，光学传感器的运用也变得愈发普遍。Amkor 具有各种封装技术，此类技术让我们能够以标准化的封装为灵活的光学传感器应用提供支持。

系统级封装

半导体行业对高水平集成和低成本的需求，以及全系统配置的意识提高，都持续推动系统级封装 (SiP) 的普及。在要求更小尺寸，更强功能的市场中，Amkor 的 SiP 技术是理想的解决方案。



凭借每天封装、测试和交付上百万个 SiP 产品，Amkor Technology 以实绩证明自己是 SiP 设计、封装和测试的行业领导者。采用聚束和阵列天线的毫米波无线电设计将被用于 5G 蜂窝式网络系统的多种先进的 SiP 产品当中。毫米电磁波设计向系统设计师和元件及 SiP 封装工程师提出了新的挑战。作为完整 SiP 设计解决方案的一部分，Amkor 在 RF 和数字测试领域拥有雄厚的专业知识，包括测试系统软件/硬件开发和制造测试等。针对常见的 RF 部件，如 PA、LNA 和集成前端 (IFE) 等，我们内部开发的世界级平台通常能将测试时间缩短 50% 至 80%。在要求更小尺寸，更强功能的市场中，Amkor 的 SiP 技术是理想的解决方案。凭借每天封装、测试和交付超过一百万个 SiP 产品，Amkor 以实绩证明自己是 SiP 设计、封装和测试的行业领导者。立即联系 Amkor，加入我们不断增加的客户名单，以 SiP 技术取得成功。

Amkor 全球分布图

战略选址的工厂和客户支持中心

Amkor 总部

销售/客户支持中心

封装与测试工厂

销售/客户支持中心和封装与测试工厂



工厂代码说明

Amkor 在全世界范围内拥有十九家封装与测试制造工厂。产品表显示的是不同工厂各自的封装产品。

大中华区

C3..... 上海

J6..... 福井

J7..... 函馆

日本

J3..... 熊本

J4..... 福冈, 北上

J5..... 大分, 白杵

韩国

K4..... 光州

K3, K5..... 仁川

马来西亚

M1..... 吉隆坡

菲律宾

P1..... 文珍俞巴市

P3/P4..... 内湖省比尼扬

葡萄牙

E1..... 波尔图

台湾

T1, T6..... 桃园市

T3, T5..... 新竹

大多数封装均支持汽车元件。
非封装实际尺寸, 仅表示可选的封装。联系 Amkor 的销售以了解更多产品的信息。

基板封装

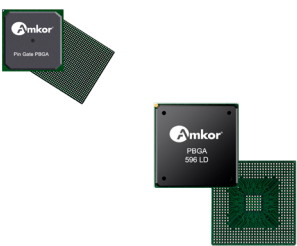
Amkor 基板封装技术的更强功能让高功率和高速集成电路从中获益，提升其电和热性能。

基板封装采用球栅阵列设计，以塑料或卷带基板为基板而非引线框架，并将电路连接置于封装的底部而不是外围。此类基板由环氧树脂，编织玻璃纤维和导电金属等多层材料复合而成。凸块为系统板提供电路连

接。它们通常均匀地分布于基板底部（即所谓“球栅阵列”）。与引脚框架封装相比，基板封装引脚之间的距离更大，互连的数量也更多。

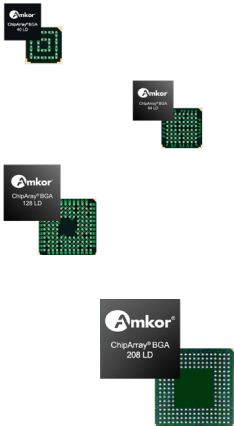
基板封装是高性能应用的理想解决方案，例如，微处理器/控制器、门阵电路、芯片组、模拟电路、闪存、SRAM、DRAM、ASICs、DSPs、RF 器件和 PLDs。

PBGA Packages – Package Dimensions (mm)

Sample	Body Size	Lead Count and Pitch			Factory	Data Sheet #
		0.8 mm	1.0 mm	1.27 mm		
	19 x 19, PGM	340, 360, 484, 529	276, 289, 292, 320, 324	–	K4	DS520
	19 x 19, CGM	–	240, 260, 320, 324	–	P3	DS520
	23 x 23, PGM	549, 569, 672, 676, 740	264, 318, 343, 376, 404, 456, 484	–	K4	DS520
	23 x 23, CGM	–	316, 376, 420, 440, 448, 456, 484	169, 177, 208, 217, 225, 249, 289	P3	DS520
	27 x 27, PGM	637, 641	336, 416, 456, 484, 515, 596, 620, 672, 676	272, 292	K4	DS520
	27 x 27, CGM	–	388, 456, 544, 625, 672	256, 272, 316, 336, 356, 400	P3	DS520
	29 x 29, PGM	–	688, 780	–	K4	DS520
	31 x 31, CGM	–	632, 639, 744, 752, 757, 817, 896, 900	304	K4	DS520
	31 x 31, CGM	–	550, 640, 676, 900	329, 385, 409, 576	P3	DS520
	35 x 35, CGM	–	596, 1156	456, 672, 729, 985	P3	DS520





Legend: Max full array ball count shown – contact Amkor for custom BGA pattern availability

CABGA Packages – Package Dimensions (mm)

Sample	Body Size	Lead Count and Pitch						Factory	Data Sheet #
		0.4 mm	0.5 mm	0.65 mm	0.8 mm	1 mm	1.27 mm		
	2.5 x 2.5	36	–	–	–	–	–	P3	DS550
	3 x 3	49	25	20	–	–	–	K4, P3	DS550
	3.5 x 3.5	34, 49	36	–	–	–	–	C3, K4, P3, J3	DS550
	4 x 4	49, 64	40, 41, 48, 49	–	24	–	–	C3, K4, P3	DS550
	4.5 x 4.5	72, 81	–	–	–	–	–	J3	DS550
	5 x 5	97, 100	44, 48, 56, 57, 62, 64, 65, 66, 68, 72, 76, 80, 81	49	25	–	–	C3, K4, P3, J3	DS550
	5.5 x 5.5	–	78, 99	–	–	–	–	J3	DS550
	6 x 6	76	48, 56, 64, 80, 84, 86, 88, 92	49, 58	36	–	–	C3, K4, P3, J3	DS550
	6 x 6	96, 140, 155	96, 97, 99, 100, 101, 105, 111, 112, 113, 120, 121	64	–	–	–	C3, K4, P3, J7, J3	DS550
	6.5 x 8	–	–	–	67	–	–	C3	–
	7 x 7	187, 191	64, 86, 100, 104, 107, 116	64, 80	48, 49, 64	–	–	C3, K4, P3, J3	DS550
	7 x 7	209, 211, 256	121, 128, 132, 137, 142, 143, 144, 154, 160	81, 84, 137	–	–	–	C3, K4, P3, J3	DS550
	8 x 8	121, 252	56, 80, 100, 108, 112, 113, 120	105	52, 64, 80, 81	–	–	C3, K4, P3	DS550
	8 x 8	308	124, 128, 132, 133, 144, 160, 161, 164, 176, 180	121, 140	–	–	–	C3, K4, P3, J7, J3	DS550
	8 x 8	–	195, 196, 208, 219, 225	–	–	–	–	C3, K4, P3	DS550

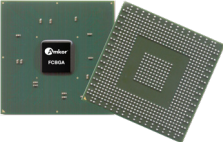
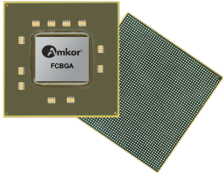
大多数封装均支持汽车元件。非封装实际尺寸，仅表示可选的封装。联系 Amkor 的销售以了解更多产品的信息。

CABGA Packages (Cont.) – Package Dimensions (mm)

Sample	Body Size	Lead Count and Pitch						Factory	Data Sheet #
		0.4 mm	0.5 mm	0.65 mm	0.8 mm	1 mm	1.27 mm		
	9 x 9	296, 383	128, 156, 188, 201, 220, 225, 265	109, 121, 141, 144	81, 100	–	–	C3, K4, P3, J3, J7	DS550
	10 x 10	216, 360, 384	173, 179, 180	164, 170	96, 100, 104, 120, 121, 128, 144	81	–	C3, K4, P3, J3	DS550
	10 x 10	387, 396, 409	181, 192, 200, 216, 221, 224, 225, 233, 235, 240	183	–	–	–	C3, K4, P3, J3, J7	DS550
	10 x 10	424, 454	244, 257, 267, 268, 273, 277, 284, 285, 289, 292, 296, 297, 328	196	–	–	–	C3, K4, P3	DS550
	10 x 10	456	336, 345, 346	–	–	–	–	C3, K4, P3	DS550
	11 x 11	432, 440, 452	204, 223	165, 177, 192, 196	128, 132, 144, 169	100	–	C3, K4, P3, J7, J3	DS550
	11 x 11	476, 576	256, 280, 289, 305, 321, 324, 337, 361, 416	200, 208, 225, 241	–	–	–	C3, K4, P3, J3	DS550
	12 x 12	216, 487, 547	236, 244, 260, 272, 291, 308, 337, 343	177	144, 160, 168, 179	121	–	C3, K4, P3, J7	DS550
	12 x 12	560, 569, 617	385, 388, 424	193, 208	180, 192, 196	–	–	C3, K4, P3, J7, J3	DS550
	12 x 12	697, 714, 745	–	213, 241	–	–	–	C3, K4, P3, J3	DS550
	13 x 13	–	276	240, 248, 273	–	–	–	C3, K4, P3	DS550
	13 x 13	–	281, 286, 289, 325, 337, 341, 345	280, 281, 282, 289, 294	145	–	–	C3, K4, P3, J7, J3	DS550
	13 x 13	–	356, 368, 385, 400, 401, 420, 424	328, 336, 348	177, 193, 201, 224, 225	144	–	C3, K4, P3, J7, J3	DS550
	13 x 13	–	505	361	256	–	–	C3, K4, P3, J7	DS550
	14 x 14	270	169, 220	304, 332, 645	233, 256	166, 169	–	C3, K4, P3	DS550
	14 x 14	683	409, 456, 480, 516, 521, 538, 562, 616	379, 387, 400	–	–	–	C3, K4, P3, J7	DS550
	15 x 15	418	393, 464, 543, 586, 603	339, 349, 351	208, 209, 217, 220, 228, 233, 240, 255, 260, 261, 265, 280, 288, 289	–	–	C3, K4, P3, J7, J3	DS550
	15 x 15	–	–	352, 368	319, 324	160, 176, 196	–	C3, K4, P3, J7	DS550
	16 x 16	–	430, 609, 624	304, 324, 360, 423, 426, 445, 477	280, 285	174, 225	–	C3, K4, P3, J7	DS550
	17 x 17	–	–	281, 457	256, 268, 272, 292, 293	199, 208, 224, 228, 252, 256	136, 164	C3, K4, P3, J3	DS550
	17 x 17	–	540, 604, 608	508, 521, 532, 600	308, 316, 318, 320, 324, 326, 358, 364, 399, 400	256	–	C3, K4, P3, J7, J3	DS550
	18 x 18	–	842, 906	–	–	–	–	J7	DS550
	19 x 19	–	–	–	–	321	–	J7	DS550
	21 x 21	–	–	–	449, 490, 537	–	–	J7	DS550
	23 x 23	–	–	–	552	324, 352, 484	–	J3	DS550
	25 x 25	–	–	–	516	–	–	K4	DS550
	27 x 27	–	–	–	–	416, 456, 484, 516	256	J3	DS550
	31 x 31	–	–	–	–	564, 613, 620, 640, 641, 704	421	J3	DS550
	35 x 35	–	–	–	–	814, 868, 1012	484	J3	–

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FCBGA Packages – Package Dimensions (mm)

Sample	Body Size	Lead Count and Pitch							Factory	Data Sheet #
		0.4 mm	0.5 mm	0.65 mm	0.7 mm	0.8 mm	1 mm	1.27 mm		
 	11x11	–	–	212	–	–	–	–	T3	DS831
	12 x 12	550, 617, 841	529	289	–	196	121	–	K4, T3	DS831
	12 x 14	–	–	–	–	224	–	–	T3	DS831
	13 x 13	961	625	301, 283, 361	–	225	144	–	K4, T3	DS831
	13.5 x 25.2	–	–	588	–	–	–	–	T3	DS831
	14 x 14	1156	729	330, 400	–	220, 236, 256, 275, 282, 289	144, 158, 164, 169	–	K4, T3	DS831
	15 x 15	1032, 1084, 1296	841	249, 271, 367, 374, 431, 433, 484	–	260, 289, 324	164, 196	–	K4, T3	DS831
	15 x 20	1448	–	–	–	–	–	–	K4	DS831
	16 x 16	1521	961	489, 529	–	361	225	–	K4, T3	DS831
	17 x 17	–	–	488, 489, 516, 517, 558, 561, 566, 592, 621, 623, 625	–	301, 337, 344, 352, 392, 395, 400, 417	196, 244, 252, 254, 256	–	K4, T3	DS831
	18 x 18	–	–	–	–	–	437	–	K4	DS831
	19 x 19	–	–	458, 557, 629, 640, 662, 780, 784	–	409, 418, 437, 441, 480, 481, 484, 497, 525, 529	244, 253, 260, 277, 320, 324	–	K4, T3	DS831
	20 x 20	–	–	–	–	440	–	–	K4	DS831
	21 x 21	–	–	818, 957, 961	729 (0.75 mm)	407, 437, 477, 484, 510, 519, 520, 521, 528, 538, 573, 595, 613, 614, 621, 623, 625	278, 368, 396, 399, 400	–	K4, T3, K5	DS831
	22 x 22	–	–	–	–	–	399, 503	244	K4	DS831
	23 x 23	–	–	834, 852, 860, 905, 911, 960, 1001, 1059, 1150, 1156	–	532, 533, 548, 561, 573, 596, 602, 605, 607, 617, 631, 635, 648, 656, 663, 664, 672, 676, 684, 729, 756, 760, 773, 780, 784	456, 480, 484	–	K4, T3, K5, J7	DS550
	24 x 24	–	–	–	–	697, 737, 827, 841	–	–	K4	DS550
	24.5 x 19.5	–	–	–	–	655	–	–	T3	DS550
	25 x 25	–	–	1031, 1313, 1369, 1372	–	632, 665, 676, 754, 818, 837, 896, 900	444, 490, 495, 529, 560, 564, 572, 576	360	K4, T3	DS550
	27 x 27	–	–	–	–	760, 777, 812, 836, 851, 871, 873, 889, 928, 947, 957, 972, 994, 1008, 1019, 1020, 1022, 1024, 1069, 1071, 1073, 1084, 1089	276, 479, 484, 512, 528, 544, 562, 563, 564, 572, 573, 575, 576, 582, 592, 596, 615, 625, 650, 665, 668, 672, 675, 676	256, 360	K4, T3, K5, J7, J3	DS550
	28 x 28	–	–	–	–	–	725	–	K4	DS831
	29 x 29	–	–	–	–	913, 962, 963, 1006, 1019, 1022, 1033, 1152, 1156, 1159, 1192, 1203, 1221, 1225	620, 692, 729, 738, 753, 762, 780, 783, 784	–	K4, T3, J7, J3	DS831
	31 x 31	–	–	–	–	1021, 1024, 1118, 1128, 1156, 1177, 1184, 1201, 1290, 1365, 1369, 1408, 1417, 1440, 1443	500, 537, 636, 640, 672, 684, 692, 708, 713, 719, 736, 741, 744, 749, 754, 772, 788, 821, 829, 841, 880, 884, 888, 894, 896, 899, 900	304, 525	K4, T3, J7, J3	DS831
31 x 41	–	–	–	–	1348	–	–	K5	DS831	
32 x 32	–	–	–	–	–	897	–	K4	DS831	
33 x 33	–	–	–	–	1292, 1600	780, 844, 880, 961, 982, 1004, 1020, 1023, 1024	589, 613	K4, T3, K5, J7, J3	DS831	
35 x 35	–	–	–	–	1215, 1292, 1302, 1330, 1351, 1378, 1413, 1636, 1686, 1713, 1738, 1764, 1822, 1845	677, 777, 817, 825, 830, 836, 857, 869, 900, 924, 931, 960, 962, 972, 976, 1008, 1068, 1089, 1106, 1112, 1122, 1136, 1144, 1147, 1148, 1152, 1153, 1155, 1156	388	K4, T3, J7, J3	DS831	

Full array ball counts (ball count shown indicates maximum package size produced to date)


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非封装实际尺寸，仅表示可选的封装。联系 Amkor 的销售以了解更多产品的信息。

FCBGA Packages (Cont.) – Package Dimensions (mm)

Sample	Body Size	Lead Count and Pitch							Factory	Data Sheet #	
		0.4 mm	0.5 mm	0.65 mm	0.7 mm	0.8 mm	1 mm	1.27 mm			
	37.5 x 37.5	-	-	-	2152, 2228	1633, 2025	876, 900, 1089, 1112, 1148, 1211, 1256, 1262, 1274, 1284, 1288, 1292, 1295, 1296, 1311, 1365, 1369, 1435	784	K4, T3, K5, J7	DS831	
	40 x 25	-	-	-	-	-	932	-	T3	DS831	
	40 x 40	-	-	-	2904	-	792, 1121, 1144, 1152, 1157, 1248, 1344, 1358, 1377, 1384, 1413, 1420, 1433, 1435, 1444, 1445, 1497, 1508, 1509, 1510, 1513, 1517, 1520, 1521	717, 900, 956	K4, T3, K5, J7	DS831	
	42.5 x 42.5	-	-	-	-	-	1152, 1189, 1208, 1244, 1252, 1308, 1357, 1433, 1461, 1517, 1521, 1605, 1608, 1632, 1648, 1657, 1661, 1668, 1671, 1677, 1680, 1681, 1738, 1759, 1760, 1764	652, 1072, 1085	K4, T3, K5, J7	DS831	
	44 x 44	-	-	-	-	-	1837	-	K4	DS831	
	45 x 45	-	-	-	-	-	1041, 1517, 1680, 1713, 1724, 1728, 1747, 1760, 1762, 1825, 1831, 1837, 1848, 1876, 1894, 1896, 1912, 1916, 1924, 1926, 1932, 1935, 1936	-	K4, T3	DS831	
	47 x 47	-	-	-	-	-	2076	-	K4	DS831	
	47.5 x 47.5	-	-	-	-	-	2824	2003, 2013, 2097, 2112, 2115, 2116	-	K4, T3, K5, J7	DS831
	50 x 50	-	-	-	-	-	-	1979, 2253, 2303, 2319, 2361, 2368, 2381, 2389, 2397, 2401	-	K4, T3	DS831
	52.5 x 45	-	-	-	-	-	-	-	1345, 1355	T3	DS831
	52.5 x 52.5	-	-	-	-	-	-	2511, 2572, 2577, 2589, 2597, 2601	-	K4, T3	DS831
	53 x 53	-	-	-	-	-	-	2700	-	K4	DS831
	55 x 55	-	-	-	-	-	-	2693, 2738, 2770, 2782, 2796, 2797, 2798, 2809, 2816, 2828, 2840, 2852, 2855, 2856, 2864, 2868, 2876, 2879, 2882, 2887, 2892, 2912, 2915, 2916	1668, 1764	K4, K5, T3	DS831
	57.5 x 57.5	-	-	-	-	-	-	3107, 3136	-	K4	DS831
	60 x 60	-	-	-	-	-	-	2460, 3291, 3342, 3389, 3439, 3441, 3452, 3477, 3481	-	K4, T3	DS831
	62.5 x 62.5	-	-	-	-	-	-	3582, 3629, 3645, 3746, 3806, 4016, 4140	-	K4	DS831
	65 x 65	-	-	-	-	-	-	4096	-	K4	DS831
	55 x 72	-	-	-	-	-	-	1929, 2079	-	K4	DS831
	56 x 66	-	-	-	-	-	-	3454	-	K4	DS831
	67.5 x 67.5	-	-	-	-	-	-	4344	-	K5	DS831
77 x 67	-	-	-	-	-	4926 (0.87 mm; LGA)	-	-	K5	DS831	
85 x 85	-	-	-	-	-	-	-	2200	K4	DS831	


Full array ball counts (ball count shown indicates maximum package size produced to date)

Stacked CSP (SCSP) Packages – Package Dimensions (mm)


Sample	Body Size	Lead Count and Pitch											Factory	Data Sheet #	
		0.4 mm	0.5 mm	0.6 mm	0.65 mm	0.75 mm	0.8 mm	0.9 mm	1 mm	1.20 mm	1.27 mm	2 mm			
	3 x 3	–	25	–	–	–	–	–	–	–	–	–	–	K4	DS573
	3.5 x 3.5	–	48, 49	–	–	–	–	–	–	–	–	–	–	K4	DS573
	4 x 4	81	41, 48	–	–	–	–	–	–	–	–	–	–	K4	DS573
	4.5 x 4.5	–	40, 60	–	–	–	–	–	–	–	–	–	–	K4	DS573
	5 x 5	97	56, 64, 65, 72, 76, 77, 81	–	49	–	–	–	–	–	–	–	–	K4	DS573
	5.7 x 9.3	–	–	–	–	–	26	–	–	–	–	–	–	C3	DS573
	6 x 6	140	64, 76, 84, 96, 97, 100, 121	–	49, 64	–	–	–	–	–	–	–	–	K4	DS573
	6 x 8	181	–	–	–	54	63	–	48	–	–	–	–	K4	DS573
	6.2 x 7.2	–	96	–	–	–	–	–	–	–	–	–	–	K4	DS573
	6.5 x 8	–	–	–	–	–	67	–	–	–	–	–	–	C3	–
	6.5 x 11	–	–	–	–	–	67	–	–	–	–	–	–	C3	DS573
	6.6 x 6.9	–	105	–	–	–	–	–	–	–	–	–	–	K4	DS573
	7 x 7	209, 211	84, 117, 121, 143, 144, 160, 169	98	64, 81, 84	81	49	–	–	–	–	–	–	C3, K4	DS573
	7 x 10	–	52, 210	–	–	–	81	–	–	–	–	–	–	C3	DS573
	7.5 x 7.5	210	–	–	–	–	–	–	–	–	–	–	–	K4	DS573
	8 x 8	252	113, 120, 128, 160, 161, 176, 196, 208, 225	–	105, 140	92, 100	64	–	–	–	–	–	–	C3, K4	DS573
	8 x 9	–	153	–	130	–	–	–	–	–	–	–	–	K4	DS573
	8 x 9.2	–	44	–	–	–	–	–	–	–	–	–	–	K4	DS573
8 x 10	–	–	–	130	–	–	–	–	–	–	–	–	–	–	–
8 x 11	–	–	–	–	–	56, 88	–	–	–	–	–	–	C3, K4	DS573	
8 x 11.6	–	–	–	–	–	73	–	–	–	–	–	–	K4	DS573	
8 x 12	–	–	–	–	–	66, 67, 74	–	44	–	–	–	–	K4	DS573	
9 x 7	–	–	–	–	–	56	–	–	–	–	–	–	K4	DS573	
9 x 9	296	128, 204, 216, 225, 236	–	124, 144, 160	121	81, 100	–	–	–	–	–	–	K4	DS573	
9 x 11	–	–	–	165	–	63, 103, 105	–	–	–	–	–	–	C3, K4	DS573	
9 x 12	–	–	–	132, 192	–	107, 130	–	–	–	–	–	–	–	–	–
9 x 13.3	–	315	–	–	–	–	–	–	–	–	–	–	–	–	DS573
10 x 10	360, 387	173, 180, 216, 259, 268, 328, 345	–	196	144	100, 121, 128, 144	–	409	–	–	–	–	C3, K4	DS573	
10 x 11	–	153	–	–	–	63	–	–	–	–	–	–	–	–	–
10 x 12	–	–	–	–	–	79, 88	–	–	–	–	–	–	K4	DS573	
10 x 13	–	–	–	–	–	63	–	64	–	–	–	–	C3	DS573	
10 x 13.5	–	–	–	–	–	149	–	–	–	–	–	–	J3	DS573	
10 x 14	–	–	–	–	–	96	–	–	–	–	–	–	K4	DS573	
10.5 x 10.5	–	316	–	–	–	–	–	–	–	–	–	–	K4	DS573	
10.5 x 13	–	–	–	–	–	107, 137	–	–	–	–	–	–	C3, K4	DS573	
11 x 8	–	133	–	–	–	72, 88, 107, 133	–	–	–	–	–	–	K4	DS573	
11 x 10	–	153	–	–	–	–	–	–	–	–	–	–	C3	DS573	
11 x 11	432	225, 256	–	200	–	144, 169	–	468	–	–	–	–	K4	DS573	
11 x 11.5	–	–	–	134	–	–	–	–	–	–	–	–	K4	DS573	
11 x 13	–	153	–	–	–	105, 135	–	–	–	–	–	–	C3, K4	DS573	
11 x 13.5	–	–	–	162	–	–	–	–	–	–	–	–	K4	DS573	
11 x 14	–	–	–	225	–	–	–	–	–	–	–	–	–	–	DS573
11.5 x 11.5	–	–	–	134	–	–	–	–	–	–	–	–	K4	DS573	
11.5 x 13	–	153, 162, 221	–	134	–	–	–	–	–	–	–	–	C3, K4	DS573	
11.5 x 13.04	–	153	–	–	–	–	–	–	–	–	–	–	C3	DS573	
11.8 x 14.6	–	–	–	–	–	110	70	–	–	–	–	–	C3	DS573	

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Stacked CSP (SCSP) Packages (Cont.) – Package Dimensions (mm)

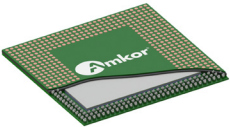
Sample	Body Size	Lead Count and Pitch											Factory	Data Sheet #
		0.4 mm	0.5 mm	0.6 mm	0.65 mm	0.75 mm	0.8 mm	0.9 mm	1 mm	1.20 mm	1.27 mm	2 mm		
	12 x 12	216	168, 228, 260, 272, 277, 289, 318, 385	–	208	–	117, 128, 144, 160, 161, 168, 179, 196	–	–	–	–	–	C3, K4	DS573
	12 x 16	–	132, 169	–	–	–	224	–	–	–	–	–	K4	DS573
	12 x 17	–	–	–	–	–	–	–	–	–	–	60	K4	DS573
	12 x 17	–	–	–	–	–	–	–	60	–	–	–	C3	DS573
	12 x 17	–	–	–	–	–	110	–	–	–	–	–	C3	DS573
	12 x 18	–	169	–	199	–	100, 224	–	132	–	–	–	K4	DS573
	12 x 18	–	–	–	–	–	252	–	–	–	–	–	C3	DS573
	13 x 13	–	289, 325, 341, 401, 417	–	294	–	225	–	144	–	–	–	K4	DS573
	14 x 14	270	220, 240, 348, 409, 516	–	151, 152, 300	–	134	–	–	–	–	–	C3, K4	DS573
	14 x 17.2	–	–	–	–	–	–	–	–	16	–	–	C3	DS573
	14 x 18	–	169	–	–	–	52, 53, 152	–	100, 152	–	–	52	K4	DS573
	14 x 18	–	–	–	–	–	272	–	–	–	–	–	C3	DS573
	14 x 22	–	–	–	–	–	–	–	–	–	119	–	K4	DS573
	15 x 15	–	543	–	160, 272	–	208, 255, 289	–	196	–	–	–	K4	DS573
	16 x 20	–	–	–	–	–	291	–	–	–	–	–	C3	DS573
	17 x 17	–	–	–	–	–	208, 256	–	256	–	–	–	K4	DS573
19 x 19	–	–	–	–	–	361, 484	–	260, 324	–	–	–	K4	DS573	

fcTMV® Packages – Nominal Package Dimensions (mm)

Sample	Body Size	TMV® Qty	BGA Qty	TMV® Diameter	BGA Diameter	Pitch – TMV®/BGA	Package Height	Factory	Data Sheet #
	10 x 6	136	180	0.23	0.25	0.40/0.50	0.66	K4	–
	12 x 13	320	858	0.27	0.21	0.40/0.40	0.60	K4	–
	12 x 12	216	569	0.25	0.25	0.40/0.40	1.15	K4	–
	12 x 12	216	745	0.27	0.25	0.40/0.57	0.78	K4	–
	14 x 14	256	1031	0.25	0.25	0.40/0.40	0.73	K4	–
	17 x 17	42	272 (LGA)	0.80	0.35 (LGA)	1.10/0.77 (LGA)	0.82	K4	–
	12 x 12	168	263	0.33	0.25	0.50/0.65	0.70	K4	–
	12 x 12	168	515	0.28	0.26	0.50/0.40	0.71	K4	–
	14 x 14	152	515	0.30	0.30	0.65/0.50	0.99	K4	–
	12 x 12	216	547	0.25	0.26	0.40/0.40	0.9	K4	–


*Simulated results @ 100 MHz

Interposer PoP Packages – Nominal Package Dimensions (mm)

Sample	Body Size	Memory Lead Qty	CCB Qty	BGA Qty	BGA Raw Diameter	Package Height (max)	Pitch – Memory Interface/CCB/BGA	Factory	Data Sheet #
	16 x 16	216	216 (solder ball to solder ball)	1400	0.22	1.25	0.40/0.40/0.40	K4	DS840
	12.4 x 14	496	314	1099	0.205	0.56	0.40/ 0.27/0.35	K4	DS840
	12.4 x 12.7	556	276	1017	0.205	0.56	0.40/0.27/0.35	K4	DS840
	12.4 x 12.4	556	278	893	0.22	0.58	0.40/0.27/0.35	K4	DS840
	12.4 x 12.4	556	276	914	0.22	0.58	0.40/0.27/0.35	K4	DS840
	12 x 12.7	366	258	885	0.22	0.63	0.40/0.27/0.35	K4	DS840
	15.6 x 15	387	356	994	0.24	0.64	0.50/0.27/0.40	K4	DS840
	15.6 x 15	387	283	1044	0.24	0.67	0.50/0.27/0.40	K4	DS840
	15.2 x 15	527	408	994	0.24	0.67	0.50/0.27/0.50	K4	DS840

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fcCSP Packages – Nominal Package Dimensions (mm)

Sample	Body Size	Lead Count	BGA Size	Ball Count	Package Height	Ball Pitch	Tray Matrix	Units Per Tray	Factory	Package Outline Drawing #	Data Sheet #
	2 x 2.8	24	0.3	24	0.17	0.4	14 x 35	490	C3, K4	744167PO0C	DS577
	2 x 4	32	0.3	32	0.17	0.4	14 x 35	490	C3, K4	718064PO0B	DS577
	2.21 x 3.05	17	N/A	17	N/A	0.5	14 x 35	490	C3, K4	No POD	DS577
	3 x 3	40	0.25	40	1.15 max.	0.4	14 x 35	490	C3, K4	652316PO	DS577
	3 x 7.5	53	0.5	53	1.2	0.5	14 x 26	364	C3, K4	607973PO0A	DS577
	3 x 8	48	0.5	48	1.15	0.65	14 x 26	364	C3, K4	610538PO	DS577
	3.2 x 2.8	21	LGA	21	0.88	0.4	14 x 35	490	C3, K4	421994PO	DS577
	4 x 4	21	LGA	21	0.9	0.5	14 x 35	490	C3, K4	480926PO	DS577
	4.2 x 3.3	44	0.3	44	0.93	0.4	14 x 26	364	C3, K4	N7170-1	DS577
	5 x 5	32	LGA	32 LGA	0.72	0.4	14 x 35	490	P3	795863PO	DS577
	5 x 5	33	LGA	33	0.9	0.5	14 x 35	490	C3, K4	463062PO0A	DS577
	5 x 5	36	LGA	36 LGA	0.72	0.4	14 x 35	490	P3	787208PO	DS577
	5 x 5	39	LGA	36	0.72	0.4	14 x 35	490	C3, K4	6439789PO	DS577
	5 x 5	64	0.3	64	0.88	0.7	N/A	N/A	C3, K4	500693PO0B	DS577
	5 x 5	44	LGA	44	0.72	0.4	14 x 35	490	P3	787184PO	DS577
	5 x 6	53	LGA	53	1.1	0.4	14 x 35	490	C3, K4	411115PO	DS577
	5 x 6	102	0.3	102	0.74	0.5	N/A	N/A	C3, K4	434380PO0A	DS577
	5 x 6	102	0.25	102	0.73	0.452 min.	13 x 31	403	C3, K4	437557PO	DS577
	5 x 7	97	0.25	97	1.00 max.	0.5	14 x 26	364	C3, K4	568933PO	DS577
	5 x 7	136	0.3	136	0.88	0.4	14 x 26	364	C3, K4	VN041-1	DS577
	5.3 x 5.25	36	LGA	36	0.72	0.5	N/A	N/A	C3, K4	477833PO0A	DS577
	5.4 x 6.2	152	0.3	152	0.9	0.4	14 x 26	364	C3, K4	637713PO	DS577
	5.5 x 6.51	NA	0.15	216	0.52	216	12 x 34	408	C3	NT90-PB420-1	DS577
	6 x 6	81	0.3	81	0.85	0.5	13 x 33	429	C3, K4	568993PO	DS577
	6 x 6	105	0.2	105	0.889 max.	0.46/0.65	12 x 29	348	C3, K4	684126PO	DS577
	6 x 6	105	0.3	105	0.92	0.5	14 x 35	490	C3, K4	VN346-1	DS577
	6 x 6	121	0.3	121	0.73	0.5	14 x 35	490	C3, K4	412011PO	DS577
	6 x 6.6	364	NA	NA	1	NA	14 x 26	364	C3, K4	N9650-1	DS577
	6.12 x 6.43	NA	0.22	253	0.6	0.35	11 x 28	308	K4	NT90-PB315-1	DS577
	6.2 x 7.8	196	0.25	196	1.00 max.	0.4	12 x 25	300	C3, K4	358233PO	DS577
	6.5 x 6.5	97	0.25	97	0.77	0.4	10 x 26	260	C3, K4	488013PO	DS577
	6.5 x 6.5	144	0.3	144	1	0.5	N/A	N/A	C3, K4	429130PO0A	DS577
	6.6 x 5.8	56	0.5	56	1.17	0.8	12 x 28	336	C3, K4	656455PO	DS577
	6.6 x 6.6	195	0.3	195	0.8	0.4	N/A	N/A	C3, K4	442617PO0A	DS577
6.7 x 8	136	0.3	136	1.49	0.5	12 x 25	300	C3, K4	607179PO	DS577	
6.8 x 6.2	90	0.3	90	0.88	0.7	10 x 26	260	C3, K4	481017PO0A	DS577	
6.9 x 7.8	326	0.2	326	0.82 max.	0.4	10 x 26	260	C3, K4	742710PO	DS577	
7 x 7	40	LGA	40	0.97	0.5	10 x 26	260	P3	766847PO	DS577	
7 x 7	64	0.5	64	1.11	0.8	N/A	N/A	C3, K4	487086PO	DS577	
7 x 7	64	0.5	64	1.596	0.8	N/A	N/A	C3, K4	495076PO	DS577	
7 x 7	64	0.5	64	1.506	0.8	N/A	N/A	C3, K4	496907PO	DS577	
7 x 7	191	0.3	191	0.95	0.4	10 x 26	260	C3, K4	VK575-1	DS577	
7 x 7	196	0.3	196	0.88	0.5	10 x 26	260	C3, K4	577133PO	DS577	
7 x 7	256	0.3	256	0.93	0.4	N/A	N/A	C3, K4	429501PO0A	DS577	



fcCSP

fcCSP

*Simulated results @ 100 MHz

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fcCSP Packages (Cont.) – Nominal Package Dimensions (mm)

Sample	Body Size	Lead Count	BGA Size	Ball Count	Package Height	Ball Pitch	Tray Matrix	Units Per Tray	Factory	Package Outline Drawing #	Data Sheet #
 	7 x 7.5	277	0.3	277	0.82	0.4	12 x 29	348	C3, K4	438217PO	DS577
	7 x 9	208	0.3	208	1	0.4	N/A	N/A	C3, K4	445259PO0A	DS577
	7 x 9	252	0.3	252	0.92	0.5	13 x 25	325	C3, K4	675144PO	DS577
	7.4 x 8.2	302	0.2	302	0.79	0.4	10 x 26	260	C3, K4	757705PO	DS577
	7.5 x 7.5	221	0.3	221	0.82	0.4	10 x 26	260	C3, K4	409303PO	DS577
	7.5 x 8.5	324	0.3	324	0.82	0.4	10 x 26	260	C3, K4	562538PO	DS577
	7.8 x 7.8	251	0.3	251	0.88	0.4	10 x 26	260	C3, K4	N2703-1	DS577
	8 x 6.5	53	LGA	50	1.1	0.4	10 x 26	260	C3, K4	476666PO	DS577
	8 x 8	69	0.8	69	2.91	0.8	10 x 26	260	C3, K4	87180PO	DS577
	8 x 8	165	0.3	165	0.76	0.5	12 x 29	348	C3, K4	638236PO	DS577
	8 x 8	188	0.3	188	0.9	0.5	N/A	N/A	C3, K4	492338PO	DS577
	8 x 13	135	0.46	135	2.36	0.8	N/A	N/A	C3, K4	670744PO	DS577
	8 x 13.5	253	0.5	253	1.32	0.5/0.6	10 x 17	170	C3, K4	468833PO	DS577
	8.1 x 8.1	157	0.3	157	0.99	0.5	10 x 26	260	C3, K4	604909PO	DS577
	8.4 x 9.2	NA	0.22	506	0.81	0.35	9 x 24	216	K4	734426PO	DS577
	8.5 x 10.5	479	0.2	479	0.8	0.4	22 x 10	220	C3, K4	647400PO	DS577
	8.5 x 11	269	0.3	269	0.84	0.5	10 x 21	210	C3, K4	497854PO	DS577
	8.6 x 7.7	76	0.4	76	0.94	0.8	12 x 28	336	C3, K4	559715PO	DS577
	8.8 x 8.8	176	0.3	176	0.88	0.7	10 x 26	26	C3, K4	NT90-Y5378-1	DS577
	9 x 9	256	0.3	256	0.90	0.5	10 x 26	260	P3	613775PO	DS577
	9.5 x 7.5	314	0.3	314	0.84 ± 0.10	0.4	10 x 21	210	C3, K4	472295PO0D	DS577
	10 x 10	69	0.5	69	1.16	1	8 x 23	184	C3, K4	443458PO	DS577
	10 x 10	69	1	69	2.91	1	8 x 23	184	C3, K4	303399PO	DS577
	10 x 10	116	0.3	116	1.05	0.8	N/A	N/A	C3, K4	406269PD0A	DS577
	10 x 10	144	0.46	144	1.91	0.8	8 x 21	168	C3, K4	464793PO	DS577
	10 x 10	144	0.5	144	1.4	0.8	8 x 23	184	C3, K4	686544PO	DS577
	10 x 10	235	0.3	235	0.86 ± 0.10	0.5	8 x 23	184	C3, K4	431863PO0A	DS577
	10 x 10	284	0.3	284	0.98	0.5	8 x 21	168	C3, K4	344519PO	DS577
	10 x 10	297	0.3	297	1	0.5	8 x 21	168	C3, K4	N3944-1	DS577
	10 x 10	391	0.3	391	1	0.4	8 x 23	184	C3, K4	611696PO	DS577
	10 x 10	424	0.25	424	0.95 max.	0.4	8 x 21	168	C3, K4	438402PO	DS577
	10 x 10	454	N/A	454	N/A	0.4	8 x 21	168	C3, K4	No POD	DS577
	10 x 10	521	0.3	521	0.86 ± 0.10	0.4	8 x 21	168	C3, K4	451777PO0B	DS577
	10 x 10.5	268	0.3	268	0.86 ± 0.10	0.5	8 x 20	160	C3, K4	461677PO0A	DS577
	10.6 x 10.6	54	0.45	54	0.85	0.65	8 x 21	168	C3, K4	715264PO	DS577
	10.7 x 10.7	337	0.2	337	0.889 max.	0.46/0.65	9 x 21	189	C3, K4	617598PO	DS577
	10.9 x 10.9	469	0.3	469	0.9	0.4	8 x 21	168	C3, K4	636373PO	DS577
	10.9 x 10.9	469	0.3	469	0.9	0.4	8 x 21	168	C3, K4	710371PO	DS577
	11 x 8	300	0.3	300	0.84	0.4	N/A	N/A	C3, K4	439355PO0A	DS577
	11 x 11	169	0.4	169	0.85	0.8	8 x 22	176	C3, K4	679034PO	DS577
11 x 11	325	0.3	325	0.91	0.5	8 x 22	176	C3, K4	583696PO	DS577	
11 x 11	361	0.3	361	0.89	0.5	8 x 22	176	C3, K4	695725PO	DS577	
11 x 11	576	0.3	576	1.05	0.4	8 x 22	176	C3, K4	N2970-1	DS577	

*Simulated results @ 100 MHz

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fcCSP Packages (Cont.) – Nominal Package Dimensions (mm)

Sample	Body Size	Lead Count	BGA Size	Ball Count	Package Height	Ball Pitch	Tray Matrix	Units Per Tray	Factory	Package Outline Drawing #	Data Sheet #
 	11 x 11.8	599	0.25	599	0.90 max.	0.4	8 x 21	168	K4	850159PO	DS577
	11 x 11.8	566	0.25	599	0.90 max.	0.4	8 x 21	168	K4	824554PO	DS577
	11 x 13.5	325	0.3	325	1.06	0.5	8 x 17	136	C3, K4	606183PO	DS577
	11.7 x 11.6	539	0.3	539	0.9	0.4	9 x 21	189	C3, K4	558280PO	DS577
	11.7 x 11.7	492	0.3	492	0.9	0.4	9 x 21	189	C3, K4	640560PO	DS577
	11.8 x 11	491	0.25	491	0.90 max.	0.4	8x21	168	K4	816866PO	DS577
	11.8 x 12.2	680	0.25	680	0.90 max.	0.4	8x19	152	K4	814369PO0A	DS577
	12 x 12	121	0.5	121	1.51	1	8 x 21	168	C3, K4	339265PO	DS577
	12 x 12	121	0.6	121	1.82	1	8 x 19	152	C3, K4	408392PO	DS577
	12 x 12	121	0.6	121	2.09 max.	1	9 x 21	189	C3, K4	613853PO	DS577
	12 x 12	121	0.64	121	2.57	1	8 x 20	160	C3, K4	585453PO	DS577
	12 x 12	288	0.3	288	1.30 max.	0.67	8 x 20	160	C3, K4	434097PO	DS577
	12 x 12	424	0.3	424	1.05	0.5	9 x 21	189	C3, K4	VB699-2	DS577
	12 x 12	424	0.3	424	1.05	0.5	9 x 21	189	C3, K4	VB699-5	DS577
	12 x 12	425	0.3	425	1.05	0.5	N/A	N/A	C3, K4	491076PO	DS577
	12 x 12	488	0.3	488	0.96	0.4	8 x 21	168	C3, K4	697685PO	DS577
	12 x 14	821	0.3	821	0.94	0.4	7 x 20	140	C3, K4	685510PO	DS577
	12.1 x 13.3	597	0.3	597	0.9	0.4	7 x 17	117	C3, K4	629993PO	DS577
	12.2 x 9.8	486	0.25	486	1.00 max.	0.4	8 x 24	192	C3, K4	360006PO	DS577
	12.6 x 12.6	669	0.25	669	1.00 max.	0.4	8 x 19	152	C3, K4	359715PO	DS577
	13 x 10	517	0.3	517	1.673	0.5	8 x 24	192	C3, K4	548093PO	DS577
	13 x 13	144	0.5	144	1.51	1	8 x 20	160	C3, K4	452287PO	DS577
	13 x 13	225	0.46	225	1.89 max.	0.8	8 x 20	160	C3, K4	481847PO	DS577
	13 x 13	357	0.4	357	1.62	0.7	7 x 17	119	C3, K4	500908PO0C	DS577
	13 x 13.4	771	0.25	771	0.90 max.	0.4	7 x 17	119	K4	802710PO0B	DS577
	13 x 13.4	873	0.25	873	0.90 max.	0.4	7 x 17	119	C3, K4	751666PO	DS577
	13.3 x 12.1	570	0.3	570	0.9	0.4	7 x 20	140	C3, K4	591657PO	DS577
	13.3 x 12.1	570	0.3	570	0.9	0.4	7 x 20	140	C3, K4	654178PO	DS577
	13.3 x 12.1	600	0.3	600	0.9	0.4	7 x 20	140	C3, K4	710373PO	DS577
	13.8 x 13.8	288	0.5	288	1.62	0.7	7 x 17	119	C3, K4	NT90-NH568-1	DS577
	13.9 x 12.3	255	0.4	255	1.29 max.	0.8	7 x 17	119	C3, K4	446695PO	DS577
	14 x 12	720	0.3	720	0.15	0.4	8 x 17	136	C3, K4	769163PO0A	DS577
	14 x 12	727	0.3	727	0.15	0.4	8 x 17	136	C3, K4	NT90-P1720-1-rev-A	DS577
	14 x 12	760	0.3	760	0.96	0.4	8 x 17	136	C3, K4	700025PO	DS577
	14 x 14	617	0.3	617	1.21	0.5	7 x 17	119	C3, K4	465801PO	DS577
	14 x 14	617	0.3	617	0.91	0.5	7 x 17	119	C3, K4	473925PO	DS577
	14 x 14	625	0.3	625	0.98	0.5	7 x 17	119	C3, K4	751921PO	DS577
	15 x 15	195	0.6	195	1.8	1	7 x 18	126	C3, K4	607829PO	DS577
	15 x 15	484	0.4	484	1.22 max.	0.65	7 x 17	119	C3, K4	617815PO	DS577
	15 x 15	990	N/A	990	N/A	0.4/0.5	7 x 18	126	C3, K4	No POD	DS577
15 x 15	992	N/A	992	N/A	0.4	7 x 17	119	C3, K4	No POD	DS577	
16 x 16	536	0.3	536	1.35	0.5	6 x 15	90	C3, K4	637699PO	DS577	
17 x 17	358	0.46	358	1.7 max.	0.8	N/A	N/A	C3, K4	358903PO	DS577	

*Simulated results @ 100 MHz

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fcSCSP Packages – Nominal Package Dimensions (mm)

Sample	Body Size	Lead Count	BGA Size	Ball Count	Package Height	Ball Pitch	Tray Matrix	Units Per Tray	Factory	Package Outline Drawing #	Data Sheet #
<div style="display: flex; align-items: center; justify-content: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; margin-right: 10px;">fcSCSP</div>  <div style="writing-mode: vertical-rl; font-weight: bold; margin-left: 10px;">fcSCSP</div> </div>	6.7 x 4	110	0.25	110	1.26	0.4	11 x 35	385	C3, K4	658535PO	DS577
	7.2 x 7.2	736	0.135	736	0.6	0.35	10 x 24	240	K4	NT90-PC105-1	DS577
	7.2 x 7.4	347	0.135	347	0.6	0.35	10 x 26	260	K4	NT90-P6103-1	DS577
	7.6 x 7.8	385	0.135	385	0.65	0.35	10 x 24	240	K4	NT90-P0194-1	DS577
	8.6 x 8.2	333	0.25	333	1.00 max.	0.4	10 x 26	260	C3, K4	487887PO	DS577
	9 x 9	383	0.25	383	1.11 max.	0.4	10 x 26	260	C3, K4	446263PO	DS577
	9 x 8.2	441	N/A	441	N/A	0.35	10 x 26	260	C3, K4	No POD	DS577
	8.6 x 8.4	443	0.195	443	0.75 max.	0.35	9 x 23	207	C3, K4	638413PO	DS577
	9.9 x 8.6	460	0.25	460	0.65 max.	0.4	8 x 22	176	C3, K4	612182PO	DS577
	11 x 11.4	852	0.18	852	0.66	0.35	8 x 20	160	K4	0850865PO	DS577
	12 x 12	640	0.25	640	1.08	0.4	9 x 21	189	C3, K4	690104PO	DS577
	13 x 11.5	775	N/A	775	N/A	0.35/0.65	8 x 21	168	C3, K4	No POD	DS577

*Simulated results @ 100 MHz

引线框架封装

引线框架封装多年以来都是行业的标准。Amkor 拥有两种最受欢迎的传统引脚框架封装类型：小外形集成电路 (SOIC) 和四方扁平封装 (QFP); 依据引脚伸出的侧面数量，它们通常也被分别称为“两侧”和“四侧”产品。

引线封装采用焊线或倒装芯片技术，以实现芯片和引脚框架封装载体之间的互连。引脚框架封装被广泛运用于大量的电子器件，而且依然是适用于众多低到中等引脚数量应用的最实用、最具性价比的解决方案。

双侧封装，常用于存储器、模拟集成电路和微控制器等各种消费品及汽车产品中。此类封装提供各式各样的封装功能，尤其是以有竞争力的成本制造低引脚数量的设备。



四侧封装，大量应用于 ASIC、DSP、微控制器和存储器 IC。它包含各种开放式与封闭式工具，为中等和低引脚数量的集成电路提供低成本的可靠解决方案。

MicroLeadFrame® QFN 封装是一种采用铜引脚框架基板的近似 CSP 塑料封装。该类型封装的外围引脚位于封装底部，提供与印刷电路板的电接触，并以 ExposedPad 技术优化热性能。基于出色的热和电气性能，MLF® 封装是任何对尺寸、重量和封装性能有要求的应用的理想选择。

为了进一步提升 MLF® 封装设计的稳固性，我们开发了 Edge Protection™ 技术，在加工操作如测试和表面贴装封装 (SMA) 中为器件的边缘提供保护。

此外，阶梯切割制程使可润湿侧翼成为可能，并可灵活运用于 MLF®/QFN/DFN 不同封装尺寸的应用。多种可供选择的可润湿侧翼选项都可实现填锡，便于汽车电子 PCB 后 组装的自动光学检查 (AOI)。

SSOP/QSOP Packages – Nominal Package Dimensions (inches unless otherwise specified)

	Sample	Lead Count	Body Width	Body Length	Body Thickness	Standoff	Overall Height	Lead Pitch	Tip-to-Tip	JEDEC	Electrical Performance*					Factory	Package Outline Drawing #	Data Sheet #	
											Pad Size (mm)	Lead	Self Inductance (nH)	Bulk Capacitance (pF)	Self Resistance (mΩ)				
SSOP		14/16	5.3 mm (209 mil)	6.2 mm	1.73 mm	0.13 mm	1.86 mm	0.65 mm	7.80 mm	MO-150	-	-	-	-	-	P1	32289	DS360	SSOP
		20	5.3 mm (209 mil)	7.2 mm	1.73 mm	0.13 mm	1.86 mm	0.65 mm	7.80 mm	MO-150	3.9 x 5.4	Longest Shortest	2.260 0.958	0.395 0.209	19.0 9.10	P1	32289	DS360	
		24	5.3 mm (209 mil)	8.2 mm	1.73 mm	0.13 mm	1.86 mm	0.65 mm	7.80 mm	MO-150	-	-	-	-	-	P1	32289	DS360	
		28	5.3 mm (209 mil)	10.2 mm	1.73 mm	0.13 mm	1.86 mm	0.65 mm	7.80 mm	MO-150	3.9 x 5.1	Longest Shortest	2.510 0.928	0.463 0.206	21.5 9.57	P1	32289	DS360	
QSOP		16	0.150	0.194	0.058	0.006	0.064	0.025	0.236	MO-137	-	-	-	-	-	P1	32864	DS360	QSOP

*Simulated results @ 100 MHz

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TSSOP/MSOP Packages – Nominal Package Dimensions (mm)

	Sample	Lead Count	Body Width	Body Length	Body Thickness	Standoff	Overall Height	Lead Pitch	Tip-to-Tip	JEDEC	Electrical Performance*					Factory	Package Outline Drawing #	Data Sheet #
											Pad Size (mm)	Lead	Self Inductance (nH)	Bulk Capacitance (pF)	Self Resistance (mΩ)			
TSSOP		8	4.4	3.0	0.90	0.10	1.00	0.65	6.4	MO-153	–	Longest Shortest	1.470 0.725	0.224 0.177	13.7 7.5	P1	38118	DS350
		14	4.4	5.0	0.90	0.10	1.00	0.65	6.4	MO-153	–	–	–	–	–	P1	38118	DS350
		16	4.4	5.0	0.90	0.10	1.00	0.65	6.4	MO-153	–	–	–	–	–	P1	38118	DS350
		20	4.4	6.5	0.90	0.10	1.00	0.65	6.4	MO-153	–	–	–	–	–	P1	38118	DS350
		28	4.4	9.7	0.90	0.10	1.00	0.65	6.4	MO-153	–	Longest Shortest	2.100 0.713	0.368 0.180	16.1 6.8	P1	38118	DS350
		38	4.4	9.7	0.90	0.10	1.00	0.50	6.4	MO-153	–	–	–	–	–	P1	38118	DS350
MSOP		8	3.0	3.0	0.85	0.10	0.95	0.65	5.0	MO-187	–	–	–	–	–	P1	37830	DS350
		10	3.0	3.0	0.85	0.10	0.95	0.50	5.0	MO-187	–	–	–	–	–	P1	37830	DS350

*Simulated results @ 100 MHz



SOIC Packages – Nominal Package Dimensions (inches)

	Sample	Lead Count	Body Width	Body Length	Body Thickness	Standoff	Overall Height	Lead Pitch	Tip-to-Tip	JEDEC	Electrical Performance*					Factory	Package Outline Drawing #	Data Sheet #
											Pad Size (mm)	Lead	Self Inductance (nH)	Bulk Capacitance (pF)	Self Resistance (mΩ)			
SOIC Narrow		8	0.150	0.194	0.058	0.006	0.064	0.050	0.236	MS-012	–	–	–	–	–	P1	00019	DS370
		14	0.150	0.342	0.058	0.006	0.064	0.050	0.236	MS-012	–	–	–	–	–	P1	00019	DS370
		16	0.150	0.391	0.058	0.006	0.064	0.050	0.236	MS-012	–	–	–	–	–	P1	00019	DS370
SOIC Wide		16	0.300	0.407	0.092	0.009	0.101	0.050	0.406	MS-013	–	–	–	–	–	P1	00020	DS370
		20	0.300	0.505	0.092	0.009	0.101	0.050	0.406	MS-013	–	–	–	–	–	P1	00020	DS370

*Simulated results @ 100 MHz






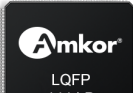
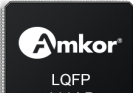
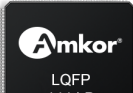






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ExposedPad TSSOP/MSOP/SOIC/SSOP Packages – Nominal Package Dimensions (mm)

	Sample	Lead Count	Body Width	Body Length	Body Thickness	Standoff	Overall Height	Lead Pitch	Tip-to-Tip	JEDEC	Electrical Performance*			Factory	Package Outline Drawing #	Data Sheet #
											Pad Size (mm)	Center Inductance (nH)	Corner Inductance (nH)			
ePad TSSOP		8	4.4	3.0	0.90	0.10	1.00	0.65	6.40	MO-153	–	–	–	P1	38118	DS571
		14	4.4	5.0	0.90	0.10	1.00	0.65	6.40	MO-153	–	–	–	P1	38118	DS571
		16	4.4	5.0	0.90	0.10	1.00	0.65	6.40	MO-153	3.0 x 3.0	1.58	2.28	P1	38118	DS571
		20	4.4	6.5	0.90	0.10	1.00	0.65	6.40	MO-153	3.0 x 4.2	1.68	2.45	P1	38118	DS571
		28	4.4	9.7	0.90	0.10	1.00	0.65	6.40	MO-153	3.0 x 5.5	1.70	2.65	P1	38118	DS571
		38	4.4	9.7	0.90	0.10	1.00	0.50	6.40	MO-153	–	–	–	P1	38118	DS571
ePad MSOP	N/A	8	3.0	3.0	0.85	0.10	0.95	0.65	5.00	MO-187	1.73 x 2.39	1.50	2.20	P1	37830	DS571
		10	3.0	3.0	0.85	0.10	0.95	0.50	5.00	MO-187	–	–	–	P1	37830	DS571
ePad SOIC		8	3.9	4.9	1.47	0.05	1.52	1.27	6.00	MS-012	–	–	–	P1	50396	DS571
		16	3.9	9.9	1.47	0.05	1.52	1.27	6.00	MS-012	–	–	–	P1	50396	DS571
ePad SSOP		36	7.6	10.3	2.28	0.05	2.45	0.50	10.40	MO-271	–	–	–	P1	469970	DS571

*Simulated results @ 100 MHz





LQFP Packages – Nominal Package Dimensions (mm)

Sample	Body Size	Lead Count	Body Thickness	Lead Pitch	Lead Form	Standoff	Foot Length	Tip-to-Tip	JEDEC	Tray Matrix	Units Per Tray	Electrical Performance*				Factory	Package Outline Drawing #	Data Sheet #	
												Pad Size (mm)	Lead	Self Inductance (nH)	Bulk Capacitance (pF)				Self Resistance (mΩ)
	7 x 7	32	1.4	0.8	1	0.1	0.6	9	MS-026	10 x 25	250	5 x 5	Longest Shortest	0.904 0.799	0.211 0.202	9.2 7.8	P1, J3	34604/ JMD3S072286	DS232
	7 x 7	48	1.4	0.5	1	0.1	0.6	9	MS-026	10 x 25	250	5 x 5	Longest Shortest	1.110 0.962	0.225 0.200	13.8 12.0	P1, J3, J5	34604/ JMD4S071223	DS232
	7 x 7	64	1.4	0.4	1	0.1	0.6	9	MS-026	10 x 25	250	-	-	-	-	-	P1, J5	34604/ JMD3S072288	DS232
	10 x 10	44	1.4	0.8	1	0.1	0.6	12	MS-026	8 x 20	160	-	-	-	-	-	P1, J5	34607/ JMD3S072296	DS232
	10 x 10	52	1.4	0.65	1	0.1	0.6	12	MS-026	8 x 20	160	-	-	-	-	-	P1, J5	34607/ JMD3S072289	DS232
	10 x 10	64	1.4	0.5	1	0.1	0.6	12	MS-026	8 x 20	160	-	-	-	-	-	P1, J3, J5	34607/ JMD4S071225	DS232
	10 x 10	80	1.4	0.4	1	0.1	0.6	12	MS-026	8 x 20	160	-	-	-	-	-	J3	34607/ JMD3S072302	DS232
	12 x 12	64	1.4	0.65	1	0.1	0.6	14	-	7 x 17	119	-	-	-	-	-	J5	JMD3S072290	DS232
	12 x 12	80	1.4	0.5	1	0.1	0.6	14	MS-026	7 x 17	119	-	-	-	-	-	P1, J3, J5	51023/ JMD3S072297	DS232
	12 x 12	100	1.4	0.4	1	0.1	0.6	14	-	7 x 17	119	-	-	-	-	-	J5	51023	DS232
	14 x 14	52	1.4	1	1	0.1	0.6	16	MS-026	6 x 15	90	-	-	-	-	-	P1	-	DS232
	14 x 14	64	1.4	0.8	1	0.1	0.6	16	MS-026	6 x 15	90	-	-	-	-	-	P1	473945	DS232
	14 x 14	80	1.4	0.65	1	0.1	0.6	16	MS-026	6 x 15	90	-	-	-	-	-	P1, J5	473945/ JMD3S072292	DS232
	14 x 14	100	1.4	0.5	1	0.1	0.6	16	MS-026	6 x 15	90	8 x 8	Longest Shortest	2.300 1.520	0.419 0.322	26.3 17.8	P1, J3, J5	473945/ JMD4S072050	DS232
	14 x 14	120	1.4	0.4	1	0.1	0.6	16	MS-026	6 x 15	90	-	-	-	-	-	P1, J3, J5	473945/ JMD3S072293/ JMD3S072298	DS232
	14 x 14	128	1.4	0.4	1	0.1	0.6	16	MS-026	6 x 15	90	-	-	-	-	-	P1, J5	473945/ JMD3S072293/ JMD3S072298	DS232
	16 x 16	120	1.4	0.5	1	0.1	0.6	18	-	6 X 15	90	-	-	-	-	-	J5	JMD3S072294	DS232
	16 x 16	144	1.4	0.4	1	0.1	0.6	18	-	6 X 15	90	-	-	-	-	-	J5	JMD3S072295	DS232
	14 x 20	128	1.4	0.5	1	0.1	0.6	16.0 x 22.0	MS-026	6 x 12	72	-	-	-	-	-	J3	JMD3S072304	DS232
	20 x 20	128	1.4	0.5	1	0.1	0.6	22	MS-026	5 x 12	60	-	-	-	-	-	P1	473996	DS232
	20 x 20	144	1.4	0.5	1	0.1	0.6	22	MS-026	5 x 12	60	8.5 x 8.5	Longest Shortest	6.430 4.230	1.100 1.070	62.9 52.6	P1, J4, J3, J5	473996/ JMD3S072299	DS232
	20 x 20	176	1.4	0.4	1	0.1	0.6	22	MS-026	5 x 12	60	-	-	-	-	-	P1, J3, J5	473996/ JMD3S072300	DS232
	24 x 24	160	1.4	0.5	1	0.1	0.6	26	MS-026	4 x 10	40	-	-	-	-	-	P1	32780	DS232
	24 x 24	176	1.4	0.5	1	0.1	0.6	26	MS-026	4 x 10	40	8 x 8	Longest Shortest	9.510 5.200	1.270 1.340	89.0 64.0	P1, J4, J3, J5	32780/ JMD3S072301	DS232
	24 x 24	216	1.4	0.4	1	0.1	0.6	26	MS-026	4 x 10	40	-	-	-	-	-	P1, J4, J3	32780/ JMD3S072310	DS232
	28 x 28	208	1.4	0.5	1	0.1	0.6	30	MS-026	4 x 9	36	11 x 11	Longest Shortest	9.670 6.190	1.380 1.210	86.2 64.8	P1, J4	34514/ JMD3S072311	DS230, DS232
	28 x 28	256	1.4	0.4	1	0.1	0.6	30	MS-026	4 x 9	36	-	-	-	-	-	P1, J4	34514/ JMD3S072312	DS230, DS232

*Simulated results @ 100 MHz


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TQFP Packages – Nominal Package Dimensions (mm)

Sample	Body Size	Lead Count	Body Thickness	Lead Pitch	Lead Form	Standoff	Foot Length	Tip-to-Tip	JEDEC	Tray Matrix	Units Per Tray	Electrical Performance*					Factory	Package Outline Drawing #	Data Sheet #
												Pad Size (mm)	Lead	Self Inductance (nH)	Bulk Capacitance (pF)	Self Resistance (mΩ)			
   	5 x 5	32	1.0	0.5	1	0.1	0.6	7	MS-026	12 x 30	360	–	–	–	–	–	P1	40138	DS230
	7 x 7	32	1.0	0.8	1	0.1	0.6	9	MS-026	10 x 25	250	5 x 5	Longest Shortest	0.904 0.799	0.211 0.202	9.2 7.8	P1	32770	DS230
	7 x 7	48	1.0	0.5	1	0.1	0.6	9	MS-026	10 x 25	250	5 x 5	Longest Shortest	1.110 0.962	0.225 0.200	13.8 12.0	P1, J4	32770	DS230
	7 x 7	64	1.0	0.4	1	0.1	0.6	9	MS-026	10 x 25	250	–	–	–	–	–	P1	32770	DS230
	10 x 10	44	1.0	0.8	1	0.1	0.6	12	MS-026	8 x 20	160	–	–	–	–	–	P1	32772	DS230
	10 x 10	52	1.0	0.65	1	0.1	0.6	12	MS-026	8 x 20	160	–	–	–	–	–	P1	32772	DS230
	10 x 10	64	1.0	0.5	1	0.1	0.6	12	MS-026	8 x 20	160	–	–	–	–	–	P1, J4	32772	DS230
	10 x 10	80	1.0	0.4	1	0.1	0.6	12	MS-026	8 x 20	160	–	–	–	–	–	P1	32772	DS230
	12 x 12	80	1.0	0.5	1	0.1	0.6	14	MS-026	7 x 17	119	–	–	–	–	–	P1	32774	DS230
	12 x 12	100	1.0	0.4	1	0.1	0.6	14	–	7 x 17	119	–	–	–	–	–	J3	JMD3S061011	DS230
	14 x 14	52	1.0	1	1	0.1	0.6	16	MS-026	6 x 15	90	–	–	–	–	–	P1	–	DS230
	14 x 14	64	1.0	0.8	1	0.1	0.6	16	MS-026	6 x 15	90	–	–	–	–	–	P1	473943	DS230
	14 x 14	80	1.0	0.65	1	0.1	0.6	16	MS-026	6 x 15	90	–	–	–	–	–	P1	473943	DS230
	14 x 14	100	1.0	0.5	1	0.1	0.6	16	MS-026	6 x 15	90	8 x 8	Longest Shortest	2.300 1.520	0.419 0.322	26.3 17.8	P1, J5	473943	DS230
	14 x 14	120	1.0	0.4	1	0.1	0.6	16	MS-026	6 x 15	90	–	–	–	–	–	P1	473943/ JMD3S072280	DS230
	14 x 14	128	1.0	0.4	1	0.1	0.6	16	MS-026	6 x 15	90	–	–	–	–	–	P1, J3, J5	473943/ JMD3S072280	DS230
	16 x 16	144	1.0	0.4	1	0.1	0.6	18	MS-026	6 x 15	90	–	–	–	–	–	P1, J3, J5	335487/ JMD3S072281	DS230
	20 x 20	144	1.0	0.5	1	0.1	0.6	22	MS-026	5 x 12	60	8.5 x 8.5	Longest Shortest	6.430 4.230	1.100 1.070	62.9 52.6	P1	473979	DS230
20 x 20	176	1.0	0.4	1	0.1	0.6	22	MS-026	5 x 12	60	–	–	–	–	–	P1	473979	DS230	




*Simulated results @ 100 MHz

ExposedPad LQFP Packages – Nominal Package Dimensions (mm)

Sample	Body Size	Lead Count	Body Thickness	Lead Pitch	Lead Form	Standoff	Foot Length	Tip-to-Tip	JEDEC	Tray Matrix	Units Per Tray	Electrical Performance*			Factory	Package Outline Drawing #	Data Sheet #
												Pad Size (mm)	Loop Inductance (nH) Center	Loop Inductance (nH) Corner			
	7 x 7	48	1.4	0.5	1	0.1	0.6	9	–	10 x 25	250	–	–	–	J5	–	DS231
	10 x 10	44	1.4	0.8	1	0.1	0.6	12	–	8 x 20	160	–	–	–	P1	430273	DS231
	10 x 10	52	1.4	0.65	1	0.1	0.6	12	–	8 x 20	160	–	–	–	P1	430273	DS231
	10 x 10	64	1.4	0.5	1	0.1	0.6	12	–	8 x 20	160	7.5 x 7.5	3.04	3.78	P1	430273	DS231
	14 x 14	52	1.4	1.0	1	0.1	0.6	16	–	6 x 15	90	–	–	–	P1	–	DS231
	14 x 14	64	1.4	0.8	1	0.1	0.6	16	–	6 x 15	90	–	–	–	P1	–	DS231
	14 x 14	80	1.4	0.65	1	0.1	0.6	16	–	6 x 15	90	–	–	–	P1	473945	DS231
	14 x 14	100	1.4	0.5	1	0.1	0.6	16	–	6 x 15	90	10.3 x 10.3	2.57	3.32	P1	473945	DS231
	14 x 14	128	1.4	0.4	1	0.1	0.6	16	–	6 x 15	90	–	–	–	P1	473945	DS231
	20 x 20	128	1.4	0.5	1	0.1	0.6	22	–	5 x 12	60	–	–	–	P1	473996	DS231
	20 x 20	144	1.4	0.5	1	0.1	0.6	22	–	5 x 12	60	7 x 7	4	5	P1, J4, J3	473996/JMD3S072329	DS231
	20 x 20	176	1.4	0.4	1	0.1	0.6	22	–	5 x 12	60	–	–	–	P1	473996	DS231
	24 x 24	160	1.4	0.5	1	0.1	0.6	26	–	4 x 10	40	–	–	–	P1	32780	DS231
	24 x 24	176	1.4	0.5	1	0.1	0.6	26	–	4 x 10	40	10 x 10	5	6	P1, J4, J3	32780/JMD4S060056	DS231
	24 x 24	216	1.4	0.4	1	0.1	0.6	26	–	4 x 10	40	–	–	–	P1, J4	32780/JMD4S061374	DS231
28 x 28	208	1.4	0.5	1	0.1	0.6	30	–	4 x 9	36	11 x 11	6	7	P1, J4	34514/JMD4S040721	DS231	
28 x 28	256	1.4	0.4	1	0.1	0.6	30	–	4 x 9	36	–	–	–	P1, J4	34514/JMD4S071468	DS231	

*JEDEC standard test boards – tested @ 1W with die attach pad soldered to PCB





ExposedPad TQFP Packages – Nominal Package Dimensions (mm)

Sample	Body Size	Lead Count	Body Thickness	Lead Pitch	Lead Form	Standoff	Foot Length	Tip-to-Tip	JEDEC	Tray Matrix	Units Per Tray	Electrical Performance*			Factory	Package Outline Drawing #	Data Sheet #
												Pad Size (mm)	Loop Inductance (nH) Center	Loop Inductance (nH) Corner			
  	5 x 5	32	1.0	0.5	1	0.1	0.6	7	–	12 x 30	360	–	–	–	P1	40579	DS231
	7 x 7	32	1.0	0.8	1	0.1	0.6	9	–	10 x 25	250	–	–	–	P1	32770	DS231
	7 x 7	48	1.0	0.5	1	0.1	0.6	9	–	10 x 25	250	5 x 5	2.29	2.81	P1, J4, J3	32770/JMD3S072313	DS231
	7 x 7	64	1.0	0.4	1	0.1	0.6	9	–	10 x 25	250	–	–	–	P1	32770	DS231
	10 x 10	44	1.0	0.8	1	0.1	0.6	12	–	8 x 20	160	–	–	–	P1	32772	DS231
	10 x 10	52	1.0	0.65	1	0.1	0.6	12	–	8 x 20	160	–	–	–	P1	32772	DS231
	10 x 10	64	1.0	0.5	1	0.1	0.6	12	–	8 x 20	160	7.5 x 7.5	3.04	3.78	P1, J4	32772/JMD3S072314	DS231
	10 x 10	80	1.0	0.4	1	0.1	0.6	12	–	8 x 20	160	–	–	–	P1	32772	DS231
	12 x 12	80	1.0	0.5	1	0.1	0.6	14	–	7 x 17	119	–	–	–	P1, J4	JMD3S072315	–
	14 x 14	52	1.0	1.0	1	0.1	0.6	16	–	6 x 15	90	–	–	–	P1	–	DS231
	14 x 14	64	1.0	0.8	1	0.1	0.6	16	–	6 x 15	90	–	–	–	P1	–	DS231
	14 x 14	80	1.0	0.65	1	0.1	0.6	16	–	6 x 15	90	–	–	–	P1	473943	DS231
	14 x 14	100	1.0	0.5	1	0.1	0.6	16	–	6 x 15	90	10.3 x 10.3	2.57	3.32	P1, J4, J3, J5	473943/JMD3S072316	DS231
	14 x 14	120	1.0	0.4	1	0.1	0.6	16	–	6 x 15	90	–	–	–	P1	473943	DS231
	14 x 14	128	1.0	0.4	1	0.1	0.6	16	–	6 x 15	90	–	–	–	P1, J3	JMD3S072319	–
	16 x 16	144	1.0	0.4	1	0.1	0.6	18	–	6 x 15	90	–	–	–	P1, J3	335487/JMD3S072320	DS231
	20 x 20	128	1.0	0.5	1	0.1	0.6	22	–	5 x 12	60	–	–	–	P1	473979	DS231
	20 x 20	144	1.0	0.5	1	0.1	0.6	22	–	5 x 12	60	7 x 7	4	5	P1	473979	DS231
20 x 20	176	1.0	0.4	1	0.1	0.6	22	–	5 x 12	60	–	–	–	P1, J3	473979/JMD3S072321	DS231	

*JEDEC standard test boards – tested @ 1W with die attach pad soldered to PCB

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MQFP Packages – Nominal Package Dimensions (mm)

Sample	Body Size	Lead Count	Body Thickness	Lead Pitch	Lead Form	Standoff	Tip-to-Tip	JEDEC	Tray Matrix	Units Per Tray	Electrical Performance*					Factory	Package Outline Drawing #	Data Sheet #
											Pad Size (mm)	Lead	Self Inductance (nH)	Bulk Capacitance (pF)	Self Resistance (mΩ)			
	10 x 10	44	2.00	0.8	1.60	0.15	13.2	MS-022	6 x 16	96	7.4 x 7.4	Longest Shortest	1.660 1.460	0.322 0.342	19.8 17.0	P1	–	DS232
	10 x 10	52	2.00	0.65	1.60	0.15	13.2	MS-022	6 x 16	96	–	–	–	–	–	P1	–	DS232
	10 x 10	64	2.00	0.5	1.60	0.15	13.20	MS-022	6 x 16	96	–	–	–	–	–	P1	–	DS232
	10 x 10	44	2.00	0.8	1.95	0.15	13.90	MS-112	6 x 16	96	–	–	–	–	–	P1	–	DS232
	10 x 10	52	2.00	0.65	1.95	0.15	13.90	MS-112	6 x 16	96	–	–	–	–	–	P1	–	DS232
	10 x 10	64	2.00	0.5	1.95	0.15	13.90	MS-112	6 x 16	96	–	–	–	–	–	P1	–	DS232
	14 x 14	52	2.67	1.0	1.60	0.15	17.20	MS-022	6 x 14	84	–	–	–	–	–	P1	–	DS232
	14 x 14	64	2.67	0.8	1.60	0.15	17.20	MS-022	6 x 14	84	–	–	–	–	–	P1	–	DS232
	14 x 14	80	2.67	0.65	1.60	0.15	17.20	MS-022	6 x 14	84	–	–	–	–	–	P1	–	DS232
	14 x 14	100	2.67	0.5	1.60	0.15	17.20	MS-022	6 x 14	84	–	–	–	–	–	P1	–	DS232
	14 x 14	52	2.67	1.0	1.95	0.15	17.90	MS-112	6 x 14	84	–	–	–	–	–	P1	–	DS232
	14 x 14	64	2.67	0.8	1.95	0.15	17.90	MS-112	6 x 14	84	–	–	–	–	–	P1, J5	–	DS232
	14 x 14	80	2.67	0.65	1.95	0.15	17.90	MS-112	6 x 14	84	–	–	–	–	–	P1	–	DS232
	14 x 14	100	2.67	0.5	1.95	0.15	17.90	MS-112	6 x 14	84	–	–	–	–	–	P1	–	DS232
	14 x 20	64	2.71	1.0	1.60	0.33	17.2 x 23.2	MS-022	6 x 11	66	–	–	–	–	–	P1	–	DS232
	14 x 20	80	2.71	0.8	1.60	0.33	17.2 x 23.2	MS-022	6 x 11	66	–	–	–	–	–	P1	–	DS232
	14 x 20	100	2.71	0.65	1.60	0.33	17.2 x 23.2	MS-022	6 x 11	66	–	–	–	–	–	P1	–	DS232
	14 x 20	128	2.71	0.50	1.60	0.33	17.2 x 23.2	MS-022	6 x 11	66	11.0 x 11.0	Longest Shortest	9.29 1.694	1.227 0.501	200.0 0.150	P1	–	DS232
	14 x 20	64	2.71	1.0	1.95	0.23	17.9 x 23.9	MS-112	6 x 11	66	–	–	–	–	–	P1	–	DS232
	14 x 20	80	2.71	0.8	1.95	0.23	17.9 x 23.9	MS-112	6 x 11	66	–	–	–	–	–	P1	–	DS232
	14 x 20	100	2.71	0.65	1.95	0.23	17.9 x 23.9	MS-112	6 x 11	66	–	–	–	–	–	P1	–	DS232
	14 x 20	128	2.71	0.5	1.95	0.23	17.9 x 23.9	MS-112	6 x 11	66	–	–	–	–	–	P1	–	DS232
	28 x 28	120	3.37	0.8	1.30	0.13	30.6	MS-029	3 x 8	24	–	–	–	–	–	P1	–	DS232
	28 x 28	128	3.37	0.8	1.30	0.13	30.6	MS-029	3 x 8	24	–	–	–	–	–	P1	–	DS232
	28 x 28	144	3.37	0.65	1.30	0.13	30.6	MS-029	3 x 8	24	–	–	–	–	–	P1	–	DS232
	28 x 28	160	3.37	0.65	1.30	0.13	30.6	MS-029	3 x 8	24	–	–	–	–	–	P1	–	DS232
	28 x 28	208	3.37	0.5	1.30	0.13	30.60	MS-029	3 x 8	24	–	Longest Shortest	9.86 3.723	7.945 2.948	0.937 0.325	P1	–	DS232
	28 x 28	256	3.37	0.4	1.30	0.13	30.60	MS-029	3 x 8	24	–	–	–	–	–	P1	–	DS232
	28 x 28	120	3.37	0.8	1.30	0.33	30.6	MS-029	3 x 8	24	–	–	–	–	–	P1	–	DS232
	28 x 28	128	3.37	0.8	1.30	0.33	30.6	MS-029	3 x 8	24	–	–	–	–	–	P1	–	DS232
	28 x 28	208	3.37	0.5	1.60	0.33	31.20	MS-022	3 x 8	24	–	–	–	–	–	P1	–	DS232
	28 x 28	256	3.37	0.4	1.60	0.33	31.20	MS-022	3 x 8	24	–	–	–	–	–	P1	–	DS232
	32 x 32	240	3.40	0.5	1.30	0.38	34.60	MS-029	3 x 8	24	12.7 x 12.7	Longest Shortest	16.84 7.87	9.480 1.513	217.5 0.543	P1	–	DS232
	32 x 32	240	3.40	0.5	1.30	0.32	34.60	MS-029	3 x 8	24	–	–	–	–	–	P1	–	DS232

*Simulated Results @ 100 MHz




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PLCC Packages – Nominal Package Dimensions (inches unless otherwise specified)

	Sample	Pkg Type	Lead Count	Body Size (mm)	Body Size (inches)	Body Thickness (inches)	Lead Pitch (inches)	JEDEC	Qty Per Tube	Electrical Performance*					Factory	Package Outline Drawing #	Data Sheet #
										Pad Size (mm)	Lead	Self Inductance (nH)	Bulk Capacitance (pF)	Self Resistance (mΩ)			
PLCC	 	Square	20	8.9 x 8.9	.352 x .352	0.152	0.05	MS-018	46	3.7 x 3.7	Longest Shortest	2.110 1.780	0.596 0.583	13.5 11.1	P1	00060	DS232
			28	11.5 x 11.5	.452 x .452	0.152	0.05	MS-018	37	6.6 x 6.6	–	–	–	–	P1	00060	DS232
			44	16.6 x 16.6	.652 x .652	0.152	0.05	MS-018	26	8.89 x 8.89	Longest Shortest	2.900 2.140	0.893 0.681	17.8 13.7	P1	00060	DS232
			52	–	.752 x .752	0.152	0.05	MS-018	23	–	–	–	–	–	P1	00060	DS232
			68	–	.952 x .952	0.150	0.05	MS-018	18	–	–	–	–	–	P1	00060	DS232
			84	29.3 x 29.3	1.152 x 1.152	0.150	0.05	MS-018	15	10.8 x 10.8	Longest Shortest	10.900 6.840	1.780 1.750	57.6 43.2	P1	00060	DS232
		Rectangular	32	–	.452 x .552	0.109	0.05	MS-016	30	–	–	–	–	–	P1	00061	DS232

*Simulated results @ 100 MHz


MicroLeadFrame®/MLF®/QFN/SON/DFN Packages – Nominal Package Dimensions (mm)

Sample	Body Size	MLF®/QFN/SON/DFN Leads	Pitch (mm)	Dual Row Lead Count Pitch (mm)	Electrical Performance*				Factory	Data Sheet #	
					Lead	Self Inductance (nH)	Bulk Capacitance (pF)	Self Resistance (mΩ)			
  	1 x 1	4, 6	0.35, 0.65	–	–	0.052	0.078	2.4	P3	DS572	
	2 x 2	4, 6, 8, 10, 12	0.50, 0.65	–	–	0.46	0.134	2	P3	DS572	
	2 x 3	8, 10, 12	0.4, 0.5, 0.65	–	–	–	–	–	P3	DS572	
	3 x 3	4, 6, 8, 10, 12	0.8, 0.65, 0.5, 0.4, 0.35, 0.3	–	–	Longest Shortest	0.564 0.531"	0.203 0.220	141.8 138.9	C3, P1, P3	DS572
	3 x 3	16	0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	3 x 3	20, 24	0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	4 x 4	8, 10, 12, 14	1.00, 0.8, 0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	0.044	0.189	1.9	C3, P1, P3, J4	DS572
	4 x 4	16, 18	0.8, 0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3, J4	DS572	
	4 x 4	20	0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3, J4	DS572	
	4 x 4	24, 28	0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3, J4	DS572	
	4 x 4	32	0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3, J4	DS572	
	4 x 4	40	0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	5 x 5	8, 10, 16	1.00, 0.8, 0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3, J4	DS572	
	5 x 5	20, 24	0.8, 0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	0.048	0.144	2.2	C3, P1, P3, J4	DS572
	5 x 5	28	0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3, J4	DS572	
	5 x 5	32, 36	0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3, J4	DS572	
	5 x 5	40	0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3, J4	DS572	
	5 x 5	44	–	–	0.5	–	–	–	C3, P3	DS572	
	5 x 5	52	–	–	0.5	–	–	–	C3, P3	DS572	
	6 x 5	18, 24	0.8, 0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P3	DS572	
	6 x 5	36	0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P3	DS572	
	6 x 5	42	0.4, 0.35, 0.3	–	–	–	–	–	C3, P3	DS572	
	6 x 6	16, 20	1.00, 0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3, J4	DS572	
	6 x 6	26, 28	0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	6 x 6	30, 32, 36, 40, 44	0.5, 0.4, 0.35, 0.3	–	–	–	0.052	0.175	2.5	C3, P1, P3, J4	DS572
	6 x 6	52	0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3, J4	DS572	
	6 x 6	56, 60, 64	0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	6 x 6	44, 60, 68	–	–	0.5	–	–	–	C3, P3	DS572	
	6 x 8	8	1.27	–	–	–	–	–	P3, J7	DS572	
	7 x 7	24, 32	0.8, 0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3, J4	DS572	
	7 x 7	36	0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3, J4	DS572	
	7 x 7	44, 48	0.5, 0.4, 0.35, 0.3	–	–	Longest Shortest	1.766 1.194	0.326 0.289"	315.1 234.5	C3, P1, P3	DS572
	7 x 7	56	0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3, J4	DS572	
7 x 7	68	0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572		
7 x 7	80	0.3	–	–	–	–	–	C3, P1, P3	DS572		
7 x 7	76	–	–	0.5	–	–	–	C3, P3	DS572		
7 x 7	84	–	–	0.5	–	–	–	C3, P3	DS572		

*Simulated results @ 12 GHz – values dependent on specific die and wire configurations

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MicroLeadFrame®/MLF®/QFN/SO/DFN Packages (Cont.) – Nominal Package Dimensions (mm)

Sample	Body Size	MLF®/QFN/SO/DFN Leads	Pitch (mm)	Dual Row Lead Count Pitch (mm)	Electrical Performance*				Factory	Data Sheet #	
					Lead	Self Inductance (nH)	Bulk Capacitance (pF)	Self Resistance (mΩ)			
	8 x 8	4	2.00, 1.42, 0.8, 0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	8 x 8	16	1.42, 0.8, 0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	8 x 8	32, 36	0.8, 0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	8 x 8	40	0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	8 x 8	52, 56	0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	8 x 8	64	0.4, 0.35, 0.3	–	–	–	–	–	P3, J3	DS572	
	8 x 8	68, 76	0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	8 x 8	88, 92	0.3	–	–	–	–	–	C3, P1, P3	DS572	
	8 x 8	84, 92, 100	–	–	0.5	–	–	–	–	C3, P1, P3	DS572
	9 x 9	36	0.8, 0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	9 x 9	44, 48	0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	9 x 9	60, 64	0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	9 x 9	76	0.4, 0.35, 0.3	–	–	0.051	0.129	2.4	C3, P1, P3, J4	DS572	
	9 x 9	88	0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	9 x 9	104	0.3	–	–	–	–	–	C3, P1, P3	DS572	
	9 x 9	100, 108, 116	–	–	0.5	–	–	–	–	C3, P3	DS572
	10 x 10	44	0.8, 0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	10 x 10	52, 56	0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	10 x 10	64, 68, 72	0.5, 0.4, 0.35, 0.3	–	–	Longest Shortest	2.179 1.475	0.518 0.409	337.5 250.8	C3, P1, P3	DS572
	10 x 10	88	0.4, 0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	10 x 10	100	0.35, 0.3	–	–	–	–	–	C3, P1, P3	DS572	
	10 x 10	116, 120	0.3	–	–	–	–	–	C3, P1, P3	DS572	
	10 x 10	132	–	–	0.5	–	–	–	–	C3, P3	DS572
	12 x 12	48	0.8, 0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1	DS572	
	12 x 12	60	0.65, 0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1	DS572	
	12 x 12	84, 88	0.5, 0.4, 0.35, 0.3	–	–	–	–	–	C3, P1	DS572	
	12 x 12	100, 108	0.4, 0.35, 0.3	–	–	–	–	–	C3, P1	DS572	
	12 x 12	124	0.35, 0.3	–	–	–	–	–	C3, P1	DS572	
	12 x 12	144	0.3	–	–	–	–	–	C3, P1	DS572	
	12 x 12	148	–	–	0.5	Longest Shortest	0.802 0.279	0.479 0.342	30.5 9.4	C3	DS572
	12 x 12	156, 164	–	–	0.5	Longest Shortest	0.787 0.276	0.468 0.332	30.4 9.8	C3	DS572
	13 x 13	164, 172, 180	–	–	0.5	Longest Shortest	0.497 0.208	0.325 0.318	20.0 7.7	C3	DS572

*Simulated results @ 12 GHz – values dependent on specific die and wire configurations

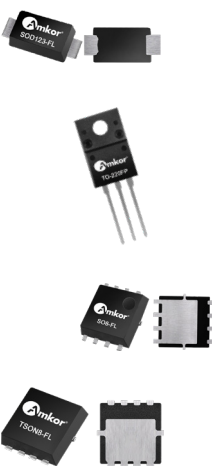
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Power Packages – Nominal Package Dimensions (mm)

Sample	Package	Lead Count	Body Width	Body Length	Body Thickness	Overall Height	Lead Pitch	Tip-to-Tip	JEDEC/JEITA	Factory	Package Outline Drawing #	Data Sheet #
	PSMC	3	4.4	6.1	1.1	1.1	2.13	6.5	JEDEC	M1	816867PO	DS617
	SOD123-FL	2	1.6	2.6	0.98	0.98	–	3.5	JEDEC	M1	798980PO	DS614
	SOD128-FL	2	2.4	3.8	0.98	0.98	–	4.7	JEDEC	M1	798800PO	DS613
	TO-220FP	3	10	15	4.5	–	2.54	28	–	M1	0850289PO	DS610
	DPAK	3	6.5	6.1	2.3	2.3	2.3	9.8	JEDEC	J6	JMD4S071870	DS414
	D2PAK	3	10	9.25	4.4	4.4	2.54	15.5	JEDEC	J6	JMD3S073456	DS619
	D2PAK	7	10	9.25	4.4	4.4	1.27	15.5	JEDEC	J6	JMD3S072779	DS619
	HSON8	8	5	5.4	1	1	1.27	5.15 x 6.0	–	J6	JMD4S071908	DS407
	SO8-FL	6	4.9	5.75	1	1	1.27	6.1	JEDEC	M1	746796PO	DS611
	SO8-FL	8	5	5	0.95	0.95	1.27	6	JEITA	M1	–	DS611
	SO8-FL	8	4.9	5.75	1	1	1.27	6.1	JEDEC	M1	808389PO	DS611
	TSON8-FL	8	3.1	3.1	0.85	0.85	0.65	3.3	JEDEC	M1	815788PO	DS612
	TSON8-FL	8	3.1	3.1	0.75	0.75	0.65	3.3	JEDEC	M1	817927PO	DS612
	TOLL	8	9.9	10.4	2.3	2.3	1.2	11.7	JEDEC	M1	777240PO, 0851402PO (w/ Kelvin pin) 777275PO (w/o Kelvin pin)	DS618
LFPACK	4	5	4.1	1.1	1.1	1.27	6	JEDEC	J6	JMD4S072407	DS415	
LFPACK8	8	4.9	4.8	1.15	1.2	1.27	6.15	JEDEC	M1	O853466PO	–	
eD2PAK	7	14	11.8	3.5	3.5	1.27	18.58	–	J6	Under registration	–	

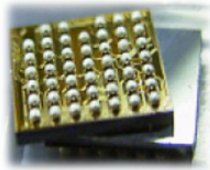
PQFN Power Packages – Nominal Package Dimensions (mm)

Sample	Package	Lead Count	Body Width	Body Length	Body Thickness	Overall Height	Lead Pitch	Tip-to-Tip	JEDEC/JEITA	Factory	Data Sheet #
	PQFN	8	3.3	3.3	1.05	1.05	0.65	3.3	JEDEC	M1, P3	DS416
	PQFN	8	5	6	1.05	1.05	1.27	6	JEDEC	M1, P3	DS416
	PQFN	8	8	8	1.05	1.05	–	8	JEDEC	M1, P3	DS416
	PQFN	22	5	6	1.05	1.05	–	6	JEDEC	M1, P3	DS416
	PQFN	22	3.5	4.5	0.75	0.75	–	4.5	JEDEC	M1, P3	DS416
	PQFN	31	5	5	0.75	0.75	–	5	JEDEC	M1, P3	DS416
	PQFN	39	5	6	0.75	0.75	–	6	JEDEC	M1, P3	DS416
	PQFN	40	6	6	0.75	0.75	0.5	6	JEDEC	M1, P3	DS416

Package layout and design are flexible to customer and application requirements

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晶粒和基板之间的电气和机械连接是任何倒装芯片封装结构最关键的因素之一。铜柱、铅锡和无铅焊料被用于形成此类连接或凸块，而且必须高质量黏着在晶粒上，在最大程度上降低阻抗，并提高组装成品率。焊锡凸块和铜柱的形成采用薄膜金属沉积、电镀或植球技术。

Amkor 提供晶圆级芯片尺寸封装 (WLCSP)，在器件和基板或最终产品的母板之间进行直接焊接互连。WLCSP 包括晶圆凸块（有或无焊盘重分布层，即 RDL）、晶圆级最终测试、器件单切和卷带封装，为完全一站式的解决方案提供支持。Amkor 的稳固的凸块下金属层位于晶粒有源表面的 PBO 或 PI 电介质层上方，提供能够适应严苛板级条件，并且满足全球消费者对可移动电子设备不断高涨需求的可靠的互连解决方案。

WLCSP 系列的适用范围广泛，可同时满足小外形尺寸和高性能要求，包括从高端 RF WLAN 组合芯片，到 FPGA、功率管理、闪存/EEPROM、集成无源网络和标准模拟应用。

WLCSP Die Processing Services (8" & 12")

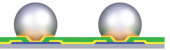


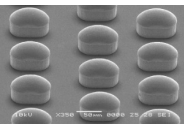
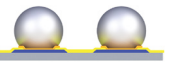
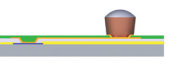

	Sample	Product Type	Factory	UBM Type	Solder Composition	Repassivation	Ball Count	Body Size	Pitch/Sphere Diameter	Die Thickness	Bump Height	RDL Trace/Space	Available Option		
WLCSP	BoR (2 mask)	CSP ^{BoR} BoR (Bump on Repassivation)	8": K4, T5, C3 12": K5, T1, C3, E1	Thick copper UBM	Pb-free SAC alloys (Plated) Sn/Ag Pb-free Cu pillar	PBO, PI, Low cure polymers	4~300	0.49~100 mm ²	0.50 mm/0.30 mm 0.40 mm/0.25 mm 0.35 mm/0.22 mm 0.30 mm/0.15 mm (0.15 mm sphere diameter is available)	150 µm to 450 µm	0.5 mm Pitch: 250 µm 0.4 mm Pitch: 198 µm 0.35 mm Pitch: 166 µm 0.3 mm Pitch: 114 µm	CSP ^{BoR} : 12/12 µm CSP ^{BoR} : 15/15 µm	Backside lamination Carrier Tape: 7" or 13" reels	WLCSP	
	CSP ^{RI} (4 mask)	CSP ^{RI} + RDL (Bump on Redistribution)													
	CSP ^{RI} (3 mask)	CSP ^{RI} + RDL (Bump on Redistribution)													
Reliability	Package Level	<ul style="list-style-type: none"> Preconditioning at Level 1: 85°C/85% RH, 168 hours, reflow @ 260°C peak Temp Cycle -55°C/+125°C, 2 cy/hr, 1000 cycles High Temp Storage 150°C, 1000 hours Unbiased HAST (uHAST): 130°C/85% RH, 96 hrs 													Reliability
	Board Level	<ul style="list-style-type: none"> Temp Cycle -40°C/+125°C, 1 cy/hr, 1000x Drop Test JEDEC condition B (1500G), 100 drops 													

WLFO Wafer Bump

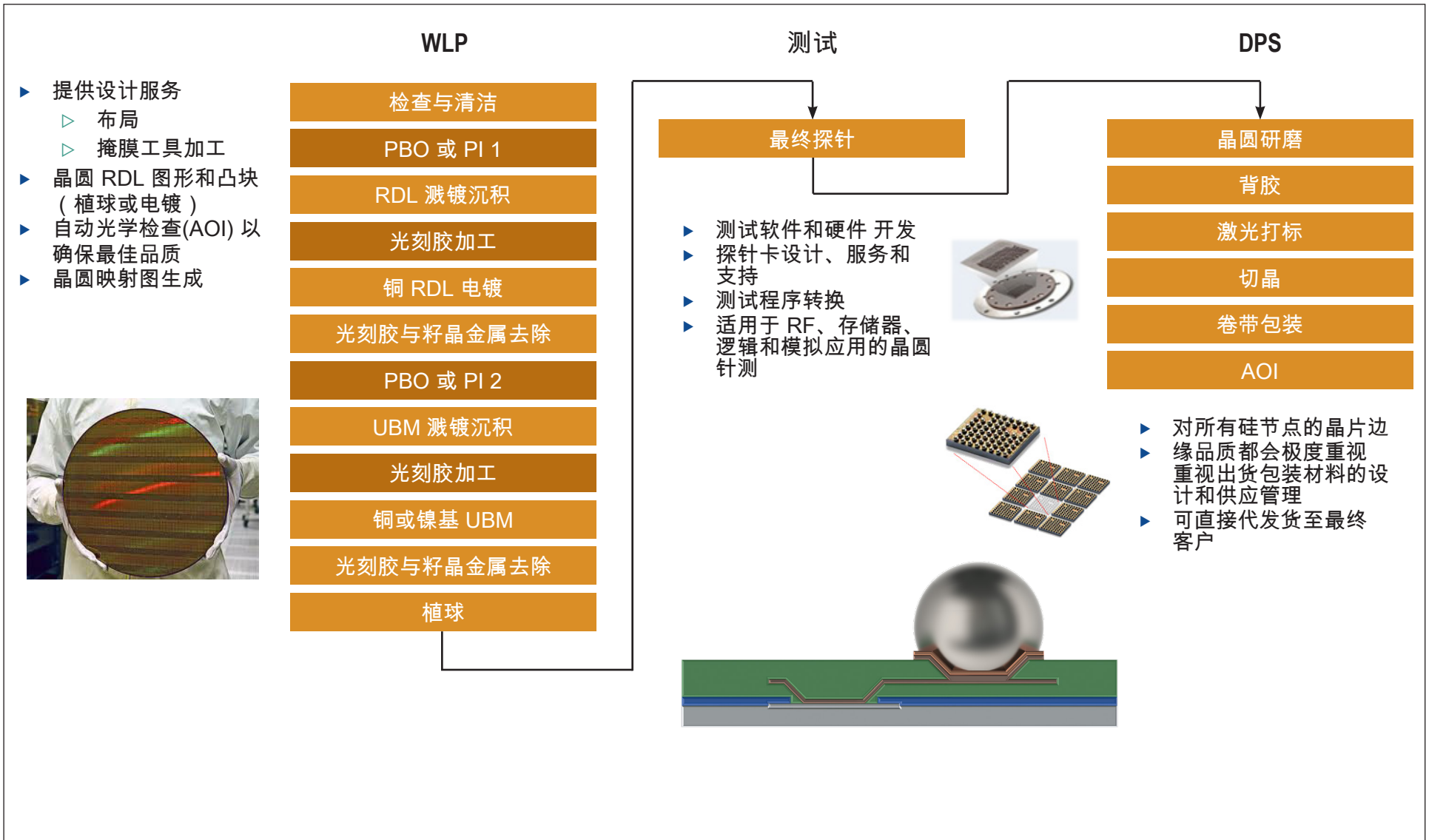
	Sample	Product Type	Factory	Seed Layer	RDL Trace/Space	UBM Type	Repassivation	Solder Composition	Pitch/Sphere Diameter	Bump Height	Min. Die Thickness	Body Size	Available Option		
WLFO	Without UBM 3 mask process	WLFO ³	K5, E1	Ti/Cu, TiW/Cu	12/12 µm	N/A	Low cure polymers	Pb-free SAC alloys	0.50 mm/0.30 mm 0.40 mm/0.25 mm 0.35 mm/0.22 mm	0.5 mm Pitch: 236 µm 0.4 mm Pitch: 194 µm 0.35 mm Pitch: 175 µm	300 µm	1.21 ~ 144 mm ²	Overmold, Exposed Die, Backside Lamination	WLFO	
	With UBM 4 mask process	WLFO ⁴	K5, E1	Ti/Cu, TiW/Cu	12/12 µm	Thick copper UBM, Ni/Au	Low cure polymers	Pb-free SAC alloys	0.50 mm/0.30 mm 0.40 mm/0.25 mm 0.35 mm/0.22 mm	0.5 mm Pitch: 236 µm 0.4 mm Pitch: 194 µm 0.35 mm Pitch: 175 µm	300 µm	1.21 ~ 144 mm ²	Overmold, Exposed Die, Backside Lamination		
Reliability	Package Level	<ul style="list-style-type: none"> Preconditioning at Level 1: 85°C/85% RH, 168 hours, reflow @ 260°C peak Temp Cycle -55°C/+125°C, 2 cy/hr, 1000 cycles High Temp Storage 150°C, 1000 hours Unbiased HAST (uHAST): 130°C/85% RH, 96 hrs 													Reliability
	Board Level	<ul style="list-style-type: none"> Temp Cycle -40°C/+125°C, 1 cy/hr, 1000x Drop Test JEDEC condition B (1500G), 100 drops 													

大多数封装均支持汽车元件。非封装实际尺寸，仅表示可选的封装。联系 Amkor 的销售以了解更多产品的信息。

Wafer Bump (8" & 12")

	Sample	Product Type	Factory	Low Alpha	Repassivation	Repassivation Opening	Typical Production Bump Height	Seed Layer	Pad Pitch Lower Limit	Wafer Example			
Wafer Bump	Solder Bumping RP 	SnAg Plating Bump with or without Redistribution	8": K4, T5, C3 12": K5, T1, C3	All available as ultra low alpha <math><0.002\text{ cts/hr/cm}^2</math>	PBO, PI, Low cure polymers	PBO/LTPI: Min. 15 μm PI: Min. 25 μm	150 μm array: 70 μm 125 μm peripheral: 75 μm	Ti/Cu, TiW/Cu	Solder bump: Array 150 μm pitch/ 75 μm UBM (min) Micro bump: Array 40 μm pitch/ 20 μm UBM (min)				
	Cu Pillar BOP 									Cu Pillar Plating Bump with or without Redistribution	8": K4, T5, C3 12": K5, T1, C3	Cu pillar bump: Staggered 25/50 μm pitch/25 μm UBM (min)	
	Solder Bumping BOP 	63Sn/37Pb Plating Bump with or without Redistribution	12": T1						Available as low alpha			PI	PI: Min. 25 μm
	Cu Pillar RDL 									Solder Bumping RDL 			

Wafer Bump



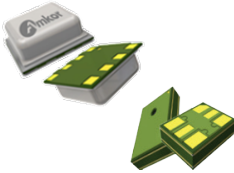
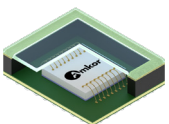
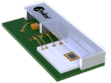
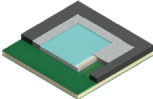
MEMS 和传感器

Amkor Technology 是微电子封装技术的全球领袖，也是世界最大的 MEMS 和 MOEMS (微光机电系统) 外包提供商。微机电系统 (MEMS) 是能够感知或操作实体世界的微型尺寸器件。MEMS 的制造采用集成电路 (IC) 设备类似的微细加工工艺。虽然这些器件的外观相似，但通常不能套用标准化的 IC 封装方


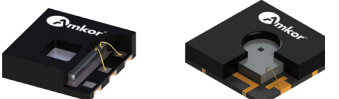

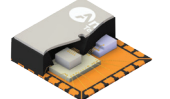

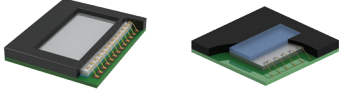
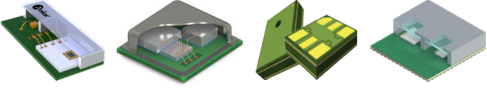
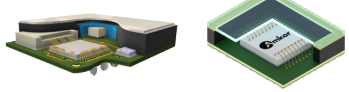
案。Amkor 为包括晶圆级在内的各种封装平台提供腔式，非腔式 and 混合式解决方案。

每个产品的封装结构和材料的选型，对整体传感解决方案的功能和性能都发挥着不可或缺的作用。

Cavity MEMS Packages

	Open Tool Available (Sample Builds)	Lead Count	Body Width (mm)	Body Length (mm)	Body Thickness (mm)	Pkg Type	Lid Type	Die Qty	Interconnect	Factory	POD Dwg	Unit Dwg
MEMS		8	2	2	0.8	Cavity LGA	Metal	Multi-die	WB	P3	TBD	-
		8	4	4	0.9	Cavity LGA	Metal	Multi-die	WB	P3	643113PO	-
		8	5	5	1	Cavity LGA	Metal	Multi-die	WB	P3	TBD	-
		8	7	7	1	Cavity LGA	Metal	Multi-die	WB	P3	647876PO	647874UD
		8	4	3	1	Cavity LGA	L2L	Multi-die	WB	P3	698505PO	698275UD
		8	5	2	1	Molded Cavity LGA/BGA	Glass/Filter	Single die	WB	C3	TBD	-
		22	6.8	4.9	1.2	Molded Cavity LGA/BGA	Glass/Filter	Single die	WB	C3	TBD	-
		20	6	6	1.9	Cavity LF	Polymer	Multi-die	WB	P3	610182PO	640993UD
		18	15	25	0.45	Molded Cavity LGA/BGA	Microlens	Single die	WB	C3	TBD	-

MEMS/Sensor Package Standards

Package Type	Overmolded	Exposed Die Surface	Cavity Package	Molded Cavity Package
Leadframe SOIC/MLF®				
ChipArray® LGA/FPBGA				

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非封装实际尺寸，仅表示可选的封装。联系 Amkor 的销售以了解更多产品的信息。

测试服务

Amkor Technology 提供完整的半导体测试服务，包括：

1. 测试制程 – 晶圆探针、最终测试、系统级测试、条带测试、老化、完整的下线服务和直接发货
2. 产品 – 分立式电源、数字、模拟、混合信号、存储器、SOC、RF、电源管理、MEMS、光学、汽车、传感器
3. 封装 – 传统引脚框架和基板封装，以及 WLCSP、MCM、SiP、堆叠、2.5D、SLIM™、SWIFT®
4. 测试工程 – 硬件和软件开发 开发、测试机转换转换、测试时间缩减、产量和产率提升、失效分析

Major IC Testers

Manufacturer	Tester Model	Application			
		Digital	Mixed	RF	Memory
Advantest	T2000	✓	✓	✓	-
	T5XXX (Memory)	✓	-	-	✓
	T65XX (SoC)	✓	✓	-	-
	93000 Series (including CX, SX and LX starting in 2020)	✓	✓	✓	-
Teradyne	Eagle Series (including ETS800)	✓	✓	-	-
	Flex/UFlex/UFlex+ Series	✓	✓	✓	✓
	J750 Series	✓	✓	✓	-
	Magnum	✓	✓	-	✓
Xcerra	X-Series, Diamond	✓	✓	✓	-
	PAX	✓	✓	✓	-
Yokogawa	TS6XXX Series	✓	✓	-	-
National Instrument	STS	✓	✓	✓	-
Chroma	3650	✓	✓	✓	-

Wafer Prober

Type	Wafer Size	Prober	Temp Range (°C)	Pin to Pad Accuracy	Min. Pad Size/Pitch	Docking
Wafer Probe	200 mm	TEL P8XL	Ambient ~ 150°C	±4 µm	50 µm/75 µm	Direct or Soft Dock
		TEL Precio Octo	Ambient ~ 150°C	±2 µm	40 µm/60 µm	Direct or Soft Dock
		EG 4090µ, 4090µ+	Ambient ~ 130°C	±4 µm/± 3 µm	50 µm/75 µm, 48 µm/72 µm	Direct or Soft Dock
		TSK UF200/200A	Ambient ~ 150°C	±4 µm	50 µm/75 µm	Direct or Soft Dock
	300 mm	TEL P12XLn+	-40°C ~ 150°C	±1.8 µm	38 µm/58 µm	Direct or Soft Dock
		TEL Precio/Precio Nano	-55°C ~ 150°C	±1.8 µm/±0.8 µm	38 µm/58 µm, 27 µm/41 µm	Direct or Soft Dock
		EG 6000	Ambient ~ 150°C	±2.5 µm	45 µm/67 µm	Direct or Soft Dock
		TSK UF3000ex (lx)	-55°C ~ 200°C	±1 µm	30 µm/45 µm	Direct or Soft Dock
Film Frame	300 mm	Semics OPUS3/OPUS3 SP	-55°C ~ 200°C	±1.5 µm/±1.0 µm	37 µm/56 µm, 30 µm/45 µm	Direct or Soft Dock
		TSK FP3000	-40°C ~ 150°C	±1.5 µm	37 µm/56 µm	-
		TEL WDF12DP+	Ambient ~ 150°C	±1.8 µm	38 µm/58 µm	-
		Semics OPUS3 FD12	Ambient	±1.5 µm	37 µm/56 µm	-

定期采用新的测试来满足客户需求。
请联系 Amkor 的全球测试服务，以了解表中未列出的其他具体能力。

Package Test Handler

Type of Handler	Manufacturer	Pkg Size (mm)		Pkg Type	Temp	Input/Output	Docking
		Min	Max				
Pick & Place	Hontech, Seiko Epson, Cohu (cold), Advantest, Techwing	2.5 x 2.5	55 x 72	BGA/CSP/LGA/MLF®/POP/TQFP/TSV	Ambient/Hot/Cold	Tray	Direct or Soft Dock
Gravity	Cohu, Xceltron	2 x 2	21 x 21	MLF®/SOIC/TQFP/TSSOP	Ambient/Hot/Cold	Tube, Bowl/Tube, TNR	Direct or Soft Dock
Turret	Cohu, SRM ASM	1 x 0.6	12 x 12	BGA/MLF®/QFP/SOIC/	Ambient/Hot	Bulk, Bowl/Canister, TNR	Soft Dock
Strip Test	MCT, Cohu	Not limited; below 1 mm with 130 µm pad size & 0.25 mm pitch		Leaded Pkg	Ambient/Hot/Cold	Strip/Singulated	Direct
Film Frame	MCT	Not limited; below 1 mm with 150 µm x 250 µm pad size & 0.3 mm pitch		sMLF®	Ambient	Film Frame	Direct

Strip Test/Film Frame Handler

Assembly Format	Handler	Temp Range (°C)	Contact Force	Packages
HDLF/FXDLF up to 100 x 300 mm	MCT H5000	-50 to +150 (±3)	77 kgf (option 194 kgf)	TQFP up to 64 lead, 10 x 10 mm
	Cohu SO3000			SOIC-N 150 mil, SOIC-W 300 mil, SOIC std 208 mil
HDLF/VHDLF 70 x 250 mm	MCT FFC (Film Frame) FH1200	Ambient	77 kgf (option 194 kgf)	TSSOP up to 28 lead (3.0 and 4.4 mm body sizes) Saw MLF® up to 11 x 6 mm

System Level Test

System in Package(SiP)/System on Chip (SOC) Test Content: Logic, Memory, Analog, RF Application: Industrial, Commercial, Automotive	
Manufacturer	Equipment Model
Teradyne	Titan, Magnus
Chroma	3260
Hontech	3216H
Techwing	TW301(N)

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Discrete/Power Test

Major Test Items	Test Handler
DC, Rg, VDSX(SUS), VCEX(SUS), Trr, Trr/Vsurge, ΔVDS/ΔVBE, Switching (trr/lrr/t off/t on/Latch), UIS, IC, Transient Test	Gravity, Turret, Strip Frame

Burn-In Oven

Memory	SOC	MCU	Analog	Logic/Automotive
Advantest, AEHR, STK	STK	Shikino Hightech	Shikino Hightech	MCC (LC2, HPB-4, HPB-5C), UniFusion (F-1)

End Of Line (EOL) Services

EOL Services	Available Package	Features
Laser Mark	CABGA, Cavity MEMS, fcCSP, fcSCSP, fpfcBGA, fpfcCSP, Hermetic, MLF®, PBGA, PLCC, PSSOP, QFP, SBGA, SC70, SCSP, SOIC, SSOP, TQFP, TSOP, TSSOP	Infra-red & Green Laser Marking, Arc Lamp
Scan		Package Size: Max. 60 x 60 mm
Bake		Temperature Range: Max. 200°C
Tape & Reel		Package Size: Bowl Type Min. 1 x 1 mm, Tray Type Min. 2.5 x 2.5 mm
Dry Pack		Vacuum Chamber Packing
Drop Ship		Warehouse Management

请联系 Amkor 的全球测试服务，以了解可供选择的工厂位置。



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客户声音快速反应

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