



电子元器件系列(中国.厦门) China.Xiamen
www.rf-china.com RF-Micom co.,Ltd

Email:sales@rf-china.com

Telephone:0086-592-5713956 Fax:5201617

Find It Fast

SOLDER PRACTICE KITS

SERIES	DESCRIPTION	VIEW	WEB CODE	PAGE
---	General Kit Information			65-66
953	BGA Visual Placement	BALL & BUMP KITS	XK1	67-69
901~909	Flip Chip Kit			70-71
921	BGA46 0.75mm pitch			72-73
963	Universal CSP 0.5/0.75/0.8mm			74-75
981	Universal BGA 0.8/1.0mm pitch			76-77
9981	BGA 1.0mm & 0.8mm pitch			78-79
976	BGA256 1.0mm/SBGA560 1.27mm pitch			80-81
974	LBGA1600/1936 Very Large 1.0mm			82-83
947	Universal BGA Daisy Chain			84-85
937	BGA 256/272 1.27mm pitch			86-87
967	BGA169/225			88-89
946	Universal BGA 1.27/1.5mm pitch			90-91
958	LBGA1225 Very Large 1.27mm			92-93
951	Ceramic CBGA			94-95
986	Lead Free Multicomponents			96-97
919	Large Machine Run	FINE PITCH KITS	XK1	98-99
928	Challenger 2			100-101
950	SMTA SABER Array			102-103
935/936	Stencil Evaluation			104-105
965	Rework 1 Practice	REWORK KITS	XK1	106-107
944	Rework 2 Practice			108-109
977	Rework 3 Practice			110-111
925	SMD Introductory			112-113
926	Practical Mixed Technology	MIXED TECHNOLOGY KITS	XK1	114-115
9696	Mixed Technology 1			116-117
914	Mixed Technology 2			118-119
938	Econo Kit II			142-143
939	Econo Kit III			144-145
912	Econo IV Recertification	MACHINE DIAGNOSTIC KITS	XK1	146-147
949	0201/0402 Chip Shooter			120-121
964	0402/0603 Chip Shooter			122-123
968	0805/1206 Chip Shooter			124-125
9618	Rotational Placement			134-135
9610	Fiducial Evaluation			136-137
931	Advanced QFP Assortment	QUAD FLAT PACK KITS	XK1	126-127
962	QFP Assortment			128-129
9625	QFP256 .4mm Pitch			130-131
9621	QFP208 .5mm Pitch			138-139

Find It Fast

SOLDER PRACTICE KITS

SERIES	DESCRIPTION	VIEW	WEBCODE	PAGE
910	Beginners Throughhole	THROUGHHOLE KITS	XK1	138-139
915~916	Multipurpose Throughhole		XK1	140-141

LEAD FREE KITS & COMPONENTS

SERIES	DESCRIPTION	VIEW	WEBCODE	PAGE
-	Lead Free Components	 Pb-Free Lead-Free		55-56
986	Multicomponents Kit			96-97
984	Chips 0402 & 0603 Kit			122-123

TOOLS & ACCESSORIES

SERIES	DESCRIPTION	VIEW	WEBCODE	PAGE
222-333	Vampire Vacuum Pick Up Tool	TOOLS & ESD	XY1	148
222	Vyper Desoldering Pump		XY1	149
250	PC Board Rework Holder		XY1	149
HRS	SMD Tape Splicing Tool		XY1	150
301	BGA Inspection Tool		XY1	151
RB2000	BGA Re-Ball Tool		XY1	152-153
CPF	BGA Rework Stencils		XY1	154-155
ESD	Static Control Products		EA1-EZ1	156
Koki	Lead Free Solder Paste		XV1	157
900000	QFP Lead Straightener		XK1	160

CERAMIC CHIP CAPACITOR



DUMMY COMPONENT ORDERING INFORMATION

CHIP SIZE		TAPE INFO		BULK CHIP CASE		4" (100mm)		7" (180mm)		13" (330mm)	
Inch	Metric	WIDTH	PITCH	XD1	QTY	XM1	QTY	XD1	QTY	XD1	QTY
PAPER TAPE											
0201	0603	8mm	2mm	-	-	SC0201P4A	500	SC0201P7A	15,000	-	-
0402	1005	8mm	2mm	SC0402F	50,000	SC0402P4A	500	SC0402P7A	10,000	SC0402P13A	50,000
0603	1608	8mm	4mm	SC0603F	15,000	SC0603P4A	500	SC0603P7A	4000	SC0603P13A	10,000
0805	2012	8mm	4mm	SC0805F-.6	10,000	SC0805P4A	500	SC0805P7A	4000	SC0805P13A	10,000
0805	2012	8mm	4mm	SC0805F-1.25	5000						
1206	3216	8mm	4mm	SC1206F	4000	SC1206P4A	500	SC1206P7A	4000	SC1206P13A	10,000
PLASTIC TAPE											
0805	2012	8mm	4mm	-		SC0805E4A	500	SC0805E7A	3000	SC0805E13A	10,000
1206	3216	8mm	4mm	-		SC1206E4A	500	SC1206E7A	3000	SC1206E13A	10,000
1210	3225	8mm	4mm	-		SC1210E4A	500	SC1210E7A	3000	SC1210E13A	10,000
1812	4532	12mm	8mm	-		SC1812E4A	100	SC1812E7A	1000	SC1812E13A	4000
2225	5664	12mm	8mm	-		SC2225E4A	100	SC2225E7A	1000	SC2225E13A	4000
LEAD-FREE  Sn100											
0201	0603	8mm	2mm	-	-	SC0201P4A-TIN	500	SC0201P7A-TIN	15000	-	-
0402	1005	8mm	2mm	-	-	SC0402P4A-TIN	500	SC0402P7A-TIN	10000	-	-
0603	1608	8mm	4mm	-	-	SC0603P4A-TIN	500	SC0603P7A-TIN	4000	-	-
0805	2012	8mm	4mm	-	-	SC0805E4A-TIN	500	SC0805E7A-TIN	4000	-	-
1206	3216	8mm	4mm	-	-	SC1206E4A-TIN	500	SC1206E7A-TIN	4000	-	-
1210	3225	8mm	4mm	-	-	SC1210E4A-TIN	500	SC1210E7A-TIN	4000	-	-
1812	4532	12mm	8mm	-	-	SC1812E4A-TIN	100	SC1812E7A-TIN	1000	-	-

DIMENSION TOLERANCE L x W

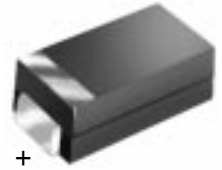
0201 ± 0.03mm	0805 ± 0.15mm
0402 ± 0.05mm	1206 ± 0.15mm
0603 ± 0.1mm	1210 ± 0.30mm

HEIGHT (H)

0201	0.3mm ± 0.03	0805	0.6~1.25mm
0402	0.5mm ± 0.1	1206	0.6~1.25mm
0603	0.8mm ± 0.1	1210	1.25~1.5mm

**I
N
F
O** Ceramic chip capacitors are standard with Sn/Pb plated Nickel-Barrier terminations. Other sizes such as 0504, 1805, 1806, 2220 are available on special order. Also available lead-free with Sn 100% tin terminations.
Nomenclature: The chip size code is the component's LxW dimensions. Example: 0805 = .08" x .05".
Chip size may also be expressed in metric code. Example: 2012 = 2.0mm x 1.2mm.

TANTALUM CAPACITOR MOLDED CASE



DUMMY COMPONENT ORDERING INFORMATION

CHIP SIZE		TAPE INFO			Bulk Part Number	QTY	4" (100mm)  Tape & Reel Part Number		QTY	7" (180mm)  Tape & Reel Part Number		QTY
METRIC	CODE	WIDTH	PITCH									
3216	A	8mm	4mm	XM0	SD3216X-100	100	XM1	SD3216E4A	250	XD1	SD3216E7A	2000
3528	B	8mm	4mm		SD3528X-100	100		SD3528E4A	250		SD3528E7A	2000
6032	C	12mm	8mm		SD6032X-50	50		SD6032E4A	100		SD6032E7A	500
7343	D	12mm	8mm		SD7343X-50	50		SD7343E4A	100		SD7343E7A	500
1608	J	8mm	4mm		-	-		-	-		SD1608E7A	4000
2012	P/R	8mm	4mm		-	-		SD2012E7A	250		SD2012E7A	2500/3000

DIMENSIONS			
CASE	LENGTH	WIDTH	HEIGHT
A	3.2mm	1.6mm	1.6mm
B	3.5mm	2.8mm	1.9mm
C	6.0mm	3.2mm	2.5mm
D	7.3mm	4.3mm	2.8mm
J	1.6mm	0.8mm	0.8mm
P/R	2.0mm	1.2mm	1.2mm

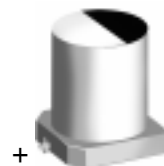
INFO

Molded tantalum capacitors are available in six standard footprints. All sizes meet EIA/IECQ dimensions. The positive (+) terminal is oriented away from the sprocket holes.

Nomenclature: The metric code specifies the LxW dimensions in millimeters. Example 3528 = 3.5mm x 2.8mm

Standard plating is Sn/Pb.  Lead Free Option: Sn100 add -TIN to end of part number.

ALUMINUM CAPACITOR



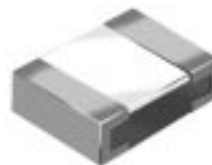
DUMMY COMPONENT ORDERING INFORMATION

CASE DIAMETER	MAXIMUM HEIGHT	TAPE INFO		7" (180mm)  Tape & Reel Part Number		13" (330mm)  Tape & Reel Part Number	
		WIDTH	PITCH	XM1	QTY	XD1	QTY
3mm	5.5mm	12mm	8mm	SE3E7A	200	SE3E13A	2000
4mm	5.5mm	12mm	8mm	SE4E7A	200	SE4E13A	2000
5mm	5.5mm	12mm	12mm	SE5E7A	100	SE5E13A	1000
6.3mm	5.5mm	16mm	12mm	SE6E7A	100	SE6E13A	1000
8mm	6.0mm	16mm	12mm	SE8E7A	100	SE8E13A	1000
8mm	10mm	24mm	16mm	SE9E7A	100	SE9E13A	500
10mm	10mm	24mm	16mm	SE10E7A	100	SE10E13A	300-500
10mm	14~22mm	32mm	20mm	-	-	SE11E13A	250-300
12.5mm	14mm	32mm	24mm	-	-	SE12E13A	200-250
12.5mm	17mm	32mm	24mm	-	-	SE13E13A	150-200
12.5mm	22mm	32mm	24mm	-	-	SE14E13A	125-150
16mm	17mm	44mm	28mm	-	-	SE16E13A	125-150
16mm	22mm	44mm	28mm	-	-	SE17E13A	75-100
18mm	17mm	44mm	32mm	-	-	SE18E13A	125-150
18mm	22mm	44mm	32mm	-	-	SE19E13A	75-100
20mm	17mm	44mm	36mm	-	-	SE20E13A	50

Aluminum electrolytic capacitors are available in 15 case sizes. Aluminum capacitors are polarized devices and require proper orientation during placement. The negative terminal (black mark on top of component) faces the sprocket holes on the carrier tape. For 15" (380mm) reel change "E13A" to "E15P"

 Lead Free Option: Sn97/Bi3.0 add -SnBi to end of part number for 3mm ~ 10mm case diameter.

RESISTOR CHIP



DUMMY COMPONENT ORDERING INFORMATION

CHIP SIZE		TAPE INFO		PART NUMBER		4" (100mm)		7" (180mm)		13" (330mm)	
Inch	Metric	WIDTH	PITCH	XD1	QTY	XM1	QTY	XD1	QTY	XD1	QTY
PAPER TAPE											
0201	0603	8mm	2mm	-	-	SR0201P4A	1000	SR0201P7A	10,000	-	-
0402	1005	8mm	2mm	SR0402F	50,000	SR0402P4A	1000	SR0402P7A	10,000	SR0402P13A	50,000
0603	1608	8mm	4mm	SR0603F	25,000	SR0603P4A	1000	SR0603P7A	5,000	SR0603P13A	10,000
0805	2012	8mm	4mm	SR0805F	10,000	SR0805P4A	1000	SR0805P7A	5,000	SR0805P13A	10,000
1206	3216	8mm	4mm	SR1206F	5,000	SR1206P4A	1000	SR1206P7A	5,000	SR1206P13A	10,000
1210	3225	8mm	4mm	-	-	SR1210P4A	1000	SR1210P7A	5,000	-	-
PLASTIC TAPE											
1210	3225	8mm	4mm	-	-	SR1210E4A	1000	SR1210E7A	4,000	-	-
2010	5025	12mm	4mm	-	-	SR2010E4A	250	SR2010E7A	4,000	-	-
2512	6332	12mm	4mm	-	-	-	-	SR2512E7A	4,000	-	-
2512	6332	12mm	8mm	-	-	SR2512E4A	250	SR2512E7A	2,000	-	-
ZERO OHM											
0201	0603	8mm	2mm	-	-	-	-	SR0201P7A-ZERO	10,000	-	-
0402	1005	8mm	2mm	-	-	-	-	SR0402P7A-ZERO	10,000	-	-
0603	1608	8mm	4mm	-	-	-	-	SR0603P7A-ZERO	5,000	-	-
0805	2012	8mm	4mm	-	-	-	-	SR0805P7A-ZERO	5,000	-	-
1206	3216	8mm	4mm	-	-	-	-	SR1206P7A-ZERO	5,000	-	-
LEAD FREE  Sn100											
0201	0603	8mm	2mm	-	-	SR0201P4A-TIN	1000	SR0201P7A-TIN	10,000	-	-
0402	1005	8mm	2mm	-	-	SR0402P4A-TIN	1000	SR0402P7A-TIN	10,000	-	-
0603	1608	8mm	4mm	-	-	SR0603P4A-TIN	1000	SR0603P7A-TIN	5,000	-	-
0805	2012	8mm	4mm	-	-	SR0805P4A-TIN	1000	SR0805P7A-TIN	5,000	-	-
1206	3216	8mm	4mm	-	-	SR1206P4A-TIN	1000	SR1206P7A-TIN	5,000	-	-
DIMENSION TOLERANCE						HEIGHT (H)					
0402 ± 0.05mm				0201		0.23mm ± 0.03		0805		0.55mm ± 0.1	
0603 ~ 2512 ± 0.15mm				0402		0.35mm ± 0.05		1206		0.55mm ± 0.1	
				0603		0.45mm ± 0.10		1210		0.55mm ± 0.15	

INFO

Resistor chips are available in seven standard sizes. Bulk Feeder cassettes are for placement by high-speed chip shooters. Zero ohm jumpers available for continuity checking. Also available Lead Free Sn100% Tin terminations. Nomenclature: The chip size code approximates the LxW dimensions in inches. Example: 0805 = .08" x .05".

MELF RESISTOR

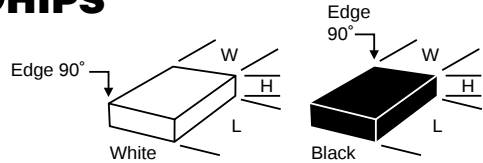


DUMMY COMPONENT ORDERING INFORMATION

SIZE CODE		SIZE LENGTH X DIA.	TAPE INFO		4" (100mm)  Tape & Reel Part Number		7" (180mm)  Tape & Reel Part Number	
INCH	NAME		WIDTH	PITCH	XM1	QTY	XD1	QTY
PLASTIC TAPE								
0604		1.6 x 1.0mm	8mm	4mm	SRM0604E4A	500	SRM0604E7P	3000
0805	Micro	2.2 x 1.1 mm	8mm	4mm	SRM0805E4A	500	SRM0805E7P	3000
1206	Mini	3.2 x 1.6mm	8mm	4mm	SRM1206E4A	500	SRM1206E7P	3000
1406	Mini	3.5 x 1.4mm	8mm	4mm	SRM1406E4A	500	SRM1406E7P	3000
2308	MELF	5.9 x 2.2mm	12mm	4mm	SRM2308E4A	250	SRM2308E7P	1500
LEAD FREE  Sn100								
0805	Micro	2.2 x 1.1	8mm	4mm	SRM0805E4A-TIN	500	SRM0805E7A-TIN	3000
1206	Mini	3.2 x 1.6	8mm	4mm	SRM1206E4A-TIN	500	SRM1206E7A-TIN	3000
2308	MELF	5.9 x 2.2	12mm	4mm	SRM2308E4A-TIN	250	SRM2308E7A-TIN	2000
ZERO OHM								
0805	Micro	2.2 x 1.1	8mm	4mm	SRM0805E4A-ZERO	500	SRM0805E7A-ZERO	3000
1206	Mini	3.2 x 1.6	8mm	4mm	SRM1206E4A-ZERO	500	SRM1206E7A-ZERO	3000
2308	MELF	5.9 x 2.2	12mm	4mm	SRM2308E4A-ZERO	250	SRM2308E7A-ZERO	2000

MELF resistors are cylindrical. Extra care is required during placement to prevent rolling during assembly. These devices are often called by their nicknames relative to size such as micro-melf, mini-melf and melf. Nomenclature: MELF = Metal Electrode Face Bonded. Lead Free version is tin over nickel plating.

BLACK & WHITE CERAMIC CHIPS



DUMMY COMPONENT ORDERING INFORMATION

CHIP SIZE		TAPE MAT'L	TAPING INFO		XD1  Tape & Reel Part Number	QTY
INCH	METRIC		WIDTH	PITCH		
WHITE CHIPS						
01005	0402	Bulk	Bulk	Bulk	SCC016008B-WHITE	5K~100K
0201	0603	Paper	8mm	2mm	SCC0201P7A-WHITE	15,000
0402	1005	Paper	8mm	2mm	SCC0402P7A-WHITE	10,000
0603	1608	Paper	8mm	4mm	SCC0603P7A-WHITE	4,000
0805	2012	Plastic	8mm	4mm	SCC0805E7A-WHITE	4,000
1206	3216	Paper	8mm	4mm	SCC1206P7A-WHITE	4,000
BLACK CHIPS						
01005	0402	Bulk	Bulk	Bulk	SCC016008B-BLACK	5K~100K
0201	0603	Paper	8mm	2mm	SCC0201P7A-BLACK	15,000
0402	1005	Paper	8mm	2mm	SCC0402P7A-BLACK	10,000
0603	1608	Paper	8mm	4mm	SCC0603P7A-BLACK	4,000
0805	2012	Plastic	8mm	4mm	SCC0805E7A-BLACK	4,000
1206	3216	Paper	8mm	4mm	SCC1206P7A-BLACK	4,000

INCH DIMENSIONS:

Inch Code	L	W	H	Tol
01005	0.016	0.008	0.008	+/- 0.001
0201	0.0225	0.0115	0.0115	+/- 0.001
0402	0.036	0.019	0.019	+/- 0.003
0603	0.058	0.031	0.029	+/- 0.003
0805	0.075	0.052	0.037	+/- 0.003
1205	0.119	0.060	0.048	+/- 0.003

METRIC DIMENSIONS:

Metric Code	L	W	H	Tol
0402	0.41	0.20	0.20	+/- 0.025
0603	0.57	0.29	0.29	+/- 0.025
1005	0.91	0.48	0.48	+/- 0.076
1608	1.47	0.79	0.74	+/- 0.076
2012	1.91	1.32	0.94	+/- 0.076
3216	3.02	1.52	1.22	+/- 0.076

INFO

Placement Ceramic Chips are available in 6 case sizes and in 2 colors: White and Black.

Right angle 90° edges for accurate placement by vision equipment. No terminations. Non-Solderable.

White chips are mounted on a dark substrate such as blue Nitto tape.

Black chips are mounted on a light substrate. Excellent contrast. Easy for vision equipment to see.

INDUCTOR



MOLDED CASE



MULTILAYER INDUCTOR

DUMMY COMPONENT ORDERING INFORMATION

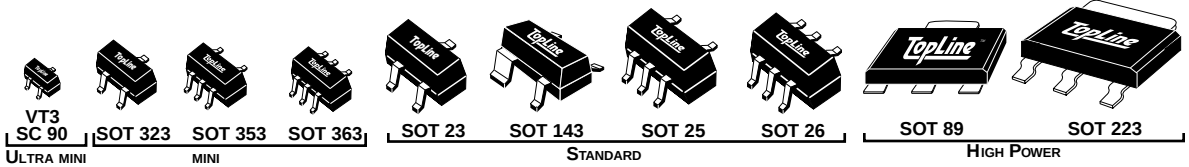
CHIP SIZE		HEIGHT	TAPE INFO		4" (100mm)  Tape & Reel Part Number		7" (180mm)  Tape & Reel Part Number	
INCH	METRIC		WIDTH	PITCH	XM1	QTY	XD1	QTY
MULTILAYER INDUCTOR								
0201	0603	0.3mm	8mm	2mm	SI0201P4A	500	SI0201P7A	15,000
0402	1005	0.5mm	8mm	2mm	SI0402P4A	500	SI0402P7A	10,000
0603	1608	0.8mm	8mm	4mm	SI0603E4A	250	SI0603E7A	4000
0805	2012	1.25mm	8mm	4mm	SI0805E4A	250	SI0805E7A	4000
1206	3216	1.60mm	8mm	4mm	SI1206E4A	250	SI1206E7A	2000
MOLDED CASE INDUCTOR								
1008	2520	1.8mm	8mm	4mm	SI1008E4A	250	SI1008E7A	2000
1210	3225	2.2mm	8mm	4mm	SI1210E4A	250	SI1210E7A	2000
1812	4532	3.2mm	12mm	8mm	SI1812E4A	100	SI1812E7A	500

INFO

Inductors are available in a variety of package types and sizes. Molded devices are useful for precision placement where vision processes are required. Multilayer devices handle and place the same as chip capacitors. Nomenclature: The chip size code approximates the LxW footprint dimensions.

 Lead Free Option: Sn100 add -TIN to end of part number.

SOT TRANSISTOR

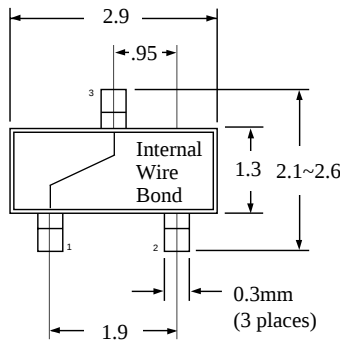
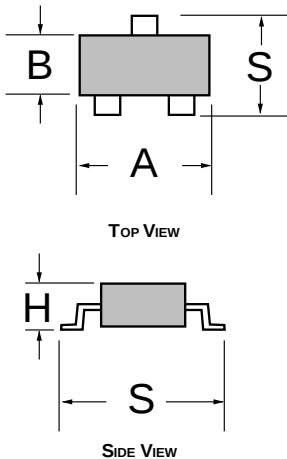


DUMMY COMPONENT ORDERING INFORMATION

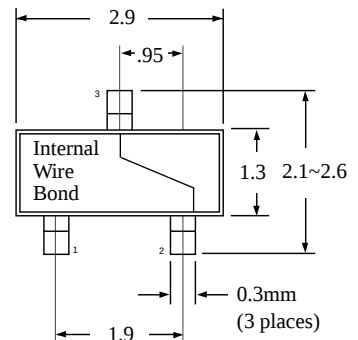
NBR LEADS	TAPE INFO		DEVICE REFERENCE			BODY SIZE NOMINAL (MM)				4" (100mm)		7" (180mm)	
	WIDTH	PITCH	SOT	SC	TO	A	B	S	H	Tape & Reel Part Number		Tape & Reel Part Number	
										XM1	QTY	XD1	QTY
3	8mm	4mm	-	-	-	1.2	0.8	1.2	0.5	-	-	VT3E7A	3000
3	8mm	4mm	-	SC59	TO236AA	2.9	1.6	2.8	1.1	-	-	SC59E7A	3000
3	8mm	4mm	SOT323	SC70	-	2.0	1.25	2.1	0.9	-	-	SC70E7A	3000
3	8mm	4mm	-	SC75A/SC90	-	1.6	0.8	1.6	0.7	-	-	SC90E7A	3000
3	8mm	4mm	SOT23	-	TO236AB	2.9	1.3	2.4	.95	SOT23E4A	500	SOT23E7A	3000
5	8mm	4mm	SOT23-5	SC74A	-	2.9	1.6	2.8	1.1	SOT25E4A	500	SOT25E7A	3000
6	8mm	4mm	SOT23-6	SC74	-	2.9	1.6	2.8	1.1	SOT26E4A	500	SOT26E7A	3000
3	12mm	8mm	SOT89	SC62	TO243AA	4.5	2.5	4.0	1.5	SOT89E4A	200	SOT89E7A	1000
4	8mm	4mm	SOT143	-	TO253AA	2.9	1.6	2.8	.95	SOT143E4A	500	SOT143E7A	3000
3	12mm	8mm	SOT223	SC73	TO261AA	6.5	3.6	7.0	1.6	SOT223E4A	100	SOT223E7A	1000-2500
3	8mm	4mm	SOT323	SC70	-	2.0	1.25	2.1	0.9	SOT323E4A	500	SOT323E7A	3000
4	8mm	4mm	SOT343	-	-	2.0	1.25	2.1	0.9	-	-	SOT343E7A	3000
5	8mm	4mm	SOT353	SC88A	-	2.0	1.25	2.1	0.9	SOT353E4A	500	SOT353E7A	3000
6	8mm	4mm	SOT363	SC88	-	2.0	1.25	2.1	0.9	SOT363E4A	500	SOT363E7A	3000
8	8mm	4mm	SOT23-8	-	-	2.9	1.3	2.4	.95	-	-	SOT28E7A	3000



LEAD FREE SOT23 WITH DAISY CHAIN



SOT23E7A-DC13-TIN
TOP VIEW

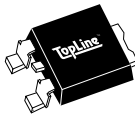


SOT23E7A-DC23-TIN
TOP VIEW

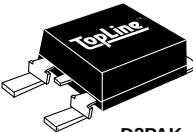
TopLine offers a full range of SOT devices conforming to JEDEC (TO) and EIAJ (SC) standards. 3-lead devices are commonly used for diodes or transistors. 5- and 6-lead devices are used for integrated circuits or diode arrays. Nomenclature: SOT = Small Outline Transistor. The TSOP6 is similar to SOT23 with 6-leads.

Lead Free Option: Sn100 add -TIN to end of part number.

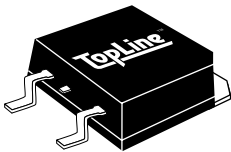
DPAK Power Device



DPAK



D2PAK

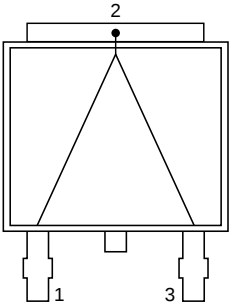
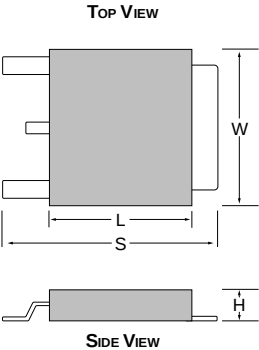


D3PAK

DUMMY COMPONENT ORDERING INFORMATION

PACKAGE SIZE NOMINAL (MM)				JEDEC SMD DEVICE	TAPE INFO		7" (180mm) Tape & Reel Part Number		13" (330mm) Tape & Reel Part Number	
L	W	H	S		WIDTH	PITCH	XM1	QTY	XD1	QTY
6	6.5	2.3	10	TO-252AA	16mm	8mm	DPAK-E7A	100	DPAK-E13A	2500
9.2	10	4.4	15	TO-263AB	24mm	12mm	D2PAK-E7A	100	D2PAK-E13A	750~1000
9.2	10.4	4.4	15	3-LEAD	24mm	12mm	-		D2PAK-3-E13A	750~1000
9.2	10.4	4.4	15	4-LEAD	24mm	12mm	-		D2PAK-4-E13A	750~1000
9.2	10.4	4.4	15	5-LEAD	24mm	12mm	-		D2PAK-5-E13A	750~1000
14	16	4.7	18.8	TO-268AA	24mm	24mm	-		D3PAK-E13A*	500

* For Reference
Check for Availability

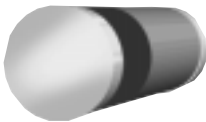


DC14
Daisy Chain Option
Top View

DPAKs are large packages used for power devices such as rectifiers and transistors. The D²PAK is the Surface Mount equivalent of the TO-220 and the D³PAK is the SMD equivalent of TO-247. Call for availability on D³PAK.

 Lead Free Option: Sn100 add -TIN to end of part number.

MELF & MINI MELF DIODES



DUMMY COMPONENT ORDERING INFORMATION

DEVICE	SIZE Dia. x L	TAPE INFO		4" (100mm)  Tape & Reel Part Number QTY		7" (180mm)  Tape & Reel Part Number QTY		13" (330mm)  Tape & Reel Part Number QTY	
		WIDTH	PITCH	XM1		XD1		XD1	
mini MELF DO-213AA (LL34)	1.6 x 3.5mm	8mm	4mm	SOD80E4A	500	SOD80E7A	2500	SOD80E13A	10,000
MELF DO-213AB (LL41)	2.5 x 5mm	12mm	4mm	SM1E4A-GLASS	250	SM1E7A-GLASS	1500	SM1E13A-GLASS	5000
MELF DO-213AB (SM1)	2.5 x 5mm	12mm	4mm	SM1E4A-PLASTIC	250	SM1E7A-PLASTIC	1750	SM1E13A-PLASTIC	5000

1

2

3

4

5

6

7

8

9

0

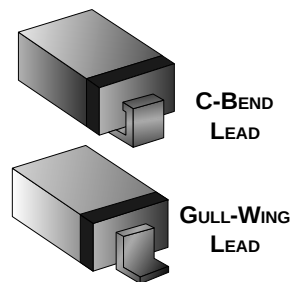
-

+

MELF and Mini Melf diodes are cylindrical cases constructed of glass or plastic. The SOD80 glass package is commonly used lower power diodes. The SM1 package is used for high current rectifiers and zener diodes. Nomenclature: DO = Diode Outline

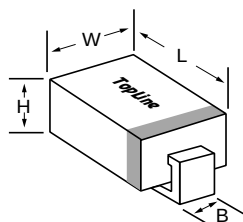
 Lead Free suffix -Tin = Sn100

RECTANGULAR DIODE

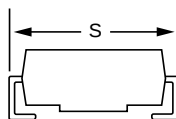


DUMMY COMPONENT ORDERING INFORMATION

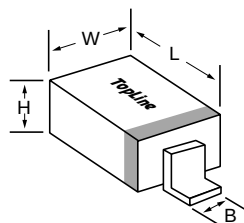
PACKAGE SIZE NOMINAL (MM)					JEDEC DEVICE	TAPE WIDTH		7" (180mm) Tape & Reel Part Number	QTY	13" (330mm) Tape & Reel Part Number	QTY
L	W	H	S	B		WIDTH	PITCH	XD1		XD1	
GULL WING LEAD											
1.2	0.8	0.6	1.6	0.3	SOD523	8MM	4MM	SC79E7A	3000	-	-
1.7	1.25	0.7	2.5	0.3	SOD323	8mm	4mm	SOD323E7A	3000	SOD323E13A	10,000
2.7	1.5	1.3	3.6	0.7	SOD123	8mm	4mm	SOD123E7A	2500	SOD123E13A	-
4.3	2.6	2.2	6.1	1.4	DO215AC	12mm	4mm	SMAG-E7A	1800	SMAG-E13A	5000
4.3	3.6	2.3	6.2	2.0	DO215AA	12mm	8mm	SMBG-E7A	1000	SMBG-E13A	2500
7.0	6.0	2.3	10	3.0	DO215AB	16mm	8mm	SMCG-E7A	900	SMCG-E13A	2500
C-BEND LEAD (MODIFIED J-LEAD)											
4.3	2.6	2.2	5.0	1.5	DO214AC	12mm	4mm	FM1E7A	1500	FM1E13A	7500
4.3	2.6	2.2	5.0	1.5	DO214AC	12mm	4mm	SMAJ-E7A	1800	SMAJ-E13A	7500
4.3	3.6	2.3	5.4	2.0	DO214AA	12mm	8mm	SMBJ-E7A	750	SMBJ-E13A	3200
7.0	6.0	2.3	8.0	3.0	DO214AB	16mm	8mm	SMCJ-E7A	850	SMCJ-E13A	3500



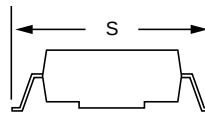
C-BEND (MODIFIED J)



SIDE VIEW



GULL WING LEAD



SIDE VIEW

INFO

Rectangular diodes and rectifiers are available in Gull-wing and C-bend leads (J-leads). C-bend leads are similar to J-leads. For 4" reels, change part numbers from E7A to E4A.

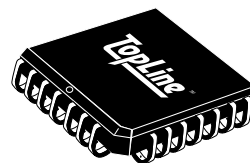
Substitutability: DO214AC = SOD106A = SMA = FM1.

Nomenclature: JEDEC DO = Diode Outline, SOD = Small Outline Diode.

PLCC

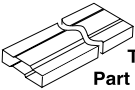
PLASTIC LEADED

CHIP CARRIER

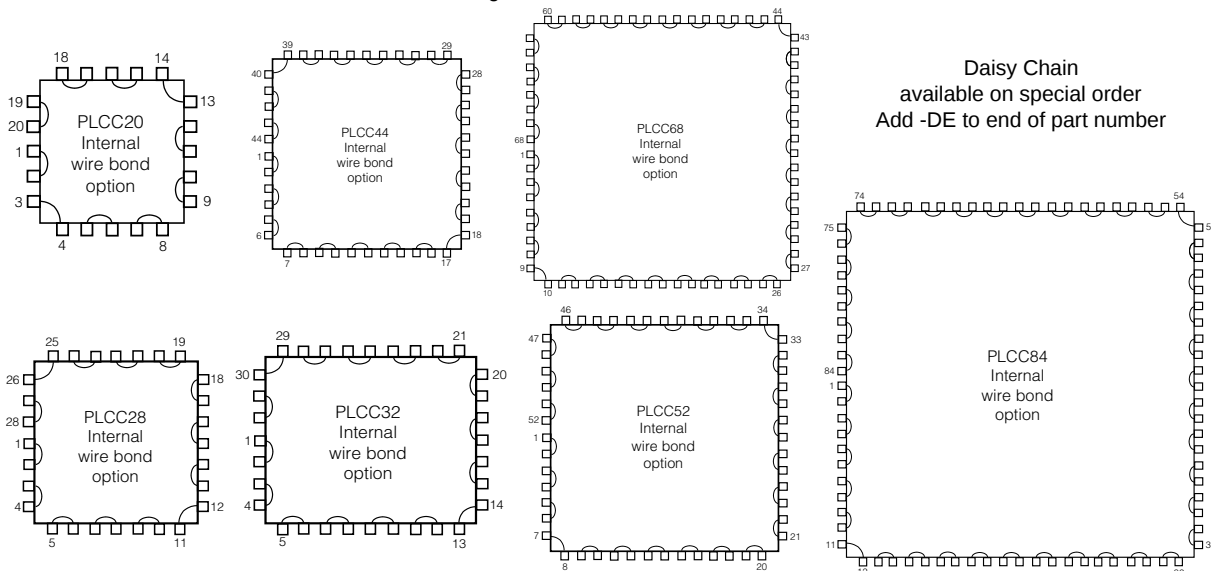


J-LEAD 50MIL PITCH

DUMMY COMPONENT ORDERING INFORMATION

NBR LEADS	BODY SIZE INCHES	TAPE INFO		 Tube Part Number	QTY	7" (180mm)  Tape & Reel Part Number		13" (330mm)  Tape & Reel Part Number	
		WIDTH	PITCH			XM1	QTY	XP1	QTY
*18	.29" x .43"	24mm	12mm	PLCC18SM	36	-	-	-	-
18	.29" x .49"	24mm	12mm	PLCC18M	36	PLCC18E7A	100	PLCC18E13A	1000
20	.35" sq.	16mm	12mm	PLCC20M	46-50	PLCC20E7A	100	PLCC20E13A	1000
28	.45" sq.	24mm	16mm	PLCC28M	37-40	PLCC28E7A	100	PLCC28E13A	500-900
32	.45" X .55"	24mm	16mm	PLCC32M	30-34	PLCC32E7A	100	PLCC32E13A	500-750
44	.65" sq.	32mm	24mm	PLCC44M	25-28	PLCC44E7A	100	PLCC44E13A	500
52	.75" sq.	32mm	24mm	PLCC52M	24-25	PLCC52E7A	50	PLCC52E13A	500
68	.95" sq.	44mm	32mm	PLCC68M	17-20	PLCC68E7A	50	PLCC68E13A	250-500
84	1.15" sq.	44mm	36mm	PLCC84M	14-17	PLCC84E7A	50	PLCC84E13A	250

*PLCC18S short version is an obsolete design.



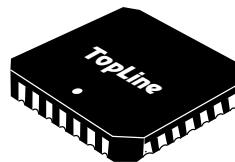
Standard plating on leads is Sn85/Pb15. Lead pitch is 50 mils (1.27mm). Tube and reel quantities may vary. Add prefix SOCKET in front of part number for PLCC Sockets.

For completely isolated (no internal connections) add - ISO to the end of part number.

 Lead Free. Add suffix to part number: B = Sn/Bi, C = SnCu, -Tin = Sn100

LCC

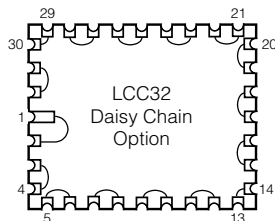
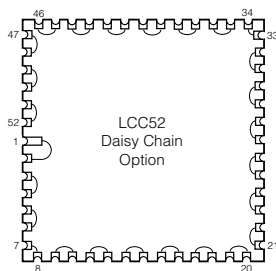
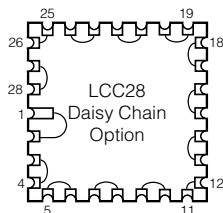
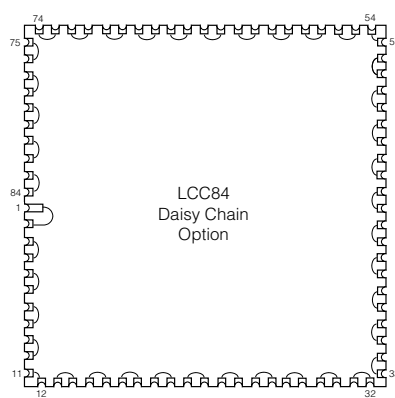
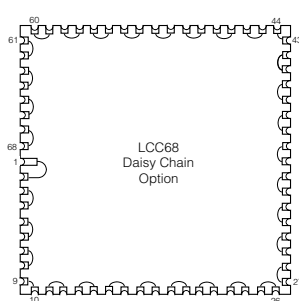
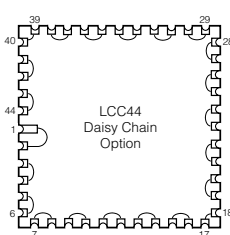
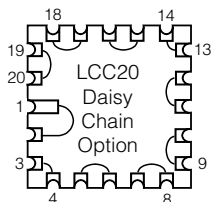
LEADLESS CHIP CARRIER



DUMMY COMPONENT ORDERING INFORMATION

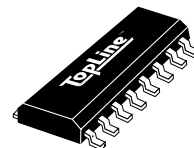
NBR LEADS	LEAD PITCH	CASE SIZES INCHES	 Bulk Part Number
			XL1
20	50 mils	.35" SQ	LCC20B50SQ.35
28	50 mils	.45" SQ	LCC28B50SQ.45
32	50 mils	.45" x .55"	LCC32B50R.45x.55
44	50 mils	.65" SQ	LCC44B50SQ.65
52	50 mils	.75" SQ	LCC52B50SQ.75
68	50 mils	.95" SQ	LCC68B50SQ.95
84	50 mils	1.15" SQ	LCC84B50SQ1.15

OPTIONAL DAISY CHAIN

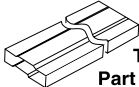


PART NUMBER

OPTIONS	PART NBR SUFFIX
With Lid	Blank
Without Lid	-N
Gold Leads	Blank
Solder Coat Leads	-SC
Completely Isolated	-ISO
Daisy Chain	-DE

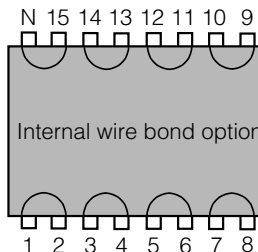


DUMMY COMPONENT ORDERING INFORMATION

NBR LEADS	BODY WIDTH		TAPE INFO		 Tube Part Number	QTY	4" (100mm)  Tape & Reel Part Number		13" (330mm)  Tape & Reel Part Number	
	MILS	METRIC	WIDTH	PITCH			XM1	QTY	XS1	QTY
4	150	3.9mm	12mm	8mm	-	-	SO4E7A	750	SO4E13A	call
4	250	6.4mm	12mm	12mm	SOM4M	50	-	-	SOM4E13A	1500
8	150	3.9mm	12mm	8mm	SO8M	96~100	SO8E4A	100	SO8E13A	2500
14	150	3.9mm	16mm	8mm	SO14M	50~56	SO14E4A	100	SO14E13A	2500
14	208	5.3mm	16mm	12mm	SOP14M	45	-	-	SOP14E13A	2000
14	220	5.6mm	24mm	12mm	SOM14M	58	-	-	SOM14E13A	2000
16	150	3.9mm	16mm	8mm	SO16M	45~50	SO16E4A	100	SO16E13A	2500
16	208	5.3mm	16mm	12mm	SOP16M	43	-	-	SOP16E13A	2000
16	220	5.6mm	24mm	12mm	SOM16M	42	SOM16E4A	100	SOM16E13A	2000
16	300	7.5mm	16mm	12mm	SOL16M	47	SOL16E4A	100	SOL16E13A	1000
18	300	7.5mm	24mm	12mm	SOL18M	41~42	-	-	SOL18E13A	1000
20	300	7.5mm	24mm	12mm	SOL20M	38	SOL20E4A	100	SOL20E13A	1000
20	430	11.0mm	44mm	16mm	HSOP20M-F	30	-	-	HSOP20E13AF	1000
24	300	7.5mm	24mm	12mm	SOL24M	31~33	SOL24E4A	100	SOL24E13A	1000
28	300	7.5mm	24mm	12mm	SOL28M	26~27	SOL28E4A	100	SOL28E13A	1000
28	330	8.4mm	24mm	16mm	SOW28M	26~27	-	-	SOW28E13A	1000
32	300	7.5mm	32mm	16mm	SOL32M	22~25	-	-	SOL32E13A	1000
32	330	8.4mm	32mm	16mm	SOW32M	22~25	-	-	SOW32E13A	1000
32	400	10.1mm	32mm	16mm	SOX32M	22~25	-	-	SOX32E13A	1000
32	450	11.4mm	44mm	16mm	SOY32M	22~25	-	-	SOY32E13A	500
40	400	10.1mm	44mm	16/24mm	SOX40M	18	-	-	SOX40E13A	500
40	450	11.4mm	44mm	16/24mm	SOY40M	18	-	-	SOY40E13A	500
44	525	13.3mm	44mm	24mm	SOZ44M	17	-	-	SOZ44E13A	500

QUICK GUIDE BODY WIDTH

SERIES	MILS	MM	SERIES	MILS	MM
SO	150	3.9	SOW	330~350	8.4~8.9
SOP	208	5.3	SOX	400	10.16
SOM	220	5.6	SOY	450	11.4
SOL	300	7.5	SOZ	525	13.3

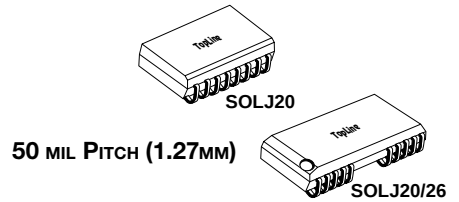


Daisy Chain
available on special order
Add -DE to end of part number

TopLine supplies gull-wing packages with 50mil (1.27) lead pitch in a variety of pin counts and body widths. Standard plating on leads is Sn85/Pb15. For completely isolated (no internal connections) add -ISO to end of part number.

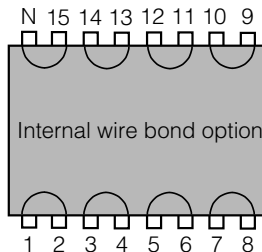


Lead Free. Add suffix to part number: B = Sn/Bi, C = SnCu, -Tin = Sn100



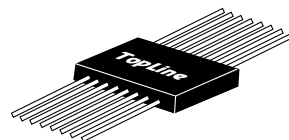
DUMMY COMPONENT ORDERING INFORMATION

NBR LEADS	BODY WIDTH		TAPE INFO		Tube Part Number	QTY	4" (100mm)		13" (330mm)	
	MILS	METRIC	WIDTH	PITCH			XS1	XM1	XS1	XM1
18	300	7.5mm	24mm	12mm	SOLJ18M	41	-	-	SOLJ18E13A	1000
20	300	7.5mm	24mm	12mm	SOLJ20M	37	-	-	SOLJ20E13A	1000
20/26	300	7.5mm	24mm	12mm	SOLJ20/26M	25~30	SOLJ20/26E4A	100	SOLJ20/26E13A	1000
24/26	300	7.5mm	24mm	12mm	SOLJ24/26M	25~30	-	-	SOLJ24/26E13A	1000
24/28	400	10.0mm	24/32mm	16mm	SOXJ24/28M	26~30	-	-	SOXJ24/28E13A	1000
28	300	7.5mm	24mm	12mm	SOLJ28M	25~27	SOLJ28E4A	100	SOLJ28E13A	1000
28	400	10.0mm	24/32mm	16mm	SOXJ28M	25~26	-	-	SOXJ28E13A	1000
32	300	7.5mm	32mm	16mm	SOLJ32M	22~23	-	-	SOLJ32E13A	1000
32	400	10.0mm	32mm	16mm	SOXJ32M	22~23	-	-	SOXJ32E13A	500~1000
40	400	10.0mm	44mm	16mm	SOXJ40M	15~18	-	-	SOXJ40E13A	500~1000
42	400	10.0mm	44mm	16mm	SOXJ42M	16~17	-	-	SOXJ42E13A	500~1000
44	400	10.0mm	44mm	16mm	SOXJ44M	17	-	-	SOXJ44E13A	500~1000



Daisy Chain
available on special order
Add -DE to end of part number

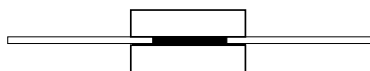
FLAT PACK



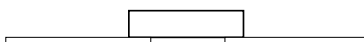
DUMMY COMPONENT ORDERING INFORMATION

NBR LEADS	CASE SIZE	LEAD PATTERN	LEAD BRAZE	XF1	PART NUMBER
50 MIL PITCH					
10	.25" SQ	All Straight	Bottom		FP10C50SQ.25B
10	.25" SQ	All Straight	Side		FP10F50SQ.25S
14	.26" x .34"	All Straight	Side		FP14C50R.26x.34S
14	.26" x .34"	All Straight	Side		M83401/03
16	.25" x .38"	All Straight	Side		FP16C50R.25x.38S
20	.27" x .40"	L-Ends	Side		FP20F50R.27x.40S
20	.27" x .50"	All Straight	Side		FP20F50R.27X.50S
24	.27" x .40"	L-Ends	Side		FP24C50R.27x.40S
24	.30" x .50"	All Straight	Side		FP24C50R.30x.50S
24	.40" x .50"	All Straight	Bottom		FP24F50R.40X.50B
24	.40" x .60"	All Straight	Bottom		FP24F50R.40X.60B
28	.40" x .72"	All Straight	Side		FP28F50R.40x.72S
28	.50" x .72"	All Straight	Side		FP28F50R.50x.72S
32	.40" x .820"	All Straight	Bottom		FP32F50R.40X.82B
42	.64" x 1.06"	All Straight	Top		FP42F50R.64x1.06T

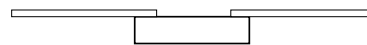
LEAD LOCATIONS



SIDE/SANDWICH
CODE S



BOTTOM BRAZED
CODE B



TOP BRAZED
CODE T

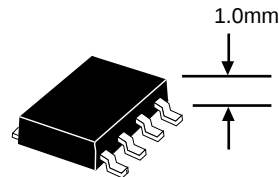
PART NUMBER

PACKAGING	CODE	LEAD PLATING	PART NBR SUFFIX
Carrier	C	Gold	Blank
Lead Frame	F	Solder Coat	-SC
		Daisy Chain	-DE

MSOP

GULL WING

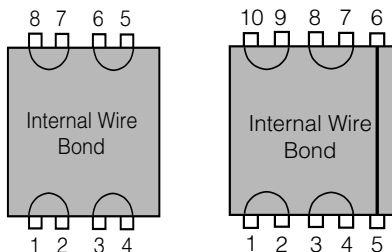
MINIATURE SMALL OUTLINE PACKAGE



DUMMY COMPONENT ORDERING INFORMATION

NBR LEADS	BODY WIDTH		TAPE INFO		LEAD PITCH		 Tube Part Number XS1	QTY	 7" (180mm) Tape & Reel Part Number XS1	QTY
	MILS	METRIC	WIDTH	PITCH	mils	mm				
8	118	3mm	12mm	8mm	25.6mils	0.65mm	MSOP8M	50~98	MSOP8E7A	3000
10	118	3mm	12mm	8mm	19.7mils	0.50mm	MSOP10M	50~98	MSOP10E7A	3000

Daisy Chain available
add -DE to end of part number



Solder plated leads Sn85/Pb15. For Daisy Chain add -DE to end of part number
For completely isolated (no internal connections) add -ISO to end of part number.

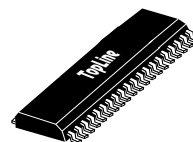


Lead Free. Suffix -Tin = Sn100

SSOP

SHRINK SMALL

OUTLINE PACKAGES



DUMMY COMPONENT ORDERING INFORMATION

BODY WIDTH	NBR LEAD		TAPE INFO		 Tube Part Number	QTY	 13" (330mm) Tape & Reel Part Number	QTY
	LEADS	PITCH	WIDTH	PITCH				
150mil (3.9mm)	16	0.636mm	12mm	8mm	QSOP16M25	99	QSOP16E13A25	1000
	20	0.636mm	16mm	8/12mm	QSOP20M25	55	QSOP20E13A25	1000
	24	0.636mm	16mm	8/12mm	QSOP24M25	55	QSOP24E13A25	1000
	28	0.636mm	16mm	8/12mm	QSOP28M25	48	QSOP28E13A25	1000
	40	0.5mm	16mm	8mm	QVSOP40M19.7	48	QVSOP40E13A19.7	1000
	48	0.4mm	16mm	8mm	QVSOP48M15.7	48	QVSOP48E13A15.7	1000
	80	0.5mm	24mm	12mm	QVSOP80M19.7	24	QVSOP80E13A19.7	1000
208 mil (5.3mm)	8		12mm	8mm	SSOP8M25	160	SSOP8E13A25	2500
	14		12/16mm	12mm	SSOP14M25	77	SSOP14E13A25	1000
	16		12/16mm	12mm	SSOP16M25	77	SSOP16E13A25	1000
	20	.65mm	16mm	12mm	SSOP20M25	66	SSOP20E13A25	1000
	24		16mm	12mm	SSOP24M25	59	SSOP24E13A25	1000
	28		16/24mm	12mm	SSOP28M25	47	SSOP28E13A25	1000
300 mil (7.5mm)	34	1.0mm	24mm	12/16mm	SSOP34M40	27	SSOP34E13A40	1000
	36	0.8mm	24mm	12/16mm	SSOP36M31.5	31	SSOP36E13A30	1000
	44	0.8mm	32mm	12/16mm	SSOP44M31.5	27	SSOP44E13A30	1000
	48	1.0mm	32mm	12/16mm	SSOP48M40	30	SSOP48E13A40	1000
	48	0.636mm	32mm	12/16mm	SSOP48M25	30	SSOP48E13A25	1000
	56	0.636mm	32mm	12/16mm	SSOP56M25	26	SSOP56E13A25	1000
472 mil (12mm)	64	0.8mm	44mm	24mm	SSOP64M31.5	24	SSOP64E13A30	500
270mil (6.8mm)	16	0.8mm	24mm	16mm	PFP16M30F	68	PFP16E13A30F	1000
433mil (11mm) Exposed Heat Sink	20	1.27mm	44mm	24mm	HSOP20M	30	HSOP20E13A	500
	24	1.0mm	44mm	24mm	HSOP24M40	30	HSOP24E13A40	500
	30	0.8mm	44mm	24mm	HSOP30M31.5	30	HSOP30E13A30	500
	36	0.65mm	44mm	24mm	HSOP36M25	30	HSOP36E13A25	500
	44	0.65mm	44mm	24mm	HSOP44M25	30	HSOP44E13A25	500

TopLine supplies SSOP - Shrink Small Outline Packages in 0.65mm (25.7 mil) and 0.80mm (31.5 mil) lead pitch. Package height is 1.63mm for 150 mil wide body, 1.75mm for 208 mil wide body and 2.3mm high for 300 mil wide body. The QSOP package is a true 25.0 mil lead pitch (0.636mm). Standard plated leads Sn85/Pb15.

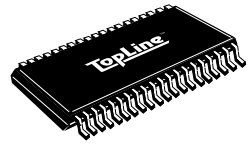


Lead Free Option. Option B = Sn/Bi. Option C = Sn/Cu. Option -TIN = Sn100.

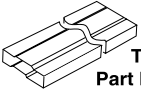
TSSOP

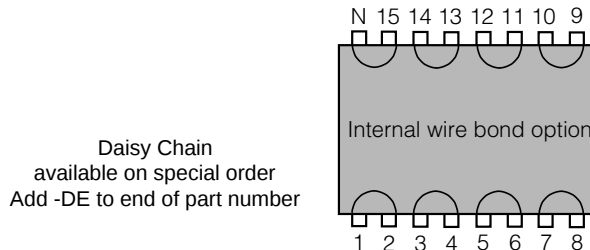
THIN SHRINK

SMALL OUTLINE PACKAGE



DUMMY COMPONENT ORDERING INFORMATION

BODY LENGTH	NBR LEAD		TAPE INFO		 Tube Part Number		 13" (330mm) Tape & Reel Part Number	
	LEADS	PITCH	WIDTH	PITCH	XS1	QTY	XS1	QTY
173 mil (4.4mm) Wide								
3.0mm	8	0.65mm	12/16mm	8mm	TSSOP8M25	100	TSSOP8E13A25	1000-3000
5.0mm	14	0.65mm	12/16mm	8mm	TSSOP14M25	96	TSSOP14E13A25	1000-3000
5.0mm	16	0.65mm	12/16mm	8mm	TSSOP16M25	96	TSSOP16E13A25	1000-3000
6.5mm	20	0.65mm	16mm	8/12mm	TSSOP20M25	74-76	TSSOP20E13A25	1000-3000
7.8mm	24	0.65mm	16mm	8/12mm	TSSOP24M25	62-63	TSSOP24E13A25	1000-3000
9.7mm	28	0.65mm	16mm	8/12mm	TSSOP28M25	50	TSSOP28E13A25	1000-3000
7.8mm	30	0.5mm	16mm	8/12mm	TSSOP30M19.7	62	TSSOP30E13A19.7	1000-3000
9.7mm	38	0.5mm	16mm	8/12mm	TSSOP38M19.7	50	TSSOP38E13A19.7	1000-3000
11.3mm	44	0.5mm	24mm	12mm	TSSOP44M19.7	42	TSSOP44E13A19.7	1000-3000
9.7mm	48	0.4mm	16mm	8/12mm	TSSOP48M15.7	50	TSSOP48E13A15.7	1000-3000
11.3mm	56	0.4mm	24mm	12mm	TSSOP56M15.7	42	TSSOP56E13A15.7	1000-3000
240 mil (6.1mm) Wide								
9.7mm	28	0.65mm	24mm	12mm	TSSOPW28M25	50	TSSOPW28E13A25	1000-3000
11.0mm	32	0.65mm	24mm	12mm	TSSOP32M25	44	TSSOP32E13A25	1000-3000
12.5mm	38	0.65mm	24mm	12mm	TSSOP38M25	39	TSSOP38E13A25	1000-3000
12.5mm	48	0.5mm	24mm	12mm	TSSOP48M19.7	39	TSSOP48E13A19.7	1000-3000
14.0mm	56	0.5mm	24mm	12mm	TSSOP56M19.7	35	TSSOP56E13A19.7	1000-3000
17.0mm	64	0.5mm	24mm	12mm	TSSOP64M19.7	28	TSSOP64E13A19.7	1000-3000
17.0mm	80	0.4mm	24mm	12mm	TSSOP80M15.7	28	TSSOP80E13A15.7	1000-3000



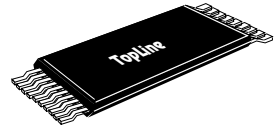
TopLine supplies TSSOP - Thin Shrink Small Outline Packages in 1.0mm height. Tape width and pitch may vary. Tube quantities may vary. Call TopLine for details. Standard plated leads Sn85/Pb15.

Lead Free. Suffix -B = Sn/Bi, suffix -C = Sn/Cu, suffix -TIN = Sn100.

TSOP - TYPE 1

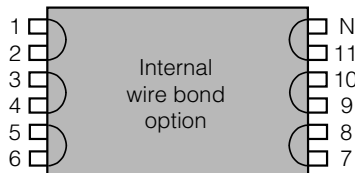
THIN SMALL

OUTLINE PACKAGE



DUMMY COMPONENT ORDERING INFORMATION

LEAD		CASE SIZE INCLUDES LEADS	TAPE INFO		 Tray Part Number	QTY	 13" (330mm) Tape & Reel Part Number	QTY
NBR	PITCH		WIDTH	PITCH				
28	0.55mm	8 x 13.4mm	24mm	12mm	TSOP28ST21.6-T1	234	TSOP28SE13A21.6-T1	1000
28/32	0.5mm	8 x 20mm	32mm	12/16mm	TSOP28/32T19.7-T1	156	TSOP28/32E13A19.7-T1	1000
32	0.5mm	8 x 20mm	32mm	12/16mm	TSOP32T19.7-T1	156	TSOP32E13A19.7-T1	1000
32	0.5mm	8 x 13.4mm	24mm	12mm	TSOP32ST19.7-T1	234	TSOP32SE13A19.7-T1	1000
40	0.5mm	10 x 14mm	24mm	16mm	TSOP40ST19.7-T1	160	TSOP40SE13A19.7-T1	1000
40	0.5mm	10 x 20mm	32mm	16mm	TSOP40T19.7-T1	120	TSOP40E13A19.7-T1	1000
48	0.5mm	12 x 20mm	32mm	16mm	TSOP48T19.7-T1	96	TSOP48E13A19.7-T1	1000
56	0.5mm	14 x 20mm	32mm	24mm	TSOP56T19.7-T1	96	TSOP56E13A19.7-T1	1000



Daisy Chain
available on special order
Add -DE to end of part number

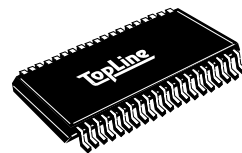
TopLine offers TSOP-Type 1 packages in lead counts from 28 to 56. Package thickness is 1.0mm with maximum seated height of 1.2mm. Type 1 indicates leads extending from narrow end of body. For Daisy Chain available on special order, add -DE to end of part number. For completely isolated (no internal connections) add -ISO to end of part number. TSOP contain internal die. Standard plated leads Sn85/Pb15.

 Lead Free. Suffix -B = Sn/Bi, suffix -TIN = Sn100.

TSOP - TYPE 2

THIN SMALL

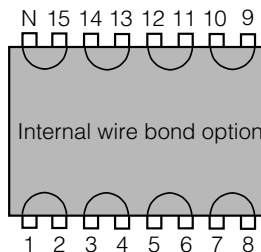
OUTLINE PACKAGE



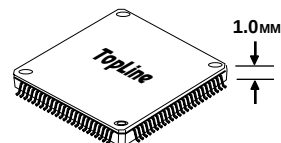
DUMMY COMPONENT ORDERING INFORMATION

LEAD		CASE SIZE EXCLUDES LEADS	TAPE INFO		Tray Part Number	QTY	13" (330mm) Tape & Reel Part Number		QTY
NBR	PITCH		WIDTH	PITCH					
20/26	1.27mm	7.6 x 17.14mm	24mm	12mm	TSOP20/26T50-T2	176	TSOP20/26E13A50-T2		500~1000
24/28	1.27mm	10 x 18.4mm	32mm	16mm	TSOP24/28T50-T2	135	TSOP24/28E13A50-T2		500~1000
32	1.27mm	10 x 21.0mm	32mm	16mm	TSOP32T50-T2	117	TSOP32E13A50-T2		500~1000
40/44	0.8mm	10 x 18.4mm	32mm	16mm	TSOP40/44T30-T2	135	TSOP40/44E13A30-T2		500~1000
44	0.8mm	10 x 18.4mm	32mm	16mm	TSOP44T30-T2	135	TSOP44E13A30-T2		500~1000
44/50	0.8mm	10 x 21mm	32mm	16mm	TSOP44/50T30-T2	117	TSOP44/50E13A30-T2		500~1000
50	0.8mm	10 x 21mm	32mm	16mm	TSOP50T30-T2	117	TSOP50E13A30-T2		500~1000
54	0.8mm	10 x 22.2mm	32mm	16mm	TSOP54T30-T2	108	TSOP54E13A30-T2		500~1000
66	0.65mm	10 x 22.2mm	32mm	16mm	TSOP66T25-T2	108	TSOP66E13A25-T2		500~1000
86	0.5mm	10 x 22.2mm	32mm	16mm	TSOP86T19.7-T2	108	TSOP86E13A19.7-T2		500~1000

Daisy Chain
available on special order
Add -DE to end of part number

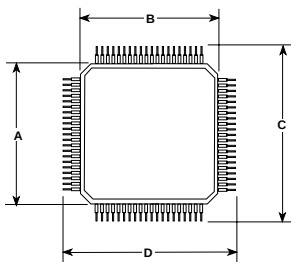


TQFP 1.0MM THICK THIN QUAD FLAT PACK

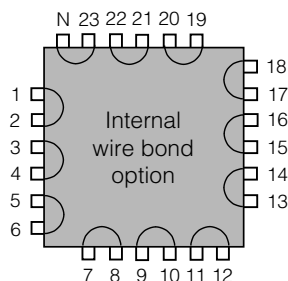


DUMMY COMPONENT ORDERING INFORMATION

NBR LEADS	LEAD PITCH		BODY SIZE A x B	TAPE INFO		Tray Part Number		13" (330mm) Tape & Reel Part Number	
	MM	MILS		WIDTH	PITCH	XQ1	QTY	XQ1	QTY
32	0.5	19.7	5mm	16mm	12mm	TQFP32T19.7	360	TQFP32E13A19.7	2500
32	0.8	31.5	7mm	16mm	12mm	TQFP32T30	250	TQFP32E13A30	1000
44	0.8	31.5	10mm	24mm	16mm	TQFP44T30	160	TQFP44E13A30	1000
48	0.5	19.7	7mm	16mm	12mm	TQFP48T19.7	250	TQFP48E13A19.7	1000
52	0.65	25.6	10mm	24mm	16mm	TQFP52T25	160	TQFP52E13A25	1000
64	0.4	15.7	7mm	16mm	12mm	TQFP64T15.7	250	TQFP64E13A15.7	1000
64	0.5	19.7	10mm	24mm	24mm	TQFP64T19.7	160	TQFP64E13A19.7	1000
64	0.8	31.5	14mm	24mm	16mm	TQFP64T30	90	TQFP64E13A30	1000
80	0.4	15.7	10mm	24mm	16mm	TQFP80T15.7	160	TQFP80E13A15.7	1000
80	0.5	19.7	12mm	24mm	24mm	TQFP80T19.7	119	TQFP80E13A19.7	1000
80	0.65	25.6	14mm	24mm	24mm	TQFP80T25	90	TQFP80E13A25	1000
100	0.5	19.7	14mm	24mm	24mm	TQFP100T19.7	90	TQFP100E13A19.7	1000
120	0.4	15.7	14mm	24mm	24mm	TQFP120T15.7	90	TQFP120E13A15.7	1000
128	0.4	15.7	14mm	24mm	24mm	TQFP128T15.7	90	TQFP128E13A15.7	1000
144	0.5	19.7	20mm	44mm	24mm	TQFP144T19.7	60	TQFP144E13A19.7	1000
176	0.4	15.7	20mm	44mm	24mm	TQFP176T15.7	60	TQFP176E13A15.7	1000



For "C" and "D" dimensions add 2.0mm to dimension "A" or "B"



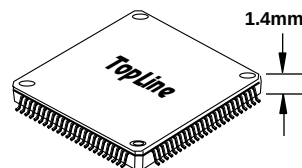
Daisy Chain
available on special order
Add -DE to end of part number

Thin Quad Flat Packs (TQFP) are 1.0mm thick. Lead length is 1.0mm per side. Add 2.0mm to body dimension for tip to tip of leads. Tape quantities may vary. For Daisy Chain "Even" available on special order, add -DE to end of part number. For completely isolated (no internal connections) add -ISO to end of part number. Solder plating Sn85/Pb15

LQFP 1.4MM THICK

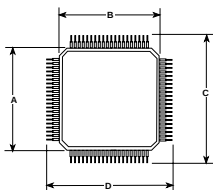
LOW PROFILE

QUAD FLAT PACK

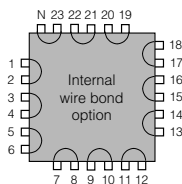


DUMMY COMPONENT ORDERING INFORMATION

NBR LEADS	LEAD PITCH		BODY SIZE A x B	TAPE INFO		Tray Part Number	QTY	13" (330mm) Tape & Reel Part Number	
	MM	MILS		WIDTH	PITCH			XQ1	QTY
32	0.5	19.7	5mm	16mm	12mm	LQFP32T19.7	360	LQFP32E13A19.7	2500
32	0.8	31.5	7mm	16mm	12mm	LQFP32T30	250	LQFP32E13A30	1000
44	0.8	31.5	10mm	24mm	16/24mm	LQFP44T30	160	LQFP44E13A30	1000
48	0.5	19.7	7mm	16mm	12mm	LQFP48T19.7	250	LQFP48E13A19.7	1000
52	0.65	25.6	10mm	24mm	16/24mm	LQFP52T25	160	LQFP52E13A25	1000
64	0.4	15.7	7mm	16mm	12mm	LQFP64T15.7	250	LQFP64E13A15.7	1000
64	0.5	19.7	10mm	24mm	16/24mm	LQFP64T19.7	160	LQFP64E13A19.7	1000
64	0.8	31.5	14mm	24mm	20/24mm	LQFP64T30	90	LQFP64E13A30	1000
80	0.4	15.7	10mm	24mm	16/24mm	LQFP80T15.7	160	LQFP80E13A15.7	1000
80	0.5	19.7	12mm	24mm	16/24mm	LQFP80T19.7	119	LQFP80E13A19.7	1000
80	0.65	25.6	14mm	24mm	20/24mm	LQFP80T25	90	LQFP80E13A25	1000
100	0.5	19.7	14mm	24mm	20/24mm	LQFP100T19.7	90	LQFP100E13A19.7	1000
100	0.65	25.6	14x20mm	44mm	24mm	LQFP100T25	72	LQFP100E13A25	1000
120	0.4	15.7	14mm	24mm	20/24mm	LQFP120T15.7	90	LQFP120E13A15.7	1000
128	0.4	15.7	14mm	24mm	20/24mm	LQFP128T15.7	90	LQFP128E13A15.7	1000
128	0.5	19.7	14x20mm	44mm	24mm	LQFP128T19.7	72	LQFP128E13A19.7	1000
144	0.5	19.7	20mm	44mm	24mm	LQFP144T19.7	60	LQFP144E13A19.7	1000
160	0.5	19.7	24mm	44mm	32mm	LQFP160T19.7	40	LQFP160E13A19.7	1000
176	0.4	15.7	20mm	44mm	24mm	LQFP176T15.7	60	LQFP176E13A15.7	1000
176	0.5	19.7	24mm	44mm	32mm	LQFP176T19.7	40	LQFP176E13A19.7	500
208	0.5	19.7	28mm	44mm	32mm	LQFP208T19.7	36	LQFP208E13A19.7	500
216	0.4	15.7	24mm	44mm	32mm	LQFP216T15.7	40	LQFP216E13A15.7	500
256	0.4	15.7	28mm	44mm	32mm	LQFP256T15.7	36	LQFP256E13A15.7	500



For dimension "C" or "D" add
2.0mm to dimension "A" or "B".

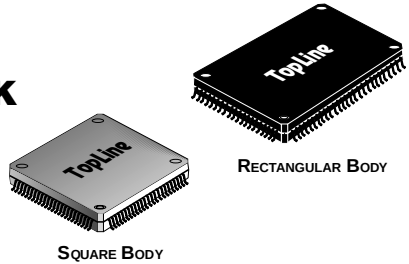


Daisy Chain "Even"
available on special order
Add -DE to end of part number

LQFPs are slightly thicker than TQFPs. Leads are 1.0mm long. Add 2.0mm to body size for total overall dimensions. For Daisy Chain "Even," add -DE to end of part number. For completely isolated (no internal connections) add -ISO to end of part number. Standard plating Sn85/Pb15.

Lead Free. Suffix B = Sn/Bi, C = Sn/Cu, TIN = Sn100.

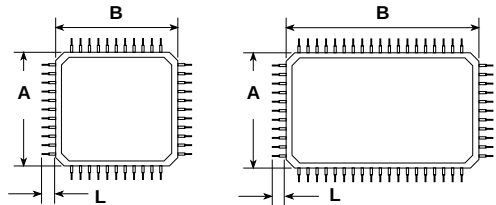
QFP QUAD FLAT PACK



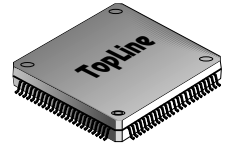
DUMMY COMPONENT ORDERING INFORMATION

NBR LEADS	2xL FOOTPRINT ADDER		LEAD PITCH		 Tray Part Number	QTY	7" (180mm)  Tape & Reel Part Number		QTY	13" (330mm)  Tape & Reel Part Number		QTY
	MM	MILS	MM	XQ1			XM1	XQ1				
10MM SQUARE BODY												
44	3.2mm	31.5	0.8	QFP44T30-3.2	96	QFP44E7A30-3.2	50	QFP44E13A30-3.2	750			
44	3.9mm	31.5	0.8	QFP44T30-3.9	96	QFP44E7A30-3.9	50	QFP44E13A30-3.9	750			
52	3.2mm	25.6	0.65	QFP52T25-3.2	96	-	-	QFP52E13A25-3.2	750			
52	3.9mm	25.6	0.65	QFP52T25-3.9	96	-	-	QFP52E13A25-3.9	750			
64	3.2mm	19.7	0.5	QFP64T19.7-3.2	96	-	-	-	-			
14MM SQUARE BODY												
44	3.2mm	40	1.0	QFP44T40-4.3	84	-	-	QFP44E13A40-4.3	350			
52	3.2mm	40	1.0	QFP52T40-3.2	84	-	-	QFP52E13A40-3.2	500			
64	3.2mm	31.5	0.8	QFP64T30-3.2-2.0H	84	-	-	QFP64E13A30-3.2-2.0H	500			
64	3.2mm	31.5	0.8	QFP64T30-3.2-2.7H	84	-	-	QFP64E13A30-3.2-2.7H	500			
80	3.2mm	25.6	0.65	QFP80T25-3.2-2.0H	84	-	-	QFP80E13A25-3.2-2.0H	500			
80	3.2mm	25.6	0.65	QFP80T25-3.2-2.7H	84	-	-	QFP80E13A25-3.2-2.7H	500			
100	2.0mm	19.7	0.5	SQFP100T19.7-2.0	50	-	-	-	-			
14MM x 20MM RECTANGULAR BODY												
64	3.2mm	40	1.0	QFP64T40-3.2	60	QFP64E7A40-3.2		QFP64E13A40-3.2	200			
64	3.9mm	40	1.0	QFP64T40-3.9	66	QFP64E7A40-3.9	50	QFP64E13A40-3.9	200			
80	3.9mm	31.5	0.8	QFP80T30-3.9	66	QFP80E7A30-3.9	50	QFP80E13A30-3.9	200			
100	3.2mm	25.6	0.65	QFP100T25-3.2	66	QFP100E7A25-3.2	50	QFP100E13A25-3.2	200			
100	3.9mm	25.6	0.65	QFP100T25-3.9	66	QFP100E7A25-3.9	50	QFP100E13A25-3.9	200			
100	5.6mm	25.6	0.65	QFP100T25-5.6	60	-	-	-	-			
128	3.2mm	19.7	0.5	QFP128T19.7-3.2	66	-	-	-	-			

BODY SIZE	TYPICAL THICKNESS	TAPE INFO	
		WIDTH	PITCH
10mm Sq.	2.0mm	24mm	16/24mm
14mm Sq.	2.0mm	32mm	24mm
14mm Sq.	2.7mm	32mm	24mm
14 x 20mm	2.7mm	44mm	32mm
28mm Sq.	3.6mm	44mm	40mm
32mm Sq.	3.8mm	-	-
40mm Sq.	3.8mm	-	-



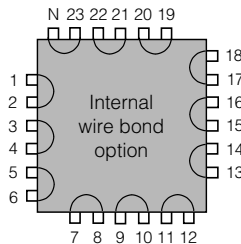
QFP QUAD FLAT PACK



DUMMY COMPONENT ORDERING INFORMATION

NBR LEADS	2xL FOOTPRINT ADDER		LEAD PITCH		 Tray Part Number		7" (180mm)  Tape & Reel Part Number		13" (330mm)  Tape & Reel Part Number	
	MM	MILS	MM	XQ1	QTY	XM1	QTY	XQ1	QTY	
28MM SQUARE BODY										
120	3.2mm	31.5	0.8	QFP120T30-3.2	24	-	-	QFP120E13A30-3.2	200	
120	3.9mm	31.5	0.8	QFP120T30-3.9	24	QFP120E7A30-3.9	50	QFP120E13A30-3.9	200	
128	3.2mm	31.5	0.8	QFP128T30-3.2	24	-	-	QFP128E13A30-3.2	200	
128	3.9mm	31.5	0.8	QFP128T30-3.9	24	-	-	QFP128E13A30-3.9	200	
136	3.2mm	25.6	0.65	QFP136T25-3.2	24	-	-	QFP136E13A30-3.2	200	
144	2.6mm	25.6	0.65	QFP144T25-2.6	24	-	-	QFP144E13A25-2.6	200	
144	3.2mm	25.6	0.65	QFP144T25-3.2	24	QFP144E7A25-3.2	50	QFP144E13A25-3.2	200	
144	3.9mm	25.6	0.65	QFP144T25-3.9	24	-	-	QFP144E13A25-3.9	200	
160	2.6mm	25.6	0.65	QFP160T25-2.6	24	-	-	QFP160E13A25-2.6	200	
160	3.2mm	25.6	0.65	QFP160T25-3.2	24	QFP160E7A25-3.2	50	QFP160E13A25-3.2	200	
160	3.9mm	25.6	0.65	QFP160T25-3.9	24	QFP160E7A25-3.9	50	QFP160E13A25-3.9	200	
184	2.6mm	19.7	0.5	QFP184T19.7-2.6	24	-	-	QFP184E13A19.7-2.6	200	
208	2.6mm	19.7	0.5	QFP208T19.7-2.6	24	QFP208E7A19.7-2.6	50	QFP208E13A19.7-2.6	200	
256	2.6mm	15.7	0.4	QFP256T15.7-2.6	24	QFP256E7A15.7-2.6	50	QFP256E13A15.7-2.6	200	
32MM SQUARE BODY										
240	2.6mm	19.7	0.5	QFP240T19.7-2.6	24	-	-			
40MM SQUARE BODY										
304	2.6mm	19.7	0.5	QFP304T19.7-2.6	12	-	-	-	-	

Daisy Chain
available on special order
Add -DE to end of part number
See page 35

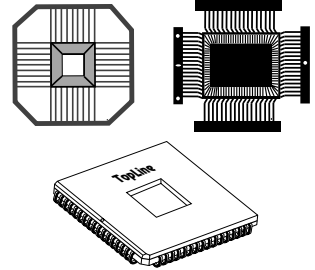


**I
N
F
O** TopLine supplies a wide assortment of Quad Flat Packs in metric packages. Add 2 x L foot print to the body size for total tip-to-tip dimension. Coplanarity guaranteed to 4 mils (0.1mm). Tray quantities may vary. Some QFP contain internal die. For completely isolated (no internal connections) add -ISO to end of part number. Standard plating Sn85/Pb15.

Lead Free option B = Sn/Bi, C = Sn/Cu, TIN = Sn100.

CERQUAD & CLCC

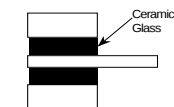
CERAMIC QUAD FLAT PACK



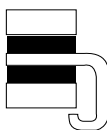
DUMMY COMPONENT ORDERING INFORMATION

NBR LEADS	LEAD PITCH		LEAD STYLE	SQUARE BODY SIZE		Tray Part Number
	MILS	MM		INCH	METRIC (MM)	
28	50	1.27	Flat	.40	10.0	CERQUAD28F50
28	50	1.27	J-lead	.45	11.5	CLCC28J50
44	50	1.27	Flat	.562	14.3	CERQUAD44F50
44	50	1.27	J-lead	.65	16.5	CLCC44J50
52	50	1.27	Flat	.75	19.0	CERQUAD52F50
52	50	1.27	J-lead	.75	19.0	CLCC52J50
68	50	1.27	Flat	.95	24.1	CERQUAD68F50
68	50	1.27	J-lead	.95	24.1	CLCC68J50
84	25	0.635	Flat	.65	16.5	CERQUAD84F25
84	50	1.27	Flat	1.06	27.0	CERQUAD84F50
84	50	1.27	J-lead	1.15	29.3	CLCC84J50
132	25	0.635	Flat	.95	24.1	CERQUAD132F25
132	25	0.635	Gull-wing	.87	22.1	CERQUAD132G25
172	25	0.635	Flat	1.15	29.3	CERQUAD172F25
196	25	0.635	Flat	1.26	32.0	CERQUAD196F25
208	19.7	0.5	Flat	1.10	28.0	CERQUAD208F19.7
208	19.7	0.5	Gull-wing	1.10	28.0	CERQUAD208G19.7

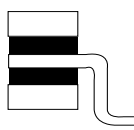
Note: To assure an accurate quotation, please complete the order form on next page. Ceramic lids sold separately.
Leads may be solder coated, kovar or gold. Add -DE to end of part number for daisy chain.



FLAT LEAD
ON LEAD FRAME



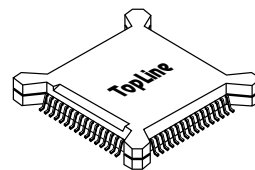
J-LEAD
CLCC



GULL-WING
WITH TIE-BAR

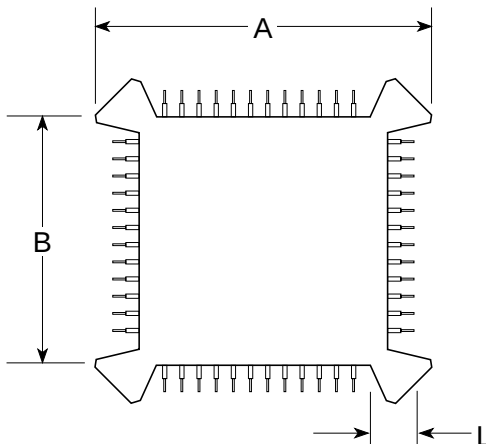
PART NUMBER

OPTIONS	PART NBR SUFFIX
With Lid	Blank
Without Lid	-N
Gold Leads	Blank
Solder Coat Leads	-SC
Completely Isolated	-ISO
Daisy Chain	-DE



DUMMY COMPONENT ORDERING INFORMATION

NBR LEADS	2xL		B	 Tray		7" (180mm)  Tape & Reel		13" (330mm)  Tape & Reel	
	FOOTPRINT ADDER	LEAD PITCH	BODY SIZE	Part Number	QTY	Part Number	QTY	Part Number	QTY
	MM	MM	MM Sq.	XQ1		XM1		XQ1	
100	3.3	0.636	19	BQFP100T25	55	BQFP100E7A25	50	BQFP100E13A25	300
132	3.3	0.636	24.1	BQFP132T25	36	BQFP132E7A25	50	BQFP132E13A25	300



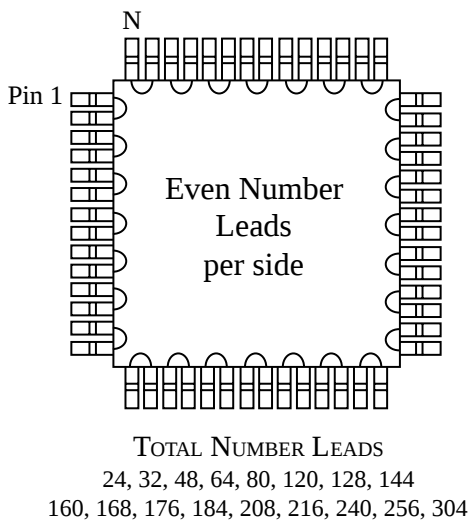
INFO

BQFP Bumper Quad Flat Packs are built to JEDEC (non-metric) standards with true 25mil (0.636mm) lead pitch. The bumpers protect leads from damage during transport in the carrier. Plating Sn85/Pb15.

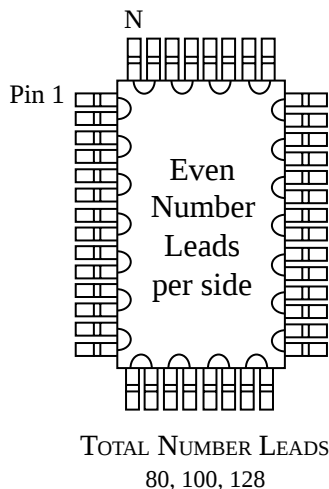
QFP

DAISY CHAIN

SQUARE BODY

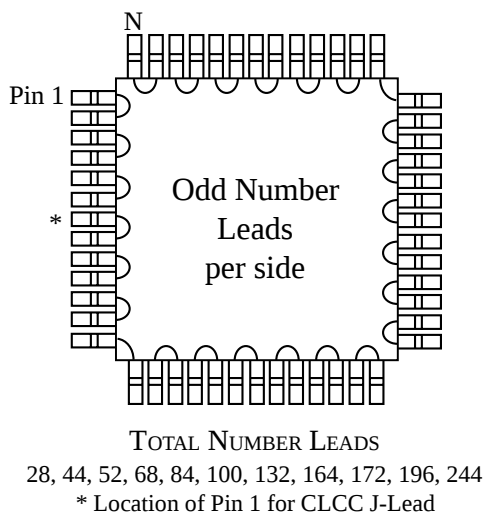


RECTANGLE BODY

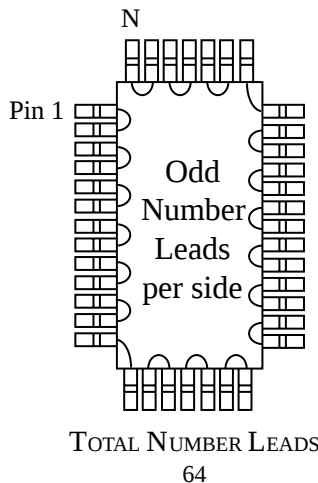


Not to Scale

SQUARE BODY



RECTANGLE BODY



FLIP CHIP



DUMMY COMPONENT ORDERING INFORMATION

NBR BUMPS	BUMP INFORMATION				DIE SIZE METRIC	NOTES	DIE PER BUMPED 5" WAFER QTY	 WAFFLE 2" SQ Tray Part Number	QTY
	PITCH	HIGH	Ø DIA	MATERIAL					
48	457µm	140	190µm	Eutectic	6.3mm SQ	PB18	236	FC48D6.3E457	25
88	204µm	125	135µm	Eutectic	5.08mm SQ	PB08	340	FC88G5.08E204	36
96	457µm	140	190µm	Eutectic	12.7mm SQ	PB18	46	FC96D12.7E457	9
112	152µm	85	88µm	Eutectic	5.08mm SQ	PB06	340	FC112K5.08E152	36
176	204µm	125	135µm	Eutectic	10.2mm SQ	PB08	80-86	FC176G10E204	9
220	204µm	125	135µm	Eutectic	10.2 x 15.25mm	PB08	46-50	FC220G10x15E204	6
317	254µm	119	135µm	Eutectic	5.08mm SQ	FA10	340	FC317G5.08E254	36
579	300µm	100	110µm	Eutectic	11.0mm SQ	WPA01	Wafer 8"	FC579G11E300-ISO	9
960	225µm	90	100µm	Eutectic	7.2mm SQ	VPA18	Wafer 8"	FC960G7.2E225-ISO	25
1268	254µm	119	135µm	Eutectic	10.2mm SQ	FA10	80-86	FC1268G10E254	9
2853	254µm	119	135µm	Eutectic	15.0mm SQ	FA10	28	FC2853G15E254	4
5072	254µm	119	135µm	Eutectic	20.0mm SQ	FA10	18	FC5072G20E254	4

FC 48 D 6.3 E

Flip Chip

FC = Standard Flip Chip
 FCW = Bumped Wafer
 FCQ = Quartz Flip Chip
 FCWQ = Quartz Wafer
 FCN = Bumpless Chip
 FCWN = Bumpless Wafer

Number Bumps

Actual Count

Bump Diameter

A = 100 x 127µm
 B = 115µm SQ
 C = 160µm
 D = 190µm
 E = 56µm SQ

Die Size

In millimeter
 6.3 = 6.3mm SQ
 10 x 15 = 10mm x 15mm

Bump Material

E = Eutectic Sn63
 G = Gold over Nickel
 C = Lead Free Sn/Ag/Cu

457 - DC

Bump Pitch

in µm
 (1000µm = 1.0mm)

Daisy Chain

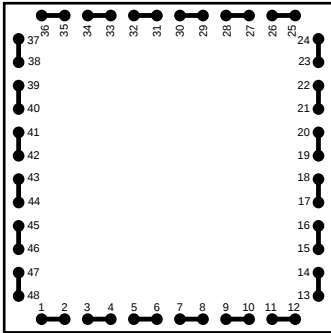
**I
N
F
O** Eutectic 63/37 SnPb allows repeatable bump collapse of 25-40µm for a typical 125µm tall bump. Flip Chips are available with daisy chain (-DC). For bumped wafers, change prefix of part number to FCW. For bumpless flip chip for wire bonding, change suffix to FCN.

 Lead Free available, change "E" to "C" in part number for Sn95.5/Ag3.5/Cu1.0 Lead Free Eutectic Bumps.

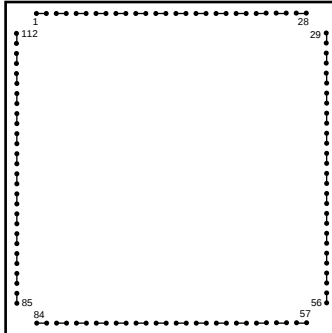
36

FLIP CHIP

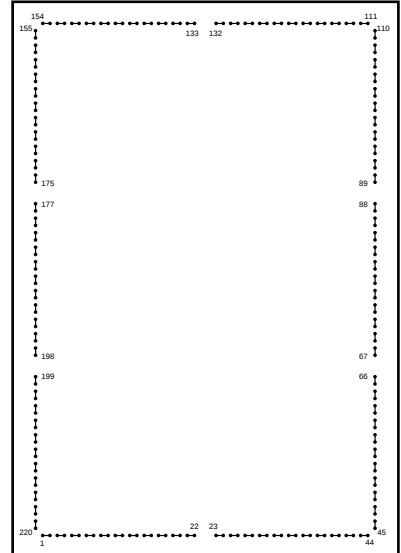
(BUMP VIEW)



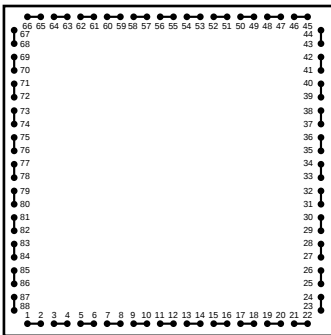
FC48 (PB18 - 250x250)



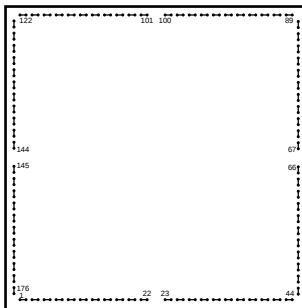
FC112 (PB06 - 200x200)



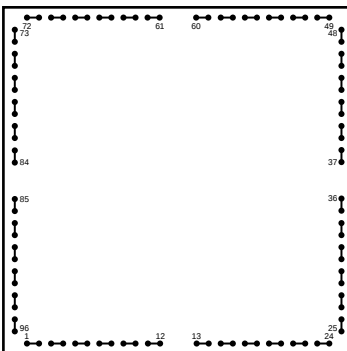
FC220 (PB08 - 400x600)



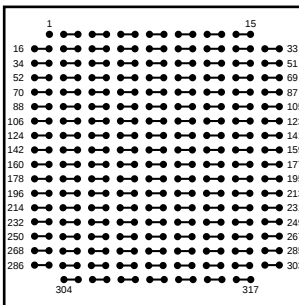
FC88 (PB08 - 200x200)



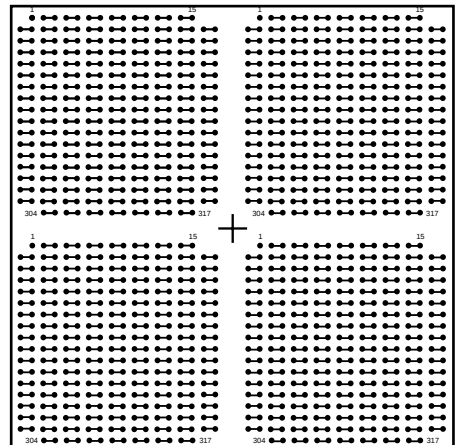
FC176 (PB08 - 400x400)



FC96 (PB18 - 500x500)

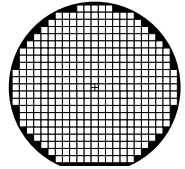


FC317 (FA10-200x200)



FC1268 (FA10 - 400x400)

MECHANICAL GRADE DUMMY WAFER AND DIE



DUMMY WAFER ORDERING INFORMATION

WAFER DIAMETER	WAFER TYPE	 WAFER IN JAR PART NUMBER	 WAFER IN CASSETTE PART NUMBER	 DIE UV TAPE PART NUMBER
4-inch (100mm)	Mirrored/Polished Wafer Wafer with Etched Pattern Wafer with Sawn Mirror Die Wafer with Sawn Etched Die	WM4-J WE4- mm x mm - J - -	WM4-C WE4- mm x mm -C - -	- - WMD4- mm x mm -UV WED4- mm x mm -UV
5-inch (125mm)	Mirrored/Polished Wafer Wafer with Etched Pattern Wafer with Sawn Mirror Die Wafer with Sawn Etched Die	WM5-J WE5- mm x mm - J - -	WM5-C WE5- mm x mm -C - -	- - WMD5- mm x mm -UV WED5- mm x mm -UV
6-inch (150mm)	Mirrored/Polished Wafer Wafer with Etched Pattern Wafer with Sawn Mirror Die Wafer with Sawn Etched Die	WM6-J WE6- mm x mm - J - -	WM6-C WE6- mm x mm -C - -	- - WMD6- mm x mm -UV WED6- mm x mm -UV
8-inch (200mm)	Mirrored/Polished Wafer Wafer with Etched Pattern Wafer with Sawn Mirror Die Wafer with Sawn Etched Die	WM8-J WE8- mm x mm - J - -	WM8-C WE8- mm x mm -C - -	- - WMD8- mm x mm -UV WED8- mm x mm -UV
12-inch (300mm)	Mirrored/Polished Wafer Wafer with Etched Pattern Wafer with Sawn Mirror Die Wafer with Sawn Etched Die	WM12-J - - -	WM12-C - - -	- - WMD12- mm x mm -UV -

TYPICAL WAFER THICKNESS BEFORE BACK GRINDING

4" wafer = 525µm (20 mils)
5" wafer = 625µm (24 mils)
6" wafer = 680µm (27 mils)
8" wafer = 725µm (29 mils)
12" wafer = 825µm (32 - 33mils)

OPTIONS

Back Grinding: Add suffix -BG after wafer size
in part number

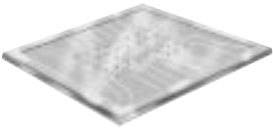
Blue Nitto Tape & Ring = UVR suffix

Die in 2" Waffle Pack:

Etch Die: ED-10mm x 5mm -WP2

Mirror Die = MD-10mm x 5mm -WP2

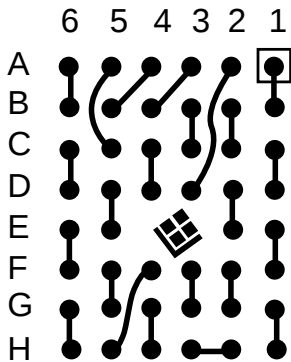
μBGA® CSP
MICRO BALL GRID ARRAY
CHIP SCALE PACKAGE



DUMMY COMPONENT ORDERING INFORMATION

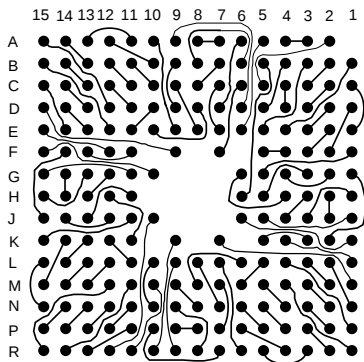
FIG	NBR BALLS	PITCH	TAPE INFO		BODY SIZE	BALL DIAMETER	BUMP MATRIX	4" SQ	
			WIDTH	PITCH				 Tray Part Number	QTY
EUTECTIC Sn63 BALLS									
1	46	0.75mm	16mm	12mm	5.76 x 7.87mm	0.325mm	6 x 8	CSP46T.75-DC24	99
2	208	0.5mm			9.3mm SQ	0.300mm	15 x 15	CSP208T.5-DC156	49
LEAD FREE									
1	46	0.75mm	SnAg		5.76 x 7.87mm	0.325mm	6 x 8	CSP46T.75F-DC24	99
1	46	0.75mm	SnAgCu		5.76 x 7.87mm	0.325mm	6 x 8	CSP46T.75C-DC24	99
2	208	0.5mm	SnAg		9.3mm SQ	0.300mm	15 x 15	CSP208T.5F-DC156	49

FIG. 1



CSP46T.75-DC24
VIEW OF BUMPS

FIG. 2



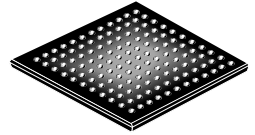
CSP208T.5-DC156
VIEW OF BUMPS

INFO Tessera's μBGA® package is a chip scale package. Ball material - Eutectic 63Sn/37Pb. For Test Boards see kit section of catalog. Tray size is 4" (100mm) square. Rated at JEDEC Level 1 moisture insensitivity and does not require baking prior to assembly.

CSP

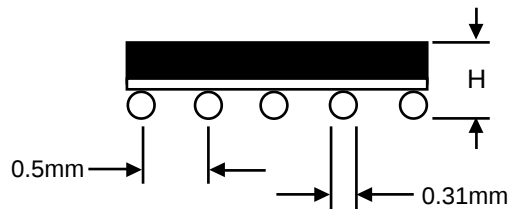
BALL GRID ARRAY

0.5MM PITCH



DUMMY COMPONENT ORDERING INFORMATION

FIG	NBR BALLS	BODY SIZE	BALL ALIGNMENT	HEIGHT	BALL MATRIX	SUBSTRATE	Tray Part Number XJ1	QTY
1	6	1.5 x 1.0mm	Full	0.65mm	3 x 2	Si	CSP6E7A.5-DC023	Reel
2	40	5mm	2-Row	1.24mm	8 x 8	BT	CSP40T.5-DC082	624
3	48	5mm	2-Row	1.24mm	8 x 8	BT	CSP48T.5-ISO	490
4	56	6mm	2-Row	1.24mm	10 x 10	BT	CSP56T.5-DC102	608
5	96	8mm	2-Row	1.24mm	14 x 14	Polyimide	fBGA96T.5-DC144	360
6	108	8mm	3-Row	1.24mm	14 x 14	BT	CSP108T.5-DC146	360



INFO

fBGA - Flex Polyimide substrate. Total package height 1.02mm. Ball diameter is 0.31mm.

For Interior Die, add suffix -D to end of part number

CSP - BT substrate. Total package height 1.24mm. Ball diameter is 0.31mm.

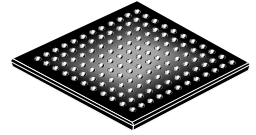
For Internal Die, add suffix -D to end of part number

Ⓢ - Lead free option: Add "C" after pitch in part number for SnAgCu balls.

BGA & CSP

BALL GRID ARRAY

0.75~0.8MM PITCH



DUMMY COMPONENT ORDERING INFORMATION

FIG	NBR BALLS	BODY SIZE	BALL PATTERN	PITCH	BALL MATRIX	SUBSTRATE	 Tray Part Number	QTY
1A	46	6 x 7mm	Full	0.75mm	6 x 8	BT	BGA46T.75-DC24	160
1C	48	6 x 7mm	Full	0.75mm	6 x 8	BT	BGA48T.75-ISO-6x8	160
2	36	6mm	Full	0.8mm	6 x 6	BT	BGA36T.8-DC069	608
1C	48	8 x 9mm	Full		6 x 8	BT	BGA48T.8-ISO-6x8	297
3	49	7mm	Full		7 x 7	BT	BGA49T.8-DC077	476
4	64	8mm	Full		8 x 8	Polyimide	fBGA64T.8-DC089	360
5	81	9mm	Full		9 x 9	BT	BGA81T.8-DC099	360
6	100	10mm	Full		10 x 10	BT	BGA100T.8-DC109	250
7	112	10mm	4-Row		11 x 11	Polyimide	fBGA112T.8-DC115	240/250
8	144	12mm	Full		12 x 12	BT	BGA144T.8-12x12	168
9	144	12mm	4-Row		13 x 13	Polyimide	fBGA144T.8-DC134	198
10	180	12mm	5-Row		14 x 14	Polyimide	fBGA180T.8-ISO	198
11	192	14mm	4-Row		16 x 16	BT	BGA192T.8-ISO	119/152
12	208	15mm	4-Row		17 x 17	FR4	LBGA208T.8-DC170	126
13	280	16mm	5-Row		19 x 19	Flex Polyimide	fBGA280T.8-DC195	119

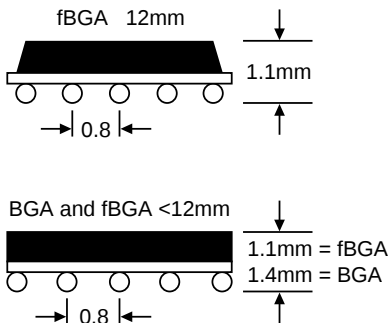


fig. 1A

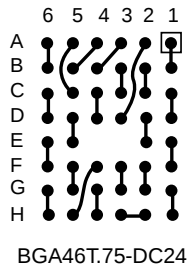
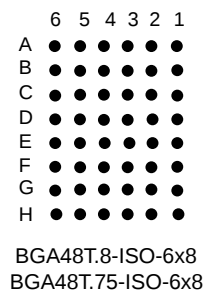


fig. 1C



INFO

BGA - Near CSP dimensions on rigid BT substrate with molding compound.

Eutectic Sn63 solder balls 0.46mm diameter. (0.75mm Pitch is 0.3mm ball diameter)

fBGA - Flex Polyimide features near CSP dimensions with over-molded body.

Eutectic Sn63 solder balls 0.46mm diameter.

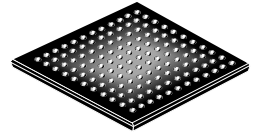


-Lead free option: Add "C" after pitch in part number for SnAgCu balls.

BGA & CSP

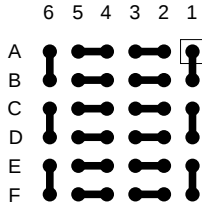
BALL GRID ARRAY

0.75~0.8MM PITCH



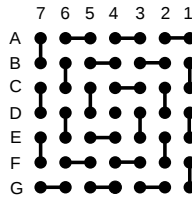
BALL VIEW

fig. 2



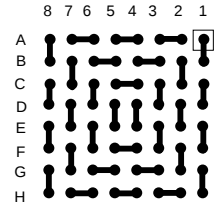
BGA36T.8-DC069

fig. 3



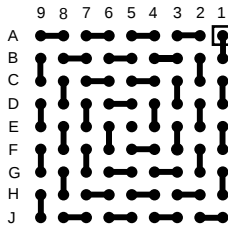
BGA49T.8-DC077

fig. 4



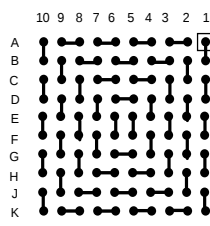
fBGA64T.8-DC089

fig. 5



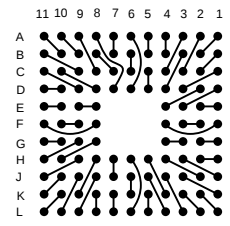
BGA81T.8-DC099

fig. 6



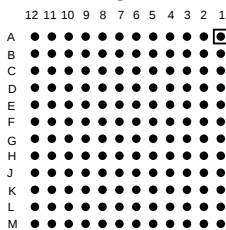
BGA100T.8-DC109

fig. 7



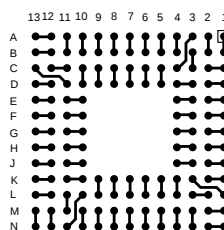
fBGA112T.8-DC115

fig. 8



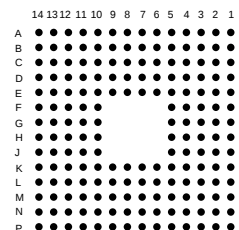
BGA144T.8-12x12

fig. 9



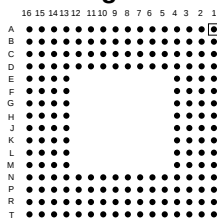
fBGA144T.8-DC134

fig. 10



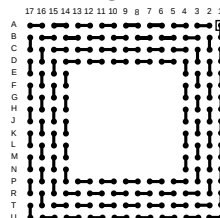
fBGA180T.8-ISO

fig. 11



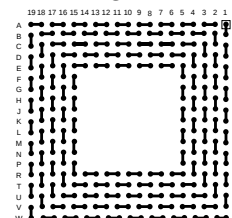
BGA192T.8-ISO

fig. 12



LBGA208T.8-DC170

fig. 13

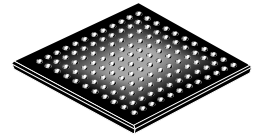


fBGA280T.8-DC195

BGA

PLASTIC BALL GRID ARRAY

1.0MM PITCH



DUMMY COMPONENT ORDERING INFORMATION

FIG	NBR BALLS	BODY SIZE	BALL PATTERN	CENTER BALL	BALL MATRIX	 Tray Part Number XJ1 STANDARD	 Tray Part Number XJ1 UNENCAPSULATED	QTY
1	81	10mm	Full Array	NA	9 x 9	BGA81T1.0-ISO	-	250
2	100	11mm	Full Array	NA	10 x 10	BGA100T1.0-ISO	-	176
3	144	13mm	Full Array	NA	12 x 12	BGA144T1.0-DC128	-	160
4	156	15mm	4-Row	-0-	14 x 14	BGA156T1.0-DC140	-	126
5	160	15mm	4-Row	2 x 2	14 x 14	BGA160T1.0-DC142	-	126
6	192	17mm	4-Row	NA	16 x 16	BGA192T1.0-DC160A	-	90
7/8	196	15mm	Full Array	NA	14 x 14	BGA196T1.0-DC149A	LBGA196T1.0-DC149	126
9	208	17mm	4-Row	4 x 4	16 x 16	BGA208T1.0-DC164A	-	90
20	209	14x22mm	Full Array	NA	11 x 19	-	LBGA209T1.0-DC1119	84
10	256	17mm	Full Array	NA	16 x 16	BGA256T1.0-DC169A	-	90
11	288	23mm	4-Row	-0-	22 x 22	BGA288T1.0-ISO	-	60
12	324	23mm	4-Row	6 x 6	22 x 22	BGA324T1.0-ISO	-	60
13	400	21mm	Full Array	NA	20 x 20	eBGA400T1.0-D209D	LBGA400T1.0-DC209	60
14	484	23mm	Full Array	NA	22 x 22	eBGA484T1.0-D229AD	LBGA484T1.0-DC229A	60
15	672	27mm	Full Array	NA	26 x 26	eBGA672T1.0-D268D	LBGA672T1.0-DC268	40
16	900	31mm	Full Array	NA	30 x 30	eBGA900T1.0-D309D	LBGA900T1.0-DC309	27
17	1156	35mm	Full Array	NA	34 x 34	eBGA1156T1.0-D349D	LBGA1156T1.0-DC349	24
18	1600	42.5mm	Full Array	NA	40 x 40	eBGA1600T1.0-D409D	LBGA1600T1.0-DC409	12
19	1936	45mm	Full Array	NA	44 x 44	eBGA1936T1.0-D449D	LBGA1936T1.0-DC449	12

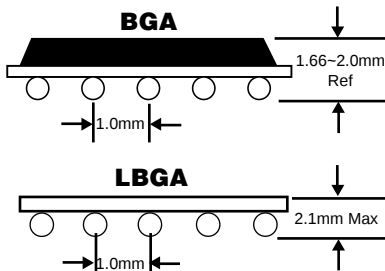
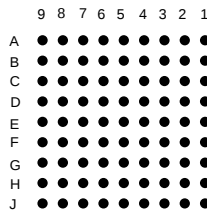
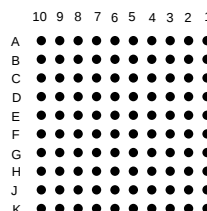


FIG. 1



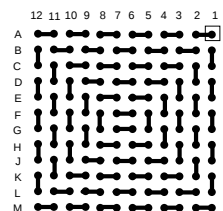
BGA81T1.0-ISO

FIG. 2



BGA100T1.0-ISO

FIG. 3



BGA144T1.0-DC128

I N F O

BGA - Standard BGA plastic packages should be baked at 120°C for 24 hours prior to assembly to prevent delamination and the "popcorn" phenomena during the assembly process. Solder balls are eutectic Sn63 SnPb 25mil (0.63mm)

LBGA- Unencapsulated profile laminate Ball Grid Arrays offer the lowest cost when placement practice is the primary concern. Includes daisy chain laminate substrate with 25mil (0.63mm) Sn62 balls for soldering at 210°C.

☐ - Lead Free Option: Add "C" after pitch in part number for SnAgCu balls.

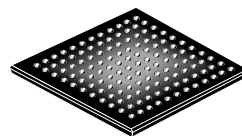
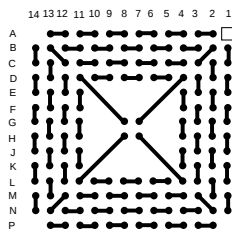
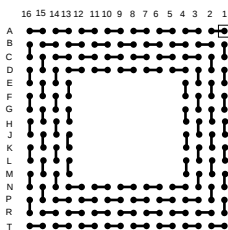


Fig. 4/5



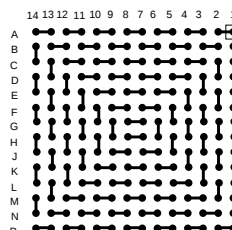
BGA156T1.0-DC140
BGA160T1.0-DC142

Fig. 6



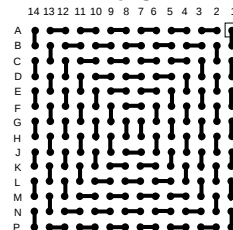
BGA192T1.0-DC160A

Fig. 7



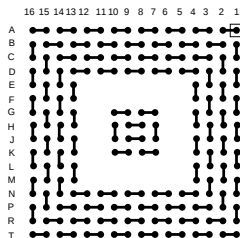
BGA196T1.0-DC149A

Fig. 8



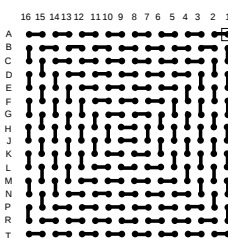
LBGA196T1.0-DC149

Fig. 9



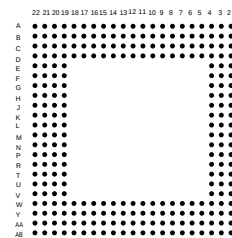
BGA208T1.0-DC164A

Fig. 10



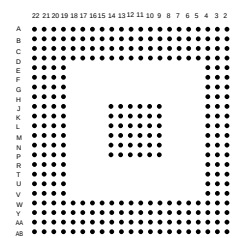
BGA256T1.0-DC169A

Fig. 11



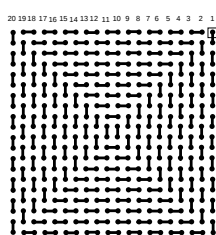
BGA288T1.0-ISO

Fig. 12



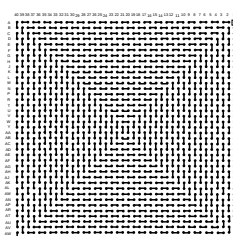
BGA324T1.0-ISO

Fig. 13



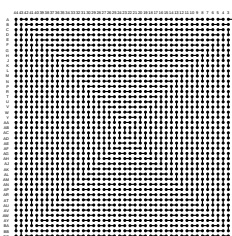
LBGA1156T1.0-DC349

Fig. 18



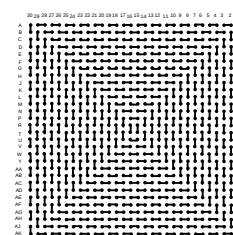
LBGA1600T1.0-DC409

Fig. 19



LBGA1936T1.0-DC449

Fig. 16



LBGA900T1.0-DC309

Fig. 17

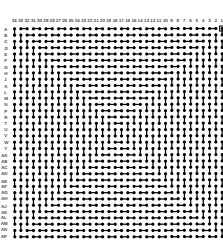
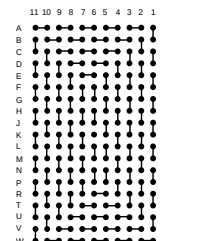


Fig. 20

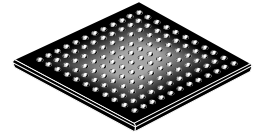


LBGA209T1.0-DC1119

BGA

PLASTIC BALL GRID ARRAY

1.27MM PITCH



DUMMY COMPONENT ORDERING INFORMATION

FIG	NBR BALLS	BODY SIZE	BALL PATTERN	CENTER BALL	BALL MATRIX	 Tray Part Number XJ1 STANDARD	 Tray Part Number UNENCAPSULATED	QTY
1	119	14 x 23mm	Full	NA	7 x 17	BGA119T1.27-DIE	-	84
2	208	23mm	4-Row	N/A	17 x 17	BGA208T1.27-DC170	-	60
3	217	23mm	4-Row	3 x 3	17 x 17	BGA217T1.27-DC171	-	60
4/5	256	27mm	4-Row	-0-	20 x 20	BGA256T1.27-DC200	LBGA256T1.27-DC200A	40
6	272	27mm	4-Row	4 x 4	20 x 20	BGA272T1.27-DC202	-	40
7	292	27mm	4-Row	6 x 6	20 x 20	BGA292T1.27	-	40
8	352	35mm	4-Row	-0-	26 x 26	BGA352T1.27-DC70	-	24
9	385	31mm	5-Row	5 x 5	23 x 23	BGA385T1.27	-	27
10	388	35mm	4-Row	6 x 6	26 x 26	BGA388T1.27-DC72	-	24
11	357	25mm	Full	NA	19 x 19	eBGA357T1.27-D73D	LBGA357T1.27-DC73	24
12	1225	45mm	Full	-0-	35 x 35	eBGA1225T1.27-D359D	LBGA1225T1.27-DC359	12

BGA DAISY CHAIN PATTERNS (BALL VIEW) - ILLUSTRATIONS NOT TO SCALE

SIDE VIEW

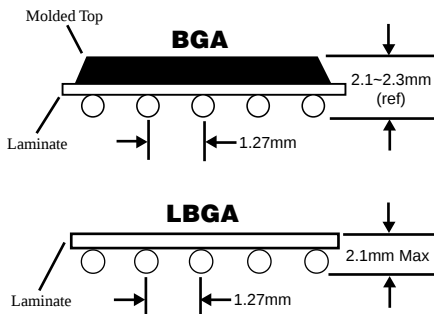


FIG. 1

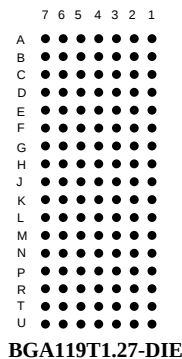


FIG. 2

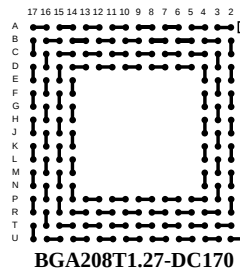
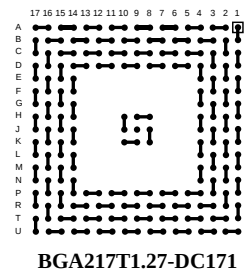


FIG. 3



BALL VIEW

- INFO

BGA - Standard BGA plastic packages should be baked at 125°C for 24 hours prior to assembly to prevent delamination and the "popcorn" phenomena during the assembly process. Solder balls are eutectic 63/37 SnPb 30mil (0.75mm)

LBGA - Laminate Ball Grid Arrays offer the lowest cost when placement practice is the primary concern. Includes daisy chain laminate with 30mil (0.75mm) 62/36/2 SnPbAg balls for soldering at 210°C.

 - Lead Free available. SnAgCu = Add "C" after pitch in part number.

BGA

PLASTIC BALL GRID ARRAY

1.27MM PITCH

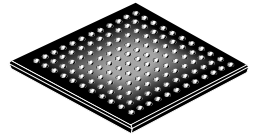
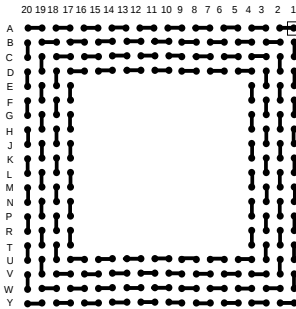
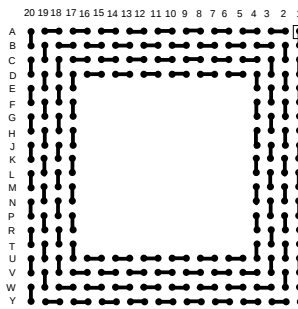


FIG. 4



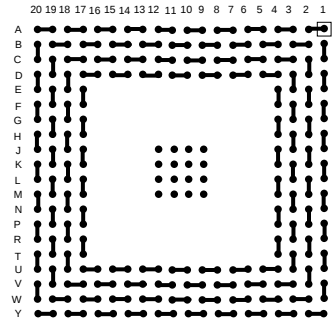
BGA256T1.27-DC200

FIG. 5



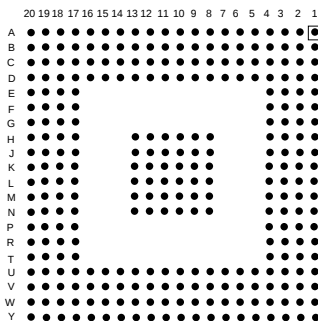
LPGA256T1.27-DC200A

FIG. 6



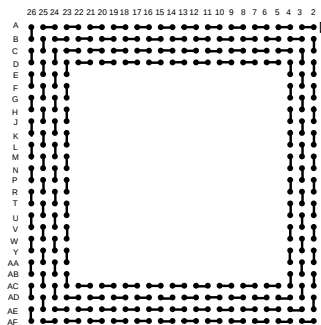
BGA272T1.27-DC202

FIG. 7



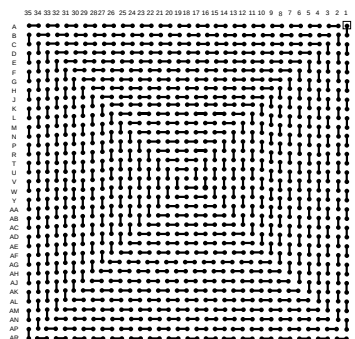
BGA292T1.27

FIG. 8



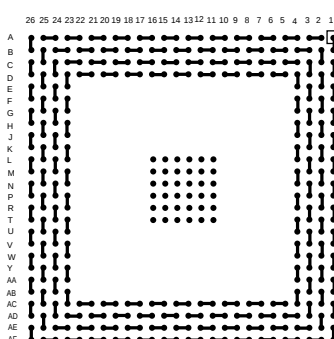
BGA352T1.27-DC70

FIG. 12



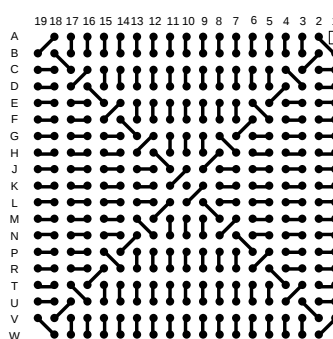
LPGA1225T1.27-DC359

FIG. 10



BGA388T1.27-DC72

FIG. 11

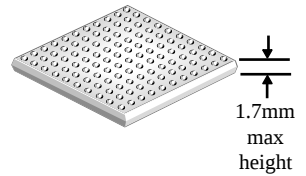


LPGA357T1.27-DC73

CBGA

CERAMIC BALL GRID ARRAY

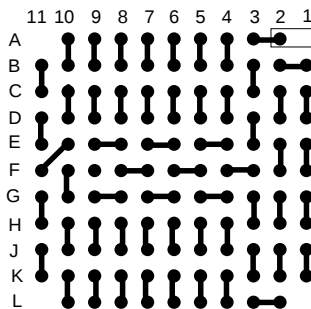
1.27MM PITCH



DUMMY COMPONENT ORDERING INFORMATION

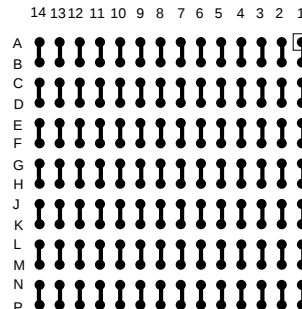
FIG	NBR BALLS	BODY SIZE	BALL PATTERN	BALL MATRIX	 Tray Part Number LOW TEMP 210°C XJ1 62/36/2 SnPbAg	 Tray Part Number HIGH TEMP 320°C XJ1 10/90 SnPb	QTY
1	121	15mm	Full Grid	11 x 11	CBGA121T1.27L-DC5	CBGA121T1.27-DC5	126
2	196	19mm	Full Grid	14 x 14	CBGA196T1.27L-DC11	CBGA196T1.27-DC11	84
3	256	21mm	Full Grid	16 x 16	CBGA256T1.27L-DC61	CBGA256T1.27-DC61	60
4	304	21 x 25mm	Full Grid	16 x 19	CBGA304T1.27L-DC63	CBGA304T1.27-DC63	55
5	361	25mm	Full Grid	19 x 19	CBGA361T1.27L-DC71	CBGA361T1.27-DC71	44
6	400	27mm	Full Grid	20 x 20	CBGA400T1.27L-DC21	CBGA400T1.27-DC21	40
7	625	32.5mm	Full Grid	25 x 25	-	CBGA625T1.27-DC81	24
8	1089	42.5mm	Full Grid	33 x 33	-	CBGA1089T1.27-DC339	12

FIG. 1



CBGA121T1.27-DC5
(BALL VIEW)

FIG. 2

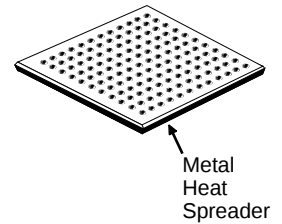


CBGA196T1.27-DC11
(BALL VIEW)

**I
N
F
O** Ceramic Ball Grid Arrays are not sensitive to moisture and do not require baking prior to assembly. Ball diameter is 30 mils (0.75mm). Standard ball material is 10/90 SnPb for high temperature soldering at 320°C to ceramic substrate. For low temperature soldering at 210°C to laminate substrate, specify 62/36/2 SnPbAg solder balls by adding -L to part number. Custom sizes and ball counts available.

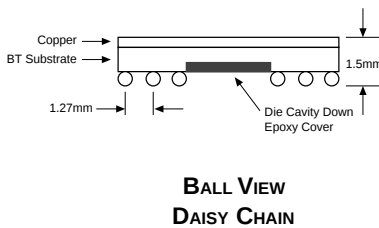


Lead free available with SnAgCu balls. Add "C" after pitch in part number



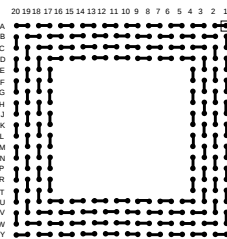
DUMMY COMPONENT ORDERING INFORMATION

FIG	NBR BALLS	BODY SIZE	BALL PATTERN	PITCH	BALL MATRIX	DIE SIZE MINI-MAX	 Tray Part Number	QTY
1	256	27mm	4-Row	1.27mm	20 x 20	6.8 - 9.8mm	SBGA256T1.27-DC200	40
2	304	31mm	4-Row	1.27mm	23 x 23	8.0 - 11mm	SBGA304T1.27-DC230	27
3	352	35mm	4-Row	1.27mm	26 x 26	11.3 - 14.3mm	SBGA352T1.27-DC70	24
4	432	40mm	4-Row	1.27mm	31 x 31	9.7 - 12.7mm	SBGA432T1.27-DC314	21
5	480	37.5mm	5-Row	1.27mm	29 x 29	10 - 14mm	SBGA480T1.27-ISO	21
6	560	42.5mm	5-Row	1.27mm	33 x 33	14.3 - 17.3mm	SBGA560T1.27-DC87	12
7	600	45mm	5-Row	1.27mm	35 x 35	15 - 18mm	SBGA600T1.27-DC335	12



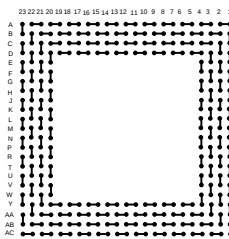
**BALL VIEW
DAISY CHAIN**

FIG. 1



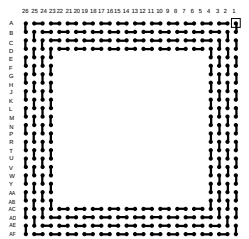
SBGA256T1.27-DC200

FIG. 2



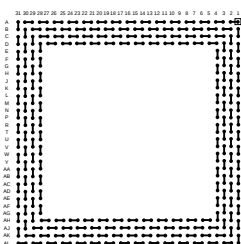
SBGA304T1.27-DC230

FIG. 3



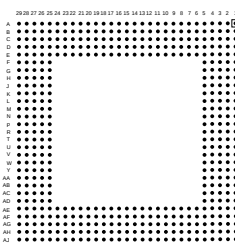
SBGA352T1.27-DC70

FIG. 4



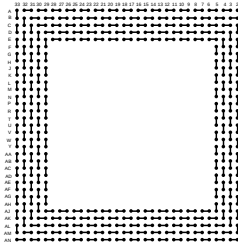
SBGA432T1.27-DC314

FIG. 5



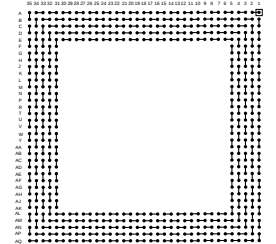
SBGA480T1.27-ISO

FIG. 6



SBGA560T1.27-DC87

FIG. 7



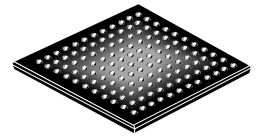
SBGA600T1.27-DC335

**I
N
F
O**

S-BGA - Copper Heat Spreader has superior thermal performance. Die is mounted cavity down. Substrate is BT. For Polyimide Tape dielectric, change part number to TBGA. Dummy units are supplied with internal die.



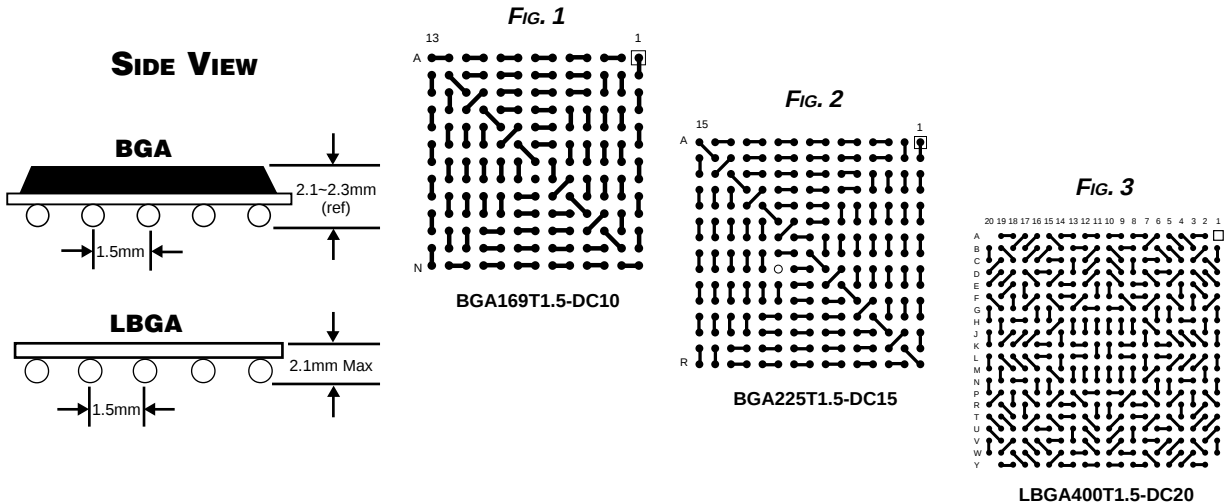
- Lead Free Available: Add "C" after pitch in part number for SnAgCu balls.



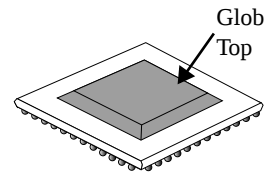
DUMMY COMPONENT ORDERING INFORMATION

FIG	NBR BALLS	BODY SIZE	BALL PATTERN	BALL MATRIX	Tray Part Number		QTY
					XJ1 STANDARD	XJ1 UNENCAPSULATED	
1	169	23mm	Full Array	13 x 13	BGA169T1.5-DC10	-	60
2	225	27mm	Full Array	15 x 15	BGA225T1.5-DC15	LBGA225T1.5-DC15	40
3	400	35mm	Full Array	20 x 20	-	LBGA400T1.5-DC20	24

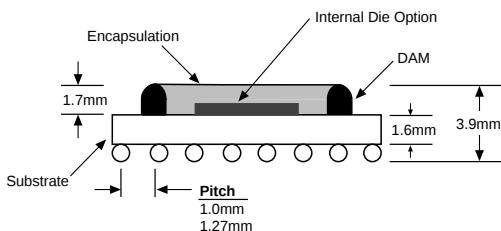
BGA DAISY CHAIN PATTERNS (BALL VIEW) - ILLUSTRATIONS NOT TO SCALE



- BGA** - Standard BGA plastic packages should be baked at 125°C for 24 hours prior to assembly to prevent delamination and the “popcorn” phenomena during the assembly process. Solder balls are eutectic 63/37 SnPb 30mil (0.75mm)
- LBGA** - Unencapsulated laminate Ball Grid Arrays offer the lowest cost when placement practice is the primary concern. Includes daisy chain laminate substrate with 30mil (0.75mm) 62/36/2 SnPbAg balls for soldering at 210°C. Since there is no molded or encapsulated top, LBGA does not require baking prior to assembly.
-  - Lead Free Available: Add “C” after pitch in part number for SnAgCu balls.



NBR BALLS	BODY SIZE	BALL PATTERN	CENTER BALL	BALL MATRIX	XJ1  Tray Part Number	QTY
1.27MM PITCH						
357	25mm	Full	NA	19 x 19	eBGA357T1.27D73D	44
420	35mm	5-Row	NA	26 x 26	eBGA420T1.27D85D	24
480	35mm	6-Row	NA	26 x 26	eBGA480T1.27D90D	24
540	42.5mm	5-Row	NA	32 x 32	eBGA540T1.27D80D	12
560	42.5mm	5-Row	NA	33 x 33	eBGA560T1.27D87D	12
676	35mm	Full	NA	26 x 26	eBGA676T1.27D269D	24
1089	42.5mm	Full	NA	33 x 33	eBGA1089T1.27D339D	12
1225	45mm	Full	NA	35 x 35	eBGA1225T1.27D359D	12
1.0MM PITCH						
416	31mm	4-Row	NA	30 x 30	eBGA416T1.0D304D	27
480	35mm	4-Row	NA	34 x 34	eBGA480T1.0D344D	24
484	23mm	Full	NA	22 x 22	eBGA484T1.0D229AD	60
580	35mm	5-Row	NA	34 x 34	eBGA580T1.0D345D	24
592	42.5mm	4-Row	NA	41 x 41	eBGA592T1.0D414D	12
620	37.5mm	5-Row	NA	36 x 36	eBGA620T1.0D365D	21
640	45mm	4-Row	NA	44 x 44	eBGA640T1.0D444D	12
672	27mm	Full	NA	26 x 26	eBGA672T1.0D268D	40
720	42.5mm	5-Row	NA	41 x 41	eBGA720T1.0D415D	12
780	45mm	5-Row	NA	44 x 44	eBGA780T1.0D445D	12
900	31mm	Full	NA	30 x 30	eBGA900T1.0D309D	27
1156	35mm	Full	NA	34 x 34	eBGA1156T1.0D349D	24
1444	40mm	Full	NA	38 x 38	eBGA1444T1.0D389D	12
1600	42.5mm	Full	NA	40 x 40	eBGA1600T1.0D409D	12
1936	45mm	Full	NA	44 x 44	eBGA1936T1.0D449D	12



PART NUMBER CONFIGURATION

eBGA

Type
eBGA =
Liquid
Encapsulated

1225

Balls

T

Trays

1.27

Pitch
mm

D

Circuit

Daisy Chain

D

Die

Blank = No Die
D = Internal Die

Ball Matl

D = Sn62 Eutectic
F = Sn96 Lead Free
C = SnAgCu Lead Free

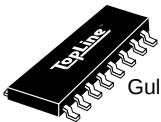
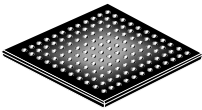
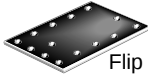
QFN, MCC, SLP



54

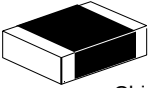


DUMMY COMPONENT ORDERING INFORMATION

NBR LEADS	LEAD PITCH	BODY SIZE	LEAD MATERIAL	VIEW	PACKAGE	PART NUMBER	QTY
8 14 16 16 20 28	1.27mm	150mil 150mil 150mil 300mil 300mil 300mil	Sn100 Sn100 Sn100 Sn100 Sn100 Sn100	 Gull	Tube	SO8M-TIN SO14M-TIN SO16M-TIN SOL16M-TIN SOL20M-TIN SOL28M-TIN Other SSOP, TSSOP available	97 55 48 47 38 27
28 32 44 52 68 84	1.27mm	.45" SQ .45 x .55" .65" SQ .75" SQ .95" SQ 1.15" SQ	Sn100	 PLCC	Tube	PLCC28M-TIN PLCC32M-TIN PLCC44M-TIN PLCC52M-TIN PLCC68M-TIN PLCC84M-TIN	39 32 28 23 19 16
208 208	0.5mm 0.5mm	28mm 28mm	Sn97/Bi3.0 Sn100	 QFP	Tray	QFP208T19.7-B-2.6 QFP208T19.7-TIN-2.6 Other TQFP, LQFP, QFP available	24 24
46 169 196 225 256 256 272 352 388	0.75mm 1.5mm 1.0mm 1.5mm 1.0mm 1.27mm 1.27mm 1.27mm 1.27mm	5.8x7.8mm 23mm 15mm 27mm 17mm 27mm 27mm 35mm 35mm	SnAg SnAgCu SnAgCu SnAgCu SnAgCu SnAgCu SnAgCu SnAgCu SnAgCu	 BGA	Tray	CSP46T.75F-DC24 BGA169T1.5C-DC10 BGA196T1.0C-DC149A BGA225T1.5C-DC15 BGA256T1.0C-DC169A BGA256T1.27C-DC200 BGA272T1.27C-DC202 BGA352T1.27C-DC70 BGA388T1.27C-DC72 Other BGA available	99 60 126 40 90 40 40 24 24
15 14 16	1.27mm 2.54mm 2.54mm	SIP 300mil 300mil	Ni-Pd Tin Sn100 Tin Sn100	 SIP	Tube	HSIP15M-F DIP14M3TIN-DE DIP16M3TIN-DE	25 25 25
16 20 24 28	0.5mm 0.5mm 0.5mm 0.5mm	3mm 4mm 4mm 5mm	Tin Sn100 Tin Sn100 Tin Sn100 Tin Sn100	 QFN/SLP/MLF	Tube	SLP16M.5-TIN-DE SLP20M.5-TIN-DE SLP24M.5-TIN-DE SLP28M.5-TIN-DE Other SLP, MLF, MCC available	123 92 92 73
48 88 317	457µm 204µm 254µm	6.3mm 5.08mm 5.08mm	Sn95.5/Ag3.5/Cu1.0	 Flip Chip	Tray	FC48D6.3C457-DC FC88G5.08C204-DC FC317G5.08C254-DC	

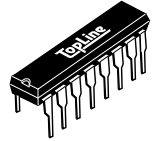


DUMMY COMPONENT ORDERING INFORMATION

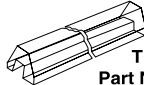
NBR LEADS	LEAD PITCH	BODY SIZE	LEAD MATERIAL	VIEW	PACKAGE	PART NUMBER	QTY
2	Capacitor	0201	Tin Sn100	 Chip	Reel	SC0201P7A-TIN	15,000
		0402				SC0402P7A-TIN	10,000
		0603				SC0603P7A-TIN	4000
		0805				SC0805E7A-TIN	4000
		1206				SC1206E7A-TIN	4000
		1210				SC1210E7A-TIN	4000
		1812				SC1812E7A-TIN	1000
2	Resistor	0201	Tin Sn100	 Chip	Reel	SR0201P7A-TIN	10000
		0402				SR0402P7A-TIN	10000
		0603				SR0603P7A-TIN	5000
		0805				SR0805P7A-TIN	5000
		1206				SR1206P7A-TIN	5000
		2010				SR2010E7A-TIN	4000
		2512				SR2512E7A-TIN	4000
2	Discrete Semi	SC79	Tin Sn100	 SOT	Reel	SC79E7A-TIN	3000
3		SOT23				SOT23E7A-DC13-TIN	3000
3		SOT23				SOT23E7A-DC23-TIN	3000
3		SOT89				SOT89E7A-TIN	1000
3		SOT223				SOT223E7A-TIN	1000
3		SOT323				SOT323E7A-TIN	3000
3		DPAK				DPAK-E13A-TIN	2500
3		D2PAK				D2PAK-E13A-TIN	800
4		SOT143				SOT143E7A-TIN	3000
4		SOT343				SOT343E7A-TIN	3000
5		SOT25				SOT25E7A-TIN	3000
5		SOT353				SOT353E7A-TIN	3000
5		D2PAK-5				D2PAK5-E13A-TIN	800
6		SOT26				SOT26E7A-TIN	3000
6		SOT363				SOT363E7A-TIN	3000
2	Tant	A-Case	Sn100		Reel	SD3216E7A-TIN	2000
		B-Case				SD3528E7A-TIN	2000
		C-Case				SD6032E7A-TIN	500
		D-Case				SD7343E7A-TIN	500
2	Al Cap	4mm	SnBi		Reel	SE4E13A-SnBi	2000
		5mm				SE5E13A-SnBi	1000
		6mm				SE6E13A-SnBi	1000
		8x6mm				SE8E13A-SnBi	1000
		8x10mm				SE9E13A-SnBi	500
		10mm				SE10E13A-SnBi	500

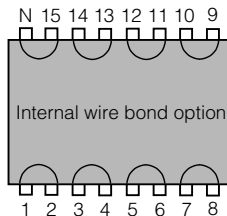
DIP / SDIP

DUAL INLINE PACKAGE



DUMMY COMPONENT ORDERING INFORMATION

NBR LEADS	CASE LENGTH INCH	CASE LENGTH METRIC	 Tube Part Number	QTY
300 MIL WIDE BODY				
2	.100	2.54mm	DIP2M3	200
8	.360"	9.1mm	DIP8M3	50
14	.760"	19.3mm	DIP14M3	25
16	.760"	19.3mm	DIP16M3	25
18	.890"	22.6mm	DIP18M3	21
20	.960"	24.1mm	DIP20M3	18
24	1.25"	31.7mm	DIP24M3	15
28	1.35"	34.5mm	DIP28M3	14
600 MIL WIDE BODY				
24	1.25"	31.7mm	DIP24M6	15
28	1.45"	36.8mm	DIP28M6	13
32	1.65"	41.9mm	DIP32M6	11
40	2.05"	52.0mm	DIP40M6	9
48	2.40"	60.9mm	DIP48M6	9
SDIP 70MIL PITCH				
30	.4" x 1.095"	10.16 x 27.8mm	SDIP30M4	20
42	.6" x 1.45"	15.24 x 36.8mm	SDIP42M6	14
52	.6" x 1.81"	15.24 x 46.0mm	SDIP52M6	11
56	.3" x 2.06"	15.24 x 52.3mm	SDIP56M6	9
64	.75" x 2.27"	19.05 x 57.6mm	SDIP64M7.5	9



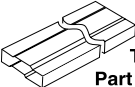
Daisy Chain
available on special order
Add -DE to end of part number

**I
N
F
O** TopLine supplies DIP Plastic Dual Inline Packages with lead pitch of 0.100" (2.54mm). Also available with Ceramic Case on special order, by adding "CER" prefix to front of part number. SDIP packages have lead pitch of 0.07" (1.778mm). For completely isolated (no internal connections) add -ISO to end of part number.

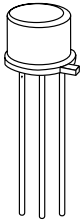
 For Lead Free option, add -TIN to end of part number.

TO TRANSISTOR

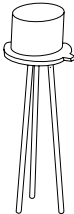
DUMMY COMPONENT ORDERING INFORMATION

MATERIAL			Bulk Part Number		Tube Part Number		Tape & Reel Part Number
CASE	LEAD	XT1	QTY	XT1	QTY	XT1	QTY
Metal	Solder	TO5	25	-	-	-	-
Metal	Solder	TO18	25	-	-	-	-
Metal	Solder	TO39	25	-	-	-	-
Metal	Solder	TO75	25	-	-	-	-
Plastic	Solder	TO92	100	-	-	TO92T	2000
Plastic	Solder	TO92-.2"	100	-	-	TO92T-.2"	2000
Metal	Solder	TO99	25	-	-	-	-
Plastic	Solder	TO220-3	25	TO220M-3	50	TO220T-3	1000

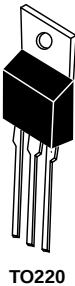
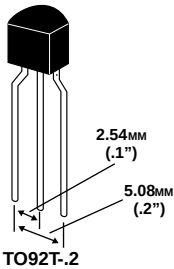
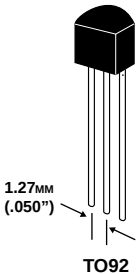
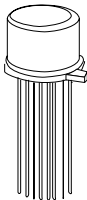
TO5 (1.25" LEAD LENGTH)
TO39 (.75" LEAD LENGTH)



TO18



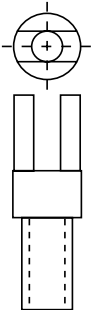
TO75 6 LEAD
TO99 8 LEAD



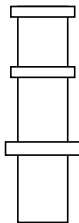
SOLDER TERMINALS

DUMMY COMPONENT ORDERING INFORMATION

TERMINAL TYPE	 XM0 Bulk Part Number		 XM0 Bulk Part Number		 XM0 Bulk Part Number		 XM0 Bulk Part Number	
	PN	QTY	PN	QTY	PN	QTY	PN	QTY
Bifurcated	103005	5	103025	25	103100	100	103999	1000
Gold Cup	104005	5	104025	25	104100	100	104999	1000
Hook	105005	5	105025	25	105100	100	105999	1000
Pierced	106005	5	106025	25	106100	100	106999	1000
Turret	107005	5	107025	25	107100	100	107999	1000
Terminal Holder	109000	1	-	-	-	-	-	-
20 AWG Wire	108020	5FT	108120	100 FT	108520	1000 FT	108920	5000 FT
22 AWG Wire	108022	5FT	108122	100 FT	108522	1000 FT	108922	5000 FT
24 AWG Wire	108024	5FT	108124	100 FT	108524	1000 FT	108924	5000 FT
26 AWG Wire	108026	5FT	108126	100 FT	108526	1000 FT	108926	5000 FT
Kit of Above	102000	1	102025	25	102100	100	102999	1000
Kit without Terminal Holder	101000	1	101025	25	101100	100	101999	1000



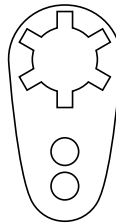
Bifurcated
Terminal



Turret
Terminal



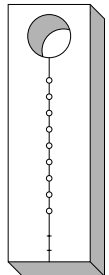
Gold Cup
Terminal



Pierced
Terminal



Hook
Terminal



Terminal
Holder

INFO

IPC style terminals for hand soldering proficiency.
Also available in kit form

AXIAL LEAD COMPONENTS



CF - RESISTOR



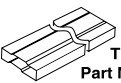
DO - DIODE

DUMMY COMPONENT ORDERING INFORMATION

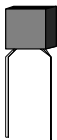
SIZE INCH DIA X L	SIZE METRIC DIA X L	LEAD DIA. INCH	BODY	 Bulk Part Number QTY	 Tape & Reel Part Number QTY
.062" X .145"	1/8 Watt Size	.016"	Conformal	CF18 100	CF18T Reel 5000 CF18A Ammo 5000
.090" X .250"	1/4 Watt Size	.025"	Conformal	CF14 100	CF14T Reel 5000 CF14A Ammo 5000
.140" X .375"	1/2 Watt Size	.028"	Conformal	CF12 100	CF12T Reel 2500 CF12A Ammo 2500
GLASS CASE .070" X .154"	1.78 X 3.9mm	.020"	0.5mm	DO35 100	DO35T 10,000
MOLDED CASE .107" X .205"	2.72 x 5.2mm	.031"	0.8mm	DO41 100	DO41T 5000

RADIAL LEAD COMPONENTS

DUMMY COMPONENT ORDERING INFORMATION

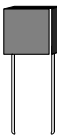
LEAD SPACE		CASE SIZE		 Tube Part Number		 Bulk Part Number		 Tape & Reel Part Number	
INCH	METRIX	INCH	METRIC	XR1	QTY	XR1	QTY	XR1	QTY
.1"	2.54mm	.2" x .6"	5 x 15mm	RS6M	35-40	RS6	200	Call	Call
		.2" x .8"	5 x 20mm	RS8M	25-30	RS8	200		
		.2" x 1.0"	5 x 26mm	RS10M	20-24	RS10	200		
.2"	5.08mm	.2" SQ	5.08mm	-		CK05	100	CK05T	2000
		.3" SQ	7.60mm	-		CK06	100	CK06T	1500
		.2 x .31	5 x 8mm	-		DD2	100	DD2T	1000
		.20 x .43	5 x 11mm	-		-	100	EH5X11A	1000

CK05



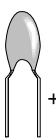
.2"

CK06



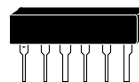
.2"

DD2



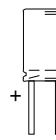
.2"

RS



.1"

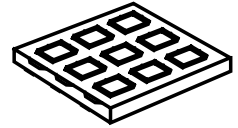
EH



.2"

TopLine offers CF series low cost, commercial grade axial lead resistors with conformal coated case or mil-spec equivalent RC series carbon composition resistors in molded tubular case with flat ends.

WAFFLE TRAYS FOR BARE DIE



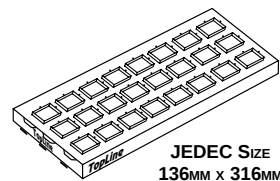
WP	2	5.0 x 5.0 x 0.8	B	Option
Series	Tray Size	Pocket Dimension (mm)	Type	Material
WP = Waffle Pack	2 = 2" SQ 4 = 4" SQ	Length x Width x Depth of Tray Bottom (blank if bottom tray)	B = Bottom Tray K = Set of Bottom, Cover + Clips	Blank = Black (standard) A = Amber N = Natural
Cover Suffix				
COVER = Standard Black Cover				
Clip Holds Covers + Bottom				
CLIP1 = Single Clip Holds Tray + Cover CLIP2 = Clip Pair Holds Tray + Cover CLIP5 = Clip Pair Holds 5 Trays + Cover CLIP6 = Clip Pair Holds 6 Trays + Cover CLIP10 = Clip Pair Holds 10 Trays + Cover				
Insert				
INSERT-PAPER = Rice Paper INSERT-TYVEK = White				
Accessories				
JIGTRAY = Jedec size holds 10 WP2 LABEL = 1.5" SQ Removable (Roll = 1000)				

WAFFLE TRAY CAPACITY (EXAMPLE)*

Pocket Size Sq	2" Square WP2		4" Square WP4	
	Matrix	Pockets	Matrix	Pockets
1mm Sq	20 x 20	400	30 x 30	900
2mm Sq	10 x 10	100	29 x 30	870
3mm Sq	10 x 10	100	20 x 20	400
4mm Sq	8 x 8	64	16 x 16	256
5mm Sq	7 x 7	49	12 x 12	144
6mm Sq	6 x 6	36	11 x 11	121
6mm Sq	5 x 5	25	10 x 10	100
7mm Sq	6 x 6	36	10 x 10	100
7mm Sq	5 x 5	25	10 x 10	100
8mm Sq	4 x 4	16	9 x 9	81
9mm Sq	4 x 4	16	8 x 8	64
10mm Sq	3 x 3	9	7 x 7	49
12mm Sq	3 x 3	9	6 x 6	36
13mm Sq	3 x 3	9	6 x 6	36
14mm Sq	3 x 3	9	5 x 5	25
15mm Sq	2 x 2	4	5 x 5	25
17mm Sq	2 x 2	4	4 x 4	16
19mm Sq	2 x 2	4	4 x 4	16
21mm Sq	2 x 2	4	3 x 3	9

*OTHER SIZES AVAILABLE

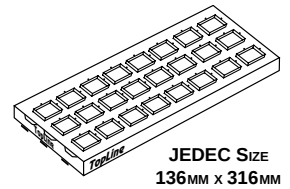
MATRIX TRAYS For BGA BALL GRID ARRAY



TRAY ORDERING INFORMATION

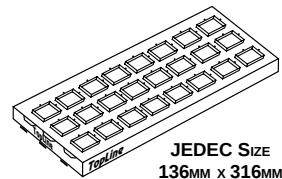
COMPONENT SIZE	COMPONENTS PER TRAY	MATRIX ROW COLUMN	XZ1	Tray Part Number
5 x 5mm	576	16 x 36		BGATRAY5mm-16x36
5 x 5mm	624	16 x 39		BGATRAY5mm-16x39
5 x 5mm	640	16 x 40		BGATRAY5mm-16x40
6 x 6mm	429	13 x 33		BGATRAY6mm-13x33
6 x 6mm	608	16 x 38		BGATRAY6mm-16x38
7 x 7mm	416	13 x 32		BGATRAY7mm-13x32
7 x 7mm	476	14 x 34		BGATRAY7mm-14x34
8 x 8mm	348	12 x 29		BGATRAY8mm-12x29
8 x 8mm	360	12 x 30		BGATRAY8mm-12x30
9 x 9mm	260	10 x 26		BGATRAY9mm-10x26
10 x 10mm	240	10 x 24		BGATRAY10mm-10x24
10 x 10mm	250	10 x 25		BGATRAY10mm-10x25
11 x 11mm	176	8 x 22		BGATRAY11mm-8x22
12 x 12mm	189	9 x 21		BGATRAY12mm-9x21
12 x 12mm	198	9 x 22		BGATRAY12mm-9x22
13 x 13mm	160	8 x 20		BGATRAY13mm-8x20
14 x 14mm	152	8 x 19		BGATRAY14mm-8x19
14 x 14mm	160	8 x 20		BGATRAY14mm-8x20
15 x 15mm	126	7 x 18		BGATRAY15mm-7x18
16 x 16mm	119	7 x 17		BGATRAY16mm-7x17
17 x 17mm	90	6 x 15		BGATRAY17mm-6x15
19 x 19mm	84	6 x 14		BGATRAY19mm-6x14
21 x 21mm	60	5 x 12		BGATRAY21mm-5x12
23 x 23mm	60	5 x 12		BGATRAY23mm-5x12
25 x 25mm	44	4 x 11		BGATRAY25mm-4x11
27 x 27mm	40	4 x 10		BGATRAY27mm-4x10
31 x 31mm	27	3 x 9		BGATRAY31mm-3x9
35 x 35mm	24	3 x 8		BGATRAY35mm-3x8
37.5 x 37.5mm	21	3 x 7		BGATRAY37.5mm-3x7
40 x 40mm	21	3 x 7		BGATRAY40mm-3x7
42.5 x 42.5mm	12	2 x 6		BGATRAY42.5mm-2x6
45 x 45mm	12	2 x 6		BGATRAY45mm-2x6
47.5 x 47.5mm	12	2 x 6		BGATRAY47.5mm-2x6
6 x 7mm	160	10 x 16		BGATRAY6x7-10x26
6 x 8mm	260	10 x 26		BGATRAY6x8-10x26
7 x 9mm	325	13 x 25		BGATRAY7x9mm-13x25
14 x 22mm	84/96	7 x 12 6 x 14 8 x 12		BGATRAY14x22-6x14
21 x 25mm	55	5 x 11		BGATRAY21x25-5x11

Specify minimum temperature rating: 50°C, 75°C, 125°C, 130°C, 140°C, 150°C or 180°C



COMPONENT BODY SIZE	COMPONENT HEIGHT	COMPONENTS PER TRAY	MATRIX COLUMN X ROW	Tray Part Number XZ1
QFP TRAY				
10mm Sq.	2.0-2.7mm	96	6 x 16	QTRAY10mm-6x16
14mm Sq.	2.0-2.7mm	84	6 x 14	QTRAY14mm-6x14
14 x 20mm	2.7mm	66	6 x 11	QTRAY14x20mm-6x11
28mm Sq.	3.6mm	24	3 x 8	QTRAY28mm-3x8
32mm Sq.	3.8mm	24	3 x 8	QTRAY32mm-3x8
40mm Sq.	3.8mm	12	3 x 4	QTRAY40mm-3x4
LQFP TRAY				
5mm Sq.	1.4mm	360	12 x 30	LQTRAY5mm-12x30
7mm Sq.		250	10 x 25	LQTRAY7mm-10x25
10mm Sq.		160	8 x 20	LQTRAY10mm-8x20
12mm Sq.		119	7 x 17	LQTRAY12mm-7x17
14mm Sq.		90	6 x 15	LQTRAY14mm-6x15
14 x 20mm		72	6 x 12	LQTRAY14x20mm-6x12
20mm Sq.		60	5 x 12	LQTRAY20mm-5x12
24mm Sq.		40	4 x 10	LQTRAY24mm-4x10
28mm Sq.		36	4 x 9	LQTRAY28mm-4x9
TQFP TRAY				
5mm Sq.	1.0mm	360	12 x 30	TQTRAY5mm-12x30
7mm Sq.		250	10 x 25	TQTRAY7mm-10x25
10mm Sq.		160	8 x 20	TQTRAY10mm-8x20
12mm Sq.		119	7 x 17	TQTRAY12mm-7x17
14mm Sq.		90	6 x 15	TQTRAY14mm-6x15
14 x 20mm		72	6 x 12	TQTRAY14x20mm-6x12
20mm Sq.		60	5 x 12	TQTRAY20mm-5x12
QFN/SLP/MLF TRAY				
3mm Sq.	0.9mm	490	14 x 35	QFNTRAY3mm-14x35
4mm Sq.		540	15 x 36	MLFTRAY4mm-15x36
4mm Sq.		490	14 x 35	QFNTRAY4mm-14x35
5mm Sq.		490	14 x 35	MLFTRAY5mm-14x35
6mm Sq.		490	14 x 35	MLFTRAY6mm-14x35
7mm Sq.		260	10 x 26	MLFTRAY7mm-10x26
8mm Sq.		260	10 x 26	MLFTRAY8mm-10x26
9mm Sq.		260	10 x 26	MLFTRAY9mm-10x26
10mm Sq.		168	8 x 21	MLFTRAY10mm-8x21

Specify minimum temperature rating at time of ordering: 50°C, 75°C, 125°C, 130°C, 140°C, 150°C or 180°C



TRAY ORDERING INFORMATION

COMPONENT SIZE	COMPONENT HEIGHT	COMPONENTS PER TRAY	MATRIX ROW X COLUMN	 Tray Part Number
XZ1				
TYPE I (INCLUDING LEADS)	1.0-1.2mm			
8 x 13.4mm		234	13 x 18	TTRAY8x13.4mm-13x18
10 x 14mm		160	16 x 10	TTRAY10x14mm-16x10
6 x 16mm		240	15 x 16	TTRAY6x16mm-15x16
8 x 16mm		195	15 x 13	TTRAY8x16mm-15x13
10 x 16mm		150	15 x 10	TTRAY10x16mm-10x15
12 x 16mm		120	15 x 8	TTRAY12x16mm-15x8
14 x 16mm		112	16 x 7	TTRAY14x16mm-16x7
8 x 20mm		156	12 x 13	TTRAY8x20mm-12x13
10 x 20mm		120	12 x 10	TTRAY10x20mm-12x10
12 x 20mm		96	12 x 8	TTRAY12x20mm-12x8
14 x 20mm		96	12 x 8	TTRAY14x20mm-12x8
TYPE II (BODY SIZE)	1.0-1.2mm			
.3" x .675" (7.62 x 17.1mm)		176	11 x 16	TT2TRAY7.6x17-1116
.4" x .725" (10.16 x 18.4mm)		135	9 x 15	TT2TRAY10x18.4-9x15
.4" x .825" (10.16 x 20.95mm)		117	9 x 13	TT2TRAY10x21-9x13
.4" x .875" (10.16 x 22.22)		108	9 x 12	TT2TRAY10x22-9x12
.4" x 1.02" (10.16 x 26mm)		99	9 x 11	TT2TRAY10x26-9x11

TRAY FOR J-LEAD, PLCC, LCC AND CLCC

COMPONENT SIZE	COMPONENT HEIGHT	COMPONENTS PER TRAY	MATRIX ROW X COLUMN	 Tray Part Number
XZ1				
PLCC44	4.4mm	40	4 x 10	PLCC44TRAY-4x10
PLCC52	4.4mm	36	4 x 9	PLCC52TRAY-4x9
PLCC68	4.4mm	21	3 x 7	PLCC68TRAY-3x7
PLCC84	4.4mm	21	3 x 7	PLCC84TRAY-3x7