2013 Product Guide

Lead Free Dummy Components Practice Kits

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TopLine®

Find It Fast Solder Practice Kits

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Find It Fast

Solder Practice Kits

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915~916	Multipurpose Throughhole			140-141
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Kit Part Numbering System

WEBCODE XK1



926

		Series		
900	=	QFP Lead Template	945 =	PC
901	=	FC176 Flip Chip	946 =	Un
902	=	FC88 Flip Chip	947 =	BG
903	=	FC317 Flip Chip	948 =	Mo
904	=	FC220 Flip Chip	949 =	02
905	=	CBGA Ceramic Substrates	950 =	SN
906	=	FC96 Ceramic	951 =	CE
907	=	FC96 Lamanate	952 =	ΤB
908	=	FC48 Ceramic	953 =	Vis
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913	=	Multilayer Throughhole	958 =	LB
914	=	Mixed Technology 2	959 =	Cu
915	=	Multipurpose Throughhole	960 =	Ma
916	=	Multipurpose Throughhole	961 =	Fic
917	=	BGA121, 352, 400 (obsolete)	962 =	28
918	=	Unassigned *	963 =	Ur
919	=	Phillips Machine	964 =	04
920	=	Challenger 1 (see 928) *	965 =	Re
921	=	µBGA TV46	966 =	BG
922	=	TV74 (obsolete)	967 =	BG
923	=	TV188 (obsolete) *	968 =	08
924	=	Beginners SMD	969 =	Mi
925	=	SMD Introductory	970 =	Dis
926	=	Practical Mixed Technology	971 =	La
927	=	Unassigned	972 =	Pa
928	=	Challenger 2	973 =	CC
929	=	Jumbo Chip Set *	974 =	eВ
930	=	Advanced w/o QFP256	975 =	QF
931	=	Advanced w/QFP256	976 =	BG
932	=	µBGA TV62	977 =	Me
933	=	Custom *	978 =	Re
934	=	µBGA TV208	979 =	NA
935	=	Stencil Eval. w/TQFP168	980 =	PC
936	=	Stencil Evaluation	981 =	Un
937	=	Econo I - BGA	982 =	QF
938	=	Econo II - Mixed	983 =	08
939	=	Econo III - Mixed	984 =	04
940	=	Monster (see 948) *	985 =	BG
941	=	Mydata *	986 =	Le
942	=	Intertronic 2001	999 =	Sp
943	=	TQFP168 (obsolete)	9603 =	TS
~				

944 = Rework 2 Practice

945	=	PCMCIA
946	=	Universal BGA 1.27/1.5mm
947	=	BGA256/272/292/352/388
948	=	Monster 2 *
949	=	0201/0402 Chip
950	=	SMTA Saber
951	=	CBGA
952	=	TBGA *
953	=	Visual BGA & Flip Chip
954	=	HP Saber Alloy Test
955	=	DIE KIT *
956	=	CLGA
957	=	CBGA196/625 *
958	=	LBGA1089/1225
959	=	Custom *
960	=	Machine Diagnostic *
961	=	Fiducial Comparator
962	=	28mm QFP Assortment
963	=	Universal BGA .5~.8mm
964	=	0402/0603 Chip
965	=	Rework 1 Practice
966	=	BGA169/225 6L
967	=	BGA169/225
968	=	0805/1206 Chip
969	=	Mixed Technology 1
970	=	Display Boards
971	=	Label for 970 *
972	=	Parts for Display
973	=	CCGA1089/CCGA1274*
974	=	eBGA1600/eBGA1936
975	=	QFN Daisy Chain
976	=	BGA256 1.0mm/SBGA560
977	=	Metcal *
978	=	Rework 3 Practice
979	=	NASA Training
980	=	PC Board Album *
981	=	Universal BGA 1.0/0.8mm
982	=	QFP208 Lead Free
983	=	0805/1206 Lead Free
984	=	0402/0603 Lead Free
985	=	BGA Lead Free *
986	=	Lead Free Multicomponent
999	=	Special/Custom *
9603	=	TSOP32 *

025

SPECIFICATIONS 000 = Single Pack Kit (Hand Solder) 001 = Standard PC Board 002 = Lead Free Tin Plated Board 003 = Populated PC Board 004 = X, Y, Theta Parts Placement ASCII File 005 = Gerber File For Solder Paste Stencil 006 = Immersion Silver Board (Lead Free) 007 = Polyimide Board 008 = OSP Copper Board Entek (Lead Free) 009 = Ni Au PC Board 010 = Kit Of 10 025 = Kit Of 50 100 = Kit Of 100

LEAD FREE (ROHS) PB-FREE KITS:

- 2XX = Tin (Sn) Board
- 6XX = Silver (Ag) Board
- 8XX = OSP (Cu) Board
- 9XX = Gold (Ni-Au ENIG) Board
- XX = Quantity of Kits

9616 = QFP160 * 9618 = Rotational Test 9621 = QFP208 9625 = QFP256

* = Not Shown in Catalog
See www.topline.tv

9613 = BQFP132 *



GENERAL KIT



Epoxy-glass FR-4 is standard for most kits. Most Boards are double sided. Tg = 140° C.

FR4 (HIGH TEMP)

High Temp (Tg = $170^{\circ}C \sim 180^{\circ}C$) is used for Lead Free boards.

POLYIMIDE (OPTIONAL)

For high temperatures during assembly or burnin. Polymide Tg is 270°C.

BT (OPTIONAL)

Bismaleimide Triazine available special order.

COPPER THICKNESS

Usually 1.0 oz. of copper.

HOT AIR SOLDER LEVELING (SN63)

Hot air solder leveling (HASL) during board fabrication gives boards a controlled plating flatness which assures coplanarity for fine pitch components.

LIQUID PHOTO IMAGEABLE SOLDER MASK

Liquid photoimageable (LPI) soldermask with Sanwa Chemical SPSR-950. Taiyo PSR4000 AUS5 is available special order.

X,Y THETA: (ACCESSORY)

Component placement data for pick and place machines. Free download.

GERBER DATA: (ACCESSORY)

For solder paste stencil. Free download.

LEAD-FREE (OPTIONAL)

Available in 4 finishes: Sn100 - Immersion (White) Tin Au (ENIG) Ni - Immersion Gold Ag - Immersion Silver OSP - ENTEK 106 Copper

GLOBAL FIDUCIALS

A minimum of two global fiducials are located diagonally opposed as far apart as possible.

LOCAL FIDUCIALS

Used to locate the position of an individual.

GENERAL

Kits are supplied with enough components for one side of the board only.

OSP (OPTIONAL)

Organic Solder Preservative over bare copper such as ENTEK106 is available special order.

Pb F

RoHS Banned Substances

Substance	Maximum Limit (ppm)
Cadmium (Cd)	100
Lead (Pb)	1000
Mercury (Hg)	1000
Hexavalent Chromium (Cr 6	i+) 1000
Polybrominated Biphenyls (P	BB) 1000
Polybrominated Diphenyl Ethers (P	BDE) 1000
. ,	,

About RoHS:

The European Union has adopted Directive 2002/95/EC – the Restriction of Hazardous Substances (RoHS) in electrical and electronic equipment. This legislation bans the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE) in electrical and electronic devices after July 1, 2006 with certain exemptions.





LEAD FREE BOARDS ROHS COMPATIBLE



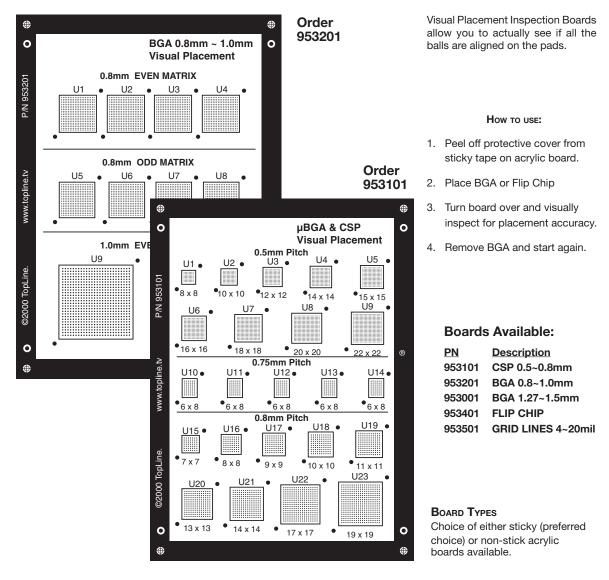
TopLine offers Lead Free boards with 4 popular finishes compatible with RoHS.

COMPARISON OF LEAD FREE FINISHES						
	Description	Advantages	Concerns			
Sn	White Tin (also known as Immersion Tin)	 Low Cost Widely Accepted Re-workable Good Flatness Good Shelf Life 	Potential WhiskerMicroscopic Voids			
Ag	Immersion Silver	 Low Cost Widely Accepted Re-workable Excellent Flatness Excellent Wetting 	• Shelf Life • Tarnishing			
OSP Cu	Organic Solderability Preservative Entek 106	 Low Cost Widely Accepted Re-workable Excellent Flatness 	 Shelf Life Degrades with Temperature Handling Sensitivity Flex Sensitive 			
Ni-Au	Electroless Nickel Immersion Gold (Also known as ENIG)	 Widely Accepted Excellent Flatness Very Long Shelf Life 	 Added Cost Difficulty with rework More brittle solder joints 			

Comparison of Standard Finishes (with Pb)				
	Description	Advantages	Concerns	
Sn/Pb	Hot Air Solder Level (also known as HASL)	 Low Cost Widely Accepted Re-workable Good Shelf Life 	Flatness (Coplanarity)Paste MisprintsNot RoHS Compatible	





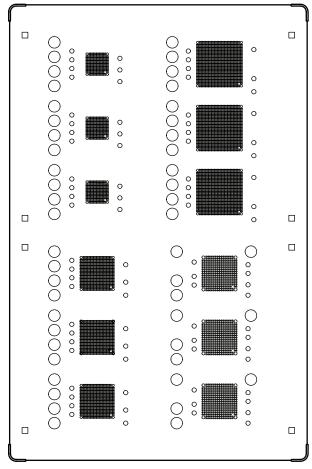


Actual Size: 4" x 5.5" (100 x 140mm) .062" Thick

TopLine[®]

CLGA - CERAMIC Land Grid Array





Actual Size: 4.0" x 5.9" (100x 150mm)

Laminate FR4 board for placement and daisy chain continuity testing of CLGA after assembly.

Each board has 3 coupons of 8 different CLGA footprint. Total 24 mounting sites.

FR4 Board RoHS Pb-Free. 4-Layers. NSMD Pads Plating: Ni-Au Standard Thickness: 0.8mm

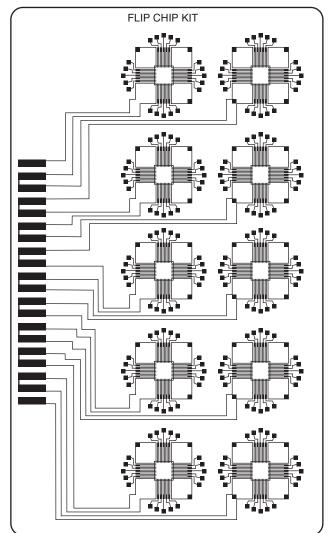
Board Order Nbr: 956009

Nbr Pads	Body Size	Pad Dia.	Pitch	Pad Matrix	Land Sites
TOP of	Board				
239	9mm	0.3mm	0.5mm	16x16	3
334	13mm	0.4mm	0.65mm	19x19mm	3
559	13mm	0.3mm	0.5mm	24x24	3
1007	17mm	0.3mm	0.5mm	32x32	3
BOTTO	M of Boa	rd		~	·
386	17mm	0.5mm	0.8mm	20x20	3
608	17mm	0.4mm	0.65mm	25x25	3
608	21mm	0.5mm	0.8mm	25x25	3
944	21mm	0.4mm	0.65mm	31x31	3



FLIP CHIP KITS





Actual Size: 3.25" x 5.5" (83 x 140mm)



Laminate FR4 board for placement and daisy chain continuity testing after assembly.

Each board has coupon sites for mounting 10 flip chips.

Laminate board features multifunctional high temperature FR4 board (Tg = 170° C)

Plating Options: Ni-Au Standard Cu-OSP Available

Board Thickness: .031" - 0.78mm FC317 .062" - 1.57mm FC48~FC220





FLIP CHIP KITS





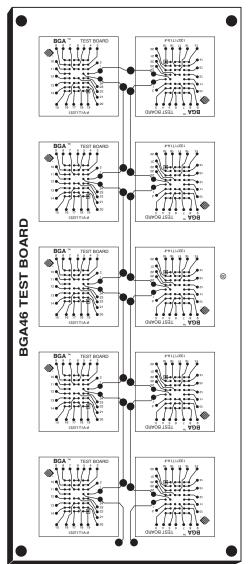
KIT ORDERING INFORMATION					
		N N	IANUAL ASSEMBLY A		
Conten		Order Number 902000 1 Kit	Order Number 903000 1 Kit	Order Number 909000 1 Kit	Order Number 911000 1 Kit
Laminate FR4 Boa	ard	1	1	1	1
FC48 457µn	n l	0	0	25	0
FC88 204µn	n l	36	0	0	0
FC112 152µn	n l	0	0	0	36
FC317 254µn	n	0	36	0	0

Lead Free (Pb-Free) Option					
Description FC48 FC88 FC317 FC112					
Lead Free Kit Gold Board + SnAgCu Flip Chip	909900	902900	903900	911900	
Spare Gold Board	909001	902001	903001	911001	
Standard Kit Gold Board + SnPb Flip Chip	909000	902000	903000	911000	



BGA46 0.75mm Test kit





Test board for 0.75mm pitch BGA46 chip scale components. Each board has 10 coupons which allow continuity testing of individual components as well as series test of all 10 components.

Parts are supplied in trays.

Pad Diameter

Bump Site	.012" (.3mm)
Fiducial	.040" (1.0mm)

FEATURES

Electroless Nickel Immersion Gold Plated LPI Solder Mask FR4 Board .03" (0.76mm) Single Sided, 1/2 oz. copper Fiducial Marks

Actual Size 2.75" x 6.5" (70 x 165mm)

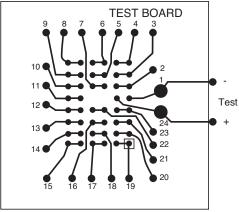


Available

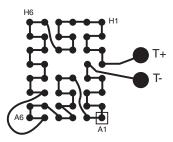
BGA46 0.75mm Test kit



Kit Ordering Information									
		Manual Assembly	e	Machine F	Run				
Component	Рітсн	Number 921000 1 Кіт	Order Number 921010 10 Kits	Order Number 921025 25 Kits	Order Number 921050 50 Kits				
Board BGA46	0.75mm	1 10	10 100	25 250	50 500				



SINGLE PCB TEST COUPON



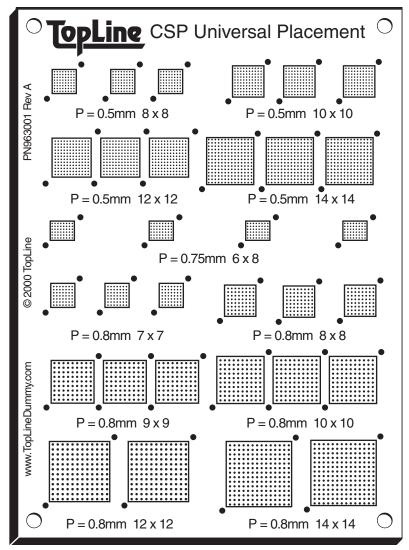
AFTER MOUNTING TO TEST BOARD

Lead Free (Pb-Free) Option									
Description	Spare Board	1 Kit	10 Kits	25 Kits	50 Kits	100 Kits			
Lead Free Gold Board + SnAgCu BGA	921001	921900	921910	921925	921950	921999			
Standard Gold Board + SnPb BGA	921001	921000	921010	921025	921050	921100			



UNIVERSAL CSP KIT 0.5~0.8MM PITCH





Actual Size 4" x 5.5" (100 x 140mm)

TopLine's Universal CSP Kits provide pads capable of mounting 0.5mm, 0.75mm and 0.8mm pitch without daisy chain. Includes fiducial marks for vision equipment.

Uses soldermask defined pads.

PAD GEOMETRY								
PAD								
DIA.	DIA.	Рітсн						
0.26mm	0.3mm	0.5mm						
0.26mm	0.3mm	0.75mm						
0.38mm	0.46mm	0.8mm						

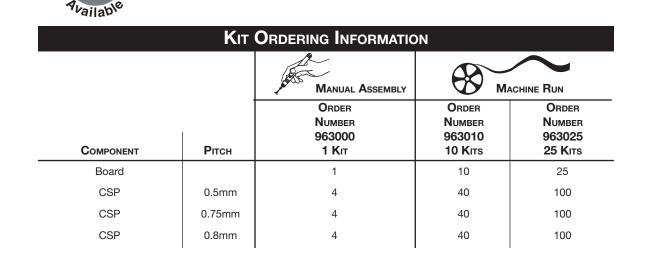


LPI Solder Mask FR4 Board .062" Double Sided Tooling Holes

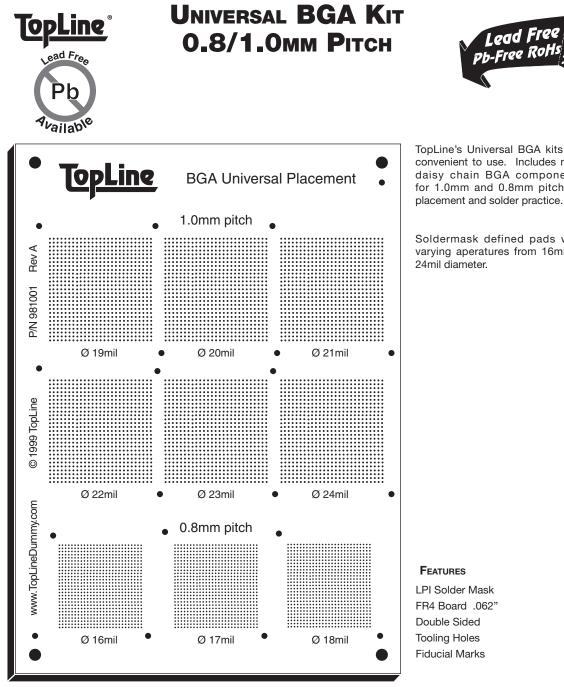


UNIVERSAL CSP KIT 0.5~0.8MM PITCH





Lead Free (Pb-Free) Option									
Description	Spare Board	1 Kit	10 Kits	25 Kits	50 Kits	100 Kits			
Lead Free									
Sn – Tin	963002	963200	963210	963225	963250	963299			
Ag – Silver	963006	963600	963610	963625	963650	963699			
Cu – OSP	963008	963800	963810	963825	963850	963899			
Au – Gold	963009	963900	963910	963925	963950	963999			
Standard									
SnPb – HASL	963001	963000	963010	963025	963050	963100			



Actual Size 4" x 5.5" (100 x 140mm)

TopLine's Universal BGA kits are convenient to use. Includes nondaisy chain BGA components for 1.0mm and 0.8mm pitch for

Soldermask defined pads with varying aperatures from 16mil to



Pb

Vailable

UNIVERSAL BGA KIT 0.8/1.0MM PITCH



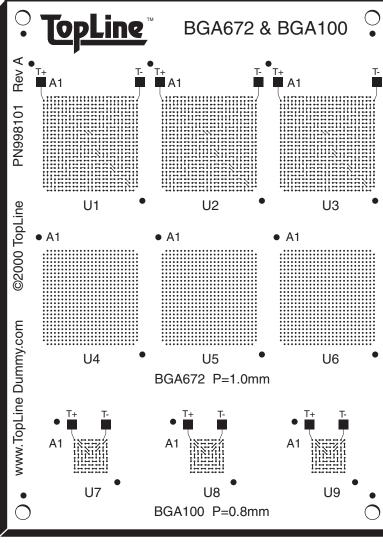
Kit Ordering Information								
		MANUAL ASSEMBLY	Mar					
Component	Рітсн	Order Number 981000 1 Kit	Order Number 981010 10 Kits	Order Number 981025 25 Kits				
Board 981001 BGA BGA	0.8/1.0mm 1.0mm 0.8mm	1 4 4	10 40 40	25 100 100				

Lead Free (Pb-Free) Option									
Description	Spare Board	1 Kit	10 Kits	25 Kits	50 Kits	100 Kits			
Lead Free									
Sn – Tin	981002	981200	981210	981225	981250	981299			
Ag – Silver	981006	981600	981610	981625	981650	981699			
Cu – OSP	981008	981800	981810	981825	981850	981899			
Au – Gold	981009	981900	981910	981925	981950	981999			
Standard									
SnPb – HASL	981001	981000	981010	981025	981050	981100			



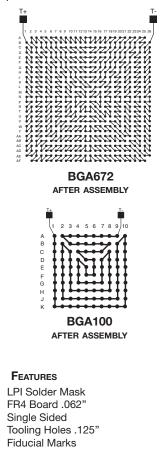
FINE PITCH BGA with Daisy Chain Test 0.8mm - 1.0mm Pitch





Actual Size 4" x 5.5 (100 x 140mm)

TopLine makes practicing with Fine Pitch Ball Grid Array technology accessible and affordable. Each board supports BGAs with 0.8mm and 1.0mm grid patterns and daisy chain test points to verify proper placement.





^vailable

FINE PITCH BGA WITH DAISY CHAIN TEST 0.8MM - 1.0MM PITCH



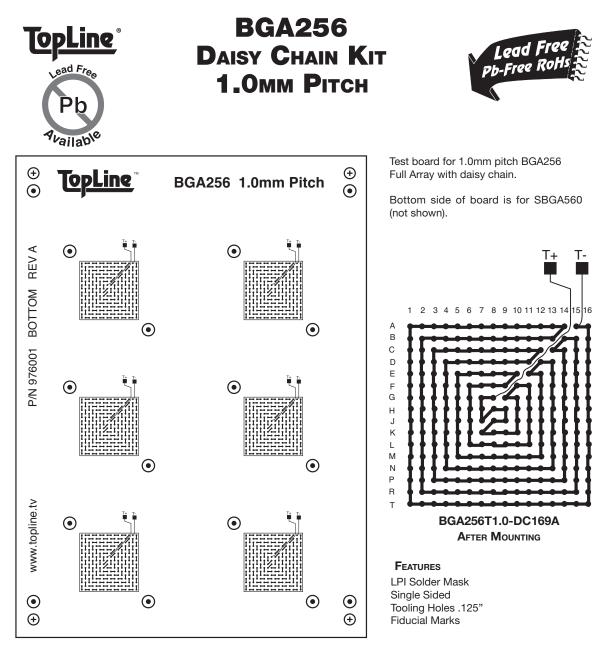
Kit Ordering Information									
Сомронент Рітсн		MAN	ual Assembly		Machine	Run			
		Order Number 998102 1 Kit	Order Number 998110 10 Kits	Order Number 998125 25 Kits	Order Number 998150 50 Kits	Order Number 998100 100 Kits			
Board BGA100 BGA672	0.8mm 1.0mm	1 2 2	10 20 20	25 50 50	50 100 100	100 200 200			

Kits are supplied with only 2 BGAs for each daisy chain portion of PC Board.

SOLDERMASK DEFINED PADS

Pitch	Pad Dia.	Ball Dia.
0.8mm	0.38mm	0.46mm
1.0mm	0.508mm	0.63mm

Lead Free (Pb-Free) Option								
Spare1102550100DescriptionBoardKitKitsKitsKitsKits								
Lead Free								
Sn – Tin	998107	998200	998210	998225	998250	998299		
Ag – Silver	998106	998600	998610	998625	998650	998699		
Cu – OSP	998108	998800	998810	998825	998850	998899		
Au – Gold	998109	998900	998910	998925	998950	998999		
Standard								
SnPb – HASL	998101	998102	998110	998125	998150	998100		



Actual Size: 4" x 5.5" (100 x 140mm)





BGA256 Daisy Chain Kit 1.0mm Pitch

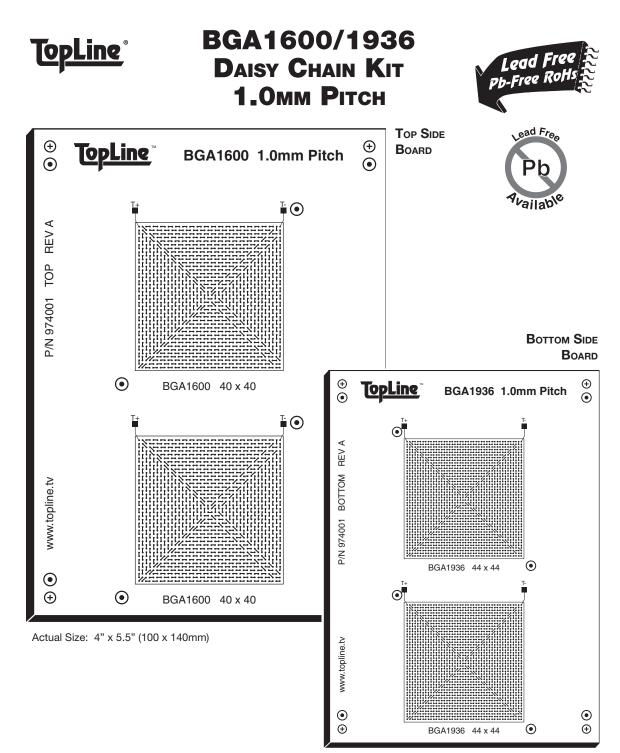


KIT ORDERING INFORMATION								
		MANUAL ASSEMBLY			Machine	Run		
Component	Ball Pitch	Order Number 976000 1 Kit	Order Number 976010 10 Kits	Order Number 976025 25 Kits	Order Number 976050 50 Kits	Order Number 976100 100 Kits		
Board		1	10	25	50	100		
BGA256	1.0mm	6	60	150	300	600		

Kits are supplied with BGAs for one side of PC Board.

Soldermask Defined Pads							
Component	Pitch	Pad Dia.	Ball Dia.				
BGA256	1.0mm	0.63mm	0.6mm				

Lead Free (Pb-Free) Option									
Spare1102550100DescriptionBoardKitKitsKitsKitsKits									
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	976002 976006 976008 976009	976200 976600 976800 976900	976210 976610 976810 976910	976225 976625 976825 976925	976250 976650 976850 976950	976299 976699 976899 976999			
Standard SnPb – HASL	976001	976002	976010	976025	976050	976100			





Ph

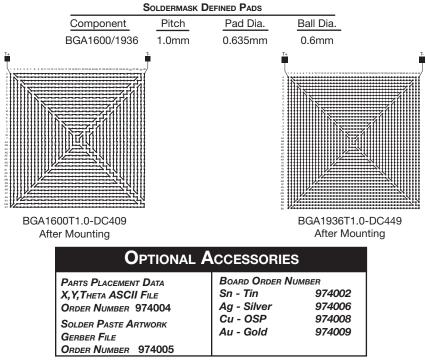
Vailable

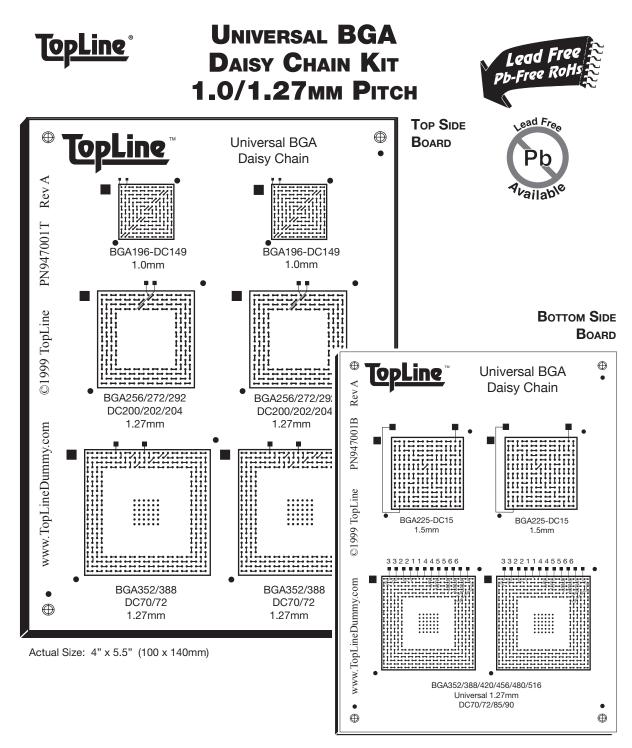
BGA1600/1936 Daisy Chain Kit 1.0mm Pitch



Kit Ordering Information							
	MANUAL ASSEMBLY OR MACHINE RUN						
	NUMBER NUMBER NUMBER NUMBER NUMBER					Order Number 974921 1 Kit	
CONTENTS		SN PB BALLS		Lead	FREE SNAGCU	BALLS	
BGA1600	2	2	0	2	2	0	
BGA1936	2	0	2	2	0	2	
Board Sn-Tin	' 1	1	1	1	1	1	

Select the kit that matches your requirements







Universal BGA Daisy Chain Kit 1.0/1.27mm Pitch

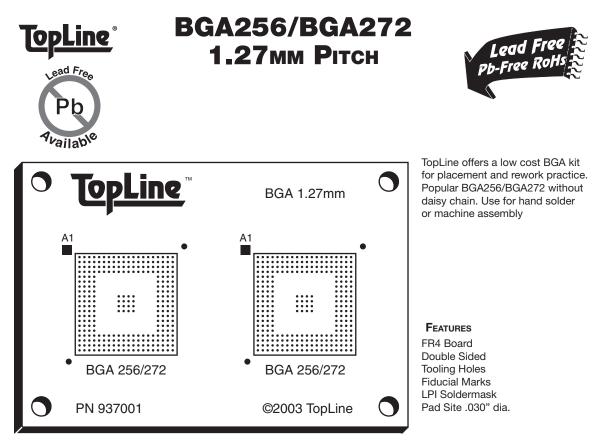


	Kit Ordering Information								
		Manual Assembly							
Component	Рітсн	Order Number 947000 1 Kit	Order Number 947010 10 Kits	Order Number 947025 25 Kits	Order Number 947050 50 Kits	Order Number 947100 100 Kits			
Board		1	10	25	50	100			
BGA196	1.0mm	2	20	50	100	200			
BGA256	1.27mm	2	20	50	100	200			
BGA352	1.27mm	2	20	50	100	200			

Kits are supplied with BGAs for top side of PC Board.

Soldermask Defined Pads								
Component	Pitch	Pad Dia.	Ball Dia.					
BGA196	1.0mm	0.508mm	0.63mm					
others	1.27~1.5mm	0.61mm	0.75mm					

Lead Free (Pb-Free) Option							
Spare1102550100DescriptionBoardKitKitsKitsKitsKits							
Lead Free Sn – Tin Ag – Silver	947002 947006	947200 947600	947210 947610	947225 947625	947250 947650	947299 947699	
Cu – OSP Au – Gold Standard SnPb – HASL	947008 947009 947001	947800 947900 947000	947810 947910 947010	947825 947925 947025	947850 947950 947050	947899 947999 947100	



Actual Size 2.75" x 4.0" (70 x 100mm))



BGA256/BGA272 1.27мм Рітсн



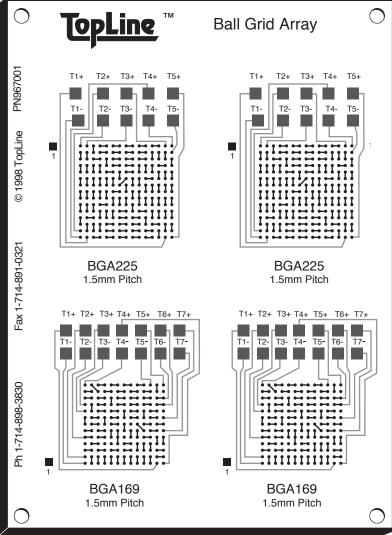
allan								
Kit Ordering Information								
		A BOARD		SSEMBLY OR	Масн			
Component Selection	Ball Pitch	937000 Order Number 1 Kit	937010 Order Number 10 Kits	937020 Order Number 20 Kits	937040 Order Number 40 Kits	937080 Order Number 80 Kits		
Board		1	10	20	40	80		
BGA256/BGA272	1.27mm	2	20	40	80	160		

Lead Free (Pb-Free) Option							
Description	Spare Board	1 Kit	10 Kits	20 Kits	40 Kits	80 Kits	
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	937002 937006 937008 937009	937200 937600 937800 937900	937210 937610 937810 937910	937220 937620 937820 937920	937240 937640 937840 937940	937280 937680 937880 937980	
Standard SnPb – HASL	937001	937000	937010	937020	937040	937080	



BGA169 & BGA225 with Daisy Chain Test 1.5mm Pitch





Actual Size 4" x 5.5 (100 x 140mm)

TopLine makes practicing with Ball Grid Array technology accessible and affordable. Each board supports four BGAs with 1.5mm grid pattern and daisy chain test points to verify proper placement.

Double sided board incorporates "two front side" design so only one solder paste stencil is needed.

FEATURES LPI Solder Mask FR4 Board .062" Double Sided Tooling Holes .125" Fiducial Marks

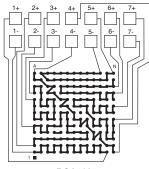


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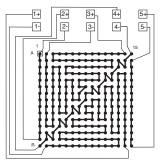
BGA169 & BGA225 with Daisy Chain Test 1.5mm Pitch



KIT ORDERING INFORMATION							
		Manual				RUN	
Component	Рпсн	Order Number 967000 1 Kit	Order Number 967012 12 Kits	Order Number 967025 25 Kits	Order Number 967050 50 Kits	Огдея Numbei 967100 100 Kit	
Board BGA 169 BGA 225	1.5mm 1.5mm	1 2 2	12 25 25	25 50 50	50 100 100	100 200 200	

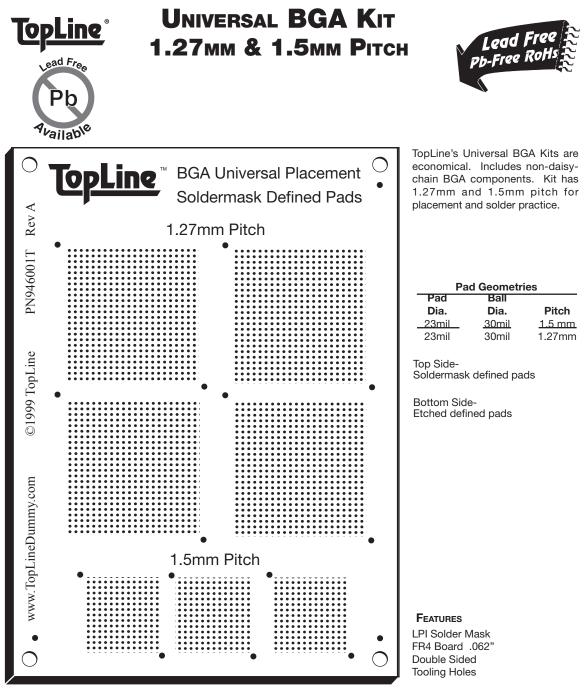


BGA169 After Mounting To Test Board



BGA225 AFTER MOUNTING TO TEST BOARD

Lead Free (Pb-Free) Option							
Spare1122550100DescriptionBoardKitKitsKitsKitsKits							
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	967002 967006 967008 967009	967200 967600 967800 967900	967212 967612 967812 967912	967225 967625 967825 967925	967250 967650 967850 967950	967299 967699 967899 967999	
Standard SnPb – HASL	967001	967000	967012	967025	967050	967100	



Actual Size: 4" x 5.5" (100 x 140mm)



Pb

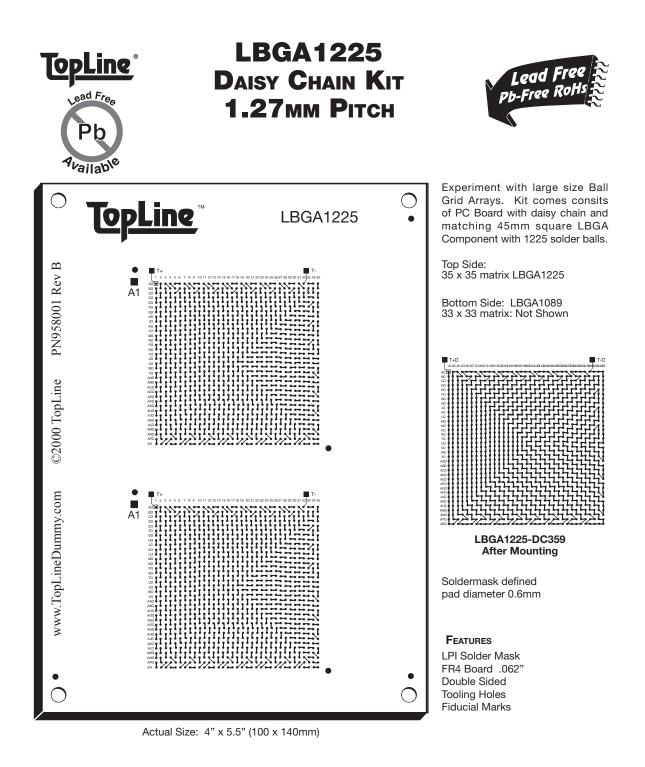
Available

UNIVERSAL BGA KIT 1.27MM & 1.5MM PITCH



	Kit Ordering Information							
		Manual Assembly	Mac					
Сомронент	Рітсн	Order Number 946000 1 Kit	Order Number 946010 10 Kits	Order Number 946025 25 Kits				
Board 946001	1.27/1.5mm	1	10	25				
BGA169 or BGA225	1.5mm	4	40	100				
BGA256 or BGA352	1.27mm	4	40	100				

Lead Free (Pb-Free) Option							
Description	Spare Board	1 Kit	10 Kits	25 Kits	50 Kits	100 Kits	
Lead Free							
Sn – Tin	946002	946200	946210	946225	946250	946299	
Ag – Silver	946006	946600	946610	946625	946650	946699	
Cu – OSP	946008	946800	946810	946825	946850	946899	
Au – Gold	946009	946900	946910	946925	946950	946999	
Standard							
SnPb – HASL	946001	946000	946010	946025	946050	946100	



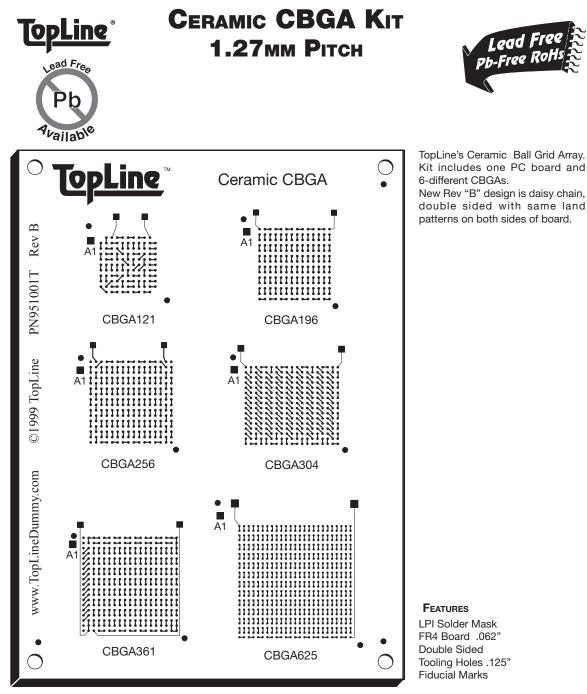


LBGA1225 Daisy Chain Kit 1.27mm Pitch



	Kit Ordering Information						
		MANUAL ASSEMBLY	M				
Сомронент	Рітсн	Irder Number 958000 1 Kit	Order Number 958012 12 Kits	Order Number 958024 24 Kits			
Board 958001 LBGA1225	1.27mm	1 2	12 24	24 48			

Lead Free (Pb-Free) Option							
Description	Spare Board	1 Kit	10 Kits	25 Kits	50 Kits	100 Kits	
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	958002 958007 958008 958009	958200 958600 958800 958900	958210 958610 958810 958910	958225 958625 958825 958925	958250 958650 958850 958950	958299 958699 958899 958899	
Standard SnPb – HASL	958001	958000	958010	958025	958050	958100	

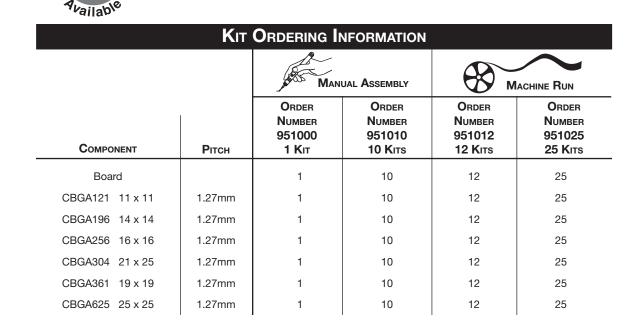


Actual Size: 4" x 5.5" (100 x 140mm)

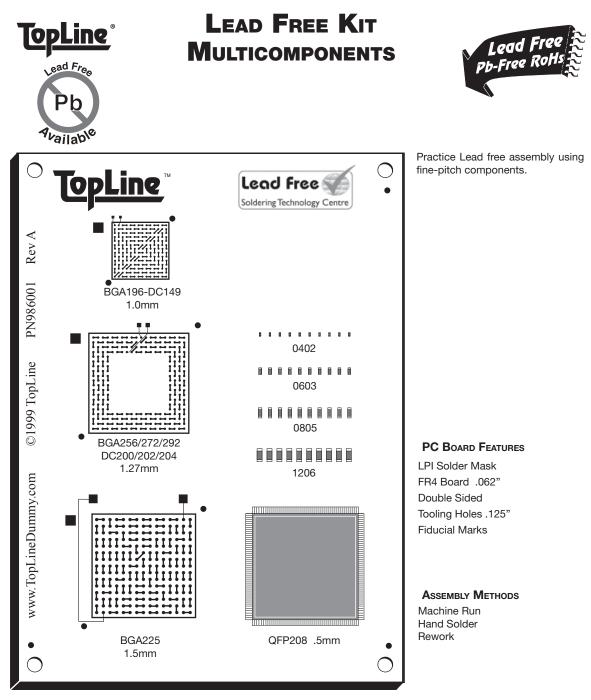


Сегаміс СВGA Кіт 1.27мм Рітсн





Lead Free (Pb-Free) Option								
Description	Spare Board	1 Kit	10 Kits	12 Kits	25 Kits			
Lead Free								
Sn – Tin	951002	951200	951210	951212	951225			
Ag – Silver	951006	951600	951610	951612	951625			
Cu – OSP	951008	951800	951810	951812	951825			
Au – Gold	951009	951900	951910	951912	951925			
Standard								
SnPb – HASL	951001	951000	951010	951012	951025			



Actual Size 4" x 5.5 (100 x 140mm)



Рh

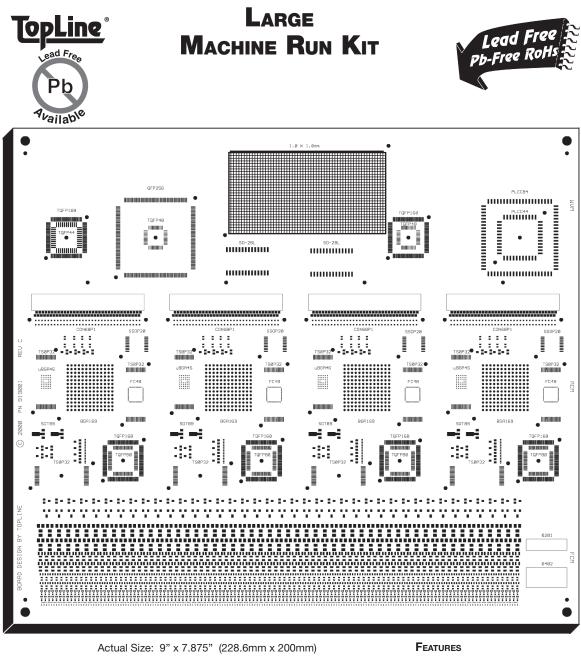
Available

LEAD FREE KIT MULTICOMPONENTS



Kit Ordering Information								
		MANUAL ASSEMBLY						
Component	Рітсн	Order Number 986000 1 Kit	Order Number 986010 10 Kits	Order Number 986024 24 Kits	Order Number 986050 50 Kits	Order Number 986100 100 Kits		
Board		1	10	24	50	100		
BGA196	1.0mm	1	10	24	50	100		
BGA225	1.5mm	1	10	24	50	100		
BGA256	1.27mm	1	10	24	50	100		
QFP208	0.5mm	1	10	24	50	100		
0402		10	100	250	500	1000		
0603		10	100	250	500	1000		
0805		10	100	250	500	1000		
1206		10	100	250	500	1000		

Lead Free (Pb-Free) Option							
Description	Spare Board	1 Kit	10 Kits	24 Kits	50 Kits	100 Kits	
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	986002 986006 986008 986009	986200 986600 986800 986900	986210 986610 986810 986910	986224 986624 986824 986924	986250 986650 986850 986950	986299 986699 986899 986899	



Single Sided Black LPI Soldermask Very High Density 0201 Chips



LARGE MACHINE RUN KIT



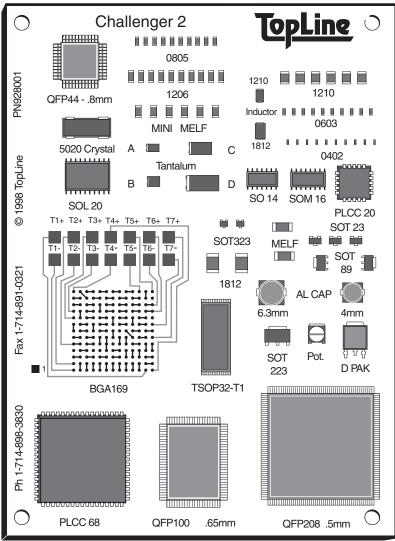
KIT ORDERING INFORMATION									
Lead Free Pb			MACHINE RUN						
	Per Board	Рітсн	Order Number 919010 10 Kit	Order Number 919025 25 Kits	Order Number 919050 50 Kits	Order Number 919100 100 Kits			
Board			10	25	50	100			
LQFP168	6	0.3mm	0	0	0	0			
QFP256	1	0.3mm 0.4mm	10	24	48	96			
TQFP48	2	0.4mm	25	50	100	200			
TQFP44	1	0.8mm	10	25	50	100			
LQFP80	4	0.4mm	40	100	200	400			
TSOP32	12	0.5mm	120	300	600	1,200			
FLIP CHIP 48	4	457µm	0	0	0	0			
µBGA46	4	0.75mm	40	100	200	400			
BGA169	4	1.5mm	40	100	180	360			
PLCC44	1	1.27mm	10	25	50	100			
PLCC84	1	1.27mm	10	25	50	100			
SOL28	2	1.27mm	20	50	100	200			
SSOP20	4	0.65mm	40	100	200	400			
SOT323	87		3,000	3,000	3,000	6,000			
SOT23	39		3,000	3,000	3,000	6,000			
SOT89	8		100	200	400	800			
0201	600		5,000	15,000	30,000	60,000			
0402	700		10,000	20,000	40,000	80,000			
0603	500		5,000	15,000	25,000	50,000			
0805	300		5,000	10,000	15,000	30,000			
1206	200		5,000	10,000	15,000	20,000			

Lead Free (Pb-Free) Option									
Spare102550100DescriptionBoardKitsKitsKitsKits									
Lead Free Sn – Tin Ag – Silver Cu – OSP	919002 919006 919008	919210 919610 919810	919225 919625 919825	919250 919650 919850	919299 919699 919899				
Au – Gold Standard SnPb – HASL	919008 919009 919001	919910 919910 919010	919925 919925 919025	919950 919950 919050	919999 919999 919100				



CHALLENGER 2 KIT INTERMEDIATE SMD

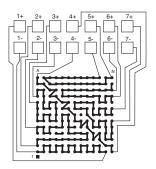




Actual Size: 4" x 5.5" (100 x 140mm)

The new Challenger 2 Kit gives you a wide selection of 33 different SMD packages. Includes BGA with daisy chain continuity test, fine-pitch components and many discrete components. Double-sided board incorporates "two-front-side" design so only one solder paste stencil is needed.

Put your machine to the test with the new Challenger 2 Kit.



BGA169 AFTER MOUNTING

Features LPI Solder Mask FR4 Board .062" Double Sided Tooling Holes .125" Fiducial Marks

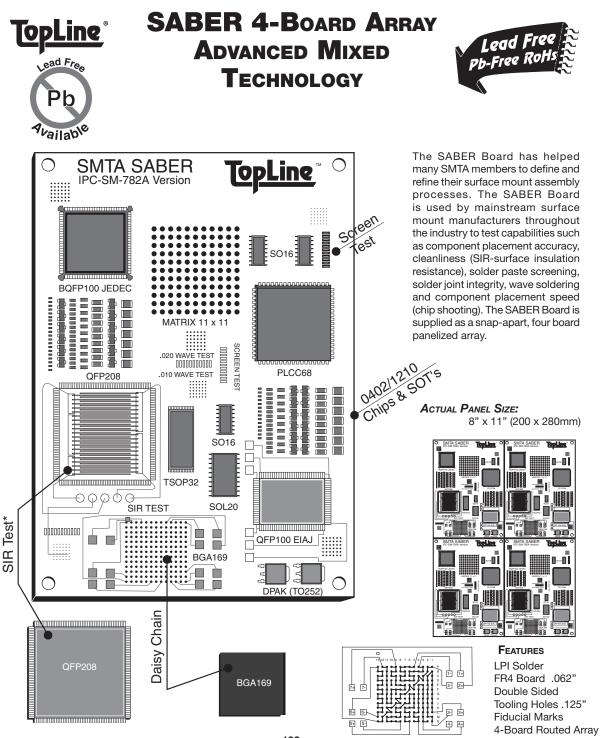


CHALLENGER 2 KIT INTERMEDIATE SMD



KIT ORDERING INFORMATION								
Lead Free		Man	UAL ASSEMBLY	Machine Run				
	Рітсн	Order Number 928000 1 Kit	Order Number 928010 10 Kits	Order Number 928025 25 Kits	Order Number 928050 50 Kits	Order Number 928100 100 Kits		
Board	1.1101	1	10	25	50	100 1013		
TSOP32	0.5mm	1	10	25	50	100		
QFP208	0.5mm		10	25	50	100		
QFP100	0.65mm	1 1	10	25	50	100		
QFP44	0.8mm	1	10	25	50	100		
PLCC20	1.27mm	1	10	25	50	100		
PLCC68	1.27mm	1	10	25	50	100		
SO14	1.27mm	1	10	25	50	100		
SOM16	1.27mm	1	10	25	50	100		
SOL20	1.27mm	1	10	25	50	100		
BGA169	1.5mm	1	10	25	50	100		
SOT23		3	30	75	150	400		
SOT89		2	20	50	100	200		
SOT223		1	10	25	50	100		
SOT323		2	20	50	100	200		
DPAK		1	10	25	100	100		
Crystal		1	10	25	100	100		
Tantalum A & B		1 ea.	10 ea.	25 ea.	50 ea.	100 ea.		
Tantalum C & D		1 ea.	10 ea.	25 ea.	100 ea.	100 ea.		
Aluminum Cap 4mm & 6.3mm		1 ea.	10 ea.	25 ea.	100 ea.	100 ea.		
0402 & 0603 Chip		10 ea.	100 ea.	250 ea.	500 ea.	1000 ea.		
0805 & 1206 Chip 1206 mini MELF		10 ea. 6	100 60	150 150	500 500	1000 500		
1206 MINI MELF 1210 Chip		6	60 60	25	500	250		
1210 Inductor		1	10	25	50	100		
1812 Chip		1	10	25	50	100		
1812 Inductor		1	10	25	50	100		
Potentiometer		1	10	25	50	100		
2308 MELF		2	20	50	100	200		
2000 milli		· <u> </u>			100	. 200		

Lead Free (Pb-Free) Option								
Spare1102550100DescriptionBoardKitKitsKitsKitsKits								
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	928002 928006 928008 928009	928200 928600 928800 928900	928210 928610 928810 928910	928225 928625 928825 928925	928250 928650 928850 928950	928299 928699 928899 928899		
Standard SnPb – HASL	928001	928000	928010	928025	928050	928100		



BGA AFTER MOUNTING (TOP SIDE)



SABER 4-BOARD ARRAY Advanced Mixed Technology Lead Free Pb-Free Rolls





Kit Ordering Information								
*BQFP100 only in SnPb Kit	MANU	AL ASSEMBLY	\otimes	MACHINE R	UN			
Component	Рітсн	Order Number 950000 4 Kits	Order Number 950012 12 Kits	Order Number 950024 24 Kits	Order Number 950048 48 Kits	Order Number 950096 96 Kits		
SABER Array		1 Array	3 Arrays	6 Arrays	12 Arrays	24 Arrays		
QFP208	0.5mm	4	12	25	50	100		
TSOP32	0.5mm	4	12	25	50	100		
QFP100	0.65mm	4	12	25	50	100		
BQFP100*	25mil	4	12	25	50	100		
BGA169	1.5mm	4	12	25	50	100		
PLCC68	1.27mm	4	12	25	50	100		
SO16	1.27mm	12	50	100	200	300		
SOL20	1.27mm	4	12	50	50	100		
DPAK	1.27mm	10	25	50	100	200		
SOT23	1.27mm	100	300	500	1000	3000		
0402/0603/0805/1206 Chip	-	100	500	1000	2000	5000		
1210 Chip	-	100	200	500	1000	1000		
DIP14 ~ 20	100mil	8	25	50	100	200		

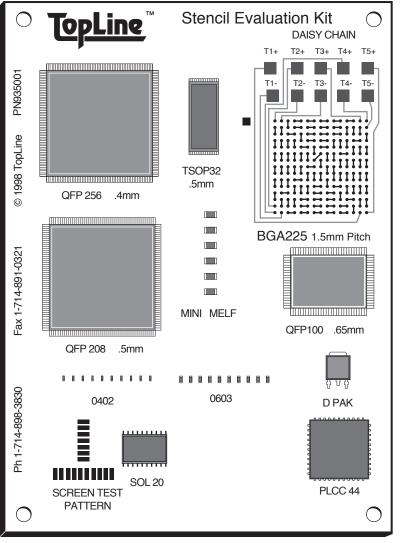
Lead Free (Pb-Free) Option									
Description	Spare Board	1 Kit	10/12 Kits	24/25 Kits	48/50 Kits	96/100 Kits			
4-Board Array Sn – Tin Ag – Silver Cu – OSP Au – Gold Standard	950002 950006 950008 950009	950200 950600 950800 950900	950212 950612 950812 950912	950224 950624 950824 950924	950248 950648 950848 950948	950296 950696 950896 950996			
SnPb – HASL Single (1-up)	950001	950000	950012	950024	950048	950196			
Sn – Tin Ag – Silver Cu – OSP Au – Gold	950013 950016 950018 950007	950201 950601 950801 950901	950210 950610 950810 950910	950225 950625 950825 950925	950250 950650 950850 950950	950299 950699 950899 950999			
Standard SnPb – HASL	950003	950011	950010	950025	950050	950100			

TopLine[®]

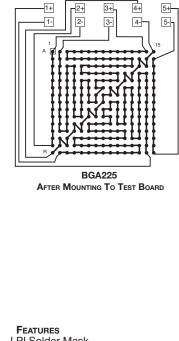
STENCIL EVALUATION KIT







We supply the board and components. You provide the stencil. All kits include a ball grid array with daisy chain test and 0.4mm pitch QFP256.



LPI Solder Mask FR4 Board .062" Double Sided Tooling Holes .125" Fiducial Marks

Actual Size: 4" x 5.5" (100 x 140mm)

TopLine®

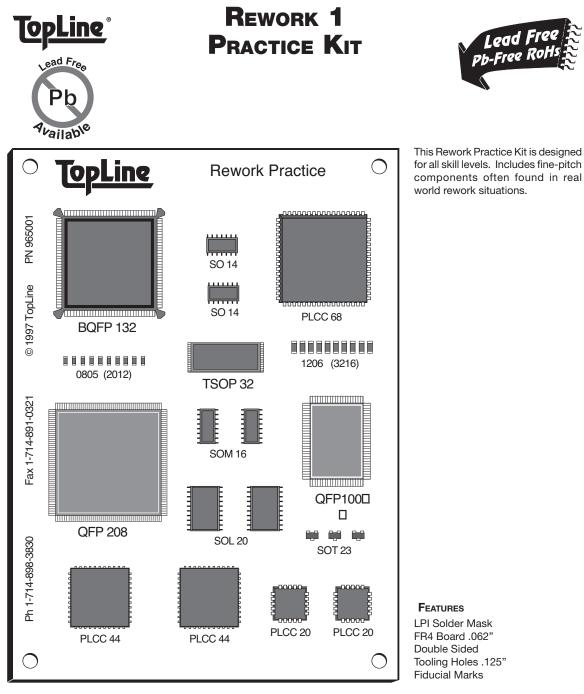
STENCIL EVALUATION KIT





Kit Ordering Information									
		MAN	ual Assembly	Machine Run					
Component	Рітсн	Order Number 936000 1 Kit	Order Number 936010 10 Kit	Order Number 936025 25 Kits	Order Number 936050 50 Kits	Order Number 936100 100 Kits			
Board		1	10	25	50	100			
LQFP168	0.3mm	0	0	0	0	0			
QFP256	0.4mm	1	10	25	50	100			
QFP208	0.5mm	1	10	25	50	100			
TSOP32	0.5mm	1	10	25	50	100			
QFP100	0.65mm	1	10	25	50	100			
BGA225	1.5mm	1	10	25	50	100			
PLCC44	50mil	1	10	25	50	100			
SOL20	50mil	1	10	25	50	100			
DPAK		1	10	25	50	100			
0402 chip		10	100	250	500	1000			
0603 chip		10	100	250	500	1000			
mini Melf		6	60	150	300	600			

Lead Free (Pb-Free) Option								
Spare1102550100DescriptionBoardKitKitsKitsKitsKits								
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	935002 935006 935008 935009	936200 936600 936800 936900	936210 936610 936810 936910	936225 936625 936825 936925	936250 936650 936850 936950	936299 936699 936899 936899		
Standard SnPb – HASL	935001	936000	936010	936025	936050	936100		



Actual Size: 4" x 5.5" (100 x 140mm)



Lead Free

Ph

Vailable





KIT ORDERING INFORMATION								
		Manual Assembly Machine Run						
Component	Рітсн	Order Number 965000 1 Kit	Order Number 965010 10 Kits	Order Number 965026 25 Kits	Order Number 965050 50 Kits	Order Number 965100 100 Kits		
Board		1	10	25	50	100		
QFP208	0.5mm	1	10	25	50	100		
TSOP32	0.5mm	1	10	25	50	100		
QFP100	0.65mm	1	10	25	50	100		
BQFP132*	25mils	1	10	25	50	100		
PLCC20	50mils	2	25	50	100	200		
PLCC44	50 mils	2	25	50	100	200		
PLCC68	50mils	1	10	25	50	100		
SO14	50mils	2	25	50	100	200		
SOM16	50mils	2	25	50	100	200		
SOL20	50mils	2	25	50	100	200		
SOT23		10	100	500	500	500		
0805 Chip		10	100	500	500	1000		
1206 Chip		10	100	250	500	1000		

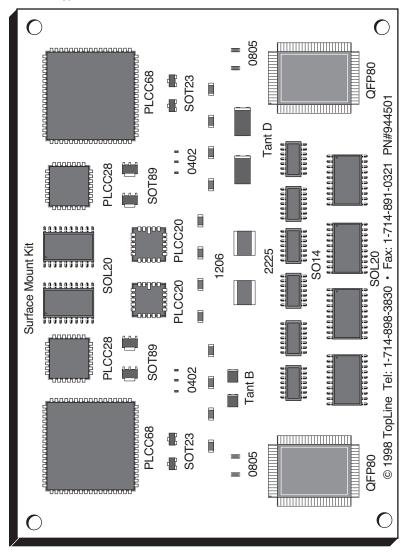
*BQFP132 only in SnPb Kits

Lead Free (Pb-Free) Option								
Spare1102550100DescriptionBoardKitKitsKitsKitsKits								
Lead Free Sn – Tin Ag – Silver Cu – OSP	965002 965006 965008	965200 965600 965800	965210 965610 965810	965225 965625 965825	965250 965650 965850	965299 965699 965899		
Au – Gold Standard SnPb – HASL	965009 965001	965900 965000	965910 965010	965925 965025	965950 965050	965100		



Rework 2 Practice Kit





Actual Size: 4" x 5.5" (100 x 140mm)

Topline provides this kit for rework practice. Kit contains popular components including fine pitch Quad Flat Pack. For manual assembly only.

FEATURES

LPI Solder Mask FR4 Board .062" Double Sided Tooling Holes .125" Fiducial Marks



Rework 2 Practice Kit



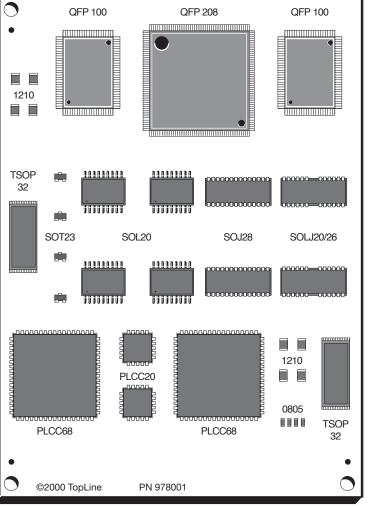
KIT ORDERING INFORMATION								
		A MA	NUAL ASSEMBLY	MA				
Component	Рітсн	Order Number 944500 1 Kit	Order Number 944510 10 Kits	Order Number 944525 25 Kits	Order Number 944550 50 Kits			
Board		1	10	25	50			
QFP80	0.8mm	2	20	50	100			
PLCC20	1.27mm	2	20	50	100			
PLCC28	1.27mm	2	20	50	100			
PLCC68	1.27mm	2	20	50	100			
SO14	1.27mm	6	60	150	300			
SOL20	1.27mm	6	60	150	300			
0402 Chips		6	60	150	300			
0805 Chips		8	80	200	400			
1206 Chips		12	120	300	600			
2225 Cap		2	20	50	100			
Tantalum 3528	B-Case	2	20	50	100			
Tantalum 7343	D-Case	2	20	50	100			
SOT23		4	40	100	400			
SOT89		4	40	100	200			

Lead Free (Pb-Free) Option								
Spare1102550100DescriptionBoardKitKitsKitsKitsKits								
Lead Free								
Sn – Tin	944502	944200	944210	944225	944250	944299		
Ag – Silver	944506	944600	944610	944625	944650	944699		
Cu – OSP	944508	944800	944810	944825	944850	944899		
Au – Gold	944509	944900	944910	944925	944950	944999		
Standard								
SnPb – HASL	944501	944500	944510	944525	944550	944599		

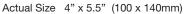


Rework 3 Practice Kit





This Rework Practice Kit is available populated and unassembled. Includes fine-pitch components often found in real work situations.



FEATURES

LPI Soldermask

FR4 Board .062" Single Sided Tooling Holes



Lead Free

Vailable





Kit Ordering Information									
	Manual Assembly				Machine Run				
Component	Рітсн	Order Number 978000 1 Kit	Order Number 978010 10 Kits	Order Number 978025 25 Kits	Order Number 978050 50 Kits	Order Number 978100 100 Kits			
Board		1	10	25	50	100			
QFP208	0.5mm	1	10	25	50	100			
QFP100	0.65mm	2	20	50	100	200			
TSOP32	0.5mm	2	20	50	100	200			
PLCC20	50mil	2	20	50	100	200			
PLCC68	50mil	2	20	50	100	200			
SOL20	50mil	4	40	100	200	400			
SOJ28	50mil	2	20	50	100	200			
*SOJ20/26	50mil	2	20	50	100	200			
SOT23		4	50	100	200	400			
0805		4	50	100	200	400			
1210		8	100	200	400	800			

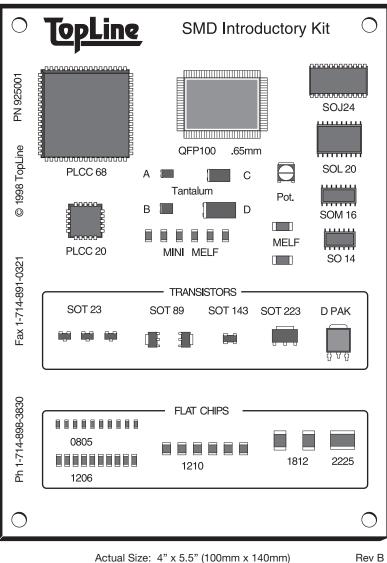
*SOJ20/26 only in SnPb Kits

Lead Free (Pb-Free) Option									
Spare1102550100DescriptionBoardKitKitsKitsKitsKits									
Lead Free Sn – Tin Ag – Silver	978002 978006	978200 978600	978210 978610	978225 978625	978250 978650	978299 978699			
Cu – OSP Au – Gold Standard	978008 978009	978800 978900	978810 978910	978825 978925	978850 978950	978899 978999			
SnPb – HASL	978001	978000	978010	978025	978050	978100			

SMD INTRODUCTORY KIT



<u>CopLine</u>®



Lead Free Pb-Free RoHs

The SMD Introductory Kit includes a wide range of popular easy-tohandle components.

FEATURES

LPI Solder Mask FR4 Board .062" Double Sided Tooling Holes .125" Fiducial Marks



SMD INTRODUCTORY KIT



Kit Ordering Information									
Pb Available Component Pitch		A MAN	ual Assembly						
		Order Number 925000 1 Kit	Order Number 925010 10 Kits	Order Number 925025 25 Kits	Order Number 925050 50 Kits	Order Number 925100 100 Kits			
COMPONENT	Thom								
Board		1	10	25	50	100			
QFP100	0.65mm	1	10	25	50	100			
SO14	50mils	1	10	25	50	100			
SOM16	50mils	1	10	25	50	100			
SOL20	50mils		10	25	50	100			
PLCC20	50mils	1	10	25	50	100			
PLCC68	50mils	1	10	25	50	100			
SOT23		3	30	75	250	300			
SOT89		2	20	50	100	200			
SOT143		1	10	25	50	100			
SOT223		1	10	25	50	100			
DPAK		1	10	25	50	100			
Tantalum-A		1	10	25 25	50	100			
Tantalum-B Tantalum-C			10 10	25 25	50 50	100 100			
Tantalum-C			10	≥5 25	50	100			
MELF		2	20	25 50	100	200			
mini-MELF		6	60	300	300	600			
Potentiometer		1	10	25	50	100			
0805 Chip		10	100	250	500	1000			
1206 Chip		10	100	250	500	1000			
1210 Chip		10	100	250	500	1000			
1812 Chip		2	20	50	100	200			
2225 Chip		1	10	25	50	100			
	I	I '		25	00	100			

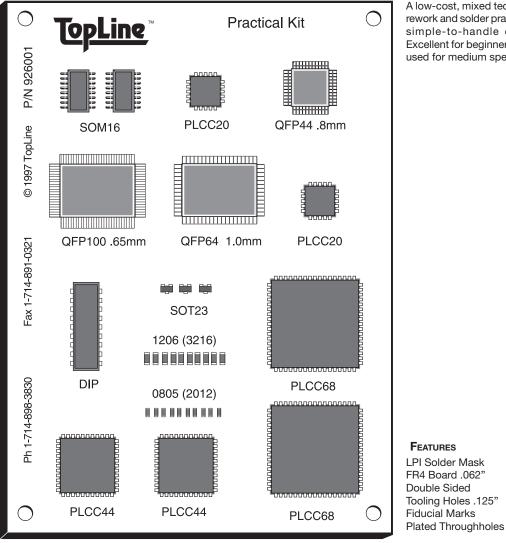
Lead Free (Pb-Free) Option										
Spare1102550100DescriptionBoardKitKitsKitsKitsKits										
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	925002 925006 925008 925009	925200 925600 925800 925900	925210 925610 925810 925910	925225 925625 925825 925925	925250 925650 925850 925950	925299 925699 925899 925999				
Standard SnPb – HASL	925001	925000	925010	925025	925050	925100				



Available

PRACTICAL **MIXED TECHNOLOGY** Кіт





A low-cost, mixed technology kit for rework and solder practice. Includes simple-to-handle components. Excellent for beginners. Can also be used for medium speed assembly.





PRACTICAL MIXED TECHNOLOGY KIT





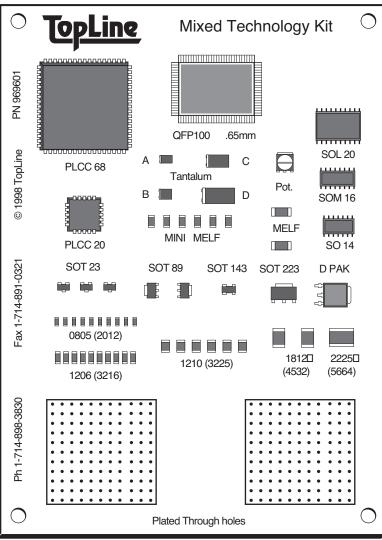
KIT ORDERING INFORMATION									
		MAN	ual Assembly						
Component	Рітсн	Order Number 926000 1 Kit	Order Number 926010 10 Kits	Order Number 926025 25 Kits	Order Number 926050 50 Kits	Order Number 926100 100 Kits			
Board		1	10	25	50	100			
QFP100	0.65mm	1	10	25	50	100			
QFP44	0.80mm	1	10	25	50	100			
QFP64	1.00mm	1	10	25	50	100			
PLCC20	50mils	2	25	50	100	200			
PLCC44	50mils	2	25	50	100	200			
PLCC68	50mils	2	25	50	100	200			
SOM16	50mils	2	25	50	100	200			
DIP14~18	100mils	1	10	25	50	100			
SOT23		10	50	500	500	500			
0805 Chip		10	100	500	500	1000			
1206 Chip		10	100	250	500	1000			

Lead Free (Pb-Free) Option										
Spare1102550100DescriptionBoardKitKitsKitsKitsKits										
Lead Free Sn – Tin Ag – Silver	926002 926006	926200 926600	926210 926610	926225 926625	926250 926650	926299 926699				
Cu – OSP Au – Gold Standard SnPb – HASL	926008 926009 926001	926800 926900 926000	926810 926910 926010	926825 926925 926025	926850 926950 926050	926899 926999 925100				

<u>TopLine</u>®

MIXED TECHNOLOGY 1 KIT





Experiment with mixed technology. Combines easy-to-handle SMD components plus plenty of throughhole components on100mil grid.

Lead Free Pb-Free RoHs

FEATURES

LPI Solder Mask FR4 Board .062" Double Sided Tooling Holes .125" Fiducial Marks Plated Throughholes

Actual Size: 4" x 5.5" (100 x 140mm)

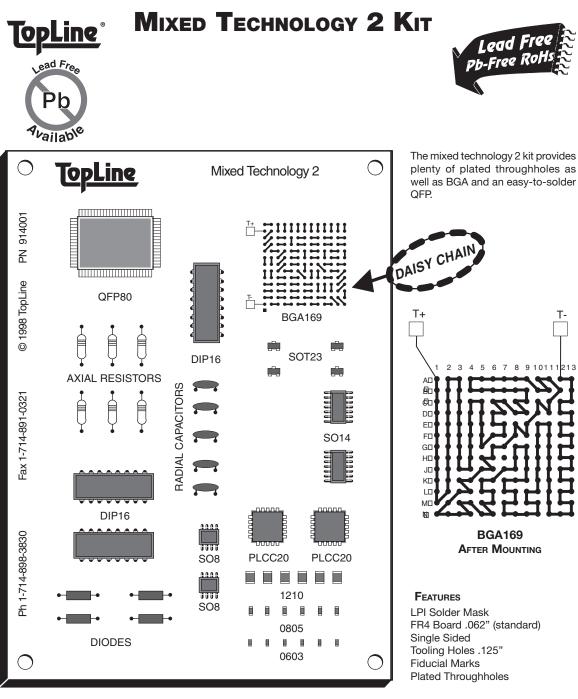


MIXED TECHNOLOGY 1 KIT



Kit Ordering Information									
Pb Puailable		AND MAN	UAL ASSEMBLY						
		Order Number 969600	Order Number 969610	Order Number 969625	Order Number 969650	Order Number 969699			
COMPONENT	Рітсн	1 К іт	10 Кітз	25 К ітз	50 Кітs	100 Kits			
Board QFP100 SO14 SOM16 SOL20 PLCC20 PLCC68 DIP14~20 SOT23 & SOT89 SOT143 SOT223 DPAK Tantalum-A Tantalum-A Tantalum-C Tantalum-D MELF	0.65mm 50mils 50mils 50mils 50mils 50mils 100mils	1 1 1 1 1 4 3 1 1 1 1 1 1 1 1 2	10 10 10 10 10 10 40 30 10 10 10 10 10 10 20	25 25 25 25 25 25 25 25 25 25 25 25 25 2	50 50 50 50 50 50 200 150 50 50 50 50 50 50 50 50 100	100 100 100 100 100 100 100 300 100 100			
mini-MELF Potentiometer 0805 Chip 1206 Chip 1210 Chip 1812 Chip 2225 Chip		6 1 10 10 10 2 1	60 10 100 100 100 20 10	150 25 250 250 250 100 25	300 50 500 500 500 100 50	600 100 1000 1000 1000 200 100			

Lead Free (Pb-Free) Option									
Spare1102550100DescriptionBoardKitKitsKitsKitsKits									
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	969602 969606 969608 969609	969200 969700 969800 969900	969210 969710 969810 969910	969225 969725 969825 969925	969250 969750 969850 969950	969299 969799 969899 969899			
Standard SnPb – HASL	969601	969600	969610	969625	969650	969699			



Actual Size: 4" x 5.5" (100 x 140mm)

TopLine°

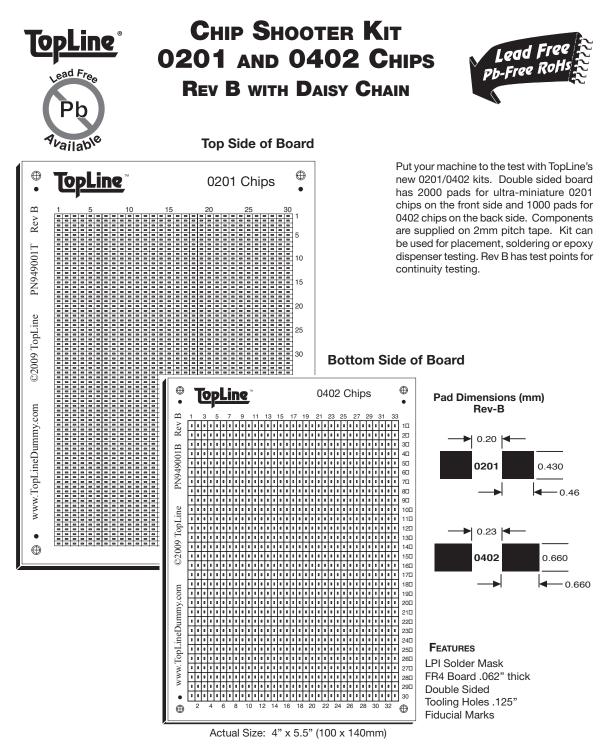
MIXED TECHNOLOGY 2 KIT





Kit Ordering Information									
		MANUAL ASSEMBLY							
Сомронент	Рітсн	ORDER ORDER NUMBER NUMBER 914000 914010 1 Kit 10 Kits		Order Number 914025 25 Kits	Order Number 914050 50 Kits	Order Number 914100 100 Kits			
Board		1	10	25	50	100			
QFP80	0.8mm	1	10	25	50	100			
BGA169	1.5mm	1	10	25	50	100			
SO8	1.27mm	2	25	50	100	200			
SO14	1.27mm	2	25	50	100	200			
PLCC20	50mil	2	25	50	100	200			
SOT23		4	40	100	200	400			
1210 Chip		6	60	150	300	600			
0805 Chip		10	100	250	500	1000			
0603 Chip		10	100	250	500	1000			
THROUGHHOLE COMPO	NENTS								
DIP16	100mil	3	30	75	150	300			
1/4W Resistor	.50"	6	60	150	300	600			
DO35 Diodes	.50"	4	40	200	200	400			
Ceramic Cap	.20"	5	50	250	250	500			

Lead Free (Pb-Free) Option										
Spare1102550100DescriptionBoardKitKitsKitsKitsKits										
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	914002 914006 914008 914009	914200 914600 914800 914900	914210 914610 914810 914910	914225 914625 914825 914925	914250 914650 914850 914950	914299 914699 914899 914999				
Standard SnPb – HASL	914001	914000	914010	914025	914050	914100				



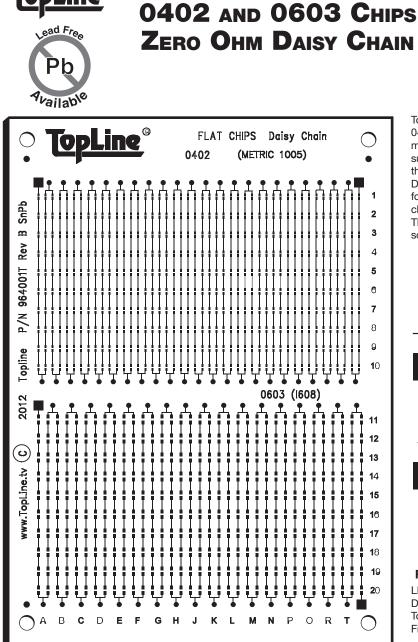


CHIP SHOOTER KIT 0201 and 0402 CHIPS ZERO OHM DAISY CHAIN



KIT ORDERING INFORMATION										
Component	Таре Рітсн	Order Number 949000 1 Kit	Order Number 949010 10 Kits	Order Number 949025 25 Kits	Order Number 949050 50 Kits	Order Number 949100 100 Kits				
Board 0201 Chip 0402 Chip	- 2mm 2mm	1 2000 1000	10 15,000 10,000	25 45,000 25,000	50 100,000 50,000	100 200,000 100,000				

Lead Free (Pb-Free) Option									
Spare1102550100DescriptionBoardKitKitsKitsKitsKits									
Lead Free Sn – Tin	949002	949200	949210	949225	949250	949299			
Ag – Silver Cu – OSP Au – Gold	949006 949008 949009	949600 949800 949900	949610 949810 949910	949625 949825 949925	949650 949850 949950	949699 949899 949999			
Standard SnPb – HASL	949009	949900	949910	949925 949025	949950 949050	949999 949100			



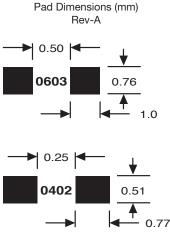
OP

CHIP SHOOTER KIT

Actual Size: 4" x 5.5" (100 x 140mm)

TopLine has thousands of zer-ohm 0402 and 0603 resistors for your machine to place. 0402 chips are supplied on tape with 2mm pitch and the 0603 chips with 4mm pitch tape. Double sided board has 460 pads for 0402 chip and 350 pads for 0603 chip per side. 1600 pads total! This kit can be used for placement, soldering or epoxy dispenser testing.

Lead Free Pb-Free RoHs







Vailable

CHIP SHOOTER KIT 0402 and 0603 Chips Zero Ohm Daisy Chain



Kit Ordering Information										
Component	ORDER ORDER ORDER ORDER ORDER ORDER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER 964000 964010 964025 984050 964100 1 KIT 10 KITS 25 KITS 50 KITS 100 KITS									
DAISY CHAIN KIT										
Board	1	10	25	50	100					
0402 Chip Resistor	1000	10,000	20,000	40,000	80,000					
0603 Chip Resistor	1000	10,000	15,000	30,000	60,000					

Lead Free (Pb-Free) Option									
Spare1102550100DescriptionBoardKitKitsKitsKitsKits									
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	964002 964006 964008 964009	964200 964600 964800 964900	964210 964610 964810 964910	964225 964625 964825 964925	964250 964650 964850 964950	964299 964699 964899 964999			
Standard SnPb – HASL	964001	964000	964010	964025	964050	964100			



ead Free

Available

CHIP SHOOTER KIT 0805 and 1206 Chips



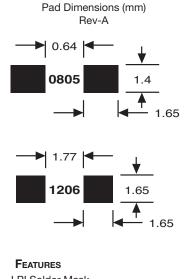
<u>[opLine</u> Speed Kit 300x 0805 Resistors PN 968001 П © 1998 TopLine ⁻ax 1-714-891-0321 300x 1206 Resistors ²h 1-714-898-3830

Actual Size: 4" x 5.5" (100 x 140mm)

Put your machine to the test . This Kit is a low cost way for you to measure the component per hour (CPH) rating of pick & place machines. Use to benchmark and compare the performance of different machines.

Each side has land patterns for 300 each 0805 and 1206. Total of 1200 pads on the board.

This kit can be used for placement, soldering or epoxy dispenser testing.



LPI Solder Mask FR4 Board .062" Double Sided Tooling Holes .125" Fiducial Marks



CHIP SHOOTER KIT 0805 and 1206 Chips

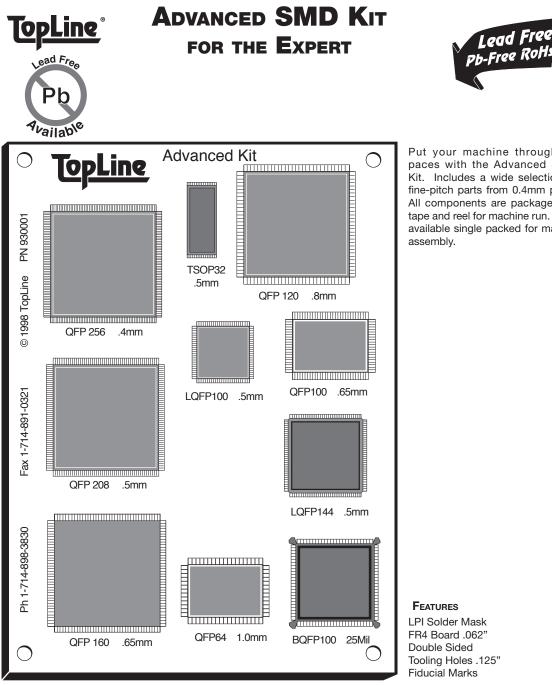




	Κιτ Ο	rdering I n	FORMATION		
		8	MACHINE RUN		
Component	Order Number 968000 1 Kit	Order Number 968010 10 Kit	Order Number 968025 25 Kits	Order Number 968050 50 Kits	Order Number 968100 100 Kits
Κιτ					
Board	1	10	25	50	100
0805 Chip Resistor	300	3,000	7,500	15,000	30,000
1206 Chip Resistor	300	3,000	7,500	15,000	30,000

Lead Free (Pb-Free) Option									
Spare1102550100DescriptionBoardKitKitsKitsKitsKits									
Lead Free Sn – Tin Ag – Silver	968002 968006	968200 968600	968210 968610	968225 968625	968250 968650	968299 968699			
Cu – OSP Au – Gold	968008 968009	968800 968900	968810 968910	968825 968925	968850 968950	968899 968999			
Standard SnPb – HASL	968001	968000	968010	968025	968050	968100			

Free Solder Paste Gerber + Parts Placement download www.topline.tv/GerbersFree.cfm Note: 983001 is now 968002



Actual Size: 4" x 5.5 (100 x 140mm)

Put your machine through its paces with the Advanced SMD Kit. Includes a wide selection of fine-pitch parts from 0.4mm pitch. All components are packaged on tape and reel for machine run. Also available single packed for manual



Ph

Vailable

Advanced SMD Kit for the Expert



Kit Ordering Information									
		MAN	ual Assembly	MACHINE RUN					
Component	Рітсн	Order Number 931000 1 Kit	Order Number 931010 10 Kits	Order Number 931024 24 Kits	Order Number 931048 48 Kits	Order Number 931096 96 Kits			
Board		1	10	24	48	96			
QFP256	0.4mm		10	24	48	96			
QFP208	0.5mm	1	10	24	48	96			
LQFP144	0.5mm	1	10	24	48	96			
LQFP100	0.5mm	1	10	24	48	96			
TSOP32	0.5mm	1	10	24	48	96			
QFP100	0.65mm	1	10	24	48	96			
*BQFP100	25.0mil	1	10	24	48	96			
QFP160	0.65mm	1	10	24	48	96			
*QFP120	0.8mm	1	10	24	48	96			
QFP64	1.0mm	I 1	10	24	48	96			

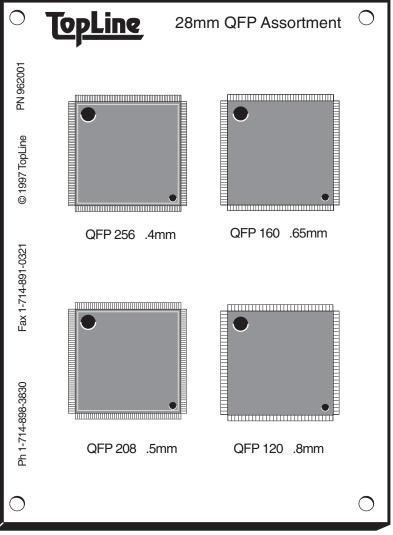
*BQFP100 and QFP120 only in SnPb Kit

Lead Free (Pb-Free) Option									
Spare110244896DescriptionBoardKitKitsKitsKitsKits									
Lead Free									
Sn – Tin	930002	931200	931210	931224	931248	931296			
Ag – Silver	930006	931600	931610	931624	931648	931696			
Cu – OSP	930008	931800	931810	931824	931848	931896			
Au – Gold	930009	931900	931910	931924	931948	931996			
Standard									
SnPb – HASL	930001	931000	931010	931024	931048	931100			



28mm QFP Assortment Kit 0.4mm to 0.8mm Pitch





Actual Size: 4" x 5.5" (100 x 140mm)

Try them all. We give you four different lead pitches: 0.4mm, 0.5mm, 0.65mm and 0.8mm. Experience the differences in levels as you progress to 0.4mm pitch.



FR4 Board .062" Double Sided Tooling Holes .125" Fiducial Marks



Lead Free

Vailable

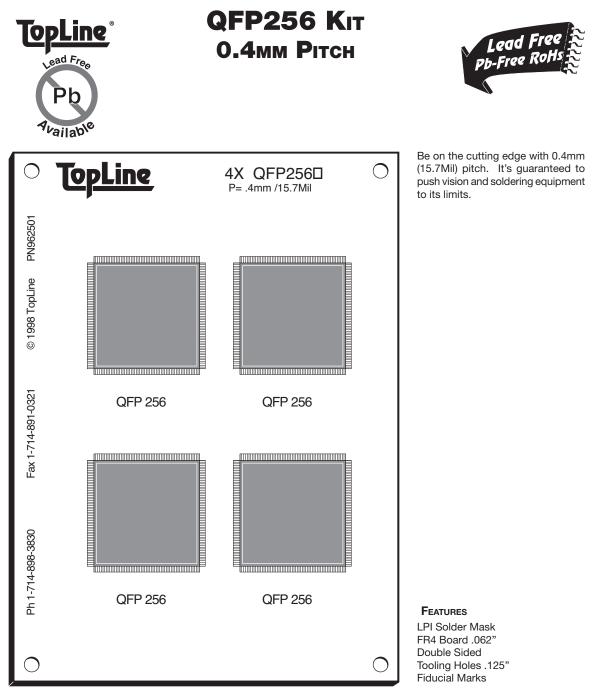


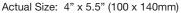


KIT ORDERING INFORMATION									
		Manual Assembly				Run			
Component	Рітсн	Order Number 962000 1 Kit	Order Number 962012 12 Kits	Order Number 962024 24 Kits	Order Number 962048 48 Kits	Order Number 962096 96 Kits			
Board		1	12	24	48	96			
QFP256	0.4mm	1	12	24	48	96			
QFP208	0.5mm	1	12	24	48	96			
QFP160	0.65mm	1	12	24	48	96			
*QFP120	0.80mm	1	12	24	48	96			

*QFP120 only in SnPb Kit

Lead Free (Pb-Free) Option									
Spare112244896DescriptionKitKitKitsKitsKits									
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	962002 962007 962008 962009	962200 962600 962800 962900	962212 962612 962812 962912	962224 962624 962824 962924	962248 962648 962848 962948	962296 962696 962896 962996			
Standard SnPb – HASL	962001	962000	962012	962024	962048	962096			





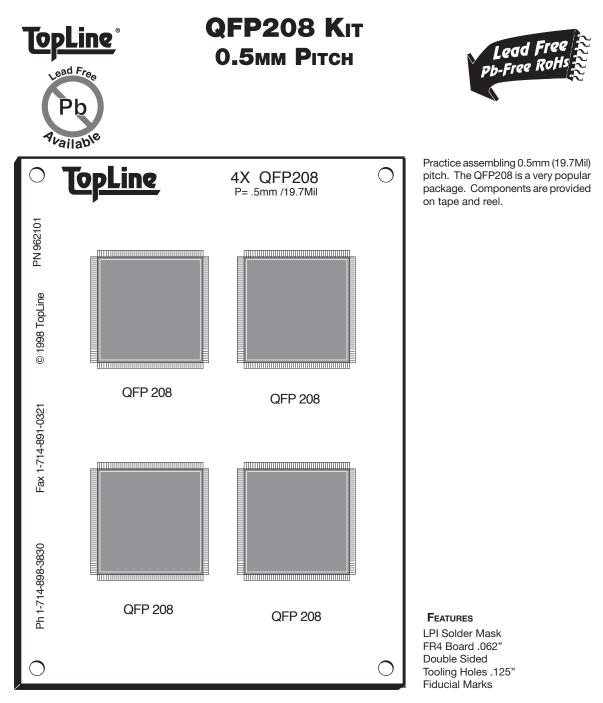


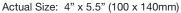
QFP256 Кіт 0.4мм **Р**ітсн



Kit Ordering Information									
Component	Рітсн	Order Number 962500 1 Kit	Order Number 962512 12 Kits	Order Number 962524 24 Kits	Order Number 962548 48 Kits	Order Number 962596 96 Kits			
Board QFP256	0.4mm	1 4	12 48	24 96	48 192	96 384			

Lead Free (Pb-Free) Option									
Description	Spare Board	1 Kit	12 Kits	24 Kits	48 Kits	96 Kits			
Lead Free									
Sn – Tin	962502	962520	962521	962522	962525	962529			
Ag – Silver	962507	962560	962561	962562	962565	962569			
Cu – OSP	962508	962580	962581	962582	962585	962589			
Au – Gold	962509	962590	962591	962592	962595	962599			
Standard									
SnPb – HASL	962501	962500	962512	962524	962548	962596			







Ρb

Available



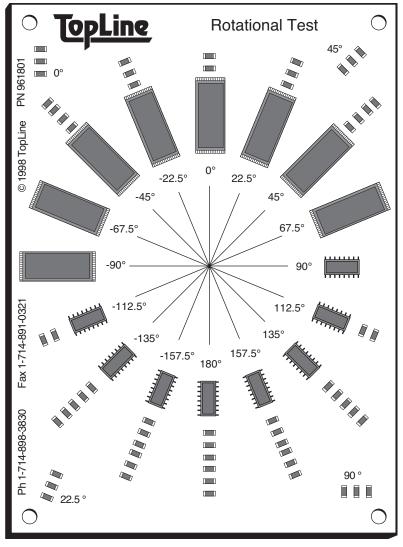


Kit Ordering Information									
				Manual Assembly					
Component	Рітсн	Order Number 962100 1 Kit	Order Number 962112 12 Kits	Order Number 962124 24 Kits	Order Number 962148 48 Kits	Order Number 962196 96 Kits			
Board QFP208	0.5mm	1 4	12 48	24 96	48 192	96 384			

Lead Free (Pb-Free) Option									
Spare112244896DescriptionBoardKitKitsKitsKitsKits									
Lead Free									
Sn – Tin	962102	962120	962121	962122	962125	962129			
Ag – Silver	962107	962160	962161	962162	962165	962169			
Cu – OSP	962108	962180	962181	962182	962185	962189			
Au – Gold	962109	962190	962191	962192	962195	962199			
Standard									
SnPb – HASL	962101	962100	962112	962124	962148	962196			

TopLineROTATIONAL PLACEMENT
KITKITTESTS ACCURACY TO ± 0.5°





Be on target! Some problems do not become evident until you start rotating components. TopLine's Rotational Placement Kit is designed to test the rotational accuracy on your system to $\pm 0.5^{\circ}$.

FEATURES

LPI Solder Mask FR4 Board .062" Double Sided Tooling Holes .125" Fiducial Marks

Actual Size: 4" x 5.5" (100 x 140mm)



Available

ROTATIONAL PLACEMENT KIT

TESTS ACCURACY TO ± 0.5°



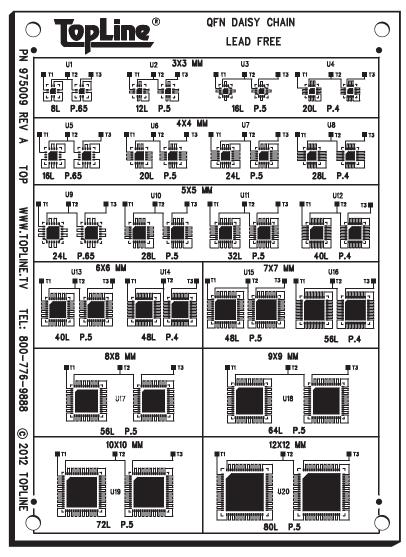
	Kit Ordering Information								
					N				
Component	Рітсн	Order Number 961800 1 Kit	Order Number 961806 6 Kits	Order Number 961812 12 Kits	Ордер Number 961825 25 Kits				
Board		1	6	12	25				
TSOP32	0.5mm	8	50	100	200				
SO16	1.27mm	8	50	100	200				
1206 Chips		60	300	750	1500				

Lead Free (Pb-Free) Option									
Description	Spare Board	1 Kit	12 Kits	25 Kits	50 Kits				
Lead Free									
Sn – Tin	961802	-	961821	961822	961824				
Ag – Silver	961807	-	961861	961862	961864				
Cu – OSP	961808	-	961881	961882	961884				
Au – Gold	961809	-	961891	961892	961894				
Standard									
SnPb – HASL	961801	961800	961812	961825	961850				



QFN DAISY CHAIN KIT 3 ~ 12mm PITCH 0.4 ~ 0.65mm





Actual Size: 4" x 5.5" (100 x 140mm)

This kit provides a wide variety of daisy chain bottom terminal QFN components 8 ~ 80pins for solder practice and continuity testing. Pitch 0.4mm to 0.65mm provides advanced and easy to handle combinations. Component size 3mm to 12mm covers the full range of package sizes. Large ground pads present a challenge for correct solder paste deposition and reflow. Test terminals T1-T2-T3 provide easy method to verify zero ohm continuity testing after assembly and reflow.



LPI Solder Mask FR4 Board .062" Double Sided Tooling Holes .125" Fiducial Marks



Lead Free

^{Available}

QFN DAISY CHAIN KIT 3 ~ 12mm PITCH 0.4 ~ 0.65mm



	KIT ORDERING INFORMATION								
		MANUAL ASSEMBLY							
Сомронент	Рітсн	Number 975200 1 Кіт	Order Number 975205 5 Kits	Order Number 975210 10 Kits	Order Number 975225 25 Kits				
Board		1	5	10	25				
QFN 16L 3x3mm	0.5mm	2	10	20	50				
QFN 16L 4x4mm	0.65mm	2	10	20	50				
QFN 20L 4x4mm	0.5mm	2	10	20	50				
QFN 24L 4x4mm	0.5mm	2	10	20	50				
QFN 24L 5x5mm	0.65mm	2	10	20	50				
QFN 28L 5x5mm	0.5mm	2	10	20	50				
QFN 32L 5x5mm	0.5mm	2	10	20	50				
QFN 40L 6x6mm	0.5mm	2	10	20	50				
QFN 48L 7x7mm	0.5mm	2	10	20	50				
QFN 56L 7x7mm	0.4mm	2	10	20	50				
QFN 56L 8x8mm	0.5mm	2	10	20	50				
QFN 64L 9x9mm	0.5mm	2	10	20	50				
QFN 72L 10x10mm	0.5mm	2	10	20	50				
QFN 80L 12x12mm	0.5mm	2	10	20	50				

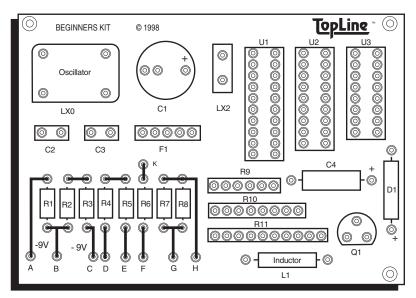
* Note: All QFN are Lead-Free (Pb-Free)

Lead Free (Pb-Free) Option									
Description	Spare Board	1 Kit	5 Kits	10 Kits	25 Kits				
Lead Free									
Sn – Tin	975002	975200	975205	975210	975225				
Ag – Silver	975006	-	-	-	975625				
Cu – OSP	975008	-	-	-	975825				
Au – Gold	975009	975900	975905	975910	975925				
Standard									
SnPb – HASL	975001	975000	975005	975010	975025				



BEGINNERS THROUGHHOLE KIT





The beginners Throughhole Kit is a low-cost, entry level kit for practicing with a wide range of components. Total of 24 easy-toidentify components are provided in kit.

FEATURES

FR4 Board .062" Single Sided Tooling Holes .125" Plated Throughholes

Actual Size: 2.75" x 4.0" (70 x 100mm)



BEGINNERS THROUGHHOLE KIT



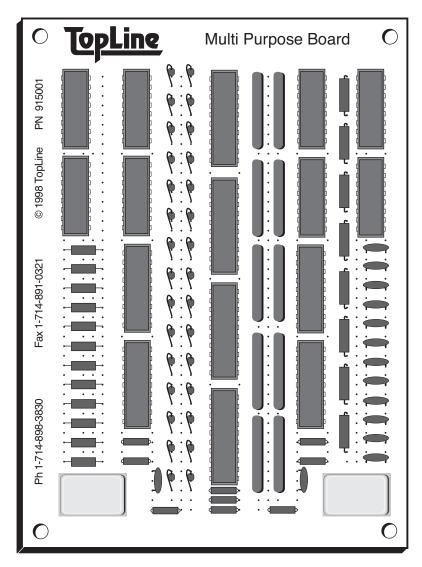
KIT ORDERING INFORMATION								
		Manual Assembly						
Component	Board Location	Order Number 910000 1 Kit	Order Number 910010 10 Kits	Order Number 910025 25 Kits	Order Number 910050 50 Kits	Order Number 910100 100 Kits		
Board		1	10	25	50	100		
Oscillator	LX0	1	10	25	50	100		
Crystal	LX2	1	10	25	50	100		
Radial Aluminum Cap	C1	1	10	25	50	100		
Ceramic Capacitor	C2	1	10	25	50	100		
Film Capacitor	C3	1	10	25	50	100		
Axial Aluminum Cap	C4	1	10	25	50	100		
Axial Inductor	L1	1	10	25	50	100		
Resistor Network SIP6	R9	1	10	25	50	100		
Resistor Network SIP8	R10	1	10	25	50	100		
Resistor Network SIP10	R11	1	10	25	50	100		
SAW Filter SIP5	F1	1	10	25	50	100		
Transistor TO92	Q1	1	10	25	50	100		
Rectifier DO35/DO41	D1	1	10	25	50	100		
Integrated Circuit DIP16	U1	1	10	25	50	100		
Integrated Circuit DIP18	U2	1	10	25	50	100		
Integrated Circuit DIP20	U3	1	10	25	50	100		
Resistor 1/8 W	R1-4	4	40	100	200	400		
Resistor 1/4 W	R5-8	4	40	100	200	400		

Lead Free (Pb-Free) Option									
Description	Spare Board	1 Kit	10 Kits	25 Kits	50 Kits	100 Kits			
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	910003 910006 910008 910009	910200 910600 910800 910900	910210 910610 910810 910910	910225 910625 910825 910925	910250 910650 910850 910950	910299 910699 910899 910999			
Standard SnPb – HASL	910002	910000	910010	910025	910050	910100			



MULTIPURPOSE THROUGHHOLE KIT





Actual Size: 4" x 5.5" (100 x 140mm)

We supply the board and a wide assortment of components. This board has room for at least 200 different components. You decide where to insert the components.

Kits are available for machine or manual insertion.

FEATURES

FR4 Board .062" Double Sided Tooling Holes .125" 920 Plated Throughholes Hole Pitch 0.10-inch



MULTIPURPOSE THROUGHHOLE KIT



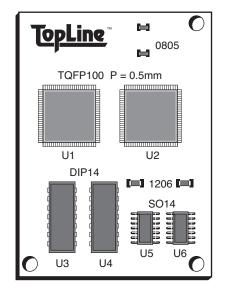
	Kit Ordering Information								
		MANU/							
Component	Order Number 916000 1 Kit	Number Numbr Numbr Numbr							
Board	1	25	50	100	50	100			
2-PIN DIP	25	400	800	1600	800	1600			
8-PIN DIP	5	100	200	400	200	400			
14-PIN DIP	5	100	200	400	200	400			
16-PIN DIP	5	100	200	400	200	400			
18-PIN DIP	5	100	200	400	200	400			
20-PIN DIP	5	50	100	200	100	200			
SIP Resistor Network	10	100	200	400	200	400			
Oscillator	2	40	100	200	100	200			
Radial Capacitor	10	250	500	1000	500	1000			
1/8 W Axial Resistor	50	1000	2500	5000	2500	5000			
1/4 W Axial Resistor	50	1000	2500	5000	2500	5000			
1/2 W Axial Resistor	20	1000	2000	4000	2000	4000			

Lead Free (Pb-Free) Option								
Spare1102550100DescriptionBoardKitKitsKitsKitsKits								
Lead Free Sn – Tin Ag – Silver	915002 915006	916200 916600	916210 916610	916225 916625	916250 916650	916299 916699		
Cu – OSP Au – Gold	915008 915009	916800 916900	916810 916910	916825 916925	916850 916950	916899 916999		
Standard SnPb – HASL	915001	916000	916010	916025	916050	916100		



ECONO KIT II MIXED TECHNOLOGY FOR SOLDERING CERTIFICATION





Actual Size: 1.62" x 2.0" (41 x 51mm)

TopLine offers an economical, mixed technology kit with fine pitch. This kit is used by employment agencies for soldering certification.

FEATURES LPI Solder Mask FR4 Board .062" Single Sided Tooling Holes .125" Plated Throughholes



ECONO KIT II MIXED TECHNOLOGY FOR SOLDERING CERTIFICATION



Kit Ordering Information								
		MANUAL ASSEMBLY						
Component	Рітсн	Order Number 938000 1 Kit	Order Number 938010 10 Kits	Order Number 938025 25 Kits	Order Number 938050 50 Kits	Order Number 938100 100 Kits		
Board		1	10	25	50	100		
LQFP100	0.5mm	2	20	50	100	200		
SO14	50mil	2	20	50	100	200		
DIP14	100mil	2	20	50	100	200		
0805 Chip		2	20	50	100	250		
1206 Chip		2	20	50	100	250		

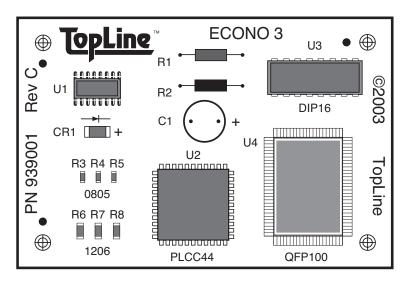
Note: Kits of 10, 25, 50 and 100 are bulk packed

Lead Free (Pb-Free) Option								
Description	Spare Board	1 Kit	10 Kits	25 Kits	50 Kits	100 Kits		
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	938002 938006 938008 938009	938200 938600 938800 938900	938210 938610 938810 938910	938225 938625 938825 938925	938250 938650 938850 938950	938299 938699 938899 938899		
Standard SnPb – HASL	938001	938000	938010	938025	938050	938100		



ECONO KIT III MIXED TECHNOLOGY FOR SOLDERING CERTIFICATION





Actual Size: 2" x 3" (50mm x 76mm)

TopLine offers an economical, mixed technology kit with popular components including fine pitch. This kit is used by employment agencies for soldering certification of assemblers.

FEATURES

LPI Solder Mask FR4 Board .062" Single Sided Plated Throughholes Fiducial Marks Tooling Holes



ECONO KIT III MIXED TECHNOLOGY FOR SOLDERING CERTIFICATION



	Kit Ordering Information									
		MANUAL ASSEMBLYORDERORDERORDERORDERNUMBERNUMBERNUMBERNUMBER9390009390109390259390501Kit10 Kits25 Kits50 Kits100 Kits								
Сомронент	Рітсн									
Board		1	10	25	50	100				
QFP100	0.65mm	1	10	25	50	100				
PLCC44	1.27mm	1	10	25	50	100				
SO16	1.27mm	1	10	25	50	100				
DIP16	2.54mm	1	10	25	50	100				
0805 Chip		3	30	75	150	300				
1206 Chip		3	30	75	150	300				
MELF		1	10	25	50	100				
1/4W resistor	.5 inch	2	20	50	100	200				
AL CAP	.2 inch	1	10	25	50	100				

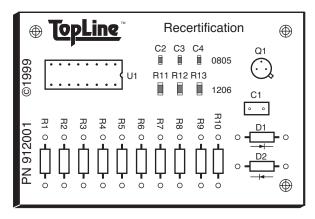
Note: Kits of 10, 25, 50 and 100 are bulk packed

Lead Free (Pb-Free) Option								
Description	Spare Board	1 Kit	10 Kits	25 Kits	50 Kits	100 Kits		
Lead Free Sn – Tin	939002	939200	939210	939225	939250	939299		
Ag – Silver Cu – OSP	939006 939008	939600 939800	939610 939810	939625 939825	939650 939850	939699 939899		
Au – Gold	939008	939800	939910	939825	939950	9399999		
Standard SnPb – HASL	939001	939000	939010	939025	939050	939100		



ECONO IV MIXED TECHNOLOGY RECERTIFICATION KIT





ACTUAL SIZE: 2" x 3" (50 x 76mm)

The Econo IV Kit offers an economical mixed technology kit with simple components. This kit is used for soldering re-certification of assemblers.

FEATURES

LPI Solder Mask FR4 Board .062" Single Sided Plated Throughholes Tooling Holes



ECONO IV MIXED TECHNOLOGY RECERTIFICATION KIT



Kit Ordering Information							
		Manual Assembly					
Component	Рітсн	ORDER ORDER ORDER ORDER ORDER ORDER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER NUMBER 912000 912010 912025 912050 912100 1Kitt 10 Kits 25 Kits 50 Kits 100 Kits					
Board		1	10	25	50	100	
DIP16/18	IC	1	10	25	50	100	
TO-5	Transistor	1	10	25	50	100	
CK05	Capacitor	1	10	25	50	100	
DO-35	Diode	2	20	50	100	200	
0805 Chip	SMD	3	30	75	150	300	
1206 Chip	SMD	3	30	75	150	300	
1/4 W Resistor	Axial Lead	10	100	250	500	1000	

Note: Kits of 10, 25, 50 and 100 are bulk packed.

Lead Free (Pb-Free) Option							
Spare1102550100DescriptionBoardKitKitsKitsKitsKits							
Lead Free							
Sn – Tin	912002	912200	912210	912225	912250	912299	
Ag – Silver	912006	912600	912610	912625	912650	912699	
Cu – OSP	912008	912800	912810	912825	912850	912899	
Au – Gold	912009	912900	912910	912925	912950	912999	
Standard							
SnPb – HASL	912001	912000	912010	912025	912050	912100	



12 Layer Lead Free Throughhole Kit Daisy Chain



12-layer board designed with heat dissipating (thermal relief) inner layers, makes this board a challenge to solder. Boards available in 4 Lead Free finishes.

BOARD PLATING (Pb Free):

Sn100 – White Tin (Immersion Tin) Ag - Immersion Silver Cu - OSP (Entek 106) Au - Gold Ni-Au (ENIG) (Electroless Nickel, Immersion Gold)

DAISY CHAIN

DIP14 Zero Ohm 1/4 W Resistors Go, No-Go Test Points

PLATED HOLES

Throughhole barrels with thermal relief are connected to all 10 inner layer copper ground planes for soldering capillary test. 10 holes with graduating sizes: .016"- .062" (0.4mm ~1.6mm)

FEATURES

LPI Solder Mask FR4 Board 0.10" (2.5mm) Thick Tg = 175° C 12 Layer Copper ground plane inner layers Tooling Holes Fiducials Marks 450 Plated Holes

Thermal Relief Wagon Wheel



A+ B+ C+ D+ • • $\bigcirc \bigcirc \bigcirc$ $\bigcirc \bigcirc \bigcirc \bigcirc$ $\bigcirc \bigcirc \bigcirc \bigcirc$ ្រា $\bigcirc \bigcirc$ I • . I I 1 1 • 16 0 0 P ្រា ি ៤ ឲា ि · 22 26 1 I 1 I I I 32 9 ៙ 9 0 ি ি ଡା Þ ° 36 o 40 I I 1 o 48 9 ៙ ø 9 0 Ø രി Ø 0.52 • 0 57 0.62 ത്രത ത്രി চিচি ۵ രി രി A-B-C-D. 0 \bigcirc \odot opLine 913001 BOTTOM REV B

Actual Size: 4.0" x 5.5" (100 x 140mm) 0.10" (2.5mm) thick







12 Layer Lead Free Throughhole Kit Daisy Chain



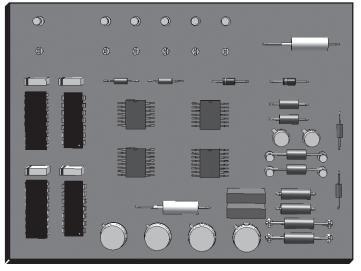
Kit Ordering Information						
Component	Notes	Order Number 913216 16 Kits	Order Number 913232 32 Kits	Order Number 913248 48 Kits	Order Number 913264 64 Kits	Order Number 913296 96 Kits
*Board	Sn100	16	32	48	64	96
DIP14	Daisy Chain Test	256	512	768	1024	1536
DIP14	Non Daisy Chain	64	128	192	256	384
1/4 W Resistors	Zero Ohm	320	640	960	1280	1920
Connector AMP 1-5145154-2	120 Pin	16	32	48	64	96

*Note: Contact TopLine for combination kits with assortment of finishes: Sn, Ag, OSP, Au

Lead Free (Pb-Free) Option						
Spare1632486496DescriptionBoardKitsKitsKitsKits						
Lead Free Sn – Tin Ag – Silver Cu – OSP Au – Gold	913002 913007 913008 913009	913216 913616 913816 913916	913232 913632 913832 913932	913248 913648 913848 913948	913264 913664 913864 913964	913296 913696 913896 913996



NASA SOLDER TRAINING THROUGHHOLE KIT



The NASA kit includes a wide assortment of legacy throughhole and SMT components including flat packs and solder terminals.

FEATURES

FR4 Board .062" SnPb HASL Double Sides Tooling Holes .125" Plated Throuhholes Without Solder Mask

Actual Size: 4" x 5.5" (100 x 140mm)

	KIT CONTENTS				
Item	Ref	Part Type or Description			
1	U1, U2	DIP 14L (.3x.75)			
2	U3, U4	DIP 16L (.3x.75)			
3	U5, U6	FP 14L (Flat Pack)			
4	U7, U8	FP 16L (Flat Pack)			
5	U9, U10	TO-99			
6	Q1, Q2	TO-5			
7	Q3, Q4	TO-18			
8	D1, D2	DO-35			
9	C1, C2, C3, C4	CK05/CK06 (Molded Capacitor)			
10	C5, C6	KK4 (Disc Capacitor)			
11	C7, C8	CS2 (B-Case Tantalum)			
12	R1, R2	RC05 1/8W Resistor (.015 wire)			
13	R3. R4	RC05 1/8W Resistor (.015 wire)			
14	R5, R6	RC07 1/4W Resistor (.025 wire)			
15	R7, R8	RC07 1/4W Resistor			
16	R9, R10	RC20 1/2W Resistor (.033 wire)			
17	R11, R12	RC20 1/2W Resistor			
18	E11-E16	Bifurcared Terminals .094 collar			
19	E17-E22	Turret Terminals 0.125 collar			

KIT O	RDERING	INFO
	ndening	

Tin-Lead PWB	ORDER	ORDER	ORDER
with components	NUMBER	UMBER NUMBER	
for customer to	979000	979010	979025
hand assemble	1 Kit	10 Kits	25 Kits

Spare PWB

Order Number 979001

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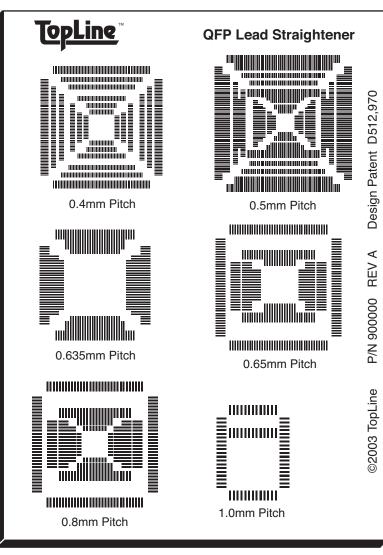
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Universal QFP Lead Straightener Rework Tool





Low cost Universal QFP Lead Straightener handles all QFP, TQFP and LQFP with pitch of 0.4mm to 1.0mm.

Complete set includes all template patterns.

Use standard hand tools such as dental picks and tweezers to adjust leads of QFP to match recessed template slots.

Great for rework and recovery of expensive QFP, TQFP and LQFP. Also use for incoming inspection.

Conductive heavy duty stainless steel construction - precision coplanarity.

For use on benchtop.

Lead Count and Pitch Includes:

0.4mm	0.5mm	0.65mm	0.8mm
64L	32L	52L	32L
80L	48L	80L	44L
120L	64L	100L	64L
128L	80L	144L	80L
176L	100L	160L	120L
216L	128L		128L
256L	144L	0.635mm	
	160L	84L	1.0mm
	176L	100L	44L
	184L	132L	52L
	208L		64L
	240L		

Order Number: 900000

Design Patent D512,970

Actual Size: 4" x 5.5" (100 x 140mm) .048" (1.2mm) thick



2013 Catalog

F7.62

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