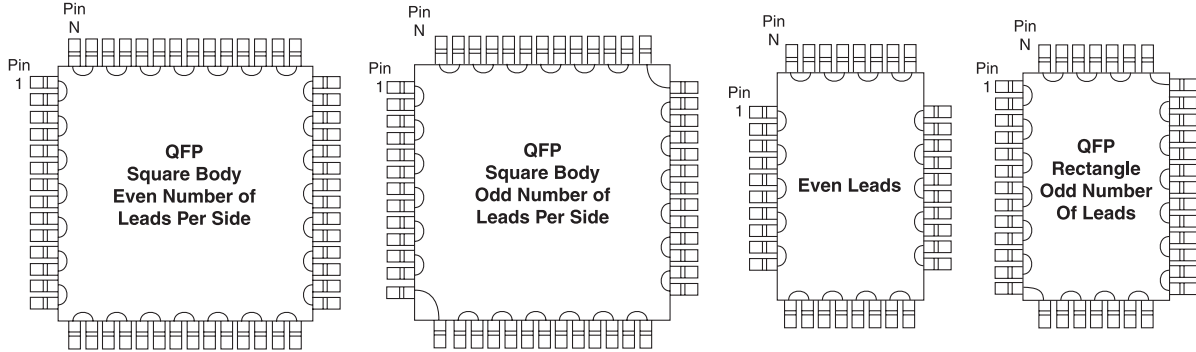


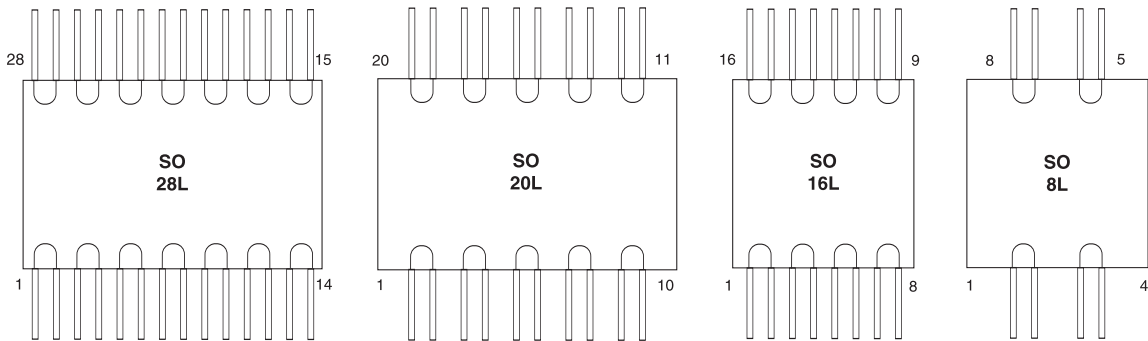
Daisy-Chain Patterns

The standard daisy chain pattern for non-BGA IC's is Even. Example of daisy-chain "even" pattern for leadframe packages. Pin 1-2, 3-4, 5-6, 7-8, etc. Continuity testing requires dummy components to contain daisy-chain connections. There is no standard daisy-chain pattern for Ball Grid Array Packages.

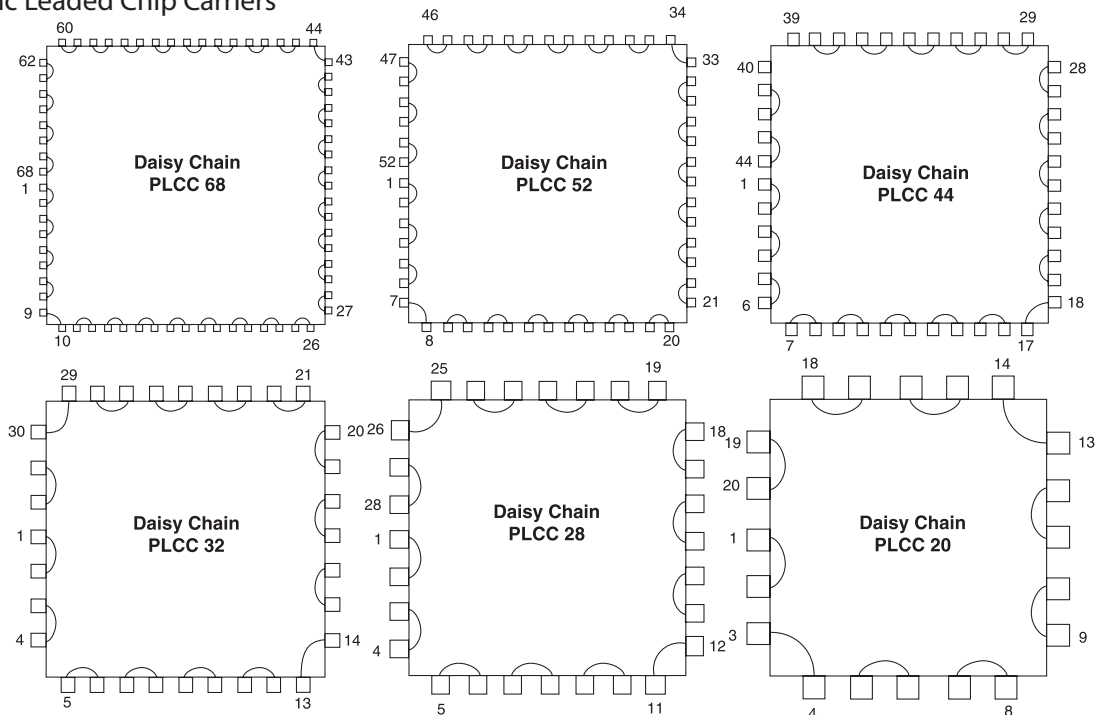
QFP Quad Flat Packs



SOIC Small Outline Integrated Circuits



PLCC Plastic Leaded Chip Carriers



Plastic Leaded Chip Carriers (PLCC) are four-sided "J" Leaded Plastic body packages. Lead counts range from 20 to 84. PLCC packages can be square or rectangle. Body sizes range from .35" to 1.15". PLCCs are JEDEC standard compliant. The PLCC "J" Lead configuration requires less board space versus equivalent gull leaded components.

Daisy-Chained And Lead-Free Parts Available!

PLCC Plastic Leaded Chip Carrier

Part Description (In Tubes)	Pin Count	Body Size	Quantity Per Tube	Part Description (Tape and Reel)	Tape Width	Tape Pitch	Quantity 13" Reel
PLCC20T	20	8.8mm	48	PLCC20TR	16mm	12mm	1,000
PLCC28T	28	11.4mm	38	PLCC28TR	24mm	16mm	750
PLCC32T	32	11.4 x 13mm	30	PLCC32TR	24mm	16mm	750
PLCC44T	44	16.5mm	27	PLCC44TR	32mm	24mm	450/500
PLCC52T	52	19.0mm	24	PLCC52TR	32mm	24mm	450
PLCC68T	68	24.1mm	18	PLCC68TR	44mm	32mm	230/250
PLCC84T	84	29.2mm	15	PLCC84TR	44mm	36mm	250

Notes

- All PLCCs have "J" leads.
- Standard lead pitch is 1.27mm (50 mils).
- PLCCs are to JEDEC standards.
- Tube quantity may vary.
- 13" reels are standard.
- Parts available on Tape and Reel.
- Moisture sensitivity is JEDEC level 3.
- Lead-free parts are available with 100% Matte Sn finish.

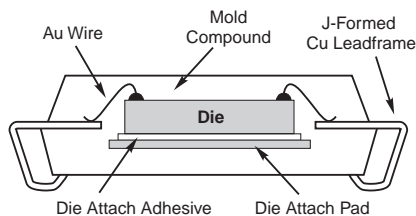


Part Description System

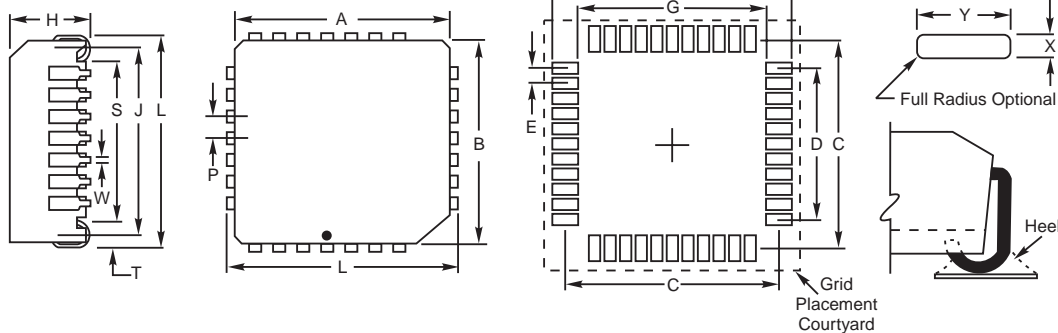
Plastic Leaded Chip Carrier — PLCC20T — Packaging

Number of Pins

- Packaging: T=Tubes, TR=Tape and Reel.
- Add "Sn" to end of part number for Lead-Free.



For kits see pages 83, 64, 68, 70, 61, 77, 79, 84 and 62.



PLCC Component Dimensions

Component Identifier	L (mm)		S (mm)		W (mm)		T (mm)		A (mm)		B (mm)		J (mm)	H (mm)	P (mm)
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Ref	Max	Basic
PLCC-20	9.78	10.03	5.78	6.53	0.33	0.53	1.50	2.00	8.89	9.04	8.89	9.04	7.87	4.57	1.27
PLCC-28	12.32	12.57	8.32	9.07	0.33	0.53	1.50	2.00	11.43	11.58	11.43	11.58	10.41	4.57	1.27
PLCC-44	17.40	17.65	13.40	14.15	0.33	0.53	1.50	2.00	16.51	16.66	16.51	16.66	15.49	4.57	1.27
PLCC-52	19.94	20.19	15.94	16.69	0.33	0.53	1.50	2.00	19.05	19.20	19.05	19.20	18.03	5.08	1.27
PLCC-68	25.02	25.27	21.02	21.77	0.33	0.53	1.50	2.00	24.13	24.33	24.13	24.33	23.11	5.08	1.27
PLCC-84	30.10	30.35	26.10	26.85	0.33	0.53	1.50	2.00	29.21	29.41	29.21	29.41	28.19	5.08	1.27

PLCC Land Patterns

Component Identifier	Z (mm)	G (mm)	X (mm)	Y (mm)	C (mm)	D (mm)	E (mm)	Placement Grid (No. of Elements)
PLCC-20	10.80	6.40	0.60	2.20	8.60	5.08	1.27	24 x 24
PLCC-28	13.40	9.00	0.60	2.20	11.20	7.62	1.27	30 x 30
PLCC-44	18.40	14.00	0.60	2.20	16.20	12.70	1.27	40 x 40
PLCC-52	21.00	16.60	0.60	2.20	18.80	15.24	1.27	44 x 44
PLCC-68	26.00	21.60	0.60	2.20	23.80	20.32	1.27	54 x 54
PLCC-84	31.20	26.80	0.60	2.20	29.00	25.40	1.27	66 x 66

Small Outline Package (SOIC) body size was compressed and the lead pitch tightened to obtain a smaller version SOIC. This yields an IC package that is a significant reduction in the size (compared to standard package).

All IC assembly processes remain the same as with our standard SOICs.

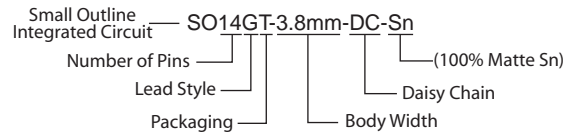
SOIC Small Outline Integrated Circuit

Part Description	Number of Pins	Lead Style	Body Width	Quantity Per Tube	Tape Width	Tape Pitch	Quantity 13" Reel
SO8GT-3.8mm	8	Gull	3.8mm	100	12mm	8mm	2,500
SO14GT-3.8mm	14	Gull	3.8mm	50	16mm	8mm	2,500
SO16GT-3.8mm	16	Gull	3.8mm	48	16mm	8mm	2,500
SO16GT-7.6mm	16	Gull	7.6mm	46	16mm	12mm	1,000
SO20GT-7.6mm	20	Gull	7.6mm	38	24mm	12mm	1,000
SO24GT-7.6mm	24	Gull	7.6mm	31	16mm	12mm	1,000
SO28GT-7.6mm	28	Gull	7.6mm	25	24mm	12mm	1,000

Notes

- Standard lead pitch is 1.27mm.
- Tube quantity may vary.
- Parts available on Tape and Reel.
- Lead-free parts are available with 100% Matte Sn finish.

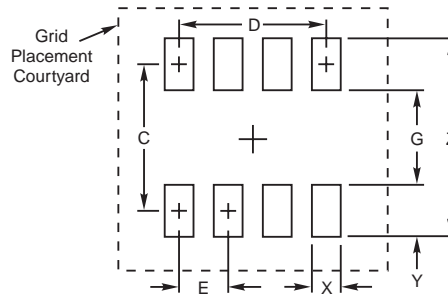
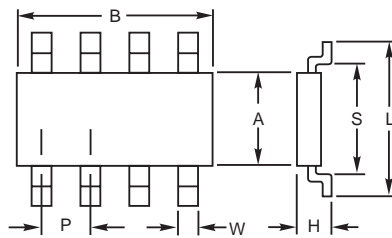
Part Description System



- Lead Style: G=Gull Wing.
- Packaging: T=Tubes, TR=Tape and Reel.
- Add "Sn" to end of part number for Lead-Free.



For kits see pages 83, 64, 68, 70, 61, 75, 76, 77, 79, 81 and 84.



SOIC Component Dimensions

Component Identifier	JEDEC Number	L (mm)		S (mm)		W (mm)		T (mm)		A (mm)		B (mm)		H (mm)		P (mm)
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Basic
S08	MS-012 AA	5.80	6.30	3.26	4.55	0.33	0.51	0.40	1.27	3.80	4.00	4.80	5.00	1.35	1.75	1.27
S014	MS-012 AB	5.80	6.30	3.26	4.55	0.33	0.51	0.40	1.27	3.80	4.00	8.55	8.75	1.35	1.75	1.27
S016	MS-012 AC	5.80	6.30	3.26	4.55	0.33	0.51	0.40	1.27	3.80	4.00	9.80	10.00	1.35	1.75	1.27
SO16-7.6mm	MS-013 AA	10.00	10.65	7.46	8.85	0.33	0.51	0.40	1.27	7.40	7.60	10.10	10.50	2.35	2.65	1.27
SO20-7.6mm	MS-013 AC	10.00	10.65	7.46	8.85	0.33	0.51	0.40	1.27	7.40	7.60	12.60	13.00	2.35	2.65	1.27
SO28-7.6mm	MO-119 AB	10.29	10.64	8.21	9.01	0.36	0.51	0.53	1.04	7.40	7.60	18.08	18.39	2.34	2.64	1.27

SOIC Land Pattern Dimensions

Component Identifier	Z (mm)	G (mm)	X (mm)	Y (mm) Ref	C (mm) Ref	D (mm) Ref	E (mm) Ref	Placement Grid (No. of Grid Elements)
S08	7.40	3.00	0.60	2.20	5.20	3.81	1.27	12 x 16
S014	7.40	3.00	0.60	2.20	5.20	7.62	1.27	20 x 16
S016	7.40	3.00	0.60	2.20	5.20	8.89	1.27	22 x 16
SO16-7.6mm	11.40	7.00	0.60	2.20	9.20	8.89	1.27	22 x 22
SO20-7.6mm	11.40	7.00	0.60	2.20	9.20	11.43	1.27	28 x 24
SO28-7.6mm	11.40	7.00	0.60	2.20	9.20	16.51	1.27	38 x 24

Thin Small Outline Packages (TSOP) are thin body size components; thickness is 1.0mm. TSOP packages have four sides and are rectangular. Type I TSOPs have the leads protruding from the width portion of the package. Lead counts range from 28 to 48. Package body size ranges from 8x11.8mm to 12x20mm.



TSOP Thin Small Outline Package – Type I

Part Description	Number of Pins	Body Size	Lead Pitch	Quantity Per Tray	Tape Width	Tape Pitch	Quantity 13" Reel
A-TI-TSOP28-8.1x11.8mm-.55mm	28	8.1 x 11.8mm	.55mm	234	24mm	12mm	1,000
A-TI-TSOP32-8x11.8mm-.5mm	32	8 x 11.8mm	.5mm	234	24mm	12mm	1,000
A-TI-TSOP32-8x18.4mm-.5mm	32	8 x 18.4mm	.5mm	156	32mm	12/16mm	1,000
A-TI-TSOP48-12x18.4mm-.5mm	48	12 x 18.4mm	.5mm	96	32mm	16mm	1,000

TSOP Thin Small Outline Package – Type II

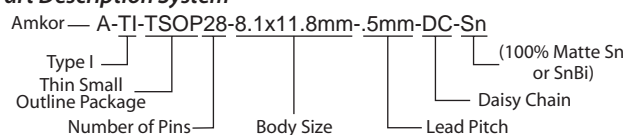
Type II TSOP are becoming obsolete. Practical has some stock. Please call for availability.

Notes

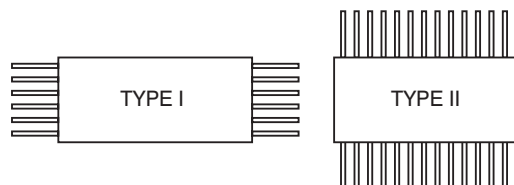
- Standard packaging is in JEDEC trays or tape and reel (quantities may vary).
- Body dimensions are measured by body length and width.
- Type I means that pins extend from the narrow end (the width) of the body.
- Parts available on Tape and Reel upon special request.
- See chart for 100% Matte Sn, SnPb, and SnBi availability.
- Type II means that pins extend from the wide end (the length) of the body. Type II TSOP are becoming obsolete. Practical has some stock. Please call for availability.



Part Description System



- Add "T" to end of part number for Tray.
- Add "TR" to end of part number for Tape and Reel.
- Add specific finish to end of part number for Lead-Free, i.e Sn or SnBi.



For recommended kits see page 61.