
Packing information for IPAD, protection, rectifiers, thyristors and AC Switches

Introduction

This technical note provides details about packing for axial, through hole, surface mounting and chip scale packages.

1 Tape and reel delivery mode

1.1 Tape dimensions for surface mount packages

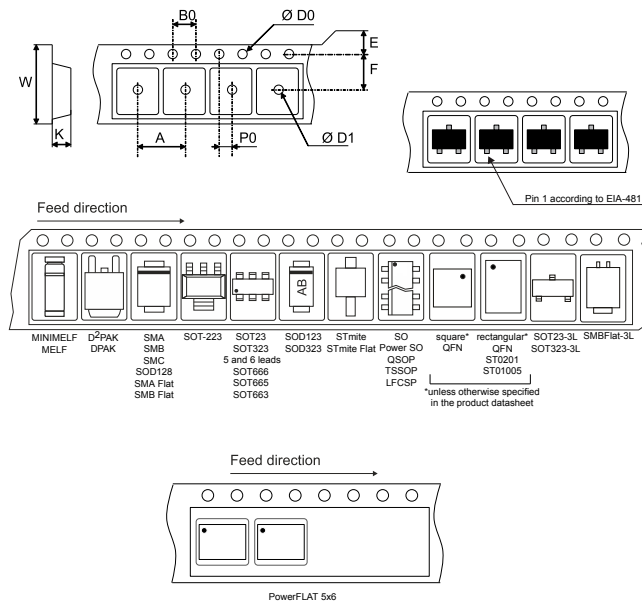
Unless otherwise specified in product specification.

Table 1. Surface mount devices - all dimensions in millimeters

Package	Drive hole spacing B0	Component spacing A	Drive hole diameter D0	Pocket hole diameter D1	Distance between hole lines F	Pocket depth K	Tape width W	Hole interval P0
D ² PAK	4 ±0.1	12±0.1	1.55 ±0.05	1.8±0.1	11.5±0.1	4.8±0.1	24±0.3	2 ±0.1
D ² PAK	4 ±0.1	16±0.1	1.55 ±0.05	1.5±0.1	11.5±0.1	5.5±0.1	24±0.3	2 ±0.1
DPAK	4 ±0.1	8 ± 0.1	1.55 ±0.05	1.6 ±0.1	7.5±0.1	2.65 ±0.1	16±0.3	2 ±0.1
LFCSP 4x4	4 ±0.2	8 ± 0.1	1.5 +0.1/-0	1.5 min.	5.5±0.05	1.1 ±0.1	12±0.3	2 ±0.05
LFCSP 5x5	4 ±0.1	4 ±0.1	1.55 ±0.05	1.5 min.	5.5 ±0.05	2.9 ±0.1	12 ±0.3	2 ±0.05
MELF	4 ±0.1	4 ±0.1	1.55 ±0.05	1 +0.2.5/-0	3.5 ±0.05	1.83 ±0.1	8 ±0.3	2 ±0.05
MiniMELF	4 ±0.1	8 ±0.1	1.5+0.1/-0	1.5 min.	5.5 ±0.05	1.2 ±0.1	12 ±0.3	2 ±0.05
Power SO-10	4 ±0.1	24 ±0.1	1.5+0.1/-0	1.5 min.	11.5 ±0.05	3.9 ±0.1	24 ±0.3	2 ±0.1
Power SO-20	4 ±	8 ±0.1	1.55 ±0.05	1.6 ±0.1	7.5 ±0.1	2.65 ±0.1	16 ±0.3	2 ±0.1
PowerFLAT 5x6	4 ±0.1	8 ±0.1	1.55 ±0.05	1.5 min.	11.5 ±0.1	4.25 ±0.1	12 ±0.3	2 ±0.1
PPAK	4 ±0.1	8 ±0.2	1.5 ±0.1	1.5 min.	5.5 ±0.05	0.8 ±0.1	12 ±0.3	2 ±0.05
QFN 1.45x1-6L	4 ±0.2	4 ±0.2	1.5 ±0.1		3.5 ±0.3	0.75	8 +0.3/-0.1	2 ±0.5
QFN 1.5x1.7-8L	4 ±0.2	4 ±0.2	1.5 ±0.1	1 min.	3.5 ±0.3	0.75	8 +0.3/-0.1	2 ±0.5
QFN 1.7x1.35-8L	4 ±0.1	8 ±0.2	1.5 +0.1/-0	1.5 min.	5.5 ±0.05	1.1 ±0.1	12 ±0.3	2 ±0.05
QFN 1.8x2-6L	4 ±0.2	4 ±0.2	1.5 ±0.1		3.5 ±0.3	0.75	8 +0.3/-0.1	2 ±0.5
QFN 1x1-6L	4 ±0.1	8 ±0.1	1.55 ±0.05	1.6 ±0.1	7.5 ±0.01	2.65 ±0.1	16 ±0.3	2 ±0.1
QFN 2.5x1-10L	4 ±0.2	4 ±0.2	1.55 ±0.05		3.5 ±0.05	0.55 ±0.1	8 +0.3/-0.1	2 ±0.5
QFN 2.5x1.5-12L	4 ±0.2	4 ±0.2	1.5 ±0.1		3.5 ±0.3	0.75	8 +0.3/-0.1	2 ±0.5
QFN 2x2-8L	4 ±0.1	4 ±0.1	1.5 ±0.05	1 ±0.25	3.5 ±0.05	1 ±0.05	8 ±0.3	2 ±0.05
QFN 3.3x1.5-16L	4 ±0.2	4 ±0.1	1.55 ±0.1	1.5 min.	5.5 ±0.05	8 ±0.1	12 ±0.3	2 ±0.05
QFN 3.5x1.2-16L	4 ±0.2	4 ±0.2	1.5 ±0.1		3.5 ±0.3	0.75	8 +0.3/-0.1 ±0.3	2 ±0.5
QFN 3x3-12L	4 ±0.1	8 ±0.2	1.5 ±0.1	1.5 min.	5.5 ±0.05	1.1 ±0.1	12 ±0.3	2 ±0.05

Package	Drive hole spacing B0	Component spacing A	Drive hole diameter D0	Pocket hole diameter D1	Distance between hole lines F	Pocket depth K	Tape width W	Hole interval P0
QFN 3x3-16L	4 ±0.1	8 ±0.1	1.5 ±0.05	1.5 min.	5.5 ±0.05	1.1	12 ±0.3	2 ±0.05
QFN 3x3-6L	4 ±0.1	8 ±0.2	1.5 ±0.1	1.5 min.	5.5 ±0.05	0.7 ±0.1	12 ±0.3	2 ±0.05
QFN 4x4-24L	4 ±0.2	8 ±0.2	1.5 ±0.1	1.5 min.	5.5 ±0.05	1.1 ±0.1	12 ±0.3	2 ±0.05
QFN 4x5-16L	4 ±0.1	2 ±0.05	1.55 ±0.05	0.4 ±0.005	3.5 ±0.05	0.47 ±0.02	8 ±0.1	2 ±0.05
QFN 5x5-14L	4 ±0.1	8 ±0.2	1.5 ±0.1	1.5 min.	5.5 ±0.05	1.1 ±0.1	12 ±0.3	2 ±0.05
QFN 5x5-5L	4 ±0.2	8 ±0.2	1.5 ±0.1	1.5 min.	5.5 ±0.05	1.1 ±0.1	12 ±0.3	2 ±0.05
QFN 6x6-36L	4 ±0.1	12 ±0.1	1.5+0.1/-0	1.5 min.	7.5 ±0.1	1.1 ±0.1	16 ±0.3	2 ±0.1
QSOP24	4 ±0.1	8 ±0.1	1.5+0.1/-0	1.6 +1/-0.1	7.5 ±0.1	2.1 ±0.1	16 ±0.3	2 ±0.1
QSOP28	4 ±0.1	8 ±0.1	1.5+0.1/-0	1.6 +1/-0.1	7.5 ±0.1	2.1 ±0.1	16 ±0.3	2 ±0.1
SMA	4 ±0.1	4 ±0.1	1.5 ±0.1	1.5 min.	5.5 ±0.05	2.29 ±0.1	12 ±0.3	2 ±0.05
SMA Flat	4 ±0.1	4 ±0.1	1.5 ±0.1	1.5 min.	5.5 ±0.05	2.29 ±0.1	12 ±0.3	2 ±0.05
SMB	4 ±0.1	8 ±0.1	1.5 ±0.5	1.5 min.	5.5 ±0.05	2.74 ±0.1	12 ±0.3	2 ±0.05
SMB Flat	4 ±0.1	8 ±0.1	1.55 ±0.05	1.5 min.	5.5 ±0.1	1.3 ±0.1	12 ±0.3	2 ±0.1
SMB Flat-3L	4 ±0.1	8 ±0.1	1.55 ±0.05	1.5 min.	5.5 ±0.1	1.3 ±0.1	12 ±0.3	2 ±0.1
SMC	4 ±0.1	8 ±0.1	1.5 ±0.5	1.5 min.	7.5 ±0.1	2.75 ±0.1	16 ±0.3	2 ±0.1
SO-20	4 ±0.1	12 ±0.1	1.5+0.1/-0	1.5 min.	11.5 ±0.05	6.5 max.	24 ±0.3	2 ±0.1
SO-8	4 ±0.1	8 ±0.1	1.5+0.1/-0	1.6 min.	5.5 ±0.05	2.6 ±0.1	12 ±0.3	2 ±0.05
SO-8W	4 ±0.1	12 ±0.1	1.5+0.1/-0	1.5 min.	7.5 ±0.3	2.6 ±0.1	16 ±0.3	2 ±0.05
SOD123	4 ±0.1	4 ±0.1	1.55 ±0.05	1 (+0.25/-0)	3.5 ±0.3	1.2 ±0.1	8 ±0.3	2 ±0.05
SOD128	4 ±0.1	4 ±0.1	1.5 ±0.1	1.55 ±0.05	5.5 ±0.05	1.25 ±0.05	12 ±0.2	2 ±0.05
SOD323	4 ±0.1	4 ±0.1	1.55 ±0.05	1 (+0.25/-0)	3.5 ±0.05	1.2 ±0.1	8 ±0.3	2 ±0.05
SOD523	4 ±0.1	4 ±0.05	1.5 ±0.1	0.5 ±0.05	3.5 ±0.05	0.73 ±0.05	8 ±0.2	2 ±0.05
SOD523	4 ±0.1	2 ±0.05	1.5 ±0.1	0.5 ±0.05	3.5 ±0.05	0.73 ±0.05	8 ±0.2	2 ±0.05
SOD723	4 ±0.1	2 ±0.05	1.5 ±0.1	0.5 ±0.05	3.5 ±0.05	0.62 ±0.05	8 ±0.2	2 ±0.05
SOD882	4 ±0.1	2 ±0.1	1.55 ±0.05	4 ±0.05	3.5 ±0.1	0.66 ±0.05	8 +0.3/-0.1	2 ±0.05
SOD882T	4 ±0.1	4 ±0.1	1.5 +0.1/-0	0.5 ±0.05	3.5 ±0.05	0.53 ±0.05	8 +0.3/-0.1	2 ±0.05
SOT223	4 ±0.1	8 ±0.1	1.55 ±0.05	1.5 ±2.25	5.5 ±0.05	1.88 ±0.1	12 ±0.3	2 ±0.05
SOT23-3L	4 ±0.1	4 ±0.1	1.5 +0.1/-0	1 min.	3.5 ±0.05	1.2 ±0.1	8 +0.3/-0.1	2 ±0.05
SOT23-5L	4 ±0.1	4 ±0.1	1.5 +0.1/-0	1 min.	3.5 ±0.05	1.4 ±0.1	8 +0.3/-0.1	2 ±0.05
SOT23-6L	4 ±0.1	4 ±0.1	1.5 +0.1/-0	1 min.	3.5 ±0.05	1.4 ±0.1	8 +0.3/-0.1	2 ±0.05
SOT323	4 ±0.2	4 ±0.2	1.5 +0.1/-0	1 min.	3.5 ±0.05	1.2 ±0.1	8 ±0.3	2 ±0.05
SOT323-5L	4 ±0.2	4 ±0.2	1.5 +0.1/-0	1 min.	3.5 ±0.05	1.2 ±0.1	8 ±0.3	2 ±0.05
SOT323-6L	4 ±0.2	4 ±0.2	1.5 +0.1/-0	1 min.	3.5 ±0.05	1.2 ±0.1	8 ±0.3	2 ±0.05
SOT663	4 ±0.1	4 ±0.1	1.5 +0.1/-0	1 min.	3.5 ±0.05	0.69 ±0.05	8 +0.3/-0.1	2 ±0.05

Package	Drive hole spacing B0	Component spacing A	Drive hole diameter D0	Pocket hole diameter D1	Distance between hole lines F	Pocket depth K	Tape width W	Hole interval P0
SOT665	4 ±0.1	4 ±0.1	1.5 +0.1/-0	1 min.	3.5 ±0.05	0.69 ±0.05	8 +0.3/-0.1	2 ±0.05
SOT666	4 ±0.1	4 ±0.1	1.5 +0.1/-0	1 min.	3.5 ±0.05	0.69 ±0.05	8 +0.3/-0.1	2 ±0.05
SOT883	4 ±0.1	2 ±0.05	1.5 +0.1/-0	0.4 ±0.05	3.5 ±0.03	0.69 ±0.05	8 +0.3/-0.1	2 ±0.05
SSOP20	4 ±0.1	12 ±0.1	1.55 ±0.05	1.5 min.	7.5 ±0.1	2.62 ±0.1	16 +0.3/-0.1	2 ±0.1
SSOP24	4 ±0.1	12 ±0.1	1.5 +0.1/-0	1.5 min.	7.5 ±0.1	2.5 ±0.1	16 ±0.3	2 ±0.05
ST01005	4 ±0.1	2 ±0.05	1.5 ±0.1		3.5 ±0.05	0.36 ±0.3	8 ⁸ +0.03/-0.01	2 ±0.05
ST0201	4 ±0.2	4 ±0.2	1.5 ±0.1		3.5 ±0.03	0.6 ±0.02	8 +0.3/-0.1	2 ±0.5
STmite	4 ±0.1	4 ±0.1	1.55 ±0.05	1.55 ±0.05	5.25 ±0.05	1.27 ±0.1	12 +0.3/-0.1	2 ±0.05
STmite Flat	4 ±0.1	4 ±0.1	1.55 ±0.05	1.5 min.	5.5 ±0.1	1.1 ±0.1	12 ±0.3	2 ±0.1
TSSOP14	4 ±0.1	12 ±0.1	1.5 ±0.1	1.5 min.	7.5 ±0.1	1.6 ±0.1	16 ±0.3	2 ±0.05
TSSOP20	4 ±0.1	12 ±0.1	1.5 ±0.1	1.5 min.	7.5 ±0.1	1.8 ±0.1	16 ±0.3	2 ±0.05

Figure 1. Tape characteristics for surface mount packages


As there is no cathode band on the bidirectional devices, the marking (logo, production code, trace code) of such devices in tape packets may not always be systematically in the same direction

1.2 Reel dimensions for surface mount packages

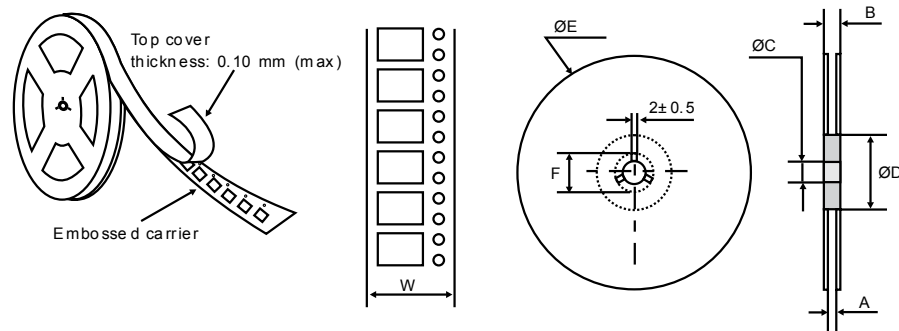
Unless otherwise specified in product specification.

Table 2. Surface mount devices - all dimensions in millimeters

Package	Base qty.	Carrier tape width	Reel dimensions					
		W	A	B (max.)	C	D (min.)	E (max.)	F (min.)
D ² PAK	1000	24 ±0.3	24.4 ±0.3	30.4	13 ±0.2	60 ±0.25	330	20.2
D ² PAK	750	24 ±0.3	24.4 ±0.3	30.4	13 ±0.2	60 ±0.25	330	20.2
DPAK	2500	16 ±0.3	16.4 +2/-0	22.4	13 ±0.2	100 ±0.25	330	20.2
Chip scale package	5000	8 ±0.3	8.4 ±0.3	14.4	13 ±0.2	59 ±0.25	180	20.2
LFCSP 5x5	5000	12 ±0.3	12.4 ±0.3	13.4	13 ±0.2	60 ±0.25	330	20.2
LFCSP 4x4	5000	12 ±0.3	12.4 ±0.3	13.4	13 ±0.2	60 ±0.25	330	20.2
MELF	1500	12 ±0.3	5 ±0.5	8.9	12.5 ±0.5	53 ±0.25	180 ±1	20.2
MiniMELF	2500	8 ±0.3	8 ±0.5	11.9	12.5 ±0.5	53 ±0.25	180 ±1	20.2
PowerFLAT 5x6	5000	12 ±0.3	12.4 ±1.5	14.4	13 ±0.2	60 ±0.5	180	20.2
Power SO-10	600	24 ±0.3	24.4 ±0.3	30.4	13 ±0.2	60 ±0.25	330	20.2
Power SO-20	600	24 ±0.3	24.4 ±0.3	30.4	13 ±0.2	60 ±0.25	330	20.2
PPAK	2500	16 ±0.3	16.4 ±0.3	22.4	13 ±0.2	60 ±0.25	330	20.2
QFN 1.45x1-6L	3000	8 +3/-0.1	8.4 ±0.3	14.4	13 ±0.2	60 ±0.25	185	20.2
QFN 1.5x1.7-8L	3000	8 +3/-0.1	8.4 ±0.3	14.4	13 ±0.2	60 ±0.25	185	20.2
QFN 1.7x1.35-8L	3000	8 +3/-0.1	8.4 ±0.3	14.4	13 ±0.2	60 ±0.5	185	20.2
QFN 1.8x2-6L	3000	8 +3/-0.1	8.4 ±0.3	14.4	13 ±0.2	60 ±0.25	185	20.2
QFN 1x1-6L	3000	8 +3/-0.1	8.4 ±1.5	14.4	13 ±0.2	60 ±0.5	180	20.2
QFN 2.5x1-10L	3000	8 +3/-0.1	8.4 ±0.3	14.4	13 ±0.2	60 ±0.5	180	20.2
QFN 2.5x1.5-12L	3000	8 +3/-0.1	8.4 ±0.3	14.4	13 ±0.2	60 ±0.25	185	20.2
QFN 2x2-8L	3000	8 ±0.3	8.4 ±1.5	14.4	13 ±0.2	60 ±0.5	180	20.2
QFN 3.3x1.5-16L	3000	12 ±0.3	12.4 ±0.3	18.4	13 ±0.2	100 ±0.25	330	20.2
QFN 3.5x1.2-16L	3000	12 ±0.3	12.4 ±0.3	18.4	13 ±0.2	60 ±0.25	180	20.2
QFN 3x3-12L	3000	12 ±0.3	12.4 ±0.3	18.4	13 ±0.2	60 ±0.25	330	20.2
QFN 3x3-16L	3000	12 ±0.3	12.4 ±1.5	18.4	13 ±0.2	60 ±0.25	330	20.2
QFN 3x3-6L	3000	12 ±0.3	12.4 ±0.3	18.4	13 ±0.2	60 ±0.25	180	20.2
QFN 4x4-24L	3000	12 ±0.3	12.4 ±0.3	18.4	13 ±0.2	100 ±0.25	330	20.2

Package	Base qty.	Carrier tape width	Reel dimensions					
		W	A	B (max.)	C	D (min.)	E (max.)	F (min.)
QFN 4x5-16L	3000	12 ±0.3	8.4 ±1.5	14.4	13 ±0.2	60 ±0.25	180	20.2
QFN 5x5-14L	3000	12 ±0.3	8.4 ±1.5	14.4	13 ±0.2	60 ±0.25	180	20.2
QFN 5x5-5L	3000	12 ±0.3	12.4 ±0.3	18.4	13 ±0.2	60 ±0.25	180	20.2
QFN 6x6-36L	3000	16 ±0.3	16.4 ±0.3	22.4	13 ±0.2	60 ±0.25	180	20.2
QSOP24	2500	16 ±0.3	16.4 ±0.3	19.1	13 ±0.2	100 ±0.25	330	20.2
QSOP28	2500	16 ±0.3	16.4 ±0.3	19.1	13 ±0.2	100 ±0.25	330	20.2
SMA Flat	2500	12 ±0.3	12.4 +2/-0	18.4	13 ±0.2	50 ±0.25	330	20.2
SMB	2500	12 ±0.3	12.4 ±0.3	18.4	13 ±0.2	50 ±0.25	330	20.2
SMB Flat	5000	12 ±0.3	12.4 ±0.3	18.4	13 ±0.2	100 ±0.25	330	20.2
SMB Flat-3L	5000	12 ±0.3	12.4 ±0.3	18.4	13 ±0.2	100 ±0.25	330	20.2
SMC	2500	16 ±0.3	16.4 ±0.3	22.4	13 ±0.2	50 ±0.25	330	20.2
SO-20	1000	24 ±0.3	24.4 ±0.3	30.4	13 ±0.2	60 ±0.25	330	20.2
SO-8	2500	12 ±0.3	12.4 ±0.3	18.4	13 ±0.2	50 ±0.25	180	20.2
	2500	12 ±0.3	13 +0.5/-0.2	18.4	13 ±0.2	50 ±0.25	330	
SO-8W	1500	16 ±0.3	16.4 ±0.3	22.4	13 ±0.2	20.2 ±0.25	185	20.2
SOD123	3000	8 ±0.3	8.4 +0.2/-0.1	14.4	13 ±0.2	60 ±0.25	185	20.2
SOD128	3000	12 ±0.3	12.4 +0.3/-0.5	18.4	13 +0.5/-0.2	60 ±0.5	330 ±0.2	20.2
SOD323	10000	8 ±0.2	8.4 +0.2/-0	14.4	13 +0.5/-0.2	100 ±0.2	185	20.5 ±0.2
	3000		8.4 +0.2/-0.1	10.9	13 ±0.2	60 ±0.25		20.2
SOD523	3000	8 ±0.3	8.4 +0.2/-0.1	14.4	13 ±0.2	60 ±0.25	185	20.2
SOD523	6000	8 ±0.3	8.4 +0.2/-0.1	14.4	13 ±0.2	60 ±0.25	185	20.2
SOD882	12000	8 ±0.1	8.4 +1.6/-0	14.4	13 ±0.2	60 ±0.25	180	20.2
SOD882T	12000	8 ±0.1	8.4 ±1.5	14.4	13 ±0.2	60 ±0.25	180	20.2
SOT223	4000	12 ±0.3	13 max.	22.4	13 ±0.2	50 ±0.25	330	20.2
	1000				13 ±0.2	60 ±0.25	178	20.2
SOT23	3000	8 ±0.3	8.4 ±0.3	14.4	13 ±0.2	50 ±0.25	180	20.2
SOT23-5L	3000	8 ±0.3	8.4 ±0.3	14.4	13 ±0.2	50 ±0.25	180	20.2
SOT23-6L	3000	8 ±0.3	8.4 ±0.3	14.4	13 ±0.2	50 ±0.25	180	20.2
SOT323	3000	8 ±0.3	8.4 ±0.3	14.4	13 ±0.2	60 ±0.25	180	20.2
SOT323-5L	3000	8 ±0.3	8.4 ±0.3	14.4	13 ±0.2	60 ±0.25	180	20.2
SOT323-6L	3000	8 ±0.3	8.4 ±0.3	14.4	13 ±0.2	60 ±0.25	180	20.2
SOT663	3000	8 ±0.3	8.4 ±0.3	10.9	13 ±0.2	60 ±0.25	180	20.2
SOT665	3000	8 ±0.3	8.4 ±0.3	10.9	13 ±0.2	60 ±0.25	180	20.2
SOT666	3000	8 ±0.3	8.4 ±0.3	10.9	13 ±0.2	60 ±0.25	185	20.2

Package	Base qty.	Carrier tape width	Reel dimensions					
		W	A	B (max.)	C	D (min.)	E (max.)	F (min.)
SOT883	12000	8 +0.3/-0.1	8.4 +1.6/-0	11.4	13 ±0.2	60 ±0.25	180	20.2
SSOP20	2000	16 ±0.3	16 ±0.3	22.4	13 ±0.2	50 ±0.25	330	20.2
SSOP24	2000	16 ±0.3	20 ±0.3	22.4	13 ±0.2	20.2 ±0.25	330	20.2
ST01005	20000	8 ±0.3	8.4 ±0.3	14.4	13.2 ±0.2	59 ±0.25	180	20.2
ST0201	5000	8 ±0.1	8.4 ±1.5	14.4	13.2 ±0.2	60 ±0.5	180	20.2
	10000							
STmite	12000	12 ±0.3	12.4 +2/-01.5	18.4	13.2 ±0.2	100 ±0.25	330	20.2
STmite Flat	12000	12 ±0.3	12.4 ±0.3	18.4	13.2 ±0.2	100 ±0.25	330	20.2
TSSOP14	2500	16 ±0.3	16.4 ±0.3	22.4	13.2 ±0.2	20.2 ±0.25	330	20.2
TSSOP20	2500	16 ±0.3	16.4 ±0.3	22.4	13.2 ±0.2	20.2 ±0.25	330	20.2
TSSOP24	2500	16 ±0.3	16.4 ±0.3	22.4	13.2 ±0.2	20.2 ±0.25	330	20.2
TSSOP24	2500	16 ±0.3	16.4 ±0.3	22.4	13.2 ±0.2	20.2 ±0.25	330	20.2

Figure 2. Reel characteristics for surface mount packages and TO92


1.3 Tape and reel dimensions for through hole packages

Table 3. Through hole devices - all dimensions in millimeters

Package	Base qty.	Carrier tape width	Reel dimensions				
		W	A	B (max.)	C	D (min.)	E (max.)
TO-92	2000	-	42	57	30	77	359

Figure 3. Tape and reel configuration

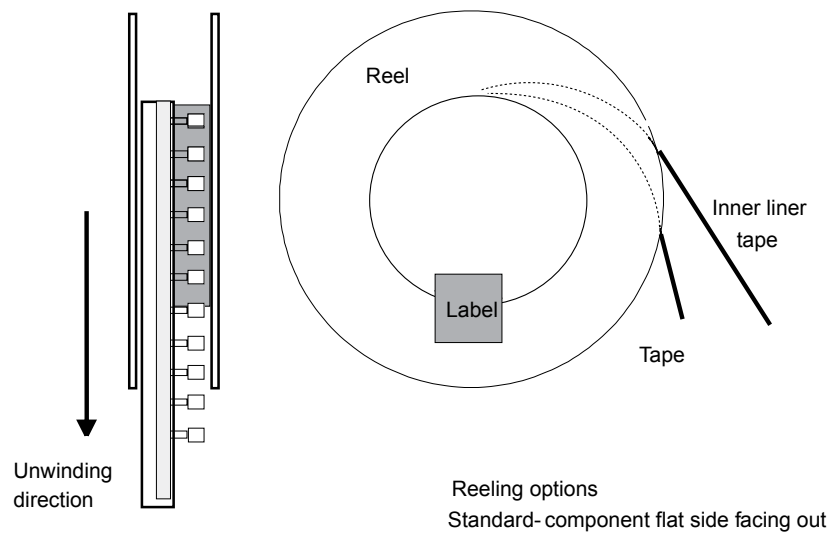


Figure 4. Standard tape and component flat side facing out

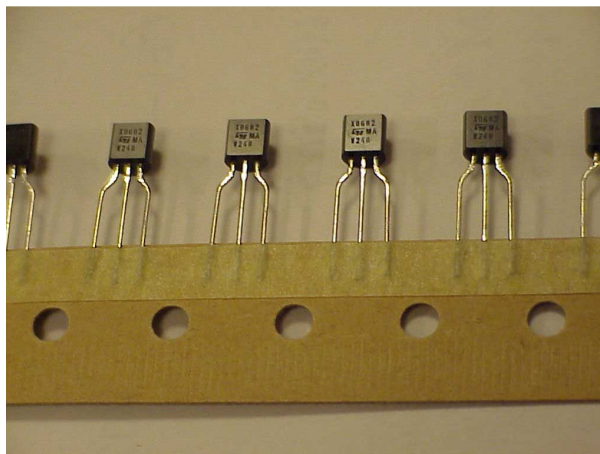
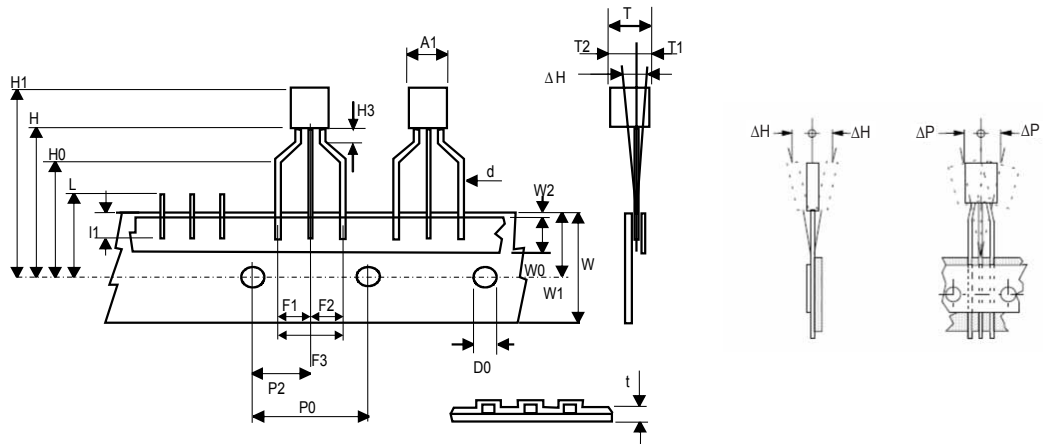


Figure 5. Tape characteristics for through hole devices


Item	Symbol	Value	Tolerance
Body width	A1	4.8	max
Body thickness	T	3.8	max
Lead center to flat distance	T1	1.6	max
Lead center to front distance	T2	2.3	max
Lead wire diameter	d	0.48	max
Feed hole pitch	P0	12.7	±0.2
Hole center to component center	P2	6.35	±0.7
Lead to lead distance	F1, F2	2.54	+0.4/-0.1
External leads distance	F3	5.08	+0.4/-0.1
Component alignment (max deviation)	ΔH	0.0	±2.0
Tape width	W	18.0	+1.0/-0.5
Hold down tape width	W0	6.0	±0.3
Hole position	W1	9.0	+0.25/-0.5
Hold down tape width	W2	0.5	max
Height of component from tape center	H	18.5	+2/-0
Lead wire clinch height	H0	16.0	±0.5
Component height	H1	25.0	max
Feed hole diameter	D0	4.0	±0.2
Total tape thickness	t	0.9	max
Length of clipped lead	L	11.0	max
Lead wire (taped portion)	I1	3.0	min
Component alignment (max deviation)	ΔP	0.0	±1.0
Longitude neck	H3	1.0	±0.5

*Dimensions in mm

*Cumulative pitch error: 0.1 mm/20 pitches

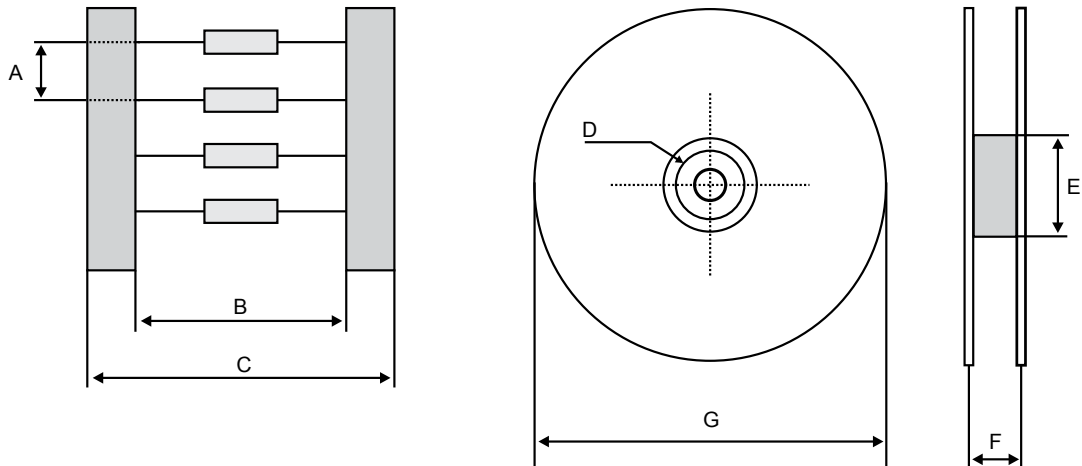
*Ground paper tape: 0.5 mm ±0.1

1.4 Tape and reel dimensions for axial packages

Table 4. Axial devices - all dimensions in millimeters

Package	Base qty.	Component spacing	Tape spacing			Reel dimensions			
		A	B	C	D	E	F	G	
DO-15	6000	5 ±0.5	52 +2/-1	66 ±2	31.5 +0.5/-0	86 ±0.5	72 +3/-0.5	356 ±2	
DO-201	1900	10 ±0.5	53 ±2	65 ±2	31.5	85	78 min.	356 ±2	
DO-201AD	1900	10 ±0.5	52 +2/-1	65 ±2	16.5 ±0.5	82 ±0.5	73 ±0.5	356 ±2	
DO-35	5000	5 ±0.5	52 +2/-1	65 ±2	20 +0.5/-0	48 ±0.5	72 +3/-1	356 ±2	
DO-41	5000	5 ±0.5	52 +2/-1	65 ±2	16.5 ±0.5	82 ±0.5	73 ±0.5	356 ±2	
R6	1000	10 ±0.5	53 ±2	65 ±2	31.5	86	78 min.	356 ±2	

Figure 6. Tape and reel characteristics for axial packages



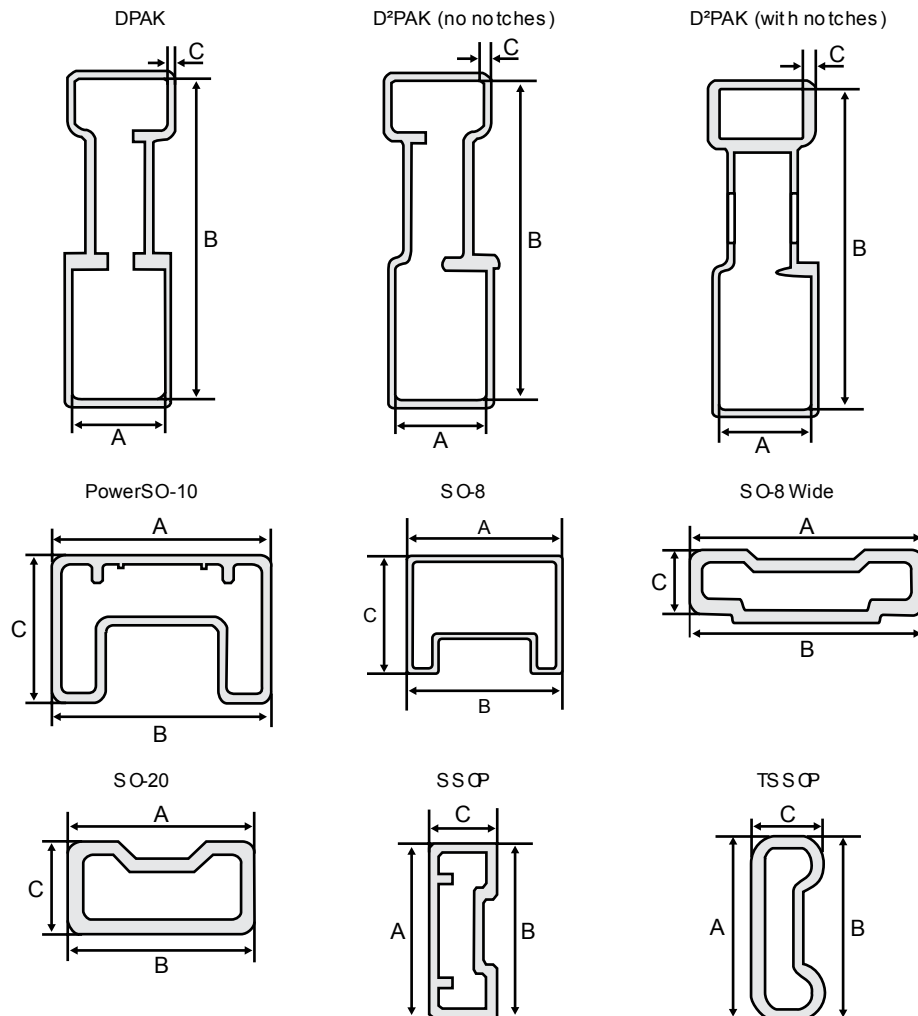
Note: All unidirectional components are oriented with a white tape on the anode and a different colored tape on the cathode. Bidirectional components have the same-colored tape on both sides.

2 Tube delivery mode

2.1 Tube dimensions for surface mount packages

Table 5. Surface mount devices - all dimensions in millimeters

Package	Base qty.	Tube dimensions			
		Length	A	B	C
D ² PAK	50	532 ±1	33.9 ±0.2	33.9 ±0.2	11 ±0.2
DPAK	75	532 ±0.5	6 ±0.1	21.3 ±0.2	0.6 +0.1/-0
PowerSO-10	50	532 ±1	18 ±0.2	18 ±0.2	12 ±0.2
SO16	50	532 ±0.1	7.8 ±0.1	7.8 ±0.1	3.8 ±0.1
SO-20	40	532 ±1	18.8 ±0.1	18.8 ±0.1	6.3 ±0.1
SO-8	100	532 ±1	7.8 ±0.1	7.8 ±0.1	3.8 ±0.1
SO-8 Wide	80	532 ±1	15 ±0.5	7.8 ±0.1	4.7 ±0.2
SSOP20	66	508 ±1.27	10.6 ±0.1	10.6 ±0.1	4 ±0.13
SSOP24	59	508 ±1.27	10.6 ±0.1	10.6 ±0.1	4 ±0.13
TSSOP20	74	508 ±1.27	7.83 ±0.1	7.83 ±0.1	3.04 ±0.127
TSSOP24	62	508 ±1.27	7.83 ±0.1	7.83 ±0.1	3.04 ±0.127
TSSOP28	20	508 ±1.27	7.83 ±0.1	7.83 ±0.1	3.04 ±0.127

Figure 7. Tube characteristics for surface mount packages


2.2 Tube dimensions for through hole packages

Table 6. Through hole devices - all dimensions in millimeters

Package	Base qty.	Tube dimensions			
		Length	A	B	C
DIP-8	50	532 ±0.5	15.2 ±0.25	11.2 ±0.25	0.5 +0.15/-0.1
DIP-16	25	532 ±1	15.2 ±0.25	11.2 ±0.2	0.5 ±0.3
DIP-20	20	532 ±0.5	15.2 ±0.25	11.2 ±0.25	-
DO247	30	532 ±0.5	10 ±0.15	37.5 ±0.2	0.9 ±0.1
DOP3	30	532 ±0.5	6.4 +0.2/-0	40.5 ±0.2	0.5 +0.1/-0
I ² PAK	75	532 ±0.5	6 ±0.1	21.3 ±0.2	0.6 ±0.1
I ² PAK	50	532 ±0.5	9.5 ±0.2	32.4 ±0.2	0.75 ±0.1
ISOTOP	10	532 ±0.5	26.5 ±0.15	23 ±0.2	1.25 max.
Max220	50	532 ±1	9.5 ±0.1	32.4 ±0.2	0.75 ±0.1

Package	Base qty.	Tube dimensions			
		Length	A	B	C
Max247	30	532 ±0.5	10 ±0.15	37.5 ±0.2	0.9 ±0.1
PENTAWATT	50	532 ±0.5	17 ±0.2	32.1 ±0.2	1 ±0.1
P ² PAK	50	532 ±0.5	9.5 ±0.2	21.4 ±0.2	0.75 ±0.1
SOD-93	30	532 ±0.5	6.4 +0.2/-0	40.5 ±0.2	0.5 +0.1/-0
SOT-82	50	532 ±0.5	3.7 ±0.1	33 ±0.2	0.65 ±0.1
SOT-93	30	532 ±0.5	6.4 +0.2/-0	40.5 ±0.2	0.5 +0.1/-0
TO202-3	50	532 ±0.5	6.5 ±0.5	38.5 ±1	0.75 ±0.1
TO-220AB / TO-220AB Ins	50	532 ±0.5	5.5 ±0.2	31.4 ±0.2	0.75 ±0.1
TO-220AC / TO-220AC Ins	50	532 ±0.5	5.5 ±0.2	31.4 ±0.2	0.75 ±0.1
TO-220FPAB / TO-220FPAC	50	532 ±0.5	5.5 ±0.2	31.4 ±0.2	0.75 ±0.1
TO-220AB Ins. F5 option	50	532 ±0.5	9.3 ±0.1	32.2 ±0.2	0.85 ±0.05
TO-220FPAB / TO-220FPAC FD5	50	532 ±0.5	9.35 ±0.2	31.3 ±0.2	0.75 ±0.2
TO-247	30	537.5 +0.5/-1.0	10 ±0.15	37.5 ±0.2	0.9 ±0.1
TOP3 / TOP3 Ins.	30	532 ±0.5	6.4 +0.2/-0	40.5 ±0.2	0.5 +0.1/-0

Figure 8. Tube characteristics for through hole packages (1/2)

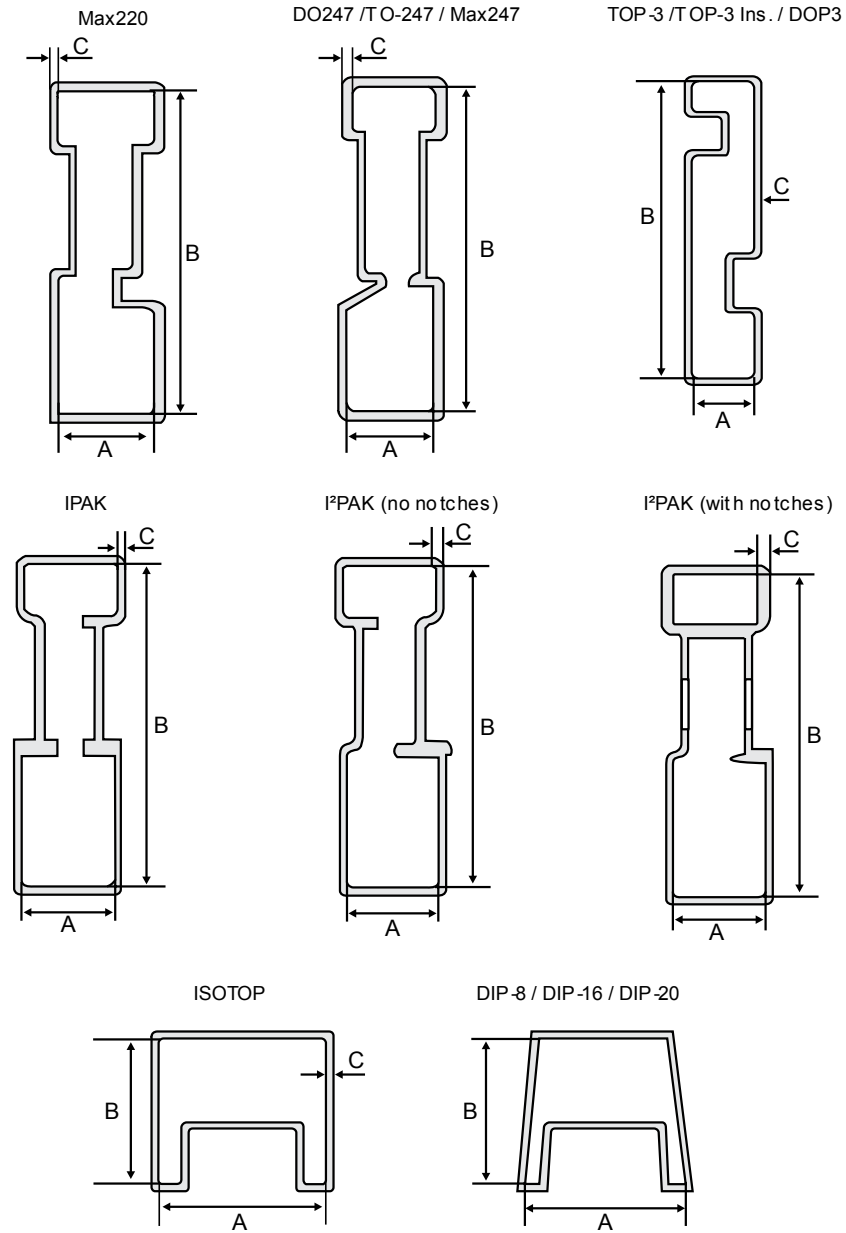
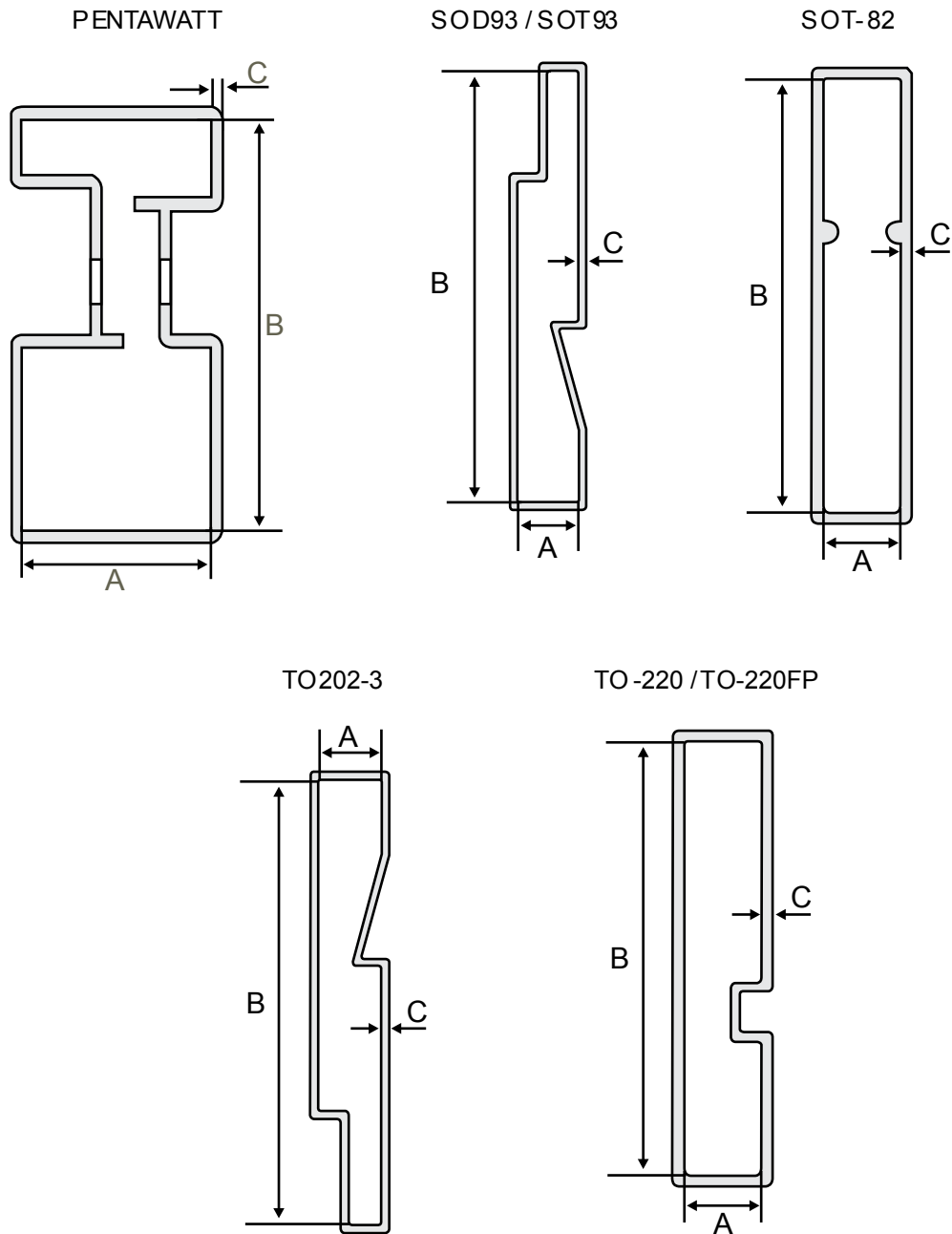


Figure 9. Tube characteristics for through hole packages (2/2)



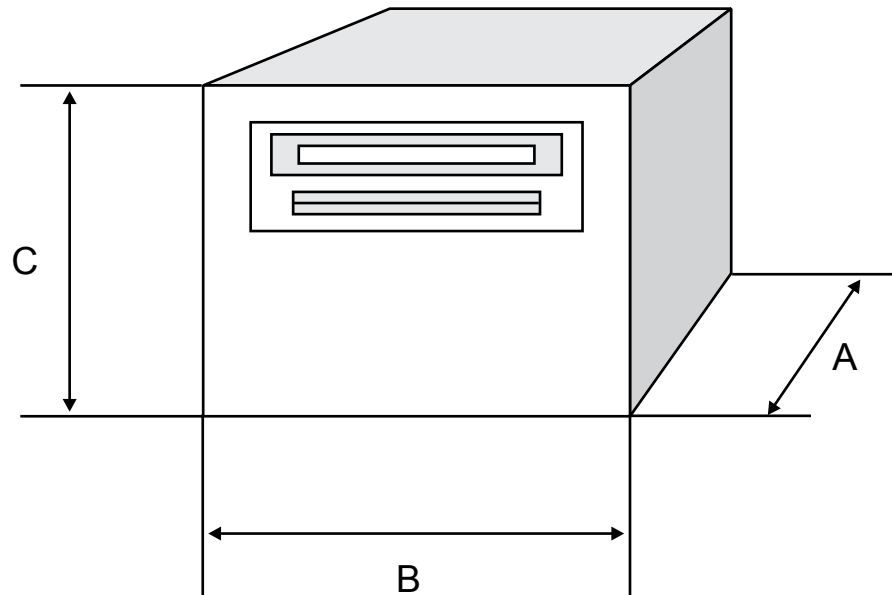
3 Box delivery mode

3.1 Matchbox (bulk) dimensions

Table 7. Axial and through hole devices - all dimensions in millimeters

Package	Base qty.	Box dimensions		
		A	B	C
DO-201AD	500	77	77	252
RD91	25	148	80	62
R6	100	80	62	148
TO202-3	250	148	80	62
TO-220AB / TO-220AB Ins.	250	148	80	62
TO-92	2500	252	77	77
TOP3 / TOP3 Ins.	120	62	80	140
DO35	500	148	80	62

Figure 10. Matchbox characteristics

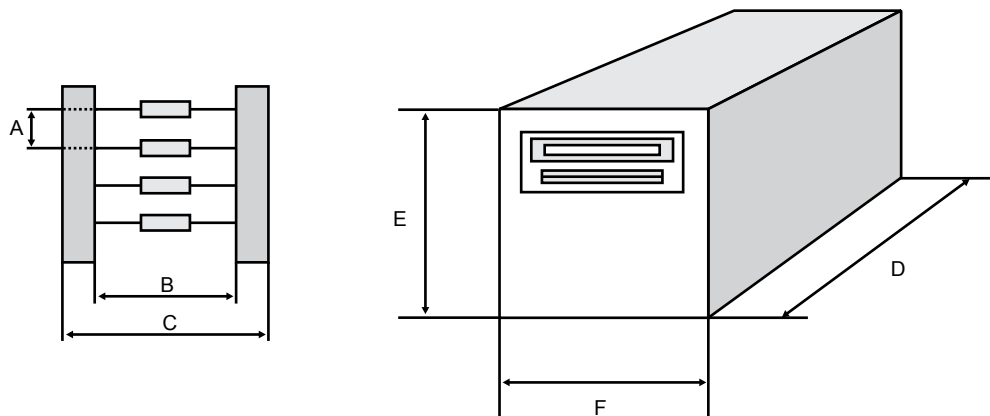


Note: TO-92 leads are not bent in matchbox packing.

3.2 Ammopack (fan fold box) dimensions

Table 8. Axial devices - all dimensions in millimeters

Package	Base qty.	Component spacing	Tape spacing			Box dimensions		
		A	B	C	D	E	F	
DO-15	1000	5 ±0.5	52 (+2/-1)	66 ±2	252	77	77	
DO-201	600	10 ±0.5	53 ±2	66 ±2	252	77	77	
DO-201AD	600	10 ±0.5	52 (+2/-1)	66 ±2	252	77	77	
DO-41 plastic	2000	5 ±0.5	52 (+2/-1)	66 ±2	252	77	77	
R6	100	5 ±0.5	53 ±2	66 ±2	252	77	77	

Figure 11. Ammopack characteristics for axial packages


Note: All unidirectional components are oriented with a white tape on the anode and a different colored tape on the cathode. Bidirectional components have the same-colored tape on both sides.

Table 9. Through hole devices - all dimensions in millimeters

Package	Base qty.	Box dimensions		
		E	F	D
TO-92	2000	180	37	326

Figure 12. TO-92 ammpack characteristics

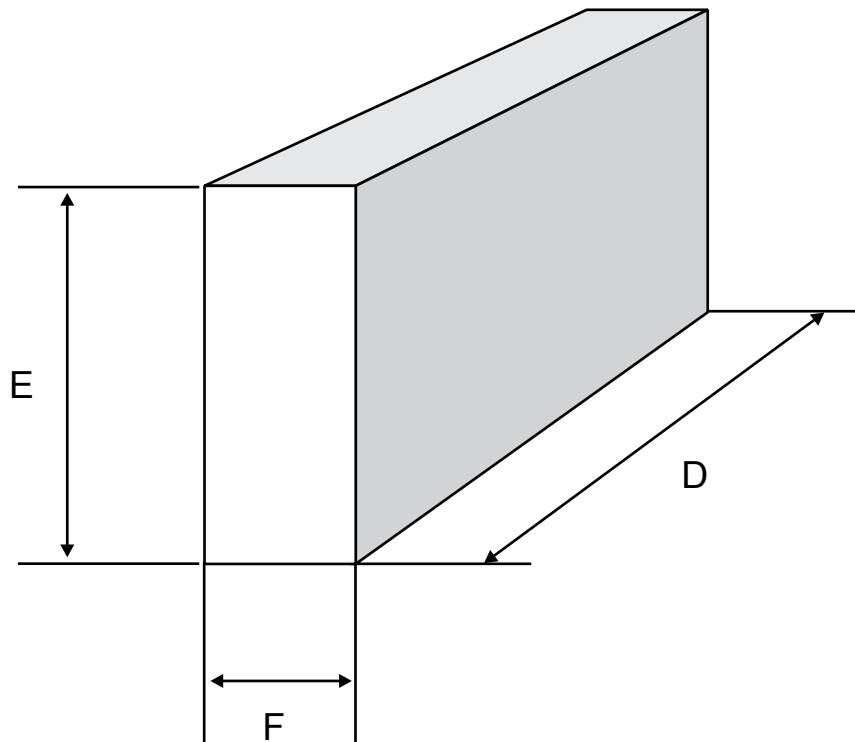
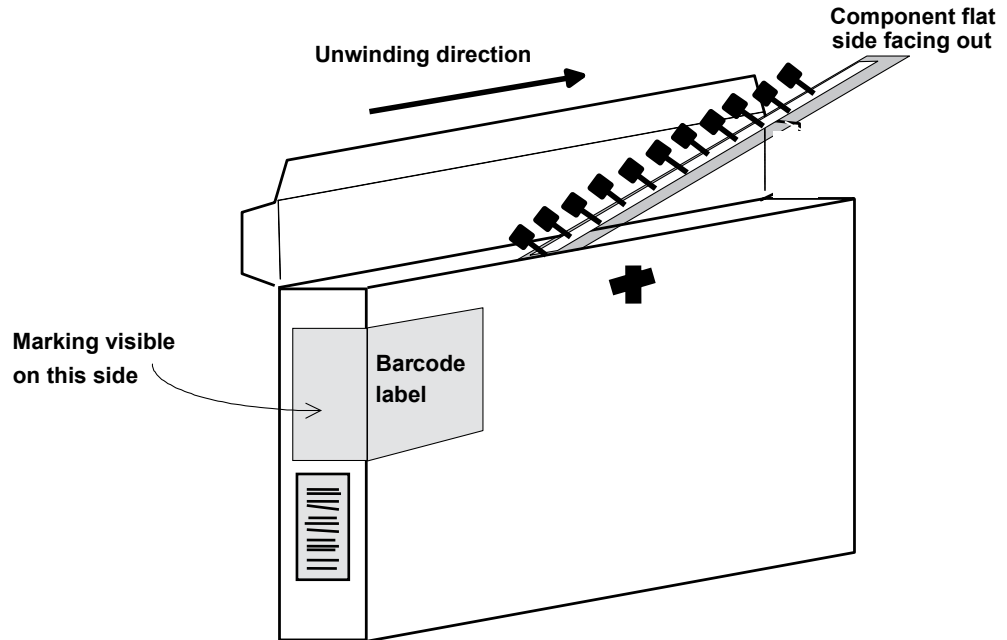


Figure 13. Tape and ammpack

For tape dimensions see Figure 5. Tape characteristics for through hole devices.



Revision history

Table 10. Document revision history

Date	Version	Changes
02-Apr-2015	1	Initial release.
11-Aug-2015	2	Updated <i>Figure 5</i> .
09-Oct-2015	3	Updated title in cover page. Updated <i>Table 1</i> , <i>Figure 1</i> , <i>Table 2</i> . Minor text changes.
14-Nov-2016	4	Updated <i>Table 1 and Table 2. Surface mount devices - all dimensions in millimeters</i> .
16-May-2017	5	Updated <i>Table 1. Surface mount devices - all dimensions in millimeters</i> .
26-Jun-2019	6	Updated <i>Table 1 and Table 2</i> .
10-Feb-2020	7	Updated <i>Figure 5. Tape characteristics for through hole devices</i> .
17-Aug-2020	8	Updated <i>Table 1. Surface mount devices - all dimensions in millimeters</i> , <i>Table 2. Surface mount devices - all dimensions in millimeters</i> and <i>Figure 1. Tape characteristics for surface mount packages</i> .
21-May-2021	9	Updated <i>Table 1 and Table 2</i> .
02-Dec-2021	10	Updated Section 1.4 Tape and reel dimensions for axial packages and Section 3.2 Ammopack (fan fold box) dimensions .

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