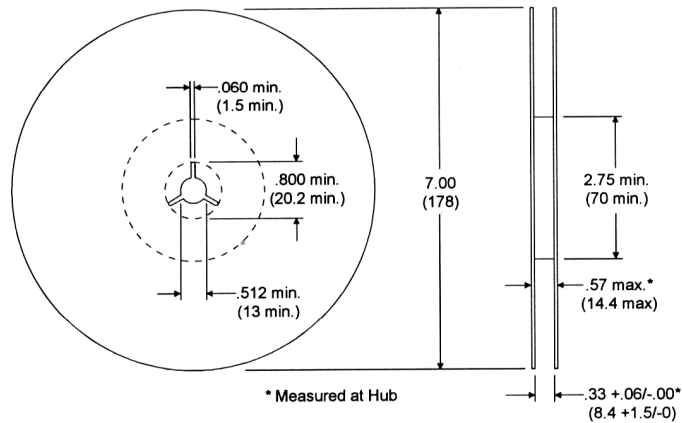


Packaging — Chip Resistors

Chip Resistor Reel

Nominal Dimensions
Inches (mm)



Packaging: Chips Per EIA Standard RS-481							inches mm		
A	B	C	D	E	F	G	H	J ¹	
0.16 ± 0.01 4.0 ± 0.1	0.08 ± 0.01 2.0 ± 0.1	0.16 ± 0.01 4.0 ± 0.1	0.06 + 0.01/-0 1.5 + 0.1/-0	0.04 1.0	0.069 1.75	0.20 5.0	0.138 ± 0.002 3.50 ± 0.05	0.32 ± 0.01 8.0 ± 0.1	
					K1	K2	L	M	
					RGC 1/16, RMC 1/16, RNC 16, TTF 16, CSR 1/8	0.04 max 1.1 max	-	0.04 ± 0.01 1.1 ± 0.2	0.08 ± 0.01 1.9 ± 0.2
					RGC 1/10, RMC 1/10, HMC 1/10, FCR 1/10, TTF 20, RNC 20, CSR 1/4	0.04 max 1.1 max	-	0.65 ± 0.008 1.65 ± 0.20	0.09 ± 0.01 2.4 ± 0.2
					RGC 1/8, RMC 1/8, HMC 1/8, FCR 1/8, TTF 32, RNC 32, CSR 1/2	0.04 max 1.1 max	0.09 max 2.4 max	0.08 ± 0.01 2.0 ± 0.1	0.138 ± 0.002 3.50 ± 0.05
					RMC 1/4, FCR 1/4	-	0.09 max 2.4 max	0.11 ± 0.01 2.8 ± 0.2	0.14 ± 0.01 3.6 ± 0.2
					RMC 1/2, CSR 1	-	0.09 max 2.4 max	0.11 ± 0.01 2.8 ± 0.2	0.21 ± 0.01 5.3 ± 0.2
					RMC 1, CSR 2	-	0.09 max 2.4 max	0.15 ± 0.01 3.8 ± 0.2	0.26 ± 0.01 6.6 ± 0.2
Notes:	1. Dimensions are 0.47 ± 0.01 (12.0 ± 0.1) for 1/2 and 1 Watt. 2. 5,000 per (7") reel — 1/16, 1/10, & 1/8 Watt. 4,000 per (7") reel — 1/4, 1/2 & 1 Watt. Available Options — 10,000 piece (13") reels. 3. Embossed taping standard 4,000 per (7") reel on 1/4, 1/2 & 1 Watt. 4. Paper taping available 4,000 per (7") reel on RMC 1/4 Watt.								

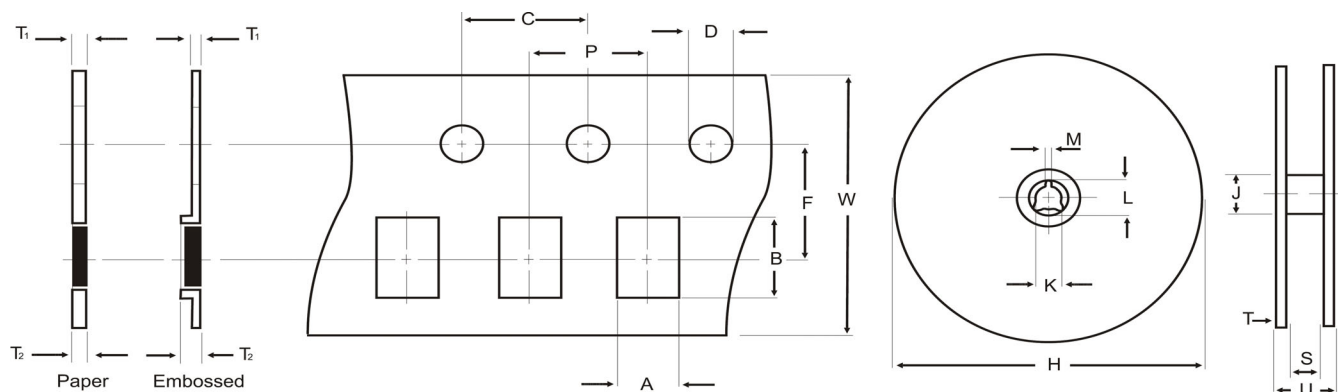
Packaging: RMC 1/16S, RGC 1/16S, RNC 10, and RMC 1/20 Chips (2mm Pitch)					inches mm	
A	B	C	D	E	F	G
0.026 + 0.004/-0.002 0.65+0.10/-0.05	0.045 + 0.004/-0.002 1.15+0.10/-0.05	0.315 ± 0.008 8.00 ± 0.20	0.138 ± 0.002 3.50 ± 0.05	0.69 ± 0.004 1.75 ± 0.10		
		J	K	L		
0.079 ± 0.002 2.00 ± 0.05	0.039 ± 0.002 1.00 ± 0.05	0.059 + 0.004/-0.000 1.50 + 0.10/-0.00	0.016 + 0.002/-0.000 0.40 + 0.05/0.00	0.020 max 0.50 max		
Standard Tape Packaging 2 mm Pitch – 10,000 per reel Reel diameter – 7.0 (178) Reel width – 0.315 (8.0)						

Packaging—Chip Resistors

Packaging for Chip Resistors			
Chip Resistors	Options	Description	Package Quantity
RMC 1/20, RMC 1/16S, RGC 1/16S, RNC 10, CSR 1/8	R	7" reel - paper taping	10,000
RMC 1/16, RMC 1/10, RMC 1/8	R G A	7" reel - paper taping 10" reel - paper taping Bulk	5,000 10,000 1,000
HMC 1/16, HMC 1/10, HMC 1/8, RGC 1/16, RGC 1/10, RGC 1/8, CSR 1/4	R	7" reel - paper taping	5,000
RNC 16, RNC 20, RNC 32, TTF 16, TTF 20, TTF 32, FCR 1/16, FCR 1/10, FCR 1/8, CSR 1/2	R I	7" reel - paper taping 7" reel - paper taping	5,000 1,000
RMC 1/4, RMC 1/2, RMC 1, FCR 1/4	R	7" reel - emboss taping	4,000
CSR 1, CSRN 1, CSR 2, CSRF 2, CSRL 2, CSRN 2	R I	7" reel - emboss taping 7" reel - emboss taping	4,000 1,000
Chip Arrays	Options	Description	Package Quantity
RAV 10-2D, RAF 10-2D, RAV 10-4D, RAF 10-4D	R	7" reel - paper taping	10,000
RAV 16-2D, RAV 16-4D, RAC 16-4D	R	7" reel - paper taping	5,000
RAV 32-4D, RAV 32-8R, RAV 32-8N, RAV 64-8N, RAV 64-8R, RAC 32-4D, RAC 40-8M, RAC 64-8N, RAC 64-8R, RAV 16-8D	R	7" reel - emboss taping	4,000

Packaging — Chip Resistors

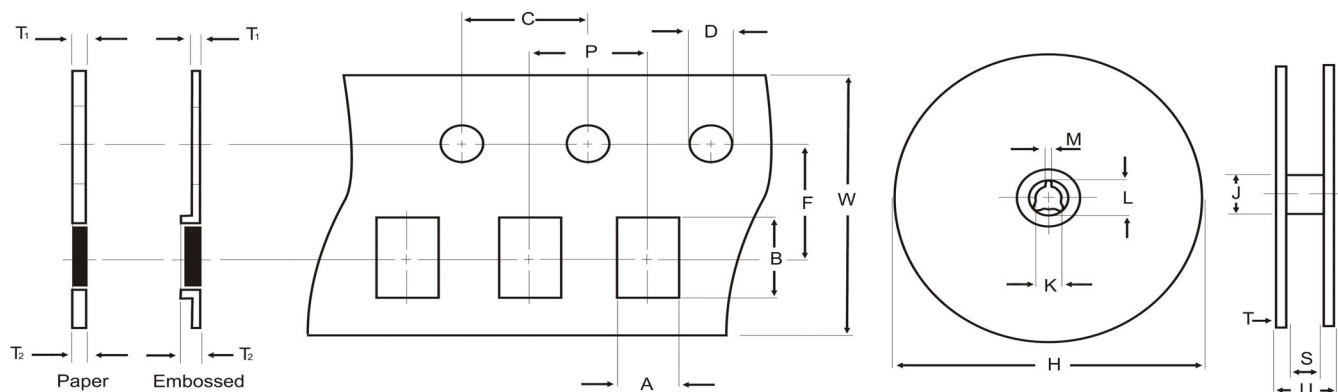
PACKING SPECIFICATIONS: Inch (mm)



FEATURES	RAV/ RAF 10-2D	RAV/ RAF 10-4D	RAV 16-2D	RAV 16-4D & 32-8	RAV 32-4D
A - Pocket Width	.046±.004 (1.17±0.10)	.051±.008 (1.30±0.20)	.071±.004 (1.80±0.10)	.079±.008 (2.00±0.20)	.134±.004 (3.40±0.10)
B - Pocket Length	.046±.004 (1.17±0.10)	.091 ±.008 (2.30±0.20)	.071±.004 (1.80±0.10)	.142±.008 (3.60±0.20)	.220±.004 (5.60±0.10)
P - Pocket Spacing	.079±.002 (2.00±0.05)	.079±.002 (2.00±0.05)	.157±.004 (4.00±0.10)	.157±.004 (4.00±0.10)	.157±.004 (4.00±0.10)
C - Pin Spacing	.157±.004 (4.00±0.10)	.157±.004 (4.00±0.10)	.157±.004 (4.00±0.10)	.157±.004 (4.00±0.10)	.157±.004 (4.00±0.10)
D - Pin Diameter	.06±.004/-0 (1.5+0.1/-0)	.06±.004/-0 (1.5+0.1/-0)	.06±.004/-0 (1.5+0.1/-0)	.06±.004/-0 (1.5+0.1/-0)	.06±.004/-0 (1.5+0.1/-0)
F - Pin-Pocket C/L	.138±.002 (3.50±0.05)	.138±.002 (3.50±0.05)	.138±.002 (3.50±0.05)	.138±.002 (3.50±0.05)	.217±.002 (5.50±0.05)
W - Strip Width	.315±.008 (8.00±0.20)	.315±.008 (8.00±0.20)	.315±.008 (8.00±0.20)	.315±.008 (8.00±0.20)	.472±.008 (12.00±0.20)
T1 - Strip Thickness	.04 max. (1.0 max.)	.04 max. (1.0 max.)	.02 max. (0.5 max.)	.04 max. (1.0 max.)	.010±.002 (0.25±0.05)
T2 - Total Thickness	.06 max. (1.4 max.)	.06 max. (1.4 max.)	.04 max. (1.0 max.)	.06 max. (1.4 max.)	.043 max. (1.10 max.)
Material Pieces/Reel	Paper 10,000	Paper 10,000	Paper 5,000	Paper 5,000	Embossed 4,000
H - Reel Diameter	7.00±.08 (178.0±2.0)	7.00±.08 (178.0±2.0)	7.00±.08 (178.0±2.0)	7.00±.08 (178.0±2.0)	7.1+0/-0.12 (180+0/-3.0)
J - Hub Diameter	2.0 (50) approx.	2.0 (50) approx.	2.0 (50) approx.	2.0 (50) approx.	2.4±.04/-0 (60±1.0/-0)
K - Hole Diameter	.51±.04 (13.0±1.0)	.51±.04 (13.0±1.0)	.51±.04 (13.0±1.0)	.51 ±.04 (13.0±1.0)	.51±.01 (13.0±0.2)
L - Key Diameter	.83±.04 (21.0±1.0)	.83±.04 (21.0±1.0)	.83±.04 (21.0±1.0)	.83±.04 (21.0±1.0)	.83±.03 (21.0±0.8)
M - Key Width	.08±.04 (2.0±1.0)	.08±.04 (2.0±1.0)	.08±.04 (2.0±1.0)	.08±.04 (2.0±1.0)	.08±.02 (2.0±0.5)
S - Reel Inside Width	.53±.08 (13.5±2.0)	.53±.08 (13.5±2.0)	.53±.08 (13.5±2.0)	.53±.08 (13.5±2.0)	.35±.01 (9.0±0.3)
T - Side Thickness	.03±.01 (0.8±0.2)	.03±.01 (0.8±0.2)	.03±.01 (0.8±0.2)	.03±.01 (0.8±0.2)	-
U - Reel Outside Width	-	-	-	-	.45±.04 (11.4±1.0)

Packaging — Chip Resistors

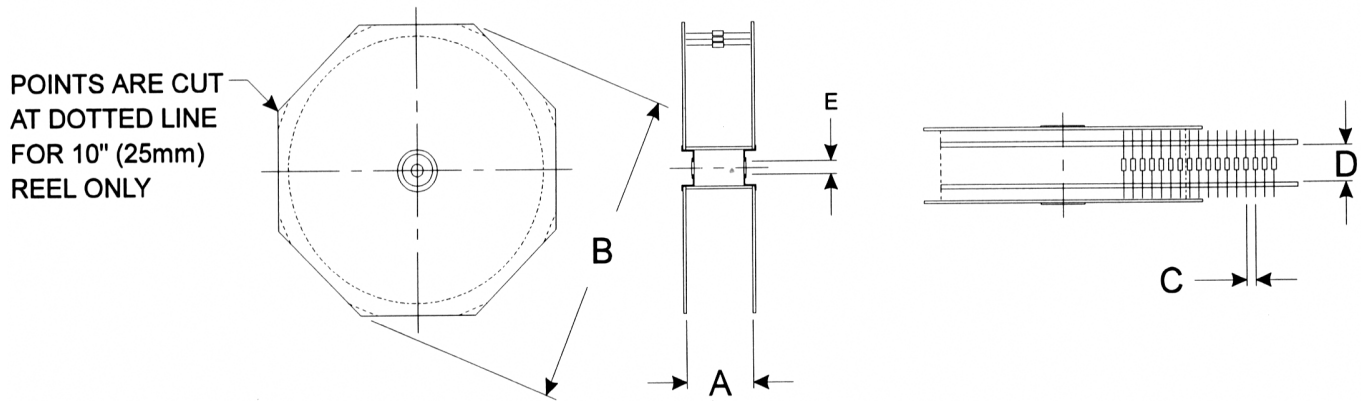
PACKING SPECIFICATIONS: Inch (mm)



FEATURES	RAC 16-4D	RAC 32-4D	RAC 40-8M	RAC 64-8N/R
A - Pocket Width	.079±.008 (2.00±0.20)	.138±.004 (3.50±0.10)	.098±.004 (2.50±0.10)	.138±.004 (3.50±0.10)
B - Pocket Length	.142±.008 (3.60±0.20)	.224±.004 (5.70±0.10)	.173±.004 (4.40±0.10)	.266±.004 (6.75±0.10)
P - Pocket Spacing	.157±.004 (4.00±0.010)	.157±.004 (4.00±0.10)	.157±.004 (4.00±0.10)	.157±.004 (4.00±0.10)
C - Pin Spacing	.157±.004 (4.00±0.10)	.157±.004 (4.00±0.10)	.157±.004 (4.00±0.10)	.157±.004 (4.00±0.10)
D - Pin Diameter	.06+.004/-0 (1.5+0.1/-0)	.06+.004/-0 (1.5+0.1/-0)	.06+.004/-0 (1.5+0.1/-0)	.06+.004/-0 (1.5+0.1/-0)
F - Pin-to-Pocket Center	.138±.002 (3.50±0.05)	.217±.002 (5.50±0.05)	.217±.002 (5.50±0.05)	.217±.002 (5.50±0.05)
W - Strip Width	.315±.008 (8.00±0.20)	.472±.008 (12.00±0.20)	.472±.008 (12.00±0.20)	.472±.008 (12.00±0.20)
T1 - Strip Thickness	.02 max. (0.5 max.)	.010±.002 (0.25±0.05)	.010±.002 (0.25±0.05)	.010±.002 (0.25±0.05)
T2 - Total Thickness	.04 max. (1.0 max.)	.043 max. (1.10 max.)	.043 max. (1.10 max.)	.043 max. (1.10 max.)
Material Pieces/Reel	Paper 5,000	Embossed 4,000	Embossed 4,000	Embossed 4,000
H - Reel Diameter	7.00±.08 (178.0±2.0)	7.09±0/- .12 (180.0±0/-3.0)	7.09±0/- .12 (180.0±0/-3.0)	7.09±0/- .12 (180.0±0/-3.0)
J - Hub Diameter	2.0 (50) approx.	2.4±.04/-0 (60±1.0/-0)	2.4±.04/-0 (60±1.0/-0)	2.4±.04/-0 (60±1.0/-0)
K - Hole Diameter	.51±.04 (13.0±1.0)	.51±.01 (13.0±0.2)	.51 ±.01 (13.0±0.2)	.51 ±.01 (13.0±0.2)
L - Key Diameter	.83±.04 (21.0±1.0)	.83±.03 (21.0±0.8)	.83±.03 (21.0±0.8)	.83±.03 (21.0±0.8)
M - Key Width	.08±.04 (2.0±1.0)	.08±.02 (2.0±0.5)	.08±.02 (2.0±0.5)	.08±.02 (2.0±0.5)
S - Reel Inside Width	.53±.08 (13.5±2.0)	.35±.01 (9.0±0.3)	.35±.01 (9.0±0.3)	.35±.01 (9.0±0.3)
T - Reel Side Thickness	.03±.01 (0.8±0.2)	-	-	-
U - Reel Outside Width	-	.45±.04 (11.4±1.0)	.45±.04 (11.4±1.0)	.45±.04 (11.4±1.0)

Packaging — Axial Leaded Resistors

Packaging & Identification Variations



Lead Tape Specifications: Reeled in accordance with RS-296-E

inches
mm

Dimensions	A max.	B max.	C	D	E	Tape	Products
Class I	See Note 1	13 1/2 343	See Note 2	2 1/16 52.4	9/16 14.3	1/4 6.35	All except below
Class II	See Note 1	13 1/2 343	See Note 2	2 1/2 63.5	9/16 14.3	1/4 6.35	RS 2, RS 3, RSM 3, RSM 5, FRN 2, WRF 2, WRF 3
Class III	See Note 1	13 1/2 343	See Note 2	2 7/8 73	9/16 14.3	1/4 6.35	RS 2 and RSM 5 capable

Note 1. The A dimension shall be governed by the overall length of the taped component. The distance between flanges shall be 0.059 inches (1.50 mm) to 0.315 inches (8.00 mm) greater than the overall component.

Note 2.	Component Diameter	Component Pitch
	0.0 to 0.197 0 to 5.0	0.200 ± 0.020 5.0 ± 0.5
	0.197 to 0.394 5.0 to 10.0	0.400 ± 0.020 10.0 ± 0.5

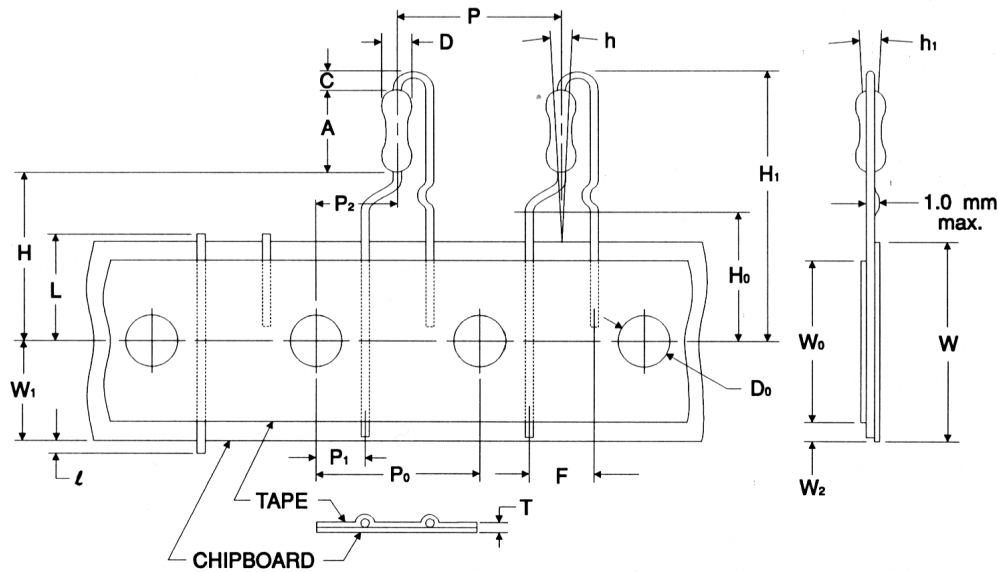
Note 3. RS 5, TMR, KAL, CB, VM, VER, NSP, available bulk only

Packaging—Axial Leaded Resistors

Packaging for Axial Leaded Resistors			
Leaded Resistors	Code	Description	Package Quantity
RN 1/8, RNM 1/4, RN 1/4, RN 1/2, RNM 1/2, CF 1/8, CFM 1/4, CF 1/4, CFM 1/2, CF 1/2	R T A	Reel Ammo Bulk	5,000 5,000 1,000
UP 1/4, UP 1/2, RC 1/4, RC 1/2, CD 1/8, CD 1/4, CD 1/2	R A	Reel Bulk	5,000 1,000
RSM 1/2	R T A	Reel Ammo Bulk	5,000 2,000 1,000
RS 1/2, RSM 1, RSPF 1/2, RSPL 1/2, RSPF 1, RSPL 1	R T A	Reel Ammo Bulk	2,500 2,000 1,000
RS 1, RSM 2, CF 1	R T A	Reel Ammo Bulk	2,000 1,000 1,000
RS 2, RSM 3, RSPF 2, RSPL 2, CF 2	R T A	Reel Ammo Bulk	1,000 1,000 1,000
RS 3, RSM 5, RSPF 3, RSPL 3	R T A	Reel Ammo Bulk	500 500 1,000
RS 5	A	Bulk	1,000
NSP (all), LC (all)	A	Bulk	1,000
WRF (all)	R A	Reel Bulk	2,000 1,000
JW 50, JW 55, JW 60	R T	Reel Ammo	10,000 10,000
JW 80	R T	Reel Ammo	10,000 10,000
FRN 1/4, ASR 1/4, SPR 1/4	R T A	Reel Ammo Bulk	5,000 2,500 1,000
FRN 1/2, FRN 1, ASR 1/2, SPR 1/2, ASR 1, SPR 1	R T A	Reel Ammo Bulk	2,500 2,500 1,000
FRN 2	R T A	Reel Ammo Bulk	1,000 2,500 1,000

Packaging — Radial Leaded Resistors

Radial Lead Taping Specification — Pana-Sert Carbon Film & Metal Film Resistors (1/4W Body Size)



Description	Symbol	PANA-SERT Inches mm
Resistor body diameter	D	0.090 ± 0.008 2.3 ± 0.2
Resistor body length	A	0.256 ± 0.020 6.5 ± 0.5
Resistor pitch ¹	P	0.500 ± 0.039 12.7 ± 1.0
Sprocket-hole pitch ¹	P ₀	0.500 ± 0.012 12.7 ± 0.3
Sprocket-hole center to lead center	P ₁	0.152 ± 0.028 3.85 ± 0.7
Sprocket-hole center to resistor center ¹	P ₂	0.250 ± 0.051 6.35 ± 1.3
Resistor lead spacing	F	0.197 ± 0.039 5.0 ± 1.0
Resistor alignment	h	0.0 ± 0.079 [0 ± 5°] 0 ± 2.0 [0 ± 5°]
Chipboard width ¹	W	0.709 ± 0.039/-0.020 18.0 ± 1.0/-0.5
Hold-down tape width	W ₀	0.492 12.5 min.
Sprocket-hole position	W ₁	0.354 ± 0.030/-0.020 0.9 ± 0.75/-0.5

Description	Symbol	PANA-SERT Inches mm
Hold-down tape position	W ₂	0.118 3.0 max.
Height to bottom of resistor	H	0.748 ± 0.039 19.0 ± 0.21.0
Height to lead clinch	H ₀	0.630 ± 0.020 16.0 ± 0.5
Lead protrusion	l	0.079 2.0 max.
Sprocket-hole diameter	D ₀	0.157 ± 0.012 4.0 ± 0.3
Thickness (chipboard and tape)	T	0.028 ± 0.008 0.7 ± 0.2
Cutout length ¹	L	0.433 11.0 max.
Height of resistor	H ₁	1.122 28.5 max.
Height of bending	C	0.098 ± 0.020 2.5 ± 0.5
Resistor alignment	h ₁	0.0 ± 0.079 [0 ± 5°] 0 ± 2.0 [0 ± 5°]

Note 1. Cumulative pitch tolerances not to exceed ±0.039 (±1.0) over 20 consecutive pitches. 2,500 pieces per reel.

Note 2. Product only available from 10Ω to 1 MΩ in 5% or 1% tolerances.