

Overview



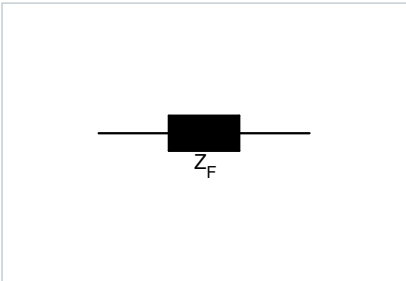
Characteristics

- EMI Suppression and noise reduction
- High Rated current up to 7.5 A
- Available in 7 different sizes
- Reliable Ni-Sn electrodes
- Operating Temperature -55 °C to +125 °C
- AEC Q200

Applications

- Data line filter for any application in the infotainment system.
- Applications for noise reduction at power-trains, body control and multimedia systems.
- Battery management systems, DC/DC converters, audio, etc
- Uncoupling of distribution voltage

Schematic:



Application Notes

- ANP002 – The Protection of USB 2.0 Applications
- ANP013 Quiet switching controller for audio amplifiers
- ANP024 The USB Interface from EMC Point of View
- ANP025 Ferrite Beads for Ringing Control
- ANP029 Accurate Inductor Loss Determination using REDEXPERT

Certification:	
RoHS Approval	Compliant [2011/65/EU&2015/863]
REACH Approval	Conform or declared [(EC)1907/2006]
Halogen Free	Conform [JEDEC JS709B]
Halogen Free	Conform [IEC 61249-2-21]
Component Qualification	AEC-Q200 Grade 1
Automotive Approval	Released

General Information:	
Do not use this part constantly beyond the Rated Current, as this will create excessive heat and can harm the component	
Ambient Temperature (referring to I_R)	-55 up to +85 °C
Operating Temperature	-55 up to +125 °C
Storage Conditions (in original packaging)	< 40 °C ; < 75 % RH
Moisture Sensitivity Level (MSL)	1
Test conditions of Electrical Properties: +20 °C, 33 % RH if not specified differently	

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Specific Information

Order Code	Z @ 100 MHz (Ω)	Z _{max} (Ω)	I _R (mA)	R _{DC} (Ω)	Type	Revision
Size 0201						
782219100	10	12.6	650	0.055	Wide Band	001.000
782219600	60	135	400	0.25	Wide Band	001.000
782219121	120	259	250	0.29	Wide Band	001.000
782219241	240	536	300	0.57	Wide Band	001.000
782219301	300	455	400	0.61	Wide Band	001.000
782219561	560	750	250	0.75	Wide Band	001.000
Size 0402						
782423100	10	17	1500	0.03	High Current	002.000
782423700	70	140	1000	0.09	High Current	002.000
782422101	100	180	500	0.3	Wide Band	003.000
782429111	110	195	1200	0.09	Wide Band	001.000
782422121	120	200	500	0.2	Wide Band	003.000
782429161	160	280	1000	0.15	High Current	001.000
782422181	180	260	400	0.3	Wide Band	004.000
782422221	220	330	400	0.3	Wide Band	003.000
782422231	220	360	300	0.35	Wide Band	003.000
782422241	240	290	300	0.35	Wide Band	003.000
782429261	260	375	1000	0.15	High Current	001.000
782422301	300	400	200	0.7	Wide Band	003.000
782422331	330	640	300	0.5	Wide Band	003.000
782429461	460	1250	500	0.55	High Speed	001.000
782422511	510	730	200	0.8	Wide Band	003.000
782429601	600	720	850	0.25	Wide Band	001.000
782422601	600	800	200	0.8	Wide Band	003.000
782422611	600	900	300	0.6	Wide Band	003.000
782429102	1000	1157	480	0.48	Wide Band	001.000
782422102	1000	1200	200	1	Wide Band	003.000
782429152	1500	1533	500	0.5	Wide Band	001.000
782429182	1800	2700	210	2.1	High Frequency	001.000
Size 0603						
782639220	22	41	7500	0.004	High Current	001.000
782632620	62	95	500	0.15	Wide Band	003.000
782633620	62	98	2500	0.04	High Current	002.000
782631111	100	125	500	0.12	Wide Band	003.000
782631101	100	610	500	0.2	High Speed	003.000
782631141	120	180	2000	0.05	High Current	003.000
782632121	120	190	500	0.2	Wide Band	003.000
782631131	120	200	500	0.12	Wide Band	003.000
782632181	180	280	500	0.2	Wide Band	003.000
782631331	330	690	400	0.25	High Speed	003.000
782632511	510	610	300	0.35	Wide Band	003.000
782639601	600	634	1500	0.1	High Current	001.000

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Specific Information

Order Code	Z @ 100 MHz (Ω)	Z _{max} (Ω)	I _R (mA)	R _{DC} (Ω)	Type	Revision
782633601	600	660	1000	0.2	High Current	002.000
782632102	1000	1100	–	0.5	Wide Band	003.001
782631182	1800	2300	100	0.75	High Speed	003.000
782631222	2200	2250	150	0.8	High Speed	003.000
Size 0805						
782853200	20	35	5000	0.008	High Current	001.010
782853270	27	45	4000	0.015	High Current	001.010
782853680	68	110	3000	0.025	High Current	001.010
782853910	91	105	2000	0.06	High Current	001.010
782853121	120	180	2500	0.035	High Current	001.010
782853131	120	180	3000	0.03	High Current	002.000
782853221	220	290	2000	0.05	High Current	001.010
782853231	220	330	3000	0.05	High Current	002.000
782853301	300	350	3000	0.05	High Current	002.000
782853321	320	370	2000	0.05	High Current	002.000
782853331	330	375	3000	0.05	High Current	002.000
782853401	400	500	300	0.3	Wide Band	002.000
782853561	560	600	1500	0.1	High Current	001.010
782853601	600	700	500	0.3	Wide Band	002.000
782853611	600	700	2000	0.11	High Current	003.000
782853701	700	730	1500	0.1	High Current	002.000
782853102	1000	1000	1000	0.3	High Current	002.000
782851102	1000	1100	300	0.35	High Speed	002.000
782853112	1100	1400	800	0.3	High Current	001.010
782853152	1500	1800	700	0.35	High Current	001.010
782853162	1500	1800	1000	0.3	High Current	002.000
782851212	2000	2000	400	0.42	High Speed	002.000
782851202	2200	2200	200	0.45	High Speed	002.000
Size 1206						
782763480	48	90	6000	0.005	High Current	002.000
782763700	70	105	500	0.15	High Speed	002.000
782763800	80	160	4000	0.02	High Current	002.000
782763820	82	130	3000	0.025	High Current	001.010
782763301	300	330	3000	0.06	High Current	002.000
782762301	300	360	500	0.1	Wide Band	002.000
782763501	500	610	2500	0.06	High Current	002.000
782763601	600	650	2500	0.048	High Current	002.000
782763621	620	620	1500	0.1	High Current	002.000
782763102	1000	1200	1000	0.3	High Current	001.010
Size 1806						
782963560	56	90	5000	0.008	High Current	001.010
782963610	60	120	6000	0.008	High Current	002.000
782963600	60	120	6000	0.01	High Current	002.000

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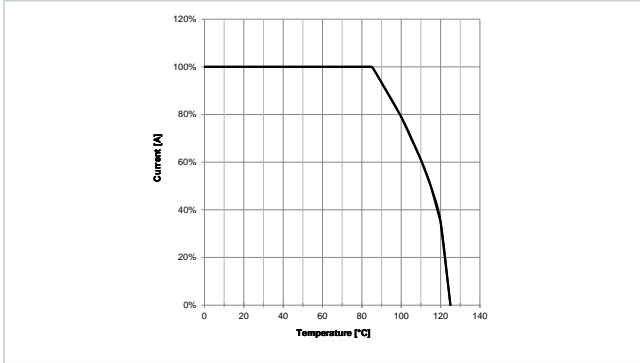

Specific Information

Order Code	Z @ 100 MHz (Ω)	Z _{max} (Ω)	I _R (mA)	R _{DC} (Ω)	Type	Revision
782963800	80	140	3000	0.04	High Current	002.000
782963820	82	110	3500	0.02	High Current	001.010
782963851	850	1250	1500	0.1	High Current	002.000
782963201	1000	1020	1500	0.09	High Current	002.000
Size 1812						
782965700	70	120	6000	0.008	High Current	002.000
782965121	120	190	3000	0.04	High Current	002.000
782965601	600	900	3000	0.04	High Current	002.000
782965781	780	1300	3000	0.04	High Current	002.000

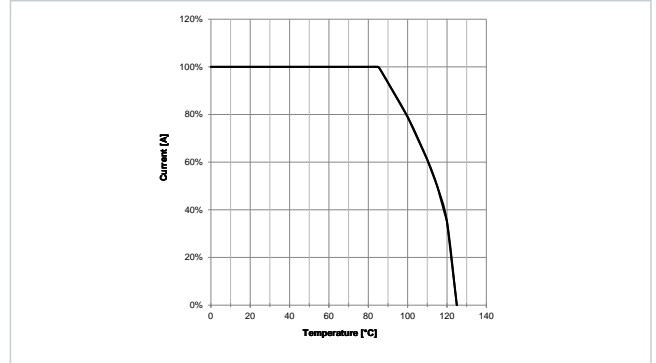
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Diagrams

Derating 85 °C:



Derating 105 °C:



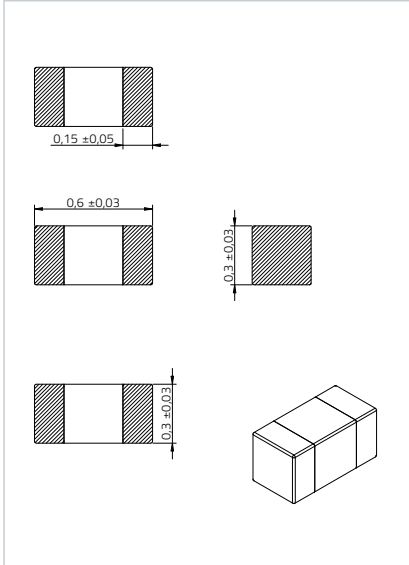
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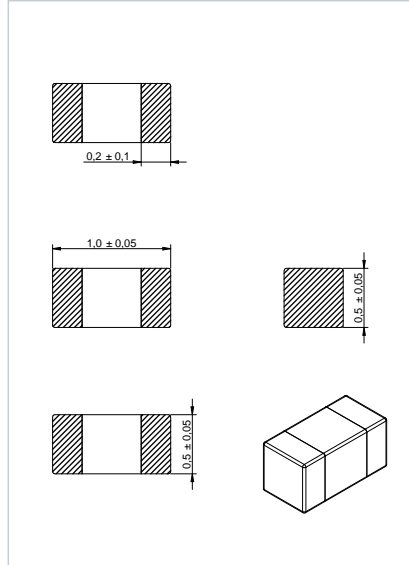


Dimensions

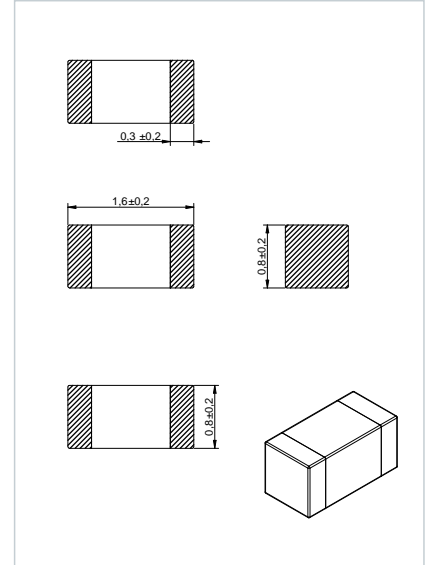
Dimensions: [mm] 0201



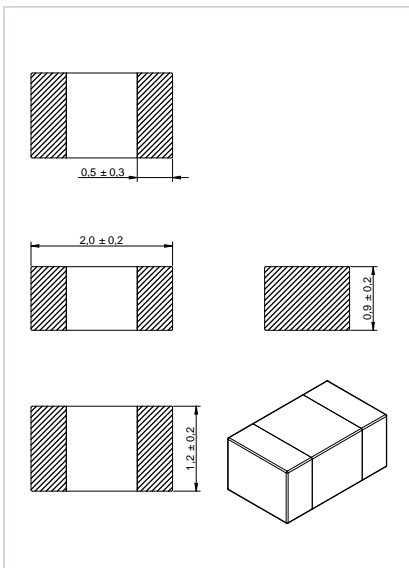
Dimensions: [mm] 0402



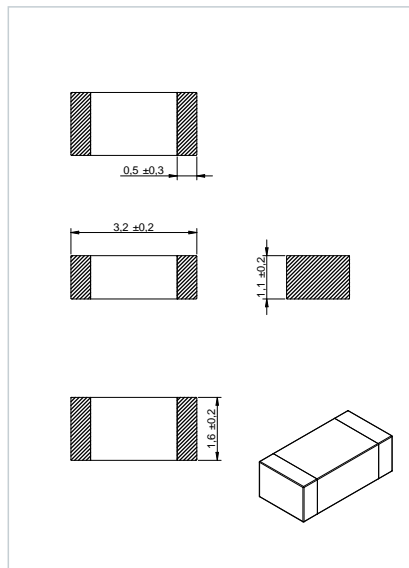
Dimensions: [mm] 0603



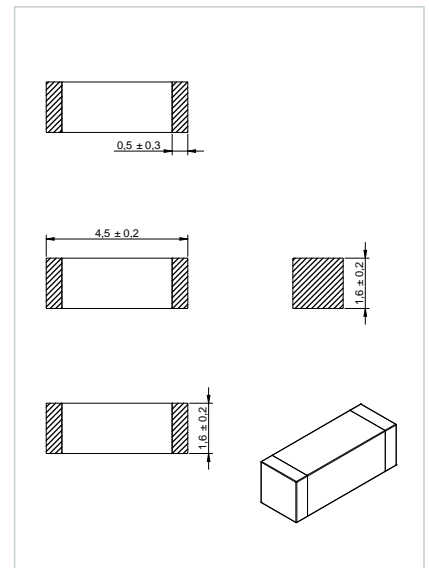
Dimensions: [mm] 0805



Dimensions: [mm] 1206



Dimensions: [mm] 1806



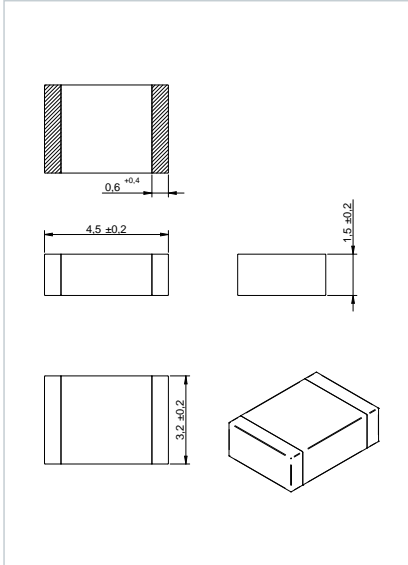
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Dimensions

Dimensions: [mm] 1812



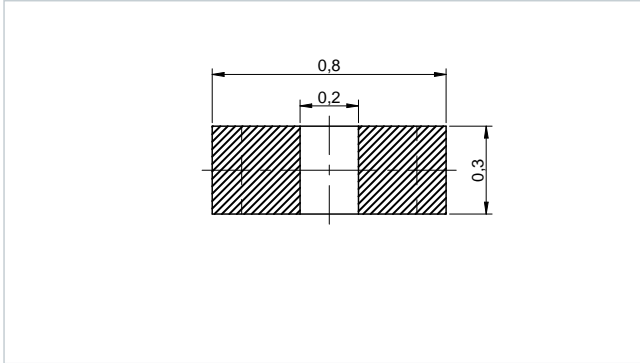
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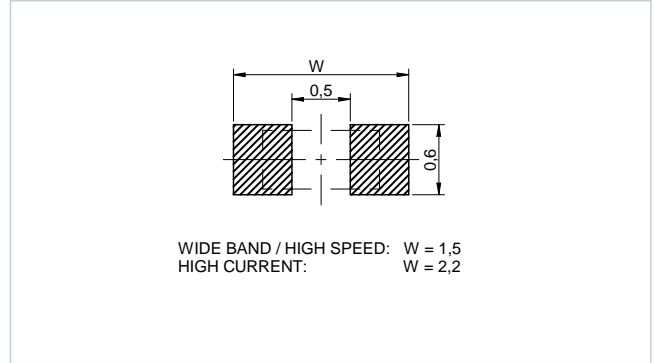


Drawings

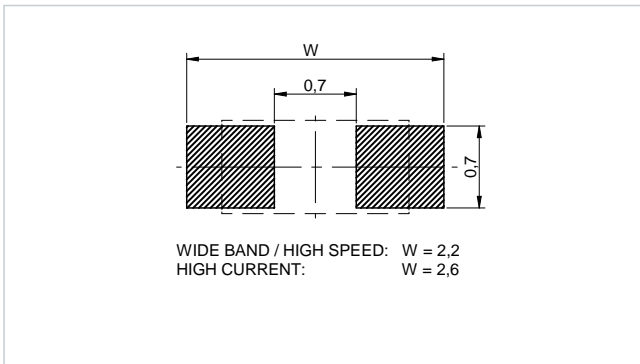
Recommended Land Pattern: [mm] 0201



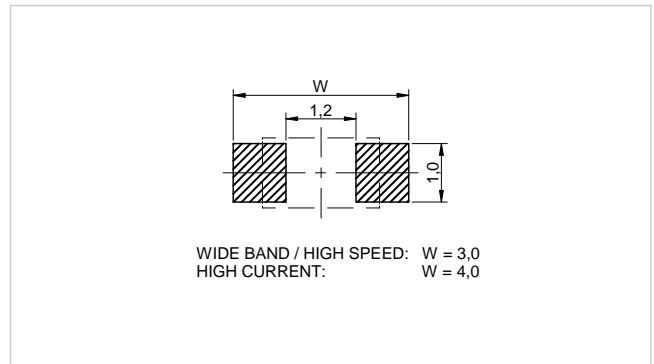
Recommended Land Pattern: [mm] 0402



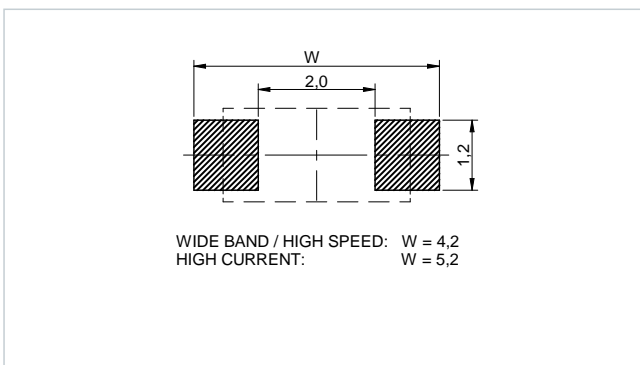
Recommended Land Pattern: [mm] 0603



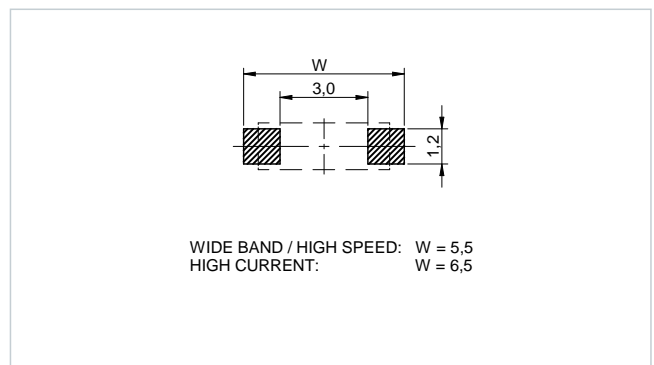
Recommended Land Pattern: [mm] 0805



Recommended Land Pattern: [mm] 1206



Recommended Land Pattern: [mm] 1806



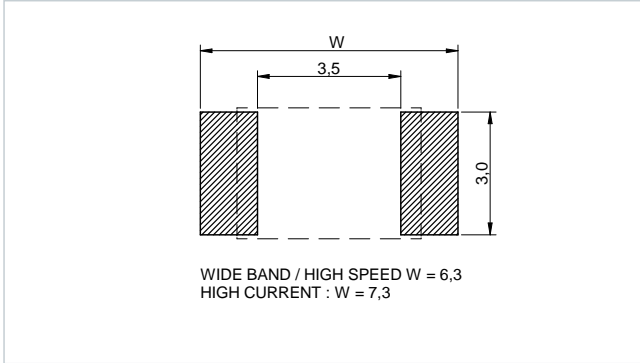
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Drawings

Recommended Land Pattern: [mm] 1812



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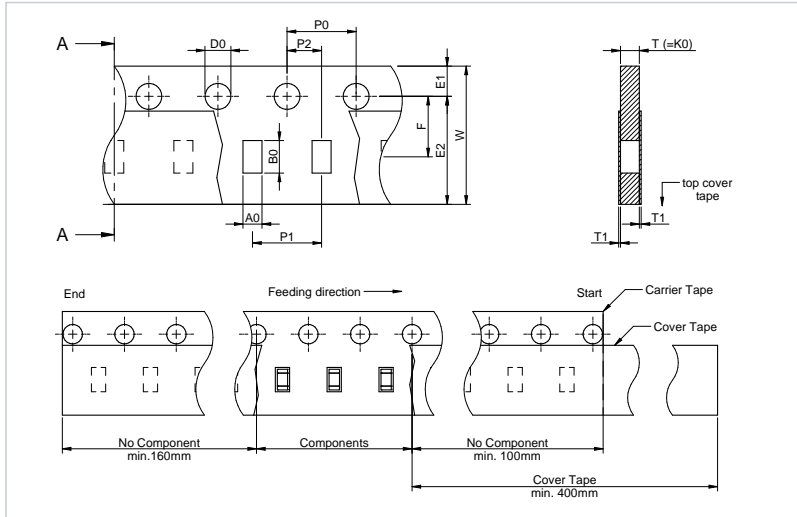
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Packaging Specification

Size 0201

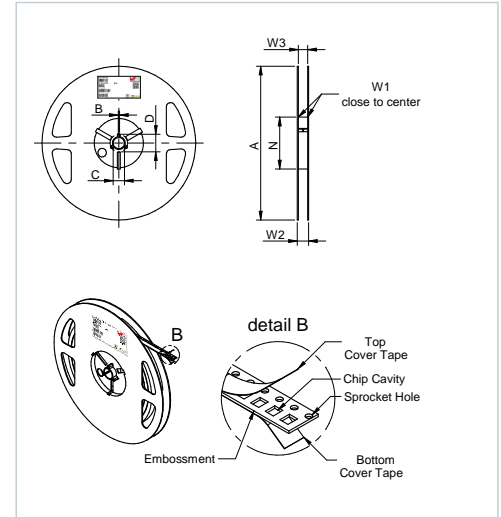
Packaging Specification - Tape: [mm]



Packaging is referred to the international standard **IEC 60286-3:2019**

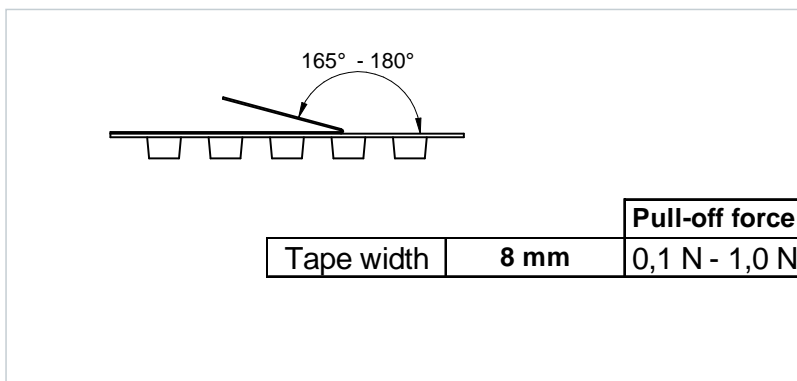
	Tape Type	A0 (mm)	B0 (mm)	W (mm)	T (mm)	T1 (mm)	P0 (mm)	P1 (mm)
Tolerance		typ.	typ.	+0,3/ -0,1	ref.	ref.	±0,1	±0,05
Value	1a	0,38	0,68	8,00	1,10	0,10	4,00	2,00
		P2 (mm)	D0 (mm)	E1 (mm)	E2 (mm)	F (mm)	Material	Qty. (pcs.)
Tolerance		±0,05	+0,1/ -0,0	±0,1	min.	±0,05		
Value		2,00	1,50	1,75	6,25	3,50	Paper	15000

Packaging Specification - Reel: [mm]



	A (mm)	B (mm)	C (mm)	D (mm)	N (mm)
Tolerance	± 2,0	min.	min.	min.	min.
Value	178	1,5	12,8	20,2	50
	W1 (mm)	W2 (mm)	W3 (mm)	W3 (mm)	Material
Tolerance	+1,5	max.	min.	max.	
Value	8,4	14,4	7,9	10,9	Polystyrene

Pull of Force:



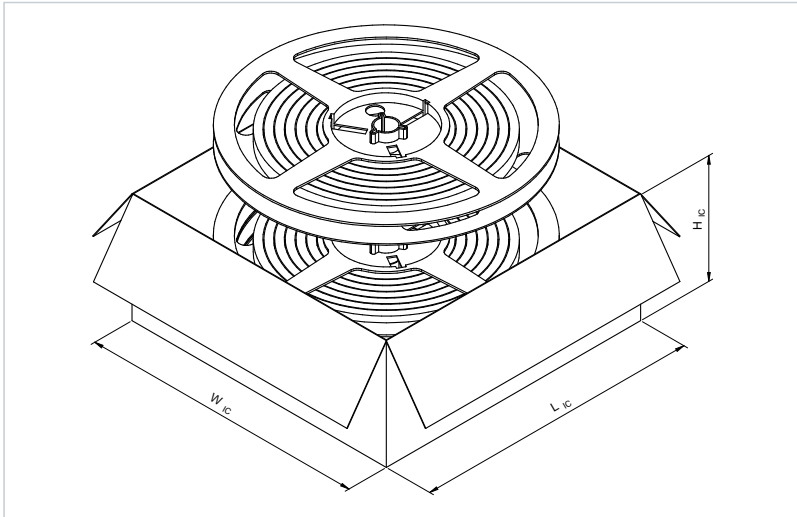
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Packaging Specification

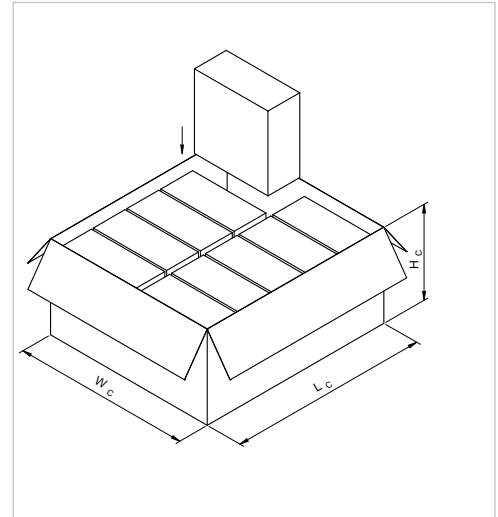
Size 0201

Packaging Specification - Reel in Carton: [mm]



	L _{IC} (mm)	W _{IC} (mm)	H _{IC} (mm)	No. of Reel (pcs.)	Qty. (pcs.)	Material
Tolerance	typ.	typ.	typ.			
Value	185,00	185,00	80,00	5	75000	Paper

Packaging Specification - Outer Carton: [mm]



	L _C (mm)	W _C (mm)	H _C (mm)	No. of Inner Carton (pcs.)	Qty. (pcs.)	Material
Tolerance	typ.	typ.	typ.			
Value	445,00	395,00	210,00	10	750000	Paper

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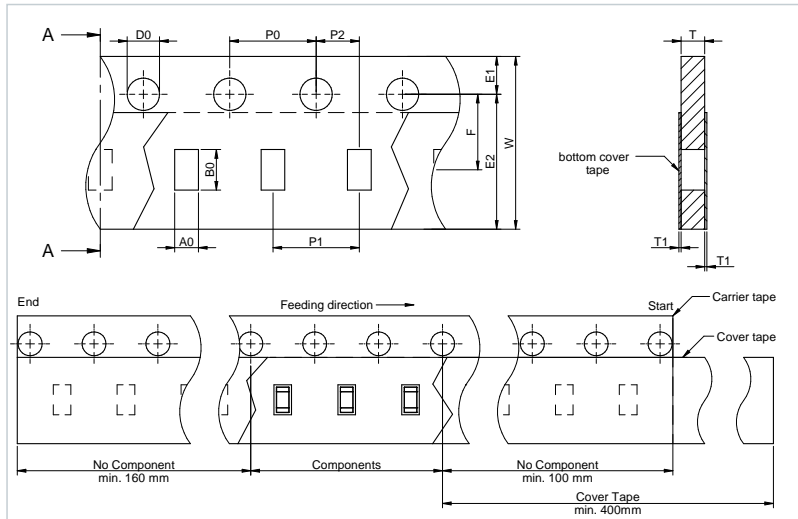
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Packaging Specification

Size 0402

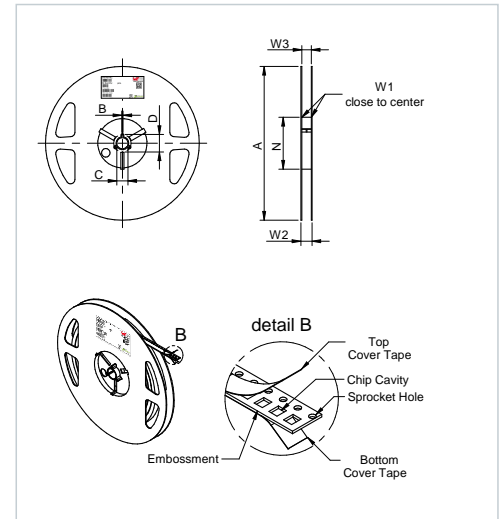
Packaging Specification - Tape: [mm]



packaging is referred to the international standard IEC 60286-3:2013

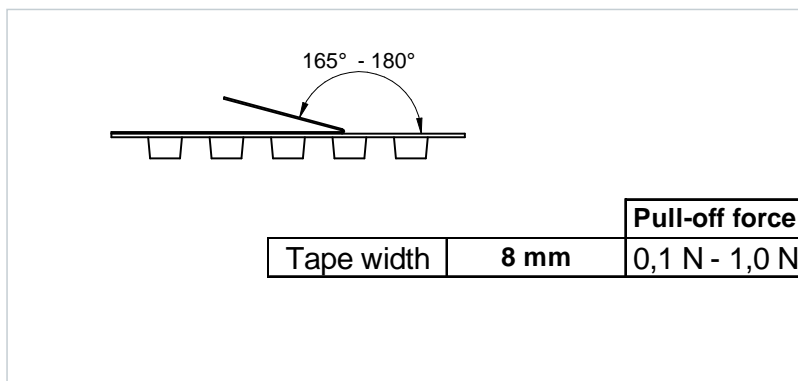
	Tape Type	A0 (mm)	B0 (mm)	W (mm)	T (mm)	T1 (mm)	P0 (mm)	P1 (mm)
Tolerance		typ.	typ.	+0,3/ -0,1	ref.	ref.	±0,1	±0,05
Value	1a	0,69	1,19	8,00	0,66	0,10	4,00	2,00
	P2 (mm)	D0 (mm)	E1 (mm)	E2 (mm)	F (mm)	Material	Qty. (pcs.)	
Tolerance	±0,05	+0,1/ -0,0	±0,1	min.	±0,05			
Value	2,00	1,50	1,75	6,25	3,50	Polystyrene	10000	

Packaging Specification - Reel: [mm]



	A (mm)	B (mm)	C (mm)	D (mm)	N (mm)
Tolerance	± 2,0	min.	± 0,8	min.	min.
Value	178	1,5	13	20,2	50
	W1 (mm)	W2 (mm)	W3 (mm)	W3 (mm)	Material
Tolerance	+1,5	max.	min.	max.	
Value	8,4	14,4	7,9	10,9	Polystyrene

Pull of Force:



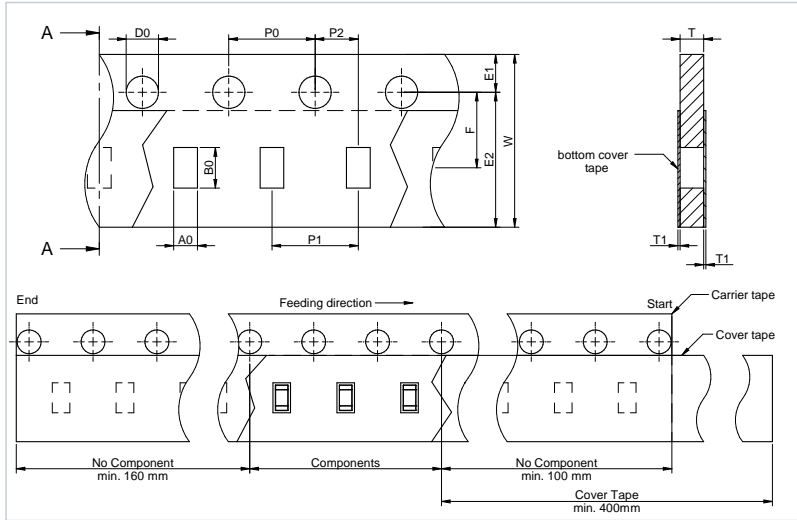
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Packaging Specification

Size 0603

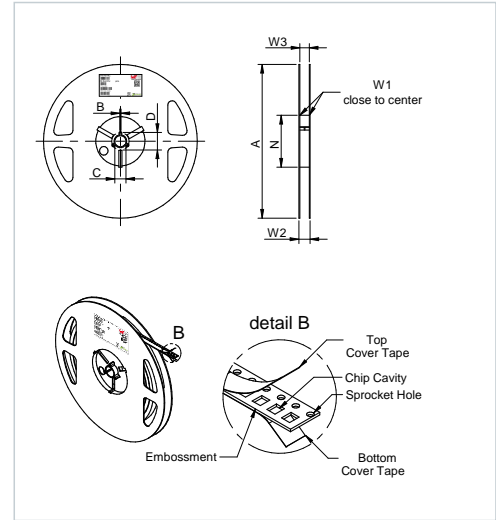
Packaging Specification - Tape: [mm]



packaging is referred to the international standard IEC 60286-3:2013

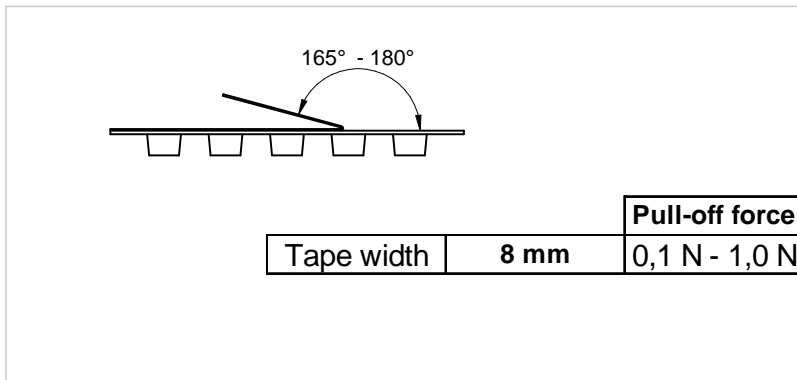
	Tape Type	A0 (mm)	B0 (mm)	W (mm)	T (mm)	T1 (mm)	P0 (mm)	P1 (mm)
Tolerance		typ.	typ.	+0,3/ -0,1	ref.	ref.	±0,1	±0,1
Value	1a	1,10	1,88	8,00	1,10	0,10	4,00	4,00
	P2 (mm)	D0 (mm)	E1 (mm)	E2 (mm)	F (mm)	Material	Qty. (pcs.)	
Tolerance	±0,05	+0,1/ -0,0	±0,1	min.	±0,05			
Value	2,00	1,50	1,75	6,25	3,50	Polystyrene	4000	

Packaging Specification - Reel: [mm]



	A (mm)	B (mm)	C (mm)	D (mm)	N (mm)
Tolerance	± 2,0	min.	± 0,8	min.	min.
Value	178	1,5	13	20,2	50
	W1 (mm)	W2 (mm)	W3 (mm)	W3 (mm)	Material
Tolerance	+1,5	max.	min.	max.	
Value	8,4	14,4	7,9	10,9	Polystyrene

Pull of Force:



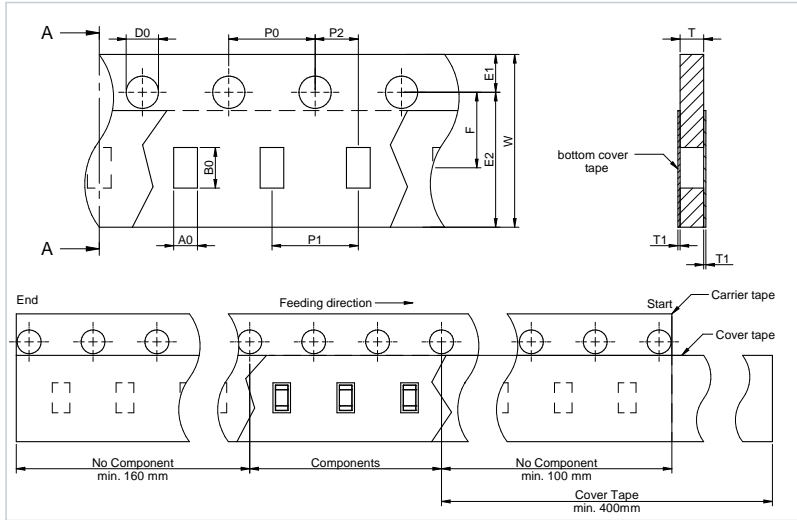
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Packaging Specification

Size 0805

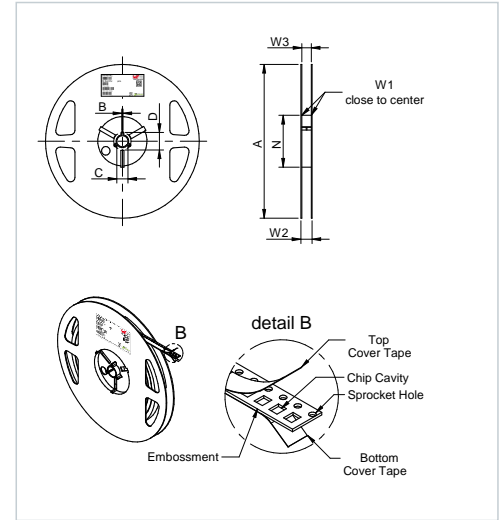
Packaging Specification - Tape: [mm]



packaging is referred to the international standard IEC 60286-3:2013

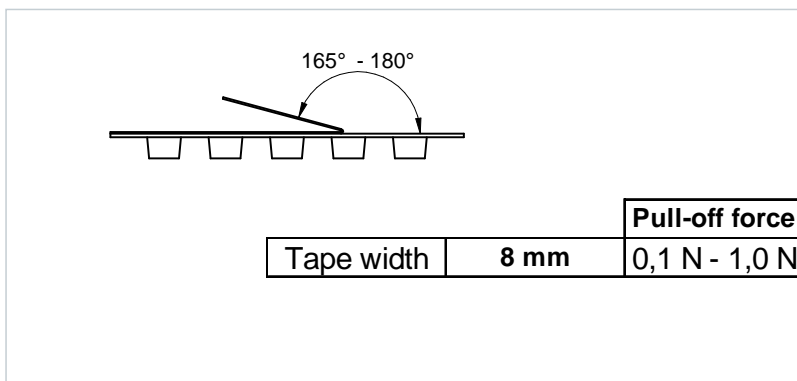
	Tape Type	A0 (mm)	B0 (mm)	W (mm)	T (mm)	T1 (mm)	P0 (mm)	P1 (mm)
Tolerance		typ.	typ.	+0,3/ -0,1	ref.	ref.	±0,1	±0,1
Value	1a	1,42	2,24	8,00	1,04	0,10	4,00	4,00
	P2 (mm)	D0 (mm)	E1 (mm)	E2 (mm)	F (mm)	Material	Qty. (pcs.)	
Tolerance	±0,05	+0,1/ -0,0	±0,1	min.	±0,05			
Value	2,00	1,50	1,75	6,25	3,50	Polystyrene	4000	

Packaging Specification - Reel: [mm]



	A (mm)	B (mm)	C (mm)	D (mm)	N (mm)
Tolerance	± 2,0	min.	min.	min.	min.
Value	178	1,5	12,8	20,2	50
	W1 (mm)	W2 (mm)	W3 (mm)	W3 (mm)	Material
Tolerance	+1,5	max.	min.	max.	
Value	8,4	14,4	7,9	10,9	Polystyrene

Pull of Force:



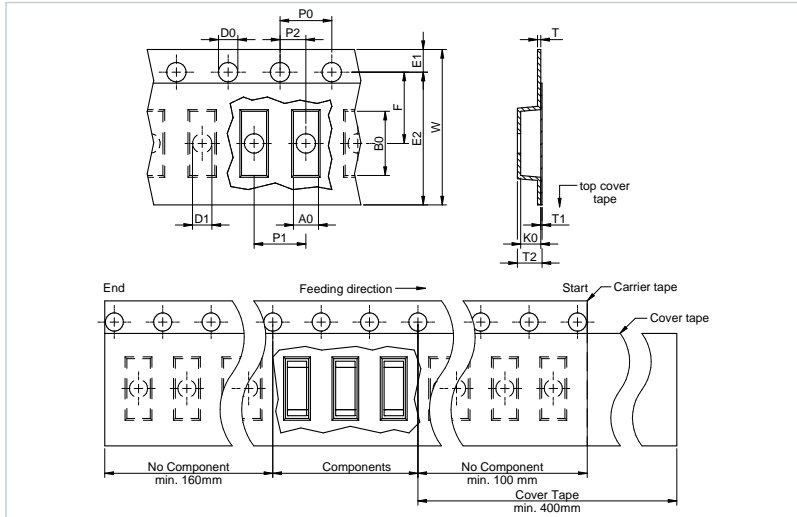
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Packaging Specification

Size 1206

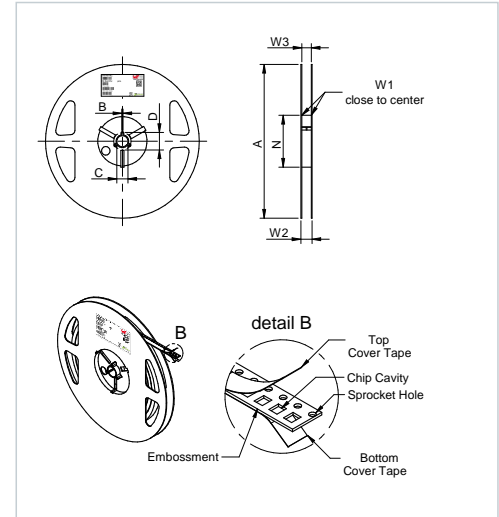
Packaging Specification - Tape: [mm]



packaging is referred to the international standard IEC 60286-3:2013

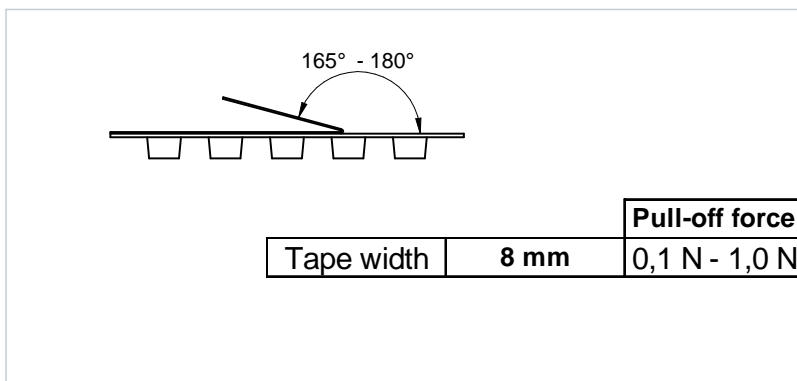
	Tape Type	A0 (mm)	B0 (mm)	W (mm)	T (mm)	T1 (mm)	P0 (mm)	P1 (mm)
Tolerance		typ.	typ.	+0,3/ -0,1	ref.	ref.	±0,1	±0,1
Value	1a	1,88	3,50	8,00	0,25	0,10	4,00	4,00
	P2 (mm)	D0 (mm)	E1 (mm)	E2 (mm)	F (mm)	Material	Qty. (pcs.)	
Tolerance	±0,05	+0,1/ -0,0	±0,1	min.	±0,05			
Value	2,00	1,50	1,75	6,25	3,50	Polystyrene	3000	

Packaging Specification - Reel: [mm]



	A (mm)	B (mm)	C (mm)	D (mm)	N (mm)
Tolerance	± 2,0	min.	± 0,8	min.	min.
Value	178	1,5	13	20,2	50
	W1 (mm)	W2 (mm)	W3 (mm)	W3 (mm)	Material
Tolerance	+1,5	max.	min.	max.	
Value	8,4	14,4	7,9	10,9	Polystyrene

Pull of Force:



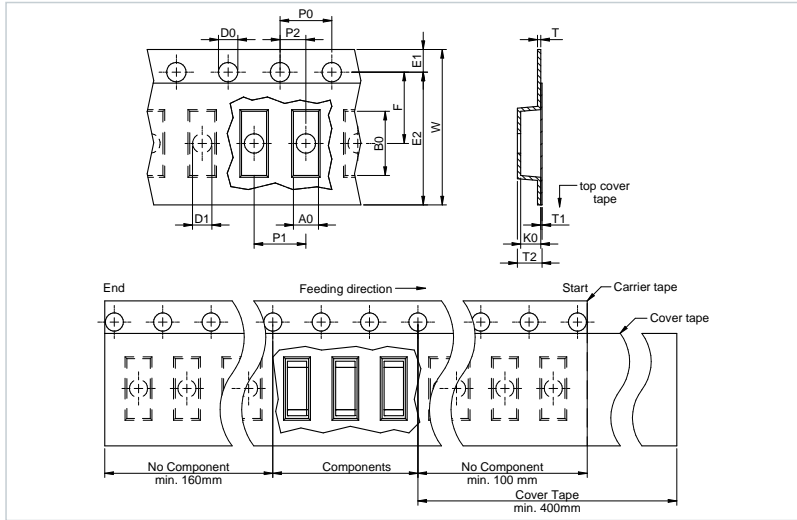
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Packaging Specification

Size 1806

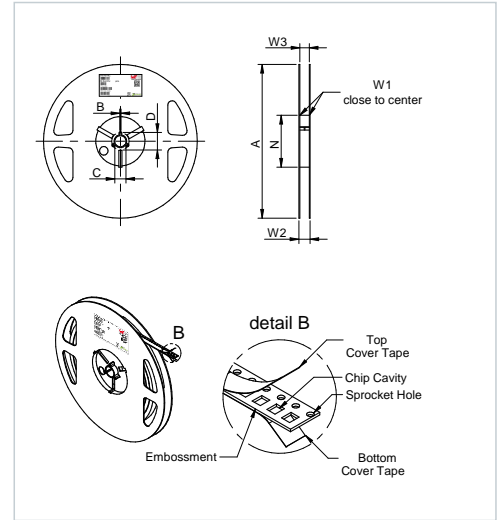
Packaging Specification - Tape: [mm]



packaging is referred to the international standard IEC 60286-3:2013

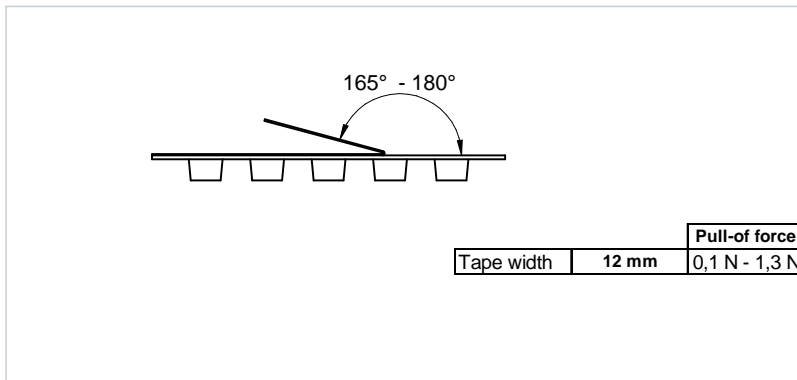
	Tape Type	A0 (mm)	B0 (mm)	W (mm)	T (mm)	T1 (mm)	P0 (mm)	P1 (mm)
Tolerance		typ.	typ.	+0,3/ -0,1	ref.	ref.	±0,1	±0,1
Value	2a	1,93	4,95	12,00	0,25	0,10	4,00	4,00
	P2 (mm)	D0 (mm)	E1 (mm)	E2 (mm)	F (mm)	Material	Qty. (pcs.)	
Tolerance	±0,05	+0,1/ -0,0	±0,1	min.	±0,05			
Value	2,00	1,50	1,75	10,25	5,50	Polystyrene	2000	

Packaging Specification - Reel: [mm]



	A (mm)	B (mm)	C (mm)	D (mm)	N (mm)
Tolerance	± 2,0	min.	± 0,8	min.	min.
Value	178,00	1,50	13,00	20,20	50,00
	W1 (mm)	W2 (mm)	W3 (mm)	W3 (mm)	Material
Tolerance	+ 1,5	max.	min.	max.	
Value	12,40	18,40	11,90	15,40	Polystyrene

Pull of Force:



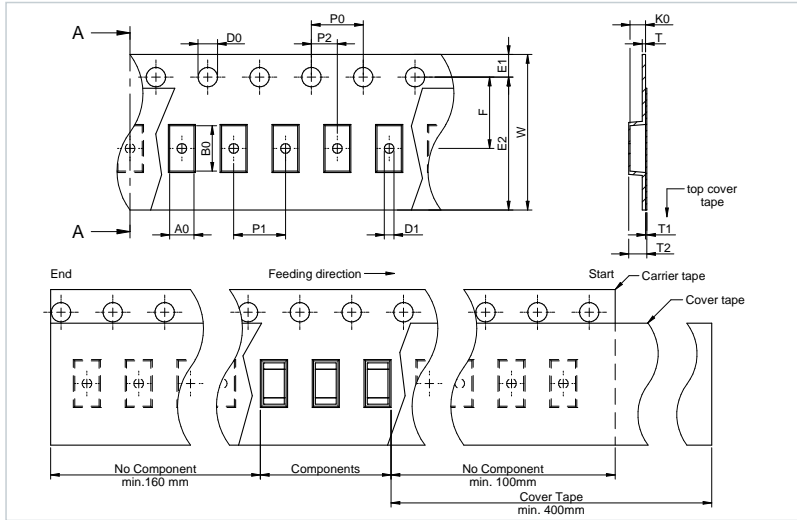
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Packaging Specification

Size 1812

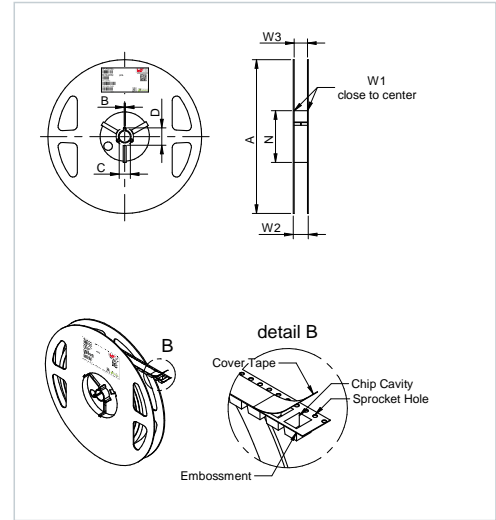
Packaging Specification - Tape: [mm]



packaging is referred to the international standard IEC 60286-3:2013

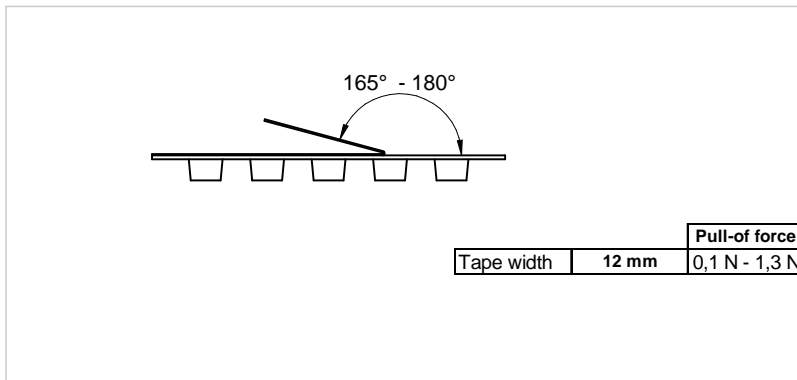
	Tape Type	A0 (mm)	B0 (mm)	W (mm)	T (mm)	T1 (mm)	T2 (mm)	K0 (mm)	P0 (mm)
Tolerance		typ.	typ.	+0,3/ -0,1	ref.	ref.	±0,25	±0,15	±0,1
Value	2a	3,66	4,95	12,00	0,24	0,10	2,09	2,09	4,00
	P1 (mm)	P2 (mm)	D0 (mm)	D1 (mm)	E1 (mm)	E2 (mm)	F (mm)	Material	Qty. (pcs.)
Tolerance	±0,1	±0,05	+0,1/ -0,0	min.	±0,1	min.	±0,05		
Value	8,00	2,00	1,50	1,50	1,75	10,25	5,50	Polystyrene	1000

Packaging Specification - Reel: [mm]



	A (mm)	B (mm)	C (mm)	D (mm)	N (mm)
Tolerance	± 2,0	min.	min.	min.	min.
Value	178,00	1,50	12,80	20,20	60,00
	W1 (mm)	W2 (mm)	W3 (mm)	W3 (mm)	Material
Tolerance	+ 2,0	max.	min.	max.	
Value	12,40	18,40	11,90	15,40	Polystyrene

Pull of Force:



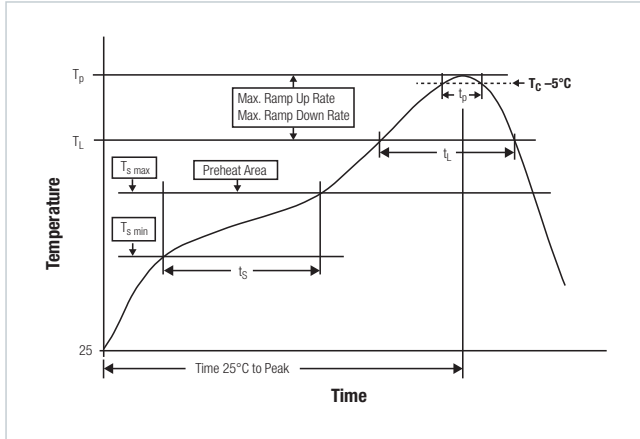
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Soldering Profile

Size 0201, 0402, 0603, 0805, 1206, 1806, 1812

Classification Reflow Profile for SMT components:



Classification Reflow Soldering Profile:

Profile Feature		Value
Preheat Temperature Min	$T_{s \text{ min}}$	150 °C
Preheat Temperature Max	$T_{s \text{ max}}$	200 °C
Preheat Time t_s from $T_{s \text{ min}}$ to $T_{s \text{ max}}$	t_s	60 - 120 seconds
Ramp-up Rate (T_L to T_p)		3 °C/ second max.
Liquidous Temperature	T_L	217 °C
Time t_L maintained above T_L	t_L	60 - 150 seconds
Peak package body temperature	T_p	$T_p \leq T_c$, see Table below
Time within 5 °C of actual peak temperature	t_p	20 - 30 seconds
Ramp-down Rate (T_p to T_L)		6 °C/ second max.
Time 25 °C to peak temperature		8 minutes max.

refer to IPC/ JEDEC J-STD-020E

Package Classification Reflow Temperature (T_c):

Properties	Volume mm ³ <350	Volume mm ³ 350-2000	Volume mm ³ >2000
PB-Free Assembly Package Thickness < 1.6 mm	260 °C	260 °C	260 °C
PB-Free Assembly Package Thickness 1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
PB-Free Assembly Package Thickness > 2.5 mm	250 °C	245 °C	245 °C
Sn-PB Assembly Package Thickness < 2.5 mm	235 °C	220 °C	
Sn-PB Assembly Package Thickness \geq 2.5 mm	220 °C	220 °C	

refer to IPC/ JEDEC J-STD-020E

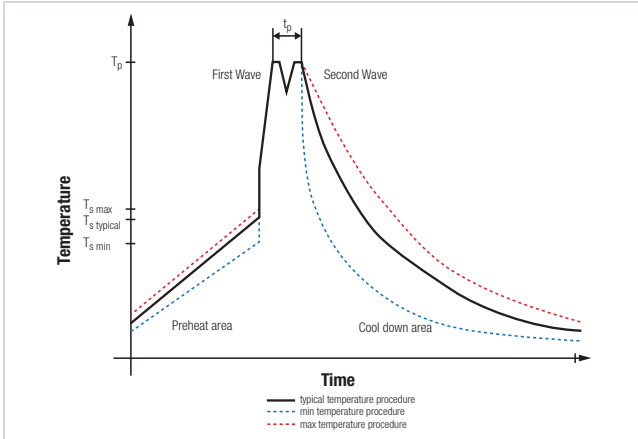
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Soldering Profile

Size 0805, 1806

Classification Wave Soldering Profile:



Classification Wave Soldering Profile:

Profile Feature		Pb-Free Assembly	Sn-Pb Assembly
Preheat Temperature Min	$T_{s \text{ min}}$	100 °C	100 °C
Preheat Temperature Typical	$T_{s \text{ typical}}$	120 °C	120 °C
Preheat Temperature Max	$T_{s \text{ max}}$	130 °C	130 °C
Preheat Time t_s from $T_{s \text{ min}}$ to $T_{s \text{ max}}$	t_s	70 seconds	70 seconds
Ramp-up Rate	ΔT	150 °C max.	150 °C max.
Peak Temperature	T_p	250 °C - 260 °C	235 °C - 260 °C
Time of actual peak temperature	t_p	max. 10 seconds max. 5 seconds each wave	max. 10 seconds max. 5 seconds each wave
Ramp-down Rate, Min		~ 2 K/ second	~ 2 K/ second
Ramp-down Rate, Typical		~ 3.5 K/ second	~ 3.5 K/ second
Ramp-down Rate, Max		~ 5 K/ second	~ 5 K/ second
Time 25 °C to 25 °C		4 minutes	4 minutes

refer to EN61760-1:2006

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Cautions and Warnings:

The following conditions apply to all goods within the product series of WE-CBA of Würth Elektronik eiSos GmbH & Co. KG:

General:

- This electronic component is designed and manufactured for use in general electronic equipment.
- Würth Elektronik must be asked for written approval (following the PPAP procedure) before incorporating the components into any equipment in fields such as military, aerospace, aviation, nuclear control, submarine, transportation (automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network, etc. where higher safety and reliability are especially required and/or if there is the possibility of direct damage or human injury.
- Electronic components that will be used in safety-critical or high-reliability applications, should be pre-evaluated by the customer.
- The component is designed and manufactured to be used within the datasheet specified values. If the usage and operation conditions specified in the datasheet are not met, the component may be damaged or dissolved.
- Do not drop or impact the components, the component may be damaged
- Würth Elektronik products are qualified according to international standards, which are listed in each product reliability report. Würth Elektronik does not warrant any customer qualified product characteristics beyond Würth Elektronik's specifications, for its validity and sustainability over time.
- The responsibility for the applicability of the customer specific products and use in a particular customer design is always within the authority of the customer. All technical specifications for standard products also apply to customer specific products.

Product specific:

Soldering:

- The solder profile must comply with the technical product specifications. All other profiles will void the warranty. Wave soldering is allowed for components bigger than 0805 after evaluation and approval.
- All other soldering methods are at the customers' own risk.

Cleaning and Washing:

- Washing agents used during the production to clean the customer application might damage or change the characteristics of the wire insulation, marking or plating. Washing agents may have a negative effect on the long-term functionality of the product.

Potting:

- If the product is potted in the customer application, the potting material might shrink or expand during and after hardening. Shrinking could lead to an incomplete seal, allowing contaminants into the core. Expansion could damage the components. We recommend a manual inspection after potting to avoid these effects.

Storage Conditions:

- A storage of Würth Elektronik products for longer than 12 months is not recommended. Within other effects, the terminals may suffer degradation, resulting in bad solderability. Therefore, all products shall be used within the period of 12 months based on the day of shipment.
- Do not expose the components to direct sunlight.
- The storage conditions in the original packaging are defined according to DIN EN 61760-2.
- The storage conditions stated in the original packaging apply to the storage time and not to the transportation time of the components.

Packaging:

- The packaging specifications apply only to purchase orders comprising whole packaging units. If the ordered quantity exceeds or is lower than the specified packaging unit, packaging in accordance with the packaging specifications cannot be ensured.

Handling:

- Violation of the technical product specifications such as exceeding the nominal rated current will void the warranty.
- The temperature rise of the component must be taken into consideration. The operating temperature is comprised of ambient temperature and temperature rise of the component. The operating temperature of the component shall not exceed the maximum temperature specified.

These cautions and warnings comply with the state of the scientific and technical knowledge and are believed to be accurate and reliable. However, no responsibility is assumed for inaccuracies or incompleteness.

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Important Notes

The following conditions apply to all goods within the product range of Würth Elektronik eiSos GmbH & Co. KG:

1. General Customer Responsibility

Some goods within the product range of Würth Elektronik eiSos GmbH & Co. KG contain statements regarding general suitability for certain application areas. These statements about suitability are based on our knowledge and experience of typical requirements concerning the areas, serve as general guidance and cannot be estimated as binding statements about the suitability for a customer application. The responsibility for the applicability and use in a particular customer design is always solely within the authority of the customer. Due to this fact it is up to the customer to evaluate, where appropriate to investigate and decide whether the device with the specific product characteristics described in the product specification is valid and suitable for the respective customer application or not.

2. Customer Responsibility related to Specific, in particular Safety-Relevant Applications

It has to be clearly pointed out that the possibility of a malfunction of electronic components or failure before the end of the usual lifetime cannot be completely eliminated in the current state of the art, even if the products are operated within the range of the specifications. In certain customer applications requiring a very high level of safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health it must be ensured by most advanced technological aid of suitable design of the customer application that no injury or damage is caused to third parties in the event of malfunction or failure of an electronic component. Therefore, customer is cautioned to verify that data sheets are current before placing orders. The current data sheets can be downloaded at www.we-online.com.

3. Best Care and Attention

Any product-specific notes, cautions and warnings must be strictly observed. Any disregard will result in the loss of warranty.

4. Customer Support for Product Specifications

Some products within the product range may contain substances which are subject to restrictions in certain jurisdictions in order to serve specific technical requirements. Necessary information is available on request. In this case the field sales engineer or the internal sales person in charge should be contacted who will be happy to support in this matter.

5. Product R&D

Due to constant product improvement product specifications may change from time to time. As a standard reporting procedure of the Product Change Notification (PCN) according to the JEDEC-Standard inform about minor and major changes. In case of further queries regarding the PCN, the field sales engineer or the internal sales person in charge should be contacted. The basic responsibility of the customer as per Section 1 and 2 remains unaffected.

6. Product Life Cycle

Due to technical progress and economical evaluation we also reserve the right to discontinue production and delivery of products. As a standard reporting procedure of the Product Termination Notification (PTN) according to the JEDEC-Standard we will inform at an early stage about inevitable product discontinuance. According to this we cannot guarantee that all products within our product range will always be available. Therefore it needs to be verified with the field sales engineer or the internal

sales person in charge about the current product availability expectancy before or when the product for application design-in disposal is considered. The approach named above does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.

7. Property Rights

All the rights for contractual products produced by Würth Elektronik eiSos GmbH & Co. KG on the basis of ideas, development contracts as well as models or templates that are subject to copyright, patent or commercial protection supplied to the customer will remain with Würth Elektronik eiSos GmbH & Co. KG. Würth Elektronik eiSos GmbH & Co. KG does not warrant or represent that any license, either expressed or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, application, or process in which Würth Elektronik eiSos GmbH & Co. KG components or services are used.

8. General Terms and Conditions

Unless otherwise agreed in individual contracts, all orders are subject to the current version of the "General Terms and Conditions of Würth Elektronik eiSos Group", last version available at www.we-online.com.

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