

LPWI Series



Applications

- DC-DC converters and power modules in general use electronic equipment
- Smartphone and tablets
- Wearable devices
- Virtual and augmented reality equipments
- Powerbanks
- Printers

Description

The Littelfuse LPWI Series provides voltage stabilization in a compact design. With its low losses, high efficiency, high durability, and excellent temperature saturation characteristics, the LPWI Series is ideal for small battery operated applications.

Features

- Thin film photolithography technology
- Compact and low profile
- Metal alloy composite material
- High current capability
- High efficiency
- Low DC resistance
- Magnetically shielded

Benefits

- Space saving
- Energy efficient
- Reliable

Electrical Characteristics

Part Number	Size (mm)	Size (Inch)	Thickness (mm)	Inductance @ 1MHz [uH]	DC Resistance [mΩ]		Rated DC Current (A)			
					Typ.	Max.	Isat, ΔL/L=30%		Itemp, ΔT=40°C	
							Typ.	Max.	Typ.	Max.
LPWI160808SR24T	1608	0603	0.8	0.24 ± 20%	30	40	3.2	2.8	3.2	2.8
LPWI160808SR47T	1608	0603	0.8	0.47 ± 20%	35	50	2.8	2.5	3.0	2.7
LPWI160808HR47T	1608	0603	0.8	0.47 ± 20%	37	45	3.4	3.1	3.2	2.9
LPWI160808S1R0T	1608	0603	0.8	1.00 ± 20%	130	150	2.0	1.7	2.0	1.7
LPWI160808H1R0T	1608	0603	0.8	1.00 ± 20%	115	135	2.2	2.0	2.0	1.7
LPWI201208SR24T	2012	0805	0.8	0.24 ± 20%	17	22	4.8	4.5	4.1	3.9
LPWI201208SR47T	2012	0805	0.8	0.47 ± 20%	30	35	4.2	4.0	4.0	3.8
LPWI201208HR47T	2012	0805	0.8	0.47 ± 20%	30	35	5.0	4.7	4.0	3.8
LPWI201208SR68T	2012	0805	0.8	0.68 ± 20%	58	65	3.4	3.1	2.8	2.5
LPWI201208S1R0T	2012	0805	0.8	1.00 ± 20%	60	65	3.4	3.1	3.0	2.7
LPWI201208S1R5T	2012	0805	0.8	1.50 ± 20%	110	120	2.3	2.0	2.1	1.9
LPWI201210SR47T	2012	0805	1.0	0.47 ± 20%	25	33	4.7	4.5	4.2	4.0
LPWI201210HR47T	2012	0805	1.0	0.47 ± 20%	25	28	5.4	4.9	4.5	4.3
LPWI201210S1R0T	2012	0805	1.0	1.00 ± 20%	50	60	3.5	3.2	3.0	2.7
LPWI201608NR24T	2016	0806	0.8	0.24 ± 20%	20	25	5.0	4.6	4.2	3.8
LPWI201608HR47T	2016	0806	0.8	0.47 ± 20%	21	27	5.0	4.7	4.1	4.0
LPWI201608H1R0T	2016	0806	0.8	1.00 ± 20%	45	50	3.9	3.6	3.5	3.2
LPWI201608S1R0T	2016	0806	0.8	1.00 ± 20%	50	65	3.3	2.9	3.0	2.6
LPWI201608N1R5T	2016	0806	0.8	1.50 ± 20%	90	120	2.9	2.3	2.1	1.9
LPWI201608S2R2T	2016	0806	0.8	2.20 ± 20%	130	150	2.0	1.6	1.9	1.5
LPWI201610SR47T	2016	0806	1.0	0.47 ± 20%	32	40	4.5	4.0	3.8	3.5
LPWI201610HR47T	2016	0806	1.0	0.47 ± 20%	20	25	5.3	4.8	4.2	3.6
LPWI201610BR47T	2016	0806	1.0	0.47 ± 20%	21	27	6.0	5.7	5.2	4.8
LPWI201610SR68T	2016	0806	1.0	0.68 ± 20%	40	50	4.1	3.7	3.5	3.1
LPWI201610S1R0T	2016	0806	1.0	1.00 ± 20%	50	65	3.5	3.1	3.1	2.8
LPWI201610H1R0T	2016	0806	1.0	1.00 ± 20%	40	45	3.9	3.6	3.1	2.7
LPWI201610B1R0T	2016	0806	1.0	1.00 ± 20%	43	46	4.2	4.0	3.5	3.2
LPWI201610H1R5T	2016	0806	1.0	1.50 ± 20%	85	100	3.2	2.8	2.5	2.3
LPWI201610B2R2T	2016	0806	1.0	2.20 ± 20%	117	140	2.6	2.4	2.1	1.9
LPWI201610S2R2T	2016	0806	1.0	2.20 ± 20%	130	150	1.8	1.5	1.7	1.6
LPWI201610H2R2T	2016	0806	1.0	2.20 ± 20%	90	120	2.7	2.5	2.4	2.2

Continued...

Electrical Characteristics

Part Number	Size (mm)	Size (Inch)	Thickness (mm)	Inductance@ 1MHz [uH]	DC Resistance [mΩ]		Rated DC Current (A)			
					Typ.	Max.	Isat, ΔL/L=30%		Itemp, ΔT=40°C	
							Typ.	Max.	Typ.	Max.
LPWI252010SR33T	2520	1008	1.0	0.33 ± 20%	20	25	6.8	6.3	5.8	5.3
LPWI252010BR47T	2520	1008	1.0	0.47 ± 20%	21	27	6.8	6.5	5.2	4.6
LPWI252010SR47T	2520	1008	1.0	0.47 ± 20%	25	30	6.0	5.5	4.1	3.7
LPWI252010HR47T	2520	1008	1.0	0.47 ± 20%	22	27	6.6	6.0	5.2	4.4
LPWI252010NR68T	2520	1008	1.0	0.68 ± 20%	32	37	5.5	5.0	4.1	3.5
LPWI252010B1R0T	2520	1008	1.0	1.00 ± 20%	33	36	5.0	4.7	4.3	4.0
LPWI252010S1R0T	2520	1008	1.0	1.00 ± 20%	40	50	4.2	3.8	3.5	3.1
LPWI252010H1R0T	2520	1008	1.0	1.00 ± 20%	35	45	4.6	4.1	4.3	4.1
LPWI252010S1R5T	2520	1008	1.0	1.50 ± 20%	65	80	3.5	3.1	2.8	2.5
LPWI252010B2R2T	2520	1008	1.0	2.20 ± 20%	85	95	3.5	3.1	2.5	2.3
LPWI252010S2R2T	2520	1008	1.0	2.20 ± 20%	100	110	3.0	2.5	2.5	2.3
LPWI252010H2R2T	2520	1008	1.0	2.20 ± 20%	90	97	3.5	3.1	2.5	2.3
LPWI252010S3R3T	2520	1008	1.0	3.30 ± 20%	155	170	2.2	2.0	1.9	1.6
LPWI252010S4R7T	2520	1008	1.0	4.70 ± 20%	230	245	1.9	1.6	1.8	1.5

Notice: Below PNs have top cover

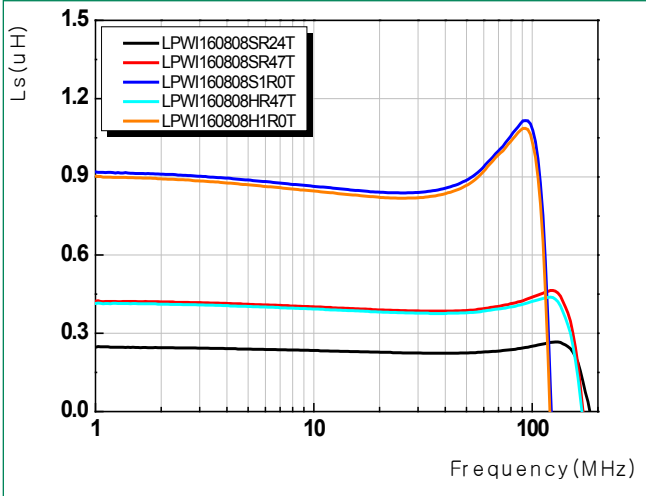
Part Number	Size (mm)	Size (Inch)	Thickness (mm)	Inductance@ 1MHz [uH]	DC Resistance [mΩ]		Rated DC Current (A)			
					Typ.	Max.	Isat, ΔL/L=30%		Itemp, ΔT=40°C	
							Typ.	Max.	Typ.	Max.
LPWI201610TR47T	2016	0806	1.0	0.47 ± 20%	20	25	5.3	4.8	4.2	3.6
LPWI201610TAR47T	2016	0806	1.0	0.47 ± 20%	35	40	4.2	3.5	3.7	3.2
LPWI201610TBR47T	2016	0806	1.0	0.47 ± 20%	21	27	6.0	5.7	5.2	4.8
LPWI201610T1R0T	2016	0806	1.0	1.00 ± 20%	58	65	3.2	2.8	3.0	2.6
LPWI201610TA1R0T	2016	0806	1.0	1.00 ± 20%	40	45	3.9	3.6	3.1	2.7
LPWI201610TB1R0T	2016	0806	1.0	1.00 ± 20%	43	46	4.2	4.0	3.5	3.2

Test Conditions:

- Inductance measuring equipment : 4287A RF LCR meter. (Agilent) at 1MHz , 0.5V
- DC Resistance measuring equipment : 4338B Milliohm meter (Agilent)
- Withstand voltage : Absolute maximum voltage DC 20V
- Rated Current "ΔL/L=30%" : Based on the inductance change rate (30% below the initial L value)
- Rated Current "ΔT=40°C" : Based on the temp. increase (40°C by self heating at. room-temperature)

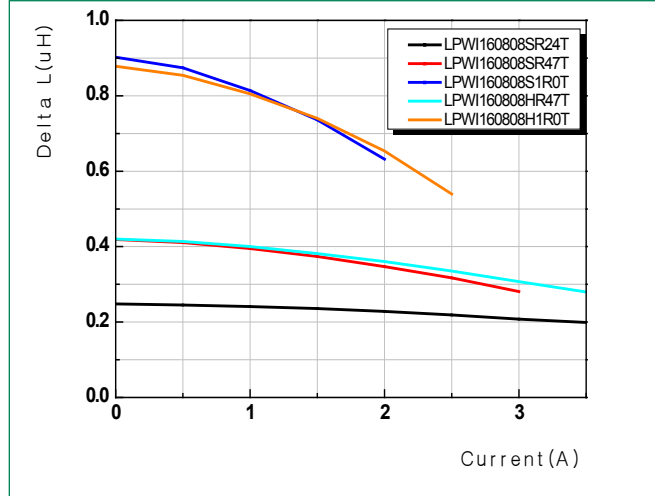
Inductive Vs. Frequency Characteristics

1.6 x 0.8 x 0.8 mm size



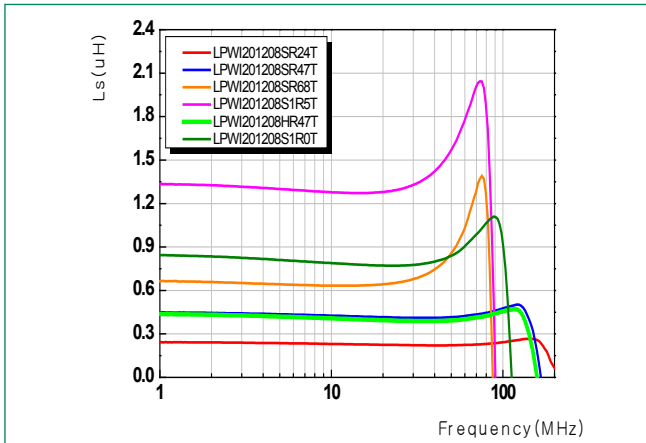
Inductive Vs. DC Current Characteristics

1.6 x 0.8 x 0.8 mm size



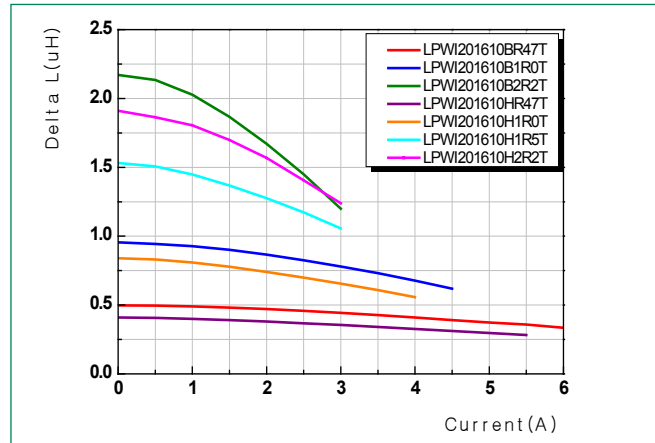
Inductive Vs. Frequency Characteristics

2.0 x 1.2 x 0.8 mm size



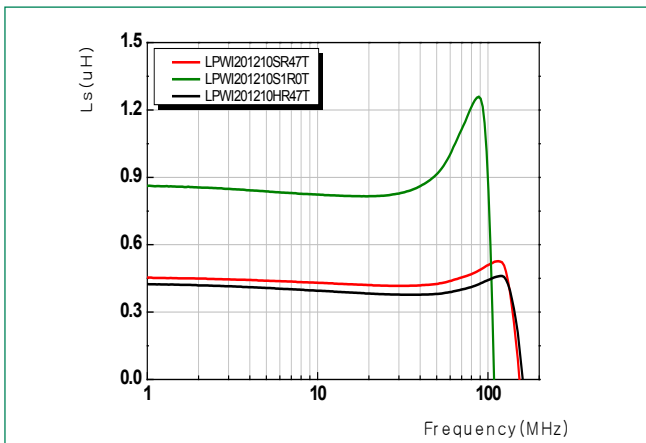
Inductive Vs. DC Current Characteristics

2.0 x 1.2 x 0.8 mm size



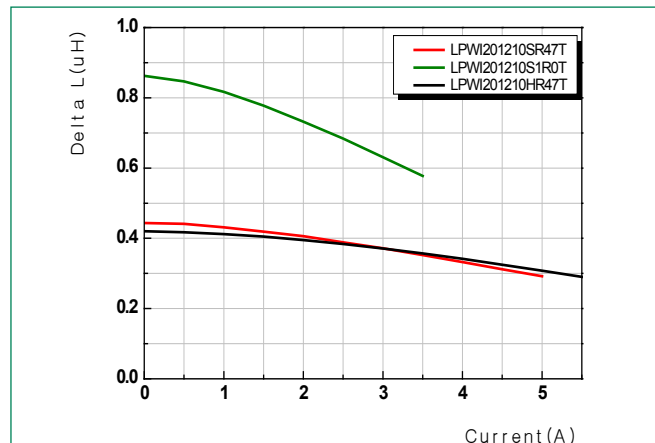
Inductive Vs. Frequency Characteristics

2.0 x 1.2 x 1.0 mm size



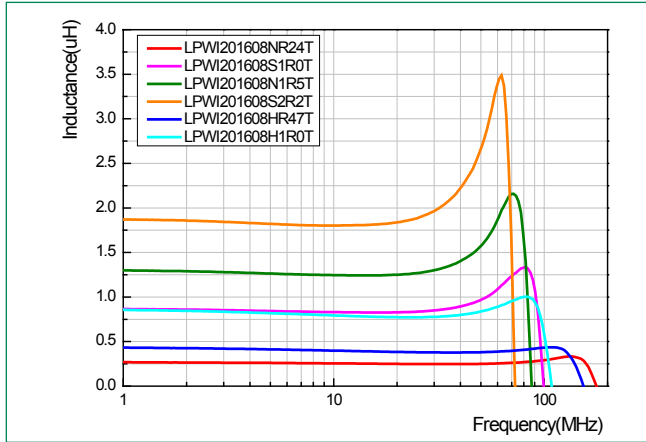
Inductive Vs. DC Current Characteristics

2.0 x 1.2 x 1.0 mm size



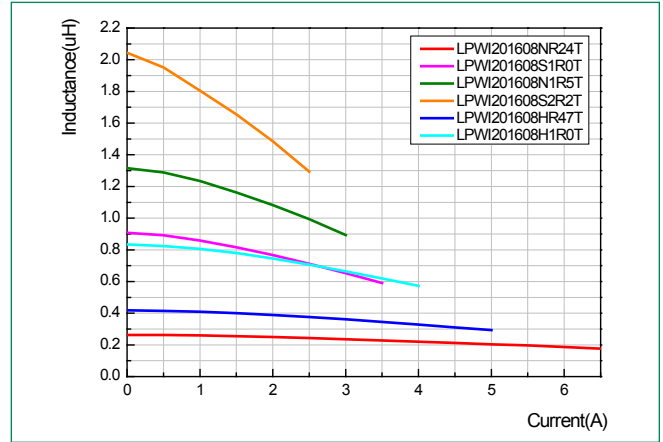
Inductive Vs. Frequency Characteristics

2.0 x 1.6 x 0.8 mm size



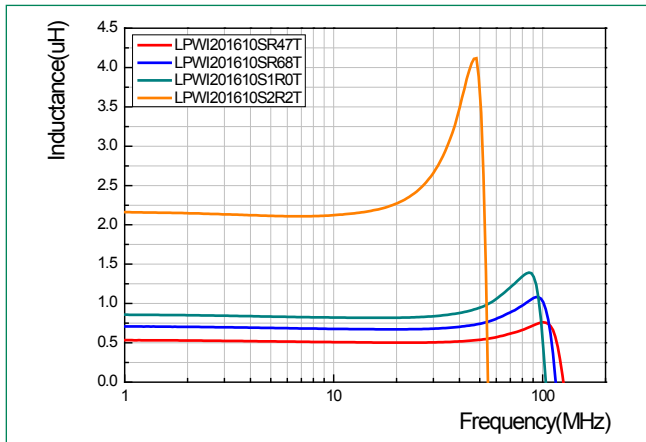
Inductive Vs. DC Current Characteristics

2.0 x 1.6 x 0.8 mm size



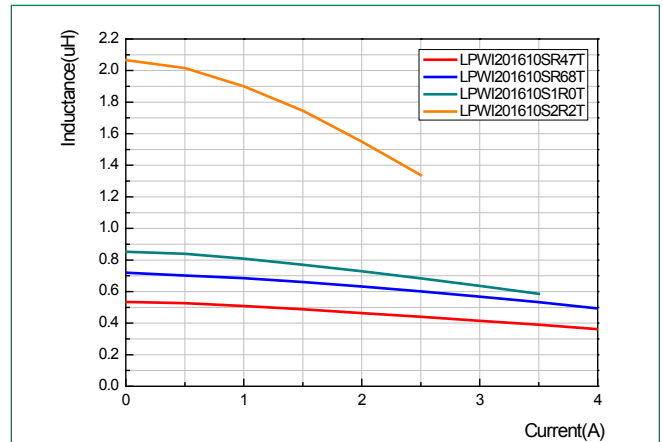
Inductive Vs. Frequency Characteristics

2.0 x 1.6 x 1.0 mm size



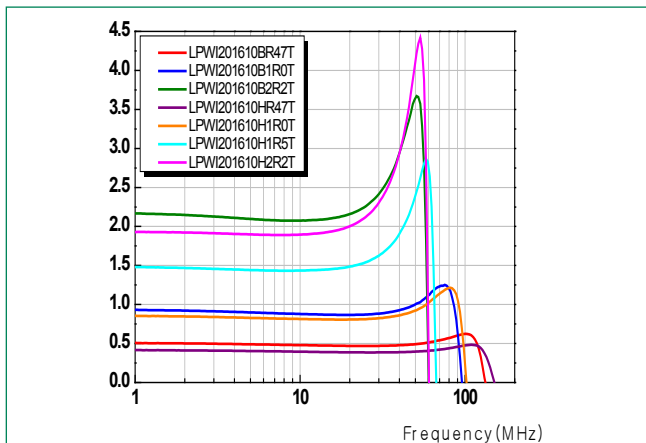
Inductive Vs. DC Current Characteristics

2.0 x 1.6 x 1.0 mm size



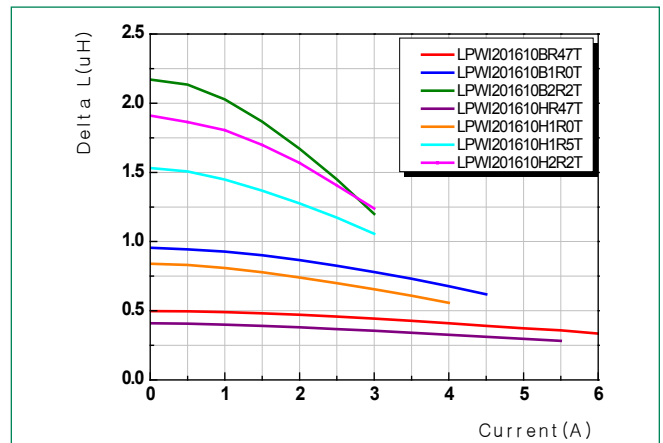
Inductive Vs. Frequency Characteristics

2.0 x 1.6 x 1.0 mm size (High Current)



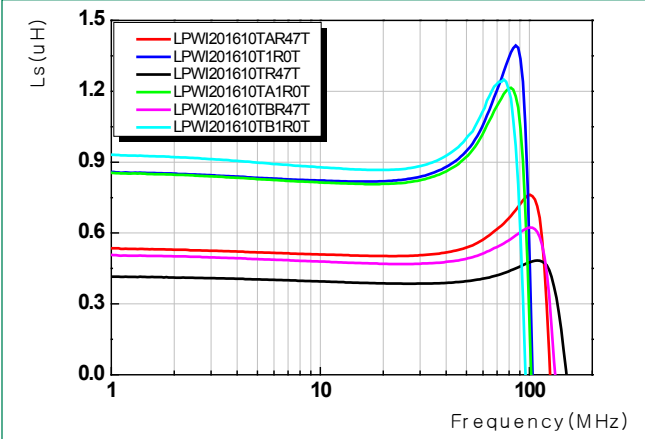
Inductive Vs. DC Current Characteristics

2.0 x 1.6 x 1.0 mm size (High Current)



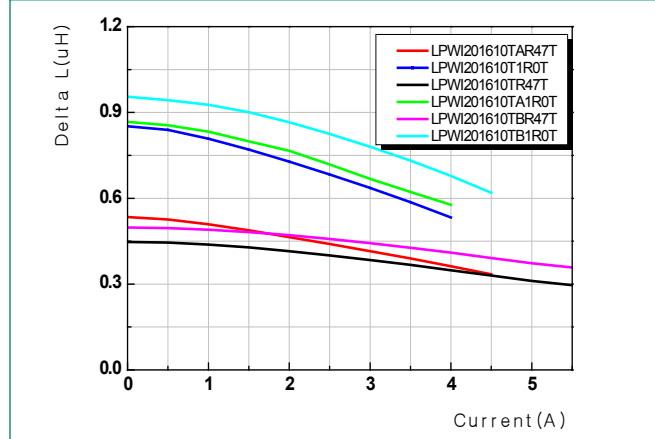
Inductive Vs. Frequency Characteristics

2.0 x 1.6 x 1.0 mm size (top cover type)



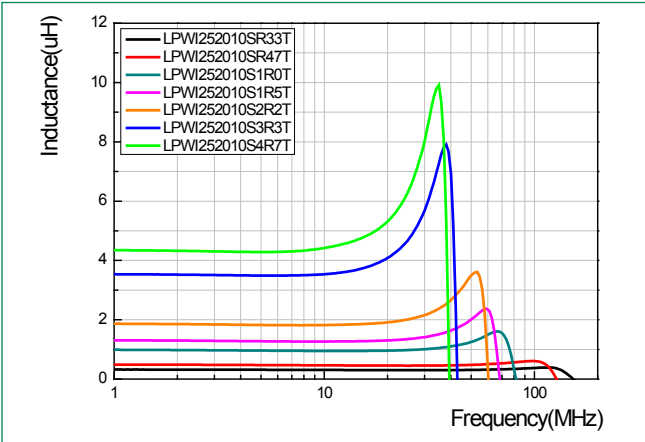
Inductive Vs. DC Current Characteristics

2.0 x 1.6 x 1.0 mm size (top cover type)



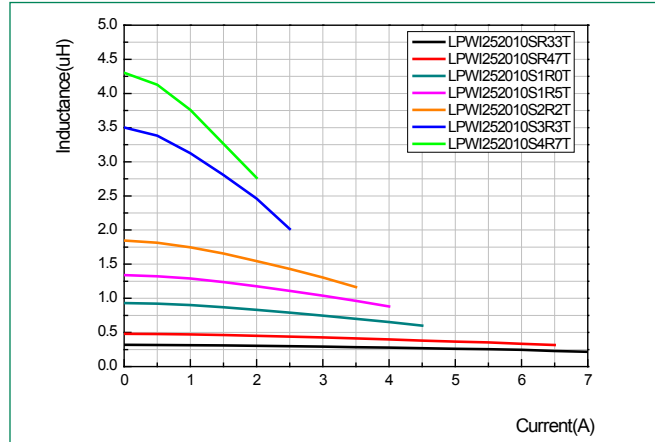
Inductive Vs. Frequency Characteristics

2.5 x 2.0 x 1.0 mm size



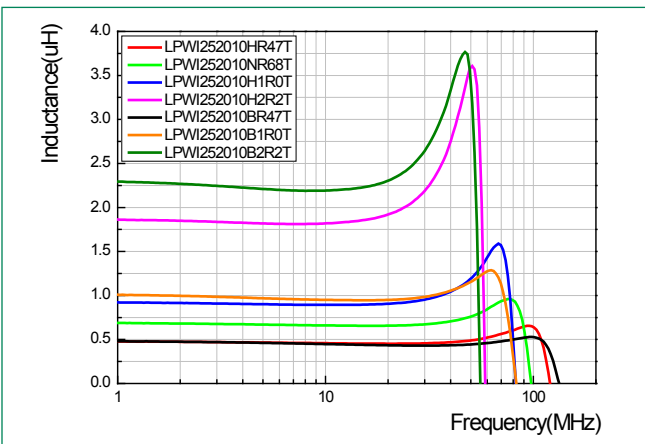
Inductive Vs. DC Current Characteristics

2.5 x 2.0 x 1.0 mm size



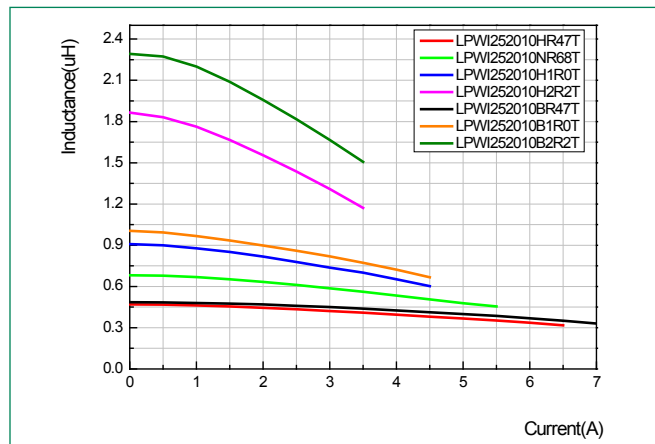
Inductive Vs. Frequency Characteristics

2.5 x 2.0 x 1.0 mm size (High Current)



Inductive Vs. DC Current Characteristics

2.5 x 2.0 x 1.0 mm size (High Current)

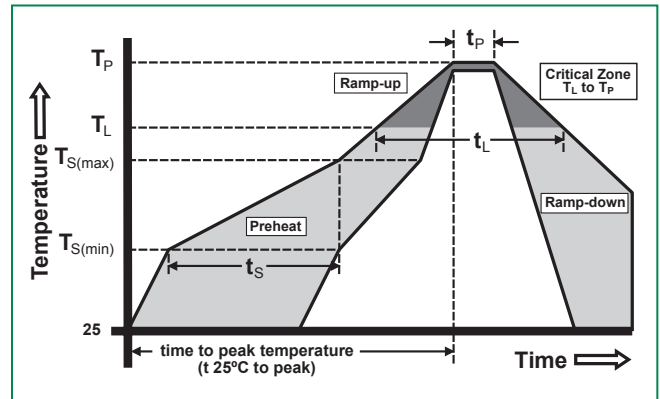


Test Conditions:

- Test Equipment: 4991A RF Impedance Analyzer (Agilent)
- Test Frequency: 1MHz ~ 200MHz

Soldering Parameters

Reflow Condition		Pb-free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	160°C
	- Temperature Max ($T_{s(max)}$)	185°C
	- Time (Min to Max) (t_s)	100 – 120 seconds
Average Ramp-up Rate (Liquidus Temp (T_L) to peak)		1°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		1°C/second max
Reflow	- Temperature (T_L) (Liquidus)	220°C
	- Temperature (t_L)	30 – 50 seconds
Peak Temperature (T_P)		260°C
Time within 5°C of actual peak Temperature (t_p)		5~10 seconds
Ramp-down Rate		2°C/second max
Time 25°C to Peak Temperature (T_P)		4 minutes max
Do not exceed		260°C
Wave Soldering		260°C, 10 sec. max

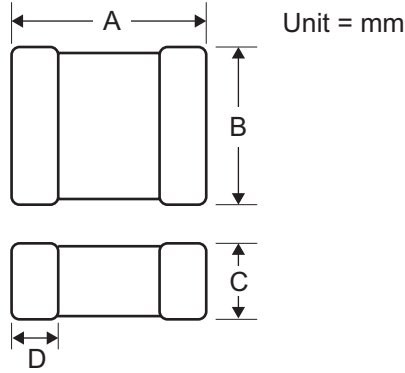


Recommended Soldering Profile (Lead free condition)

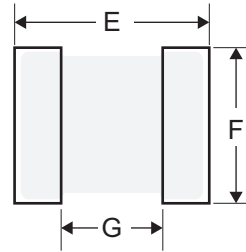
Product Characteristics

Lead Pull Strength	5N
Solderability	260°C, ≤10s (Reflow), Max 380°C, ≤5s (Soldering iron)
Soldering Heat Resistance	Max 260°C 10sec (Wave), Max Temperature: Max 380°C (Max 5sec)
Operating Temperature	-40°C ~ + 125°C
Climatic Category	-40°C ~ + 85°C/8 days
Stock Conditions	-10°C ~ + 40°C RH, ≤ 70%
Vibration Resistance	5 g's for 20 minutes, 12 cycles each of 3 orientations

Dimensions



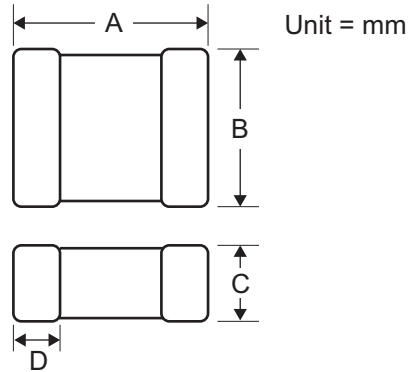
Recommended Footprint and Stencil Mask



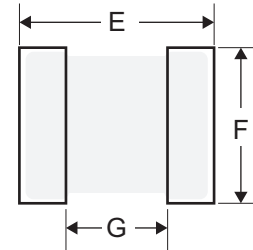
Stencil Mask T = 0.10mm

Part Number	A	B	C (max.)	D	E	F	G
LPWI160808SR24T	1.60±0.20	0.80±0.20	0.80	0.30±0.20	1.80+0.10	1.00+0.10	0.80±0.10
LPWI160808SR47T							
LPWI160808HR47T							
LPWI160808S1R0T							
LPWI160808H1R0T							
LPWI201208SR24T	2.00±0.20	1.20±0.20	0.80	0.50±0.30	2.40+0.10	1.45+0.10	0.80±0.10
LPWI201208SR47T							
LPWI201208HR47T							
LPWI201208SR68T							
LPWI201208S1R0T							
LPWI201208S1R5T							
LPWI201210SR47T	2.00±0.20	1.20±0.20	1.00	0.50±0.30	2.40+0.10	1.45+0.10	0.80±0.10
LPWI201210HR47T							
LPWI201210S1R0T							
LPWI201608LR24T	2.00±0.20	1.60±0.20	0.80	0.40±0.10	2.40+0.10	1.80+0.10	1.00±0.10
LPWI201608NR24T							
LPWI201608HR47T							
LPWI201608H1R0T							
LPWI201608S1R0T							
LPWI201608N1R5T							

Dimensions



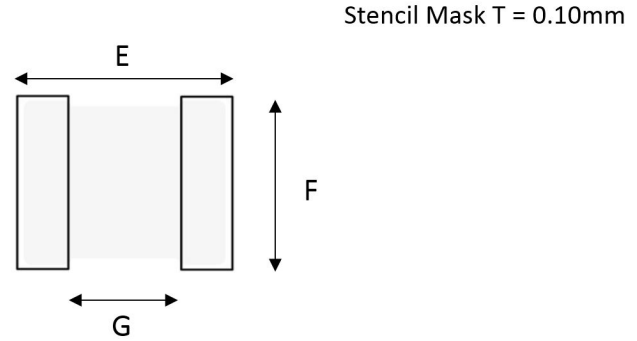
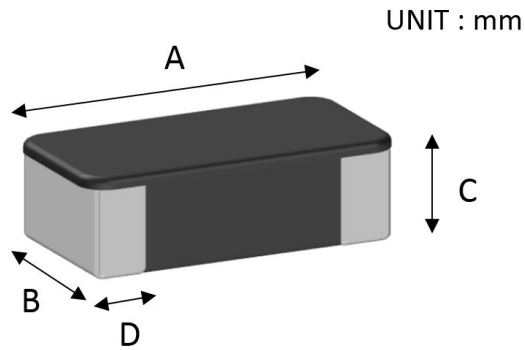
Recommended Footprint and Stencil Mask



Stencil Mask T = 0.10mm

Part Number	A	B	C (max.)	D	E	F	G
LPWI201610B1R0T	2.00±0.20	1.60±0.20	1.00	0.50±0.30	2.40+0.10	1.80+0.10	1.00±0.10
LPWI201610BR47T							
LPWI201610B2R2T							
LPWI201610SR47T	2.00±0.30	1.60±0.20	1.00	0.40±0.10	2.40+0.10	1.80+0.10	1.00±0.10
LPWI201610SR68T							
LPWI201610S1R0T							
LPWI201610S2R2T							
LPWI201610HR47T	2.00±0.30	1.60±0.10	1.00	0.40±0.10	2.40+0.10	1.70+0.10	1.30±0.10
LPWI201610H1R0T							
LPWI201610H1R5T							
LPWI201610H2R2T							
LPWI252010SR33T	2.50±0.20	2.00±0.20	1.00	0.50±0.30	2.80+0.10	2.20+0.10	1.20±0.10
LPWI252010BR47T							
LPWI252010SR47T							
LPWI252010HR47T							
LPWI252010NR68T							
LPWI252010B1R0T							
LPWI252010S1R0T							
LPWI252010H1R0T							
LPWI252010S1R5T							
LPWI252010B2R2T							
LPWI252010S2R2T							
LPWI252010H2R2T							
LPWI252010S3R3T							

Dimensions

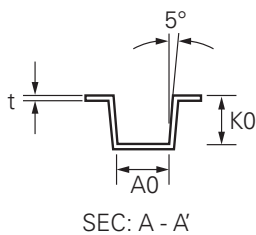
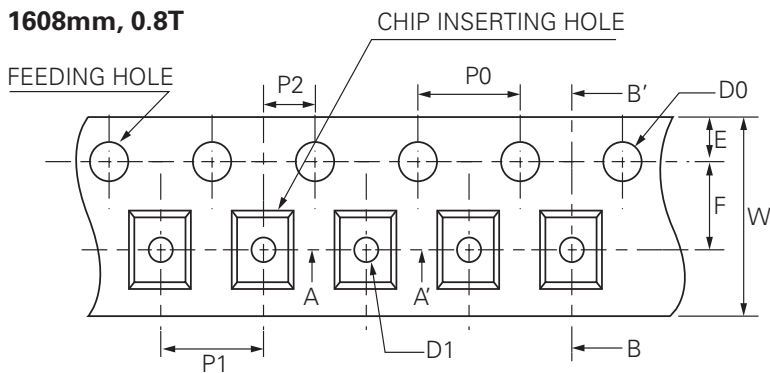


Part Number	A	B	C (max.) Include top cover	D	E	F	G
LPWI201610TR47T	2.00±0.20	1.60±0.20	1.00	0.50±0.30	2.40+0.10	1.80+0.10	1.00±0.10
LPWI201610TAR47T							
LPWI201610TBR47T							
LPWI201610T1R0T							
LPWI201610TA1R0T							
LPWI201610TB1R0T							

Special Notice: Above PNs have top cover; no ground

Carrier Tape Dimensions

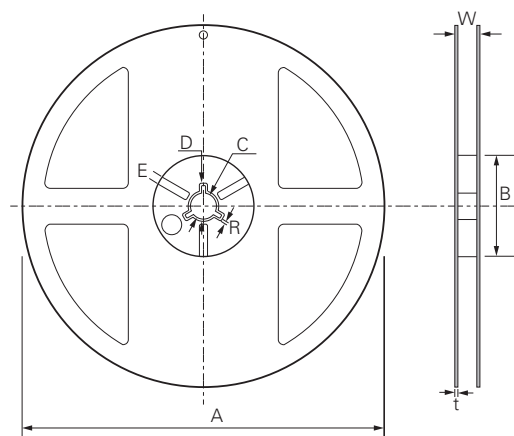
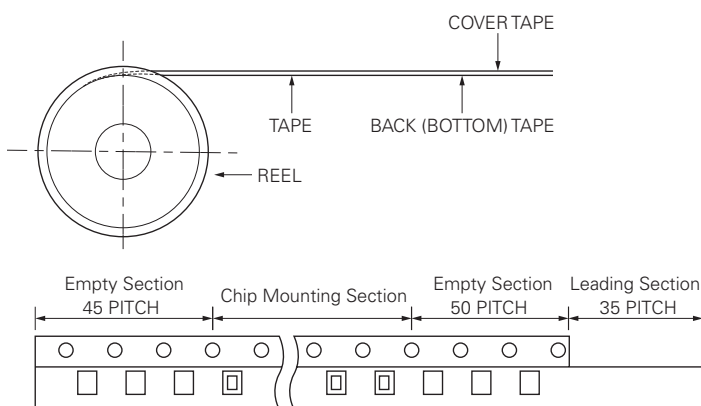
1608mm, 0.8T



Symbol	Dimensions
	Millimeters
A0	1.14±0.05
B0	1.95±0.05
W	8.00±0.10
F	3.50±0.05
E	1.75±0.05
P1	4.00±0.10
P2	2.00±0.05
P0	4.00±0.10
D0	1.55±0.03
t	0.22±0.05

Tape and Reel Dimensions

1608mm, 0.8T

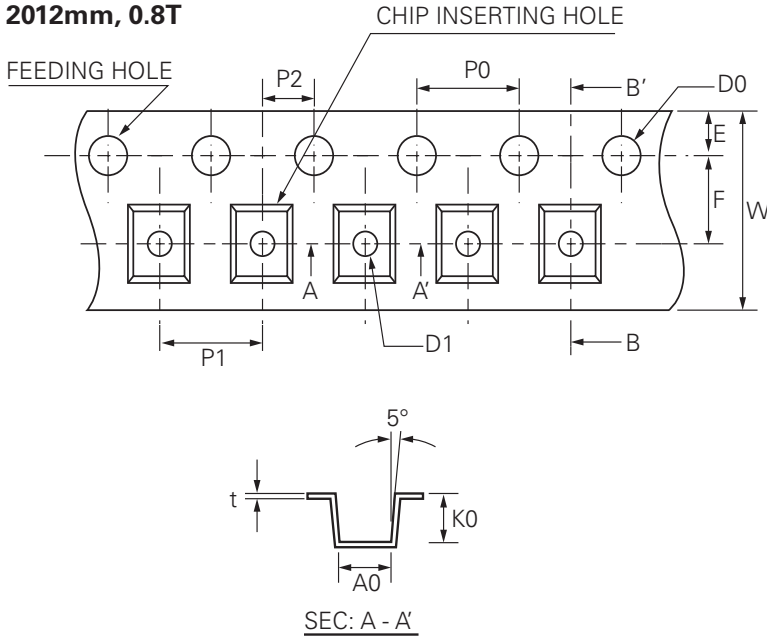


(1) Reel Materials: Polystyrene (2) Label (3) Taping
 - Standard Packing Quantity per Reel (Ø178)
 - PE Tape: 4,000pcs

Code	A	B	C	D	E	W	t	R
Dimension	Ø178±2	Min. Ø50	Ø13±0.5	Ø20±0.8	3.0±0.5	10±1.5	1.3±0.2	1.0±0.2

Carrier Tape Dimensions

2012mm, 0.8T

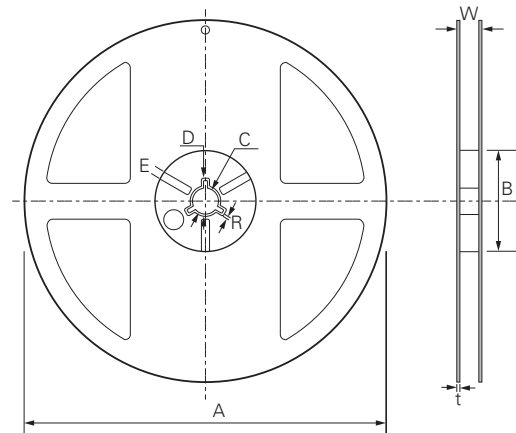
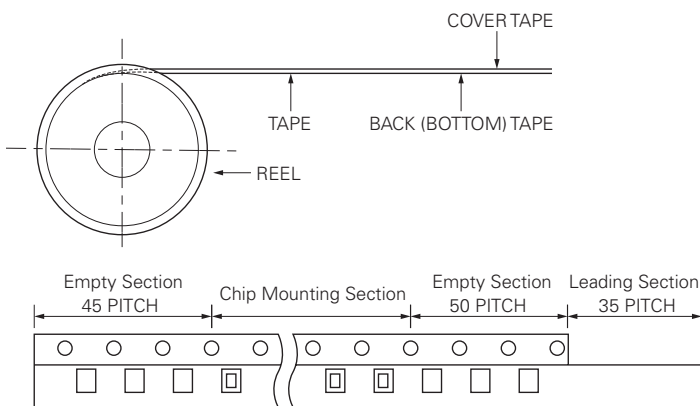


SEC: B - B'

Symbol	Dimensions
	Millimeters
A0	1.50±0.05
B0	2.35±0.05
K0	0.90±0.05
W	8.00±0.02
F	3.50±0.05
E	1.75±0.10
P1	4.00±0.10
P2	2.00±0.05
P0	4.00±0.05
D0	1.50+0.10 & -0
D1	1.00±0.05
t	0.25±0.05

Tape and Reel Dimensions

2012mm, 0.8T

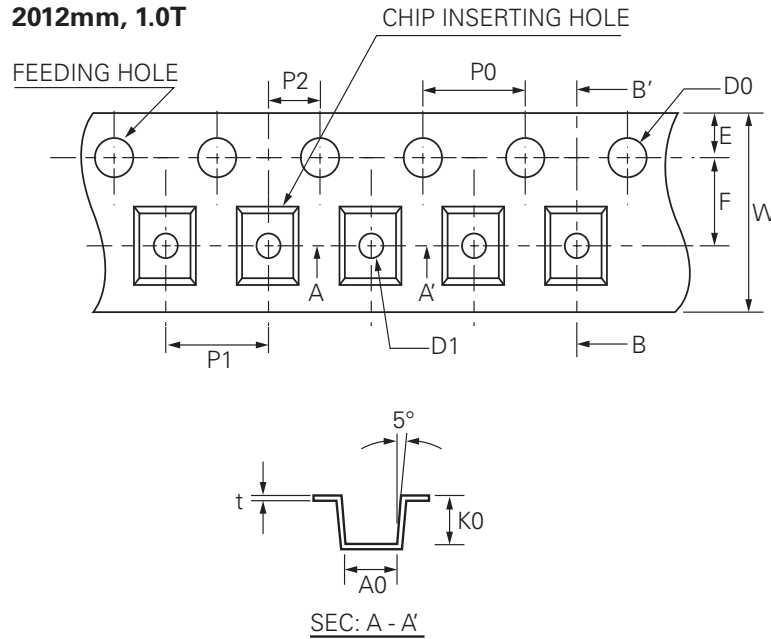


- (1) Reel Materials: Polystyrene (2) Label (3) Taping
- Standard Packing Quantity per Reel (Ø178)
- PE Tape: 3,000pcs

Code	A	B	C	D	E	W	t	R
Dimension	Ø178±2	Min. Ø50	Ø13±0.5	Ø20±0.8	3.0±0.5	10±1.5	1.3±0.2	1.0±0.2

Carrier Tape Dimensions

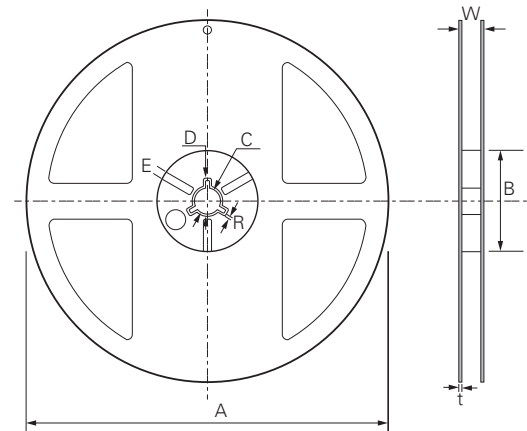
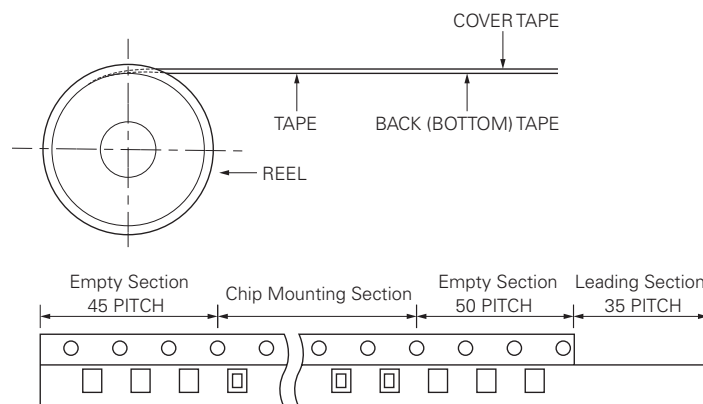
2012mm, 1.0T



Symbol	Dimensions
	Millimeters
A0	1.42±0.10
B0	2.35±0.05
K0	1.09±0.05
W	8.00±0.2
F	3.50±0.05
E	1.75±0.10
P1	4.00±0.10
P2	2.00±0.05
P0	4.00±0.05
D0	1.50+0.10 & -0
D1	1.00±0.10
t	0.22±0.05

Tape and Reel Dimensions

2012mm, 1.0T

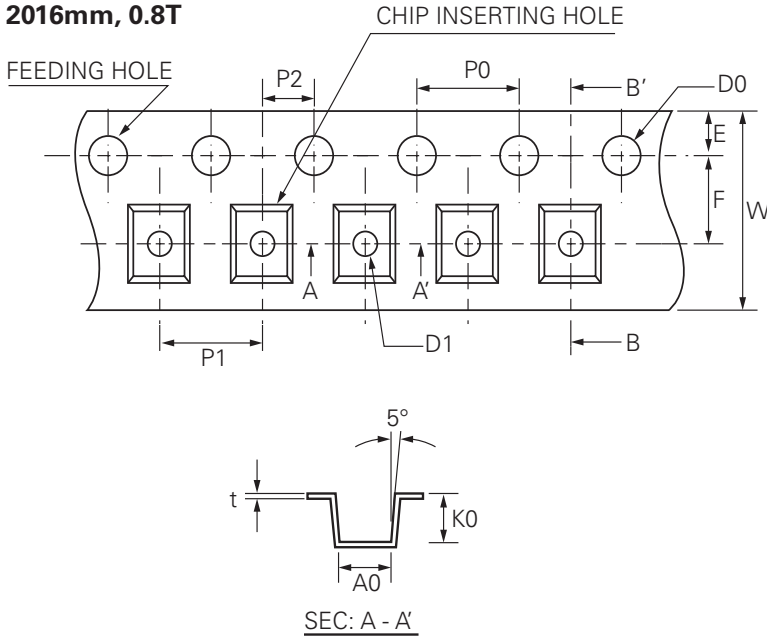


(1) Reel Materials: Polystyrene (2) Label (3) Taping
- Standard Packing Quantity per Reel (Ø178)
- PE Tape: 3,000pcs

Code	A	B	C	D	E	W	t	R
Dimension	Ø178±2	Min. Ø50	Ø13±0.5	Ø20±0.8	3.0±0.5	10±1.5	1.3±0.2	1.0±0.2

Carrier Tape Dimensions

2016mm, 0.8T

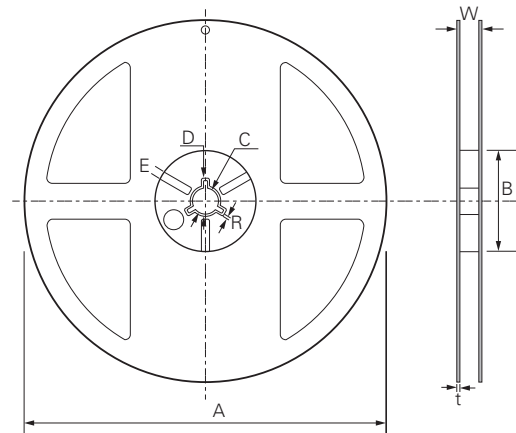
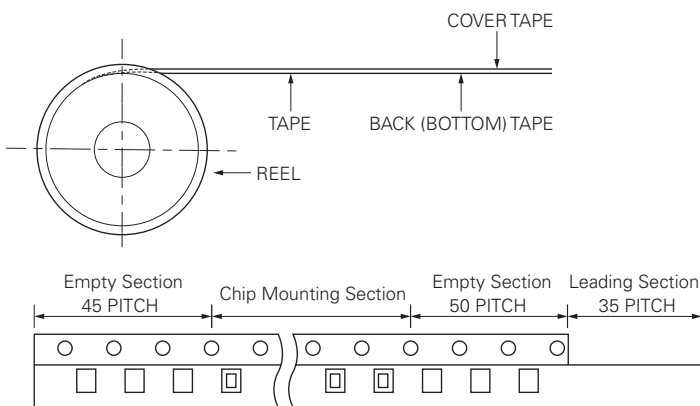


SEC: B - B'

Symbol	Dimensions
	Millimeters
A0	1.90±0.10
B0	2.35±0.10
K0	1.15±0.10
W	8.00±0.2
F	3.50±0.05
E	1.75±0.10
P1	4.00±0.10
P2	2.00±0.05
P0	4.00±0.05
D0	1.50+0.10 & -0
D1	1.00±0.10
t	0.22±0.05

Tape and Reel Dimensions

2016mm, 0.8T

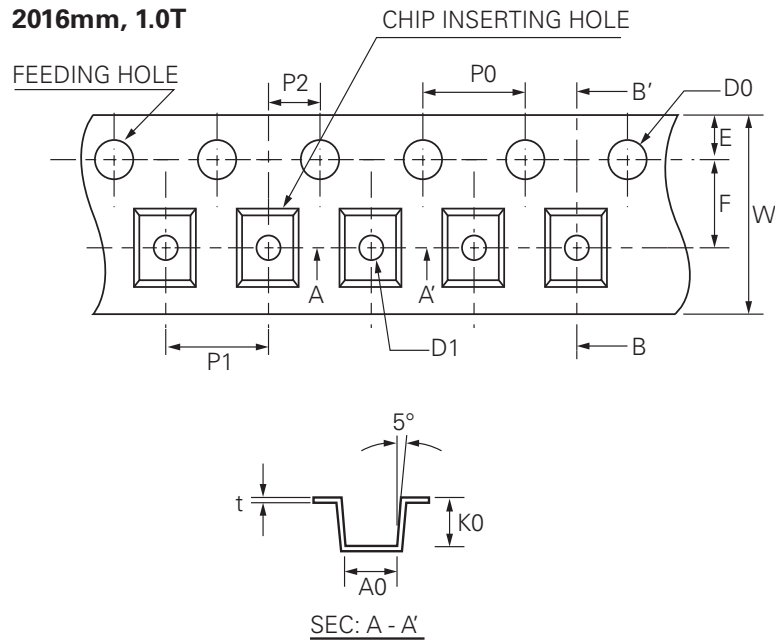


- (1) Reel Materials: Polystyrene (2) Label (3) Taping
- Standard Packing Quantity per Reel (Ø178)
- PE Tape: 3,000pcs

Code	A	B	C	D	E	W	t	R
Dimension	Ø178±2	Min. Ø50	Ø13±0.5	Ø21±0.8	2.0±0.5	10±1.5	0.8±0.2	1.0

Carrier Tape Dimensions

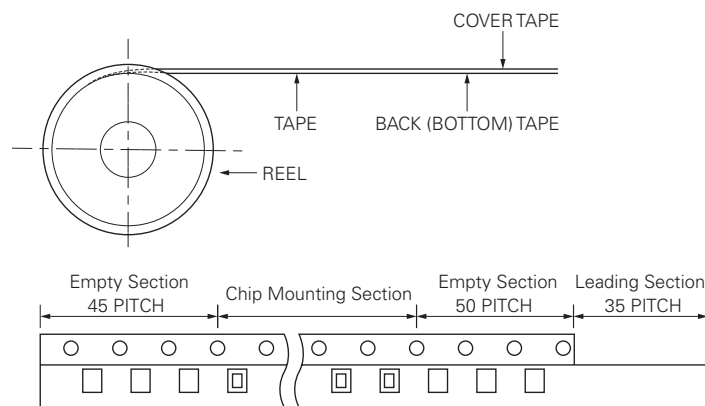
2016mm, 1.0T



Symbol	Dimensions
	Millimeters
A0	1.90±0.10
B0	2.35±0.10
K0	1.15±0.10
W	8.00±0.2
F	3.50±0.05
E	1.75±0.10
P1	4.00±0.10
P2	2.00±0.05
P0	4.00±0.05
D0	1.50+0.10 & -0
D1	1.00±0.10
t	0.22±0.05

Tape and Reel Dimensions

2016mm, 1.0T

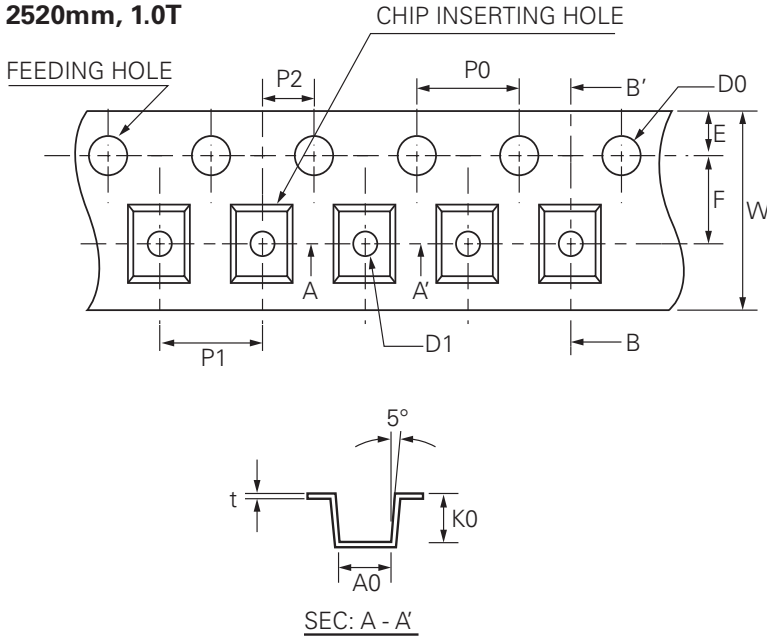


(1) Reel Materials: Polystyrene (2) Label (3) Taping
- Standard Packing Quantity per Reel (Ø178)
- PE Tape: 3,000pcs

Code	A	B	C	D	E	W	t	R
Dimension	Ø178±2	Min. Ø50	Ø13±0.5	Ø21±0.8	2.0±0.5	10±1.5	0.8±0.2	1.0

Carrier Tape Dimensions

2520mm, 1.0T

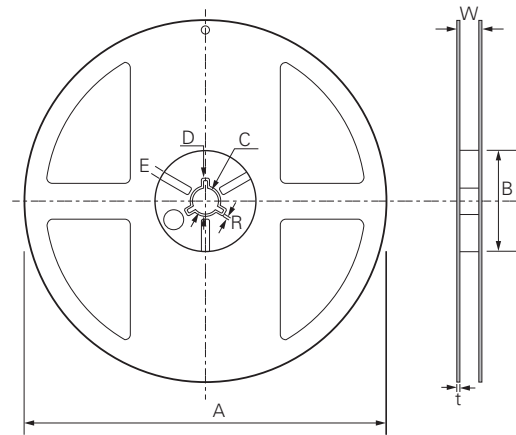
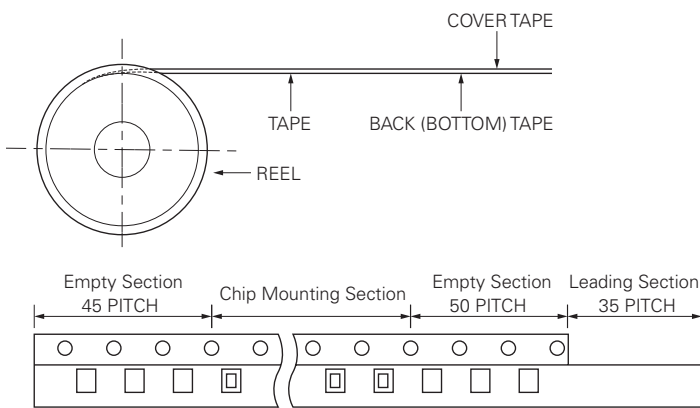


SEC: B - B'

Symbol	Dimensions
	Millimeters
A0	2.23±0.10
B0	2.74±0.10
K0	1.17±0.10
W	8.00±0.2
F	3.50±0.05
E	1.75±0.10
P1	4.00±0.10
P2	2.00±0.05
P0	4.00±0.05
D0	1.50+0.10 & -0
D1	1.00±0.10
t	0.22±0.05

Tape and Reel Dimensions

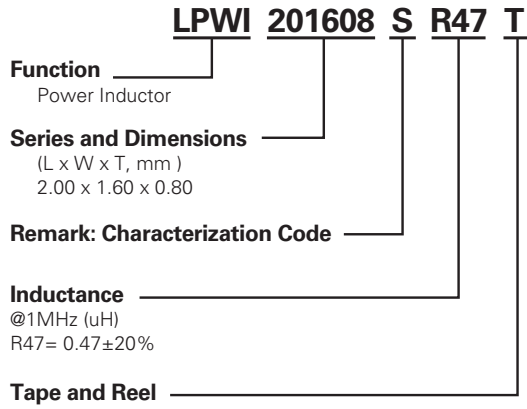
2520mm, 1.0T



- (1) Reel Materials: Polystyrene (2) Label (3) Taping
- Standard Packing Quantity per Reel (Ø178)
- PE Tape: 3,000pcs

Code	A	B	C	D	E	W	t	R
Dimension	Ø178±2	Min. Ø50	Ø13±0.5	Ø20±0.8	3.0±0.5	10±1.5	1.3±0.2	1.0±0.2

Part Numbering System



Packaging

Part Number	Packaging Option	Quantity
LPWI1608*****	Tape and Reel	4000
LPWI2012*****	Tape and Reel	3000
LPWI2016*****	Tape and Reel	3000
LPWI2520*****	Tape and Reel	3000

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