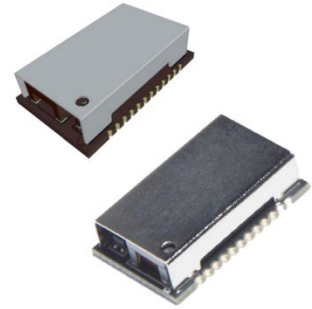


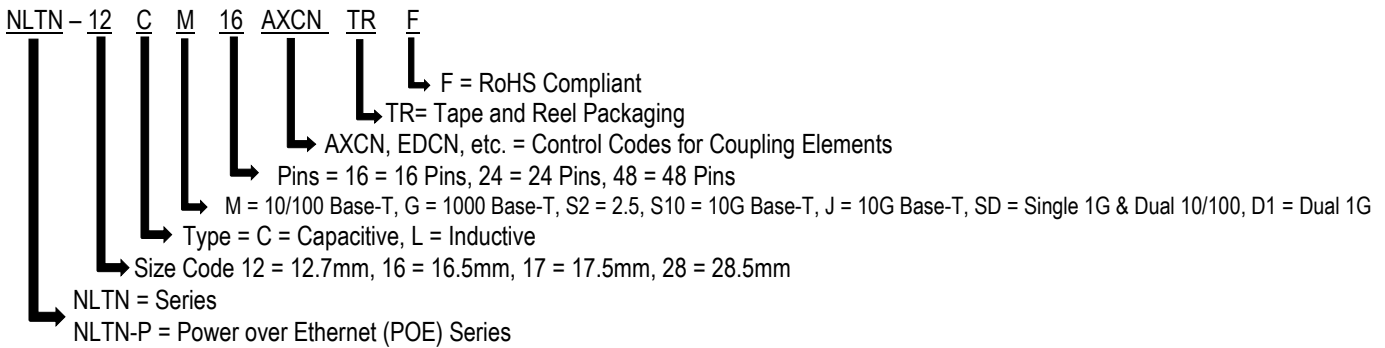
### FEATURES

- 10/100 Ethernet Applications
- Gigabit Ethernet Applications
- Single 1G Ethernet Applications
- Single 2.5G Ethernet Applications
- Single 10G Ethernet Applications
- Dual 1G Ethernet Applications
- IEC 61000-4-5 10/700us 4KV (CM)
- IEC 61000-4-5 10/700us 1KV (DM)
- Small SMT Packages
- Wide Temperature: 0°C to +85°C
- RoHS Compliant
- Taped And Reeled for Automatic Insertion



**RoHS Compliant**  
 includes all homogeneous materials  
 \* See Part Number System for Details

### Part Number Designations



### CHARACTERISTICS:

PN:	NLTN12CM16EDTRF
Application	10/100 Base-T, Single Port, Isolation Transformer
Type	Capacitive 1:1 ratio, 16 Pins
Operating Temperature Range	0°C to +85°C (including self-heating)
Schematic	

PN:	NLTN12LM16BXCNTRF
Application	10/100 Base-T, Single Port, Isolation Transformer, Low Profile
Type	Inductive 1:1 ratio, 16 Pins
Operating Temperature Range	0°C to +85°C (including self-heating)
Schematic	

PN:	NLTN-P12LM16ABCNTRF
Application	10/100 Base-T, Single Port, Isolation Transformer, 16 Pins, Low Profile
Type	Inductive, Power Over Ethernet (POE) 1:1 ratio, up to 15W, 16 Pins, Low Profile
Operating Temperature Range	0°C to +85°C (including self-heating)
Schematic	

PN:	NLTN16CM24EDCNTRF
Application	Dual 10/100 Base-T, 1G Single Port, Isolation Transformer
Type	Capacitive, 1:1 ratio, 24 Pins
Operating Temperature Range	0°C to +85°C (including self-heating)
Schematic	<p>The schematic shows a transformer with 24 pins. The RJ SIDE (left) has pins 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, and 24. The PHY SIDE (right) has pins 12, 11, 9, 8, 6, 5, 3, and 2. The transformer consists of four primary windings on the left and four secondary windings on the right. Each primary winding is connected to a secondary winding through a transformer core. The secondary windings are connected to the PHY SIDE pins. The transformer is shown with a ground symbol at the bottom left.</p>

PN:	NLTN16LM24BXCNTRF
Application	Dual 10/100 Base-T, 1G Single Port, Isolation Transformer
Type	Inductive 1:1 ratio, 24 Pins, Low Profile
Operating Temperature Range	0°C to +85°C (including self-heating)
Schematic	<p>The schematic shows a transformer with 24 pins. The PHY SIDE (left) has pins 1, 2, 3, 4, 5, and 6. The RJ SIDE (right) has pins 18, 17, 16, 15, 14, and 13. The transformer consists of four primary windings on the left and four secondary windings on the right. Each primary winding is connected to a secondary winding through a transformer core. The secondary windings are connected to the RJ SIDE pins. The transformer is shown with a ground symbol at the bottom left.</p>

PN:	<b>NLTN-P16LG24APCNTRF</b>
Application	1000 Base-T (1G) Single Port, Isolation Transformer, Low Profile
Type	<b>Inductive, Power Over Ethernet (POE)</b> 1:1 ratio, up to 15W, 24 Pins, Low Profile
Operating Temperature Range	0°C to +85°C (including self-heating)
Schematic	<p>The schematic diagram shows the internal wiring of the transformer. On the left, the PHY side has pins 1 through 6. On the right, the RJ side has pins 13 through 18. The center shows the internal connections between the PHY and RJ sides, including pins 7 through 12. The connections are as follows:</p> <ul style="list-style-type: none"> <li>PHY 1 (TCT1) connects to RJ 18 (MCT3)</li> <li>PHY 2 (TD1+) connects to RJ 17 (MX3+)</li> <li>PHY 3 (TD1-) connects to RJ 16 (MX3-)</li> <li>PHY 4 (TCT2) connects to RJ 15 (MCT4)</li> <li>PHY 5 (TD2+) connects to RJ 14 (MX4+)</li> <li>PHY 6 (TD2-) connects to RJ 13 (MX4-)</li> <li>PHY 7 (TCT3) connects to PHY 1</li> <li>PHY 8 (TD3+) connects to PHY 2</li> <li>PHY 9 (TD3-) connects to PHY 3</li> <li>PHY 10 (TCT4) connects to PHY 4</li> <li>PHY 11 (TD4+) connects to PHY 5</li> <li>PHY 12 (TD4-) connects to PHY 6</li> <li>PHY 13 (MCT1) connects to PHY 7</li> <li>PHY 14 (MX1+) connects to PHY 8</li> <li>PHY 15 (MX1-) connects to PHY 9</li> <li>PHY 16 (MCT2) connects to PHY 10</li> <li>PHY 17 (MX2+) connects to PHY 11</li> <li>PHY 18 (MX2-) connects to PHY 12</li> </ul>

PN:	<b>NLTN-P16LG24ABCNTRF</b>
Application	1000 Base-T (1G) Single Port, Isolation Transformer, Low Profile
Type	<b>Inductive, Power Over Ethernet (POE)</b> 1:1 ratio, up to 30W, 24 Pins, Low Profile
Operating Temperature Range	0°C to +85°C (including self-heating)
Schematic	<p>The schematic diagram shows the internal wiring of the transformer. On the left, the PHY side has pins 1 through 6. On the right, the RJ side has pins 13 through 18. The center shows the internal connections between the PHY and RJ sides, including pins 7 through 12. The connections are as follows:</p> <ul style="list-style-type: none"> <li>PHY 1 (TCT1) connects to RJ 18 (MCT3)</li> <li>PHY 2 (TD1+) connects to RJ 17 (MX3+)</li> <li>PHY 3 (TD1-) connects to RJ 16 (MX3-)</li> <li>PHY 4 (TCT2) connects to RJ 15 (MCT4)</li> <li>PHY 5 (TD2+) connects to RJ 14 (MX4+)</li> <li>PHY 6 (TD2-) connects to RJ 13 (MX4-)</li> <li>PHY 7 (TCT3) connects to PHY 1</li> <li>PHY 8 (TD3+) connects to PHY 2</li> <li>PHY 9 (TD3-) connects to PHY 3</li> <li>PHY 10 (TCT4) connects to PHY 4</li> <li>PHY 11 (TD4+) connects to PHY 5</li> <li>PHY 12 (TD4-) connects to PHY 6</li> <li>PHY 13 (MCT1) connects to PHY 7</li> <li>PHY 14 (MX1+) connects to PHY 8</li> <li>PHY 15 (MX1-) connects to PHY 9</li> <li>PHY 16 (MCT2) connects to PHY 10</li> <li>PHY 17 (MX2+) connects to PHY 11</li> <li>PHY 18 (MX2-) connects to PHY 12</li> </ul>

PN:	NLTN16LS224AGCGTRF
Application	Single 2.5G, Single Port, Isolation Transformer
Type	Inductive, 1:1 ratio, 24 Pins
Operating Temperature Range	0°C to +85°C (including self-heating)
Schematic	<p>The schematic diagram shows a transformer with 24 pins. The PHY SIDE (left) has pins: TCT1 1, TD1+ 2, TD1- 3, TCT2 4, TD2+ 5, and TD2- 6. The center has pins: 24 MCT1, 23 MX1+, 22 MX1-, 21 MCT2, 20 MX2+, 19 MX2-, and 18 MCT3. The RJ SIDE (right) has pins: TCT3 7, TD3+ 8, TD3- 9, TCT4 10, TD4+ 11, TD4- 12, 17 MX3+, 16 MX3-, 15 MCT4, 14 MX4+, and 13 MX4-.</p>

PN:	NLTN16LS1024ASCGTRF
Application	Single 10G, Single Port, Isolation Transformer
Type	Inductive, 1:1 ratio, 24 Pins
Operating Temperature Range	0°C to +85°C (including self-heating)
Schematic	<p>The schematic diagram shows a transformer with 24 pins. The PHY SIDE (left) has pins: TCT1 1, TD1+ 2, TD1- 3, TCT2 4, TD2+ 5, and TD2- 6. The center has pins: 24 MCT1, 23 MX1+, 22 MX1-, 21 MCT2, 20 MX2+, 19 MX2-, and 18 MCT3. The RJ SIDE (right) has pins: TCT3 7, TD3+ 8, TD3- 9, TCT4 10, TD4+ 11, TD4- 12, 17 MX3+, 16 MX3-, 15 MCT4, 14 MX4+, and 13 MX4-.</p>

PN:	<b>NLTN17CM24EDCNTRF</b>
Application	10/100 Base-T Dual port or 1G Single port.
Type	<b>Capacitive</b> 1:1 ratio, 24 Pins
Operating Temperature Range	0°C to +85°C (including self-heating)
Schematic	

PN:	<b>NLTN17LM24BXCNTRF</b>
Application	10/100 Base-T Dual port or 1G Single port.
Type	<b>Inductive</b> 1:1 ratio, 24 Pins, Low Profile
Operating Temperature Range	0°C to +85°C (including self-heating)
Schematic	

<b>PN:</b> NLTN28LD148BXCNTRF	
<b>Application</b>	Dual 1G, Single Port, Isolation Transformer
<b>Type</b>	Inductive, 1:1 ratio, 48 Pins
<b>Operating Temperature Range</b>	0°C to +85°C (including self-heating)
Schematic	<p>The schematic diagram illustrates the internal structure of the NLTN28LD148BXCNTRF transformer, which consists of four primary-secondary transformer pairs. Each pair is labeled with a 1CT:1CT ratio. The primary windings are connected to the PHY SIDE pins, and the secondary windings are connected to the RJ SIDE pins. The connections are as follows:</p> <ul style="list-style-type: none"> <li><b>PHY SIDE (Left):</b> <ul style="list-style-type: none"> <li>TC1 1, TD1+ 2, TD1- 3, TC2 4, TD2+ 5, TD2- 6, TC3 7, TD3+ 8, TD3- 9, TC4 10, TD4+ 11, TD4- 12</li> </ul> </li> <li><b>PHY SIDE (Right):</b> <ul style="list-style-type: none"> <li>TC75 13, TD5+ 14, TD5- 15, TC76 16, TD6+ 17, TD6- 18, TC77 19, TD7+ 20, TD7- 21, TC78 22, TD8+ 23, TD8- 24</li> </ul> </li> <li><b>RJ SIDE (Left):</b> <ul style="list-style-type: none"> <li>48 MCT1, 47 MX1+, 46 MX1-, 45 MCT2, 44 MX2+, 43 MX2-, 42 MCT3, 41 MX3+, 40 MX3-, 39 MCT4, 38 MX4+, 37 MX4-</li> </ul> </li> <li><b>RJ SIDE (Right):</b> <ul style="list-style-type: none"> <li>36 MCT5, 35 MX5+, 34 MX5-, 33 MCT6, 32 MX6+, 31 MX6-, 30 MCT7, 29 MX7+, 28 MX7-, 27 MCT8, 26 MX8+, 25 MX8-</li> </ul> </li> </ul>

## Typical Performance Characteristics

Part Number	Insertion Loss (dB Max)	Return Loss (dB min)			Differential Mode to Common Mode Rejection (DCMR) (dB min)		
		30Mhz	60Mhz	100Mhz	30Mhz	60Mhz	100Mhz
	1 to 100Mhz						
NLTN12CM16EDCNTRF	-1.0	-20	-15	-10	-25	-25	-25
NLTN12LM16BXCNTRF	-1.0	-20	-15	-10	-25	-25	-25
NLTN16CM24EDCNTRF	-1.0	-20	-15	-10	-25	-25	-25
NLTN16LM24BXCNTRF	-1.0	-20	-15	-10	-25	-25	-25
NLTN17CM24EDCNTRF	-1.0	-20	-15	-10	-25	-25	-25
NLTN17LM24BXCNTRF	-1.0	-20	-15	-10	-25	-25	-25
NLTN28LD148BXCNTRF	-1.0	-20	-15	-10	-25	-25	-25

Part Number	Insertion Loss (dB Max)	Return Loss (dB min)				Differential Mode to Common Mode Rejection (DCMR) (dB min)	
		1~30Mhz	30~60Mhz	60~80Mhz	80~100Mhz	1~60Mhz	60~100Mhz
	1 to 100Mhz						
NLTN-P12LM16APCNTRF	-1.1	-20	-18	-14	-12	-35	-30

Part Number	Insertion Loss (dB Max)	Return Loss (dB min)					Differential Mode to Common Mode Rejection (DCMR) (dB min)	
		1~30Mhz	40Mhz	50Mhz	60~80Mhz	100Mhz	1~60Mhz	60~100Mhz
	1 to 100Mhz							
NLTN-P16LG24APCNTRF	-1.1	-18	-14.4	-13.1	-12	-10	-35	-30
NLTN-P16LG24ABCNTRF	-1.1	-18	-14.4	-13.1	-12	-10	-35	-30

Part Number	Insertion Loss (dB Max)	Return Loss (dB min)		Differential Mode to Common Mode Rejection (DCMR) (dB min)	
		1~40MHz	40~500MHz	1 ~ 250MHz	250 ~ 250MHz
	1 to 250MHz				
NLTN16LS224AGCGTRF	-3.0	-16	-5	-30	-22

Part Number	Insertion Loss (dB Max)	Return Loss (dB min)		Differential Mode to Common Mode Rejection (DCMR) (dB min)	
		1~40MHz	40~500MHz	1 ~ 250MHz	250 ~ 500MHz
	1 to 500MHz				
NLTN16LS1024ASCGTRF	-3.0	-16	-5	-22	-18



## Typical Performance Characteristics Continued

Part Number	OCL (uH Min) @100KHz/0.1V with 8mA DC Bias	Cross Talk (db min)	Inductance Pins	Input-Output Isolation	Resistance to Solder Heat
NLTN12CM16AXCNTRF	200	-35	1-3, 6-8, 9-11, 14-16	N/A	+260°C for 10 seconds
NLTN12LM16BXCNTRF	350	-38	1-3, 6-8, 9-11, 14-16	1500VAC/60s	+260°C for 10 seconds
NLTN-P12LM16APCNTRF	90	-38	1-3, 6-8, 9-11, 14-16	1500VAC/60s	+260°C for 10 seconds
NLTN16CM24EDCNTRF	200	-35	2-3, 5-6, 8-9, 11-12, 13-14, 16- 17, 19-20, 22-23	N/A	+260°C for 10 seconds
NLTN16LM24AXCNTRF	350	-35	2-3, 5-6, 8-9, 11-12, 13-14, 16- 17, 19-20, 22-23	1500VAC/60s	+260°C for 10 seconds
NLTN-P16LG24APCNTRF	90	-35	2-3, 5-6, 8-9, 11-12, 13-14, 16- 17, 19-20, 22-23	1500VAC/60s	+260°C for 10 seconds
NLTN-P16LG24ABCNTRF	90	-35	2-3, 5-6, 8-9, 11-12, 13-14, 16- 17, 19-20, 22-23	1500VAC/60s	+260°C for 10 seconds
NLTN16LS224AGCGTRF	120	-35	2-3, 5-6, 8-9, 11-12, 13-14, 16- 17, 19-20, 22-23	1500VAC/60s	+260°C for 10 seconds
NLTN16LS1024ASCGTRF	120	-30	2-3, 5-6, 8-9, 11-12, 13-14, 16- 17, 19-20, 22-23	1500VAC/60s	+260°C for 10 seconds
NLTN17CM24EDCNTRF	200	-35	2-3, 5-6, 8-9, 11-12, 13-14, 16- 17, 19-20, 22-23	N/A	+260°C for 10 seconds
NLTN17LM24BXCNTRF	350	-35	2-3, 5-6, 8-9, 11-12, 13-14, 16- 17, 19-20, 22-23	1500VAC/60s	+260°C for 10 seconds
NLTN28LD148BXCNTRF	350	-35	2-3, 5-6, 8-9, 11-12, 14-15, 17- 18, 20-21, 23-24, 25-26, 28- 29, 31-32, 34-35, 37-38, 40- 41, 43-44, 46-47	1500VAC/60s	+260°C for 10 seconds

DIMENSIONS: (mm)

Series	Figure	A	B	C	D	E	F	A'	B'	C'
NLTN12	1	12.7 ±0.25	8.87 ±0.25	4.0 ±0.25	0.6 ±0.25	1.27 ±0.25	1.0 ±0.25	8.87 ±0.25	7.2 ±0.25	0.8 ±0.05
NLTN-P12	2	12.7 ±0.25	8.67 ±0.25	4.0 ±0.25	0.6 ±0.25	1.27 ±0.25	1.0 ±0.25	8.89 ±0.25	7.2 ±0.25	0.8 ±0.05
NLTN16	3	16.5 ± 0.2	10.0 ± 0.2	4.15 ± 0.2	6.75 ± 0.2	4.75 ± 0.2	3.75 ± 0.2	15.99 ± 0.2	9.5 ± 0.2	0.8 ± 0.2
NLTN-P16	4	16.5 ± 0.25	10.3 ± 0.25	4.1 ± 0.25	6.75 ± 0.25	4.75 ± 0.25	3.75 ± 0.25	16.0 ± 0.25	9.65 ± 0.25	0.8 ± 0.05
NLTN16_LS	5	16.5 ± 0.25	10.3 ± 0.25	4.1 ± 0.25	6.75 ± 0.25	4.75 ± 0.25	3.75 ± 0.25	16.0 ± 0.25	9.65 ± 0.25	0.8 ± 0.05
NLTN17	6	17.5 ± 0.2	14.6 ± 0.2	4.5 ± 0.2	6.86 ± 0.2	4.32 ± 0.2	3.05 ± 0.2	17.03 ± 0.2	13.92 ± 0.2	1.0 ± 0.2
NLTN28	7	28.58 ± 0.25	14.6 ± 0.25	5.0 Max	6.64 ± 0.25	4.6 ± 0.25	3.58 ± 0.25	28.08 ± 0.25	13.99 ± 0.25	1.2 ± 0.25

Figure 1

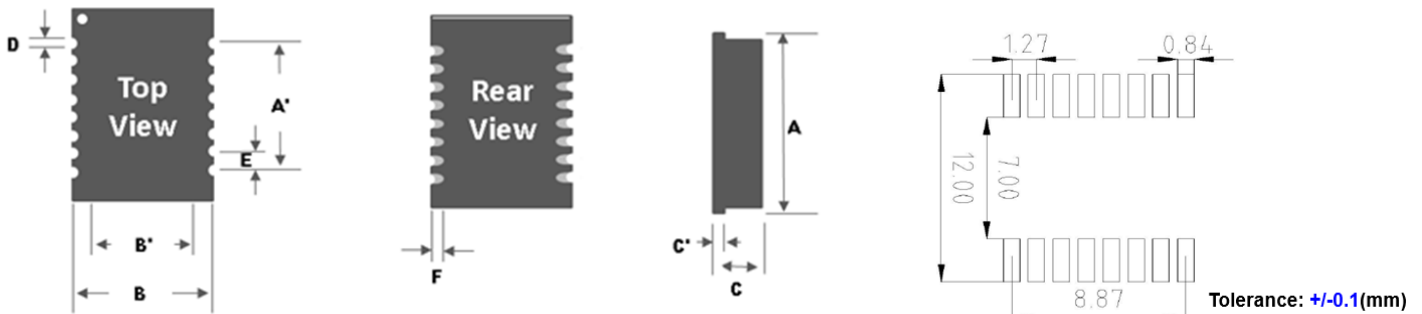


Figure 2

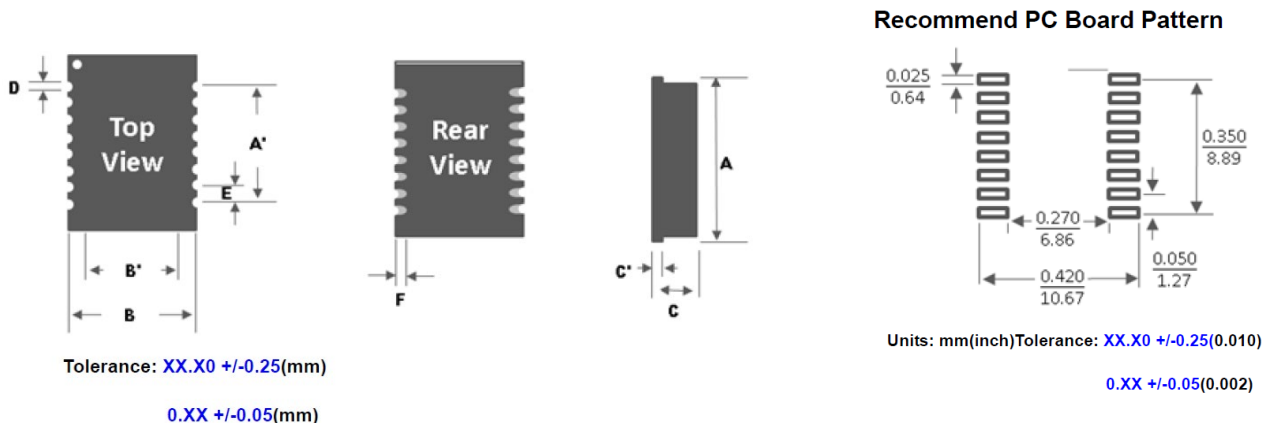


Figure 3

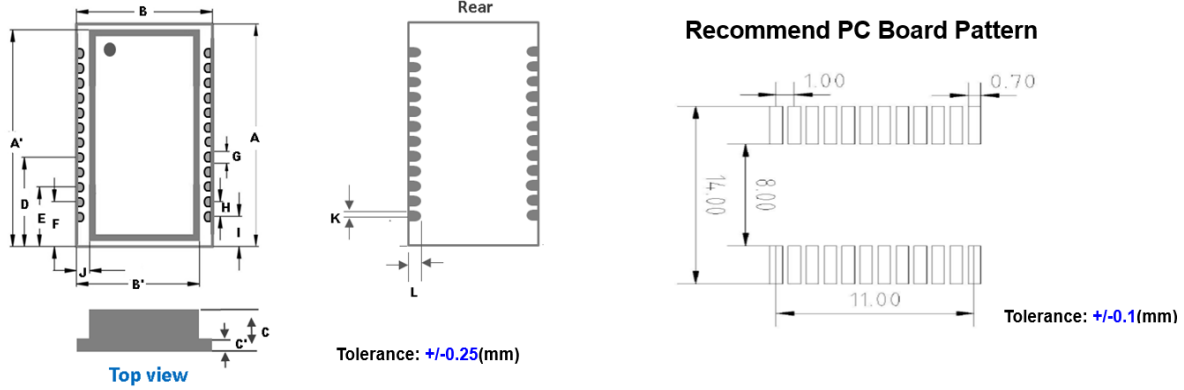


Figure 4

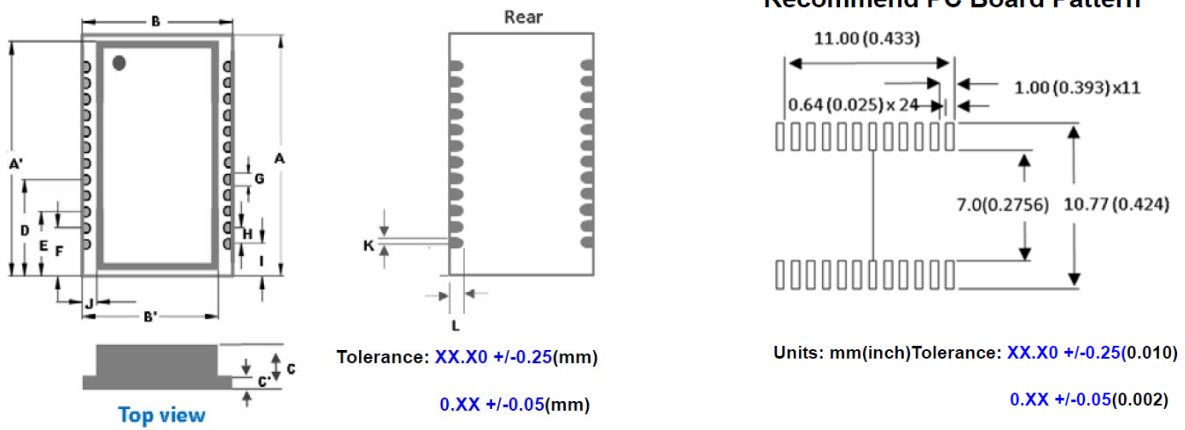


Figure 5

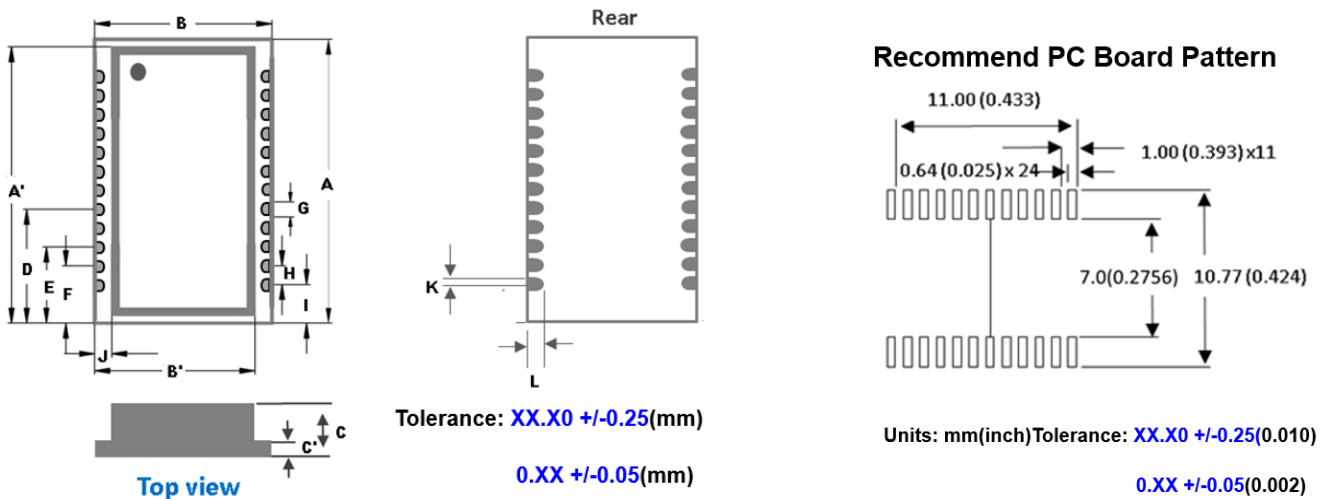
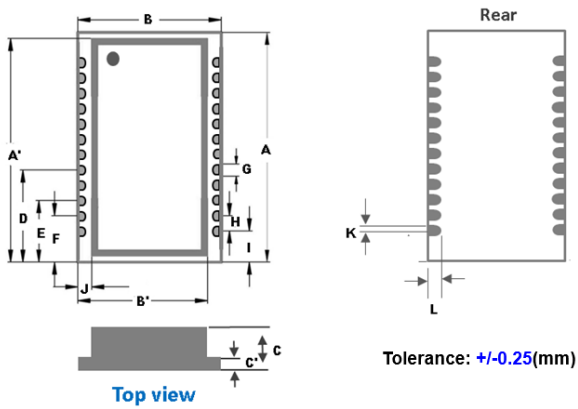
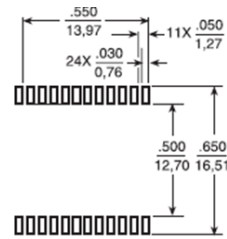


Figure 6

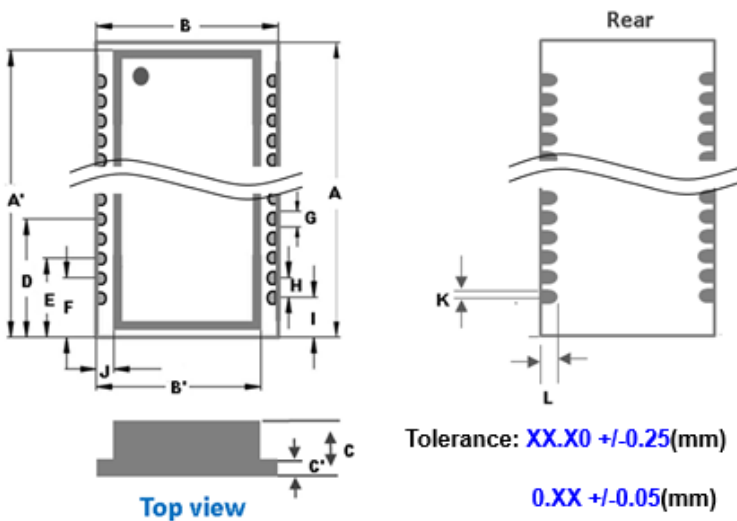


### Recommend PC Board Pattern

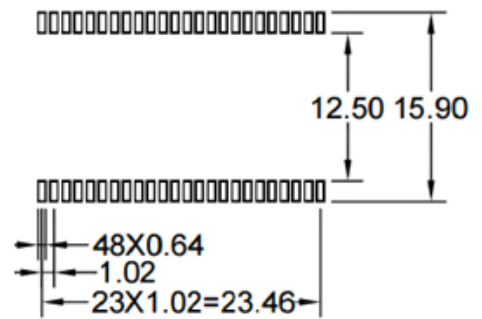


Units: mm (inch) Tolerance: XX.X0 +/-0.25 (0.010)  
0.XX +/-0.05 (0.002)

Figure 7



### Recommend PC Board Pattern

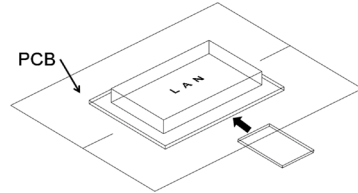


Units: mm(inch) Tolerance:  $\pm 0.25(0.010)$

$0.XX \pm 0.05(0.002)$

Reliability Tests										
Item	Performance	Test Condition – Method - Equipment								
Insertion Loss	See Performance Characteristics	Agilent E5071C								
Return Loss										
Cross talk										
DCMR										
Operating Temperature	0°C~+85°C (Including self-heating)									
Storage Temperature	0°C~+85°C (components mounted to PCB assemblies; not taped)									
Life Test		Preconditioning: Run through IR reflow for 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) Temperature : 85 ±2°C Duration : 1000±12hrs Measured at room temperature after placing for 24±2 hrs								
Humidity Resistance Test	Appearance : No damage. Insertion Loss : within spec. Return Loss : within spec.	Preconditioning: Run through IR reflow for 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) Humidity : 85±2 % R.H, Temperature : 85°C±2°C Duration : 1000hrs Min. Bead: with 100% rated current. Inductance: with 10% rated current. Measured at room temperature after placing for 24±2 hrs								
Thermal shock Test	Appearance : No damage. Insertion Loss : within spec. Return Loss : within spec.	Preconditioning: Run through IR reflow for 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) Step1 : 0 ±2°C 30±5min Step2 : 85 ±2°C ≤0.5min Step3 : 85 ±2°C 30±5min Number of cycles : 500 Measured at room temperature after placing for 24±2 hrs								
Vibration Test		Preconditioning: Run through IR reflow for 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) Oscillation Frequency: 10Hz~2KHz~10Hz for 20 minutes Equipment : Vibration checker Total Amplitude:10g Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations)								
Solderability Test	More than 95% of bottom terminal electrode should be covered with solder.	a. Method B, 4 hrs @155°C dry heat @235°C±5°C Test time:5 +0/-0.5 seconds.  b. Method D category 3. (steam aging 8hours ± 15 min)@ 260°C±5°C Test time: 30 +0/-0.5 seconds.								
Resistance To Solder Heat Test	Appearance : No damage.	Depth: completely cover bottom of the termination <table border="1"> <thead> <tr> <th>Temperature(°C)</th> <th>Time(s)</th> <th>Temperature ramp/immersion and emersion rate</th> <th>Number of heat cycles</th> </tr> </thead> <tbody> <tr> <td>260 ±5 (Solder Temp)</td> <td>10 ±1</td> <td>25mm/s ±6 mm/s</td> <td>1</td> </tr> </tbody> </table>	Temperature(°C)	Time(s)	Temperature ramp/immersion and emersion rate	Number of heat cycles	260 ±5 (Solder Temp)	10 ±1	25mm/s ±6 mm/s	1
Temperature(°C)	Time(s)	Temperature ramp/immersion and emersion rate	Number of heat cycles							
260 ±5 (Solder Temp)	10 ±1	25mm/s ±6 mm/s	1							

	Series No.	2(Kg)	With the component mounted on a PCB with the device to be tested, apply a force to the side of a device being tested. This force shall be applied for 60 +1 seconds. Also the force shall be applied gradually as not to apply a shock to the component being tested.
	LAN	1.0(min.)	



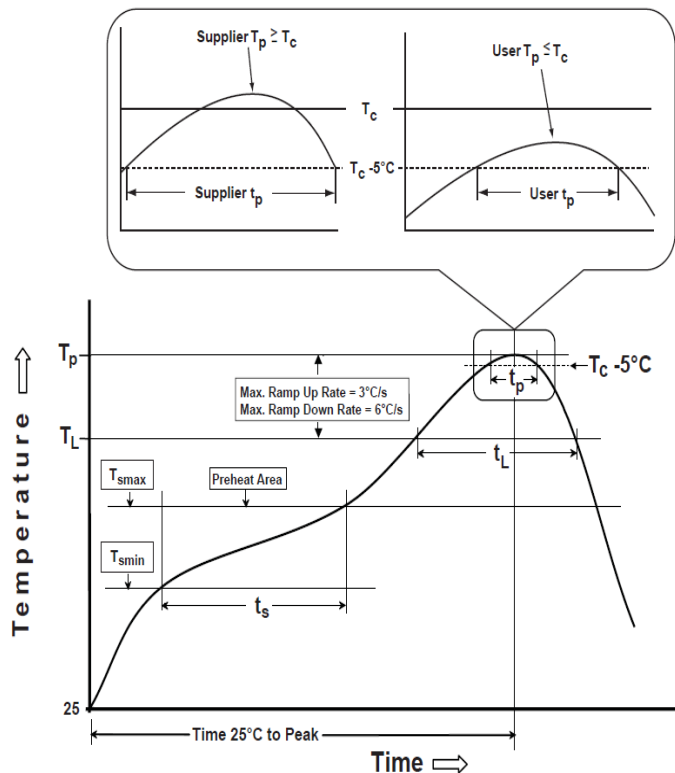
## Soldering

MSL Level: Level 1

**Soldering Reflow:** Recommended temperature profiles for lead-free reflow soldering; Figure 8.

**Peak Temperature ( $T_p$ ):** +260°C for 10 seconds maximum

Figure.8 - Soldering Reflow / Reflow per IPC/JEDEC J-STD-020E

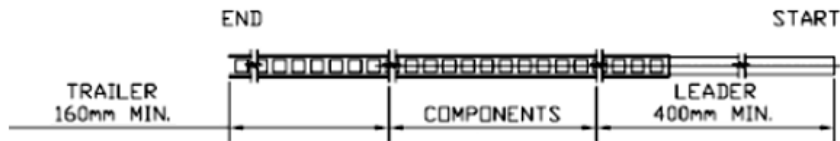


Reflow Cycles: 3 times max

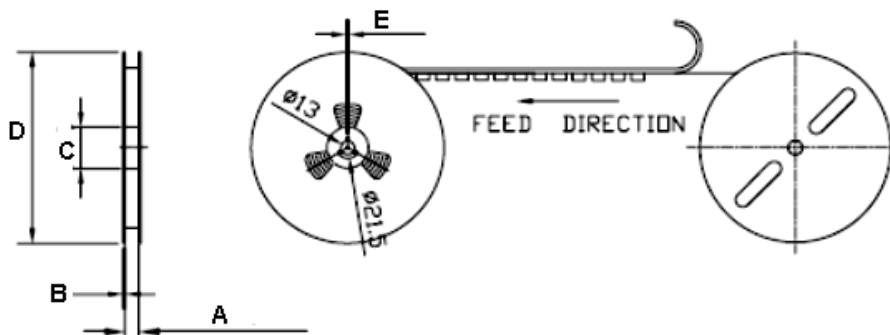
Profile Type:	Pb-Free Assembly
Preheat -Temperature Min( $T_{smin}$ ) -Temperature Max( $T_{smax}$ ) -Time( $t_s$ )from( $T_{smin}$ to $T_{smax}$ )	150°C 200°C 60-120seconds
Ramp-up rate( $T_L$ to $T_p$ )	3°C/second max.
Liquidus temperature( $T_L$ ) Time( $t_L$ )maintained above $T_L$	217°C 60-150 seconds
Classification temperature( $T_c$ )	See Table (1.2)
Time( $t_p$ ) at $T_c - 5^\circ\text{C}$ ( $T_p$ should be equal to or less than $T_c$ .)	< 30 seconds
Ramp-down rate( $T_p$ to $T_L$ )	6°C /second max.
Time 25°C to peak temperature	8 minutes max.

## PACKAGING:

### Packaging Information



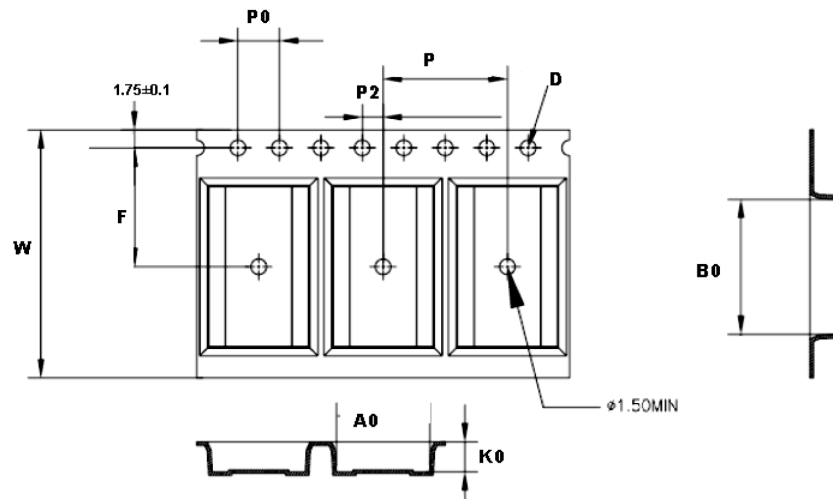
### (1) Reel Dimensions



PN	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)
NLTN12CM16EDCNTRF	24.4±2.0	2.1±0.15	φ100	φ330±2	2.5
NLTN12LM16BXCNTRF	24.4±2.0	2.1±0.15	φ100	φ330±2	2.5
NLTN-P12LM16APCNTRF	24.4±2.0	2.1±0.15	φ100	φ330±2	2.5
NLTN16CM24EDCNTRF	33.5±2.0	2.0±0.15	φ100	φ330±2	2.5
NLTN16LM24BXCNTRF	33.5±2.0	2.0±0.15	φ100	φ330±2	2.5
NLTN-P16LG24APCNTRF	33.5±2.0	2.0±0.15	φ100	φ330±2	2.5
NLTN-P16LG24ABCNTRF	33.5±2.0	2.0±0.15	φ100	φ330±2	2.5
NLTN16LS224AGCGTRF	33.5±2.0	2.0±0.15	φ100	φ330±2	2.5
NLTN16LS1024ASCGRF	33.5±2.0	2.0±0.15	φ100	φ330±2	2.5
NLTN17CM24EDCNTRF	33.5±2.0	2.0±0.15	φ100	φ330±2	2.5
NLTN17LM24BXCNTRF	33.5±2.0	2.0±0.15	φ100	φ330±2	2.5
NLTN28LD148BXCNTRF	45.5±2.0	2.0±0.15	φ100	φ330±2	2.5



## (2) Tape Dimension



PN	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	Po(mm)	P2(mm)	W(mm)	F(mm)	D(mm)
NLTN12CM16EDCNTRF	13.0±0.1	9.0±0.1	4.4±0.1	16.0±0.1	4.0±0.1	2.0±0.1	24.0±0.3	11.5±0.1	1.5±0.1
NLTN12LM16BXCNTRF	13.0±0.1	9.0±0.1	4.4±0.1	16.0±0.1	4.0±0.1	2.0±0.1	24.0±0.3	11.5±0.1	1.5±0.1
NLTN-P12LM16APCNTRF	13.0±0.1	9.0±0.1	4.9±0.1	16.0±0.1	4.0±0.1	2.0±0.1	32.0±0.3	14.2±0.1	1.5±0.1
NLTN16CM24EDCNTRF	16.8±0.1	10.6±0.1	4.9±0.1	16.0±0.1	4.0±0.1	2.0±0.1	32.0±0.3	14.2±0.1	1.5±0.1
NLTN16LM24BXCNTRF	16.8±0.1	10.6±0.1	4.9±0.1	16.0±0.1	4.0±0.1	2.0±0.1	32.0±0.3	14.2±0.1	1.5±0.1
NLTN-P16LG24APCNTRF	16.8±0.1	10.6±0.1	4.9±0.1	16.0±0.1	4.0±0.1	2.0±0.1	32.0±0.3	14.2±0.1	1.5±0.1
NLTN-P16LG24ABCNTRF	16.8±0.1	10.6±0.1	4.9±0.1	16.0±0.1	4.0±0.1	2.0±0.1	32.0±0.3	14.2±0.1	1.5±0.1
NLTN16LS224AGCGTRF	16.8±0.1	10.6±0.1	4.9±0.1	16.0±0.1	4.0±0.1	2.0±0.1	32.0±0.3	14.2±0.1	1.5±0.1
NLTN16LS1024ASCGTRF	16.8±0.1	10.6±0.1	4.9±0.1	16.0±0.1	4.0±0.1	2.0±0.1	32.0±0.3	14.2±0.1	1.5±0.1
NLTN17CM24EDCNTRF	17.93±0.1	15.3±0.1	4.8±0.1	24.0±0.1	4.0±0.1	2.0±0.1	32.0±0.3	11.5±0.1	1.5±0.1
NLTN17LM24BXCNTRF	17.93±0.1	15.3±0.1	4.8±0.1	24.0±0.1	4.0±0.1	2.0±0.1	32.0±0.3	11.5±0.1	1.5±0.1
NLTN28LD148BXCNTRF	28.9±0.1	14.9±0.1	5.8±0.1	20.0±0.1	4.0±0.1	2.0±0.1	44.0±0.3	20.2±0.1	1.5±0.1

## (3) Packaging Quantity

PN	Reel / Pcs
NLTN12CM16EDTRF	800
NLTN12LM16BXCNTRF	800
NLTN-P12LM16APCNTRF	800
NLTN12CM16EDCNTRF	800
NLTN12LM16BXTRF	800
NLTN16CM24EDCNTRF	800
NLTN16LM24BXCNTRF	800
NLTN-P16LG24APCNTRF	800
NLTN-P16LG24ABCNTRF	800
NLTN16LS224AGCGTRF	800
NLTN16LS1024ASCGTRF	800
NLTN17CM24EDCNTRF	400
NLTN17LM24BXCNTRF	400
NLTN28LD148BXCNTRF	500

## *Storage – Shipment - Handling Notice*

### 1.) Storage Conditions (component level)

To maintain the solderability of terminal electrodes:

- Store Indoors
- Temperature: +5°C ~ +35°C (41°F ~ 95°F)
- Relative humidity: 40 to 75%
- Avoid storage where chlorine or sulfur exists in the atmosphere

### 2.) Period:

- Recommended to use within 12 months from the time of delivery.

### Shipment / Handling:

- Products should be handled with care to avoid damage or contamination
- The use of tweezers or vacuum pick up is strongly recommended for individual components
- Bulk handling should ensure that abrasion and mechanical shock are minimized.