

# LAN4VSOP

## 5G BASE-T LAN transformer, PoE



Photo is representative

### Product features

- IEEE 802.3bz, 802.3.af compliant
- 1500 Vac isolation between primary and secondary
- Single port, PoE
- Toroid core winding, open header, surface mount
- Weight 1.53 g typical
- Moisture sensitivity level (MSL): 1

### Applications

- SELV/ELV equipment
- IP telephones
- Wireless LAN access point
- IoT, Remote monitoring
- Smart TV
- Network camera
- Data centers

### Environmental compliance and general specifications

- Operating ambient temperature range: -40 °C to +85 °C
- Storage temperature range (component): -40 °C to +125 °C



**Product specifications** (+25 °C)

Meets IEEE 802.3af Standards 360 mA current capability Per PoE Port / Two-pair.

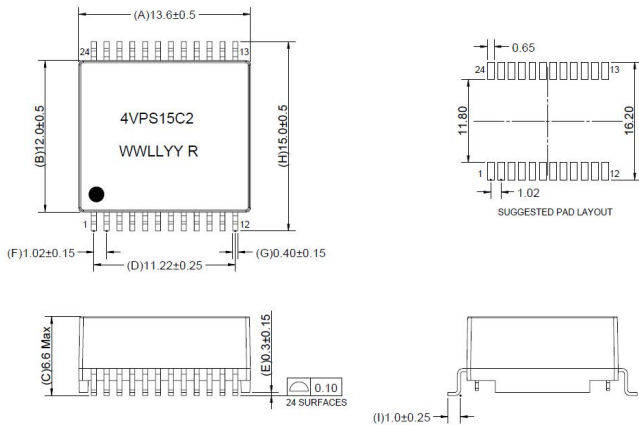
Part number <sup>4</sup>	Port	Pins	Inductance <sup>1,5</sup> ( $\mu$ H)	Leakage inductance <sup>1,5</sup> ( $\mu$ H)	DCR <sup>2,5</sup> ( $\Omega$ )	CWW <sup>1,5</sup> (pF)	Turns ratio <sup>3</sup>	Insertion loss <sup>3,5</sup> (dB)	Return loss <sup>3,5</sup> (dB)	Cross talk <sup>5</sup> (dB) (between each channel)	CMRR <sup>3,5</sup> (dB)
LAN4VSOPS24151C2*	Single	24	180 @ 0 mA DC Bias 150 @ 10.8 mA DC Bias	0.5	1.2	35	1CT:1CT, $\pm 2\%$	-0.5 @ 1-50 MHz -1 @ 50-125 MHz -1.5 @ 125-250 MHz	-20 @ 1-40 MHz -20+12.5*log(f/40) @ 40-250 MHz	-30 @ 1-150 MHz -20 @ 150-250 MHz	-20 @ 30-400 MHz

1. Inductance (Transformer side), Leakage Inductance (Transformer side, short CMC side), CWW (Interwinding capacitance, Pri to Sec): Test parameters: 100 kHz, 0.2 V  
2. DCR: CMC side  
3. Turns ratio, Insertion loss, return loss and CMRR (Common mode rejection ratio): Primary to secondary: Polarity pin 1 side in phase  
\* Operating temperature: -40 °C to +85 °C, (temperature rise not included,)  
LAN4VSOPS24151C2: Temperature rise  $\leq 10$  °C, Hipot: 1500 Vac, primary to secondary

4. Part Number definition: LAN4VSOPxxx151xx  
LAN4VSOP= Product code  
xxx: S24 = Single Port, 24 pin  
xx: C2 = -40 to +85 °C  
5. DCR, CWW, Leakage inductance and Insertion loss values are maximum; Inductance, Return loss, CMRR and Cross talk values are minimum

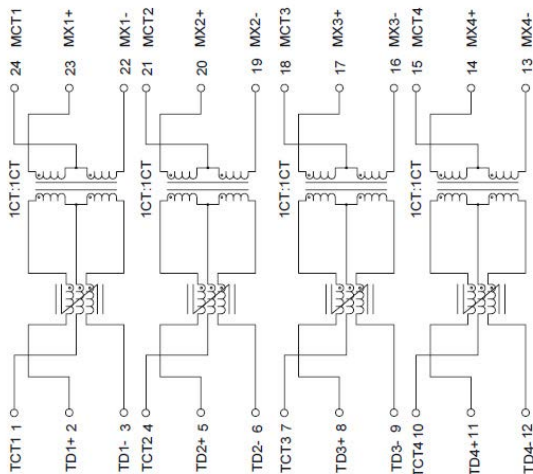
**Mechanical parameters (mm)**

**LAN4VSOPS24151C22**



Part marking: 4VPS15C2, WWLLYY R = Lot code, Dot indicates pin 1  
Pin length does not include include solder point  
Silkscreen thickness: 0.1 mm to 0.15 mm  
Traces or vias underneath the transformer is not recommended

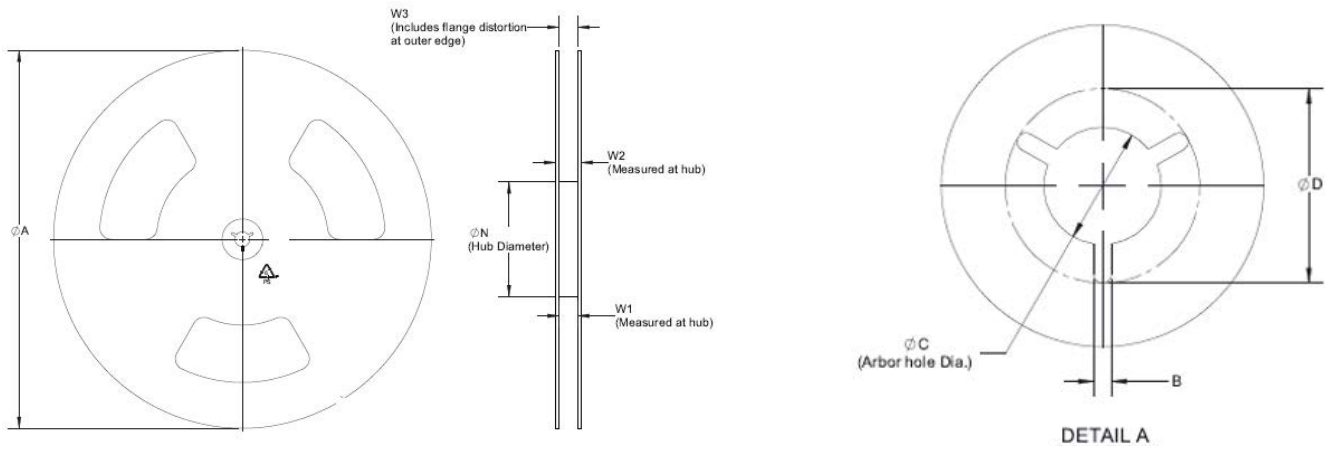
**Schematic**



**Packaging information (mm)**

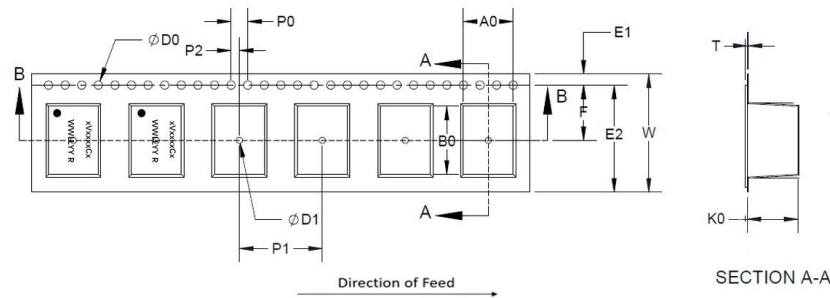
Drawing not to scale

Supplied in tape and reel packaging on a 13" diameter reel, EIA-481 compliant



**Reel dimension (mm)**

Part number	ØA	B	ØC	ØD	ØN	W1	W2	W3
LAN4VSOPS24151C2	330 ± 2	1.5 min	13 + 0.5 / -0.2	20.2 min	100	24.4 + 2 / -0	30.4 max	N/A



**Tape dimension (mm)**

Part number	Ao	Bo	Ko	T	W	F	E	E2	P0	P1	P2	ØD0	ØD1
LAN4VSOPS24151C2	15.8 ± 0.1	14.0 ± 0.1	6.8 ± 0.1	0.5 ± 0.05	24 ± 0.3	11.5 ± 0.1	1.75 ± 0.1	21.85 min	4 ± 0.1	24 ± 0.1	2 ± 0.1	1.5 + 0.1 / -0	N/A

**Packaging quantity**

Part number	Reel	Bag	Box	Carton
LAN4VSOPS24151C2	350	350	700	2800

### General specifications

Solderability	J-STD-002.	8 hours steam age test, Solder: +245 °C ± 5 °C (5 s)
Reflow	MIL-STD-202G Condition J	+260 °C ± 5 °C, 30 s ± 5 s, 1 times reflow
Resistance soldering heat	MIL-STD-202H, Method 210	+260 °C , 10 s
Operational life	MIL-STD-202, Method 108	1000 hours, +85 °C @ 360 mA
Temperature cycling	MIL-STD-202G	High temperature= +125 °C, low temperature -40 °C, conversion time 15 minutes, 32 cycles
Biased humidity	MIL-STD-202G	+85 °C, 85% RH, Duration= 1000 hours
Vibration	MIL-STD-202	10 Hz to 80 Hz, Increased at +3 dB/octave, 80 Hz to 350 Hz, 0.053 g <sup>2</sup> /Hz, 350 Hz to 2000 Hz, Decrease at -3 dB/octave, X, Y and Z vibrate for 15 minutes each.
Mechanical shock	MIL-STD-202, Method 213	Half-sine shock pulse, peak=50 g's, 11 ms, total 18 shocks
Terminal strength	CBA203A-001	Standard: 4.5 kg, Minimum: 60 s, no visible damage

Solder reflow profile

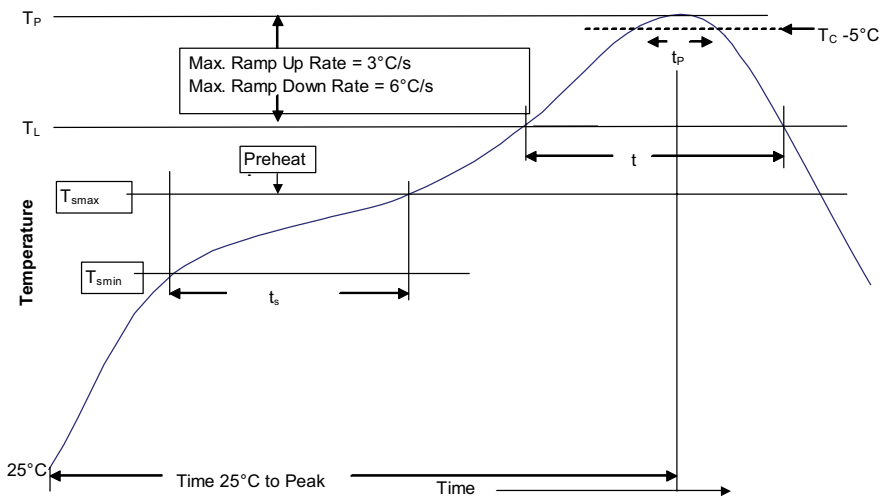


Table 1 - Standard SnPb solder (T<sub>C</sub>)

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder (T<sub>C</sub>)

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350 - 2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference J-STD-020

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat and soak		
• Temperature min. (T <sub>smin</sub> )	100 °C	150 °C
• Temperature max. (T <sub>smax</sub> )	150 °C	200 °C
• Time (T <sub>smin</sub> to T <sub>smax</sub> ) (t <sub>s</sub> )	60-120 seconds	60-120 seconds
Ramp up rate T <sub>L</sub> to T <sub>p</sub>	3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T <sub>L</sub> )	183 °C	217 °C
Time (t <sub>L</sub> ) maintained above T <sub>L</sub>	60-150 seconds	60-150 seconds
Peak package body temperature (T <sub>p</sub> )*	Table 1	Table 2
Time (t <sub>p</sub> )* within 5 °C of the specified classification temperature (T <sub>C</sub> )	20 seconds*	30 seconds*
Ramp-down rate (T <sub>p</sub> to T <sub>L</sub> )	6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

\* Tolerance for peak profile temperature (T<sub>p</sub>) is defined as a supplier minimum and a user maximum.

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