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LAN1VSOP Series PoE 100 Base-T

TITLE: LAN PoE Transformer /100 BASE-T

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1 Product features and environmental data

Product features

- IEEE 802.3u, 802.3.af, 802.3.at compliant
- 1500 Vac isolation between primary and secondary
- Multi option: Single port, Quad port
- Toroid core winding, SMD, Open header
- Weight 0.78g-2.8g
- Moisture Sensitivity Level (MSL): 1

Applications

- IP telephones
- Wireless LAN access point APs
- Network cameras, etc.

Environmental data

Storage temperature range: -40 °C to +125 °C

Operating ambient temperature range: Single port -40 °C to +85 °C, Quad port 0 °C to +70 °C

Solder reflow temperature: J-STD-020 (latest revision) compliant

RoHS

REACH

PFOS & PFOA

Halogen free, Sb₂O₃ and Red Phosphorus

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2 Specification

2.1 Electrical parameters@25°C

Meets IEEE 802.3at Standards 720mA current capability Per PoE Port / Two-pair.

Part Number	Port	Pins	Inductance (uH Min) ¹	Leakage Inductance (uH Max) ¹	DCR (Ω Max) ²	CWW (pF Max) ¹	Turns Ratio ³	Insertion Loss (dB Max) ³	Return Loss (dB Min) ³	Cross Talk (Between each Channel, dB Min)	DCMR (dB Min) ³	Hi-Port (Vac) ³	Operating Temperature ⁴
LAN1VSOPS16351C2	Single	16	350 @ 8mA DC Bias 120 @ 19mA DC Bias	0.5	1.4	35	1CT:1CT, ±2%	-1 @ 1- 100MHz	-18 @ 1-30MHz -14 @ 60MHz -12 @ 80MHz	-45 @ 30MHz -40 @ 60MHz -35 @ 100MHz	-42 @ 30MHz -37 @ 50MHz -33 @ 100MHz	1500	-40-85°C

Meets IEEE 802.3af Standards 350mA current capability Per PoE Port / Two-pair.

Part Number	Port	Pins	Inductance (uH Min) ¹	Leakage Inductance (uH Max) ¹	DCR (Ω Max) ²	CWW (pF Max) ¹	Turns Ratio ³	Insertion Loss (dB Max) ³	Return Loss (dB Min) ³	Cross Talk (Between each Channel, dB Min)	CMRR (dB Min) ³	Hi-Port (Vac) ³	Operating Temperature ⁴
LAN1VSOPQ48351C1	Quad	48	350@ 8mA DC Bias	0.5	1.2	35	1CT:1CT, ±2%	-1.1 @ 0.5- 100MHz	18 @ 0.5-30MHz -12+20*log(f/80) @30.1-60MHz -12 @ 60.1-80MHz	-35 @ 0.5-40MHz -33+20*log(f/50) @40.1-100MHz	-30 @ 0.5- 100MHz	1500	0-70°C

- Inductance (Transformer side), Leakage Inductance (Transformer side, short CMC side), CWW (Interwinding Capacitance, Pri to Sec): Test parameters: 100KHz, 0.2V
- DCR: CMC side
- Primary to secondary: Polarity pin 1 side in phase
- Operating Temperature: Not include temperature rise,
LAN1VSOPS16351C2: Temperature rise ≤ 20°C
LAN1VSOPQ48351C1: Temperature rise ≤ 15°C
- Part Number Definition: LAN1VSOPxxx351xx
LAN1VSOP= LAN Transformer 100 Base-T PoE, SMD Open Header
xxx: S16=Single port, 16Pin, Q40=Quad Port, 40pin
xx: C1=0-70°C, C2=-40-85°C

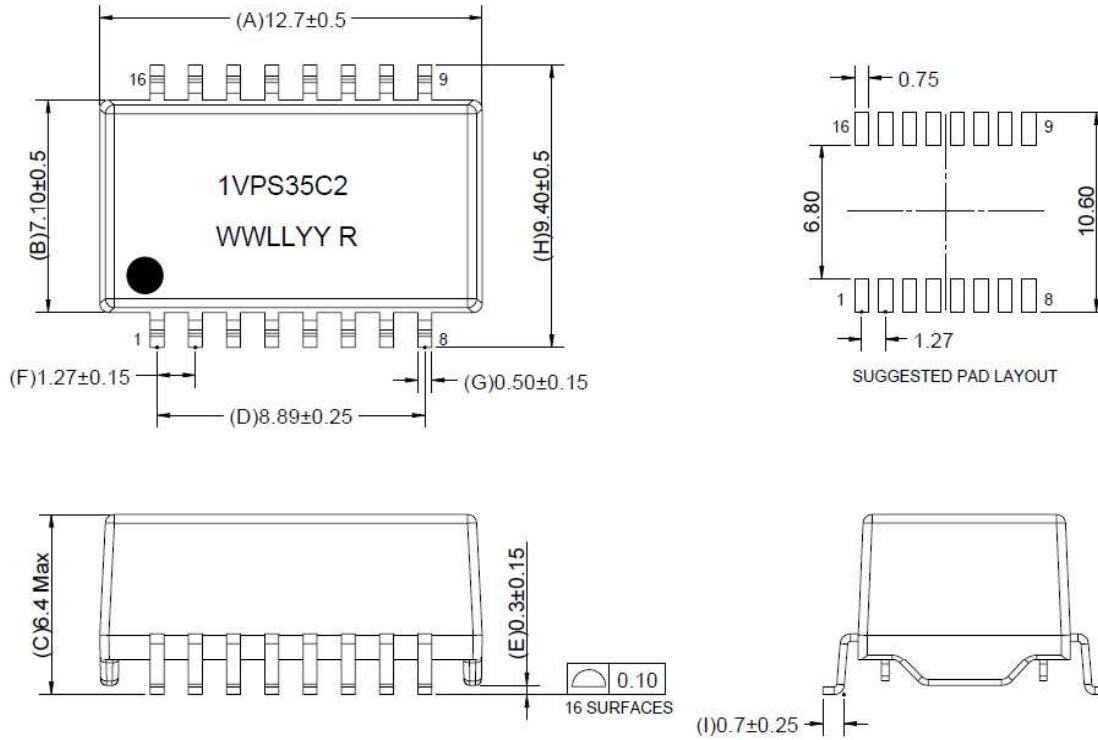
LAN1VSOP Series PoE 100 Base-T

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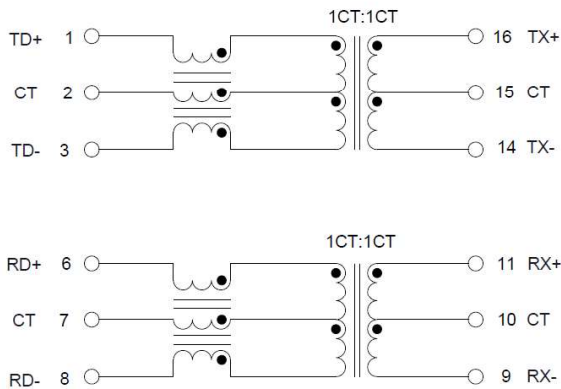
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2.2 Mechanical parameters, schematic, pad layout- mm

LAN1VSOPS16351C2



Schematic



Marking: 1VPS35C2 = LAN1VSOPS16351C2

WWLLYY R = (Date Code) (Revision)

● is Pin 1 orientation

Pin length don't include solder point

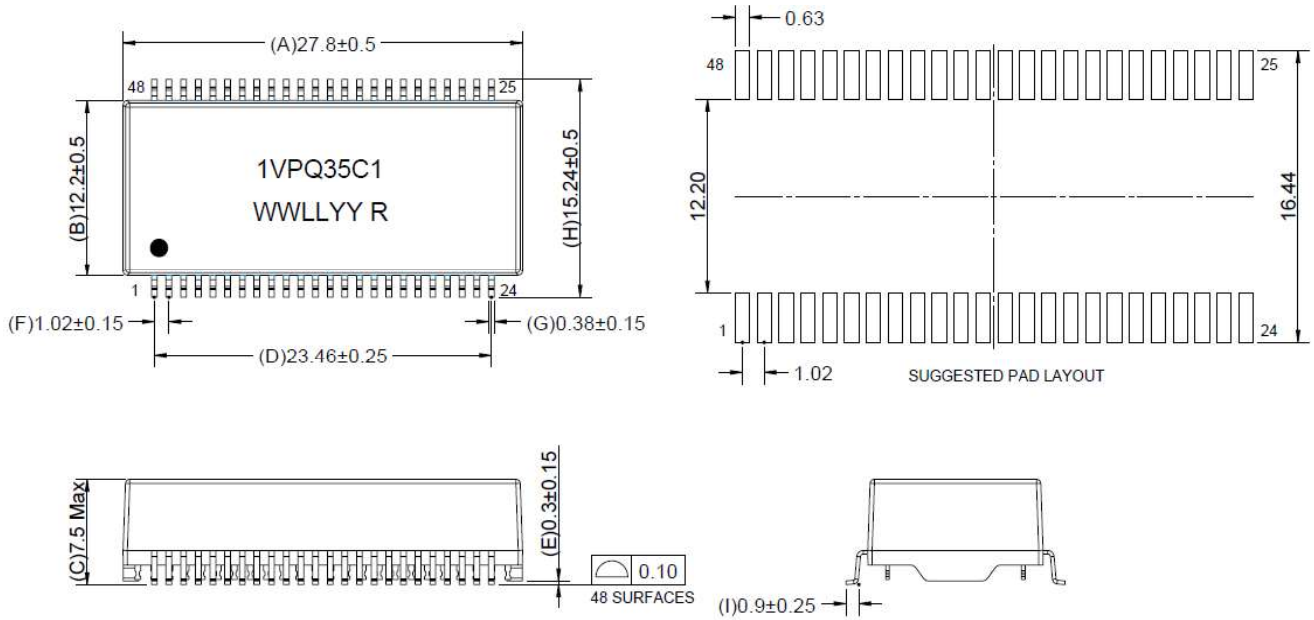
Silkscreen thickness: 0.1-0.15mm

LAN1VSOP Series PoE 100 Base-T

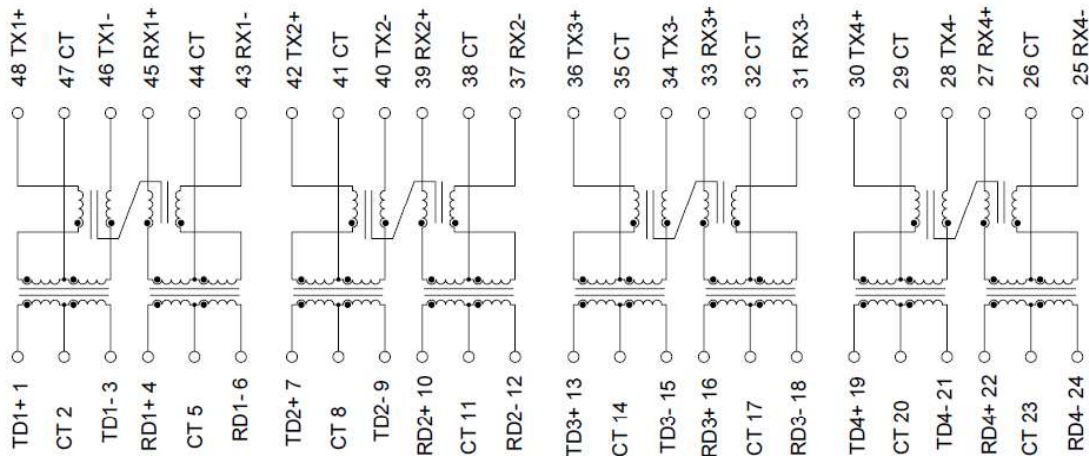
TITLE: LAN PoE Transformer /100 BASE-T

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LAN1VSOPQ48351C1



Schematic



Marking: 1VPQ35C1 = LAN1VSOPQ48351C1

WWLLYY R = (Date Code) (Revision)

● is Pin 1 orientation

Pin length don't include solder point

Silkscreen thickness: 0.1-0.15mm

Engineering Product Specification

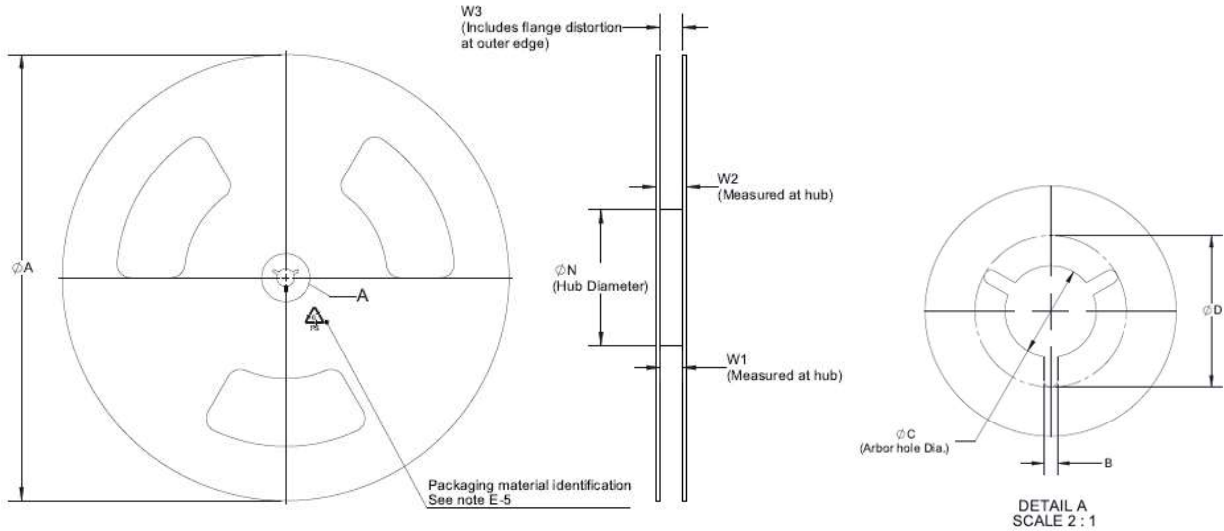
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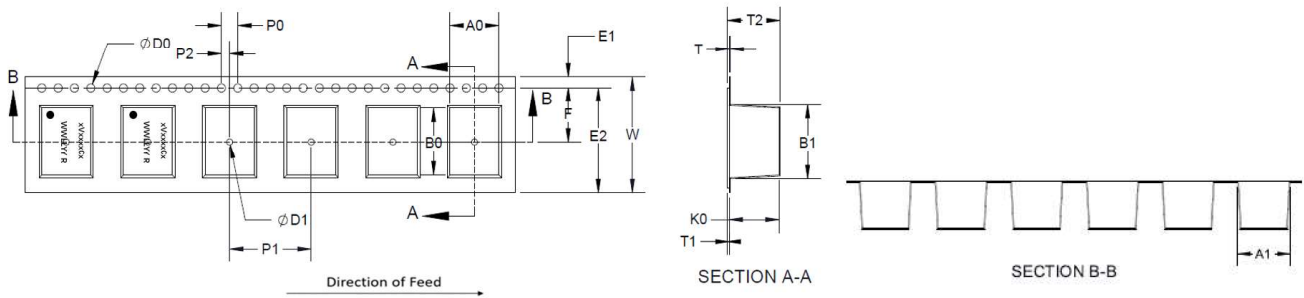
3 Packaging information- mm

Supplied in tape and reel packaging, 300/600 parts per 13" diameter reel, compliant to EIA-481



Reel Dimension(mm)

PN	A	B	C	ΦD	N	W1	W2	W3
LAN1VSOPS16351C2	330±2	1.5min	13+0.5/-0.2	20.2min	100	24.4+2/-0	30.4max	N/A
LAN1VSOPQ48351C1	330±2	1.5min	13+0.5/-0.2	20.2min	100	44.4+2/-0	50.4max	N/A



Tape Dimension(mm)

PN	Ao	Bo	Ko	T	W	F	E1	E2	P0	P1	P2	ΦD0	D1
LAN1VSOPS16351C2	10.8±0.1	13±0.1	6.75±0.1	0.5±0.05	24±0.3	11.5±0.1	1.75±0.1	21.85min	4±0.1	16±0.1	2±0.1	1.5+0.1/-0	1.5+0.1/-0
LAN1VSOPQ48351C1	16±0.15	28.2±0.1	7.8±0.1	0.5±0.05	44±0.3	20.2±0.1	1.75±0.1	41.85min	4±0.1	24±0.1	2±0.1	1.5+0.1/-0	2+0.1/-0

Packaging Quantity

PN	Chip/Reel	Bag	Box	Carton
LAN1VSOPS16351C2	600	600	1200	4800
LAN1VSOPQ48351C1	300	300	600	1200

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4 Reliability Summary

Test Item	According to	Test Specification	Acceptable Value/Range
External Visual	MIL-STD-883 Method 2009	Inspect device construction, marking and workmanship	Appearance meets the requirements
Pre- and Post-Stress Electrical Test	Product specifications.	Electrical parameters and meet specifications	Test all electrical parameters and meet specifications
Dimensional Measurement	Product specifications.	Dimensional measurement meet specifications.	All dimension meet spec
Solderability	J-STD-002	1. 8 hours steam age test 2. Dip & Look @245°C 5s	The wetting area of the electrode shall be at least 95% covered with new solder coating. (in magnification 50X)
Reflow	MIL-STD-202G	1. IR furnace:260°C ± 5°C, time:30s ± 5s 2. 1 time reflow.	1. No visual damaged. 2. Electrical parameters and meet specifications.
Resistance Soldering Heat	MIL-STD-202H, Method 210	1.Soldering temperature:260°C , 2.Soldering time:10s.	1. No visual damaged. 2. Electrical parameters and meet specifications.
Operational Life	MIL-STD-202, Method 108	1. Environment temperature: 85°C 2. Rated current: LAN1VSOPS16351C2-720mA, LAN1VSOPQ48351C1-350mA 3. Duration of load:1000h.	1. No visual damaged. 2. Electrical parameters and meet specifications.
Temperature Cycling	MIL-STD-202G	High temperature: 125°C, low temperature - 40°C, conversion time 15 minutes, conversion time 10s, 32 cycles.	1. No visual damaged. 2. Electrical parameters and meet specifications.
Biased Humidity	MIL-STD-202G	1.Temperature: 85°C, Relative Humidity: 85%RH, 2. Duration: 1000 hours.	1. Cumulative corrosion area <10% 2. Electrical parameters and meet specifications.
Vibration	MIL-STD-202, Method 204	1. PSD:10Hz~80Hz Increased at +3dB/octave, 80Hz~350Hz, 0.053g ² /Hz, 350Hz~2000Hz Decrease at -3dB/octave 2. X, Y and Z vibrate for 15 minutes each.	1. No visual damaged. 2. Electrical parameters and meet specifications.
Mechanical Shock	MIL-STD-202, Method 213	1. Waveform: half sine. 2. Acceleration: 50g Pulse duration: 11ms 3. Shock time in each direction :3 times 4. Direction of shock: ±X、±Y、±Z.	1. No visual damaged. 2. Electrical parameters and meet specifications.
Terminal Strength	CBA203A-001	1. Standard: 4.5kg 2. Minimum: 60s	No visual damaged.

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6 Solder reflow profile

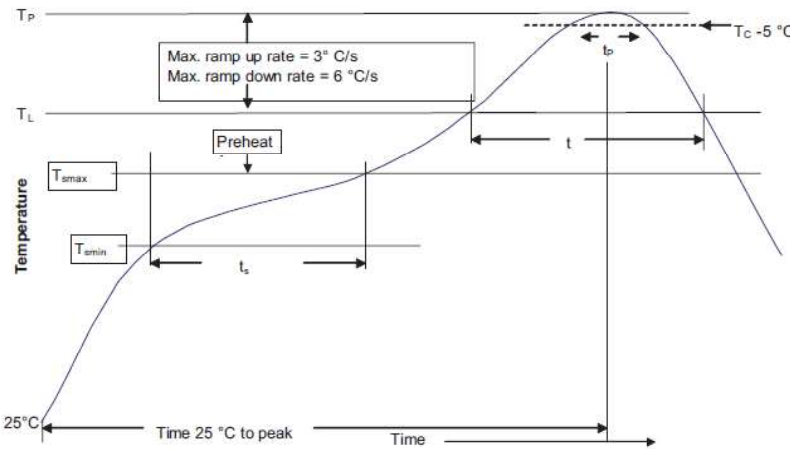


Table 1 - Standard SnPb solder (T_c)

Package Thickness	Volume mm ³ <350	Volume mm ³ ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder (T_c)

Package thickness	Volume mm ³ <350	Volume mm ³ 350 - 2000	Volume mm ³ >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 JDEC J-STD-020

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat and soak		
• Temperature min. (T_{smin})	100 °C	150 °C
• Temperature max. (T_{smax})	150 °C	200 °C
• Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds	60-120 seconds
Average ramp up rate T_{smax} to T_p	3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T_L)	183 °C	217 °C
Time at liquidous (t_l)	60-150 seconds	60-150 seconds
Peak package body temperature (T_p)*	Table 1	Table 2
Time (t_p)** within 5 °C of the specified classification temperature (T_c)	10 seconds**	10 seconds**
Average ramp-down rate (T_p to T_{smax})	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_p) is defined as a supplier minimum and a user maximum.
 ** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.