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High Density 1Gigabit PoE/PoE+ SMD Modules

BGA Quad/Dual/Single port for flexible PCB placement
HX52xxNL, HX54xxNL, HX5610NL, and HX6xxxHL

Pulse a YAGEO company



- *Compact SMT 1Gigabit PoE modules offering less than 140mm2 /port density*
- *Reliable surface mount ball grid array*
- *Standard and Industrial Temperature range*
- *Modular construction exceeds IEEE802.3u/ab*
- *Options support 4pair PoE+ (70W) of DC power*
- *Designed to fit behind 2xN connectors*
- *RoHS-6, peak reflow temperature rating 245°C*
- *Supplied in Trays or Tape and Reel*

Standard Range	Electrical Specifications @ 25°C – Operating Temperature 0°C to +70°C												
RoHS-6 Compliant Part Number	Number of Ports	Insertion Loss (dB Max)	Return Loss (dB Min)					Common Mode Rejection [CMMR] (dB Min)			Crosstalk (dB Min)			4P PoE Rating
		1-100MHz	1-30MHz	40MHz	50MHz	60-80MHz	100MHz	30-60MHZ	80-100MHz	125MHz	30MHz	60MHz	100MHz	(Watts)
H5610NL	1	1.5	-18	-16	-14	-11	-10	-32	-25	-19	-44	-37	-33	35max
H5200NL	2	1.5	-18	-16	-14	-11	-10	-32	-25	-19	-44	-37	-33	35max
H5201NL	2	1.5	-18	-16	-14	-11	-10	-32	-25	-19	-44	-37	-33	30max
H5400NL	4	1.5	-18	-16	-14	-11	-10	-32	-25	-19	-44	-37	-33	35max
H5401NL	4	1.5	-18	-16	-14	-11	-10	-32	-25	-19	-44	-37	-33	30max
Industrial Range	Electrical Specifications @ 25°C – Operating Temperature -40°C to +80°C												
HX5610NL	1	1.5	-18	-16	-14	-10	-10	-32	-25	-19	-44	-37	-33	35max
HX5200NL	2	1.5	-18	-16	-14	-10	-10	-32	-25	-19	-44	-37	-33	35max
HX5201NL	2	1.5	-18	-16	-14	-10	-10	-32	-25	-19	-44	-37	-33	30max
HX5400NL	4	1.5	-18	-16	-14	-10	-10	-32	-25	-19	-44	-37	-33	35max
HX5401NL	4	1.5	-18	-16	-14	-10	-10	-32	-25	-19	-44	-37	-33	30max
Power over Ethernet [6]	Electrical Specifications @ 25°C – Operating Temperature 0°C to + 70°C / -40°C to +80°C												
H6600NL	1	1.5	-18	-16	-14	-11	-10	-32	-25	-19	-44	-37	-33	70max
HX6621NL	1	1.5	-18	-16	-14	-10	-10	-32	-25	-19	-44	-37	-33	70max
H6200NL	2	1.5	-18	-16	-14	-11	-10	-32	-25	-19	-44	-37	-33	70max
HX6221NL	2	1.5	-18	-16	-14	-10	-10	-32	-25	-19	-44	-37	-33	70max
H6400NL	4	1.5	-18	-16	-14	-11	-10	-32	-25	-19	-44	-37	-33	70max
HX6400NL	4	1.5	-18	-16	-14	-10	-10	-32	-25	-19	-44	-37	-33	70max

Notes:

1. Header DAP with flamability Rating UL-94V-0
2. **MSL** = Moisture Sensitivity Level: 1 per J-STD-020
3. J-STD-075 R7m 235°C maximum
4. Compliance to J-STD-002 Solderable at 245°C
5. Reflow Profile, J-STD-020: LEVEL 1
6. **RoHS-6**: Product does not contain 5 out of the 6 banned substances specified in the RoHS directive. Some internal connections may contain lead in high-temperature solder (solder alloys containing more than 85% lead)
7. Operating Temperature:
   Standard "H" parts 0°C to +70°C
   Industrial "HX" products -40°C to +85°C
8. Storage Temperature:
   Standard "H" parts - 20°C to +125°C,
   Indusrial "HX" parts -50°C to +125°C
9. Contact Pulse for other connector option via the "Resources" link on he Pulse Electronics website.
10. To order parts in Tape and Reel Packaging add a "T" suffix to the part number (***ie. HX6221NL becomes HX6221NLT**).

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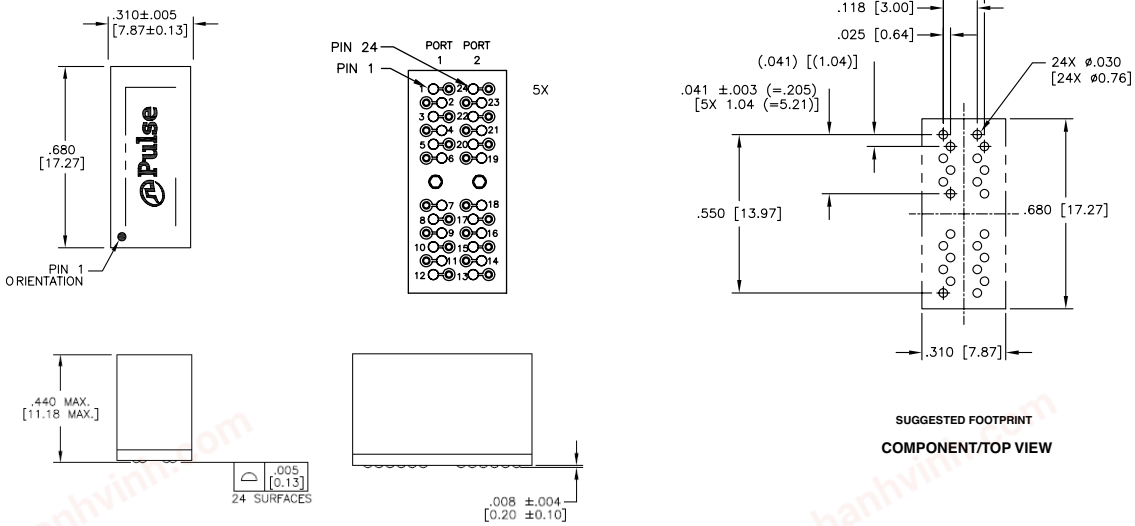
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Mechanical

SINGLE PORT - H5610NL, HX5610NL, H6600NL and HX6621NL

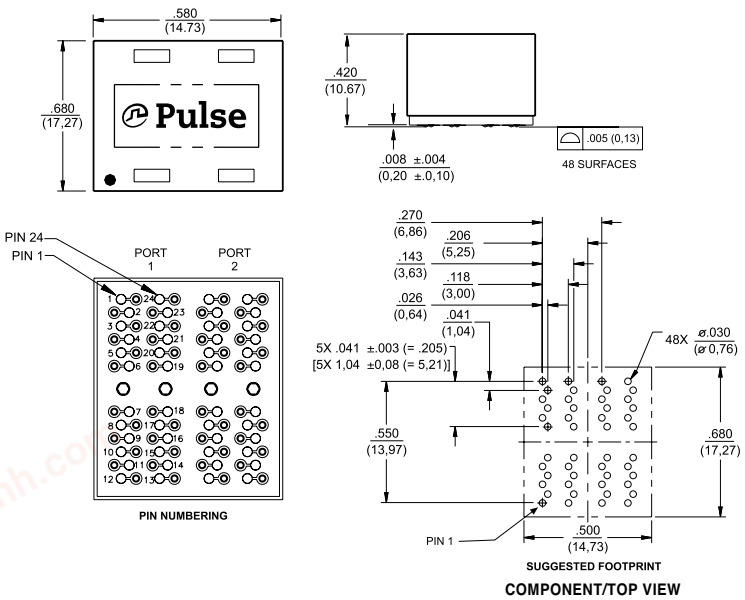


Weight..... 2.5 grams
Tray/Box..... 60/600
Reel/Box..... 300/1500

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± 0.10 / 0,25

DUAL PORT - H520xNL, HX520xNL, H6200NL and HX6221NL



Weight..... 5 grams
Tray/Box..... 84/420
Reel/Box..... 170/850

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± 0.10 / 0,25

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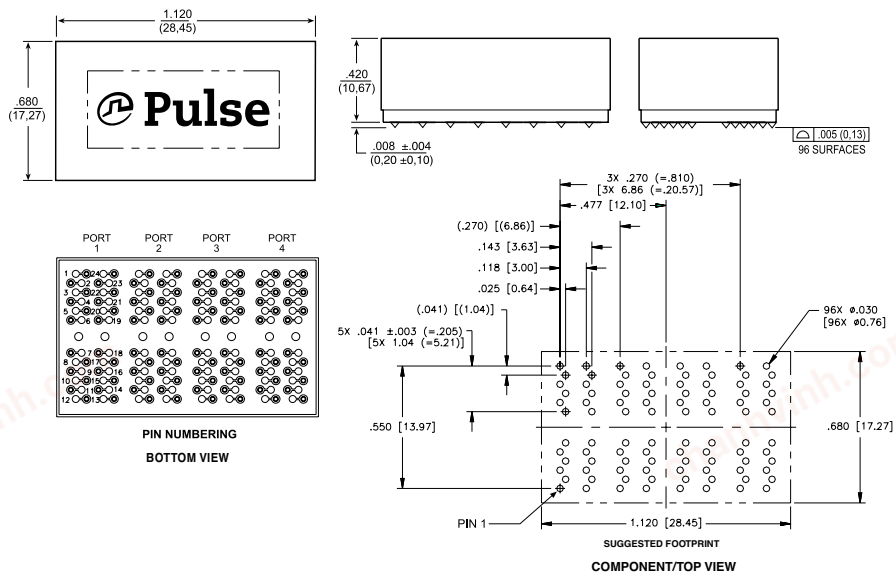
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Mechanical

QUAD PORT - H540xNL, HX540xNL, H6400NL and HX6400NL



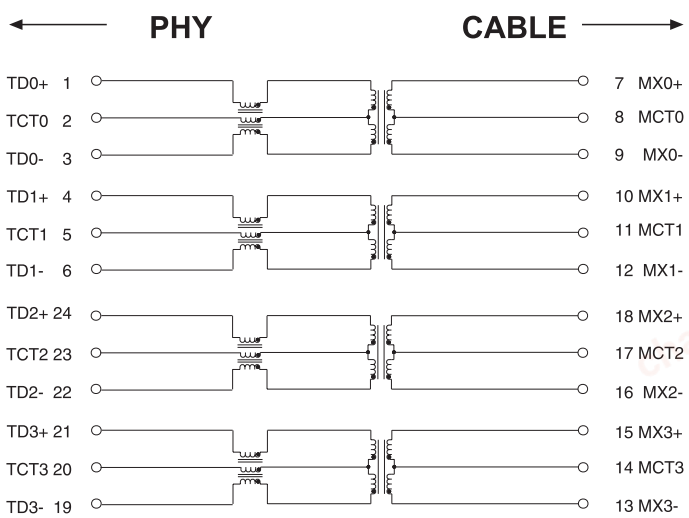
Weight..... 11 grams
Tray/Box..... 60/300
Reel/Box..... 170/850

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± 0.10 / 0,25

Schematic

H/HX5200NL, H/HX5400NL, H6600NL, HX6621NL, H6200NL, HX6221NL, H/HX6400NL



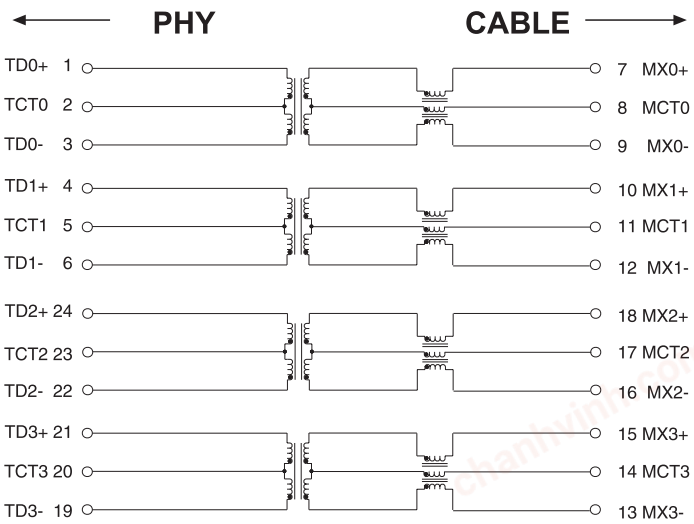
Schematic shown for one port

DUAL and QUAD designs use the same pad numbering for the 2 and 4 ports

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Schematic

H/HX5201NL, H/HX5401NL



Schematic shown for one port

DUAL and QUAD designs use the same pad numbering for the 2 and 4 ports

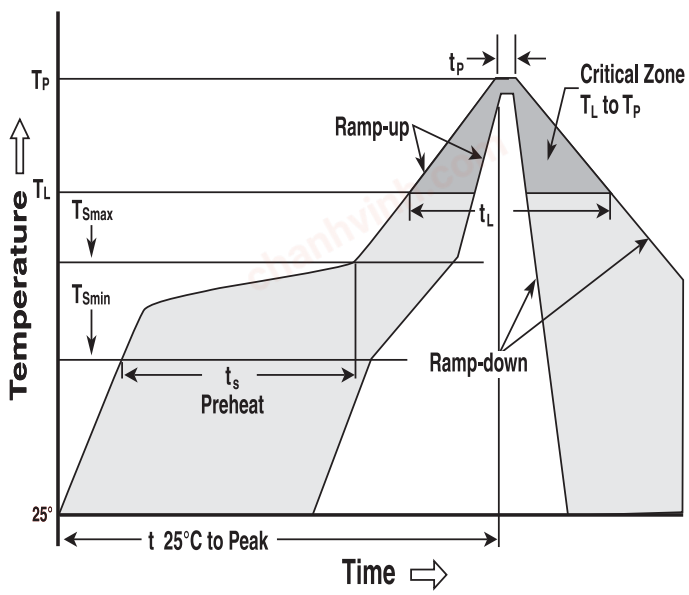
Soldering Information

Solder reflow profile conditions

Profile Feature		Lead-free Solder*
Pre-heat	Temperature Min (T_{Smin})	150°C
	Temperature Max (T_{Smax})	200°C
	Time (t_{Smin} to t_{Smax})	60-180 seconds
Reflow	Liquidus Temperature (T_L)	217°C
	Time (t_L)	60-150 seconds
Peak Temperature (T_P)		245°C (±5°C)
Time within 5°C of peak (T_P)		20-30 seconds
Average Ramp Up Rate (T_{Smax} to T_P)		3°C/second max
Ramp Down Rate		6°C/second max
Time 25°C to Peak Temperature (T_P)		8 minutes max
Parts should not exceed. . .		245°C

* ***See*** *Curve*

Typical reflow profile



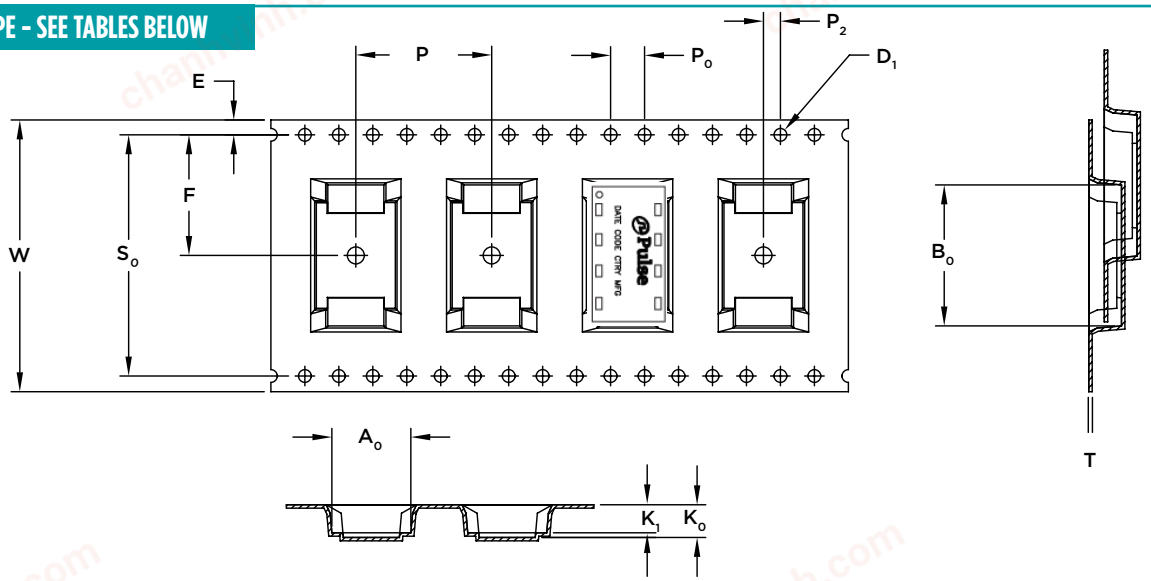
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Tape & Reel

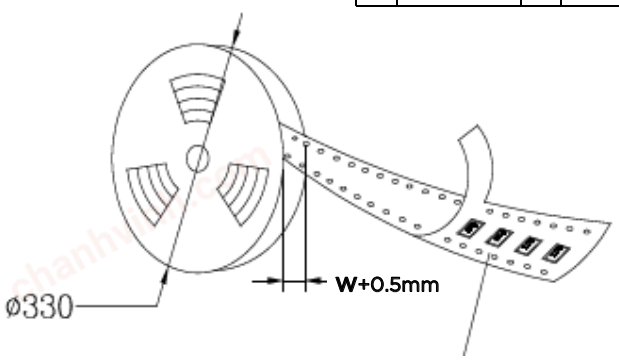
CARRIER TAPE - SEE TABLES BELOW



SINGLE PORT MODULES							
W	32.0±0.30	P	16.00	A_o	8.20	B_o	17.60
S_o	28.40	P_o	4.00	A_1	--------	B_1	--------
E	1.75	P_2	2.00	A_2	--------	B_2	--------
F	14.20	D_o	--------	K_o	11.80	K_1	11.30
T	0.50±0.05	D_1	1.50 +0.10 -0.00	QUANTITY PER REEL			300 pieces

DUAL PORT MODULES							
W	32.0±0.30	P	24.00	A_o	17.40	B_o	14.85
S_o	28.40	P_o	4.00	A_1	--------	B_1	--------
E	1.75	P_2	2.00	A_2	--------	B_2	--------
F	14.20	D_o	--------	K_o	11.70	K_1	11.20
T	0.50±0.05	D_1	1.50 +0.10 -0.00	QUANTITY PER REEL			170 pieces

QUAD PORT MOULES							
W	44.0±0.30	P	24.00	A_o	17.60	B_o	28.94
S_o	40.40	P_o	4.00	A_1	--------	B_1	--------
E	1.75	P_2	2.00	A_2	--------	B_2	--------
F	20.20	D_o	--------	K_o	11.70	K_1	11.20
T	0.50±0.05	D_1	1.50 +0.10 -0.00	QUANTITY PER REEL			170 pieces



All Dimensions meet EIA-481-D requirements.

1. **Material:** Black Conductive Polystyrene
2. **Components per Reel:** see table
3. **Quantity per carton:**

5reels (44mm) x 170 = 850 pcs
5reels (32mm) X 170 = 850 pcs
5reels (32mm) x 300 = 1500 pcs

For More Information:
Americas - prod_info_network_americas@yageo.com | **Europe -** prod_info_network_emea@yageo.com | **Asia -** prod_info_network_apac@yageo.com

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