

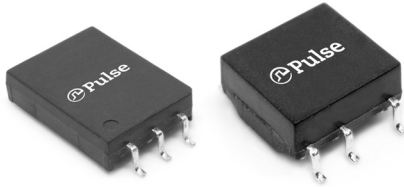


**THE DATASHEET OF  
HM2113ZNL**



# Low profile BMS Transformers

HM1236/38NL, HM2146/47NL and HM2113ZNL



- Ⓢ Fully qualified with leading BMS Silicon ICs
- Ⓢ Designed to meet IEC/UL61558
- Ⓢ Low profile height 3.45 or 4.06mm max
- Ⓢ High temperature performance up to 125/150°C
- Ⓢ Ideal for electric vehicles (EV), Energy Storage (ESS) and marine or aviation transportation.

## Operating Temperature - see Table Below

Part Number	Inductance (100kHz, 100mVrms)	Turns Ratio	Choke fitted	Isolation breakdown (Pri:Sec)	Working Voltage	Insulation	Operating Temperature	Qualified BMS Silicon
HM1236NL	500 uH min	1.00 +/- 2%	YES	3200Vrms / 60sec	600VDC	Functional	-40 to +125°C	MAXIM ; MAX17841B
HM1238NL	300 uH min	1.00 +/- 2%	YES	4300Vrms / 60sec	1000VDC	Functional	-40 to +150°C	MAXIM ; MAX17841B
HM2113ZNL	150 uH min	1.00 +/- 2%	YES	4300Vrms / 60sec	1000VDC	Functional	-40 to +125°C	NXP , ADI, Infineon
HM2146NL	150 uH min	1.00 +/- 1%	NO	3000Vrms / 60sec	1000VDC	Functional	-40 to +125°C	Texas Instr./ NXP, ADI
HM2147NL	500 uH min	1.00 +/- 2%	NO	4300Vrms / 60sec	1500VDC	Functional	-40 to +125°C	Texas Instr.; BQ7961x-Q1

## Additional Electrical performance

### Electrical (Cont...)

Part Number	Leakage Inductance (Max)	Winding DCR ( $\Omega$ )		Insertion Loss	Return Loss  Z out = 100 Ohm	CMRR	
		PHY Side	Line Side			1 - 10MHz	10- 1000MHz
HM2113ZNL	0.50 uH @ 100kHz	0.45 max	0.85 max	-0.25dB max @ 4MHz	-20dB min @ 4MHz	-35dB	-20dB
HM2146NL	0.50 uH @ 2000kHz	0.50 max	0.50 max	-0.25dB max @ 2MHz	-20dB min @ 2MHz	N/A	N/A
HM2147NL	0.50 uH @ 2000kHz	0.50 max	0.50 max	-0.25dB max @ 2MHz	-20dB min @ 2MHz	N/A	N/A

#### Notes:

1. Storage Temperature: -50°C to +125°C
2. Compliance to J-STD:
  - A. J-STD-002: Solderability at 245°C Reflow Profile
  - B. J-STD-020: Moisture Sensitive Level 1
  - C. J-STD-075: R7, 245°C Maximum Through Reflow Solder
3. The NL suffix part comes in Tubes. To order tape and reel packaging add a 'T' suffix to the part number (ie: HM2146NL becomes HM2146NLT).
4. Header: DAP (Diallyl Phthalate) with flammability Rating UL 94V-0 or better
5. Lead Frame: Cooper Alloy  
Under plated: Half Hard Ductile Nickel 50-100" (1.3-2.5um)  
Over plated : 100% Tin electro-deposited per ASTM B545 300 - 50u"(8-13um)  
Finish : Matte finish 100% Tin solder
6. AEC-Q200 Qualified, PPAP on request

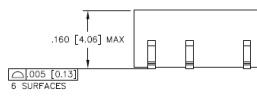
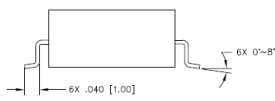
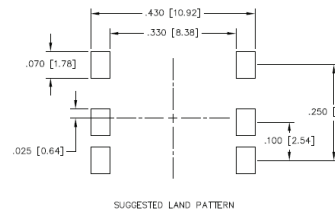
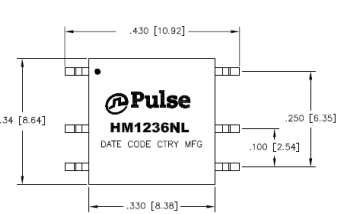
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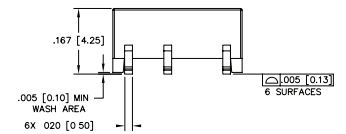
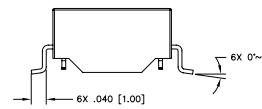
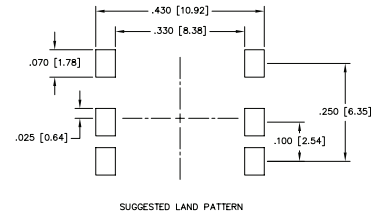
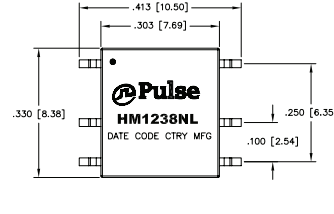


## MECHANICALS

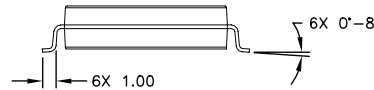
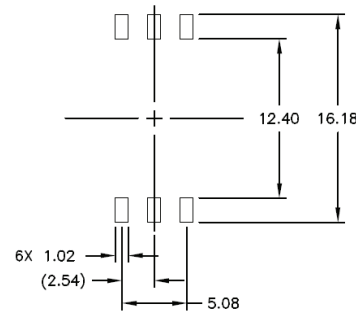
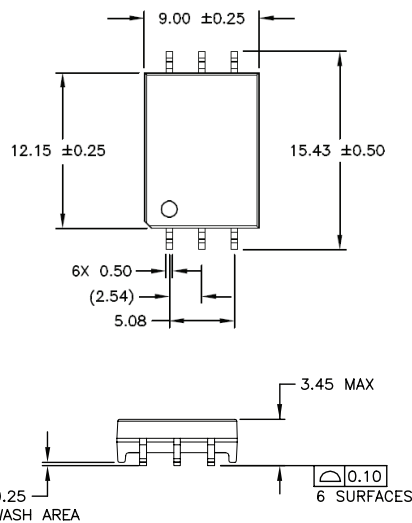
### HM1236NL



### HM1238NL



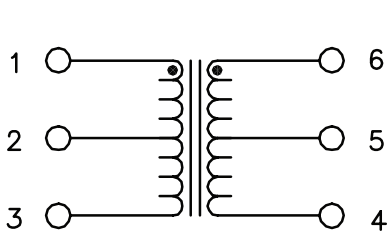
### HM2113ZNL, HM2146NL, HM2147NL



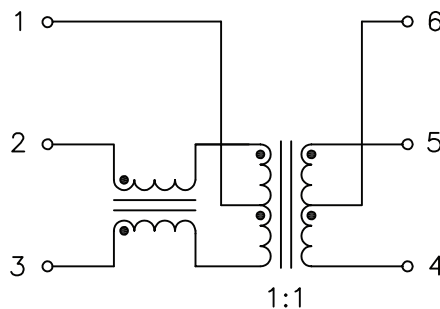
**Dimensions:**  
Unless otherwise specified,  
all tolerances are ± 0,25

## SCHEMATICS

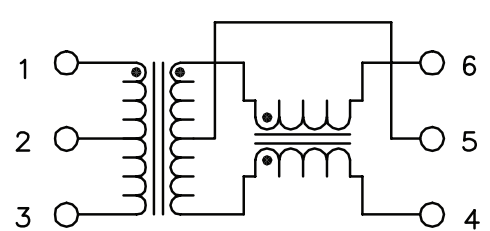
### HM21464NL, HM2147NL



### HM1236NL, HM1238NL



### HM2113ZNL

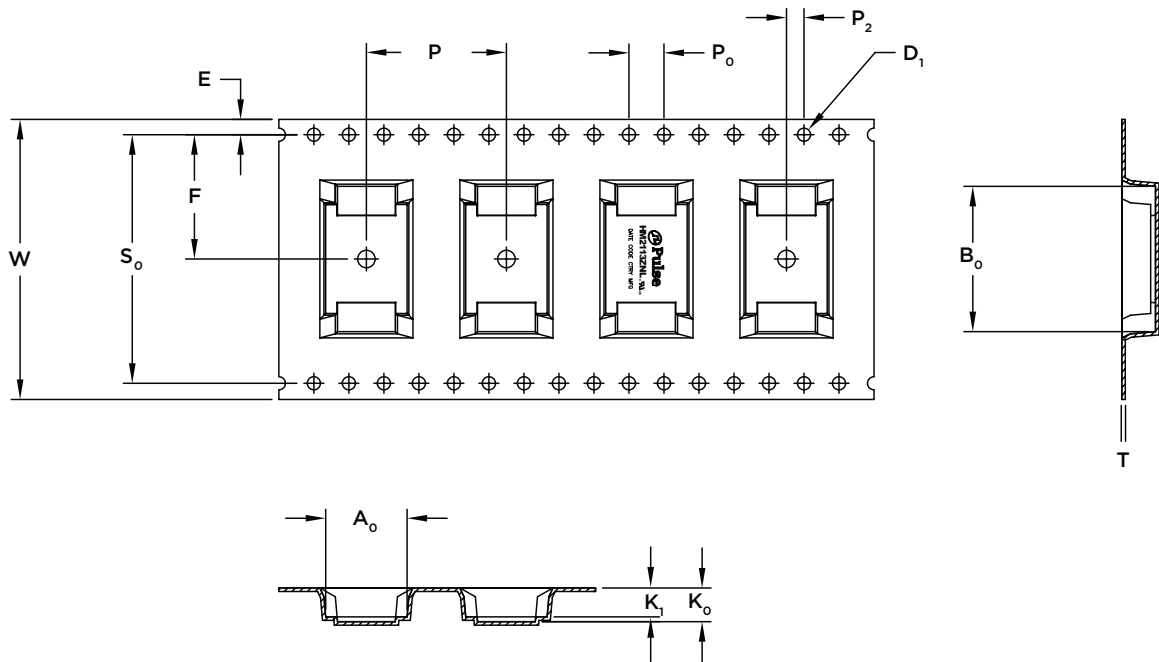


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## TAPE & REEL

HM2113ZNL, HM2146NL, HM2147NL

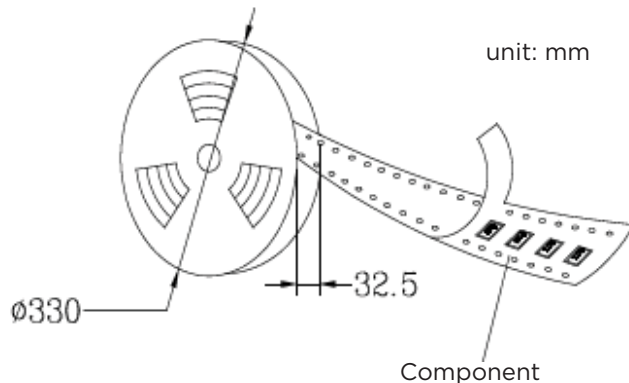


HM2113ZNL, HM2146NL, HM2147NL

W	32.0±0.30	P	16.00	A <sub>0</sub>	9.30	B <sub>0</sub>	16.60
S <sub>0</sub>	28.40	P <sub>0</sub>	4.00	A <sub>1</sub>	-----	B <sub>1</sub>	-----
E	1.75	P <sub>2</sub>	2.00	A <sub>2</sub>	-----	B <sub>2</sub>	-----
F	14.20	D <sub>0</sub>	-----	K <sub>0</sub>	3.85	K <sub>1</sub>	3.30
T	0.40±0.05	D <sub>1</sub>	1.50 ±0.10 -0.00	QUANTITY PER REEL		900 PCS	

HM1236NL, HM1238NL

W	24.0±0.30	P	16.00	A <sub>0</sub>	10.82	B <sub>0</sub>	8.83
S <sub>0</sub>	28.40	P <sub>0</sub>	4.00	A <sub>1</sub>	-----	B <sub>1</sub>	-----
E	1.75	P <sub>2</sub>	2.00	A <sub>2</sub>	-----	B <sub>2</sub>	-----
F	11.50	D <sub>0</sub>	-----	K <sub>0</sub>	4.74	K <sub>1</sub>	4.44
T	0.40±0.05	D <sub>1</sub>	1.50 ±0.10 -0.00	QUANTITY PER REEL		800 pcs	



1. Material: Black Conductive Polystyrene
2. Components per Reel: see table
3. Quantity per carton:
  - 5 reels x 900 = 4500 pcs
  - 6 reels x 800 = 4800 pcs

### For More Information:

Americas - [prodinfo\\_network\\_americas@yageo.com](mailto:prodinfo_network_americas@yageo.com) | Europe - [prodinfo\\_network\\_emea@yageo.com](mailto:prodinfo_network_emea@yageo.com) | Asia - [prodinfo\\_network\\_apac@yageo.com](mailto:prodinfo_network_apac@yageo.com)

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