Power Beads - PA051XNL, PA121XNL, PA151XNL Series





Current Rating: Over 70Apk

• Inductance Range: 72nH to 470nH

Four Package Sizes:

**PA0512/PA1212:** 7.0 x 7.0 x 4.96mm Max **PA0511/PA1211:** 10.2 x 7.0 x 4.96mm Max **PA0515:** 11.2 x 11.2 x 9.0mm Max

**PA0513/PA1513:** 13.5 x 13.0 x 8.0mm Max

Electrical Specifications @ 25°C - Operating Temperature -40°C to +130°C <sup>7,8</sup>											
Part	Inductance	Inductance	Irated <sup>1</sup>	DCR <sup>2</sup>	<b>Saturatio</b> (T	Heating⁴ Current					
Number	<b>@ ОА</b> ьс (nH ±20%)	<b>@ Irated</b> (nH TYP)	(Adc)	$(m\Omega)$	25°C	100°C	(A TYP)				
PA0512NL and PA1212NL	- 7.0mm x 7.0mm x 4.9	6mm Max									
PA0512.700NLT	72	72	31		58	45					
PA0512.101NLT	105	102	31	0.32 ±9.4%	46	38	31				
PA0512.151NLT	150	134	24		30	24					
PA1212.700NLT	72	72	31		58	45					
PA1212.101NLT	105	102	31	0.46 ±6.5%	46	38	31				
PA1212.151NLT	150	134	24		30	24					
PA0511NL and PA1211NL	- 10.2mm x 7.0mm x 4.	96mm Max									
PA0511.850NLT	85	85	31		70+	70					
PA0511.900NLT	100	100	31		70	65					
PA0511.101NLT	120	120	31	0.39 ±7.7%	52	42	31				
PA0511.151NLT	155	150	31		40	36					
PA0511.221NLT	220	176	25		33	25					
PA1211.850NLT *	85	85	31		70+	70					
PA1211.900NLT *	100	100	31		70	65					
PA1211.101NLT	120	120	31	0.55 ±7.3%	52	42	31				
PA1211.151NLT	155	150	31		40	36					
PA1211.221NLT	220	176	25		33	25					
PA0515NL - 11.2mm x 11.	.2mm x 9.0mm Max										
PA0515.221NLT	225	225	35		68	59					
PA0515.271NLT	270	280	35	0.63 ±9.5%	50	44	35				
PA0515.321NLT	325	325	35	U.03 ±9.3%	43	36	),,				
PA0515.471NLT	470	380	23		30	23					



4 pulseelectronics.com

SPM2007 (06/13)

Power Beads - PAO51XNL, PA121XNL, PA151XNL Series

Electrical Specifications @ 25°C – Operating Temperature –40°C to +130°C <sup>7,8</sup>											
Part	Inductance	Inductance	Irated <sup>1</sup>	DCR <sup>2</sup>	<b>Saturatio</b> (T	Heating⁴ Current					
Number	<b>@ ОА</b> ю (nH ±20%)	@ Irated (nH TYP)	(Adc)	(mΩ)	25°C	100°C	(A TYP)				
PA0513NL and PA1513NL	- 13.5mm x 13.0mm x 8	.0mm Max									
PA0513.211NLT	210	210	45		71	64					
PA0513.261NLT	260	260	45	0.32 ±9.4%	60	55	45				
PA0513.321NLT	320	285	41	0.32 13.470	50	45	43				
PA0513.441NLT	440	363	30		35	30					
PA1513.211NLT	210	210	45		71	64					
PA1513.261NLT	260	260	45	0.53 ±11.3%	60	55	45				
PA1513.321NLT	320	285	41	0.55 ±11.5%	50	45	47				
PA1513.441NLT	440	363	30		35	30					

### Notes:

- 1. The rated current as listed is either the saturation current or the heating current depending on which value is lower.
- 2. The nominal DCR tolerance is by design. The nominal DCR is measured from point (a) to point(b), as shown below on the mechanical drawing.
- 3. The saturation current is the typical current which causes the inductance to drop by 20% at the stated ambient temperatures (25°C and 100°C). This current is determined by placing the component in the specified ambient environment and applying a short duration pulse current (to eliminate selfheating effects) to the component.
- 4. The heating current is the DC current which causes the part temperature to increase by approximately 40 °C. This current is determined by soldering the component on a typical application PCB, and then applying the current to the device for 30 minutes without any forced air cooling.

SUGGESTED PAD LAYOUT

pulseelectronics.com

45

- 5. In high volt\*time applications, additional heating in the component can occur due to core losses in the inductor which may necessitate derating the current in order to limit the temperature rise of the component. To determine the approximate total losses (or temperature rise) for a given application, the coreloss and temperature rise curves can be used.
- 6. Pulse complies to industry standard tape and reel specification EIA481.

SPM2007 (06/13)

- 7. The temperature of the component (ambient plus temperature rise) must be within the stated operating temperature range.
- 8. Part numbers shown on this datasheet (with NL suffix) are for the RoHS compliant versions of the series. Non-RoHS compliant versions use the same part number but without the NL suffix (ie: PA0511.221NL becomes PA0511.221). Electrical and mechanical specs are identical for RoHS and non-RoHS components.
- \* Contact Pulse for availability

# PAXXXX.XXXNLT Dimensions: Inches mm Unless otherwise specified, all tolerances are ± .010/0.25 Dimensions: Inches mm Unless otherwise specified, all tolerances are ± .010/0.25 TAPE & REEL LAYOUT TAPE & REEL LAYOUT TAPE & REEL LAYOUT

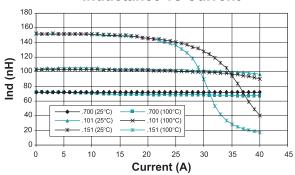
Power Beads - PA051XNL, PA121XNL, PA151XNL Series

## Dimensions (inches/mm)

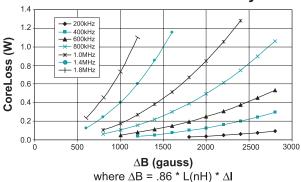
Mechanical Dimensions										T&F	Dimensions					
Part Number	A (MAX)	B (MAX)	C (MAX)	D (NOM)	E (NOM)	F (NOM)	G (NOM)	H (NOM)	Ao	Во	Ко	Po	W	Parts/Reel	<b>Weight</b> (grams)	
PA0512/PA1212	<u>.276</u> 7,00	<u>.276</u> 7,00	<u>.195</u> 4,96	<u>.060</u> 1,52	<u>.098</u> 2,49	<u>.120</u> 3,05	<u>.080</u> 2,03	<u>.130</u> 3,30	.295 7,49	<u>.300</u> 7,62	<u>.205</u> 5,21	<u>.472</u> 12,00	<u>.630</u> 16,00	1000	0.94	
PA0511/PA1211	.400 10,20	.276 7,00	.195 4,96	.060 1,52	.098 2,49	.120 3,05	.080 2,03	.250 6,35	.295 7,49	.420 10,67	.205 5,21	.472 12,00	.945 24,00	1000	1.35	
PA0515	.400 11,18	.440 11,18	.354 9,00	.100 2,54	.080 2,03	.100 2,54	.120 3,05	.210 5,33	.453 11,50	.453 11,50	.378 9,60	.945 24,00	.945 24,00	250	4.5	
PA0513/PA1513	.530 13,46	.510 12,95	.315 8,00	.100 2,54	.200 5,08	.300 7,62	.125 3,18	.280 7,11	.525 13,34	.525 13,34	.320 8,13	.630 16,00	.945 24,00	400	5.7	

### **PA0512NL & PA1212NL**

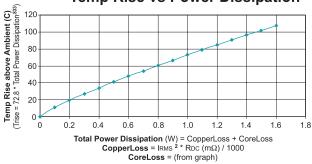
### **Inductance vs Current**



### **CoreLoss vs Flux Density**

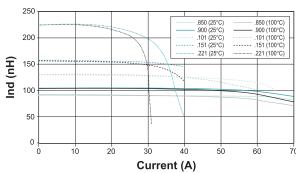


### **Temp Rise vs Power Dissipation**

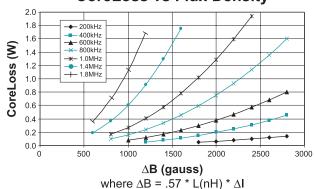


### **PA0511NL & PA1211NL**

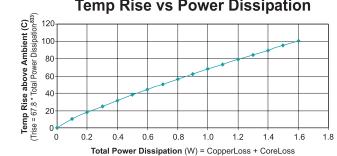
### **Inductance vs Current**



### **CoreLoss vs Flux Density**



### **Temp Rise vs Power Dissipation**



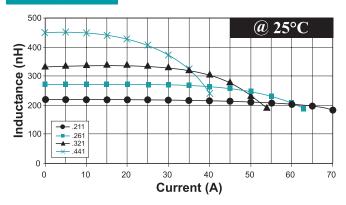
Total Power Dissipation (W) = CopperLoss + CoreLoss CopperLoss = IRMS  $^{2}$  \* RDC (m $\Omega$ ) / 1000 CoreLoss = (from table)

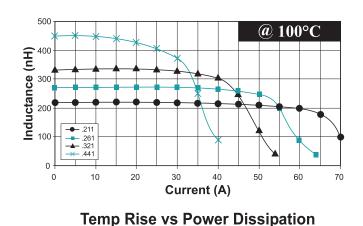
SPM2007 (06/13)

Power Beads - PA051XNL, PA121XNL, PA151XNL Series

# **Typical Inductance vs Current**

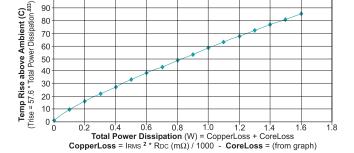
# PA0513NL / PA1513NL





### **CoreLoss vs Flux Density** 1.4 → 200kHz 1.2 → 300kHz → 400kHz → 500kHz CoreLoss (W) 0.8 --- 700kHz 0.2 0.0 3000

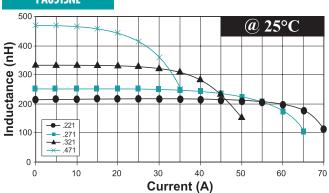
 $\Delta$ B (gauss) where  $\Delta$ B = .23 \* L(nH) \*  $\Delta$ I

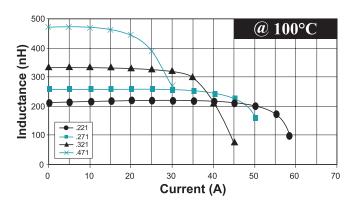


### **Typical Inductance vs Current**

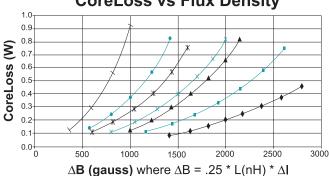
100

# PA0515NL





# **CoreLoss vs Flux Density**



pulseelectronics.com

### **Temp Rise vs Power Dissipation**



SPM2007 (06/13)