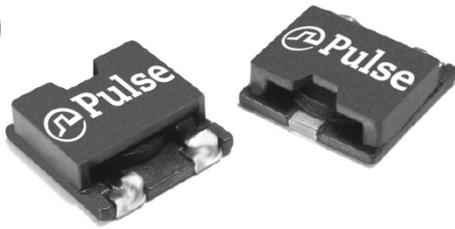


# SMT Power Inductors

Flat Coils - PG0006NL and PG0138NL Series



a YAGEO company

- Ⓢ **Height:** 6.0mm Max (PG0006) - 4.8mm Max (PG0138)
- Ⓢ **Footprint:** 13.4mm x 13.3mm (PG0006)  
13.0mm x 12.8mm (PG0138)
- Ⓢ **Current Rating:** up to 28.3ADC
- Ⓢ **Inductance Range:** 0.50μH to 5.0μH

## Electrical Specifications @ 25°C - Operating Temperature -40°C to +130°C<sup>1</sup>

Part <sup>7,8</sup> Number	Inductance <sup>2</sup> @ Irated (μH TYP)	Irated <sup>3</sup> (A)	DCR (m)		Inductance @ 0ADC (μH ±20%)	Saturation <sup>4</sup> Current Isat (A)	Heating <sup>5</sup> Current I <sub>dc</sub> (A)	Core Loss <sup>6</sup> Factor K2
			TYP	MAX				
<b>PG0006NL Series</b>								
PG0006.601NL	0.5	23	0.6	0.75	0.60	23	47	69.3
PG0006.102NL	0.9	20	1.4	1.75	1.0	20	31	77.1
PG0006.212NL	1.9	14	3.0	3.6	2.1	14	21	121.3
PG0006.312NL	2.8	12	7.0	7.5	3.1	12	14	119.4
PG0006.422NL	3.8	10	7.0	7.5	4.2	10	14	161.8
PG0006.462NL	4.2	9	9.8	10.4	4.6	9	12	151.9
PG0006.552NL	5	8	11.8	12.4	5.5	8	11	158.9
<b>PG0138NL Series</b>								
PG0138.601NL	0.48	28.3	1.40	1.75	0.60	28.3	30.5	55.3
PG0138.102NL	0.8	21	3.0	3.6	1.0	22.8	21	69.1
PG0138.222NL *	1.8	13.5	7.0	7.5	2.2	15.5	13.5	101.3
PG0138.332NL	2.8	11.5	9.8	10.4	3.3	12.2	11.5	130.3
PG0138.472NL	3.7	10.2	11.8	12.4	4.7	10.2	10.5	162.3
PG0138.552NL	4.4	8.2	11.8	12.4	5.5	8.2	10.5	190.0

### Notes:

- The temperature of the component (ambient plus temperature rise) must be within the standard operating temperature range.
- Inductance at Irated is a typical inductance value for the component taken at rated current.
- The rated current listed is the lower of the saturation current @ 25°C or the heating current.
- The saturation current, Isat, is the current at which the component inductance drops by the 10% typical (20% typical for PG0138.XXX) at an ambient temperature of 25°C. This current is determined by placing the component in the specified ambient environment and applying a short duration pulse current (to eliminate self-heating effects) to the component.
- The heating current, I<sub>dc</sub>, is the DC current required to raise the component temperature by approximately 40°C. The heating current is determined by mounting the component on a typical PCB and applying current for 30 minutes. The temperature is measured by placing the thermocouple on top of the unit under test. Take note that the component's performance varies depending on top of the unit under test. Take note that the component's performance varies depending on the system condition. It is suggested that the component be tested at the system level, to verify the temperature rise of the component during system operation.
- Core Loss approximation is based on published core data:  

$$\text{Core Loss}_{\text{PG0006 SERIES}} = K1 * (f)^{1.02} * (K2\Delta I)^{2.29}$$

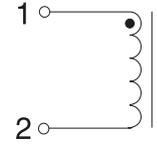
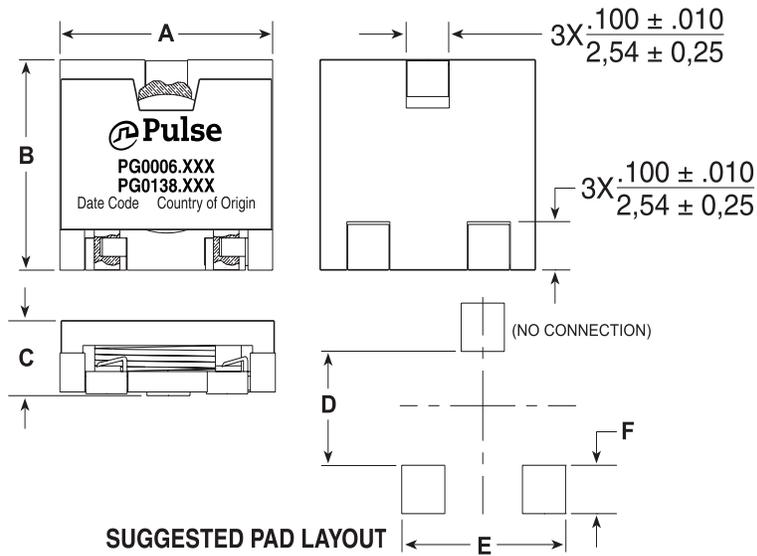
$$\text{Core Loss}_{\text{PG0138 SERIES}} = \{K1a * (f)^{1.12} * (K2\Delta I)^{2.17}\} + \{K1b * (f)^{1.25} * (K2\Delta I)^{2.32}\}$$

**Where: Core Loss** = in Watts  
**f** = switching frequency in kHz  
**K1** = 4.75E-11 / **K1a** = 4.43E-11 / **K1b** = 1.73E-11  
**ΔI** = delta I across the component in Ampere  
**K2ΔI** = one half of the peak to peak flux density across the component in Gauss
- Unless otherwise specified, all testing is made at 100kHz, 0.25V<sub>AC</sub>.
- Optional Tape & Reel packaging can be ordered by adding a "T" suffix to the part number (i.e. PG0006.102NL becomes PG0006.102NLT). Pulse complies to industry standard tape and reel specification EIA481.
- The "NL" suffix indicates an RoHS-compliant part number. Non-NL suffixed parts are not necessarily RoHS compliant, but are electrically and mechanically equivalent to NL versions. If a part number does not have the "NL" suffix, but an RoHS compliant version is required, please contact Pulse for availability.  
 \* Contact Pulse for availability

## Mechanical

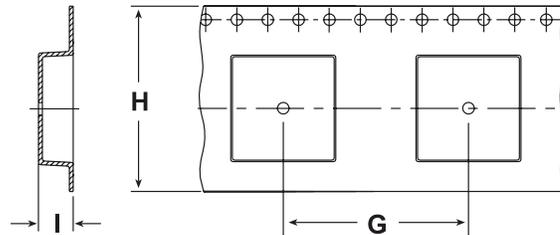
## Schematic

PG0006.XXX, PG0138.XXX



	PG0006	PG0138
<b>Weight</b> .....	3.0 grams	2.4 grams
<b>Tape &amp; Reel</b> .....	340/reel	600/reel

**Dimensions:**  $\frac{\text{Inches}}{\text{mm}}$   
 Unless otherwise specified,  
 all tolerances are:  $\pm \frac{.010}{0,25}$



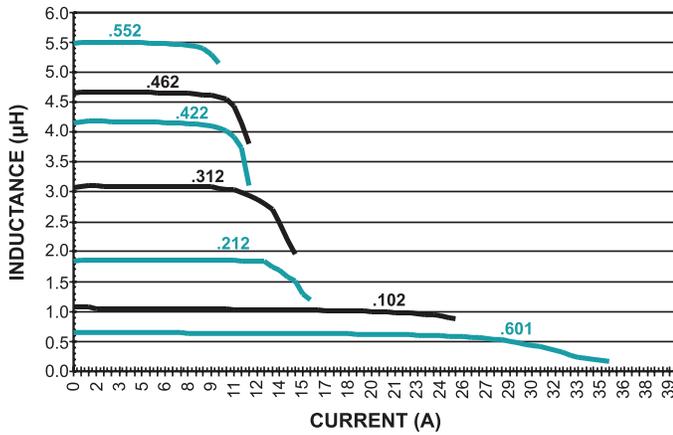
**TAPE & REEL LAYOUT**

Dim.	PG0006	PG0138
<b>A</b>	.528/13, 40 MAX	.504/12, 80 MAX
<b>B</b>	.523/13, 28 MAX	.512/13, 00 MAX
<b>C</b>	.236/6, 00 MAX	.193/4, 90 MAX
<b>D</b>	.260/6, 60 $\pm$ .005/0, 12	.260/6, 60 $\pm$ .005/0, 12
<b>E</b>	.417/10, 60 $\pm$ .005/0, 12	.425/10, 80 $\pm$ .005/0, 12
<b>F</b>	3x. 146/3, 70 $\pm$ .005/0, 12	3x. 146/3, 70 $\pm$ .005/0, 12
<b>G</b>	.787/20,00	.630/16,00
<b>H</b>	.945/24,00	.945/24,00
<b>I</b>	.272/6,91	.232/5,90

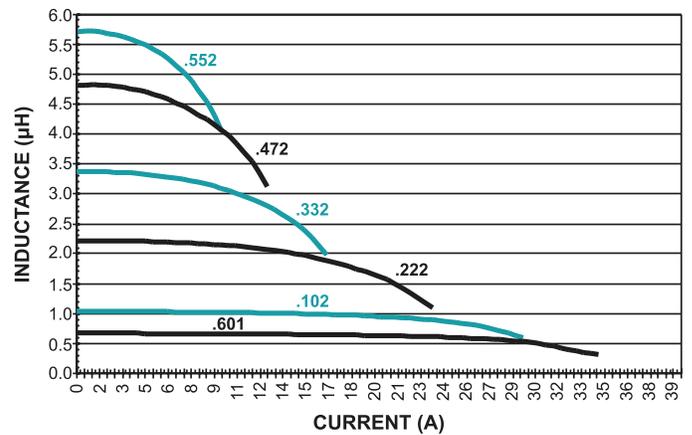
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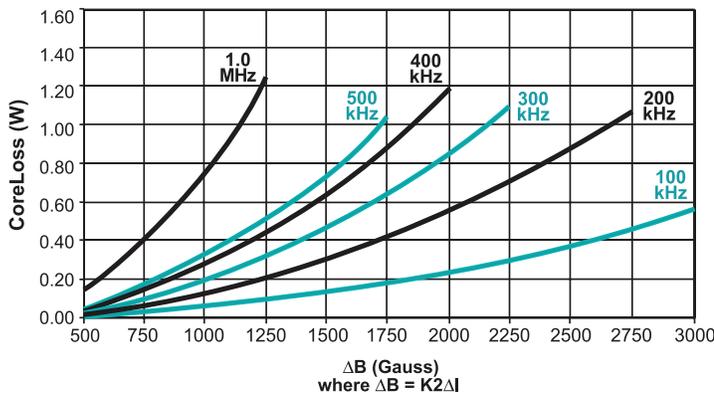
**PG0006NL Typical Inductance vs DC Bias**



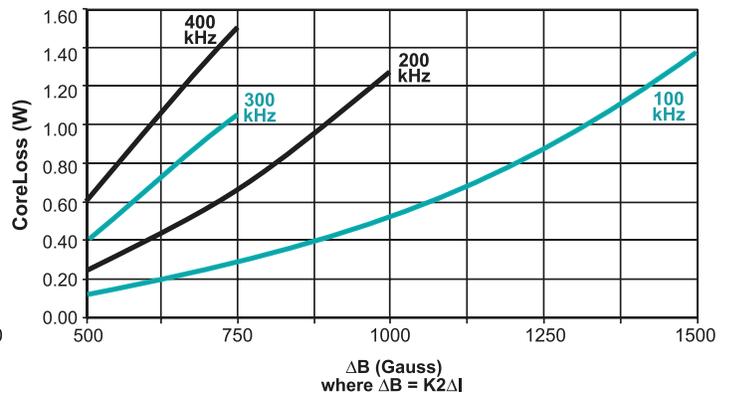
**PG0138NL Typical Inductance vs DC Bias**



**PG0006NL Typical Core Loss vs Peak Flux Density**



**PG0138NL Typical Core Loss vs Peak Flux Density**



**For More Information:**

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