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Wirewound Inductors Save Space In DC-DC Converters

From Murata Electronics North America, members of the LQH88P_38 series of shielded, wirewound power inductors offer current ratings up to 8 A, yet measure only 8 mm x 8 mm x 3.8 mm (Fig. 1). These inductors can offer a space-saving alternative to the larger conventional power inductors used in dc-dc converters for flat screen televisions, set-top boxes, digital recording devices, wireless base stations and other electronic applications. The LQH88P_38 series marks Murata's entry into the market for large form-factor power inductors.

According to Deryl Kimbro, group product manager for Murata Electronics North America, these new 8-mm x 8-mm inductors offer current ratings, DCR values, and saturation levels that rival larger power inductors currently in use (see the table). And for those applications where the LQH88P_38 specifications are sufficient, these inductors enable cost reduction as well as a reduction in the required board-space.

Kimbro attributes the small size of the LQH88P_38 to innovations in magnetic shielding as well as improvements in the ferrite core materials and winding technology, which lower dc resistance and improve dc bias (rated current) characteristics (Fig. 2). To achieve shielding, the LQH88P_38 utilizes a ferrite resin to prevent interference with other circuits and devices. This approach is more compact than the usual technique of placing a ferrite sleeve over the core. In addition, the ferrite resin is a lower-cost solution compared to the ferrite sleeve. Sample pricing for LQH88P_38 series components is $0.220.

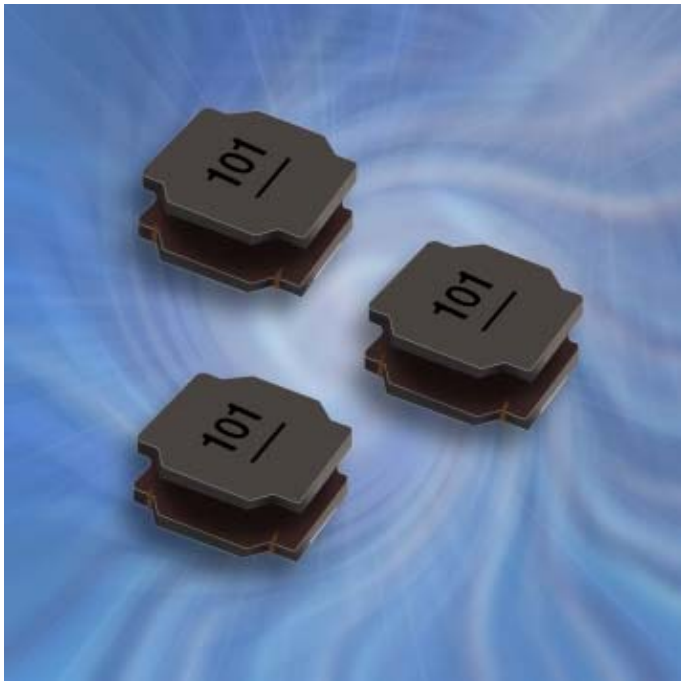

Fig. 1. Measuring just 8 mm x 8 mm, the LQH88P_38 shielded, wirewound power inductors offers performance that rivals large, more costly components.

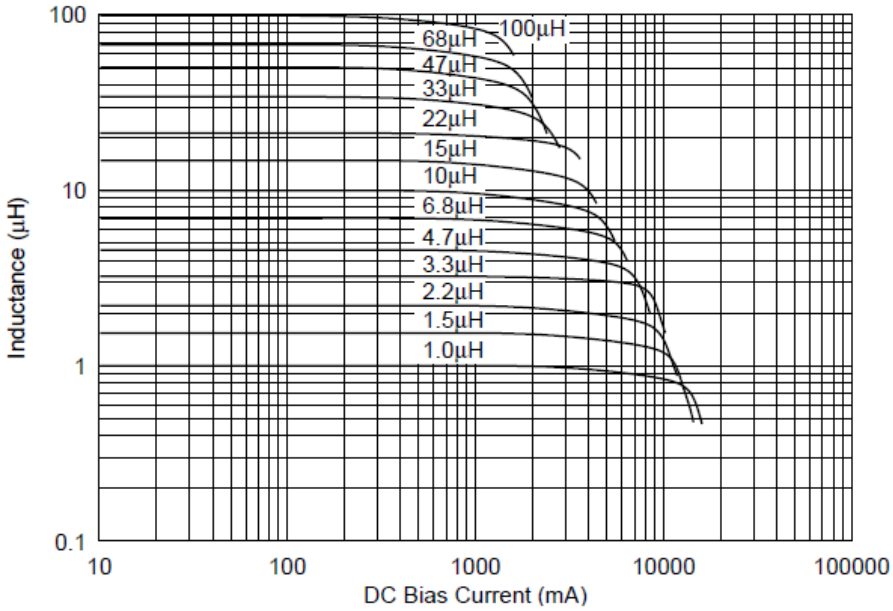

Fig. 2. The LQH88P_38 series inductors tolerate high levels of dc bias current.

Part number	Inductance (µH) measured at 100 kHz	Allowable dc current (A) based on 40°C temp. rise	DC resistance (Ω)*	Self-resonance frequency (MHz)
LQH88PN1R0N38	1.0 µH ±30%	8.00	0.006	100
LQH88PN1R5N38	1.5 µH ±30%	7.10	0.008	60
LQH88PN2R2N38	2.2 µH ±30%	6.40	0.009	50
LQH88PN3R3N38	3.3 µH ±30%	5.00	0.013	35
LQH88PN4R7N38	4.7 µH ±30%	4.20	0.017	30
LQH88PN6R8N38	6.8 µH ±30%	3.80	0.022	20
LQH88PN100M38	10 µH ±20%	3.15	0.029	18
LQH88PN150M38	15 µH ±20%	2.45	0.041	13
LQH88PN220M38	22 µH ±20%	2.25	0.066	10
LQH88PN330M38	33 µH ±20%	1.75	0.095	9
LQH88PN470M38	47 µH ±20%	1.45	0.157	7
LQH88PN680M38	68 µH ±20%	1.10	0.190	7
LQH88PN101M38	100 µH ±20%	1.00	0.265	4

Table. Key Specifications for LQH88P_38 series wirewound inductors. (*DCR values have ±30% tolerance.)