

High Frequency Power Inductor

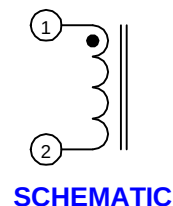
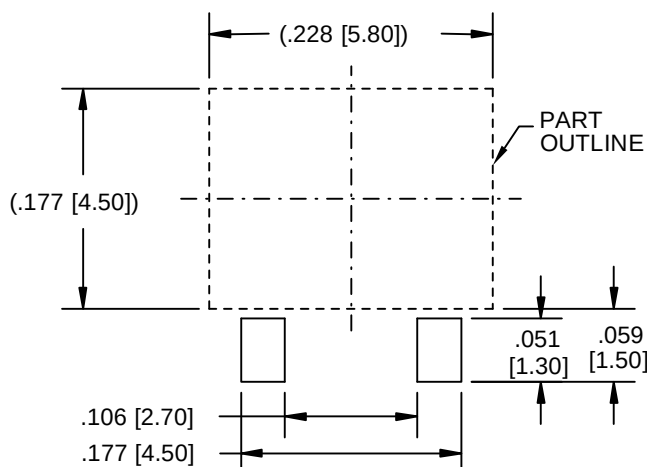
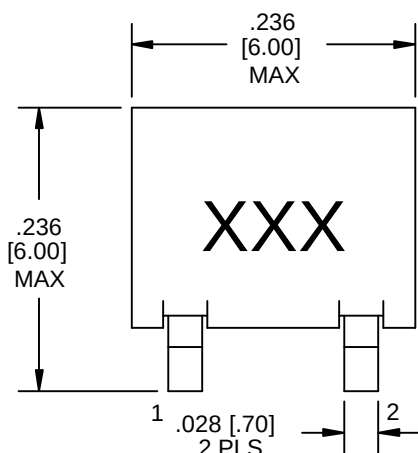
59P34-XXX

FEATURES

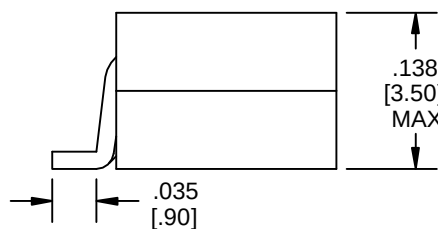
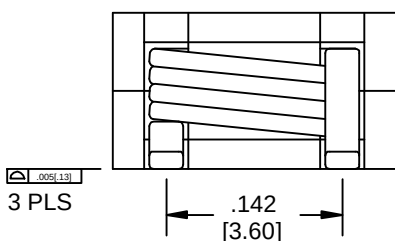
- Designed for use in VRM Applications.
- Operating Frequency 0.100 - 2.0 MHz.
- Operating Temperature Range of -40°C to 125°C.
- RoHS Compliant Version Available.
- Surface Mount Package for pick and place assembly.

MECHANICAL

PRELIMINARY



SUGGESTED PCB LAYOUT



ALL DIMENSIONS GIVEN IN INCHES (MM).
TOLERANCES UNLESS OTHERWISE SPECIFIED.
.XX±.01 [X±.25] .XXX±.005 [XX±.13] ANGULAR: ±1°

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AF5015 59P34-XXX_042409

High Frequency Power Inductor

59P34-XXX

ELECTRICAL SPECIFICATIONS @ 25°C

Part Number		Inductance ⁴ @ 0 Adc	Inductance ⁴ @ Isat ²	DCR ⁶	Isat ² Max Saturation Current			Temp. Rise Current ³	Temp. Rise Factor A (TRF A) ⁵	Temp. Rise Factor B (TRF B) ⁵	Temp. Rise Factor C (TRF C) ⁵
Classic	RoHS	nH ±10%	nH MIN	mOhms ±10%	ADC 25°C	ADC 100°C	ADC 125°C	ADC MAX			
59P34-221	59PR34-221	220	158	1.1	17	14	13	14.6	2.13	0.000655	0.09838
59P34-331	59PR34-331	330	238	2.2	17	14	13	10.3	2.13	0.000662	0.09823
59P34-401	59PR34-401	400	288	2.2	14	12	11	10.3	2.13	0.000658	0.11922
59P34-471	59PR34-471	470	338	2.2	12	10	9	10.3	2.13	0.000655	0.14012
59P34-561	59PR34-561	560	403	3.3	13.2	11.2	10.4	8.4	2.13	0.000663	0.12497
59P34-681	59PR34-681	680	490	3.3	10.9	9.2	8.5	8.4	2.13	0.000658	0.15200
59P34-821	59PR34-821	820	590	5.5	11.3	9.6	8.9	6.5	2.13	0.000666	0.14623
59P34-102	59PR34-102	1000	720	5.5	9.2	7.8	7.3	6.5	2.13	0.000659	0.17875

PRELIMINARY

Notes:

- 1 - The Rated Current (I_{rated}) is either the Saturation Current at 25°C or the Temperature Rise Current ; the lowest number of the two specified currents.
- 2 - The Saturation Current (Isat) is the current at which the Inductance drops by a maximum of 20% below the lower limit of its value specified at 0 ADC Bias. Inductance at Isat is measured at the specified Ambient Temperature by applying DC Bias by a short period of time to minimize the self-heating effect of the component.
- 3 - The Temperature Rise Current is the current at which the temperature of the part increases by 50°C. This test is performed with the part mounted on a PCB with traces having 1.75 times the cross sectional area of the copper leads of the part. The temperature of the part is measured after applying the DC current for a minimum of 10 minutes.
- 4 - Inductance is measured at 100 KHz and 1.0 Vrms.
- 5 - Temperature Rise can be estimated using the provided formulas:
- 6 - DCR is measured from lead to lead at test point TP1.

$$\text{Trise (°C)} = \left(\frac{\text{Core Loss} + \text{DCR Loss}}{\text{TRF A}} \right)^{0.833}$$

$$\text{DCR Loss (mW)} = \left(\text{IDC}^2 + \left(\frac{\Delta I}{2} \right)^2 \right) \times \text{TYP DCR (mOhms)}$$

$$\text{Core Loss (mW)} = \text{TRF B} \times (\text{F})^{1.84} \times (\text{TRF C} \times \Delta I)^{2.28}$$

IDC = DC Output Current (ADC)

ΔI = Delta I across the inductor (Amps)

F = Switching Frequency (kHz)

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