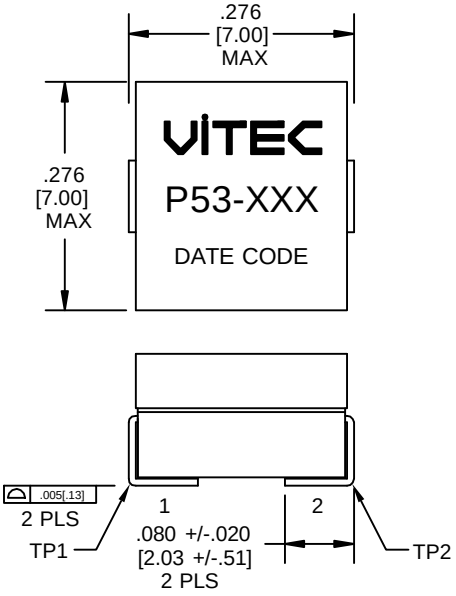
High Frequency Power Inductor

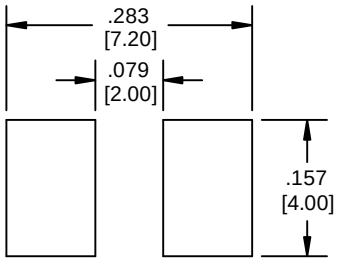
59P53-XXX

FEATURES

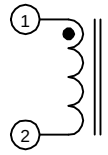
- Designed for use in VRM 9.X, 10.X & 11.X Applications.
- Operating Frequency 0.100 - 2.0 MHz.
- Operating Temperature Range of -40°C to 125°C.
- RoHS Compliant Version Available.
- Surface Mount Package for pick and place assembly.
- Low Profile SMT Package.

MECHANICAL

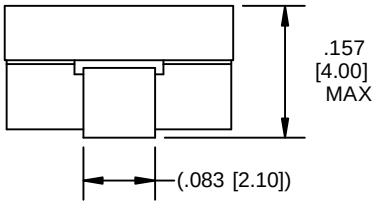




SUGGESTED PCB LAYOUT



SCHEMATIC



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

ELECTRICAL SPECIFICATIONS @ 25°C

Part Number		Inductance [4] @ 0 Adc	Inductance [4] @ Isat [2]	DCR (TP1-TP2)	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	nH	mOhms	ADC	ADC	ADC	ADC			
		+/-10%	MIN	+/-10%	25°C	100°C	125°C	MAX			
59P53-750	59PR53-750	75	54	0.40	46	39	36	24	2.10	0.001506	0.03615
59P53-101	59PR53-101	100	72	0.40	34	29	27	24	2.10	0.001494	0.04829
59P53-151	59PR53-151	150	108	0.40	23	19	18	24	2.10	0.001486	0.07252
59P53-201	59PR53-201	200	144	0.40	17	15	14	24	2.10	0.001479	0.09677
59P53-471	59PR53-471	470 +/-15%	320	0.40	6.5	5.5	5	24	2.10	0.001473	0.22756

Add an "R" to the part number after "P" for the RoHS compliant version (i.e. 59PR53-750 is the RoHS compliant version of 59P53-750).

Notes:

1 - The Rated Current (Irated) 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 following formulas:

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

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

$$\text{Core Loss (mW)} = \text{TRF B X } (F)^{1.84} \text{ X } (\text{TRF C X } \triangle)^{2.28}$$

IDC = DC Output Current (ADC)
△I = Delta I across the inductor (Amps)
F = Switching Frequency (kHz)

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REF: AF4424A/B/C/D AF4425A/B

FILE NAME: 59P53-XXX_080310

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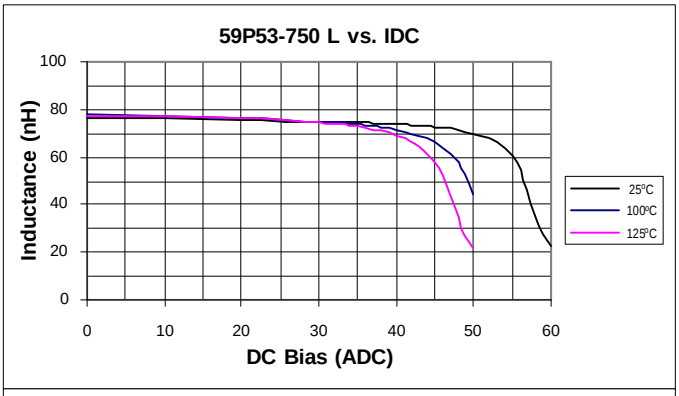
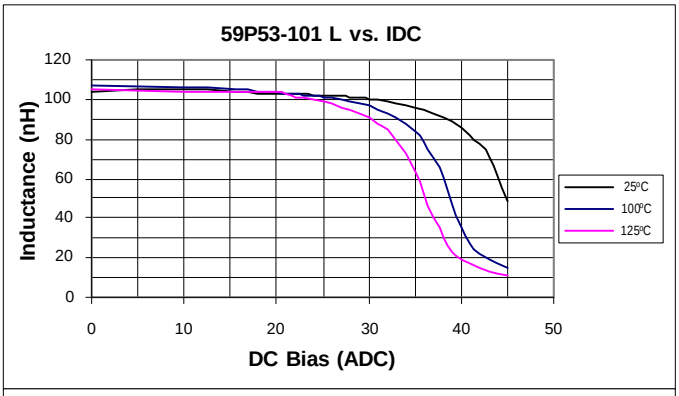
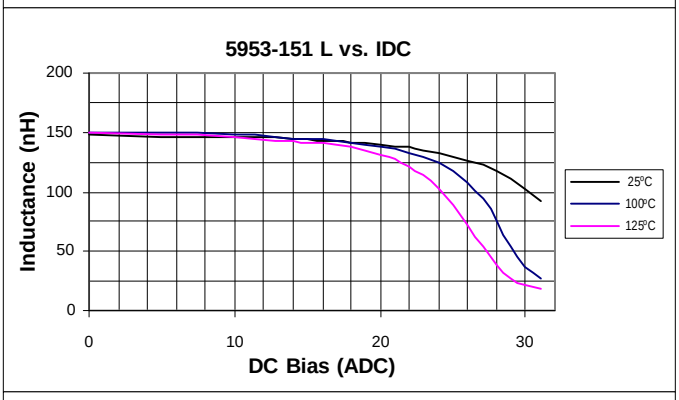
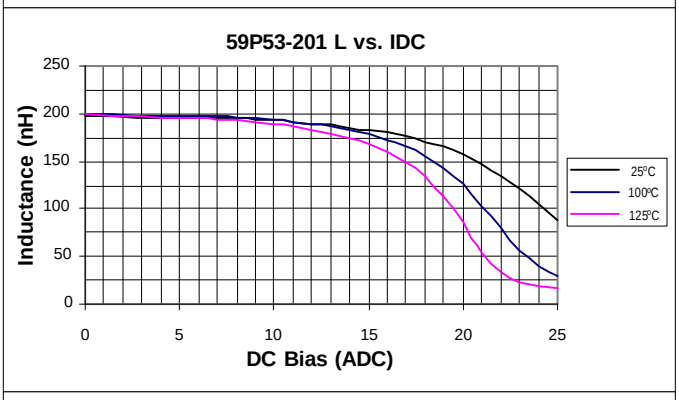
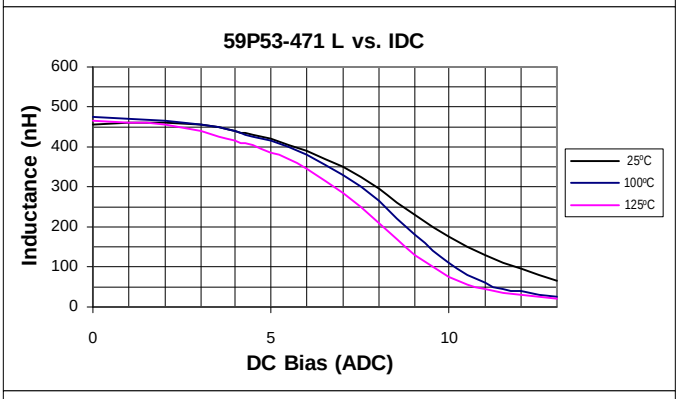
PERFORMANCE GRAPHS

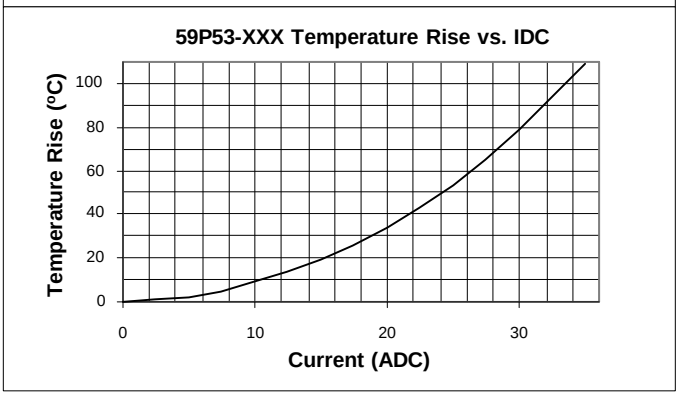


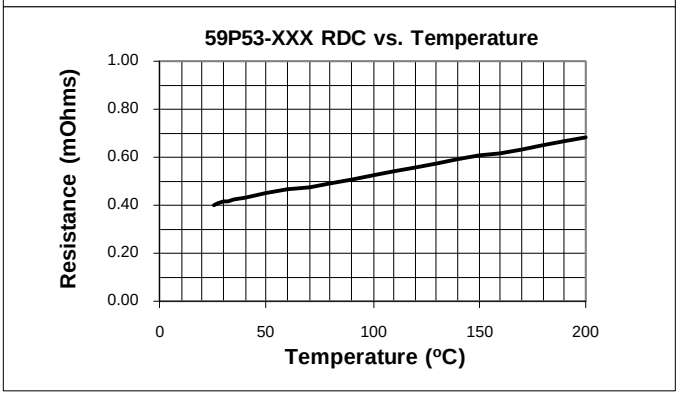












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