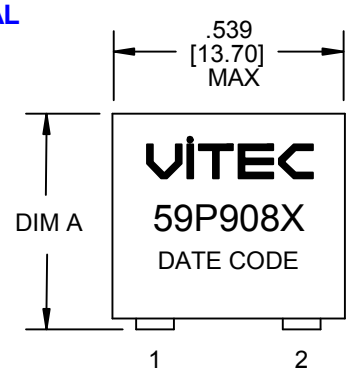
High Frequency Power Inductor

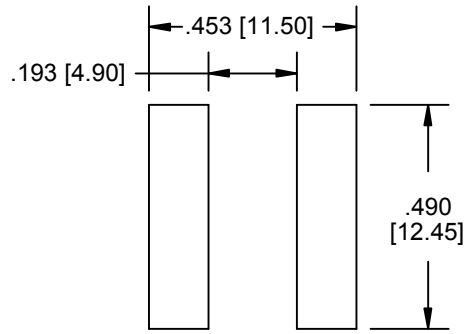
59P908X

FEATURES

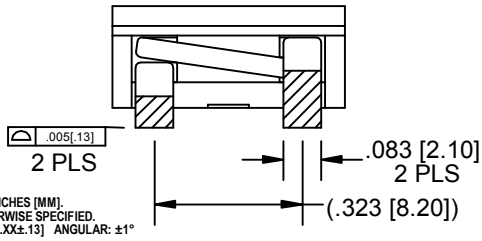
- Designed for use in VRM Applications.
- Operating Frequency 0.100 - 2.0 MHz.
- Operating Temperature Range of -40°C to 125°C.
- RoHS Compliant Version Available.
- Surface Mount Package for pick and place assembly.

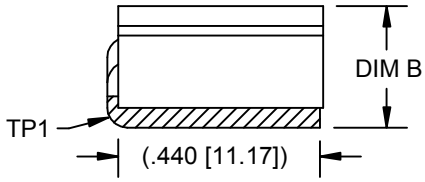
MECHANICAL



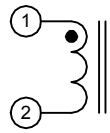


SUGGESTED PCB LAYOUT





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



SCHEMATIC

P.N:	DIM A (MAX)	DIM B (MAX)
59P9081	.496 [12.60]	.311 [7.90]
59P9081N	.496 [12.60]	.311 [7.90]
59P9082	.480 [12.20]	.291 [7.40]
59P9082N	.480 [12.20]	.287 [7.30]
59P9083	.476 [12.10]	.287 [7.30]
59P9083N	.476 [12.10]	.283 [7.20]
59P9084	.472 [12.00]	.272 [6.90]

ELECTRICAL SPECIFICATIONS @ 25°C

Part Number		Inductance [3] @ 0 Adc	Inductance [3] @ Isat [1]	DCR [5]	Isat [1] Max Saturation Current			Temp. Rise Current [2]	Temp. Rise Factor A (TRF A) [4]	Temp. Rise Factor B (TRF B) [4]	Temp. Rise Factor C (TRF C) [4]
Classic	RoHS	nH ±10%	nH MIN	mOhms ±10%	ADC 25°C	ADC 100°C	ADC 125°C	ADC MAX			
59P9081	**59PR9081**	220	158	0.44	82	68	64	60	14.46	0.005537	0.02192
59P9081N	**59PR9081N**	320	230	0.44	56	48	44	60	14.46	0.005421	0.03205
59P9082	**59PR9082**	510	367	0.98	54	45	42	43	16.54	0.005530	0.03389
59P9082N	**59PR9082N**	680	490	0.98	40	33	31	43	16.54	0.005435	0.04538
59P9083	**59PR9083**	860	619	1.63	42	35	33	30	13.39	0.005565	0.04277
59P9083N	**59PR9083N**	1000	720	1.63	36	30	28	30	13.39	0.005507	0.04984
59P9084	**59PR9084**	1500	1080	2.50	30	25	23	23	12.07	0.005509	0.05988

Add an "R" to the part number after "P" for the RoHS compliant version (i.e. 59PR9081 is the RoHS compliant version of 59P9081).

Notes:

1 - 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.
2 - 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.
3 - Inductance is measured at 100 KHz and 1.0 Vrms.
4 - Temperature Rise can be estimated using the following formulas:
5 - DCR is measured at test points (TP1).

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

$$\text{DCR Loss (mW)} = \left(\text{IDC2} + \left(\frac{\triangle I}{2} \right)^2 \right) \text{ X TYP DCR (mOhms)}$$

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

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

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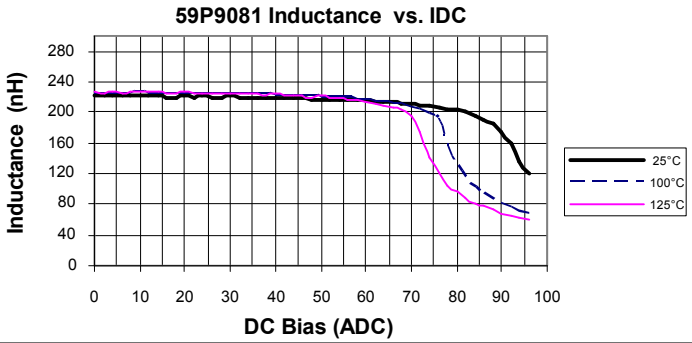

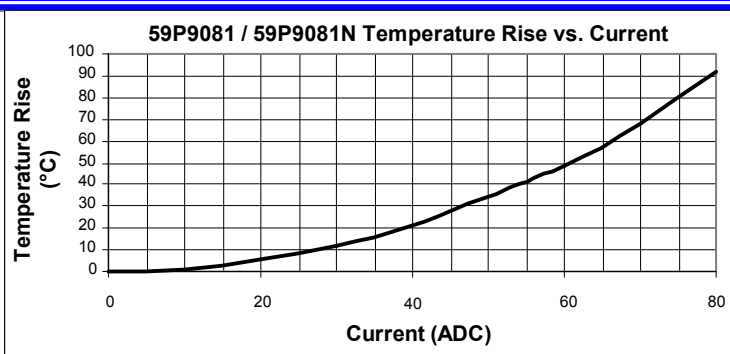

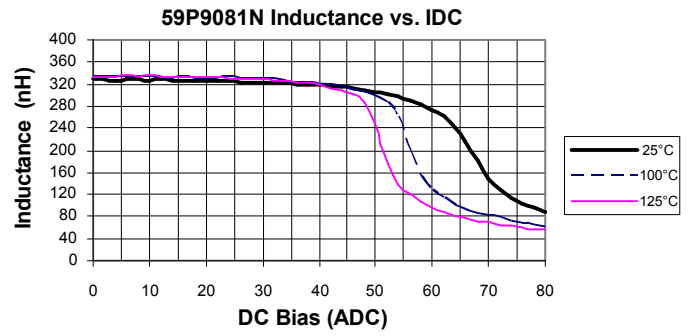

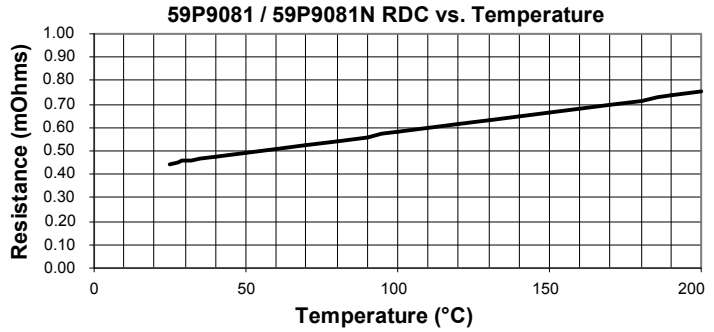

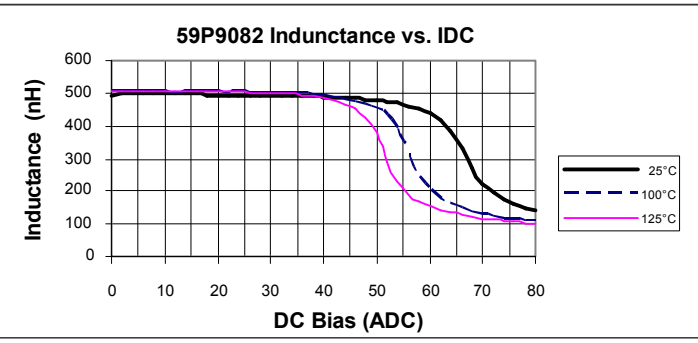

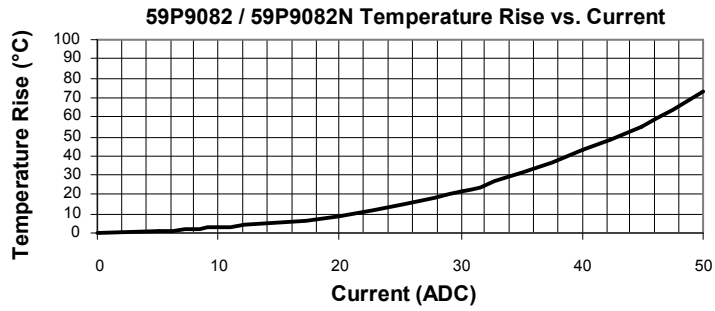

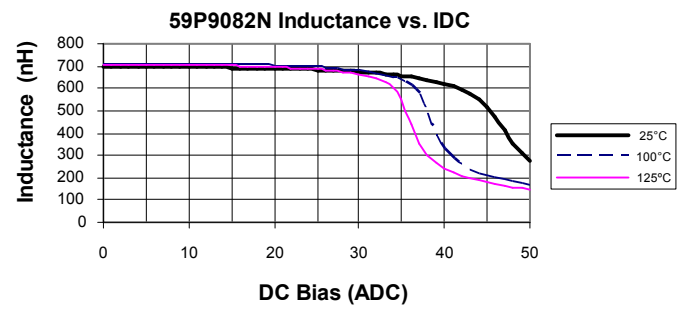

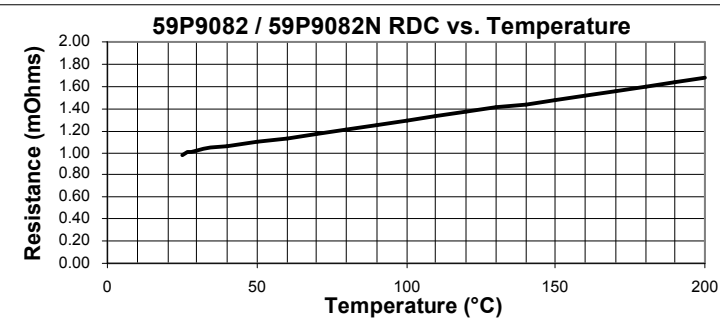

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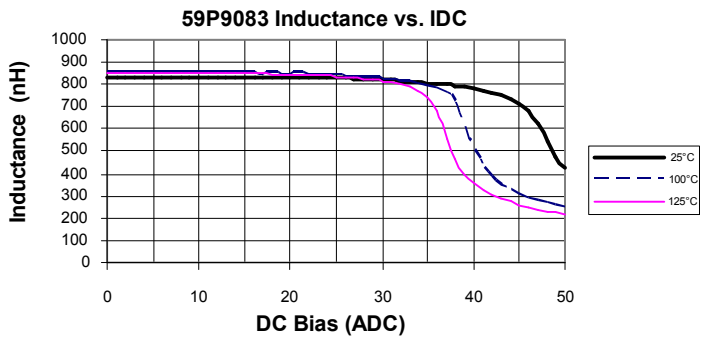

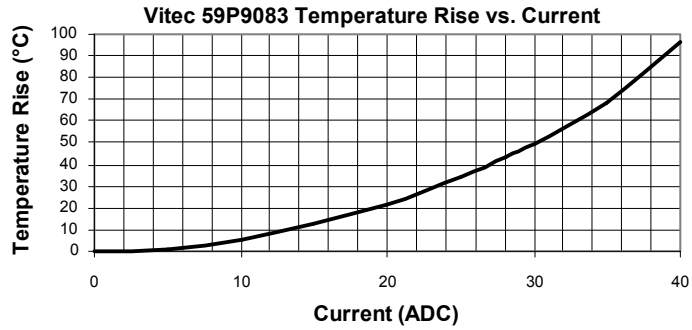

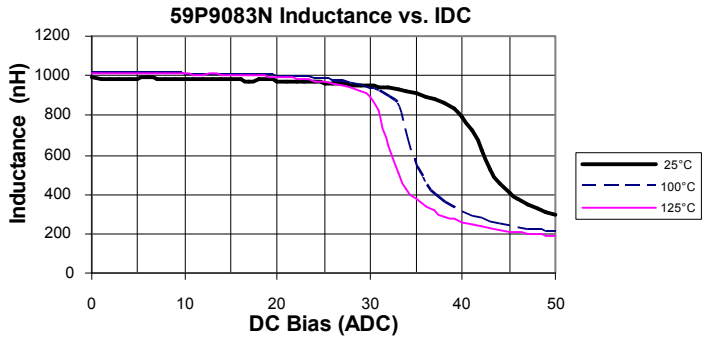

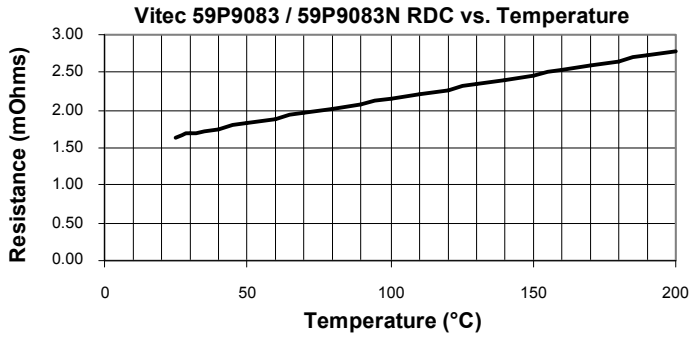

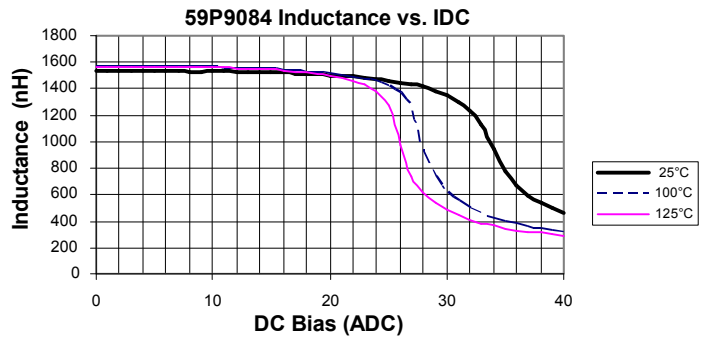

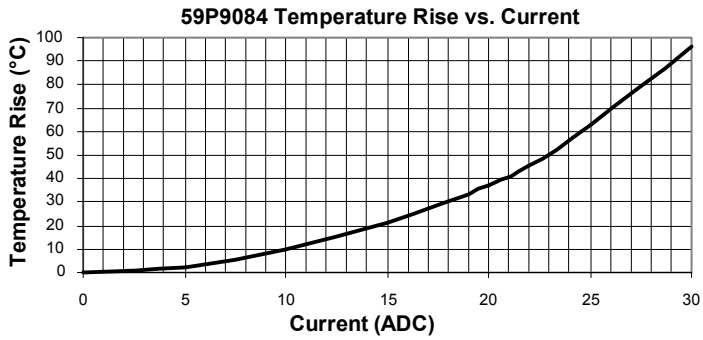

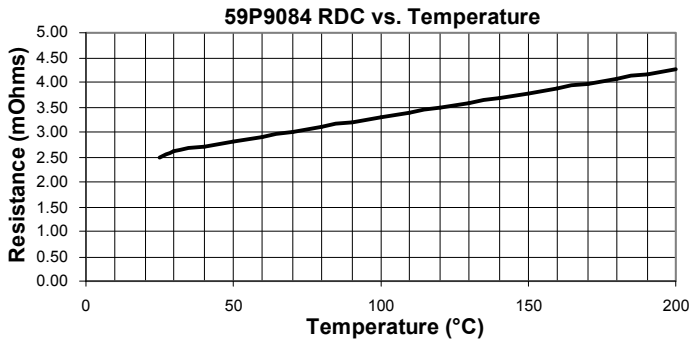

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