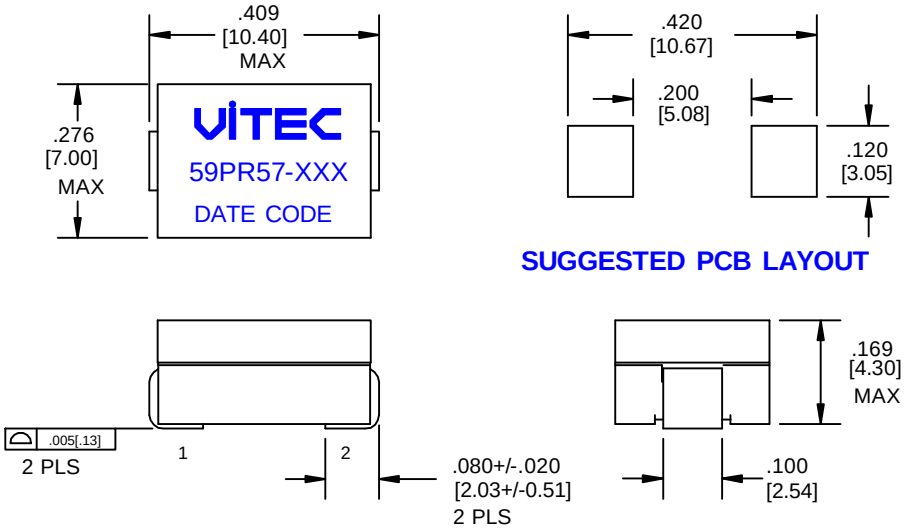
SMD High Frequency Power Inductor

Designed for VRD & VRM 10.X & 11.X Applications

FEATURES

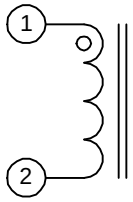
- Low Profile SMT Package
- Operating Frequency of 0.100 - 2.0 MHz
- Extended Operating Temperature Range of -40ºC to 125ºC
- High Current Handling Capability in the Smallest Footprint

MECHANICAL



ALL DIMENSIONS GIVEN IN INCHES [MM].
TOLERANCES UNLESS OTHERWISE SPECIFIED.
.XX+/-.01 [.X+/-0.25] .XXX+/-.005 [.XX+/-0.13] ANGULAR: +/-1º

SCHEMATIC



ELECTRICAL CHARACTERISTICS @ 25ºC

Part Number		Inductance @ 0Adc[4]	Inductance @ I_{rated}[4]	I_{rated}[1]	DCR	MAX Saturation Current2			Temp. Rise Current3	Temp. Rise Factor5
Classic	RoHS	nH	nH	ADC	mOhms	ADC	ADC	ADC	ADC	
		+/-10%	MIN	MAX	+/-10%	-40ºC	25ºC	125ºC	MAX	
59P57-121	59PR57-121	120	86	25	0.45	26	25	20	25	0.036520
59P57-201	59PR57-201	200	144	20	0.45	21	20	16	25	0.060867

Add an "R" to the part number after "P" for the RoHS compliant version

Notes:

1. The rated current is the saturation current @ 25ºC.
2. The I(Saturation) is the current at which the inductance drops by 20% maximum of its value at 0ADC. This current is measured at the stated ambient environment and by applying a short duration pulse current to the component, minimizing the self-heating effects.
3. The I(Temp. Rise) is the current at which the temperature of the part increases by a maximum of 50ºC. This test is performed with the part mounted on a PCB with traces having 1.7 times the cross sectional area of the copper leads and applying the DC current for a minimum of 30 minutes.
4. Inductance is measured at 100 KHz and 1.0 Vrms.
5. Temperature Rise can be estimated using the following formulas:

$$\text{Trise (ºC)} = \left(\frac{\text{Core Loss + DCR Loss}}{2.48}\right)^{0.833}$$

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

$$\text{Core Loss (mW)} = 0.002292 \times (F)^{1.84} \times (\text{Temp. Rise Factor} \times \triangle I)^{2.28}$$

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

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