Measurement Report

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| --- | --- |
| Subject of the exercise: | <Title> (Exercise <No>.) |
| **Date:** | <year>. <month>. <day> |
| **Students name:** | <name 1>  <name 2>  <name 3> |
| **Course and group No.** | Course: P2, <Group No.> |
| **Supervisors:** | <name 1>, <name 2> |

Equipment in use, devices under test

|  |  |  |
| --- | --- | --- |
| Precision Magnetics Analyzer | Wayne Kerr 3260B | <Unit no.> |
| Test panel | VIK– 01–07 | <Unit no.> |

Measurement Tasks

1. Measurement of ferromagnetic properties of materials

Technical data of core:

* Type: TDK H5A
* Material: ferrite
* Shape: toroidal
* Dimensions: D= 68 mm, d= 44 mm, h= 13,5 mm
* Bandwidth: max. 0,2 MHz
* Initial permeability, *μ*i : 3300 -0….+40%
* Max. flux density, Bm: 410 mT
* Inductivity factor, AL: 4300±25% nH
  1. Measure the coil impedance at 1V in the range of 100 Hz…500 kHz!

<your comments>

* 1. Measure the resonance frequency and the self-capacitance of the coil using the built-in function of the Analyzer! Determine the self-capacitance by two methods (e.g., using resonance frequency or high frequency measurement)!

<your comments>

* 1. What is the max. measurement frequency if the systematic error caused by the resonance is not higher than 1%?

<your comments>

* 1. Measure the coil impedance at 150 Hz in the range of 1 mV…10 V using the Graph-mode of the Analyzer!

<your comments>

* 1. Calculate *μ*r(*B*m) and AL(*B*m) from the *Z*(*U*) characteristics!

<your comments>

1. Measurement of model parameters of transformers

**Technical data of DUT No Tr-1 and Tr-2**:

* Type: TDK H5A
* Core material: ferrite
* Shape: toroidal
* Dimensions: D = 68 mm, d = 44 mm, h = 13,5 mm
* Frequency: max. 0,2 MHz
* Initial permeability, *μ*i : 3300 -0….+40%
* Max. flux density, Bm: 410 mT
* Inductivity factor, AL: 4300±25% nH
* Number or primary turns, Np: 110
* Number or secondary turns, Ns: 110
* Cross section of the copper wire, ACu: 0,05 mm2
* Diameter of isolated wire dv: 0,6 mm
* Coupling: tight coupling (Tr-1), loose coupling (Tr-2)
  1. Measure the model parameters at *U*eff = 5V and *f* = 1 kHz! Measure the dc parameters! What are the differences between the two transformers?

<your comments>

* 1. Estimate the measurement uncertainties of the copper resistances and that of the magnetizing inductivity!

<your comments>

* 1. Measure the primary impedance *Z*(*U*, *f*) of the unloaded transformer!

<your comments>

1. In-circuit measurement on RC-network

**Technical data of the RC-components:**

* R1= 100 Ω ±0,1%   
   R2= *R*4= 1 kΩ ±1%   
   R5 = 10 kΩ ±2%   
   C1= 1 μF ±5%   
   C2= 100 nF ±5%



Figure 7–1. Schematic of low-pass filter to be measured

* 1. Measure all of the RC components using in-circuit technique! Are the measured values within the specified tolerance bands?

<your comments>