



# *Updates: Test Data for 10GBase-T Magnetics*

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# *Objectives*

- Provide actual test data for a couple of typical magnetic examples:
  - transformer alone
  - transformer and common-mode choke

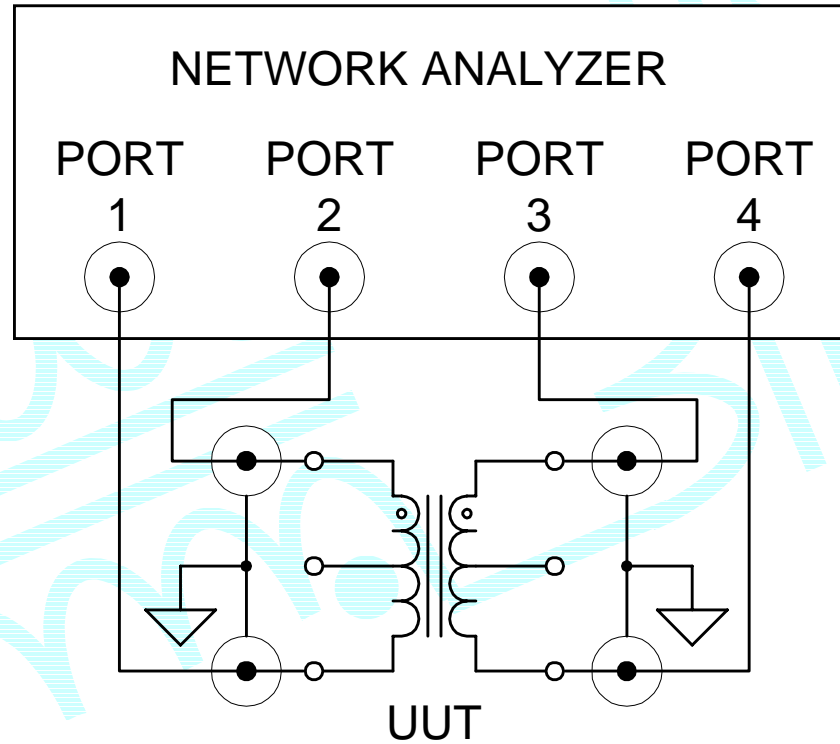


# *10GBase-T magnetics, example 1*

- Characteristics:
  - 1CT:1CT turns ratio (center tap on each side).
  - Insulation to meet 1500 VAC.
  - OCL of about 200  $\mu\text{H}$  @ 100 kHz.
  - Wound on small core made out of common high-permeability ferrite material.
  - No common-mode choke.
  - Each package has 4 channels.
  - Sample tested with direct connections to package from analyzer SMB connectors.



# Test set up

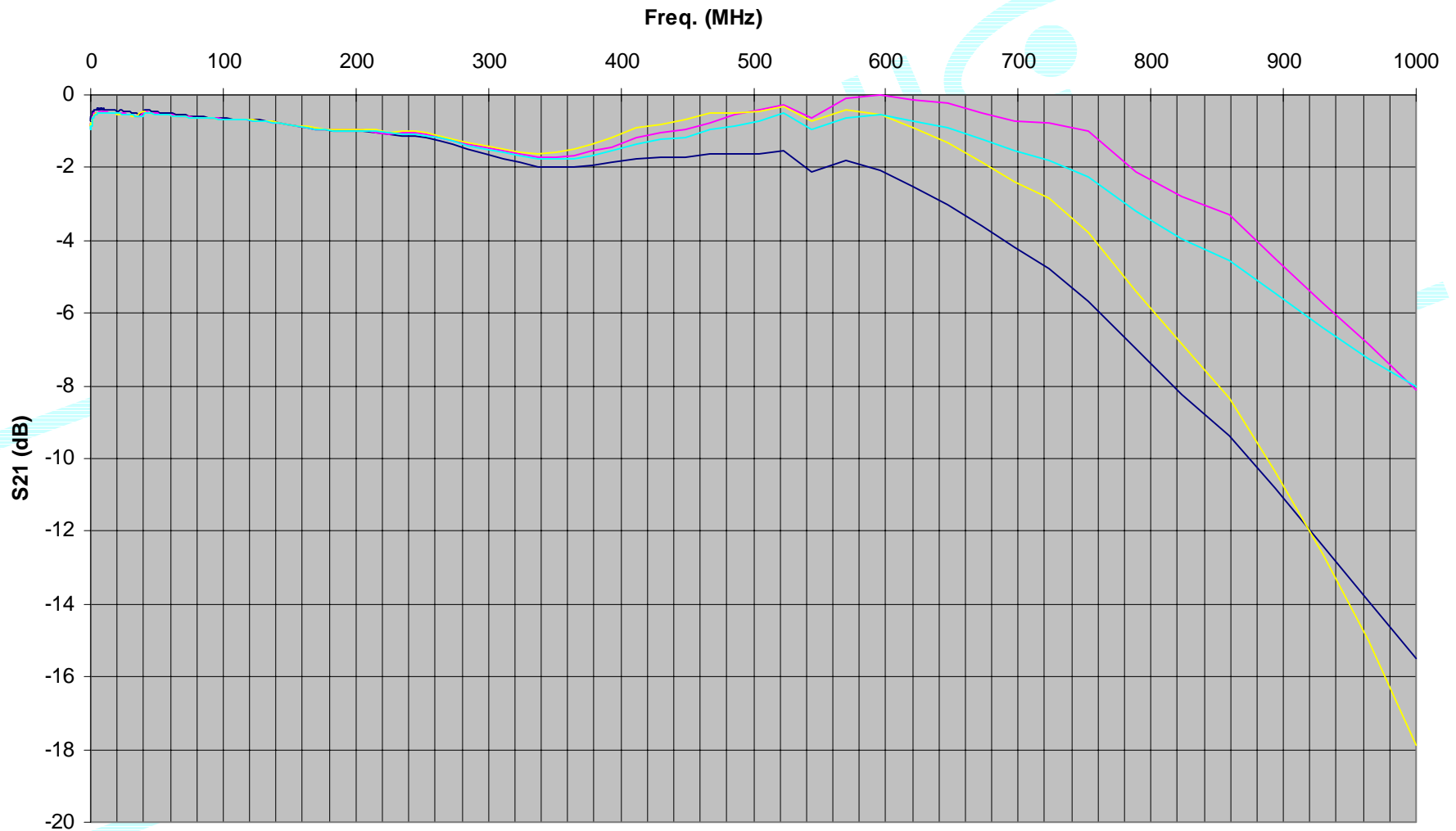


## TEST SET UP



# Test results, example 1

## Insertion Loss, example 1

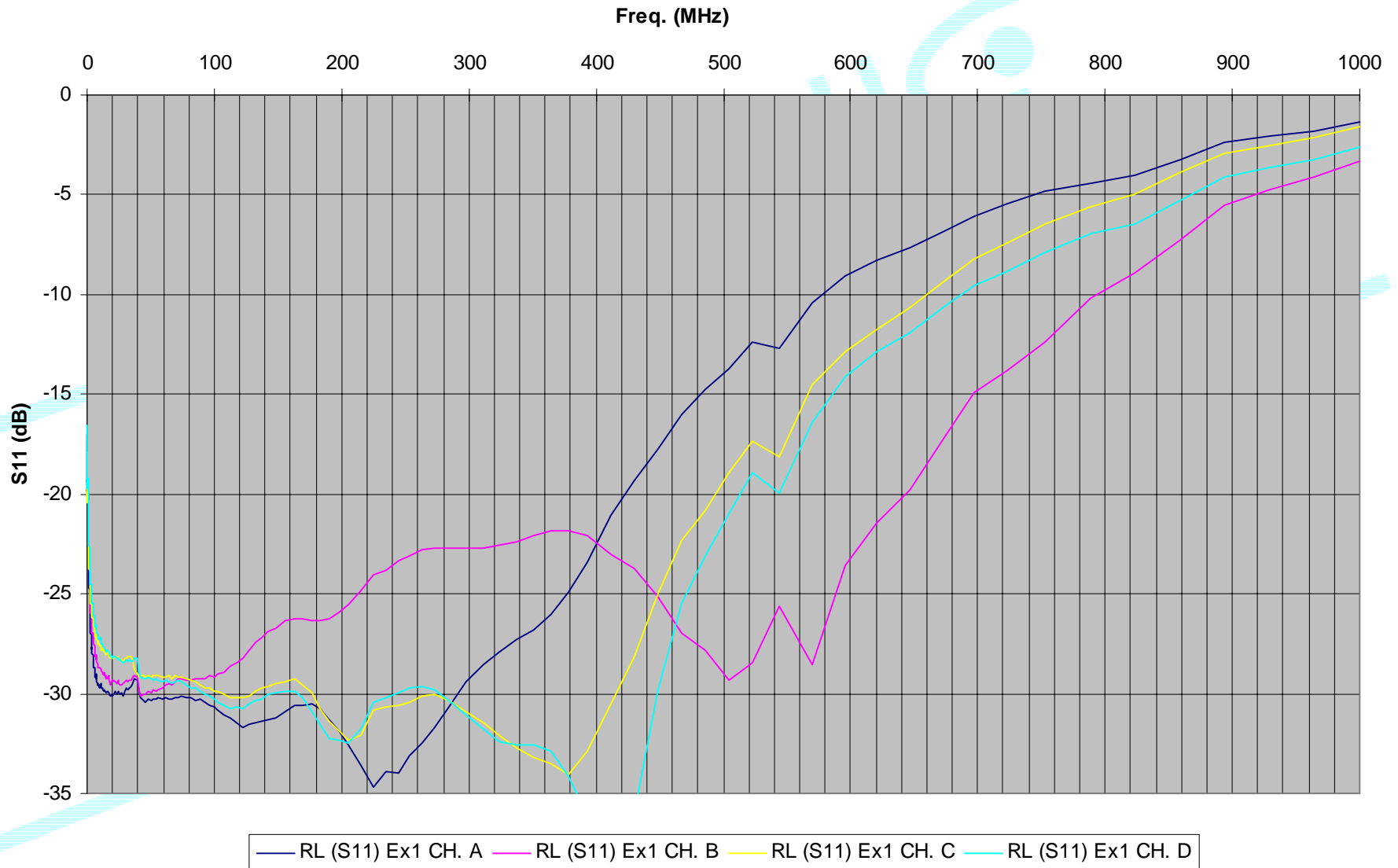


— IL Ex1 CH. A — IL Ex1 CH. B — IL Ex1 CH. C — IL Ex1 CH. D



# Test results, example 1 (continued)

## Return Loss, example 1





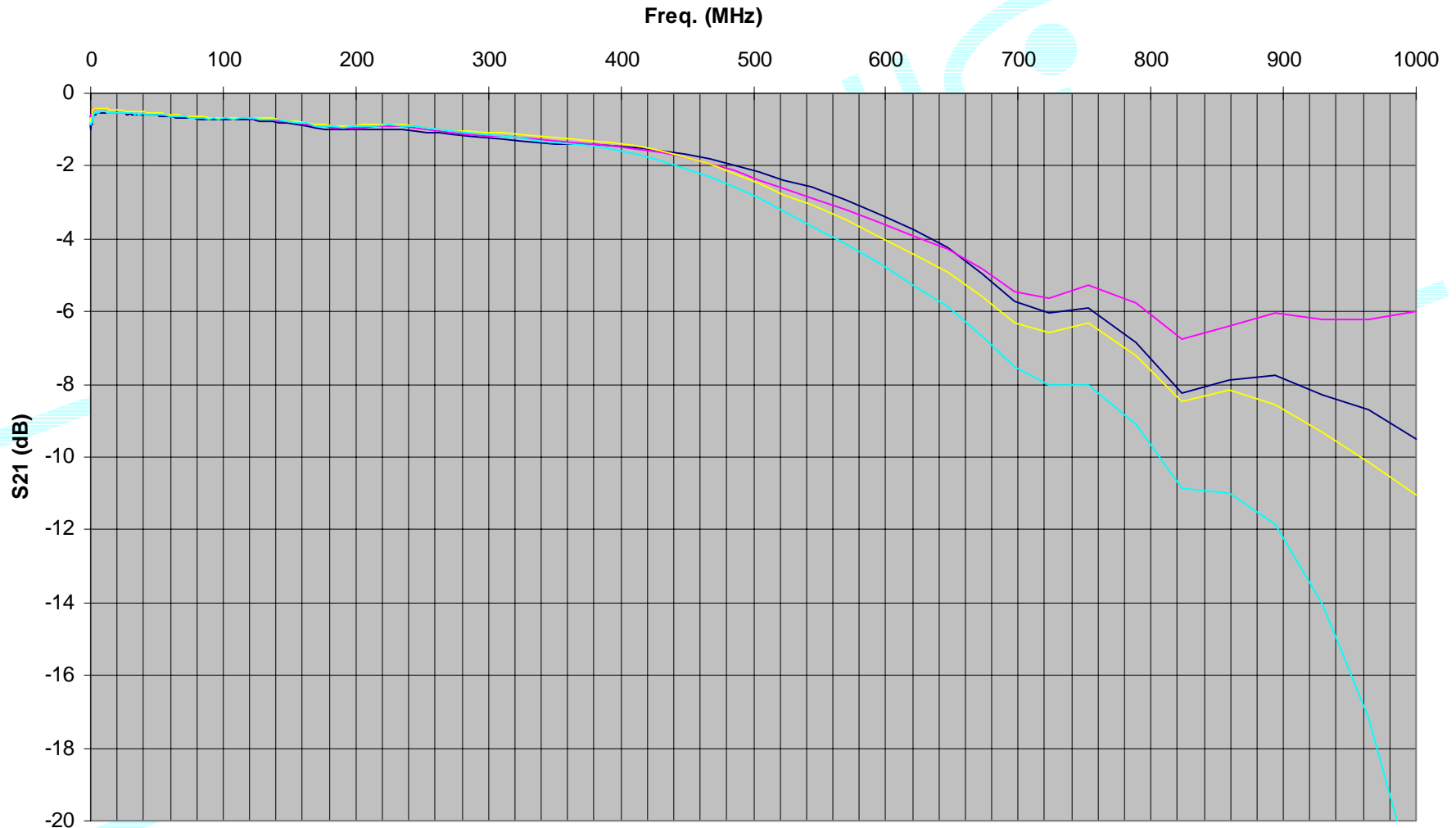
## *10GBase-T magnetics, example2*

- Characteristics:
  - Same as in design example 1, but with a common-mode choke of same design as those in typical 10/100/1000 magnetics.
  - Same test setup.



# Test results, example 2

## Insertion Loss, example 2



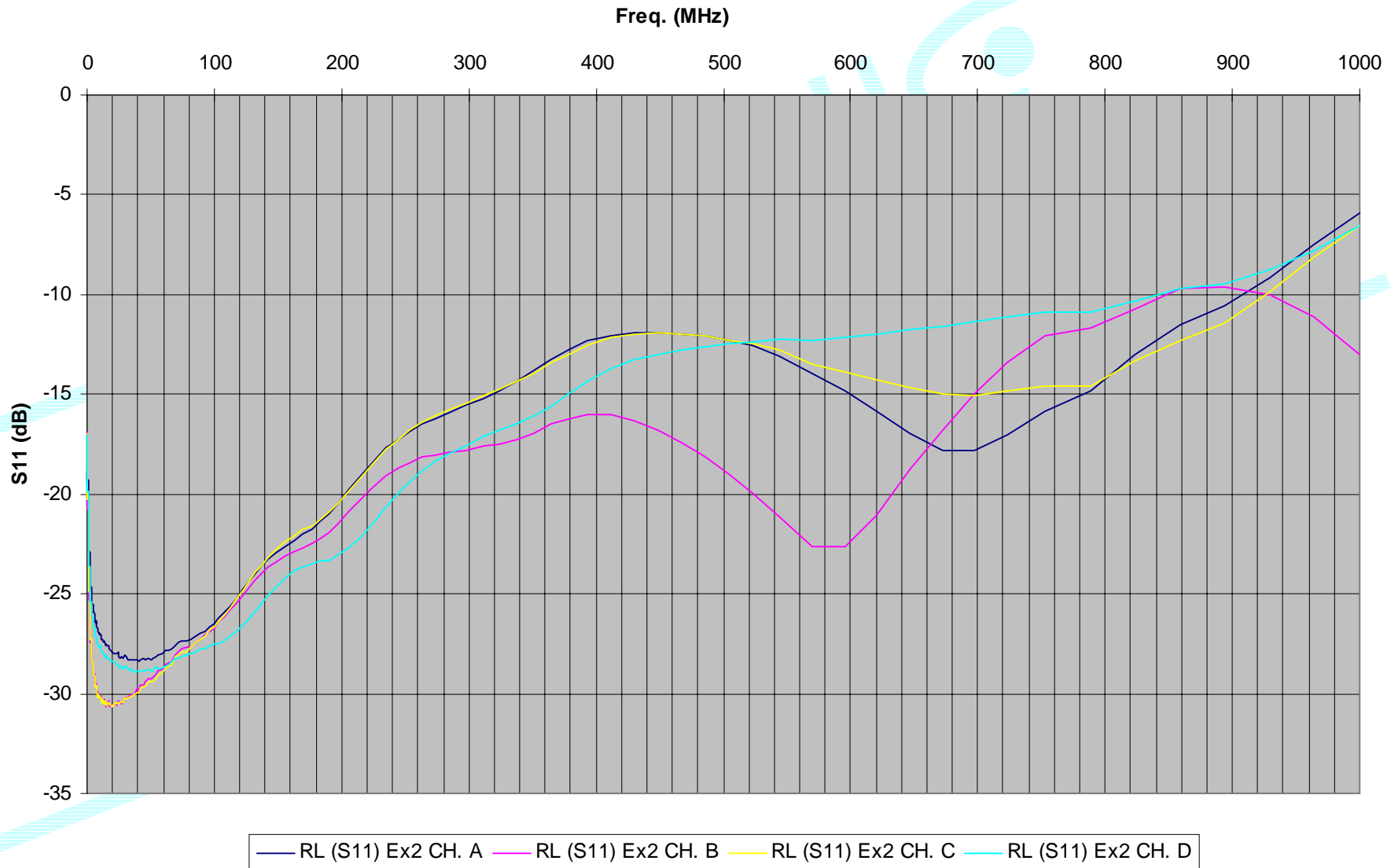
— IL Ex2 CH. A — IL Ex2 CH. B — IL Ex2 CH. C — IL Ex2 CH. D





# Test results, example 2 (continued)

## Return Loss, example 2





## *Summary*

- Bandwidth (3dB) from less than 100 kHz to more than 600 MHz is feasible with transformer alone, but upper bandwidth may be reduced to less than 500 MHz with common-mode chokes.