



# Test Reductions via Data Referencing for Closely Related Products

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# Overview

1. Rationale
2. Test Reduction via Data Referencing
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# Rationale

- Extending [KDB Publication 484596](#) on a case-by-case basis (KDB Inquiry required)
- Methodology devised to allow [faster time-to-market](#) for new products
- Provisions to assure that [accurate testing data](#) are provided to verify that products available in the marketplace fully comply with RF exposure and EMC requirements



# Test Reduction via Data Referencing

- Streamlined testing for-very similar products
- Set consists of a **reference** model with several **variants**
- On a case-by-case basis, and only under specific conditions, **test data from reference model** may be allowed for compliance verification reports
- KDB Inquiry required for FCC evaluation and approval



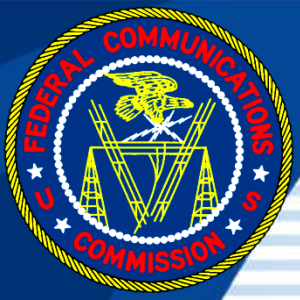
# Variants vs. Reference Model

- The **reference** model is **fully populated**, i.e. contains all the components required for all the design features
- The reference model shall undergo to full testing (EMC, RF eXposure, HAC)

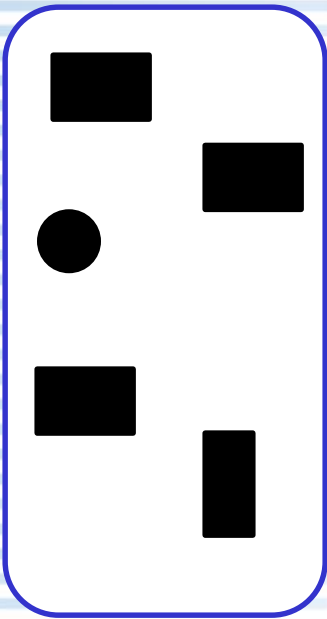


## Variants vs. Reference Model (II)

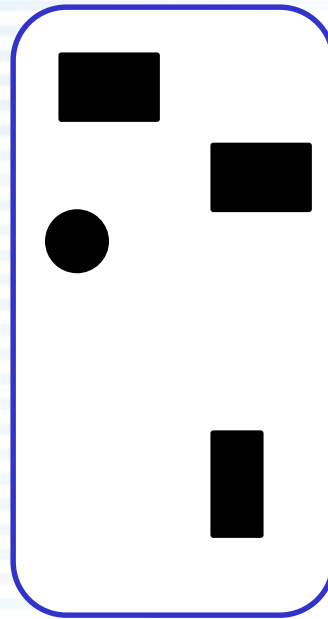
- The variants are **depopulated** versions of the **fully populated** reference model
- For each a variant it is required that
  1. the device materials, form factor, and PCB layout are not changed,and
  2. the position of the components on the PCB is not changedIn alternative, it needs to be shown that all the changes cause negligible differences in the **EM emissions patterns** relevant for all the frequencies under consideration.



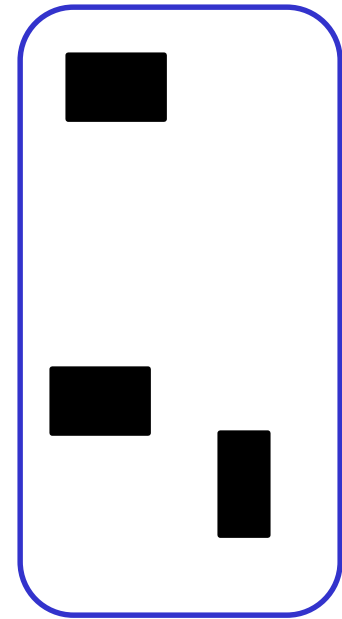
# Variants vs. Reference Model (III)



Reference



Variant 1

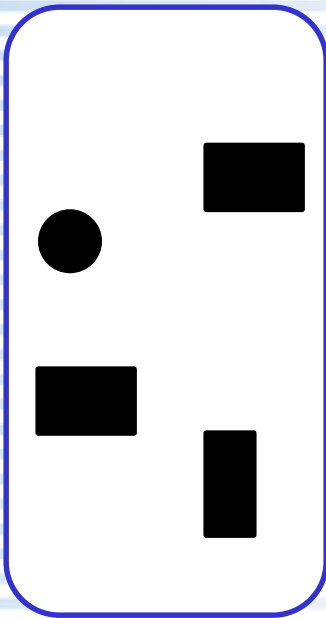


Variant 2

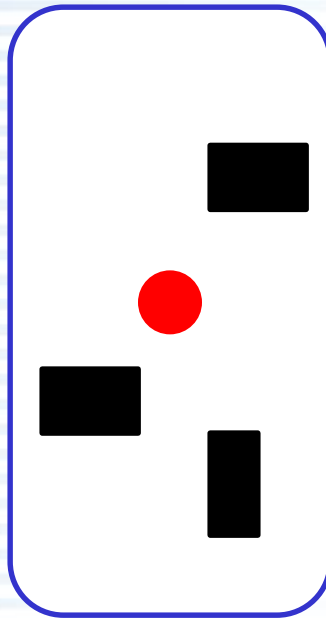
*Example of acceptable variant definition*



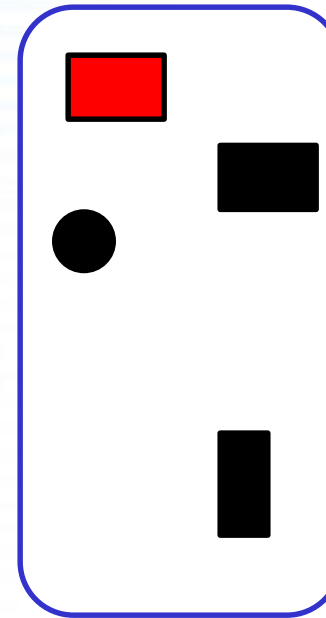
# Variants vs. Reference Model (IV)



Reference



Variant 1



Variant 2

*Example of (likely)un-acceptable variant definitions*





# Data Referencing Applicability

- For approved variants, referencing to the test data obtained for the reference model may be allowed to show compliance with **EMC** spurious emissions requirements
- When the depopulation process on a variant can be shown to have negligible impact on the near field emission pattern, **SAR** data referencing may be allowed
- When applicable, RF Exposure data based on **power density** and related to 5G-NR-FR2 (> 6 GHz) are presently not allowed for data referencing



# Spot-Check Verification

- Compliance reports for variant model shall clearly indicate what data are being referenced
- Referencing test data will be allowed only when supplemented by additional **spot-check** test data for specified conditions.
- Spot check definition may be proposed by the manufacturer, showing choices dictated by analysis of the reference model test data.
- The FCC may request any additional number of spot-check conditions, or even require full testing of any particular model version, as deemed necessary



# Spot-Check Verification

- Test exhibits for variants shall **clearly indicate** what results are being related to the reference version, in addition to the results from the spot checks.
- The final published certification for compliance shall be **based on the most conservative results**, selected among the measurements on the reference model, and those from the spot-check testing.
- If requested by the FCC, the manufacturer needs to provide, all the software and hardware details, **regardless of their proprietary nature**, for properly establishing and verifying the test conditions of all the devices (**full confidentiality** is assured)



# Conclusions

- The proposed approach was already **tested successfully** by working with TCB's and industry
- **Full disclosure** of actual correlations between reference and variant models, and related data organization, is **essential** to avoid delays and possible setbacks