

# Radio Equipment Directive

## General Introduction



READY  
FOR  
RED?

[www.rohde-schwarz.com](http://www.rohde-schwarz.com) / RED

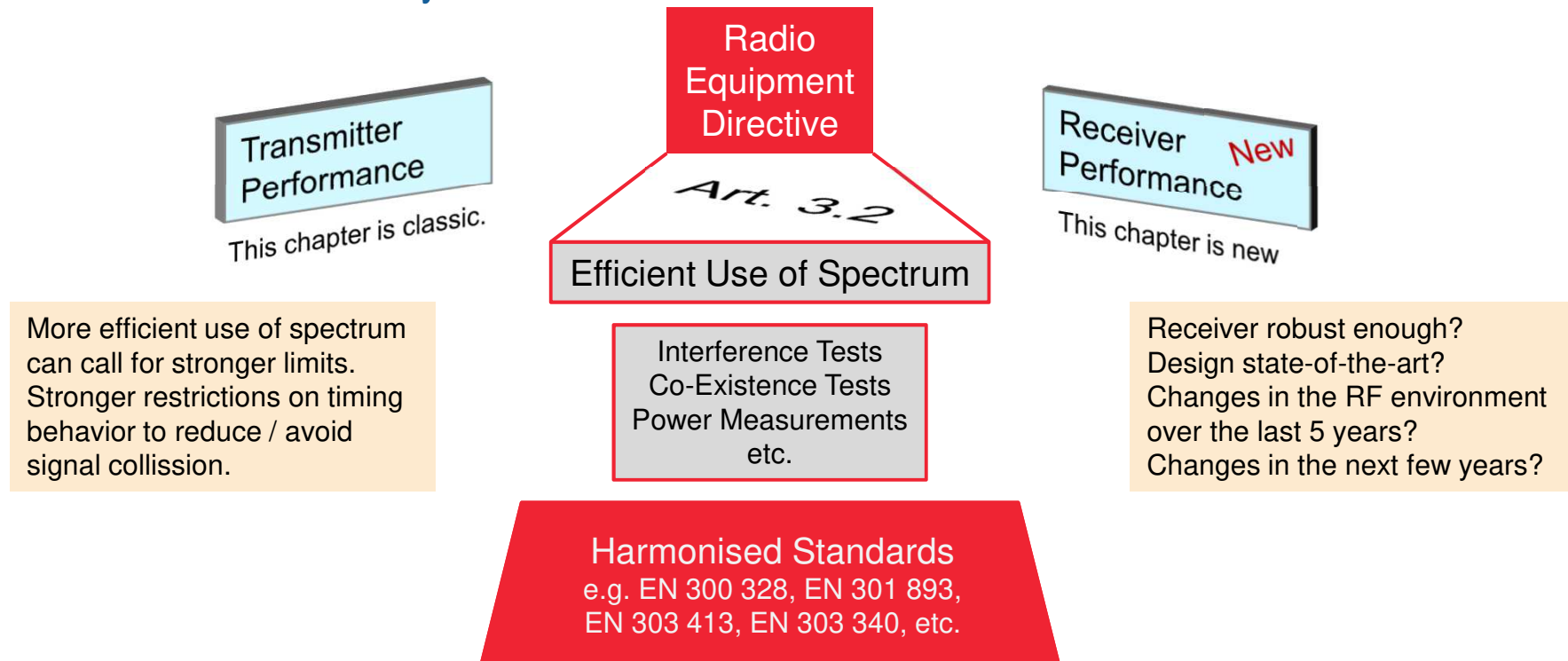
Christian Reimer

  
**ROHDE & SCHWARZ**

# RED: Radio Equipment Directive

2014/53/EU: mandatory since June 2017

Keyword: Regulatory Testing



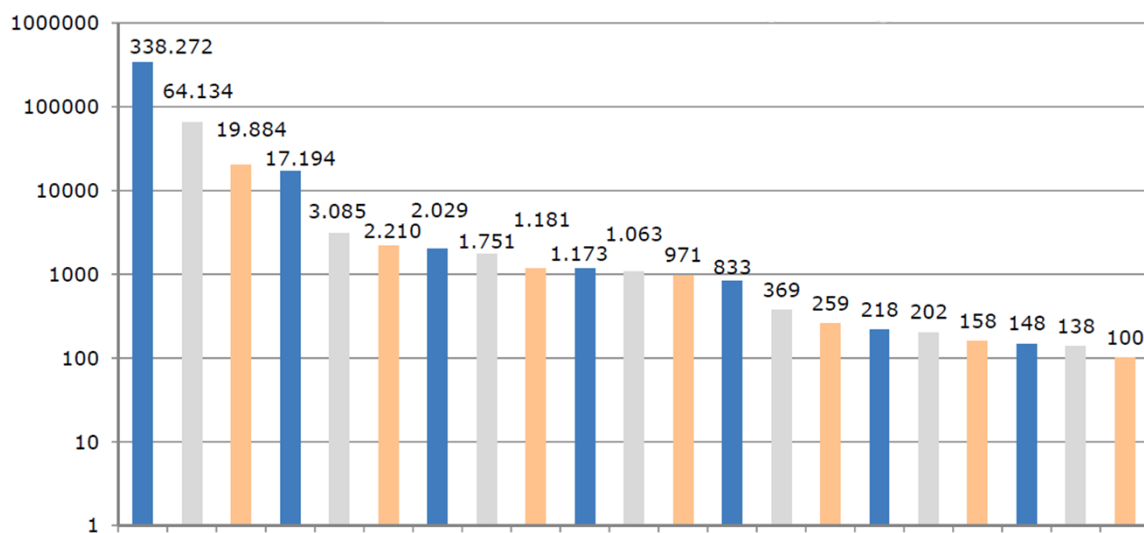
## Who cares?

The individual regulator  
per EU / EFTA / Candidate / MRA country  
can decide market surveillance measures.

The combined group of regulators → e.g. TCAM  
can run administrative cooperation campaigns.

# Market Surveillance Example

## German regulator online trade interventions per product category



Source: BundesNetzAgentur.  
Statistik Marktüberwachung 2017

Rank	Category	Stops of Online Sales
1	Radio headphones	338,272
2	Drones / Quadrocopters	64,134
3	Smartwatches	19,884
4	Radio transmitters (e.g. portable FM Tx')	17,194
5	Backup cameras	3,085
6	Remote-controlled sockets	2,210
7	Audio mixers	2,029
8	Hand-held radios	1,751
9	LED lamps	1,181
10	e-cigarettes	1,173
11	Surveillance cameras	1,063
12	Radio door bells	971
13	Mobile radios	833
14	Radio alert systems	369
15	Bluetooth applications	259
16	others 1	218
17	others 2	202
18	Multimedia equipment	158
19	Alarm clocks	148
20	Game pads	138
21	HDMI switches	100
22	USB chargers	99
	others 3	284

455,755

# Be aware of Market Surveillance by TCAM / ADCO

## Telecommunication Conformity Assessment and Market Surveillance

### TCAM

Regulators of...  
EU states +  
EFTA states +  
„candidates“

Each regulator can  
decide on random checks up to  
10 years after market placement  
and may ask for

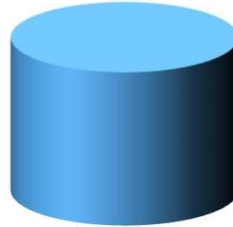
- Test reports
- Declaration of Conformity
- Purchase of radio equipment
- Test of radio equipment
- Notes and calculations done  
during the risk assessment

Is there a mismatch?

Is there something strange?

### Joint Actions

Committee work,  
around 3 meetings  
per year.



Common Data  
including black-list

### Administrative Cooperation - RED



- Trials
- Cross-border surveillance  
Campaigns
- Conformity assessment  
cooperation

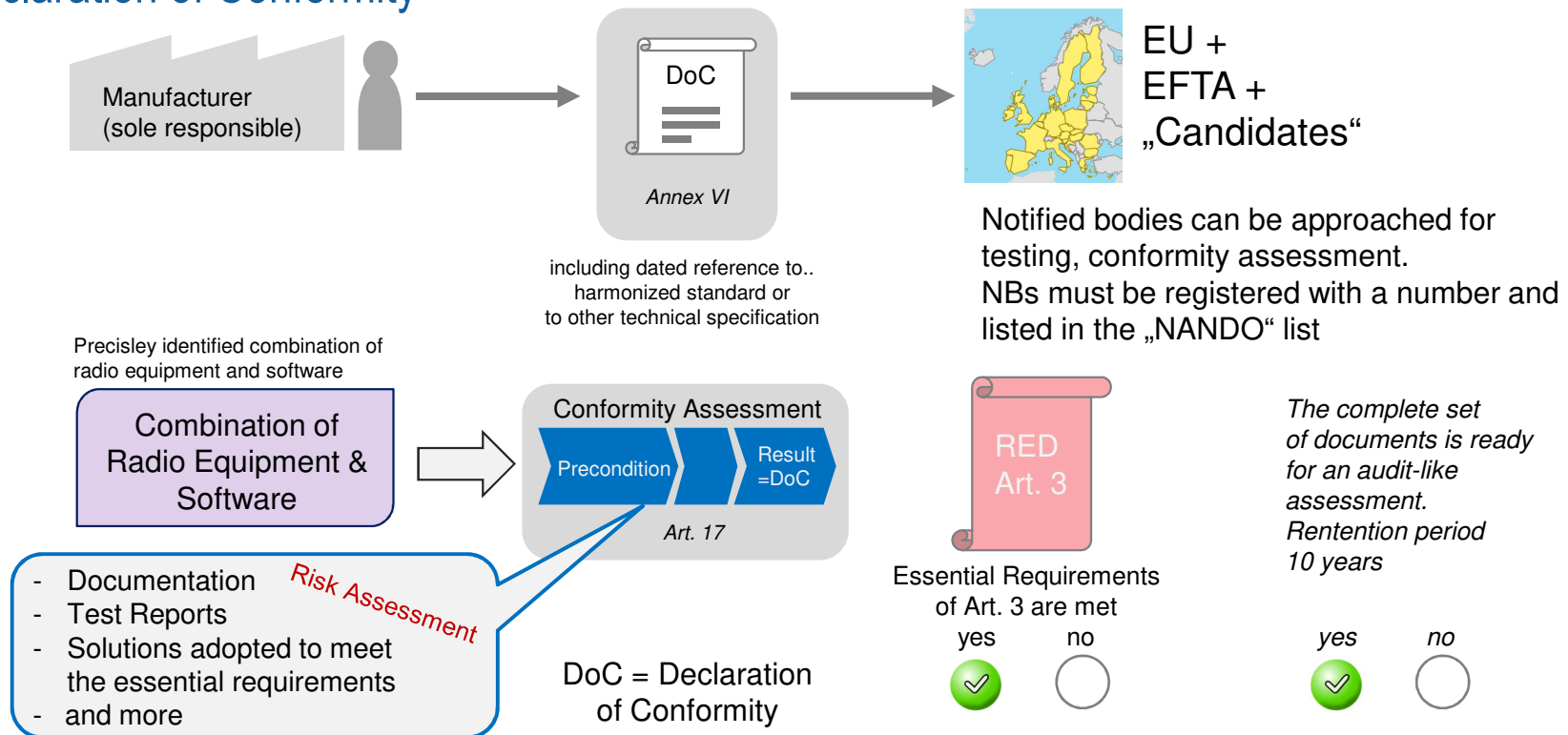
Extra:

Administrative  
Cooperation - EMC



# Manufacturer's Homework according RED

## Declaration of Conformity



# Declaration of Conformity

Manufacturer Name  
and address

Reference Number

EU Declaration of Conformity

This declaration is issued under the  
sole responsibility of the manufacturer

We declare, that the product  
<xyz>  
is in conformity with the essential  
requirements of EU directive(s)

by applying the following standards	
EU Directive(s) and Regulation(s)	Reference of standard(s) and amendment(s)
2014/53/EU	EN 300 328 V2.1.1
	EN 301 489-1 V2.1.1
	EN 301 489-17 V3.1.1
	EN 301 489-3 V2.1.1
	EN 60950-1:2006 with the following amendment(s) to this standard
	A11:2009, A1:2010, A12:2011, A2:2013
	EN 62311:2008
	EN 55032:2012 (Class B)
	EN 55024:2010
2011/65/EU	EN 50581:2012
2009/125/EC, (EU) No1194/2012	—

by applying the following standards

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	A11:2009, A1:2010, A12:2011, A2:2013
	EN 62311:2008
	EN 55032:2012 (Class B)
	EN 55024:2010
2011/65/EU	EN 50581:2012
2009/125/EC, (EU) No1194/2012	—

Date: \_\_\_\_\_

Signature \_\_\_\_\_

On the radio part...

self-declaration is possible as soon as a harmonised  
standard is published in the Official Journal of the EU.



# Increase of Testing Efforts

Check the standard versions:  
The table of contents is a good  
indicator for testing efforts.

Harmonised  
Standard under the  
R&TTE Directive

Table of  
Contents

Harmonised  
Standard under the  
Radio Equipment  
Directive (RED)

Table of  
Contents





# Increase of Testing Efforts

## Example: EN 302 567 under Directive 1999/5/EC (R&TTE)

5	Testing for compliance with technical requirements.....	11
5.1	Environmental conditions for testing .....	11
5.2	Interpretation of the measurement results .....	11
5.3	Essential radio test suites.....	12
5.3.1	Product Information.....	12
5.3.2	Test modulation, frequency and configuration .....	12
5.3.3	Spectral power density.....	13
5.3.4	RF output power .....	14
5.3.5	Transmitter unwanted emissions.....	15
5.3.5.1	Pre-scan.....	15
5.3.5.2	Identified emissions .....	16
5.3.6	Receiver unwanted emissions.....	16
5.3.6.1	Pre-scan.....	17
5.3.6.2	Identified emissions .....	17
Annex A (normative):	HS Requirements and conformance Test specifications Table (HS-RTT).....	18

Chapter 5 of a harmonised EN standard under RED (article 3.2) describes the test procedures. The chapter 5 can be taken as a measure of testing efforts. Take a look at the chapter 5 when changing from R&TTE (old regulatory regime) to RED (new regulatory regime). You can do this kind of effort comparison with any harmonized EN standard that existed under R&TTE.



# Increase of Testing Efforts

## Example: EN 302 567 under Directive 1999/5/EC (R&TTE)

5	Testing for compliance with technical requirements.....	11
5.1	Environmental conditions for testing .....	11
5.2	Interpretation of the measurement results .....	11
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5.3.6	Receiver unwanted emissions.....	16
5.3.6.1	Pre-scan.....	17
5.3.6.2	Identified emissions .....	17
Annex A (normative):	HS Requirements and conformance Test specifications Table (HS-RTT).....	18



# Increase of Testing Efforts

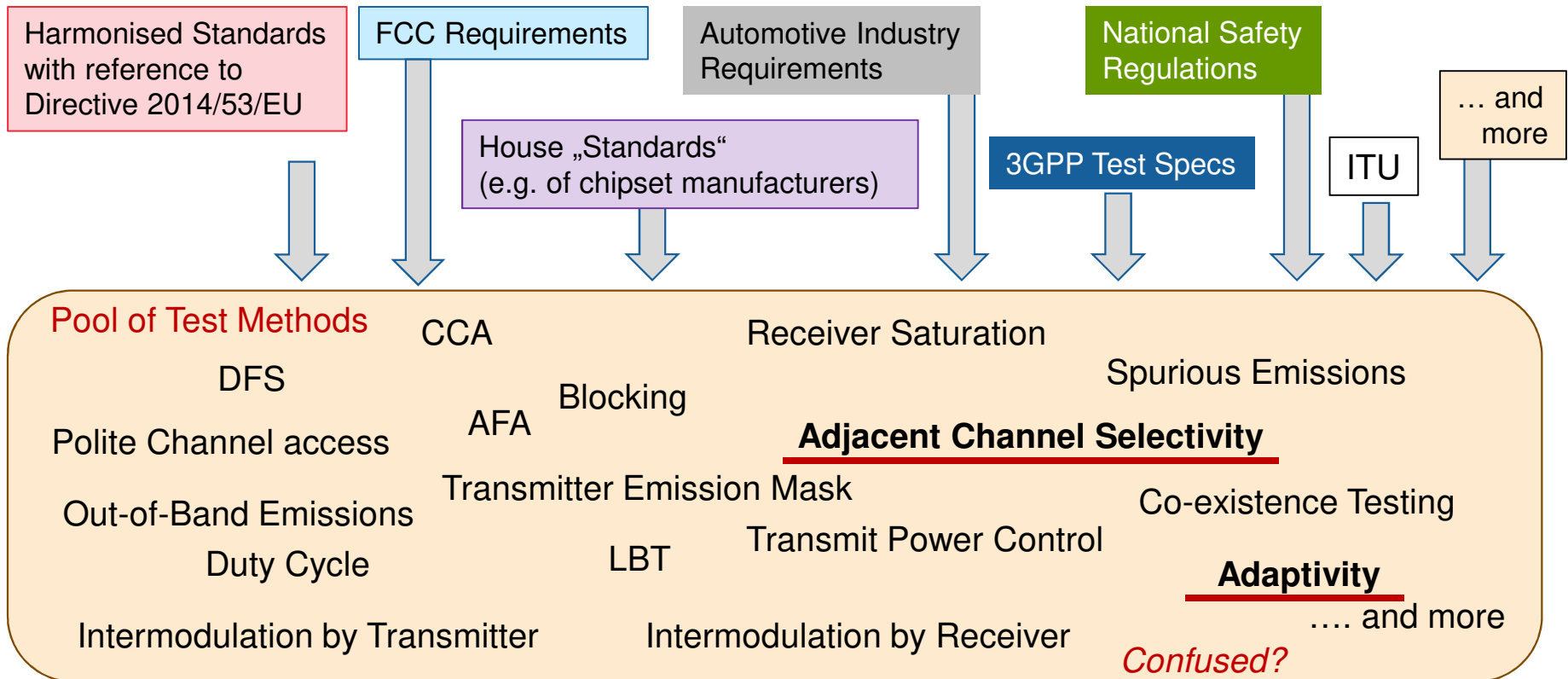
Example: EN 302 567 under Directive 2014/53/EU (RED)

Extended table  
of contents in the  
standard

5	Testing for compliance with technical requirements.....	16
5.1	Environmental conditions for testing .....	16
5.1.1	Introduction.....	16
5.1.2	Normal test conditions .....	16
5.1.2.1	Normal temperature and humidity .....	16
5.1.2.2	Normal power source .....	17
5.2	Interpretation of the measurement results .....	17
5.3	Test procedure for the essential radio test suites .....	17
5.3.0	General.....	17
5.3.1	Product Information.....	17
5.3.2	Test modulation, frequency and configuration .....	18
5.3.3	Spectral power density.....	18
5.3.4	RF output power .....	19
5.3.5	Transmitter unwanted emissions.....	20
5.3.5.0	Introduction .....	20
5.3.5.1	Pre-scan.....	20
5.3.5.2	Identified emissions .....	21
5.3.6	Receiver unwanted emissions.....	22
5.3.6.0	Introduction.....	22
5.3.6.1	Pre-scan.....	22
5.3.6.2	Identified emissions .....	22
5.3.7	Receiver Adjacent Channel Rejection .....	23
5.3.7.1	Test conditions .....	23
5.3.7.2	Test Method .....	23
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5.3.8.1	Test conditions .....	24
5.3.8.2	Test method.....	24
5.3.8.3	Generic test procedure for measuring channel/frequency usage .....	26
5.3.9	Transmitter unwanted emissions in the out-of-band domain.....	27
5.3.9.1	Test conditions .....	27
5.3.9.2	Test method.....	27
5.3.10	Occupied Channel Bandwidth .....	28
5.3.10.1	Test conditions .....	28
5.3.10.2	Test method.....	28

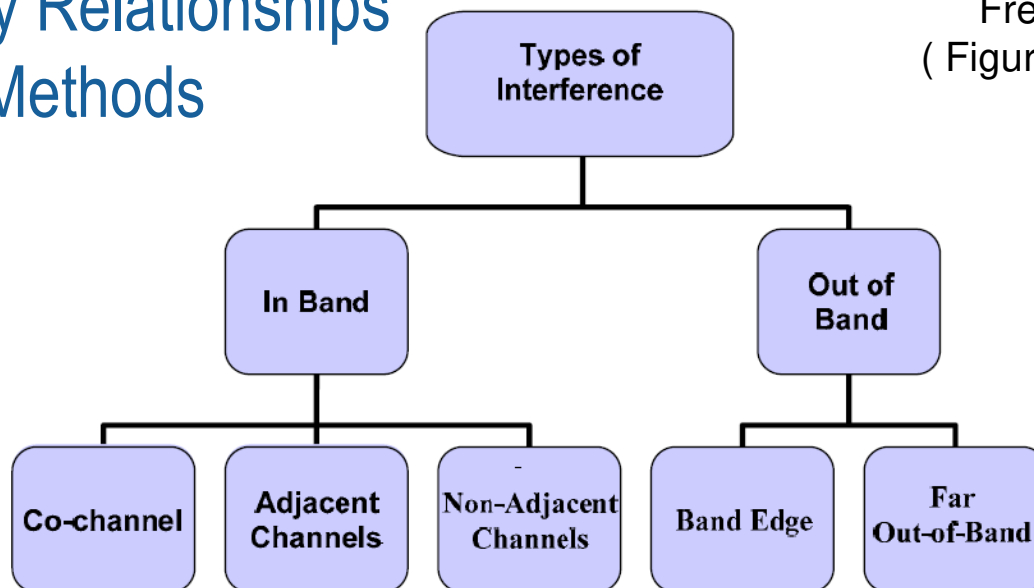
More  
requirements

# Pool of Test Methods



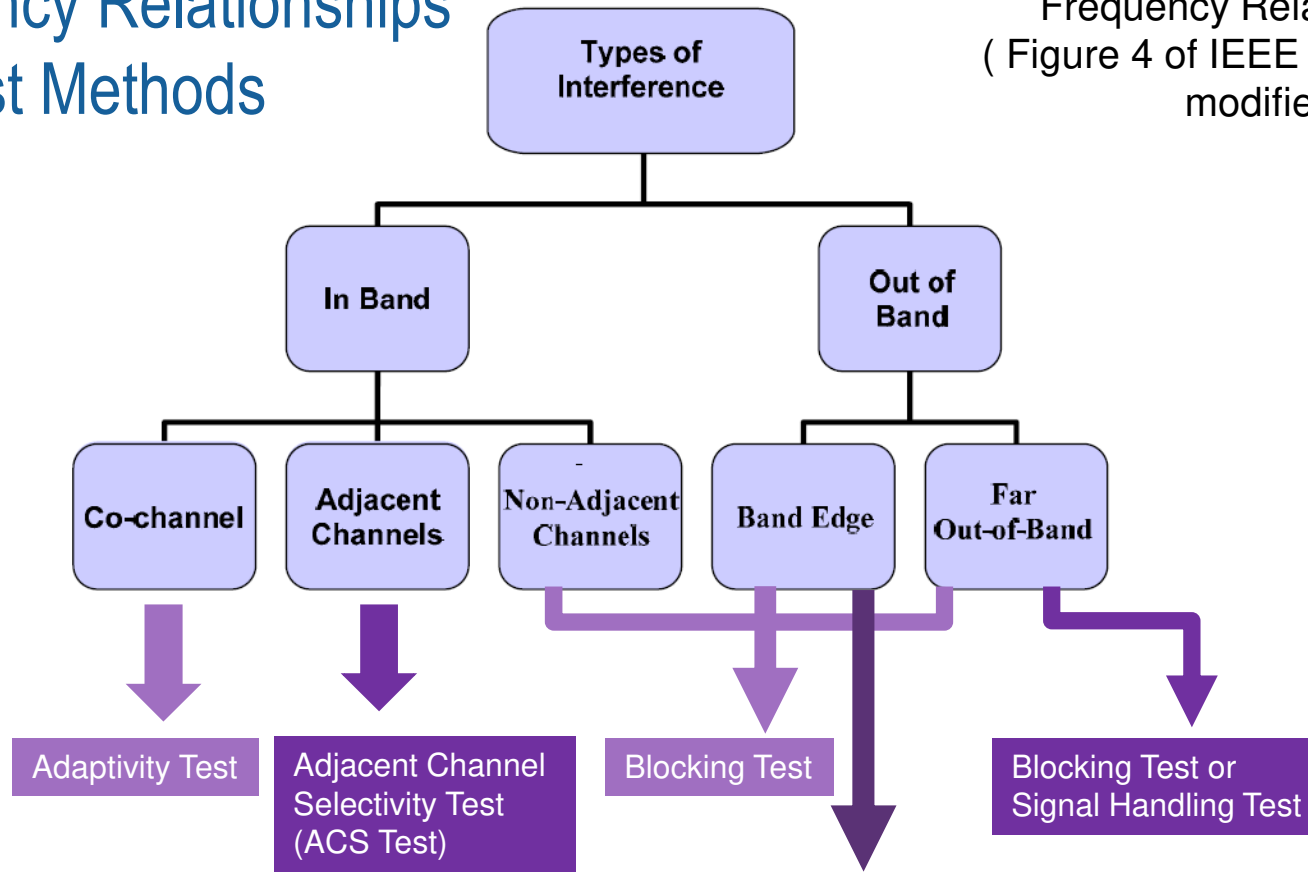
# Frequency Relationships and Test Methods

Frequency Relationships  
( Figure 4 of IEEE Std 1900.2 )



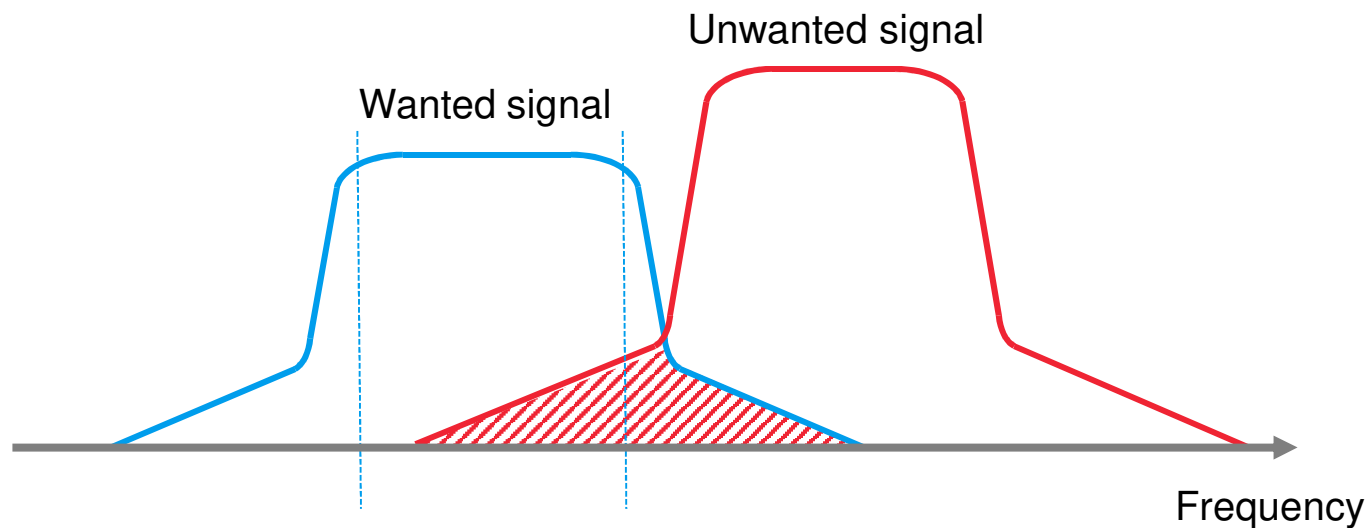
# Frequency Relationships and Test Methods

Frequency Relationships  
( Figure 4 of IEEE Std 1900.2 )  
modified



# Interference Mechanism

# Interference Mechanism



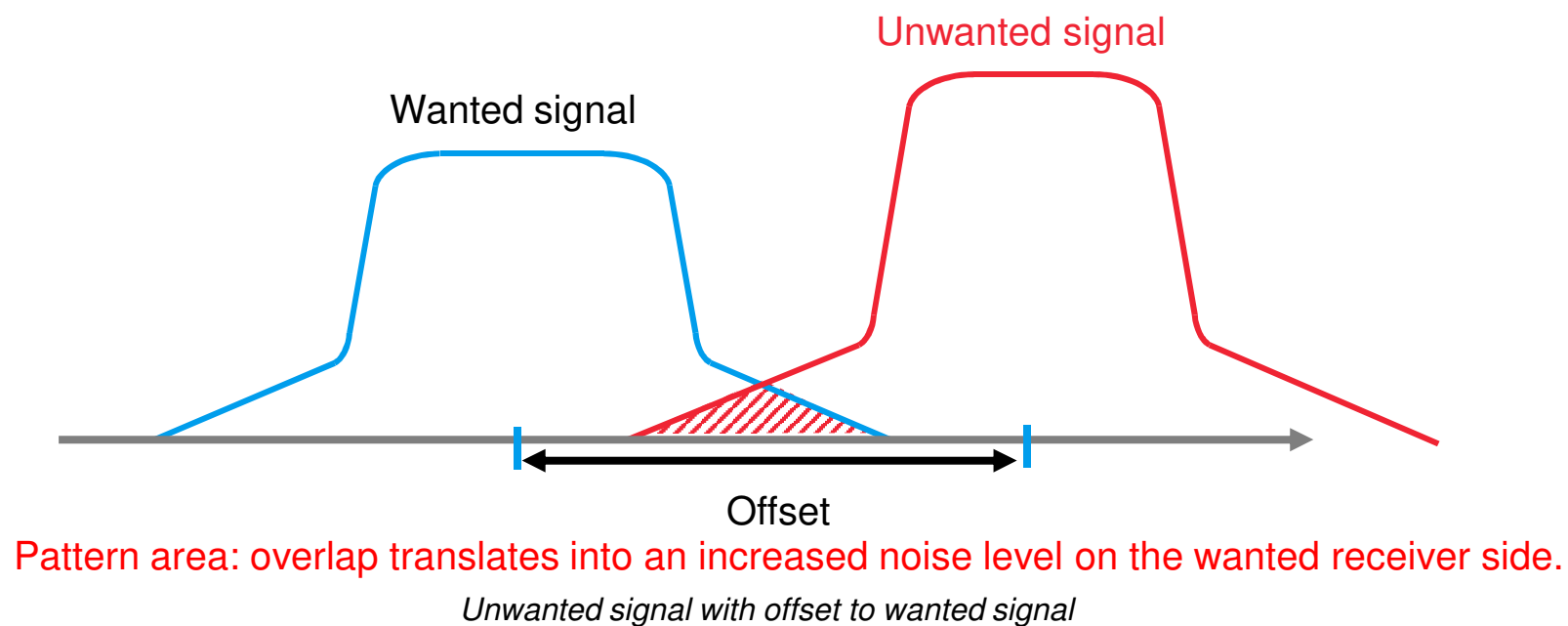
Pattern area: overlap translates into an increased noise level on the wanted receiver side.

*Unwanted signal adjacent to wanted signal*

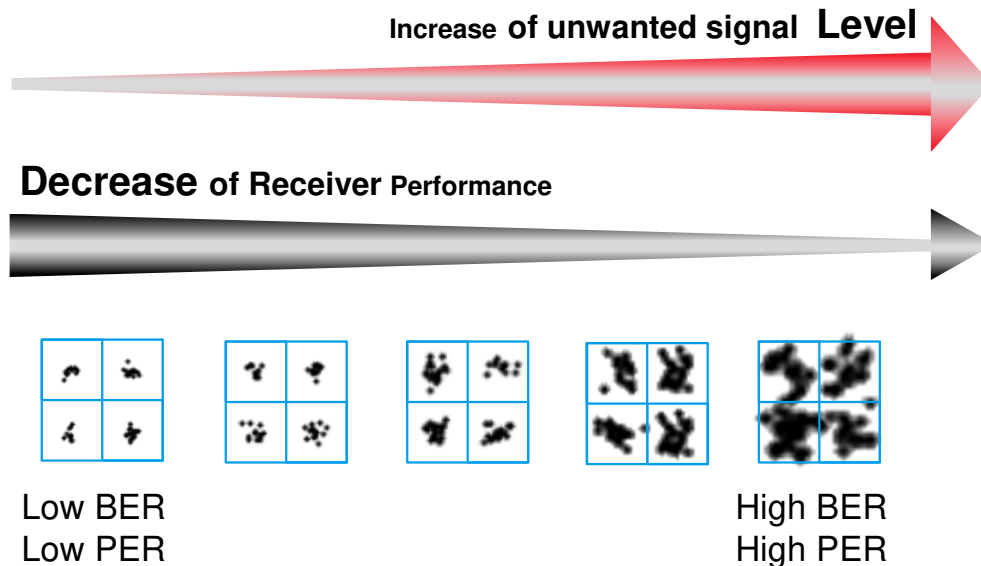




# Interference Mechanism



# Receiver under Interference Condition



Wanted signal receiver  
= receiver under interference conditions:

Can the receiver handle the interference  
and provide with a good performance?

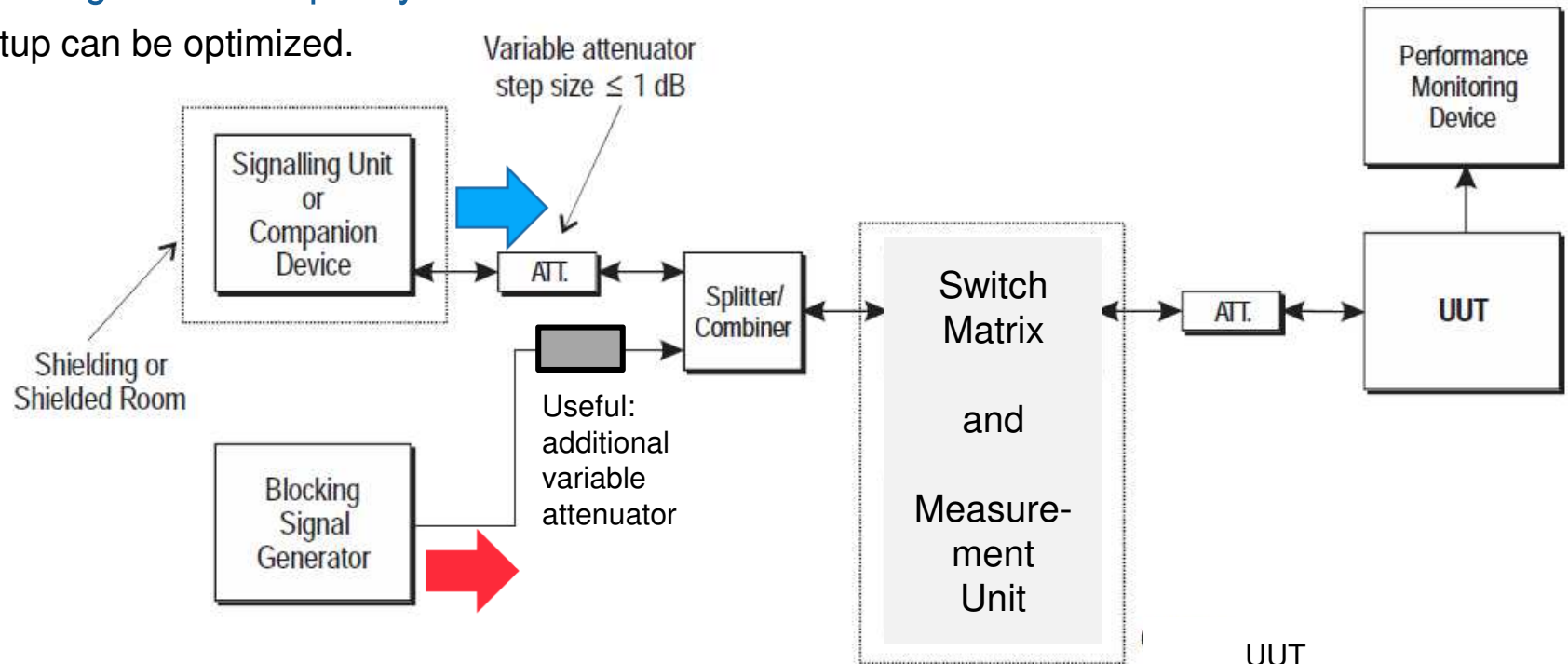
Does the receiver ask for retransmission  
again and again while the already transmitted  
data is wasted (pure design)?

Does the receiver support for example  
a HARQ process and therefore asks  
for re-transmissions only when necessary  
(advanced design)?

# Receiver under Interference Condition

## Blocking Test Example by ETSI BRAN

Setup can be optimized.



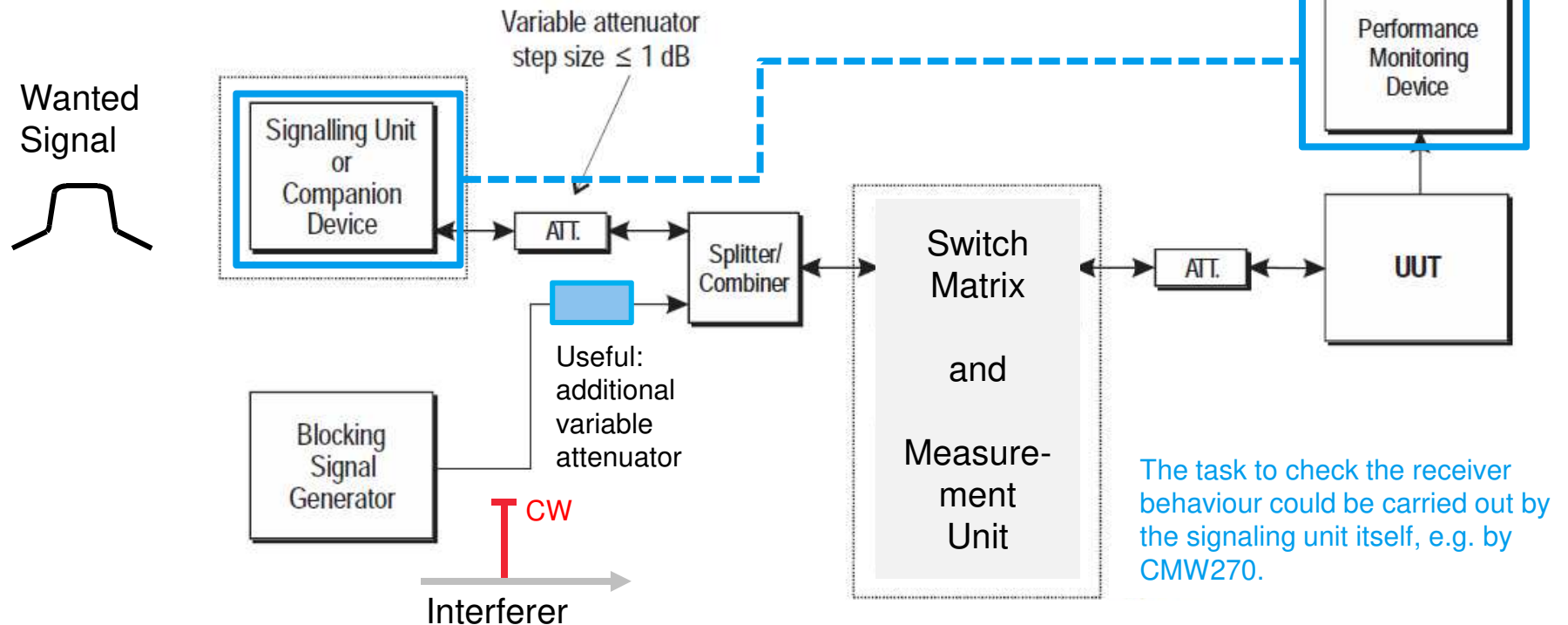
Picture from ETSI TS 103 521 v 1.1.1 with modification

UUT  
User Equipment Under Test

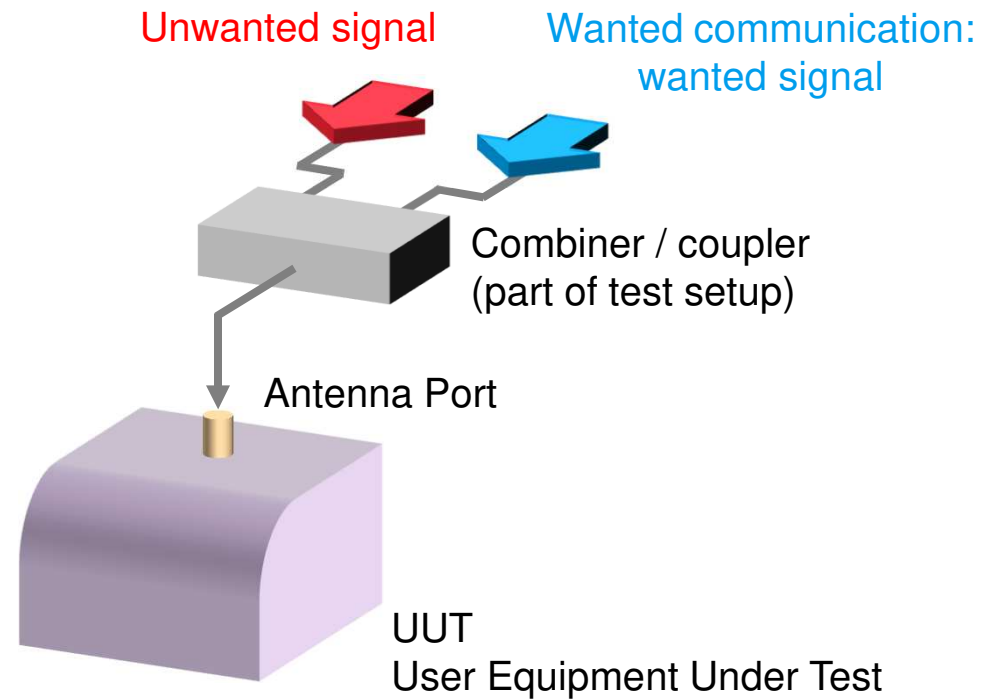
# Blocking Test in EN 301 893:

## Challenge: Check of Receiver Performance

Tasks handled by signaling unit  
e.g. by CMW270 during blocking test  
PER evaluation



## Receiver under Interference Condition



# RED Approach allows Wireless Coexistence Tests

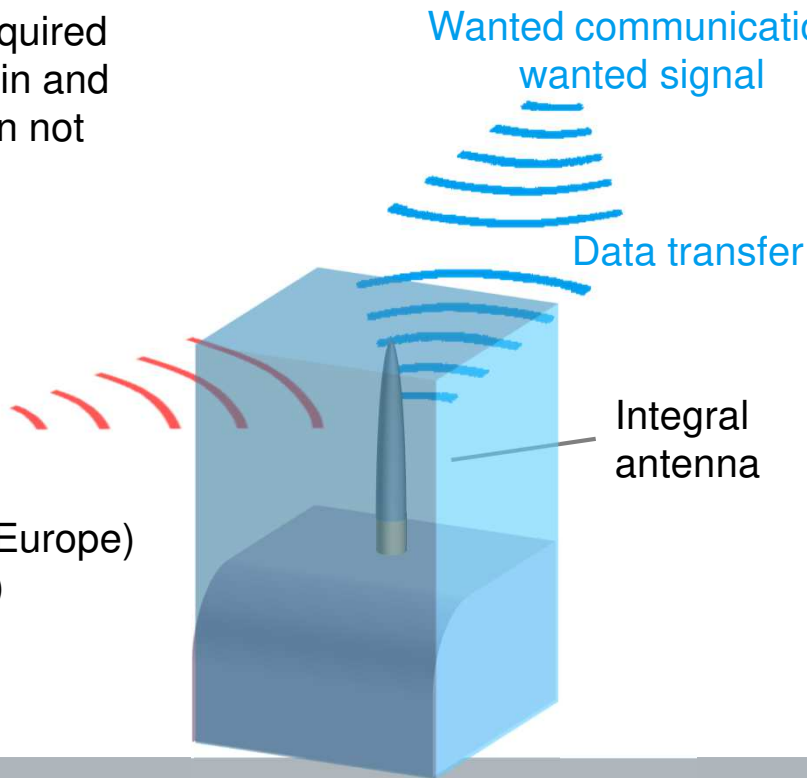
## Radiated Test

Radiated testing is required if the antenna is built-in and if the antenna port can not be reached.

Suggestion:  
immunity test system

Unwanted signal

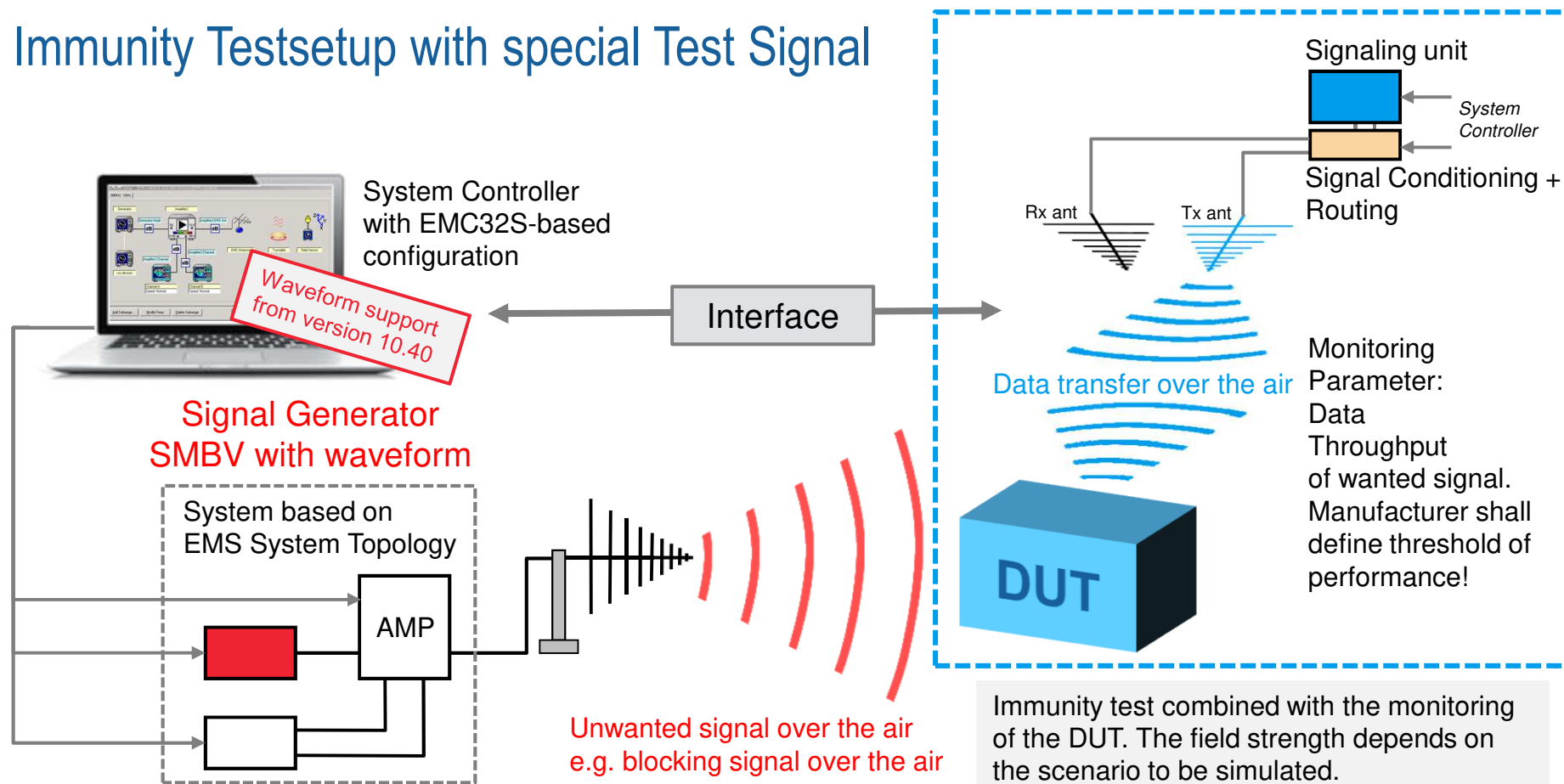
Waveform,  
LTE uplink (FDD7 Europe)  
LTE TDD 41 (USA)



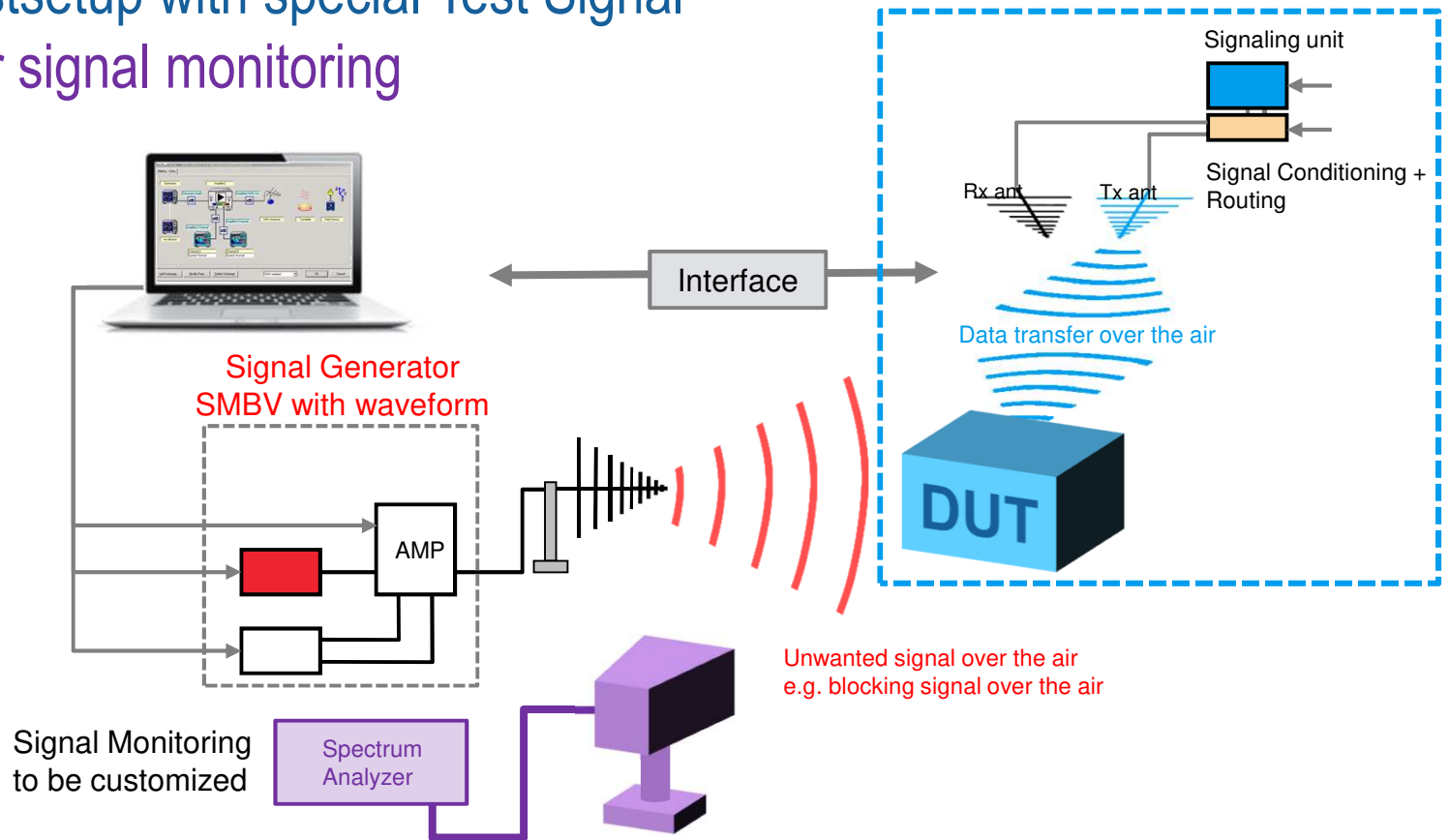
e.g. non-cellular  
link maintained by  
CMW.  
Parameter to monitor:  
PER, BER or NACK

Throughput reported by  
the DUT can be used for  
the characterization of the  
communication quality.

# Immunity Testsetup with special Test Signal



## Immunity Testsetup with special Test Signal Extension for signal monitoring





# Field Strength and Power Discussion

# Field Strength and Power Discussion

Example

## Scenario

R&S Field Strength and Power Estimator

File Help

**Persistent Data**

Frequency:  $f = 2.500\text{k}$  MHz

Antenna Gain Transmitter:  $G_t = 0.000$  dBi

Antenna Gain Receiver:  $G_r = 0.000$  dBi

Distance:  $R = 1$  ft

**Transmitter Power**

Transmitted Power:  $P_x = 20.000$  dBm

**Receiver Power**

Receiver Power:  $P_x = -10.087$  dBm

**Field Strength**

Electric Field Strength:  $E = 5.683$  V/m

Magnetic Field Strength:  $H = 15.074\text{m}$  A/m

Power Flux Density:  $S = 85.656\text{m}$  W/m<sup>2</sup>

1 ft separation. EIRP (unwanted)  
20 dBm at 2.5 GHz

## Simulation by immunity system

R&S Field Strength and Power Estimator

File Help

**Persistent Data**

Frequency:  $f = 2.500\text{k}$  MHz

Antenna Gain Transmitter:  $G_t = 5.000$  dBi

Antenna Gain Receiver:  $G_r = 0.000$  dBi

Distance:  $R = 3.000$  m

**Transmitter Power**

Transmitted Power:  $P_x = 34.863$  dBm

**Receiver Power**

Receiver Power:  $P_x = -10.086$  dBm

**Field Strength**

Electric Field Strength:  $E = 5.683$  V/m

Magnetic Field Strength:  $H = 15.075\text{m}$  A/m

Power Flux Density:  $S = 85.669\text{m}$  W/m<sup>2</sup>

Keep the field strength. Put in the  
setup parameter, e.g. 3 m. Gain 5 dBi.

## RMS power level

R&S Field Strength and Power Estimator

File Help

**Persistent Data**

Frequency:  $f = 2.500\text{k}$  MHz

Antenna Gain Transmitter:  $G_t = 5$  dBi

Antenna Gain Receiver:  $G_r = 0.000$  dBi

Distance:  $R = 3.000$  m

**Transmitter Power**

Transmitted Power:  $P_x = 3.064$  W

**Receiver Power**

Receiver Power:  $P_x = -10.086$  dBm

**Field Strength**

Electric Field Strength:  $E = 5.683$  V/m

Magnetic Field Strength:  $H = 15.075\text{m}$  A/m

Power Flux Density:  $S = 85.669\text{m}$  W/m<sup>2</sup>

Required power for RMS: 3 Watt.  
Additional head room to cope with the PAPR  
of the unwanted signal: 8 dB → 19.3 Watt (net).  
Losses of 1.5 dB? → 27.3 Watt → select 30 W.

# Fieldstrength and Power Discussion

## R&S Field Strength and Power Estimator

### Application Note 1MA85

**R&S Field Strength and Power Estimator**

**Persistant Data**

Frequency:  $f =$  1.000 GHz

Antenna Gain Transmitter:  $G_t =$  0.000 dBi

Antenna Gain Receiver:  $G_r =$  0.000 dBi

Distance:  $R =$  10.000 m

**Transmitter Power**

Transmitted Power:  $P_{tx} =$  20.000 W

**Receiver Power**

Receiver Power:  $P_{rx} =$  113.829  $\mu$  W

**Field Strength**

Electric Field Strength:  $E =$  2.449 V/m

Magnetic Field Strength:  $H =$  6.497m A/m

Power Flux Density:  $S =$  15.915m W/m<sup>2</sup>

**Estimator Formulas**

**Formula Explanation**

$f$  Frequency

$G_t$  Antenna Gain Transmitter

$G_r$  Antenna Gain Receiver

$R$  Distance

$P_{tx}$  Transmitted Power

$P_{rx}$  Receiver Power

$E$  Electric Field Strength

$H$  Magnetic Field Strength

$S$  Power Flux Density

$Z_0$  Characteristic impedance of free s

$c_0$  Speed of light in vacuum

$\pi$  The mathematical constant

$\lambda$  Wavelength

$A_e$  Effective Area

$E^2 = Z_0 \cdot H^2$

$G \cdot \lambda^2 = 4\pi$

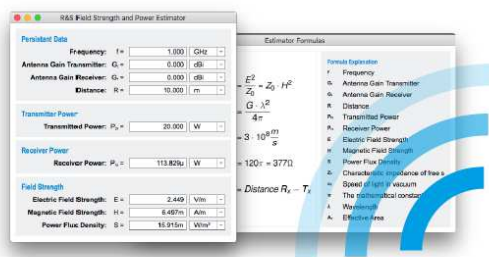
$3 \cdot 10^8 \frac{m}{s}$

$120\pi = 377\Omega$

$= \text{Distance } R_x - T_x$

# Application Note 1MA85

## Field Strength and Power Estimator Application Note



Determining the field strength from transmitted power is not an easy job. Various, quite complicated formulas have to be evaluated correctly. This application note explains how to calculate electric and magnetic field strength, and power flux density. A program associated with this application note helps with the calculation and converts Watts to mW and dBm, V/m to  $\mu\text{V/m}$  and dB $\mu\text{V/m}$  as well as A/m to  $\mu\text{A/m}$  and dB $\mu\text{A/m}$ . Additional applications are calculation of propagation loss or antenna factor. Smartphone versions of the application software are also available.



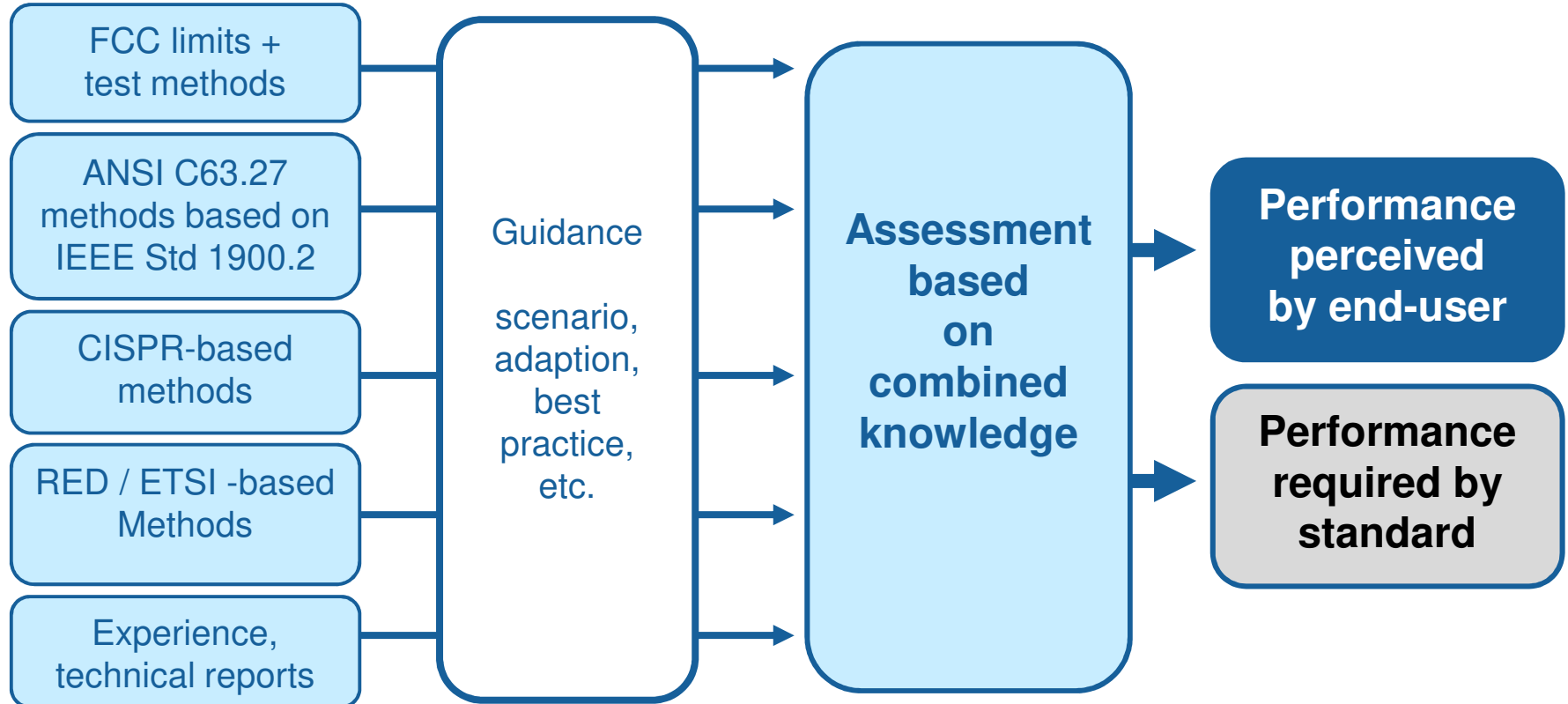
### Note:

Please find the most up-to-date document on our homepage <http://www.rohde-schwarz.com/appnote/1MA85>.

This document is complemented by software. The software may be updated even if the version of the document remains unchanged

# More than Minimum Performance?

## More than Minimum Performance



# More than Minimum Performance – Receiver Example

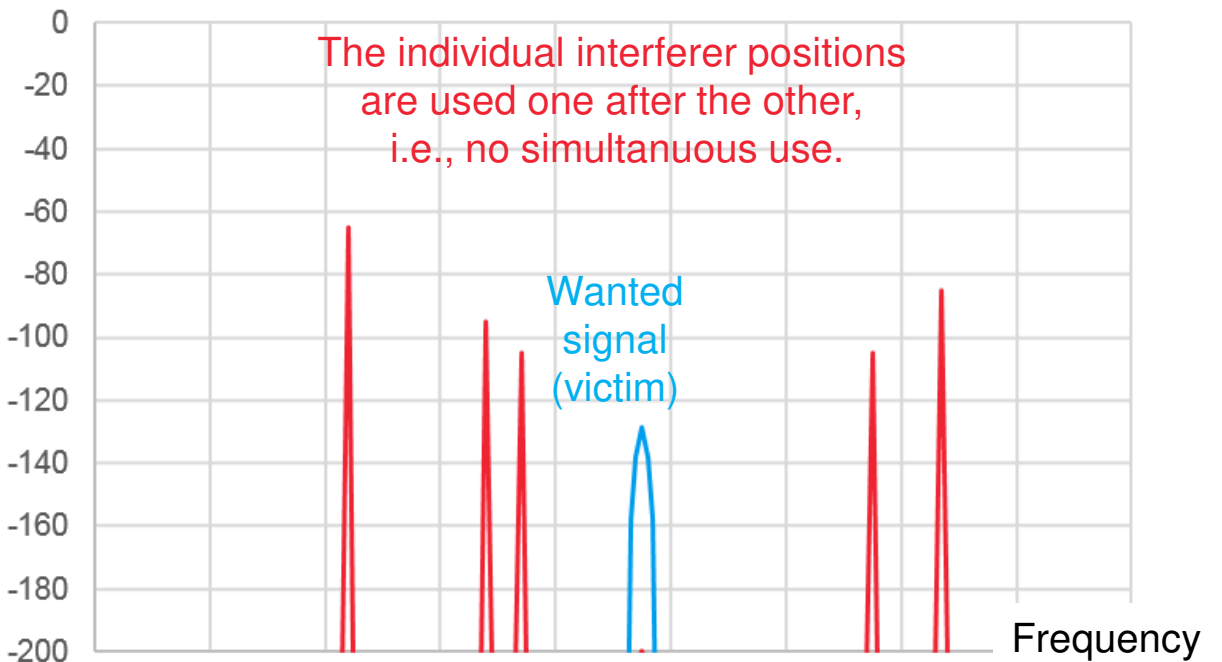
## Selectivity: Blocking Tests

Interferer Positions and Levels taken from the table(s) in the standard

*One interferer per test result.*

*Check of receiver performance degradation.*

Signal level in dBm



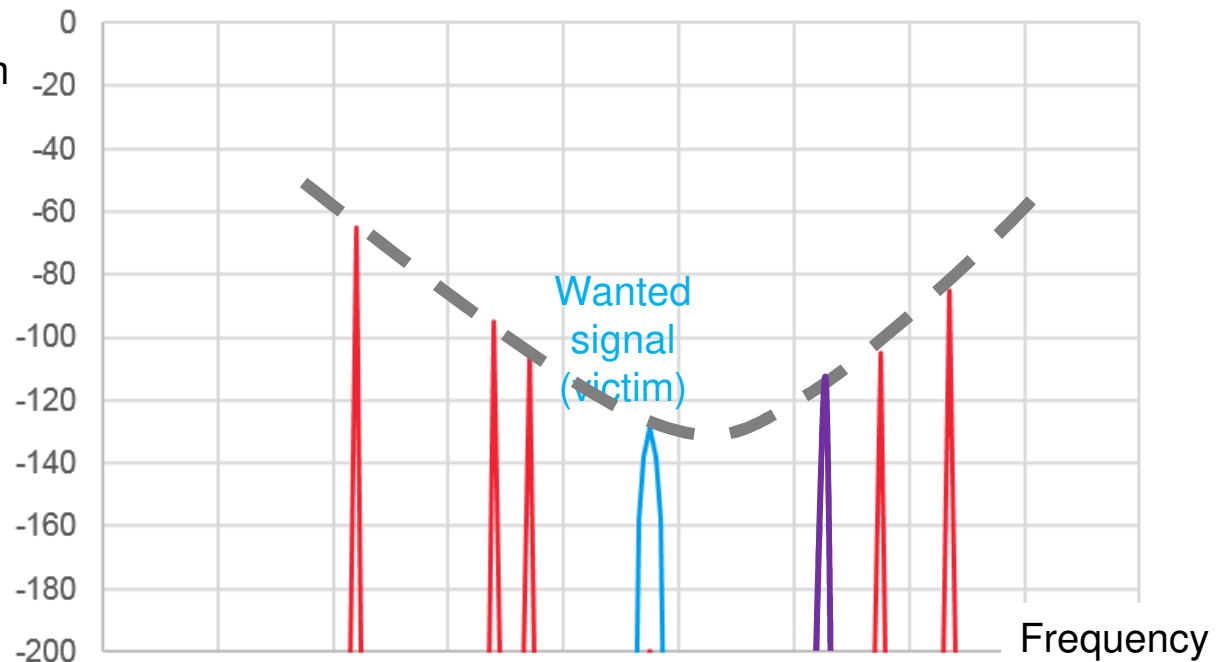
# More than Minimum Performance – Receiver Example

## Selectivity: Blocking Tests

Signal  
level in dBm

Interferer Positions and Levels  
taken from the table(s) in the  
standard

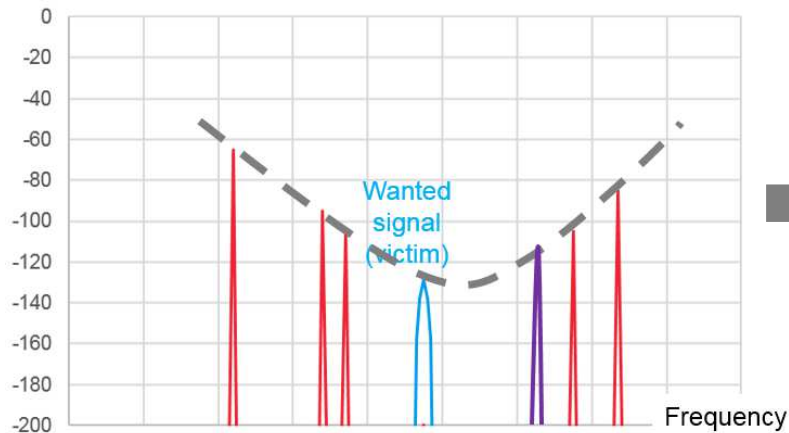
View your intra-system interferer.  
Does it fit into the pattern?



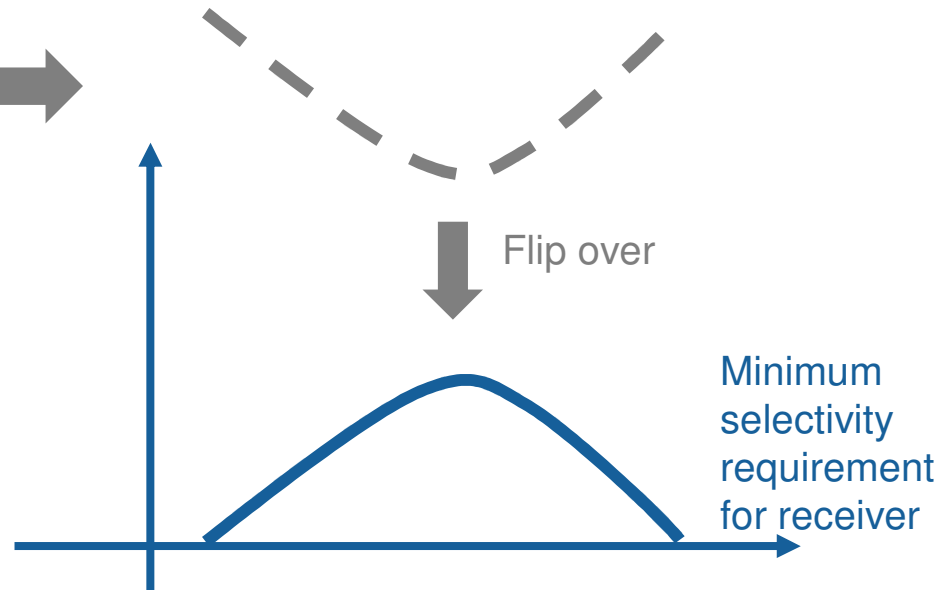


# More than Minimum Performance – Receiver Example

## Selectivity: Blocking Tests

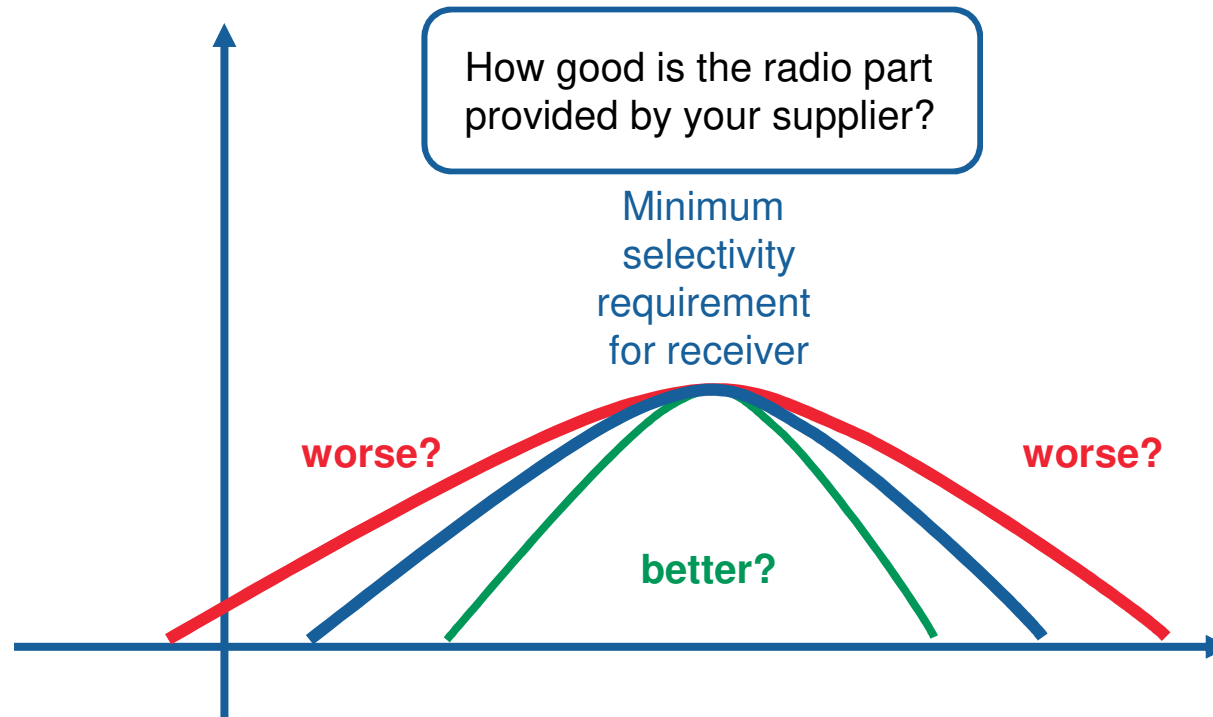


Some standards reflect tough requirements on receiver sturdiness. Some standards requirements look weak in terms of testing the robustness of receivers. Risk assessment testing allows the follow up on scenarios, that come close to the expected RF environment condition.



# More than Minimum Performance – Receiver Example

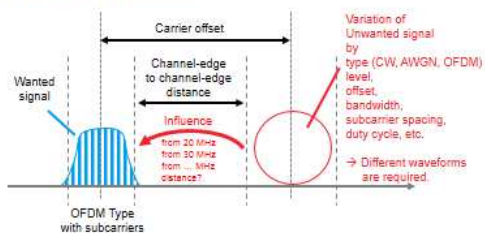
Selectivity: Blocking Tests



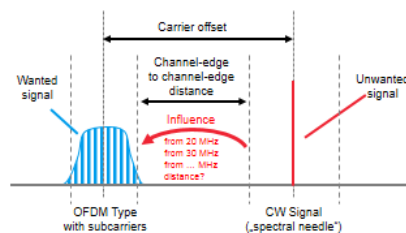
# Backup

# Variation of Unwanted Signal Parameters

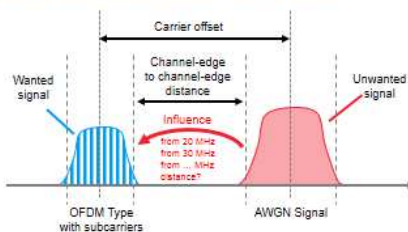
Unwanted Signal: Parameters



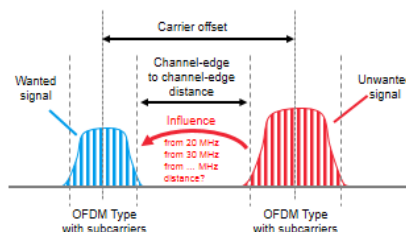
Unwanted Signal: Typical Standard Test Signal (1)



Unwanted Signal: Typical Standard Test Signal (2)



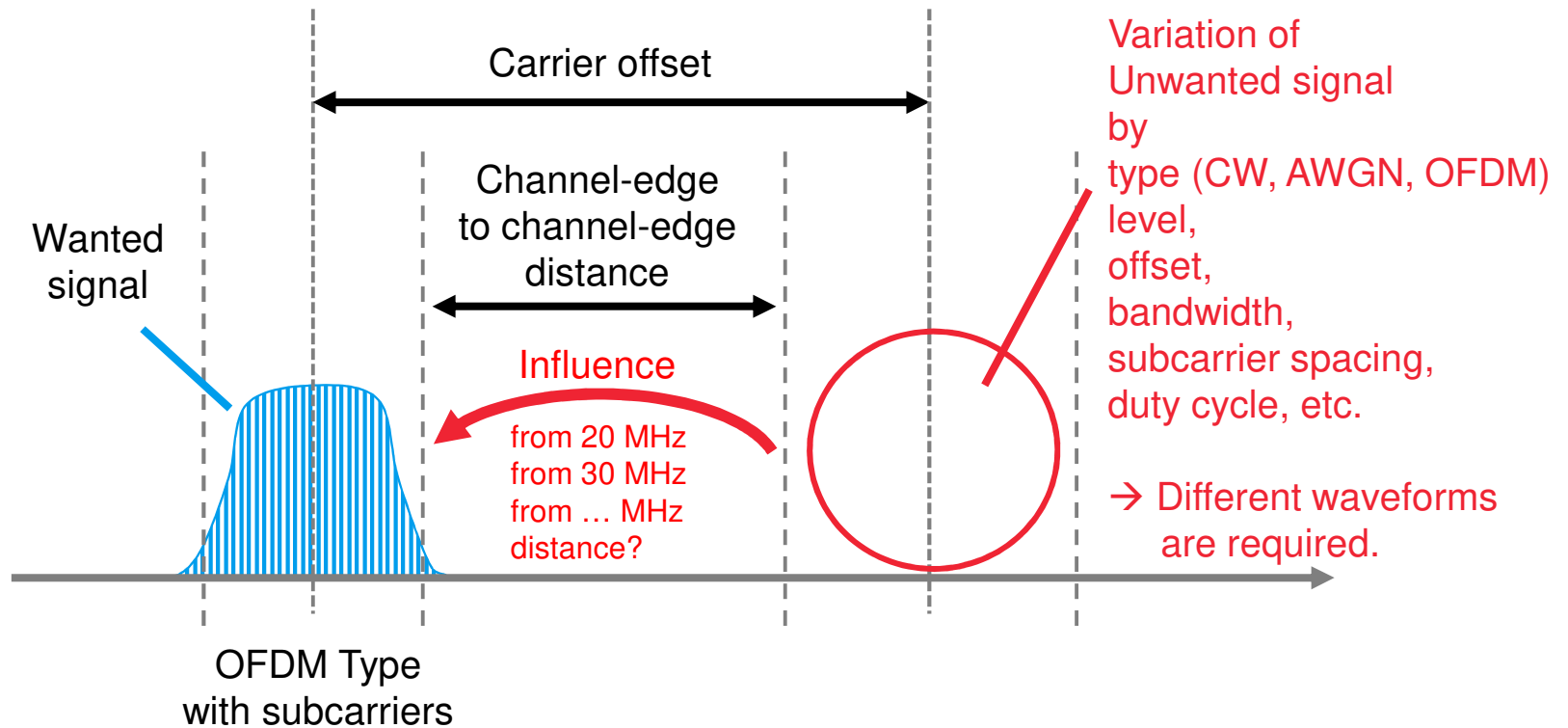
Unwanted Signal: Typical Standard Test Signal (3)



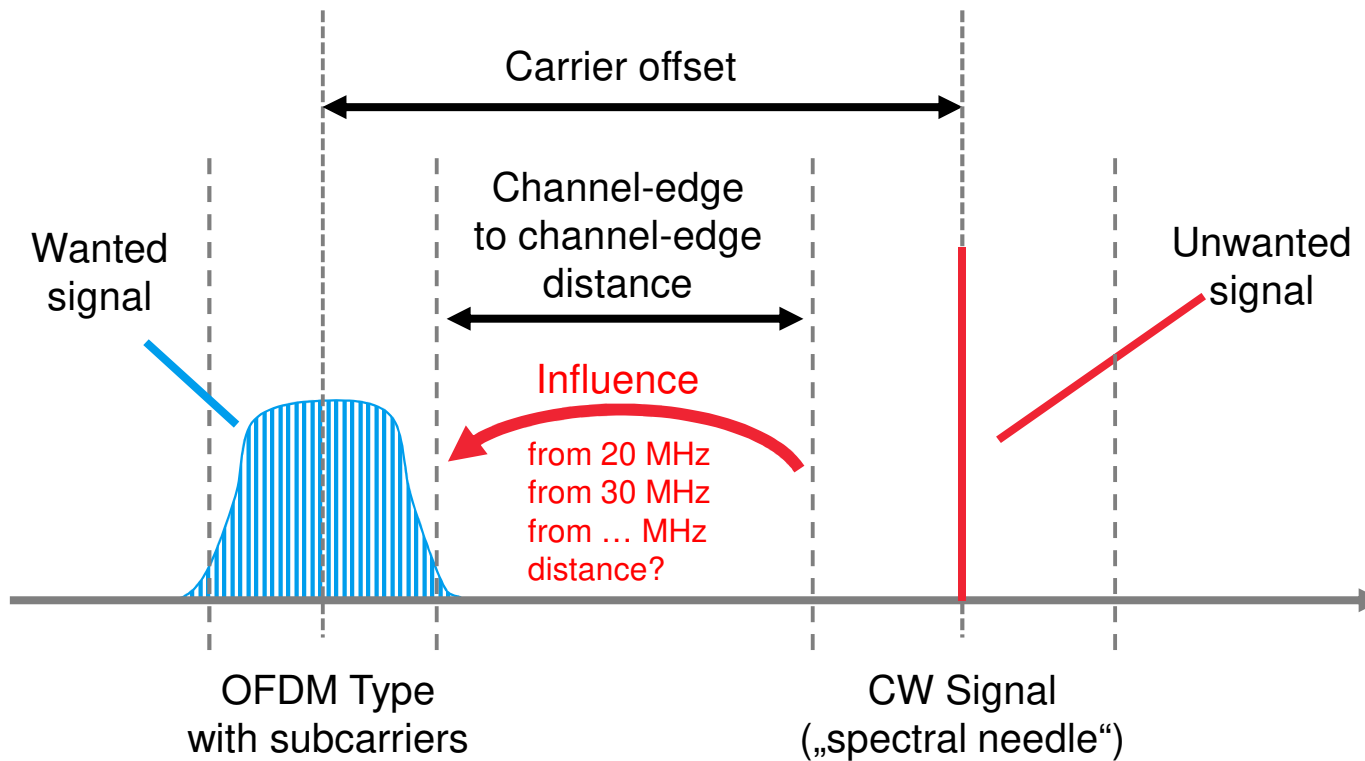
Unwanted Signal Type:

- CW
- AWGN
- OFDM

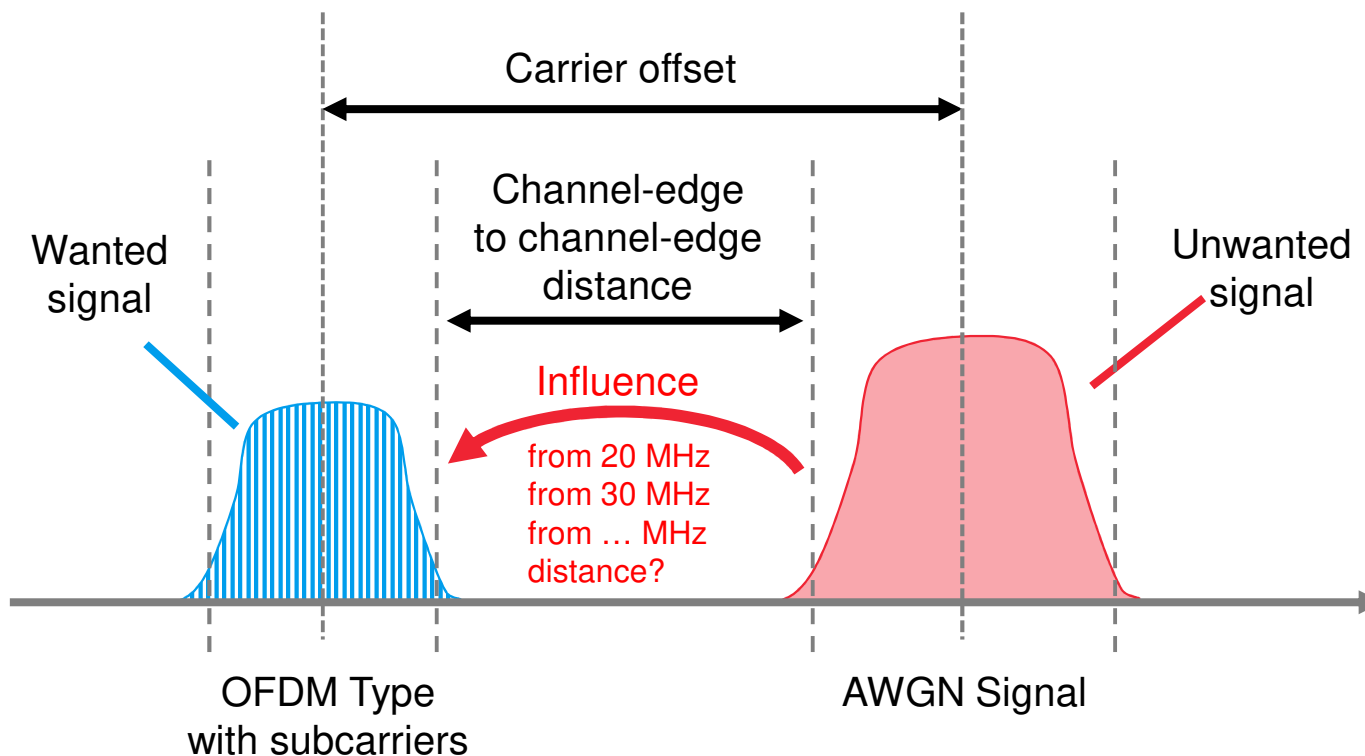
## Unwanted Signal: Parameters



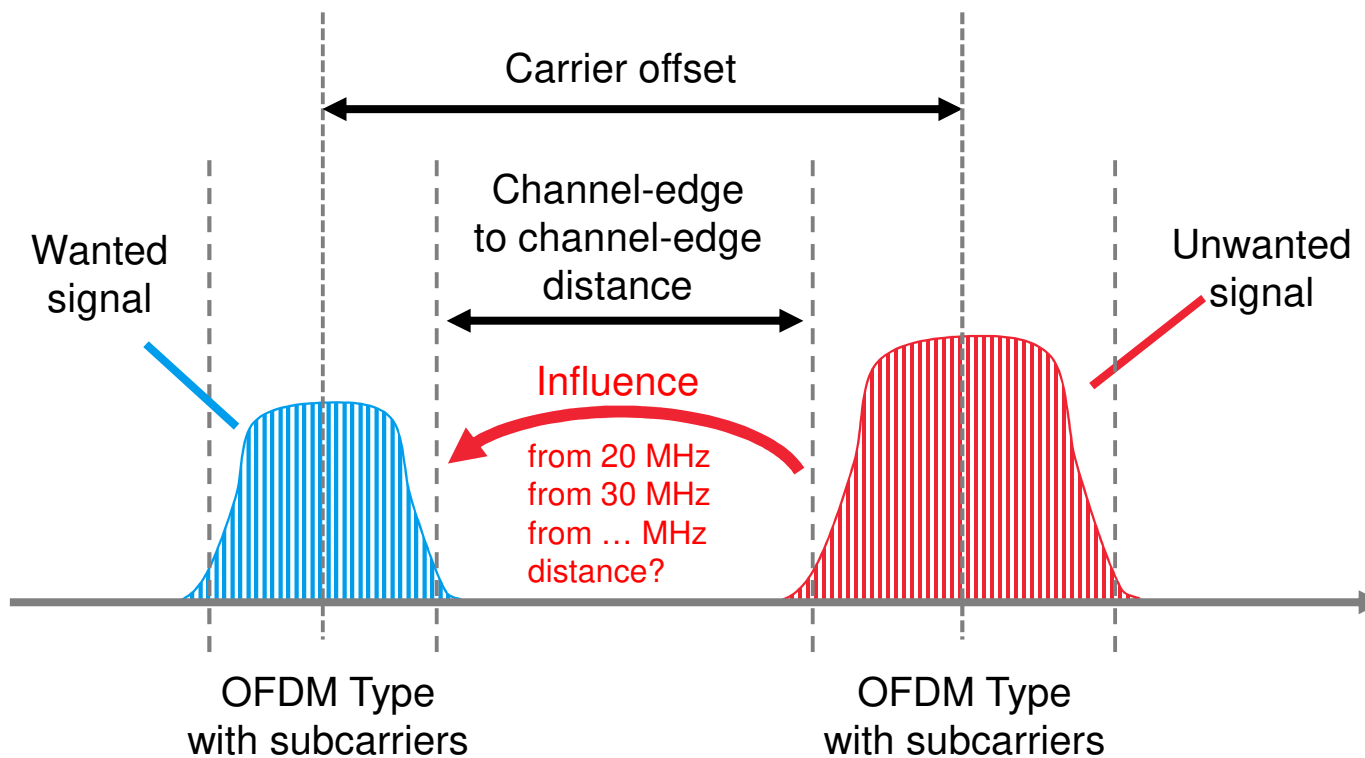
## Unwanted Signal: Typical Standard Test Signal (1)



## Unwanted Signal: Typical Standard Test Signal (2)



## Unwanted Signal: Typical Standard Test Signal (3)





# Self Declaration, how to find a published Harmonised Standard

Is Self-Declaration possible?

Article 3 of 2014/53/EU  
Essential Requirements

Article 3 of the RED  
has an „umbrella“ function.

Health & Safety (art. 3.1a) EMC (art. 3.1b) Radio (art. 3.2) Specific (art. 3.3)

YES for 3.1b, if...

...the radio equipment complies to an applicable harmonized EMC standard with reference to art. 3.1 of directive 2014/53/EU then the radio equipment is presumed to be in conformity with the essential requirements set out in article 3.1 b of the RED.

For the EMC part, self-declaration is always possible.

YES for 3.2, if...

...the radio equipment complies to an applicable harmonized standard with reference to art. 3.2 of directive 2014/53/EU then the radio equipment is presumed to be in conformity with the essential requirements set out in article 3.2 of the RED.

For the Radio part, self-declaration is possible, if the applicable EN standard is listed in the Official Journal (EU). Outsourcing of tests possible.

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How to check the status „published“ of a standard?

[http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/red\\_en](http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/red_en)

A long list...

[CTRL]+[F] <your EN number>

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Up-to-date Harmonised Standards refer to 2014/53/EU

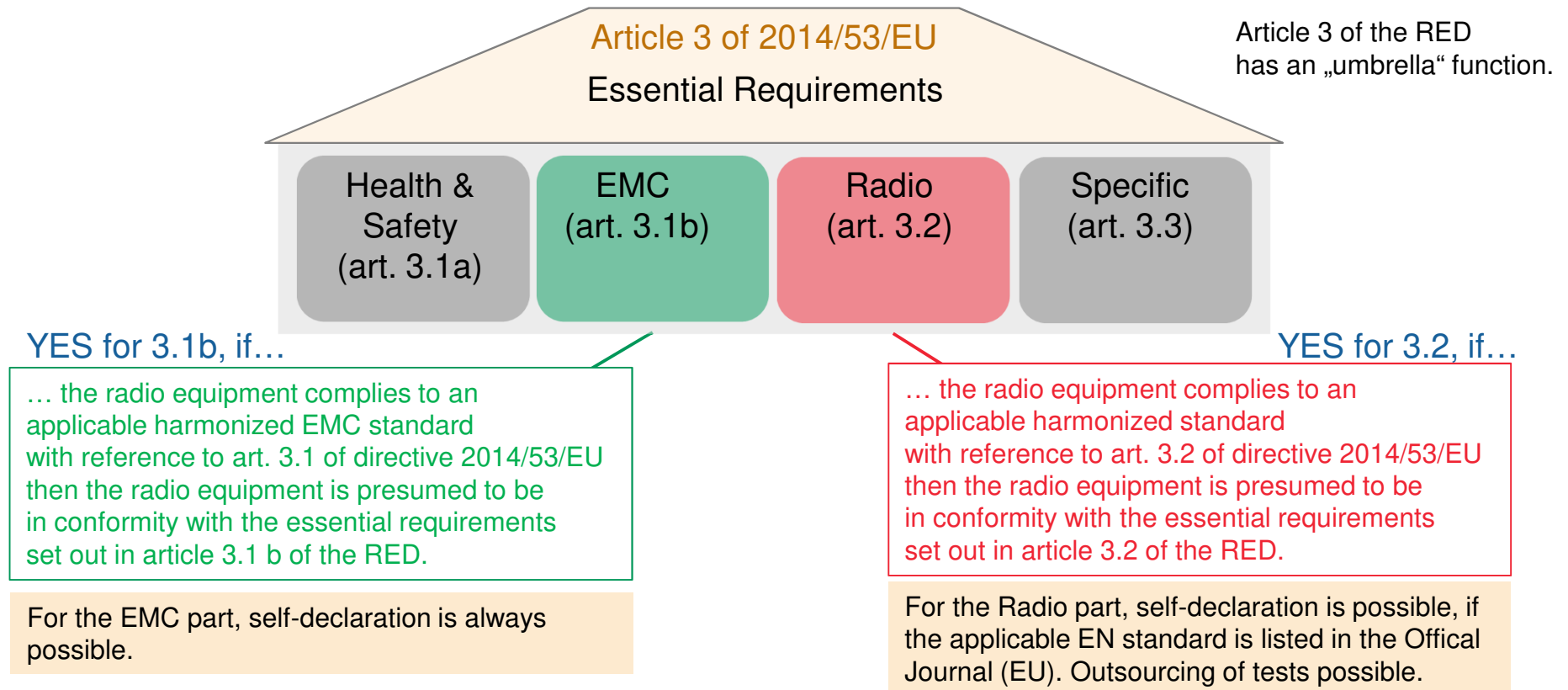
Reference on title page of standard  
Old versions of Harmonised Standards refer to Directive 1999/5/EC  
Up-to-date Harmonised Standards refer to Directive 2014/53/EU.

EN 3xx xxx Version Number (Date)

Chapter / Title / EUT Type  
Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

RONDE & SCHWARZ 21

# Is Self-Declaration possible?



# How to check the status „published“ of a standard?

[http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/red\\_en](http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/red_en)



[CTRL]+[F] <your EN number>

ETSI	EN 303 413 V1.1.1 <b>(new)</b> Satellite Earth Stations and Systems (SES); Global Navigation Satellite System (GNSS) receivers; Radio equipment operating in the 1 164 MHz to 1 300 MHz and 1 559 MHz to 1 610 MHz frequency bands; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU	<a href="#">This is the first publication</a>			Article 3(2)
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A long list....

The image shows a long list of harmonized standards for radio equipment. The list is organized into multiple columns, including standard numbers, titles, and status indicators. The first column lists standard numbers like EN 303 413 V1.1.1. The second column lists the titles of the standards, such as 'Satellite Earth Stations and Systems (SES); Global Navigation Satellite System (GNSS) receivers; Radio equipment operating in the 1 164 MHz to 1 300 MHz and 1 559 MHz to 1 610 MHz frequency bands; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU'. The third column contains status indicators, with some entries marked as 'new' or 'first publication'. The list continues with many more standards, each with its own set of details.

## Up-to-date Harmonised Standards refer to 2014/53/EU

*Reference on title page of standard*

*Old versions of Harmonised Standards refer to Directive 1999/5/EC*

*Up-to-date Harmonised Standards refer to Directive 2014/53/EU.*

EN 3xx xxx Version Number (Date)



Chapter / Title / EUT Type

**Harmonised Standard covering the essential requirements  
of article 3.2 of Directive 2014/53/EU**

## Growing Number of Notified Bodies

Country of NB Registration	Aount of NBs	NB Reg.#					5					10					15
United States	15	0976	0978	0980	0981	0982	0984	1177	1313	1317	1588	1797	1925	2155	2200	2280	
Germany	11	0123	0197	0366	0678	0680	0681	0682	0700	1948	2522	2784					
United Kingdom	10	0086	0168	0359	0673	0888	0889	0890	0891	1942	2783						
Poland	5	1434	1451	1471	1664	2703											
Italy	4	0051	0477	0648	2051												
Spain	3	0370	1909	2031													
France	2	0081	0536														
Denmark	2	0199	0200														
Sweden	2	0402	0413														
Austria	2	0408	0438														
Norway	2	0470	2544														
Netherlands	2	0560	0620														
Greece	2	0848	2537														
Slovakia	2	1293	1299														
Japan	2	1731	1780														
Bulgaria	2	1857	2024														
Finland	1	0598															
Slovenia	1	1304															
Czech Republic	1	1383															
Hungary	1	1413															
Ireland	1	1595															
Canada	1	1622															
Croatia	1	2094															
Malta	1	2559															
<b>Total</b>	<b>76</b>																

Status in August 2018

# Notified Bodies...

Country of NB Registration	Acount of NBs	NB Reg.#					5						10					15
United States	15	0976	0978	0980	0981	0982	0984	1177	1313	1317	1588	1797	1925	2155	2200	2280		
Germany	11	0123	0197	0366	0678	0680	0681	0682	0700	1948	2522	2784						
United Kingdom	10	0086	0168	0359	0673	0888	0889	0890	0891	1942	2763							
Poland	5	1434	1451	1471	1664	2703												
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Spain	3	0370	1909	2031														
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Sweden	2	0402	0413															
Austria	2	0408	0438															
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Netherlands	2	0560	0620															
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Slovakia	2	1293	1299															
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Canada	1	1622																
Croatia	1	2094																
Malta	1	2559																
Total	76																	

## Notified bodies....


- can qualify (alternative) test methods
- can perform tests
- can do the paperwork  
but do not sign the declaration of conformity
- can sub-contract with test houses (incl. 3rd parties)  
which do not have NB status.
- are not responsible for the risk assessment

In context with the RED, the use of a draft standard is regarded as a use of alternative test methods.  
Thus a NB has to be involved.

## List of Notified Bodies

[illegible]

NANDO LIST RED



All

Images

Videos

News

Shopping

More

Settings

Tools

About 5.750.000 results (0,54 seconds)

EUROPA - European Commission - Growth - Regulatory policy - NANDO

[ec.europa.eu/growth/tools-databases/nando/index.cfm?fuseaction=directive...dir...](https://ec.europa.eu/growth/tools-databases/nando/index.cfm?fuseaction=directive...dir...) ▼

Withdrawn/Expired/Suspended Notifications/NBs are not displayed in this list, you can find them in the Body module under the hyperlink ...

[\[PDF\] LIST OF BODIES NOTIFIED UNDER DIRECTIVE : 2014/53/EU Rad...](#)

[ec.europa.eu/growth/tools-databases/nando/index.cfm?fuseaction=directive...cd...](https://ec.europa.eu/growth/tools-databases/nando/index.cfm?fuseaction=directive...cd...) ▼

Aug 14, 2018 - 0051. Radio equipment. Conformity assessment modules B and C (EU-type examination and conformity to type based on internal production ...



# How to find an example of a Declaration of Conformity?

Search: <manufacturer name> + 2014/53/EU + Declaration of Conformity

**Autoliv**

Search bar containing: autoliv 2014/53/eu declaration of conformity

Navigation tabs: All, News, Shopping, Images, Videos, More, Settings, Tools

About 26 results (0,45 seconds)

[\[PDF\] EU Declaration of Conformity EC Directive\(s\) 2014/53/EU ... - Autoliv](#)  
[https://www.autoliv.com/.../DoC-RED-Autoliv-NB24G175V1\\_PK%20signed%20201...](https://www.autoliv.com/.../DoC-RED-Autoliv-NB24G175V1_PK%20signed%20201...)  
Jun 8, 2017 - EU Declaration of Conformity. EC Directive(s). 2014/53/EU. Manufacturer. Autoliv ASP, Inc. 26545 American Drive. Southfield, Michigan 48034.

[\[PDF\] DoC 6234734 - Autoliv](#)  
<https://www.autoliv.com/regulatory/EU%20RED%20DoC/DoC%206234734.pdf>  
Jun 29, 2017 - EU Declaration of Conformity. 2014/53/EU. Autoliv ASP, Inc. 26545 American Drive. Southfield, Michigan 48034. United States of America.

**EU Radio Directive Equipment (RED) : Declaration of Conformity (DoC)**  
<https://www.autoliv.com/regulatory/Pages/EURED-DoC.aspx>  
Hereby, Autoliv ASP, Inc. declares that the radio equipment for the Autoliv Radar Sensors is in compliance with Radio Equipment Directive 2014/53/EU. ...

[\[PDF\] Page 1 EU Declaration of Conformity EC Directive\(s\) 2014/53/EU ...](#)  
[https://www.autoliv.com/.../EU%20%20DoC%20-RED%20%20Autoliv%206234734\\_...](https://www.autoliv.com/.../EU%20%20DoC%20-RED%20%20Autoliv%206234734_...)  
Jun 8, 2017 - EU Declaration of Conformity. EC Directive(s) 2014/53/EU. Manufacturer Autoliv ASP, Inc. 26.545 American Drive. Southfield, Michigan 48034.

EC Directive(s)	EU Declaration of Conformity
Manufacturer	<b>2014/53/EU</b> Autoliv ASP, Inc. 26545 American Drive Southfield, Michigan 48034 United States of America
Radio Equipment	Type Designation: <b>NB24G175V1</b>
Description / Intended Use	<b>Narrow Band 1.75 / vehicular radar utilized for object detection applications</b>
Article 3.2: Applied Radio Spectrum Standard(s)	<b>EN 302 858 v2.1.1 (2016-12)</b>
Article 3.1(b): Applied EMC Standard(s)	<b>EN 301 489-1 v1.9.2 (2011-09), EN 301 489-1 v2.1.1 (2017-03), EN 301 489-3 v2.1.0 (2017-03)</b>
Article 3.1(a): Applied Health and Safety Standard(s)	<b>EN 60950-1: 2006 / A2:2013, EN 62479:2010, EN 62311:2008</b>
Frequency band(s) in which the radio equipment operates	Transceive: <b>24.05 – 24.25 GHz</b>
Maximum radio-frequency power transmitted	<b>Category D – &lt; 20 dBm peak EIRP</b>
Hereby, <b>Autoliv ASP, Inc.</b> declares that the object of the declaration described above is in conformity with the relevant Union harmonisation legislation ( <b>Directive 2014/53/EU</b> ).	
This declaration is issued under the sole responsibility of the manufacturer.	

Wich standards are listed under „Article 3.2“?

In this example:  
**EN 302 858 V 2.1.1**

*Patricia A. Kaye*  
Patricia Kaye, Project Team Leader – Engineering and Development  
Signed for and on behalf of Autoliv ASP, Inc.  
Southfield, Michigan, United States of America / 8 June 2017



# How to find an example of a Declaration of Conformity?

Search: <manufacturer name> + 2014/53/EU + Declaration of Conformity

**TORICA Tokai Rika Create Corporation**  
HEAD OFFICE: 2-3-10, AOI, HIGASHI-KU, NAGOYA 461-0004 JAPAN TEL: 81-52-934-2111 FAX: 81-52-934-2101

**EU DECLARATION of CONFORMITY (DoC)**  
(No. 11604303-A)


This declaration of conformity is issued under the sole responsibility of the manufacturer:

Name: Tokai Rika Create Corporation  
Address: 2-3-10Aoi,Higashi-ku,Nagoya,Aichi 461-0004,Japan

We declare that the DoC is issued under our sole responsibility and belongs to the following product.

Object of the declaration:

Product Name	Car audio with DAB radio, DABTK1
Model Name	347-2021-000 347-2027-000
Software Ver.	FM: 1.0 AM: 1.0 DAB: 1.1.14.0



Accessories N/A

The object of the declaration described above is in conformity with the relevant Union harmonization legislation:

Radio Equipment (RE) Directive (2014/53/EU)

The following harmonized standards and technical specifications have been applied:



Health & Safety (Article 3.1(a)):	EN 60065:2014
EMC (Article 3.1(b)):	EN 301 489-1 V2.1.1 EN 301 489-3 V2.1.0 (Draft)
Radio Spectrum (Article 3.2):	EN 303 345 V1.1.1 (Draft)

Notified Body performed an EU-type examination in accordance with the requirements of Annex III of RE Directive and issued the EU-type examination certificate.

Notified Body:  
UL Japan, Inc. (No. 1731)  
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021, Japan

Certificate No.: ULAR1703004

Signed for and on behalf of:

	March 13, 2017	
Place of Issue:	Date of Issue:	General Manager Engineering Div.

# How to find the „right“ standard version?


## Search in the ETSI-Portal

5a

**Work Programme**

[Simple Search](#) | [Advanced Search](#) | [Pre-Defined Reports](#) | [Help](#)

To find out which is the National Standards Organization for your country



[click here](#)

Search

**ETSI Doc. Number** ?

**Type**  ?

EN - European Standard (Telecommunications series)  
ES - ETSI Standard  
EG - ETSI Guide

☐ All Versions

**Current Status** ? **Achieved Status Since** ? **Report Type** ?

Published  
Approval Stage  
Drafting Stage  
New Work Item  
Withdrawn  
Historical

Day Month Year  
▼ ▼

☐ Include Items That Have Moved On

☒ Summary List  
☐ Work Item Plan  
☐ Progress Report

**Display** ?

10 Items per Page

**Technical Body** ?

3GPP - Third Generation Partnership Project  
ATTM - Access, Terminals, Transmission and Multiplexing  
BOARD - Board  
BRAN - Broadband Radio Access Networks

[Include Non-Active TBs](#)

Search

Select prefix  
„EN“

Enter the number:  
3 digits  
„space“  
3 digits:  
302 858

# How to find the „right“ standard version?

Search in the ETSI-Portal

5b

The screenshot shows the ETSI search portal interface. At the top, there are 'Search' and 'Clear All' buttons. Below this is a section titled 'ETSI Doc. Number' with a question mark icon. It contains two main input areas: 'Type' and 'Number'. The 'Type' dropdown menu is open, showing options: 'EN - European Standard (Telecommunications series)' (highlighted), 'ES - ETSI Standard', and 'EG - ETSI Guide'. A red arrow points from a callout box to the 'EN' option. The 'Number' input field contains '302 858'. A red arrow points from a callout box to this field. Below the 'Number' field is a checkbox labeled 'All Versions', which is checked. A red arrow points from a callout box to this checkbox. To the left of the 'Number' field is a 'Current Status' dropdown menu with options: 'Published', 'Approval Stage', 'Drafting Stage', 'New Work Item', 'Withdrawn', and 'Historical'. Below this is an 'Achieved Status Since' section with 'Day', 'Month', and 'Year' dropdowns, and a checkbox 'Include Items That Have Moved On'. To the right of this is a 'Report Type' section with radio buttons for 'Summary List' (selected), 'Work Item Plan', and 'Progress Report'. Below the 'Report Type' section is a 'Display' section with a dropdown for 'Items per Page' set to '10'. At the bottom is a 'Technical Body' dropdown menu with options: '3GPP - Third Generation Partnership Project', 'ATTM - Access, Terminals, Transmission and Multiplexing', 'BOARD - Board', and 'BRAN - Broadband Radio Access Networks'. A link 'Include Non-Active TBs' is below the dropdown. At the very bottom, there are 'Search' and 'Clear All' buttons.

Select prefix  
„EN“

Enter the number:  
3 digits  
„space“  
3 digits:  
302 858

Activate  
all versions

# How to find the „right“ standard?

## Search in the ETSI-Portal

6

2017-08-02
Work Programme
Version 2.3.3

[Simple Search](#) | [Advanced Search](#) | [Pre-Defined Reports](#) | [Help](#)

### Work Items with ETSI Document Number of '302 858' of Type 'EN'

[View As Work Item Plan](#) | [View As Work Item Progress Report](#)

Found 4 Items...  
Displaying items 1 to 4 ...

	IDENTIFICATION	TITLE	STATUS
1	Doc. Nb. <a href="#">EN 302 858-2 Ver. 1.3.1</a> Ref. <a href="#">REN/ERM-TGSRR-061-2</a> Technical Body: <a href="#">ERM TGSRR</a> Directives: <a href="#">2014/53/EU</a> <a href="#">Details and Download</a>	Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Automotive radar equipment operating in the 24,05 GHz up to 24,25 GHz or 24,50 GHz frequency range; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive EN for NB SRR @ 24GHz	Published Current Status: <a href="#">Citation in the OJ (2017-06-08)</a>
2	Doc. Nb. <a href="#">EN 302 858-2 Ver. 1.3.1</a> Ref. <a href="#">REN/ERM-TGSRR-061-2_R&amp;TTE</a> Technical Body: <a href="#">ERM TGSRR</a> Directives: <a href="#">99/5/EC</a> <a href="#">Details and Download</a>	Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Automotive radar equipment operating in the 24,05 GHz up to 24,25 GHz or 24,50 GHz frequency range; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive EN for NB SRR @ 24GHz	Published Current Status: <a href="#">No more cited in the OJ (2017-06-13)</a>
3	Doc. Nb. <a href="#">EN 302 858-1 Ver. 1.3.1</a> Ref. <a href="#">REN/ERM-TGSRR-061-1</a> Technical Body: <a href="#">ERM TGSRR</a> <a href="#">Details and Download</a>	Electromagnetic compatibility and Radio spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Automotive radar equipment operating in the 24,05 GHz up to 24,25 GHz or 24,50 GHz frequency range; Part 1: Technical characteristics and test methods EN for NB and WLAM SRR @ 24GHz	Published Current Status: <a href="#">Publication (2013-11-22)</a>
4	Doc. Nb. <a href="#">EN 302 858 Ver. 2.1.1</a> Ref. <a href="#">REN/ERM-TGSRR-77</a> Technical Body: <a href="#">ERM TGSRR</a> Directives: <a href="#">2014/53/EU</a> <a href="#">Details and Download</a>	Short Range Devices; Transport and Traffic Telematics (TTT); Radar equipment operating in the 24,05 GHz to 24,25 GHz or 24,05 GHz to 24,50 GHz range; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU vehicular radar operating in 24 GHz NB range	Published Current Status: <a href="#">Delivery to the EC (2016-12-12)</a> Next Status: <a href="#">Citation in the OJ (2017-03-06)</a>

Found 4 Items...  
Displaying items 1 to 4 ...  
[New Query](#)

Any comments or problems with this application? Please [let us know...](#)

<https://portal.etsi.org/webapp/WorkProgram/PreDefinedReports/QueryForm.asp>

# How to find the „right“ standard?





## Search in the ETSI-Portal

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2017-08-02
Work Programme
Version 2.3.3

[Simple Search](#) | [Advanced Search](#) | [Pre-Defined Reports](#) | [Help](#)

### Details of 'REN/ERM-TGSRR-77' Work Item

	Work Item Reference	ETSI Doc. Number	STF	Technical Body in Charge	Download Standard
	REN/ERM-TGSRR-77	EN 302 858		ERM TGSRR	
	Current Status (Click to View Full Schedule)	Latest Version	Cover Date	Standstill	Creation Date
	<a href="#">Delivery to the EC (2016-12-12)</a>	2.1.1	2016-12-12	<a href="#">View Standstill Information</a>	2015-02-19
	Rapporteur	Technical Officer	Harmonized Standard		
	<a href="#">Andreas John</a> 	<a href="#">Igor Minaev</a> 	Yes		<a href="#">View Transposition Data</a>

**Title**
Short Range Devices; Transport and Traffic Telematics (TTT); Radar equipment operating in the 24,05 GHz to 24,25 GHz or 24,05 GHz to 24,50 GHz range; Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU  
vehicular radar operating in 24 GHz NB range

**Scope and Field of Application**
HEN covering the technical requirements and measurement procedures for short range vehicular radar operating in the 24,05 GHz to 24,25 GHz or 24,05 GHz to 24,50 GHz range; Revision and merging of current standard parts (EN 302 858-1 and 302 858-2) to cover the essential requirements of article 3.2 of the RE-D.

**Supporting Organizations**
JSConsulting, Continental Automotive GmbH, Valeo Radar Systems Inc., Hella

	Keywords	Projects	Clusters	Frequencies	Mandates	Directives
	Harmonised standard RADAR RADIO RTTT SRD TESTING		Transportation		M/536	2014/53/EU

**Official Journal**

2016-07-25 butscheidt Draft contributed - V 1.0.1 contributed for Decision in ERM(16)59b012 as Draft Review after PE  
2016-07-25 butscheidt A new draft is uploaded - V 1.0.1 with status: Draft Review after PE - with comment: The results of the resolution meeting: successful. The resolution meeting was during TG SRR\_25.

# Does R&S have solutions?

≥119 standards with reference to  
RED article 3.2 (= radio part)

Additional standards with reference to  
RED article 3.1b (= EMC part incl. immunity)

” YES & NO “

Discussions are required:

- Manual test vs. automated tests
- Conducted testing vs. radiated testing
- R&S as a solution provider vs. R&S as sub-supplier
- Generic approaches vs. dedicated solutions

There is a common set of test  
approaches in the standards  
that allow a general approach.

2nd channel e.g. for blocking,  
adjacent channel selectivity  
→ additional SMBV, variable attenuators  
General monitoring of the signals  
(offset, level, OBW) → Analyzer

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# Does R&S have solutions?

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RED article 3.2 (= radio part)

Additional standards with reference to  
RED article 3.1b (= EMC part incl. immunity)

BTC → 3 standards

CMW + CMW run + SMBV → sub-chapters of standards

TS8997 → 2 standards

TS8980 → conducted for LTE-, 3G-, 2G-  
related regulatory tests.

GNSS solution → 1 standard

Radiated spurious emission setups →  
RS system integration groups

” YES & NO “

Radiated power measurements

ITS100 → R&D stopped (1 standard)

R&D work on ATS1000 + 5G test solution  
→ we will see what can be re-used  
e.g. for automotive RADAR  
(1 standard + 3 more )

CMA under preparation → various standards  
for „analog hand-helds“

Immunity system combined with sensitivity  
test solution → risk assessment (radiated)

Test solution for automotive RADAR modules



# R&S Solutions

EN 391 908-2 → UTRA FDD UE

EN 301 908-13: IMT cellular networks,  
e.g. LTE UE E-UTRA freq bands 1,3,7,8 ...

EN 301 511: Global System for Mobile  
communications (GSM)



**R&S®TS8980** Also interesting: TS8980 PRE



**R&S® TS8997**

EN 303 413: Satellite Earth Stations and  
Systems (SES): Global Navigation  
Satellite System (GNSS)



**R&S®SMW**

+



**R&S®FSV**

EN 300 328 & EN 301 893:  
Regulatory Test Systems for  
Wireless Devices 2.4/5 GHz band

EN 302 571: Intelligent  
Transport systems (ITS) car-  
to-car communications  
(5855 MHz to 5925 MHz)



**R&S®BTC**

EN 303 345: Sound broadcast receivers



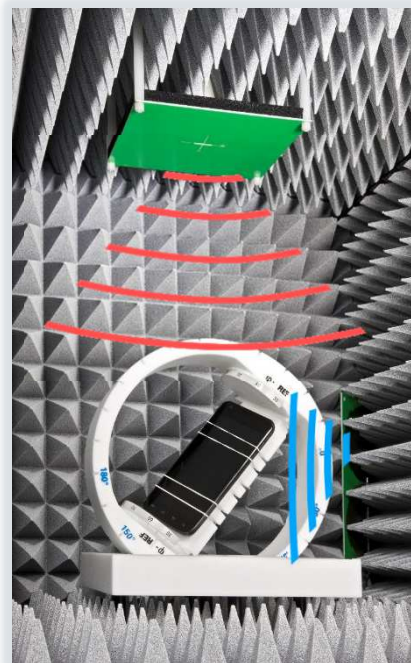
**R&S®TS-ITS100**

frozen

## RSmall Scale Setup based on DST200



R&S® DST200
R&S® DST-B101
R&S® DST-B102
R&S® DST-B150
R&S® DST-B160
R&S® DST-B165
R&S® DST-B215
R&S® DST-B270



Antenna in the roof  
→ unwanted signal

Antenna in the corner  
→ wanted signal

## Contact Details

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