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EE06A LTE Technical data (summary)

UHF-YAGI with LTE – bandstop filter

Hinweis: Endgültiger Name : **EE06A** (früher: EE07 LTE), Änderung per Mail H. Karl am 28.01.13

S. Suckrow (Design Engineer)

2012-12-21



basics

Target

In order to avoid any disturbing interferences in TV- tuners caused by LTE – base stations, which now transmit signals in frequencies of formerly UHF – band (digital dividend), a bandstop filter is designed for the UHF YAGI-antenna EE06.

The new name for the LTE robust antenna is EE06A.



basics

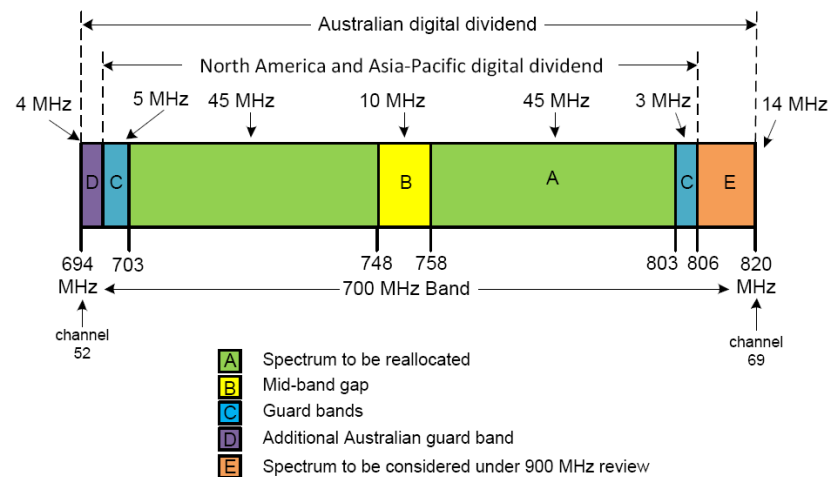
LTE700 bands Australia

Quellen:

Draft Reallocation recommendations for digital dividend May 2011 AMCA

Table 1 Terms of the draft recommendations

Element of draft recommendation	700 MHz	2.5 GHz
Parts of the spectrum	Two 45 MHz blocks of spectrum, with frequency boundaries 703–748 MHz and 758–803 MHz. The above frequency bands should be reallocated nationally, excluding part of the Mid West Radio Quiet Zone.	Two 70 MHz blocks of spectrum, with frequency boundaries 2500–2570 MHz and 2620–2690 MHz. The above frequency bands should be reallocated nationally, excluding part of the Mid West Radio Quiet Zone.
Reallocation period	The reallocation period should start on 2 November 2011 and should end on 31 December 2014 .	The reallocation period should start on 2 November 2011 and should end on: (a) 31 January 2016 for the Perth area (b) 30 September 2014 for all other parts of Australia.
Reallocation deadline	The reallocation deadline should be 31 December 2013.	The reallocation deadline should be 30 September 2013.
Licence type	Spectrum licences.	Spectrum licences.



Due to the lack of a common broadcasting band among all International Telecommunications Union (ITU) regions, a globally harmonised digital dividend band has not been established. There are separate digital dividend band plans in the European Union (EU) and in the US, however neither of these is considered to be suitable for Australia.

Multiplex-Schema according to Frequency Allocation APT (Asia Pacific Telecommunication):

2 frequency blocks each 45MHz, lower block uplink (mobile transmit), upper block downlink (base station transmit)

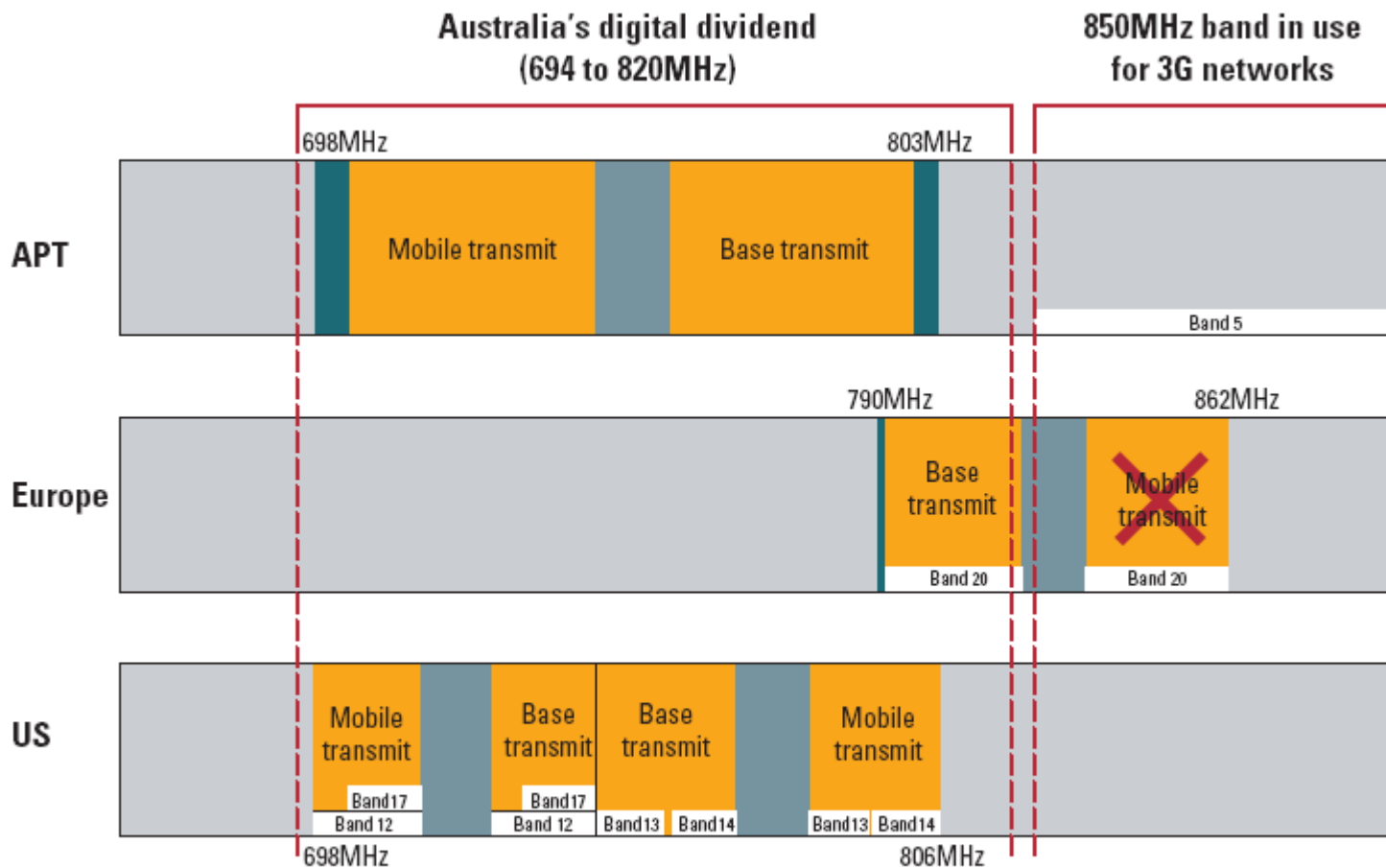


basics

Frequency bands LTE700 worldwide (up-/downlink)

Quelle:

The digital dividend: the Australian perspective



hint:

Australia belongs to country region 3 (Asia-Pacific)

APT: Asia-Pacific Telecommunication

The three band plan options: the Asia-pacific APT 700MHz plan, the European CEPT 800MHz plan and the US 700MHz plan.



basics

Target specification EE06 A

TV band UHF Australia: 519 – 694 MHz (band 27 -51)

specific characteristic EE06 A: no limitation of lower bands:

470 – 694 MHz (band 21 – 51)

band stop characteristics LTE700:

703 – 748 MHz (Uplink, mobile transmit)

758 – 803 MHz (Downlink, base station transmit)

Side Condition:

Because antenna is commonly roof-mounted, no interference of mobile phone (lower band) is expected

Target: Best isolation on downlink



basics

Design target

- Bandstop characteristics are realized by inserting SMD filter elements in existing balun
- No changes in radiation pattern and reflection loss
- No changes in antenna radiator elements
- No changes in Housing and other mechanical components



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Technical Data

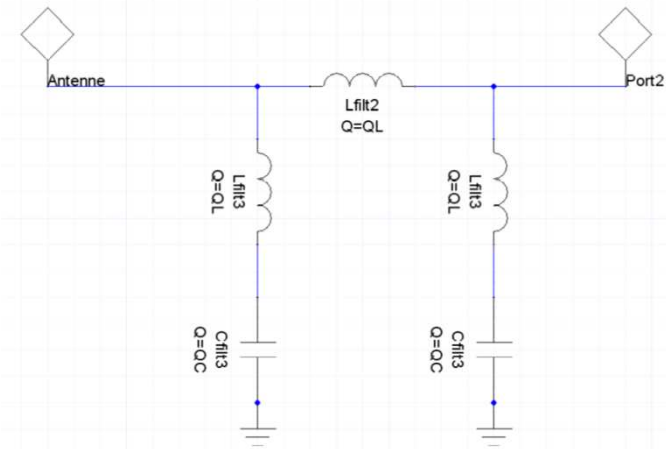
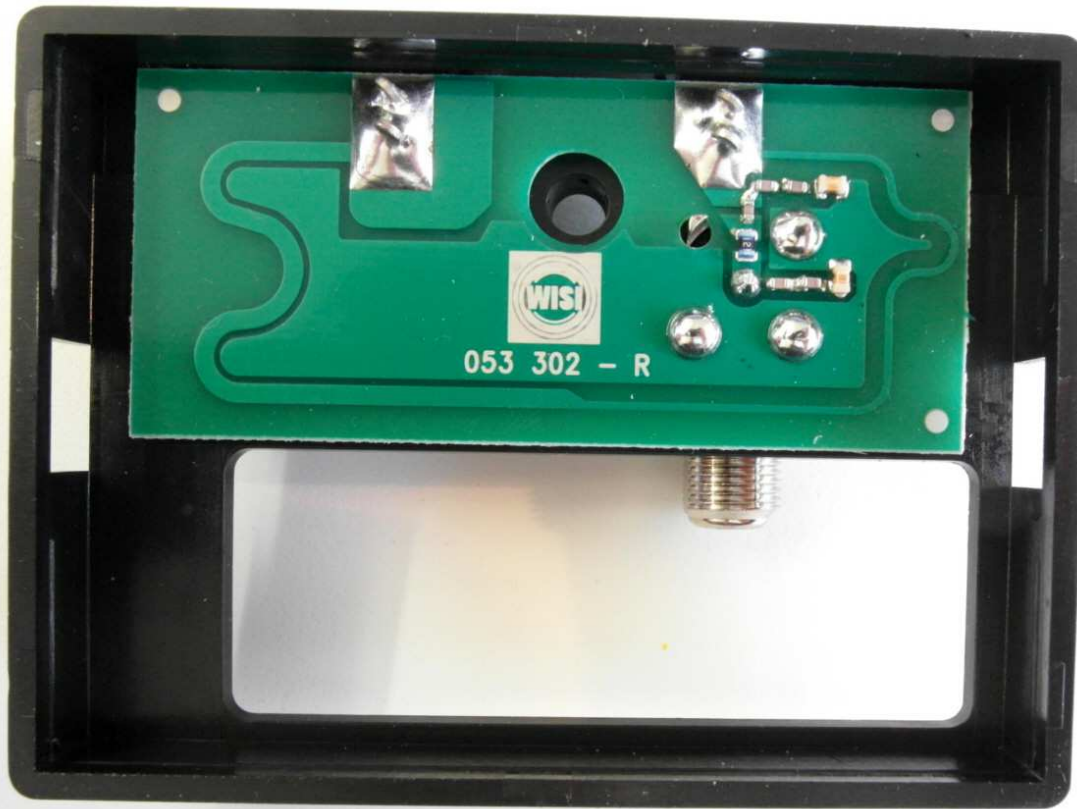
EE06 A



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Technical Data

Band stop filter



Technical Data

reflection loss „filter only“

Parameter:
EE07 C-Stand vs. B3-Stand (Serie)
nur Filter

Anpassung Filter
EE07 LTE (UHF-YAGI)

Objekt:
EE07 LTE
(EE06 mit LTE-
Unterdrückung)

Sachnummer WISI:
073 099

Kunde:
Matchmaster Australia

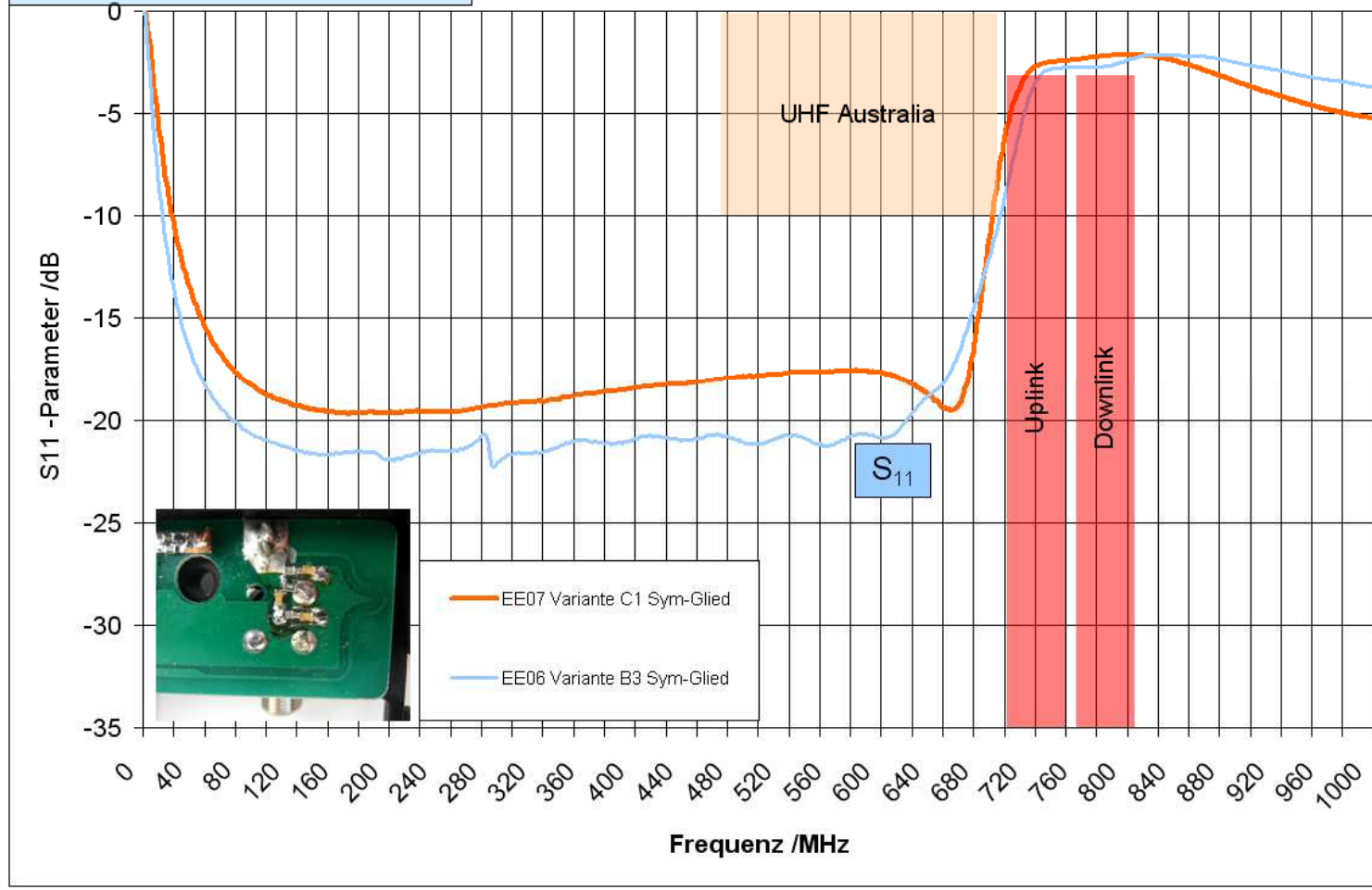
Sachnummer Kunde:
-

E-/Q-Stand:
C-Stand

Herstelldatum:
KW48 2012 (nur Dipolkasten)

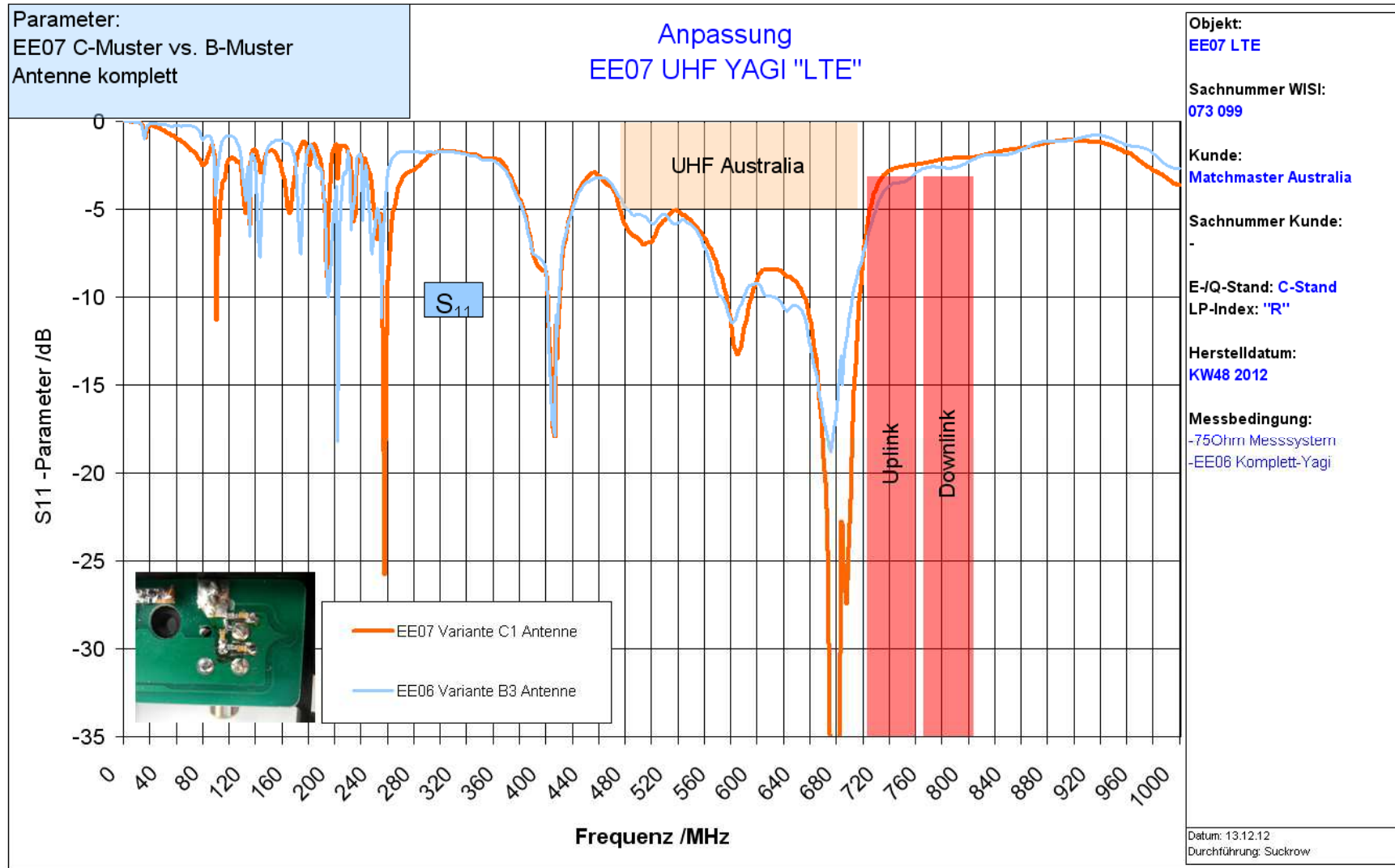
Messbedingung:
-75Ohm Messsystem
-EE06 Komplett-Yagi
-Symmetrierglied OHNE
symmetrierung mit 68Ohm
Abschluß (wie Bild)

Datum: 13.12.12
Durchführung: Suckrow



Technical Data

reflection loss EE06 A





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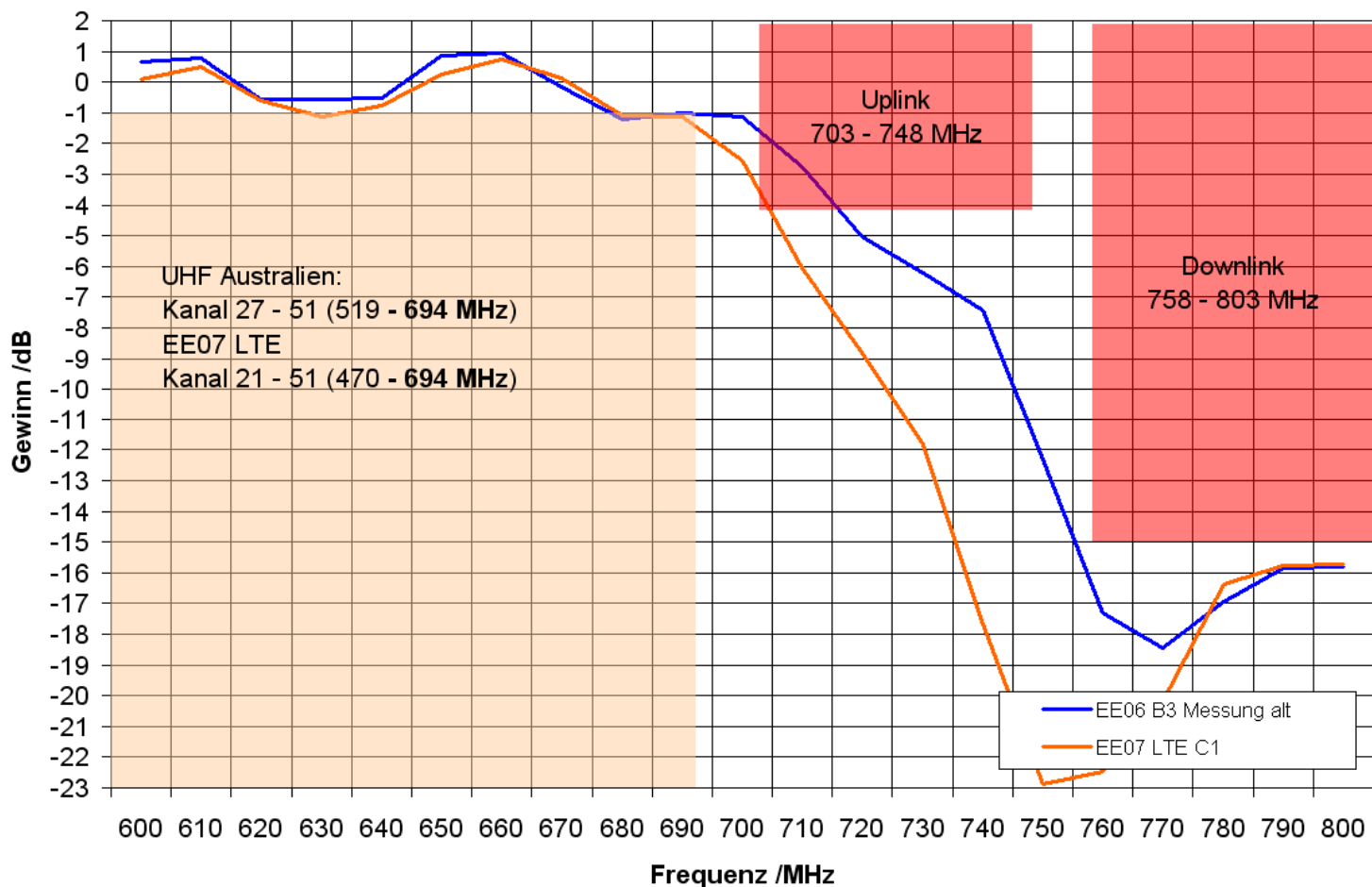
Technical Data

Gewinn fein

Parameter:
C1-Muster (Serie) vs. B3-Muster (bestes B-Muster)

Gewinn UHF (600 - 800MHz) EE07 LTE

Kurven
einheitlich
färben



Projekt
EE07 LTE

Musterstände:
B3, C1

Messstrecke: 2D
Sendant.: FT01 UHF
Polarisation: horizontal
Elevation Sendant.: 0°
Referenzantenne: EE06 Original
Position Referenz: wie Testant.
Position Test-Antenne: Stativ auf Fahrzeugdach

Bewertung:
Im Durchlaßbereich UHF gleichwertig (Zusatzdämpfung Filter <1dB vs. Original)

Im Sperrbereich steilere Flanke, daher höhere Dämpfung bereits bei LTE Uplink (Mobil Senden)

Produktionsfreigabe erteilt !

Datum: 13.12.12
Durchführung: Suckrow



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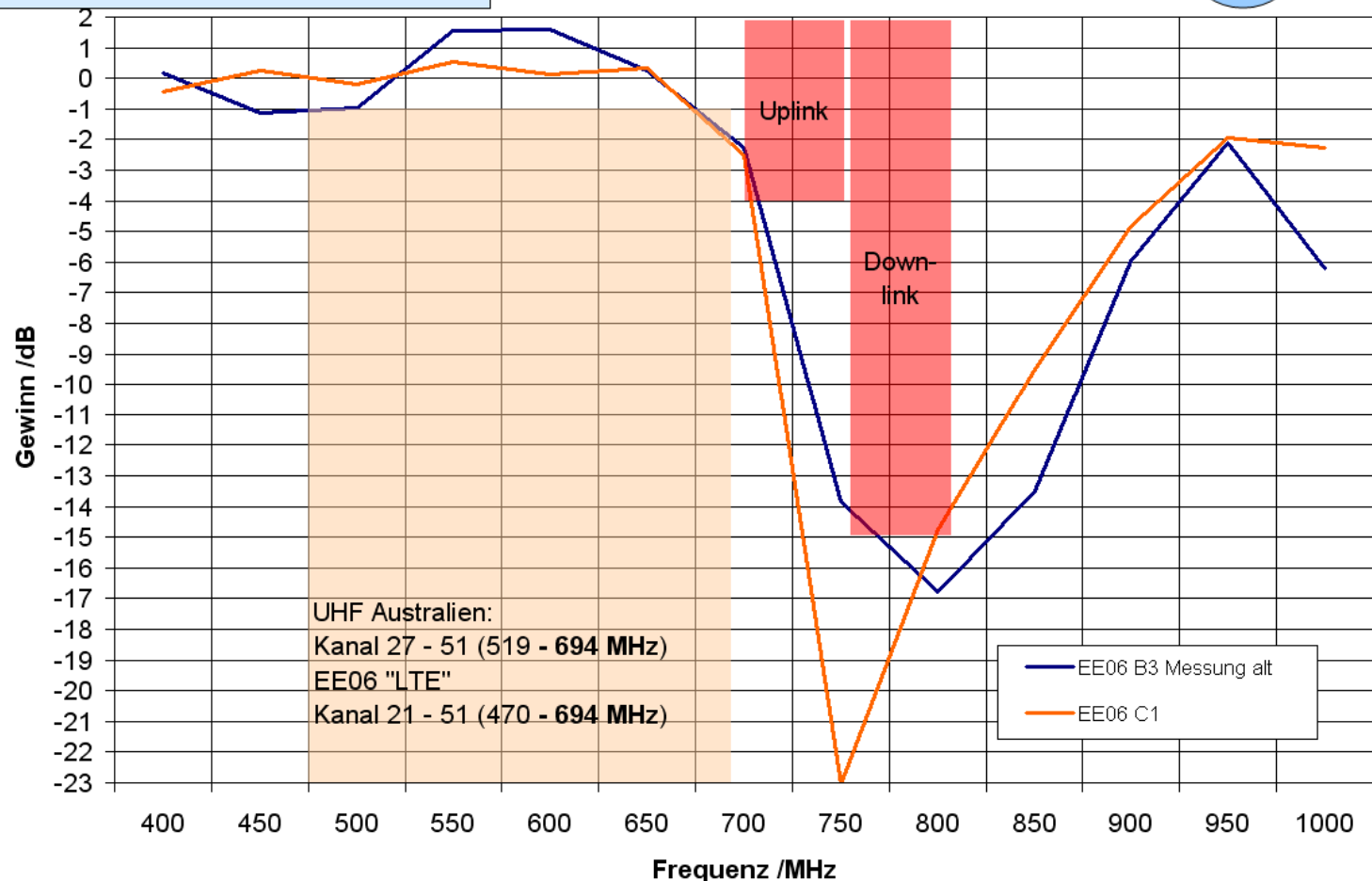
Technical Data

Gewinn weit

Parameter:
C1 - Stand (Serie) vs. B3-Stand (Referenz)

Gewinn UHF (400 - 1000MHz)
EE07 LTE

Kurven
einheitlich
färben



Projekt
EE07 LTE

Musterstände:
B3, C1

Messstrecke: 2D
Sendant.: FT01 UHF
Polarisation: horizontal
Elevation Sendant.: 0°
Referenzantenne:
EE06 Original
Position Referenz:
wie Testant.
Position Test-Antenne:
Stativ auf Fahrzeugdach

Bewertung:
Im Durchlaßbereich UHF
gleichwertig
(Zusatzdämpfung Filter
<1dB vs. Original)

Im Sperrbereich steilere
Flanke, höhere Dämpfung
bereits bei LTE Uplink
(Mobil Senden)

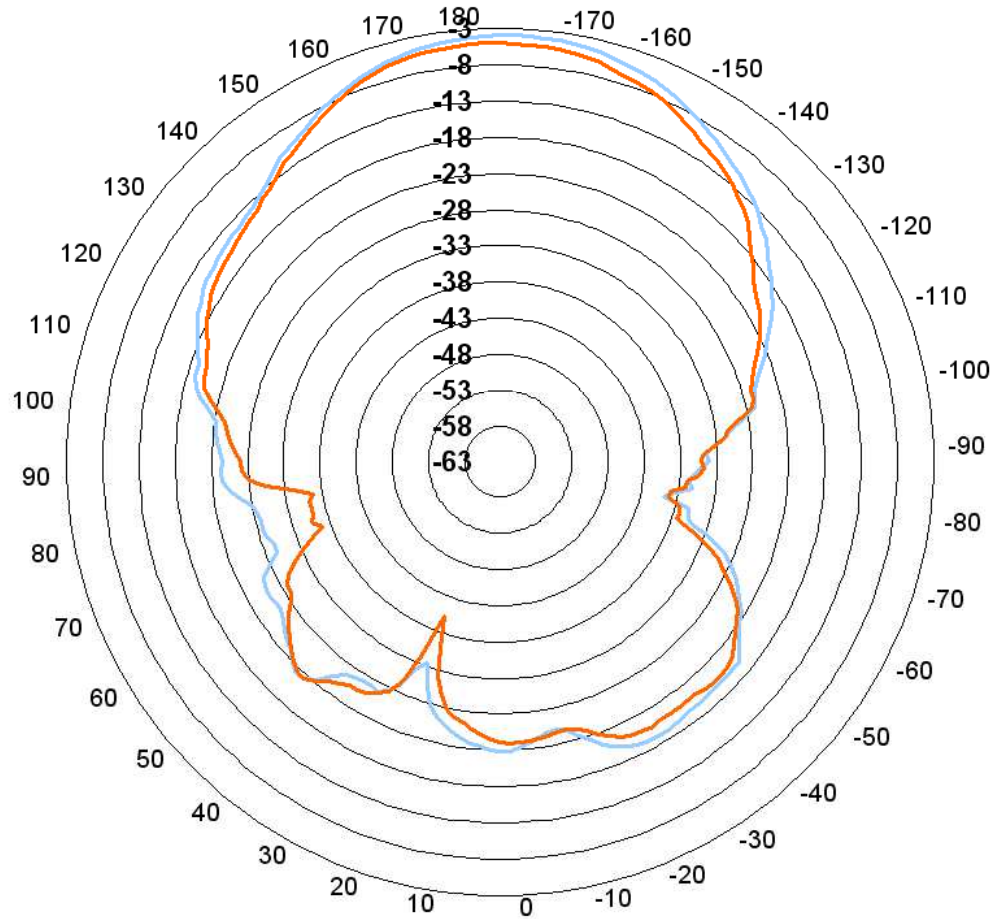
**Produktionsfreigabe
erteilt !**

Datum: 13.12.12
Durchführung: Suckrow

Technical Data

Richtdiagramme (Durchlassbereich UHF)

Richtdiagramm
EE07 horizontal (Durchlaßbereich UHF)



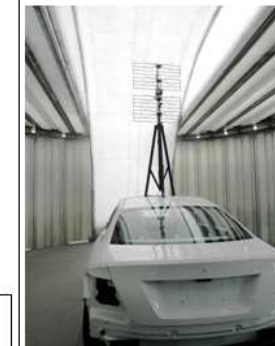
690 MHz

Projekt
EE07 Australia

Musterstände:
C-Stand (Serie)

Messstrecke: 2D
Sendeant.: FT01 UHF
Polarisation:
horizontal
Elevation Sendeant.:
0°

Referenzantenne:
EE06 Original
Position Referenz:
wie Testant.
Position Test-Antenne:
Stativ auf Fahrzeugdach



Datum: 13.12.12
Durchführung: Suckrow

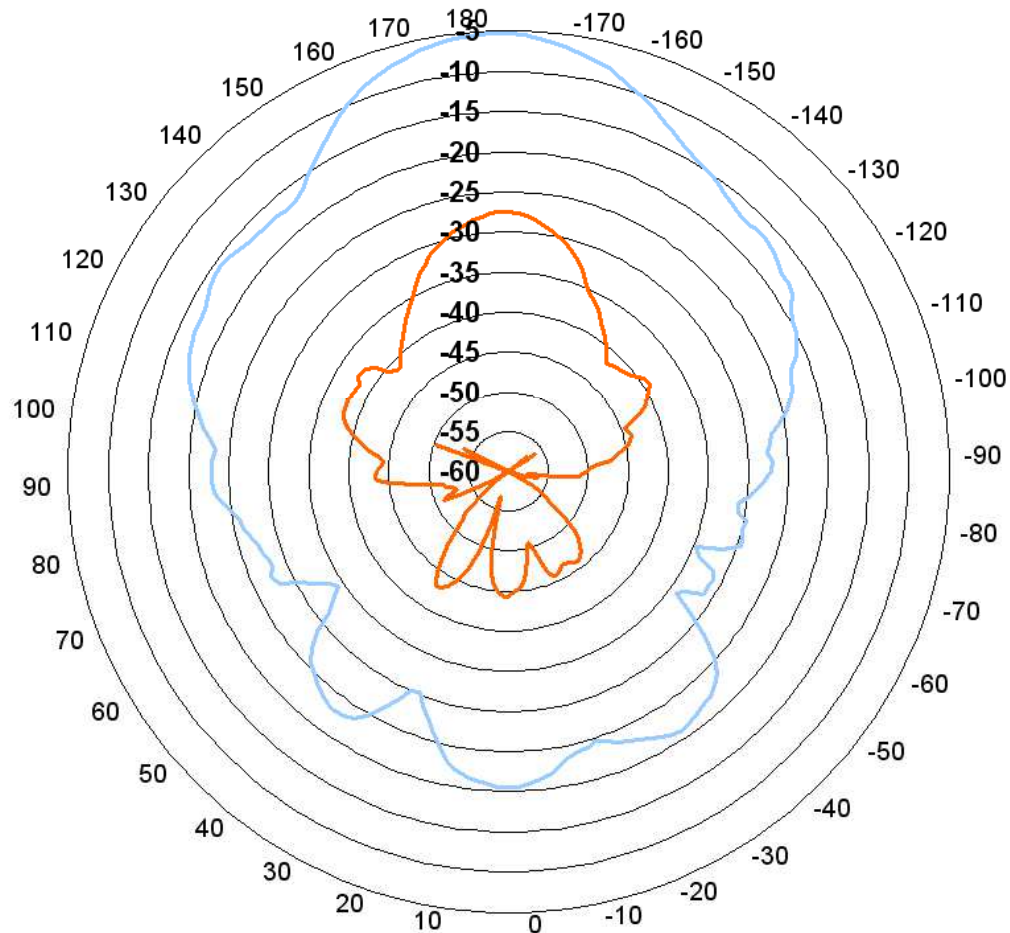


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Technical Data

Richtdiagramme (Sperrbereich LTE Tx)

Richtdiagramm
EE07 horizontal (Sperrbereich LTE Tx)



Projekt
EE07 Australia

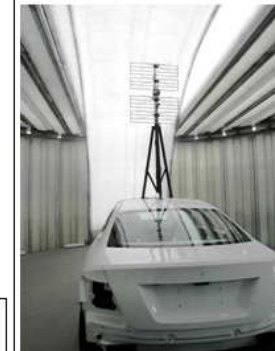
Musterstände:
C-Stand (Serie)

Messstrecke: 2D
Sendeant.: FT01 UHF
Polarisation:
horizontal
Elevation Sendeant.:
0°

Referenzantenne:
EE06 Original

Position Referenz:
wie Testant.

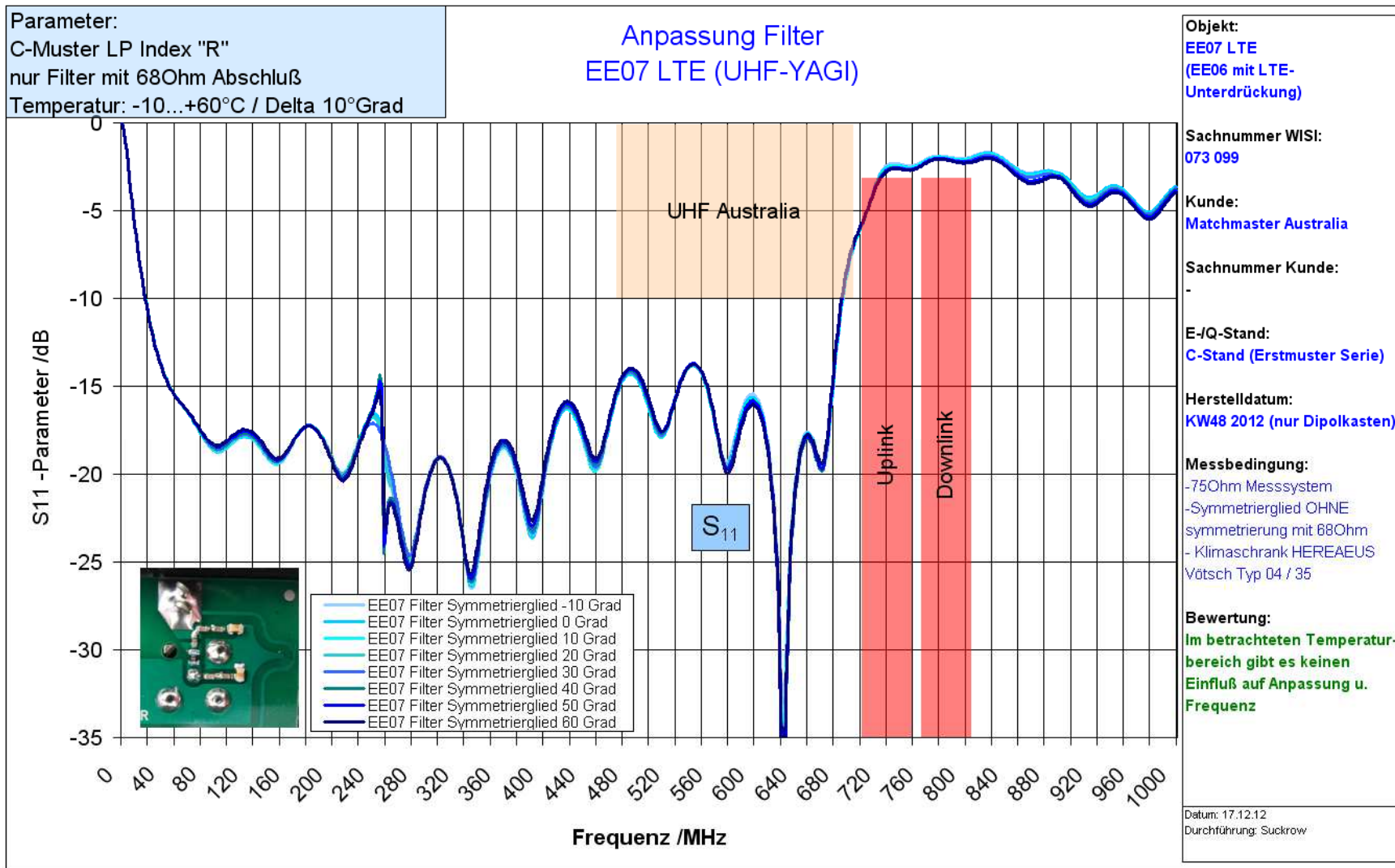
Position Test-Antenne:
Stativ auf Fahrzeugdach



Datum: 13.12.12
Durchführung: Suckrow

Technical Data

Temperaturtest „Anpassung Filter“





Technics

Final specification EE06 A

TV band UHF Australia:

470 – 694 MHz (channel 21 – 51)

insertion loss vs. original antenna: < 1dB

band stop characteristics LTE700:

Isolation 703 – 748 MHz (Uplink) : > 4 dB

Isolation 758 – 803 MHz (Downlink) : > 15 dB

All other electrical data exactly like original EE06



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Ende.....