TSG-RAN Working Group4 meeting #8 **TSGR4#8(99) 652**

Sophia Antipolis, 26. – 29. October 1999

Agenda Item:

Source: Infineon Technologies

Title: **Proposal for UE ACS test parameters change**

Document for: Discussion and approval

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1. Introduction

In this paper UE ACS test parameters are discussed, furthermore the crossmodulation measurement results are given together with a proposal for the new UE ACS test parameters.

2. Discussion

The current ACS' test parameters (from Doc TS 25.101 v2.3.0) are given in a table 14b.

Table 14b: Test parameters for Adjacent Channel Selectivity

Parameter	Unit	Level
$\frac{PCCPCH\_Ec}{I_{or}}$	dB	-0.46
$\frac{DPCH\_Ec}{I_{or}}$	dB	-10
$\hat{I}_{or}$	dBm/3.84 MHz	-93
I_{oac}	dBm/3.84 MHz	-52
F_{uw} (modulated)	MHz	+5 or -5

Remarks related to the present specification:

1. Interfering signal (I_{oac}) is specified as a modulated signal but the modulation type is missing (for example creast factor).
2. ACS test set up description gives an indication that UE transmitter is ON during the UE ACS measurement but the power of UE Tx is not specified.
3. BS ACLR1 is specified to be 45 dB. The RF power difference in UE ACS test case between interferer (-52 dBm) and wanted signal (-93 dBm) is 41 dB. This means that BS ACLR1 of 45 dB contributes to the noise increase in a wanted channel with an amount of 1.4 dB.

4. Suppose that in the UE ACS test the UE Tx has full power, than linearity of the UE receiver is determined by the crossmodulation effect (Appendix) what makes intermodulation test redundant.

3. Proposal

1. Specify modulation for the ACS test interferer (worst case creast factor of 12 dB).
2. Specify power of UE Tx for ACS test case (worst case max. UE Tx power).
3. Reduce I_{oac} , $\hat{I}_{or}$ difference from 41 to 35 dB, and related to this, change $\frac{DPCH\_Ec}{I_{or}}$ from –10 dB to –16 dB.

References

[1] TS 25.101 v2.3.0 “UE Radio Transmission and Reception (FDD)”

4. Appendix

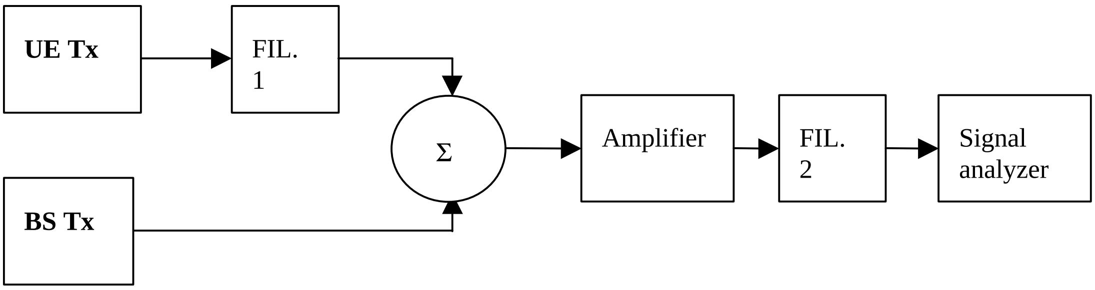

Fig. 1 Crossmodulation measurement set up

UE Tx (SMIQ 03) – QPSK WCDMA signal (creast factor 6 dB) with variable level

BS Tx (HP ESG-D) – multi channel (15 data + Perch) WCDMA (creast factor 10 dB)

FIL1 – filter for filtering UE Tx far off noise

FIL2 – filter for filtering UE Tx signal before Signal analyzer

Signal analyzer – FSIQ7

Amplifier – MITEQ AMF-30-001040-20-13P Gain=35.5 dB, IIP3=-8dBm

Difference of interferer power (UE Tx leakage) and amplifier’s IIP in [dB] Δ	7	8	9	10	11	12	13	14	15	16	17	18	**19**	20	21	22
ACLR of the adjacent channel interferer due to crossmodulation [dB]	17.2	18.6	20.3	21.9	24.4	27.0	30.1	33.3	36.4	39.4	41.8	44.1	**45.7**	47.6	49.3	50.8

Table 1

Table 1 shows relation between adjacent channel interferer’s ACLR versus distance between UE Tx leakage power and amplifier’s IIP3.

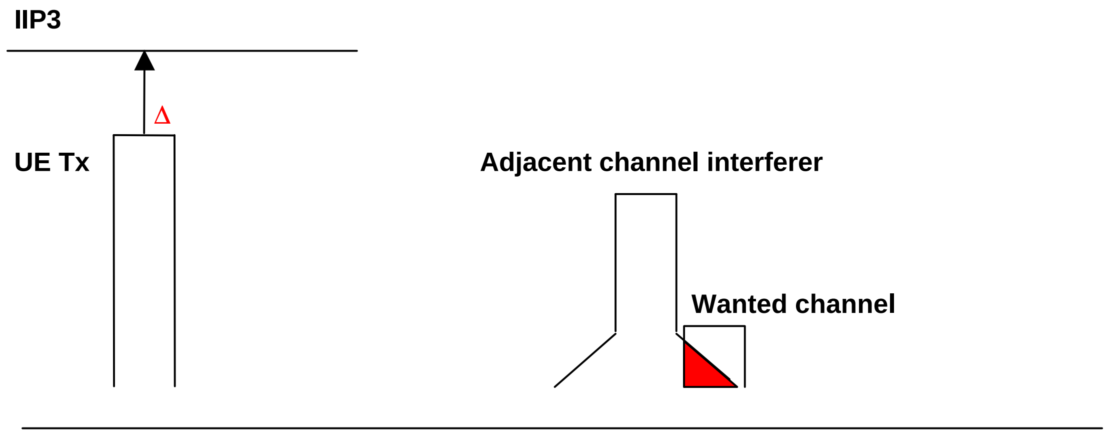

Fig 2. Constellation of signals after amplifier

Conclusion from measurements:

In order to keep distortion's products (due to crossmodulation) 45 dB below adjacent channel interfering level, it is required that amplifier's IIP3 is 19 dB above interferer's (UE Tx leakage) level.

Example: UE Tx leakage level of -27 dBm (+23 dBm –50 dB duplexer) leads to required IIP3 of –8 dBm (required IIP3 for intermodulation test is –16 dBm).

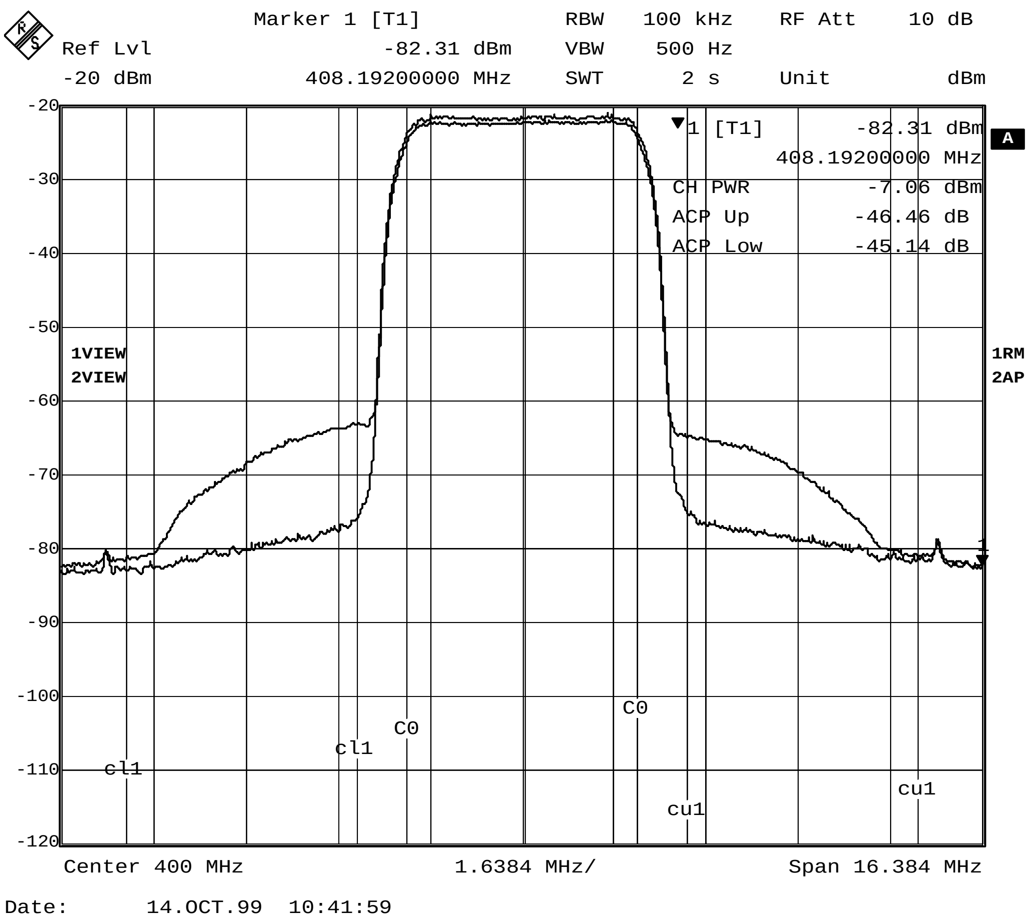

Figure 3

Fig. 3 shows crossmodulation effect in the case when interfering signal (UE Tx leakage) is 19 below amplifier's IIP3. The second curve shows linearity of measurement's set up (with UE Tx OFF).