
Agenda item:	AH24 : High Speed Downlink Packet Data Access
Source:	Motorola and Lucent Technologies
Title:	Text modifications for TR in section on UE complexity
Document for:	Inclusion in TR

1. INTRODUCTION

These modifications for section 7.4.2 in the Technical Report [1] are based on issues raised in [2] and subsequent offline discussions.

2. MODIFICATIONS

- A. **UE form factor.** Remove the following two sentences: *High data rate services will most likely target terminals with relatively large screens such as personal digital assistants (PDAs) or laptop computers. Hence these devices will have ample surface area to easily support up to 4 antennas.*
- B. **Antenna spacing.** Remove the following sentence: *Because the terminal receiver is at the same level as local scatterers, only $\frac{1}{2}$ wavelength antenna spacing is required to achieve uncorrelated fading [3].* Replace with the following two sentences: *Because the terminal receiver is at the same level as local scatterers, $\frac{1}{2}$ wavelength antenna spacing can generally achieve a fair amount of decorrelation of multipath signals, particularly in cases in which there is no direct path between receiver and transmitter (Rayleigh fading) ^[1]. However, the final correlation could be increased by factors such as the proximity to the human body and other objects.*
- C. **RF complexity.** Add the following paragraph at the end of section 7.4.2:

With regard to RF complexity, for a terminal with M antennas, where M in this case is assumed to be 2 or 4, one could simply replicate the conventional RF/IF chain M times and perform baseband combining. However, one may potentially lower the complexity by performing combining in RF or using a homodyne chip solution. In performing combining in RF, the UE cost can be reduced by using a single IF chain and by omitting baseband combiners. Using homodyne chip technology, the entire RF/IF chain is implemented in silicon, resulting in significantly reduced cost. The practicality w.r.t cost and complexity of the above mentioned technologies needs to be investigated.

3. REFERENCES

- [1] 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Physical Layer Aspects of UTRA High Speed Downlink Packet Access;

¹ Field measurements need to be performed to find out typical values of correlations.

(Release 2000), (3G Technical Report (TR) 25.848, version 0.2.1), Tdoc R1-00-1480, TSG-RAN WG1; January 15th-18th, 2001, Boston, USA.

[2] Motorola. Comments on MIMO complexity text in technical report. TSG_R WG1 document TSGR1#18(01)0109, 15-18th, January 2001, Boston, USA.