

RT305X DC FILTER APPLICATION NOTE

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1 INTRODUCTION

This application note describes how to enable the DC filter, and its benefits.

1 SCOPE

This application note (AN) focuses on the DC filter issue. All issues other than the DC filter are not addressed in this AN.

2 DESCRIPTION

The DC filter is disabled by default in SDK 3.2's wireless LAN driver. Enabling the DC filter means enabling both the DC offset filter and the DC offset calibration (update) mode.

By measuring the RF signal's DC offset value, the DC filter is designed to filter the undesired DC offset from the receiving signal. As a result of this filtering nature, the DC offset will be used on calibration. By enabling the DC filter function, receiving sensitivity is improved and a better yield rate can be obtained.

2.1 SDK3.2 wireless lan Driver

SDK 3.2 must be modified to enable the DC filter for RT3052. Please follow the instructions below to enable the DC filter feature.

FILE: source/linux-2.6.21.x/drivers/net/wireless/rt2860v2/common

```
REG_PAIR BBPRegTable[] = {  
.....  
#ifdef CONFIG_RALINK_RT3052  
    {BBP_R103, 0xC0},  
#else  
    {BBP_R103, 0x00},  
#endif  
.....  
}
```

3 ANALYSIS

A comparison of the receiving sensitivity before and after enabling the DC Filter is presented in Table 1. RX sensitivity at CCK 1-Mbps data rate has improved by 2 ~ 3 dB. This 2 ~ 3 dB improvement gives users an advantage in MFG yield rate control.

Card #	RX Sensitivity (dBm)							
	DC Filter Disabled				DC Filter Enabled			
	CCK (1M) CH1		CCK (1M) CH14		CCK (1M) CH1		CCK (1M) CH14	
	RX0	RX1	RX0	RX1	RX0	RX1	RX0	RX1
1	-92.0	-96.0	-93.0	-95.0	-95.0	-95.0	-95.0	-95.0
2	-93.0	-92.0	-93.0	-91.0	-94.0	-95.0	-94.0	-94.0
3	-94.0	-91.0	-94.0	-90.0	-95.0	-94.0	-95.0	-94.0
4	-93.0	-91.0	-93.0	-92.0	-96.0	-94.0	-96.0	-94.0
5	-94.0	-93.0	-94.0	-92.0	-96.0	-95.0	-95.0	-94.0
6	-93.0	-94.0	-92.0	-93.0	-95.0	-96.0	-95.0	-95.0

Table 1. RX Sensitivity Comparison

4 CONCLUSION

Enabling the DC filter improves receiving sensitivity and provides a better yield rate. No side effects have been found so far. We strongly recommended enabling the DC filter feature, for the benefits explained in this document.