

# **EC200x&EC600S&EG912Y Series**

## **Power Back-off Application Note**

**LTE Standard Module Series**

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# About the Document

## Revision History

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# 1 Introduction

This document mainly introduces how to implement the frequency band power back-off function of EC200x series, EC600S-CN and EG912Y series modules under the corresponding GSM/WCDMA/LTE networks through AT commands.

This document is applicable for the following Quectel modules:

- EC200T Series
- EC200S Series
- EC600S-CN
- EG912Y Series

## 2 Power Back-off AT Commands

### 2.1. AT Command Syntax

#### 2.1.1. Definitions

- **<CR>** Carriage return character.
- **<LF>** Line feed character.
- **<...>** Parameter name. Angle brackets do not appear on command line.
- **[...]** Optional parameter of a command or an optional part of TA information response. Square brackets do not appear on command line. When an optional parameter is omitted, the new value equals its previous value or its default setting, unless otherwise specified.
- **Underline** Default setting of a parameter.

#### 2.1.2. AT Command Syntax

The **AT** or **at** prefix must be added at the beginning of each command line. Entering **<CR>** will terminate a command line. Commands are usually followed by a response that includes **<CR><LF><response><CR><LF>**. Throughout this document, only the response **<response>** will be presented, **<CR><LF>** are omitted intentionally.

Table 1: Type of AT Commands and Responses

Test Command	AT+<cmd>=?	This command returns the list of parameters and value ranges set by the corresponding Write Command or internal processes.
Read Command	AT+<cmd>?	This command returns the currently set value of the parameter or parameters.
Write Command	AT+<cmd>=<p1> [,<p2>[,<p3>[...]]]	This command sets the user-definable parameter values.
Execution Command	AT+<cmd>	This command reads non-variable parameters affected by internal processes in the module.

## 2.2. Usage for Power Back-off AT Commands

**Step1:** Set the frequency band and the corresponding power back-off value under GSM/WCDMA/LTE network through AT command **AT+QPWRBACKOFF=<band>,<power\_value>**.

**Step2:** Reboot the module to make the power back-off function take effect. For example, set **AT+QPWRBACKOFF="GSM900",4** and then reboot the module, the power of band EGSM900 will be backed off by 4 dBm.

**Step3:** **AT+QGRIP=<mode>** enables/disables power back-off function. During debugging, if you need to disable power back-off function in real time, execute **AT+QGRIP=0**, and then the band power will restore the original value. **AT+QGRIP=1** can enable the power back-off function, and the power back-off value will restore the value set before disablement. **AT+QGRIP?** can be used to check whether the power back-off function takes effect. If the query result is 1, the power back-off takes effect, and 0 is not.

### NOTE

The value set by **AT+QGRIP** will not be saved, so the power back-off function will still take effect after rebooting the module (namely, the result queried by **AT+QGRIP?** is always 1 after rebooting the module).

## 2.3. Description of Power Back-off AT Commands

### 2.3.1. AT+QPWRBACKOFF Configure Power Back-off Value for Band under GSM/WCDMA/LTE

AT+QPWRBACKOFF Configure Power Back-off Value for Band under GSM/WCDMA/LTE	
Test Command <b>AT+QPWRBACKOFF=?</b>	Response <b>+QPWRBACKOFF: &lt;band&gt;,(range of supported &lt;power_value&gt;s)</b>  <b>OK</b> Or <b>ERROR</b>  If the error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b>
Write Command <b>AT+QPWRBACKOFF=&lt;band&gt;[,&lt;power_value&gt;]</b>	Response If the optional parameter is omitted, query the current setting: <b>+QPWRBACKOFF: &lt;band&gt;,&lt;power_value&gt;</b>



	<p><b>OK</b></p> <p>If the optional parameter is specified, configure power back-off value for band under GSM/WCDMA/LTE:</p> <p><b>OK</b></p> <p>Or</p> <p><b>ERROR</b></p> <p>If the error is related to ME functionality:</p> <p><b>+CME ERROR: &lt;err&gt;</b></p>
Characteristics	<p>The command takes effect after rebooting;</p> <p>The configurations will be saved automatically.</p>

## Parameter

<b>&lt;band&gt;</b>	<p>String type. The frequency bands supported under GSM/WCDMA/LTE network are as follows:</p> <p><b>GSM:</b></p> <p>"GSM850"</p> <p>"GSM900"</p> <p>"GSM1800"</p> <p>"GSM1900"</p> <p><b>WCDMA:</b></p> <p>"WB1"</p> <p>"WB2"</p> <p>"WB4"</p> <p>"WB5"</p> <p>"WB8"</p> <p><b>LTE:</b></p> <p>"LTE1"–"LTE44"</p>
<b>&lt;power_value&gt;</b>	<p>Integer type. Power back-off value. Range: 1–20. Unit: dBm.</p>

## Example

<b>AT+QPWRBACKOFF="GSM900",4</b>	//Set power back-off value as 4 dBm of band EGSM900.
<b>OK</b>	
<b>AT+QPWRBACKOFF="WB1",2</b>	//Set power back-off value as 2 dBm of WCDMA band 1.
<b>OK</b>	
<b>AT+QPWRBACKOFF="LTE2",3</b>	//Set power back-off value as 3 dBm of LTE band 2.
<b>OK</b>	
<b>AT+QPWRBACKOFF="GSM900"</b>	//Query power back-off value of band EGSM900.
<b>+QPWRBACKOFF: GSM900,4</b>	

```

OK
AT+QPWRBACKOFF="WB1"           //Query power back-off value of WCDMA band 1.
+QPWRBACKOFF: WB1,2

OK
AT+QPWRBACKOFF="LTE2"          //Query power back-off value of LTE band 2.
+QPWRBACKOFF: LTE2,3

OK

```

### 2.3.2. AT+QGRIP Enable/Disable Power Back-off Function

AT+QGRIP Enable/Disable Power Back-off Function	
Test Command <b>AT+QGRIP=?</b>	<p>Response</p> <p><b>+QGRIP:</b> (list of supported &lt;mode&gt;s)</p> <p><b>OK</b> Or <b>ERROR</b></p> <p>If the error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b></p>
Read Command <b>AT+QGRIP?</b>	<p>Response</p> <p><b>+QGRIP:</b> &lt;mode&gt;</p> <p><b>OK</b> Or <b>ERROR</b></p> <p>If the error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b></p>
Write Command <b>AT+QGRIP=&lt;mode&gt;</b>	<p>Response</p> <p><b>OK</b> Or <b>ERROR</b></p> <p>If the error is related to ME functionality: <b>+CME ERROR: &lt;err&gt;</b></p>
Characteristics	<p>The command takes effect immediately; The configuration will not be saved.</p>

## Parameter

---

<b>&lt;mode&gt;</b>	Integer type. Enable/disable power back-off function.
0	Disable
1	Enable

---

## Example

```
AT+QGRIP=1 //Enable power back-off function. The band power will be backed off
              according to the previously set value after OK is responded.
OK
AT+QGRIP? //Query the power back-off enabling/disabling status.
+QGRIP: 1
OK
AT+QGRIP=0 //Disable power back-off function. The corresponding frequency
              band power will restore the value before back-off after OK is
              responded.
OK
```

## 3 Appendix A Reference

Table 2: Terms and Abbreviations

Abbreviation	Description
EGSM	Enhanced Global System for Mobile Communications
GSM	Global System for Mobile Communications
LTE	Long Term Evolution
WCDMA	Wideband Code Division Multiple Access