

POWER SUPPLY

The power supply for the Bluetooth module should be chosen carefully. Bad power supply can reduce the performance, or in worst case even cause irreversibly damage to the module. Please use the recommended voltage regulator or similar for best performance. It is also essential to use a proper reset circuit to the module for correct operation.

VOLTAGE REGULATOR

The modules have either one or two power supplies; +VCC and +VCC_PA for modules with long-range capabilities. The table below shows the power supply for the different modules.

Model	+VCC	+VCC and +VCC_PA
F2M03C1		X
F2M03C2	X	
F2M03AC2	X	
F2M03GLA	X	
F2M03GX / GXA		X
F2M03MLA	X	

Table of the power supply for the different modules.

The most critical power supply is +VCC, which is powering the analog and digital circuitry of the module. The voltage supplied should have low noise, less than 10mV rms between 0 and 10MHz. The transient response of the regulator is also important, as the start of a Bluetooth packet will cause the power consumption jump to high levels. It is essential that the power rail recover quickly hence the regulator should have a response time of 20µs or less. Place a ceramic decoupling capacitor of ~4u7 with low ESR as close as possible to the feeding pin for each supply. One recommended voltage regulator for the +VCC supply is XC6209B332MR from Torex Semiconductor.

+VCC_PA can be supplied with either the above voltage regulator or you can use a more powerful regulator capable of supplying both +VCC and +VCC_PA from the same source. One regulator that can be used is TPS73633DBVTG4 from Texas Instrument.

RESET

The module can either have an *active low reset* or *active high reset* depending on the model as shown in the table below.

Model	Active low reset (/RESET)	Active high reset (RESET)
F2M03C1		X
F2M03C2		X
F2M03AC2	X	
F2M03GLA	X	
F2M03GX / GXA	X	
F2M03MLA	X	

Table of the reset option for the different modules

It is **highly** recommended to connect a dedicated reset monitoring IC to the module to ensure proper operation. The lack of a proper reset monitoring IC can cause the module to irreversibly drop the persistent configurations in the flash memory. The problem occurs when the power drops below the critical voltage of 2.9V, possibly caused by transients at the power supply which in turn might change the flash unintentionally. The reset monitoring IC will reset the module quickly if the voltage drops below a given threshold and by that protecting the module from irreversibly damage.

The reset monitoring IC should always be used when having a battery powered application or/and where high noise on the power supply is present.

Note: The use of a reset monitoring IC is the only way to quickly detect voltage drop at the power supply of the module. Please use the table below for recommended reset monitoring ICs.

Monitoring IC	Active low reset (/RESET)	Active high reset (RESET)
MAX812S		X
MAX811S	X	
TC1270S	X	
TCM811S	X	
DS1818	X	
DS1817		X

Table of recommended reset circuits.

It is NOT recommended but possible to skip the reset monitoring IC in application where the power supply is free from high transients and very stable. Two solutions are presented below but Free2move ONLY recommend customers to use a reset monitoring IC!

>> Control the reset of the module using an I/O from a microcontroller. Special considerations must be taken when using an I/O from a microcontroller; a pull-down/up* resistor (1.8kΩ) should be placed on the I/O-line. It is recommended that RESET is applied for a period greater than 5ms.

>> The simplest reset circuit is to connect the module's reset pin directly to GND (for modules with *active high reset*) or to +VCC (for modules with *active low reset*).

During reset, the digital I/O pins are set to inputs for bi-directional pins and outputs are tristated. The PIOs have weak pull-downs. Please look at the datasheet for each module for more information about design considerations and application schematics.

*Pull-down is used for modules with *active low reset* and a pull-up is used for modules with *active high reset*.