



M12

Quectel Cellular Engine

**Hardware Upgrade
Specification**



M12, built on MTK new platform, (hereinafter to be referred as M12 R2.0) is launched officially. Adopted the latest platform MT6252, M12 R2.0 inherits all of the functionality of MT6223D chipset and has higher main frequency, more powerful interfaces and functionality. Compatible with M12 R1.0 in hardware, M12 R2.0 also has a great improvement in performance. M12 R2.0 can totally replace M12 R1.0.

1. Compatibility between M12 R2.0 and R1.0

- Size
- Pins and electrical characteristics
- Hardware interface
- Software functionality
- Reference design for customer

2. Comparison of hardware performance

Compared with M12 R1.0, M12 R2.0 provides enhanced hardware performance, especially RF receiving sensitivity and current consumption, which can help customers improve the performance of their products.

2.1. Comparison of supply voltage range

	M12 R2.0	M12 R1.0
Supply voltage range	3.3~4.6V	3.4~4.5V

2.2. Comparison of RF receiving sensitivity

Frequency	RF receiving sensitivity	
	M12 R2.0	M12 R1.0
EGSM900	< -108.5dBm	< -107dBm
DCS1800	< -108.5dBm	< -107dBm

2.3. Comparison of current consumption

Sleep mode and Mini-function mode			
Mode		M12 R2.0	M12 R1.0
Power down		29uA	65uA
Sleep mode	DRX=5	1.1mA	1.1mA
AT+CFUN=0	Idle mode	12.8mA	12mA
	Sleep mode	0.84mA	0.9mA
AT+CFUN=4	Sleep mode	0.83mA	1mA
Peak current	GSM900 Maximum power	Max 1.6A	Max 1.8A

Voice call			
Frequency	Power Level	M12 R2.0	M12 R1.0
GSM900	@power level #5	220mA	260mA
DCS1800	@power level #0	197mA	230mA

2.4. Comparison of ESD endurance (Temperature:25°C, Humidity:45%)

Tested point	M12 R2.0 (Air discharge)	M12 R1.0 (Air discharge)
VBAT,GND	±12KV	±10KV
PWRKEY	+8KV/-6V	+8KV/-6V
SIM Card	+8KV/-6V	+8KV/-6V
Antenna	±10KV	±10KV
SPK1P,SPK2P/2N MIC1P/1N,MIC2P/2N	+8KV/-6V	+8KV/-6V

3. Difference between M12 R2.0 and R1.0

3.1. Label

Customers can distinguish M12 R2.0 from M12 R1.0 based on the module's label. The difference in detail is given below:

M12 R2.0	M12 R1.0
<p>Customer purchase order code of M12 R2.0 M12E-04-NCH-STD</p> 	<p>Customer purchase order code of M12 R1.0 M12-04-NCH-STD</p> 
<p>Notes:</p> <ol style="list-style-type: none"> M12 R2.0 adopts 2-D code label, M12 R1.0 adopts barcode label. Depending on the different customer purchase order code, customer also can distinguish M12 R2.0 from R1.0. 	

3.2. Version

ITEM	M12 R2.0	M12 R1.0
Document version	V3.0 and later versions	Earlier versions than V3.0

3.3. Customer purchase order code

ITEM	M12 R2.0	M12 R1.0
Customer purchase order code	M12E-04-NCH-STD	M12-04-NCH-STD

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