EGIGATEK eGM-A19 Brief

（*CSR8811 based Bluetooth 4.0 Dual Mode BR/EDR/LE UART HCI Module*）

1. DESCRIPTION

Dual mode means it supports classic Bluetooth basic rate (BR) and enhanced data rate (EDR) operations as well as the new low energy (LE) standard.

eGM-A19 is CSR single-chip radio and baseband IC solution for Bluetooth 2.4GHz systems including EDR to 3Mbits/s and Bluetooth low energy. BLE allows mobile devices to exchange simple data sets with very low consumption. Example use cases include watches, medical sensors and fitness trainers that can operate for many years from a small coin cell battery.
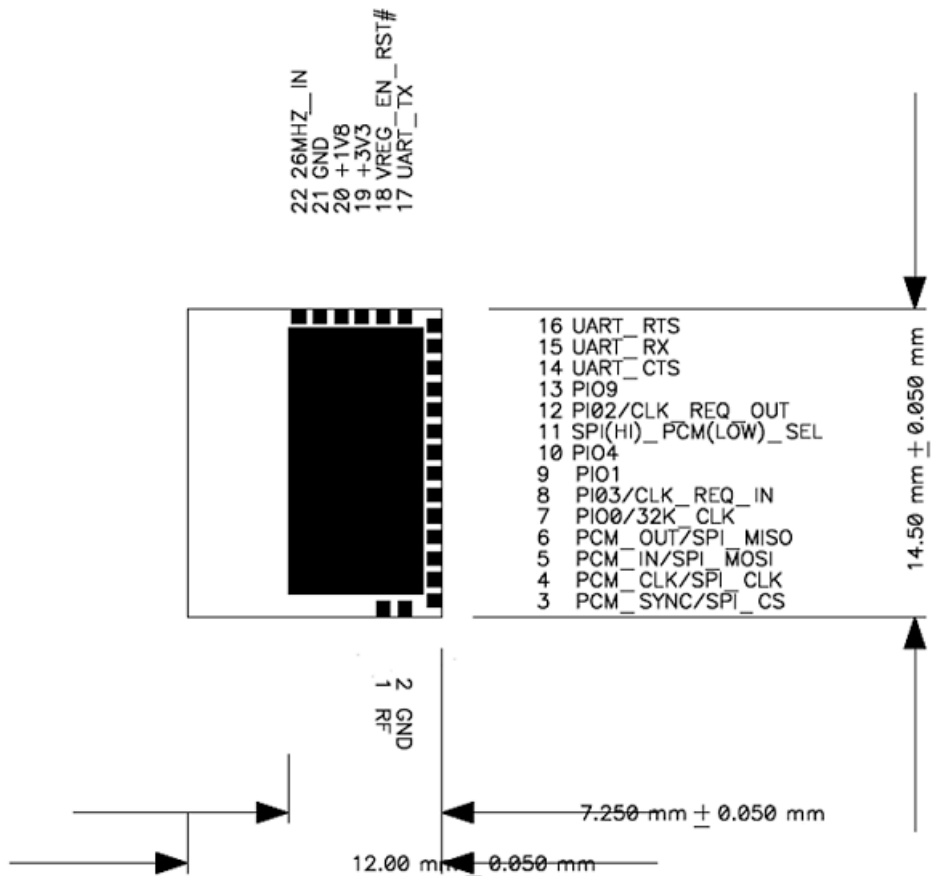
2. FEATURES

■ Bluetooth Low Energy available with CSR8811WLCSP
■ Bluetooth v4.0 specification
■ Dual-mode Bluetooth®/Bluetooth low energy radio
■ Can form part of Bluetooth v4.0 + HS system
■ Class 1 or Class 2 Bluetooth power levels
■ High-sensitivity Bluetooth and Bluetooth low energy receiver
■ Full-speed Bluetooth operation with full piconet and scatternet support
■ On-chip balun and minimal BOM
■ Low-power selectable 1.2 to 3.6V I/O
■ Integrated I/O and core regulators
■ High-speed UART port (up to 4Mbps)
■ Two PCM/I2S digital audio interfaces
■ Support for IEEE 802.11 coexistence
■ Dimensions: 14.5mm x 7.25mm x 2.0mm(eGM-A19A, without antenna)
　　　　　　　14.5mm x 12mm x 2.0mm(eGM-A19B, with printed antenna)
■ Storage temperature range: -40ºC ~ +85ºC
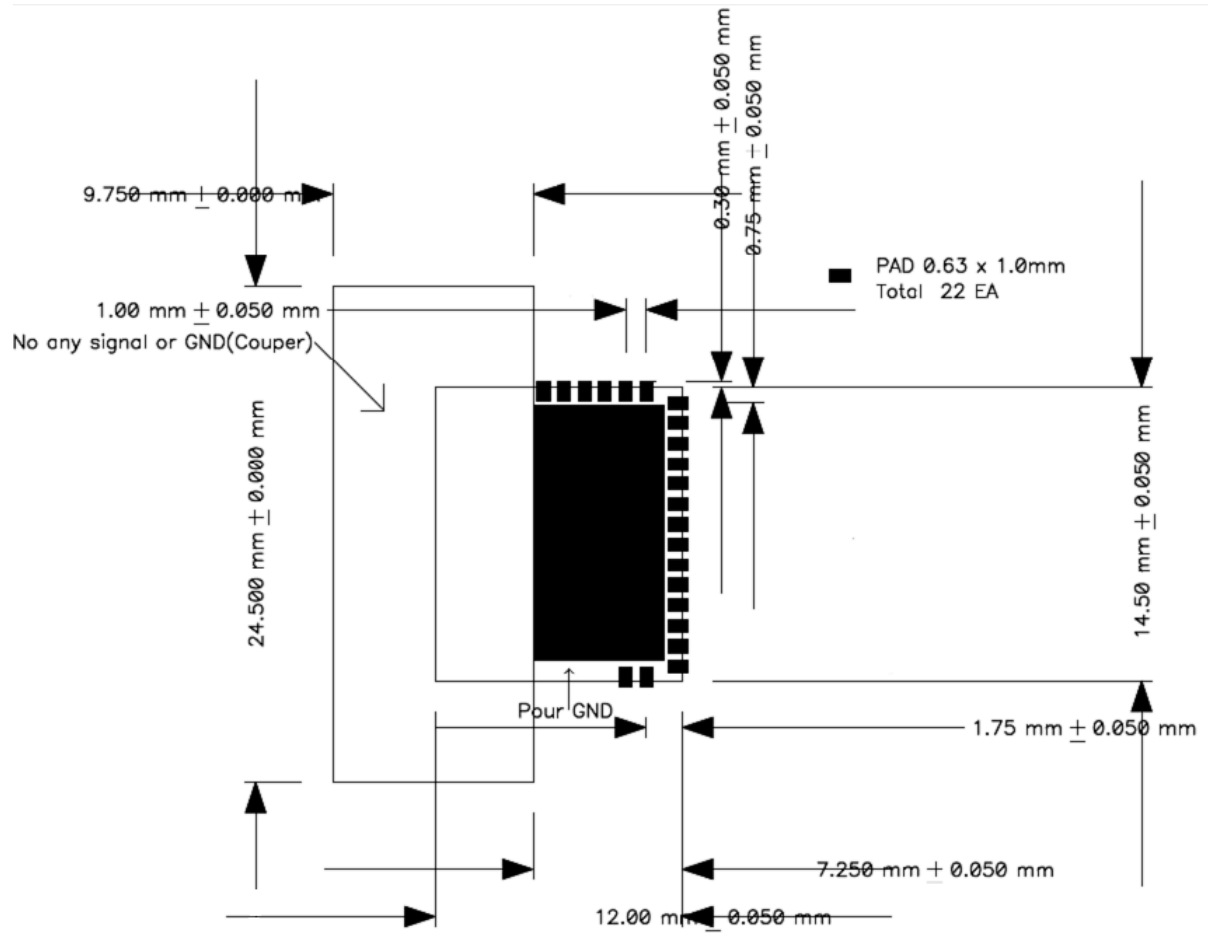■ Operating temperature range: -30ºC ~ +85ºC

3. Applications

■ Low-cost phones
■ Feature phones
■ Smart phones

- The high-power Class 1 Bluetooth transmitter removes the requirement for external amplification.
- The balun is integrated, which results in a single ended 50Ω port that does not require additional matching components.
- Integrated LDOs, with minimum decoupling components, allow the chip to be operated directly from the battery or a regulated supply.
- To improve the performance of both Bluetooth and IEEE 802.11b/g/n co-located systems a wide range of coexistence features are supported.

4. Dimensions (in mm)

5. Land Pattern

9.750 mm ± 0.000 mm

0.30 mm ± 0.050 mm

0.75 mm ± 0.050 mm

PAD 0.63 x 1.0mm
Total 22 EA

1.00 mm ± 0.050 mm

No any signal or GND(Couper)

24.500 mm ± 0.000 mm

14.50 mm ± 0.050 mm

Pour GND

1.75 mm ± 0.050 mm

7.250 mm ± 0.050 mm

12.00 mm ± 0.050 mm

4. COMPARISON WITH CLASSIC BLUETOOTH

Feature	BR/EDR	LE	Notes
RF Channels	79	40	2 MHz spacing in LE
Modulation	GFSK	GFSK	Simple and effective
Modulation Index	0.25~0.35	0.45~0.55	Wider signal –more robust
Max Tx Power	+20dBm(class 1) +4dBm(class 2)	+10dBm	No "class" structure +10 dBm regulatory limit
Rx Sensitivity(typical)	-85dBm	-85dBm	Pathloss = 90 dB for BR Pathloss = 95 dB for LE
LERange (typical)	30 meters	50 meters	Modulation Index, increased power for class 2
Packet Format	6 (BR / EDR)	2 (LE)	ID, FHS, DM, DH, 2-DH, 3-DH -Advertising / Data
Ack Packet Len	126 μs	80 μs	63% shorter
8 octet Packet	214 μs	144 μs	67% shorter
Max Packet Size	2875 μs = 1021 octets	328 μs = 27 octets	LE very short
Max Data Rate	2178.1 kb/s	305 kb/s	EDR much faster
Time to transfer 1Mbyte	DH1 = 18.2 s, DH5 = 8.8 s, 3-DH5 = 2.9 s	13.9 s (LE)	LE less efficient for large packets
CRC Strength	16	24	LE stronger
Encryption	Safer+	AES-128	LE stronger