



BP30

Hardware Platform

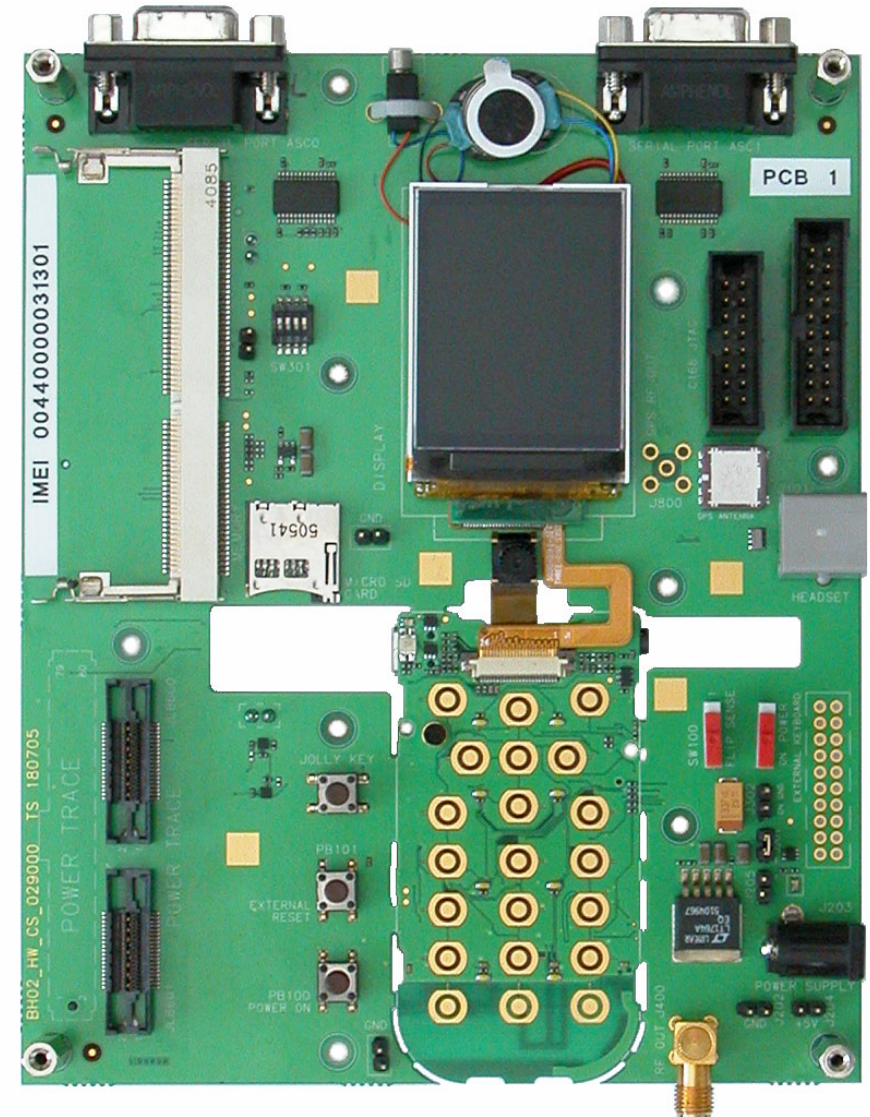
12 October 2005

BP30 Hardware Platform

GSM/GPRS Basic Platform

based on EGOLDradio Baseband Processor and RF Transceiver

- Hardware environment for software development
 - Evaluation of the functionalities and quick customization of the system
 - Infineon chipset provide the full modem functionality
 - Equipped with many standard and optional mobile phone peripherals
- dual display, bluetooth radio interface, FM radio receiver, stereo MP3 decoder, stereo audio DAC with integrated headphone amplifier, quality speaker, voice memo, microSD card connector, IrDA interface, PTT key, vibrator, embedded A-GPS subsystem, camera module
- External interfaces provided for debug and development



BP30 Hardware Platform

GSM/GPRS Basic Platform

Infineon chipset key componets:

■ E-GOLDradio PMB7870

GSM/GPRS **Single Chip** Solution integrates Baseband System and GSM850/E-GSM/DCS/PCS Quad-Band RF Transceiver for voice and data applications

■ PASi-G PMB6293

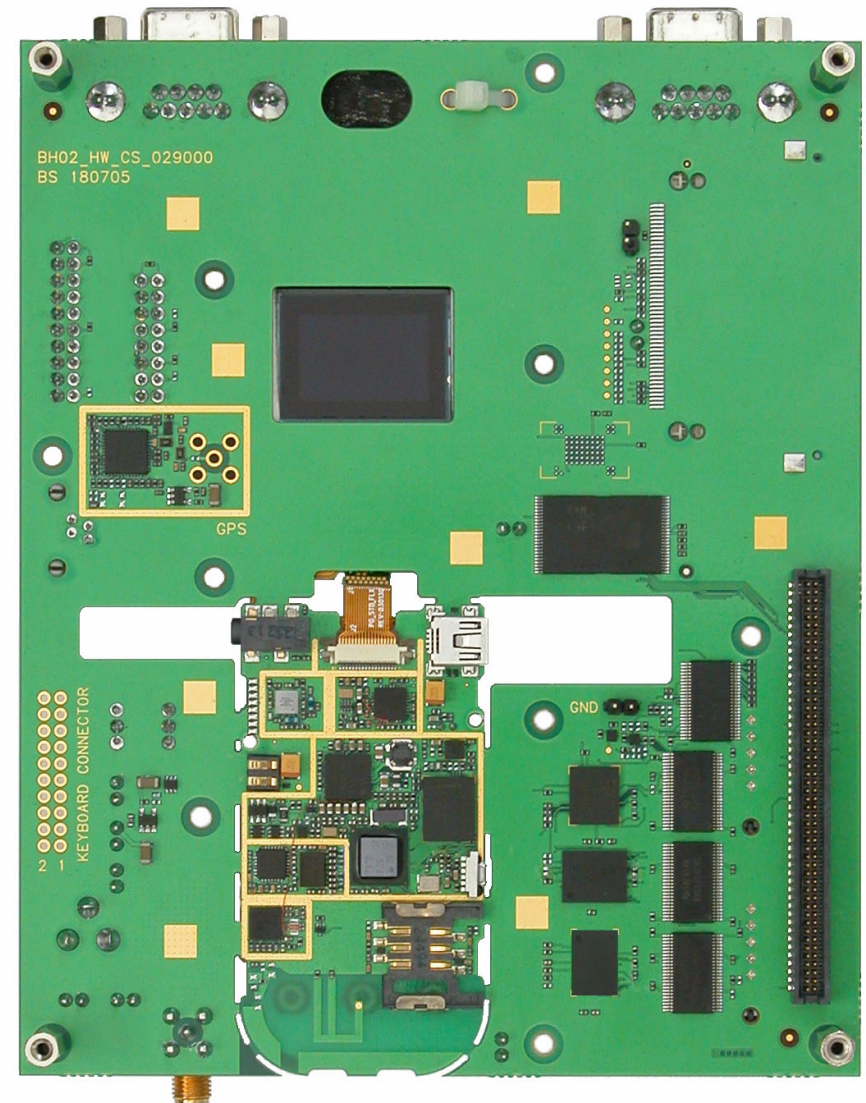
Quad-Band GSM850/E-GSM/DCS/PCS **Power Amplifier** Module based on 0.13μm CMOS technology, with integrated power controller

■ E-POWERlite PMB6814

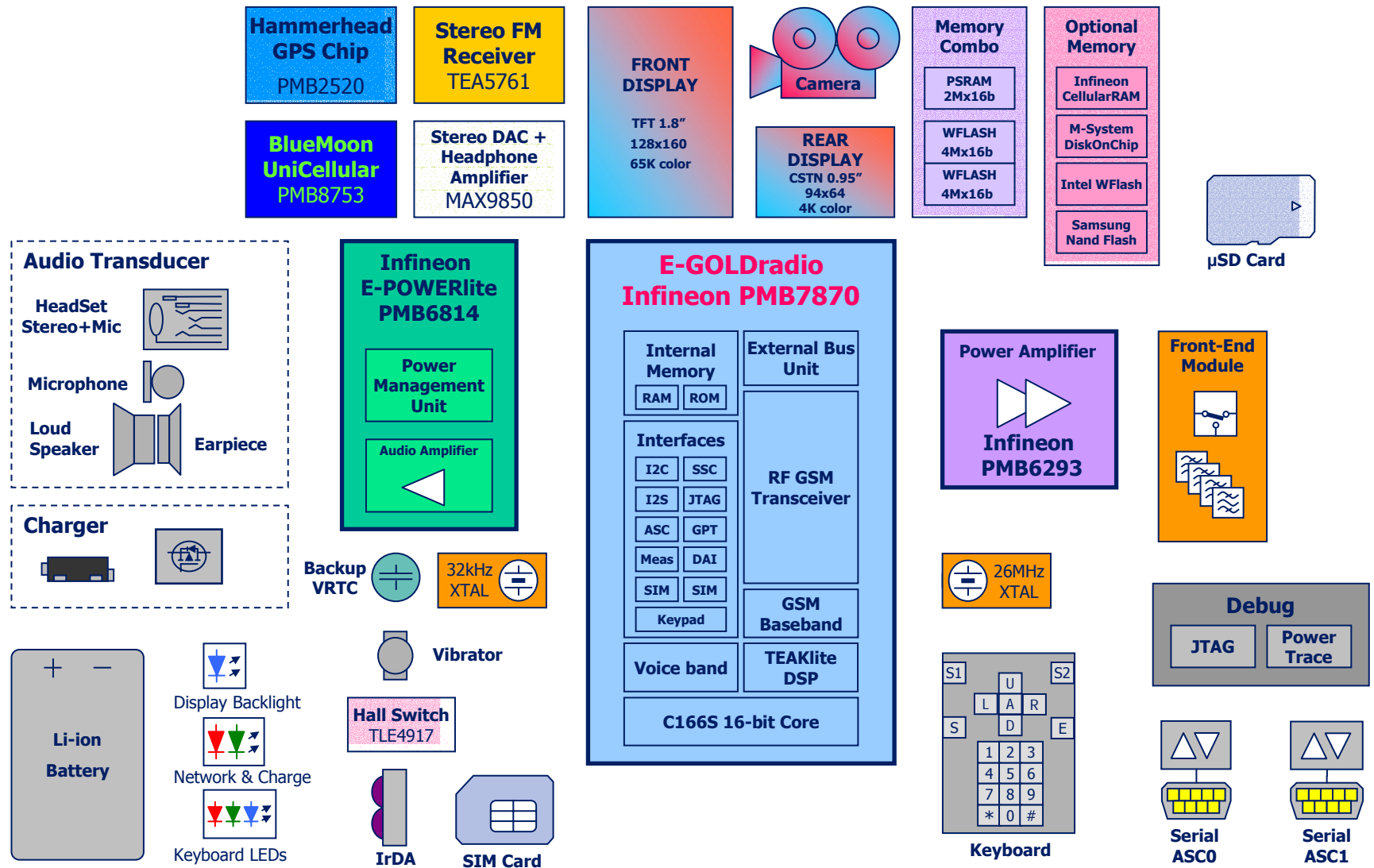
Power Management Unit

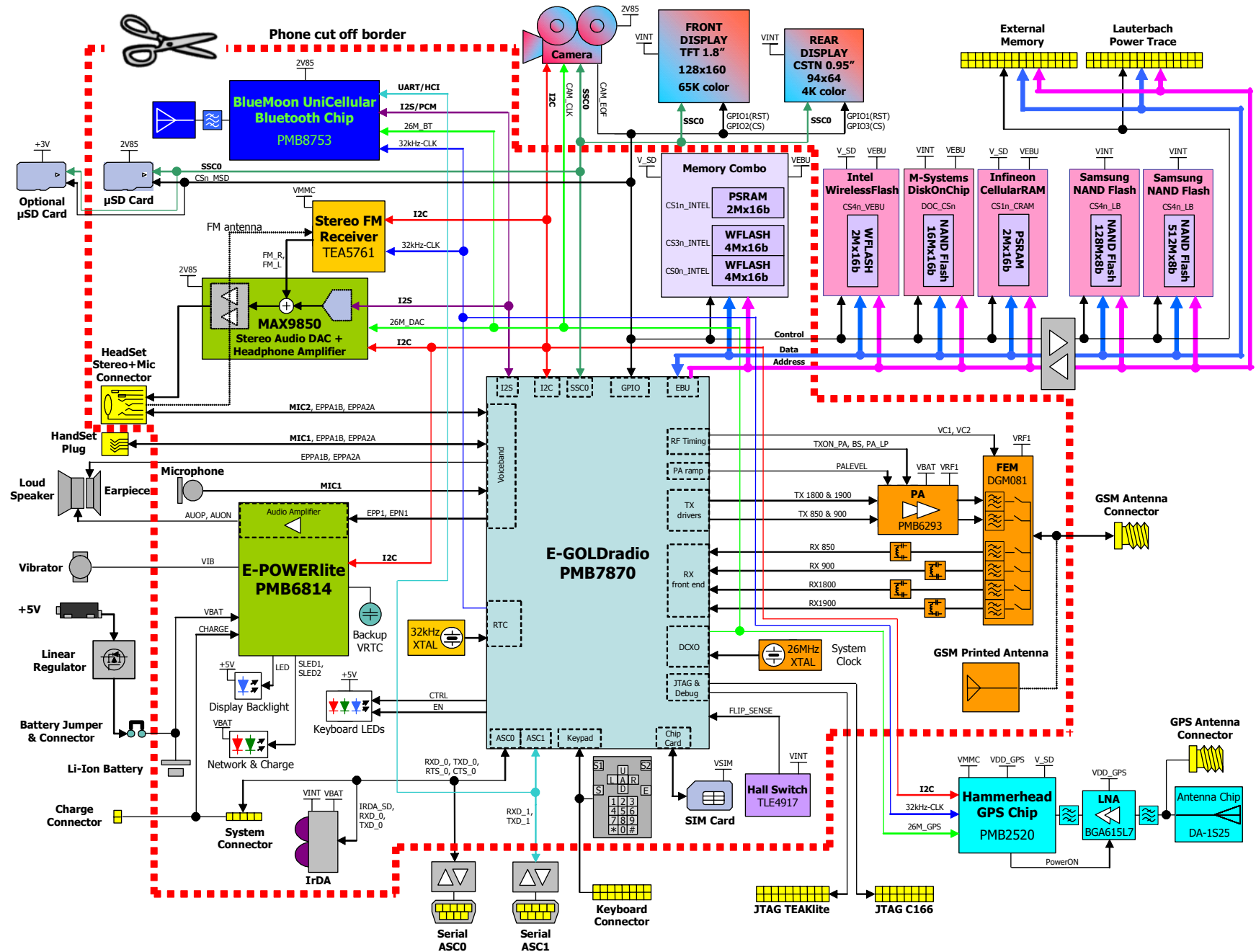
■ BlueMoon UniCellular PMB8753

Single-Chip Bluetooth 2.0 + EDR



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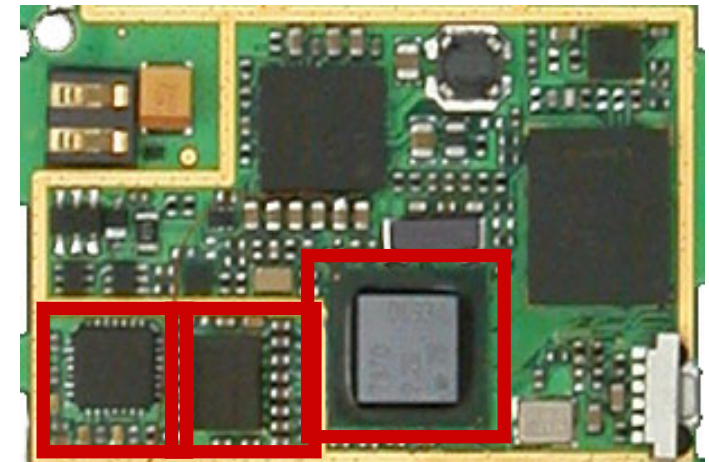
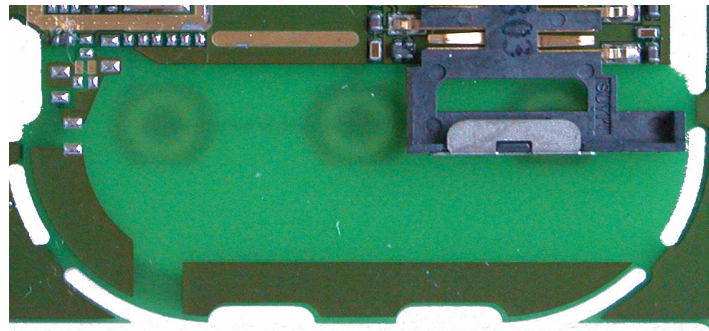




BP30 Globe6 Feature

Modem

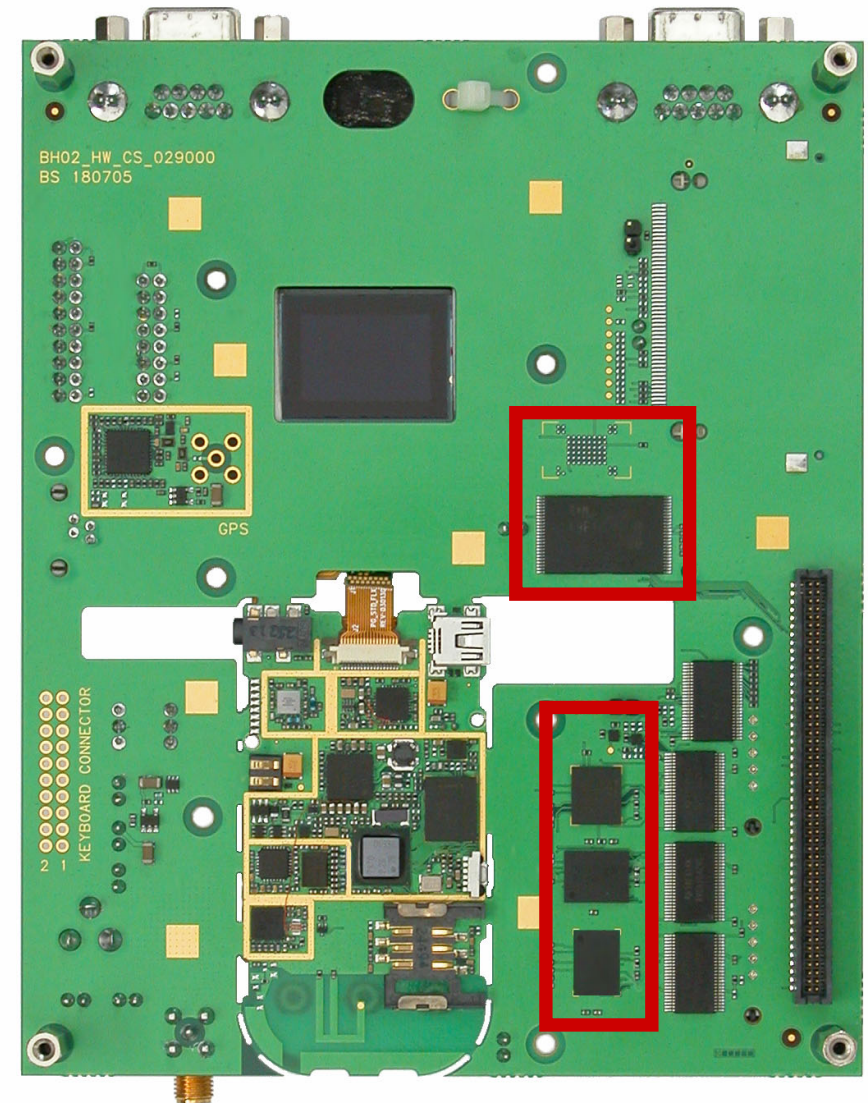
- Infineon **E-GOLDradio** PMB7870 GSM/GPRS Single Chip Solution that integrates Baseband System and Quad-Band GSM850/E-GSM/DCS/PCS RF Transceiver for voice and data applications.
- Infineon PMB6293 Quad-Band GSM850/E-GSM/DCS/PCS **Power Amplifier** Module based on 0.13 μ m CMOS technology, with integrated power controller.
- Epcos DGM081 Quad-Band Antenna Switch Module with integrated SAW filters and external RX matching components for GSM850/E-GSM/DCS/PCS Receiver.
- Possibility to use PCB printed quad band printed antenna or SMA Interface connector for RF output.



BP30 Globe6 Feature

Memory

- Intel Multi-Chip Package 128Mbits Wireless Flash and 32Mbits PSRAM
 - 2 x 64Mbits Wireless Flash
 - Top 8kbit sector of parameters for boot
 - 14ns Sync / 65ns Async speed
 - 32Mbits PSRAM (Pseudo-Static RAM)
 - 1.8V voltage core and I/O
 - 88-Ball (80-Active Ball) Stacked-CSP (Stacked Chip Scale Package)
- Additional (outside phone design)
 - Infineon 32Mbits Sync Burst CellularRAM
 - Intel 32Mbits Wireless Flash Memory for banking
 - M-Systems 256Mbits Flash Memory Mobile DiskOnChip
 - Samsung 1GBits NAND Flash Memory
 - Samsung 4GBits NAND Flash Memory
- External Memory Daughterboard connector.



BP30 Globe6 Feature

Power Management

■ Infineon E-POWERlite PMB6814

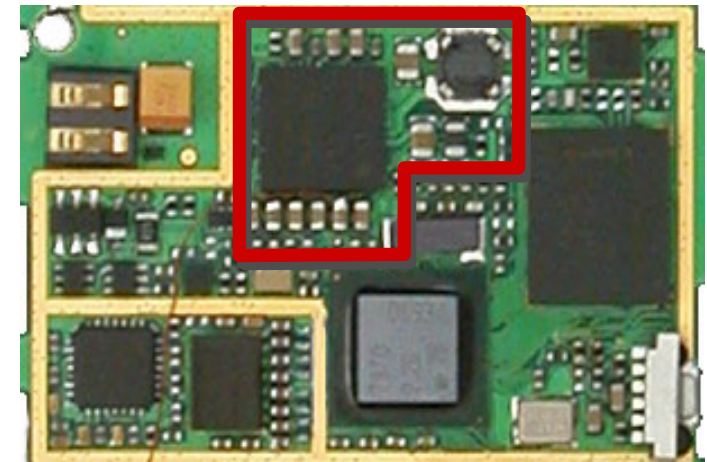
All the modem power rails are supplied by E-POWERlite.

■ Discrete Regulators:

- 5V Low-Noise Switched-Capacitor Boost Regulator for LEDs and displays backlight.
- 3.3V Low-Noise LDO Regulator for fast serial ports voltage translators (outside phone design).
- 3.0V Low-Noise LDO Regulator for optional microSD card (outside phone design).
- 2.85V Low-Noise LDO Regulator for GPS subsystem (GPS LNA and Hammerhead).

■ Power supply connectors for 5V AC/DC adapter, connected to the input of a Low Noise LDO Voltage Regulator with 3.8-4.0V output voltage (VBAT).

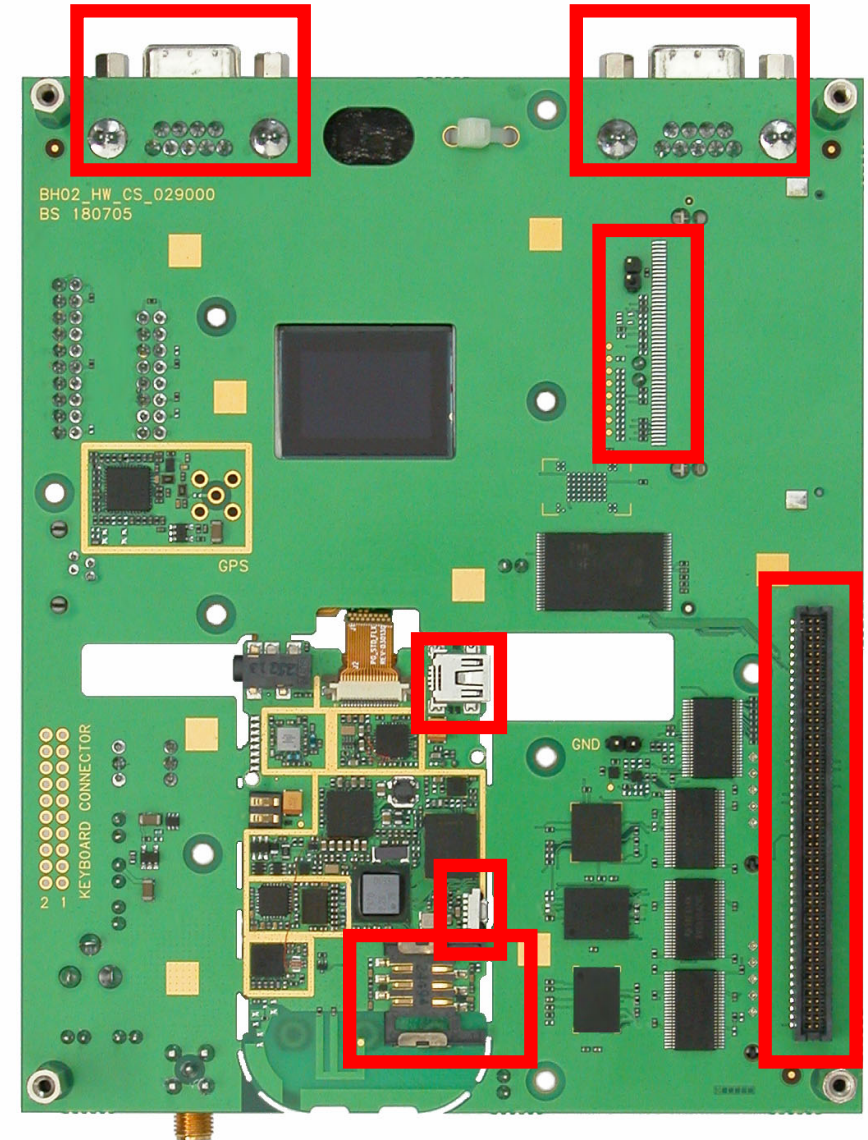
■ Battery connector



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Interfaces

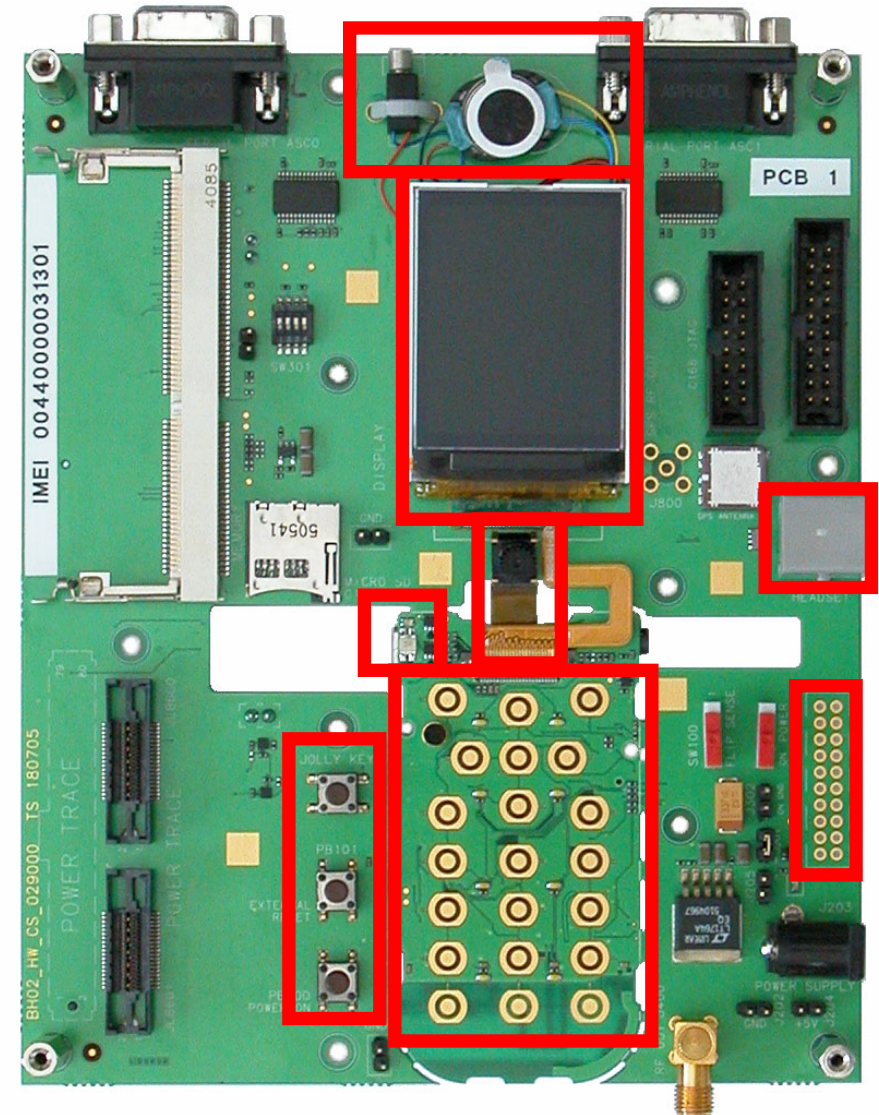
- **SIM card holder** supporting 1.8V and 3V card type via E-POWERlite.
- **System connector** on phone part for charging, external accessory supporting and serial data I/O with handshake signals.
- **SIR IrDA transceiver**. IrDA is mutually exclusive with Serial Port 0.
- Connector for **multimedia expansion** (Graphical companion chip, Touchscreen, WLAN, etc)
- Connector for BlueMoon UniCellular compact flash card (external board).
- **Two RS232 interfaces**: Serial Port 0 with hardware handshake signals; Serial Port 1 with software flow control. Both of them are accessible on SubD-9 connectors and supports high speed dataflow.
- **MicroSD** (TransFlash) card connectors (SPI compatible mode)
- **Debug connectors** (JTAG) for C166S MCU and for TEAKlite DSP debug tools.
- Connector for Lautherbach analyzer adaptation head (**Power Trace**).



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Man- Machine Interface

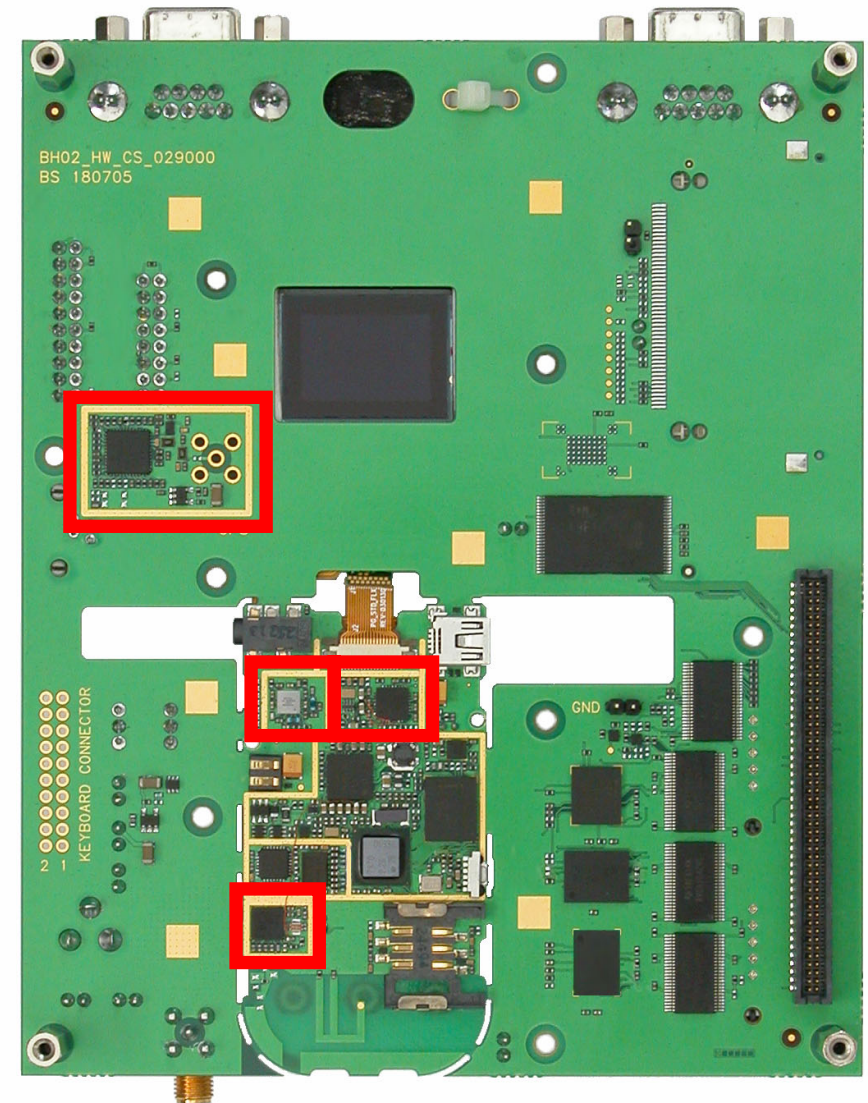
- Realistic phone keypad with four-directional and center-push keys.
- Power on button and external reset button
- Connector for external keypad
- Additional Jolly Key mapped for fast application access (Vodafone Live, PoC, etc).
- **Dual display module** for clam shell design with front 1.8" (128x160) 65k colors TFT LCD panel and rear 0.95" (96x64) 4k colors CSTN LCD panel, both with serial mode interface.
- **CIF camera**
- Vibrator motor driven by E-POWERlite.
- Keyrin 1813-TW2 dual outputs, mechanical assembled Loudspeaker/Earpiece.
- Full color spectrum LEDs. Color control via PWM through E-GOLDradio CAPCOM output.
- 4-pole plug for handset (outside phone design).
- 5-pole plug for stereo headset with external microphone.



BP30 Globe6 Feature

Miscellaneous Features

- Infineon PMB8753 **BlueMoon UniCellular** Single-Chip Bluetooth with PCB printed antenna.
- Philips TEA5761UK Low Power **FM Radio** Receiver.
- Maxim MAX9850 **Stereo Audio DAC** with integrated Headphone Amplifier and Volume Controls.
- Infineon PMB2520 **Hammerhead A-GPS** Single-Chip Device, Infineon BGA615L7 GPS Low Noise Amplifier, FDK DA-5T33N GPS Chip Antenna and SMA connector for external GPS antenna.
- Hall Sensor for clam shell closure detection and Flip Sense Switch to simulate clam shell closure.
- Stereo MP3 decoder.
- 40 tones polyphonic ring tones support.

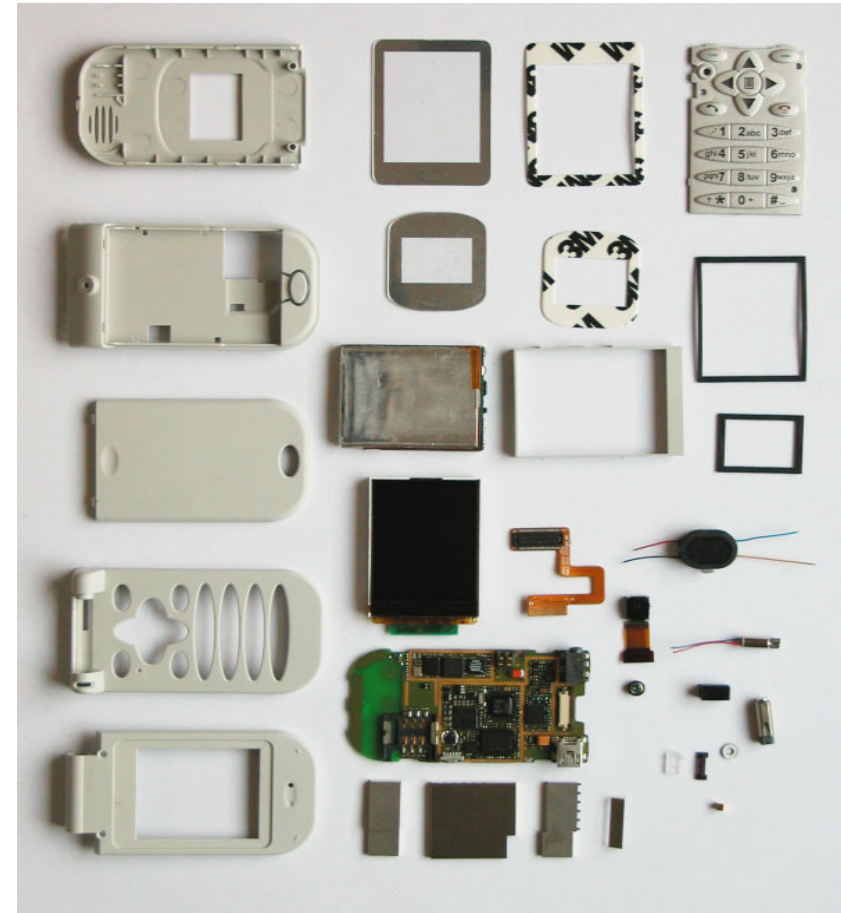


BP30 Globe6 Feature

Form Factor

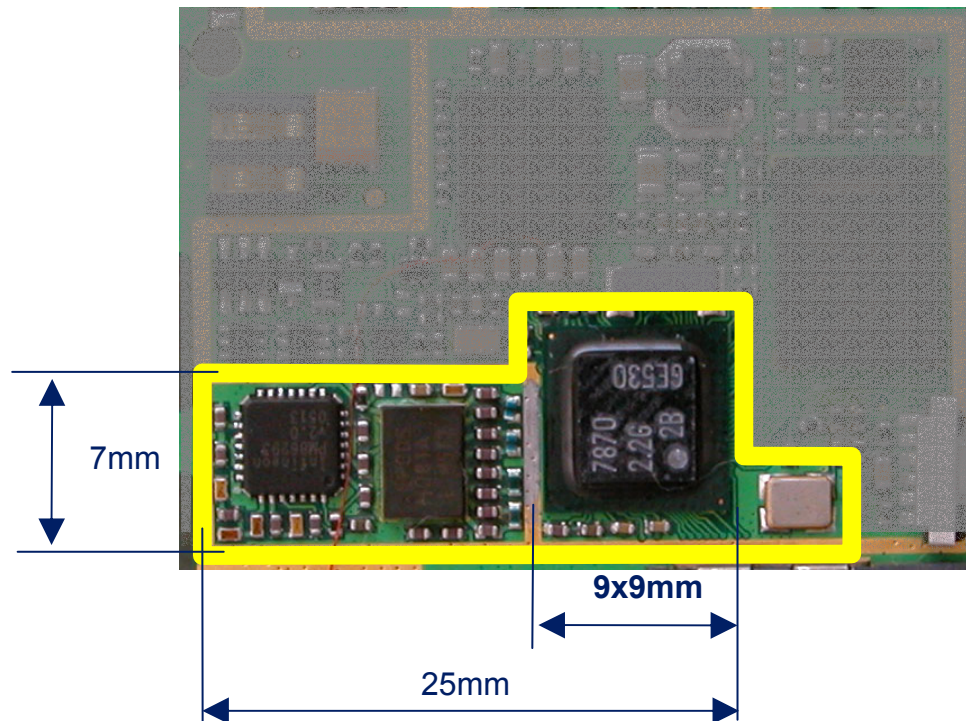


76.5 x 41 x 19.7 mm



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The Globe6 implements the leading-edge solution for 2G GSM/GPRS RF Transceiver



- Quad-Band
- GPRS class 12
- 40 components total
(including 12 passives for RX matching)
- 6-layers PCB

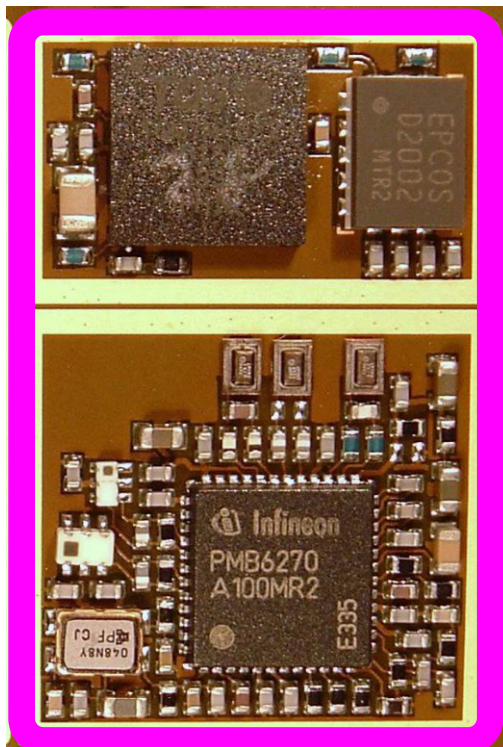


Infineon **EGOLDradio** is the “key component”

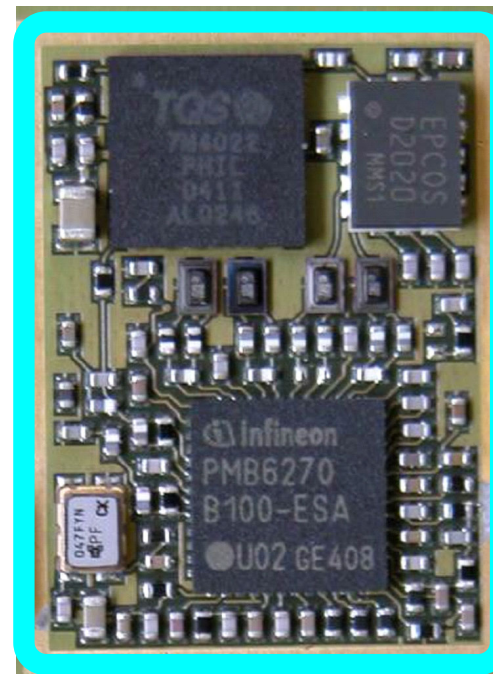
BP30 Hardware Platform

RF Transceiver history and evolution

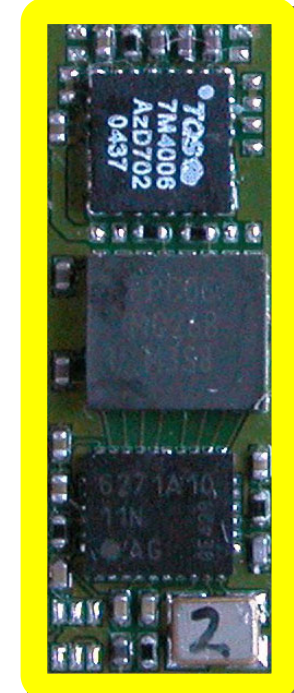
**BP2 Globe1
Tri-Band
Transceiver
Oct 2003**



**BP2 Globe2
Quad-Band
Transceiver
Feb 2004**



**BP2.1 Globe3
Quad-Band
Transceiver
Dec 2004**



BP30 Hardware Platform

Infineon PMB7870 E-GOLDradio highlights

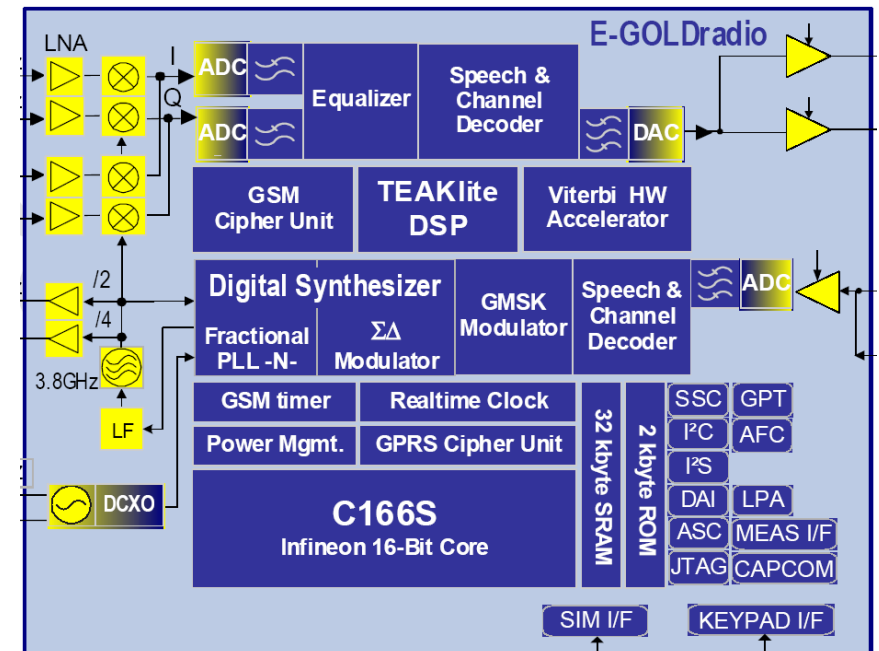
- CMOS process

➡ Low cost,
high production capability

- Very very Integrated

➡ Low PCB area,
minimized LOM

- Single ended outputs to PA
- integrated **3.8GHz** VCO
- Integrated Loop filter
- 3 clock outputs
- Integrated Digitally Controlled Crystal Oscillator → no TCXO



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Infineon PMB7870 E-GOLDradio highlights

- Integrated balanced LNAs for 850/900/1800/1900



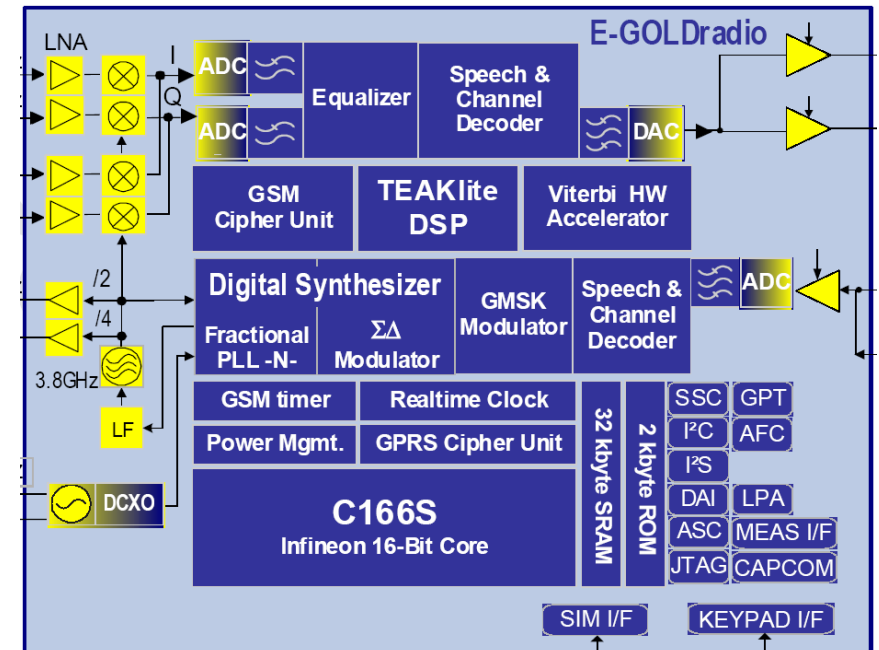
- Internal fractional-N $\Sigma\Delta$ synthesizer



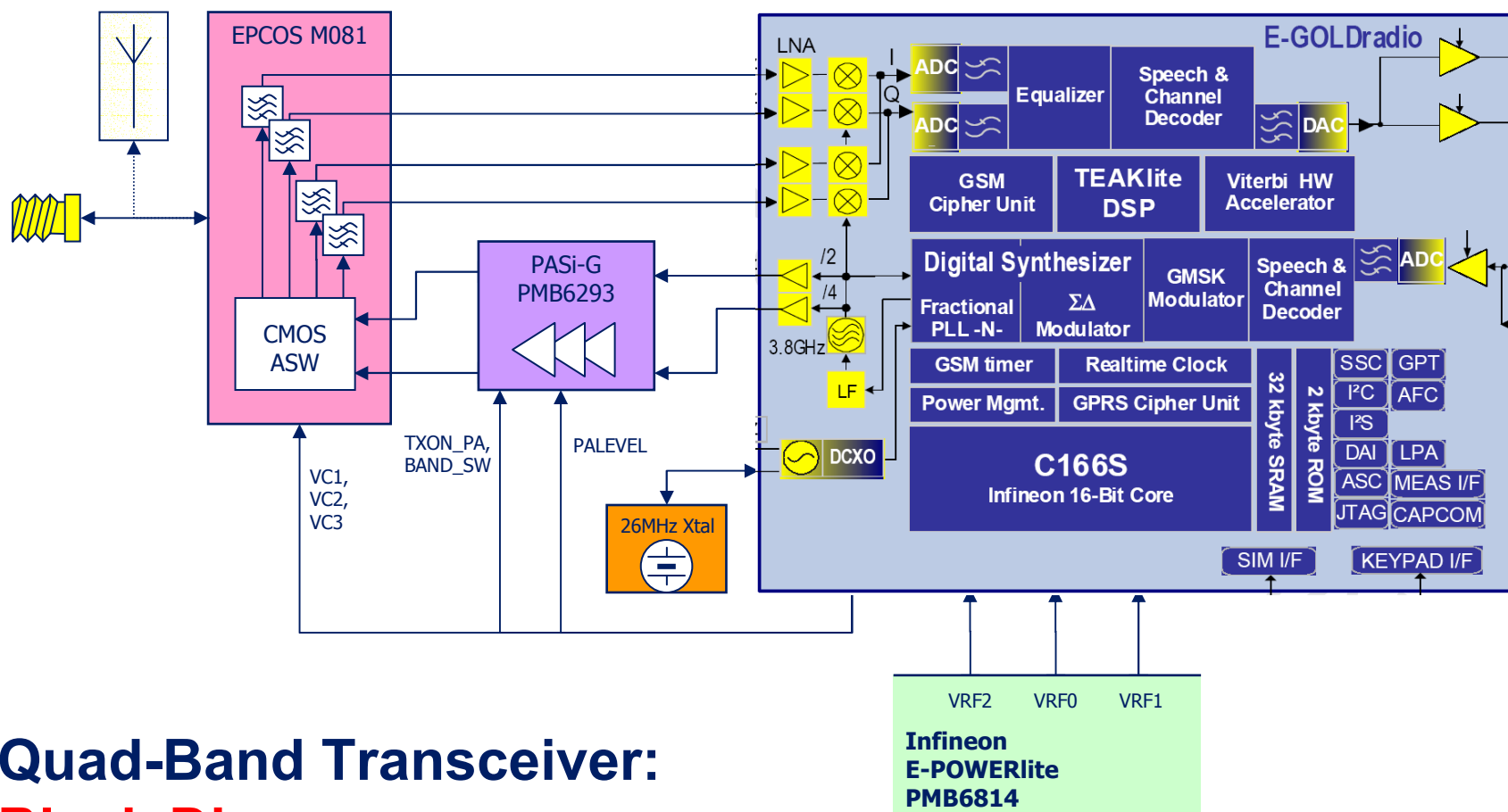
- Delta-Sigma transmitter modulator



- Integrated enhanced resolution receiver
- Digital TX Path



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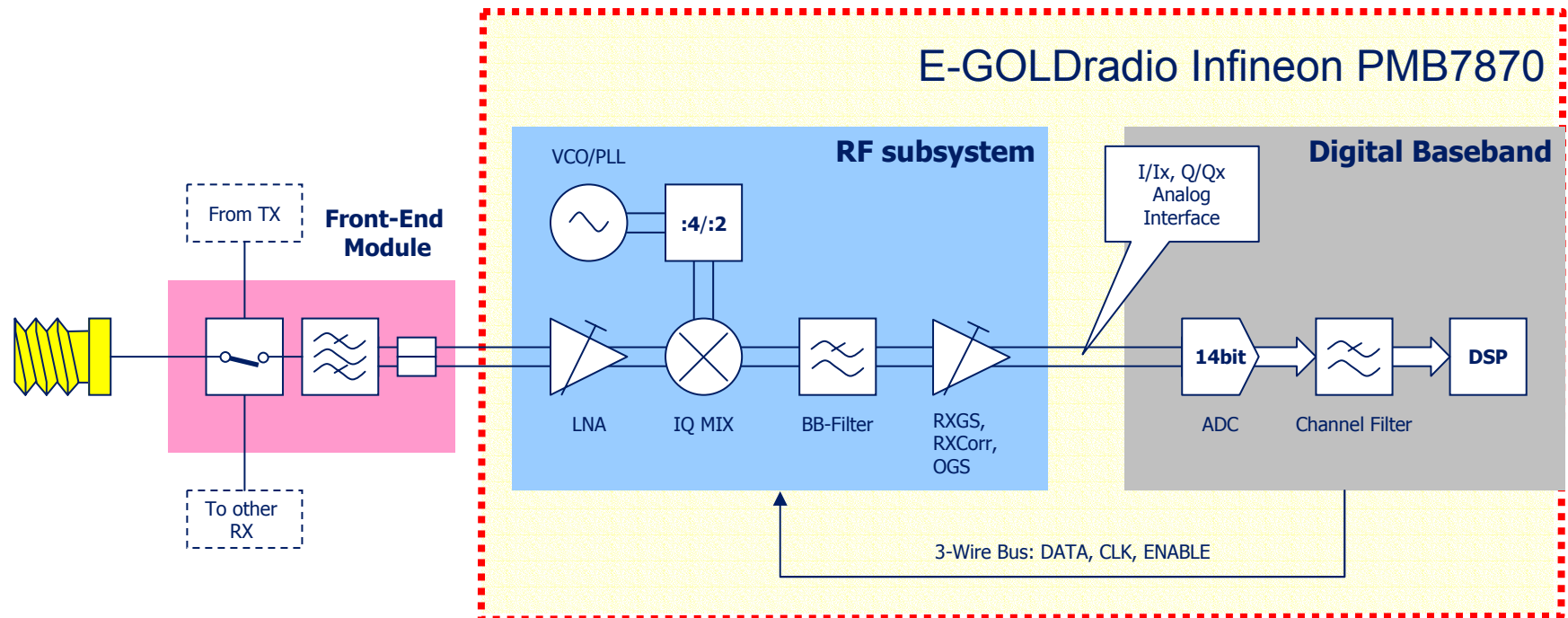
Quad-Band Transceiver: Block Diagram

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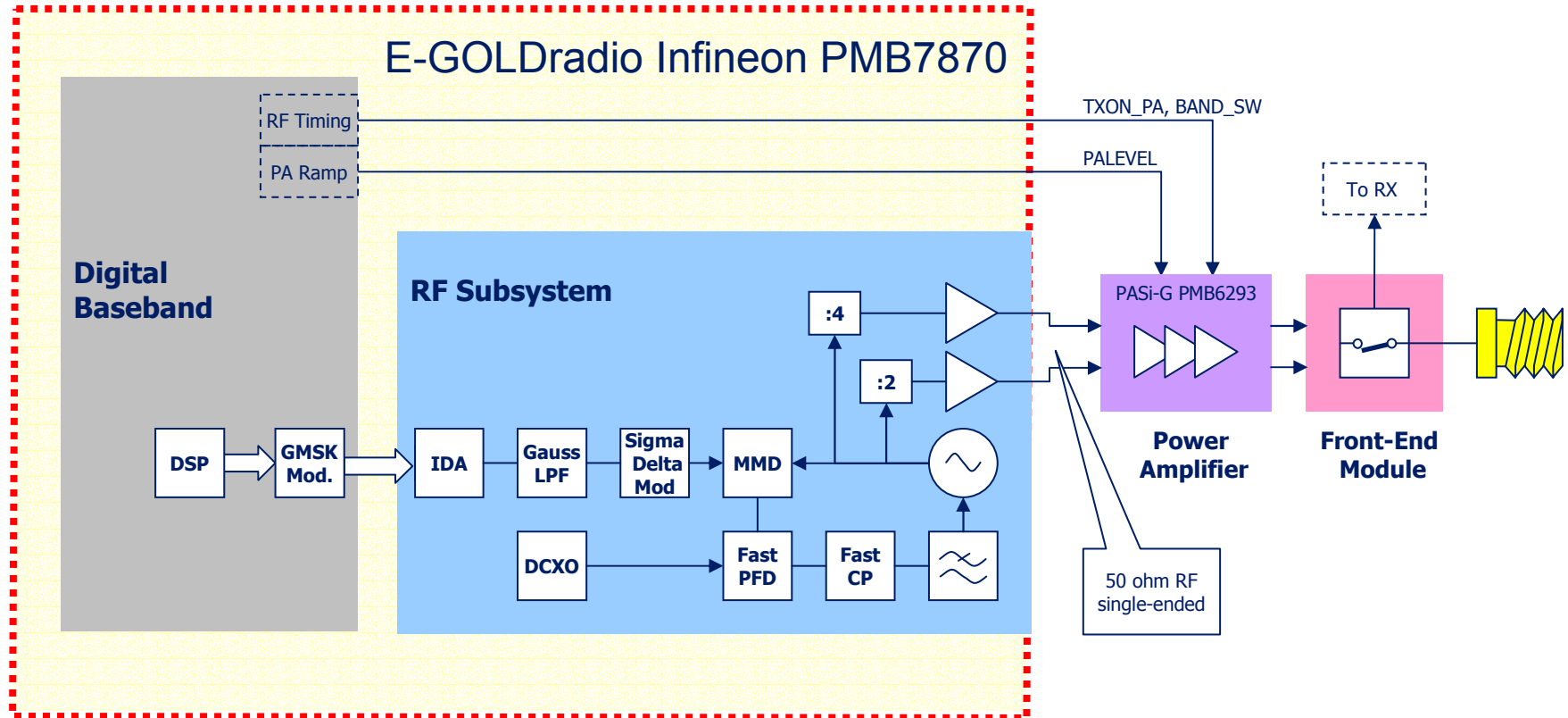
Direct Conversion Receiver is implemented by:

- Infineon **EGOLDradio PMB787**
- Epcos M081 Front-End Module

For each of the 4-band (GSM900, DCS1800, PCS1900 and GSM850), the RX path is mainly composed by similar functional blocks:



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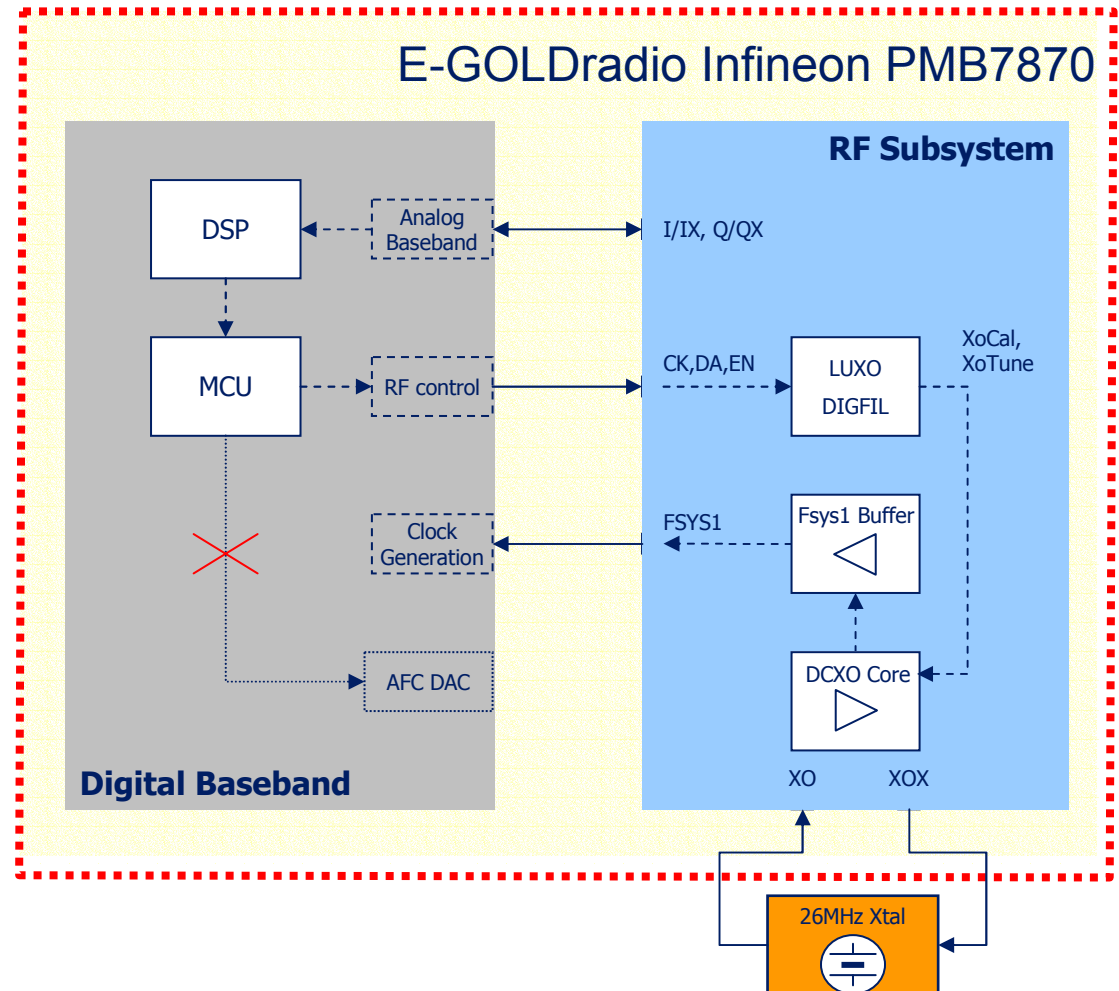
Sigma Delta Transmitter is implemented by:

- Infineon **EGOLDRadio PMB7870**
- Infineon PMB6293 Power Amplifier
- Epcos M081 Front-End Module

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Digitally Controlled Crystal Oscillator

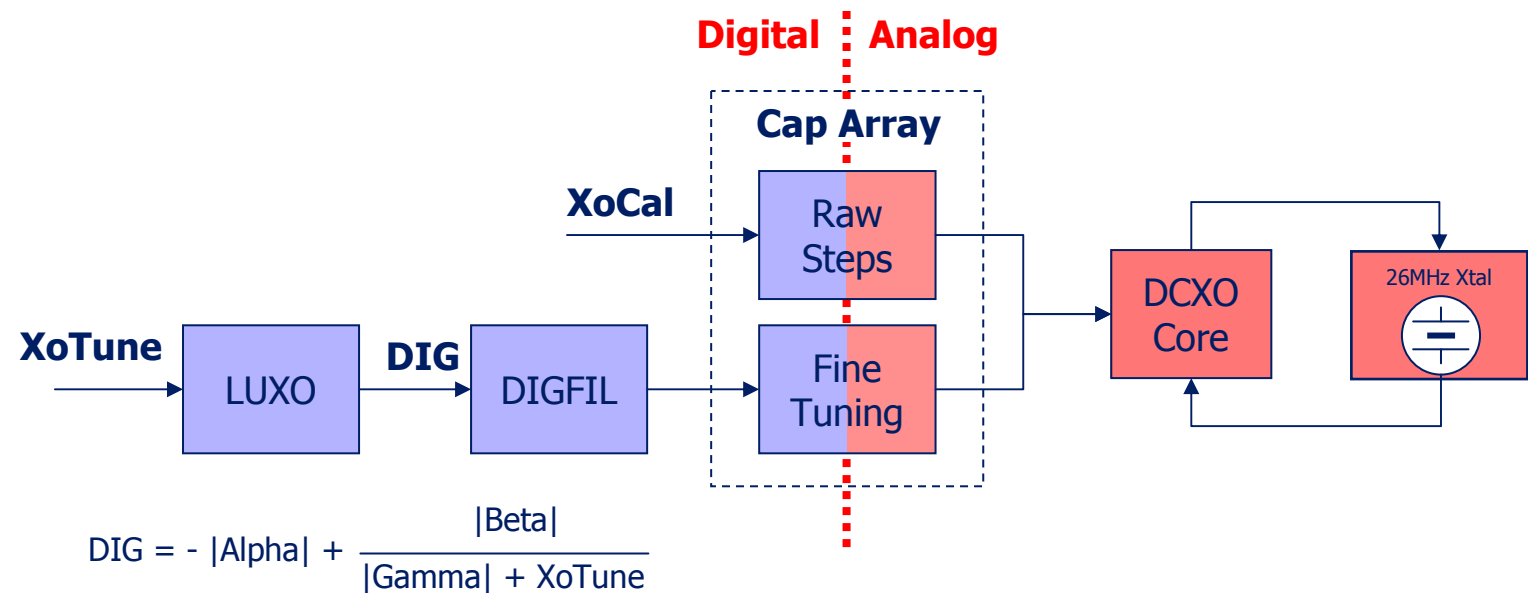
- Automatic Frequency Control loop is closed within EGR
- Only need external Crystal, no need for TCXO



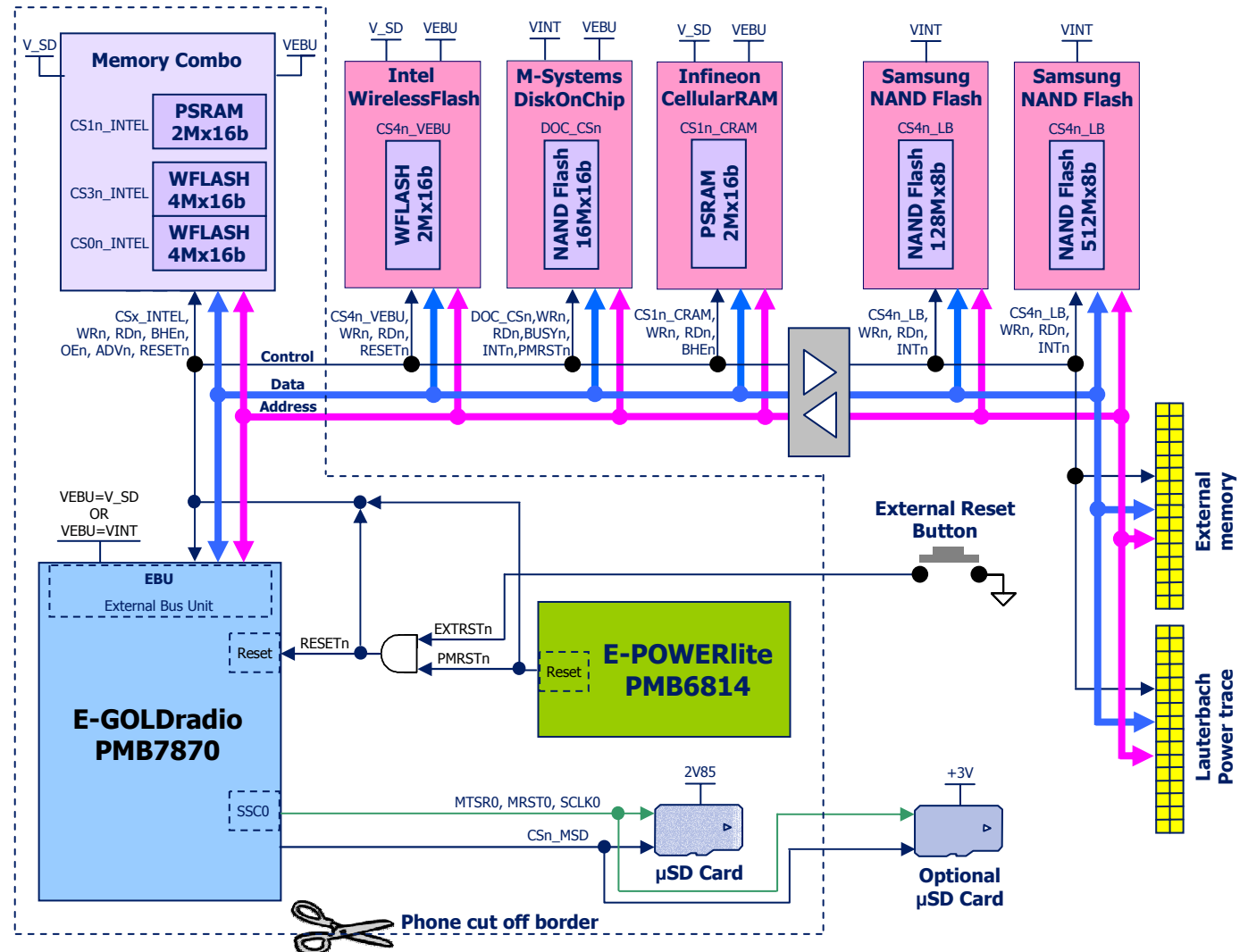
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Linearization Unit

- With Xtal Oscillator Linearization Unit - LUXO - enabled (default & recommended) E-GOLDRadio elaborates internally the XoTune setting in order to achieve a linear tuning characteristics for DCXO



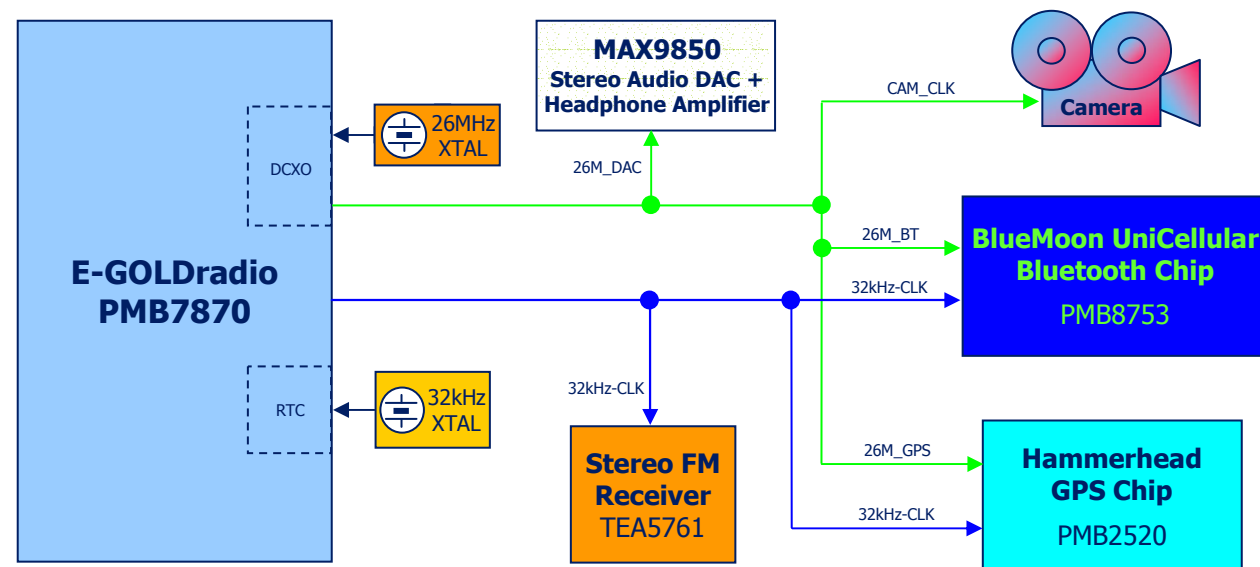
Memory



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Clock

- 26MHz master clock from DCXO
- 32kHz from Real Time Clock

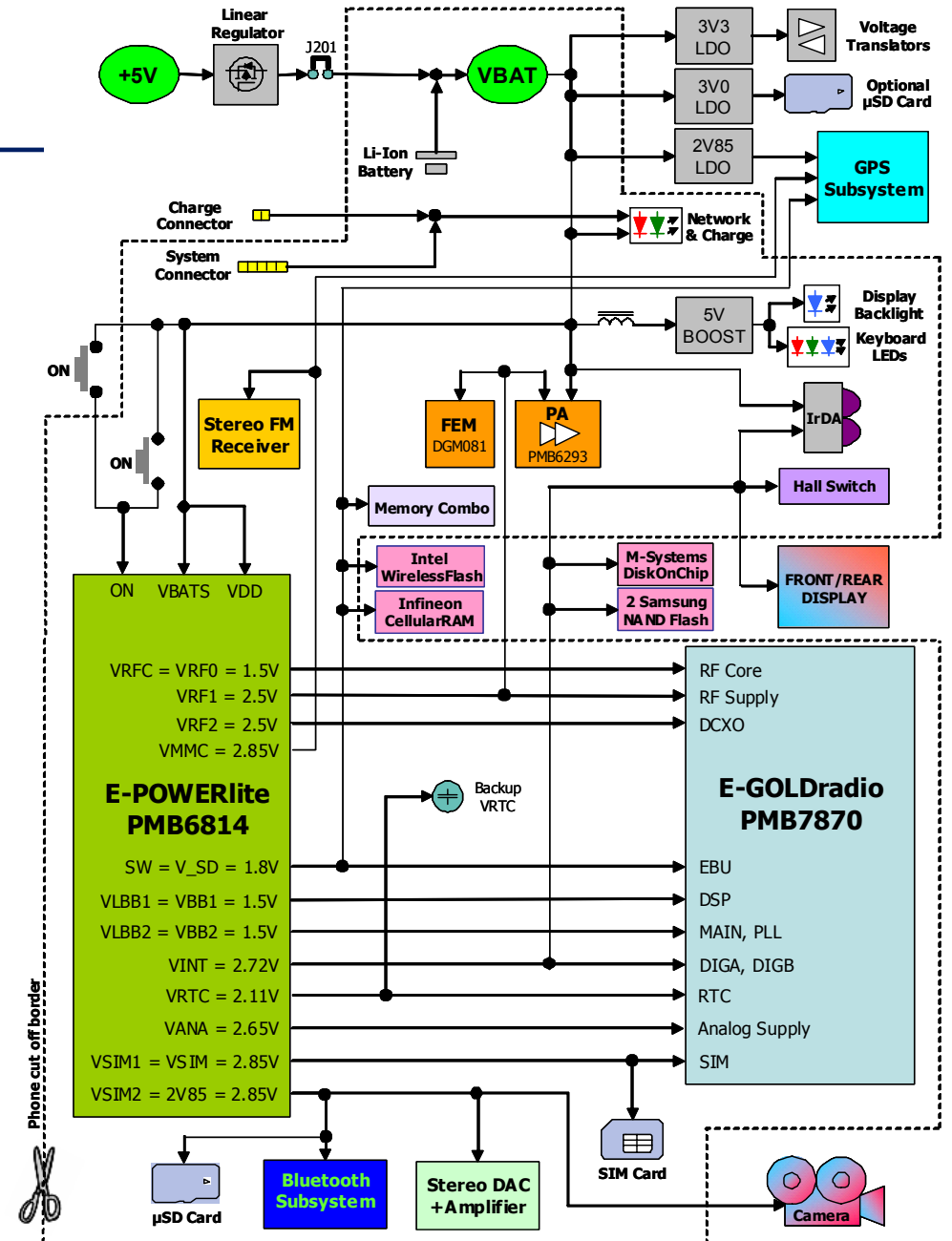


BP30 Hardware Platform

Power Supply

E-POWERlite provides almost all the required supply domain for the modem functionality:

- 12 x Low-drop-out (LDO) regulators
- 1 x Highly efficient step-down converter
- Charge control for charging of NiMH and Li-Ion/Polymer batteries



BP30 Hardware Platform

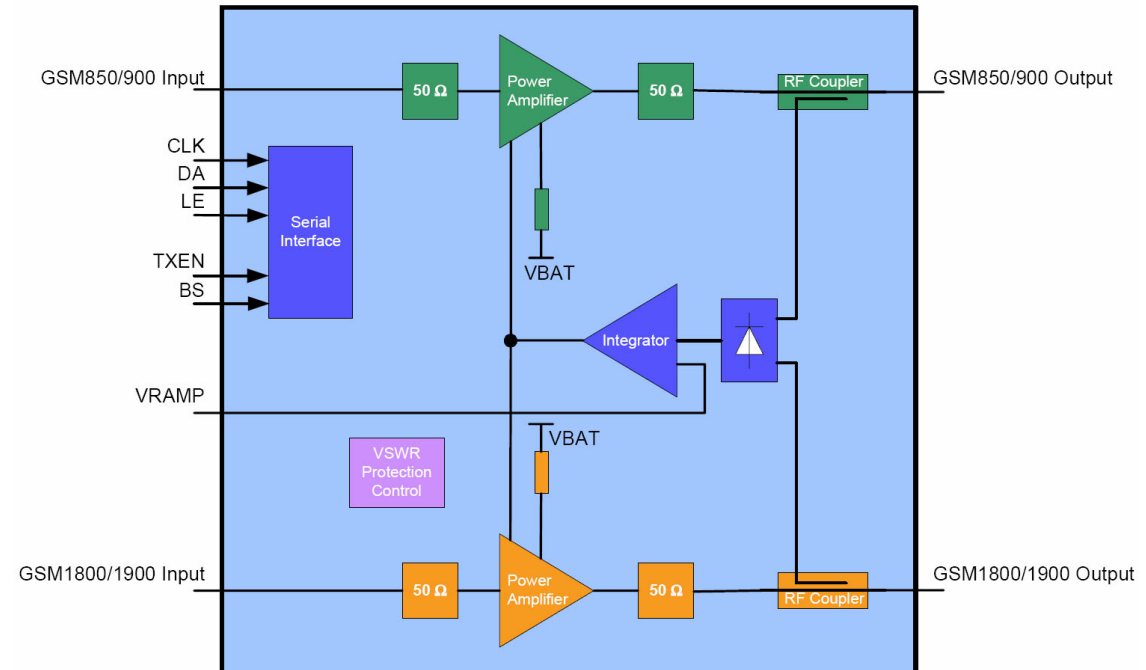
Infineon PAsi-G PMB6293

- Quad-Band
- GPRS Class 12
- Integrated Closed Loop Power Control

Distribute
Active
Transformer



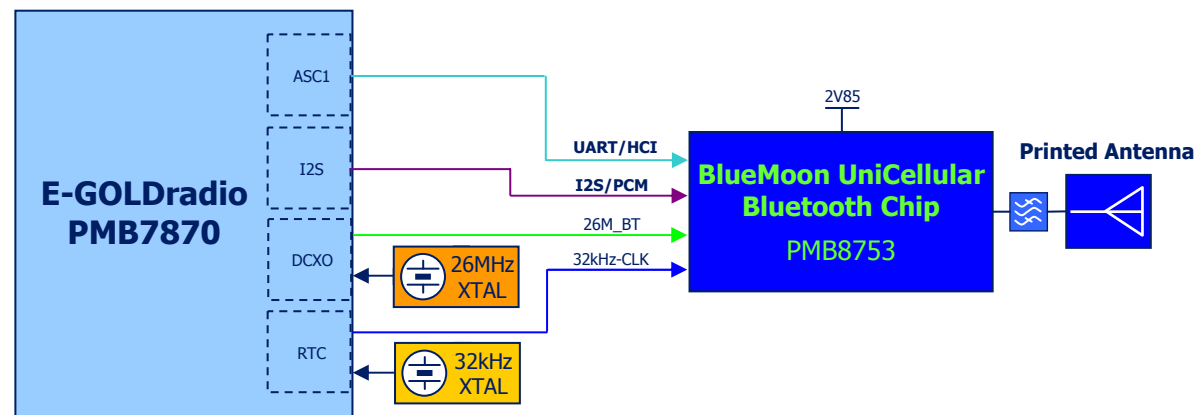
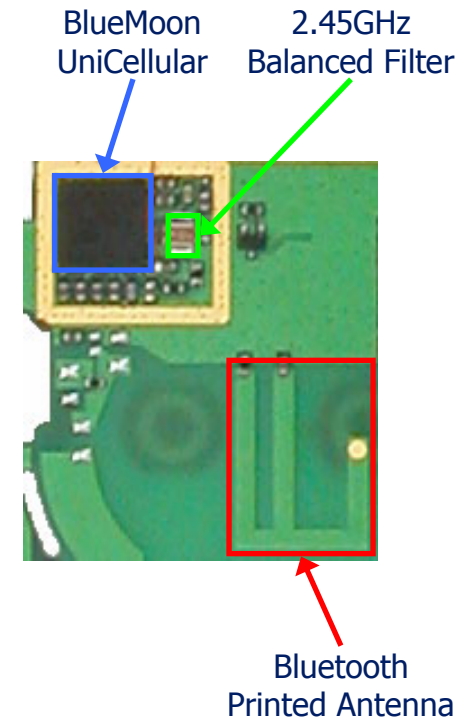
- Single-die 0.13 μm CMOS Technology
- Small Package - 5mm x 5mm MLF
- 50 Ω Input/Output Matching



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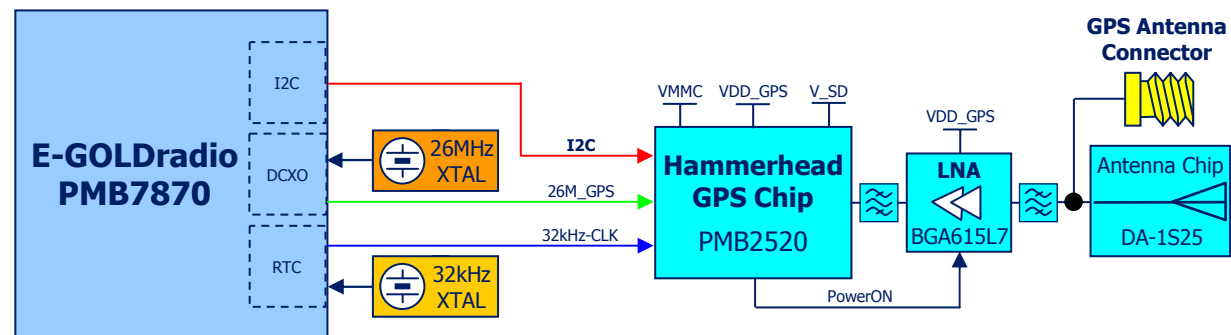
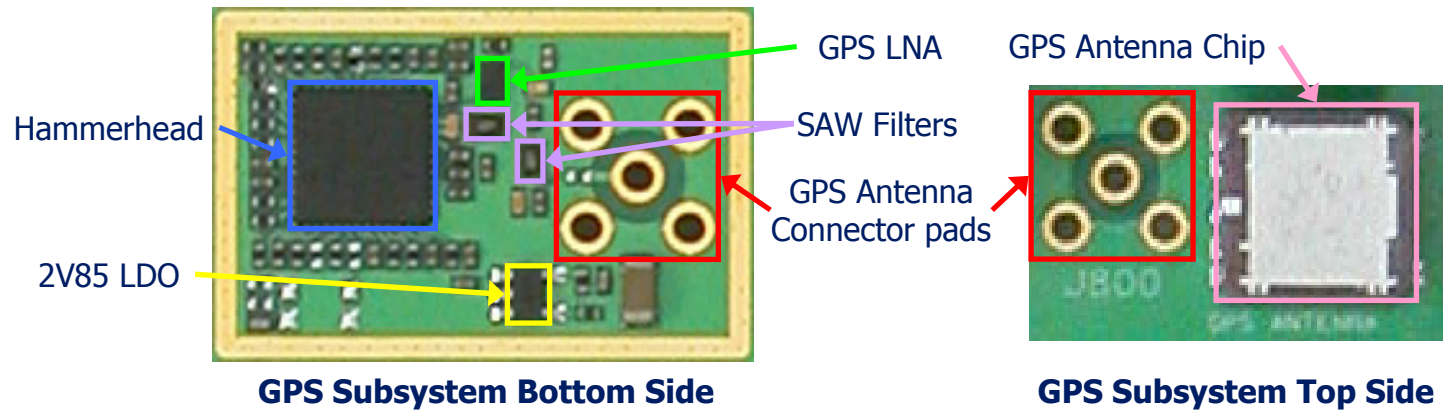
Infineon BlueMoon UniCellular PMB8753

- Single chip Bluetooth 2.0 + EDR solution
- Low power design in 0.13 μm CMOS
- Integrates ARM7TDMI, RAM and patchable ROM
- On-chip voltage regulators.
- Low-IF receiver topology with integrated LNA, VCO and Digital demodulation

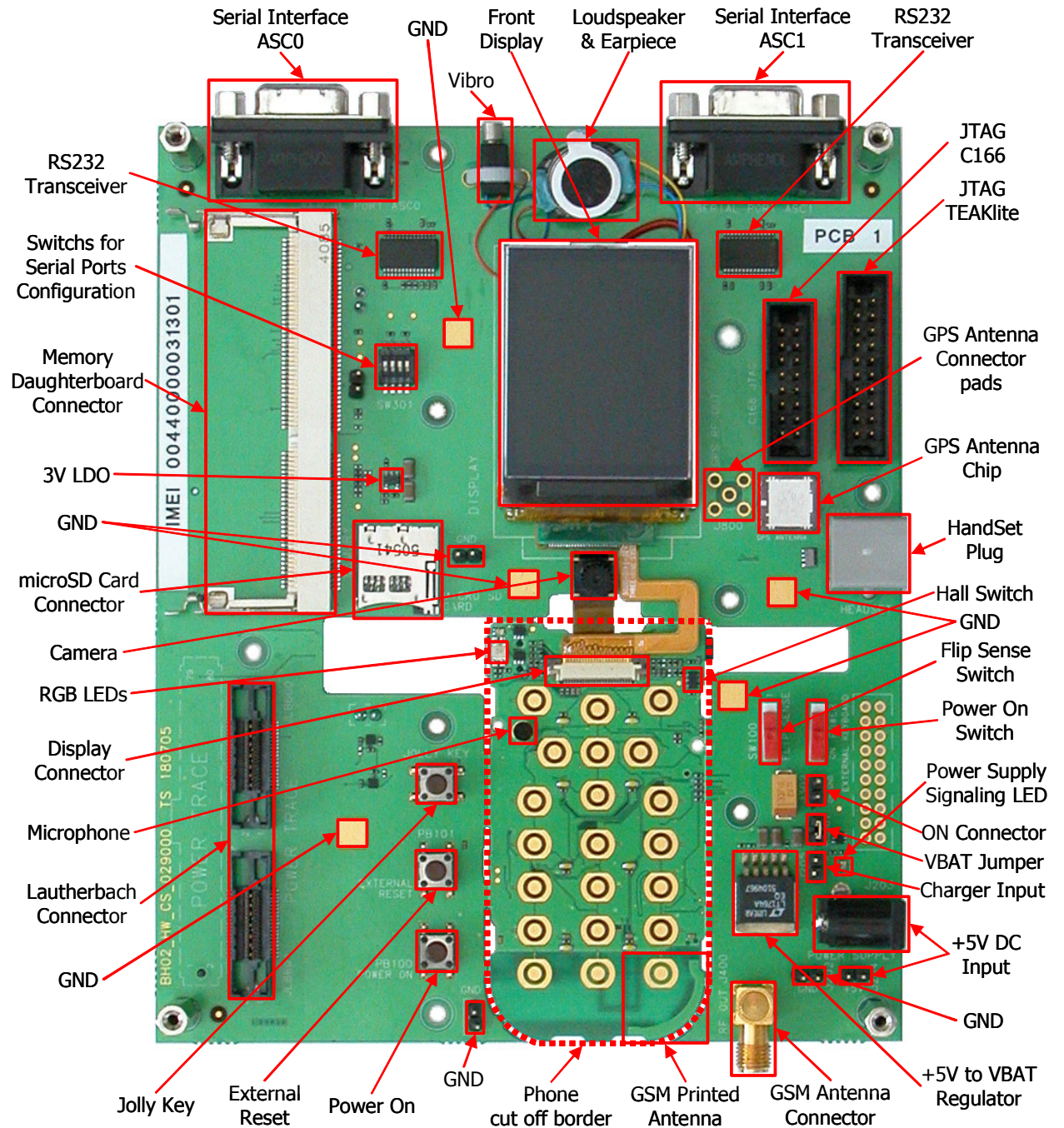


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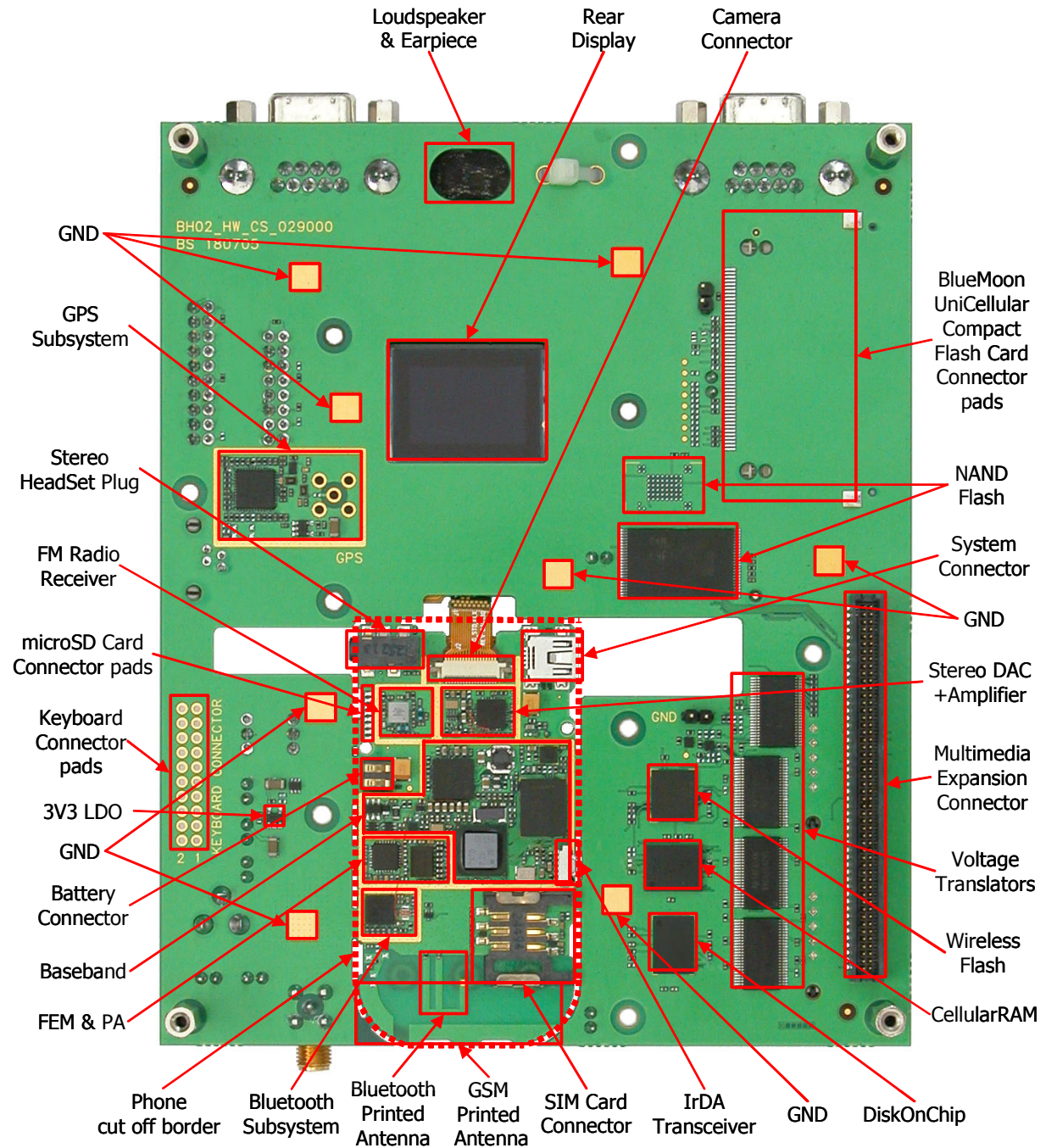
Infineon & Global Locate's Hammerhead A-GPS PMB2520



NEON SEVEN



Bottom Side





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Thank You