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Si4212

Aero IIe Transceiver for GSM, GPRS, and EDGE

Description

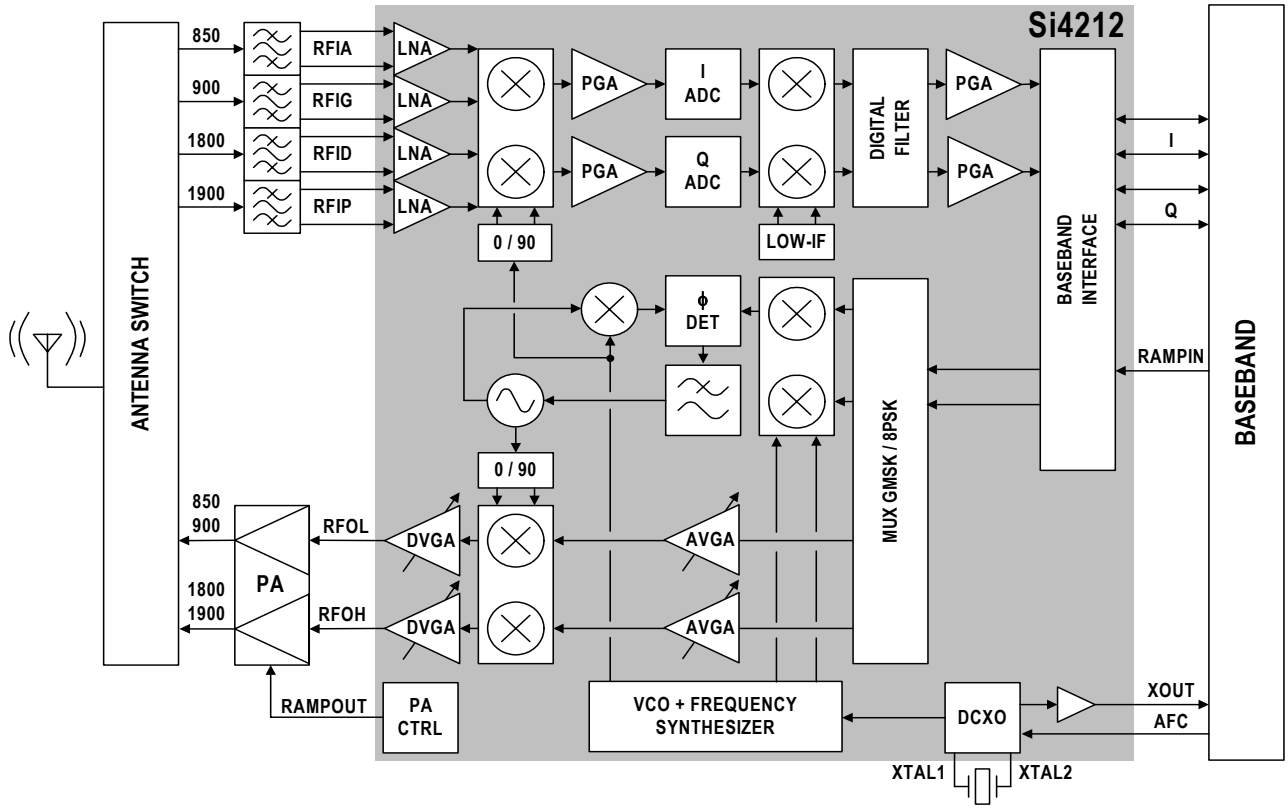
The Aero® IIe transceiver is a complete RF front end for multi-band GSM, GPRS, and EDGE wireless communications. The receive section interfaces between the RF band-select SAW filters and the baseband processor. The transmit section interfaces between the baseband processor and the power amplifier and uses a unique dual-transmitter architecture for EDGE. In GMSK mode, the offset phase locked loop (OPLL) is modulated by the I and Q signals. In 8-PSK mode, the OPLL is unmodulated and acts as a local oscillator (LO) to the direct upconversion mixer. All functions traditionally performed by sensitive components such as VCOs, loop filters, tuning inductors, and varactors are integrated into the integrated circuit (IC). The Aero IIe transceiver includes a digitally-controlled crystal oscillator (DCXO) and completely integrates the reference oscillator and varactor functions. The Aero IIe digital low-IF receiver architecture provides inherent suppression of dc offsets, preventing the need for dc offset compensation, manufacturing calibration, or related baseband support.

Features

- 5 x 6 mm 36-pin QFN
- Highly integrated transceiver supports both GMSK and 8-PSK modulation
  - Unique dual-transmitter architecture
  - Integrated frequency synthesizer including all VCOs and loop filters
  - Digital low-IF receiver including digital filter
  - Quad-band LNAs
- Integrated digitally-controlled crystal oscillator (DCXO)
- Analog baseband interface
- Class 12 compliant for GPRS and EDGE
- 3-wire serial control interface
- 2.7 to 3.0 V operation
- CMOS process technology

Applications

- Multi-band GSM/GPRS/EDGE cellular handsets and smart phones
- Multi-band GSM/GPRS/EDGE data modems



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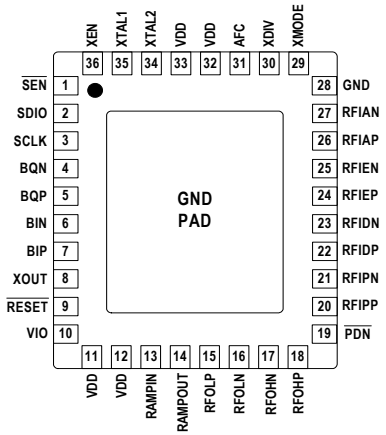
Selected Electrical Specifications

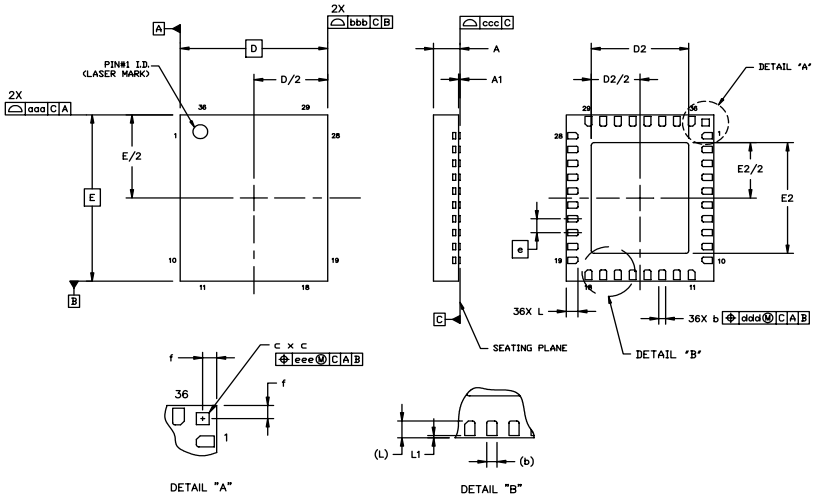
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Receiver Characteristics						
Input Frequency	F_{IN}	GSM 850 band	869	—	894	MHz
		E-GSM 900 band	925	—	960	MHz
		DCS 1800 band	1805	—	1880	MHz
		PCS 1900 band	1930	—	1990	MHz
Noise Figure at 25 °C	NF_{25}	GSM 850 band	—	2.1	—	dB
		E-GSM 900 band	—	2.3	—	dB
		DCS 1800 band	—	2.4	—	dB
		PCS 1900 band	—	2.5	—	dB
Transmitter Characteristics: GMSK Modulation						
RFOL Output Frequency		GSM 850 band	824	—	849	MHz
		E-GSM 900 band	880	—	915	MHz
RFOH Output Frequency		DCS 1800 band	1710	—	1785	MHz
		PCS 1900 band	1850	—	1910	MHz
Phase Error			—	1.9	—	deg RMS
			—	5	—	deg PEAK
RFOL Output Modulation Spectrum		400 kHz offset	—	–66	—	dBc
RFOH Output Modulation Spectrum		400 kHz offset	—	–65	—	dBc
RFOL Output Phase Noise		10 MHz offset	—	–160	—	dBc/Hz
		20 MHz offset	—	–165	—	dBc/Hz
RFOH Output Phase Noise		20 MHz offset	—	–160	—	dBc/Hz
Transmitter Characteristics: 8-PSK Modulation						
Origin Offset Suppression			—	–40	—	dBc
Error Vector Magnitude			—	4.0	—	% RMS
			—	10.0	—	% PEAK
RFOL Output Modulation Spectrum		400 kHz offset	—	–64	—	dBc
RFOH Output Modulation Spectrum		400 kHz offset	—	–64	—	dBc
RFOL Output Phase Noise		10 MHz offset	—	–154	—	dBc/Hz
		20 MHz offset	—	–160	—	dBc/Hz
RFOH Output Phase Noise		20 MHz offset	—	–155	—	dBc/Hz

Pin Assignments



Patents pending

Package Information



Dimension	MIN	NOM	MAX
A	0.80	0.85	0.90
A1	0.00	0.02	0.05
b	0.18	0.23	0.30
c	0.20	0.25	0.30
D		5.00 BSC	
D2	3.20	3.30	3.40
e		0.50 BSC	

Dimension	MIN	NOM	MAX
f		0.28 BSC	
E		6.00 BSC	
E2	3.90	4.00	4.10
L	0.30	0.40	0.50
L1	0.03	0.05	0.08
aaa	—	—	0.10
bbb	—	—	0.10

Dimension	MIN	NOM	MAX
ccc	—	—	0.08
ddd	—	—	0.10
eee	—	—	0.10

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