

Si4209

Si4209 Transceiver for GSM and GPRS

Description

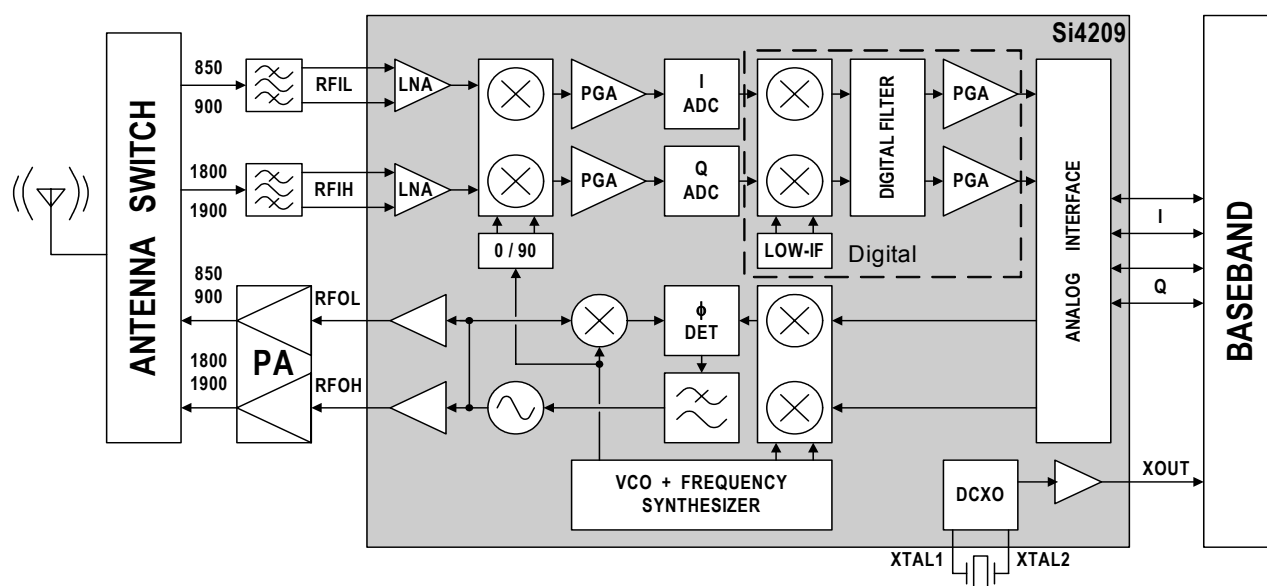
The Si4209 transceiver is a complete RF front end for dual-band GSM and GPRS wireless communications. The receive section interfaces between the RF band-select SAW filters and the baseband subsystem. The Si4209 receiver leverages a proven digital low-IF architecture and enables a universal baseband interface without the need for complex dc offset compensation. The transmit section of Si4209 provides a complete upconversion path from the baseband subsystem to the power amplifier (PA) using an offset phase-locked loop (OPLL) integrated with Silicon Laboratories' patented synthesizer technology. All sensitive components, such as TX/RV VCOs, loop filters, tuning inductors, and varactors are completely integrated into a single integrated circuit. The Si4209 transceiver includes a digitally-controlled crystal oscillator (DCXO) and completely integrates the reference oscillator and varactor functionality.

Features

- 5x5 mm 25-pin QFN
- Smallest solution footprint
- Highest integration
- Industry-leading performance
- Integrated GSM/GPRS transceiver including the following:
 - Digital low-IF receiver
 - Complete support for 900/1800, 900/1900, 850/1800, 850/1900 band configurations
 - Region management flexibility
 - Offset PLL transmitter
 - Integrated TX VCO, loop filter, and varactor
 - Frequency synthesizer
 - Integrated RF VCO, loop filter, and varactor
- Digitally-controlled crystal oscillator (DCXO)
- Universal analog baseband interface
- Quad-band support:
 - GSM 850 Class 4, small MS
 - E-GSM 900 Class 4, small MS
 - DCS 1800 Class 1
 - PCS 1900 Class 1
- GPRS class 12 compliant
- 3-wire serial control interface
- 2.7 to 3.0 V operation
- CMOS process technology
 - Lead-free/RoHS-compliant

Applications

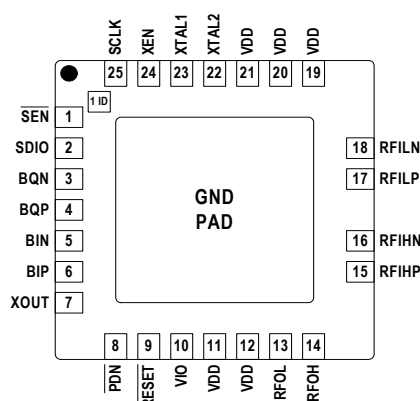
- Dual-band GSM/GPRS digital cellular handsets
- Dual-band GSM/GPRS wireless data modems



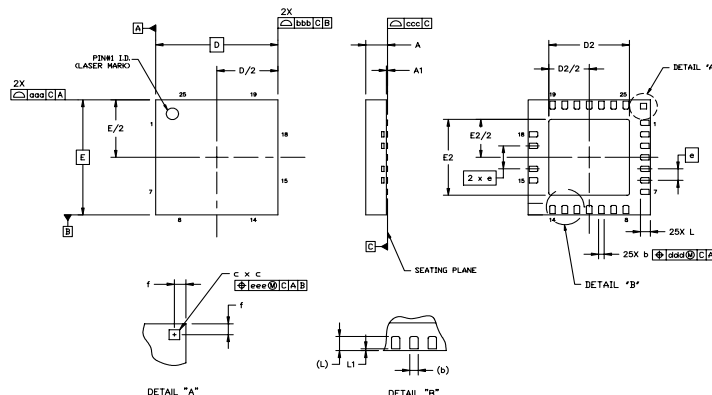
Selected Electrical Specifications

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	—	2.9	TBD	dB
		E-GSM 900 band	—	3.1	TBD	dB
		DCS 1800 band	—	2.8	TBD	dB
		PCS 1900 band	—	2.9	TBD	dB
Transmitter Characteristics						
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		RFOL Transmit Mode	—	1.5	3.0	° _{RMS}
		RFOH Transmit Mode	—	1.9	3.0	° _{RMS}
			—	5	10	° _{PEAK}
RFOL Output Modulation Spectrum		400 kHz offset	—	−66	−62	dBc
RFOH Output Modulation Spectrum		400 kHz offset	—	−65	−62	dBc
RFOL Output Phase Noise		10 MHz offset	—	−160	−155	dBc/Hz
		20 MHz offset	—	−165	−164	dBc/Hz
RFOH Output Phase Noise		20 MHz offset	—	−160	−157	dBc/Hz

Pin Assignments



Package Information



Patents pending

Symbol	Millimeters		
	Min	Nom	Max
A	0.80	0.85	1.00
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		
f	0.28 BSC		
E	5.00 BSC		

Symbol	Millimeters		
	Min	Nom	Max
E2	3.20	3.30	3.40
L	0.30	0.40	0.50
L1	0.03	0.05	0.08
aaa	—	—	0.10
bbb	—	—	0.10
ccc	—	—	0.08
ddd	—	—	0.10
eee	—	—	0.10