

CQP810

TECHNICAL SPECIFICATIONS

TRANSMITTER MODULES

The following detailed specifications are all typical values measured at 20°C ambient temperature, unless otherwise stated.

CRYSTAL OSCILLATOR XO812

Supply Voltage

7.5 V

Current Drain

< 4 mA

Frequency Range

17.0 to 22.0 MHz

Output Power

> 1 mW, $R_L = 50 \text{ ohm}$

CRYSTAL OSCILLATOR XO815

Supply Voltage

7.5 V

Current Drain

< 4 mA

Frequency Range

17.0 to 22.0 MHz

Output Power

> 1 mW, $R_L = 50 \text{ ohm}$

Pilot Tone Level

2 V r.m.s. + 1 dB (71.9 Hz to 127.5 Hz)

Pilot Tone Modulation

> $\pm 300 \text{ Hz}$

(measured at the transmitter output)

Distortion at $\Delta F + 300 \text{ Hz}$

< 10%

MODULATION AMPLIFIER AA802

Supply Voltage

7.5 V

Current Drain

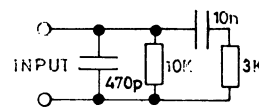
2.5 mA normal condition

3.0 mA amplifier blocked

Microphone Signal Input Impedance

12 k ohm

Tone Signal Input Impedance



Equivalent AC Diagram

Maximum DC Blocking Voltage

1.2 V

Blocking Gate Current

100 uA

Microphone Signal Input Sensitivity (1000 Hz)

Signal clipping begins to occur with an input signal of:

5 mV with amplifier set for min. gain.

0.2 mV with amplifier set for max. gain.

Limiting

Output signal observed at output of AA802 when clipping occurs: 6.0 V p.p.

Distortion (at 1000 Hz Microphone Signal)

measured at output of AA802.

 V_{IN} = Signal clipping level - 1 dB

0.4% Gain set to minimum

3.0% Gain set to maximum

Distortion (at 1000 Hz Tone signal)

0.2% measured at output of AA802

Microphone amplifier blocked

 V_{IN} = Signal clipping level - 1 dB

Frequency Response

300 Hz : -10.5 dB

1000 Hz: 0 dB

3000 Hz: + 8.5 dB

Measured at constant input voltage and the level kept just below that at which clipping occurs at 3000 Hz.

PHASE MODULATOR PM811
Supply Voltage

7.5 V

Current Drain

10 mA

Frequency Range

17.0 - 22.0 MHz

RF Input Impedance

80 ohm // 60 pF

RF Drive

1 mW

AF Input Impedance

400 ohm

Modulation sensitivity

200 mV for $\Delta f = \frac{5}{8}$ kHz, $f_{mod} = 1000$ Hz

Modulation Distortion

2% at $\Delta f = \frac{5}{8}$ kHz, $f_{mod} = 1000$ Hz

Z generator = 600 ohm

FREQUENCY DOUBLER FD811
Supply Voltage

7.5 V

Current Drain

5.5 mA

Frequency Range

Input: 18.25 MHz to 21.75 MHz

Output: 36.5 MHz to 43.5 MHz

Input Impedance

approx 1 k ohm

Drive

approx 1 mW

RF Bandwidth (1 dB)

500 kHz

Output Power

2.5 mW, $R_{load} = 1$ k ohm

FREQUENCY DOUBLER FD812
Supply Voltage

7.5 V

Current Drain

7 mA

Frequency Range

Input: 36.5 MHz to 43.5 MHz

Output: 73 to 87 MHz

RF Input Impedance

approx. 200 ohm

Drive

approx. 2 mW

RF Bandwidth (1 dB)

1.3 MHz

RF Output Power

9 mW, $R_{load} = 270$ ohm

FREQUENCY DOUBLER FD813
Supply Voltage

7.5 V

Current Drain

15 mA

Frequency Range

Input: 73 to 87 MHz

Output: 146 to 174 MHz

RF Bandwidth (1 dB)

1.5 MHz

Input Impedance
approx. 100 ohm

Drive
approx. 5 mW

RF Output
20 mW, $R_{load} = 50 \text{ ohm}$

BAND-PASS FILTER BP811

Frequency Range
146 to 174 MHz

Input and Output Impedance
50 ohm

Bandwidth
12 MHz

Insertion Loss
1.5 dB

POWER AMPLIFIER PA811

Supply Voltage
> 9.5 V

Current Drain
80 mA

Frequency Range
146 to 174 MHz

Bandwidth
3 MHz

Drive
10 mW

RF Output Power
300 mW

ADC Input Voltage
4 to 8 V

POWER AMPLIFIER PA812

Supply Voltage
11 V for 1 W output power
12 V for 1.5 W output power

Current Drain
230 mA at 1 W output power
300 mA at 1.5 W output power

Input Voltage
2 V for 1 W output power
4 V for 1.5 W output power

Maximum RF Output Power
1.2 W at 11 V supply voltage
1.8 W at 12 V supply voltage

Insertion Loss (Ant - RX)
0.25 dB

ADC Output
1.2 V/A

ANTENNA FILTER FN811
Input and Output Impedance
50 ohm

Insertion Loss
0.5 dB

Attenuation at 300 MHz
50 dB

ADC CIRCUIT AD801

Supply Voltage
11 V and 7.5 V

Current Drain
2 mA from 11 V
~0 mA from 7.5 V

Input Voltage
0 - 300 mV

Output Current
0 - 30 mA
 $R_{load} = 300 \text{ ohm}$, $R_{Adj} = 3.9 \text{ k ohm}$

RECEIVER MODULES

RECEIVER CONVERTER RC811

Supply Voltage

9 V to 15 V

Current Drain

1.5 mA

Frequency Range

146 to 174 MHz

Injection Frequency Range

124.6 to 152.6

Output Frequency

21.4 MHz

RF Input Impedance

50 ohm

Injection Frequency Impedance

50 ohm

Output Impedance

700 ohm or 1600 ohm

Injection Frequency Input

1 mW

RF Bandwidth

≥ 1.5 MHz

CRYSTAL OSCILLATOR XO811

Supply Voltage

7.5 V

Current Drain

< 3 mA

Frequency Range

124 to 153 MHz

RF Output

> 1 mW, $R_{load} = 50$ ohm

CRYSTAL FILTER XF803 and XF804

Type	XF803	XF804
Channel Spacing	20/25kHz	12.5kHz
Max. Frequency Dev.	± 5 kHz	± 2.5 kHz
Generator Impedance	1600 ohm	700 ohm
Output Impedance	140ohm//12p	140ohm//12p
Selectivity 3 dB	$\geq \pm 7.1$ kHz	$\geq \pm 2.35$ kHz
60 dB	$\geq \pm 15.4$ kHz	$\geq \pm 7.9$ kHz
80 dB	$\geq \pm 20.4$ kHz	$\geq \pm 10.4$ kHz
90 dB	$\geq \pm 25.4$ kHz	$\geq \pm 12.9$ kHz
Insertion loss	≤ 6.1 dB	≤ 5.6 dB
Band pass ripple	≤ 2 dB	≤ 2 dB

IF CONVERTER IC801

Supply Voltage

7.5 V

Current Drain

0.5 mA

Input Frequency

21.4 MHz

Output Frequency

103.5 kHz

Input Impedance

140 ohm // 12 pF

Output Impedance

1.2 k ohm

Bandwidth (3 dB relative to 21.4 MHz)

± 16 kHz

Power Gain

23 dB

Crystal Oscillator Frequency

21.2965 MHz

IF AMPLIFIER IA801

Supply Voltage

7.5 V

Current Drain

380 uA

Gain

44.5 dB \pm 4 dB, $R_{load} = 3.3 \text{ k ohm}$

Maximum Output

220 mV, $R_{load} = 3.3 \text{ k ohm}$

IF AMPLIFIER IA802

Supply Voltage

7.5 V

Current Drain

 $\leq 1 \text{ mA}$

Input Frequency

103.5 kHz

Bandwidth 3 dB

 $\geq 18 \text{ kHz}$

Maximum Frequency Deviation

 $> \pm 12 \text{ kHz}$

(measured at 5% distortion and BW = 25 kHz)

Input Impedance

3 k ohm

Discriminator Conversion Efficiency

38 mV/kHz at 25 kHz channel spacing

75 mV/kHz at 12.5 kHz channel spacing

12 dB SINAD SENSITIVITY

 $\leq 5 \text{ uV}$ input to IC801 (pin 9). Output measured at output of IA802 (pin 7). $\Delta f = 3.5 \text{ kHz}$, $f_{mod} = 1 \text{ kHz}$.

Discriminator Linearity

Pass-band 300 - 3000 Hz + 1 dB

Minimum Load Resistance

10 k ohm via capacitor

Harmonic Distortion

1%

SQUELCH CIRCUIT SQ801a

Supply Voltage

7.5 V

Current Drain

Squelched condition: $< 800 \text{ uA}$ Un-squelched condition: $< 900 \text{ uA}$

Output Voltage

Squelched condition: $< 0.4 \text{ V}$ Un-squelched condition: $> 5.5 \text{ V}$ Squelch disabled: $> 7.0 \text{ V}$

Input Impedance at 1 kHz

40 k ohm

Minimum Load Resistance

10 k ohm

Noise Filter Cut-off Frequency

7 kHz

Transition Time

Turn-on delay $< 20 \text{ ms}$ Turn-off delay $< 8 \text{ ms}$

AF AMPLIFIER AA801

Supply Voltage

9.6 V to 15.0 V

7.5 V

Current Drain at 11 V supply

No signal condition: $< 15 \text{ uA}$ Squelched condition: $< 170 \text{ uA}$ at 0.25 W output: $< 70 \text{ mA}$

Input Impedance at 1 kHz

120 k ohm

Loudspeaker Impedance

30 ohm

Output Power at nominal supply voltage

400 mW

measured at 1 kHz, distortion 7%

Distortion

< 5%

measured at 1 kHz and 0.25 W output

Frequency Response relative to 1000 Hz.

	100 Hz	300 Hz	3 kHz	6 kHz
25kHz	-4 dB -2/+4 dB	+9.6 dB -0.5/+1dB	-10dB -1.5/+2 dB	-19 dB -4/+1dB
12.5 kHz	-4dB -2/+4dB	+9.6dB -0.5/+1dB	-13dB -3/+3 dB	

VOLTAGE REGULATOR VR801

Supply Voltage

9.6 V to 15 V

Current Drain

< 200 μ A

Regulated Output Voltage

7.5 V \pm 2%

Maximum Regulator Output Current

60 mA

Internal Resistance of Regulator

< 2 ohm

Output Impedance at 1 kHz

< 2 ohm

Transition Time

< 15 ms