

CQP830

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, $R_L = 50 \text{ ohm}$

MODULATION AMPLIFIER AA802

Supply Voltage

7.5 V

Current Drain

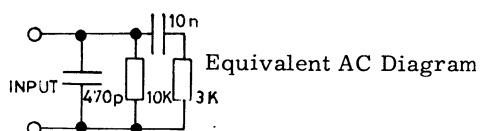
2.5 mA normal condition

3.0 mA amplifier blocked

Microphone Signal Input Impedance

12 k ohm

Tone Signal Input Impedance



Maximum DC Blocking Voltage

1.2 V

Blocking Gate Current

100 μ A

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

PHASE MODULATOR PM831

Supply Voltage

7.5 V

Current Drain

2.7 mA

Frequency Range

17.0 - 22.0 MHz

RF Input Impedance

approx. 2 k ohm

RF Drive

3 mV

AF Input Impedance

approx. 1 k ohm

Modulation Sensitivity

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

Modulation Distortion

1.5% at $\Delta f = \frac{5}{8}$ kHz, $f_{mod} = 1000$ Hz

Z generator = 600 ohm

FREQUENCY DOUBLER FD831

Supply Voltage

7.5 V

Current Drain

13.5 mA

Frequency Range

Input: 17.0 MHz to 22.0 MHz

Output: 34.0 MHz to 44.0 MHz

Input Impedance

approx. 150 ohm

Output Impedance

approx. 100 ohm

RF Input Level

- 20 dBm

RF Bandwidth (1 dB)

700 kHz

Output Power Level

2 dBm, $R_{load} = 1$ k ohm

Frequency Doubler FD832

Supply Voltage

7.5 V

Current Drain

13.5 mA

Frequency Range

Input: 34.0 MHz to 44.0 MHz

Output: 68.0 MHz to 88.0 MHz

RF Input Impedance

approx. 1000 ohm

RF Output Impedance

50 ohm

RF Input Level

2 dBm

RF Bandwidth (1 dB)

1.3 MHz

RF Output Power

8.5 dBm, $R_{load} = 270$ ohm

BAND-PASS FILTER BP831

Frequency Range

68 to 88 MHz

Input and Output Impedance

50 ohm

Bandwidth (0.5 dB)

5 MHz

Insertion Loss

3 dB

Attenuation

50 dB at $\frac{1}{2} \times F_o$

38 dB at $1.5 \times F_o$

POWER AMPLIFIER PA831

Supply Voltage

> 9.5 V

Current Drain at 10 V

65-95 mA (ADC = 10 V)

Frequency Range

68 to 88 MHz

Bandwidth (1 dB)

5 MHz

Drive

3.5 mW

RF Output Power

300 mW

ADC Input Voltage

4 to 10 V

POWER AMPLIFIER PA832

Supply Voltage

11 V for 1 W output power

12 V for 1.5 W output power

Current Drain

210 mA at 1 W output power

275 mA at 1.5 W output power

Bandwidth (1 dB)

approx. 6 MHz

Maximum RF Output Power

1.25 W at 11 V supply voltage

1.8 W at 12 V supply voltage

Insertion Loss (Ant - RX)

1 dB

ADC Output

1.2 V/A

ANTENNA FILTER FN831

Input and Output Impedance

50 ohm

Insertion Loss

0.8 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

CRYSTAL FILTER XF803 and XF804

RECEIVER CONVERTER RC831

Supply Voltage

9 V to 15 V

Current Drain

> 2 mA

Frequency Range

68 to 88 MHz

Injection Frequency Range

89.4 to 109.4 MHz

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

≥ 1.0 MHz

CRYSTAL OSCILLATOR XO831

Supply Voltage

7.5 V

Current Drain

3.5 mA

Frequency Range

90 to 110 MHz

RF Output

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

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 Drain380 μ A**Gain**44.5 dB + 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** $\geq \pm 12 \text{ kHz}$

(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 supplyNo 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 Responce 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 uA

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