3 Signal List

Package Q1 Pin No.	Name	Description
1	A2QO	Amplifier 2 output (Q Channel)
2	EAQP	Error Amplifier Input Positive (Q Channel)
3	EAQN	Error Amplifier Input Negative (Q Channel)
4	EAQO	Error Amplifier Output (Q Channel)
5	MODQP	Modulator Input (Q Channel)
6	MODQN	Modulator input reference (Q Channel)
7	VEEQTX	Analogue Ground for Q Channel Modulator
8	MON	Modulator Output Negative
9	MOP	Modulator Output Positive
10	VEEITX	Analogue Ground for I Channel Modulator
11	MODIN	Modulator input reference (I Channel)
12	MODIP	Modulator Input (I Channel)
13	EAIO	Error Amplifier Output (I Channel)
14	EAIN	Error Amplifier Input Negative (I Channel)
15	EAIP	Error Amplifier Input Positive (I Channel)
16	A2IO	Amplifier 2 output (I Channel)
17	A2IP	Amplifier 2 input Positive (I Channel)
18	A1IO	Amplifier 1 Output (I Channel)
19	A1IN	Amplifier 1 Input Negative (I Channel)
20	A1IP	Amplifier 1 Input Positive (I Channel)
21	VCCITX	Analogue Supply for I Channel Modulator
22	VCCLO1	Analogue Supply for LO path
23	VEELO1	Analogue Ground for LO path
24	LON	Local Oscillator Negative Input (Note: when differentially driving LOP and LON this LON pin requires a low impedance dc path to ground otherwise it may be decoupled to ground)
25	LOP	Local Oscillator Positive Input (Note: this pin requires a low impedance dc path to ground)
26	VEELO2	Analogue Ground for LO path
27	VCCLO2	Analogue Supply for LO path
28	VCC	Analogue Supply
29	Spare	(Do not connect to this pin: reserved for future use)
30	VREF	Bandgap reference decoupling
31	BVREF	Buffered V_{REF}
32	VEE	Analogue Ground (0V)
33	DCMEAS	DC Measurement Output
34	VDREF	Reference Supply for monitor signals full scale value
35	VCCIRX	Analogue Supply I Channel Downconverter
36	SOI	Switch Output (I Channel)
37	SII	Switch Input when open loop (I Channel)
38	DOI	Demodulator Output (I Channel)
39	VEEIRX	Analogue Ground I Channel Downconverter
40	DIP	Demodulator Input Positive
41	DIN	Demodulator Input Negative
42	VEEQRX	Analogue Ground Q Channel Downconverter
43	DOQ	Demodulator Output (Q Channel)
44	SIQ	Switch Input when open loop (Q Channel)

Package Q1 Pin No.	Name	Description
45	SOQ	Switch Output (Q Channel)
46	IASIG	Demodulator Output for Instability Detector
47	VCCQRX	Analogue Supply Q Channel Downconverter
48	IAI	Instability Amplifier Input
49	IAO	Instability Amplifier Output
50	PDI	Peak Detector Input
51	PDO	Peak Detector Output
52	VDD	Digital Supply
53	VDDIO	Supply voltage for digital control interface
54	SCK	C-BUS Serial Clock
55	SDI	C-BUS Command Data Input
56	SDO	C-BUS Reply Data Output
57	CSN	C-BUS Enable
58	RESET	General RESET (RESET active LOW)
59	VSS	Digital Ground
60	VCCQTX	Analogue Supply for Q Channel Modulator
61	A1QP	Amplifier 1 Input Positive (Q Channel)
62	A1QN	Amplifier 1 Input Negative (Q Channel)
63	A1QO	Amplifier 1 Output (Q Channel)
64	A2QP	Amplifier 2 Input Positive (Q Channel)
EXPOSED METAL PAD	VEE	This pad must be connected to Analogue Ground (0V).

Table 1 Pin List

3.1 Signal Definitions

Signal Name	Pins	Usage
AV_{DD}	VCC, VCCIRX, VCCQRX, VCCITX, VCCQTX, VCCLO2, VCCLO1	Power supply for analogue circuits
DV_{DD}	VDD	Power supply for digital circuits
VD_{IO}	VDDIO	Power supply voltage for digital interface (C-BUS)
VD_{ref}	VDREF	Power Supply for scaling analogue measurement signal outputs. (RF detector, instability detector and dc offset measurement)
DV_{SS}	VSS	Ground for digital circuits
AV_{SS}	VEE, VEEIRX, VEEQRX, VEEITX, VEEQTX, VEELO2, VEELO1	Ground for analogue circuits
V_{REF}	VREF	Connection for decoupling of internal band-gap reference voltage
BV_{REF}	BVREF	Buffered version of V_{REF} which may be used for bias of input signals etc.

Table 2 Definition of Power Supply and Reference Voltages

4 External Components

4.1 Power Supply Decoupling

The CMX998 has separate supply pins for the analogue and digital circuitry: a 3.3V nominal supply is recommended for all circuits.

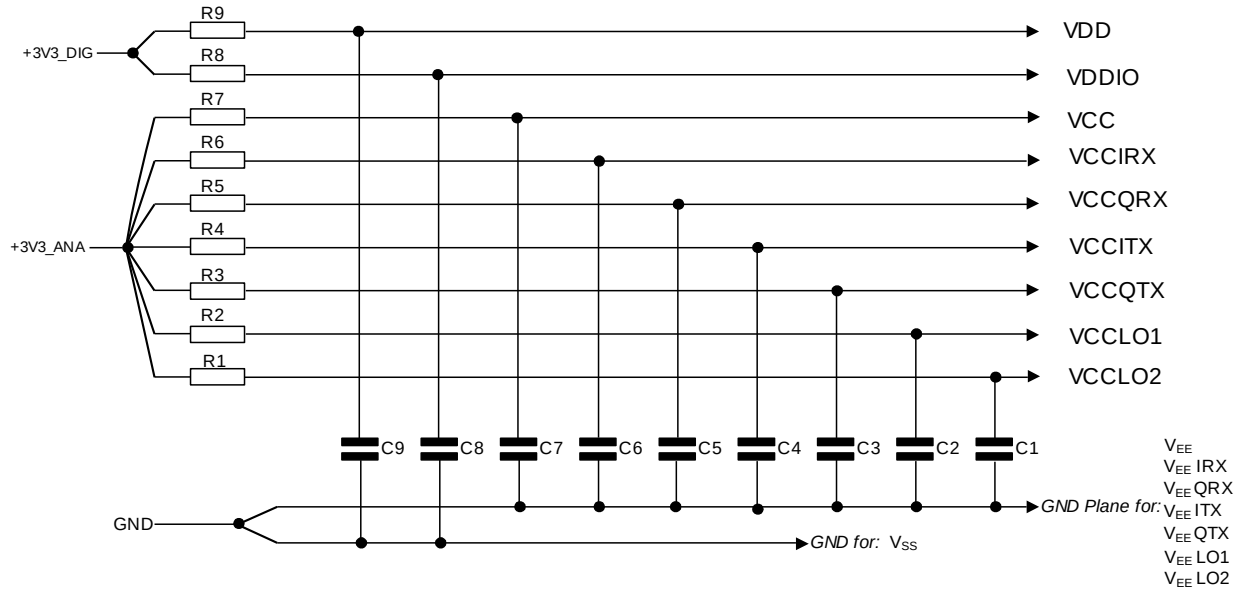

Figure 2 Power Supply Connections and Decoupling

C1	10nF	R1	3.3 W
C2	10nF	R2	3.3 W
C3	10nF	R3	3.3 W
C4	10nF	R4	3.3 W
C5	10nF	R5	3.3 W
C6	10nF	R6	3.3 W
C7	10nF	R7	3.3 W
C8	10nF	R8	10 W
C9	10nF	R9	10 W

Resistors ° 5%, capacitors and inductors ° 20% unless otherwise stated

Note:

It is expected that low frequency interference on the 3.3 Volt supply will be removed by active regulation; a large capacitor is an alternative but may require more board space and so may not be preferred. It is particularly important, to ensure that there is no interference from the VDDIO (which supplies the digital I/O) or from any other circuit that may use the +3V3_DIG supply (such as a microprocessor), to sensitive analogue supplies like VCCITX or VCCIRX. It is therefore advisable to use separate power supplies for the digital and analogue circuitry.

The supply decoupling shown is intended for RF noise suppression. It is necessary to have a small series impedance prior to the decoupling capacitor for the decoupling to work well; this may be cost effectively done with the resistor and capacitor values shown. The use of resistors results in small dc voltage drops (up to approx 0.1V). Choosing resistor values approximately inversely proportional to the dc current requirements of each supply, ensures the dc voltage drop on each supply are reasonably matched. In any case the dc voltage change that results is well within the design tolerance of the device. If higher