10 MHZ BUFFER

GENERAL DESCRIPTION

     The 10 MHz Buffer accepts a 10 MHz signal of power level
-20 to +10 dbm and has either four or eight outputs (there are
two versions). For the four output version, each of the outputs
is +11 dbm; for the eight output units, each output is +8dbm.
The input is a balanced amplifier chip, a CA3028A, which drives
two 2N3734 transistors in push-pull. The output is coupled to
the four or eight port power splitter through a low pass filter.
These units are intended to provide an approximately constant
output power with a range of input powers. Saturation occurs
at about -10 dbm input. Despite the saturation, the balanced
output stage tends to produce little odd harmonic distortion.
The even harmonics are reduced by the low pass filter, which
has its band edge at 12 MHz. The units also have good phase
stability with changes in input power, power supply voltage,
and physical temperature. The measured properties of a typical
unit are given below.

TECHNICAL PROPERTIES

1.   Output/Input Relation (8 output ports)
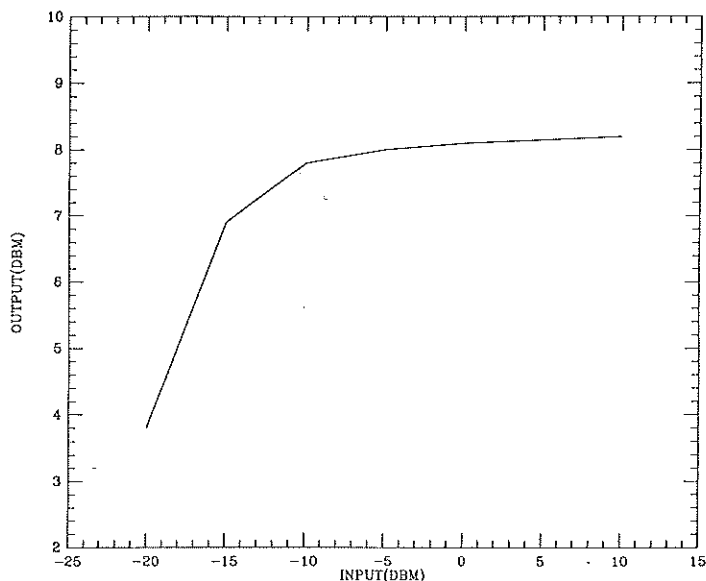
2.   Match.   The output match is -32 db.   The input match is
          also -32 db, but note that a good input match requires
          a pad on the other input port.

3. Output harmonic content.

Input(dbm)	Second Harmonic(dbc)	Third Harmonic(dbc)
-13 dbm	-66 dbc	-80 dbc
-9	-60	-60
-6	-55	-54
-3	-53	-51
+7	-54	-50

4. Dependence of transmission phase on input power.

    With -6 dbm input, a 10% input power change produced 1.0 degree phase shift. With -16 dbm input, the result was the same.
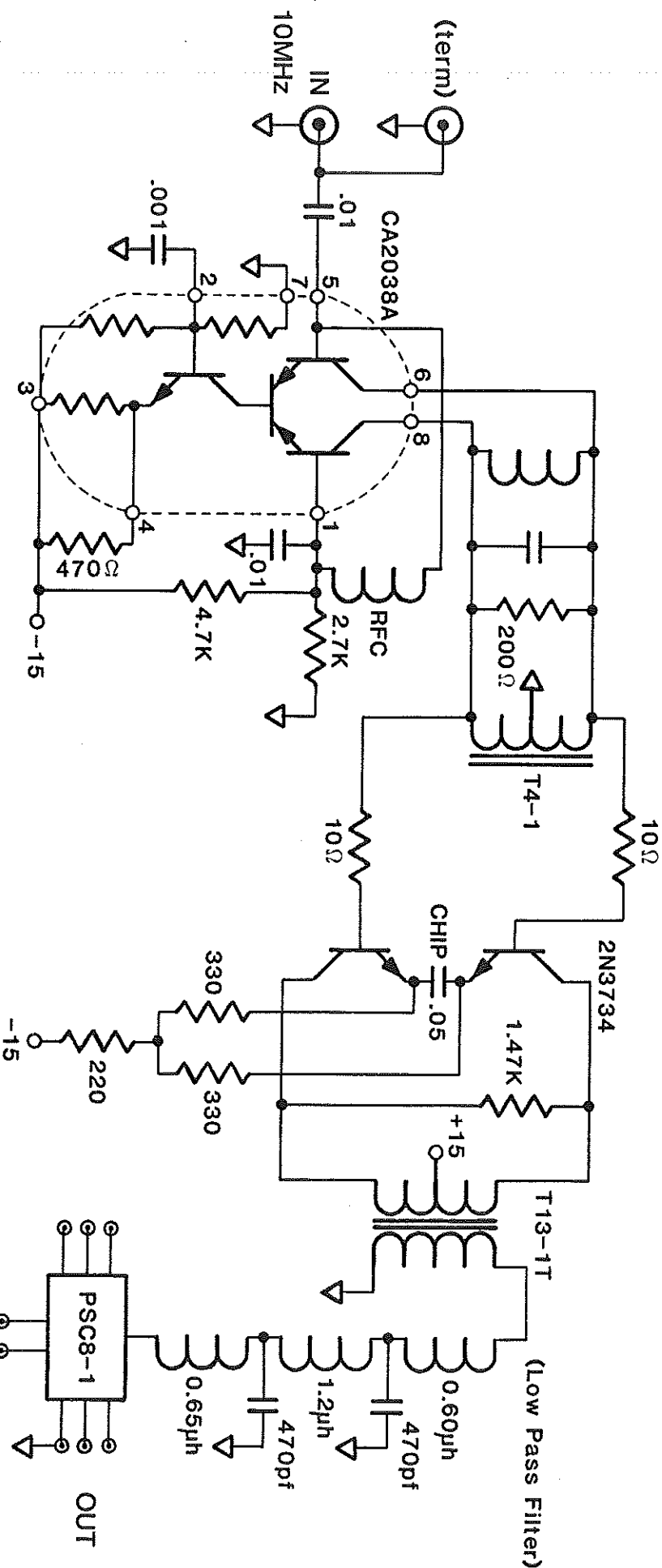
5. Dependence of transmission phase on Supply Voltage.

    Changing from 15 volts to 13 volts produced 2.0 degrees phase shift: one deg/volt
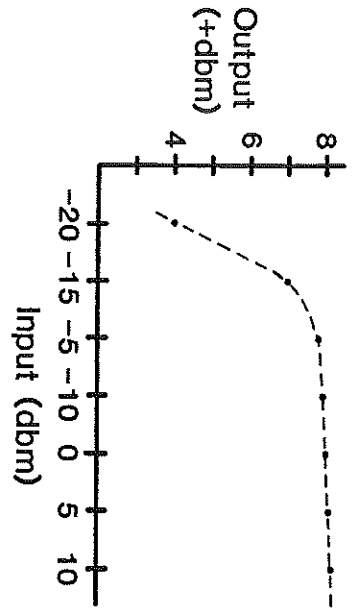
6. Dependence of transmission phase on temperature.

    In the range of 10 to 32 deg C, the magnitude of the coefficient is 0.1 deg phase/deg C.

10MHz Buffer

(term)

IN
10MHz

CA2038A

.01
.001

470 Ω
4.7K
2.7K
RFC
.01
−15

200 Ω
T4-1

10 Ω
10 Ω

CHIP .05
2N3734
330
330
220
1.47K
−15
+15
T13-1T

(Low Pass Filter)

0.60µh
470pf
1.2µh
470pf
0.65µh

PSC8-1
OUT

8 outputs; +8dbm out of each
[+11dbm out of 4-way splitters]

Each output should be terminated.
Output match and input match are −32db.

Output (+dbm) vs Input (dbm) graph

Output
(+dbm)
8
6
4

Input (dbm)
−20 −15 −10 −5 0 5 10

Output Harmonic Content

Input (dbm)	2nd Harmonic (rel. to 10)	3rd
−13	−66db	−80
−9	−60	−60
−6	−55	−54
−3	−53	−51
+7	−54	−50