

DDS Board Assembly

A number of surface mount components will be installed on the DDS board in areas away from the DDS chip in order to provide some additional practice in surface mount soldering before tackling the much finer lead spacing of the DDS chip. The space near the DDS chip will be left clear of other components to provide an uncluttered space to work on that chip.

Surface mount resistors

Install the following

- [] R5 120 Ω size 1206
- [] R4 36 Ω size 1206

Surface Mount Capacitors

Install the following

- [] C19 51 pF size 1206
- [] C18 0.1 μ F size 1206
- [] C17 0.1 μ F size 1206
- [] C7 0.1 μ F size 1206
- [] C6 0.1 μ F size 1206

note: C4 and C5 are very close together, and the two adjacent pads are electrically in common. For convenience, solder the pads at the far ends of both parts first, then solder the adjacent pads in one operation.

- [] C4 0.1 μ F size 1206
- [] C5 0.1 μ F size 1206

note: repeat the above procedure for C2 and C3

- [] C2 0.1 μ F size 1206
- [] C3 0.1 μ F size 1206

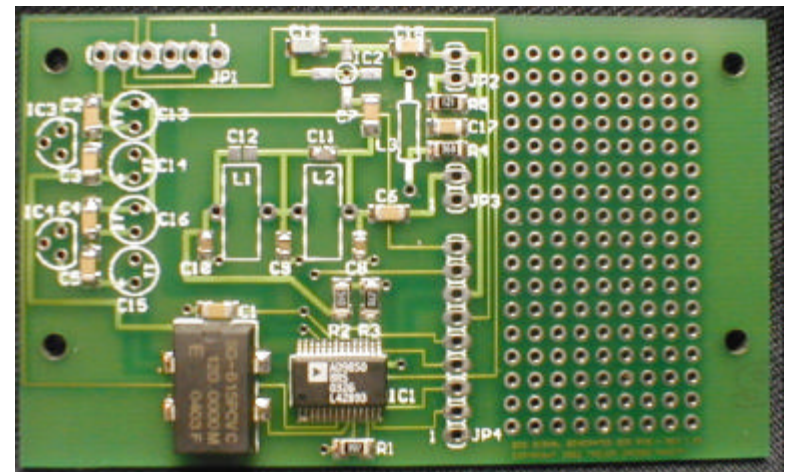


Figure 8. Top view of DDS board after surface mount components have been installed (except the ERA-1SM).

Surface Mount Capacitors (continuing)

[]	C1	0.1 μ F	size 1206
[]	C8	82 pF	size 0805
[]	C10	82 pF	size 0805
[]	C9	150 pF	size 0805
[]	C11	10 pF	size 0805

note: C12 is marked on the DDS board, but will not be used. Those pads will remain vacant.

Installation of the DDS chip - IC1

The leads of IC1 (AD9850) are exceedingly closely spaced and great care must be used when installing this part. Alignment of the chip leads with the circuit board pads is critical. A very fine tipped soldering iron is required.

Begin by applying a very small amount of liquid solder flux to the IC1 pads on the circuit board. Position the chip over the pads and, using a magnifier, verify that the leads and pads are aligned. Be sure that the chip is oriented properly (see Figure 9). Holding the chip in position, heat the pad at one corner with the tip of the soldering iron, just enough to cause the solder plating on the pad to flow and wet the lead of the chip.

Double check the alignment and then repeat the above process with a lead at the opposite corner of the chip. ***Before proceeding any further check the alignment again.***

Now carefully heat each pad, just touching the pad and the chip's lead with the tip of the soldering iron. After all leads, including the first two corner pads, have been soldered, use the magnifier and carefully inspect for any connections where the solder has not flowed, or for the presence of solder bridges.

[]	IC1	AD9850	DDS surface mount integrated circuit
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Installation of the remaining surface mount components may now proceed.

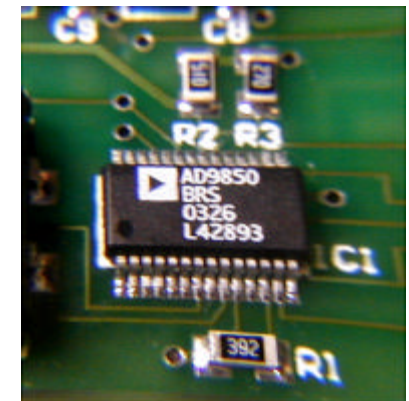


Figure 9. DDS chip in position for soldering.

Surface mount resistors

Install the following

- [] R2 51 Ω size 1206
- [] R3 27 Ω size 1206 note: this part is marked 25 Ω on the schematic
- [] R1 3.9 K size 1206

Surface Mount Oscillator Module and Broad Band Amplifier

Install the QG1, the 120 MHz oscillator. Carefully observe the orientation of the notch at one end of the chip (see Figure 8). Be sure the notched end of the chip is placed nearest capacitor C1.

- [] QG1 SG-615PCVC 120 MHz Oscillator module

Install the ERA-1SM broadband amplifier chip at IC-2. Note the dot on the package outline closest to C7. Be sure the corresponding lead of the ERA-1SM matches this orientation (see Fig. 10).

- [] IC2 ERA-1SM 4-lead monolithic amplifier.

This completes installation of the surface mount components on the DDS board. Inspect the board once more for component alignment, unsoldered leads, or solder bridges

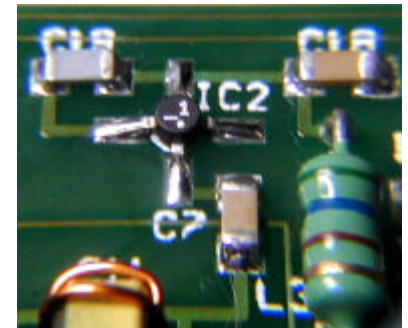


Figure 10. ERA-1SM in position for soldering.

Through-Hole Components

Install the following, being careful to observe the polarity of the electrolytic capacitors

- [] C13 10 μ F 25 V axial leads
- [] C14 10 μ F 25 V axial leads
- [] C15 10 μ F 25 V axial leads
- [] C16 10 μ F 25 V axial leads
- [] L3 560 μ H molded axial rf choke

Install the following TO-92 packaged voltage regulators. Be careful to position the flat side of the component according to the outline on the circuit board.

- [] IC3 78L05 TO-92 case
- [] IC4 78L05 TO-92 case

Two toroidal inductors, L1 and L2, are required. For each one, cut 6 inches of AWG#25 enameled wire and wind 8 turns on a T-36-6 (usually color coded yellow) core. Count one turn each time the wire penetrated the middle of the core, and distribute the turns evenly over about 80% of the core's circumference. Scrape the enamel from the wire almost to the body of the core, then tin the leads with solder. Be sure the leads are thoroughly scraped and tinned, since PTTL (poorly tinned toroid leads) is one of the most frequent causes of malfunctioning kits. Insert the tinned leads through the circuit board holes and gently pull the leads to bring the toroid snug against the board. Bend the leads slightly to hold the toroid in place for soldering.

[] L1 0.2 μ H 8 t #24 - T37-6

[] L2 0.2 μ H 8 t #24 - T37-6

Connectors

Install the following

[] JP1 6-pin **male** header connector, installed on the **BOTTOM** of the DDS board

[] JP2 2-pin **male** header connector, installed on the TOP of the DDS board

[] JP3 2-pin **male** header connector, installed on the TOP of the DDS board

[] JP4 9-pin **male** header connector, installed on the TOP of the DDS board

note: JP4 is optional. It will only be used if the DDS extension feature is used.

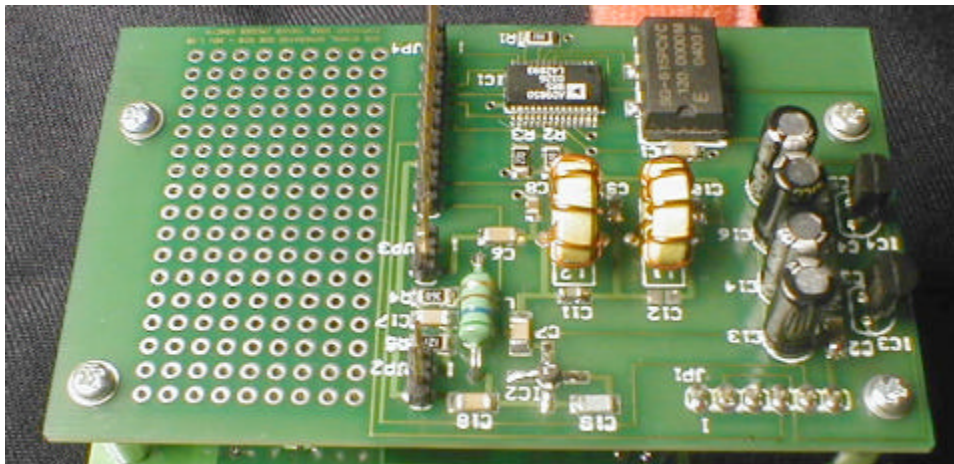


Figure 11. Completed DDS board, top view.