

#### 4.3.1.2.4 Sample Removal

To remove a sample mounted to a sample card with rubber cement, gently push the side of the sample with a wooden stick or other soft object to shear it from the adhesive.

### CAUTION

**Prying the sample up with tweezers or a razor blade can damage the sample. Pushing on the sample with any hard, sharp object can also cause damage.**

Remove lead wires from the sample with tweezers and a soldering iron. To reuse a card, remove any adhesive left on the card and remove all leads. Remove adhesive gently to avoid scratching the card. Remove typical “permanent” inks from the card with isopropyl alcohol or acetone.

#### 4.3.1.3 Mounting a Sample to the Prober Sample Card

The prober sample card has tungsten needle probes to contact the sample. Samples contactable with the needle probes can be rapidly mounted and demounted. A prober sample card with a 50 mm (2 in) diameter sample wafer (but only two probes making contact to the sample) is shown in FIGURE 4-5.

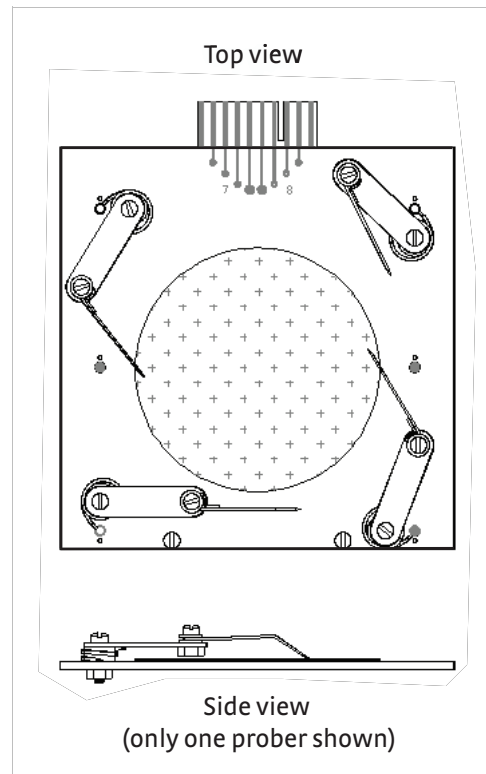


FIGURE 4-5 Prober sample card

Use this procedure to mount samples.

1. Move the probe tips out of the sample mounting region. The probe tips can be picked up and swung out of the way using your fingers or tweezers.
2. Place the sample in the center of the prober card. Hold the card up to a light to see the sample mounting area indicator on the back side. The “X” marks the center of the sample mounting area (as well as the tail of the positive magnetic field vector oriented up through the sample).
3. Pick up one probe tip at a time and place it on the desired contact location on the sample. Some samples might have metallized contact pads.



**Ohmic contact can be made by direct contact to some semiconducting samples, typically those with higher electrical conductivity. Ohmic contacts can sometimes be formed by running current through the contacts, typically a current significantly higher than the measurement current. Be careful, excessive currents could damage sensitive samples!**

The force required to move the prober arms can be changed by tightening or loosening the nylon screws and nuts. The force of the prober on the sample can be adjusted by swinging the probe tip over the edge of the card and then bending the probe needle up or down as required.

Nothing (sample, arms, or probers) should extend beyond the edges of the prober card or they might contact the inside of the sample enclosure.

Heavy samples might require additional support. A small amount of temporary adhesive such as rubber cement could be used. The two nylon screw heads at the bottom of the prober sample card can be used as rests for 75 mm (3 in) diameter wafers. Similar rests could be added as needed.

Accurate van der Pauw measurements require the probes to be as near a sample edge as possible. Some compromise might be necessary if the edge of the sample is not uniform. Symmetrically placed probes on a symmetrical sample generally improve measurement accuracy by minimizing misalignment voltages. For further discussion of this subject, see Appendix A: Hall Effect Measurement Theory and Practice.

#### 4.3.1.4 Using Auxiliary Contacts

The auxiliary contacts shown as numbers 9 and 10 in FIGURE 4-6, are available for a temperature sensor, heater, light source, sample bias, additional sample contacts, or other use. The auxiliary contacts are not guarded and their use might not be directly supported by the hardware or software supplied.

The four auxiliary contacts, numbered 7-10 on the sample card, are connected to the 10-pin bulkhead connector on the junction box (FIGURE 4-1). Wiring assignments are given in TABLE 4-4.

Connector	Pin	Use	Wire R [Ω]
B-1	1	Sample card pad #1	25
B-2	2	Sample card pad #2	
B-3	3	Sample card pad #3	
B-4	4	Sample card pad #4	
B-5	5	Sample card pad #5, I+ for Hall bars	
B-6	6	Sample card pad #6, I- for Hall bars	
B-7	A	Sample card pad #10; "Sensor": temperature sensor (Channel B), V-	8
	B	Sample card pad #9; "Sensor": temperature sensor (Channel B), V+	
	C	Sample card pad #8; "Sensor": temperature sensor (Channel B), I-	
	J	Sample card pad #7; "Sensor": temperature sensor (Channel B), I+	
	D	Heater, 50, 1 A, in header block (Loop 1), I+	
	E	Heater, 50, 1 A, in header block (Loop 1), I-	
	G	"Control" temperature sensor (Channel A), V-	
	H	"Control" temperature sensor (Channel A), V+	
	F	"Control" temperature sensor (Channel A), I-	
K	"Control" temperature sensor (Channel A), I+		
B-8		unused	

TABLE 4-4 Sample connection wiring for the 75013 SCSM