COMPONENT NEWS

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Progress in Power

While Planar and Planar Epitaxial power devices have been available for some time, only recently have devices been introduced at reasonable prices. *Fairchild* semiconductor has several new devices of this construction, coupled with a descrete emitter (overlay) process which provides switching times well into the sub μs area. F_t's in the 30 - 70 MHz and V_{CE}'s to 250 V are available with maximum I_C's to 12A. Some of these devices use a nichrome overlay to balance current between emitters and improve safe operating areas. Very high frequency overlay devices (100 - 600 MHz) are still limited to low V_{CE}'s (30 - 50 V) and high costs, although some breaks below $10.00 in quantity now exists.

Higher voltage devices of the alloy type are also becoming available at more nearly reasonable prices. The DTS 423, safe-area specified to 300 V_{CE}, is presently under $5.00 at the 1 k level. *Motorola* recently introduced a line nearly identical at similar prices. Lower current devices in TO-66 packages are also available to 350 V_{CE}. Rumors are that very high voltage (over 1 kV ?) devices may soon be available, but very little is known of these at this time.

Higher current silicon NPN devices are becoming more common, though if you need beta above 15 A I_C, germanium PNP is still the best bet. New high current NPN silicon has been recently introduced by *Motorola* with V_{CE}'s in the 40 - 60 V area and we hear promises from *RCA* of more of the same. Unfortunately, high current PNP silicon is still a ways off, if cost is important. Manufacturers seem to be having trouble with the larger PNP devices in most areas.

Plastic power devices are available now at interesting prices, but much evaluation needs to be done to ensure good reliability, and present devices are limited to relatively narrow performance ranges.

-Dick Compton

Several Notes About Using The New Smaller (DO-35) Size Diodes

The first high volume parts in the DO-35 package will soon be available replacing the present DO-7 size units. Two vendors have been approved for each of the 152-0141-00 and 152-0185-00 devices with large scale shipments expected to begin about week 49. Other suppliers are under evaluation and will be approved as time permits, provided their parts meet the standards set by our present sources. Other part numbers will be approved as various devices become available in the DO-35 package. Present technology does not permit the extremely low leakage (less than about 100 pA), high voltage (above about 100 V), or Germanium devices to be supplied in this size. Need I add that several manufacturers are trying various methods to overcome the problems presented by the physical contact between the Silicon semiconductor chip and the glass case. Low power (.4 W or less) zeners are also expected to be available shortly.

Plant IV now has its first insertion machine in operation for this size part. It will place the diodes on .5 inch centers. A second machine for .4 inch spacing is expected to be available by week 10, corresponding to the beginning of production of the 3S5 and 3T5. These machines are designed to take the diodes (and 1/8 W molded composition resistors) from lead taped reels and hence polarity is very important. Each orientation of the device (no problem for the resistors) will require a separate setup in the machine. *For example: Initial design of one etched circuit board for the 3S5 would require 4 setups on the .5 inch machine and 2 additional setups on the .4 inch machine just to place the 152-0185-00 diodes into position. This could be reduced to 4 just by a redesign of the board so that only one "spacing" is used and possibly to 2 if the few devices which are at right angles to the majority of the parts could be rotated 90 degrees and placed in parallel with the others.* While setup time is not expected to be very great, it can add up to quite a total if too much unnecessary handling is involved. Another consideration is that these machines will insert only one type of value of part at a time (unlike the present *Hughes* Numerically Controlled inserter which can place a series of different parts in one pass) so each type or value of part will require a different supply reel and setup for that part.

A major consideration in the change-over to the smaller package was the economy which could be achieved by machine manufacturing methods as compared to the hand assembly required by the DO-7 package. The 152-0185-00 last year cost us about 15 cents each, while in the new package the price is in the 8 cent area with drops in the forseeable future to under a nickel. For a device which is used at a two million per year level, this can create quite a savings. The price reductions on the 152-0141-00 are even more dramatic, but the lesser usage of that device will not effect the cost picture to as great an extent. In addition, we are getting a more rugged device, better heat dissipation, and greater packing densities.

Part numbers 152-0141-02 and 152-0185-01, the present devices in the DO-35 only size, will be deleted from the parts list in about 6 months when all present stock of the DO-7 devices has been processed through manufacturing. Usage of these parts will revert to the respective -00 numbers.

For further information contact me at Ext. 7263.

-Jim Kassebaum