

# ***Tucson Amateur Packet Radio***

*A Non-Profit Research and Development Institute*

subject: **Battery Backup Diode Requirements for TUC52 and Diode Test Procedure**

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## **Memorandum**

### **1. INTRODUCTION**

The TAPR TUC-52 (TAPR Universal Controller) makes use of diodes to route power to the battery backup RAM. These diodes should have low forward voltage drop and low reverse current. Diodes such as germanium 1N270 diodes are suitable, provided they meet the reverse current leakage requirements. Schottky diodes may also be suitable, provided they meet the forward voltage requirements.

### **2. DIODE REQUIREMENTS**

TUC52 diodes D8 and D9 have must meet special requirements shown in Table 1 below.

D8		D9	
Max Vf @ 10 mA	Max Ir @ 10 V	Max Vf @ 10 mA	Max Ir @ 10 V
400 mV	5 uA	400 mV	5 uA

The forward voltage (Vf) specification determines the amount of voltage provided to the RAM device. If Vf is too large, the RAM may not have sufficient voltage to provide error-free operation. The reverse current (Ir) specification for D8 determines the amount of current drained from the battery that flows through D8 to the +5 rail (which is grounded when main power is removed from TUC52). The D8 Ir simply represents lost energy. The reverse current (Ir) specification for D9 determines the amount of current from the powered +5 bus through D9 to the battery. For some button type batteries, forcing a charge current into the battery (which is what Ir through D9 represents) is detrimental to the battery.

### **3. TEST FIXTURE**

The test fixture for measuring forward voltage ( $V_f$ ) is shown in Figure 1 below. The test fixtures for measuring reverse voltage ( $I_r$ ) is shown in Figure 2 below.

NOTE: Acceptable results can be achieved by using a common 9V transistor radio battery in place of the 10VDC source shown in Figures 1 and 2.

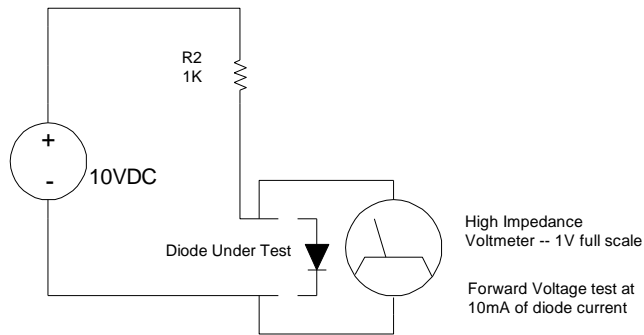


Figure 1 -- Diode Forward Voltage Test Fixture

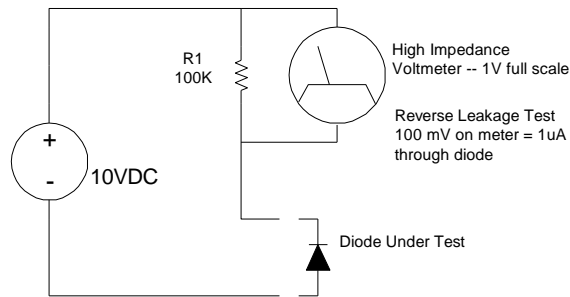


Figure 2 -- Diode Reverse Current Test Fixture

