Brief reliability summary

The unique sandwich construction of the 5 watt audio lead frame guarantees full thermo-mechanical stability of the construction during the sharp thermal cycling experienced in audio I.C.'s—testing has proven that the product withstands in excess of 6000 supply switches at full power and 70°C ambient—representing a life of greater than 10 years under normal use.

Similarly, the unique heat sink attachment-using advanced crimping techniques with extruded aluminium—gives excellent long term mechanical/thermal stability.

Tests have been performed which show the product to exceed the vibration and shock requirements normally placed on car radio components.

External components

The output D.C. quiescent voltage is set by the voltage on pin 1, which is in turn set by the internal voltage on pin 2 less the Iin (Ra + Rb), where Iin is the input current for Q4. The voltage on pin 2 has been set slightly above half the supply voltage to allow for the volt drop across Ra + Rb. The filter Rb C3 is to attenuate any A.C. ripple injected from the supply line and to prevent positive feed back appearing on pin 1. The supply voltage rejection is a direct function of the filter attenuation.

The input signal applied through C2 sees an input impedance determined by Ra in parallel with the input impedance of the amplifier, which is a function of open loop gain, closed loop gain and Q8 current. In practice this is well above 1MΩ and the input impedance of the amplifier will in most cases be set by Ra.

The value of C1 used will depend on the regulation of the power supply. It is possible for the amplifier to work with a value of C1 as low as 0.1μF to attenuate high frequency supply line signals. C1 should ideally be placed as near pin 10 as possible. For a poorly regulated supply C1 should be an electrolytic to avoid ripple appearing on the output.

The closed loop gain is set by the ratio $\frac{R2+R1+RC}{R1+RC}$ where R1 and R2 are internal and RC external where closed loop gains below 46dB are required. The low frequency 3dB point will be reached when impedance of C5 equals RC+R1. Where very low closed loop gains are required less than 30dB, it is necessary to decouple high frequency signals by C4, which should be chosen so that at the top end of the desired band width its impedance is less than R1 + RC.

Capacitor C6 from pin 15 provides overall compensation, the first break-point for a 46dB closed loop gain occurring at 200 Khz for C6 equal to 1000pf. Increase in C6 above this value will start limiting the slew rate at high signal levels as C6 is charged via the constant current source Q10 for positive going signals. Capacitor C7 provides compensation on negative voltage swings, the PNP Q19 having a lower ft than the NPN devices.

The filter C8 RD on the output is a standard requirement for audio class B outputs driving reactive loud speaker loads, the capacitance compensating for speaker inductance and the resistor RD limiting current surges through the capacitor.

The value of the coupling capacitor to the load will determine the low frequency response of the amplifier where the impedance of C9 equals the load impedance.