

Ref: Michael Kiwanuka "The Safe Operating Area (SOA) Protection of Linear Audio Power Amplifiers " Fig 41

Ref: David Eather "A Practical Approach to Amplifier Output Stage Design"

Ref "APEX Microtechnology AN22 SOA and Load Lines"

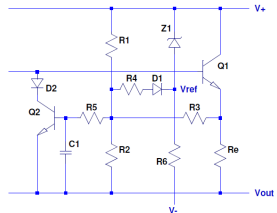


FIG41

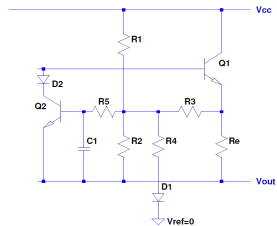


Fig A

Input Values

Input Data

Result

Data sheet (approx)

| Protected pairs N | 1       | Pmax(W) | I(A)  |
|-------------------|---------|---------|-------|
| Vcc               | 48.00   | V       |       |
| Re                | 0.39    | Ω       |       |
| R1                | 6200    | Ω       | 1.469 |
| R2                | 47      | Ω       | 0.006 |
| R3*               | 120     | Ω       | 0.073 |
| R4                | 3300    | Ω       | 0.600 |
| Vref              | 0       | V       |       |
| V <sub>DSQ2</sub> | 0.55    | V       |       |
| I <sub>D1</sub>   | 0.01348 | A       |       |
| V <sub>ID1</sub>  | 0.55    | V       |       |

From sheet  
"Fig 1  
single"

\*For N protected pairs of o/p devices, R3 actual = R3\* x N = 120

| Vce@Ic=0 | Vce     | Ic     | Vout     | Dual slope<br>Vref=0 |
|----------|---------|--------|----------|----------------------|
|          | 0.0000  | 9.0116 | 44.4855  |                      |
|          | 46.9641 | 2.6561 | 0.0000   |                      |
|          | 95.8932 | 0.2739 | -48.0000 |                      |

101.520

| S/C | P(W) |
|-----|------|
| 0   | 125  |

$$I_{C@V_{CE}=0} = V_{be}(R_2 + R_1 R_3 / (R_1 + R_3)) / (R_2 R_e)$$

$$V_{C@I_{C=0}} = I_{C@I_{C=0}} (1 + R_1 / R_3)$$

4.9425 single slope ie R4 = O/C

101.5199

|         |        |
|---------|--------|
| 0.0000  | 4.9425 |
| 46.9641 | 2.6561 |
| 95.8932 | 0.2739 |

single slope  
Fig 1

|    |       |    |
|----|-------|----|
| R5 | 10000 | Ω  |
| C1 | 1     | μF |

| Loss    | Freq (Hz) | Period (ms) |
|---------|-----------|-------------|
| -0.25dB | 3.98      | 251.33      |
| -1dB    | 7.96      | 125.66      |
| -3dB    | 15.92     | 62.83       |
| -7.5dB  | 31.83     | 31.42       |
| -12.5dB | 63.66     | 15.71       |
| -18dB   | 127.32    | 7.85        |

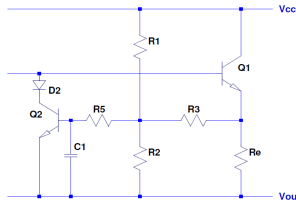


Fig 1

