

### 1.0 DESCRIPTION

Hybrid Integrated Circuit, Channel Switch. Initially Designated as H752.
The component consists of two M178 SHF III chips mounted on a $1.75 \times 1.75$ $x .0635 \mathrm{~cm} \mathrm{A1} 2_{3}$ thin film substrate.
2.0 ABSOLUTE MAXIMUM RATINGS
2.1 Storage Temperature Range ( $\mathrm{T}_{\text {stg }}$ ) . . . . . . . . . $-55^{\circ} \mathrm{C}$ to $+125^{\circ} \mathrm{C}$
2.2 Operating Ambient Temperature ( $\mathrm{T}_{\mathrm{A}}$ ) . . . . . . . . 0 to $+70^{\circ} \mathrm{C}$
2.3 Total Device Power Dissipation ( $\mathrm{P}_{\mathrm{DAX}}$ ) . . . . . . . 2,8 Watts
2.3 Maximum Voltage (Pins 2, 3, 12, and 13) . . . . . . . 15 Volts
(Referred to Substrate Backplane)
2.4 Maximum Current (Pins 2, 3, 12, and 13) . . . . . . . 200 mA
2.5 Maximum Input Signal (Pins 7, 9, 17, and 19) . . . . . $\pm 1$ Volt
(Referred to Substrate Backplane)

### 2.6 Electrical Specification

Parameters measured at $25^{\circ} \mathrm{C}$ substrate backplane temperature.

### 3.0 SCHEMATIC



| TEKTRONIX.INC. beAVERTON. OREGON | sht 3 of 30 | $\begin{aligned} & \text { CODE IENT NO } \\ & 80009 \end{aligned}$ | ${ }^{\text {S12E }}$ | PART NumaER | 155-0206-00 | $\begin{gathered} \text { REV } \\ A \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |

### 3.1 Layout Drawing





An
PART NUMBER

### 4.0 PARAMETRIC DEFINITIONS

$$
\text { Refer to Section } 5.0 \text { (Parametric Summary) }
$$

### 5.0 PARAMETRIC SUMMARY

Electrical characteristics (for an ambient temperature of $25^{\circ} \mathrm{C}$ except where a different temperature may be shown).

| NO | SYMBOL | PARAMETER | CONDITIONS | MIN | MAX | UNIT |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | $\begin{gathered} \mathrm{I}_{\mathrm{CBO}}^{1-4} \\ 9-12 \\ \text { at } 8 \text { Volts } \end{gathered}$ | Collector-base leakage of Q1, Q2, Q3, Q4, Q9, Q10, Q11, and Q12 in parallel, emitters open | Pins 7, 8, 9, 17, 18, and 19 , back of substrate grounded. <br> Pins 1, 2, 3, 10, 11, 12, 13, and 20 held at +8.8 volts. <br> All other pins open <br> Measure current from +8.8 volt source |  | 50 | $\mu \mathrm{A}$ |
| 2 | $\begin{gathered} \mathrm{I}_{\text {CES }} 1-4, \\ 9-12 \\ \text { at } 8 \text { Volts } \end{gathered}$ | Collector-emitter leakage of Q1, Q2, Q3, Q4, Q9, Q10, Q11, and Q12 in parallel, bases shorted to emitters | Same as in \#1 except Pins 4, 5, 6, 14, 15, and 16 grounded |  | 50 | $\mu \mathrm{A}$ |
| 3 | $\begin{gathered} \mathrm{I}_{\mathrm{CBO}}^{5-8} \\ 13-16 \\ \text { at } 12 \text { Volts } \end{gathered}$ | Collector-base leakage of Q5, Q6, Q7, Q8, Q13, Q14, Q15, and Q16 in parallel, emitters open | Pins 1, 10, 11, and 20 grounded <br> Pins 2, 3, 12, and 13 held at +12 volts <br> All other pins, substrate backplane open <br> Measure current from +12 volt source |  | 50 | $\mu \mathrm{A}$ |



| PARAMETRIC SUMMARY (continued) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NO | SYMBOL | PARAMETER | CONDITIONS | MIN | MAX | UNIT |
| 7 | $\mathrm{I}_{\mathrm{in}_{7}}$ | Pin 7 input bias current with total emitter current at 80 mA per channel | Pins 1 and 11 held at +2.0 volts <br> Pins 10 and 20 held at +2.6 volts <br> Pins 12 and 13 through $50 \Omega$ resistors to +9.8 V <br> Pins 2 and 3 through $50 \Omega$ resistors to +5.8 V <br> Pins 4, 6, 14, and 16 through $103 \Omega$ resistors to -3.95 volts <br> Pins 5 and 15 to -3.95 V <br> Pins 8 and 18 grounded <br> Pins 7, 9, 17, and 19, substrate backplane held at 0.0 volts <br> Measure current delivered by source connected to Pin 7 | 80 | 450 | $\mu \mathrm{A}$ |
| 8 | $\mathrm{I}_{\mathrm{in}_{9}}$ | Pin 9 input bias current with total emitter current of 80 mA per channel | Same as \#7 except measure current delivered by source connected to Pin 9 | 80 | 450 | $\mu \mathrm{A}$ |
| 9 | $\mathrm{I}_{\text {in Substrate }}$ | Q2, Q3, Q10, and Q11 input bias current with total emitter current of 80 mA per channe1 | Same as in \#7 except measure current delivered by source connected to substrate backplane | 0.320 | 1.800 | mA |
| 10 | $\mathrm{I}_{\mathrm{in}}^{10(0 \mathrm{~N})} \textrm{}$ | Pin 10 input bias current with channel "on" and total emitter current of 80 mA per channel | Same as \#7 except measure current delivered by source connected to Pin 10 | 0.320 | 1.800 | mA |
| 11 | $\mathrm{I}_{\mathrm{in}}^{11(\mathrm{ON})},$ | Pin 11 input bias current with channel "on" and total emitter current of 80 mA per channel | Same as \#7 except measure current delivered by source connected to Pin 11 | -10 | +10 | $\mu \mathrm{A}$ |


| PARAMETRIC DEFINITIONS (continued) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NO | SYMBOL | PARAMETER | CONDITIONS | MIN | MAX | UNIT |
| 12 | $\mathrm{I}_{\mathrm{in}_{17}}$ | Pin 17 input bias current with total emitter current of 80 mA per channel | Same as \#7 except measure current delivered by source connected to Pin 17 | 80 | 450 | $\mu \mathrm{A}$ |
| 13 | $\mathrm{I}_{\mathrm{in}_{19}}$ | Pin 19 input bias current with total emitter current of 80 mA per channel | Same as \#7 except measure current delivered to by source connected to Pin 19 | 80 | 450 | $\mu \mathrm{A}$ |
| 14 | $\mathrm{I}_{\mathrm{in}_{20() N}}$ | Pin 20 bias current with channel "on" and total emitter current of 80 mA per channel | Same as \#7 except measure current delivered by source connected to Pin 20 | 0.320 | 1.800 | mA |
| 15 | $\mathrm{I}_{\mathrm{n}_{1(0 N)}}$ | Pin 1 bias current with channel "on" and total emitter current of 80 mA per channel | Same as \#7 except measure current delivered by source connected to Pin 1 | -10 | +10 | $\mu \mathrm{A}$ |
| 16 | $\mathrm{I}_{\left.\mathrm{in}_{20(0 \mathrm{FF}}\right)}$ | Pin 20 bias current with channel "off" and total emitter current of 80 mA per channel | Same as \#7 except: <br> Pin 1 held at +2.6 V <br> Pin 20 held at $+2.0 V$ <br> Pin 11 held at +2.6 V <br> Pin 10 held at +2.0 V <br> Pin 2 through $50 \Omega$ to +9.8 volts <br> Pin 3 through $50 \Omega$ to +9.8 volts <br> Pin 12 through $50 \Omega$ to +5.8 volts <br> Pin 13 through $50 \Omega$ to 5.8 volts <br> Measure current delivered by source connected to Pin 20 | -10 | +10 | $\mu \mathrm{A}$ |
| 17 | $\mathrm{I}_{\mathrm{in}_{10(0 \mathrm{FF})}}$ | Pin 10 bias current with channel "off" and total emitter current of 80 mA per channel | Same as \#16 except measure current delivered by source connected to Pin 10 | -10 | +10 | $\mu \mathrm{A}$ |


| PARAMETRIC SUMMARY (continued) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NO | SYMBOL | PARAMETER | CONDITIONS | MIN | MAX | UNIT |
| 18 | $\mathrm{I}_{\mathrm{in}_{11(\mathrm{OFF})}}$ | Pin 11 bias current with channel "off" and total emitter current of 80 mA per channel | Same as \#16 except measure current delivered by source to $\operatorname{Pin} 11$ | 0.320 | 1.800 | mA |
| 19 | $\mathrm{I}_{\text {in }}{ }_{\text {( OFF })}$ | Pin 1 bias current with channel "off" and total emitter current of 80 mA per channel | Same as \#16 except measure current delivered by source connected to Pin 1 | 0.320 | 1.800 | mA |
| 20 | $V_{\text {OUT 1 (ADD }}$ | Common mode DC output voltage, ADD mode | Pins 7, 9, 17, and 19 open | 5.6 | 5.8 | v |
|  |  |  | Pins 10 and 20 to 2.6 volts |  |  |  |
|  |  |  | Pin 3 through $50 \Omega$ to +5.8 volts |  |  |  |
|  |  |  | Pin 4 through $103 \Omega$ to -3.95 volts |  |  |  |
|  |  |  | Pins 5 and 15 to -3.95 volts |  |  |  |
|  |  |  | Pin 6 through $103 \Omega$ to -3.95 volts |  |  |  |
|  |  |  | Pins 8 and 18, substrate backplane grounded |  |  |  |
|  |  |  | Pins 1 and 11 to 2.0 volts |  |  |  |
|  |  |  | Pin 2 through $50 \Omega$ to +5.8 volts |  |  |  |
|  |  |  | Pin 14 through $103 \Omega$ to -3.95 volts |  |  |  |
|  |  |  | Pin 16 through $103 \Omega$ to -3.95 volts |  |  |  |
|  |  |  | Pin 12 through $50 \Omega$ to +9.8 volts |  |  |  |
|  |  |  | Pin 13 through $50 \Omega$ to +9.8 volts |  |  |  |
|  |  |  | Measure average of voltages at Pins 12 and 13 |  |  |  |



### 5.0 PARAMETRIC SUMMARY (continued)

| NO | SYMBOL | PARAMETER | CONDITIONS | MIN | MAX | UNIT |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 24 | $V_{O S 1}$ (ADD) | Output \#1 offset voltage, ADD mode | Same as \#20 except measure voltage at Pin 12 with respect to $\operatorname{Pin} 13$ | -100 | +100 | mV |
| 25 | $V_{0 S 1} 1$ (L-ADD) | Output \#1 offset voltage between modes, LEFT-ADD | $\begin{aligned} & V_{O S} 1(L-A D D)= \\ & V_{O S} 1(L)^{-V_{O S} 1(A D D)} \end{aligned}$ | -50 | +50 | mV |
| 26 | $V_{0 S 1} 1(R-L)$ | Output \#1 offset voltage between modes, RIGHT-LEFT | $\begin{aligned} & V_{O S ~} 1(R-L) \quad= \\ & V_{O S} 1(R)^{-V_{O S} 1(L)} \end{aligned}$ | -50 | +50 | mV |
| 27 | $V_{O S 1} 1$ (R-ADD) | Output \#1 offset voltage between modes, RIGHT-ADD | $\begin{aligned} & V_{O S ~} 1(R-A D D) \\ & V_{O S} 1(R)^{-V_{O S}} 1(A D D) \end{aligned}$ | -50 | +50 | mV |
| 28 | $V_{0 S} 2(L)$ | Output \#2 offset voltage, LEFT mode | Same as \#22 except measure voltage at Pin 3 with respect to Pin 2 | -100 | +100 | mV |
| 29 | $V_{0 S 2}$ (R) | Output \#2 offset voltage, RIGHT mode | Same as \#23 except measure voltage at Pin 3 with respect to Pin 2 | -100 | $+100$ | mV |
| 30 | $V_{0 S} 2$ (OFF) | Output \#2 offset voltage, OFF mode | Same as \#21 except measure voltage at Pin 3 with respect to $\operatorname{Pin} 2$ | -100 | +100 | mV |
| 31 | $V_{0 S 2}$ (L-OFF) | Output \#2 offset voltage between modes, LEFT-OFF | $\begin{aligned} & V_{\text {OS 2(L-OFF) }}= \\ & V_{\text {OS 2(L) }}-V_{\text {OS 2 }} \text { (OFF) } \end{aligned}$ | -50 | +50 | mV |
| 32 | $V_{0 S 2}$ (R-L) | Output \#2 offset voltage between modes, RIGHT-LEFT | $\begin{aligned} & V_{\text {OS } 2(R-L)}= \\ & V_{\text {OS } 2(R)^{-}} V_{\text {OS 2 }}(L) \end{aligned}$ | -50 | +50 | mV |
| 33 | $V_{0 S} 2(\mathrm{R}-0 \mathrm{FF})$ | Output \#2 offset voltage between modes, RIGHT-0FF | $\begin{aligned} & V_{O S} 2(R-O F F)= \\ & V_{\text {OS 2(R) }}-V_{O S} 2(O F F) \end{aligned}$ | -50 | +50 | mV |


| 5.0 PARAMETRIC SUMMARY (continued) |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NO | SYMBOL | PARAMETER |  |  | CONDITİNS | MIN |  | UNIT |
| 34 | $\mathrm{R}_{\mathrm{IN}_{7(\mathrm{ADD})}}$ | Input resistance Pin 7 to ground, ADD mode |  |  | $\begin{aligned} & \text { Pins } 1 \text { and } 11 \text { to } \\ & +2.0 \text { volts } \end{aligned}$ | 49.70 | 50.50 | $\Omega$ |
|  |  |  |  |  | Pin 10 and 20 to +2.6 volts |  |  |  |
|  |  |  |  |  | Pins 12 and 13 to <br> +9.8 volts through <br> $50 \Omega$ resistors |  |  |  |
|  |  |  |  |  | Pins 2 and 3 to +5.8 volts through $50 \Omega$ resistors |  |  |  |
|  |  |  |  |  | Pins 4, 6, 14, and 16 through separate $103 \Omega$ resistors to -3.95 volts |  |  |  |
|  |  |  |  |  | Pins 5 and 15 to -3.95 volts |  |  |  |
|  |  |  |  |  | Pins 8 and 18, backplane of substrate grounded |  |  |  |
|  |  |  |  |  | Pins 7 and 17 connected to current sources of +1 mA then -1 mA |  |  |  |
|  |  |  |  |  | Pins 9 and 19 connected to current sources of -1 mA then +1 mA |  |  |  |
|  |  |  |  |  | Measure voltage from Pin 7 to ground. |  |  |  |
|  |  |  |  |  | Voltage difference between application of +1.0 mA and -1.0 mA divided by 2.0 mA is $\mathrm{R}_{\mathrm{IN}}$ |  |  |  |
| 35 | $\mathrm{R}^{\mathrm{IN}}{ }_{9(\mathrm{ADD})}$ | Input resistance Pin 9 to ground, ADD mode |  |  | Same as \#34 except measure voltage from Pin 9 to ground | 49.70 | 50.50 | $\Omega$ |
| 36 | $\mathrm{R}^{\mathrm{IN}}{ }_{17 \text { (ADD })}$ | Input resistance Pin 17 to ground, ADD mode |  |  | Same as \#34 except measure voltage from Pin 17 to ground | 49.70 | 50.50 | $\Omega$ |
| 37 | $\mathrm{R}_{\mathrm{IN}_{19(\mathrm{ADD})}}$ | Input resistance Pin 19 to ground, ADD mode |  |  | Same as \#34 except measure voltage from Pin 19 to ground | 49.70 | 50.50 | $\Omega$ |
| EKTRONIX AVERTON. | X,INC.  <br> OREGON SHT | Of 30 | $\begin{aligned} & \text { CODE IDENT NOO } \\ & \mathbf{8 0 0 0 9} \end{aligned}$ | ${ }_{\text {A }}^{\text {SI2E }}$ | PAAT NUMBER $\quad 155-020$ |  |  | REV OR |

### 5.0 PARAMETRIC SUMMARY (continued)

|  | SYMBOL PARAMETER CONDITIONS MIN MAX |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 38 | T 1 (ADD) | Output resistance, Pin 12 to Pin 13, ADD mode | Pins 1 and 11 to | $99.50101 .5 \Omega$ |  |  |

Pin 13 held at +5.55 volts (case 1), then +6.05 volts (case 2) by current through $50 \Omega$ resistor

Pin 4 through $103 \Omega$ to -3.95 volts

Pins 5 and 15 to -3.95 volts

Pin 6 through $103 \Omega$ to -3.95 volts
Pin 7 through $50 \Omega$ to ground
Pins 8 and 18 backplane of substrate ground
Pin 9 through $50 \Omega$ to ground

Pins 10 and 20 to +2.6 volts

Pin 12 held at +6.05 volts (case 1) then
+5.55 volts (case 2 )
by current through
$50 \Omega$ resistor
Pin 14 through $103 \Omega$ to -3.95 volts
Pin 16 through $103 \Omega$ to -3.95 volts
Pin 17 through $50 \Omega$ to ground
Pin 19 through $50 \Omega$ to ground
Pin 3 through $50 \Omega$ to +5.8 volts
Pin 2 through $50 \Omega$ to +5.8 volts

## Continued on Page 14






### 5.0 PARAMETRIC SUMMARY (continued)

NO SYMBOL PARAMETER CONDITIONS MIN MAX UNIT

49 OFF Accuracy Rejection of equal but opposite polarity input signals measured at Output \#2, OFF mode

Same as \#42 except: $\quad-0.5 \quad 0.5 \%$
Pin 10 to +2.0 volts
Pin 11 to +2.6 volts
Pins 12 and 13 through
$50 \Omega$ resistors to
+5.8 volts
Pins 2 and 3 through
$50 \Omega$ resistors to
+9.8 volts
Measure voltage difference of Pin 2 with respect to Pin 3

Calculated current
gain divided by 2.355
and expressed as a percentage is OFF
Accuracy

| 50 | Output-toOutput Accuracy, LEFT Input | Difference in gains of LEFT input to Output \#1 or Output \#2 | $\left(A_{i L 1} 1(L)^{-A_{i L}} 2(R)\right) /$ <br> $2.355=$ Output-to-Output Accuracy, <br> LEFT Input <br> Express result as a percentage | -0.5 | 0.5 | \% |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 51 | Output-toOutput Accuracy, RIGHT Input | Difference in gains of RIGHT input to Output \#1 or Output \#2 | $\left(A_{i R 1(R)}-A_{i R 2(L)}\right) /$ <br> $2.355=$ Output-to-Output Accuracy, RIGHT Input <br> Express result as a percentage | -0.5 | 0.5 | \% |
| 52 | Left to ADD Accuracy, Output \#1 | Change in gain of a signal from the LEFT input directed to Output \#1 when the mode is changed from LEFT to ADD | $\begin{aligned} & \left(A_{i L 1(L)^{-A}}^{i L A(A D D)}\right)^{\prime} / \\ & 2.355 \\ & \text { Express in percent } \end{aligned}$ | -0.5 | 0.5 | \% |


| PARAMETRIC SUMMARY (continued) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NO | SYMBOL | PARAMETER | CONDITIONS | MIN | MAX | UNIT |
| 53 | Right to ADD Accuracy, Output \#1 | Change in gain of a signal from the RIGHT input directed to Output \#1 when the mode is changed from RIGHT to ADD | $\begin{aligned} & \left(A_{i R 1(R)^{-A_{i R 1}} 1(A D D)}\right) / \\ & 2.355 \\ & \text { Express in precent } \end{aligned}$ | -0.5 | 0.5 | \% |
| 54 | Left to OFF Accuracy, Output \#2 | Change in gain of a signal from the RIGHT input directed to Output \#2 when the mode is changed from LEFT to OFF | $\begin{aligned} & \left(A_{i R 2(L)^{-A}} \mathrm{AR}_{2(\text { OFF })}\right) / \\ & 2.355 \\ & \text { Express in precent } \end{aligned}$ | -0.5 | 0.5 | \% |
| 55 | Right to OFF Accuracy, Output \#2 | Change in gain of a signal from the LEFT input directed to Output \#2 when the mode is changed from RIGHT to OFF | $\begin{aligned} & \left(A_{i L} 2(R)^{-A_{i L} 2(0 F F)}\right)^{\prime} / \\ & 2.355 \\ & \text { Express in precent } \end{aligned}$ | -0.5 | 0.5 | \% |
| 56 | $A_{i L 1} 1(\mathrm{R})$ | Current gain from LEFT input, RIGHT mode, measured at Output \#1 | Same as \#42 except: <br> Pins 7 and 9 open <br> Pin 17 connected to a current source of -7.5 mA then +7.5 mA and Pin 19 connected to a current source of +7.5 mA then -7.5 mA <br> Measure the voltage difference between Pins 12 and 13 <br> The change in voltage difference between application of -7.5 mA and +7.5 mA divided by 1.5 volts then 2.355 and expressed in dB is the current gain |  | -66 | dB |


| PARAMETRIC SUMMARY (continued) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| NO | SYMBOL | PARAMETER | CONDITIONS | MIN | MAX | UNITS |
| 57 | $\mathrm{A}_{\text {iR } 1(L)}$ | Current gain from RIGHT input, LEFT mode, measured at Output \#1 | Same as \#56 except; <br> Pins 1 and 10 to +2.0 volts <br> Pins 11 and 20 to +2.6 v.olts <br> Pins 17 and 19 open <br> Pin 7 connected to a current source of -7.5 mA then +7.5 mA and Pin 9 connected to a current source of +7.5 ma then $-7.5 \mathrm{~mA}$ |  | -66 | dB |
| 58 | $A_{\text {ir } 1 \text { (OFF) }}$ | Current gain from RIGHT input, OFF mode, measured at Output \#1 | Same as \#57 except; <br> Pin 1 to +2.6 volts <br> Pin 20 to +2.0 volts <br> Pin2 12 and 13 through $50 \Omega$ resistors to +5.8 volts <br> Pins 2 and 3 through $50 \Omega$ resistors to +9.8 volts |  | -66 | dB |
| 59 | $A_{i L 1} 1$ (OFF) | Current gain from LEFT input, OFF mode, measured at Output \#1 | Same as \#56 except <br> Pin 10 to +2.0 volts <br> Pin 11 to +2.6 volts <br> Pins 12 and 13 through <br> $50 \Omega$ resistor to +5.8 volts <br> Pins 2 and 3 through $50 \Omega$ resistor to +9.8 volts |  | -66 | dB |
| 60 | $A_{i R 2} 2(R)$ | Current gain from RIGHT input, RIGHT mode, measured at Output \#2 | Same as \#57 except; <br> Pins 11 and 20 to +2.0 volts <br> Pins 1 and 10 to +2.6 volts <br> Measure voltage difference between Pins 3 and 2 |  | -66 | dB |
| $\begin{aligned} & \text { RONI } \\ & \text { RTON. } \end{aligned}$ | NC. sht 20 | 30 80 COE IDENT NO $^{2}$ | PART Number $155-0206-00$ |  |  | REV |






## 5.1 <br> Test Fixture



### 6.0 PACKAGING

$1.75 \mathrm{~cm} \mathrm{x} 1.75 \mathrm{~cm} \mathrm{Al}_{2} \mathrm{O}_{3}$ (805) substrate with 22 pin HYPCON connector.
6.1 Terminal Identification

PIN NUMBER
INPUT/OUTPUT

1

2

3
3a
4
5

6

7
8

9

10
11
12
13
13a
14
15
16
17
18
19
20

Left Channel OFF
-Output \#2
+Output \#2
$+V_{C C}{ }^{2}$
Right Channel Emitter Pick-Off
Right Channel Emitter Longtail
Right Channel Emitter Pick-Off
Right Channel -Input
Right Channel Bias
Right Channel +Input
Right Channel ON
Right Channel OFF
+Output \#1
-Output \#1
$+V_{C C}{ }^{1}$
Left Channel Emitter Pick-Off
Left Channel Emitter Longtail
Left Channel Emitter Pick-Off
Left Channel +Input
Left Channel Bias
Left Channel -Input
Left Channel ON

### 6.1 Outline Drawing



|  |  |  |  | 14, 28 | $25 \Omega$ | $\pm 20 \%$ | $25 \Omega$ | 20\% |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 12,13, 26, 27 | $45 \Omega$ | $\pm 12 \%$ |  | - |
|  |  |  |  | 8,22 | $100 \Omega$ | $\pm 20 \%$ | $100 \Omega$ | $\pm 20 \%$ |
|  |  |  |  | 7,9,21,23 | $135 \Omega$ | $\pm 12 \%$ | $150 \Omega$ | $\pm 1 \%$ |
|  |  |  |  | 6,10,20,24 | $35 \Omega$ | $\pm 12 \%$ |  | - |
|  |  |  |  | 5,11,12, 25 | $40 \Omega$ | $\pm 12 \%$ | $47 \Omega$ | $\pm 1 \%$ |
|  |  |  |  | 3,4,17,18 | $41.6 \Omega$ | $\pm 12 \%$ | $51 \Omega$ | 10.75\% |
| 32,3,4 | 5.5.n | 6,2,5,4 | 0.4 pf | 1,2,15,16 | $50 \Omega$ | $\pm 20 \%$ | $50 \Omega$ | -20\% |
| $\angle N^{\text {OS }}$ | VALUE | CNes. | value | Pasas. | VALUE | rok. | VALUE | E.04.704 |
|  |  |  |  |  | AS AEOCESSED |  | ASTRIMMED |  |
| ANDUCTOR, CARACITOE, RESISTOR VALUES |  |  |  |  |  |  |  |  |
|  |  |  |  | TABLE | III |  |  |  |

### 6.2 Hybrid Substrate Pattern


6.3 Thermal Characteristics

For 1.64 W total M178 power, $\Delta \mathrm{T}_{\text {J-Die Pad }}=18.7^{\circ} \mathrm{C}$
For 2.01 W total substrate power, $\Delta \mathrm{T}_{\text {Die Pad-Ambient }}=62.0^{\circ} \mathrm{C}$
(EC Board Mounting)
$\Delta T_{J}$ M178 Ambient $=80.7^{\circ} \mathrm{C}$ (EC Board Mounting)
$\mathrm{T}_{\mathrm{J}}$ M178 (For $\mathrm{T}_{\text {Ambient }}=65^{\circ} \mathrm{C}$ ) $=145.7^{\circ} \mathrm{C}$
7.0 RELIABILITY STATEMENT Based on the H442 - No Test Done on the H752
7.1 Reliability Goal
$\lambda$, Failure Rate $\leq .7 \% / 1 \mathrm{~K}$ Hours at $145^{\circ} \mathrm{C} \mathrm{T}_{\mathrm{j}}$
$\lambda$, Failure Rate $\leq .0026 \% / 1 \mathrm{~K}$ Hours at $75^{\circ} \mathrm{C} \mathrm{T}_{\mathrm{j}}$
MTTF $\geq 143 \mathrm{~K}$ Hours at $145^{\circ} \mathrm{C} \mathrm{T}_{\mathrm{j}}$
Expected Instrument Life; 10K Hours
7.2 Life Test Results

90\% Confidence Level
$\lambda, .25 \% / 1 \mathrm{~K}$ Hours at $145^{\circ} \mathrm{C} \mathrm{T}_{\mathrm{j}}$
$\lambda, .00093 \% / 1 \mathrm{~K}$ Hours at $75^{\circ} \mathrm{C} \mathrm{T}_{\mathrm{j}}$
Life Test Report \#RA-32

## 8.0

APPLICATIONS INFORMATION
The circuit receives analog input data at differential input RIGHT and at differential input LEFT. The outputs select the inputs according to the following schedule:

| MODE* | MODE** | PIN 1 | PIN 20 | PIN 11 | PIN 10 |
| :--- | :--- | :--- | :---: | :---: | :---: |
| LEFT | RIGHT | 2.0 Volts | 2.6 Volts | 2.6 Volts | 2.0 Volts |
| RIGHT | LEFT | 2.6 Volts | 2.0 Volts | 2.0 Volts | 2.6 Volts |
| ADD | OFF | 2.0 Volts | 2.6 Volts | 2.0 Volts | 2.6 Volts |
| OFF | ADD | 2.6 Volts | 2.0 Volts | 2.6 Volts | 2.0 Volts |

*Referenced to Output \#1: All of the preceeding mode designations are referenced to Output \#1
**Referenced to Output \#2
9.0 REFERENCE LIST

SPEC NO
TITLE

