

NOTICE - WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY FOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

#### REQUIREMENTS:

##### GENERAL:

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.  
SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 1  
UNITS SHALL BE CAPABLE OF MEETING ALL THE QUALIFICATION REQUIREMENTS OF ND 1002051, UNLESS MODIFIED OR AMENDED BY DESIGN REQUIREMENTS SECTION OF THIS DRAWING.  
UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491 LEVEL A.  
UNITS SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

##### INSPECTION AND ACCEPTANCE:

##### MECHANICAL REQUIREMENTS:

LEAD DATA: KOVAR WITH GOLD PLATING PER ND 1015402  
A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.  
MARKING: THE MANUFACTURER'S NAME, TRADEMARK OR CODE; MANUFACTURER'S TYPE DESIGNATION; DATE CODE; LOT CODE AND SERIAL NUMBER SHALL BE PERMANENTLY AND LEGIBLY MARKED ON THE PART PER MIL-STD-130. MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE IN ACCORDANCE WITH MIL-P-19491 AND SHALL INCLUDE THE NASA DRAWING NUMBER AND REVISION LETTER.

MECHANICAL DIMENSIONS PER OUTLINE SHOWN.  
ELECTRICAL REQUIREMENTS: PER TABLE II & III

COLLECTOR CUTOFF CURRENT ( $I_{CBO}$ ) AT  $100^{\circ}\text{C}$   
EMITTER CUTOFF CURRENT ( $I_{EBO}$ )  
SWITCHBACK VOLTAGE ( $V_{CE0}$ )  
STATIC FORWARD CURRENT TRANSFER RATIO ( $h_{FE}$ )  
STATIC FORWARD CURRENT TRANSFER RATIO, RATIO.  
BASE VOLTAGE DIFFERENTIAL.

COLLECTOR SATURATION VOLTAGE  $V_{CE}(\text{SAT})$

##### DESIGN REQUIREMENTS:

ELECTRICAL RATING: PER TABLE I  
ELECTRICAL CHARACTERISTICS: PER TABLES II & III  
STORAGE AND OPERATING JUNCTION TEMPERATURE:  $-65^{\circ}\text{C}$  TO  $+200^{\circ}\text{C}$   
POWER DISSIPATION: (EACH ELEMENT)  
AT  $25^{\circ}\text{C}$  CASE TEMPERATURE: 1.5 WATTS.  
AT  $100^{\circ}\text{C}$  CASE TEMPERATURE: 860 MILLIWATTS.  
AT  $25^{\circ}\text{C}$  AMBIENT TEMPERATURE: 500 MILLIWATTS.  
POWER DISSIPATION (DUAL) TOTAL:  
AT  $25^{\circ}\text{C}$  CASE TEMPERATURE: 3 WATTS.  
AT  $100^{\circ}\text{C}$  CASE TEMPERATURE: 1.7 WATTS.  
AT  $25^{\circ}\text{C}$  AMBIENT TEMPERATURE: 600 MILLIWATTS.  
LIFE TEST CONDITIONS FOR ND 1002051 SAME AS BURN-IN CONDITIONS.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING ONLY

#### SPECIAL CONDITIONING BY SUPPLIER:

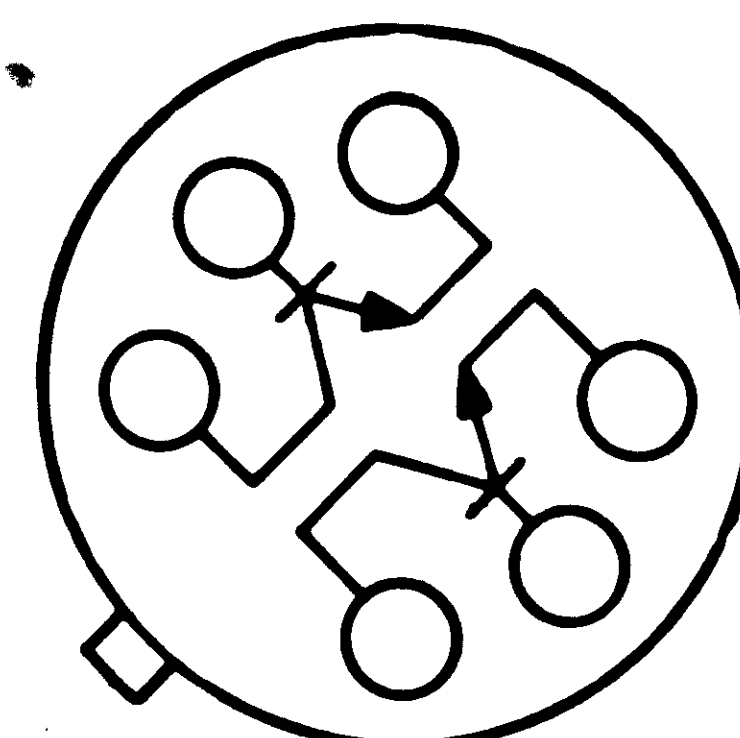
BURN-IN: UNITS SHALL BE BURNED-IN FOR 240 HOURS AT THE FOLLOWING CONDITIONS:

1. AMBIENT TEMPERATURE:  $25^{\circ} \pm 5^{\circ}\text{C}$
2. COLLECTOR VOLTAGE  $V_{CE}$ :  $45 \pm 5$  VDC PER ELEMENT
3. POWER DISSIPATION:  $150 \text{ MW} \pm 10\%$  PER ELEMENT

THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN:

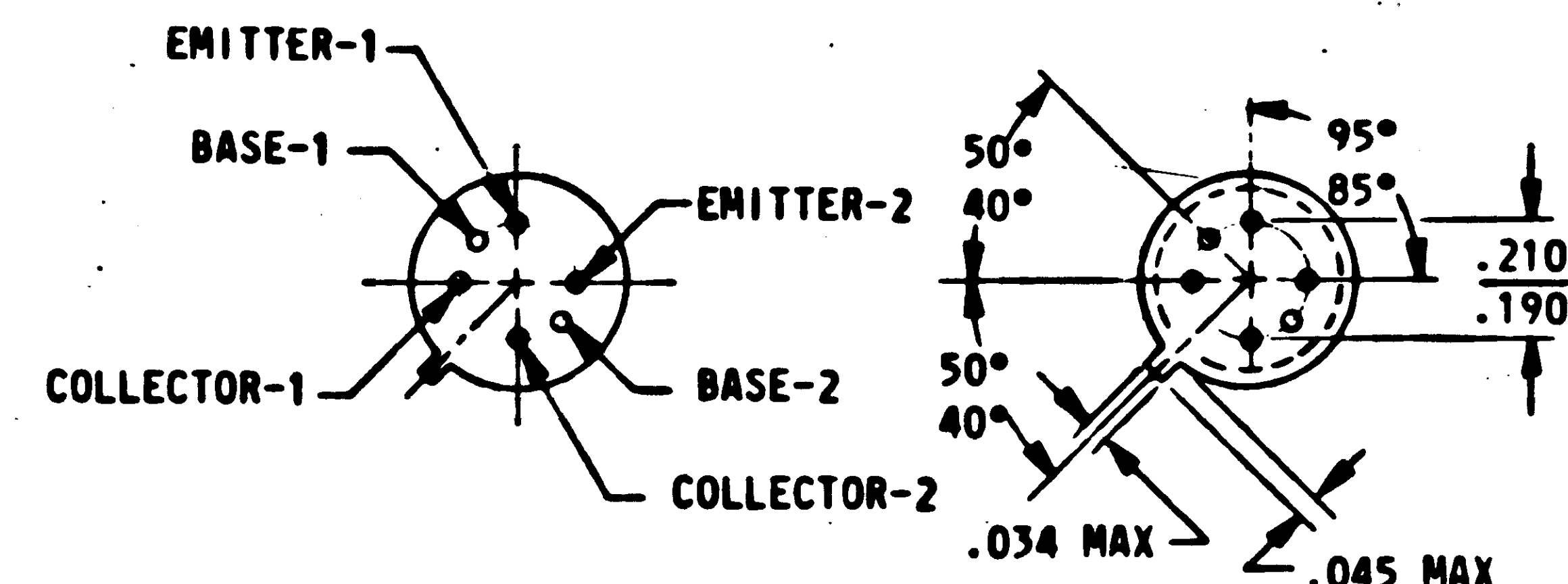
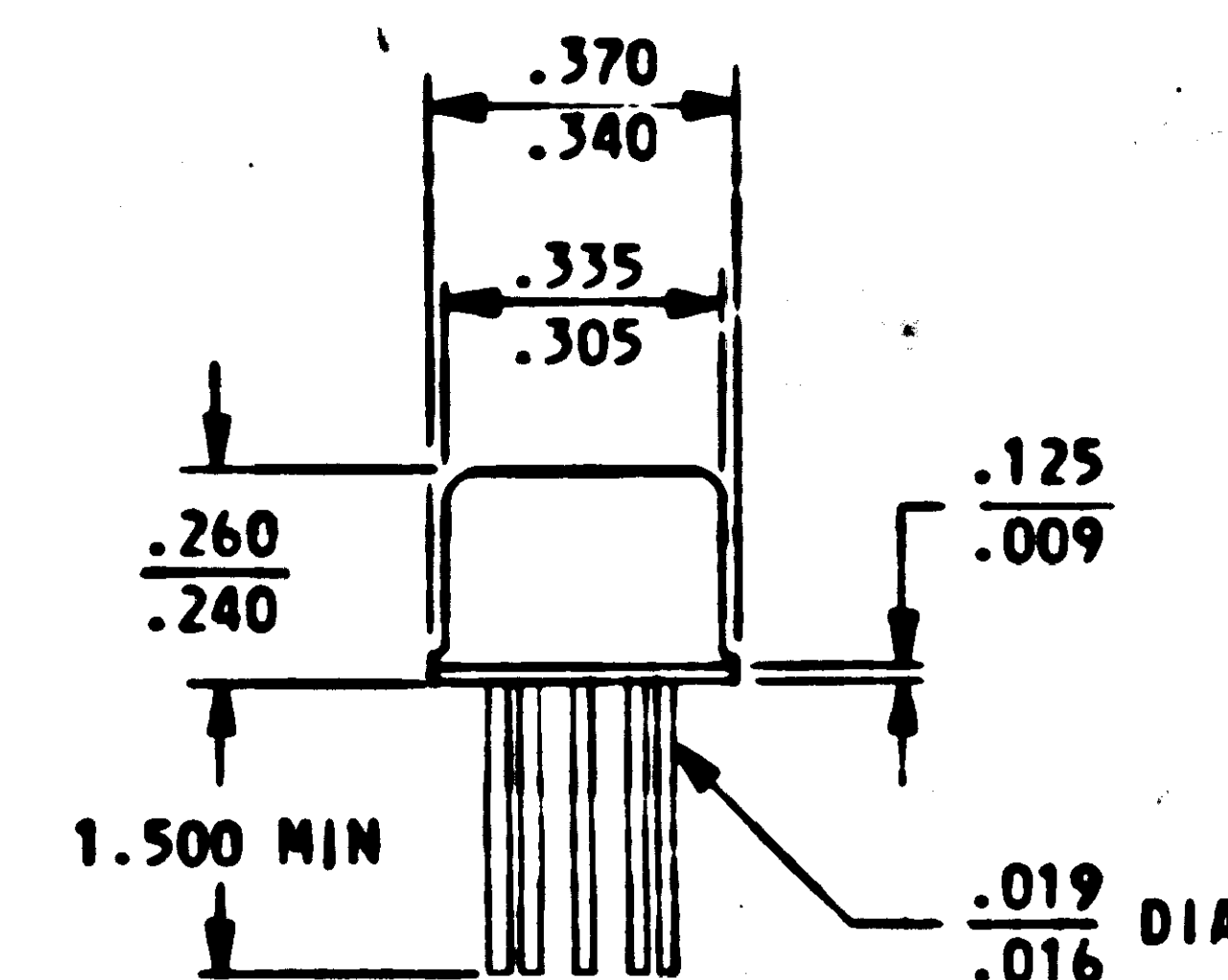
- a. EMITTER CUTOFF CURRENT,  $I_{EBO}$ .
- b. COLLECTOR CUTOFF CURRENT,  $I_{CBO}$ .
- c. COLLECTOR SATURATION VOLTAGE,  $V_{CE}(\text{SAT})$
- d. STATIC FORWARD CURRENT TRANSFER RATIO,  $h_{FE}$ , SEE NOTE 3.

THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL TRANSISTOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR HAVING CHANGED MORE THAN 20% IN  $h_{FE}$ , OR HAVING INCREASED MORE THAN 3 TIMES IN  $I_{CBO}$  (THE ABSOLUTE CHANGE MUST BE GREATER THAN 5 NANAMPERE) SHALL NOT BE ACCEPTABLE.



GRAPHICAL SYMBOL

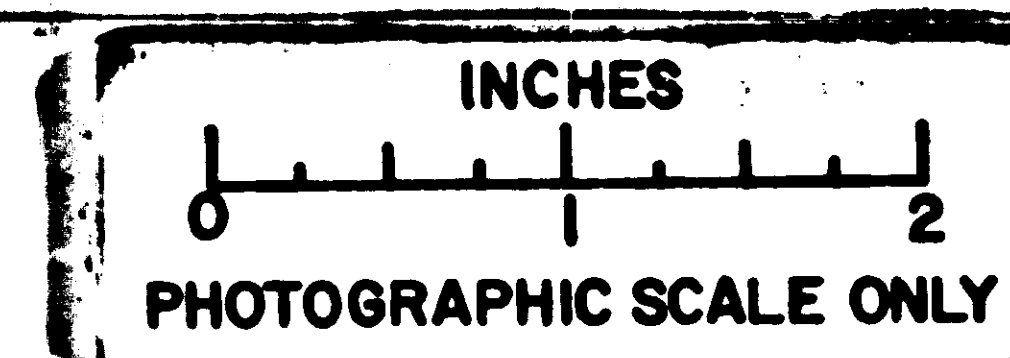
ELEMENTS INSULATED FROM CASE



| F                         | F       | F       | F       |
|---------------------------|---------|---------|---------|
| SHEET 1                   | SHEET 2 | SHEET 3 | SHEET 4 |
| REVISION STATUS OF SHEETS |         |         |         |

REPLACES REV(E) WITH CHANGE

|             |  |                                                                                                                                                                    |  |                                                                                                                                                               |  |                                            |  |
|-------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------|--|
|             |  | UNLESS OTHERWISE SPECIFIED<br>DIMENSIONS ARE IN INCHES<br>TOLERANCES ON<br>FRACTIONS DECIMALS ANGLES<br>$\pm$ $\pm$ $\pm$<br>DO NOT SCALE THIS DRAWING<br>MATERIAL |  | MIT<br>INSTRUMENTATION LAB<br>CAMBRIDGE, MASS.<br>CONTRACT 497<br>DWN. NO. 89 MAY 63<br>CHECKED E. J. J. 31 MAY 63<br>APPROVAL E. J. J. 25 JUN 63<br>APPROVAL |  | MANNED SPACECRAFT CENTER<br>HOUSTON, TEXAS |  |
|             |  | HEAT TREATMENT<br>NONE                                                                                                                                             |  | NASA APPROVAL J. J. J. 25 JUN 63<br>MIT APPROVAL J. J. J. 25 JUN 63                                                                                           |  | TRANSISTOR,<br>NPN, SILICON, DUALSECTION   |  |
| NEXT ASSY   |  | USED ON                                                                                                                                                            |  | CODE IDENT NO.                                                                                                                                                |  | NASA DRAWING NO.                           |  |
| APPLICATION |  | FINAL FINISH<br>NONE                                                                                                                                               |  | C                                                                                                                                                             |  | 1010376                                    |  |
|             |  |                                                                                                                                                                    |  | SCALE NONE                                                                                                                                                    |  | SHEET 1 OF 4                               |  |





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TABLE II

| ELECTRICAL CHARACTERISTIC AT $T_C = 25^\circ\text{C}$ & 1000 CPS<br>(UNLESS OTHERWISE SPECIFIED) |                                                                                            |                           |        |      |                        |
|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------|--------|------|------------------------|
| PARAMETER                                                                                        | TEST CONDITIONS                                                                            | SYMBOL                    | LIMITS |      | UNITS                  |
|                                                                                                  |                                                                                            |                           | MIN    | MAX  |                        |
| COLLECTOR CUTOFF CURRENT                                                                         | $I_E=0$<br>$V_{CB}=80\text{V}$                                                             | $I_{CBO}$                 | --     | 2    | NA                     |
| COLLECTOR CUTOFF CURRENT                                                                         | $I_E=0$<br>$V_{CB}=80\text{V}$<br>$T_C=150^\circ\text{C}$                                  | $I_{CBO}$                 | --     | 10   | UA                     |
| EMITTER CUTOFF CURRENT                                                                           | $I_C=0$<br>$V_{EB}=5\text{V}$                                                              | $I_{EBO}$                 | --     | 2    | NA                     |
| EMITTER TO BASE BREAKDOWN VOLTAGE                                                                | $I_E=100\text{UA}$<br>$I_C=0$                                                              | $B_{VEBO}$                | 7      | --   | VOLTS                  |
| COLLECTOR TO EMITTER (SEE NOTE 4) BREAKDOWN VOLTAGE                                              | $I_C=100\text{MA}$<br>$I_{BE}=10\text{A}$                                                  | $B_{VCER}$                | 80     | --   | VOLTS                  |
| COLLECTOR TO BASE BREAKDOWN VOLTAGE                                                              | $I_C=100\text{UA}$<br>$I_E=0$                                                              | $B_{VCBO}$                | 100    | --   | VOLTS                  |
| SWITCHBACK VOLTAGE (SEE NOTE 4)                                                                  | $I_C=30\text{MA}$<br>$I_B=0$                                                               | $LV_{CEO}$                | 60     | --   | VOLTS                  |
| STATIC FORWARD CURRENT (SEE NOTE 1) TRANSFER RATIO, RATIO                                        | $I_C=1\text{MA}$<br>$V_{CE}=10\text{V}$                                                    | $h_{FE1}$<br>$h_{FE2}$    | .9     | 1    | ---                    |
| STATIC FORWARD CURRENT (SEE NOTE 1) TRANSFER RATIO, RATIO                                        | $I_C=100\text{UA}$<br>$V_{CE}=10\text{V}$                                                  | $h_{FE1}$<br>$h_{FE2}$    | .9     | 1    | ---                    |
| COLLECTOR SATURATION VOLTAGE                                                                     | $I_C=50\text{MA}$<br>$I_B=5\text{MA}$                                                      | $V_{CE}(\text{SAT})$      | --     | 1.2  | VOLTS                  |
| BASE SATURATION VOLTAGE                                                                          | $I_C=50\text{MA}$<br>$I_B=5\text{MA}$                                                      | $V_{BE}(\text{SAT})$      | --     | .9   | VOLTS                  |
| BASE VOLTAGE DIFFERENTIAL (ABSOLUTE VALUE)                                                       | $I_C=1\text{MA}$<br>$V_{CE}=5\text{V}$                                                     | $IV_{BE-1}$<br>$V_{BE-2}$ | --     | 5    | MV                     |
| BASE VOLTAGE DIFFERENTIAL (ABSOLUTE VALUE)                                                       | $I_C=100\text{UA}$<br>$V_{CE}=5\text{V}$                                                   | $IV_{BE-1}$<br>$V_{BE-2}$ | --     | 5    | MV                     |
| BASE VOLTAGE DIFFERENTIAL CHANGE                                                                 | $I_C=100\text{UA}$<br>$V_{CE}=5\text{V}$<br>$T_A=-55^\circ\text{C}$ TO $125^\circ\text{C}$ | $IV_{BE-1}$<br>$V_{BE-2}$ | --     | 10   | UV/ $^\circ\text{C}$   |
| SMALL-SIGNAL, SHORT-CIRCUIT INPUT IMPEDANCE                                                      | $I_C=1\text{MA}$<br>$V_{CB}=5\text{V}$                                                     | $h_{ib}$                  | 20     | 30   | OHMS                   |
| OUTPUT CAPACITANCE                                                                               | $I_E=0$<br>$V_{CB}=10\text{V}$<br>$f=140\text{KC}$                                         | $C_{ob}$                  | --     | 15   | UUF                    |
| INPUT CAPACITANCE                                                                                | $I_C=0$<br>$V_{EB}=0.5\text{V}$<br>$f=140\text{KC}$                                        | $C_{ib}$                  | --     | 85   | UUF                    |
| NOISE FIGURE                                                                                     | $I_C=300\text{UA}$<br>$V_{CE}=10\text{V}$<br>$BW=1$<br>$R_g=510\Omega$                     | NF                        | --     | 10   | db                     |
| SMALL-SIGNAL, SHORT-CIRCUIT FORWARD CURRENT TRANSFER RATIO                                       | $I_C=50\text{MA}$<br>$V_{CE}=10\text{V}$<br>$f=20\text{MC}$                                | $h_{fe}$                  | 3      | --   | ---                    |
| COLLECTOR CUTOFF CURRENT                                                                         | $V_{CB}=80\text{V}$<br>$T_C=100^\circ\text{C}$                                             | $I_{CBO}$                 | --     | 1    | UA                     |
| NOISE VOLTAGE (SEE NOTE 2)                                                                       | $V_{CE}=5\text{V}$<br>$I_C=100\text{UA}$<br>$f=1\text{KC}$<br>$R_g=1\text{K}\Omega$        | --                        | --     | .015 | UV/ $\sqrt{\text{Hz}}$ |

TABLE I

| MAXIMUM RATINGS $T_C=25^\circ\text{C}$<br>(UNLESS OTHERWISE SPECIFIED) |                                 |                               |                                  |                          |
|------------------------------------------------------------------------|---------------------------------|-------------------------------|----------------------------------|--------------------------|
| COLLECTOR VOLTAGE ( $V_{CE0}$ )                                        | COLLECTOR VOLTAGE ( $V_{CB0}$ ) | EMITTER VOLTAGE ( $V_{EB0}$ ) | POWER DISSIPATION (EACH ELEMENT) | POWER DISSIPATION (DUAL) |
| VDC                                                                    | VDC                             | VDC                           | WATTS                            | WATTS                    |
| 60                                                                     | 100                             | 7                             | 1.5                              | 3                        |

NOTES:

1. LOWEST VALUE OF  $h_{FE}$  SHALL BE  $h_{FE1}$  (NUMERATOR).
2. TO BE MEASURED ON QUANTECH NOISE ANALYZER MOD. 310 OR 311 OR EQUIVALENT.
3. AT LOWEST SPECIFIED COLLECTOR CURRENT,  $I_C$
4. PULSE CONDITIONS: LENGTH  $\leq 300\text{ U SEC}$ , DUTY CYCLE  $\leq 1\%$

REPLACES REV(E) WITH CHANGE

|                                                                                                                                                                                          |  |  |                                                                                                                                                                                                                                                                                              |  |                                                                                                                                                                                     |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| UNLESS OTHERWISE SPECIFIED<br>DIMENSIONS ARE IN INCHES<br>TOLERANCES ON<br>FRACTIONS DECIMALS ANGLES<br>± ± ±<br>DO NOT SCALE THIS DRAWING<br>MATERIAL<br>HEAT TREATMENT<br>FINAL FINISH |  |  | MIT<br>INSTRUMENTATION LAB<br>CAMBRIDGE, MASS. NAS9-<br>CONTRACT 497<br>DRAWN <i>[Signature]</i> DATE 25 MAY 63<br>CHECKED <i>[Signature]</i> DATE 3 MAY 63<br>APPROVAL <i>[Signature]</i> DATE 25 JUN 63<br>APPROVAL<br>NASA APPROVAL <i>[Signature]</i><br>MIT APPROVAL <i>[Signature]</i> |  | MANNED SPACECRAFT CENTER<br>HOUSTON, TEXAS<br>TRANSISTOR<br>NPN, SILICON, DUALSECTION<br>SPECIFICATION CONTROL DRAWING<br>CODE IDENT NO. SIZE<br>C<br>SCALE NONE WT<br>SHEET 2 OF 4 |  |
|                                                                                                                                                                                          |  |  |                                                                                                                                                                                                                                                                                              |  | NASA DRAWING NO.<br>1010376                                                                                                                                                         |  |

INCHES  
0 1 2  
PHOTOGRAPHIC SCALE ONLY



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TABLE III

ADDITIONAL ELECTRICAL CHARACTERISTIC AT TC = 25°C & 1000 CPS (UNLESS OTHERWISE SPECIFIED)

| NASA<br>PART NUMBER | EIA<br>TYPE<br>DESIGNATION<br>(FOR REF<br>ONLY) | NO. OR<br>ELEMENTS<br>PER DEVICE | PARAMETER                                                                            | TEST<br>CONDITIONS  | SYMBOL | LIMITS |      | UNIT |
|---------------------|-------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------|---------------------|--------|--------|------|------|
|                     |                                                 |                                  |                                                                                      |                     |        | MIN    | MAX  |      |
| 1010376-1           | 2N2060                                          | 2                                | SMALL-SIGNAL, SHORT-CIRCUIT FORWARD CURRENT TRANSFER RATIO                           | IC=1MA<br>VCE=5V    | hfe    | 50     | 150  | --   |
|                     |                                                 |                                  | SMALL-SIGNAL, SHORT-CIRCUIT INPUT IMPEDANCE                                          | IC=1MA<br>VCE=5V    | hie    | 1000   | 4000 | OHMS |
|                     |                                                 |                                  | SMALL-SIGNAL, OPEN CIRCUIT OUTPUT ADMITTANCE                                         | IC=1MA<br>VCE=5V    | hoe    | 4      | 16   | UMHO |
|                     |                                                 |                                  | STATIC FORWARD CURRENT TRANSFER RATIO                                                | IC=10UA<br>VCE=10V  | hFE    | 25     | 75   | --   |
|                     |                                                 |                                  | STATIC FORWARD CURRENT TRANSFER RATIO                                                | IC=100UA<br>VCE=10V | hFE    | 30     | 90   | --   |
|                     |                                                 |                                  | STATIC FORWARD CURRENT TRANSFER RATIO                                                | IC=1MA<br>VCE=10V   | hFE    | 40     | 120  | --   |
|                     |                                                 |                                  | STATIC FORWARD CURRENT TRANSFER RATIO                                                | IC=10MA<br>VCE=10V  | hFE    | 50     | 150  | --   |
| 1010376-2           |                                                 | 2                                | ALL REQUIREMENTS OF -1.<br>SMALL-SIGNAL SHORT-CIRCUIT FORWARD CURRENT TRANSFER RATIO | IC=1MA<br>VCE=10V   | hfe    | 80     | 120  | --   |
| 1010376-3           |                                                 | 2                                | SMALL-SIGNAL, SHORT-CIRCUIT FORWARD CURRENT TRANSFER RATIO                           | IC=1MA<br>VCE=5V    | hfe    | 75     | 180  | --   |
|                     |                                                 |                                  | SMALL-SIGNAL, SHORT-CIRCUIT INPUT IMPEDANCE                                          | IC=1MA<br>VCE=5V    | hie    | --     | 5000 | OHMS |
|                     |                                                 |                                  | SMALL-SIGNAL, OPEN CIRCUIT OUTPUT ADMITTANCE                                         | IC=1MA<br>VCE=5V    | hoe    | --     | 20   | UMHO |
|                     |                                                 |                                  | STATIC FORWARD CURRENT TRANSFER RATIO                                                | IC=10UA<br>VCE=10V  | hFE    | 40     | 100  | --   |
|                     |                                                 |                                  | STATIC FORWARD CURRENT TRANSFER RATIO                                                | IC=100UA<br>VCE=10V | hFE    | 60     | 125  | --   |
|                     |                                                 |                                  | STATIC FORWARD CURRENT TRANSFER RATIO                                                | IC=1MA<br>VCE=10V   | hFE    | 80     | 150  | --   |
|                     |                                                 |                                  | STATIC FORWARD CURRENT TRANSFER RATIO                                                | IC=10MA<br>VCE=10V  | hFE    | 90     | 180  | --   |
|                     |                                                 |                                  | STATIC FORWARD CURRENT TRANSFER RATIO                                                | IC=300UA<br>VCE=10V | hFE    | 75     | 125  | --   |

1010376

| REVISIONS |                                                                            |         |          |
|-----------|----------------------------------------------------------------------------|---------|----------|
| SYM       | DESCRIPTION                                                                | DATE    | APPROVAL |
| F         | REPLACES REV E WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 01775 | 6-26-63 | WJL      |

REPLACES REV (E) WITH CHANGE

|                                                                                                                          |                |                                                                           |                             |
|--------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------|-----------------------------|
| MIT<br>INSTRUMENTATION LAB<br>CAMBRIDGE, MASS. NAS 9-<br>CONTRACT 497                                                    |                | MANNED SPACECRAFT CENTER<br>HOUSTON, TEXAS                                |                             |
| DRAWN <i>[Signature]</i> DATE 25 MAY 63<br>CHECKED <i>[Signature]</i> 31 MAY 63<br>APPROVAL <i>[Signature]</i> 25 JUN 63 |                | TRANSISTOR<br>NPN, SILICON, DUAL SECTION<br>SPECIFICATION CONTROL DRAWING |                             |
| NASA APPROVAL <i>[Signature]</i>                                                                                         | CODE IDENT NO. | SIZE<br>C                                                                 | NASA DRAWING NO.<br>1010376 |
| MIT APPROVAL <i>[Signature]</i>                                                                                          | SCALE NONE     | WT                                                                        | SHEET 3 OF 4                |

INCHES  
0 1 2  
PHOTOGRAPHIC SCALE ONLY



| NASA PART NUMBER |  | TYPE DESIGNATION (FOR REF ONLY) |  | NO. OR ELEMENTS PER DEVICE |  | PARAMETER                              |  | TEST CONDITIONS                             |  | SYMBOL            |  | LIMITS |  | UNIT |  |
|------------------|--|---------------------------------|--|----------------------------|--|----------------------------------------|--|---------------------------------------------|--|-------------------|--|--------|--|------|--|
|                  |  |                                 |  |                            |  |                                        |  |                                             |  |                   |  | MIN    |  | MAX  |  |
| 1010376-4        |  |                                 |  | 2                          |  | ALL REQUIREMENTS OF -1                 |  |                                             |  |                   |  |        |  |      |  |
|                  |  |                                 |  |                            |  | SWITCHBACK VOLTAGE                     |  | I <sub>C</sub> =10MA, I <sub>B</sub> =0     |  | LV <sub>CEO</sub> |  | 80     |  | -    |  |
|                  |  |                                 |  |                            |  | STATIC FORWARD CURRENT TRANSFER RATIO  |  | V <sub>CE</sub> =1.0VDC I <sub>C</sub> =5MA |  | h <sub>FE</sub>   |  | 50     |  | -    |  |
|                  |  |                                 |  |                            |  | COLLECTOR TO EMITTER BREAKDOWN VOLTAGE |  | I <sub>C</sub> =100MA R <sub>BE</sub> =10Ω  |  | BV <sub>CER</sub> |  | 100    |  | -    |  |

MIT INSTRUMENTATION LAB  
CAMBRIDGE, MASS. CONTRACT 492

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCES ON  
FRACTIONS DECIMALS ANGLES  
+ - + - + -  
DO NOT SCALE THIS DRAWING  
MATERIAL  
NEXT ASSY USED ON  
APPLICATION CONTRACT

MIT APPROVAL  
NASA APPROVAL  
CODE IDENT NO.  
SIZE  
SCALE NONE  
SHEET 4 OF 4

MANNED SPACECRAFT CENTER  
HOUSTON, TEXAS  
TRANSISTOR  
NPN, SILICON, DUALSECTION  
SPECIFICATION CONTROL DRAWING  
1010376

