

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.

1006317

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR 16585	2-17-65	

REQUIREMENTS:

1. GENERAL:

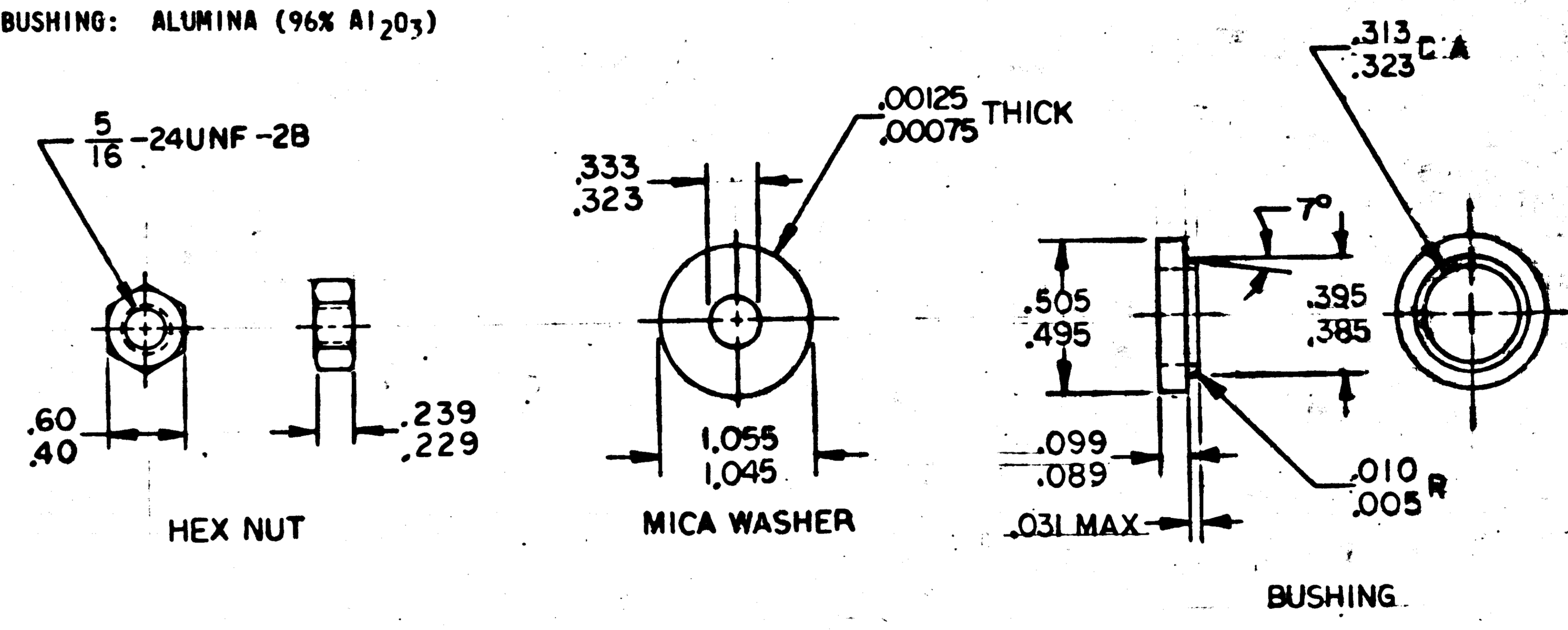
- A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
- B. UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.
- C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
- D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.
- E. PART MARKING: PARTS SHALL BE PERMANENTLY AND LEGIBLY MARKED, IN ACCORDANCE WITH ND 1002019, WITH THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER), LOT CODE, SERIAL NUMBER AND TERMINAL IDENTIFICATION.
- F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.
  - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

- A. MECHANICAL REQUIREMENTS (MIL-STD-105D, LEVEL I, AQL = 4.0)
  - (1) DIMENSIONS: AS DELINEATED HEREIN.
  - (2) MOUNTING HARDWARE: THE FOLLOWING PARTS AS DELINEATED SHALL ACCOMPANY EACH TRANSISTOR, PACKAGED IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2, SEPARATELY.
    - NUT, PLAIN, HEXAGON - CODE 7
    - INSULATOR, WASHER - CODE 4
    - INSULATOR, BUSHING - CODE 4
- B. ELECTRICAL CHARACTERISTICS: THE FOLLOWING PARAMETERS, AS SPECIFIED IN TABLE I, SHALL BE INSPECTED ON 100 PERCENT OF PROCUREMENT.
  - (1) BREAKDOWN VOLTAGE:  $V_{EBO}$ ,  $V_{CBO}$ ,  $V_{CEO}$
  - (2) CUTOFF CURRENT:  $I_{CBO}$
  - (3) STATIC FORWARD CURRENT TRANSFER RATIO:  $h_{FE1}$ ,  $h_{FE2}$ ,  $h_{FE3}$
  - (4) SATURATION VOLTAGE:  $V_{CE(SAT)1}$ ,  $V_{BE(SAT)1}$
- C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING INFORMATION.
  - (1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.
  - (2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.

3. DESIGN:

- A. STORAGE LIFE: INDEFINITE WHEN STORED AT TEMPERATURES BETWEEN  $-65^{\circ}\text{C}$  AND  $+200^{\circ}\text{C}$ .
- B. ABSOLUTE MAXIMUM RATINGS (AT  $+25^{\circ} \pm 3^{\circ}\text{C}$  UNLESS OTHERWISE SPECIFIED).
  - (1) COLLECTOR-BASE VOLTAGE ( $V_{CB}$ ): 100 VDC
  - (2) COLLECTOR-EMITTER VOLTAGE ( $V_{CE}$ ): 80 VDC
  - (3) EMITTER-BASE VOLTAGE ( $V_{BE}$ ): 8 VDC
  - (4) COLLECTOR CURRENT ( $I_C$ ): 30 AMPERES DC
  - (5) POWER DISSIPATION, TOTAL ( $P_T$ ): 100 WATTS AT  $+100^{\circ}\text{C}$  CASE TEMPERATURE.
  - (6) THERMAL RESISTANCE, JUNCTION-CASE ( $\theta_{J-C}$ ):  $1^{\circ}\text{C}/\text{WATT}$
  - (7) JUNCTION OPERATING TEMPERATURE ( $T_J$ ):  $+200^{\circ}\text{C}$
  - (8) STORAGE TEMPERATURE ( $T_{STG}$ ):  $-65^{\circ}\text{C}$  TO  $+200^{\circ}\text{C}$
- C. CONSTRUCTION:
  - (1) MATERIAL:
    - LEADS: WELDABLE, GOLD PLATED, ANNEALED IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH ND 1015402 EXCEPT AS FOLLOWS:
      - (a) TERMINAL DIMENSIONS AS SPECIFIED ON DRAWING.
      - (b) PLATING THICKNESS TO BE 175-225 MICROINCHES NICKEL AND 10-20 MICROINCHES OF GOLD.
    - STUD AND NUT: NICKEL PLATED BRASS.
    - INSULATOR, WASHER:  $0.00075 \pm 0.00050 - 0.00000$  THICK NATURAL MICA (MUSCOVITE)
    - INSULATOR, BUSHING: ALUMINA ( $96\% \text{Al}_2\text{O}_3$ )



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			
MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.		MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES $\pm$ $\pm$ $\pm$		TRANSISTOR, NPN, SILICON, POWER	
DO NOT SCALE THIS DRAWING MATERIAL SEE NOTES		SPECIFICATION CONTROL DRAWING	
HEAT TREATMENT NONE		CODE IDENT NO. SIZE	NASA DRAWING NO.
FINAL FINISH SEE NOTES		C	1006317
NEXT ASSY	USED ON	SCALE NONE	WT
APPLICATION		SHEET 1 OF 2	

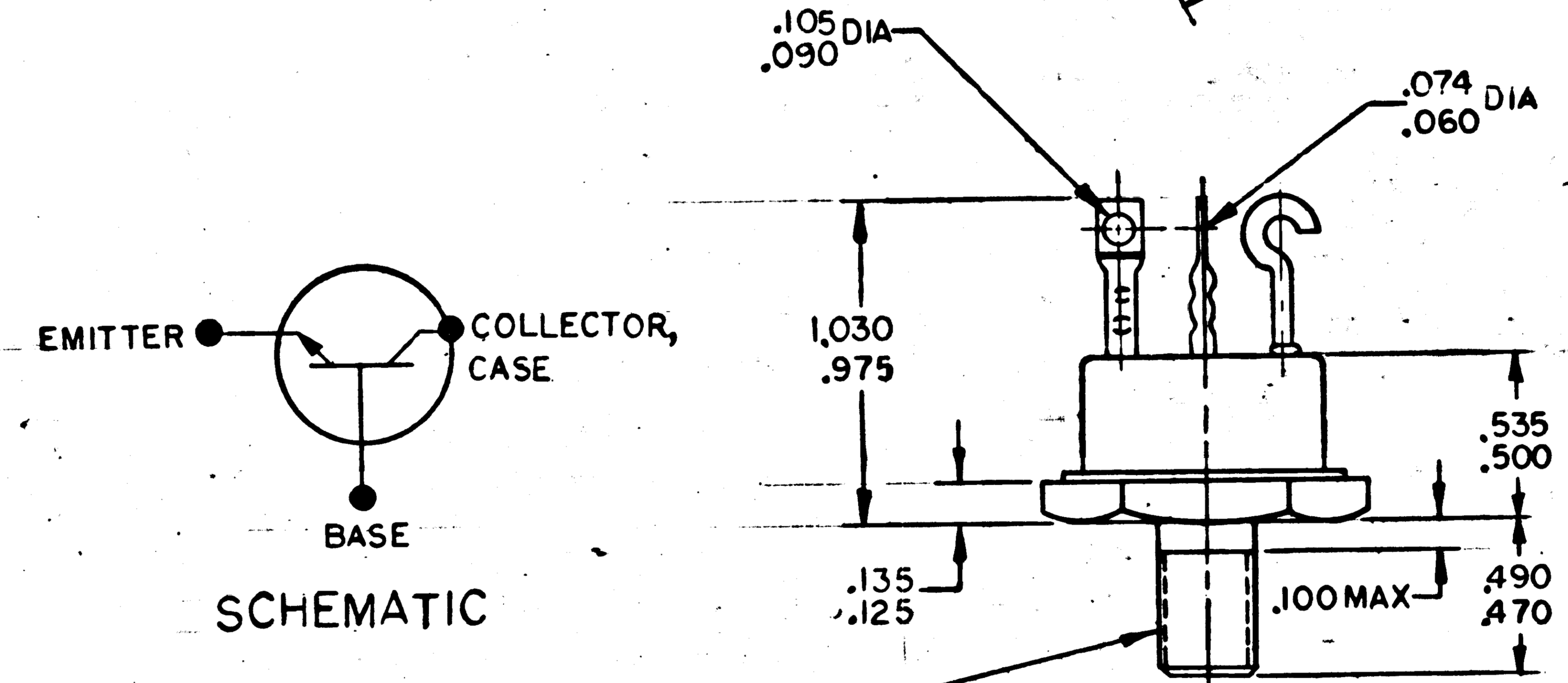
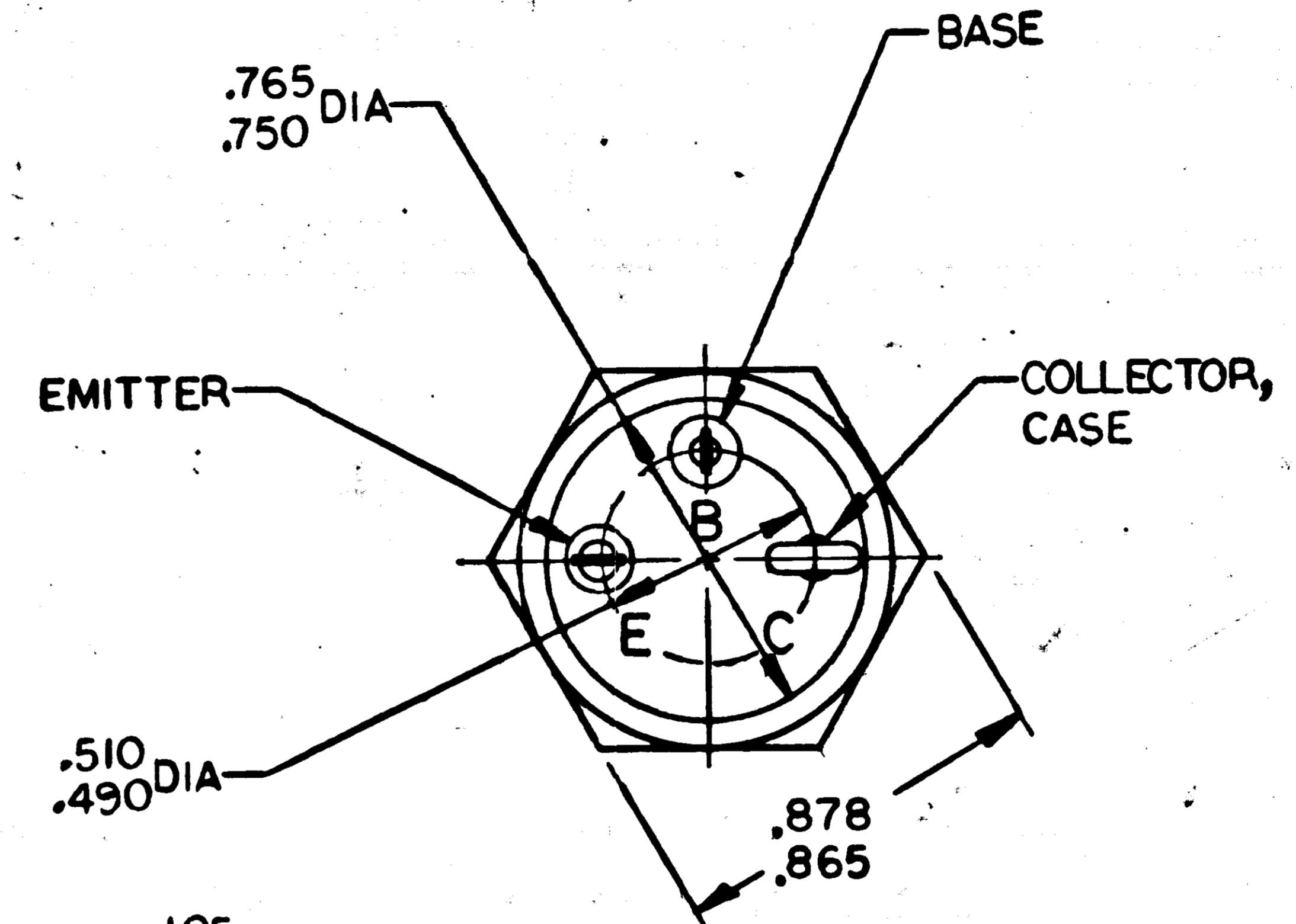
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TABLE I  
ELECTRICAL CHARACTERISTICS AT TC = +25°C (UNLESS OTHERWISE SPECIFIED)

PARAMETER	CONDITION	SYMBOL	SPECIFICATION LIMIT		UNIT
			MIN	MAX	
BREAKDOWN VOLTAGE, COLLECTOR-BASE	$I_C=200\mu A, I_E=0$	$BV_{CBO}$	100	-	VDC
BREAKDOWN VOLTAGE, EMITTER-BASE	$I_E=200\mu A, I_C=0$	$BV_{EBO}$	8	-	VDC
BREAKDOWN VOLTAGE, COLLECTOR-EMITTER	$I_C=10mA, I_B=0$	$BV_{CEO}$	80	-	VDC
SUSTAINING VOLTAGE, COLLECTOR-EMITTER	$I_C=100mA, I_B=0$	$LV_{CEO}$	70	-	VDC
CUTOFF CURRENT, COLLECTOR	$V_{CB}=60V, I_E=0$	$I_{CBO}$	-	10	$\mu ADC$
STATIC FORWARD CURRENT TRANSFER RATIO	$V_{CE}=5V, I_C=10mA$	$hFE_1$	100	-	-
	$V_{CE}=5V, I_C=10A$	$hFE_2$	100	-	-
	$V_{CE}=5V, I_C=20A$	$hFE_3$	10	-	-
SATURATION VOLTAGE, COLLECTOR-EMITTER	$I_C=10A, I_B=1A$	$V_{CE(sat)1}$	-	0.5	VDC
SATURATION VOLTAGE, BASE-EMITTER	$I_C=10A, I_B=1A$	$V_{BE(sat)1}$	-	1.2	VDC
GAIN BANDWIDTH PRODUCT	$V_{CE}=10V, I_C=1A$	-	25	-	MC

1 PULSE CONDITIONS: WIDTH < 300 MICROSECONDS; DUTY CYCLE < 2%.



$\frac{5}{16}$  -24UNF-2A  
MAX PITCH DIA OF PLATED THREADS SHALL BE BASIC PITCH DIA (.2854) REF (SCREW THREAD STD FOR FEDERAL SERVICES 1957) HANDBOOK H28 1957 PART 1

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIN. NO.
LIST OF MATERIALS			
MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.		MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
DRAWN <i>E.P. Sim</i> DATE 2/20/64		TRANSISTOR, NPN, SILICON, POWER	
CHECKED <i>R.T. D...</i> DATE 3/20/64			
APPROVAL <i>E.H. ...</i>		SPECIFICATION CONTROL DRAWING	
NASA APPROVAL <i>J. ...</i>			
MIT APPROVAL <i>W. ...</i>		CODE IDENT NO.	NASA DRAWING NO.
MIT APPROVAL <i>W. ...</i>		SIZE <b>C</b>	<b>1006317</b>
APPLICATION		SCALE NONE	WT
		SHEET 2 OF 2	