

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 NOR 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:

1. GENERAL:

- INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
- UNITS SHALL MEET THE REQUIREMENTS OF MIL-S-19500 EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED HEREIN.
- SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
- UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002051.
- 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.
- PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 2.
 - MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

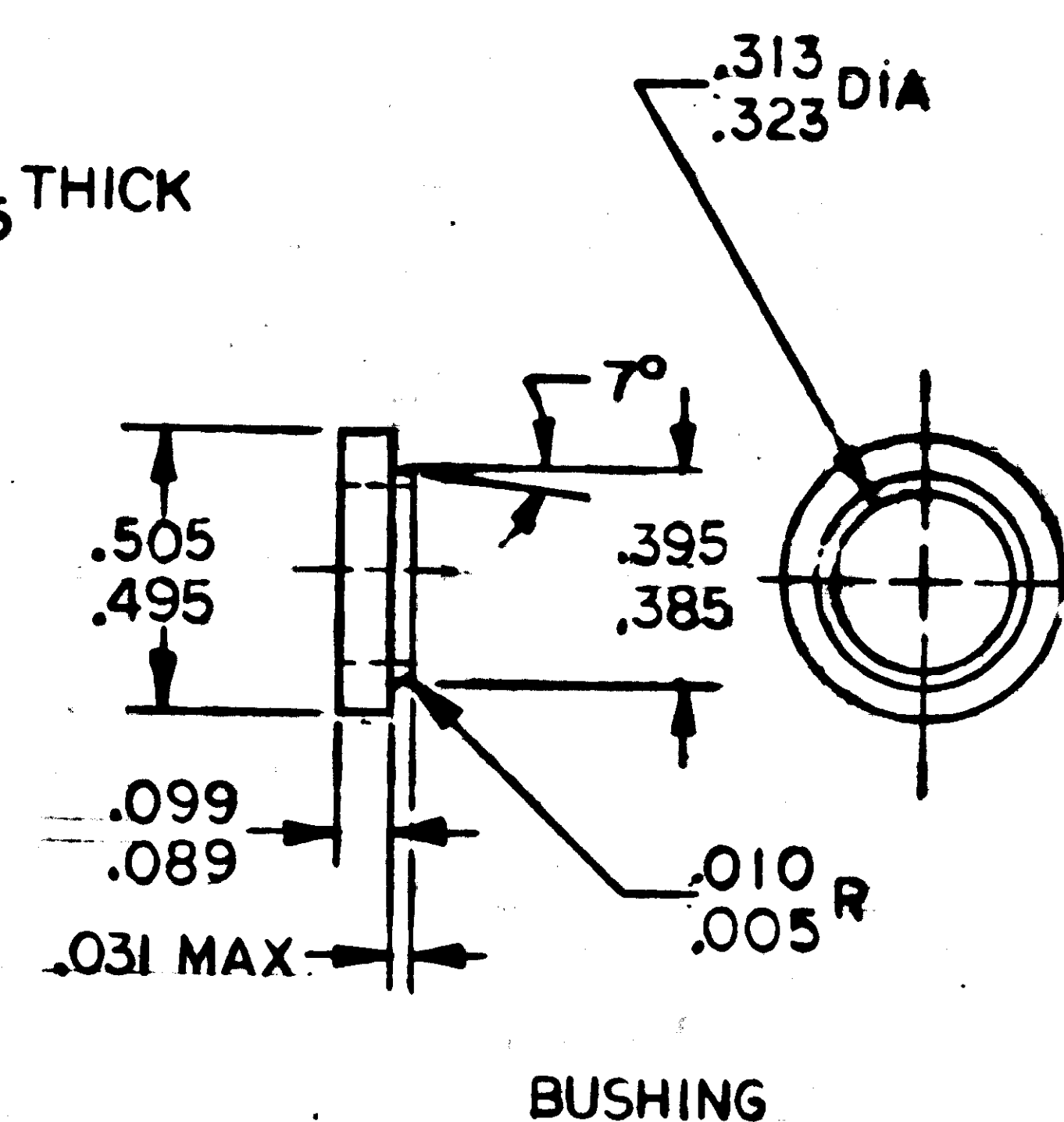
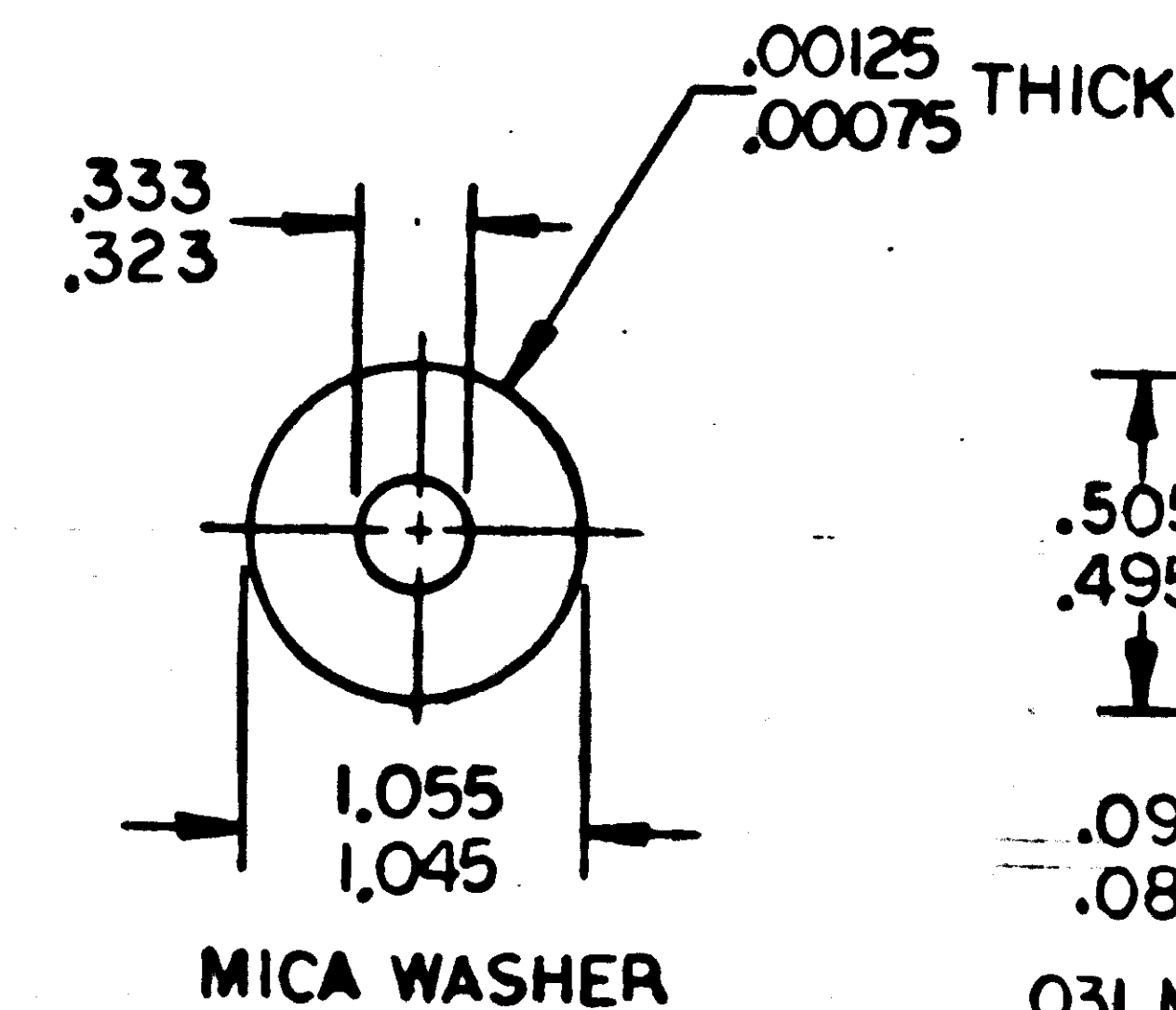
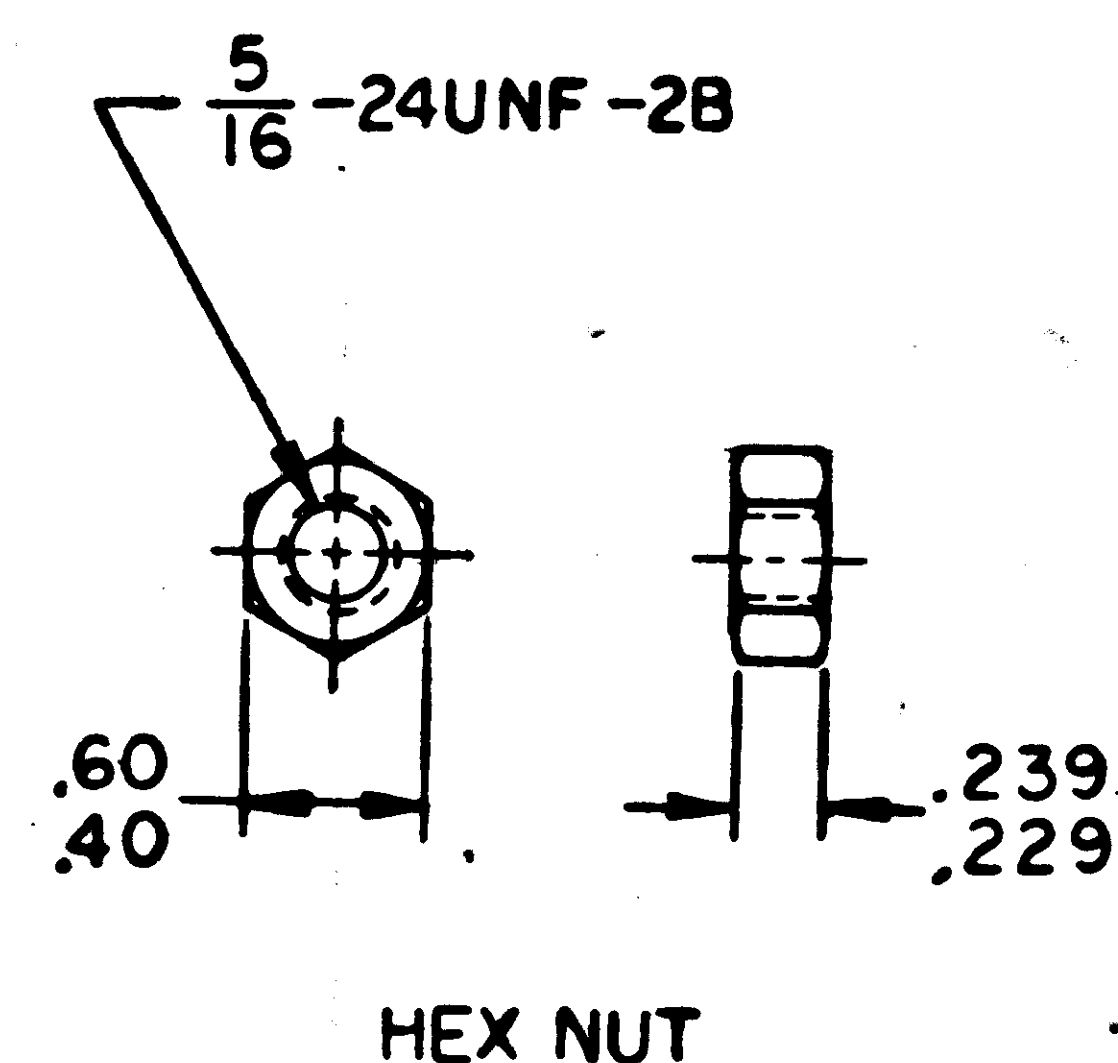
2. ACCEPTANCE AND INSPECTION:

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

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

3. DESIGN:

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



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			
MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.		MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
DRAWN <i>E. B. Spindel</i> 11/11/66 CHECKED <i>R. T. Darnell</i> 11/11/66 APPROVAL <i>E. B. Spindel</i> 11/11/66		TRANSISTOR, NPN, SILICON, POWER	
MATERIAL SEE NOTES		SPECIFICATION CONTROL DRAWING	
HEAT TREATMENT NONE		CODE IDENT NO. SIZE C	
FINAL FINISH SEE NOTES		NASA DRAWING NO. 1006317	
NEXT ASSY	USED ON	SCALE NONE	WT
APPLICATION		SHEET 1 OF 2	

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TABLE I

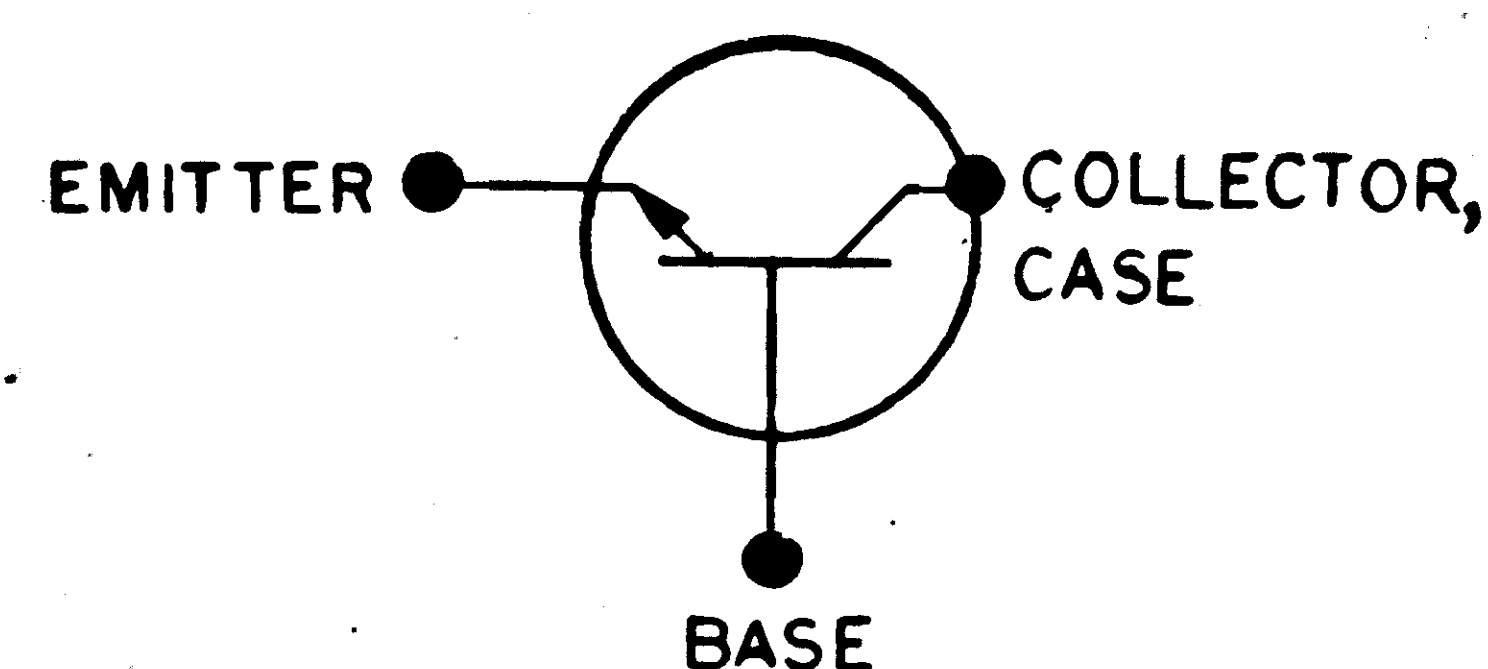
ELECTRICAL CHARACTERISTICS AT TC = +25°C (UNLESS OTHERWISE SPECIFIED)					
PART NO. 1006317-000 PARAMETER	CONDITION	SYMBOL	SPECIFICATION LIMIT		
			MIN	MAX	UNIT
BREAKDOWN VOLTAGE, COLLECTOR-BASE	$I_C=200\mu A, I_E=0$	BV_{CBO}	100	-	V _{DC}
BREAKDOWN VOLTAGE, EMITTER-BASE	$I_E=200\mu A, I_C=0$	BV_{EBO}	8	-	V _{DC}
BREAKDOWN VOLTAGE, COLLECTOR-EMITTER	$I_C=10\text{MA}, I_B=0$	BV_{CEO}	80	-	V _{DC}
SUSTAINING VOLTAGE, COLLECTOR-EMITTER	$I_C=100\text{MA}, I_B=0$ 1	LV_{CEO}	70	-	V _{DC}
CUTOFF CURRENT, COLLECTOR	$V_{CB}=60\text{V}, I_E=0$	I_{CB0}	-	10	μADC
STATIC FORWARD CURRENT TRANSFER RATIO	$V_{CE}=5\text{V}, I_C=10\text{MA}$	h_{FE1}	100	-	-
	$V_{CE}=5\text{V}, I_C=10\text{A}$ 1	h_{FE2}	100	-	-
	$V_{CE}=5\text{V}, I_C=20\text{A}$ 1	h_{FE3}	10	-	-
SATURATION VOLTAGE, COLLECTOR-EMITTER	$I_C=10\text{A}, I_B=1\text{A}$ 1	$V_{CE(sat)1}$	-	0.5	V _{DC}
SATURATION VOLTAGE, BASE-EMITTER	$I_C=10\text{A}, I_B=1\text{A}$ 1	$V_{BE(sat)1}$	-	1.2	V _{DC}
GAIN BANDWIDTH PRODUCT	$V_{CE}=10\text{V}, I_C=1\text{A}$	-	25	-	MC

PART NO. - 1006317-001 SHALL MEET THE CHARACTERISTICS OF TABLE I EXCEPT FOR STATIC FORWARD CURRENT TRANSFER RATIO WHICH SHALL BE WITHIN THE LIMITS SPECIFIED IN TABLE II

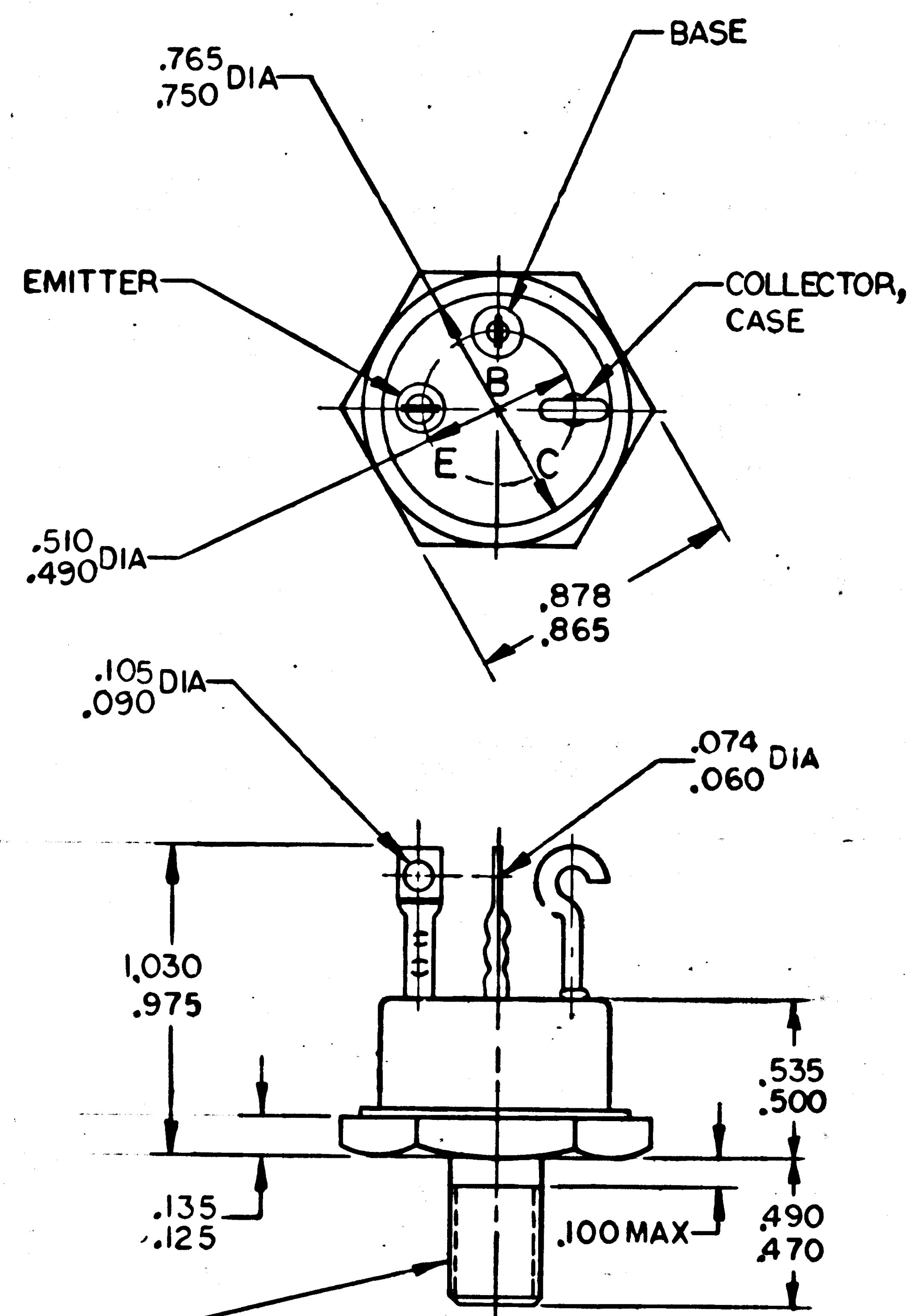
TABLE II

STATIC FORWARD CURRENT TRANSFER RATIO	CONDITION	SYMBOL	SPECIFICATION LIMIT		
			MIN	MAX	UNIT
	$V_{CE} = 5\text{V}, I_C = 100\text{MA}$	h_{FE1}	80	240	-
	$V_{CE} = 2\text{V}, I_C = 2\text{AMP}$	h_{FE2}	80	240	-
	$V_{CE} = 3\text{V}, I_C = 10\text{AMP}$	h_{FE3}	30	90	-
	$V_{CE} = 3\text{V}, I_C = 20\text{AMP}$	h_{FE4}	10	-	-

1. PULSE CONDITIONS: WIDTH \leq 300 MICROSECONDS: DUTY CYCLE \leq 2%.



SCHEMATIC



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 I

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			
MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.		MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
DRAWN <i>E.P. Smith</i> DATE <i>23 Dec 64</i> CHECKED <i>R.T. D... 30 Dec 64</i>		TRANSISTOR, NPN, SILICON, POWER	
APPROVAL <i>E.H. Smith</i> APPROVAL <i>E.H. Smith</i>		SPECIFICATION CONTROL DRAWING	
NASA APPROVAL <i>W.C. Smith</i> 2/1/65		CODE IDENT NO.	NASA DRAWING NO.
MIT APPROVAL <i>W.C. Smith</i> 17 Feb 65		SIZE C	1006317
MIT APPROVAL <i>W.C. Smith</i> 17 Feb 65		SCALE NONE	WT
		SHEET 2 OF 2	