REQUIREMENTS:

1. GENERAL:
   A. Interpreting the 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. Processed lots must meet the acceptance requirements of ND 1002213. Processing in accordance with ND 1002313 shall be performed at location specified by the buyer.

2. MARKING:
   (1) Parts shall be permanently and legibly marked, in accordance with ND 1002019, with the NASA part number (drawing number and revision letter) or as many significant digits as possible (e.g., 6323). Other marking such as manufacturer's identification and type number is permissible.

3. PREPARATION FOR DELIVERY:
   (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.

ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:
   (1) Dimensions: As delineated herein.

B. SEAL TEST: The units shall be subjected to a helium or radiflo leak detection test with a sensitivity of at least 1 x 10^-8 cc/ATM/sec and a hot glycerine bubble test for gross leaks. The leak test shall be performed in accordance with MIL-STD-202C Method 112. Test condition C shall be used for the helium or radiflo test. Test condition A shall be used for the gross leak test except that glycerine shall replace the mineral oil. A leakage rate of 1 x 10^-8 cc-ATM-sec or greater shall constitute a failure.

C. ELECTRICAL CHARACTERISTICS: Per Table I, as listed below:
   (1) Electrical testing: The tests listed in Table I shall be performed as listed below:
      - Collector cutoff current
      - Collector-base breakdown voltage
      - Emitter-base breakdown voltage
      - Emitter-base reverse current
      - Collector-emitter sustaining voltage
      - Collector-emitter current
      - Collector-emitter threshold current
      - Direct current gain
      - Base-emitter saturation voltage
      - Collector-emitter saturation voltage
      - Collector capacitance

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.
D. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANYED BY THE FOLLOWING DOCUMENTATION:
   (1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.
   (2) CERTIFICATE OF COMPLIANCE WITH NSN 1015404, CLASS 2.

3. DESIGN:
A. STORAGE LIFE: INDEFINITE WHEN STORED AT TEMPERATURES BETWEEN -65°C AND +150°C.
B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:
   (1) COLLECTOR-EMITTER VOLTAGE (VCEO): 35 VDC.
   (2) COLLECTOR-BASE VOLTAGE (VCEO): 60 VDC.
   (3) EMITTER-BASE VOLTAGE (VEBO): 5 VDC.
   (4) COLLECTOR CURRENT (IC): 600 MILLIAMPERES.
   (5) THERMAL RESISTANCE, JUNCTION-CASE (RJC): 50°C/WATT.
   (6) THERMAL RESISTANCE, JUNCTION-AMBIENT (RJA): 350°C/WATT.
   (7) TEMP. RANGE, JUNCTION, OPERATING: -65°C TO +150°C.
   (8) TEMP. RANGE, STORAGE: -65°C TO +150°C.

C. CONSTRUCTION:
   (1) SEMICONDUCTOR: SILICON PLANAR EPITAXIAL NPN.
   (2) CASE: METAL CASE AND METAL HEADER HERMETICALLY SEALED (JEDEC TO-18).
   (3) COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.
   (4) LEAD MATERIAL: WELDABLE, GOLD PLATED, ANNEALED NICKEL-COBALT (KOVAR) ALLOY IN ACCORDANCE WITH NSN 1015402.

D. QUALITY ASSURANCE REQUIREMENTS:
   (1) LOT DEFINITION: A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.
   (2) INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED, ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF +25°C ± 3°C.

UNLESS OTHERWISE SPECIFIED:

DRAWN: H. JONES
CHECKED: A. CASASO
DATE: 2/27/70
APPROVED: B. C. HALL

MIT INSTRUMENTATION LAB
HARVARD UNIVERSITY
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SPECIFICATION CONTROL DRAWING

MATERIAL: SILICON

SEAS REQUIREMENTS

APPROVAL: W. KUPPER

MIT APPROVAL
Sheet 2 of 2

VOLTAGE IN: VIN = +7.5V
PULSE WIDTH: PW = 0.5u SEC
TOTAL RISE, FALL: TR = TF ≤ 6N SEC
IMPEDEANCE IN: ZIN = 50Q

FIGURE 1

SWITCHING CIRCUIT: T ON; T OFF

+130Q
+37Q

-14V
+6V

+7.5V
1.0uF

250Q

50Q

1N916

OUT TO OSCILLOSCOPE

Z IN ≥ 0.1M Q

tr ≤ 1N SEC

CODE IDENT NO. 80230

NASA APPROVAL

MICHAELS, ET

1006323
### Table 1

**Acceptance Inspection**

<table>
<thead>
<tr>
<th>Test</th>
<th>Symbol</th>
<th>MIL-STD-750 Test Conditions</th>
<th>Limit</th>
<th>Testing Required</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subgroup 1</strong>&lt;br&gt;Visual and Mechanical Examination</td>
<td>Method 2071</td>
<td>TA = 25° ± 3°C unless specified</td>
<td>LTPD = 10 (Note 1)&lt;br&gt;Max ACC NO. = 3</td>
<td></td>
</tr>
<tr>
<td><strong>Subgroup 2</strong>&lt;br&gt;Collector Cutoff Current</td>
<td>VCE=30 V; IE=0</td>
<td>100 NA</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Collector Cutoff Current 150°C</td>
<td>VCE=30 V; IE=0, T A=+150°C</td>
<td>200 µA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collector-Base Breakdown Voltage</td>
<td>IC=100 µA; IE=0</td>
<td>60 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emitter-Base Reverse Current</td>
<td>VCE=3 V; IE=0</td>
<td>100 NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emitter-Base Breakdown Voltage</td>
<td>IC=100 µA; IE=0</td>
<td>5 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collector-Emitter Sustaining Voltage (Note 2)</td>
<td></td>
<td>35 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collector-Emitter Current Return</td>
<td>VCE=30 V; RBE=100 K</td>
<td>10 µA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collector-Emitter Threshold Current</td>
<td>VCE=-0.4 V; VCE=40 V</td>
<td>10 µA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC Current Gain (Note 2)</td>
<td>IC=500 mA; VCE=10 V</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC Current Gain (Note 2)</td>
<td>IC=150 mA; VCE=10 V</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC Current Gain (Note 2)</td>
<td>IC=10 mA; VCE=10 V</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base-Emitter Saturation Voltage (Note 2)</td>
<td>VBE(sat)</td>
<td>IC=500 mA; IB=50 mA</td>
<td>1.00 V</td>
<td></td>
</tr>
<tr>
<td>Collector-Emitter Saturation Voltage (Note 2)</td>
<td>VCE(sat)</td>
<td>IC=150 mA; IB=15 mA</td>
<td>0.40 V</td>
<td></td>
</tr>
<tr>
<td>Collector-Emitter Saturation Voltage (Note 2)</td>
<td></td>
<td>IC=500 mA; IB=50 mA</td>
<td>1.0 V</td>
<td>100%</td>
</tr>
<tr>
<td>Collector-Emitter Saturation Voltage (Note 2)</td>
<td></td>
<td>VCE(sat)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collector Capacitance</td>
<td></td>
<td>VCE=10 V; IC=0</td>
<td>8 PF</td>
<td></td>
</tr>
<tr>
<td>Turn On Time</td>
<td></td>
<td>t(on)</td>
<td>25 nsec</td>
<td></td>
</tr>
<tr>
<td>Turn Off Time</td>
<td></td>
<td>t(off)</td>
<td>40 nsec</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>2% Duty Cycle</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2% Duty Cycle</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. LTPD = 10, Maximum Accept NO. = 1, Reject = 2.
2. Pulse ≤ 300 µsec, AT ≤ 2% Duty Cycle.
3. LTPD OR X PER MIL-S-28500 D, TABLE CI OR CII.
4. Currents to within ±10%.