UNIVAC ENGINEERING STANDARD
COMPANY CONFIDENTIAL
APPROVED VENDORS LIST

THIS PAGE MUST BE DETACHED FROM THE PURCHASED PART DRAWING WHENEVER THIS DRAWING IS SHOWN OR TRANSMITTED TO VENDORS.

REV. D

DWG. NO. 4908000

APPROVED SOURCE OF SUPPLY

MOTOROLA SEMICONDUCTOR PRODUCTS (04713)
PHOENIX, ARIZONA

TEXAS INSTRUMENTS INC. (01295)
DALLAS, TEXAS

UNIVAC IDENT NO.	MOTOROLA PART NO.	TEXAS INST. PART NO.
4908000-00	SM313	GM0172
4908000-01	SM15	GM0089

NOTE:
SOURCE INFORMATION TRANSFERRED TO PURCHASED PART DRAWING.

SYM	EIR	DESCRIPTION	DATE	CHK	APPD
P	U-11554-1	ADDED NOTE	7-8-66	[illegible]	[illegible]
N	U11472-1	REDRAWN	3-23-67	[illegible]	

REVISIONS

SHEET 1 OF 1

APPROVED VENDORS LIST

TITLE
TRANSISTOR-PNP
GERMANIUM, SWITCHING

CLASS U

PURCHASED PART DRAWING

UNIVAC

DWG. NO. 4908000

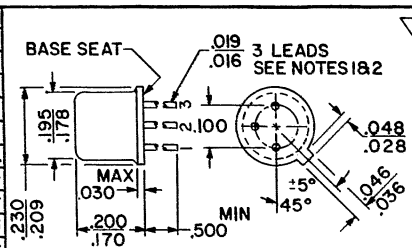
N P

A-1783

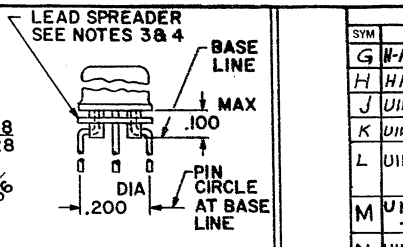
UNIVAC ENGINEERING STANDARD

DWG NO. 4908000

G H J K L M N P



TO-18 OUTLINE, EXCEPT MAX HEIGHT
FIGURE 1



SAME AS FIGURE 1, WITH LEAD SPREADER
FIGURE 2

NOTES:
1. THE SPECIFIED LEAD DIAMETER APPLIES IN THE ZONE BETWEEN .050 AND .250 FROM THE BASE SEAT. BETWEEN .250 AND 0.500 A MAXIMUM OF .021 DIAMETER IS HELD. OUTSIDE OF THESE ZONES THE LEAD DIAMETER IS NOT CONTROLLED
2. LEAD #1-EMITTER, LEAD #2-BASE, LEAD #3-COLLECTOR TIED TO CASE
3. LEAD SPREADER ASSEMBLY REQUIREMENTS SHALL BE IN ACCORDANCE WITH GS 429
4. THE LEAD SPREADER MUST MEET THE REQUIREMENTS OF RRU 4912263-00

SCOPE: THIS DRAWING COVERS THE DETAIL REQUIREMENTS FOR A GERMANIUM PNP, EPITAXIAL MESA TRANSISTOR.

APPLICABLE DOCUMENTS: THE FOLLOWING DOCUMENTS OF THE ISSUE IN EFFECT ON THE DATE OF INVITATION FOR BIDS, FORM A PART OF THIS DRAWING
RRU GS 420 -- TRANSISTORS, GENERAL SPECIFICATION FOR
RRU GS 421 -- COMPONENT ACCEPTANCE TESTING AND STORAGE
MIL-STD-105 -- SAMPLING PROCEDURES AND TABLES FOR INSPECTION BY ATTRIBUTES
RRU 4907929 -- SEMICONDUCTOR DEVICE, DIODE--GERMANIUM, SWITCHING
RRU 4912263-00 ADAPTER, TRANSISTOR HOLDER
RRU GS429-- SPREADER, TRANSISTOR LEAD, MOUNTING REQUIREMENTS FOR

REQUIREMENTS:
GENERAL: THE GENERAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH GS 420, GS429 AND AS SPECIFIED HEREIN
PHYSICAL:
TERMINALS: KOVAR, TINNED OR GOLD PLATED
CASE: HERMETICALLY SEALED-WELDED METAL CASE
MARKINGS MINIMUM: MANUFACTURER'S TYPE NUMBER, MANUFACTURER'S IDENTIFICATION AND ACCEPTANCE DATE CODE ALL TYPOGRAPHICALLY INDICATED.

ELECTRICAL
ABSOLUTE MAXIMUM RATINGS:

	25 ± 1.5°C AMBIENT	°C
1) V_{CEO}		
2) V_{CES} (V_{RBE} 0 R_B 0)	-15 V	
3) V_{CBO}	-15 V	
4) V_{EBO}	-2.0V	
5) I_C (DC)	-100 ma	
6) I_B (DC)		
7) TOTAL TRANSISTOR DISSIPATION: (a) FREE AIR, DERATE BY 2.0 mW/°C	150 mW	
(b) INF. HEAT SINK, DERATE BY ___ mW/°C		
(c)		
(d)		
8) STORAGE TEMPERATURE -65°C TO 100°C		
9) OPERATING JCT. TEMPERATURE -65°C TO 100°C		
10) V_{CEX}	-12.5V	
11)		

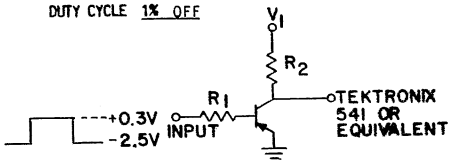
CHARACTERISTICS:

	25 ±1.5°C AMBIENT MIN	25 ±1.5°C AMBIENT MAX	°C MIN	°C MAX		25 ±1.5°C AMBIENT MIN	25 ±1.5°C AMBIENT MAX
12) I_{CBO} (a) V_{CBO}					PE12		
(b) V_{CBO}							
13) I_{EBO} (a) V_{EBO} -2.0V		-100ua			PE13		-200ua
(b) V_{EBO}							
14) I_{CEX} (a) V_{CEX} V_{BE} R_B					PE14		
(b) V_{CEX} V_{BE} R_B							
15) I_{CES} (a) V_{CES} -1.0V		-1.5ua			PE15		-14ua
(b) V_{CES} -10V		-7 ua					-200ua
(c) V_{CES} -15 V		-100ua			PE16		
16) LV_{CEO} @ I_{CEO}					PE17		
17) h_{FE} (a) V_{CE} -0.3V I_C -10 ma	30					32	
(b) V_{CE} -0.4V I_C -40 ma	40	200			PE18		-0.6V
18) V_{BE} (a) I_C -40ma I_B -2 ma		-0.6V					
(b) I_C ___ I_B ___					PE19		
19) V_{CE} (a) I_C ___ I_B ___							
(b) I_C ___ I_B ___					PE20		
20) C_{ob} @ f 1.0 mc V_{CB} -3.0V I_E 0		5 pf			PE21		
21) f_{hfb} @ V_{CB} ___ I_E ___							
22) h_{fe} @ f 100 mc V_{CE} -0.5V, I_E 10ma	2.5						
23) C_{ie} @ f 1 mc, V_{BE} 1.0V, V_{CE} 0 V		6 pf					
24) LV_{CEX} @ I_{CEX} -55 ma APPROX 1/	-12.5V						

1/ LV_{CEX} SHALL BE MEASURED USING THE FOLLOWING CIRCUIT.

R_1 500 OHMS
R_2 220 OHMS
V_1 -12.5V
t_{ri} 20 NSEC ±10%

PW 10 USEC
DUTY CYCLE 1% OFF



RRU IDENT. NO. 4908000-SEE TAB

UNLESS OTHERWISE SPECIFIED		
ALL DIMENSIONS IN INCHES		
TOLERANCE ON FRACTIONS ±1/64	DECIMALS ± .010	ANGLES ± 2°

REVISIONS

SYM	EIR	DESCRIPTION	DATE	COMP ENG	QUAL	STD
G	W-111341	REVISED & REDRAWN-SEE EIR	11/17/61			
H	H111145-1	SEE EIR	12/10/62			
J	U11379-1	REV LV_{CEX} DIAG & GROUP 'B' TEST	1/17/63			
K	U11401-1	ADDED "INACTIVE" NOTATION	3/21/63			
L	U11416-1	DELETED "INACTIVE" NOTATION INACTIVE FOR COMMERCIAL ENGRG ONLY AFTER 3-1-66	5/1			
M	U11421-1	REV AVL SHEET ONLY	6/1			
N	U11472-1	REVISED PULSE WIDTH				
P	U-11554-1	ADDED SOURCE TO DRAWING	7/16/63			

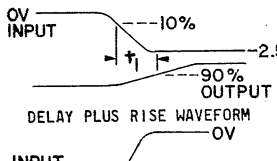
25) PULSE REPONSE TIME:
(a) TURN ON TIME $t_1 = t_d + t_{ro}$
I_C ≅ -10 MA
I_{B1} ≅ -0.8 MA
$V_{BE(0)}$ ≅ 0.7 VOLTS
(b) TURN OFF TIME $t_2 = t_s + t_{fo}$
I_C ≅ -10 MA
I_{B1} ≅ -1.5 MA
I_{B2} ≅ 0.3 MA

	25 ± 1.5°C AMBIENT MIN	25 ± 1.5°C AMBIENT MAX
t_d		
t_{ro}		
t_1		60 n sec
t_s		
t_{fo}		
t_2		100 n sec

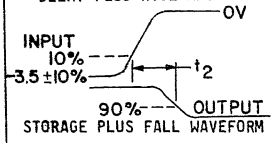
*C_C 100 ±5% pf
R_L 1.2K ±1% OHMS
V_{CC} -12 ±5% VOLTS

t_{ri} 10 n SEC. MAX.
t_{fi} 10 n SEC. MAX.
PRR 1 MEG CPS NOM.

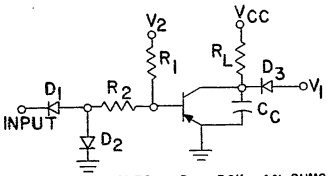
* INCLUDES SCOPE PROBE CAPACITANCE
PULSE WIDTH 200 n SEC NOM



DELAY PLUS RISE WAVEFORM



STORAGE PLUS FALL WAVEFORM



V_1 -3 ±5% VOLTS R_1 39K ±1% OHMS
V_2 12±5% VOLTS R_2 1.5K±1% OHMS
D_1, D_2, D_3: RRU 4907929 OR EQUIVALENT.

QUALITY ASSURANCE PROVSIONS:
SAMPLING AND INSPECTION: SAMPLING AND INSPECTION SHALL BE IN ACCORDANCE WITH GS420, GS421 AND AS SPECIFIED HEREIN.

PACKAGING: PACKAGING SHALL BE IN ACCORDANCE WITH GS 420.

TABLE 1

INSPECTION OR TEST	ITEM	INSPECTION OR TEST	ITEM	INSPECTION OR TEST	ITEM
GROUP A		GROUP B		GROUP D	
SUBGROUP I		SHOCK AND CENTRIFUGE		HERMETIC SEAL	
DESIGN AND CONSTRUCTION		I_{EBO}	13a	I_{EBO}	13a
SUBGROUP II		I_{CES}	15b	I_{CES}	15b
I_{EBO}	13a	I_{CES}	15c	I_{CES}	15c
I_{CES}	15a	h_{FE}	17b	h_{FE}	17b
I_{CES}	15b	V_{BE}	18a	V_{BE}	18a
I_{CES}	15c	GROUP C			
h_{FE}	17a	OPERATING LIFE (V_{CB}= -5V MIN, P_T =150 mw MIN)		INSPECTION LEVEL AND AQL % DEFECTIVE PER MIL-STD-105	
h_{FE}	17b	I_{EBO}	PE13a	GROUP A	II
V_{BE}	18a	I_{CES}	PE15b	SUBGROUP I	.65
SUBGROUP III		I_{CES}	PE15c	SUBGROUP II	.65
C_{ob}	20	h_{FE}	PE17b	SUBGROUP III	.65
h_{fe}	22	V_{BE}	PE18a	GROUP B	II 1.0
C_{ie}	23			GROUP C	L8 1.0
LV_{CEX}	24			GROUP D	L8 1.0
t_1	25a				
t_2	25b				

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UNIVAC IDENT NO.	MOTOROLA PART NO.	TEXAS INST. PART NO.
4908000-00	SM313	GM0172
4908000-01	SM15	GM0089

RRU IDENT NUMBER	CASE CONFIGURATION
4908000-00	FIGURE 1
-01	FIGURE 2

COMPONENT ENGINEER J.E. DIGER	DATE 7/25/61	CLASS U	Remington Rand Univac DIVISION OF SPERRY RAND CORPORATION
DESIGN ENGINEER R.J. KERLER	7/25/61		PURCHASE PART DRAWING
QUALITY K.N. HAUGEN	7/27/61	TYPE	SPECIFICATION CONTROL DRAWING Q
STANDARDS L.E. SABINE	5/17/62	TITLE	TRANSISTOR-- PNP, GERMANIUM, SWITCHING
		CODE IDENT NO. 94209	SIZE C
FIRST USER	WEIGHT	CATALOG CODE 5960	DWG NO. 4908000
			SHEET 1 OF 1

G H J K L M N P