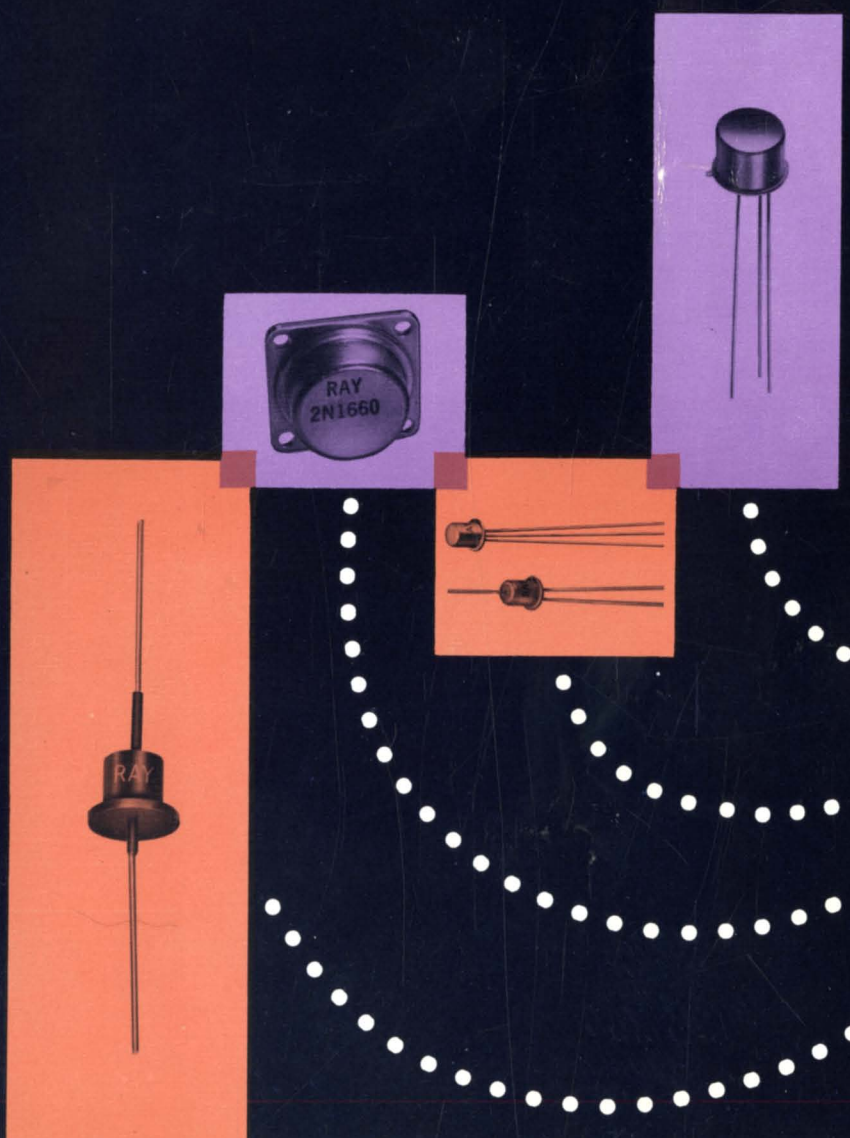
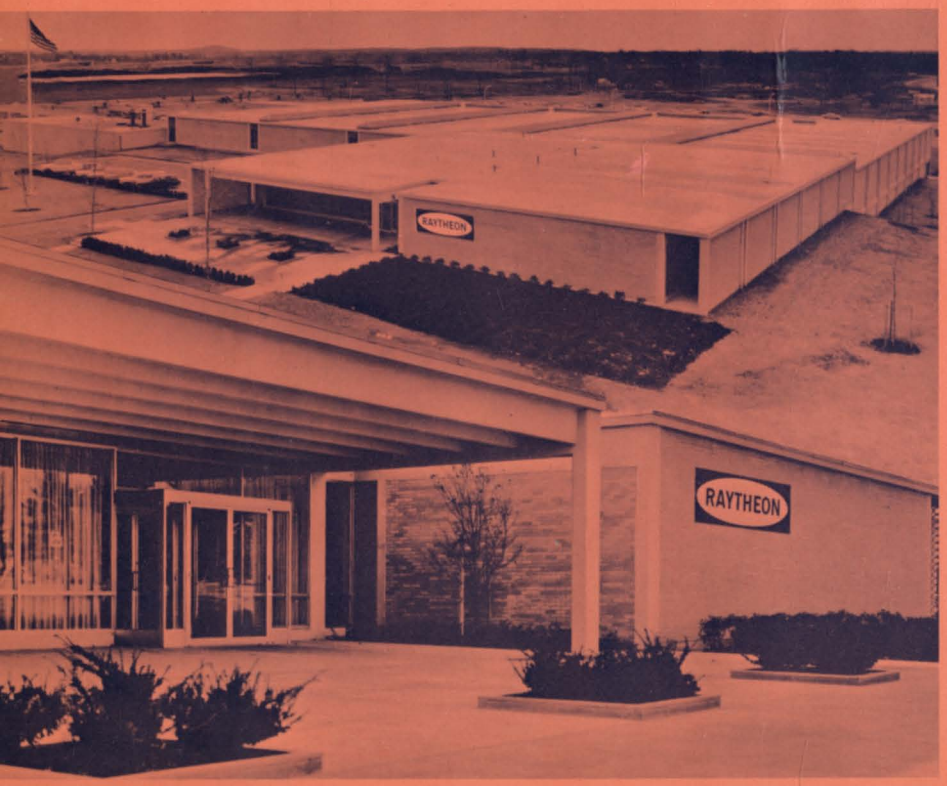
RAYTHEON

SEMICONDUCTORS



RAYTHEON SEMICONDUCTOR DIVISION PRODUCTION FACILITIES



Lowell, Massachusetts, Plant of Raytheon Semiconductor

Modern Manufacturing Plants and Equipment for the Latest in Semiconductor Devices.

Manufacturing semiconductors is at best a highly delicate operation. The trend toward smaller devices . . . the need for even more product reliability . . . the inherent electrical sensitivity of semiconductor materials to contamination of all sorts — these are some reasons why semiconductor manufacturing is such a demanding skill.

Well-trained personnel is a necessity for this type of operation. And Raytheon Semiconductor Division has it. Equally-important are our modern, contaminant-free production areas and trend setting equipment.

Equipment is an especially critical area, since the special requirements of semiconductor manufacturing necessitate special machinery not generally available from outside sources. To meet the stringent requirements of today's products, we have established our own Equipment Development Department. This group has designed and developed much of the precision equipment used in our plants.

A good example of this is the automatic boat loader used on our automated tran-

Lewiston, Maine, Plant of Raytheon Semiconductor.

...istor production lines. These boats (or ...ssembly jigs) were previously loaded manually with materials to form alloy junction transistors. This operation required considerable manual dexterity as well as time. With the automatic boat loader developed by our Equipment Development Department, product reliability was considerably increased by elimination of manual manipulations, while customer costs were decreased.

Raytheon Semiconductor's manufacturing operations are centered in two of the newest, most modern semiconductor plants presently in operation. One is located in Lowell, Massachusetts, and the other at Lewiston, Maine. Much of the equipment for these plants — which are considered model semiconductor manufacturing facilities — was developed especially by our Equipment Development Department to provide better products at lower cost than previously available.

Both the 200,000-square foot Lowell Plant and the 116,500 -square foot Lewis-...n Plant are fully air-conditioned, contain a special water purification system, humidity and dust controls, and many other unique manufacturing features.

SILICON SUBMINIATURE GLASS DIODES

GENERAL PURPOSE

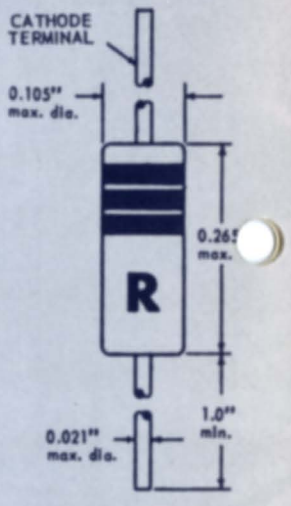
		PIV	I_F Min. @ 1.0V mA	I_O Max. mA		Maximum Reverse Current in μA			Max. One Second Surge Current Amps
				@ 25°C	@ 150°C	Volts	@ 25°C	@ 150°C	
Temperature Range −65°C to +200°C CASE K	1N456	30	40	90	40	25	0.025	5	0.7
	1N457	70	20	75	36	60	0.025	5	0.6
	1N458	150	7	55	24	125	0.025	5	0.5
	1N459	200	3	40	17	175	0.025	5	0.4
	1N461	30	15	60	25	25	0.5	30	0.7
	1N462	70	5	50	25	60	0.5	30	0.6
	1N463	200	1	30	15	175	0.5	30	0.4
	1N464	150	3	40	20	125	0.5	30	0.5
	JAN 1N457	70	20	75	—	60	0.025	5	0.6
	JAN 1N458	150	7	55	—	125	0.025	5	0.5
	JAN 1N459	200	3	40	—	175	0.025	5	0.4

HIGH CONDUCTANCE — GENERAL PURPOSE

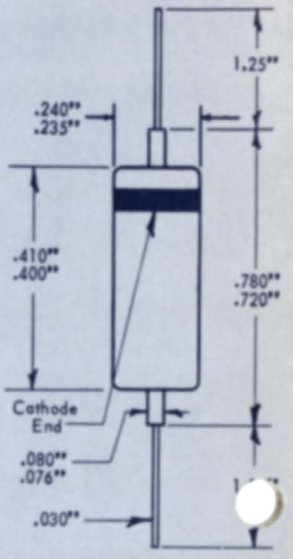
		PIV	V_F Max. @ 100 mA Volts	I_O Max. mA		Maximum Reverse Current in μA			Max. One Second Surge Current Amps
				@ 25°C	@ 150°C	Volts	@ 25°C	@ 150°C	
Temperature Range −65°C to +200°C CASE K	1N456A	30	1.0	200	70	25	0.025	5	1.5
	1N457A	70	1.0	200	70	60	0.025	5	1.5
	1N458A	150	1.0	200	70	125	0.025	5	1.5
	1N459A	200	1.0	200	70	175	0.025	5	1.5
	1N461A	30	1.0	200	70	25	0.5	30	1.5
	1N462A	70	1.0	200	70	60	0.5	30	1.5
	1N463A	200	1.0	200	70	175	0.5	30	1.5
	1N464A	150	1.0	200	70	125	0.5	30	1.5
	1N482	40	1.1	100	25	30	0.25	30	1.0
	1N483	80	1.1	100	25	60	0.25	30	1.0
	1N484	150	1.1	100	25	125	0.25	30	1.0
	1N485	200	1.1	100	25	175	0.25	30	1.0
	1N486	250	1.1	100	25	225	0.25	50	1.0
	1N487	330	1.1	100	25	300	0.25	50	1.0
	1N488	420	1.1	100	25	380	0.25	50	1.0

HIGH CONDUCTANCE — HIGH RESISTANCE

Temperature Range −65°C to +200°C CASE K	1N482A	40	1.0	200	50	30	0.025	15	2.0
	1N482B	40	1.0	200	50	30	0.025	5	2.0
	1N483A	80	1.0	200	50	60	0.025	15	2.0
	1N483B	80	1.0	200	50	60	0.025	5	2.0
	1N484A	150	1.0	200	50	125	0.025	15	2.0
	1N484B	150	1.0	200	50	125	0.025	5	2.0
	1N485A	200	1.0	200	50	175	0.025	15	2.0
	1N485B	200	1.0	200	50	175	0.025	5	2.0
	1N486A	250	1.0	200	50	225	0.05	25	2.0
	1N486B	250	1.0	200	50	225	0.05	5	2.0
	1N487A	330	1.0	200	50	300	0.1	25	2.0
	1N488A	420	1.0	200	50	380	0.1	25	2.0



CASE K



CASE R

SILICON UHF-MIXER DIODES

GENERAL PURPOSE

		Peak Reverse Voltage	
CASE R	1N82*	5	Designed for efficient low-noise mixer operation from 470 to 890 mc.
	1N82A*	5	

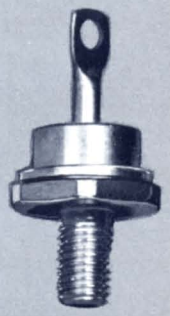
*Units are tested for noise figure in instruments designed to correlate with customer applications.

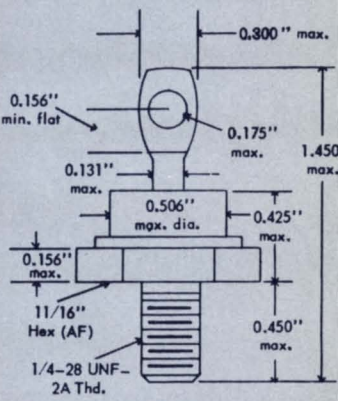
SILICON DIFFUSED RECTIFIERS

HIGH CURRENT — STUD MOUNTED

		Peak Recurrent Inverse Voltage	Average Rectified Current @ 150°C Case Temp. Amps	Max. Average Reverse Current @ 150°C mA	Vf @ 25°C Volts @ Amps	Max. Half Cycle Surge Current Amps
Temperature Range −65°C to +190°C CASE P	1N248	50	10	5	1.5 @ 25	250
	1N249	100	10	5	1.5 @ 25	250
	1N250	200	10	5	1.5 @ 25	250
	1N248A	50	20	5	1.5 @ 50	250
	1N249A	100	20	5	1.5 @ 50	250
	1N250A	200	20	5	1.5 @ 50	250
	1N1191A	50	22	5	1.2 @ 50	100▲
	1N1192A	100	22	5	1.2 @ 50	100▲
	1N1193A	150	22	5	1.2 @ 50	100▲
	1N1194A	200	22	5	1.2 @ 50	100▲
	1N1195	300	18	10	1.5 @ 50	200
	1N1196	400	18	10	1.5 @ 50	200
	1N1197	500	18	10	1.5 @ 50	200
	1N1198	600	18	10	1.5 @ 50	200

▲For one second

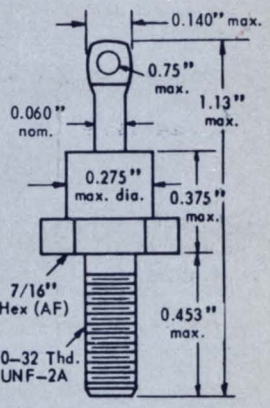




CASE P

MEDIUM CURRENT — STUD MOUNTED

		Peak Recurrent Inverse Voltage	Average Rectified Current @ Specified Case Temp. Amps @ 30°C	@ 135°C	Maximum Reverse Current @ Specified Voltage in μA Volts	@ 135°C	Vf @ 25°C Volts @ Amps	Max. Half Cycle Surge Current Amps
Low Reverse Current Temperature Range −65°C to +150°C CASE N	1N253	95	3.0	1.0	95	100*	1.5 @ 1.0	4 ‡
	1N254	190	1.5	0.4	190	100*	1.5 @ 0.5	1.5‡
	1N255	380	1.5	0.4	380	150*	1.5 @ 0.5	1.5‡
	1N256	570	1.0	0.2	570	250*	2. @ 0.5	1.0‡
					Volts	@ 25°C	@ 25°C	
	JAN 1N253	75		1.0	75	10	1.5 @ 1.0	4 ▲
	JAN 1N254	150		0.4	150	10	1.5 @ 0.5	1.5▲
	JAN 1N255	350		0.4	350	10	1.5 @ 0.5	1.5▲
	JAN 1N256	500		0.2	500	20	2 @ 0.5	1.0▲
			@ 50°C	@ 150°C		@ 150°C		
Low Reverse Current Mag. Amp. Types Temperature Range −65°C to +175°C CASE N and CASE O	1N332, (R)	400	2	0.4	400	200*	2 @ 0.8	15
	1N333, (R)	400	1	0.2	400	200*	2 @ 0.4	10
	1N334, (R)	300	2	0.4	300	200*	2 @ 0.8	15
	1N335, (R)	300	1	0.2	300	200*	2 @ 0.4	10
	1N336, (R)	200	2	0.4	200	100*	2 @ 0.8	15
	1N337, (R)	200	1	0.2	200	100*	2 @ 0.4	10
	1N339, (R)	100	2	0.4	100	100*	2 @ 0.8	15
	1N340, (R)	100	1	0.2	100	100*	2 @ 0.4	10
Power Supply Types Temperature Range −65°C to +175°C CASE N and CASE O	1N341, (R)	400	2	0.4	400	500*	2 @ 0.8	15
	1N342, (R)	400	1	0.2	400	500*	2 @ 0.4	10
	1N343, (R)	300	2	0.4	300	500*	2 @ 0.8	15
	1N344, (R)	300	1	0.2	300	500*	2 @ 0.4	10
	1N345, (R)	200	2	0.4	200	500*	2 @ 0.8	15
	1N346, (R)	200	1	0.2	200	500*	2 @ 0.4	10
	1N348, (R)	100	2	0.4	100	500*	2 @ 0.8	15
	1N349, (R)	100	1	0.2	100	500*	2 @ 0.4	10
			@ 30°C	@ 100°C ambient		@ 25°C		
Low Reverse Current High Forward Conductance Temperature Range −65°C to +150°C CASE N and CASE O	1N607A, (R)	50	1.8	1.0	50	1.0	1.5 @ 0.2	2**
	1N608A, (R)	100	1.8	1.0	100	1.0	1.5 @ 0.2	2**
	1N609A, (R)	150	1.8	1.0	150	1.0	1.5 @ 0.2	2**
	1N610A, (R)	200	1.8	1.0	200	1.0	1.5 @ 0.2	2**
	1N611A, (R)	300	1.8	1.0	300	1.0	1.5 @ 0.2	2**
	1N612A, (R)	400	1.8	1.0	400	1.5	1.5 @ 0.2	2**
	1N613A, (R)	500	1.8	1.0	500	2.0	1.5 @ 0.2	2**
	1N614A, (R)	600	1.8	1.0	600	2.5	1.5 @ 0.2	2**



CASE N

(R) denotes reverse polarity (Anode-to-Stud)

*Full Cycle Average

‡For 0.1 second @ 135°C

**For 0.1 second

▲For 1 second

SILICON DIFFUSED RECTIFIERS

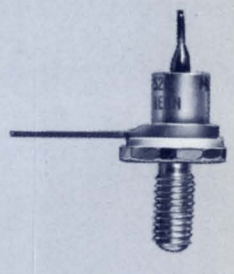
MEDIUM CURRENT — STUD MOUNTED

		Peak Recurrent Inverse Voltage	Average Rectified Current @ Specified Case Temp. Amps @ 30°C	@ 135°C	Maximum Reverse Current @ Specified Voltage in μA Volts	@ 135°C	Vf @ 25°C Volts @ Amps	Max. Half Cycle Surge Current Amps
			@ 100°C					
Low Reverse Current Temperature Range −65°C to +150°C CASE N and CASE O	1N550, (R)	100	2.0	0.5	100	0.5	1.5 @ 1.0	15
	1N551, (R)	200	2.0	0.5	200	1.0	1.5 @ 1.0	15
	1N552, (R)	300	2.0	0.5	300	1.5	1.5 @ 1.0	15
	1N553, (R)	400	2.0	0.5	400	2.5	1.5 @ 1.0	15
	1N554, (R)	500	2.0	0.5	500	3.5	1.5 @ 1.0	15
	1N555, (R)	600	2.0	0.5	600	5.0	1.5 @ 1.0	15
			@ 85°C	@ 150°C		@ 150°C	@ 150°C	
Temperature Range −65°C to +175°C CASE N and CASE O	1N1115, (R)	100	1.5	0.6	100	300*	0.65* @ 0.2	30
	1N1116, (R)	200	1.5	0.6	200	300*	0.65* @ 0.2	30
	1N1117, (R)	300	1.5	0.6	300	300*	0.65* @ 0.2	30
	1N1118, (R)	400	1.5	0.6	400	300*	0.65* @ 0.2	30
	1N1119, (R)	500	1.5	0.6	500	300*	0.65* @ 0.2	30
	1N1120, (R)	600	1.5	0.6	600	300*	0.65* @ 0.2	30

CASE N

MEDIUM CURRENT — STUD MOUNTED

		Peak Recurrent Inverse Voltage	Average Rectified Current @ Specified Case Temp. Amps @ 50°C	@ 150°C	Maximum Reverse Current @ Specified Voltage in μA Volts	@ 25°C	@ 150°C	Vf @ 25°C Volts @ Amps	Max. Half Cycle Surge Current Amps
Low Reverse Current Temperature Range −65°C to +165°C CASE N	1N1124, (R)	200	3.0	1.0	200	10	300*	1.1 @ 1.0	25
	1N1124A, (R)	250	3.3	1.2	250	10	300*	1.1 @ 1.0	25
	1N1125, (R)	300	3.0	1.0	300	10	300*	1.1 @ 1.0	25
	1N1126, (R)	400	3.0	1.0	400	10	300*	1.1 @ 1.0	25
	1N1126A, (R)	500	3.3	1.2	500	10	300*	1.1 @ 1.0	25
	1N1127, (R)	500	3.0	1.0	500	10	300*	1.1 @ 1.0	25
	1N1128, (R)	600	3.0	1.0	600	10	300*	1.1 @ 1.0	25
	1N1128A, (R)	750	3.3	1.2	750	10	300*	1.1 @ 1.0	25
	USN 1N1124A	200	3.3	1.0	200	10	200	1.1 @ 1.0	25
	USN 1N1126A	400	3.3	1.0	400	10	250	1.1 @ 1.0	25
	USN 1N1128A	600	3.3	1.0	600	10	350	1.1 @ 1.0	25
			@ 30°C						
	1N2512, (R)	100	4.0	1.0	100	2	—	1.1 @ 1.0	30
	1N2513, (R)	200	4.0	1.0	200	2	—	1.1 @ 1.0	30
	1N2514, (R)	300	4.0	1.0	300	2	—	1.1 @ 1.0	30
	1N2515, (R)	400	4.0	1.0	400	2	—	1.1 @ 1.0	30
	1N2516, (R)	500	4.0	1.0	500	2	—	1.1 @ 1.0	30
	1N2517, (R)	600	4.0	1.0	600	2	—	1.1 @ 1.0	30



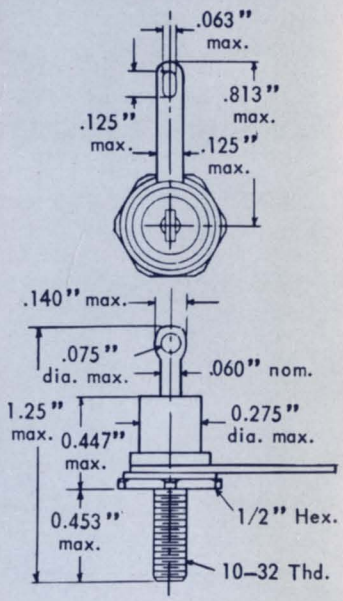
CASE O

(R) denotes reverse polarity (Anode-to-Stud)

*Full Cycle Average

MEDIUM CURRENT — INSULATED STUD

		Peak Recurrent Inverse Voltage	Average Rectified Current @ Specified Case Temp. Amps @ 30°C	@ 150°C	Maximum Reverse Current @ Specified Voltage in μA Volts	@ 25°C	Vf @ 25°C Volts @ Amps	Max. Half Cycle Surge Current Amps
High Forward Conductance Temperature Range −65°C to +165°C CASE O	1N2518	100	4.0	1.0	100	2	1.1 @ 1.0	30
	1N2519	200	4.0	1.0	200	2	1.1 @ 1.0	30
	1N2520	300	4.0	1.0	300	2	1.1 @ 1.0	30
	1N2521	400	4.0	1.0	400	2	1.1 @ 1.0	30
	1N2522	500	4.0	1.0	500	2	1.1 @ 1.0	30
	1N2523	600	4.0	1.0	600	2	1.1 @ 1.0	30



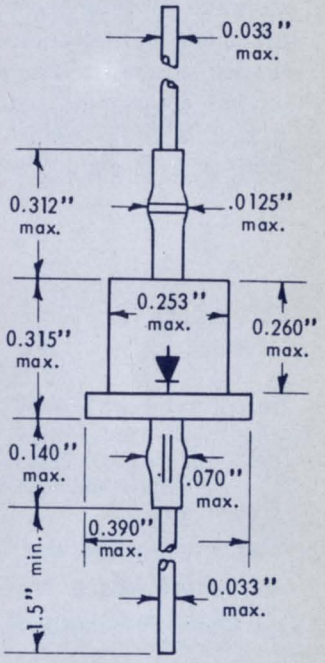
CASE O

SILICON DIFFUSED RECTIFIERS

LOW CURRENT — LEAD MOUNTED

		Peak Recurrent Inverse Voltage	Average Rectified Current @ Specified Temperature mA		Maximum Reverse Current @ Specified Voltage in μA			Vf @ 25°C Volts @ mA		Max. Half Cycle Surge Current Amps
			@ 50°C	@ 150°C	Volts	@ 25°C	@ 150°C			
High Conductance	1N440B	100	750	250	100	0.3	200*	1.5	@ 750	15
Temperature	1N441B	200	750	250	200	0.75	200*	1.5	@ 750	15
Range	1N442B	300	750	250	300	1.0	200*	1.5	@ 750	15
−65°C to +175°C	1N443B	400	750	250	400	1.5	200*	1.5	@ 750	15
CASE Q	1N444B	500	750	250	500	1.75	200*	1.5	@ 750	15
	1N445B	600	750	250	600	2.0	200*	1.5	@ 750	15
Low Reverse	1N536	50	750	250	50	10	300*	1.0	@ 500	15
Current	1N537	100	750	250	100	10	300*	1.0	@ 500	15
(Metal & Glass)	1N538	200	750	250	200	10	300*	1.0	@ 500	15
Temperature	1N539	300	750	250	300	10	300*	1.0	@ 500	15
Range	1N540	400	750	250	400	10	300*	1.0	@ 500	15
−65°C to +175°C	1N1095	500	750	250	500	10	300*	1.0	@ 500	15
CASE Q	1N547	600	750	250	600	10	300*	1.0	@ 500	15
	(1N1096)						@ 25°C			
	JAN 1N538	200	—	250	200	10	500	1.1	@ 500	15
	JAN 1N540	400	—	250	400	10	500	1.1	@ 500	15
	JAN 1N547	600	—	250	600	10	500	1.2	@ 500	15
			@ 25°C	@ 100°C					@ 25°C	
Low Reverse	1N599A	50	600	400	50	1.0		1.2	@ 600	15
Current	1N600A	100	600	400	100	1.0		1.2	@ 600	15
Temperature	1N601A	150	600	400	150	1.0		1.2	@ 600	15
Range	1N602A	200	600	400	200	1.0		1.2	@ 600	15
−65°C to +150°C	1N603A	300	600	400	300	1.0		1.2	@ 600	15
CASE Q	1N604A	400	600	400	400	1.5		1.2	@ 600	15
	1N605A	500	600	400	500	2.0		1.2	@ 600	15
	1N606A	600	600	400	600	2.5		1.2	@ 600	15
		Volts	@ 50°C	@ 150°C		@ 150°C				
Low Reverse	1N1100	100	750	250	100	300*		1.5	@ 750	15
Current	1N1101	200	750	250	200	300*		1.5	@ 750	15
(Metal & Glass)	1N1102	300	750	250	300	300*		1.5	@ 750	15
Temperature	1N1103	400	750	250	400	300*		1.5	@ 750	15
Range	1N1104	500	750	250	500	300*		1.5	@ 750	15
−65°C to +175°C	1N1105	600	750	250	600	300*		1.5	@ 750	15
CASE Q										
			@ 25°C	@ 125°C		@ 125°C				
Low Reverse	1N1487	100	750	250	100	300*		0.55*	@ 250	15
Current	1N1488	200	750	250	200	300*		0.55*	@ 250	15
(Metal & Glass)	1N1489	300	750	250	300	300*		0.55*	@ 250	15
Temperature	1N1490	400	750	250	400	300*		0.55*	@ 250	15
Range	1N1491	500	750	250	500	300*		0.55*	@ 250	15
−65°C to +150°C	1N1492	600	750	250	600	300*		0.55*	@ 250	15
CASE Q										
			@ 50°C	@ 100°C		@ 100°C			@ 100°C	
Medium Temperature	1N1692	100	600	250	100	500*		0.6*	@ 250	20
Temperature	1N1693	200	600	250	200	500*		0.6*	@ 250	20
Range	1N1694	300	600	250	300	500*		0.6*	@ 250	20
−65°C to +115°C	1N1695	400	600	250	400	500*		0.6*	@ 250	20
CASE Q	1N1696	500	600	250	500	500*		0.6*	@ 250	20
	1N1697	600	600	250	600	500*		0.6*	@ 250	20
			@ 80°C			@ 25° C	@ 100°C		@ 25°C	
Radio & TV	1N1763	400	750		400	100	1 mA	1.5	@ 750	35‡
Power Supplies	1N1764	500	750		500	100	1 mA	1.5	@ 750	35‡
Temperature										
−65°C to +100°C										
CASE Q										

CASE Q

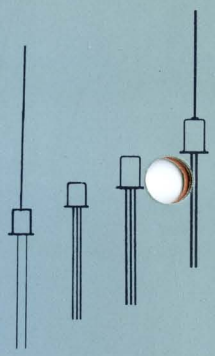


CASE Q

* Full Cycle Average

‡ For 2 milliseconds

RAYTHEON SUBMINIATURE TRANSISTORS...

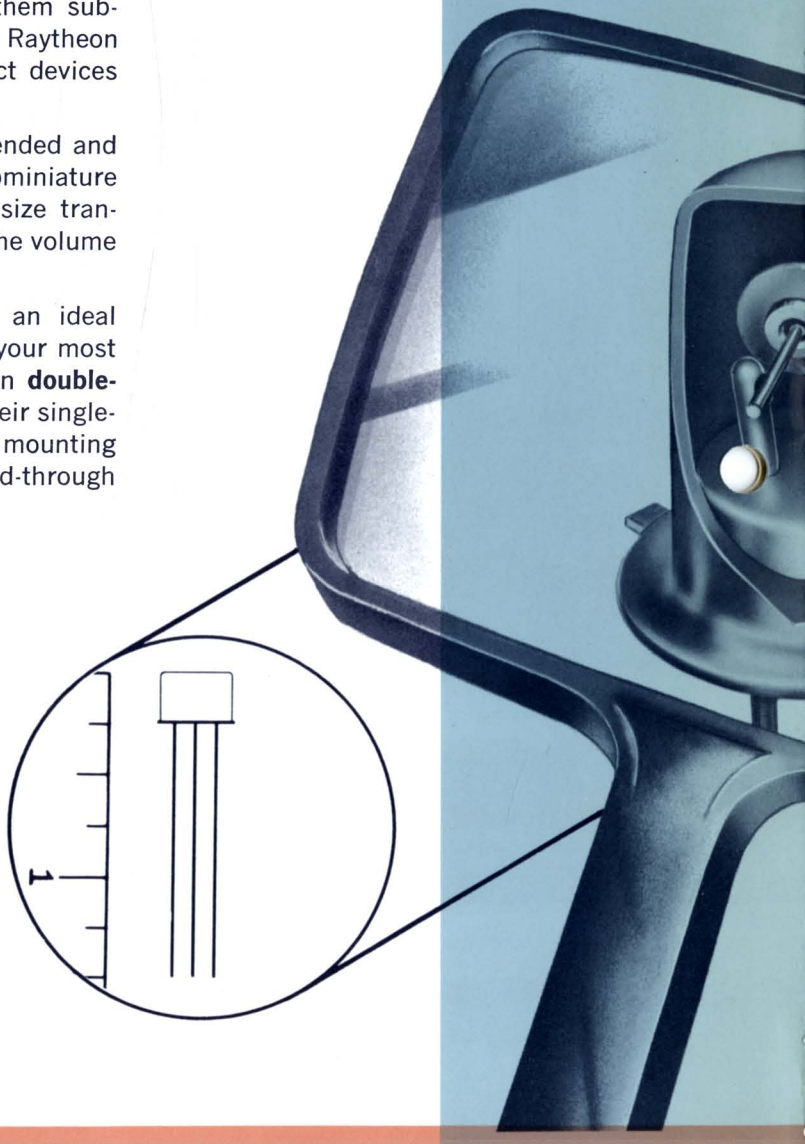


Types for a WIDE RANGE of Applications...

Some people call them miniature transistors . . . and others microminiature transistors. At Raytheon Semiconductor we call them subminiature transistors. But no matter what you call them, Raytheon Semiconductor has the most complete line of these compact devices in the industry.

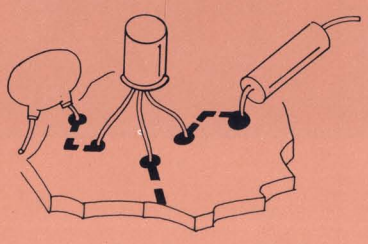
Germanium and silicon . . . PNP and NPN . . . single-ended and double-ended construction — the majority of Raytheon subminiature transistors are electrical equivalents of popular JEDEC-30 size transistors, and are now available in a package as small as 1/21 the volume of the JEDEC-30.

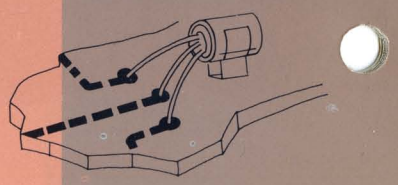
Reliable Raytheon subminiature transistors offer you an ideal solution for your most critical space requirements. To meet your most unusual — and compact — circuit needs, specify Raytheon **double-ended** silicon transistors. These units, used with or without their single-ended equivalents, enable you to utilize a wide variety of mounting possibilities — single and multiple board configurations, feed-through connections, welded assemblies.



For the newest and most complete selection of subminiature transistors, it will pay you to check Raytheon Semiconductor first!

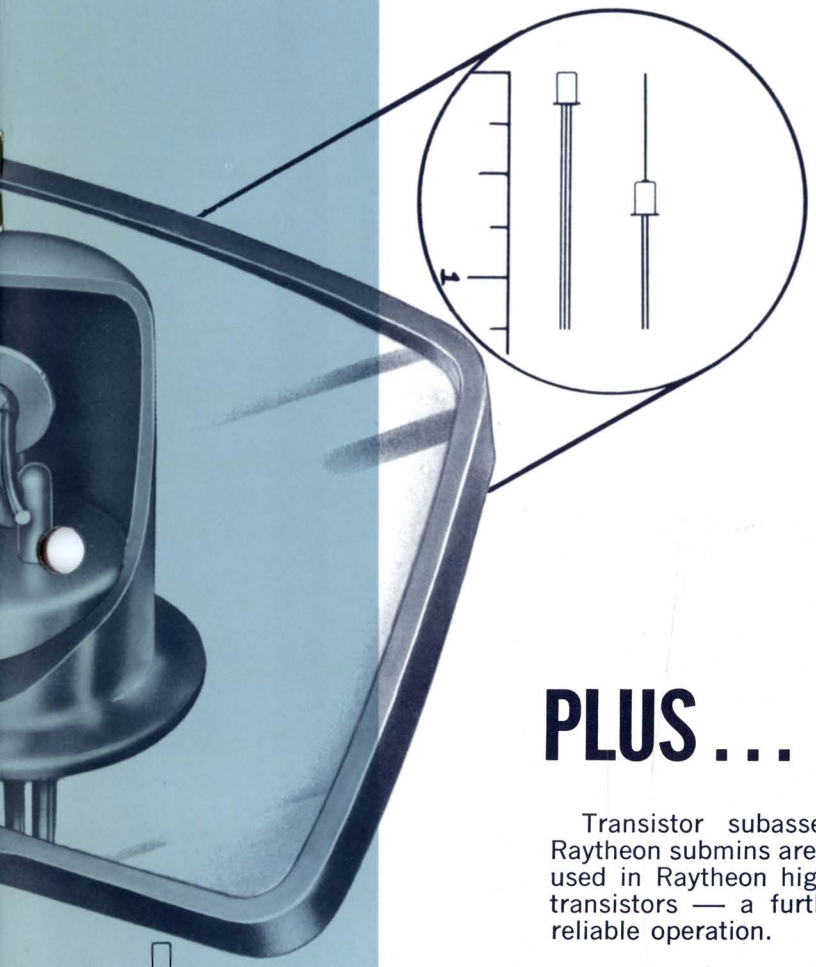
A FEW OF THE MANY MOUNTING POSSIBILITIES FOR RAYTHEON SINGLE-ENDED AND DOUBLE-ENDED SUBMINS...





RELIABILITY IS BUILT-IN RAYTHEON SUBMINS 5-WAYS!

Germanium Submin
Actual Size: 0.130" x 0.130"



1. **50 mils of hard glass oxide-bonded to Kovar leads of uniformly fine crystalline structure — wetting is assured by controlled glass rise.**

2. **Full areal bond of hard glass to Kovar pan — assured by tight tolerances on glass volume.**

3. **Full circumferential weld of Kovar pan to steel case.**

4. **Production sampling of seal quality using destructive testing.**

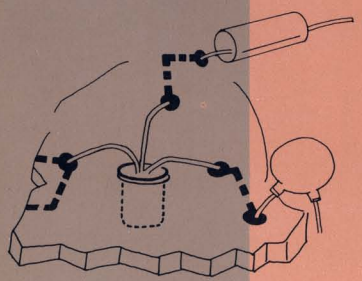
5. **Statistical sampling of all outgoing lots.**

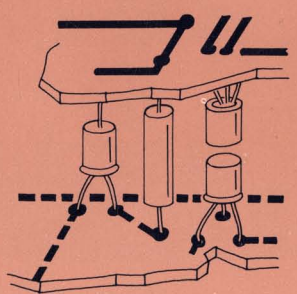
PLUS . . .

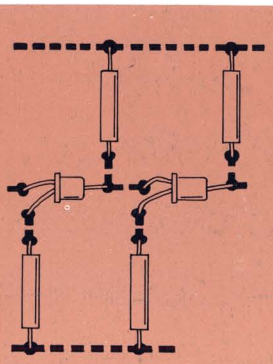
Transistor subassemblies used in Raytheon submins are identical to those used in Raytheon high reliability TO-5 transistors — a further assurance of reliable operation.

All units are sealed in a controlled atmosphere and are vacuum baked and aged at elevated temperatures to insure stability of electrical parameters.

Silicon Submin
Actual Size: 0.130" x 0.160"







SINGLE-ENDED SUBMINS — GERMANIUM TRANSISTORS

COMPUTER SWITCHING

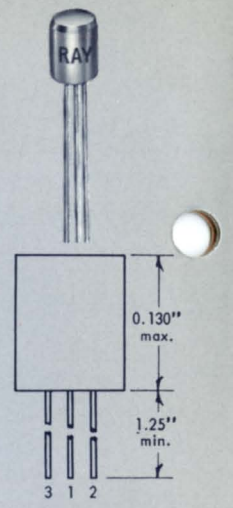
	Type	BVPT Min Volts	fαb Min	hFE_1 Min	hFE_1 Max	hFE_2 Min	Rsat Max ohms	Applications
PNP	CK4A	−24	4.0	30	—	24	—	Medium Current
Temperature	CK26A	−25	3.0	30	60	10	3.2	High Frequency
Range	CK25A	−30	2.5	20	40	10	3.2	High Gain Switches
−65°C to +85°C	CK27A	−20	5.0	40	80	15	2.1	
CASE J	CK28A	−15	10.0	60	—	20	1.6	

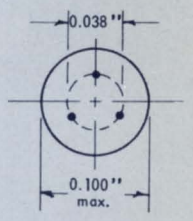
GENERAL PURPOSE — RADIO FREQUENCY

	Type	BVCEO Min Volts	fαb Avg mc	hfe Avg	Cob f=1mc Max. pf	rb″ Max ohms
PNP	CK13A	−18	2.5	30	18	100
Temperature	CK14A	−15	7.0	60	18	120
Range	CK16A	−12	10.0	80	18	140
−65°C to +85°C	CK17A	−10	18.0	140	18	160
CASE J						

GENERAL PURPOSE — AUDIO FREQUENCY

	Type	BVCEO Max Volts	hfe Min	hfe Max	Power Gain Class A Avg DB	ICO Max μA	Noise Factor Max DB
PNP	CK22A	−20	54	132	44	5	6.5
Temperature	CK64A	−29	13	45	40	5	22.0
Range	CK65A	−24	27	66	42	5	22.0
−65°C to +85°C	CK66A	−20	54	132	44	5	22.0
CASE J	CK67A	−15	108	264	45	5	22.0





CASE J

CASE F

CASE G

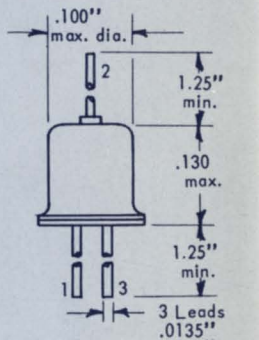
SINGLE-ENDED AND DOUBLE-ENDED SUBMINS — WELDED CASE GERMANIUM TRANSISTORS

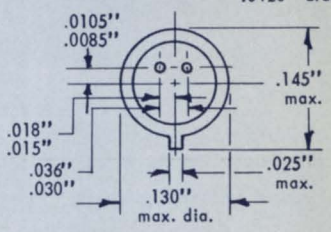
COMPUTER SWITCHING

	Submin Single Ended Type Case F	Submin Double Ended Type Case G	TO-5 Equivalent Case A	BVPT Min. Volts	hFE_1 Min.	hFE_2 Min.	Rsat Max. ohms	fαb Min. mc	Applications
NPN	2N815	2N816	2N388	20	60	30	5.0	5.0	Medium Current
Temperature	2N817	2N818	2N438A	25	20	—	5.0	2.5	High Frequency
Range	2N819	2N820	2N439A	20	30	—	5.0	5.0	High Gain
−65°C to +85°C	2N821	2N822	2N440A	15	40	—	5.0	10.0	Switches
	2N823	2N824	2N1605	24	40	24	5.0	4.0	
PNP	2N799	2N800	2N404	−24	30	24	—	4.0	Medium Current
Temperature Range	2N801	2N802	2N426	−25	30	10	3.2	3.0	High Frequency
−65°C to +85°C	2N803	2N804	2N427	−20	40	15	2.1	5.0	High Gain
	2N805	2N806	2N428	−15	60	20	1.6	10.0	Switches
	2N807	2N808	2N582	−14	40	—	—	14.0	
	2N825	2N826	2N396	−20	30	15	2.1	5.0	

GENERAL PURPOSE RADIO FREQUENCY

	Submin Single Ended Type Case F	Submin Double Ended Type Case G	TO-5 Equivalent Case A	BVCEO Max. Volts	fαb Min. mc	hfe Min.	Cob f=1mc Max. pf	rb″ Max. ohms
PNP	2N809	2N810	2N414	−15	3.0	30	20	120
Temperature	2N811	2N812	2N416	−12	5.0	50	20	140
Range	2N813	2N814	2N417	−10	15.0	70	20	160
−65°C to +85°C								



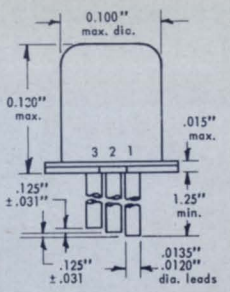


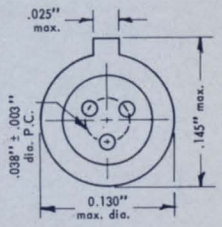
CASE G

SINGLE-ENDED AND DOUBLE-ENDED SUBMINS — WELDED CASE GERMANIUM TRANSISTORS

GENERAL PURPOSE AUDIO

	Submin Single Ended Type Case F	Submin Double Ended Type Case G	TO-5 Equivalent Case A	BVCEO Max. Volts	hfe Min.	hfe Max.	Power Gain Class A Avg. db	ICO Max. μA	Noise Figure Max. db
PNP Temperature Range −65°C to +85°C	CK22B	CK22C	2N422	−20	54	132	44	10	6.5
	CK64B	CK64C	2N464	−29	13	45	40	10	22.0
	CK65B	CK65C	2N465	−24	27	66	42	10	22.0
	CK66B	CK66C	2N466	−20	54	132	44	10	22.0
	CK67B	CK67C	2N467	−15	108	264	45	10	22.0
NPN Temperature Range −65°C to +85°C	CK261	CK262	—	20	54	—	44	10	5.0



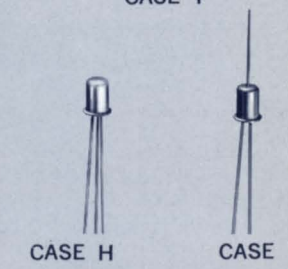


CASE F

SINGLE-ENDED AND DOUBLE-ENDED SUBMINS — WELDED CASE SILICON TRANSISTORS

SWITCHING

	Submin Single Ended Case H	Submin Double Ended Case I	TO-5 Equivalent Case A	IEBO Avg. μA	ICBO Avg. μA	BVCES Max. Volts	hFE Min.	hFE Max.	Vsat Avg. Volts	Cob Avg. pf	fαb Avg. mc
NPN Temperature Range −65°C to +160°C	2N745	2N907	2N337	0.002	0.002	—	20‡	55‡	75*	1.4	30
	2N746	2N908	2N338	0.002	0.002	—	45‡	150‡	75*	1.4	45
	2N747	—	—	0.006	0.006	25	30‡	90‡	0.4	4.0	60
	2N748	—	—	0.006	0.006	30	20‡	40‡	0.4	4.0	50



CASE H CASE I

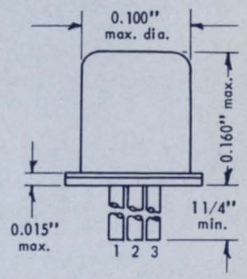
VIDEO AMPLIFIERS

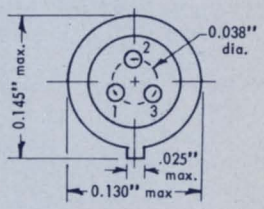
	2N750	—	—	—	—	50	4#	—	0.6	4.0	40
	2N751	—	—	—	—	20	2.2#	—	—	7.0	30

GENERAL PURPOSE

	2N789	2N902	2N332	—	0.002	—	9†	20†	0.7	5.0	6.0
	2N790	2N903	2N333	—	0.002	—	18†	40†	0.7	5.0	8.0
	2N791	2N904	2N334	—	0.002	—	18†	90†	0.7	5.0	11.0
	2N792	2N905	2N335	—	0.002	—	36†	88†	0.7	5.0	8.0
	2N793	2N906	2N336	—	0.002	—	78†	330†	0.7	5.0	13.0

* Rsat
† hfe @ VCE = 5V, IC = 1 mA, f = 1 kc
‡ VCE = 5V, IC = 10 mA, f = 1 kc
# VCE = 6V, IE = 1 mA, f = 6.0 mc





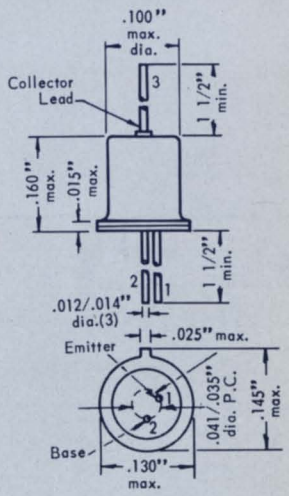
CASE H

SILICON TRANSISTORS

SWITCHING

	Type	IEO & ICO Avg. μA	BVCEO Max. Volts	hFE IC=3.0 mA VCE=0.5V Min.	hFE IC=3.0 mA VCE=0.5V Max.	Vsat Max. Volts	Cob Avg. pf	fαb Avg. mc
PNP Temperature Range −65°C to +160°C CASE A (TO-5)	2N327A	0.005	−40	9	22	60*	70	0.200
	2N328A□	0.005	−35	18	44	50*	70	0.300
	2N329A□	0.005	−30	36	88	40*	70	0.500
NPN Temperature Range −65°C to +160°C CASE A (TO-5)	CK419	0.005	40	9	22	1.2	6	30
	CK420	0.005	35	18	44	1.0	6	30
	CK421	.0.005	30	36	88	0.8	6	30
	CK422	0.005	35	9	44	1.2	6	30
NPN Temperature Range −65°C to +175°C CASE A (TO-5)	2N337□	0.002	—	20	55	1.5	2	30
	2N338□	0.002	—	45	150	1.5	2	45

* Rsat □ MIL Types



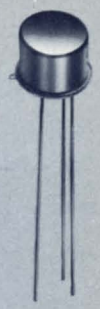
CASE I

SILICON TRANSISTORS

HIGH VOLTAGE

PNP
Temperature Range
−65°C to +160°C
CASE A (TO-5)

Type	IEBO Avg. μA	ICBO Avg. μA	BVCEO Volts	hFE IC=1.0mA VCE=6V Min.	hFE IC=1.0mA VCE=6V Max.	Noise Figure Avg. db	Cob Avg. pf	fαb Avg. kc
2N1275	0.005	0.005	−80	9	25	18	60	200
2N1654	0.005	0.005	−80	20	45	18	60	250
2N1655	0.005	0.005	−125	10	22	18	60	200
2N1656	0.005	0.005	−125	20	45	18	60	250

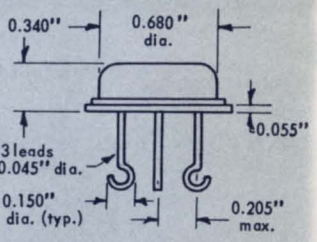


CASE A

AVALANCHE MODE

NPN
Temperature Range
−65°C to +160°C
CASE A (TO-5)

Type	IEBO Max. μA	VCB Min. Volts	VEB Min. Volts	tr Max. nsec
CK273	1.0	25	10	5.0
CK277	1.0	90	10	5.0



SMALL SIGNAL

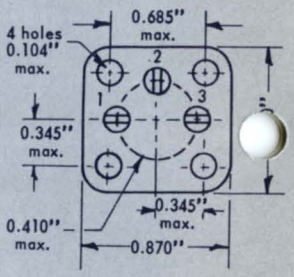
PNP
Temperature Range
−65°C to +160°C
CASE A (TO-5)

NPN
Temperature Range
−65°C to +160°C
CASE A (TO-5)

NPN
Temperature Range
−65°C to +175°C
CASE A (TO-5)

Type	ICBO Avg. μA	IEBO Avg. μA	BVCEO Max. Volts	hfe Min.	hfe Max.	hie μmhos Avg.	hoe μmhos Avg.	Noise Figure Avg. db	Cob Avg. pf	fαb Avg. mc
2N1034	0.005	0.005	40	9*	22*	900	15	18	70	0.200
2N1035	0.005	0.005	35	18*	42*	1700	40	18	70	0.300
2N1036	0.005	0.005	30	34*	88*	2500	50	18	70	0.500
2N1037	0.005	0.005	35	9*	42*	1400	20	6	70	0.300
2N1623	0.005	0.005	20	9*	40*	1000	35	18	70	0.300
CK474	0.005	0.005	40	9*	22*	1000	7	18	8	20.0
CK475	0.005	0.005	35	18*	44*	1700	10	18	8	20.0
CK476	0.005	0.005	30	36*	88*	1700	10	18	8	20.0
CK477	0.005	0.005	35	9*	44*	2500	10	8	8	20.0
2N332□	0.002	0.002	—	9**	20**	50	0.5‡	20	7	6.0
2N333□	0.002	0.002	—	18**	40**	50	0.5‡	20	7	8.0
2N334□	—	0.002	—	18**	90**	50	0.5‡	20	7	11.0
2N335□	—	0.002	—	36**	88**	50	0.5‡	20	7	8.0
2N336□	—	0.002	—	78**	330**	50	0.5‡	20	7	13.0

*VCE = 6V, IC = 1.0 mA, f = 1 kc
**VCE = 5V, IC = 1 mA, f = 1 kc
‡hob Avg.
□ MIL Types



CASE C

HIGH POWER

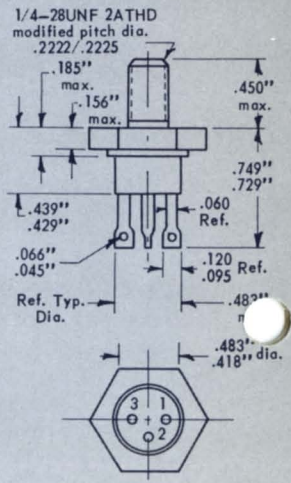
NPN
Temperature Range
−65°C to +200°C
CASE C

Type	BVCER Max. Volts	BVEBO Max. Volts	Vsat Avg. Volts	hFE Min.	hFE Max.	ft Avg. mc
2N389	60	10	3.5	12†	60†	—
2N424	80	10	3.5	12†	60†	—
2N1657	60*	3	1.5	15‡	—	10**
2N1660	60	10	2.5	45†	135†	40
2N1661	80	10	2.5	45†	135†	40
2N1662	100	10	2.5	45†	135†	40

NPN
Temperature Range
−65°C to +200°C
CASE E
(Stud-Mounted Hex)

Type	BVCER Max. Volts	BVEBO Max. Volts	ICER Avg. mA	Vsat Avg. Volts	hFE IC=1A VCE=15V Min.	hFE IC=1A VCE=15V Max.	fT Avg. mc
2N1894	60	10	1.0	3.5	12	60	—
2N1895	80	10	1.0	3.5	12	60	—
2N1896	60	10	1.0	2.5	45	135	40
2N1897	80	10	1.0	2.5	45	135	40
2N1898	100	10	1.0	2.5	45	135	40

*BVCES
**fαb
†IC = 1.0A, VCE = 15V
‡VCE = 5.0V



CASE E

MEDIUM POWER

NPN
Temperature Range
−65°C to +200°C
CASE B (TO-5)

Type	ICBO Avg. μA	IEBO Max. μA	BVCEO Max. Volts	hFE Min.	hFE Max.	Noise Figure Avg. db	Cob Avg. pf	fαb Avg. mc
2N497	10**	—	60	12	36	—	—	—
2N498	10**	—	100	12	36	—	—	—
2N656	10**	—	60	30	90	—	—	—
2N657	10**	—	100	30	90	—	—	—

** Max.

RAYTHEON CIRCUIT PAKS

Pre-Packaged to Your Specifications . . .

Next time your system design calls for modular sub-circuits, make it a point to check Raytheon Circuit-Paks. Pre-packaged to your special requirements, Circuit-Paks have provided the economical, reliable answer to a host of circuit problems.

More than 740 different Circuit-Pak configurations have been produced by Raytheon. In many of these, we have provided our customers with technical aid from initial design to final production.

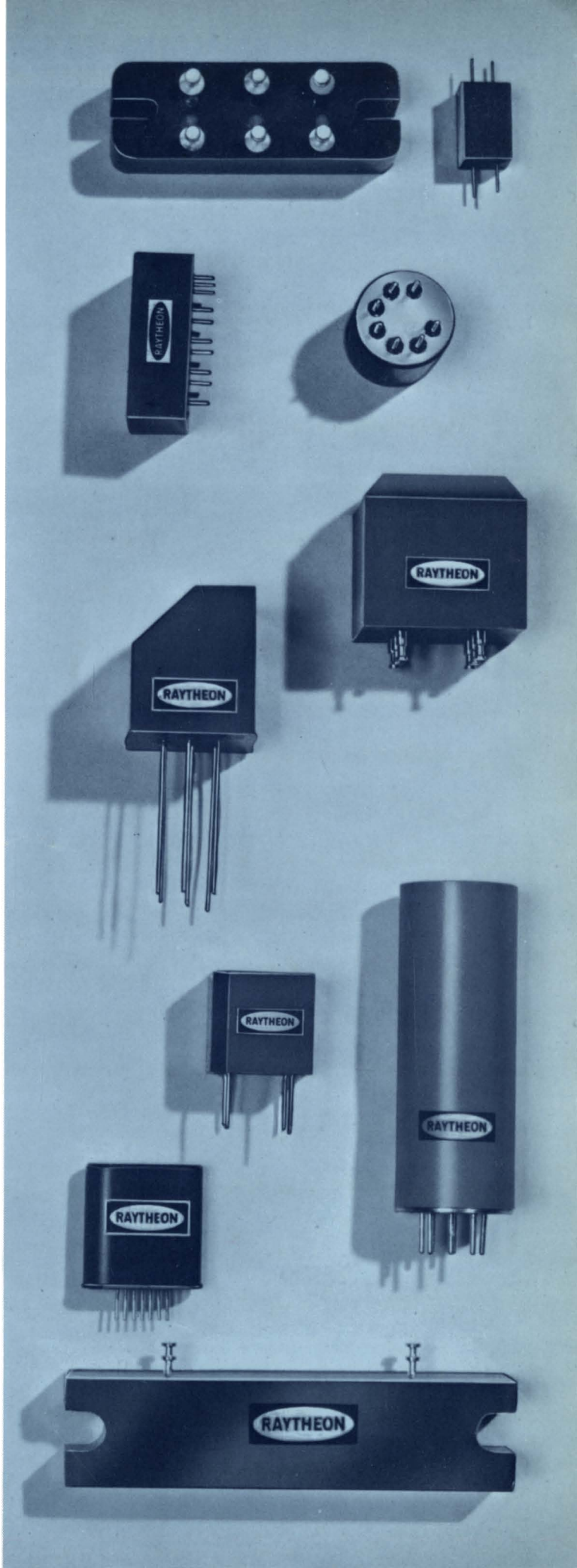
There is a good chance that an in-stock Circuit-Pak module could do just the job you want. If not, we would be pleased to have the opportunity of providing a unit to your specifications. Standard or special, you can be sure Circuit-Pak prices are quite reasonable.

Circuit-Paks are composed of selected matched components. Our know-how allows us to perform the matching operation most skillfully — and economically.

Reliability of Circuit-Paks is assured by Raytheon's long experience with high temperature epoxy molding . . . ruggedized component packaging for maximum shock resistance . . . precision welding techniques . . . more uniform temperature control through utilization of the encapsulation as a heat sink . . . and many other features.

And here's another benefit from Circuit-Paks: They can be made even more compact when Raytheon sub-miniature transistors are incorporated into the design.

Your nearest Raytheon Semiconductor Sales Office would be pleased to have the opportunity to discuss your Circuit-Pak requirements — as well as provide complete details on these modules. We also have a Circuit-Pak brochure, and it's yours for the asking.

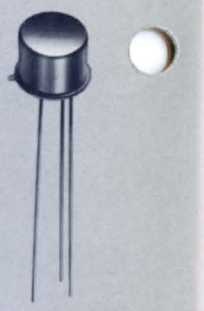


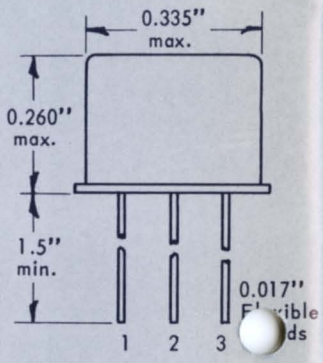
GERMANIUM TRANSISTORS

COMPUTER SWITCHING

	Type	BVPT Min. Volts	$f_{\alpha b}$ Min. mc	hFE_1 Min.	hFE_2 Min.	Rsat Max. ohms	Applications
NPN	2N388	20	5.0	60	30	—	Medium Current
Temperature	2N438A	25	2.5	20	—	5.0	High Frequency
Range	2N439A	20	5.0	30	—	5.0	High Gain
−65°C to +100°C	2N440A	15	10.0	40	—	5.0	Switches
CASE A (TO-5)	2N1302	25	3.0	20	10	5.0	
	2N1304	20	5.0	40	15	5.0	
	2N1306	15	10.0	60	20	5.0	
	2N1308	15	15.0	80	20	5.0	
	2N1605	24	4.0	40	24	5.0	
PNP	2N658	−24	2.5	25	15*	2.1	1 Amp
Temperature	2N659	−20	5.0	40	30*	1.6	High Frequency
Range	2N660	−16	10.0	60	40**	1.3	High Gain Switches
−65°C to +100°C	2N661	−14	15.0	80	55**	1.3	
CASE A (TO-5)	2N662	−16	4.0	30	18*	1.6	
PNP	2N395	−15	3.0	20	10	3.2	Medium Current
Temperature	2N396	−20	5.0	30	15	2.1	High Frequency
Range	2N396A□	−20	5.0	30	15	2.1	
−65°C to +100°C	2N397	−15	10.0	40	20	1.6	
CASE A (TO-5)	2N404□	−24	4.0	30	24	—	
	2N404A	−35	4.0	30	24	—	
	2N425□	−30	2.5	20	10	3.2	
	2N426□	−25	3.0	30	10	3.2	
	2N427□	−20	5.0	40	15	2.1	
	2N428□	−15	10.0	60	20	1.6	
	2N582	−14	14.0	40	—	—	
	2N1017	−12	15.0	70	20	1.3	
	2N1303	25	3.0	20	10	0.2‡	
	2N1305	20	5.0	40	15	0.2‡	
	2N1307	15	10.0	60	20	0.2‡	
	2N1309	15	15.0	80	20	0.2‡	

□ MIL Types *Ic = 200mA **Ic = 400mA ‡Vce (sat)

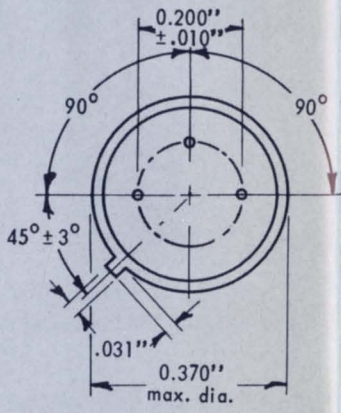




AUDIO CIRCUITS — ENTERTAINMENT

	Type	Supply Max. Volts	Circuit Usage	Class A Amplifier[9] Gain Min. db	Class A Amplifier[9] Distortion Min. %	Class B Amplifier[9] Gain Min. db	Class B Amplifier[9] Distortion Min. %	hFE ▲ Min.	hFE ▲ Max.
PNP, AUDIO TYPES	2N359	−9	Output	37*	5*	30†	8†	100	300
Temperature	2N360	−12	Output	34*	5*	27†	8†	50	150
Range	2N361	−18	Output	30*	5*	24†	8†	25	75
−65°C to +85°C	2N362	−9	Driver	42	—	—	—	50	150◸
CASE A (TO-5)	2N363	−15	Driver	40	—	—	—	25	75◸
	2N631	−9	Output	35**	8**	—	—	100	300
	2N632	−12	Output	—	—	25‡	8‡	50	150
	2N633	−18	Output	—	—	25‡	8‡	25	75

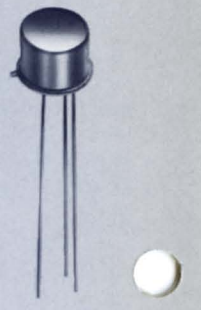
*Po = 50 mW
**Po = 30 mW
†Po = 450 mW
‡Po = 150 mW
[9]9V Supply for all Gain Measurements
▲ Vce = 1V, Ic = 150 mA
◸ Small Signal



CASE A

AUDIO CIRCUITS — ENTERTAINMENT

	Type	Supply Max. Volts	Circuit Usage	Cob Max. pf	Max. Gain 455 Kc Avg.	Conv. Gain Avg. db
PNP, RF TYPES	2N481	−12	Oscillator	20	—	—
Temperature	2N482	−12	IF	12±2	31	—
Range	2N483	−12	IF	12±2	35	—
−65°C to +85°C	2N484	−12	IF	12±2	39	—
CASE A (TO-5)	2N485	−12	Converter	20	—	28
	2N486	−12	Converter	20	—	30



GERMANIUM TRANSISTORS

INDUSTRIAL SWITCHING

Type	BVPT Min.	hFE_1 Min.	hFE_2* Min.	ICBO Max. μA	Applications
2N1954	−30	30	22	20	Low Frequency
2N1955	−30	50	35	20	High Power Switch
2N1956	−45	30	22	20	
2N1957	−60	30	22	20	

PNP
Temperature
Range
−65°C to +100°C
CASE A (TO-5)
*Ic = 200mA

GENERAL PURPOSE — AUDIO

Type	BVCEO Min. Volts	hfe* Min.	Power Gain Class A Avg. db	ICO Max. μA	Noise Figure Max. ** db
2N422☐	−20	25	38	15	6.5
2N464☐	−40	14	40	15	22.0
2N465☐	−30	27	42	15	22.0
2N466☐	−20	56	42	15	22.0
2N467☐	−15	112	43	15	22.0

PNP
Temperature
Range
−65°C to +100°C
CASE A (TO-5)

☐ MIL Types *Vce = 6V, Ic = 1mA **Vce=2.5V Ic=0.5 mA

GENERAL PURPOSE — RADIO FREQUENCY

Type	BVCEO Min. Volts	fαb Min. mc	hfe* Min.	Cob f=1mc Max. pf	rb″ Max. ohms
2N413	−18	2	20	20	100
2N414	−15	3	30	20	120
2N416☐	−12	5	50	20	140
2N417☐	−10	15	70	20	160

PNP
Temperature
Range
−65°C to +100°C
CASE A (TO-5)

☐ MIL Types *Vce = 6V, Ic = 1mA

POWER

	VCB Max. Vdc	VCE Max. Vdc	VEB Max. Vdc	Ic Max. amps.	Dissipation watts	hFE Min.
2N156	−30	−30	−15	3	20	25
2N158	−60	−60	−30	3	20	21
2N158A	−80	−60	−30	3	20	21

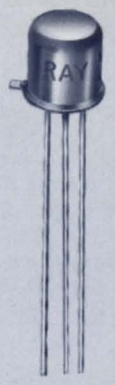
PNP
Temperature Range
−65°C to +85°C
CASE D

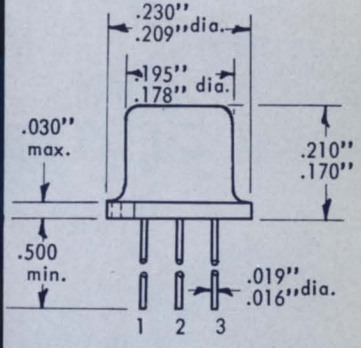
The Following Types Are Similar To 2N158 Except For Collector Voltage Characteristics:

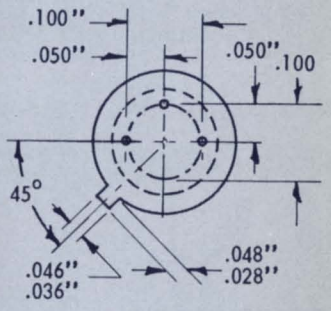
	BVCES @ Ic = 5.0mAdc Min. VCE	BVCBO @ Ic = 5.0mAdc Min. VCB	Base Saturation Voltage VBE @ Ic = 500mA VCE = −2V Max. Limit
CK311*	80 Vdc	—	1.05 Vdc
CK312*	100 Vdc	—	1.15 Vdc
CK313*	120 Vdc	—	1.25 Vdc
CK314*	150 Vdc	—	1.35 Vdc
CK315*	—	200 Vdc	0.95 Vdc

*CK311 through CK315 were formerly designated LT-11 through LT-15 respectively.

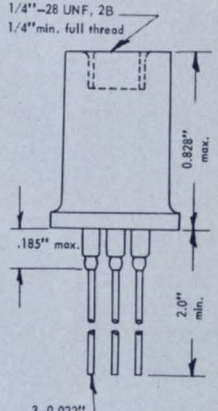
☐ MIL Types

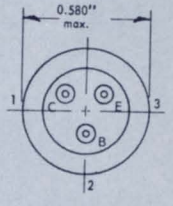






CASE B





CASE D

GERMANIUM EPITAXIAL MESA TRANSISTORS

ULTRA HIGH SPEED COMPUTER TYPES

Type	ICO Avg. μA	Vsat Avg. Volts	fαb Avg. mc	BVCBO Max. Volts	BVEBO Max. Volts	BVCES Max. Volts
2N705	0.15	0.125	300	−15	−3.5	−15
2N705A	0.15	0.125	—	−15	−3.5	−15
2N710	0.15	0.125	300	−15	−2.0	−15
2N710A	0.15	0.125	—	−15	−2.0	−15
2N711	0.15	0.125	300	−12	−1.0	−12
2N711A	0.15	0.125	—	−15	−1.5	−14
2N781	0.15	0.125	—	−15	−2.5	−15
2N782	0.15	0.125	—	−12	−1.0	−12
2N828	0.15	0.125	—	−15	−2.5	−15

PNP
Temperature
Range
−65°C to +100°C
CASE B (TO-18)

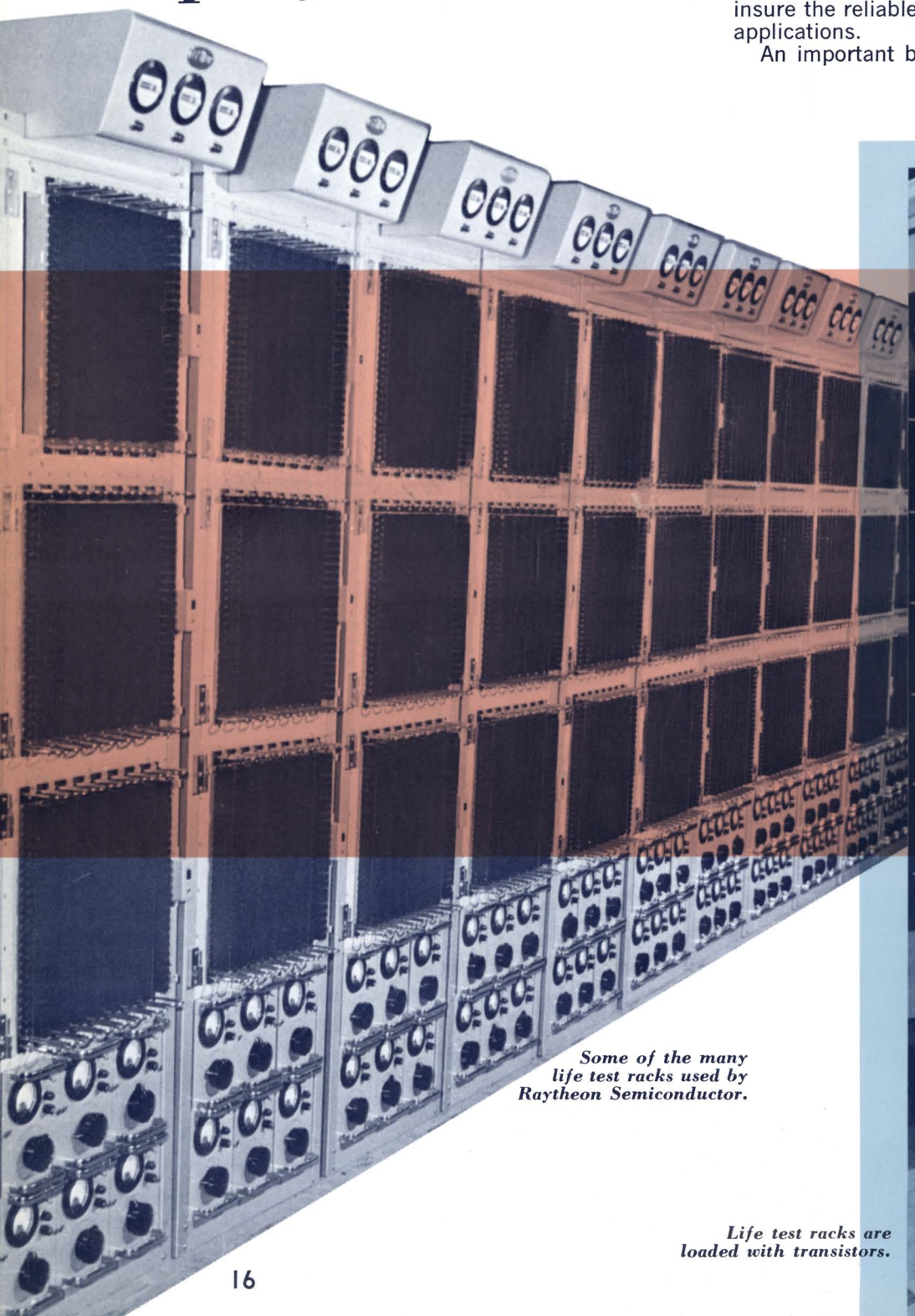
RELIABILITY AND

pathways to peak performance

Dependable performance — it's easy to say, difficult to achieve. Stringent production procedures . . . frequent quality control checks during manufacturing . . . new and efficient equipment . . . well-trained personnel — these are among the techniques employed by Raytheon Semiconductor to obtain product dependability.

But we go much further through Raytheon's Reliability Assurance Program. This all-inclusive reliability program, which has been in operation for a number of years, was developed for one specific purpose — to insure the reliable performance of **our** products in **your** applications.

An important by-product of the Raytheon Reliability



Some of the many life test racks used by Raytheon Semiconductor.

Life test racks are loaded with transistors.

QUALITY CONTROL...

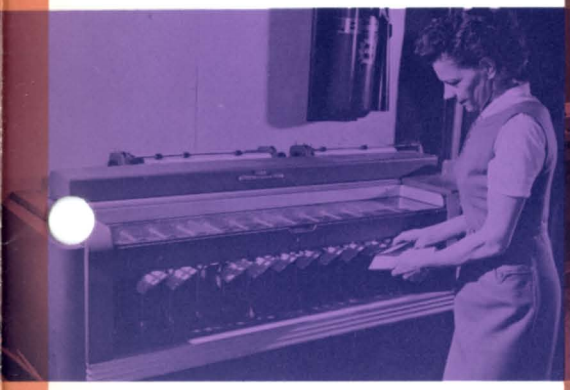
Assurance Program is the considerable data generated on the reliability of our devices. This data, as well as much other valuable information, is now available to you through our series of Quality & Reliability Bulletins.

These Bulletins have been recognized by the electronic industry as representing the most comprehensive guide to semiconductor reliability published to date. Not only do the Bulletins provide information on the broad field of reliability, but they contain a wealth of data on the reliability of specific semiconductor devices and families of devices. The Bulletins can help you build semiconductor reliability into your products economically. For free copies of these important bulletins, simply contact your nearest Raytheon Semiconductor Sales Office.

The publication of these Bulletins by our Quality & Reliability Department represents a major step forward in the establishment of quality standards in the semiconductor industry. Still, the Quality & Reliability Department has an even more important job: making certain that all our products consistently meet your specifications.

This is a daily job for our Quality & Reliability Department . . . a job that never ends. Because of this, you can have complete assurance that even with the present high reliability levels of our devices, strong emphasis on this vital area will continue at Raytheon.

Punch cards with reliability data are sorted by machine.



This equipment is used for recording on punch cards the variables readings on ten parameters.

Additional equipment being utilized by Raytheon Semiconductor for recording reliability data on punch cards.

13 SPECIAL TESTS OFFERED BY RAYTHEON SEMICONDUCTOR

While all Raytheon transistors, diodes and rectifiers undergo exhaustive testing as standard procedure, there are occasions when our customers need special testing of devices to meet a particular specification requirement.

To meet this need, Raytheon Semiconductor Division maintains two fully-equipped environmental testing laboratories. The following are some of the extra tests that we offer, many of which are performed in the environmental laboratories:

1. High Temperature
2. Low Temperature
3. Temperature Shocks
4. Leak Detection
5. Moisture Resistance
6. Mechanical Shock
7. Mechanical Vibration
8. High Altitude
9. Centrifuge
10. Lead Fatigue
11. Salt Spray
12. Life Evaluation
13. Special Processing or Screening

Even without the added cost of special testing, Raytheon Semiconductor Division can help you obtain all-important quality assurance. One method is through our free consultation service, by which we aid you to adapt the results of our standard testing to your special applications. Another way is by using our great backlog of data on the reliability of our devices. There is a good chance that this data file contains just the information you require.

As another of our standard services, each and every outgoing shipment from our plants is subjected to the exclusive Raytheon "Shipping Audit." Large or small, these shipments undergo a thorough quality control inspection — completely apart from the regular quality control functions of our manufacturing departments — to assure that reliability is truly "built-in" to Raytheon devices.

Such is that broad scope of our testing capabilities. Whatever your specification requirement, you can depend on Raytheon Semiconductor Division to provide just the right devices.

MILITARY TYPES

Whatever your requirements for military types of semiconductors, you'll find a big selection at Raytheon. Silicon transistors . . . germanium transistors . . . gold bonded or point contact diodes . . . diffused junction silicon rectifiers — Raytheon gives you a choice of types to give you utmost latitude in circuit design and component procurement.

All of these Raytheon Semiconductor Products are designed to meet Military Specifications.

NPN SILICON TRANSISTORS

NAVY	2N332	MIL-T-19500/37A	NAVY	2N335	MIL-T-19500/37A
NAVY	2N333	MIL-T-19500/37A	NAVY	2N337	MIL-S-19500/69C
NAVY	2N334	MIL-T-19500/37A	NAVY	2N338	MIL-S-19500/69C

PNP SILICON TRANSISTORS

SIGC	2N328A	MIL-S-19500/110 (Amend. 1)	SIGC	2N329A	MIL-S-19500/111 (Amend. 1)

GERMANIUM GOLD BONDED DIODES

JAN	1N270	MIL-E-1/992A	JAN	1N277	MIL-E-1/993A
JAN	1N276	MIL-S-19500/192	JAN	1N281	MIL-E-1/961

PNP GERMANIUM TRANSISTORS

NAVY	2N396A	MIL-S-19500/64A	SIGC	2N427	MIL-T-19500/43A
JAN	2N396A	MIL-S-19500/64B	SIGC	2N428	MIL-T-19500/44A
USAF	2N404	MIL-T-19500/20	JAN	2N428	MIL-S-19500/44B
SIGC	2N416	MIL-T-19500/56A	SIGC	2N464	MIL-T-19500/49B
SIGC	2N417	MIL-T-19500/57A	SIGC	2N465	MIL-T-19500/50A
NAVY	2N422	MIL-T-19500/66A	SIGC	2N466	MIL-T-19500/51A
SIGC	2N425	MIL-T-19500/41A	JAN	2N466	MIL-S-19500/51C
SIGC	2N426	MIL-T-19500/42A	SIGC	2N467	MIL-T-19500/52B

GERMANIUM POINT CONTACT DIODES

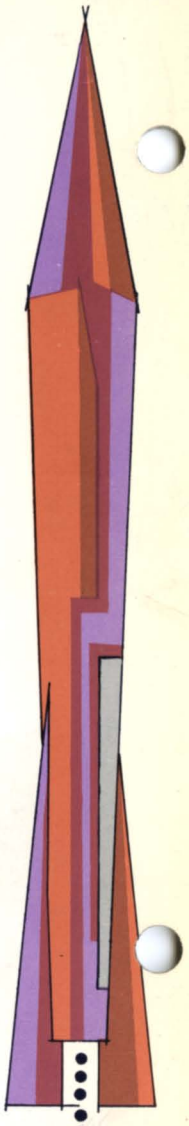
JAN	1N126A	MIL-E-1/156C	JAN	1N128	MIL-E-1/158B
JAN	1N127A	MIL-E-1/157C	JAN	1N198	MIL-E-1/700

DIFFUSED JUNCTION SILICON DIODES

JAN	1N457	MIL-S-19500/193	USAF	1N646	MIL-E-1/1143
JAN	1N458	MIL-S-19500/193	USAF	1N647	MIL-E-1/1143
JAN	1N459	MIL-S-19500/193	USAF	1N648	MIL-E-1/1143
USAF	1N645	MIL-E-1/1143	USAF	1N649	MIL-E-1/1143

DIFFUSED JUNCTION SILICON RECTIFIERS

JAN	1N253	MIL-E-1/1024A	JAN	1N540	MIL-E-1/1085A
JAN	1N254	MIL-E-1/989B	JAN	1N547	MIL-E-1/1083A
JAN	1N255	MIL-E-1/990B	NAVY	1N1124A	MIL-S-19500/104
JAN	1N256	MIL-E-1/991B	NAVY	1N1126A	MIL-S-19500/104
JAN	1N538	MIL-E-1/1084A	NAVY	1N1128A	MIL-S-19500/104



RAYTHEON COMPANY

RAYTHEON

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  LAkeside 6-7921
- **DAYTON**
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  BAldwin 3-8128
- **DETROIT**
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  TRinity 3-5330
- **LOS ANGELES**
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  PLymouth 7-3151
- **MINNEAPOLIS**
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  WEst 9-2988
- **NEW YORK CITY**
  210 Sylvan Avenue, Englewood Cliffs, N.J.
  LOwell 7-4911
  In N.Y. City—Dial—WIsconsin 7-6400
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