

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 CONFERRING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

**REQUIREMENTS:**

**1. GENERAL:**

- A. UNITS SHALL BE CAPABLE OF MEETING THE APPLICABLE REQUIREMENTS OF MIL-R-93 CHARACTERISTIC C; EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
- B. PACKAGING: UNITS SHALL BE PACKAGED PER MIL-R-93, LEVEL A.
- C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404 CLASS 2.
- D. INTERPRET DRAWING SYMBOLS, ABBREVIATIONS AND REFERENCE DESIGNATIONS IN ACCORDANCE WITH GOVERNMENT STANDARDS PRESCRIBED IN MIL-D-70327.

**2. INSPECTION AND ACCEPTANCE:**

- A. RESISTANCE VALUES: SEE TABLE.
- B. RESISTANCE TOLERANCE: SEE TABLE.
- C. TEMPERATURE COEFFICIENT: ABOVE 10Ω 15 PPM/°C, 10Ω TO 1Ω 30 PPM/°C, 1Ω AND BELOW 40 PPM/°C.
- D. LEAD DATA: UNITS SHALL HAVE WELDABLE GRADE A NICKEL LEADS PER ND PS 1015400. A CERTIFICATE OF COMPLIANCE OF LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.
- E. MARKING: MARK UNITS PER MIL-STD-130 WITH THE NASA PART NUMBER AND REVISION LETTER AND THE MANUFACTURER'S NAME AND/OR SYMBOL. THE MANUFACTURER'S PART NUMBER MAY APPEAR ON THE PART OR PACKAGE. MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL INCLUDE NASA PART NUMBER AND REVISION LETTER.

**3. DESIGN REQUIREMENTS:**

- A. POWER RATING: 1/10 WATT AT +125°C DERATED TO ZERO AT 145°C
- B. MAXIMUM VOLTAGE RATING: 150 VOLTS.
- C. STABILITY: 100 PPM/YEAR AT +25°C AT 1/2 RATED POWER.
- D. TEMPERATURE RANGE: MINUS 65°C TO PLUS 125°C.
- E. EACH LEAD SHALL BE CAPABLE OF WITHSTANDING TWO (2) BENDS UNDER A TWO (2) POUND VERTICAL PULL (LEADS VERTICAL WITH RESPECT TO UNIT BODY). TWO (2) BENDS SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° TO THE OPPOSITE DIRECTION AND BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.
- F. EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.

**4. SPECIAL CONDITIONING BY SUPPLIER:**

- A. BURN IN: 100 HOURS @ 125°C @ 1/10 WATT (AC OR DC). REJECT ANY PART WHICH CHANGES MORE THAN 0.1% OR CANNOT MEET PURCHASE TOLERANCE.

**NOTES:**

- 1. RESISTANCE VALUES ABOVE 35K ARE NOT AVAILABLE, PER THE REQUIREMENTS OF THIS DRAWING AND MIL-R-93, USING .001 MIN. DIA. WIRE.

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

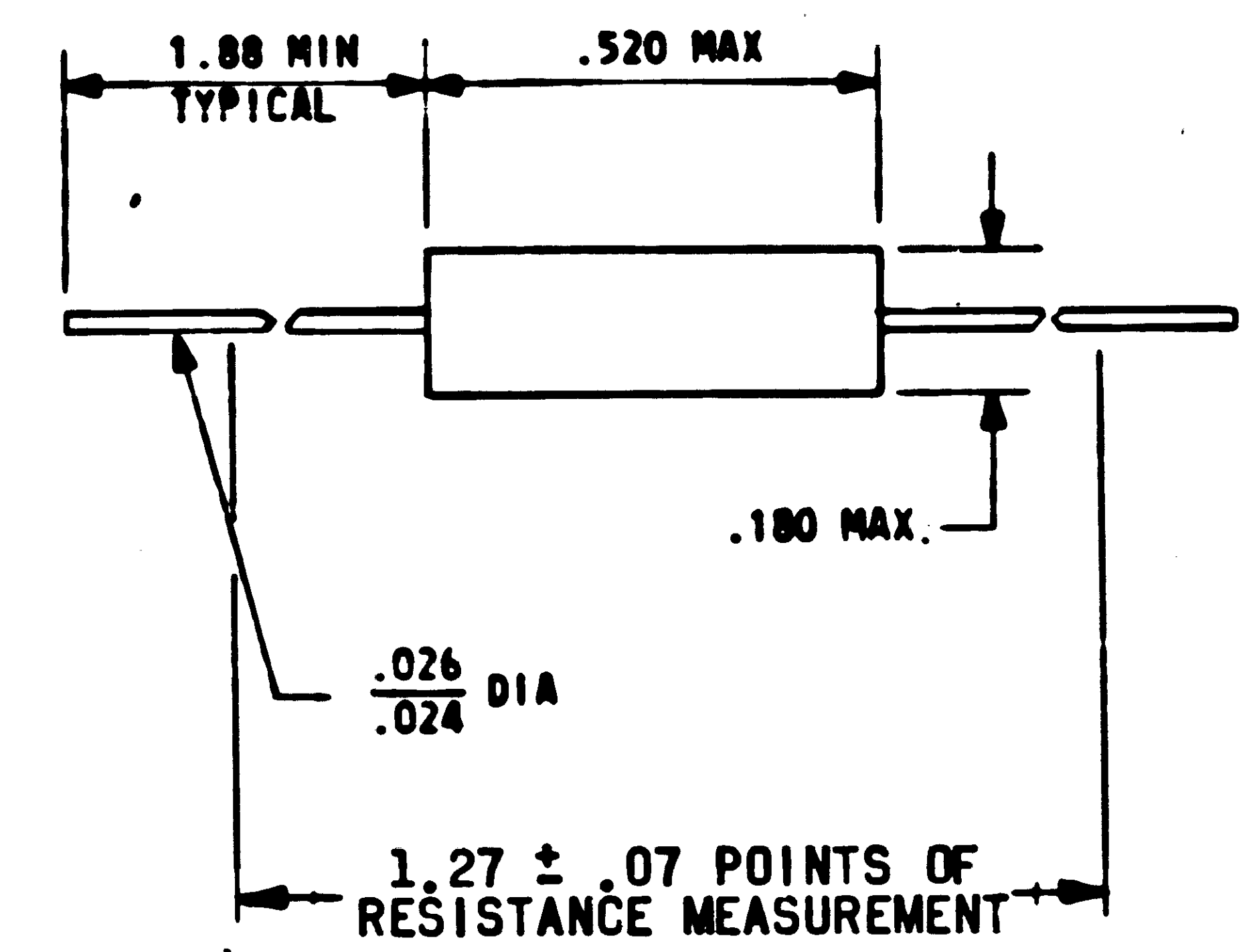
SEE NOTE 1.

DASH NO.	NOMINAL RES OHMS	RES TOL	DASH NO.	NOMINAL RES OHMS	RES TOL
1	4,000	±0.1%	53	25,000	±0.1%
2	87,500		54	12,500	
3	88,750		55	8,330	
4	90,000		56	6,250	
5	91,250		57	1	±0.5%
6	92,500		58	2	
7	93,750		59	3	
8	95,000		60	4	
9	96,250		61	5	
10	97,500		62	6	
11	98,750		63	7	
12	100,000		64	8	
13	101,250		65	9	
14	102,500		66	10	
15	103,750		67	11	
16	105,000		68	12	
17	106,250		69	13	
18	107,500		70	14	
19	108,750		71	15	
20	110,000		72	16	
21	111,250		73	17	
22	112,500	±0.1%	74	18	
23	50	±1%	75	19	
24	374		76	82,500	
25	400		77	83,750	
26	600		78	85,000	
27	650		79	86,250	
28	700		80	87,500	
29	750		81	88,750	
30	775		82	90,000	
31	850		83	91,250	
32	925		84	92,500	
33	1,000		85	93,750	
34	1,100		86	95,000	
35	1,200		87	96,250	
36	3,300		88	97,500	±1.0%
37	10,000		89	98,750	
38	22,500		90	100,000	
39	35,000		91	101,250	
40	45,000		92	102,500	
41	67,500		93	103,750	
42	90,000		94	105,000	
43	112,000		95	106,250	
44	134,500		96	107,500	
45	157,000		97	108,750	
46	179,500		98	110,000	
47	202,500		99	111,250	
48	225,000		100	112,500	
49	39,000		101	113,750	
50	20,000		102	115,000	
51	5,000		103	116,250	
52	25,000		104	117,500	

1010377

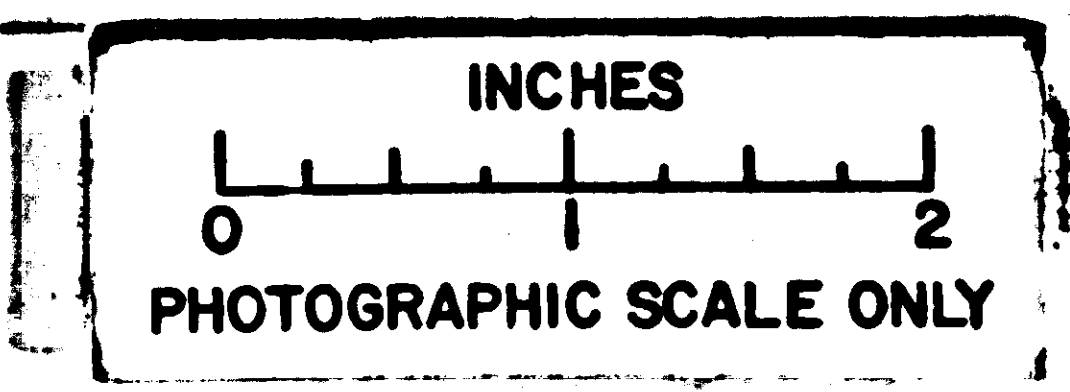
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
K	REPLACES REV J WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02103	7/17/62	JW
L	REVISED PER TDRR 02478	8-7-62	WIL
M	REVISED PER TDRR 03382	9/24/62	JW

M	M
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	



K REPLACES REV J WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			
MIT INSTRUMENTATION LAB CAMBRIDGE MASS DWG NO. CONTRACT 497		MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
DRAWN <i>C. G. G.</i> DATE 7 JUN 63		<b>RESISTORS, FIXED, WW, PRECISION</b>	
CHECKED <i>W. B. G.</i> DATE 15 JUL 63			
APPROVAL <i>W. B. G.</i>		SPECIFICATION CONTROL DRAWING	
HEAT TREATMENT NONE		CODE IDENT NO. C	NASA DRAWING NO. 1010377
FINAL FINISH NONE		SCALE	SHEET 1 OF 2
NEXT ASSY		MIT APPROVAL <i>W. B. G.</i> 7/17/62	
USED ON			
APPLICATION			





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W LLE0101

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
K	REPLACES REV J WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02103	7/7/63	WJ
L	REVISED PER TDRR 02478	8-7-63	WJ
M	REVISED PER TDRR 033F2	7/2/63	WJ

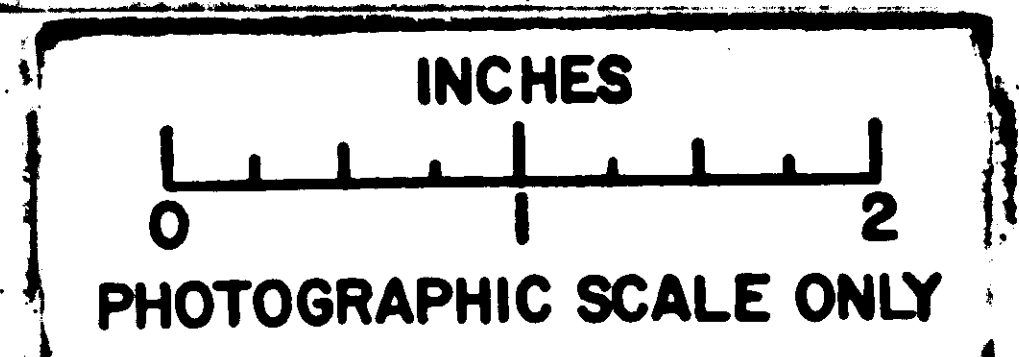
DASH NO.	NOMINAL RES OHMS	RES TOL	DASH NO.	NOMINAL RES OHMS	RES TOL
105	16,000	±1.0%	165	119	±0.1%
106	6,200		166	121	
107	100		167	123	
108	150		168	125	
109	7,500		169	127	
110	4,700		170	129	
111	91,000		171	131	
112	1		172	133	
113	15	±0.1%	173	135	
114	17		174	137	
115	19		175	139	
116	21		176	141	
117	23		177	143	
118	25		178	145	
119	27		179	147	
120	29		180	149	
121	31		181	151	
122	33		182	153	
123	35		183	155	
124	37		184	157	
125	39		185	159	
126	41		186	161	
127	43		187	163	
128	45		188	165	
129	47		189	167	
130	49		190	169	
131	51		191	171	
132	53		192	173	
133	55		193	175	
134	57		194	177	
135	59		195	179	
136	61		196	181	
137	63		197	183	
138	65		198	185	
139	67		199	187	
140	69		200	189	
141	71		201	191	
142	73		202	193	
143	75		203	195	
144	77		204	197	
145	79		205	199	
146	81		206	201	
147	83		207	203	
148	85		208	205	
149	87		209	207	
150	89		210	209	
151	91		211	211	
152	93		212	213	
153	95		213	215	
154	97		214	217	
155	99		215	219	
156	101		216	220	
157	103		217	221	
158	105		218	222	
159	107		219	223	
160	109		220	224	
161	111		221		
162	113		222		
163	115		223		
164	117		224		

DASH NO.	NOMINAL RES OHMS	RES TOL
225	880	±0.1%
226	890	
227	900	
228	910	
229	920	
230	930	
231	940	
232	950	
233	960	
234	970	
235	980	
236	990	
237	1000	
238	1010	
239	1020	
240	1030	
241	1040	
242	1050	
243	1060	
244	1070	
245	1080	
246	1090	
247	1100	
248	1110	
249	1120	
250	1130	
251	1140	
252	1150	
253	1160	
254	1170	
255	1180	
256	1190	
257	1200	
258	1210	
259	1220	
260	1230	
261	1240	
262	1250	
263	1260	
264	1270	
265	1280	
266	1290	
267	1300	
268	1310	
269	1320	
270	1330	
271	1340	
272	1350	
273	1360	
274	1370	

DASH NO.	NOMINAL RES OHMS	RES TOL
275	1380	±0.1%
276	1390	
277	1400	
278	500	±1%
279	2100	
280	1620	

K REPLACES J WITH CHANGE

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>Carol</i> DATE 15 JUN 63		<b>RESISTORS, FIXED, WW, PRECISION</b>	
CHECKED <i>William H. Hanel</i> 3		SPECIFICATION CONTROL DRAWING	
APPROVAL <i>W. A. Test</i> 15 JUL 63		CODE IDENT NO.	NASA DRAWING NO.
HEAT TREATMENT		C	1010377
NEXT ASSY	USED ON	SCALE	WT
APPLICATION	FINAL FINISH		SHEET 2 OF 2



1010377