

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 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 THERE TO.

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. PRESERVATION, PACKAGING, PACKING AND CONTAINER MARKING PER ND1002215 CLASS 1, CODE 2.
- C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404 CLASS 2.
- D. INTERPRET DRAWING 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 10 Ω 15 PPM/°C, (EXCEPT AS SPECIFIED IN NOTE 2) 10 Ω TO 1 Ω 30 PPM/°C, 1 Ω AND BELOW 40 PPM/°C.
- D. LEAD DATA: WELDABLE GRADE A GOLD PLATED NICKEL PER ND PS 1015400. A CERTIFICATE OF COMPLIANCE TO THIS REQUIREMENT SHALL ACCOMPANY EACH LOT SHIPPED.
- E. MARKING: MARK UNITS PER ND 1002019 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 PER MIL-STD-129.

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 (SEE NOTE 2)
- 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.

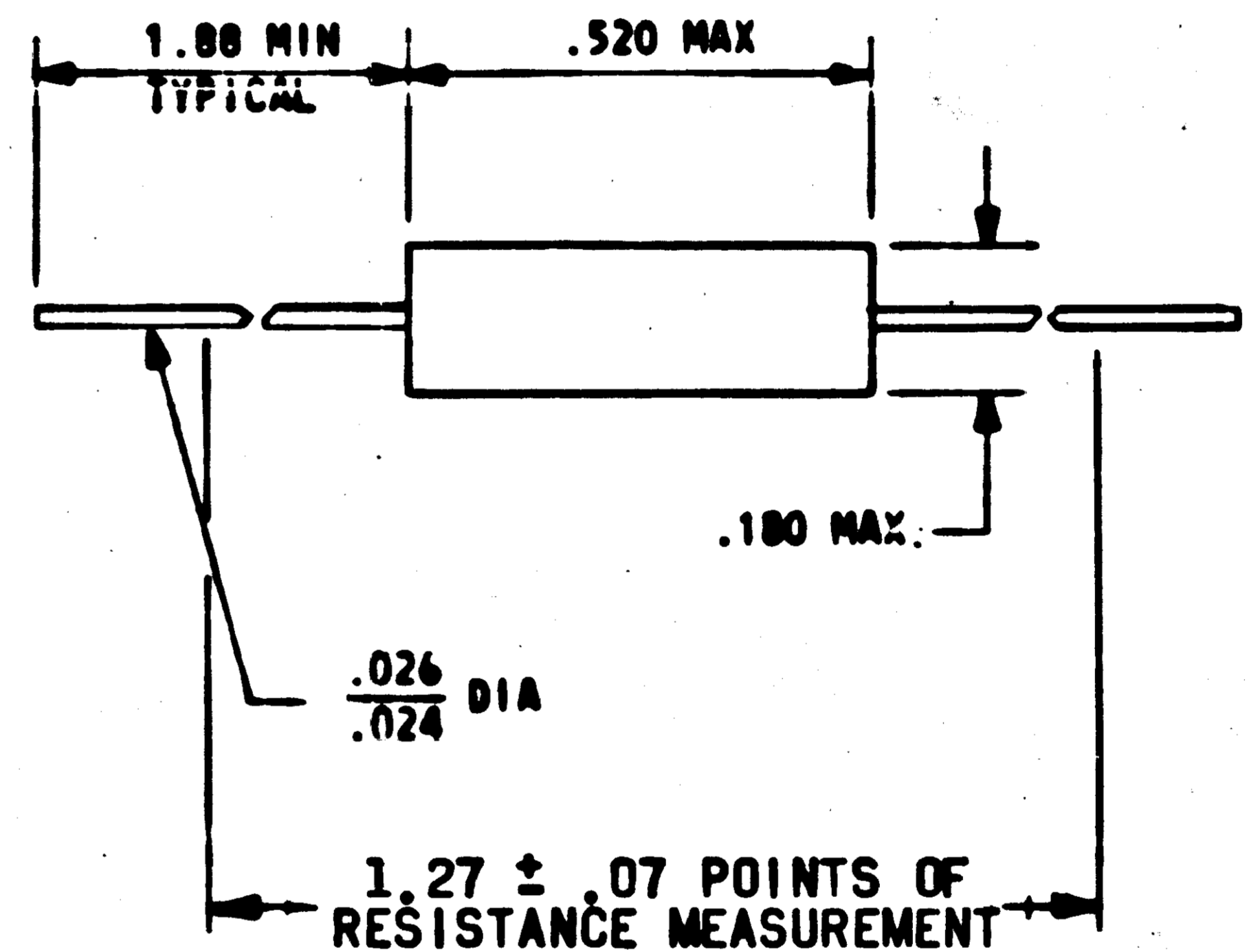
PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

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	98,750		55	8,350	
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	7/17/63	JW
L	REVISED PER TDRR 02478	8-7-63	WIL
M	REVISED PER TDRR 03382	9/1/63	JW
N	REVISED PER TDRR 03968	10/21/63	WIL
P	REVISED PER TDRR 07311	3/31/64	WIL
R	REVISED PER TDRR 08175	4/28/64	WIL
S	REVISED PER TDRR 08941	6/2/64	WIL
T	REVISED PER TDRR 10045	6/9/64	WIL
U	REVISED PER TDRR 11508	8/12/64	WIL
V	REVISED PER TDRR 12608	9/12/64	WIL
W	REVISED PER TDRR 13388	11/10/64	WIL
Y	REVISED PER TDRR 16598	2/24/65	WIL
Z	REVISED PER TDRR 18746	8/18/66	WIL
AA	REVISED PER TDRR 20878	7-20-65	WIL
AB	REVISED PER TDRR 25371	1-25-66	WIL
AC	REVISED PER TDRR 26791	3/8/66	WIL



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 CONTRACT 437		MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
DRAWN: [Signature] DATE: 7 JUN 63		RESISTORS, FIXED, WW, PRECISION SPECIFICATION CONTROL DRAWING	
CHECKED: [Signature] DATE: 15 JUL 63			
APPROVAL: [Signature]		CODE IDENT NO. SIZE	NASA DRAWING NO.
NASA APPROVAL: [Signature] 7/17/63		80230 C	1010377
MIT APPROVAL: [Signature] 7/17/63		SCALE	WT
			SHEET 1 OF 2

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AC 1010377

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
K	REPLACES REV J WITH CHANGES AND UPGRADED TO CLASS A RELEASE. PER TDRR 02103	7/1/63	WR
L	REVISED PER TDRR 02478	8-7-63	WR
M	REVISED PER TDRR 03382	7/2/63	WR
N	REVISED PER TDRR 03968	10/2/63	WR
P	REVISED PER TDRR 07311	3/31/64	WR
R	REVISED PER TDRR 08175	4/28/64	WR
S	REVISED PER TDRR 08941	6/2/64	WR
T	REVISED PER TDRR 10045	6/9/64	WR
U	REVISED PER TDRR 11508	8/14/64	WR
V	REVISED PER TDRR 12608	9/22/64	WR
W	REVISED PER TDRR 13388	10/20/64	WR
Y	REVISED PER TDRR 16598	2/24/65	WR
Z	REVISED PER TDRR 18746	5/18/65	WR
AA	REVISED PER TDRR 20878	7-22-65	WR
AB	REVISED PER TDRR 25371	1-25-66	WR
AC	REVISED PER TDRR 26791	3/8/66	WR

NOTE 2: DASH 301 TO 313 AND DASH 315, 316, 345, 348, 349, 350 & 351 SHALL HAVE TEMP COEFFICIENT OF 3 PPM/°C BETWEEN THE TEMPERATURES OF 0°C TO +65°C. AND SHALL HAVE SPECIAL STABILITY FEATURE OF 50 PPM/YR @ 25°C AT 1/2 RATED POWER

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	221	
157	103		217	223	
158	105		218	225	
159	107		219	227	
160	109		220	229	
161	111		221	231	
162	113		222	233	
163	115		223	235	
164	117		224	237	

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	
281	53K	±1%
282	64K	
283	73K	
284	127K	
285	136K	
286	145K	
287	154K	
288	163K	
289	172K	
290	181K	
291	190K	
292	199K	
293	208K	
294	217K	
295	226K	
296	235K	
297	244K	
298	253K	
299	262K	
300	271K	
301	866.98Ω	±0.1%
302	1.9638K	
303	2.6027K	
304	4.000K	
305	8.000K	
306	12.500K	
307	25.000K	
308	25.490K	
309	30.000K	
310	30.067K	
311	44.999K	
312	100.000K	
313	128.146K	
314	80K	±1%
315	25.760K	±0.01%
316	125.574K	±0.01%
SEE NOTE 2		
317	16.5Ω	±1%
318	21.4Ω	
319	27.0Ω	
320	33.7Ω	
321	43.0Ω	
322	20.7Ω	
323	18.8Ω	
324	44.0Ω	±1%

DASH NO.	NOMINAL RES OHMS	RES TOL
325	740	±1%
326	810	
327	890	
328	960	
329	1050	
330	1150	
331	42	±1%
332	125.842K	±0.01%
333	25.708K	±0.01%
334	25.009K	±0.01%
335	1740	±1%
336	82.250K	±0.1%
337	82.500K	
338	83.750K	
339	85.000K	
340	113.750K	
341	115.000K	
342	116.250K	
343	117.500K	
344	86.250K	
345	125.796K	±0.01%
SEE NOTE 2		
346	25.013K	±0.01%
347	125.500K	±0.01%
348	1560	±0.05%
349	2384	±0.05%
SEE NOTE 2		
350	9.000K	±0.01%
351	13.000K	±0.01%
SEE NOTE 2		

K REPLACES J WITH CHANGE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± — ± — ± —

DO NOT SCALE THIS DRAWING

MATERIAL _____

HEAT TREATMENT _____

FINAL FINISH _____

NEXT ASSY _____ USED ON _____ APPLICATION _____

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			
MIT INSTRUMENTATION LAB CAMBRIDGE MASS DWC NO. _____ CONTRACT 497		MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
DRAWN <i>Chick</i> DATE 10 JUN 63 CHECKED <i>William Humel</i> APPROVAL <i>W.A. Test</i> 15 JUL 63		RESISTORS, FIXED, WW, PRECISION SPECIFICATION CONTROL DRAWING	
NASA APPROVAL <i>W.A. Test</i> 7/17/63 MIT APPROVAL <i>W.A. Test</i> 7/17/63		CODE IDENT NO. 80230 SCALE _____	SIZE C WT _____ SHEET 2 OF 2