

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 FOR 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:
GENERAL:
 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.
PACKAGING: UNITS SHALL BE PACKAGED PER MIL-R-93, LEVEL A.
SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404 CLASS 1.
 INTERPRET DRAWING SYMBOLS, ABBREVIATIONS AND REFERENCE DESIGNATIONS IN ACCORDANCE WITH GOVERNMENT STANDARDS PRESCRIBED IN MIL-D-70327.

INSPECTION AND ACCEPTANCE:
 RESISTANCE VALUES: SEE TABLE.
 RESISTANCE TOLERANCE: SEE TABLE.
 TEMPERATURE COEFFICIENT: ABOVE 10Ω 15 PPM/°C, 10Ω TO 1Ω 30 PPM/°C, 1Ω AND BELOW 40 PPM/°C.
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.
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.

DESIGN REQUIREMENTS:
POWER RATING: 1/10 WATT AT +125°C DERATED TO ZERO AT 145°C
MAXIMUM VOLTAGE RATING: 150 VOLTS.
STABILITY: 100 PPM/YEAR AT +25°C AT 1/2 RATED POWER.
TEMPERATURE RANGE: MINUS 65°C TO PLUS 125°C.
 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.
 EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.

SPECIAL CONDITIONING BY SUPPLIER:
 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.

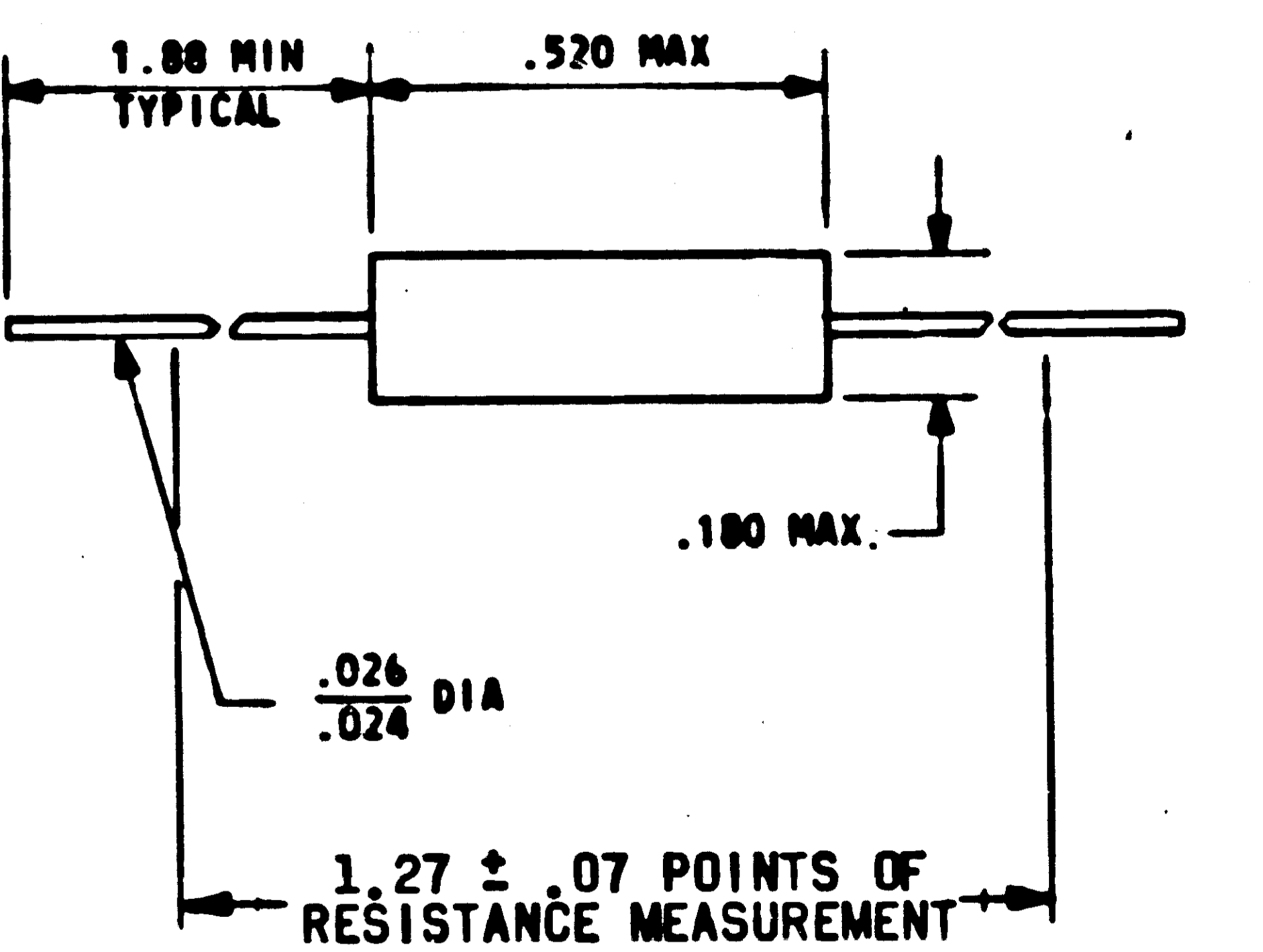
PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DRAWING

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	600		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	

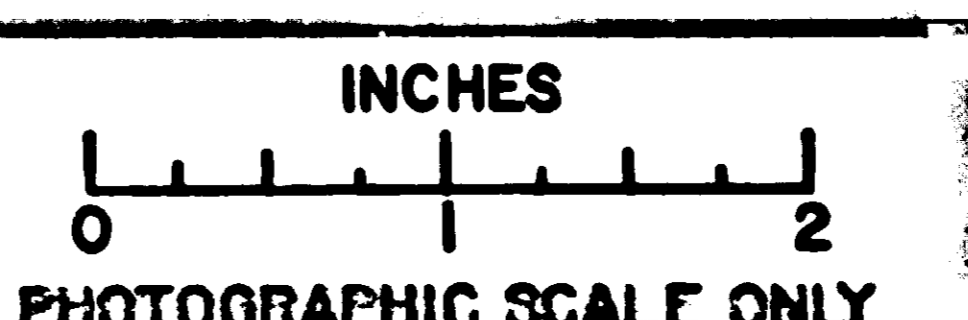
7 1010377

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
K	REPLACES REV J WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 02103	7/17/62	SW
L	REVISED PER TDRR 02478	8-7-62	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 497		MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
DRAWN: [Signature] DATE: JUN 63 CHECKED: [Signature] DATE: JUN 63 APPROVAL: [Signature] DATE: JUN 63		RESISTORS, FIXED, WW, PRECISION	
SEE NOTES		SPECIFICATION CONTROL DRAWING	
HEAT TREATMENT: NONE		CODE IDENT NO. C	NASA DRAWING NO. 1010377
FINAL FINISH: NONE		SCALE: —	WT: —
NEXT ASSY: —		SHEET 1 OF 2	



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NOMINAL RES OHMS	RES TOL	105	16,000	±1.0%	106	6,200		107	100		108	150		109	7,500		110	4,700		111	\$1,000		112	1		113	15	±0.1%	114	17		115	19		116	21		117	23		118	25		119	27		120	29		121	31		122	33		123	35		124	37		125	39		126	41		127	43		128	45		129	47		130	49		131	51		132	53		133	55		134	57		135	59		136	61		137	63		138	65		139	67		140	69		141	71		142	73		143	75		144	77		145	79		146	81		147	83		148	85		149	87		150	89		151	91		152	93		153	95		154	97		155	99		156	101		157	103		158	105		159	107		160	109		161	111		162	113		163	115		164	117		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DASH NO.</th> <th>NOMINAL RES OHMS</th> <th>RES TOL</th> </tr> </thead> <tbody> <tr><td>165</td><td>119</td><td>±0.1%</td></tr> <tr><td>166</td><td>121</td><td></td></tr> <tr><td>167</td><td>123</td><td></td></tr> <tr><td>168</td><td>125</td><td></td></tr> <tr><td>169</td><td>127</td><td></td></tr> <tr><td>170</td><td>129</td><td></td></tr> <tr><td>171</td><td>131</td><td></td></tr> <tr><td>172</td><td>133</td><td></td></tr> <tr><td>173</td><td>135</td><td></td></tr> <tr><td>174</td><td>137</td><td></td></tr> <tr><td>175</td><td>139</td><td></td></tr> <tr><td>176</td><td>141</td><td></td></tr> <tr><td>177</td><td>143</td><td></td></tr> <tr><td>178</td><td>145</td><td></td></tr> <tr><td>179</td><td>147</td><td></td></tr> <tr><td>180</td><td>149</td><td></td></tr> <tr><td>181</td><td>151</td><td></td></tr> <tr><td>182</td><td>153</td><td></td></tr> <tr><td>183</td><td>155</td><td></td></tr> <tr><td>184</td><td>157</td><td></td></tr> <tr><td>185</td><td>159</td><td></td></tr> <tr><td>186</td><td>161</td><td></td></tr> <tr><td>187</td><td>163</td><td></td></tr> <tr><td>188</td><td>165</td><td></td></tr> <tr><td>189</td><td>167</td><td></td></tr> <tr><td>190</td><td>169</td><td></td></tr> <tr><td>191</td><td>171</td><td></td></tr> <tr><td>192</td><td>173</td><td></td></tr> <tr><td>193</td><td>175</td><td></td></tr> <tr><td>194</td><td>177</td><td></td></tr> <tr><td>195</td><td>179</td><td></td></tr> <tr><td>196</td><td>181</td><td></td></tr> <tr><td>197</td><td>183</td><td></td></tr> <tr><td>198</td><td>185</td><td></td></tr> <tr><td>199</td><td>187</td><td></td></tr> <tr><td>200</td><td>189</td><td></td></tr> <tr><td>201</td><td>191</td><td></td></tr> <tr><td>202</td><td>193</td><td></td></tr> <tr><td>203</td><td>195</td><td></td></tr> <tr><td>204</td><td>197</td><td></td></tr> <tr><td>205</td><td>199</td><td></td></tr> <tr><td>206</td><td>201</td><td></td></tr> <tr><td>207</td><td>203</td><td></td></tr> <tr><td>208</td><td>205</td><td></td></tr> <tr><td>209</td><td>207</td><td></td></tr> <tr><td>210</td><td>209</td><td></td></tr> <tr><td>211</td><td>211</td><td></td></tr> <tr><td>212</td><td>213</td><td></td></tr> <tr><td>213</td><td>215</td><td></td></tr> <tr><td>214</td><td>217</td><td></td></tr> <tr><td>215</td><td>219</td><td></td></tr> <tr><td>216</td><td>221</td><td></td></tr> <tr><td>217</td><td>223</td><td></td></tr> <tr><td>218</td><td>225</td><td></td></tr> <tr><td>219</td><td>227</td><td></td></tr> <tr><td>220</td><td>229</td><td></td></tr> <tr><td>221</td><td>231</td><td></td></tr> <tr><td>222</td><td>233</td><td></td></tr> <tr><td>223</td><td>235</td><td></td></tr> <tr><td>224</td><td>237</td><td></td></tr> </tbody> </table>				DASH NO.	NOMINAL RES OHMS	RES TOL	165	119	±0.1%	166	121		167	123		168	125		169	127		170	129		171	131		172	133		173	135		174	137		175	139		176	141		177	143		178	145		179	147		180	149		181	151		182	153		183	155		184	157		185	159		186	161		187	163		188	165		189	167		190	169		191	171		192	173		193	175		194	177		195	179		196	181		197	183		198	185		199	187		200	189		201	191		202	193		203	195		204	197		205	199		206	201		207	203		208	205		209	207		210	209		211	211		212	213		213	215		214	217		215	219		216	221		217	223		218	225		219	227		220	229		221	231		222	233		223	235		224	237		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DASH NO.</th> <th>NOMINAL RES OHMS</th> <th>RES TOL</th> </tr> </thead> <tbody> <tr><td>225</td><td>880</td><td>±0.1%</td></tr> <tr><td>226</td><td>890</td><td></td></tr> <tr><td>227</td><td>900</td><td></td></tr> <tr><td>228</td><td>910</td><td></td></tr> <tr><td>229</td><td>920</td><td></td></tr> <tr><td>230</td><td>930</td><td></td></tr> <tr><td>231</td><td>940</td><td></td></tr> <tr><td>232</td><td>950</td><td></td></tr> <tr><td>233</td><td>960</td><td></td></tr> <tr><td>234</td><td>970</td><td></td></tr> <tr><td>235</td><td>980</td><td></td></tr> <tr><td>236</td><td>990</td><td></td></tr> <tr><td>237</td><td>1000</td><td></td></tr> <tr><td>238</td><td>1010</td><td></td></tr> <tr><td>239</td><td>1020</td><td></td></tr> <tr><td>240</td><td>1030</td><td></td></tr> <tr><td>241</td><td>1040</td><td></td></tr> <tr><td>242</td><td>1050</td><td></td></tr> <tr><td>243</td><td>1060</td><td></td></tr> <tr><td>244</td><td>1070</td><td></td></tr> <tr><td>245</td><td>1080</td><td></td></tr> <tr><td>246</td><td>1090</td><td></td></tr> <tr><td>247</td><td>1100</td><td></td></tr> <tr><td>248</td><td>1110</td><td></td></tr> <tr><td>249</td><td>1120</td><td></td></tr> <tr><td>250</td><td>1130</td><td></td></tr> <tr><td>251</td><td>1140</td><td></td></tr> <tr><td>252</td><td>1150</td><td></td></tr> <tr><td>253</td><td>1160</td><td></td></tr> <tr><td>254</td><td>1170</td><td></td></tr> <tr><td>255</td><td>1180</td><td></td></tr> <tr><td>256</td><td>1190</td><td></td></tr> <tr><td>257</td><td>1200</td><td></td></tr> <tr><td>258</td><td>1210</td><td></td></tr> <tr><td>259</td><td>1220</td><td></td></tr> <tr><td>260</td><td>1230</td><td></td></tr> <tr><td>261</td><td>1240</td><td></td></tr> <tr><td>262</td><td>1250</td><td></td></tr> <tr><td>263</td><td>1260</td><td></td></tr> <tr><td>264</td><td>1270</td><td></td></tr> <tr><td>265</td><td>1280</td><td></td></tr> <tr><td>266</td><td>1290</td><td></td></tr> <tr><td>267</td><td>1300</td><td></td></tr> <tr><td>268</td><td>1310</td><td></td></tr> <tr><td>269</td><td>1320</td><td></td></tr> <tr><td>270</td><td>1330</td><td></td></tr> <tr><td>271</td><td>1340</td><td></td></tr> <tr><td>272</td><td>1350</td><td></td></tr> <tr><td>273</td><td>1360</td><td></td></tr> <tr><td>274</td><td>1370</td><td></td></tr> </tbody> </table>				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		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DASH NO.</th> <th>NOMINAL RES OHMS</th> <th>RES TOL</th> </tr> </thead> <tbody> <tr><td>275</td><td>1380</td><td>±0.1%</td></tr> <tr><td>276</td><td>1390</td><td></td></tr> <tr><td>277</td><td>1400</td><td></td></tr> </tbody> </table>				DASH NO.	NOMINAL RES OHMS	RES TOL	275	1380	±0.1%	276	1390		277	1400	
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