FEDERAL SUPPLY CLASS
5940

RATIONALE

TIN WHISKER RESISTANT TERMINALS ARE REQUIRED FOR SENSITIVE LOW SIGNAL AND SPACE APPLICATIONS.

NOTICE

THE REQUIREMENTS FOR PROCURING THE CONTACTS DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION AND THE LATEST ISSUE OF: SAE AS7928

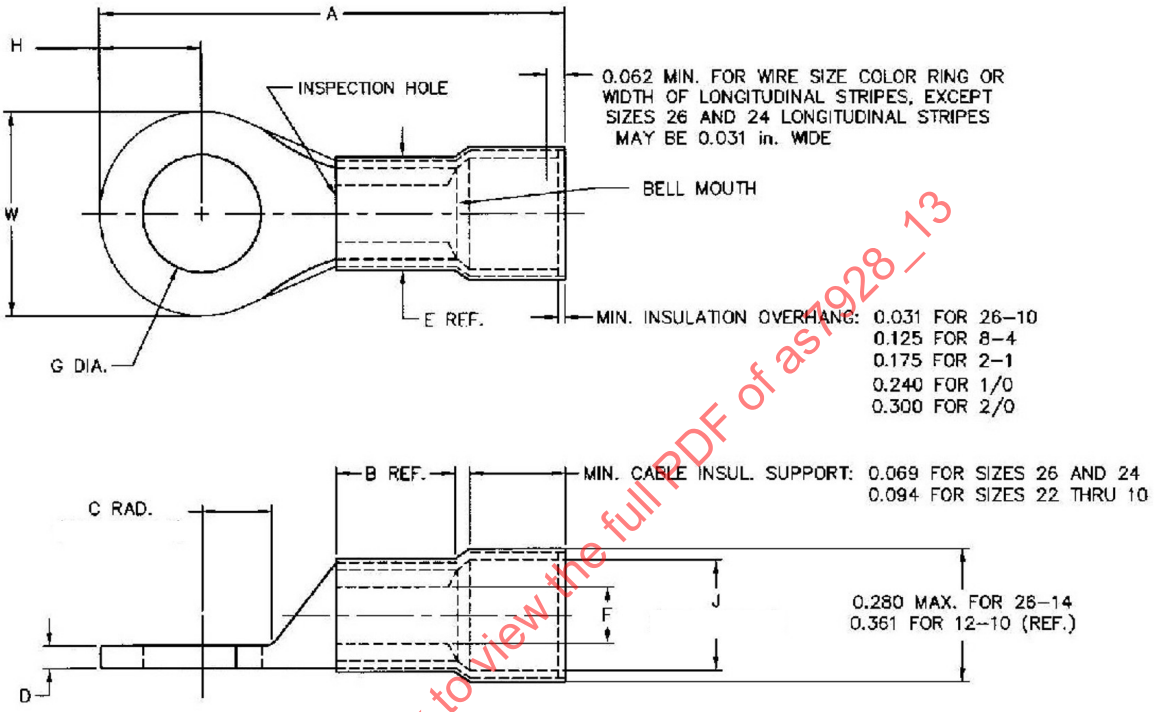
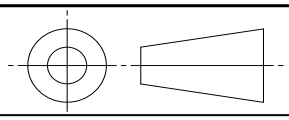



FIGURE 1 - AS7928/4 TERMINAL





THIRD ANGLE PROJECTION



ISSUED 2009-10

CUSTODIAN: AE-8/AE-8C2

PROCUREMENT SPECIFICATION: AS7928

SAE Aerospace
An SAE International Group

# AEROSPACE STANDARD

TERMINALS, LUG AND SPLICES, CONDUCTOR, CRIMP STYLE, COPPER TERMINAL, LUG, INSULATED, TIN WHISKER RESISTANT, RING TONGUE, BELL-MOUTHED, TYPE II, CLASS 1 (FOR 150°C TOTAL CONDUCTOR TEMPERATURE)

SAE AS7928/13

TABLE 1 - DASH NUMBERS AND CHARACTERISTICS

| DASH NO. | TERMINAL SIZE | STUD SIZE | A MAX | B REF | C MIN RAD | D MAX | D MIN | E DIA REF | F DIA | G DIA MAX | G DIA MIN | J MIN DIA | W MAX | W MIN | COLOR OF CIRCULAR RING OR LONGITUDINAL STRIPES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 143 | 26 - 24 | 2 (0.086) | 0.740 | 0.126 | 0.133 | 0.028 | 0.022 | 0.215<br>0.190 | 0.033<br>0.027 | 0.098 | 0.090 | 0.084 | 0.210 | 0.133 | Yellow |
| 144 | | 4 (0.112) | 0.755 | | 0.171 | | | | | 0.122 | 0.114 | | 0.260 | 0.193 | |
| 145 | | 6 (0.138) | 0.855 | | 0.202 | | | | | 0.152 | 0.142 | | | 0.245 | |
| 146 | | 8 (0.164) | | | | | | | | 0.178 | 0.168 | | 0.330 | | |
| 147 | | 10 (0.190) | 0.865 | | 0.227 | | | | | 0.203 | 0.193 | | | | |
| 159 | 22 - 18 | 2 (0.086) | 0.755 | 0.156 | 0.115 | 0.035 | 0.027 | 0.215<br>0.190 | 0.073<br>0.052 | 0.098 | 0.090 | 0.120 | 0.230 | 0.193 | Red |
| 148 | | 4 (0.112) | | | 0.125 | | | | | 0.122 | 0.114 | | | 0.210 | |
| 101 | | 6 (0.138) | | | | | | | | 0.152 | 0.142 | | | | |
| 102 | | 6 (0.138) | 0.865 | | 0.202 | | | | | | | | 0.260 | 0.245 | |
| 149 | | 8 (0.164) | 0.910 | | | | | | | 0.178 | 0.168 | | 0.320 | 0.305 | |
| 103 | | 10 (0.190) | 1.090 | | 0.234 | | | | | 0.203 | 0.193 | | | | |
| 150 | | 1/4 (0.250) | | | 0.265 | | | | | 0.275 | 0.260 | | 0.473 | 0.450 | |
| 104 | | 5/16 (0.312) | | | 0.296 | | | | | 0.338 | 0.323 | | | | |
| 105 | | 3/8 (0.375) | 1.320 | | 0.328 | | | | | 0.400 | 0.385 | | 0.540 | 0.520 | |
| 151 | | 1/2 (0.500) | 1.320 | | 0.453 | | | | | 0.525 | 0.510 | | 0.720 | 0.705 | |
| 152 | 16 - 14 | 4 (0.112) | 0.774 | 0.156 | 0.125 | 0.035 | 0.029 | 0.240<br>0.210 | 0.095<br>0.081 | 0.122 | 0.114 | 0.153 | 0.260 | 0.240 | Blue |
| 106 | | 6 (0.138) | | | | | | | | 0.152 | 0.147 | | | | |
| 107 | | 6 (0.138) | 0.910 | | 0.202 | | | | | | | | 0.317 | 0.302 | |
| 153 | | 8 (0.164) | | | | | | | | 0.178 | 0.168 | | | | |
| 108 | | 10 (0.190) | 0.915 | | 0.234 | | | | | 0.203 | 0.193 | | | | |
| 154 | | 1/4 (0.250) | 1.085 | | 0.265 | | | | | 0.275 | 0.260 | | 0.473 | 0.430 | |
| 109 | | 5/16 (0.312) | | | 0.296 | | | | | 0.338 | 0.323 | | | | |
| 110 | | 3/8 (0.375) | 1.225 | | 0.328 | | | | | 0.400 | 0.385 | | 0.540 | 0.520 | |
| 155 | | 1/2 (0.500) | 1.320 | | 0.453 | | | | | 0.525 | 0.510 | | 0.720 | 0.705 | |
| 111 | 12 - 10 | 6 (0.138) | 1.120 | 0.234 | 0.202 | 0.043 | 0.037 | 0.300<br>0.275 | 0.139<br>0.129 | 0.152 | 0.142 | 0.210 | 0.380 | 0.365 | Yellow |
| 156 | | 8 (0.164) | | | | | | | | 0.178 | 0.168 | | | | |
| 112 | | 10 (0.190) | | | 0.234 | | | | | 0.203 | 0.193 | | | | |
| 157 | | 1/4 (0.250) | 1.322 | | 0.265 | | | | | 0.275 | 0.260 | | 0.536 | 0.516 | |
| 113 | | 5/16 (0.312) | | | 0.296 | | | | | 0.338 | 0.323 | | | | |
| 114 | | 3/8 (0.375) | 1.414 | | 0.328 | | | | | 0.400 | 0.385 | | 0.598 | 0.573 | |
| 158 | | 1/2 (0.500) | | | 0.453 | | | | | 0.525 | 0.510 | | 0.720 | 0.705 | |
| 115 | 8 | 10 (0.190) | 1.402 | 0.315 | 0.234 | 0.084 | 0.038 | 0.350<br>0.300 | 0.186<br>0.176 | 0.203 | 0.193 | 0.257 | 0.429 | 0.386 | Red |
| 116 | | 1/4 (0.250) | 1.446 | | 0.265 | | | | | 0.275 | 0.260 | | 0.478 | 0.435 | |
| 117 | | 5/16 (0.312) | 1.544 | | 0.296 | | | | | 0.338 | 0.323 | | 0.590 | 0.547 | |
| 118 | | 3/8 (0.375) | | | 0.328 | | | | | 0.400 | 0.385 | | | | |
| 119 | 6 | 10 (0.190) | 1.599 | 0.375 | 0.238 | 0.084 | 0.043 | 0.419<br>0.360 | 0.232<br>0.222 | 0.203 | 0.193 | 0.300 | 0.503 | 0.460 | Blue |
| 120 | | 1/4 (0.250) | | | 0.265 | | | | | 0.275 | 0.260 | | | | |
| 121 | | 5/16 (0.312) | 1.762 | | 0.305 | | | | | 0.338 | 0.323 | | 0.623 | 0.580 | |
| 122 | | 3/8 (0.375) | | | 0.328 | | | | | 0.400 | 0.385 | | | | |

TABLE 1 - DASH NUMBERS AND CHARACTERISTICS (CONTINUED)

| DASH NO. | TERMINAL SIZE STUD SIZE | STUD SIZE | A MAX | B REF | C MIN RAD | D MAX | D MIN | E DIA REF | F DIA | G DIA MAX | G DIA MIN | J MIN DIA | W MAX | W MIN | COLOR OF CIRCULAR RING OR LONGITUDINAL STRIPES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 123 | 4 | 1/4 (0.250) | 1.812 | 0.437 | 0.276 | 0.096 | 0.047 | 0.500<br>0.425 | 0.290<br>0.280 | 0.275 | 0.260 | 0.370 | 0.570 | 0.480 | YELLOW |
| 124 | | 5/16 (0.312) | 1.879 | | 0.308 | | | | | 0.338 | 0.323 | | 0.648 | 0.605 | |
| 125 | | 3/8 (0.375) | | | 0.328 | | | | | 0.400 | 0.385 | | | | |
| 126 | 2 | 1/4 (0.250) | 2.069 | 0.505 | 0.343 | 0.109 | 0.054 | 0.560<br>0.510 | 0.365<br>0.355 | 0.275 | 0.260 | 0.453 | 0.711 | 0.665 | Red |
| 127 | | 5/16 (0.375) | | | | | | | | 0.400 | 0.385 | | | | |
| 128 | | 3/8 (0.500) | 2.269 | | 0.453 | | | | | 0.525 | 0.510 | | 0.804 | 0.740 | |
| 129 | 1 | 1/4 (0.250) | 2.150 | 0.565 | 0.383 | 0.125 | 0.070 | 0.620<br>0.560 | 0.398<br>0.388 | 0.275 | 0.260 | 0.500 | 0.793 | 0.740 | White |
| 130 | | 3/8 (0.375) | | | | | | | | 0.400 | 0.385 | | | | |
| 131 | | 1/2 (0.500) | 2.370 | | 0.453 | | | | | 0.525 | 0.510 | | 0.987 | | |
| 132 | 0 | 1/4 (0.250) | 2.401 | 0.630 | 0.418 | 0.125 | 0.070 | 0.685<br>0.625 | 0.458<br>0.438 | 0.275 | 0.260 | 0.550 | 0.853 | 0.810 | Blue |
| 133 | | 3/8 (0.375) | | | | | | | | 0.400 | 0.385 | | | | |
| 134 | | 1/2 (0.500) | 2.525 | | 0.453 | | | | | 0.525 | 0.510 | | 0.903 | 0.860 | |
| 135 | 00 | 5/16 (0.312) | 2.750 | 0.700 | 0.473 | 0.129 | 0.075 | 0.755<br>0.685 | 0.520<br>0.500 | 0.338 | 0.323 | 0.610 | 0.956 | 0.913 | Yellow |
| 136 | | 3/8 (0.375) | | | | | | | | 0.400 | 0.385 | | | | |
| 137 | | 1/2 (0.500) | | | | | | | | 0.525 | 0.510 | | | | |

REQUIREMENTS

1. DESIGN AND CONFIGURATION (SEE FIGURE 1 AND TABLE 1):

   DIMENSIONS ARE IN INCHES. MAX AND MIN DIMENSIONS DUE TO OVALIZATION MUST BE WITHIN 3% OF SPECIFICATION REQUIREMENTS. CONTOUR INDICATED BY PHANTOM LINES MAY VARY FROM THAT SHOWN TO SUIT INDIVIDUAL MANUFACTURER'S DESIGN.

   THE "C" MIN DIMENSION IS MIN WASHER CLEARANCE RADIUS.

   INSULATION SUPPORT AND TERMINAL BARREL MAY BE MULTIPLE PIECE CONSTRUCTION.

2. MATERIAL:

   INSULATION SLEEVE SHALL BE IN ACCORDANCE WITH AS7928. SLEEVE COLOR SHALL BE CLEAR (UNCOLORED).

   FINISH (WHISKER RESISTANT): TIN PLATED. ASTM B 545, ALLOYED WITH 3% BY WEIGHT, MINIMUM LEAD. PLATING THICKNESS SHALL BE 0.0001 in MINIMUM (SEE AS7928 FOR MORE DETAILS).

3. IDENTIFICATION OF PRODUCT MARKING:

   MANUFACTURER IDENTIFICATION AND PART NUMBER MARKING SHALL BE AS SPECIFIED IN AS7928.

   COLOR RINGS OR LONGITUDINAL STRIPES SHALL BE LOCATED AS SHOWN IN FIGURE 1. COLOR OF CIRCULAR RING OR LONGITUDINAL STRIPES SHALL BE AS SPECIFIED IN TABLE 1 AND SHALL BE IN ACCORDANCE WITH EIA STANDARD RS359.

   COLOR RINGS MUST COVER A MINIMUM OF 315° OF THE CIRCUMFERENCE.

   LONGITUDINAL STRIPES SHALL BE 2 OR MORE AND EQUALLY SPACED ON THE INSULATION PORTION OF THE TERMINAL. THE STRIPES MUST EXTEND TO WITHIN 1/16 INCHES OF THE ENDS OF THE INSULATION AND MUST NOT OBLITERATE THE BASIC SLEEVE COLOR.

4. CRIMPING TOOLS:

CRIMPING TOOLS SHALL BE AS SPECIFIED IN TABLE 2.

TABLE 2 - TERMINAL CRIMPING TOOLS

| TERMINAL SIZE (SEE TABLE 1) | CRIMP TOOL | CRIMP DIE |
|---|---|---|
| 26-10 | M22520/5-01 | M22520/5-100 |
| 26-14 | M22520/10-01 | M22520/10-101 |
| 8 – 00 | AS5259/1 (MS25441) | AS5259/1 (MS23002) |

5. PART NUMBER:

M7928 /13 -103

- -103 — DASH NUMBER FOR TERMINAL FOR SIZE 22-18 WIRE WITH A (.190) STUD HOLE
- /13 — DETAIL SPECIFICATION NUMBER FOR TERMINALS (150°C TEMPERATURE)
- M7928 — BASIC SPECIFICATION NUMBER

6. QUALIFICATION AND QUALITY CONFORMANCE:

FOR QUALIFICATION, TERMINALS SHALL BE TESTED WITH ONE WIRE AS SPECIFIED IN AS81044/6, /7, /8, /9, /10, /12, /13, OR AS22759/16, /17, /18, /19.

THE FINISH REQUIREMENT SPECIFIED HEREIN SHALL BE INCLUDED AS PART OF THE GROUP 1 QUALIFICATION REQUIREMENTS. THREE ADDITIONAL SPECIMENS SHALL BE INSPECTED FOR FINISH COMPOSITION USING ANALYTICAL METHODS SUCH AS X-RAY FLUORESCENCE, SCANNING ELECTRON MICROSCOPE WITH ENERGY DISPERSION SPECTRO-PHOTOMETRY TECHNIQUE OR OTHER ATOMIC ABSORPTION METHODS. FINISH CONTAINING LESS THAN 3% BY WEIGHT LEAD SHALL BE CAUSE FOR FAILURE TO QUALIFY.

QUALITY CONFORMANCE VALIDATION OF CORROSION PROTECTION REQUIREMENTS SHALL BE MADE FOR EACH LOT AS SPECIFIED IN THE SPECIFIED FINISH SPECIFICATIONS.

QUALITY ASSURANCE: FOR QUALITY CONFORMANCE TESTING, THE TERMINAL FINISH SHALL BE TESTED AS PART OF GROUP A INSPECTION. FIVE (5) SPECIMENS PER PLATING LOT SHALL BE INSPECTED FOR FINISH COMPOSITION USING ANALYTICAL METHODS SUCH AS X-RAY FLUORESCENCE, SCANNING ELECTRON MICROSCOPE WITH ENERGY DISPERSION SPECTRO-PHOTOMETRY TECHNIQUE OR OTHER ATOMIC ABSORPTION METHODS. FINISH CONTAINING LESS THAN 3% BY WEIGHT LEAD SHALL BE CAUSE FOR REJECTION OF THE ENTIRE LOT. FOR EACH LOT DELIVERED, A CERTIFICATE OF COMPLIANCE SHALL BE PROVIDED FROM THE SUPPLIER, WHICH STATES CONFORMANCE TO THE FINISH REQUIREMENT HEREIN.