

| REVISIONS | | | |
|-----------|--|--------------|--------------|
| LTR | DESCRIPTION | DATE | APPROVED |
| A | Add new source of supply; change temperature coefficient of schematics 6 and 14. Editorial changes throughout. | 20 May 1988 | D. MOORE |
| B | Changes in accordance with NOR 5905-R010-93. | 28 May 1993 | D. MOORE |
| C | Update and validation of drawing. Editorial changes throughout. | 11 Sep 2000 | K. COTTONGIM |
| D | Add pure tin prohibition paragraph. Editorial changes throughout. | 29 Jan 2007 | M. RADECKI |
| E | RTC Tracking changes for Schematics 01, 02, 03, 05, 15 and 24. Dash number 06 seat height is .350 inch max. QR Code added. Vendor address change. Editorial changes throughout | 06 June 2016 | M. RADECKI |

CURRENT DESIGN ACTIVITY CAGE CODE 037Z3
 DEFENSE LOGISTICS AGENCY
 DEFENSE SUPPLY CENTER, COLUMBUS
 COLUMBUS, OHIO 43218-3990



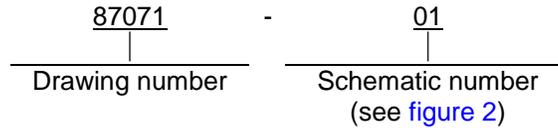
Prepared in accordance with [ASME Y14.100](#)

| REV STATUS OF PAGES | REV | E | E | E | E | E | E | E | E | E | E | E | E | E | E | E | | | |
|---|--------------------------------|--------------------------|---|---|---|---|---|--|----------------------|---|----|----|----|----|----|----|--|--|--|
| | PAGES | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | | | |
| PMIC N/A | PREPARED BY Alan R. Knox | | | | | | | DESIGN ACTIVITY: DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO 45444-5000 | | | | | | | | | | | |
| Original date of drawing: 29 December 1987 | CHECKED BY David W. Withrow | | | | | | | TITLE RESISTOR NETWORK, FIXED, FILM, 10-PIN SIP, MULTIPLE RESISTANCE VALUES, MULTIPLE SCHEMATICS, (LOW PROFILE) | | | | | | | | | | | |
| | APPROVED BY David E. Moore | | | | | | | | | | | | | | | | | | |
| | SIZE A | CODE IDENT. NO. 14933 | | | | | | | DWG NO. 87071 | | | | | | | | | | |
| | REV E | | | | | | | PAGE 1 OF 15 | | | | | | | | | | | |

1. SCOPE

1.1 Scope. This drawing describes the requirements for a 10-pin, low profile, single-in-line package (SIP), fixed film, resistor network.

1.2 Part or Identifying Number (PIN). The complete PIN is as follows:



2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

[MIL-PRF-83401](#) - Resistor Network, Fixed, Film, and Capacitor-Resistor Network, Ceramic Capacitor and Fixed Film Resistor, General Specification for.

DEPARTMENT OF DEFENSE STANDARDS

[MIL-STD-1285](#) - Marking of Electrical and Electronic Parts.

(Copies of these documents are available online at <http://quicksearch.dla.mil>).

2.2 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence unless otherwise noted. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Item Requirements. The individual item requirements shall be in accordance with [MIL-PRF-83401](#) and as specified herein.

3.2 Interface and physical dimensions. The resistor shall meet the interface and physical dimensions as specified in [MIL-PRF-83401](#) and herein (see [figure 1](#)). For dash number 06, the seat height is .350 inch max.

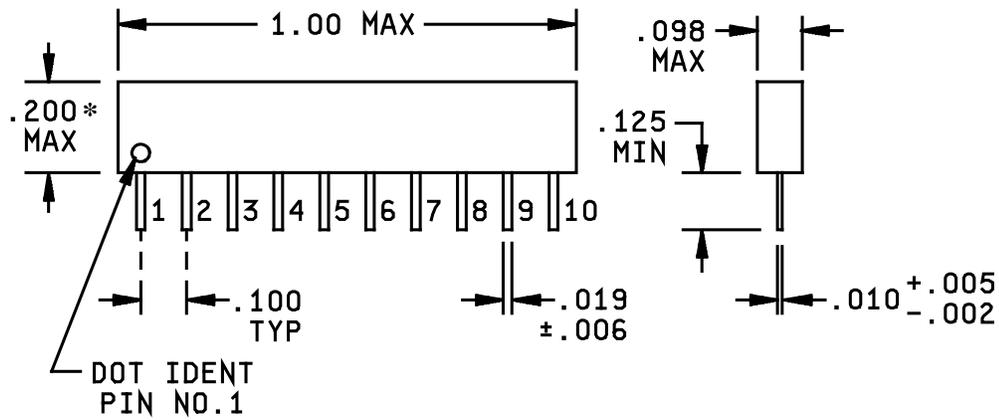
3.3 Electrical characteristics.

3.3.1 Resistance. The resistance value shall be as specified on [figure 2](#).

3.3.2 Resistance tolerance. The resistance tolerance shall as specified on [figure 2](#).

3.3.3 Resistor power rating. The resistor power rating for individual resistors shall be 125 milliwatts maximum at 70°C derated to 0 watts at 150°C.

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|--|-------------------|---------------------------------|--------------------------|
| DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO | SIZE A | CODE IDENT NO. 14933 | DWG NO. 87071 |
| | | REV E | PAGE 2 |



* Dash number 06, the seat height is .350 inch max.

| Inches | mm | Inches | mm | Inches | mm |
|--------|------|--------|------|--------|-------|
| 0.002 | 0.05 | 0.019 | 0.48 | 0.200 | 5.08 |
| 0.005 | 0.12 | 0.098 | 2.48 | 0.350 | 8.89 |
| 0.006 | 0.15 | 0.100 | 2.54 | 1.000 | 25.40 |
| 0.010 | 0.25 | 0.125 | 3.17 | | |

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, dimensional tolerances shall be ± 0.02 (0.5 mm) for two decimal places and ± 0.010 (0.25 mm) for three decimal places.
4. The picturization of the styles above is given as representative of the envelope of the item. Slight deviations from the outline shown, which are contained within the envelope and do not alter the functional aspects of the device, are acceptable.

FIGURE 1. Resistor network.

3.3.4 Package power rating. The package power rating shall not exceed the sum of the individual resistance element power rating in the network.

3.3.5 Operating voltage. Each resistor element shall have a maximum operating voltage of 100 V dc or ac rms.

3.3.6 Schematic. Resistor networks are available in schematics listed on [figure 2](#).

3.3.7 Resistance temperature characteristic. Unless otherwise specified, the resistance temperature characteristic shall be ± 100 ppm/ $^{\circ}$ C.

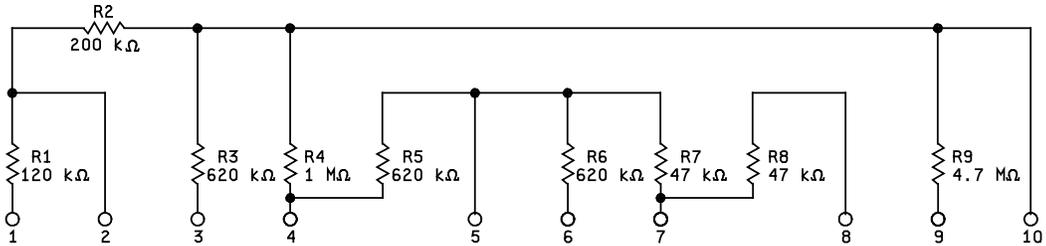
3.4 Characteristic. The characteristic shall be in accordance with [MIL-PRF-83401](#), characteristic K.

3.5 Environmental requirements. The environmental requirements shall be in accordance with [MIL-PRF-83401](#), characteristic K.

3.6 Marking. Marking shall be in accordance with [MIL-STD-1285](#) except the networks shall be marked with the PIN as specified herein (see [1.2](#)), the manufacturer's name or Commercial and Government Entity (CAGE) code, and date lot codes.

| | | | |
|--|-------------------|---------------------------------|--------------------------|
| DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO | SIZE A | CODE IDENT NO. 14933 | DWG NO. 87071 |
| | | REV E | PAGE 3 |

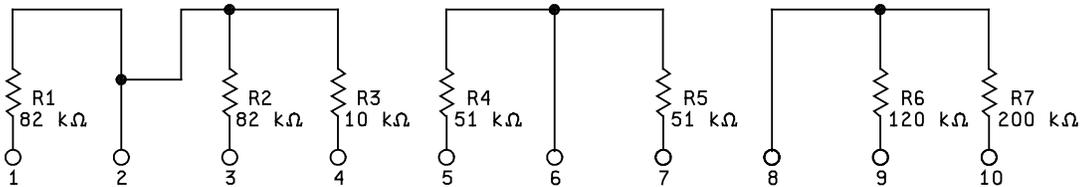
SCHEMATIC - 01



NOTES:

1. Resistance tolerance for shall be ± 2 percent, except for R9 which shall be ± 10 percent.
2. R1 through R8 resistor temperature coefficient tracking shall be ± 100 ppm/ $^{\circ}$ C maximum.
3. k Ω = kilohms, M Ω = megohms.

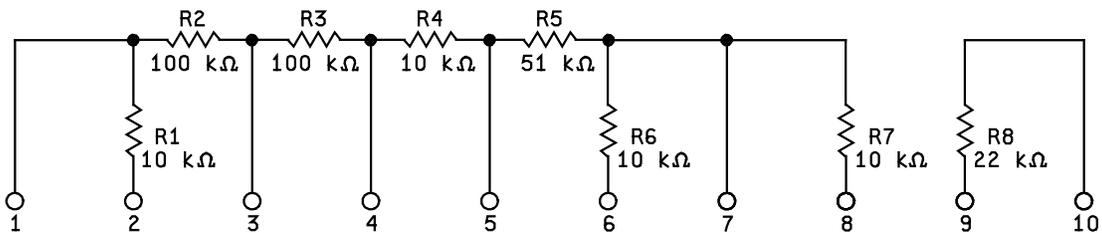
SCHEMATIC - 02



NOTES:

1. Resistance tolerance for shall be ± 2 percent.
2. R1 through R7 resistor temperature coefficient tracking shall be ± 100 ppm/ $^{\circ}$ C maximum.
3. k Ω = kilohms.

SCHEMATIC - 03



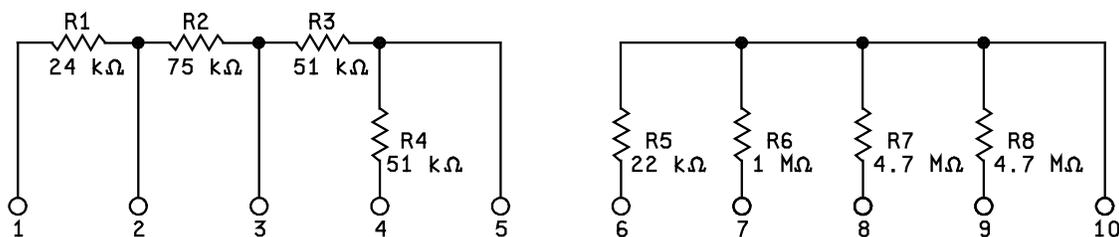
NOTES:

1. Resistance tolerance for shall be ± 2 percent.
2. R2 through R6 resistor temperature coefficient tracking shall be ± 100 ppm/ $^{\circ}$ C maximum.
3. k Ω = kilohms.

FIGURE 2. Schematic, resistance and tolerance.

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|--|--------------------------|--|---------------------------------|
| <p>DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO</p> | <p>SIZE A</p> | <p>CODE IDENT NO. 14933</p> | <p>DWG NO. 87071</p> |
| | | <p>REV E</p> | <p>PAGE 4</p> |

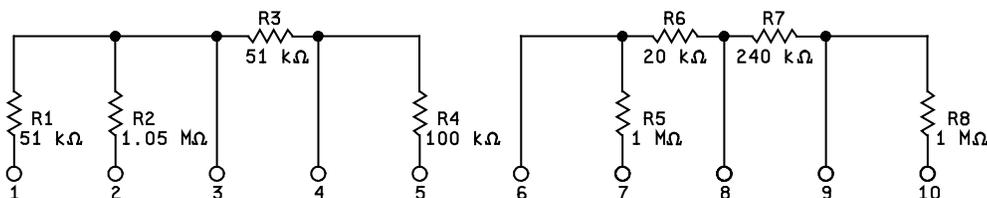
SCHEMATIC - 04



NOTES:

1. Resistance tolerance for R1 and R2 shall be ± 2 percent. R3 and R4 shall be ± 1 percent. R5 through R8 shall be ± 20 percent
2. Resistor temperature coefficient for R1 through R5 shall be ± 100 ppm/ $^{\circ}$ C maximum. R6 through R8 shall be ± 200 ppm/ $^{\circ}$ C.
3. Resistor temperature coefficient tracking for R1 through R5 shall be ± 50 ppm/ $^{\circ}$ C maximum
4. k Ω = kilohms, M Ω = megohms.

SCHEMATIC - 05



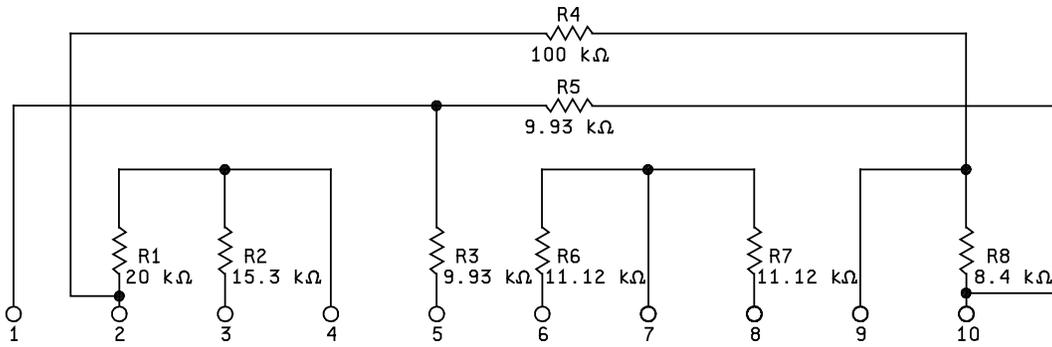
NOTES:

1. Resistance tolerance for R1, R2 and R8 shall be ± 1 percent. R3 through R7 shall be ± 2 percent.
2. Resistor temperature coefficient for R1, R3, R4, R6 and R7 shall be ± 100 ppm/ $^{\circ}$ C maximum. R2, R5, and R8 shall be ± 200 ppm/ $^{\circ}$ C.
3. Resistor temperature coefficient tracking for R1 through R5 and R8 shall be ± 100 ppm/ $^{\circ}$ C maximum
4. k Ω = kilohms, M Ω = kilohms.

FIGURE 2. Schematic, resistance and tolerance - Continued.

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|--|--------------------------|--|---------------------------------|
| <p>DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO</p> | <p>SIZE A</p> | <p>CODE IDENT NO. 14933</p> | <p>DWG NO. 87071</p> |
| | | <p>REV E</p> | <p>PAGE 5</p> |

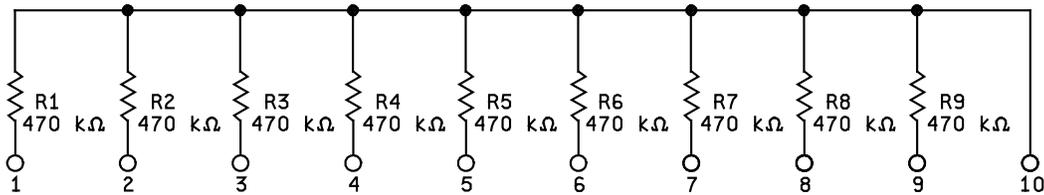
SCHEMATIC - 06



NOTES:

1. Resistance tolerance for shall be ± 1 percent.
2. Resistor temperature coefficient shall be ± 100 ppm/ $^{\circ}$ C maximum.
3. Ω = ohms, k Ω = kilohms.

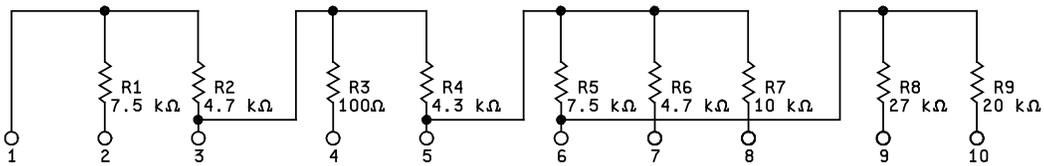
SCHEMATIC - 07



NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C.
3. Power rating shall be 20 mW at $+120^{\circ}$ C.
4. k Ω = kilohms.

SCHEMATIC - 08



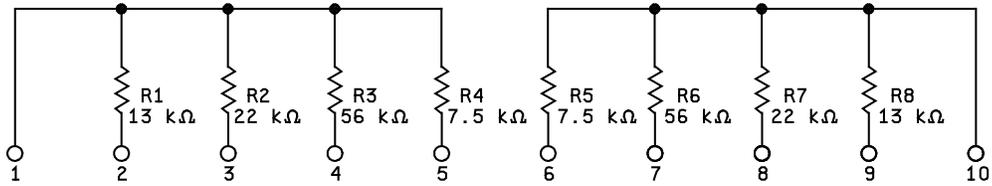
NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. R3 power rating shall be 40 mW at $+120^{\circ}$ C. R1, R2, R4 through R9 power ratings shall be 25 mW at $+120^{\circ}$ C.
4. Ω = ohms, k Ω = kilohms.

FIGURE 2. Schematic, resistance and tolerance - Continued.

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|--|--------------------------|--|---------------------------------|
| <p>DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO</p> | <p>SIZE A</p> | <p>CODE IDENT NO. 14933</p> | <p>DWG NO. 87071</p> |
| | | <p>REV E</p> | <p>PAGE 6</p> |

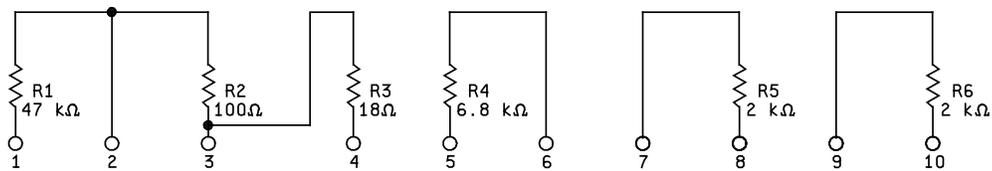
SCHMATIC - 09



NOTES:

1. Resistance tolerance shall be ± 1 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. k Ω = kilohms.

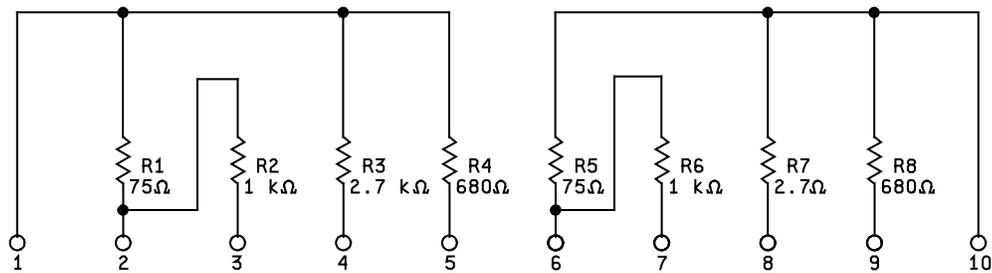
SCHMATIC - 10



NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. R2 and R3 power rating shall be 60 mW at $+120^{\circ}$ C. R1, R4 through R6 power ratings shall be 25 mW at $+120^{\circ}$ C.
4. Ω = ohms, k Ω = kilohms.

SCHMATIC - 11



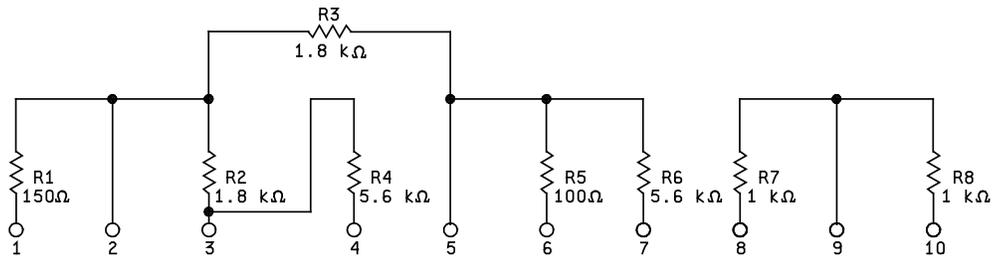
NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. Ω = ohms, k Ω = kilohms.

FIGURE 2. Schematic, resistance and tolerance - Continued.

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|--|--------------------------|--|---------------------------------|
| <p>DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO</p> | <p>SIZE A</p> | <p>CODE IDENT NO. 14933</p> | <p>DWG NO. 87071</p> |
| | | <p>REV E</p> | <p>PAGE 7</p> |

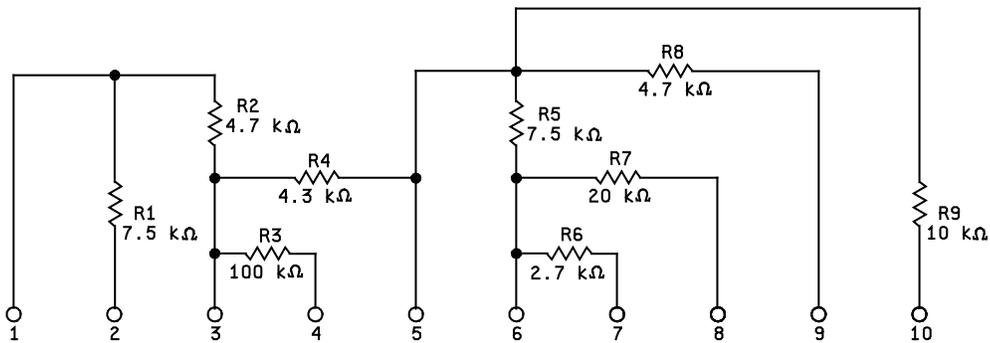
SCHEMATIC - 12



NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. R1 and R5 power rating shall be 60 mW at $+120^{\circ}$ C. R2, R3, R4, R6, R7, and R8 power ratings shall be 25 mW at $+120^{\circ}$ C.
4. Ω = ohms, k Ω = kilohms.

SCHEMATIC - 13



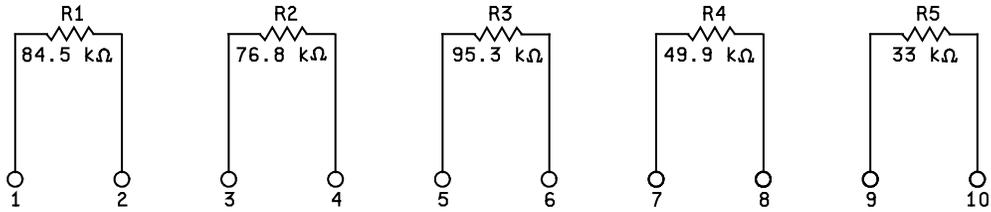
NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. R3 power rating shall be 40 mW at $+120^{\circ}$ C. R1, R2, R4, through R9 power ratings shall be 25 mW at $+120^{\circ}$ C.
4. Ω = ohms, k Ω = kilohms.

FIGURE 2. Schematic, resistance and tolerance - Continued.

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|--|--------------------------|--|---------------------------------|
| <p>DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO</p> | <p>SIZE A</p> | <p>CODE IDENT NO. 14933</p> | <p>DWG NO. 87071</p> |
| | | <p>REV E</p> | <p>PAGE 8</p> |

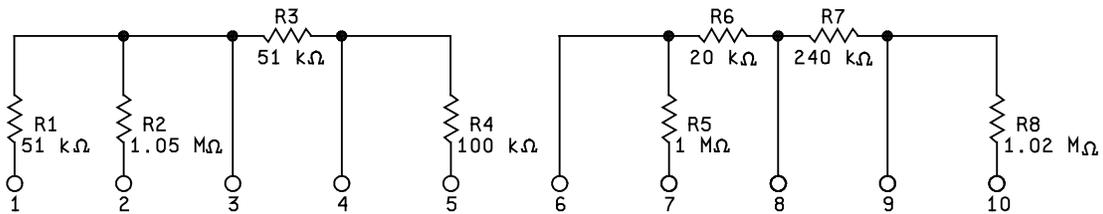
SCHEMATIC - 14



NOTES:

1. Resistance tolerance shall be ± 1 percent.
2. Resistor temperature coefficient shall be ± 100 ppm/ $^{\circ}$ C maximum.
3. k Ω = kilohms.

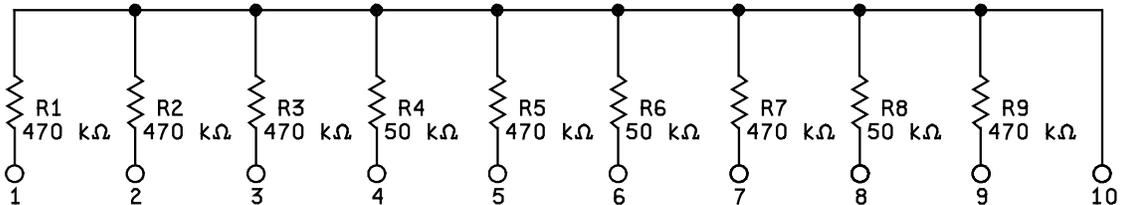
SCHEMATIC - 15



NOTES:

1. Resistance tolerance for R1, R2 and R8 shall be ± 1 percent. R3 through R7 shall be ± 2 percent.
2. Resistor temperature coefficient for R1, R3, R4, R6 and R7 shall be ± 100 ppm/ $^{\circ}$ C maximum. R2, R5, and R8 shall be ± 200 ppm/ $^{\circ}$ C.
3. Resistor temperature coefficient tracking shall be ± 100 ppm/ $^{\circ}$ C maximum
4. k Ω = kilohms, M Ω = megohms.

SCHEMATIC - 16



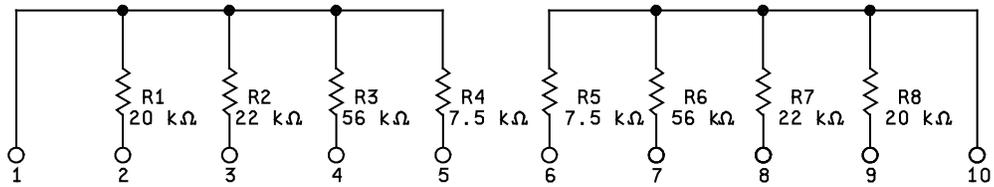
NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. R1, R2, R3, R5, R7 and R9 power rating shall be 40 mW at $+120^{\circ}$ C. R4, R6, and R8 power ratings shall be 130 mW at $+120^{\circ}$ C.
4. k Ω = kilohms.

FIGURE 2. Schematic, resistance and tolerance - Continued.

| | | | |
|--|------------------|--------------------------------|-------------------------|
| DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO | SIZE A | CODE IDENT NO. 14933 | DWG NO. 87071 |
| | | REV E | PAGE 9 |

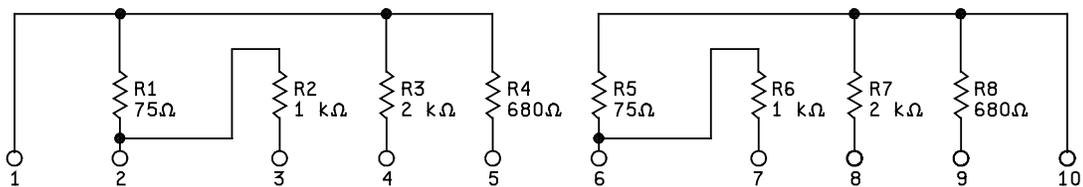
SCHMATIC - 17



NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. k Ω = kilohms.

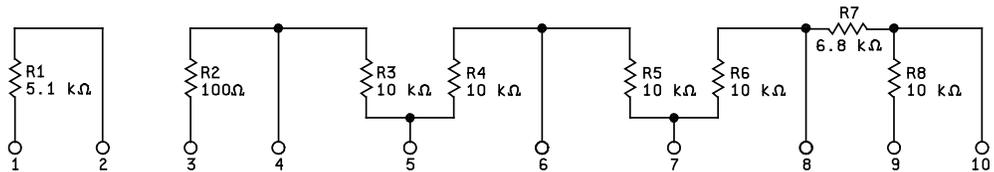
SCHMATIC - 18



NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. Ω = ohms, k Ω = kilohms.

SCHMATIC - 19



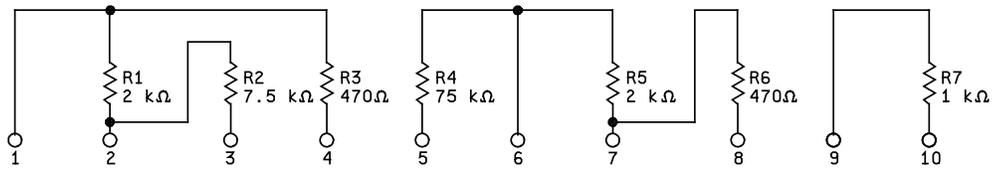
NOTES:

1. Resistance tolerance shall be ± 2 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. Power rating shall be 25 mW at $+120^{\circ}$ C.
4. Ω = ohms, k Ω = kilohms.

FIGURE 2. Schematic, resistance and tolerance - Continued.

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|--|--------------------------|--|---------------------------------|
| <p>DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO</p> | <p>SIZE A</p> | <p>CODE IDENT NO. 14933</p> | <p>DWG NO. 87071</p> |
| | | <p>REV E</p> | <p>PAGE 10</p> |

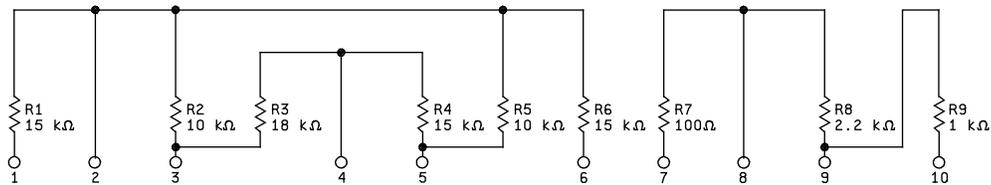
SCHEMATIC - 20



NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. R3, and R6 power rating shall be 60 mW at $+120^{\circ}$ C. R1, R2, R4, R5, and R7 power ratings shall be 25 mW at $+120^{\circ}$ C.
4. Ω = ohms, k Ω = kilohms.

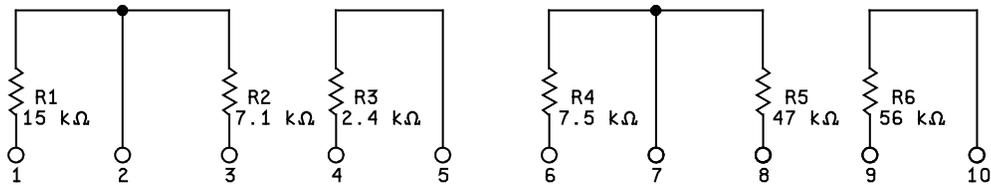
SCHEMATIC - 21



NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. R1 and R6 power rating shall be 60 mW at $+120^{\circ}$ C. R2, R3, R4, R5, R7, R8, and R9 power ratings shall be 25 mW at $+120^{\circ}$ C.
4. Ω = ohms, k Ω = kilohms.

SCHEMATIC - 22



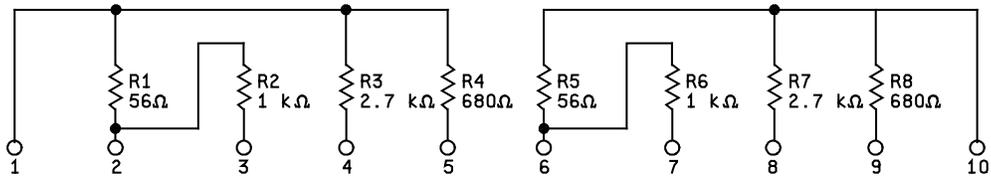
NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. Power rating shall be 25 mW at $+120^{\circ}$ C.
4. Ω = ohms, k Ω = kilohms.

FIGURE 2. Schematic, resistance and tolerance - Continued.

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|--|--------------------------|--|---------------------------------|
| <p>DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO</p> | <p>SIZE A</p> | <p>CODE IDENT NO. 14933</p> | <p>DWG NO. 87071</p> |
| | | <p>REV E</p> | <p>PAGE 11</p> |

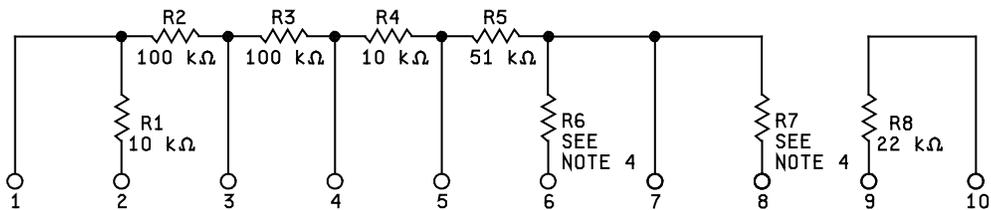
SCHEMATIC - 23



NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. Ω = ohms, k Ω = kilohms.

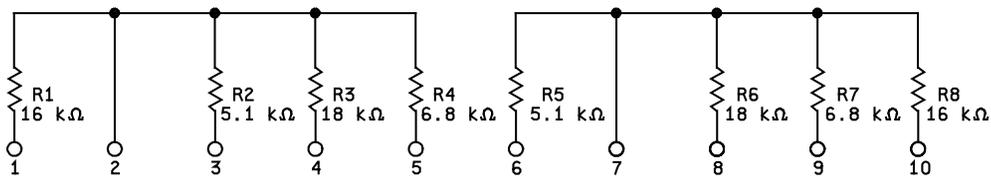
SCHEMATIC - 24



NOTES:

1. Resistance tolerance shall be ± 2 percent.
2. Resistor temperature coefficient tracking for R2, R3, R4, and R5 shall be ± 100 ppm/ $^{\circ}$ C maximum.
3. k Ω = kilohms, M Ω = megohms.
4. Resistor values of R6 and R7 shall not exceed 2 ohms when measured over the operating temperature range.

SCHEMATIC - 25



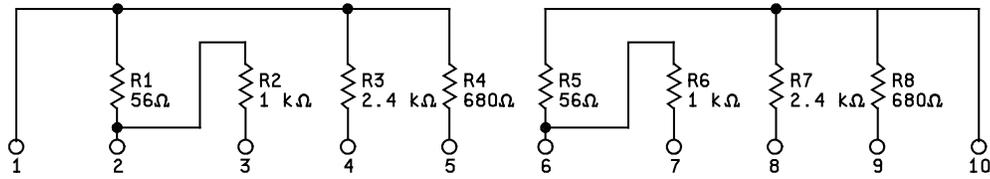
NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. Power rating shall be 25 mW at $+120^{\circ}$ C.
4. Ω = ohms, k Ω = kilohms.

FIGURE 2. Schematic, resistance and tolerance - Continued.

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|--|--------------------------|--|---------------------------------|
| <p>DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO</p> | <p>SIZE A</p> | <p>CODE IDENT NO. 14933</p> | <p>DWG NO. 87071</p> |
| | | <p>REV E</p> | <p>PAGE 12</p> |

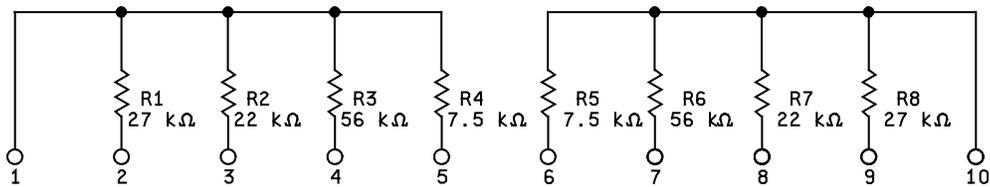
SCHEMATIC - 26



NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. Ω = ohms, k Ω = kilohms.

SCHEMATIC - 27



NOTES:

1. Resistance tolerance shall be ± 3 percent.
2. Resistor temperature coefficient shall be ± 200 ppm/ $^{\circ}$ C maximum.
3. k Ω = kilohms.

FIGURE 2. Schematic, resistance and tolerance - Continued.

3.7 Manufacturer eligibility. To be eligible for listing as an approved source of supply, a manufacturer shall be listed on the MIL-PRF-83401 Qualified Products List for at least one part, or perform the group A and group B inspections specified herein on a sample of parts agreed upon by the manufacturer and DLA Land and Maritime - VAT.

3.7.1 Certificate of compliance. A certificate of compliance shall be required from manufacturers requesting to be an approved source of supply.

3.8 Pure tin. The use of pure tin, as an underplate or final finish, is prohibited both internally and externally. Tin content of resistor components and solder shall not exceed 97 percent, by mass. Tin shall be alloyed with a minimum of 3 percent lead, by mass (see 6.3).

3.9 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.10 Workmanship. Resistors shall be uniform in quality and free from defects that will affect life, serviceability, or appearance.

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|--|-------------------------|---------------------------------------|--------------------------------|
| DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO | SIZE A | CODE IDENT NO. 14933 | DWG NO. 87071 |
| | | REV E | PAGE 13 |

4. VERIFICATION

4.1 Qualification inspection. Qualification inspection is not applicable to this document.

4.2 Conformance inspections.

4.2.1 Inspection of product for delivery. Inspection of product for delivery shall consist of group A and group B inspections of [MIL-PRF-83401](#).

4.2.2 Certification. The acquiring activity, at its discretion, may accept a certificate of compliance with group B requirements in lieu of performing group B tests (see 6.2d).

4.3 Inspection of packaging. Inspection of packaging shall be in accordance with [MIL-PRF-83401](#).

4.4 Visual and mechanical examination. Resistors shall be examined to verify that the materials, design, construction, physical dimensions, marking, and workmanship are in accordance with the applicable requirements of [MIL-PRF-83401](#).

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Resistor networks are used in surface mounting applications where space is a major concern.

6.2 Ordering data. The contract or purchase order should specify the following:

- a. Complete PIN (see [1.2](#)).
- b. Requirements for delivery: One copy of the conformance inspection data or certification of compliance that parts have passed conformance inspection with each shipment of parts by the manufacturer.
- c. Requirements for packaging and packing. (i.e. ESD sensitive packaging).
- d. Whether the manufacturer performs the group B tests or provides certification of compliance with group B requirements.

6.3 Electrostatic charge. Under several combinations of conditions, these resistors can be electrically damaged, by electrostatic charges, and drift from specified value. Users should consider this phenomena when ordering or shipping resistors. Direct shipment to the Government is controlled by [MIL-DTL-39032](#) which specifies a preventive packaging procedure.

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| <p>DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO</p> | <p>SIZE A</p> | <p>CODE IDENT NO. 14933</p> | <p>DWG NO. 87071</p> |
| | | <p>REV E</p> | <p>PAGE 14</p> |

6.4 Tin whisker growth. The use of alloys with tin content greater than 97 percent, by mass, may exhibit tin whisker growth problems after manufacture. Tin whiskers may occur anytime from a day to years after manufacture and can develop under typical operating conditions, on products that use such materials. Conformal coatings applied over top of a whisker-prone surface will not prevent the formation of tin whiskers. Alloys of 3 percent lead, by mass, have shown to inhibit the growth of tin whiskers. For additional information on this matter, refer to [ASTM-B545](#) (Standard Specification for Electrodeposited Coatings of Tin).

6.5 User of record. Coordination of this document for future revisions is coordinated only with the approved source of supply and the users of record of this document. Requests to be added as a recorded user of this drawing may be achieved online at resistor@dla.mil or in writing to: DLA Land and Maritime-VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-8754 or DSN 850-8754.

6.6 Approved source of supply. Approved source of supply is listed herein. Additional sources will be added as they become available. Assistance in the use of this drawing may be obtained online at resistor@dla.mil or contact DLA Land and Maritime-VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-8754 or DSN 850-8754.

| DLA Land and Maritime drawing PIN | Vendors similar designation or type number ^{1/} | Vendor CAGE | Vendor's name and address |
|---|--|-------------|--|
| 87071-** All schematics | 10SM-****-FX | 91637 | Vishay Techno P.O. Box 609, 1122 23rd St., Columbus, NE 68602-0609 http://www.vishay.com/ |
| 87071-** Schematics: 06, 07, 08, 09, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, and 27 | MSP10 or CSC10 | | Vishay Dale P.O. Box 609, 1122 23rd St., Columbus, NE 68602-0609 http://www.vishay.com/ |

^{1/} Parts must be purchased to the DLA Land and Maritime PIN to assure that all performance requirements and test are met.

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| DEFENSE ELECTRONIC SUPPLY CENTER DAYTON, OHIO | SIZE A | CODE IDENT NO. 14933 | DWG NO. 87071 |
| | | REV E | PAGE 15 |