

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

Prepared in accordance with ASME Y14.100

Selected item drawing

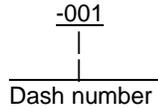
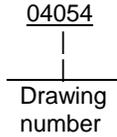
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PMIC N/A	PREPARED BY James Crum	DESIGN ACTIVITY DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OH 43218-3990
Original date of drawing  12 April 2005	CHECKED BY James Crum	TITLE RELAYS, ELECTROMAGNETIC, 25 AMPERES, 3 PDT, CONTINUOUS DUTY, HERMETICALLY SEALED, PERMANENT MAGNET DRIVE, AC COIL
	APPROVED BY Kendall A. Cottongim	
	SIZE A	CODE IDENT. NO. 037Z3
		DWG NO.  04054
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1. SCOPE

1.1 Scope. This drawing describes the requirements for a hermetically sealed electromechanical relay supplied to the requirements of this drawing.

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



2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 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-83536 - Relays, Electromagnetic, Established Reliability, 25 Amperes and Below, General Specification For.
- MIL-PRF-83536/32 - Relays, Electromagnetic, Established Reliability, 3PDT, 25 Amperes (Resistive), Permanent Magnetic Drive, Hermetically Sealed, All Welded, DC Coil.
- MIL-PRF-83536/33 - Relays, Electromagnetic, Established Reliability, 3PDT, 25 Amperes (Resistive), Permanent Magnetic Drive, Hermetically Sealed, All Welded, Transient Suppressed DC Coil.

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or <http://www.dodssp.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Non-Government publications. The following documents 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.

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

- SAE-AMS2422 - Plating, Gold, Electronic and Electrical Applications.
- SAE-AMS-QQ-N-290 - Nickel Plating (Electrodeposited).
- SAE-AMS3332 - Silicone Rubber Extreme Low-Temperature Resistant, 15-30

(Application for copies should be made online at <http://www.sae.org> or by mail to the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, Pennsylvania, 15906-0001.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. 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-83536 and as specified herein.

3.2 Interface and physical dimensions. The interface and physical dimensions shall be as specified in MIL-PRF-83536 and herein (see figure 1).

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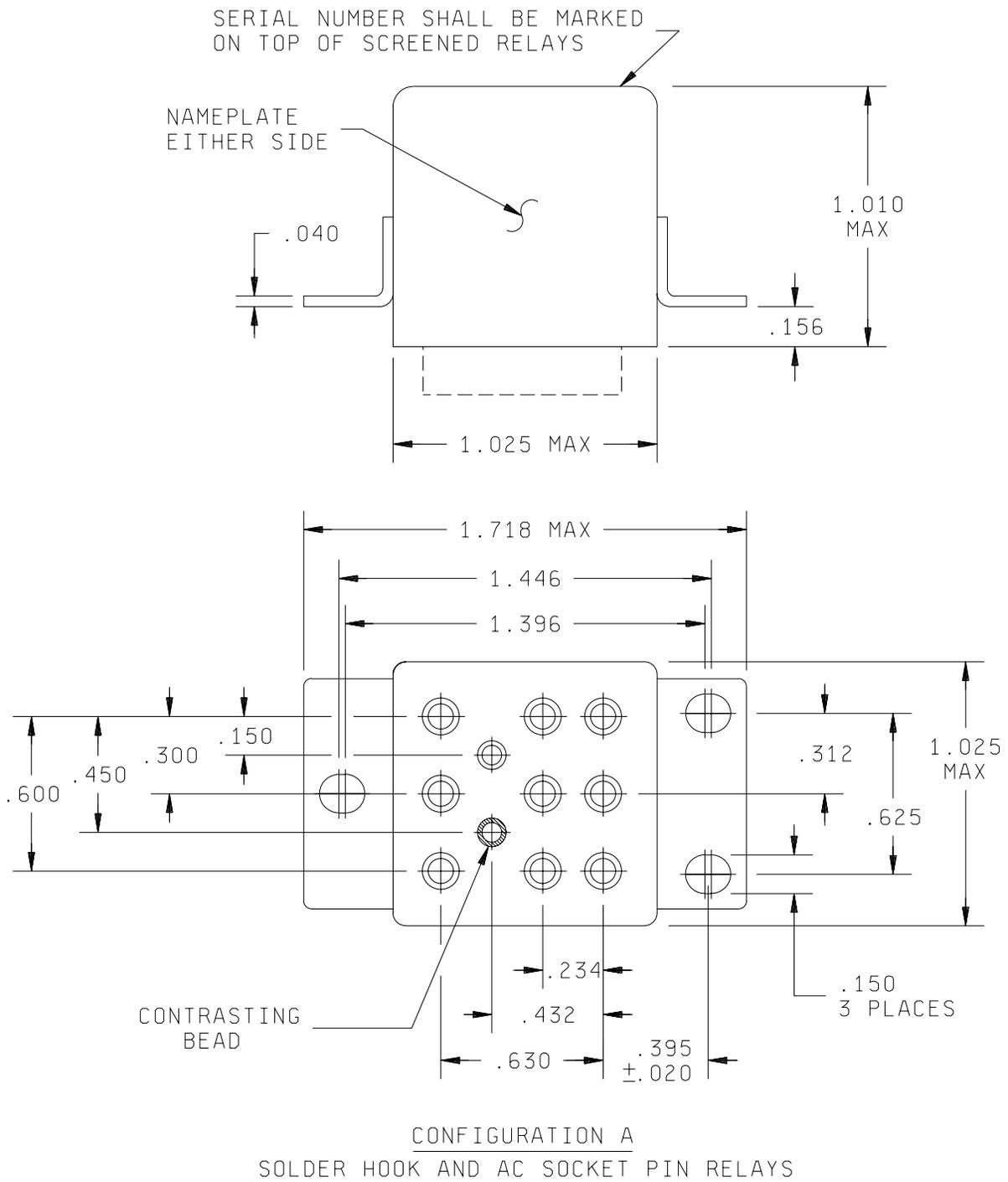
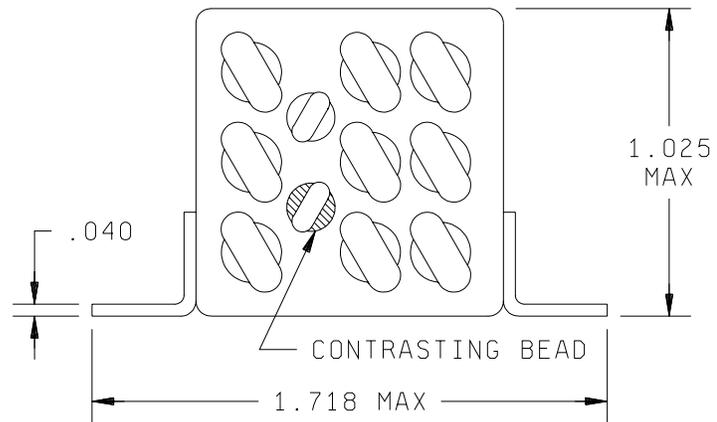
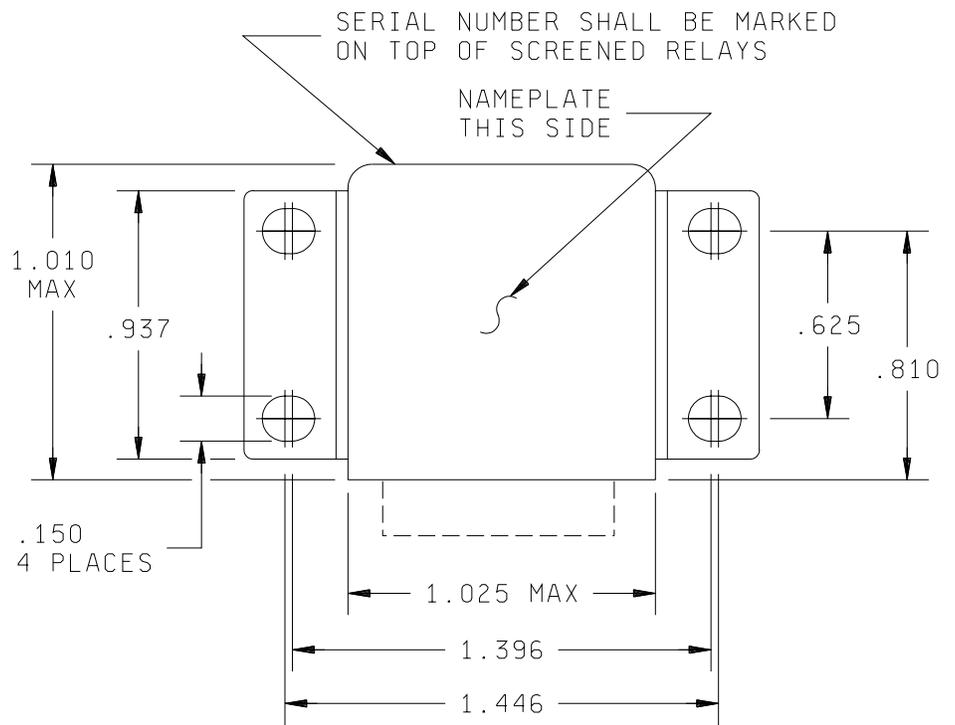


FIGURE 1. Configurations and dimensions.

<b>DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO</b>	<b>SIZE A</b>	<b>CODE IDENT NO. 037Z3</b>	<b>DWG NO. 04054</b>
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Inches	mm
.020	0.51
.040	1.02
.150	3.81
.156	3.96
.234	5.94
.300	7.62
.312	7.96
.395	10.03
.432	10.97
.625	15.88
.630	16.00
.810	20.57
.937	23.80
1.010	25.65
1.025	26.04
1.396	35.46
1.446	36.73
1.718	43.64



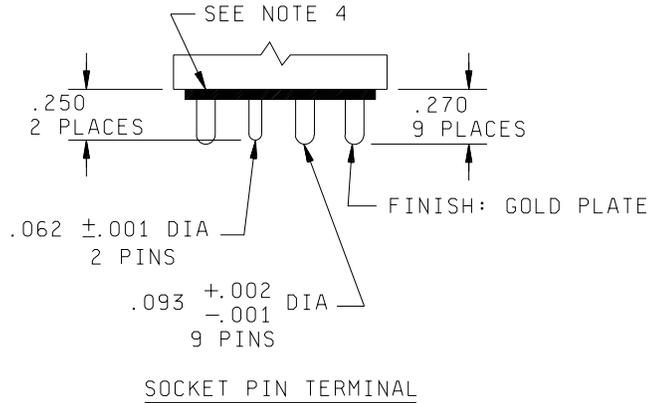
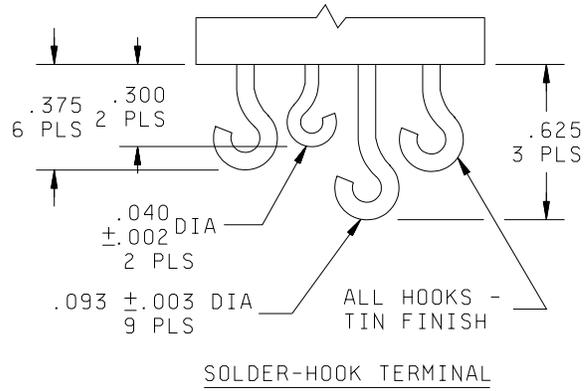
CONFIGURATION C  
SOLDER HOOK RELAYS

NOTES:

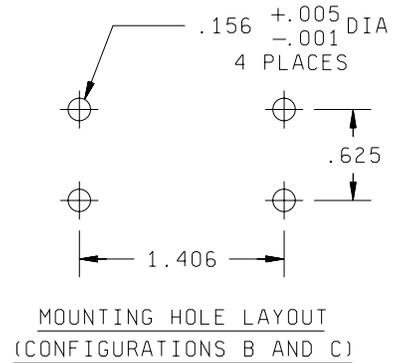
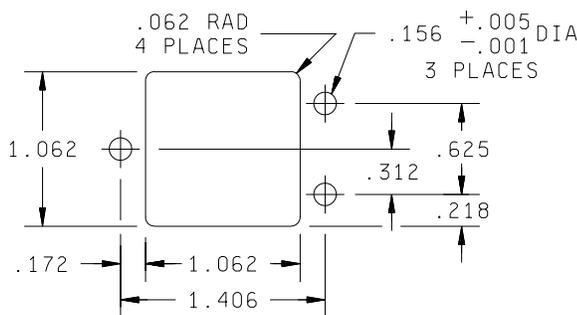
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is  $\pm 0.10$  (0.25 mm).
4. There shall be affixed to the relay a legible circuit diagram that identifies each terminal location specified.
5. For design feature purposes, this specification takes precedence over acquisition documents referenced herein.
6. Shape of flanges is optional within the envelope dimensions shown.

FIGURE 1. Configurations and dimensions - Continued.

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Inches	mm
.001	0.03
.002	0.05
.003	0.08
.005	0.13
.040	1.02
.050	1.27
.062	1.57
.093	2.36
.156	3.96
.172	4.37
.218	5.54
.250	6.35
.270	6.86
.300	7.62
.312	7.92
.375	15.24
.625	15.88
1.062	26.98
1.406	35.71

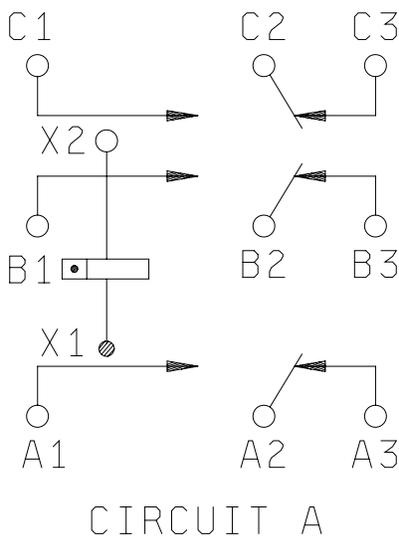


NOTES:

1. Dimensions are inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is  $\pm 0.010$  (0.25 mm).
4. Silicone rubber gasket, SAE-AMS3332, shore hardness 15-35, thickness  $.050 \pm .005$ .

FIGURE 2. Terminal types and mounting hole layouts.

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NOTE: Permanent magnet drive consists of a permanent magnet with its flux path switched and combined with the electromagnetic flux.

FIGURE 3. Circuit diagram.

TABLE I. Dash number and general characteristics.

PIN 04054-	Coil frequency (Hz)	Terminal type 1/	Mounting config- uration	Mating socket
001	400	Solder hook	A	N/A
002	400	Solder hook	C	N/A
003	400	Socket pin	B	MIL-DTL-12883/48
004	50/400	Solder hook	A	N/A
005	50/400	Solder hook	C	N/A
006	50/400	Socket pin	B	MIL-DTL-12883/48

1/ All socket pins shall be gold plated in accordance with SAE-AMS2422, type II, class 1, with a nickel underplating in accordance with SAE-AMS-QQ-N-290 and 50 to 150 microinches thick.

3.2.1 Design documentation. The design documentation shall be in accordance with MIL-PRF-83536 unless otherwise specified in the contract or purchase order, and shall be retained by the manufacturer and available for review by the acquiring activity or contractor upon request.

3.3 Electrical characteristics. Relays shall meet all electrical characteristics as specified in MIL-PRF-83536 and herein.

3.3.1 Coil data and operational data. See table II.

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TABLE II. Operating characteristics.

PIN 04054-	Coil data									Time - (milliseconds maximum) <u>5/</u>				Break bounce NO only <u>5/</u>			
	Coil	Rated		Max		Max pickup voltage			Hold voltage <u>2/</u>	Drop- out voltage <u>2/</u>	Operate <u>3/</u>	Re- lease <u>4/</u>	Contact bounce				
		Volts <u>1/</u>	Freq. (Hz)	Volts	A	Norm al test <u>2/</u>	High temp test	Cont curre nt test					Main		Aux		
													NO		NC	NO	NC
001, 002, 003	X1,X2	115	400	122	0.04	90	95.4	103.5	30	5.0	20	50	1	1			0.1
004, 005, 006	X1,X2	115	50/ 400	122	0.03	95	100	105	40	5	20	50	1	1			0.1

1/ CAUTION: Use of any coil voltage less than the rated coil voltage will compromise the operation of the relay.

2/ Over the temperature range.

3/ With rated coil voltage.

4/ From rated coil voltage.

5/ At 25 °C.

3.3.2 Contact data and load rating. See table III.

TABLE III. Rated contact load (amperes per pole) case grounded.

Type of load	Life operating cycles x 10 <sup>3</sup>	28 V dc				115 V ac, 1 phase				115/200 V ac, 3 phase <u>1/</u>			
		Main		Aux		Main		Aux		Main		Aux	
		NO	NC	NO	NC	400 Hz	60 Hz	400 Hz	60 Hz	400 Hz	60 Hz	400 Hz	60 Hz
Resistive	50	25	25			25				25			
Inductive	10	12	12										
Inductive	20					15				15			
Motor	50	10	10			10				10			
Lamp	50	5	5			5				5			
Mechanical life (reduced current)	200	6	6			6				6			

1/ Absence of value indicates that the relay is not rated for 3 phase applications.

2/ For full rated load, maximum temperature, and altitude use number 12 wire or larger. Relays shall be mounted so as to limit mounting bracket temperature to +160°C maximum.

3.3.3 Maximum contact drop:

3.3.3.1 Initial: 0.150 V.

3.3.3.2 After life test: 0.175 V.

3.3.3 Overload current. 80 A ac., 50 A dc.

3.3.4 Rupture current. 100 A ac., 60 A dc.

3.3.5 Insulation resistance:

3.3.5.1 Initial: 100 megohms minimum.

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3.3.5.2 After life or environmental test: 50 megohms.

3.3.6 Dielectric withstanding voltage:

3.3.6.1 Sea level, 2-5 seconds:

(Dielectric may be improved by suitable insulation of terminals and wiring after installation.)

	Initial	After life tests
Coil to case	1,000 V rms	1,000 V rms
Aux. contacts	N/A	N/A
All other points	1,250 V rms	1,000 V rms

3.3.6.2 Altitude, 1 minute:

	80,000 ft.	300,000 ft.
Coil to case	350 Vrms	500 V rms
Aux. contacts	N/A	N/A
All other points	350 V rms	500 V rms

3.3.7 Time current characteristics: See table IV.

TABLE IV. Time-current relay characteristics at +25°C. 1/ 2/

1	30 A - 1 hour
2	50 A - 5.0 seconds
3	100 A - 1.2 seconds
4	250 A - 0.2 seconds
5	350 A - 0.1 second

1/ Caution: Compare with time-current characteristics of the associated circuit protective device.

2/ Time-current relay characteristics at 25°C:  
Relays must be able to sustain five applications (make and carry only) of power concurrently on adjacent poles at each of five different current levels and 115/200 V ac, 400 Hz 3-phase. Cooling time between successive applications shall be 30 minutes. Tests shall be performed on both normally open and normally closed contacts of each relay. There shall be no failures or evidence of welding or sticking, and relays shall pass the contact voltage drop test at the conclusion.

3.4 Physical. Physical requirements of the relay shall be as specified herein.

3.4.1 Dimension and configuration. See figures 1, 2, and 3.

3.4.2 Weight: 0.188 pound (85.3 grams) max.

3.5 Environmental characteristics. Relays shall meet all environmental requirements as specified herein.

3.5.1 Vibration.

3.5.1.1 Sinusoidal.

3.5.1.1.1 Configurations A and B: 30 g's, frequency range curve: 33 Hz to 3,000 Hz.

3.5.1.1.2 Configuration C: 20 g's, frequency range curve: 33 Hz to 3,000 Hz.

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3.5.1.2 Random. Random vibration, method 214 of MIL-STD-202,

3.5.1.2.1 Configurations A and B: Test condition IG (0.4 G<sup>2</sup>/Hz, 50 to 2000 Hz), duration: 15 minutes in each plane.

3.5.1.2.2 Configuration C: Test condition IE (0.2 G<sup>2</sup>/Hz, 50 to 2000 Hz), duration: 15 minutes in each plane.

3.5.1.3 Shock, g-level: Configurations A and B: 200 g's for 6 ms;  
Configuration C: 100 g's for 6 ms.

3.5.2 Acceleration: 15 g's.

3.5.3 Temperature Range: - 70 °C to +125 °C.

3.5.4 Maximum altitude rating: 300,000 feet.

3.6 Marking. Marking shall be in accordance with 1.2 herein. The "04054-XX" part number shall be used.

3.7 Conformance requirements. Relays furnished under this drawing shall have been subjected to, and passed all the requirements, tests, and inspections detailed herein.

3.7.1 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-83536 and 4.2 herein.

3.8 Certification as an approved source of supply. In order to be listed as an approved source of supply for relays manufactured to this drawing, a manufacturer shall:

- a. Agree to make available to DSCC, upon request, all pertinent test data on its production of the subject part, including, but not limited to, test data in accordance with the qualification inspection table of MIL-PRF-83536.
- b. Provide to DSCC or its designated agent, upon request, free of charge and without obligation, a current production sample from its production of the subject part.
- c. Meet one of the following criteria:
  - (1) Currently possess listing on qualified products list QPL-83536 for at least one part.
  - (2) Be in current production of the subject part.

3.9 Certificate of compliance. A certificate of compliance shall be required from manufacturers requesting to be a suggested source of supply.

3.10 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable 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.

3.11 Workmanship. The relay shall be uniform in quality and free from any defects that will affect life, serviceability, or appearance.

#### 4. VERIFICATION

4.1 Sampling and inspection. Sampling and inspection shall be in accordance with MIL-PRF-83536 except as modified herein.

4.2 Conformance inspection. Conformance inspection shall be in accordance with group A testing of MIL-PRF-83536. Group A testing shall be performed on each inspection lot and manufacturers shall keep lot records for 3 years (minimum), monitor for compliance to the prescribed procedures, and observe that satisfactory manufacturing conditions and records on lots are maintained for these relays.

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5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Departments 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 which may be helpful, but is not mandatory.)

6.1 Notes. Only definitions of the notes specified in MIL-PRF-83536 will apply to this drawing.

6.2 Intended use. Relays conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. This drawing is intended exclusively to prevent the proliferation of unnecessary duplicate specifications, drawings, and stock catalog listings.

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

- a. Complete PIN (see 1.2).
- b. Requirements for delivery of one copy of the conformance inspection data or certificate of compliance that parts have passed conformance inspection with each shipment of parts by the manufacturer.
- c. Requirements for packaging and packing.

6.4 Replaceability. Relays covered by this drawing will replace the same generic device covered by a contractor prepared specification or drawing.

6.5 Supersession data. MS27743 was cancelled 31 July 1999 and superseded by MIL-PRF-83536/32 and MIL-PRF-83536/33 with dc coils and this drawing for ac coils. See MIL-PRF-83536/32 and MIL-PRF-83536/33 for dc coil supersession data. See table V below for ac coil supersession data.

TABLE V. Supersession data.

Superseded PIN MS27743-	Replacement PIN 04054-
7	001
8	002
9	003
13	001
14	002
15	003
19	004
20	005
21	006
25	004
26	005
27	006

6.6 Users of record. Coordination of this document for future revisions is coordinated only with the suggested source(s) 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 <mailto:Relay@dsc.c.dla.mil> or if in writing to: Defense Supply Center, Columbus, ATTN: DSCC/VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-0542 or DSN 850-0542.

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6.7 Approved or Suggested sources of supply. Suggested sources of supply are listed herein. Additional sources will be added as they become available. Assistance in the use of this drawing may be obtained online at <mailto:Relay@dsc.dla.mil>, or by contacting Defense Supply Center, Columbus, ATTN: DSCC-VAT, Post Office Box 3990, Columbus, OH 43218-3990 or by telephone (614) 692-0542 or DSN 850-0542.

DSCC drawing PIN 04054-	Vendor similar designation or type number <u>1/</u>	Vendor CAGE	Vendor name and address
001	EA325LHH1255	99699	Deutsch Relays, Incorporated 55 Engineers Road Hauppauge, NY 11788 Phone: (631) 342-1700
002	EA325L3H1256		
003	EA325L2C1257		
004	EA325NHH1258		
005	EA325N3H0037		
006	EA325N2C1259		

1/ Parts must be purchased to the DSCC PIN to assure that all performance requirements and tests are met.

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