Bendix
Aerospace Systems Division

ALSEP
ACCEPTABLE PARTS LIST
FOR
ARRAY - E
AMENDMENT-1

ATM 241 | E(I)
Instructions
PAGE 1 OF 2
DATE 7/16/71

THIS ATM 241 REVISION "E" IS APPLICABLE TO ARRAY "E"

The E Revision of ATM-241 adds requirements for selection, specification and screening to be consistent with the new NASA two (2) year life requirements. In particular, enhanced screening techniques are prescribed to include precap inspection for semiconductor and other devices, and also, extended burn-in periods with read, record, and serialize requirements (see Table II page 6) for better control of drift parameters.

AMENDMENT 1 to Revision E dated July 16, 1971 is provided to amend and update the parts and requirements contained in the original issue. Portions which are amended are:

(1) The basic section was rewritten to: (a) Add general requirements for acceptable parts; (b) Clarify the screening tests for all types of parts, (c) Detail the requirements for parts specifications, and (d) Delete the reference to Limited Usage Parts.

(2) Attachment I is amended to incorporate current specification and qualification status of capacitors (mica, ceramic, and non-solid tantalum types) and more recent additions of diodes and transistors (MIL/TX).

(3) Attachment II is amended to incorporate new data summarized in attachment I.

(4) Attachment III which was prepared as a guideline for Array E initial design is deleted.

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To incorporate Amendment 1:

(1) Replace the basic section pages 1 through 11 entirely

(2) In Attachment I:
- (a) Replace sheet I-2
- (b) Replace sheet I-4
- (c) Add sheet I-8A after I-8
- (d) Replace sheet I-9
- (e) Add sheet I-15A after I-15

(3) In Attachment II
- (a) Replace index sheet II-1
- (b) Remove sheet 1.2.0 and insert sheets 1.2.0 thru 1.2.9
- (c) Remove sheet 1.5.0 and insert sheets 1.5.0 thru 1.5.3
- (d) Remove sheet 1.5.9 and insert sheets 1.5.9 thru 1.5.15
- (e) Add sheet 3.0.12A after 3.0.12
- (f) Replace sheet 3.0.14
- (g) Add sheets 3.0.21 and 3.0.22
- (h) Replace sheets 4.0.3 thru 4.0.6
- (i) Add sheets 4.0.12A and 4.0.12B after 4.0.12
- (j) Replace sheets 4.0.15 and 4.0.16

(4) Attachment III - delete entirely

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ALSEP
Acceptable Parts List
For
Array - E

ATM-241 | E(1)

DATE 7/16/71

This report contains a list of electronic common parts which are recommended for application in ALSEP equipment. The principle factors in listing these parts is the reliability and availability status. Recommended stress levels are indicated.

CONTENTS

ATTACHMENTS: (I) Acceptable Parts Lists

1. Capacitors
2. Resistors
3. Diodes
4. Transistors
5. Connectors
6. Relays
7. Transformers
8. Integrated Circuit

(II) Parts Data Sheets

(III) Summary of Electronics part type used in ALSEP.

(IV) Summary of Electronics Part Type Used In ALSEP Array E (Bendix Design).

A. Introduction:

In selecting parts for ALSEP Array E equipment, primary emphasis is to be given to those types of parts which have a documented reliability history. The majority of types of parts listed in this APL have been used in previous ALSEP equipments and have demonstrated reliable performance in equipment placed on the lunar surface on Apollo flights 11 and 12. Requirements for Array E equipment are even more stringent because the design life is for 2-year operation rather than 1-year.

It is obvious that demonstrating this kind of reliability in unit-hours of life-testing even with a large number of samples is prohibitive. Therefore it is necessary to select parts with a proven history and provide adequate process controls and screening techniques to minimize the chance of any failure mode or mechanism.

B. Types of High-Reliability Parts

Parts with substantial reliability histories are those described by NASA/MSFC/JPL Specifications and Apollo contractors who have furnished electronic subsystems for the CM and LM. Additionally parts may be available procured to Minuteman specifications which are well documented and well-controlled.

Also the "Established Reliability" parts described in current MIL specifications (see Table I) and the TX semiconductor devices are examples of parts which have demonstrated substantially reliable performance and by further selection and sources for such parts which have had a long history of production of this type of product, the quality level is enhanced further. The vendors cited in this APL are ones whose products have been used in earlier ALSEP equipments.

Many of the vendors furnishing parts to various DOD and NASA programs have developed their own in-house methods of producing and characterizing hi-rel products, which may then be furnished to several customers, with the economics of combined documentation testing and negotiation. Examples of such vendor hi-rel programs are: Texas Instrument "MACH IV", Motorola "Checkmate", Fairchild "UNIQUE", Signetics "SURE", National "883".

TABLE I

SUMMARY OF SELECTED FEATURES OF "ER" SPECIFICATIONS

Ref. Desig	Part Type	"ER" Spec No MIL-( )	Failure Rate %/KHR Note 1	Conf Level	Note 2	Note 3	Lot Size Max	GP A Rej Limit	Conditioning Tests Time	% Stress Note 5	Temp	Periodic Tests Note 6	GP B Life Tests Note 7	Periodic GP B/C/D Life Tests Sample Note 8	Time Hrs	GP B/C/D Total Sample Note 9	Extended Life Tests Time	% Drift
	Capacitors:			%			4	%										
CYR	Glass	23269C	2.0-.001	90	A	B	Mo	5	50 Hr	500%(A)	R.T.	C (A)	A	10	6K	51/Mo	30K	±2%
CMR	Mica	39001A	2.0-.0001	90	B	A	Mo	8	48 Hr	200%	Max.R.	C (A)	A	3	2K (A)	72/Mo	50K	±1%
CSR	Tantalum Solid	39003A(4)	2.0-.001	60	--	A	Wk	5	40 Hr (B)	100%	85°C	D (B)	B	100	250	110/Wk(A)	10K	±10%
CLR	Tantalum Non-Solid	39006A(2)	2.0-.001	60	--	A	Wk	5	24-100 Hr	Surge V	85°C	C	C	40	2K	(B)	10K	±25%
CPV	Paper(-Plstc)Metal	14157E(1)	1.0-.001	90	C	A	*	5	15/5 sec	200/250%	15-35°C	C	D	N.A.		24/Mo	6K	±5%, (Char. "K")
CZR	Feedthrough	39011 (1)	Not Updated (3Feb 65)															
CKR	Ceramic, Gen Purp	39014A	1.0-.001	90	D	A	Wk	2	100 Hr	200%	Max R.	C	D	24	1K	42/08 Mo	32K	±20%
CHR	M-Paper(-Plstc)metal	39022B	5.0-.001	90	C	A	Mo	8	15/5 Sec	200/250%	15-35°C	C(A)	A	10	2K	48/Mo	10K	±10%
CFR	M-Paper(-Plstc)N.M.	55514A	1.0-.001	90	E	A	Wk	5	10-60 Sec	200%	15-35°C	B	E	10+(Mo	2K	(C)	10K	±5%
LTR	Coil, RF	39010A	1.0-.001	60	--	A	*	5	Temp cyc	Meth 102	-65/max R	C(C)	--	10+	10K	(D)	10K	±3% (Phenolic)
RS	Connector, PWB	23353A	Not Updated (28 Aug 64)														100K Opn	Rc< 2X
FRR	Filters	39025	Not Updated (24 Feb 65)															
MS-	Relay	39016	1.0-.01*	90	--	*	*	10	2x2500(C)	Rated I_C	(C)	C		5(B)	1K	17/3Mo		
	Resistors:																10K	±0.2%, ±1%
RBR	W.W. Accurate	39005B(1)	1.0-.001	60	--	A	Mo	5	100 Hr	100%(E)	+125°C	C (C)	--	5+/Mo	10K	(E)	10K	±1%
RWR	W.W. Power	39007B(1)	1.0-.001	60	--	A	Mo	5	100 Hr	100% (E)	+25°C	C (C)	--	5+/Mo	10K	(F)	10K	±15%
RCR	Composition	39008A(5)	1.0-.001	60	--	A	Mo	--	(.25 % Aql - Meas. Res)			B	F	5+/Mo	10K	(G)	10K	±2%
RER	W.W. Pwr Housed	39009A(2)	1.0-.001	60	--	B	Mo	5	96 Hr	100% (E)	+25°C	C (C)	--	5+/Mo	10K	(H)	10K	±4%
RLR	Film, Insulated	39017A(5)	1.0-.001	60	--	A	Mo	--	24 Hr	150%	20-45°C	C (C)	--	5+/Mo	10K	(K)	10K	±2%
RNR	Film, Hi-Stability	55182D	1.0-.001	60	--	A	Mo	3	1 Hr	500% (F)	20-45°C	C (C)	--	5+/Mo	10K	(L)	10K	±3%
RTR	Var, W. W.	39015A(3)	1.0-.001	60	--	B	Mo	5	50 Hr	133% (E)	25°C	B	F	5+/Mo	10K	(M)		±5%, ±1%
RVR	Var, Non-W.W.	39035	1.0-.001	60	--	B	Mo	5	50 Hr	150% (E)	15-35°C	B	F	5+/Mo	10K	(N)	10K	Init. Tol.
TFR	Transformer & Inductor	39013A	5.0-.01	60	--	A	*	5	Therm Shk	Meth 107	Par 4.8.17	C (C)	--	5+/Mo	10K	(P)		
TPR	Transformer, Pulse	39026	Not Updated (21 Jan 65)															

Note 1 * Per 10,000 Operations

Note 2 Acceleration Factor for Units Tested at Max rated temperature

Code:	A	B	C	D	E
Ratio:	5.1	25:1	5:1	8:1	5:1
% Stress:	150	150	140	200	125/140 (volts)

Note 3 Qualification maintenance period per MIL-STD-6908:
(* See MIL-R-39016)

Symbol	F.R. %KHR	Period: A	B	Unit Hrs x 10^{-6} for (c) failures allowed 1	2	3	4	5
L	>1.0	3Mo	6Mo	CM" Row Divided By "L")				
M	1.0	3Mo	6Mo	.0532	.110	.175	.243	.315
P	.1	6Mo	9Mo	.532	1.10	1.75	2.43	3.15
R	.01	9Mo	12Mo	5.32	11.0	17.5	24.3	31.5
S	.001	12Mo	15Mo	53.2	110	175	243	315
T	.0001	--	--	532	1100	1750	2430	3150

Note 4* Lot Size Determined by Material Lots

Note 5 A 400% for Units Rated at Less Than 300V
B Preceded by Temperature Cycling
C Cycles of Operation
D 2500 Cycles at Min Rated Temp & 2500 at Max
E 1 1/2 Hr "ON", 1/2 Hr "OFF"
F 400% for RNR 65, 225% for RNR to

Note 6 A Group B Tests Per Lot for Level "L" only
B Group B Tests not req'd for Level "L". Group C (Life at 85°C) requires 110 samples per lot 250 Hrs at 85°C and rated V.
C Group B inspection does not include life tests

Note 7

Code:	A	B	C	D	E	F
Sample Size:	21	12	110	110	10/Mo	See GP B/C/D
Time (Hrs)	240	1000cyc	250	250	2000	Life Tests
Deliverable:	N	N	Y	N	N	

Note 8 A Accelerated Conditions
B Coil Life

Note 9 Periodic Group B/C/D Sampling Rates (Units):

Symbol	Group	Mo	Qtr	6 Mo	12 Mo	Other
A	D	48/60	--	--	--	--
B	C	48	--	18	--	40/7 Mo
C	B	10 min	22	17	--	--
D	C	16	39	--	--	--
E	C	18	18	6	102	--
F	C	20	--	39	102	--
G	B	15	40/50	70	--	--
H	C	18+5+	28	--	102+	--
K	C	20+5+	30	102	--	--
L	C	92+5+	30	102	--	--
M	B	24+5+	33	--	--	--
N	B	--	30+5+	--	--	--
P	C	5+	6	2	--	--

C. Order of Preference:

Notwithstanding the subtle differences in reliability potential, the following order of preference has been established.

*1. MSFC parts, JPL parts, Minuteman parts

*2. ER series specs (and MIL-S-19500 TX series)

*3. Industry Hi-Rel

4. MIL-spec with added burn-in and screening

5. Non MIL-spec with MIL-STD lot acceptance testing and 100% burn-in.

The order above correlates inversely with the delivery cycle expected being longer with the first items in the list, and it is noted that it may be necessary to permit vendor to ship prior to completion of Lot Acceptance Tests (such as group "B" and "C" test of ER specs) in order to expedite delivery. None of the Group "A" (100%) tests) shall be reduced or waived.

D. Selection of Parts

It is important to distinguish between selection of parts and application of parts because the performance of a part is intimately related to the required function in its circuit. Thus while a part may be approved on the basis of its being properly specified and controlled, the assurance of adequacy in its function requires that it be properly applied.

The sections which follow include factors relating to the screening of parts, specification of parts and derating in circuit applications which must be considered on arriving at reliable circuit functions in the end-item.

Additionally the successful use of parts includes the processes and procedures which control the portion of its life-cycle from manufacture through handling, storage, and packaging in the subassemblies.

To sum up, reliable circuits are a function of:

1. selection of proven parts
2. adequate specification including
3. testing and screening
4. judicious application
5. control of handling and installation

The parts identified in Attachment I to this document are defined as acceptable parts and are predominantly in categories 1 & 2 of par C above. The basic requirements for selection of an acceptable part are:

(a) A part with a proven reliability history
(b) A part specified by a user's procurement specification (DOD or NASA) or a specification Control Drawing with equivalent requirements
(c) A part which is fully qualified to the specification and procured from (or traceable to) an approved vendor
(d) A part which is screened on a 100% lot sample basis
(e) A part from a lot which receives periodic lot conformance testing as Group B and C tests of the MIL Spec series.

E. Parts Screening

Screening is a series of tests which are:
(a) Nondestructive
(b) Applied to 100% of the production lot
(c) Apply stresses which will identify potential failures and eliminate manufacturing defects
(d) Include burn-in or run-in to obtain data on performance stability for up to 240 hours.

Screening tests applied to 100% of the procurement lot are a condition of acceptance for the lot but are classified separately because of the general practice of classifying acceptance tests as the immediate tests to establish conformance of the product to the product's basic parameter requirements such as electrical measurements and visual/mechanical insepction on an AQL (sample) basis.

Recommended screening tests are presented in Table II.

TABLE II

SCREENING TESTS

1. Capacitors
   a. CKR Style: per MIL-C-39014
   b. CSR Style: per MIL-C-39003
   c. CMR Style: per MIL-C-39001
   d. CLR Style: per MIL-C-39006 adding the requirement of MSC-SN-C-0046

2. Resistors
   a. RCR Style: per MIL-R-39008
   b. RER Style: per MIL-R-39009
   c. RNR Style: per MIL-R-55182
   d. RWR Style: per MIL-R-39007

3. Diodes
   a. MSFC types: per the appropriate MSFC Spec
   b. JAN/TX Types: per the appropriate MIL-S-19500/slash sheet with the addition of: (1) 100% internal inspection per MSFC Spec 85M02713 (2) individual serialization and (3) read and record parameters with delta limits prior to and following burn-in.

4. Transistors
   a. MSFC Types: per the appropriate MSFC Spec
   b. JAN/TX Types: per the appropriate MIL-S-19500/slash sheet with the addition of : (1) pre-cap inspection per MSFC Spec 85M03924 (2) individual serialization, and (3) read and record parameters with delta limits prior to and following burn-in.

5. Connectors
   a. Integral contact types: (1) Dielectric Strength, (2) Insulation resistance, (3) Mating and unmating force and (4) contact resistance (10% of contacts)
   b. Removable Contact types: (1) Dielectric Strength and Insulation Resistance using a fixture to simulate installed contacts, (2) Contact resistance and insertion/withdrawal force (5% sample contacts).

6. Relays
   a. Armature type - screen per MSFC-Spec-339 Table III or in accordance with an approved procurement document.

7. Transformers and Inductors
   a. All types: Temperature Shock per MIL-STD-202 Method 107 Condition B modified to use the high temperature equal to the maximum rated temperature. Units to be individually serialized and electrical parameters and test results recorded.

8. Integrated Circuits
   a. All types: per MIL-STD-883 Method T5004 Class A or in accordance with an approved procurement document.

9. Miscellaneous

9.1 Thermistors
   a. All types: Screen per GSFC-S-450-P4A

F. Parts Derating

The principle on which derating is based relates to the manner in which the rated values are established for various families of parts. The maximum rated value of voltage, current, power frequency or the like is ordinarily defined as the limiting value above which there may occur rapid deterioration or degradation. Thus when the rated value is used in a circuit application, the design margin (related to normal deterioration with life) is zero.

The values listed in this section are subject to the following conditions:

1. The derating states is the maximum percentage of the rated value which may be used, and does not preclude the use of lower values.

2. Derating is essential to meeting reliability requirements of manned spaceflight electrical-electronic equipment, even for those parts which have been thoroughly screened and burned-in.

3. Circuit designs must consider the effect of worst-case thermal-vacuum on the thermal dissipation of the devices.

4. For devices not included in these guidelines, the user is required to use stringent derating from rated maximum values consistent with similar devices specified herein.

5. The derating specified is applied after the manufacturers recommended thermal derating is applied.

6. Derating of current, voltage, and power is not independent; for example, in some applications the power derating limit may require further voltage derating or vice versa.

7. To establish the percentage derating, the applied voltage shall include the DC or steady-state value plus any superimposed AC or ripple voltage.

The stress levels tabulated indicate a maximum upper limit for the majority of applications based on 100% duty cycle. These are summarized below:

I Capacitors

Ceramic	50% Voltage
Mica	50% Voltage
Paper/Plastic	50% Voltage
Electrolytic, Wet	60% Voltage
Solid	60% Voltage*

*Requires series impedance of 3 ohms per volt.

II Resistors

Film	50% Power
Wirewound	50% Power
Composition	50% Power, also ΔR = 25% allowable

III Diodes, Silicon — 50% Voltage, 50% current
Max. T_J = 140°C

IV Integrated Circuits

(1) Power supply voltages are derated as follows:

Derated minimum voltage = $V_{nom} - 0.6 (V_{nom} - V_{min})$

Derated maximum voltage = $V_{nom} + 0.6 (V_{max} - V_{nom})$

(2) For logic circuits, the derated fan-in and fan-out loading shall be 75% or less of the manufacturer's rating.

(3) For linear circuits the derated current loading shall be 75% or less of the manufacturer's rating.

(4) Preferred junction temperature is 100°C for silicon I. C. 's. However if reliability analysis or system trade-offs can justify a higher temperature the absolute upper junction temperature limit shall conform to the table below.

Manufacturers Rated Maximum Temperature	ALSEP Derated Maximum Temperature
200°C	140°C
175°C	130°C
150°C	120°C

V Transistors, silicon — 50% Voltage, 50% current
Max. T_J = 140°C

VI Transformers and Coils — 15°C rise

The derating shall be computed after recommended operating temperature derating has been made.

G. Parts Specifications

All electronic and electromechanical parts are to be procured to procurement specifications, specification control drawings, or source control drawings, which are prepared in accordance with the six-section format of MIL-S-83490 or Defense Supply Manual M200 Sec V.

The specification shall contain all information necessary to describe the part mechanically and electrically, and shall provide for identification and marking. Environmental requirements sufficient to assure proper application shall be included. Section 4 shall contain as reference acceptance tests including 100% screening, qualification tests and periodic or lot-by-lot conformance tests, stating sample sizes to be used.

When the product specified is qualified and is subject to periodic lot conformance tests (as parts listed in a MIL Specification Qualified Products List) the requirements for such tests may be referenced and such tests need not be specified for current procurement.

H. Subcontractor's Non-standard Parts Approval Request (NSPAR)

BxA subcontractors shall select parts in the order of preference indicated in Section C, i.e., Categories 1 through 5. Categories 3, 4, and 5 are classified as non-standard parts and will require a non-standard part approval request to Bendix.

For each nonstandard part (NSPAR item) and for any item for which adequate specifications do not exist, the subcontractor shall prepare the specification/source control drawings for all such parts to be used. See Par. G.

Description & Specification	Slash No.	Style	Voltage	Temp. °C	Value Range Min	Value Range Max	Value Range Unit	Tol ±%	Body Size (NOM) L	Body Size (NOM) W	Body Size (NOM) T	Notes	Derate to % Rated	Preferred Vendor
Capacitors, Fixed														
Glass Dielectric	1A	ECY 10	500	+125°	0.5	150	PF	5	.344	.172	.078		50	Corning
		ECY 10	300	+125°	160	240	PF	5	.344	.172	.078		50	Corning
MSFC-SPEC-400A	2A	ECY 15	500	+125°	160	510	PF	5	.469	.266	.109		50	Corning
		ECY 15	300	+125°	560	1200	PF	5	.469	.266	.109		50	Corning
Ceramic Dielectric MIL-C-39014	1B	CKR 05	200	+125°	10	1000	PF	10, 20	.190	.190	.090		50	Aerovox
	1B	CKR 05	100	+125°	.0012	.01	UF	10, 20	.190	.190	.090		50	Aerovox
	1B	CKR 05	50	+125°	.012	.1	UF	10, 20	.190	.190	.090		50	Aerovox
	2D	CKR 06	200	+125°	.0012	.01	UF	10, 20	.290	.290	.090		50	Aerovox
	2D	CKR 06	100	+125°	.012	.1	UF	10, 20	.290	.290	.090		50	Aerovox
	2D	CKR 06	50	+125°	.12	1.0	UF	10, 20	.290	.290	.090		50	Aerovox
	5B	CKR 11	100	+125°	10	4700	PF	10, 20	.160	.090	Diam		50	Aerovox
	5B	CKR 11	50	+125°	.0056	.01	UF	10, 20	.160	.090	Diam		50	Aerovox
	5B	CKR 12	100	+125°	.0056	.01	UF	10, 20	.250	.090	Diam		50	Aerovox
	5B	CKR 12	50	+125°	.012	.047	UF	10, 20	.250	.090	Diam		50	Aerovox
	5B	CKR 14	100	+125°	.012	.047	UF	10, 20	.390	.140	Diam		50	Aerovox
	5B	CKR 14	50	+125°	.056	.1	UF	10, 20	.390	.140	Diam		50	Aerovox
	5B	CKR 14*	100	+125°	.056	.1	UF	10, 20	.390	.140	Diam		50	Aerovox
	5B	CKR 14*	50	+125°	.12	.27	UF	10, 20	.390	.140	Diam		50	Aerovox
	5B	CKR 15	100	+125°	.056	.1	UF	10, 20	.500	.250	Diam		50	Aerovox
	5B	CKR 15*	100	+125°	.12	.33	UF	10, 20	.500	.250	Diam		50	Aerovox
	5B	CKR 15*	50	+125°	.47	1.0	UF	10, 20	.500	.250	Diam		50	Aerovox
	5B	CKR 16*	100	+125°	.47	1.0	UF	10, 20	.690	.350	Diam		50	Aerovox
	5B	CKR 16*	50	+125°	2.2	3.3	UF	10, 20	.690	.350	Diam		50	Aerovox
	13	CKR 17	100	+125°	10	10,000	PF	10, 20	.275	.090	Diam		50	Aerovox
	13	CKR 18	100	+125°	.015	.1	UF	10, 20	.390	.145	Diam		50	Aerovox
Mica Dielectric MIL-C-39001	5	CMR04	500	+125°	1	240	PF	2, 5	.390	.380	.220 (Max)		50	Elmenco
	5	CMR04	300	+125°	270	300	PF	2, 5	.390	.380	.220 (Max)		50	Elmenco
	5	CMR04	100	+125°	330	390	PF	2, 5	.390	.380	.220 (Max)		50	Elmenco
	5	CMR05	500	+125°	1	390	PF	2, 5	.470	.400	.220 (Max)		50	Elmenco
	5	CMR06	500	+125°	430	4700	PF	2, 5	.700	.580	.350 (Max)		50	Elmenco
	5	CMR07	500	+125°	.0051	.02	UF	2, 5	.830	.920	.450 (Max)		50	Elmenco
	5	CMR08	500	+125°	.022	.051	UF	2, 5	1.480	.920	.470 (Max)		50	Elmenco
	5	CMR08	300	+125°	.056	.062	UF	2, 5	1.470	.920	.450 (Max)		50	Elmenco
	5	CMR08	100	+125°	.075	.091	UF	2, 5	1.500	.940	.500 (Max)		50	Elmenco
Tantalum Solid-Dielectric MIL-C-39003 (Tolerance 5, 10, 20%) Size Length Diam					Min and Max Value for Each Case Size (UF): Case A		Case B		Case C		Case D			Sprague Kemet
	1D	CSR13	6	+85°	5.6	6.8	47	56	150	180	270	330	60	
	1D	CSR13	10	+85°	3.9	4.7	27	39	82	120	180	220	60	
	1D	CSR13	15	+85°	2.7	3.3	18	22	56	68	120	150	60	
	1D	CSR13	20	+85°	1.2	2.2	8.2	15	27	47	56	100	60	
A .422 .135	1D	CSR13	35	+85°	---	---	5.6	6.8	22	---	27	47	60	
B .610 .185	1D	CSR13	50	+85°	.0047	1.0	1.2	4.7	5.6	18	22	---	60	
C .822 .289	1D	CSR13	75	+85°	.1	.68	.82	3.9	4.7	10	12	15	60	
D .922 .351	1D	CSR13	100	+85°	.0047	.56	.68	2.7	---	---	---	---	60	
Tantalum Non-Solid Dielectric MIL-C-39006 Size Length Diam					Capacitance Value for Each Case Size (UF): G2		G3		G4		G5			GE (16K)
	1B	CLR25	15	+85°	60		200		400		580		60	
	1B	CLR25	25	+85°	40		120		250		350		60	
	1B	CLR 25	30	+85°	32		110		220		300		60	
	1B	CLR25	50	+85°	18		60		100		75, 150		60	
G2 1.469 .312	1B	CLR25	75	+85°	12		30		70		100		60	
G3 1.938 .406	1B	CLR25	100	+85°	8		25		50		70		60	
G4 2.625 .406	1B	CLR25	150	+85°	4		13		25		36		60	
G5 3.250 .406														

* Voltage - Temperature Limits are +15%, -40%; otherwise +15%, -25%

Tolerance (%):
Rated V: %:
≤ 30V +75, -15
50, 75 +50, -15
100, 150 +30, -15

Bendix Aerospace Systems Division

ALSEP
Acceptable Parts List
For
Array - E

ATM 241 E(I)

DATE 7/16/71

3. Acceptable Diodes

Table I: Lists "S" Diodes, Screened per MSFC Screening Specification Control Drawings. This listing is obtained from MSFC Drawing 85M02703 Rev E, dated 6/24/70, Title - Semiconductor Devices, Screened, Qualified Product List.

These diodes may be specified on assembly drawings by MSFC part number (e.g., S1N645 and must be procured from qualified manufacturers only.

Table II: Lists diodes from MIL-S-19500 with TX (testing extra) designation.

Page I-8 Table II

1. Before 1N645 list
   1N483B
   1N485B
   1N486B

2. Following 1N4627 remove
   1N483B
   1N485B
   1N486B

3. Remove 1N2220B, RB (error in listing)

4. Add the following types to the list:

1N3595	1N4565A	1N5461B	1N5518B	1N5530B	1N5542B
1N3821A	1N4566A	62B	19B	31B	43B
22A	1N4567A	63B	20B	32B	44B
23A	68A	64B	21B	33B	45B
24A	69A	65B	22B	34B	46B
25A	70A	66B	23B	35B	1N5711
26A	71A	67B	24B	36B	1N5712
27A	72A	68B	25B	37B	1N5719
28A	73A	69B	26B	38B	
1N4306	74A	70B	27B	39B	
1N4307		71B	28B	40B	
1N4376		72B	29B	41B	
		73B			
		74B			
		75B			
		76B			

4. Acceptable Transistors

Table I: Lists "S" Transistors, Screened per MSFC Screening Specification Control Drawings. This listing is obtained from MSFC Drawing 85M02703 Rev E, dated 6/24/70, Title - Semiconductor Devices, Screened, Qualified Product List.

These transistors may be specified on assembly drawings by MSFC part number (e.g, S2N335B) and must be procured from qualified manufacturers only.

Table II: Lists "TX" Transistors from MIL-S-19500 with TX (testing extra) designation.

Page I-15 Table II

1. Add the following types to the list:

2N682	2N3740
683	2N3741
685	2N3810
686	2N3811
687	2N4399
688	2N4405
689	2N5038
690	2N5039
691	2N5071
692	2N5745
	2N5926
	2N5927
	2N5957
	2N5958
	2N5959
	2N5960

ATTACHMENT II

PARTS DATA SHEET

For convenience of the user, the parts data sheets for capacitors resistors, diodes and transistors are included in Attachment II of ATM 241. For parts data sheets on other types of parts, the reader should refer to ATM 507, "ALSEP Parts Data Book", or BSC 42275 "Parts Application and Reliability Bulletin, Volumes I and II".

Individual copies of any specific data sheets may be requested from the BxA Parts and Materials Group (313) 665-7766.

	Part Name	Type	Spec.	Page
1.	Capacitors			
	Glass	ECY-Basic	MSFC-Spec-400A	1.1.0
	Glass	ECY-10	MSFC-Spec-400/1	1.1.2
	Glass	ECY-15	MSFC-Spec-400/2A	1.1.6
	Mica	CMR-Basic	MIL-C-39001	1.2.0
	Mica	CMR-04, 05 06, 07, 08	MIL-C-39001/5	1.2.1
	Tant. Solid	CSR-Basic	MIL-C-39003A	1.3.0
	Tant. Solid	CSR-13	MIL-C-39003/1C	1.3.2
	Ceramic	CKR05	MIL-C-39014/1B	1.5.0
	Ceramic	CKR06	MIL-C-39014/2D	1.5.4
	Ceramic	CKR 11, 12, 14, 15, 16	MIL-C-39104/5B	1.5.9
	Ceramic	CKR17, 18	MIL-C-39104/13	1.5.16
2.	Resistors	General		2.0.0
	Film, Hi-Stab	RNR-XX	MIL-R-55182	2.1.0
	Film, Hi-Stab	RNR-55	MIL-R-55182/1F	2.1.0
	Film, Hi-Stab	RNR-65	MIL-R-55182/5F	2.1.10
	Film, Hi-Stab	RNR-70	MIL-R-55182/6F	2.1.13
	Film, Insul.	RLR-XX	MIL-R-39017A	2.2.0
	Film, Insul	RLR-05	MIL-R-39017/5	2.2.4
	Film, Insul.	RLR-07	MIL-R-39017/1D	2.2.6
	Film, Insul.	RLR-20	MIL-R-39017/2D	2.2.8
	W.W. Power	RWR-XX	MIL-R-39007	2.3.0
	W. W. Power	RER-XX	MIL-R-39009	2.4.0
	Comp. Insul	RCR-XX	MIL-R-39008	2.5.0
	Comp. Insul	RCR-05	MIL-R-39008/4C	2.5.4
	Comp. Insul	RCR-07	MIL-R-39008/1B	2.5.6
	Comp. Insul	RCR-20	MIL-R-39008/2B	2.5.9
3.	Diodes	INXXXX	MIL-S-19500	3.0.0
4.	Transistors	2NXXXX	MIL-S-19500	4.0.0

TYPE CMR
(MILITARY SPECIFICATION MIL-C-39001)

Type Designation Code:

CMR	04	C	010	D	O	D	M
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

(1) Type: Capacitor, fixed, mica-dielectric, established reliability

(2) Style: See below

(3) Characteristic:

Symbol	Temperature Coefficient	Capacitance Drift
C	± 200 ppm/°C	±(0.5% +0.1 pf)
E	-20, + 100 ppm/°C	±(0.1% +0.1 pf)
F	0, +70 ppm/°C	±(0.05% +0.1 pf)

(4) Capacitance Value: Capacitance in picofarads; first 2 digits are significant figures, 3rd digit is number of zeros to follow.

(5) Capacitance Tolerance:
D = ± 0.5 pf; f = ± 1%; G = ± 2%; J = ± 5%

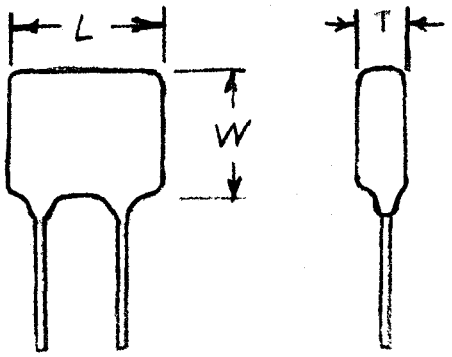
(6) Operating Temperature Range:
O = -55 to +125°C; P = -55 to +150°C

(7) Rated Voltage (DC):
A = 100; C = 300; D = 500

(8) Failure Rate Level (%/1000 hrs., 90% confidence):
L = 2.0%; M = 1.0%; P = 0.1%; R = 0.01%; S = 0.001%; T = 0.0001%

Styles (Ref. MIL-C-39001/5):

Designation	Size Range (L x W x T Max)	
CMR04	.360 x .330 x .190	.390 x .380 x .220
CMR05	.450 x .360 x .170	.470 x .400 x .220
CMR06	.640 x .510 x .200	.700 x .580 x .350
CMR07	.780 x .860 x .280	.830 x .920 x .450
CMR08	1.420 x .880 x .310	1.500 x .940 x .500



MIL-C-39001/5
6 April 1970

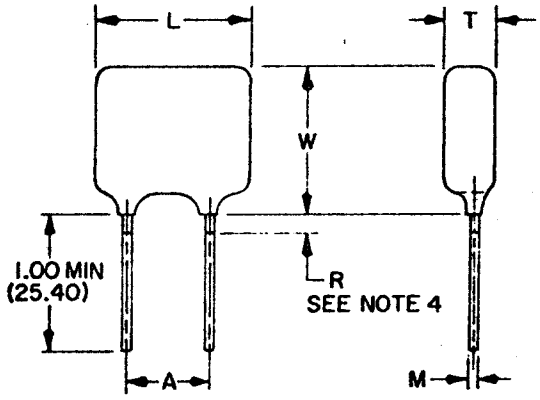
MILITARY SPECIFICATION SHEET

CAPACITORS, FIXED, MICA DIELECTRIC, ESTABLISHED RELIABILITY,

STYLES CMR04, CMR05, CMR06, CMR07, AND CMR08

The complete requirements for procuring the capacitors described herein shall consist of this document and the latest issue of Specification MIL-C-39001.

This specification is mandatory for use by all Departments and Agencies of the Department of Defense.



NOTES:
1. Dimensions are in inches (see table 1).
2. Millimeters are in parentheses (see table 1).
3. Metric equivalents (to the nearest .01 mm) are given for general information only and are based upon 1 inch = 25.4 mm.
4. The 'R' dimension may not be solderable as it may be covered by a clear epoxy or resinous coating.

FSC 5910

MIL-C-39001/5

TABLE I. *Dimensions.*

Capacitance range (pF)	L		T		W, max	R, max	A Spacing ±.031(.79)	M, Dia ±.002(.05)
	Min	Max	Min	Max				
STYLE CMR04								
1 to 24, incl	.300 (7.62)	.360 (9.14)	.100(2.54)	.190 (4.83)	.330 (8.38)	.125(3.18)	.150 (3.81)	.016 (.36)
27	.300 (7.62)	.370 (9.40)	.100(2.54)	.190 (4.83)	.330 (8.38)	.125(3.18)	.150 (3.81)	.016 (.36)
30 to 68, incl	.300 (7.62)	.370 (9.40)	.100(2.54)	.190 (4.83)	.340 (8.64)	.125(3.18)	.150 (3.81)	.016 (.36)
75	.300 (7.62)	.370 (9.40)	.110(2.79)	.200 (5.08)	.340 (8.64)	.125(3.18)	.150 (3.81)	.016 (.36)
82	.300 (7.62)	.370 (9.40)	.110(2.79)	.200 (5.08)	.350 (8.89)	.125(3.18)	.150 (3.81)	.016 (.36)
91 to 100, incl	.300 (7.62)	.370 (9.40)	.110(2.79)	.200 (5.08)	.350 (8.89)	.125(3.18)	.150 (3.81)	.016 (.36)
110 to 120, incl	.300 (7.62)	.380 (9.65)	.110(2.79)	.200 (5.08)	.350 (8.89)	.125(3.18)	.150 (3.81)	.016 (.36)
130	.300 (7.62)	.380 (9.65)	.110(2.79)	.200 (5.08)	.360 (9.14)	.125(3.18)	.150 (3.81)	.016 (.36)
150 to 160, incl	.300 (7.62)	.380 (9.65)	.120(3.05)	.210 (5.33)	.360 (9.14)	.125(3.18)	.150 (3.81)	.016 (.36)
180	.300 (7.62)	.390 (9.91)	.120(3.05)	.210 (5.33)	.370 (9.40)	.125(3.18)	.150 (3.81)	.016 (.36)
200 to 390, incl	.300 (7.62)	.390 (9.91)	.140(3.56)	.220 (5.59)	.380 (9.65)	.125(3.18)	.150 (3.81)	.016 (.36)
STYLE CMR05								
1 to 62, incl	.400(10.16)	.450(11.43)	.090(2.29)	.170 (4.32)	.360 (9.14)	.125(3.18)	.225 (5.72)	.025 (.64)
68 to 82, incl	.400(10.16)	.450(11.43)	.095(2.30)	.180 (4.57)	.360 (9.14)	.125(3.18)	.225 (5.72)	.025 (.64)
91 to 100, incl	.400(10.16)	.460(11.68)	.095(2.30)	.180 (4.57)	.360 (9.14)	.125(3.18)	.225 (5.72)	.025 (.64)
110 to 130, incl	.400(10.16)	.460(11.68)	.095(2.30)	.180 (4.57)	.370 (9.40)	.125(3.18)	.225 (5.72)	.025 (.64)
150 to 180, incl	.400(10.16)	.460(11.68)	.110(2.79)	.190 (4.83)	.370 (9.40)	.125(3.18)	.225 (5.72)	.025 (.64)
200	.400(10.16)	.460(11.68)	.110(2.79)	.190 (4.83)	.380 (9.65)	.125(3.18)	.225 (5.72)	.025 (.64)
220 to 240, incl	.400(10.16)	.460(11.68)	.110(2.79)	.200 (5.08)	.380 (9.65)	.125(3.18)	.225 (5.72)	.025 (.64)
270 to 330, incl	.400(10.16)	.470(11.94)	.110(2.79)	.210 (5.33)	.390 (9.91)	.125(3.18)	.225 (5.72)	.025 (.64)
360 to 390, incl	.400(10.16)	.470(11.94)	.120(3.05)	.220 (5.59)	.400(10.16)	.125(3.18)	.225 (5.72)	.025 (.64)
STYLE CMR06								
430 to 470, incl	.550(13.97)	.640(16.26)	.090(2.29)	.200 (5.08)	.510(12.95)	.141(3.58)	.350 (8.89)	.032 (.81)
510 to 620, incl	.560(14.22)	.650(16.51)	.090(2.29)	.200 (5.08)	.510(12.95)	.141(3.58)	.350 (8.89)	.032 (.81)
680 to 910, incl	.560(14.22)	.650(16.51)	.100(2.54)	.210 (5.33)	.510(12.95)	.141(3.58)	.350 (8.89)	.032 (.81)
1000 to 1100, incl	.560(14.22)	.650(16.51)	.110(2.79)	.220 (5.59)	.520(13.21)	.141(3.58)	.350 (8.89)	.032 (.81)
1200 to 1300, incl	.570(14.48)	.660(16.78)	.110(2.79)	.220 (5.59)	.520(13.21)	.141(3.58)	.350 (8.89)	.032 (.81)
1500	.570(14.48)	.660(16.78)	.120(3.05)	.230 (5.84)	.520(13.21)	.141(3.58)	.350 (8.89)	.032 (.81)
1600	.570(14.48)	.660(16.78)	.120(3.05)	.230 (5.84)	.530(13.46)	.141(3.58)	.350 (8.89)	.032 (.81)
1800 to 2000, incl	.580(14.73)	.670(17.02)	.130(3.30)	.240 (6.10)	.530(13.46)	.141(3.58)	.350 (8.89)	.032 (.81)
2200	.580(14.73)	.670(17.02)	.140(3.56)	.250 (6.35)	.530(13.46)	.141(3.58)	.350 (8.89)	.032 (.81)
2400	.580(14.73)	.670(17.02)	.150(3.81)	.260 (6.60)	.540(13.72)	.141(3.58)	.350 (8.89)	.032 (.81)
2700	.590(14.99)	.680(17.27)	.160(4.06)	.270 (6.86)	.540(13.72)	.141(3.58)	.350 (8.89)	.032 (.81)
3000	.590(14.99)	.680(17.27)	.170(4.32)	.280 (7.11)	.550(13.97)	.141(3.58)	.350 (8.89)	.032 (.81)
3300	.590(14.99)	.680(17.27)	.180(4.57)	.290 (7.37)	.550(13.97)	.141(3.58)	.350 (8.89)	.032 (.81)
3600	.590(14.99)	.680(17.27)	.190(4.83)	.300 (7.62)	.560(14.22)	.141(3.58)	.350 (8.89)	.032 (.81)
3900	.600(15.24)	.690(17.53)	.200(5.08)	.310 (7.87)	.560(14.22)	.141(3.58)	.350 (8.89)	.032 (.81)
4300	.600(15.24)	.690(17.53)	.220(5.59)	.330 (8.38)	.570(14.48)	.141(3.58)	.350 (8.89)	.032 (.81)
4700	.610(15.49)	.700(17.78)	.220(5.59)	.350 (8.89)	.580(14.73)	.141(3.58)	.350 (8.89)	.032 (.81)
STYLE CMR07								
5100	.680(17.27)	.780(19.81)	.150(3.81)	.280 (7.11)	.860(21.84)	.141(3.58)	.425(10.80)	.040(1.02)
5600 to 6200, incl	.680(17.27)	.780(19.81)	.150(3.81)	.290 (7.37)	.870(22.10)	.141(3.58)	.425(10.80)	.040(1.02)
6800	.680(17.27)	.780(19.81)	.150(3.81)	.300 (7.62)	.870(22.10)	.141(3.58)	.425(10.80)	.040(1.02)
7500	.690(17.53)	.790(20.07)	.150(3.81)	.310 (7.87)	.880(22.35)	.141(3.58)	.425(10.80)	.040(1.02)
8200	.690(17.53)	.790(20.07)	.150(3.81)	.320 (8.13)	.880(22.35)	.141(3.58)	.425(10.80)	.040(1.02)
9100	.690(17.53)	.790(20.07)	.150(3.81)	.330 (8.38)	.880(22.35)	.141(3.58)	.425(10.80)	.040(1.02)
10,000	.700(17.78)	.800(20.32)	.200(5.08)	.340 (8.64)	.890(22.61)	.141(3.58)	.425(10.80)	.040(1.02)
11,000	.700(17.78)	.800(20.32)	.200(5.08)	.350 (8.89)	.890(22.61)	.141(3.58)	.425(10.80)	.040(1.02)
12,000	.700(17.78)	.800(20.32)	.200(5.08)	.360 (9.14)	.890(22.61)	.141(3.58)	.425(10.80)	.040(1.02)
13,000	.710(18.03)	.810(20.57)	.200(5.08)	.370 (9.40)	.890(22.61)	.141(3.58)	.425(10.80)	.040(1.02)
15,000	.710(18.03)	.810(20.57)	.250(6.35)	.390 (9.91)	.900(22.86)	.141(3.58)	.425(10.80)	.040(1.02)
16,000	.720(18.29)	.820(20.83)	.250(6.35)	.410(10.41)	.900(22.86)	.141(3.58)	.425(10.80)	.040(1.02)
18,000	.720(18.29)	.820(20.83)	.250(6.35)	.430(10.92)	.910(23.11)	.141(3.58)	.425(10.80)	.040(1.02)
20,000	.730(18.54)	.830(21.08)	.250(6.35)	.450(11.43)	.920(23.37)	.141(3.58)	.425(10.80)	.040(1.02)
STYLE CMR08								
22,000	1.300(33.02)	1.420(36.07)	.180(4.57)	.310 (7.87)	.880(22.35)	.141(3.58)	1.050(26.67)	.040(1.02)
24,000	1.310(33.27)	1.430(36.32)	.180(4.57)	.320 (8.13)	.880(22.35)	.141(3.58)	1.050(26.67)	.040(1.02)
27,000	1.320(33.53)	1.430(36.32)	.180(4.57)	.330 (8.38)	.880(22.35)	.141(3.58)	1.050(26.67)	.040(1.02)
30,000	1.330(33.78)	1.440(36.58)	.180(4.57)	.350 (8.89)	.890(22.61)	.141(3.58)	1.050(26.67)	.040(1.02)
33,000	1.330(33.78)	1.440(36.58)	.180(4.57)	.360 (9.14)	.890(22.61)	.141(3.58)	1.050(26.67)	.040(1.02)
36,000	1.340(34.04)	1.450(36.83)	.180(4.57)	.380 (9.65)	.900(22.86)	.141(3.58)	1.050(26.67)	.040(1.02)
39,000	1.340(34.04)	1.450(36.83)	.220(5.59)	.400(10.16)	.900(22.86)	.141(3.58)	1.050(26.67)	.040(1.02)
43,000	1.350(34.29)	1.460(37.08)	.225(5.72)	.420(10.67)	.910(23.11)	.141(3.58)	1.050(26.67)	.040(1.02)
47,000	1.360(34.54)	1.470(37.34)	.250(6.35)	.450(11.43)	.910(23.11)	.141(3.58)	1.050(26.67)	.040(1.02)
51,000	1.370(34.80)	1.480(37.59)	.250(6.35)	.470(11.94)	.920(23.37)	.141(3.58)	1.050(26.67)	.040(1.02)
56,000	1.350(34.29)	1.460(37.08)	.225(5.72)	.420(10.67)	.910(23.11)	.141(3.58)	1.050(26.67)	.040(1.02)
62,000	1.360(34.54)	1.470(37.34)	.250(6.35)	.450(11.43)	.920(23.37)	.141(3.58)	1.050(26.67)	.040(1.02)
68,000	1.370(34.80)	1.480(37.59)	.260(6.60)	.470(11.94)	.920(23.37)	.141(3.58)	1.050(26.67)	.040(1.02)
75,000	1.360(34.54)	1.470(37.34)	.240(6.10)	.440(11.18)	.910(23.11)	.141(3.58)	1.050(26.67)	.040(1.02)
82,000	1.370(34.80)	1.480(37.59)	.310(7.87)	.460(11.68)	.920(23.37)	.141(3.58)	1.050(26.67)	.040(1.02)
91,000	1.390(35.31)	1.500(38.10)	.340(8.64)	.500(12.70)	.940(23.88)	.141(3.58)	1.050(26.67)	.040(1.02)

REQUIREMENTS:

Dimensions: See figure and table I.

Case material: Resin (dipped).

Capacitance value: See table II.

Capacitance tolerance: See table II.

DC rated voltage: See table II.

Operating temperature range: See table II.

Characteristic: See table II.

Failure rate level: See table II.

Dielectric withstanding voltage: . Method 301 of MIL-STD-202: 200 percent of rated dc voltage for not less than 1 second nor more than 5 seconds.

Barometric pressure: Method 105, condition D (100, 000 ft), of MIL-STD-202. Test potential - 100 percent of rated dc voltage for style CMR04, 500 volts; 150 percent for lesser voltages and all other styles.

Insulation resistance (IR): Method 302, test condition A, of MIL-STD-202: (Minimum requirements):
At 25° C:
0 to 10, 000 pF - - - - - - - - 100, 000 megohms
10, 000 pF and greater - - - - 1, 000 megohm-microfarads
At 125° C:
0 to 3, 300 pF- - - - - - - - - 10, 000 megohms
3, 300 pF and greater - - - - 33 megohm-microfarads
At 150° C:
0 to 1, 500 pF- - - - - - - - - 5, 000 megohms
1, 500 pF and greater- - - - - 7. 5 megohm-microfarads

Capacitance (Cap): Method 305 of MIL-STD-202.

Dissipation factor (DF): See MIL-C-39001.

High voltage stabilization: 1, 000 vdc for a minimum of 48 hours at a minimum temperature of 125° C or 150° C, as applicable.

Solderability: Method 208 of MIL-STD-202.

Vibration, high frequency: Method 204 of MIL-STD-202.

Temperature coefficient and capacitance drift: Within the limits specified for the applicable characteristic.

Temperature cycling: Method 102, condition D, MIL-STD-202, except the high temperature shall be as follows:
Symbol O - +125° C.
Symbol P - +150° C.

MIL-C-39001/5

Immersion cycling: Method 104, condition B, of MIL-STD-202.
DWV - Meet initial requirement.
IR - At least 30 percent of initial requirement.
ΔCap. - Shall not exceed ±1 percent or 1 pF, whichever is greater, of reference measurement.
DF - Not greater than 150 percent of initial requirement.

Shock, specified pulse: Method 213, condition I (100 g(pk), sawtooth), of MIL-STD-202.

Terminal strength:
Pull test - 5 pound pull applied perpendicular to the leads for at least 5 seconds.
Twist test- 5 alternate 360° rotations.

Moisture resistance: Method 106 of MIL-STD-202.
DWV - Meet initial requirement.
IR - At least 25 percent of initial requirement.
ΔCap. - Shall not exceed ±1 or 0.1 pF, whichever is greater, of reference measurement.
DF - Not greater than 150 percent of initial requirement.

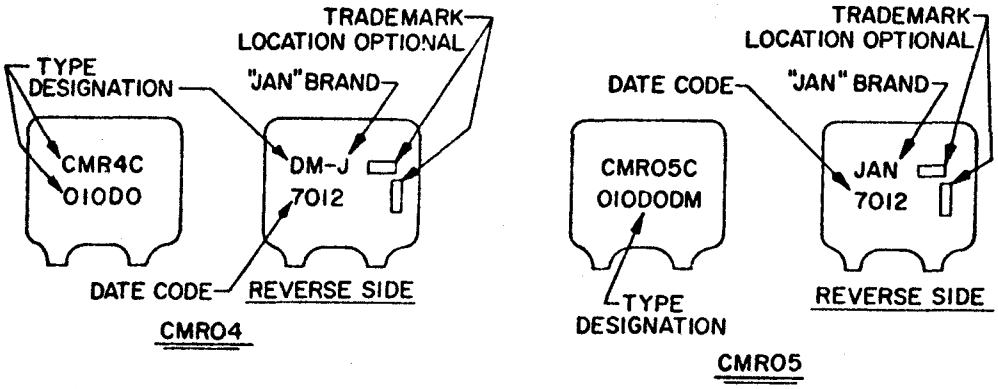
Life:
Forty-eight hours, minimum, at $-55^{\circ}\ ^{+0^{\circ}}_{-2^{\circ}}$ C immediately followed by qualification or quality conformance test, as applicable.
Qualification test: 2,000 hours at applicable high test temperature with 100 percent or 150 percent of rated dc voltage applied, as applicable.
DWV - Meet initial requirement.
IR - Meet initial requirement.
ΔCap. - Shall not exceed ±1 percent or 1 pF, whichever is greater, of the initial measurement.
DF - Not greater than 150 percent of initial requirement.
Quality conformance test (240- and 2000-hour): 240 hours (L FR level) and 2000 hours (M, P, R, S, and T FR levels) at applicable high test temperature and 150 percent of rated dc voltage; requirements as specified for qualification.
Extended life (L FR level only):
Qualification test: 48,000 $^{+96}_{-0}$ hours at applicable high test temperature and rated dc voltage; requirements as specified for qualification.
Quality conformance test: 1,760 hours at applicable high test temperature and 150% of rated dc voltage; requirements as specified for qualification.

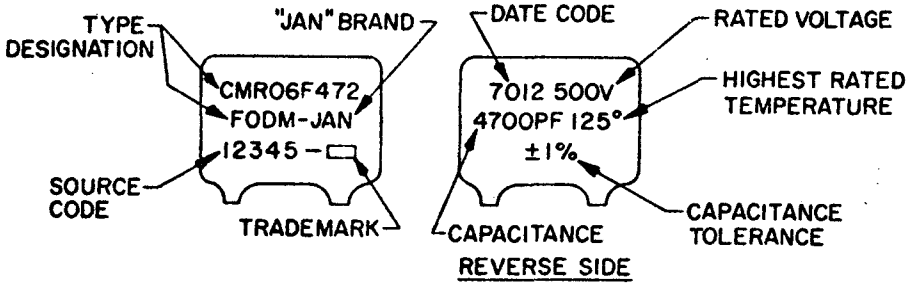
Fungus: Method 508 of MIL-STD-810 or manufacturer's equivalent.

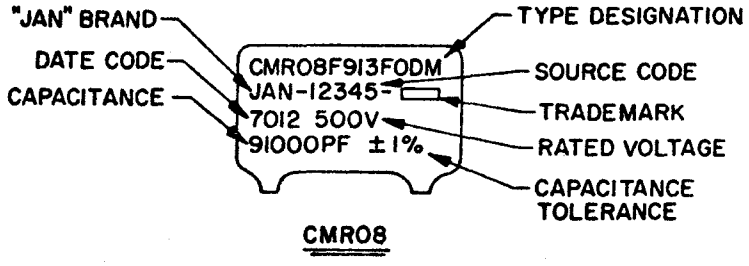
Resistance to solvents: Method 215 of MIL-STD-202.

Resistance to soldering heat: Method 210 of MIL-STD-202.
IR - Meet initial requirement.
ΔCap. - Shall not exceed ±1 percent or 1 pF, whichever is greater, of the initial measurement.
DF - Meet initial requirement.

Marking: Capacitors shall be marked as indicated in the following examples:







MIL-C-39001/5

TABLE II. Type designations.

STYLE CMR04				
Type designation 1/	Capacitance value	DC rated voltage	Operating temperature range	Capacitance tolerances available
	(pF)	(volts)		
CMR04C010D-D-	1	500	OP	D
CMR04C050D-D-	5	500	OP	D
CMR04C060D-D-	6	500	OP	D
CMR04C070D-D-	7	500	OP	D
CMR04C080D-D-	8	500	OP	D
CMR04C100D-D-	10	500	OP	D
CMR04C120J-D-	12	500	OP	J
CMR04C150J-D-	15	500	OP	J
CMR04C180J-D-	18	500	OP	J
CMR04E200J-D-	20	500	OP	J
CMR04E220J-D-	22	500	OP	J
CMR04E240J-D-	24	500	OP	J
CMR04E270--D-	27	500	OP	GJ
CMR04E300--D-	30	500	OP	GJ
CMR04E330--D-	33	500	OP	GJ
CMR04E360--D-	36	500	OP	GJ
CMR04E390--D-	39	500	OP	GJ
CMR04E430--D-	43	500	OP	GJ
CMR04E470--D-	47	500	OP	GJ
CMR04E510--D-	51	500	OP	FGJ
CMR04E560--D-	56	500	OP	FGJ
CMR04E620--D-	62	500	OP	FGJ
CMR04E680--D-	68	500	OP	FGJ
CMR04E750--D-	75	500	OP	FGJ
CMR04E820--D-	82	500	OP	FGJ
CMR04F910--D-	91	500	OP	FGJ
CMR04F101--D-	100	500	OP	FGJ
CMR04F111--D-	110	500	OP	FGJ
CMR04F121--D-	120	500	OP	FGJ
CMR04F131--D-	130	500	OP	FGJ
CMR04F151--D-	150	500	OP	FGJ
CMR04F161--D-	160	500	OP	FGJ
CMR04F181--D-	180	500	OP	FGJ
CMR04F201--D-	200	500	OP	FGJ
CMR04F221--D-	220	500	OP	FGJ
CMR04F241--D-	240	500	OP	FGJ
CMR04F271--C-	270	300	OP	FGJ
CMR04F301--C-	300	300	OP	FGJ
CMR04F331--A-	330	100	OP	FGJ
CMR04F361--A-	360	100	OP	FGJ
CMR04F391--A-	390	100	OP	FGJ

1/ See footnote at end of table.

TABLE II. Type designations. (Cont)

STYLE CMR05				
Type designation 1/	Capacitance value (pF)	DC rated voltage (volts)	Operating temperature range	Capacitance tolerances available
CMR05C010D-D-	1	500	OP	D
CMR05C050D-D-	5	500	OP	D
CMR05C060D-D-	6	500	OP	D
CMR05C070D-D-	7	500	OP	D
CMR05C080D-D-	8	500	OP	D
CMR05C100D-D-	10	500	OP	D
CMR05C120J-D-	12	500	OP	J
CMR05C150J-D-	15	500	OP	J
CMR05C180J-D-	18	500	OP	J
CMR05E200J-D-	20	500	OP	J
CMR05E220J-D-	22	500	OP	J
CMR05E240J-D-	24	500	OP	J
CMR05E270--D-	27	500	OP	GJ
CMR05E300--D-	30	500	OP	GJ
CMR05E330--D-	33	500	OP	GJ
CMR05E360--D-	36	500	OP	GJ
CMR05E390--D-	39	500	OP	GJ
CMR05E430--D-	43	500	OP	GJ
CMR05E470--D-	47	500	OP	GJ
CMR05E510--D-	51	500	OP	FGJ
CMR05E560--D-	56	500	OP	FGJ
CMR05E620--D-	62	500	OP	FGJ
CMR05E680--D-	68	500	OP	FGJ
CMR05E750--D-	75	500	OP	FGJ
CMR05E820--D-	82	500	OP	FGJ
CMR05F910--D-	91	500	OP	FGJ
CMR05F101--D-	100	500	OP	FGJ
CMR05F111--D-	110	500	OP	FGJ
CMR05F121--D-	120	500	OP	FGJ
CMR05F131--D-	130	500	OP	FGJ
CMR05F151--D-	150	500	OP	FGJ
CMR05F161--D-	160	500	OP	FGJ
CMR05F181--D-	180	500	OP	FGJ
CMR05F201--D-	200	500	OP	FGJ
CMR05F221--D-	220	500	OP	FGJ
CMR05F241--D-	240	500	OP	FGJ
CMR05F271--D-	270	500	OP	FGJ
CMR05F301--D-	300	500	OP	FGJ
CMR05F331--D-	330	500	OP	FGJ
CMR05F361--D-	360	500	OP	FGJ
CMR05F391--D-	390	500	OP	FGJ

1/ See footnotes at end of table.

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TABLE II. Type designations. (Cont)

Type designation 1/	Capacitance value (pF)	DC rated voltage (volts)	Operating temperature range	Capacitance tolerances available
STYLE CMR06				
CMR06F431--D-	430	500	OP	FGJ
CMR06F471--D-	470	500	OP	FGJ
CMR06F511--D-	510	500	OP	FGJ
CMR06F561--D-	560	500	OP	FGJ
CMR06F621--D-	620	500	OP	FGJ
CMR06F681--D-	680	500	OP	FGJ
CMR06F751--D-	750	500	OP	FGJ
CMR06F821--D-	820	500	OP	FGJ
CMR06F910--D-	910	500	OP	FGJ
CMR06F102--D-	1,000	500	OP	FGJ
CMR06F112--D-	1,100	500	OP	FGJ
CMR06F122--D-	1,200	500	OP	FGJ
CMR06F132--D-	1,300	500	OP	FGJ
CMR06F152--D-	1,500	500	OP	FGJ
CMR06F162--D-	1,600	500	OP	FGJ
CMR06F182--D-	1,800	500	OP	FGJ
CMR06F202--D-	2,000	500	OP	FGJ
CMR06F222--D-	2,200	500	OP	FGJ
CMR06F242--D-	2,400	500	OP	FGJ
CMR06F272--D-	2,700	500	OP	FGJ
CMR06F302--D-	3,000	500	OP	FGJ
CMR06F332--D-	3,300	500	OP	FGJ
CMR06F362--D-	3,600	500	OP	FGJ
CMR06F392--D-	3,900	500	OP	FGJ
CMR06F432--D-	4,300	500	OP	FGJ
CMR06F472--D-	4,700	500	OP	FGJ
STYLE CMR07				
CMR07F512--D-	5,100	500	OP	FGJ
CMR07F562--D-	5,600	500	OP	FGJ
CMR07F622--D-	6,200	500	OP	FGJ
CMR07F682--D-	6,800	500	OP	FGJ
CMR07F752--D-	7,500	500	OP	FGJ
CMR07F822--D-	8,200	500	OP	FGJ
CMR07F912--D-	9,100	500	OP	FGJ
CMR07F103--D-	10,000	500	OP	FGJ
CMR07F113--D-	11,000	500	OP	FGJ
CMR07F123--D-	12,000	500	OP	FGJ
CMR07F133--D-	13,000	500	OP	FGJ
CMR07F153--D-	15,000	500	OP	FGJ
CMR07F163--D-	16,000	500	OP	FGJ
CMR07F183--D-	18,000	500	OP	FGJ
CMR07F203--D-	20,000	500	OP	FGJ

1/ See footnote at end of table.

MIL-C-39001/5

TABLE II. Type designations. (Cont)

STYLE CMR08				
Type designation 1/	Capacitance value (pF)	DC rated voltage (volts)	Operating temperature range	Capacitance tolerances available
CMR08F223--D-	22,000	500	OP	FGJ
CMR08F243--D-	24,000	500	OP	FGJ
CMR08F273--D-	27,000	500	OP	FGJ
CMR08F303--D-	30,000	500	OP	FGJ
CMR08F333--D-	33,000	500	OP	FGJ
CMR08F363--D-	36,000	500	OP	FGJ
CMR08F393--D-	39,000	500	OP	FGJ
CMR08F433--D-	43,000	500	OP	FGJ
CMR08F473--D-	47,000	500	OP	FGJ
CMR08F513--D-	51,000	500	OP	FGJ
CMR08F563--C-	56,000	300	OP	FGJ
CMR08F623--C-	62,000	300	OP	FGJ
CMR08F683--C-	68,000	300	OP	FGJ
CMR08F753--A-	75,000	100	OP	FGJ
CMR08F823--A-	82,000	100	OP	FGJ
CMR08F913--A-	91,000	100	OP	FGJ

1/ Complete type designation will include additional letter symbols to indicate the following:

Capacitance tolerance: D, .5 pF; F, 1%; G, 2%; and J, 5%.
Operating temperature range: 0, -55 to +125°C; P, -55 to +150°C.
Failure rate level: L, 2%; M, 1.0%; P, 0.1%; R, 0.01%; S, 0.001%; and T, 0.0001%.

Custodians:
Army - EL
Navy - EC
Air Force - 11

Review activities:
Army - EL
Navy - EC
Air Force - 11, 17, 85
DSA - ES

User activities:
Army -
Navy - MC
Air Force - 19

Preparing activity:
Army - EL

Agent:
DSA - ES

(Project 5910-0971-5)

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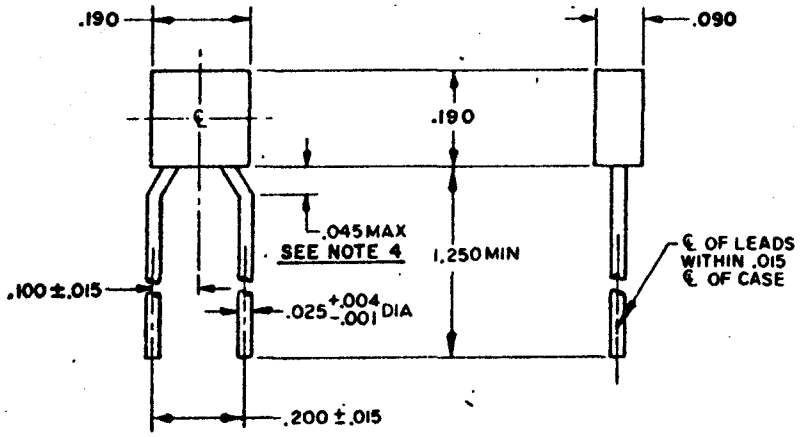
MIL-C-39014/1B
21 August 1970
SUPERSEDING
MIL-C-39014/1A
1 February 1968

MILITARY SPECIFICATION SHEET

CAPACITORS, FIXED, CERAMIC DIELECTRIC (GENERAL PURPOSE), ESTABLISHED RELIABILITY, STYLE CKR05

The complete requirements for procuring the capacitors described herein shall consist of this document and the latest issue of Specification MIL-C-39014.

This specification is mandatory for use by all Departments and Agencies of the Department of Defense.



INCHES	MM	INCHES	MM
.001	.03	.090	2.29
.004	.10	.100	2.54
.015	.38	.190	4.83
.025	.64	.200	5.08
.045	1.14	1.250	31.75

NOTES:
1. Dimensions are in inches.
2. Metric equivalents (to the nearest .01 mm) are given for general information only and are based upon 1 inch = 25.4 mm.
3. Unless otherwise specified, tolerance is ±.010 (.25 mm).
4. For flush mounting .078 (1.98 mm) printed-circuit-hole diameter is required to clear shoulder.

FSC 5910

MIL-C-39014/1B

REQUIREMENTS:

Dimensions and configuration: See figure and table I.

Case type: Molded or preformed.

Capacitance value: See table I.

Capacitance tolerance: See table I.

Operating temperature range: -55°C to +125°C.

Voltage rating: See table I.

Dissipation factor: Not more than 2.5 percent.

Dielectric withstanding voltage:
Body insulation - Shall be able to withstand 1,300 volts between leads and case.

Insulation resistance:
At 25°C - Not less than 100,000 megohms or 1,000 megohm-microfarads whichever is less.
At 125°C - Not less than 10,000 megohms or 100 megohm-microfarads whichever is less.

Insertion loss: Not applicable.

Seal: Not applicable.

Voltage-temperature limits: In accordance with MIL-C-39014.

Capacitance change with reference to 25°C	
Steps A through D of table V Bias = 0 volts	Steps E through G of table V Bias = rated voltage
±15 percent	+15, -25 percent

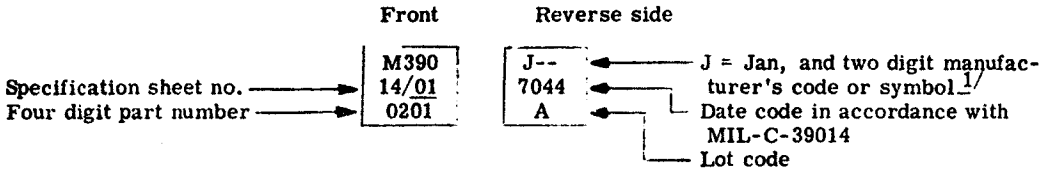
Immersion:
IR - Not less than 50 percent of initial 25°C requirement.

Salt spray (corrosion): Not applicable.

Life:
Rated conditions, 100 percent of dc rated voltage at 125°C.
0 through 2,000 hours:
IR - At 25°C, not less than 50 percent of initial 25°C requirement.
- At 125°C, not less than 50 percent of initial 125°C requirement.
ΔC - Less than ±20 percent from initial measured value.
Dissipation factor - Not greater than 2.5 percent.
4,000 through 32,000 hours:
IR - At 25°C, not less than 15 percent of initial 25°C requirement.
At 125°C, not less than 15 percent of initial 125°C requirement.
ΔC - Less than ±20 percent from initial measured value.
Dissipation factor - Not greater than 2.5 percent.
Accelerated conditions, 200 percent of dc rated voltage at 125°C.
0 and 250 hours:
IR - At 25°C, not less than 50 percent of initial 25°C requirement.
At 125°C, not less than 50 percent of initial 125°C requirement.
ΔC - Less than ±20 percent from initial measured value.
Dissipation factor - Not greater than 2.5 percent.

1,000, 2,000, and 4,000 hours:
IR - At 25°C, not less than 15 percent of initial 25°C requirement.
At 125°C, not less than 15 percent of initial 125°C requirement.
ΔC - Less than ± 20 percent from initial measured value.
Dissipation factor - Not greater than 2.5 percent.

Marking: In accordance with MIL-C-39014 except that minimum marking as shown in the following example will be permitted.



1/ Location of manufacturer's code or symbol is optional.

Part number: M39014/01-(Dash number from table I).

TABLE I. Dash number and electrical characteristics.

Dash number: Failure rate level (%/1,000 hours) 2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.001(S)	Capacitance	Capacitance tolerance	DC rated voltage
					pF	± percent	volts
0361	0201	0241	0281	0321	10	10	200
0362	0202	0242	0282	0322	10	20	200
0363	0203	0243	0283	0323	12	10	200
0364	0204	0244	0284	0324	15	10	200
0365	0205	0245	0285	0325	15	20	200
0366	0206	0246	0286	0326	18	10	200
0367	0207	0247	0287	0327	22	10	200
0368	0208	0248	0288	0328	22	20	200
0369	0209	0249	0289	0329	27	10	200
0370	0210	0250	0290	0330	33	10	200
0371	0211	0251	0291	0331	33	20	200
0372	0212	0252	0292	0332	39	10	200
0373	0213	0253	0293	0333	47	10	200
0374	0214	0254	0294	0334	47	20	200
0375	0215	0255	0295	0335	56	10	200
0376	0216	0256	0296	0336	68	10	200
0377	0217	0257	0297	0337	68	20	200
0378	0218	0258	0298	0338	82	10	200
0379	0219	0259	0299	0339	100	10	200
0380	0220	0260	0300	0340	100	20	200
0381	0221	0261	0301	0341	120	10	200
0382	0222	0262	0302	0342	150	10	200
0383	0223	0263	0303	0343	150	20	200
0384	0224	0264	0304	0344	180	10	200
0385	0225	0265	0305	0345	220	10	200

TABLE I. Dash number and electrical characteristics. -Continued

Dash number					Capacitance	Capacitance tolerance	DC rated voltage
Failure rate level (%/1,000 hours)							
2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.001(S)	pF	± percent	volts
0386	0226	0266	0306	0346	220	20	200
0387	0227	0267	0307	0347	270	10	200
0388	0228	0268	0308	0348	330	10	200
0389	0229	0269	0309	0349	330	20	200
0390	0230	0270	0310	0350	390	10	200
0391	0231	0271	0311	0351	470	10	200
0392	0232	0272	0312	0352	470	20	200
0393	0233	0273	0313	0353	560	10	200
0394	0234	0274	0314	0354	680	10	200
0395	0235	0275	0315	0355	680	20	200
0396	0236	0276	0316	0356	820	10	200
0397	0237	0277	0317	0357	1,000	10	200
0398	0238	0278	0318	0358	1,000	20	200
0399	0239	0279	0319	0359	1,200	10	100
0400	0240	0280	0320	0360	1,500	10	100
0401	0441	0481	0521	0561	1,500	20	100
0402	0442	0482	0522	0562	1,800	10	100
0403	0443	0483	0523	0563	2,200	10	100
0404	0444	0484	0524	0564	2,200	20	100
0405	0445	0485	0525	0565	2,700	10	100
0406	0446	0486	0526	0566	3,300	10	100
0407	0447	0487	0527	0567	3,300	20	100
0408	0448	0488	0528	0568	3,900	10	100
0409	0449	0489	0529	0569	4,700	10	100
0410	0450	0490	0530	0570	4,700	20	100
0411	0451	0491	0531	0571	5,600	10	100
0412	0452	0492	0532	0572	6,800	10	100
0413	0453	0493	0533	0573	6,800	20	100
0414	0454	0494	0534	0574	8,200	10	100
0415	0455	0495	0535	0575	10,000	10	100
0416	0456	0496	0536	0576	10,000	20	100
0417	0457	0497	0537	0577	12,000	10	50
0418	0458	0498	0538	0578	15,000	10	50
0419	0459	0499	0539	0579	15,000	20	50
0420	0460	0500	0540	0580	18,000	10	50
0421	0461	0501	0541	0581	22,000	10	50
0422	0462	0502	0542	0582	22,000	20	50
0423	0463	0503	0543	0583	27,000	10	50
0424	0464	0504	0544	0584	33,000	10	50
0425	0465	0505	0545	0585	33,000	20	50
0426	0466	0506	0546	0586	39,000	10	50
0427	0467	0507	0547	0587	47,000	10	50
0428	0468	0508	0548	0588	47,000	20	50
0429	0469	0509	0549	0589	56,000	10	50
0430	0470	0510	0550	0590	68,000	10	50
0431	0471	0511	0551	0591	68,000	20	50
0432	0472	0512	0552	0592	82,000	10	50
0433	0473	0513	0553	0593	100,000	10	50
0434	0474	0514	0554	0594	100,000	20	50

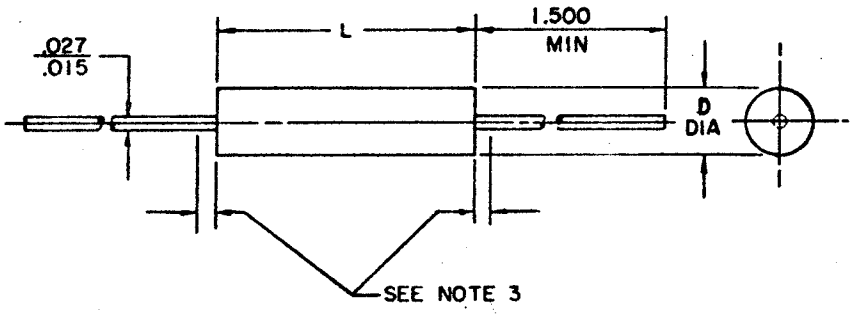
MIL-C-39014/5B
21 August 1970
SUPERSEDING
MIL-C-39014/5A
1 February 1968

MILITARY SPECIFICATION SHEET

CAPACITORS, FIXED, CERAMIC DIELECTRIC (GENERAL PURPOSE), ESTABLISHED RELIABILITY. STYLES CKR11, CKR12, CKR14, CKR15 AND CKR16

The complete requirements for procuring the capacitors described herein shall consist of this document and the latest issue of Specification MIL-C-39014.

This specification is mandatory for use by all Departments and Agencies of the Department of Defense.



Style	Dimensions	
	L	D
CKR11	.160 ±.010	.090 ±.010
CKR12	.250 ±.010	.090 ±.010
CKR14	.390 ±.010	.140 ±.010
CKR15	.500 ±.020	.250 ±.015
CKR16	.690 ±.030	.350 ±.020

INCHES	MM	INCHES	MM
.010	.25	.160	4.06
.015	.38	.250	6.35
.020	.51	.350	8.89
.027	.69	.400	10.16
.030	.76	.500	12.70
.090	2.29	.690	17.53
.150	3.81	1.500	38.10

NOTES:
1. Dimensions are in inches.
2. Metric equivalents (to the nearest .01 mm) are given for general information only and are based upon 1 inch = 25.4 mm.
3. Non-conductive material shall not extend beyond .010 (.25 mm) from end of capacitor body.

FSC 5910

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REQUIREMENTS:

Dimensions and configuration: See figure and table I.

Case type: Tubular.

Capacitance value: See table I.

Capacitance tolerance: See table I.

Operating temperature range: -55°C to +125°C.

Voltage rating: See table I.

Dissipation factor: Not more than 2.5 percent.

Insulation resistance:
At 25°C - Not less than 100,000 megohms or 1,000 megohm-microfarads whichever is less.
At 125°C - Not less than 10,000 megohms or 100 megohm-microfarads whichever is less.

Insertion loss: Not applicable.

Seal: Not applicable.

Voltage-temperature limits: In accordance with MIL-C-39014.

Capacitance change with reference to 25°C	
Steps A through D of table V Bias = 0 volts	Steps E through G of table V Bias = rated voltage
±15 percent	+15, -25 percent as applicable (see table I)
±15 percent	+15, -40 percent as applicable (see table I)

Immersion:
IR - Not less than 50 percent of initial 25°C requirement.

Salt spray (corrosion): Not applicable.

Life:
Rated conditions, 100 percent of dc rated voltage at 125°C.
0 through 2,000 hours:
IR - At 25°C, not less than 50 percent of initial 25°C requirement.
At 125°C, not less than 50 percent of initial 125°C requirement.
ΔC - Less than ±20 percent from initial measured value.
Dissipation factor - Not greater than 2.5 percent.
4,000 through 32,000 hours:
IR - At 25°C, not less than 15 percent of initial 25°C requirement.
At 125°C, not less than 15 percent of initial 125°C requirement.
ΔC - Less than ±20 percent from initial measured value.
Dissipation factor - Not greater than 2.5 percent.
Accelerated condition, 200 percent of dc rated voltage at 125°C.
0 and 250 hours:
IR - At 25°C, not less than 50 percent of initial 25°C requirement.
At 125°C, not less than 50 percent of initial 125°C requirement.
ΔC - Less than ±20 percent from initial measured value.
Dissipation factor - Not greater than 2.5 percent.

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1,000, 2,000 and 4,000 hours:
IR - At 25°C, not less than 15 percent of initial 25°C requirement.
At 125°C, not less than 15 percent of initial 125°C requirement.
ΔC - Less than ±20 percent from initial measured value.
Dissipation factor - Not greater than 2.5 percent.

Part number: M39014/05-(Dash number from table I).

Marking: In accordance with MIL-C-39014 except that minimum marking as shown in the following examples will be permitted for styles CKR11 and CKR12. Full marking shall be included on the package.

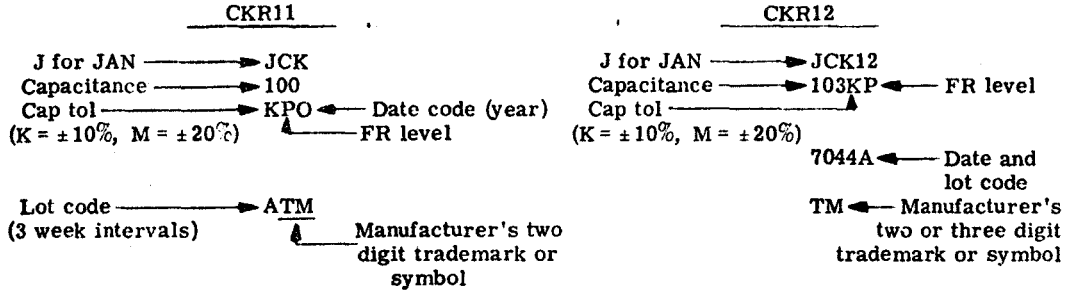

TABLE I. Dash number and electrical characteristics.

Dash number Failure rate level (%/1,000 hours)					Capacitance	Capacitance tolerance	DC rated voltage
2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.001(S)			
Style CKR11, voltage-temperature limits of ±15% and +15, -25%							
					pF	± percent	volts
0401	0601	0801	1001	1201	10	10	100
0402	0602	0802	1002	1202	10	20	100
0403	0603	0803	1003	1203	12	10	100
0404	0604	0804	1004	1204	15	10	100
0405	0605	0805	1005	1205	15	20	100
0406	0606	0806	1006	1206	18	10	100
0407	0607	0807	1007	1207	22	10	100
0408	0608	0808	1008	1208	22	20	100
0409	0609	0809	1009	1209	27	10	100
0410	0610	0810	1010	1210	33	10	100
0411	0611	0811	1011	1211	33	20	100
0412	0612	0812	1012	1212	39	10	100
0413	0613	0813	1013	1213	47	10	100
0414	0614	0814	1014	1214	47	20	100
0415	0615	0815	1015	1215	56	10	100
0416	0616	0816	1016	1216	68	10	100
0417	0617	0817	1017	1217	68	20	100
0418	0618	0818	1018	1218	82	10	100
0419	0619	0819	1019	1219	100	10	100
0420	0620	0820	1020	1220	100	20	100
0421	0621	0821	1021	1221	120	10	100
0422	0622	0822	1022	1222	150	10	100
0423	0623	0823	1023	1223	150	20	100

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TABLE I. Dash number and electrical characteristics. -Continued

Dash number					Capacitance	Capacitance tolerance	DC rated voltage
Failure rate level (%/1,000 hours)							
2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.001(S)			
Style CKR11, voltage-temperature limits of ±15% and +15, -25%							
					pF	± percent	volts
0424	0624	0824	1024	1224	180	10	100
0425	0625	0825	1025	1225	220	10	100
0426	0626	0826	1026	1226	220	20	100
0427	0627	0827	1027	1227	270	10	100
0428	0628	0828	1028	1228	330	10	100
0429	0629	0829	1029	1229	330	20	100
0430	0630	0830	1030	1230	390	10	100
0431	0631	0831	1031	1231	470	10	100
0432	0632	0832	1032	1232	470	20	100
0433	0633	0833	1033	1233	560	10	100
0434	0634	0834	1034	1234	680	10	100
0435	0635	0835	1035	1235	680	20	100
0436	0636	0836	1036	1236	820	10	100
0437	0637	0837	1037	1237	1,000	10	100
0438	0638	0838	1038	1238	1,000	20	100
0439	0639	0839	1039	1239	1,200	10	100
0440	0640	0840	1040	1240	1,500	10	100
0441	0641	0841	1041	1241	1,500	20	100
0442	0642	0842	1042	1242	1,800	10	100
0443	0643	0843	1043	1243	2,200	10	100
0444	0644	0844	1044	1244	2,200	20	100
0445	0645	0845	1045	1245	2,700	10	100
0446	0646	0846	1046	1246	3,300	10	100
0447	0647	0847	1047	1247	3,300	20	100
0448	0648	0848	1048	1248	3,900	10	100
0449	0649	0849	1049	1249	4,700	10	100
0450	0650	0850	1050	1250	4,700	20	100
0451	0651	0851	1051	1251	5,600	10	50
0452	0652	0852	1052	1252	6,800	10	50
0453	0653	0853	1053	1253	6,800	20	50
0454	0654	0854	1054	1254	8,200	10	50
0455	0655	0855	1055	1255	10,000	10	50
0456	0656	0856	1056	1256	10,000	20	50
Style CKR12, voltage-temperature limits of ±15% and +15, -25%							
					pF	± percent	volts
0457	0657	0857	1057	1257	5,600	10	100
0458	0658	0858	1058	1258	6,800	10	100
0459	0659	0859	1059	1259	6,800	20	100
0460	0660	0860	1060	1260	8,200	10	100
0461	0661	0861	1061	1261	10,000	10	100
0462	0662	0862	1062	1262	10,000	20	100
0463	0663	0863	1063	1263	12,000	10	50
0464	0664	0864	1064	1264	15,000	10	50
0465	0665	0865	1065	1265	15,000	20	50
0466	0666	0866	1066	1266	18,000	10	50
0467	0667	0867	1067	1267	22,000	10	50
0468	0668	0868	1068	1268	22,000	20	50
0469	0669	0869	1069	1269	27,000	10	50

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TABLE I. Dash number and electrical characteristics. -Continued

Dash number Failure rate level (%/1,000 hours)					Capacitance	Capacitance tolerance	DC rated voltage
2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.001(S)			
Style CKR12, voltage-temperature limits of ±15% and +15, -25% -Continued							
					pF	± percent	volts
0470	0670	0870	1070	1270	33,000	10	50
0471	0671	0871	1071	1271	33,000	20	50
0472	0672	0872	1072	1272	39,000	10	50
0473	0673	0873	1073	1273	47,000	10	50
0474	0674	0874	1074	1274	47,000	20	50
Style CKR14, voltage-temperature limits of ±15% and +15, -25%							
					pF	± percent	volts
0475	0675	0875	1075	1275	12,000	10	100
0476	0676	0876	1076	1276	15,000	10	100
0477	0677	0877	1077	1277	15,000	20	100
0478	0678	0878	1078	1278	18,000	10	100
0479	0679	0879	1079	1279	22,000	10	100
0480	0680	0880	1080	1280	22,000	20	100
0481	0681	0881	1081	1281	27,000	10	100
0482	0682	0882	1082	1282	33,000	10	100
0483	0683	0883	1083	1283	33,000	20	100
0484	0684	0884	1084	1284	39,000	10	100
0485	0685	0885	1085	1285	47,000	10	100
0486	0686	0886	1086	1286	47,000	20	100
0487	0687	0887	1087	1287	56,000	10	50
0488	0688	0888	1088	1288	68,000	10	50
0489	0689	0889	1089	1289	68,000	20	50
0490	0690	0890	1090	1290	82,000	10	50
0491	0691	0891	1091	1291	100,000	10	50
0492	0692	0892	1092	1292	100,000	20	50
Style CKR14, voltage-temperature limits of ±15% and +15, -40%							
					pF	± percent	volts
0493	0693	0893	1093	1293	56,000	10	100
0494	0694	0894	1094	1294	68,000	10	100
0495	0695	0895	1095	1295	68,000	20	100
0496	0696	0896	1096	1296	82,000	10	100
0497	0697	0897	1097	1297	100,000	10	100
0498	0698	0898	1098	1298	100,000	20	100
0499	~~0698~~	0899	1099	~~1298~~ 1299	120,000	10	50
0500	0700	0900	1100	1300	150,000	10	50
0501	0701	0901	1101	1301	150,000	20	50
0502	0702	0902	1102	1302	180,000	10	50
0503	0703	0903	1103	1303	220,000	10	50
0504	0704	0904	1104	1304	220,000	20	50
0505	0705	0905	1105	1305	270,000	10	50
Style CKR15, voltage-temperature limits of ±15% and +15, -25%							
					pF	± percent	volts
0506	0706	0906	1106	1306	56,000	10	100
0507	0707	0907	1107	1307	68,000	10	100
0508	0708	0908	1108	1308	68,000	20	100

TABLE I. Dash number and electrical characteristics. -Continued

Dash number: Failure rate level (%/1,000 hours) 2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.001(S)	Capacitance	Capacitance tolerance	DC rated voltage
Style CKR15, voltage-temperature limits of ±15% and +15, -25% -Continued							
					pF	± percent	volts
0509	0709	0909	1109	1309	82,000	10	100
0510	0710	0910	1110	1310	100,000	10	100
0511	0711	0911	1111	1311	100,000	20	100
Style CKR15, voltage-temperature limits of ±15% and +15, -40%							
					pF	± percent	volts
0512	0712	0912	1112	1312	120,000	10	100
0513	0713	0913	1113	1313	150,000	10	100
0514	0714	0914	1114	1314	150,000	20	100
0515	0715	0915	1115	1315	180,000	10	100
0516	0716	0916	1116	1316	220,000	10	100
0517	0717	0917	1117	1317	220,000	20	100
0518	0718	0918	1118	1318	270,000	10	100
0519	0719	0919	1119	1319	330,000	10	100
0520	0720	0920	1120	1320	330,000	20	100
0521	0721	0921	1121	1321	470,000	10	50
0522	0722	0922	1122	1322	470,000	20	50
0523	0723	0923	1123	1323	680,000	10	50
0524	0724	0924	1124	1324	680,000	20	50
0525	0725	0925	1125	1325	1,000,000	10	50
0526	0726	0926	1126	1326	1,000,000	20	50
Style CKR16, voltage-temperature limits of ±15% and +15, -40%							
					pF	± percent	volts
0527	0727	0927	1127	1327	470,000	10	100
0528	0728	0928	1128	1328	470,000	20	100
0529	0729	0929	1129	1329	680,000	10	100
0530	0730	0930	1130	1330	680,000	20	100
0531	0731	0931	1131	1331	1,000,000	10	100
0532	0732	0932	1132	1332	1,000,000	20	100
0533	0733	0933	1133	1333	2,200,000	10	50
0534	0734	0934	1134	1334	2,200,000	20	50
0535	0735	0935	1135	1335	3,300,000	10	50
0536	0736	0936	1136	1336	3,300,000	20	50

Supersession data:
Supersession of capacitors formerly covered by this specification sheet (identified by part number) is as specified in table II.

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TABLE II. Superseded part numbers.

Superseded part number	Replacement part number	Superseded part number	Replacement part number	Superseded part number	Replacement part number	Superseded part number	Replacement part number
0201	0601	0251	0801	0301	1001	0351	1201
0202	0602	0252	0802	0302	1002	0352	1202
0203	0607	0253	0807	0303	1007	0353	1207
0204	0608	0254	0808	0304	1008	0354	1208
0205	0610	0255	0810	0305	1010	0355	1210
0206	0611	0256	0811	0306	1011	0356	1211
0207	0613	0257	0813	0307	1013	0357	1213
0208	0614	0258	0814	0308	1014	0358	1214
0209	0615	0259	0815	0309	1015	0359	1215
0210	0616	0260	0816	0310	1016	0360	1216
0211	0617	0261	0817	0311	1017	0361	1217
0212	0618	0262	0818	0312	1018	0362	1218
0213	0618	0263	0818	0313	1018	0363	1218
0214	0619	0264	0819	0314	1019	0364	1219
0215	0620	0265	0820	0315	1020	0365	1220
0216	0622	0266	0822	0316	1022	0366	1222
0217	0623	0267	0823	0317	1023	0367	1223
0218	0624	0268	0824	0318	1024	0368	1224
0219	0625	0269	0825	0319	1025	0369	1225
0220	0626	0270	0826	0320	1026	0370	1226
0221	0628	0271	0828	0321	1028	0371	1228
0222	0629	0272	0829	0322	1029	0372	1229
0223	0630	0273	0830	0323	1030	0373	1230
0224	0631	0274	0831	0324	1031	0374	1231
0225	0632	0275	0832	0325	1032	0375	1232
0226	0633	0276	0833	0326	1033	0376	1233
0227	0634	0277	0834	0327	1034	0377	1234
0228	0635	0278	0835	0328	1035	0378	1235
0229	1/	0279	1/	0329	1/	0379	1/
0230	0636	0280	0836	0330	1036	0380	1236
0231	0636	0281	0836	0331	1036	0381	1236
0232	0637	0282	0837	0332	1037	0382	1237
0233	0638	0283	0838	0333	1038	0383	1238
0234	0639	0284	0839	0334	1039	0384	1239
0235	0640	0285	0840	0335	1040	0385	1240
0236	0641	0286	0841	0336	1041	0386	1241
0237	0642	0287	0842	0337	1042	0387	1242
0238	0643	0288	0843	0338	1043	0388	1243
0239	0644	0289	0844	0339	1044	0389	1244
0240	0646	0290	0846	0340	1046	0390	1246
0241	0647	0291	0847	0341	1047	0391	1247
0242	0649	0292	0849	0342	1049	0392	1249
0243	0650	0293	0850	0343	1050	0393	1250
0244	0652	0294	0852	0344	1052	0394	1252
0245	0653	0295	0853	0345	1053	0395	1253
0246	0655	0296	0855	0346	1055	0396	1255
0247	0656	0297	0856	0347	1056	0397	1256

1/ These part numbers represented a nonstandard decade value (720 pF) which was deleted with no replacement recommended.

LISTING OF DIODES BY "DESCRIPTION"

	STA NO	DESCRIPTION PARAMETERS						FIG	SLASH
T	1N4565A	DIO REF	.4W	6.4V	100MV	60MA		2D	452
T	1N4566A	DIO REF	.4W	6.4V	50MV	60MA		2D	452
T	1N4567A	DIO REF	.4W	6.4V	20MV	60MA		2D	452
T	1N4568A	DIO REF	.4W	6.4V	10MV	60MA		2D	452
T	1N4569A	DIO REF	.4W	6.4V	5MV	60MA		2D	452
T	1N4570A	DIO REF	.4W	6.4V	100MV	60MA		2D	452
T	1N4571A	DIO REF	.4W	6.4V	50MV	60MA		2D	452
T	1N4572A	DIO REF	.4W	6.4V	20MV	60MA		2D	452
T	1N4573A	DIO REF	.4W	6.4V	10MV	60MA		2D	452
T	1N4574A	DIO REF	.4W	6.4V	5MV	60MA		2D	452
T	1N2824B	DIO REG	50W	5%	27V	1.75MA		5A	114
T	1N3821A	DIO REG	1W	5%	3.3V	276MA		4A	115
T	1N3822A	DIO REG	1W	5%	3.6V	252MA		4A	115
T	1N3823A	DIO REG	1W	5%	3.9V	238MA		4A	115
T	1N3824A	DIO REG	1W	5%	4.3V	213MA		4A	115
T	1N3825A	DIO REG	1W	5%	4.7V	194MA		4A	115
T	1N3826A	DIO REG	1W	5%	5.1V	178MA		4A	115
T	1N3827A	DIO REG	1W	5%	5.6V	162MA		4A	115
T	1N3828A	DIO REG	1W	5%	6.2V	146MA		4A	115
T	1N5518B	DIO REG LND	.4W	5%	3.3V	115MA		1A	437
T	1N5519B	DIO REG LND	.4W	5%	3.6V	105MA		1A	437
T	1N5520B	DIO REG LND	.4W	5%	3.9V	96MA		1A	437
T	1N5521B	DIO REG LND	.4W	5%	4.3V	88MA		1A	437
T	1N5522B	DIO REG LND	.4W	5%	4.7V	81MA		1A	437
T	1N5523B	DIO REG LND	.4W	5%	5.1V	75MA		1A	437
T	1N5524B	DIO REG LND	.4W	5%	5.6V	68MA		1A	437
T	1N5525B	DIO REG LND	.4W	5%	6.2V	61MA		1A	437
T	1N5526B	DIO REG LND	.4W	5%	6.8V	56MA		1A	437
T	1N5527B	DIO REG LND	.4W	5%	7.5V	51MA		1A	437
T	1N5528B	DIO REG LND	.4W	5%	8.2V	46MA		1A	437
T	1N5529B	DIO REG LND	.4W	5%	9.1V	42MA		1A	437
T	1N5530B	DIO REG LND	.4W	5%	10V	38MA		1A	437
T	1N5531B	DIO REG LND	.4W	5%	11V	35MA		1A	437
T	1N5532B	DIO REG LND	.4W	5%	12V	32MA		1A	437
T	1N5533B	DIO REG LND	.4W	5%	13V	29MA		1A	437
T	1N5534B	DIO REG LND	.4W	5%	14V	27MA		1A	437
T	1N5535B	DIO REG LND	.4W	5%	15V	25MA		1A	437
T	1N5536B	DIO REG LND	.4W	5%	16V	24MA		1A	437
T	1N5537B	DIO REG LND	.4W	5%	17V	22MA		1A	437
T	1N5538B	DIO REG LND	.4W	5%	18V	21MA		1A	437
T	1N5539B	DIO REG LND	.4W	5%	19V	20MA		1A	437
T	1N5540B	DIO REG LND	.4W	5%	20V	19MA		1A	437
T	1N5541B	DIO REG LND	.4W	5%	22V	17MA		1A	437
T	1N5542B	DIO REG LND	.4W	5%	24V	16MA		1A	437
T	1N5543B	DIO REG LND	.4W	5%	25V	15MA		1A	437
T	1N5544B	DIO REG LND	.4W	5%	28V	14MA		1A	437
T	1N5545B	DIO REG LND	.4W	5%	30V	13MA		1A	437
T	1N5546B	DIO REG LND	.4W	5%	33V	12MA		1A	437
T	1N3595	DIO SW		125V	150MA	6PF	30SEC	1C	241
T	1N4306	DIO PA IB SW		50V	75MA	2.0PF	4NSEC	1BA	278
T	1N4307	DIO QUAD SW		50V	75MA	2.0PF	4NSEC	11A	284
T	1N4376	DIO SW		10V	50MA	1PF	.75NSEC	1P	282
T	1N5711	DIO SW		50V	20.0MA	2PF	100PS	2F	444
T	1N5712	DIO SW		16V	150MA	1.2PF	100PS	2C	445
T	1N5719	DIO SW		15CV	100MA	.3PF	100PS	2E	443
T	1N5461B	DIO VCAP		30V	6.8PF	2.7	600	1D	436
T	1N5462B	DIO VCAP		30V	8.2PF	2.8	600	1D	436
T	1N5463B	DIO VCAP		30V	10.0PF	2.8	550	1D	436
T	1N5464B	DIO VCAP		30V	12.0PF	2.8	550	1D	436
T	1N5465B	DIO VCAP		30V	15.0PF	2.8	550	1D	436
T	1N5466B	DIO VCAP		30V	18.0PF	2.9	500	1D	436
T	1N5467B	DIO VCAP		30V	20.0PF	2.9	500	1D	436
T	1N5468B	DIO VCAP		30V	22.0PF	2.9	500	1D	436
T	1N5469B	DIO VCAP		30V	27.0PF	2.9	500	1D	436
T	1N5470B	DIO VCAP		30V	33.0PF	2.9	500	1D	436
T	1N5471B	DIO VCAP		30V	39.0PF	2.9	450	1D	436
T	1N5472B	DIO VCAP		30V	47.0PF	2.9	400	1D	436
T	1N5473B	DIO VCAP		30V	56.0PF	2.9	300	1D	436
T	1N5474B	DIO VCAP		30V	68.0PF	2.9	250	1D	436
T	1N5475B	DIO VCAP		30V	82.0PF	2.9	225	1D	436
T	1N5476B	DIO VCAP		30V	100PF	2.9	200	1D	436

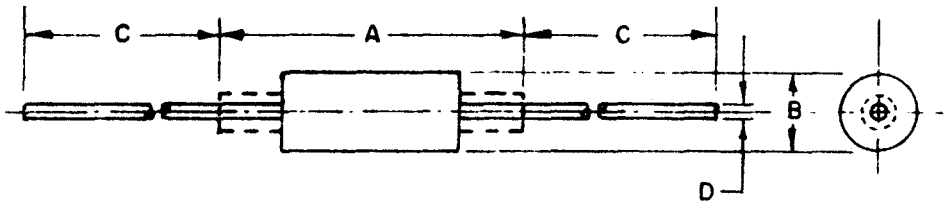


Fig.	Dim A		Dim B		Dim C		Dim D	
	Min	Max	Min	Max	Min	Max	Min	Max
2A	.140	.180	.056	.075	1.000	1.500	.018	.022
2B	.080	.120	.050	.065	1.000	1.500	.018	.022
2C	.315	.360	.120	.150	1.000	1.500	.029	.033
2D	.195	.300	.078	.107	1.000	1.625	.018	.022
2E	.100	.170	.045	.076	.975	1.500	.014	.016
2F	.150	.170	.068	.076	1.000	1.250	.014	.020
2G	.150	.170	.068	.076	1.000	1.250	.014	.016

Figure 2

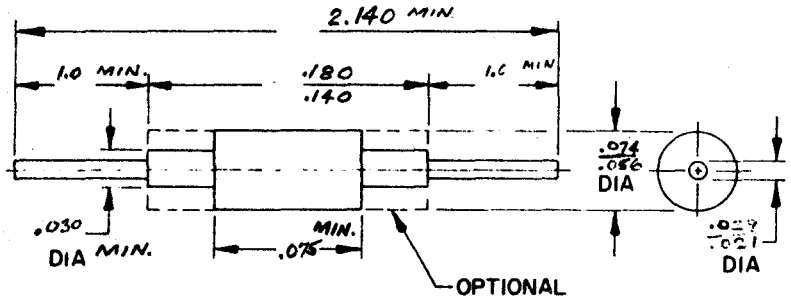


Figure 3A

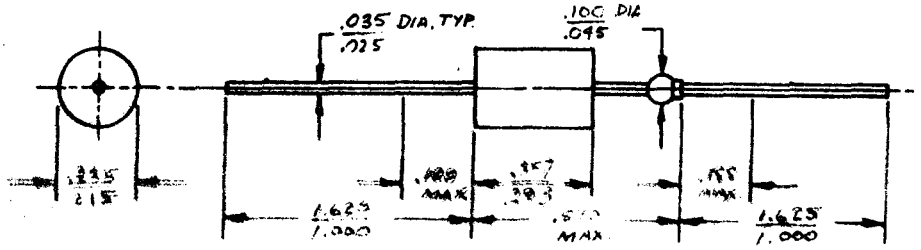


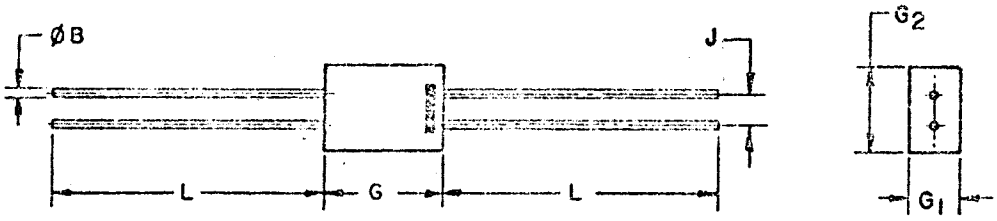
Figure 3B

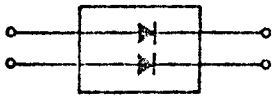
MIL-S-0019500/278B(USAF)
AMENDMENT 1
26 May 1971

MILITARY SPECIFICATION

SEMICONDUCTOR DEVICE, DIODE, SILICON, MATCHED PAIR

TYPES 1N4306 AND TX1N4306





CONNECTION DIAGRAM

LTR	DIMENSIONS				NOTES
	INCHES		MILLIMETERS		
	MIN	MAX	MIN	MAX	
ØB	.019	.021	.48	.53	
G	.435	.455	11.05	11.56	
G_1	.172 Nom		4.37 Nom		
G_2	.290 Nom		7.37 Nom		
J	.115	.135	2.92	3.43	
L	1.000		25.40		

NOTES:
1. Metric equivalents (to the nearest .01 mm) are given for general information only and are based upon 1 inch = 25.4 mm.
2. Unless otherwise specified, tolerance is ±.010(.25 mm).
3. Leads shall be gold plated.
4. Tinned leads may be substituted when specified in the contract or order.
5. All leads shall be electrically isolated from package.

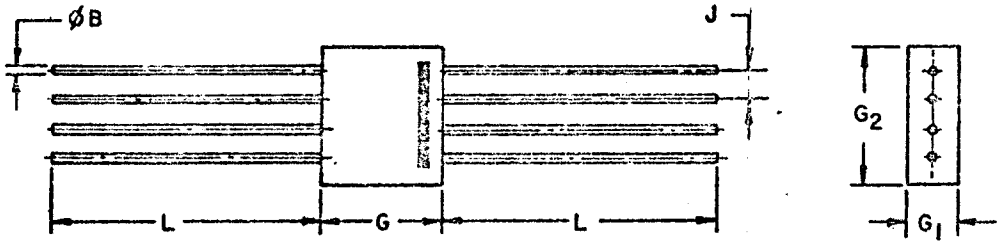
Figure 10A

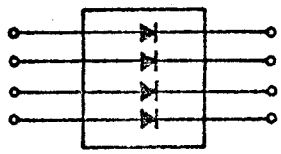
MIL-S-0019500/284B(USAF)
AMENDMENT 1
26 May 1971

MILITARY SPECIFICATION

SEMICONDUCTOR DEVICE, DIODE, SILICON, MATCHED QUAD

TYPES 1N4307 AND TX1N4307





CONNECTION DIAGRAM

LTR	DIMENSIONS				NOTES
	INCHES		MILLIMETERS		
	MIN	MAX	MIN	MAX	
ØB	.019	.021	.48	.53	
G	.435	.455	11.05	11.56	
G_1	.172 Nom		4.37 Nom		
G_2	.490 Nom		12.45 Nom		
J	.115	.135	2.92	3.43	
L	1.000		25.40		

NOTES:
1. Metric equivalents (to the nearest .01 mm) are given for general information only and are based upon 1 inch = 25.4 mm.
2. Unless otherwise specified, tolerance is ±.010(.25 mm).
3. Leads shall be gold plated.
4. Tinned leads may be substituted when specified in the contract or order.
5. All leads shall be electrically isolated from package.

Figure 11A

LISTING OF TRANSISTORS BY "DESCRIPTION"

STAND	DESCRIPTION	PARAMETERS			FIG	SLASH
T	.2N1771A	THYR SCR	PN	4-A 50V 2V- 30MA	TO-64	168
T	.2N1772A	THYR SCR	PN	4-A 100V 2V- 30MA	TO-64	168
T	.2N1774A	THYR SCR	PN	4-A 200V 2V- 30MA	TO-64	168
T	.2N1776A	THYR SCR	PN	4-A 300V 2V- 30MA	TO-64	168
T	.2N1777A	THYR SCR	PN	4-A 400V 2V- 30MA	TO-64	168
T	.2N2323	THYR SCR	PN	.22A 50V 1V-350UA	TO-5	276
T	.2N2323A	THYR SCR	PN	.22A 50V .9V-750A	TO-5	276
T	.2N2324	THYR SCR	PN	.22A 100V 1V-350UA	TO-5	276
T	.2N2324A	THYR SCR	PN	.22A 100V .9V-750A	TO-5	276
T	.2N2326	THYR SCR	PN	.22A 200V 1V-350UA	TO-5	276
T	.2N2326A	THYR SCR	PN	.22A 200V .9V-750A	TO-5	276
T	.2N2328	THYR SCR	PN	.22A 300V 1V-350UA	TO-5	276
T	.2N2328A	THYR SCR	PN	.22A 300V .9V-750A	TO-5	276
T	.2N2329	THYR SCR	PN	.22A 400V 1V-350UA	TO-5	276
T	2N3027	THYR SCR	PN	175mA 30V .8V-200MA	TO-18	419
T	2N3028	THYR SCR	PN	175mA 60V .8V-200MA	TO-18	419
T	2N3029	THYR SCR	PN	175mA 100V .8V-200MA	TO-18	419
T	2N3030	THYR SCR	PN	175mA 30V .6V-20MA	TO-18	419
T	2N3031	THYR SCR	PN	175mA 60V .6V-20MA	TO-18	419
T	2N3032	THYR SCR	PN	175mA 100V .6V-20MA	TO-18	419
T	2N682	THYR SCR	PN	16-A 50V 3V 80MA	FIG 7	108
T	2N683	THYR SCR	PN	16-A 100V 3V 80MA	FIG 7	108
T	2N685	THYR SCR	PN	16-A 200V 3V 80MA	FIG 7	108
T	2N686	THYR SCR	PN	16A 250V 3V 80MA	FIG 7	108
T	2N687	THYR SCR	PN	16A 300V 3V 80MA	FIG 7	108
T	2N688	THYR SCR	PN	16A 400V 3V 80MA	FIG 7	108
T	2N689	THYR SCR	PN	16A 500V 3V 80MA	FIG 7	108
T	2N690	THYR SCR	PN	16A 600V 3V 80MA	FIG 7	108
T	2N691	THYR SCR	PN	16A 700V 3V 80MA	FIG 7	108
T	2N692	THYR SCR	PN	16A 800V 3V 80MA	FIG 7	108
T	2N2417A	THYR UJT	PN	.35w+ 60V 4.7-6.8 .51-.62	TO-18	*75
T	2N2418A	THYR UJT	PN	.35w+ 60V 6.2-9.1 .51-.62	TO-18	*75
TM	2N2419A	THYR UJT	PN	.35w+ 60V 4.7-6.8 .55-.68	TO-18	*75
T	2N2420A	THYR UJT	PN	.35w+ 60V 6.2-9.1 .56-.68	TO-18	*75
T	2N2421A	THYR UJT	PN	.35w+ 60V 4.7-6.8 .62-.75	TO-18	*75
T	2N2422A	THYR UJT	PN	.35w+ 60V 6.2-9.1 .62-.75	TO-18	*75
T	2N489A	THYR UJT	PN	.6w+ 60V 4.7-6.8 .51-.62	TO-5*	75
T	2N490A	THYR UJT	PN	.6w+ 60V 6.2-9.1 .51-.62	TO-5*	75
TM	2N491A	THYR UJT	PN	.6w+ 60V 4.7-6.8 .56-.68	TO-5*	75
T	2N492A	THYR UJT	PN	.6w+ 60V 6.2-9. .56-.68	TO-5*	75
T	2N493A	THYR UJT	PN	.6w+ 60V 4.7-6.8 .62-.75	TO-5*	75
T	2N494A	THYR UJT	PN	.6w+ 60V 6.2-9.1 .62-.75	TO-5*	75
T	.2N4947	THYR UJT	PN	.36w 30V 4-9.1K .51-.69	TO-18	*38
T	.2N4948	THYR UJT	PN	.36w 30V 4-12K .55-.82	TO-18	*38
T	.2N4949	THYR UJT	PN	.36w 30V 4-12K .74-.86	TO-18	*38
T	2N3431	THYR UJT	PN	.3W 30V 6-9.5K .72-.80	TO-18	425
T	2N1483	XSTR AMPL PWR	N	25w 60V 20-60(750)	TO-8	180
T	2N1484	XSTR AMPL PWR	N	25w 100V 20-60(750)	TO-8	180
T	.2N1485	XSTR AMPL PWR	N	25w 60V 35-100(750)	TO-8	180
TM	2N1486	XSTR AMPL PWR	N	25w 100V 35-100(750)	TO-8	180
T	.2N1722	XSTR AMPL PWR	N	50w 175V 30-90 (2A)	TO-53	262
TM	.2N1724	XSTR AMPL PWR	N	50w 175V 30-90 (2A)	TO-61	262
TM	.2N1893	XSTR AMPL RF	N	3w 120V 40-120(150)	TO-5	182
T	.2N2150	XSTR AMPL PWR	N	30w 150V 20-60 (1A)	FIG 1	277
T	.2N2151	XSTR AMPL PWR	N	30w 150V 40-120 (1A)	FIG 1	277

LISTING OF TRANSISTORS BY "DESCRIPTION"

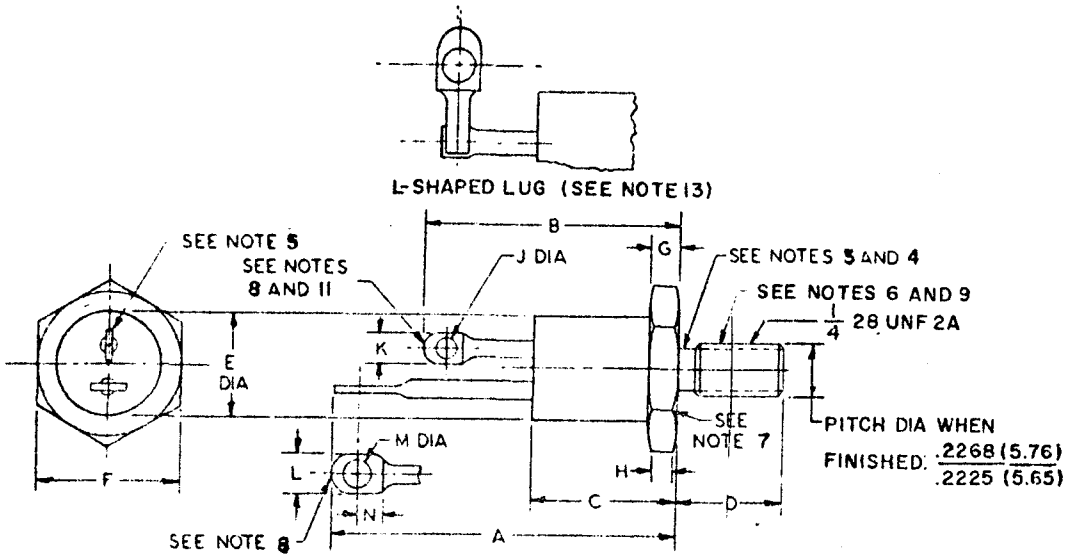
STANC	DESCRIPTION PARAMETERS					REG SLASH
T 2N2484	XSTR AMPL LL	N	1.2m	60V 200-900(100A)		TO-18 376
T .2N2657	XSTR AMPL UHF	N	.3W	30V 30-150(3)		TO-72 343
T .2N3019	XSTR AMPL RF	N	.5W	140V 50-200(0.1)		TO-5 391
T .2N3055	XSTR AMPL PWR	N	117W	100V 20-60(4A)		TO-3 407
T .2N3057A	XSTR AMPL RF	N	.4W	140V 50-200(0.1)		TO-46 391
T .2N3375	XSTR AMPL RF PWR	N	11.6W	65V 3W 400MHZ		TO-60 *34
T .2N3553	XSTR AMPL RF PWR	N	7W	65V 2.5W 175MHZ		TO-39 341
T .2N3700	XSTR AMPL RF	N	5W	140V 50-200(0.1)		TO-18 391
T .2N3739	XSTR AMPL AF	N	3W *	325V 40-200(100)		TO-66 402
T 2N3742	XSTR AMPL HV	N	5W	300V 30-120 (30)		TO-39 405
T 2N3743	XSTR AMPL HV	P	5W	300V 50-200 (30)		TO-39 397
T .2N3646	XSTR AMPL PWR	N	4W*	300V 12-60(10A)		TO-63 412
T .2N3647	XSTR AMPL PWR	N	4W*	400V 12-60(10A)		TO-63 412
T .2N3866	XSTR AMPL UHF	N	1W*	60V 15-200(50)		TO-39 398
T .2N3902	XSTR AMPL HV	N	100W	400V 30-90 (1A)		TO-3 371
T .2N4440	XSTR AMPL RF PWR	N	11.6W	65V 4W 400MHZ		TO-60 *34
T 2N4926	XSTR AMPL HV	N	5W	250V 30-120(30)		TO-39 405
T 2N4927	XSTR AMPL HV	N	5W	250V 30-120(30)		TO-39 405
T 2N4930	XSTR AMPL HV	P	5W	250V 50-200(30)		TO-39 397
T 2N4931	XSTR AMPL HV	P	5W	250V 50-200(30)		TO-39 397
T 2N4957	XSTR AMPL LNA	P	.2W*	30V 30-150(5)		TO-72 426
T .2N5016	XSTR AMPL RF PWR	N	30W	30V 15MIN 400MHZ		TO-60 400
T 2N5157	XSTR AMPL HV	N	100W	500V 30-90(1.5A)		TO-3 371
TM.2N720A	XSTR AMPL RF	N	1.8W	120V 40-120(150)		TO-18 182
TM 2N910	XSTR AMPL AF	N	1.0W	100V 75-300(10)		TO-18 274
T 2N911	XSTR AMPL AF	N	1.8W	100V 35-140(10)		TO-18 274
T 2N912	XSTR AMPL AF	N	1.4W	100V 15-60(10)		TO-18 274
TM.2N918	XSTR AMPL UHF	N	.3W	30V 6 MIN(100MHZ)		TO-72 301
T 2N929	XSTR AMPL LP	N	.6W	60V 40-120(10UA)		TO-18 253
TM.2N930	XSTR AMPL LP	N	.6W	60V 100-300(10UA)		TO-18 253
T 2N1613	XSTR AMPL&SW	N	3W	75V 40-120(150)		TO-5 161
T .2N1711	XSTR AMPL&SW	N	3W	75V 100-300(150)		TO-5 225
T .2N1890	XSTR AMPL&SW	N	3W	100V 100-300(150)		TO-5 225
TM.2N2034	XSTR AMPL&SW	N	7.5W	60V 20-60 (1A)		TO-5 281
T .2N2216	XSTR AMPL&SW	N	3W	60V 35MIN(10)		TO-5 251
T .2N2218A	XSTR AMPL&SW	N	3W	75V 40MIN(10)		TO-5 251
T .2N2219	XSTR AMPL&SW	N	3W	60V 75MIN(10)		TO-5 251
TM.2N2219A	XSTR AMPL&SW	N	3W	75V 100MIN(10)		TO-5 251
T .2N2221	XSTR AMPL&SW	N	1.8W	60V 35MIN(10)		TO-18 255
T .2N2221A	XSTR AMPL&SW	N	1.8W	75V 40MIN(10)		TO-18 255
T .2N2222	XSTR AMPL&SW	N	1.8W	60V 75MIN(10)		TO-18 255
TM.2N2222A	XSTR AMPL&SW	N	1.8W	75V 100MIN(10)		TO-18 255
T .2N2656	XSTR AMPL&SW	N	7.5W	100V 20-60(1A)		TO-5 281
T .2N2659	XSTR AMPL&SW	N	7.5W	120V 20-60(1A)		TO-5 381
T .2N2911	XSTR AMPL&SW	N	7.5W	150V 20-60(1A)		TO-5 381
T 2N3250A	XSTR AMPL&SW	P	1.2W	60V 50-150(10)		TO-18 323
T .2N3251A	XSTR AMPL&SW	P	1.2W	60V 100-300(10)		TO-18 323
T .2N3498	XSTR AMPL&SW	N	5W	100V 40-120(150)		TO-5 366
T .2N3499	XSTR AMPL&SW	N	5W	100V 100-300(150)		TO-5 366
T .2N3500	XSTR AMPL&SW	N	5W	150V 40-120(150)		TO-5 366
T .2N3501	XSTR AMPL&SW	N	5W	150V 100-300(150)		TO-5 366
T .2N3634	XSTR AMPL&SW	P	5W	140V 50-150(150)		TO-5 357
T .2N3635	XSTR AMPL&SW	P	5W	140V 100-300(150)		TO-5 357
T .2N3636	XSTR AMPL&SW	P	5W	50-150(50)		TO-5 357
T .2N3637	XSTR AMPL&SW	P	5W	50-150(50-300(50)		TO-5 357

LISTING OF TRANSISTORS BY "DESCRIPTION"

STAND	DESCRIPTION	PARAMETERS				FIG	SLASH
T 2N4453	XSTR AMPL&SW	P	.3W*	25V	40-120(10)	TO-18	283
TM.2N718A	XSTR AMPL&SW	N	1.0W	75V	40-120(150)	TO-18	181
T .2N869A	XSTR AMPL&SW	P	.36W*	25V	40-120(10)	TO-18	283
T .2N2432	XSTR CHP	N	.6W	30V	20 OHM	TO-18	313
T .2N2432A	XSTR CHP	N	.6W	40V	15 OHM	TO-18	313
T .2N2944A	XSTR CHP	P	.4W*	15V	40HM	TO-46	382
T .2N2945A	XSTR CHP	P	.4W*	25V	60HM	TO-46	382
T .2N2946A	XSTR CHP	P	.4W*	40V	80HM	TO-46	382
T 3N127	XSTR CHP DE	N	.3W	35V	150V OFS	TO-72	390
T .3N74	XSTR CHP DE	N	.6W	50V	500V OFS	TO-72	390
T .3N75	XSTR CHP DE	N	.6W	50V	350V OFS	TO-72	390
T .3N76	XSTR CHP DE	N	.6W	50V	200V OFS	TO-72	390
T 2N3638	XSTR COMP	NP	1.4W	60V	100-300(150)	TO-5*	421
T 2N4854	XSTR COMP	NP	2W	60V	100-300(150)	TO-5*	421
T 2N3810	XSTR DIFF AMPL	P	.6W	60	100-300 (100uA)	TO-5*	336
T 2N3811	XSTR DIFF AMPL	P	.6W	60	300-900 (100uA)	TO-5*	336
TM.2N2060	XSTR DIFFAMPL	N	5W	150V	60MEGOHM	TO-5*	270
T 2N2639	XSTR DIFFAMPL	N	1.2W	40V	50-150(100uA)	TO-5*	316
T 2N2642	XSTR DIFFAMPL	N	1.2W	40V	100-300(100uA)	TO-5*	316
T .2N2919	XSTR DIFFAMPL	N	1.25W	70V	60-240(100uA)	TO-5*	355
TM.2N292C	XSTR DIFFAMPL	N	1.25W	70V	175-500(100uA)	TO-5*	355
T 2N5545	XSTR DUAL JFET	N	.4W*	50V	3.6MV	TO-71	430
T 2N5546	XSTR DUAL JFET	N	.4W*	50V	1.8MV	TO-71	430
T 2N5547	XSTR DUAL JFET	N	.4W*	50V	3.6MV	TO-71	430
T 2N2497	XSTR JFET	P	.5W*	20V	1500-6000	TO-5	378
T 2N2498	XSTR JFET	P	.5W*	20V	1500-6000	TO-5	378
T 2N2499	XSTR JFET	P	.5W*	20V	2500-6000	TO-5	378
T 2N2500	XSTR JFET	P	.5W*	20V	1000-2500	TO-5	378
T 2N3329	XSTR JFET	P	.3W*	20V	1000-2500	TO-72	378
T 2N3330	XSTR JFET	P	.3W*	20V	1500-3000	TO-72	378
T 2N3331	XSTR JFET	P	.3W*	20V	2500-4000	TO-72	378
T 2N3332	XSTR JFET	P	.3W*	20V	1000-2200	TO-72	378
T .2N3821	XSTR JFET	N	.3W*	50V	1000-4500	TO-72	375
T .2N3822	XSTR JFET	N	.3W*	50V	3000-6500	TO-72	375
T .2N3823	XSTR JFET	N	.3W*	30V	35 6500	TO-72	375
T 2N4091	XSTR JFET SW	N	.36W*	40V	30 OHM	TO-18	431
T 2N4092	XSTR JFET SW	N	.36W*	40V	50 OHM	TO-18	431
T 2N4093	XSTR JFET SW	N	.36W*	40V	80 OHM	TO-18	431
T .2N4856	XSTR JFET	N	.36W*	40V	25OHM	TO-18	385
T .2N4857	XSTR JFET	N	.36W*	40V	40OHM	TO-18	385
T .2N4858	XSTR JFET	N	.36W*	40V	60OHM	TO-18	385
T .2N4859	XSTR JFET	N	.36W*	30V	25OHM	TO-18	385
T .2N486C	XSTR JFET	N	.36W*	30V	40OHM	TO-18	385
T .2N4861	XSTR JFET	N	.36W*	30V	60OHM	TO-18	385
T 2N4416A	XSTR JFETAMPL	N	.3W*	35V	4500-900	TO-72	428
T 2N3740	XSTR PWR	P	25W	60	30-300 (250MA)	TO-66	441
T 2N3741	XSTR PWR	P	25W	60	30-120 (250MA)	TO-66	441
T 2N3771	XSTR PWR	N	150W	50V	15-60 15A)	TO-3	413
T 2N3772	XSTR PWR	N	150W	100V	15-60(10A)	TO-3	413
T 2N5241	XSTR PWR	N	125W	400V	15-30(2.5A)	TO-3	414
T 2N4405	XSTR PWR AF	P	5W	80	100-300 15C	TO-39	448
TM.2N3749	XSTR PWR HS	N	30W	110V	15 MIN (5A)	FIG 3	315
T 2N2812	XSTR PWR SW	N	50W	80V	15MIN(10A)	TO-61	415
T 2N2814	XSTR PWR SW	N	50W	8120V	15MIN (10A)	TO-61	415
TM.2N2880	XSTR PWR SW	N	30W	110V	15MIN 5A)	FIG2	315

LISTING OF TRANSISTORS BY "DESCRIPTION"

STANC	DESCRIPTION PARAMETERS					FIG SLASH
T .2N3715	XSTR PWR SW	N	150W	80V	30-120(3A)	TO-3 408
T .2N3716	XSTR PWR SW	N	150W	100V	30-120 (3A)	TO-3 408
T .2N3791	XSTR PWR SW	P	150W	60V	30-120(3A)	TO-3 379
T .2N3792	XSTR PWR SW	P	150W	80V	30-120(3A)	TO-3 379
T .2N3996	XSTR PWR SW	N	30W	100V	40-120(1A)	FIG 4 374
T .2N3997	XSTR PWR SW	N	30W	100V	80-240(1A)	FIG 4 374
T .2N3998	XSTR PWR SW	N	30W	100V	40-120(1A)	FIG 5 374
T .2N3999	XSTR PWR SW	N	30W	100V	80-240(1A)	FIG 5 374
T 2N4399	XSTR PWR SW	P	115W	60	15-60 (10A)	TO-3 433
T .2N4865	XSTR PWR SW	N	350W	100V	10-40(70A)	FIG 380
T 2N5038	XSTR PWR SW	N	150W	100	12-48 (2A)	TO-3 439
T 2N5039	XSTR PWR SW	N	150W	125	12-48 (2A)	TO-3 439
T .2N5250	XSTR PWR SW	N	350W	120V	10-40(70A)	FIG 6 380
T .2N5251	XSTR PWR SW	N	350W	100V	10-40(70A)	FIG 6 380
T 2N5745	XSTR PWR SW	P	115W	80	15-60 (10A)	TO-3 433
T 2N5926	XSTR PWR SW	N	200W	150	10-40 (50A)	TO-63 447
T 2N5927	XSTR PWR SW	N	200W	150V	10-40 (70A)	FIG 6 440
T 2N5957	XSTR PWR SW	N	100W	100V	10 (20A)	FIG 6 451
T 2N5958	XSTR PWR SW	P	100W	100V	10 (20A)	FIG 6 450
T 2N5959	XSTR PWR SW	N	100W	100V	10 (20A)	FIG 6 451
T 2N5960	XSTR PWR SW	P	100W	100V	10 (20A)	FIG 6 450
T 2N5071	XSTR PWR UHF	N	70W	35	10-100 (3A)	TO-60 442
T .2N3959	XSTR SW	N	.4W+	20V	60-300(10)	TO-18 399
T .2N3960	XSTR SW	N	.4W+	20V	60-300(10)	TO-18 399
T 2N5561	XSTR SW	N	2W	75V	40-120(150)	TO-46 423
T 2N5562	XSTR SW	N	2W	75V	100-300(150)	TO-46 423
T 2N914	XSTR SW FS	N	1.2W	40V	30-120(10)	TO-18 373
T .2N2369A	XSTR SW HS	N	1.2W	40V	40-120(10)	TO-18 317
T .2N2481	XSTR SW HS	N	1.2W	40V	40-120(10)	TO-18 266
T .2N2904	XSTR SW HS	P	3W	40V	40-120(150)	TO 5 290
T .2N2904A	XSTR SW HS	P	3W	60V	40-120(150)	TO 5 290
T .2N2905	XSTR SW HS	P	3W	40V	100-300(150)	TO 5 290
TM.2N2905A	XSTR SW HS	P	3W	60V	100-300(150)	TO 5 290
T .2N2906	XSTR SW HS	P	1.8W	40V	40-120(150)	TO-18 291
T .2N2906A	XSTR SW HS	P	1.8W	60V	40-120(150)	TO-18 291
T 2N2907	XSTR SW HS	P	1.8W	40V	100-300(150)	TO-18 291
TM.2N2907A	XSTR SW HS	P	1.8W	60V	100-300(150)	TO-18 291
T .2N3485A	XSTR SW HS	P	2W	60V	40-120(150)	TO-46 392
T .2N3486A	XSTR SW HS	P	2W	60V	120-300(150)	TO-46 392
T .2N3506	XSTR SW HS	N	5W	60V	40-200(1.5A)	TO-5 349
T .2N3507	XSTR SW HS	N	5W	60V	30-150(1.5A)	TO-5 349
T .2N3735	XSTR SW HS	N	1W+	75V	40-140(500)	TO-5 395
T .2N3737	XSTR SW HS	N	.5W+	75V	40-140(500)	TO-46 395
T .2N3763	XSTR SW HS	P	1W+	60V	40-140(500)	TO-5 396
T .2N3765	XSTR SW HS	P	.5W+	60V	40-140(500)	TO-46 396
T .2N3867	XSTR SW HS	P	10W	40V	40-200(1.5A)	TO-5 350
T .2N3868	XSTR SW HS	P	10W	60V	30-150(1.5A)	TO-5 350
T .2N4449	XSTR SW HS	N	1.5W	40V	40-120(10)	TO-46 317
TM 2N708	XSTR SW HS	N	1.2W	40V	40-120(10)	TO-18 312
T 2N3418	XSTR SW MED PWR	N	15W	80V	20-60 (1A)	TO-5 393
T .2N3419	XSTR SW MED PWR	N	15W	125V	20-60 (1A)	TO-5 393
T .2N3420	XSTR SW MED PWR	N	15W	80V	40-120 (1A)	TO-5 393
T .2N3421	XSTR SW MED PWR	N	15W	125V	40-120(1A)	TO-5 393
TM.2N4150	XSTR SW PWR	N	1.5W+	100V	40-120(5A)	TO-5 394
T .2N5237	XSTR SW PWR	N	1.5W+	100V	40-120(5A)	TO-5 394
T .2N5238	XSTR SW PWR	N	1.5W+	200V	40-120(5A)	TO-5 394
T 2N5332	XSTR SW RT	P	1.2W	20V	20- 0 (1)	TO-46 409
T 2N5399	XSTR SW RT	N	1.2W	20V	30-90 (1)	TO-46 410

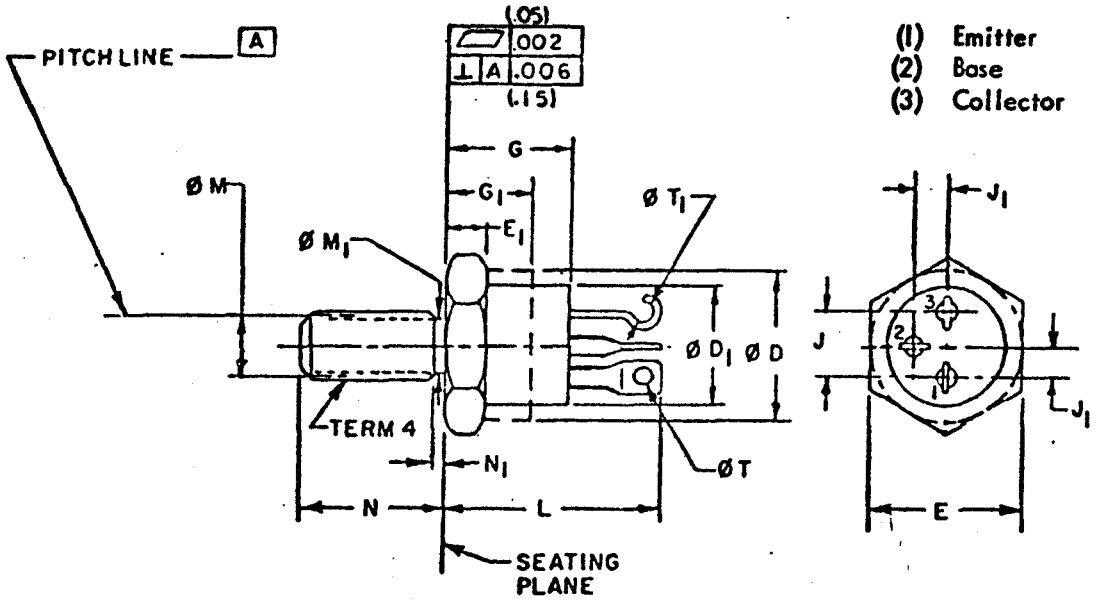


LTR	DIMENSIONS				NOTES
	INCHES		MILLIMETERS		
	MIN	MAX	MIN	MAX	
A		1.193		30.30	
B		.875		22.23	
C	.330	.505	8.38	12.83	
D	.422	.453	10.72	11.51	
E		.544		13.82	
F	.544	.562	13.82	14.27	
G	.113	.200	2.87	5.08	
H	.060		1.52		
J	.060	.075	1.52	1.91	
K	.115	.140	2.92	3.56	
L	.210	.300	5.33	7.62	
M	.125	.165	3.18	4.19	
N	.120		3.05		

NOTES:
1. Metric equivalents (to the nearest .01 mm) are given for general information only and are based upon 1 inch = 25.4 mm.
2. Millimeters are in parentheses.
3. Complete threads to extend to within 2-1/2 threads of head.
4. Diameter of unthreaded portion .249 (6.32) maximum, .220 (5.59) minimum.
5. Angular orientation of these terminals to each other and to the hexagon is undefined.
6. Maximum pitch diameter of plated threads shall be basic pitch diameter .2268 (5.76). Ref: Screw-Thread Standards for Federal Services - 1957; Handbook H28, Part I.
7. A chamfer (or undercut) on one or both ends of hexagonal portions is optional.
8. Square or radius on end of terminal is optional.
9. Stud is anode connection.
10. Large terminal is cathode connection.
11. Small terminal is gate connection.
12. Dimensions are in inches.
13. The terminals may be constructed L-Shaped. The end of the lugs shall not protrude beyond the .562/.544 (14.27/13.82) hex dimension.

Semiconductor device, thyristors (controlled rectifiers) types 2N682, 2N683, 2N685 thru 2N692 (TO-48).

Figure 7



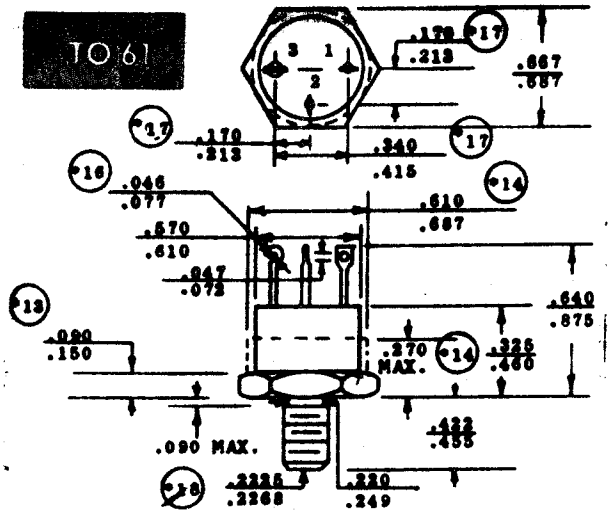
LTR	DIMENSIONS				NOTES
	INCHES		MILLIMETERS		
	MIN	MAX	MIN	MAX	
ØD	.610	.687	15.50	17.44	2
ØD1	.570	.610	14.48	15.49	
E	.669	.688	17.00	17.47	
E1	.090	.150	2.29	3.81	1
G	.325	.460	8.26	11.68	
G1		.270		6.85	2
J1	.170	.213	4.32	5.41	5
J	.340	.415	8.64	10.54	5
L	.640	.875	16.26	22.22	
ØM					3
ØM1	.220	.249	5.59	6.32	
N	.422	.455	10.72	11.55	
N1		.090		2.28	6
ØT	.047	.072	1.20	1.82	
ØT1	.046	.077	1.17	1.95	4

NOTES

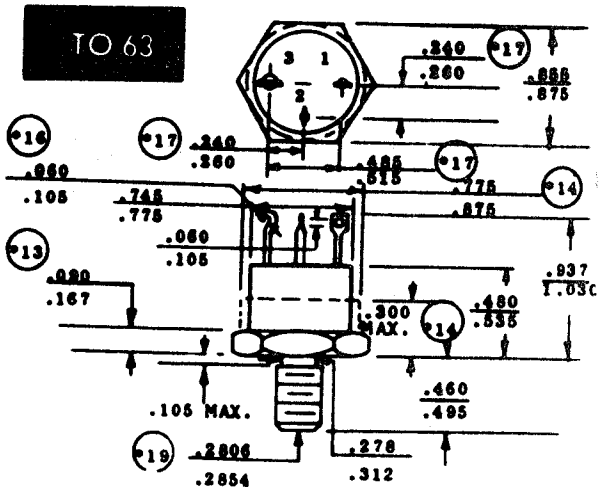
1. Chamfer or undercut on one or both ends of haxagonal portion is optionsl.
2. Package contour with the exception of the hexagon is optional within dimensions specified.
3. Pitch diameter 1/4-28 UNF-2A (coated) -.2268 (5.76 mm).
4. This terminal can be flattened and pierced or hook type.
5. Position of leads in relation to the hexagon is not controlled.
6. Length of incomplete or undercut threads of ϕM_1.
7. 2N5957 and 2N5958 collector is electrically connected to case.
8. 2N5959 and 2N2960 all leads electrically isolated from case.

Figure 8

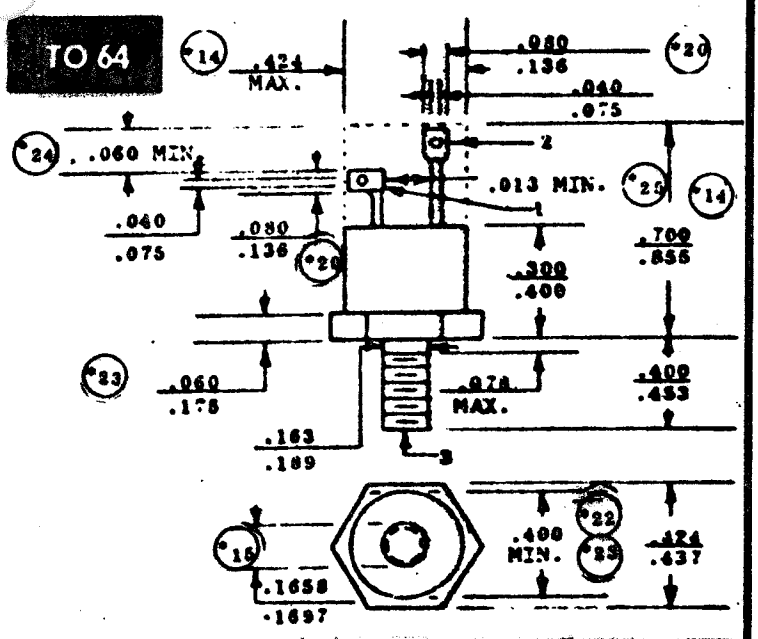
TO 61



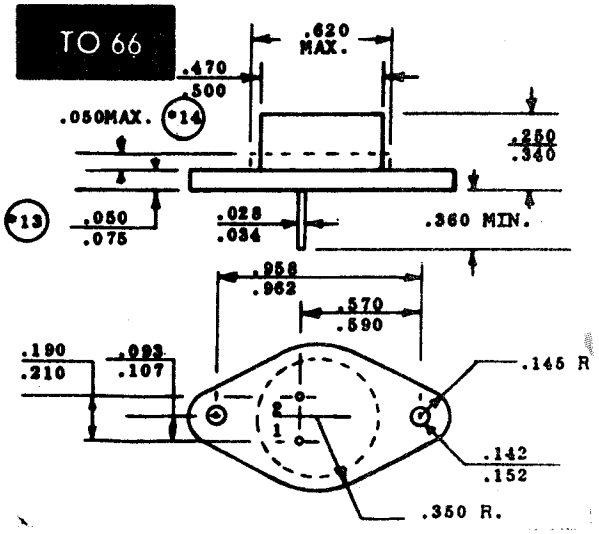
TO 63



TO 64

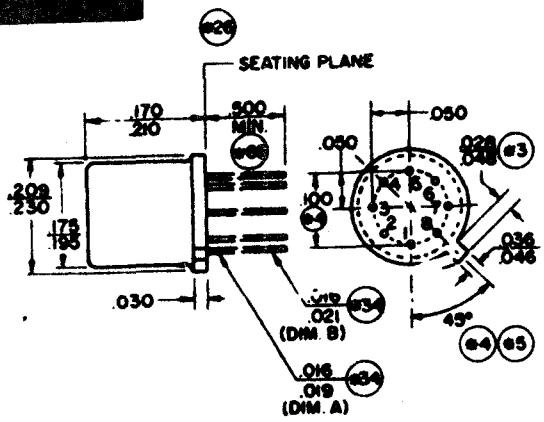


TO 66

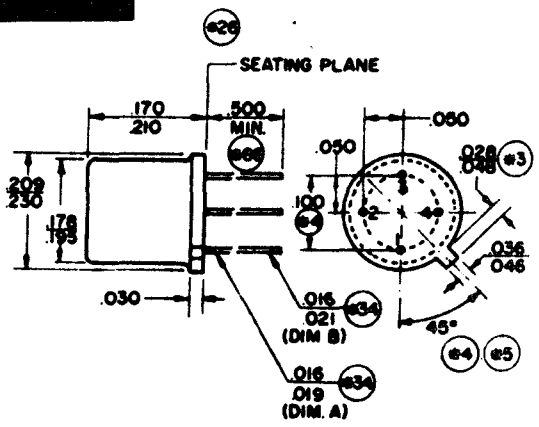


*For Notes - See Page 4.0.17

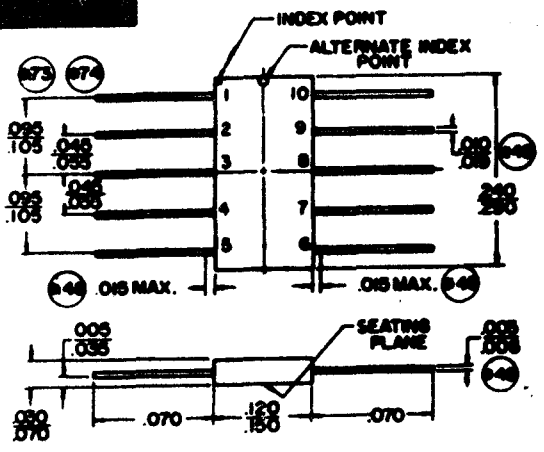
TO 71



TO 72



TO 89



* For Notes - See Page 4.0.17

ATTACHMENT IV

SUMMARY OF ELECTRONICS PART TYPE

USED IN ALSEP ARRAY E

(BxA DESIGNED EQUIPMENT)

This Attachment is provided for information only and should not be considered as an acceptable Parts List.

SUMMARY OF ELECTRONICS PART TYPE USED IN ALSEP

Part No./Type	Part Name	MIL Spec	Vendor's Name	Commercial Equiv. Type
CLR25	CAPACITOR	C-39006	G.E.	
CMR02	CAPACITOR	C-39001	ELMENCO	
ECY10	CAPACITOR	MSFC400A	CORNING	
RCR05	RESISTOR	R-39008	ALLEN BRAD	
RCR07	RESISTOR	R-39008	ALLEN BRAD	
RCR20	RESISTOR	R-39008	ALLEN BRAD	
RCR32	RESISTOR	R-39008	ALLEN BRAD	
RLR05	RESISTOR	R-39017	CORNING	
RLR07	RESISTOR	R-39017	CORNING	
RLR20	RESISTOR	R-39017	CORNING	
RNR55	RESISTOR	R-55182	*	
RNR57	RESISTOR	R-55182	MEPCO	
RNR65	RESISTOR	R-55182	MEPCO	
RWR71	RESISTOR	R-39007	DALE	
RWR80	RESISTOR	R-39007	DALE	
RWR81	RESISTOR	R-39007	DALE	
SM1N914	DIODE	50M60197	GE/TI	
SM101G-1	MICROCKT	85M03910	NATIONAL	
SM104G	MICROCKT	85M03889	NATIONAL	
SM105F	MICROCKT	85M03889	NATIONAL	
SM105G	MICROCKT	85M03889	NATIONAL	
SM107G-1	MICROCKT	85M03910	NATIONAL	
SM2N2905A	TRANSISTOR	50M60198	TI	
SM2N2907A	TRANSISTOR	50M60198	TI	
SM4419C	TRANSISTOR	50M60205	TI	
S1N645	DIODE	85M01645	GEN. INST	
S1N750A	DIODE	85M01308	DICKSON	
S1N751A	DIODE	85M01308	DICKSON	
S1N754A	DIODE	85M01308	DICKSON	
S1N755A	DIODE	85M01308	DICKSON	
S1N757A	DIODE	85M01308	DICKSON	
S1N916B	DIODE	85M01305	FAIRCHILD	
S1N963B	DIODE	85M01309	DICKSON	
S1N4942	DIODE	85M03895	SEM. TECH.	
S1N5417	DIODE	85M03896	SEM. TECH.	
S2N910	TRANSISTOR	85M01677	TI	
S2N918	TRANSISTOR	85M01674	TI	

*RNR55 S MEPCO/SCHWEBER Up to 100K

RNR55 R VAMISTOR 100K-300K

SUMMARY OF ELECTRONICS PART TYPE USED IN ALSEP (CONTD)

Part No./Type	Part Name	MIL Spec	Vendor's Name	Commercial Equiv. Type
S2N2060	TRANSISTOR	85M02708	TI/GE	
S2N2222A	TRANSISTOR	85M02699	TI	
S2N2419B	TRANSISTOR	85M01102	GE	
S2N2920	TRANSISTOR	85M02710	TI	
S2N4863	TRANSISTOR	85M03773	SOLITRON	
2330151 -XX	RELAY		TELEDYNE	421-3051
2331210 -XX	CONNECTOR		SCHJELDAHL	
2334459 -XX	TRANSISTOR		RCA	2N3263
2335190 -1	TRANSISTOR		T. I.	2N3049
2335191 -1	TRANSISTOR		T. I.	2N3045
2335293 -1	SWITCH			
2335661 -2	THERMISTOR		FENWAL	GB42MM62
2335662 -1	THERMISTOR		TYLAN	FG108N
2340305 -1	MICROCKT		NATIONAL	DM7800H
2340307 -1	MICROCKT		NATIONAL	LM102F
2340311 -1	MICROCKT		NATIONAL	LM111H
2340312 -1	MICROCKT		NATIONAL	LM107
2340313 -1	CRYSTAL		MONITOR	
2340319 -XX	INDUCTOR		DELVAN	1025-XXX
2340328 -1	MICROCKT		AMI	UL02C
2340329 -1	MICROCKT		AMI	MX02D
2340330 -1	MICROCKT		AMI	SPO1C
2340338 -XX	DIODE		DICKSON	1N4568A-84A
2340351 -4	HEATER		MINCO	
2340353 -XX	RESISTOR		IRC	CEA
2340354 -1	CONNECTOR		OMNI. SPECTRA	SPEC
2340355 -XX	DIODE		DICKSON	1N4370A-71A
2340356 -1	TRANS-FORMER		O. SCHOTT	SPEC.
2340362 -X	CONNECTOR			
2340363 -1	DIODE (1)		DICKSON	1N4568A-SEL
2340365 -1	TRANS-FORMER		O. SCHOTT	SPEC
2340366 -1	TRANSISTOR		T. I./SILCONIX	2N4416A
2330367 -XX	RESISTOR		CADDOCK	MH681-XX
2330368 -1	MICROCKT		NATIONAL	NH0019-SEL
2330369 -XX	CONNECTOR		MICRODOT	MCDB1
2330370 -1	DIODE		TRW	IID4790682

(1) Selected From 2340338

SUMMARY OF ELECTRONICS PART TYPE USED IN ALSEP (CONTD)

Part No./Type	Part Name	MIL Spec	Vendor's Name	Commercial Equiv. Type
2330372-5	FILTER	85M03773	ERIE	1250-700
2330376-1	DIODE	85M03773	UNITRODE	UTR4310
2330379-1	DIODE	85M03773	HEW. PACK.	5082-3001
2330386-XX	RESISTOR	85M03773	SAGE	250SL-XX
2330388-1	SCR	19500/168	SOLID STATE	2N1777A
2330389-1	TRANSISTOR	19500/398	RCA	2N3866
2330391-17	CAPACITOR		ATC	100B-471
2330392-XX	DIODE	19500/435	DICKSON	1N4615-18
2346200-XX	FUSE		LITTLE FUSE	262-XX
2346201-XX	MICROCKT		T.I.	54LXX
2346202-XX	TRANS-FORMER		O. SCHOTT	SPEC
2346203-1	INDUCTOR		O. SCHOTT	SPEC
2346204-1	INDUCTOR		O. SCHOTT	SPEC
2346206-1	INDUCTOR		O. SCHOTT	SPEC
2346207-XX	MICROCKT		T.I.	54XX
2346208-1	CAPACITOR		ELMENCO	WQM2DM
2346209-1	INDUCTOR		O. SCHOTT	SPEC
2346211-1	INDUCTOR		O. SCHOTT	SPEC
2346217-XX	CONNECTOR		HUGHES	WST, WSW
2346220	CUTTER		ATLAS	1SE166
2346222-1	INDUCTOR		O. SCHOTT	SPEC
2346223-1	INDUCTOR		O. SCHOTT	SPEC
2346224-1	INDUCTOR		O. SCHOTT	SPEC
2346225-1	INDUCTOR		O. SCHOTT	SPEC
2346226-1	TRANS-FORMER		O. SCHOTT	SPEC
2346227-1	TRANS-FORMER		O. SCHOTT	SPEC
2346230-XX	CAPACITOR		AEROVOX	CKR05
2346231-XX	CAPACITOR		AEROVOX	CKR06
2346233-XX	CAPACITOR		AEROVOX	CKR11
2346234-XX	CAPACITOR		AEROVOX	CKR12
2346235-XX	CAPACITOR		AEROVOX	CKR14
2346236-3	CAPACITOR		AEROVOX	CKR15
2346237-XX	CAPACITOR		AEROVOX	CKR16
2346238-XX	THERMISTOR		YSI	44032
2346239-1	RELAY		TELEDYNE	431-12
2346240-XX	CAPACITOR		SPRAGUE	CSR13

SUMMARY OF ELECTRONICS PART TYPE USED IN ALSEP (CONTD)

Part No./Type	Part Name	MIL Spec	Vendor's Name	Commercial Equiv. Type
2346241-20	CAPACITOR		KEMET	CSR13
2346242-1	SWITCH		MICRO SWITCH	IHM-19
2346244-3	CRYSTAL		MONITOR PROD	2.0352 MHz
2346246-XX	CAPACITOR		SPRAGUE	337D
2346247-XX	CAPACITOR		MARSHALL IND.	HL5-XX
2346249-1	TRANS-FORMER		O. SCHOTT	SPCL
2346250-1	TRANSISTOR		RCA/SOLITRON	2N5071
2346252-1	TRANSISTOR		TELEDYNE	2N4857
2346255-1	TRANS-FORMER		O. SCHOTT	SPCL
2346256-1	CRYSTAL, FIL		McCOY	SPCL
2346257-1	TRANSISTOR		MOTOROLA	2N4351
2346258-2	WIRE		GORE	
2346259-XX	WIRE		GORE	
2346261-1	RELAY		ELECTROL	SPCL
2346262-1	RELAY		BABCOCK	BR-17
2346263-1	INDUCTOR		O. SCHOTT	SPCL
2346264-1	RELAY		TELEDYNE	422-12
2346265-2	SWITCH		KL1XON	M1080063
2346266-1	RELAY		BABCOCK	BR20-AX-
2346268-1	TRANS-FORMER		O. SCHOTT	SPCL
2346269-1	TRANS-FORMER		O. SCHOTT	SPCL
2346270-XX	MICROCKT		NATIONAL	NH0001AF
2346271-XX	MICROCKT		NATIONAL	LM108AF, AH
2346272-1	MICROCKT		PHILBRICK	1402-02
2346273-XX	MICROCKT		NATIONAL	LM103-XX
2346274-XX	MICROCKT		CRYSTALONICS	CDA2-X
2346275-XX	MICROCKT		SIGNETICS	8T80, 90
2346278-1	MICROCKT		NATIONAL	NH0019F
2346279-1	TRANSISTOR		NATIONAL	2N930A
2346280-1	TRANS-FORMER		UTC	DO-T37
2346281-1	TRANS-FORMER		UTC	FHA-15
2346283-XX	CAPACITOR		JOHANSON	JMC52XX
2346285-1	TRANSISTOR		NATIONAL	2N3019

SUMMARY OF ELECTRONICS PART TYPE USED IN ALSEP (CONTD)

Part No./Type	Part Name	MIL Spec	Vendor's Name	Commercial Equiv. Type
2346286-XX	CAPACITOR		AEROVOX	MC605
2346287-5	RESISTOR		IRC	CEC
2346288-XX	CRYSTAL		McCOY	SPCL
2346289-XX	RESISTOR		VISHAY	S102
2346290-1	RESISTOR		VISHAY	310737
2346291-XX	DIODE	19500	MOTOROLA	1N5283-
2346295-XX	DIODE	19500	UNITROIDE	Uz1360
2346296-1	MICROCKT		MOTOROLA	MC1590G
2346297-1	MICROCKT		FAIRCHILD	93L11
2349497-XX	CONNECTOR		AMP INC	
2349498-XX	CONNECTOR		AMP INC	
2363402-1	METER		INT. INST.	100W
2340361-2	CONNECTOR		TRANSITRON	SPEC.
2346294-XX	CONNECTOR		MICRODOT	MCD
40M37496-33	RELAY		TELEDYNE	421-26V