RAYTHEON

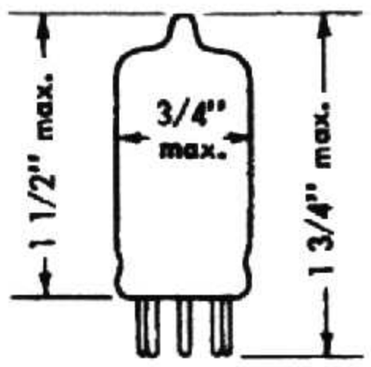
TECHNICAL INFORMATION

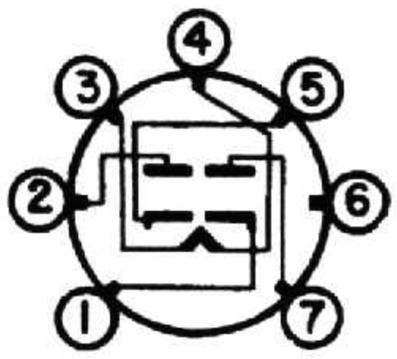
RELIABLE DOUBLE DIODE

Excellence in Electronics

TYPE CK5726/6AL5W/6097

The CK5726/6AL5W/6097 is a heater-cathode type double-diode of miniature construction designed for dependable operation under conditions usually found in mobile and aircraft applications. The heaters are designed to minimize the possibility of failure under severe intermittent on-off operation. The heaters for the two diode units are internally connected in series so that a heater failure makes both units inoperative.





BOTTOM VIEW

6BT

MECHANICAL DATA

ENVELOPE: T-5½ Glass

BASE: Miniature Button 7-Pin

TERMINAL CONNECTIONS:

Pin 1 Cathode, Unit #1	Pin 5 Cathode, Unit #2
Pin 2 Plate, Unit #2	Pin 6 Internal Shield
Pin 3 Heater	Pin 7 Plate, Unit #1
Pin 4 Heater	

MECHANICAL RATINGS:

Maximum Impact Acceleration (Shock Test - Note 3)	720 G
Maximum Vibrational Acceleration (96 Hour Fatigue Test - Note 4)	2.5 G
Maximum Bulb Temperature	165 °C

MOUNTING POSITION: Any

ELECTRICAL DATA

Caution-----To Electron Equipment Design Engineers. Special attention should be given to the temperature at which the tubes are to be operated. Reliability will be seriously impaired if maximum bulb temperature is exceeded. The life expectancy may be reduced if conditions other than those specified for life test are imposed on the tube and will be reduced appreciably if absolute maximum ratings are exceeded. Both reliability and performance will be jeopardized if filament voltage ratings are exceeded. Life and reliability of performance are directly related to the degree that regulation of the heater voltage is maintained at its center rated value.

RATINGS AND NORMAL OPERATION:	MIL-E-1B SYMBOL	ABSOLUTE MINIMUM	NORMAL TEST CONDITIONS (Note 6)	NORMAL OPERATION (Note 5)	ABSOLUTE MAXIMUM	MIL-E-1B UNITS
Heater Voltage (Note 7)	Ef:	5.7	6.3	6.3	6.9	V
Plate Supply Voltage (RMS) (each plate):	Epp:	----	165	117	----	Vac
Load Resistance	RL:	----	11,000	----	----	ohms
Filter Input Capacitance	CL:	----	8	8	----	μf
Peak Inverse Plate Voltage	epx:	----	----	----	360	v
Steady State Peak Plate Current (each plate)	ib/p:	----	----	----	60	mA
DC Output Current (each plate)	Io/p:	----	----	9	10	mAdc
Peak Transient Plate Current (each plate)	i surge/p:	----	----	----	350	mA
Heater-Cathode Voltage	Ehk:	----	----	----	360	V
Minimum Effective Plate Supply Impedance (per Plate)	Zp/p:	----	----	300	----	ohms

CHARACTERISTICS AND QUALITY CONTROL TESTS (Note 1)
(In the following tests, each unit is tested separately)

TEST	CONDITIONS	AQL %	MIL-E-1B SYMBOL	MIN.	BOGIE	MAX.	MIL-E-1B UNITS
ACCEPTANCE TESTS - GROUP C							
Continuity and Short		0.4					
ACCEPTANCE TESTS - GROUP D.	**COMBINED AQL = 1.0%**						
Heater-Current:		0.65	If:	275	300	325	mA

Tentative Data

Printed in U.S.A.

ELECTRICAL DATA (cont'd)

CHARACTERISTICS AND QUALITY CONTROL TESTS (Note 1)(cont'd)

TEST	CONDITIONS	AQL %	MIL-E-1B SYMBOL	MIN.	BOGIE	MAX.	MIL-E-1B UNITS
ACCEPTANCE TESTS GROUP D (cont'd)							
Heater-Cathode Leakage:	Ehk=100Vdc: Heater Positive	0.65	Ihk:	----	----	10	μAdc
	Ehk=100Vdc: Heater Negative	0.65	Ihk:	----	----	10	μAdc
Operation:	Full Wave Operation	0.65	Io:	16	18	----	mAdc
Emission (1):	Eb=10 Vdc	0.65	Is:	40	----	----	mAdc
ACCEPTANCE TESTS - GROUP E							
Insulation of Electrodes:	Ef=6.3V; Ep-all=-300Vdc	2.5	R (p-all):	100	----	----	Meg.
	Esd-all=-300 Vdc	2.5	R(sd-all):	100	----	----	Meg.
Emission (2):	Eb=7.0Vac: (Note 8)	2.5	Δ Is (2):	----	----	15	%
Plate Current:	Ebb=0;Rp=40,000 ohms	2.5	Ib:	2	----	20	μAdc
Plate Current Difference between diodes:	Ebb=0;Rp=40,000 ohms	2.5	Ib:	-----	----	5	μAdc
Hum:	Ef=7.0 Vac	2.5	Eo:	----	----	10	mVac
ACCEPTANCE TESTS - GROUP F							
Capacitance: (Note 2)	Plate #1 to Plate #2		Cpp:	----	----	0.026	μμf
	Plate to (ht+ct+int.sd.+ext.sd.)	6.5	C:	2.4	----	4.0	μμf
	Cathode to (ht+pt+int.sd.+ext.sd.)		C:	3.1	----	4.7	μμf
Low Pressure Voltage Breakdown:		6.5		500	----	----	Vac
ACCEPTANCE TESTS - GROUP A							
Shock:	Hammer Angle=48°; Epp/p=0 (Note 3)	----	-----	----	----	----	-----
Fatigue:	96 Hours: (Note 4)	6.5	-----	----	----	----	-----
Post Shock and Fatigue Test End Points:							
Heater-Cathode Leakage:	Ehk=+100Vdc		Ihk:		----	----	15	μAdc
	Ehk=-100Vdc		Ihk:		----	----	15	μAdc
Operation:	Full-Wave Circuit		Io:		14	----	----	mAdc
ACCEPTANCE TESTS - GROUP B							
Glass Strain:		2.5	-----		----	----	----	----

TESTS	CONDITIONS	AQL %	MIL-E-1B SYMBOL	MIN.	MAX.	MIL-E-1B UNITS	Maximum defects per Characteristics 1 st Sample	Maximum defects per Characteristics Combined Sample
ACCEPTANCE LIFE TEST								
Heater Cycling:	Ef=7.5V; Ehk=+135Vdc; Epp=0; 1 min. on, 1 min. off	----	-----	2000	----	Cycles		
Heater Cycling Life Test End Points:								
Heater-Cathode Leakage:	Heater Positive	----	Ihk:	----	20	μAdc		
	Heater Negative	----	Ihk:	----	20	μAdc		
1 Hour Stability Life Test*:	TA=Room; Ehk=Eo+ 117Vac; Full wave circuit	----	-----	----	----	-----		
1 Hour Stability Life Test End Points:								
Change in Emission (2) of individual tubes from initial:	Eb=7.0 Vac (Typical sample size=50 tubes)	1.0	Δ_t Is (2):	----	10	%		
100 Hour Survival Rate Life Test:	TA=Room; Ehk=Eo+ 117 Vac; full wave circuit	----	-----	----	----	----		
100 Hour Survival Rate Life Test End Points:								
Inoperatives:	(Typical sample size= 200 tubes)	0.65	-----	----	----	----		
500 and 1000 Hour Intermittent High Temperature Life Test:	T Bulb=165°C; Ehk= Eo+117Vac; Full wave circuit.	----	-----	----	----	-----		

ELECTRICAL DATA (cont'd)

TESTS	CONDITIONS	AQL %	MIL-E-1B Symbol	MIN.	MAX.	MIL-E-1B UNITS	Maximum defects per Characteristics 1st Sample	Maximum defects per Characteristics Combined Samples
ACCEPTANCE LIFE TEST (cont'd)								
500 Hour Intermittent High Temperature Life End Points:	(Typical sample size=20 tubes 1st sample 40 tubes 2nd sample) (Total allowable combined defects=4 tubes 1st sample 8 tubes 1st and 2nd sample)							
Inoperatives:		----	-----	----	----	-----	1	3
Heater Current:		----	If:	275	325	mA	1	3
Heater-Cathode Leakage:		----	Ihk:	----	10	μAdc	1	3
Emission (1):		----	Is(1):	35	----	mAdc	1	3
Plate Current:		----	Ib:	2	20	μAdc	2	5
Electrode Insulation:	(p-all)	----	Rp-all:	50	----	Meg.	2	5
	(sd-all)	----	Rsd-all:	50	----	Meg.		
Emission (2):		----	Is(2):	----	15	%	2	5
1000 Hour Intermittent High Temperature Life Test End Points:	(Typical sample size=20 tubes 1st sample 40 tubes 2nd sample)							
Inoperatives:				----	----		2	5
Heater Current:			If:	275	325	mA	2	5
Heater-Cathode Leakage:			Ihk:	----	10	μAdc	2	5
Emission (1):			Is(1):	30	----	mAdc	2	5

NOTES

Note 1: Characteristics, Quality Control Test Procedures, and Inspection Levels are made according to the appropriate paragraphs of MIL-E-1B, "Inspection Instructions for Electron Tubes," and MIL-STD-105A.

Note 2: With Shield #316.

Note 3: Test Conditions and Acceptance Criteria per Shock Test Procedures of Mil-E-1B basic specifications.

Note 4: Test Conditions and Acceptance Criteria per Fatigue Test Procedures of MIL-E-1B basic specifications.

Note 5: These normal values represent conditions at which control of reliability may be excected.

Note 6: These normal test conditions are used for all characteristic tests unless otherwise stated under the individual test item.

Note 7: For most applications the performance will not adversily affected by ±10% heater voltage variation, but when the application can provide a closer control of heater voltage an improvement in reliability will be realized.

Note 8: Change of emission (2) for individual tubes from that value measured at Ef=6.3 V to that value measured at Ef=5.7 V.

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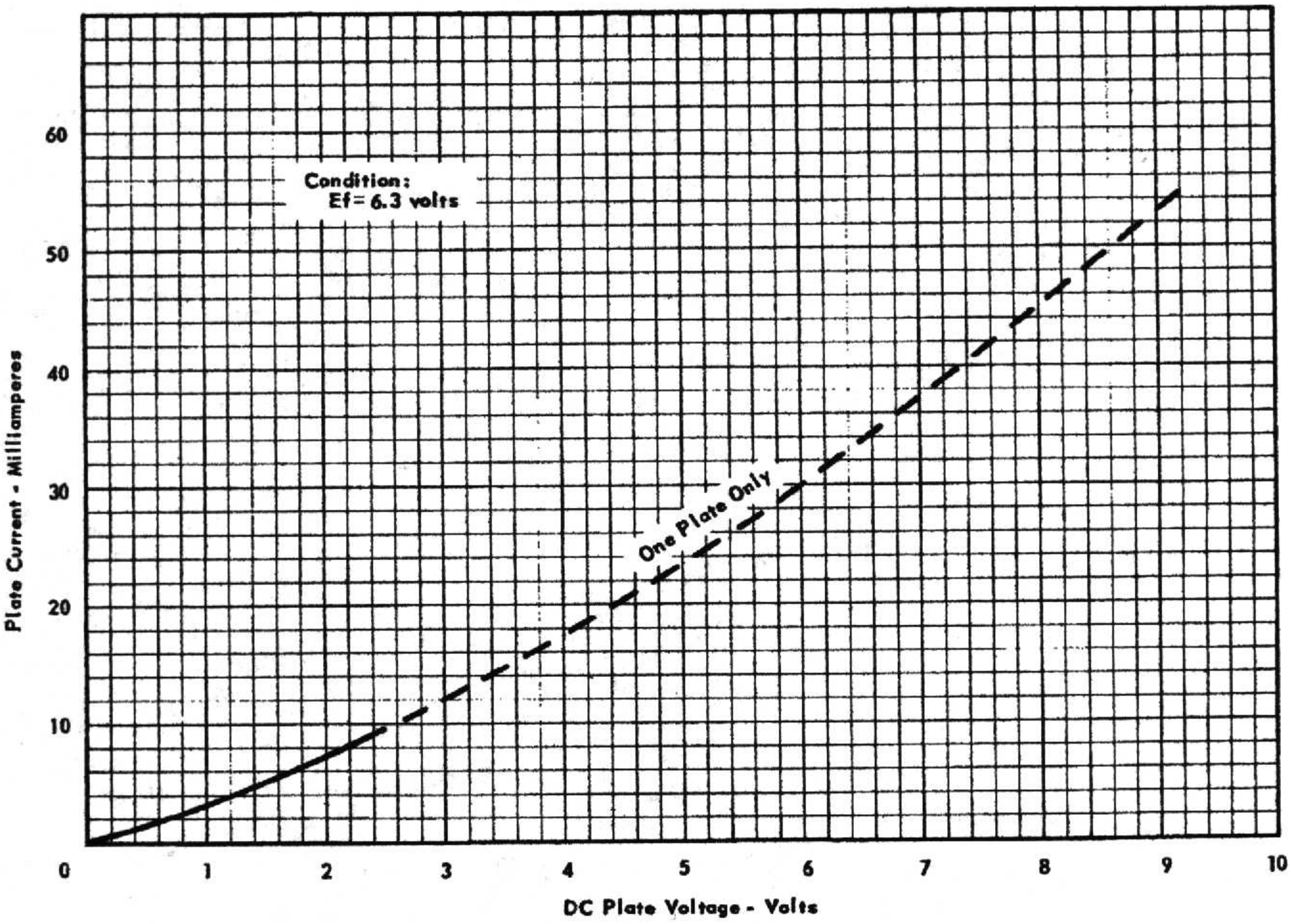
AVERAGE PLATE CHARACTERISTICS



RELIABLE DOUBLE DIODE

AVERAGE CHARACTERISTICS
Half-Wave Rectification - Single Diode