

Attachment

User's Manual

SCORPIUS 98A /98A PLUS KEYBOARD SPECIFICATIONS

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I SCOPE

The purpose of this specification is to define the generic operational, Environmental, electrical and mechanical characteristics of the " Scorpius 98A PLUS " rubber mechanical keyswitch keyboard.

II GENERAL

Description

The Scorpius 98A keyboard has an enhanced slim design and can work with IBM PC AT & PS/2 compatible computer.

Utilizing the latest in rubber mechanical key switch technology, the Scorpius 98A plus offers durability and style that will enhance any system for years to come. 3 ACPI Keys added for easy using under Windows 98. and should be supported by system M/B BIOS

Features

- 107 ,108 or 112 key standard layouts .
- Adjustable tilt mechanism.
- Tactile key stroke.
- 20,000,000 lift cycles per switch.
- High quality rubber mechanical key switches.

Appearance / Durability

This keyboard is to be used in home and office environments . Therefore, the quality of appearance and touch are of great importance. Because of the environmental severity of home and office place, longevity, durability and resistance to contamination are also of major concern. Good engineering design practices shall be followed throughout, both mechanically and electrically.

Package Contents

- SCORPIUS 98A PS/2 Keyboard (or with wrist pad)
- SCORPIUS 98A PS/2 with AT Keyboard (or with wrist pad)

Definitions

The term "keyboard" when used in this document defines a PC board with 104 /105 /109 key switches and 3 ACPI keys additional which are fully assembled and housed in an enclosure with an interconnecting cable. The complete assembly shall be tested and ready for use when plugged into a host device.

III ENVIRONMENTAL SPECIFICATIONS

Temperature

Operating

The operating temperature range shall be from 0°C to 50°C (32°F to 122 °F). There shall be an operational temperature test of a single cycle, ambient, cold, hot, ambient, With a minimum of a 15 minute dwell (pause) for every 15°C increment of change. The rate of temperature change shall not exceed 20°C per hour. The keyboard will operate normally throughout the cycle requiring no operator Intervention or corrective actions, except to cause normal movement.

Non-Operating

The non-operating temperature range shall be from -10°C to 60°C (14°F to 140°F). There Shall be a thermal shock test of five(5) cycles from -15°C to 55°C holding for 30 minutes at each extreme. The rate of temperature change shall not exceed 25°C per hour. Normal keyboard operation will be verified before and after the thermal shock test.

Humidity

Operating

The operating relative humidity range shall be from 10% to 85% non condensing ambient temperature.

Non-Operating

The non-operating relative humidity range shall be from 10% to 95% non- Condensing. The keyboard shall withstand an environment varying between 25°C and 55°C, 95% relative humidity, non condensing, for a period of 96 hours.

Vibration Test (*Packaged for shipment*)

Operating

With the system installed on a shock platform and operating the test software, a vibration with a displacement of 0.02" shall be exerted over the frequency range of 5 Hz to 22 Hz and an acceleration of 0.5 g over the frequency range of 22 Hz to 500 Hz on each of the three orthogonal axes. This shall be sustained for approximately 13 minutes per axis only.

Non-operating

With the system installed on a vibration platform and switched OFF, a vibration with a displacement of 0.1" shall be exerted over the frequency range of 5 Hz to 22 Hz and an acceleration of 0.75 g over the frequency range of 22 Hz on each of the three orthogonal axes. This test shall be sustained for approximately 13 minutes per axis.

Shock Test

Operating

With the system installed on a shock platform and operating the test software, a shock pulse of 5 G half sine for a duration of 15 ms shall be exerted on each of the 3 orthogonal axes. The test shall be repeated 3 times for the vertical axes only.

Non-operating

With the system installed on a shock platform and switched OFF , a pulse of 10 G half sine for a duration of 15 ms shall be exerted on each of the 3 orthogonal axes. The test shall be repeated 5 time.

Drop Test

- Drop Height: 91.5cm
- Sequence : 1 corner, 3 edges, 6 faces

Related Documents

The keyboard shell meet the requirements of FCC Part 15, Sub-part J, for Class B computing devices

ESD

- Test Condition : 3.5KV no data loss, 5kv no component damage
- Test Procedure : IEC 801-2

Contaminants

Dust

The keyboard has been designed to be unaffected by the normal accumulation of airborne dust as found in the home or office place. This includes non-metallic dust and grime as might be carried into the work place or home from outside sources.

Gases

The keyboard shall not be corroded or defaced or otherwise damaged by atmospheres acceptable to OSHA standards for the home and work place. This includes normal amounts of oxygen and ozone.

IV MECHANICAL SPECIFICATIONS

Materials

General

- keyboard Bases, Cover and Keytop :
Injection molded ABS Thermoplastic rates UL 94HB or better.
- PC Board : Paper Phenolic. Rated UL-94V0.

Interconnect Cable

- Jacket : Low durometer PVC, 5mm to 10%mm nominal diameter.
- Conductor Insulation : PVC, Polypropylene or Teflon.

Standard Connector(4 Pin USB-A plug)

- Connector Shell :Shielded, plastic plated , with metallic contact dimples
- Insulator: Thermoplastic
- Contacts :Tin flash plated with a minimum of 15 micro-inches in contact area.
- Flex and Strain Relief: PVC.
- Backshell :Molded PVC.

Key Switch

- Type: Tactile feeling rubber membrane.
- Membrane Key Travel: 3.5 mm $\pm$ 0.2mm
- Contact Bounce: Switch shall have electronically debounced contact time of 5 ms (max)
- Operation Force : 55g + 10 g
- Mechanical Life : 20million cycles

Weight

The weight shall be 1.1kilogram.

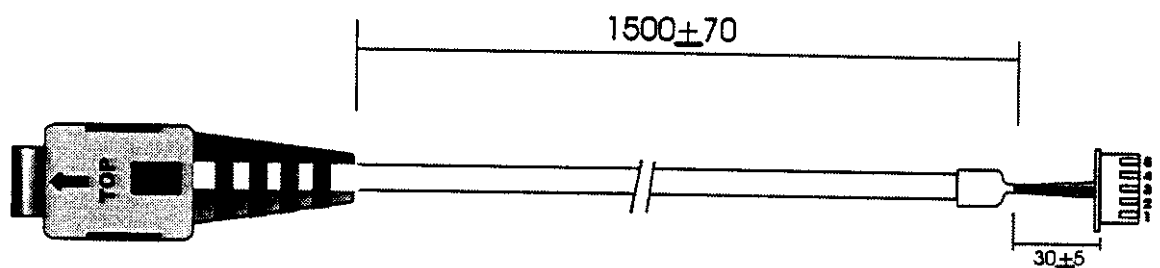
Standard Colors

White (Color No : 3361)

Dimentions

The maximum dimensions of the keyboard enclosure will not exceed 74mm in length , 190mm in width and 27mm in height.

Cable Specification



V ELECTRICAL SPECIFICATIONS

Components

All component will be of the highest commercial grade and shall be mounted according to IPC and recommended vendor practices. Standard values are to be adhered to at all times . Single sources, unusual values or designs outside specified component ratings shall be avoided.

PC Boards

PC Board shall be made of UL (Underwriters Laboratories) rated material, 94V-0 or better as per UL 478.

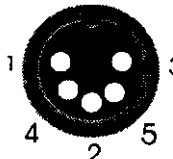
Design Practice.

All components shall perform well within their design ratings. Good IC design with respect to unused inputs and number of outputs shall be observed. Trace width and spacing shall be conservative wherever possible and shall meet IPC minimums at all times. Bypass capacitors shall be used liberally and some on-board filtering is expected when possible . Power consumption shall be minimized.

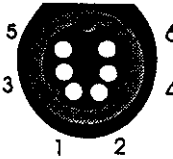
Connector Pin Assignments

The standard connector pin out for XT/AT and PS/2 is as follows :

XT OR AT

DESCRIPTION	SIGNAL	PINS	CONNECTOR
Keyboard Clock	+5Vdc Signal	1	
Keyboard Data	+5Vdc Signal	2	
NC	NC	3	
Ground	0	4	
Power Supply	+5Vdc	5	

PS-2

DESCRIPTION	SIGNAL	PINS	CONNECTOR
Keyboard Clock	+5Vdc Signal	1	
NC	NC	2	
Ground	0	3	
Power Supply	+5Vdc	4	
Keyboard Data	+5Vdc Signal	5	
NC	NC	6	

Power Requirements

- Current Consumption : 40mA
- Operation Voltage : 5Vdc $\pm$ 5%

Rubber / Membrane

- Rubber Dome Contact Resister : 100 Ω (max)
- Membrane Contact Resister : 100 Ω
- Membrane Open Resister 10M Ω

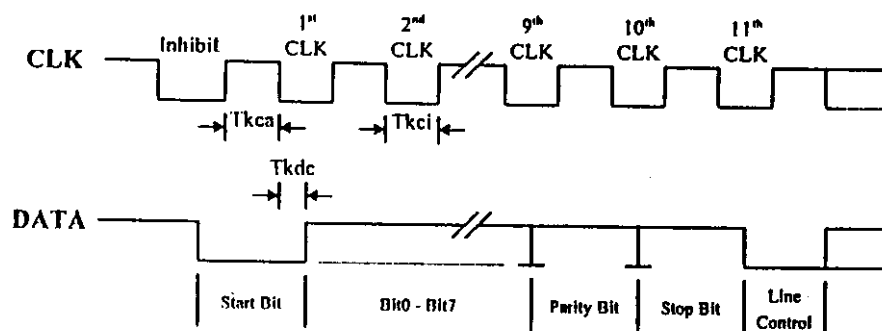
Interface

- Fully IBM PC AT/PS-2 compatible
- Serial data transfer
- Timing detail:

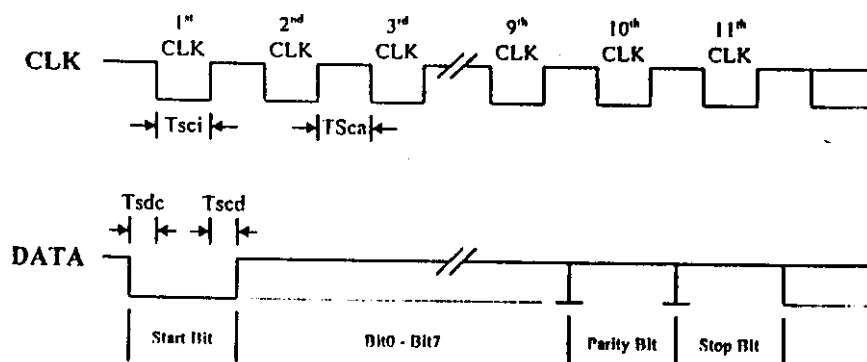
Transmission mode	Clock	Data
Transmission inhibit	Low	High
System to send	High	Low
Keyboard to send	High	High

TIMING DIAGRAMS

1) Receiving Data



2) Sending Data



VI CODE SET TABLE

The following table shows three scan code sets used in the keyboard.

Key Number	Scan Code Set 1		Scan Code Set 2	
	Make Code	Break Code	Make Code	Break Code
1	29	A9	0E	F0 0E
2	02	82	16	F0 16
3	03	83	1E	F0 1E
4	04	84	26	F0 26
5	05	85	25	F0 25
6	06	86	2E	F0 2E
7	07	87	36	F0 36
8	08	88	3D	F0 3D
9	09	89	3E	F0 3E
10	0A	8A	46	F0 46
11	0B	8B	45	F0 45
12	0C	8C	4E	F0 4E
13	0D	8D	55	F0 55
15	0E	8E	66	F0 66
16	0F	8F	0D	F0 0D
17	10	90	15	F0 15
18	11	91	1D	F0 1D
19	12	92	24	F0 24
20	13	93	2D	F0 2D
21	14	94	2C	F0 2C
22	15	95	35	F0 35
23	16	96	3C	F0 3C
24	17	97	43	F0 43
25	18	98	44	F0 44
26	19	99	4D	F0 4D
27	1A	9A	54	F0 54
28	1B	9B	5B	F0 5B
29	2B	AB	5D	F0 5D
30	3A	BA	58	F0 58
31	1E	9E	1C	F0 1C
32	1F	9F	18	F0 18
33	20	A0	23	F0 23
34	21	A1	2B	F0 2B
35	22	A2	34	F0 34
36	23	A3	33	F0 33
37	24	A4	3B	F0 3B
38	25	A5	42	F0 42
39	26	A6	4B	F0 4B
40	27	A7	4C	F0 4C
41	28	A8	52	F0 52
42	28	AB	5D	F0 5D
43	1C	9C	5A	F0 5A
44	2A	AA	12	F0 12
45	56	D6	61	F0 61
46	2C	AC	1A	F0 1A

Key Number	Scan Code Set 1		Scan Code Set 2	
	Make Code	Break Code	Make Code	Break Code
47	2D	AD	22	F0 22
48	2E	AE	21	F0 21
49	2F	AF	2A	F0 2A
50	30	B0	32	F0 32
51	31	B1	31	F0 31
52	32	B2	3A	F0 3A
53	33	B3	41	F0 41
54	34	B4	49	F0 49
55	35	B5	4A	F0 4A
57	36	B6	59	F0 59
58	1D	9D	14	F0 14
60	38	B8	11	F0 11
61	39	B9	29	F0 29
62	E0 38	E0 B8	E0 11	E0 F0 11
64	E0 1D	E0 9D	E0 14	E0 F0 14
90	45	C5	77	F0 77
91	47	C7	6C	F0 6C
92	4B	CB	6B	F0 6B
93	4F	CF	69	F0 69
96	48	CC	75	F0 75
97	4C	CC	73	F0 73
98	50	D0	72	F0 72
99	52	D2	70	F0 70
100	37	B7	7C	F0 7C
101	49	C9	7D	F0 7D
102	4D	CD	74	F0 74
103	51	D1	7A	F0 7A
104	53	D3	71	F0 71
105	4A	CA	7B	F0 7B
106	4E	CE	79	F0 79
108	E0 1C	E0 9C	E0 5A	E0 F0 5A
110	01	B1	76	F0 76
112	3B	BB	05	F0 05
113	3C	BC	06	F0 06
114	3D	BD	04	F0 04
115	3E	BE	0C	F0 0C
116	3F	BF	03	F0 03
117	40	C0	0B	F0 0B
118	41	C1	83	F0 83
119	42	C2	0A	F0 0A
120	43	C3	01	F0 01
121	44	C4	09	F0 09
122	57	D7	78	F0 78
123	58	D8	07	F0 07
125	46	C6	7E	F0 7E

Key Number	Scan Code Set 1*		
	Base Case, Shift+Num Lock Make / Break	Shift Case * Make / Break	Num Lock On Make / Break
75	E0 52/E0 D2	E0 AA E0 52 /E0 D2 E0 2A	E0 2A E0 52 /E0 D2 E0 AA
76	E0 53 / E0 D3	E0 AA E0 53 /E0 D3 E0 2A	E0 2A E0 53 /E0 D3 E0 AA
79	E0 4B / E0 CB	E0 AA E0 4B /E0 CB E0 2A	E0 2A E0 4B /E0 CB E0 AA
80	E0 47 / E0 C7	E0 AA E0 47 /E0 C7 E0 2A	E0 2A E0 47 /E0 C7 E0 AA
81	E0 4F / E0 CF	E0 AA E0 4F /E0 CF E0 2A	E0 2A E0 4F /E0 CF E0 AA
83	E0 48 / E0 C8	E0 AA E0 48 /E0 C8 E0 2A	E0 2A E0 48 /E0 C8 E0 AA
84	E0 50 / E0 D0	E0 AA E0 50 /E0 D0 E0 2A	E0 2A E0 50 /E0 D0 E0 AA
85	E0 49 / E0 C9	E0 AA E0 49 /E0 C9 E0 2A	E0 2A E0 49 /E0 C9 E0 AA
86	E0 51 / E0 D1	E0 AA E0 51 /E0 D1 E0 2A	E0 2A E0 51 /E0 D1 E0 AA
89	E0 4D / E0 CD	E0 AA E0 4D /E0 CD E0 2A	E0 2A E0 4D /E0 CD E0 AA

* If the left shift key is held down, the AA / 2A shift make and break is sent with the other scan codes. If the right Shift key is held down, B6 / 36 is sent. If both Shift keys are down, both sets of codes are sent with the other scan code.

Scan Code Set 1			
Key No.	Make / Break Code	Shift Case Make / Break *	
95	E0 35 / E0 B5	E0 AA E0 35/E0 B5 E0 2A	

* If the left Shift key is held down, the AA / 2A shift make and break is sent with the other scan codes. If the right Shift key is held down, B6 / 36 is sent. If both Shift keys are down, both sets of codes are sent with the other scan code.

Scan Code Set 1			
Key No.	Make / Break Code	Ctrl, Shift Case Make / Break	Alt Case Make / Break
124	E0 2A E0 37 /E0 B7 E0 AA	E0 37 / E0 B7	54 / D4

Scan Code Set 1		
Key No.	Make Code	Ctrl Key Pressed
126	E1 1D 45 E1 9D C5	E0 46 E0 C6

SCORPIUS 98A /98A PLUS KEYBOARD SPECIFICATIONS

Key Number	Scan Code Set 1*		
	Base Case Shift+Num Lock Make / Break	Shift Case Make / Break	Num Lock On Make / Break
75	E0 70 / E0 F0 70	E0 F0 12 E0 70 /E0 F0 70 E0 12	E0 12 E0 70 / E0 F0 70 E0 F0 12
76	E0 71 / E0 F0 71	E0 F0 12 E0 71 /E0 F0 71 E0 12	E0 12 E0 71 / E0 F0 71 E0 F0 12
79	E0 68 / E0 F0 68	E0 F0 12 E0 68 /E0 F0 68 E0 12	E0 12 E0 68 / E0 F0 68 E0 F0 12
80	E0 6C / E0 F0 6C	E0 F0 12 E0 6C /E0 F0 6C E0 12	E0 12 E0 6C / E0 F0 6C E0 F0 12
81	E0 69 / E0 F0 69	E0 F0 12 E0 69 /E0 F0 69 E0 12	E0 12 E0 69 / E0 F0 69 E0 F0 12
83	E0 75 / E0 F0 75	E0 F0 12 E0 75 /E0 F0 75 E0 12	E0 12 E0 75 / E0 F0 75 E0 F0 12
84	E0 72 / E0 F0 72	E0 F0 12 E0 72 /E0 F0 72 E0 12	E0 12 E0 72 / E0 F0 72 E0 F0 12
85	E0 7D / E0 F0 7D	E0 F0 12 E0 7D /E0 F0 7D E0 12	E0 12 E0 7D / E0 F0 7D E0 F0 12
86	E0 7A / E0 F0 7A	E0 F0 12 E0 7A /E0 F0 7A E0 12	E0 12 E0 7A / E0 F0 7A E0 F0 12
89	E0 74 / E0 F0 74	E0 F0 12 E0 74 /E0 F0 74 E0 12	E0 12 E0 74 / E0 F0 74 E0 F0 12

* If the left shift key is held down, the F0 12 / 12 shift make and break is sent with the other scan codes. If the right shift key is held down, F0 59 / 59 is sent. If both shift keys are down, both sets of codes are sent with the other scan code.

Scan Code Set 2		
Key No.	Make / Break Code	Shift Case Make / Break
95	E0 4A / E0 F0 4A	E0 F0 12 4A / E0 12 F0 4A

* If the left Shift key is held down, the AA / 2A shift make and break is sent with the other scan codes. If the right Shift key is held down, B6 / 36 is sent. If both Shift keys are down, both sets of codes are sent with the other scan code.

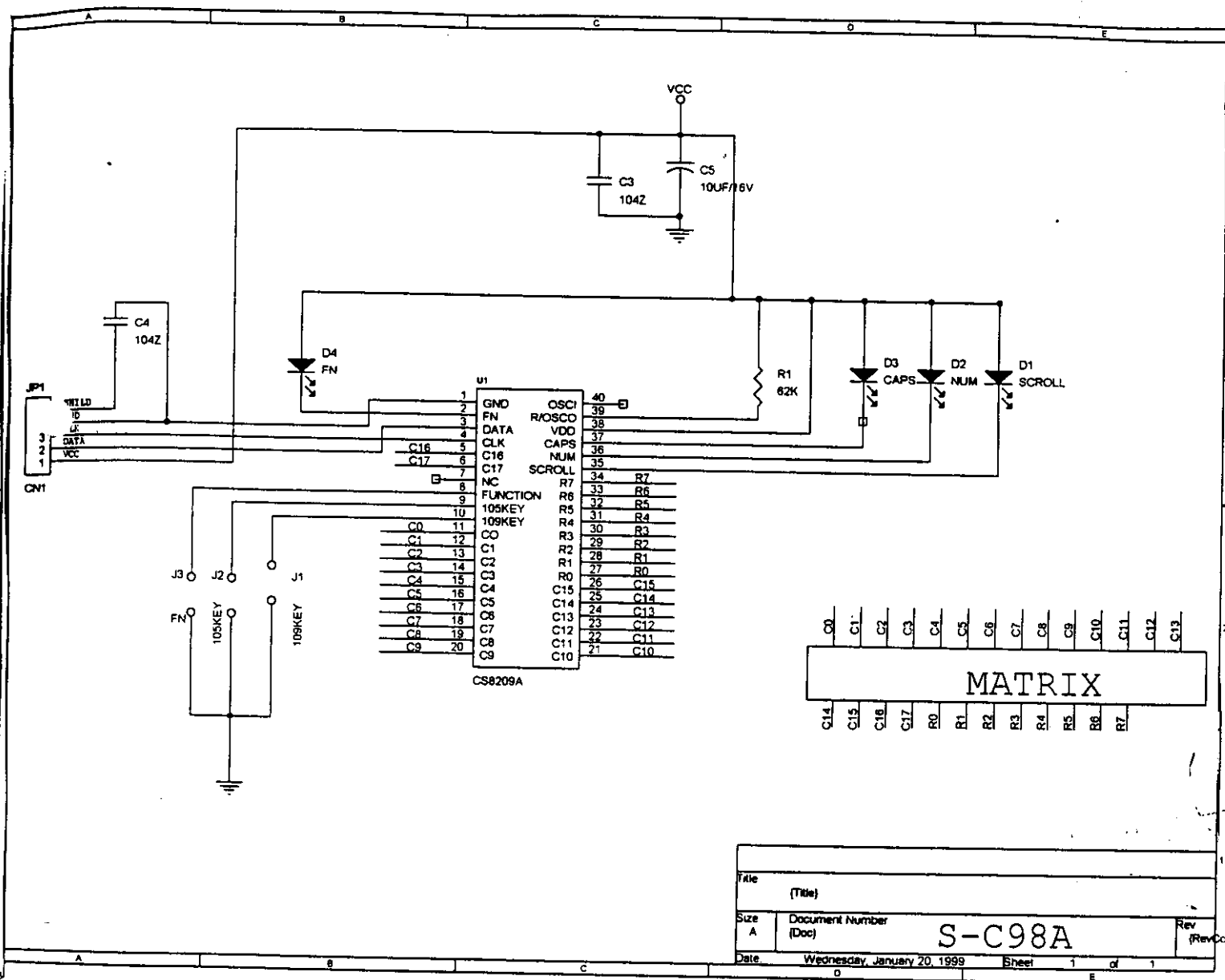
Scan Code Set 2			
Key No.	Make / Break Code	Ctrl, Shift Case Make / Break	Alt Case Make / Break
124	E0 12 E0 7C / E0 F0 7C E0 F0 12	E0 7C / E0 F0 7C	84 / F0 84

Scan Code Set 2		
Key No.	Make Code	Ctrl Key Pressed
126	E1 14 77 E1 F0 14 F0 77	E0 7E E0 F0 7E

Scan Code 3			
T=Typematic, M/B=Make/Break M=Make only			
Key No.	Make Code	Break Code	Default Status
1	0E	F0 0E	T
2	1B	F0 1B	T
3	1E	F0 1E	T
4	2B	F0 2B	T
5	25	F0 25	T
6	2E	F0 2E	T
7	3B	F0 3B	T
8	3D	F0 3D	T
9	3E	F0 3E	T
10	4B	F0 4B	T
11	45	F0 45	T
12	4E	F0 4E	T
13	55	F0 55	T
15	6B	F0 6B	T
16	0D	F0 0D	T
17	15	F0 15	T
18	1D	F0 1D	T
19	24	F0 24	T
20	2D	F0 2D	T
21	2C	F0 2C	T
22	35	F0 35	T
23	3C	F0 3C	T
24	43	F0 43	T
25	44	F0 44	T
26	4D	F0 4D	T
27	54	F0 54	T
28	5D	F0 5D	T
29	5C	F0 5C	T
30	14	F0 14	M/B
31	1C	F0 1C	T
32	1B	F0 1B	T
33	23	F0 23	T
34	2B	F0 2B	T
35	34	F0 34	T
36	3B	F0 3B	T
37	3B	F0 3B	T
38	42	F0 42	T
39	4B	F0 4B	T
40	4C	F0 4C	T
41	52	F0 52	T
42	53	F0 5D	T
43	5A	F0 5A	T
44	12	F0 12	M/B
45	13	F0 13	T
46	1A	F0 1A	T
47	22	F0 22	T
48	21	F0 21	T
49	2A	F0 2A	T
50	32	F0 32	T
51	31	F0 31	T
52	3A	F0 3A	T

Scan Code 3			
T=Typematic, M/B=Make/Break M=Make only			
Key No.	Make Code	Break Code	Default Status
53	41	F0 41	T
54	49	F0 49	T
55	4A	F0 4A	T
57	59	F0 59	M/B
58	11	F0 11	M/B
60	19	F0 19	M/B
61	29	F0 29	T
62	39	F0 39	M
64	58	F0 58	M
75	67	F0 67	M
76	64	F0 64	T
79	61	F0 61	T
80	6E	F0 6E	M
81	65	F0 65	M
83	63	F0 63	T
84	60	F0 60	T
85	6F	F0 6F	M
86	6D	F0 6D	M
89	6A	F0 6A	T
90	7B	F0 7B	M
91	6C	F0 6C	M
92	6B	F0 6B	M
93	69	F0 69	M
95	77	F0 77	M
96	75	F0 75	M
97	73	F0 73	M
98	72	F0 72	M
99	70	F0 70	M
100	7E	F0 7E	M
101	7D	F0 7D	M
102	74	F0 74	M
103	7A	F0 7A	M
104	71	F0 71	M
105	84	F0 84	M
106	7C	F0 7C	T
108	79	F0 79	M
110	0B	F0 0B	M
112	07	F0 07	M
113	0F	F0 0F	M
114	17	F0 17	M
115	1F	F0 1F	M
116	27	F0 27	M
117	2F	F0 2F	M
118	37	F0 37	M
119	3F	F0 3F	M
120	47	F0 47	M
121	4F	F0 4F	M
122	5B	F0 5B	M
123	5E	F0 5E	M
124	57	F0 57	M
125	5F	F0 5F	M
126	62	F0 62	M

VII RELIABILITY



VII RELIABILITY

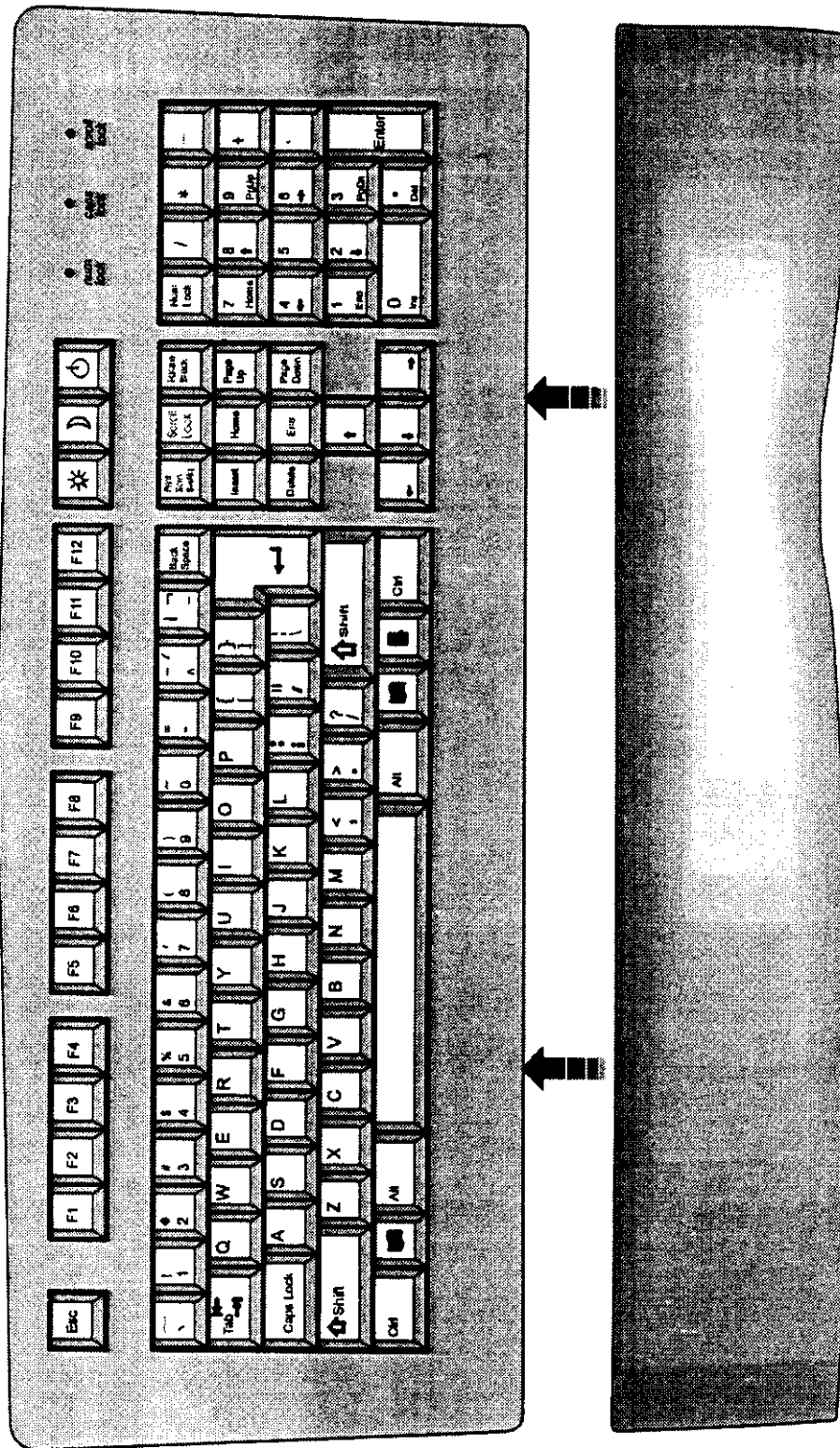
MTBF

The keyboard assembly shall have a demonstrated MTBF of over five (5) years When operated in a 30° C environment. Test results must meet 90% confidence level of the specified MTBF. Test report to be submitted with the first article unit shipment to Customer . MTBF report to include environmental, operating and non-operating, ESD, vibration, switch and key button life test plans and results.

Yield

During the first six (6) months of production yields as received by Buyer shall be 95% or greater.

VIII. Physical Dimensions



Scorpius98A/98APlus