NEWHAVEN DISPLAY INTERNATIONAL

User's Guide

C-20-1003FN

VFD

(Vacuum Fluorescent Character Display Module)

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October 31, 2006

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Vacuum Fluorescent Display Specification

PART NUMBER: **C-20-1003FN**

FEATURES: 9 Digits – Alphanumeric, with custom fixed segments

APPLICATION: Audio/Video- DVD

RATINGS: Below

Outer Dimensions	Panel Length	P.L.	110.2	mm
	Panel Height	P.H.	20.5	mm
	Panel Thickness	P.T.	6.1	mm
Leads	Lead Pitch	L.P.	2.54	mm
	Lead Out	-	SIL	
Character Size	Character Height	C.H.	-	mm
	Character Width	C.W.	-	mm

Item	Symbol	Min.	Recommended	Max.	Unit
Filament Voltage	Ef	3.51	3.90	4.29	Vac
Peak Grid Voltage	ec	-	24.0	27.0	Vp-p
Peak Anode Voltage	eb	-	24.0	27.0	Vp-p
Cut-off Bias	Ek	-	0	-	Vdc
Duty Cycle	Du	-	1/11	-	-
Pulse Width	tp	-	100	-	uS
Operating Temperature	Topr	-20	-	+ 70	C
Storage Temperature	Tstg	-55	-	+ 80	C
Color of Illumination	Green, Red				

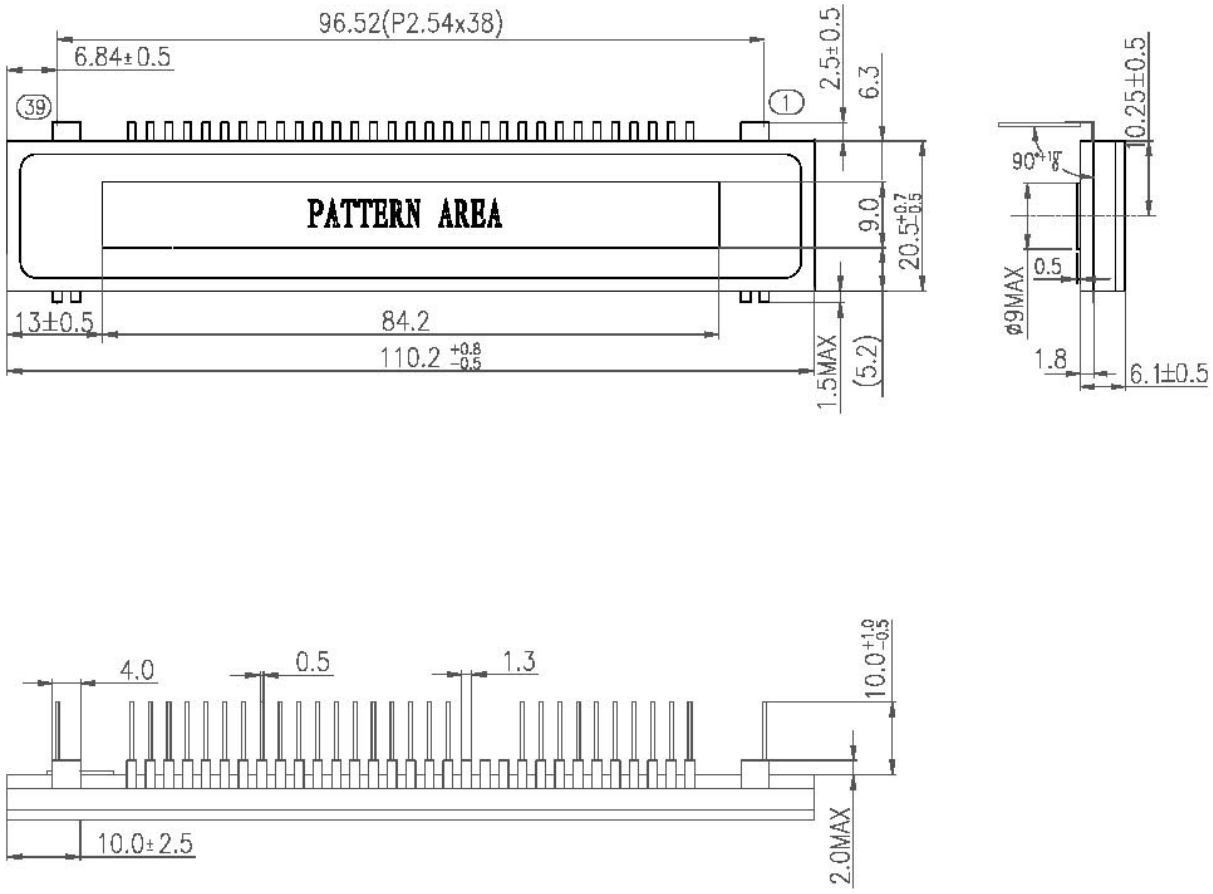
C-20-1003FN

Electrical Characteristics

Item	Symbol	Test Condition	Min.	Typical	Max.	Unit
Filament Current	If -	Ef = 3.9 V_{ac} eb = ec = 0	99.0 -	110.0 -	121.0 -	mAac -
Anode Current	ib / 3, 5, 7,8, 10G	Ef = 3.9 V_{ac}	-	4.0	8.0	mAp-p
	ib/ 4, 6, 9G	eb = 24.0 V_{p-p}	-	5.0	10.0	mAp-p
	ib/ 2G	ec = 24.0 V_{p-p}	-	7.0	14.0	mAp-p
	ib/ 1G	Du = 1/11	-	15.0	30.0	mAp-p
	-	tp = 100uS	-	-	-	-
Grid Current	ic / 3, 5, 7,8, 10G	(All segs are ON)	-	4.0	8.0	mA_{p-p}
	ic / 4, 6, 9G		-	5.0	10.0	mA_{p-p}
	ic / 2G		-	7.0	14.0	mA_{p-p}
	ic / 1G		-	15.0	28.0	mA_{p-p}
	-		-	-	-	-
Luminance	L(G)		350 (102)	700 (204)	-	cd/m^2 /fL
	L(R)		70 (35)	140 (70)	-	cd/m^2 /fL
	-		-	-	-	-
Luminance Ratio	Lmin/Lmax		50	-	-	%
Grid Cut-off Voltage	Ecco	Ef = 3.9 Vac Eb = 27.0 Vdc	-4.8	-	-	Vdc
Anode Cut-off Voltage	Ebco	Ef = 3.9 Vac ec = 27.0 Vp-p Du = 1/10 Tp = 100uS	-4.8	-	-	V_{dc}

DRIVE MODE: Dynamic State

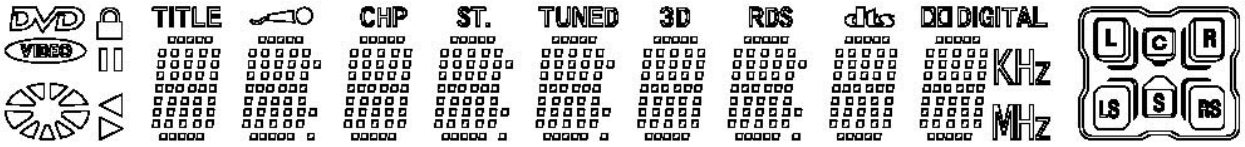
1: Outline Drawing (Unit: mm)



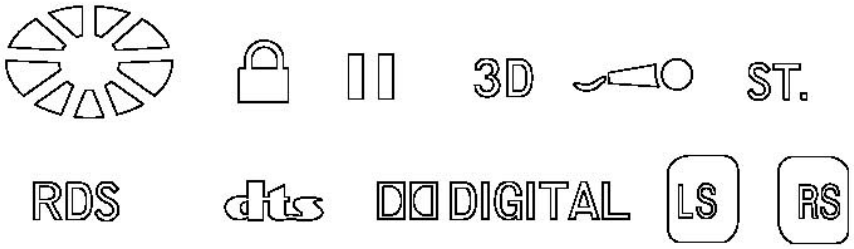
Pin Connections

Pin Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Connection	F	NX	NP	NP	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	NC	NC	NC	P1	P2	P3
Pin Number	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	
Connection	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	NP	NP	NX	F	

F: Filament P: Anode G: Grid NC: No Connection NP: No Pin NX:

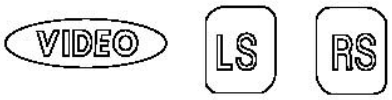


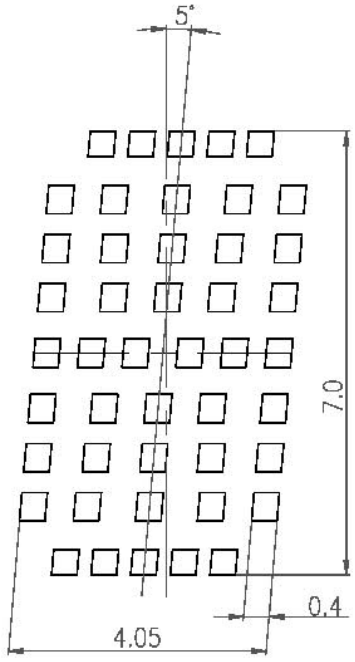
Red (x = 0.627, y = 0.371):

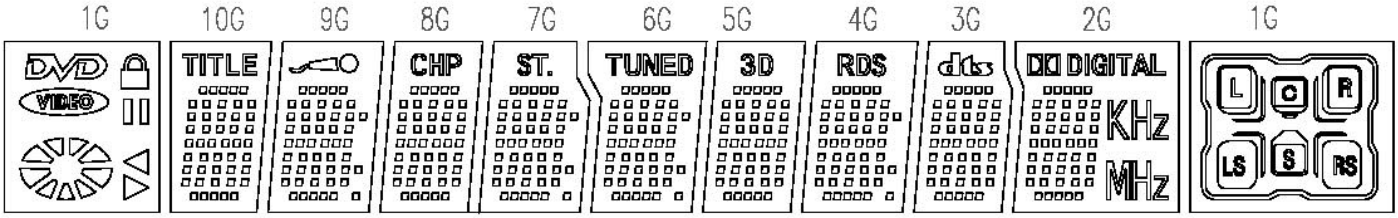


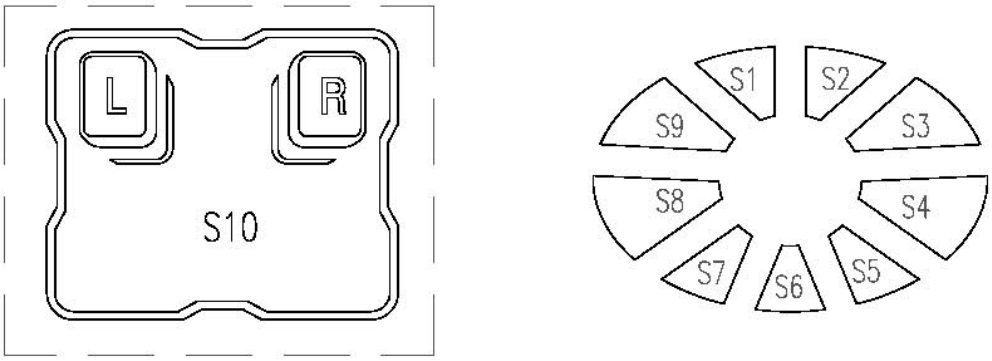
Green (x = 0.250, y = 0.440): Others

Negative Pattern:

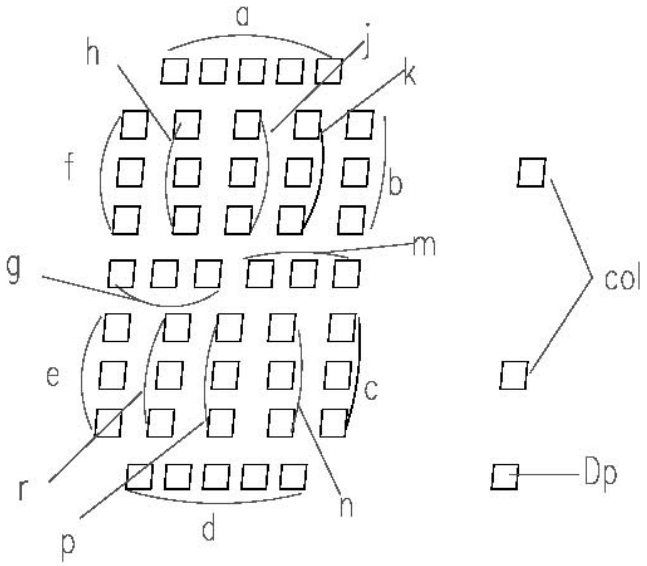




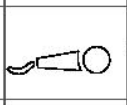




(1G)



(2G~10G) (4G,6G,7G,9G)

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G
P1				RDS	3D	TUNED	ST.	CHP		TITLE
P2		a	a	a	a	a	a	a	a	a
P3		b	b	b	b	b	b	b	b	b
P4		f	f	f	f	f	f	f	f	f
P5		h	h	h	h	h	h	h	h	h
P6	S1	j	j	j	j	j	j	j	j	j
P7	S2	k	k	k	k	k	k	k	k	k
P8	S3	m	m	m	m	m	m	m	m	m
P9	S4	g	g	g	g	g	g	g	g	g
P10	S5	c	c	c	c	c	c	c	c	c
P11	S6	e	e	e	e	e	e	e	e	e
P12	S7	r	r	r	r	r	r	r	r	r
P13	S8	p	p	p	p	p	p	p	p	p
P14	S9	n	n	n	n	n	n	n	n	n
P15	S10	d	d	d	d	d	d	d	d	d
P16		KHz		col		col	col		col	
P17		MHz		Dp		Dp	Dp		Dp	
P18