

Model	HNA-11LM10	Rev.① 22-Mar-2012
Application	AUDIO	
Color of Illumination #6)	GREEN (G. :x=0.250,y=0.439) Cd-free REDDISH ORANGE (Cd-free Rsh.O. :x=0.62,y=0.37) Cd-free YELLOWISH ORANGE (Cd-free Ysh.O. :x=0.50,y=0.47)	

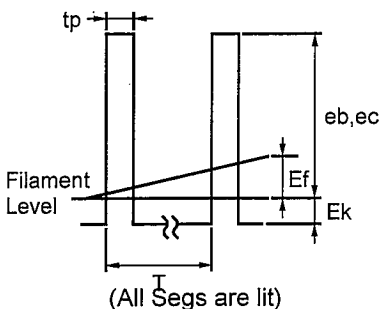
ABSOLUTE MAXIMUM RATINGS #4)

Item	Symbol	Min.	Max.	Unit	Condition
Filament Voltage #2)	Ef	—	4.56	Vdc	eb,ec = Typ.
Anode Voltage	eb	—	36.0	Vp-p	Ef=Typ.
Grid Voltage	ec	—	36.0	Vp-p	
Operating Temperature	Topr	-40	+85	°C	—

RECOMMENDED OPERATING CONDITION #5)

Item	Symbol	Min.	Typ.	Max.	Unit
Filament Voltage #2)	Ef	3.42	3.80	4.18	Vdc
Peak Anode Voltage	eb	27.0	30.0	33.0	Vp-p
Peak Grid Voltage	ec	27.0	30.0	33.0	Vp-p
Cut-Off Bias Voltage	Ek	2.0	—	—	Vdc
Duty Factor	Du	—	1/12	—	—
Pulse Width	tp	—	100	—	μs
Operating Temperature	Topr	-20	—	+70	°C
Storage Temperature	Tstg	-55	—	+85	°C

ELECTRICAL CHARACTERISTICS

Item	Test Condition	Symbol	Min.	Typ.	Max.	Unit	
Filament Current	Ef= 3.8 Vdc ,eb=ec=0	If	248	275	303	mAdc	
Anode Current #1)	Ef= 3.8 Vdc eb= 30.0 Vp-p ec= 30.0 Vp-p	ib	2G-9G	—	8.0	16.0	mAp-p
			1G	—	10.0	20.0	
			10G	—	15.0	30.0	
			11G	—	41.0	82.0	
Grid Current #1)	Duty= 1/12 tp= 100 μs tb= 0 μs	ic	2G-9G	—	8.0	16.0	mAp-p
			1G	—	10.0	20.0	
			10G	—	15.0	30.0	
			11G	—	39.0	78.0	
Brightness	 <p>(All Segs are lit)</p>	GREEN	102	204	—	ft-L	
		Cd-free Rsh.O.	20	41	—		
		Cd-free Ysh.O.	17	35	—		
Brightness Ratio Between Digits		L(Max.) / L(Min.)	—	—	2		
Grid Cut-Off Voltage #3)	Ef= 3.8 Vdc, Eb= 30.0 Vdc, Ec=Vary	Ecco	(-2.0)	—	—	Vdc	
Anode Cut-Off Voltage #3)	Ef= 3.8 Vdc, Du= 1/12 ec= 30.0 Vp-p, Eb= Vary	Ebco	(-2.0)	—	—	Vdc	

#1. Unless otherwise specified, the anode and the grid current should be measured for each grid when all anodes turn on.

#2. DC driving voltage.

#3. The cut-off voltage measurement should be grounded at negative(-) side of the filament terminal.

#4. Absolute Maximum Ratings : The value should not be exceeded in any conditions.

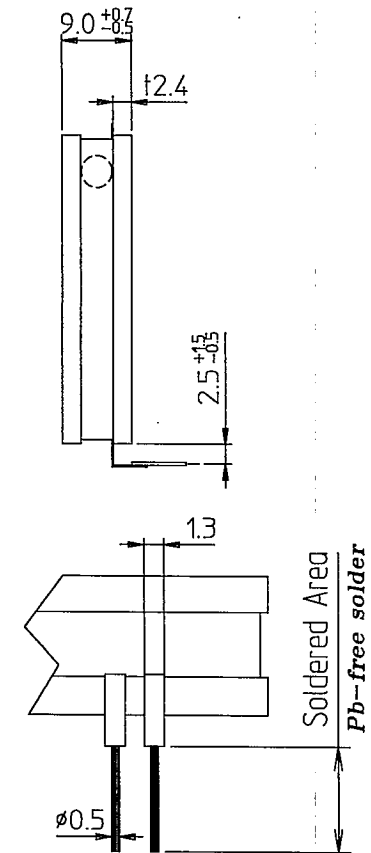
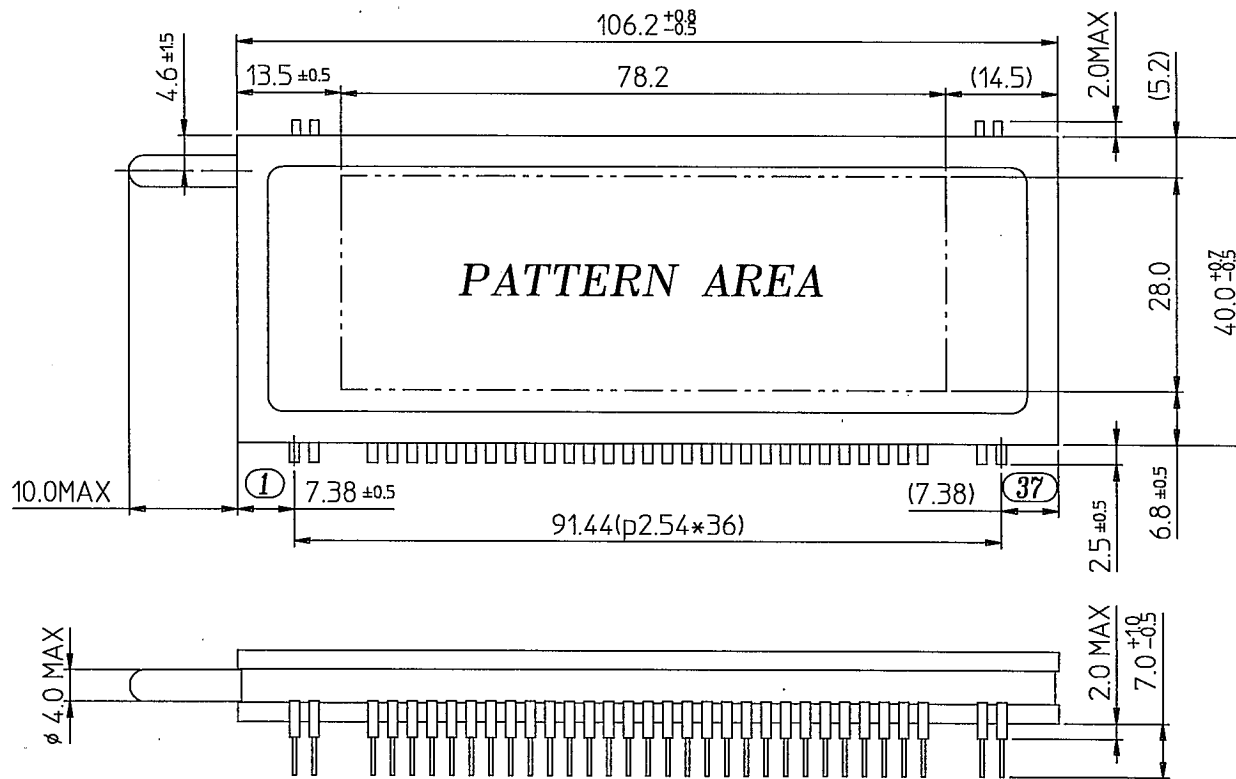
If a user don't keep this condition, then VFD may be permanently damaged.

#5. Recommended Operating Condition : Quality can be assured within this condition.

Typical rating is the most optimized value on the life time

#6. All phosphor is Cd-free phosphor.

OUTER DIMENSIONS



PIN CONNECTION

PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	
CONNECTION	F-	F-	NP	NP	P1	P7	P16	P15	P14	P13	P12	P11	P10	P9	P8	P7	P6	P5	P4	P3	P2	P1	NC	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	NP	NP	F+	F+

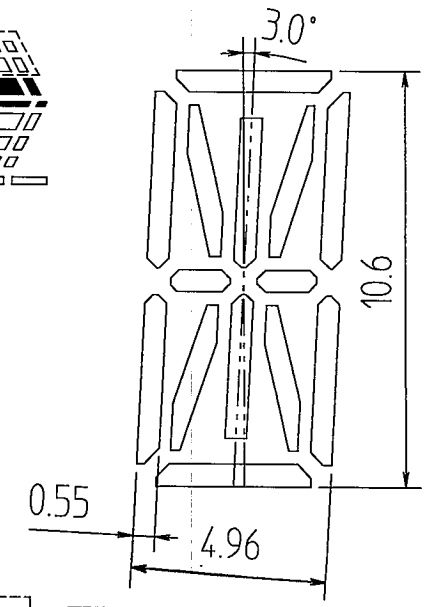
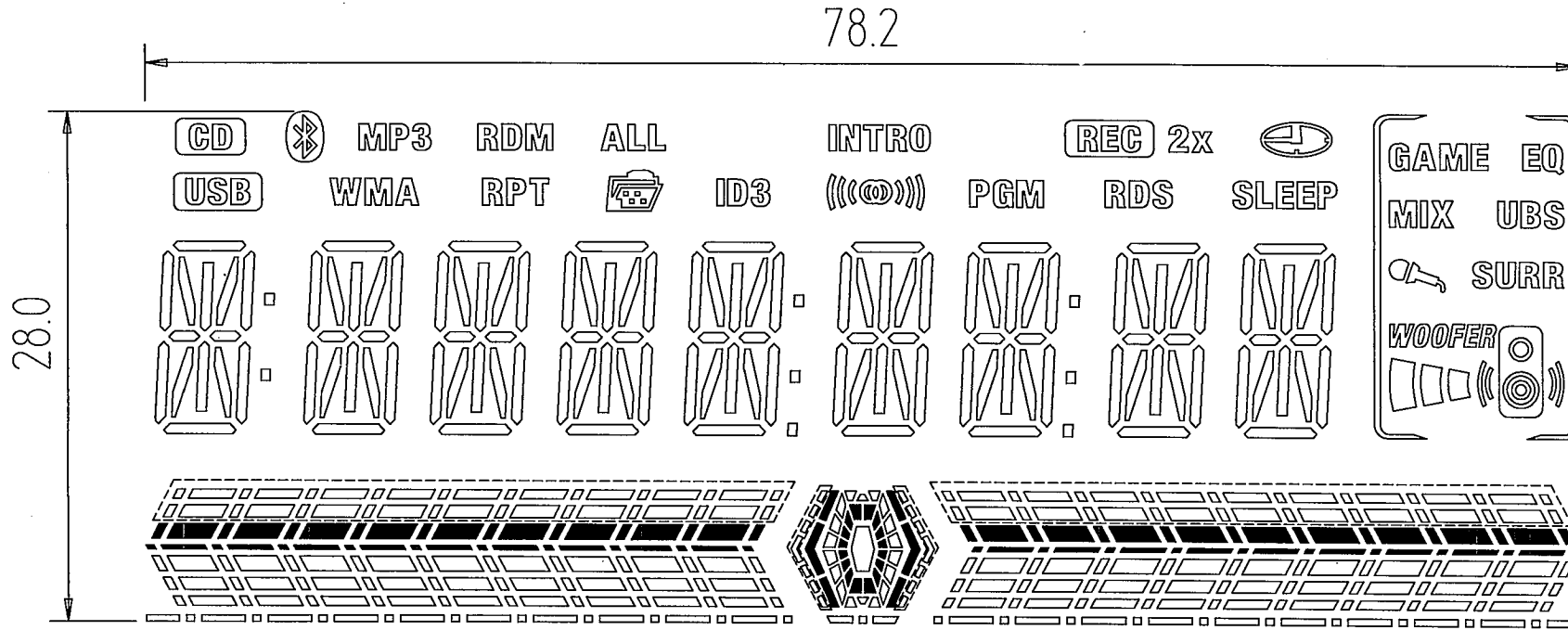
Notes

- 1) F+, F- : Filament pin
- 2) nG : Grid pin
- 3) Pn : Anode pin
- 4) NP : No pin
- 5) NC : No connection pin

LEAD DETAILS

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 OUTER DIMENSIONS
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PATTERN DETAILS



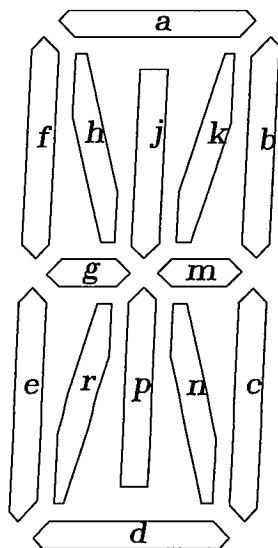
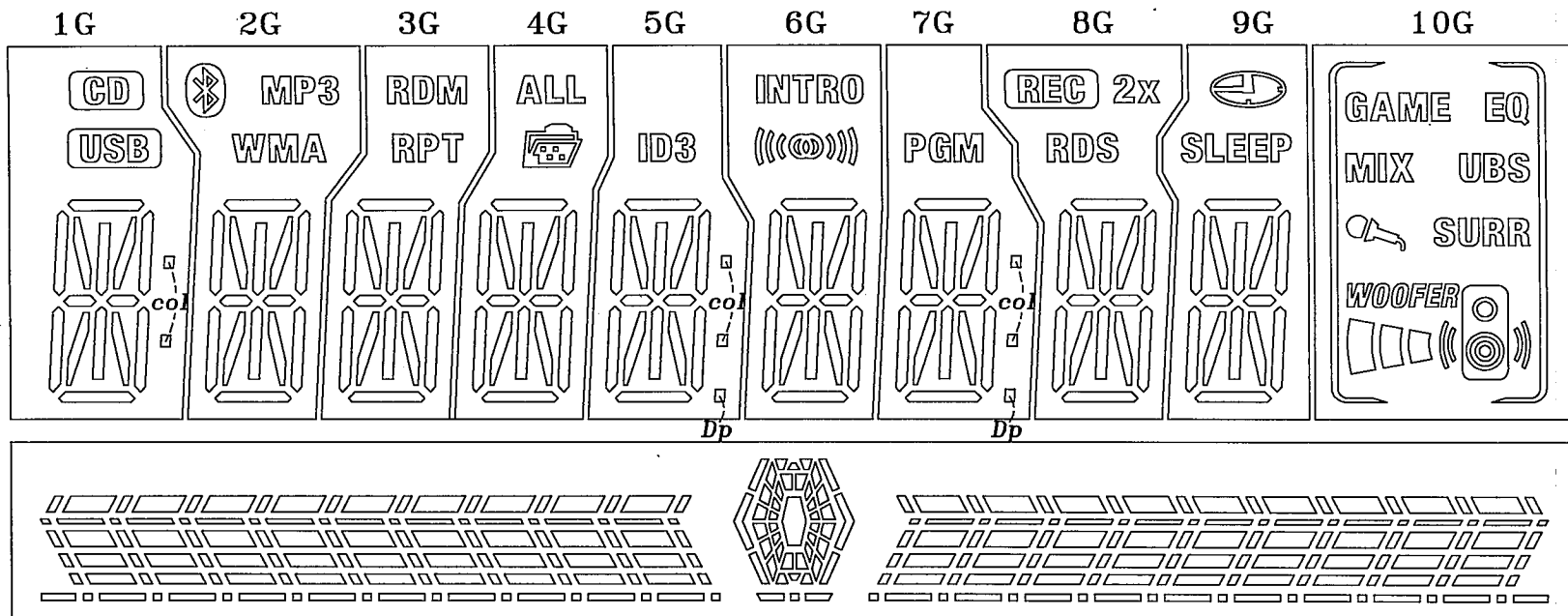
◎ Color of Illumination ◎

- Cd-free Yellowish Orange (Cd-free Ysh.0. $x=0.50, y=0.47$) ----- Hatched Patterns.
- Cd-free Reddish Orange (Cd-free Rsh.0. $x=0.62, y=0.37$) ----- Patterns Within the Dotted Line.
- Green (G. $x=0.250, y=0.439$) ----- Others.

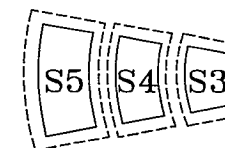
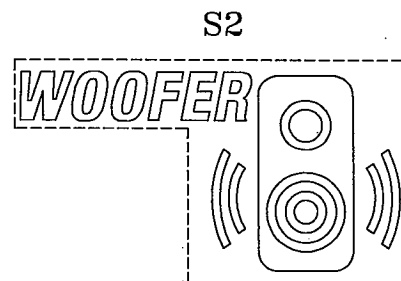
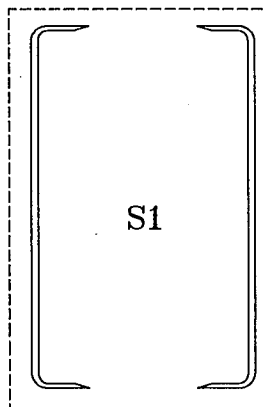
Negative Patterns. **USB** **CD** **REC**

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 PATTERN DETAILS
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GRID ASSIGNMENT(1)



(1G-9G)

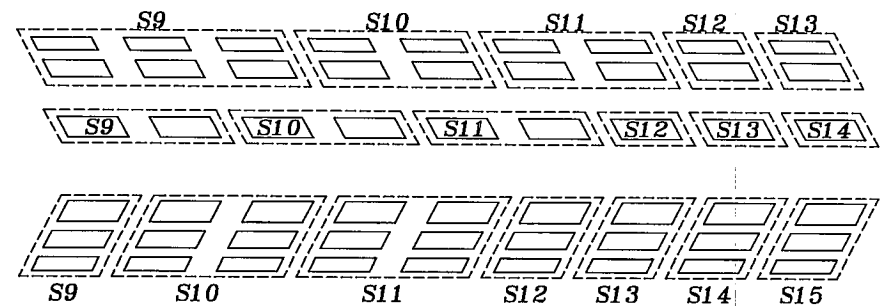
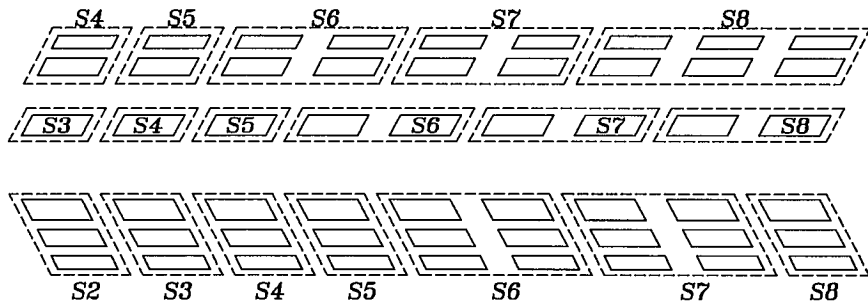
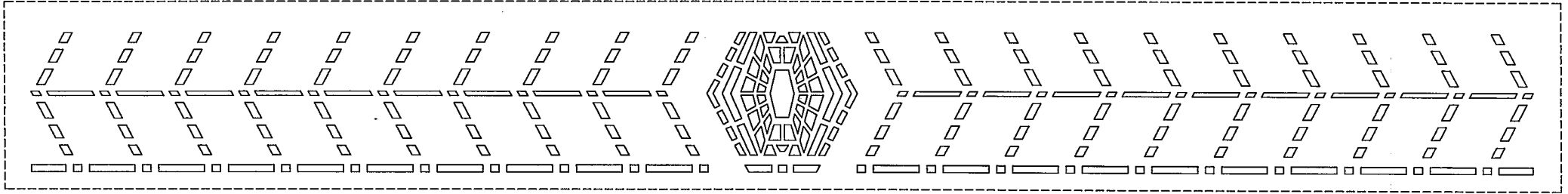


(10G)

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 GRID ASSIGNMENT(1)
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GRID ASSIGNMENT (2)

S1



(11G)

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GRID ASSIGNMENT (2)
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ANODE CONNECTION

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G
P1			RDM	ALL	ID3	INTRO	PGM			S1	S15
P2		MP3	RPT		Dp		Dp	2X	SLEEP	GAME	S14
P3	col	WMA			col		col	RDS		EQ	S13
P4	a	a	a	a	a	a	a	a	a	MIX	S12
P5	b	b	b	b	b	b	b	b	b	UBS	S11
P6	f	f	f	f	f	f	f	f	f		S10
P7	k	k	k	k	k	k	k	k	k	SURR	S9
P8	j	j	j	j	j	j	j	j	j	S2	S8
P9	h	h	h	h	h	h	h	h	h	S3	S7
P10	m	m	m	m	m	m	m	m	m	S4	S6
P11	g	g	g	g	g	g	g	g	g	S5	S5
P12	n	n	n	n	n	n	n	n	n		S4
P13	p	p	p	p	p	p	p	p	p		S3
P14	r	r	r	r	r	r	r	r	r		S2
P15	c	c	c	c	c	c	c	c	c		S1
P16	e	e	e	e	e	e	e	e	e		
P17	d	d	d	d	d	d	d	d	d		

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