DC-Heating
Directly-Heated
Connected in Parallel

KORG

Nutube
6P1
Twin Triode

1. Ratings

Parameter	Symbol	MIN	TYP	MAX	Unit
Operating Temp.	To	-40	-	+85	℃
Storage Temp.	Ts	-50	-	+85	℃
Filament Voltage	Ef #1	0.6	0.7	0.8	V
Grid Voltage	Eg #2	-	-	5.0	V
Anode Voltage	Ea #2	5.0	-	80.0	V
Anode Power Dissipation	Na	-	-	1.7	mW
Insulation Resistance(Anode-Other)	-	3	-	-	MΩ
Insulation Resistance(Grid-Other)	-	3	-	-	MΩ
Color of Illumination	Green				

2. Electrical Characteristics

Parameter	Symbol	Test Condition		MIN	TYP	MAX	Unit
Filament Current	If	Ef=0.7Vdc #1	Eg=Ea=0V	16.0	17.0	20.0	mAdc
Bias Voltage	Bias		Ia=18.2μA #5#6 Vin=0Vrms #5	1.5	2.5	3.5	Vdc
Voltage Amplification (Vout / Vin)	A		Ia=18.2μA #5#6 Vin=0.245Vrms, 1kHz	3.7	5.0	6.4	-
Resonance Frequency	Fr #7		Ia=18.2μA #5#6 Vin=0Vrms #5	-	5.8	-	kHz
Anode Current	Ig #3		Eg=2.0Vdc #2	-	32.0	-	μAdc
Grid Current	Ia #4		Ea=12.0Vdc	-	6.0	-	μAdc
Amplification Factor	μ			-	14.5	-	-
Transconductance	gm			-	54	-	-
Anode Resistance	Ra			-	330	-	kΩ

#1 Per each filament
#2 See Fig.1
#3 Per each grid
#4 Per each anode
#5 See Fig.2
#6 Ia adjusted by 'Bias'

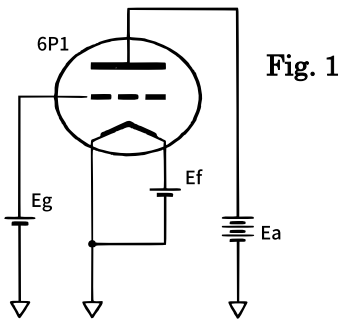


Fig. 1

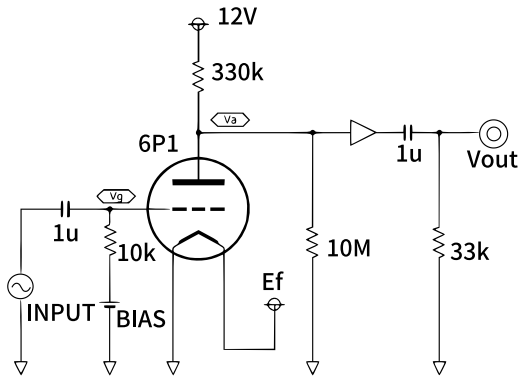


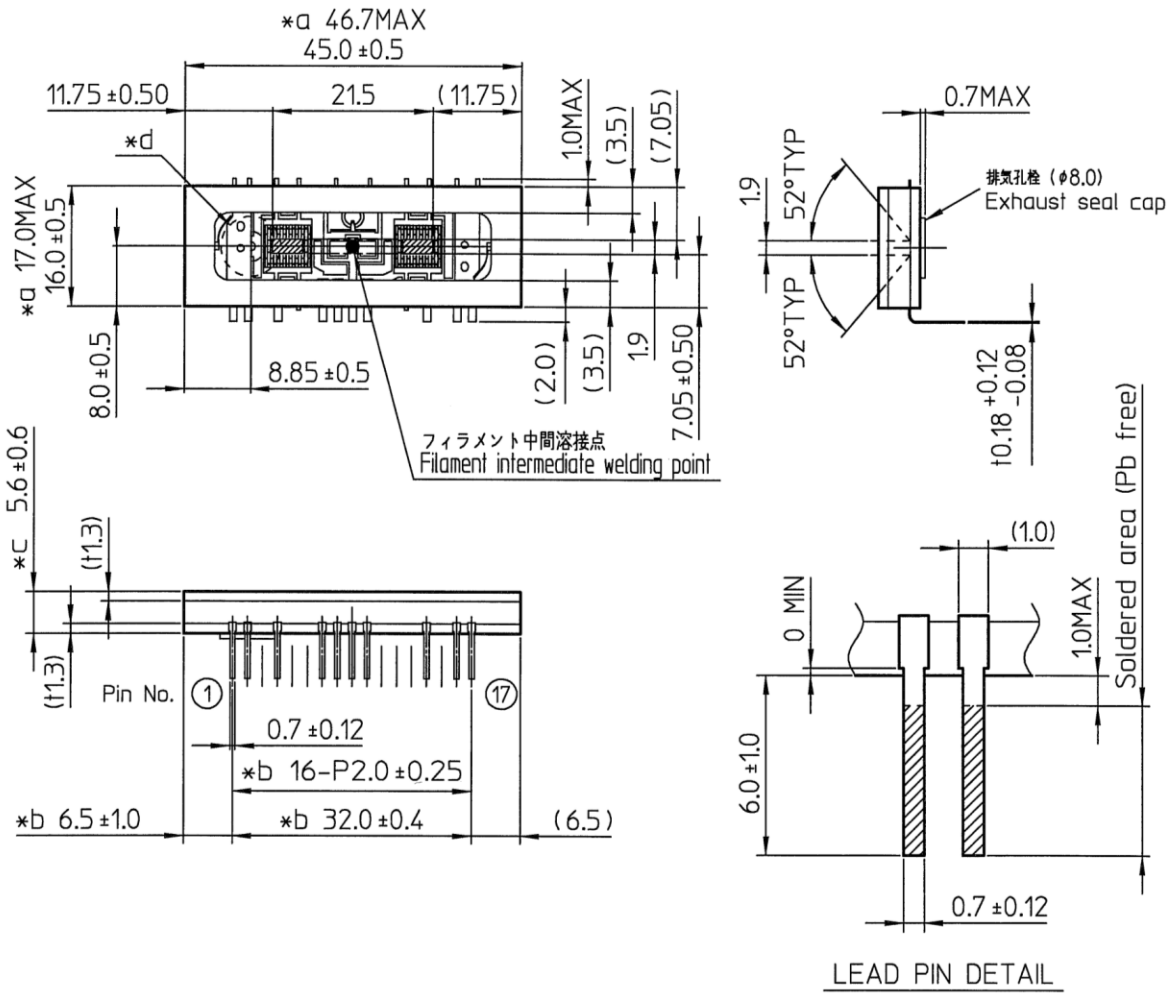
Fig. 2

Capacitances (Typical)

F1-G1 2-4	F1-A1 2-7	F1-GND 2-8	G1-A1 4-7	G1-GND 4-8	G1-A2 4-10	G1-G2 4-14	A1-GND 7-8	A1-A2 7-10
9.1pF	4.3pF	39.2pF	2.5pF	10.9pF	2.3pF	4.3pF	4.5pF	1.4pF

Nutube 6P1 External Dimensions

Unit: mm
( ): Reference only
参考寸法



*a フリットのはみ出しを含む寸法とする.
Including any protruding frit glass.

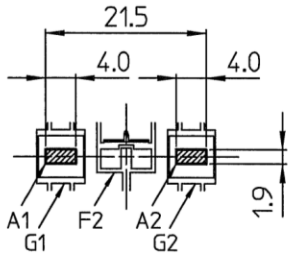
*b 基板底面より3mmの位置の寸法とする.
Within 3mm from the bottom of the glass substrate.

*c 排気孔栓の厚みを含まない.
Does not include the thickness of the exhaust seal cap.

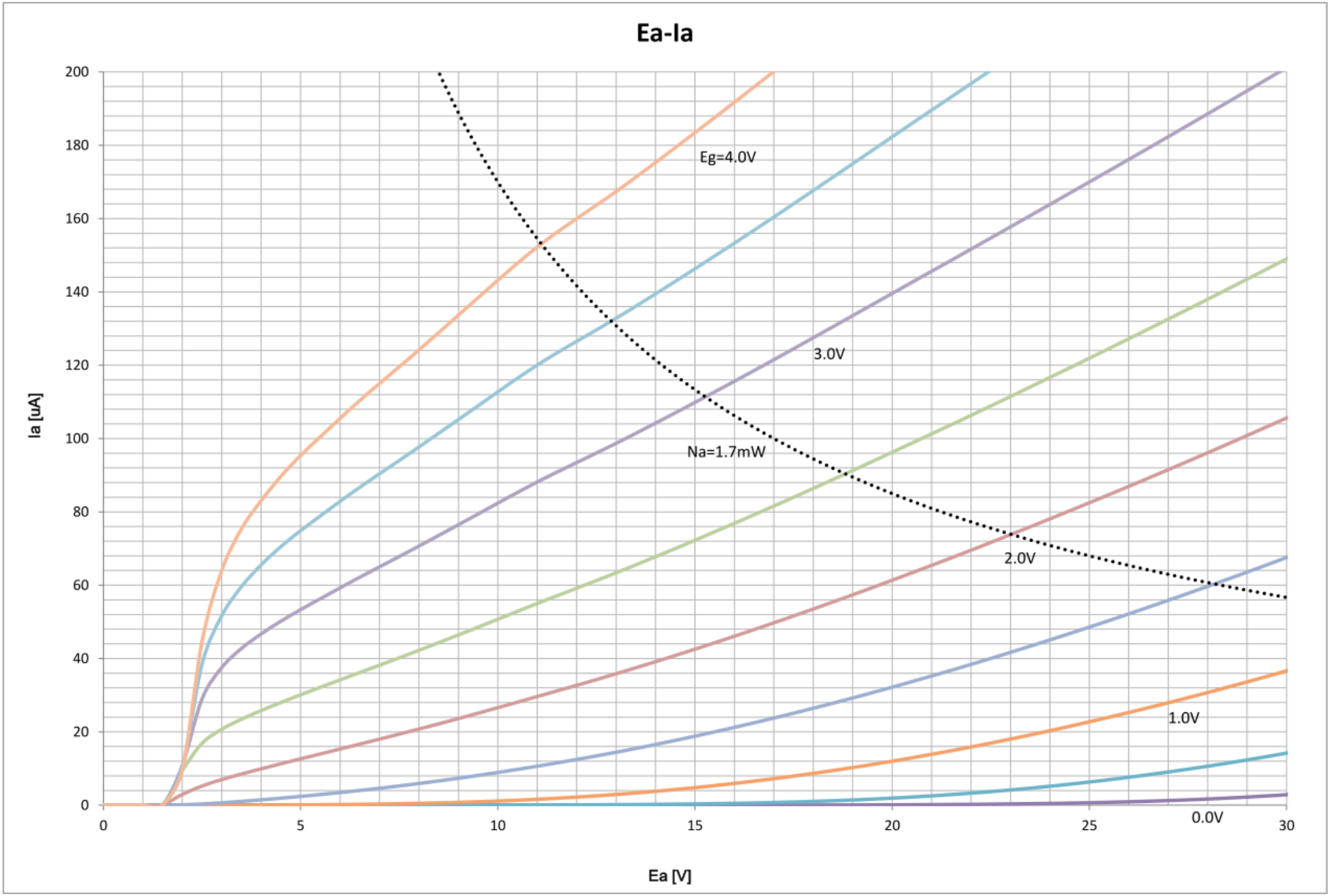
*d 排気孔栓は排気孔の中心から半径6mmの範囲に収まっていること.
Exhaust seal cap is entirely within a 6mm radius from the center point.

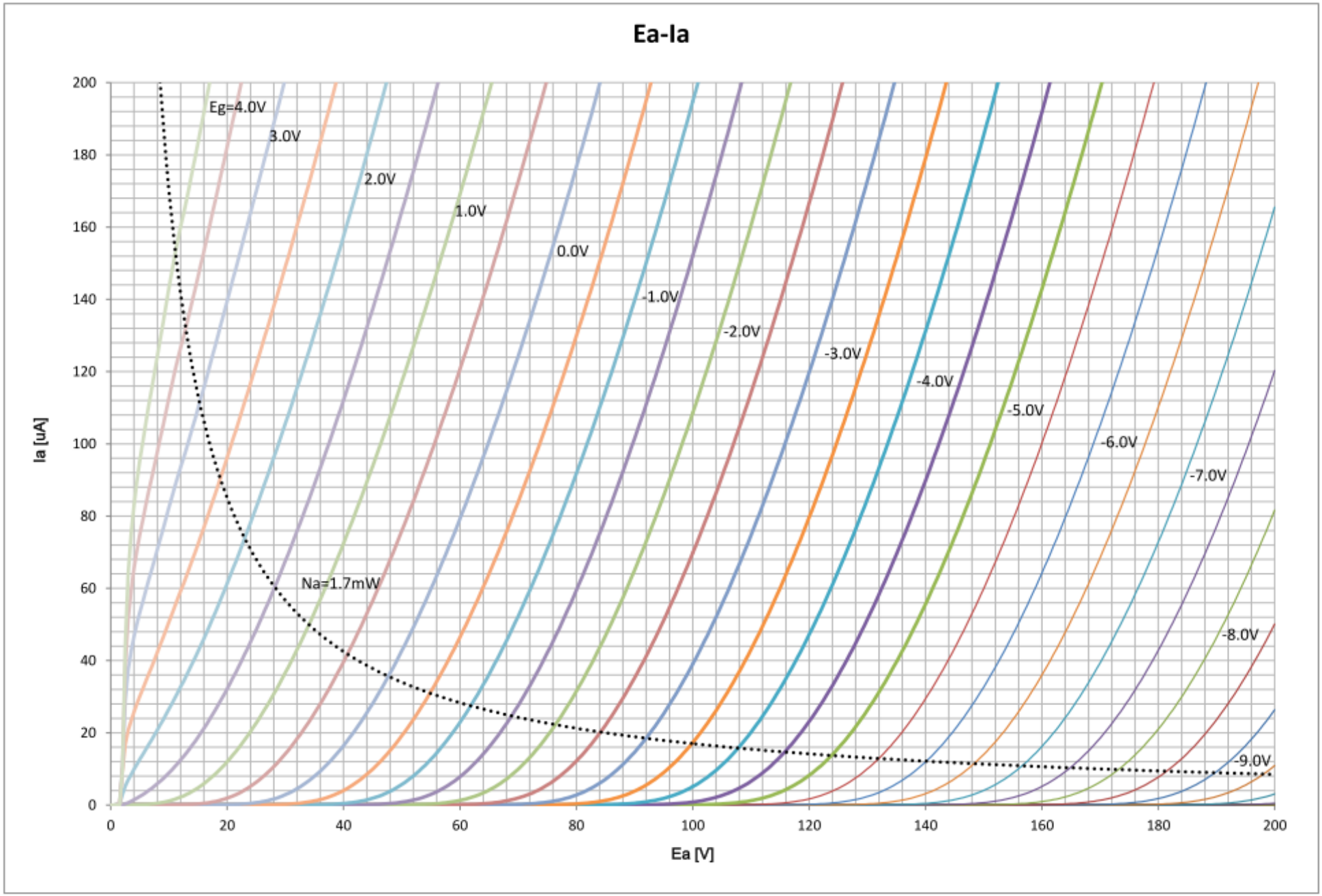
Pin assignment

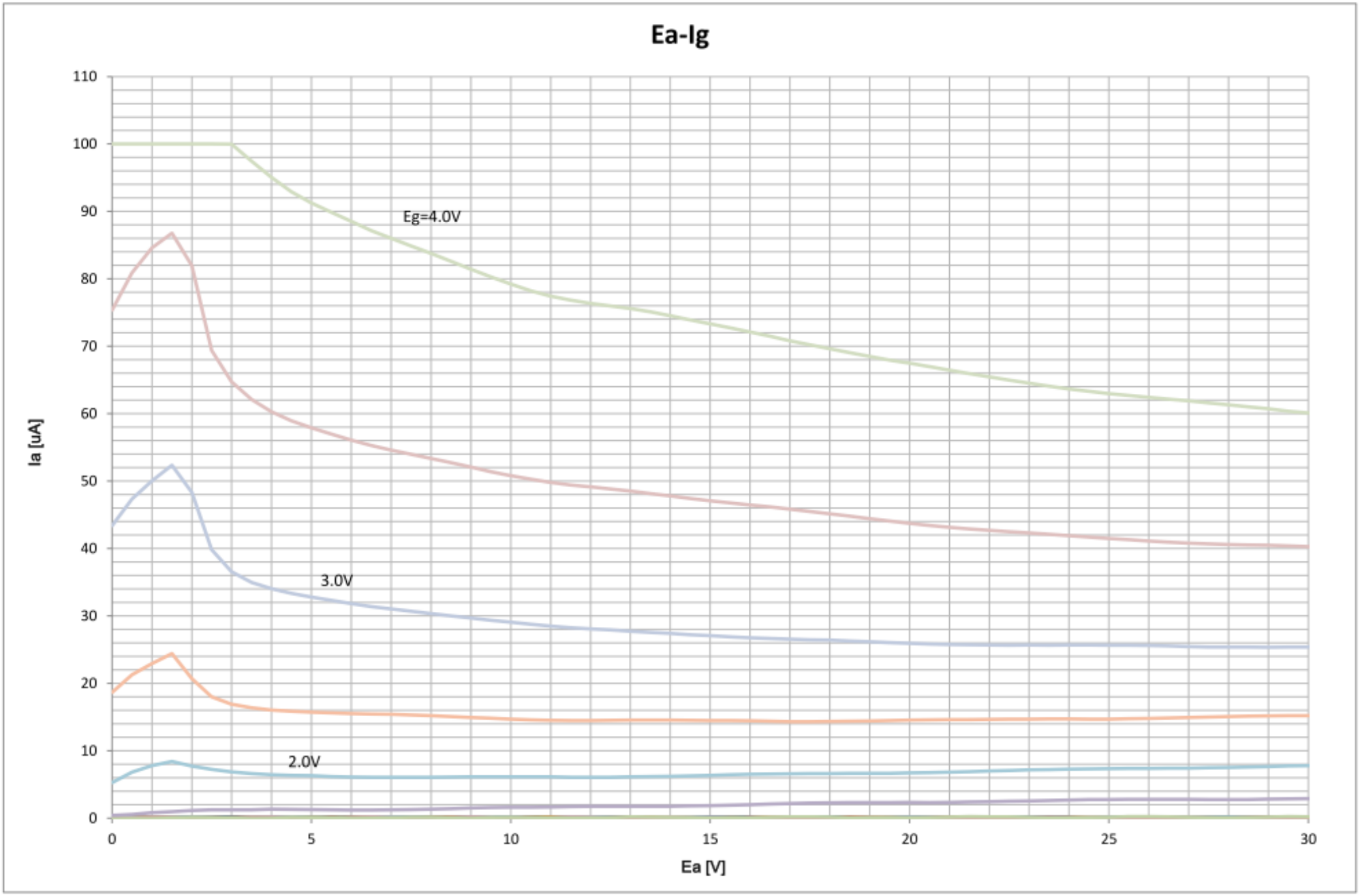
Pin NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Assignment	F1	F1	NP	G1	NP	NP	A1	GND	F2	A2	NP	NP	NP	G2	NP	F3	F3



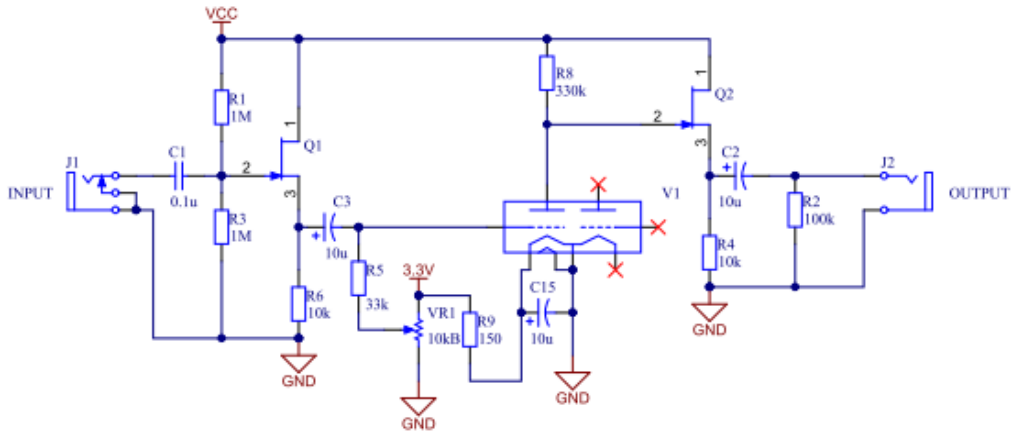
F1: フィラメント 1 (左)/Filament 1 (Left)
F2: フィラメント 2 (中間)/Filament 2 (Center)
F3: フィラメント 3 (右)/Filament 3 (Right)
NP: ノーピン/No Pin
G1: グリッド 1/Grid 1
G2: グリッド 2/Grid 2
A1: アノード 1/Anode 1
A2: アノード 2/Anode 2


Ea-Ia
Ia [uA]
Ea [V]
Eg=4.0V
3.0V
Na=1.7mW
2.0V
1.0V
0.0V
0
20
40
60
80
100
120
140
160
180
200
0
5
10
15
20
25
30


Ea-Ia
Ia [uA]
Ea [V]
Eg=4.0V
3.0V
2.0V
1.0V
0.0V
-1.0V
-2.0V
-3.0V
-4.0V
-5.0V
-6.0V
-7.0V
-8.0V
-9.0V
Na=1.7mW
0
20
40
60
80
100
120
140
160
180
200


Ea-Ig
Ia [uA]
Ea [V]
Eg=4.0V
3.0V
2.0V
0
10
20
30
40
50
60
70
80
90
100
110
0
5
10
15
20
25
30

Nutube Basic Circuit

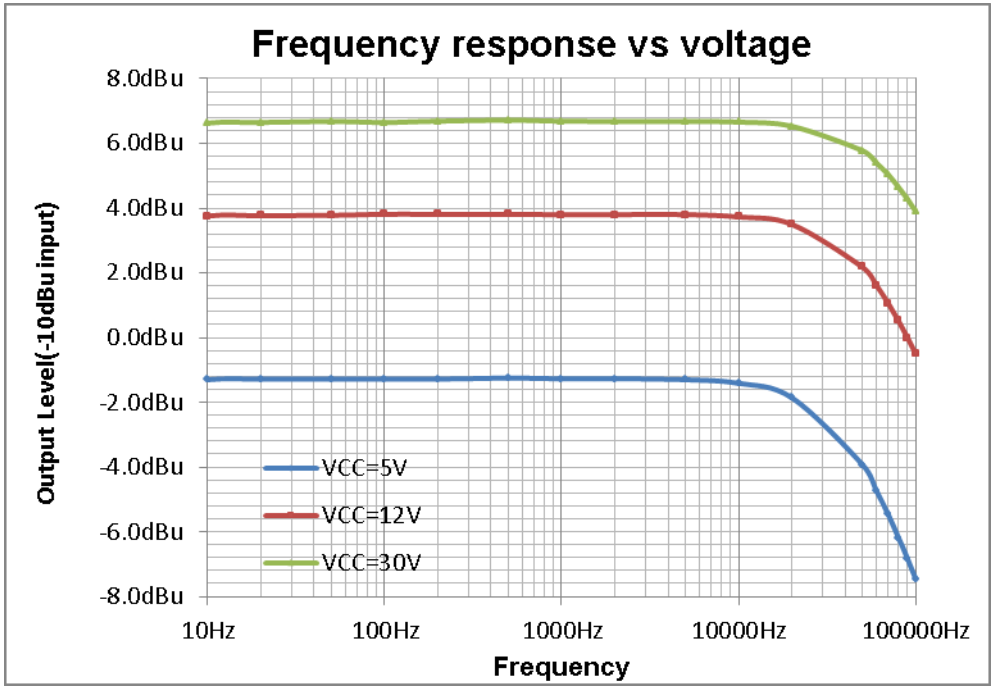


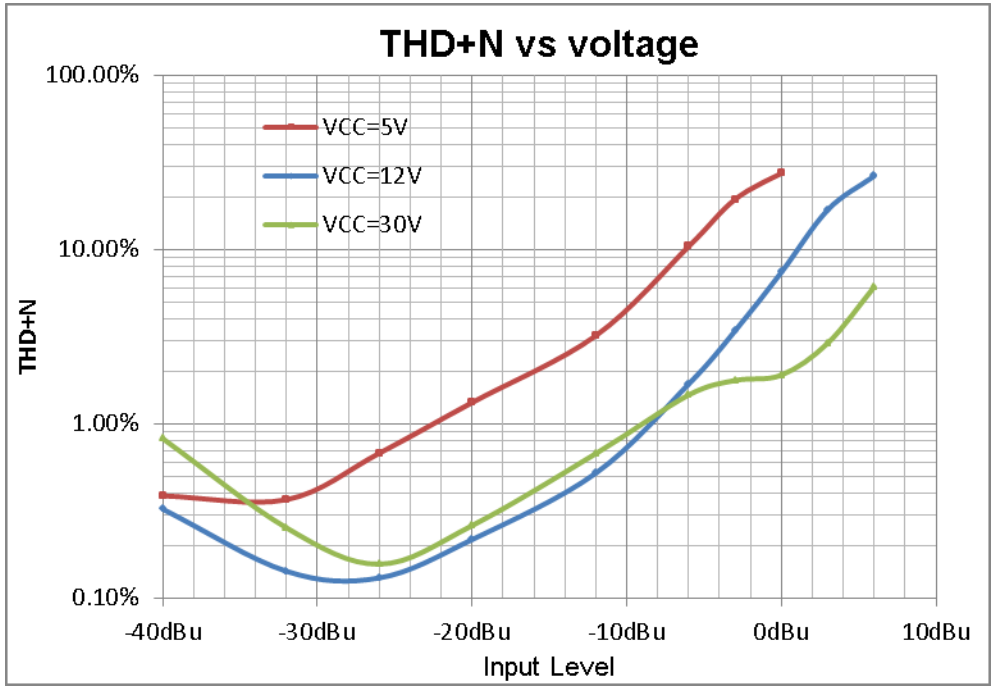
Application notes
1. C15 reduces residual noise.
When C15=10uF, residual noise is 9dB less than when without C15.

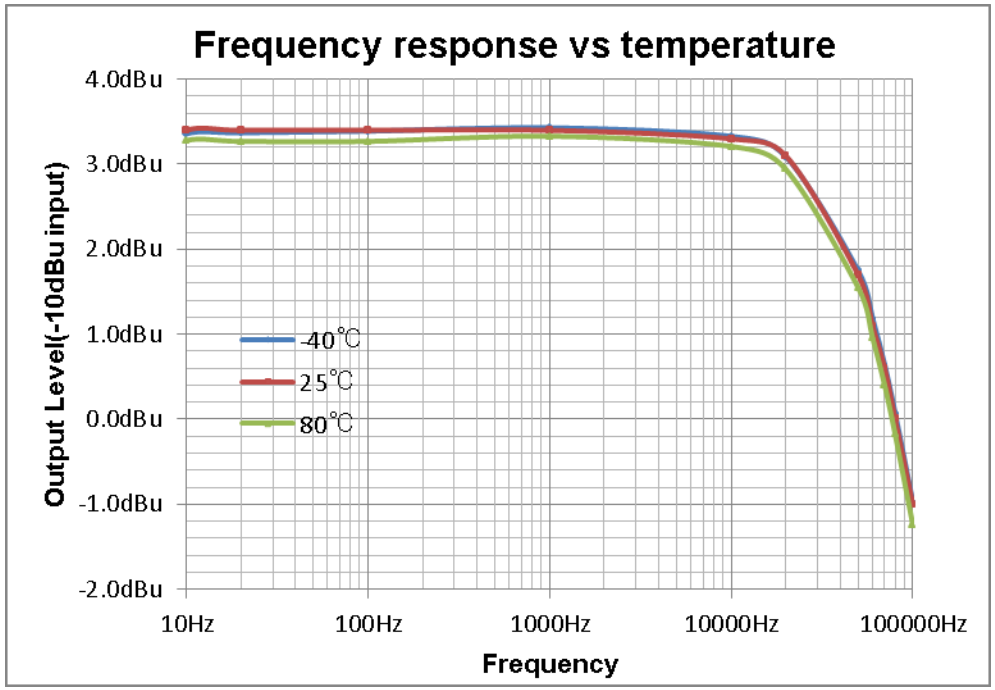
2. Nutube requires POSITIVE grid bias when the VCC voltage is under 40V approximately.
VR1 adjusts the bias voltage.

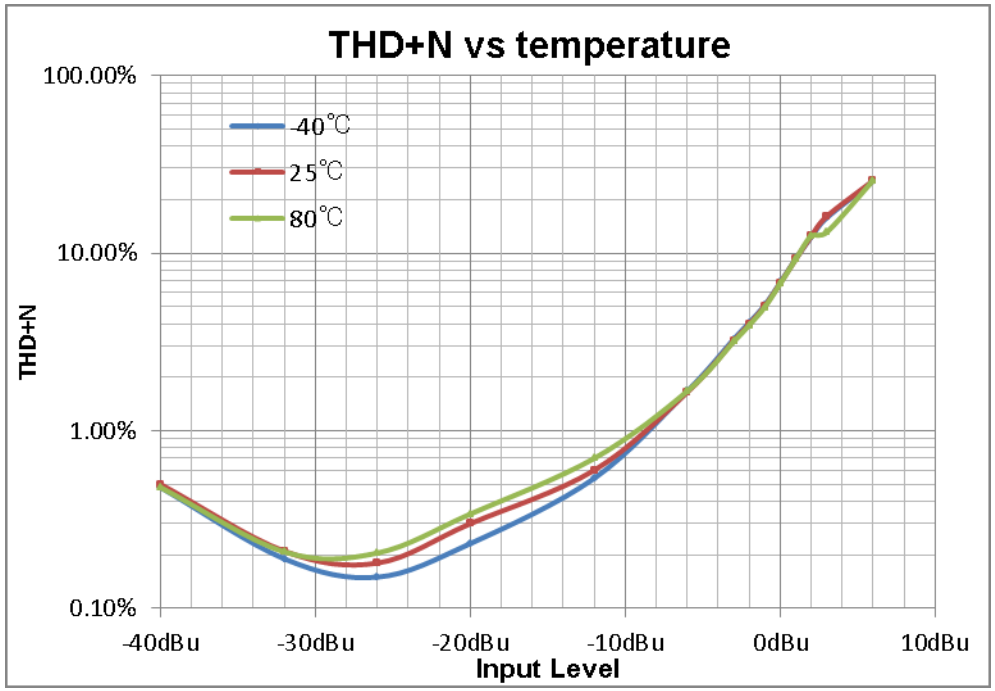
3. The approximate circuit gains are:
9dB(VCC=5V)
14dB(VCC=12V)
17dB(VCC=30V)

When R8 varies(VCC=12V):
9dB(R8=100k)
13dB(R8=220k)
14dB(R8=330k)


Frequency response vs voltage
8.0dBu
6.0dBu
4.0dBu
2.0dBu
0.0dBu
-2.0dBu
-4.0dBu
-6.0dBu
-8.0dBu
Output Level(-10dBu input)
VCC=5V
VCC=12V
VCC=30V
10Hz
100Hz
1000Hz
10000Hz
100000Hz
Frequency


THD+N vs voltage
100.00%
10.00%
1.00%
0.10%
THD+N
VCC=5V
VCC=12V
VCC=30V
-40dBu
-30dBu
-20dBu
-10dBu
0dBu
10dBu
Input Level


Frequency response vs temperature
4.0dBu
3.0dBu
2.0dBu
1.0dBu
0.0dBu
-1.0dBu
-2.0dBu
Output Level(-10dBu input)
-40℃
25℃
80℃
10Hz
100Hz
1000Hz
10000Hz
100000Hz
Frequency


THD+N vs temperature
100.00%
10.00%
1.00%
0.10%
THD+N
-40℃
25℃
80℃
-40dBu
-30dBu
-20dBu
-10dBu
0dBu
10dBu
Input Level