

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	°C
Storage Temp.	Ts	-50	-	+85	°C
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	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'

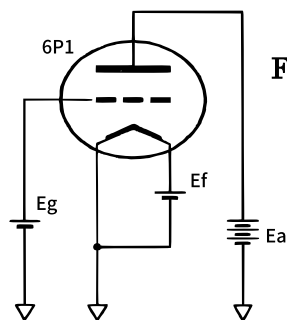


Fig. 1

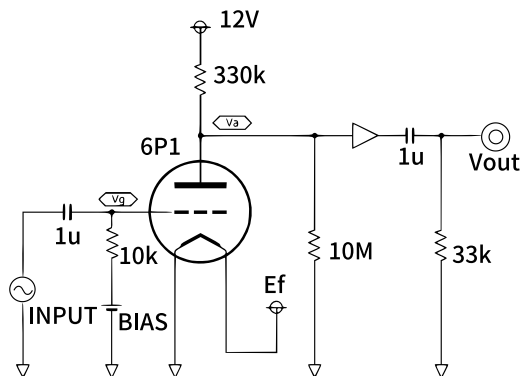


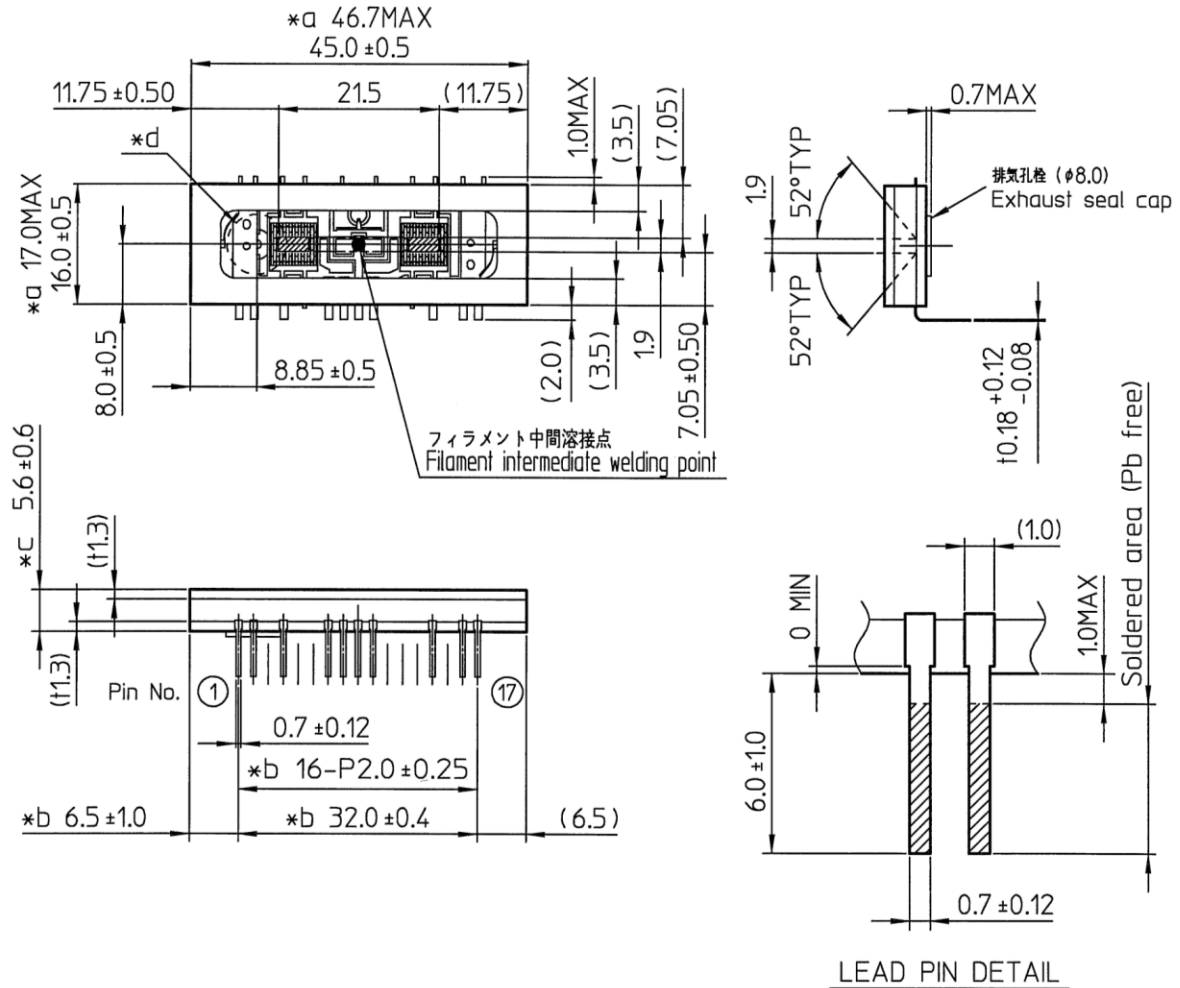
Fig. 2

Capacitances (Typical)

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

Nutube 6P1 External Dimensions

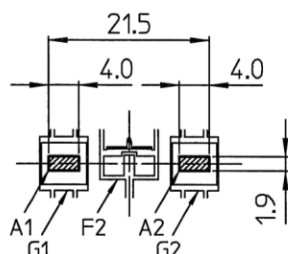
Unit: mm  
 ( ): Reference only  
 参考寸法



- \*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.

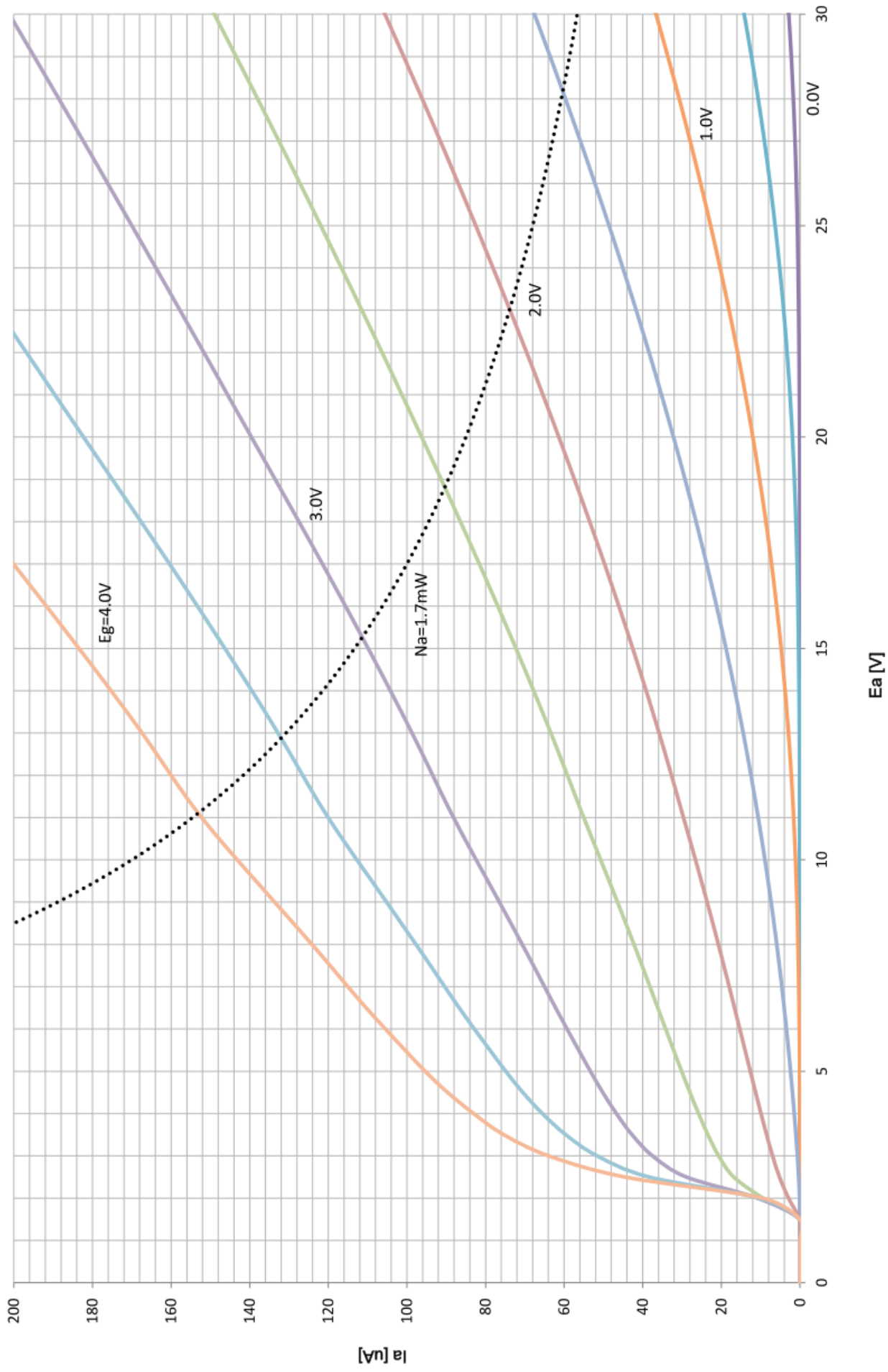
Pin assignment

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

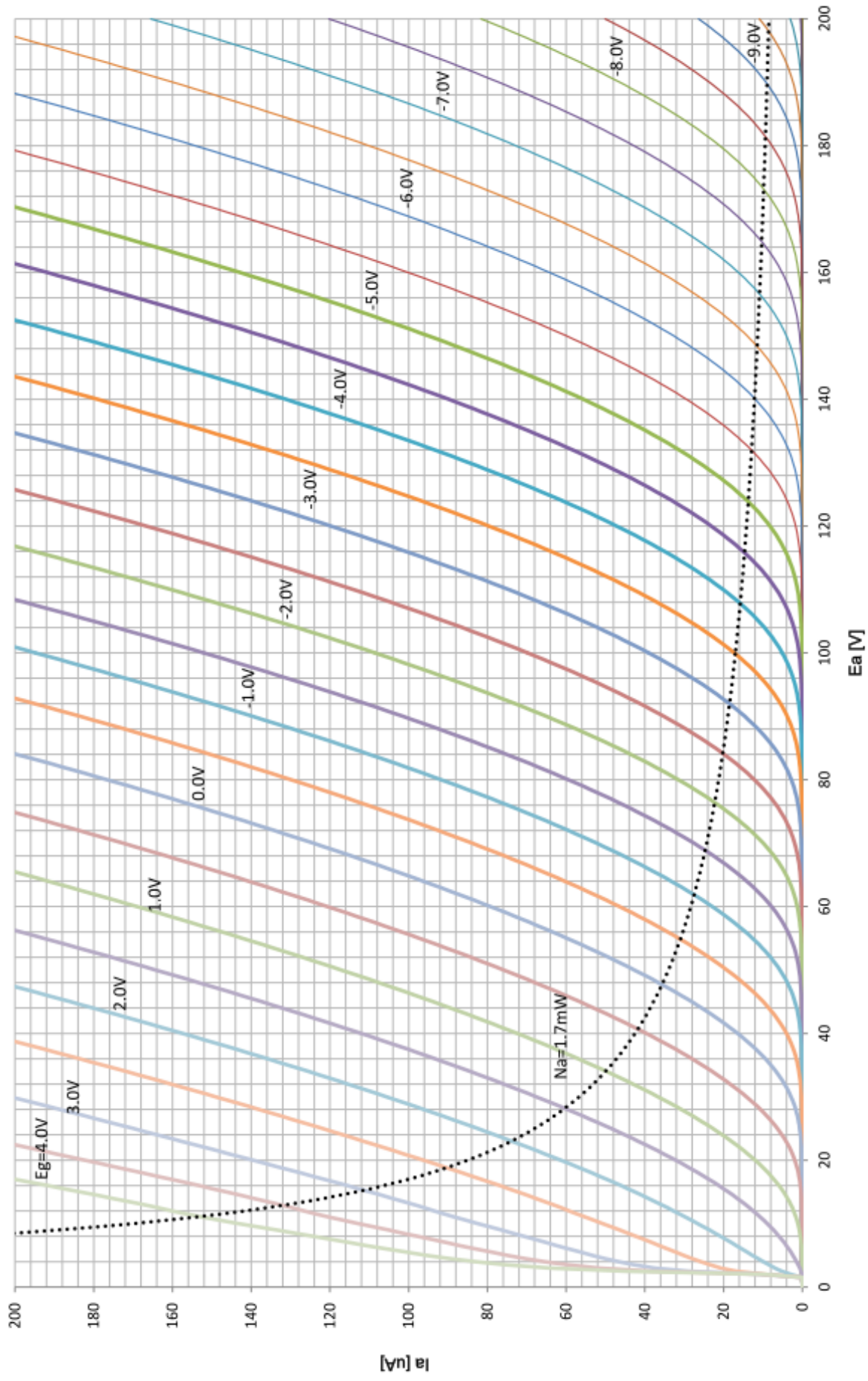


- F1: フィラメント 1 (左)/Filament 1 (Left)
- F2: フィラメント 2 (中間)/Filament 2 (Center)
- F3: フィラメント 3 (右)/Filament 3 (Right)
- NP: ノーピン/No Pin
- G1: グリッド 1/Grid 1
- G2: グリッド 2/Grid 2
- A1: アノード 1/Anode 1
- A2: アノード 2/Anode 2

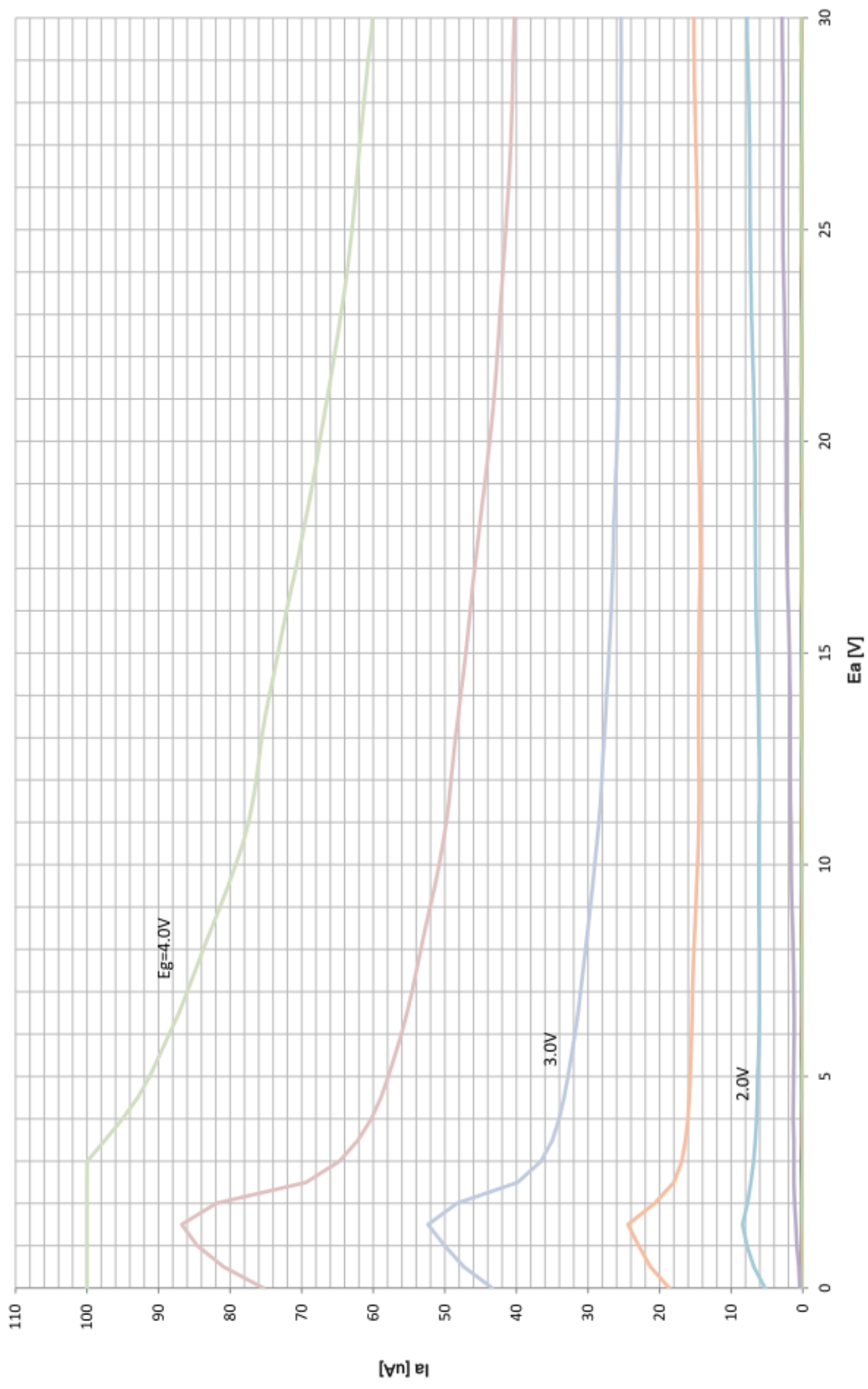
Ea-Ia



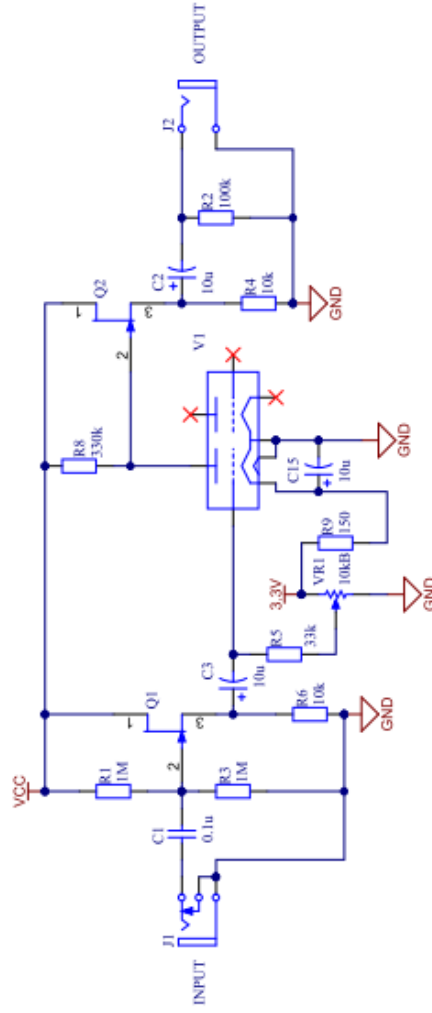
# Ea-Ia



# Ea-Ig



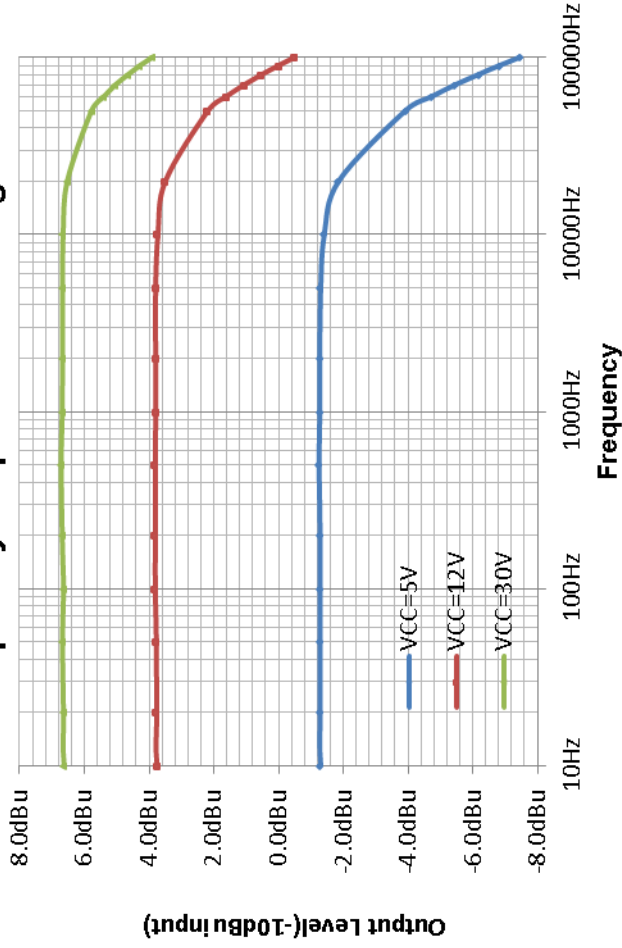
## Nutube Basic Circuit



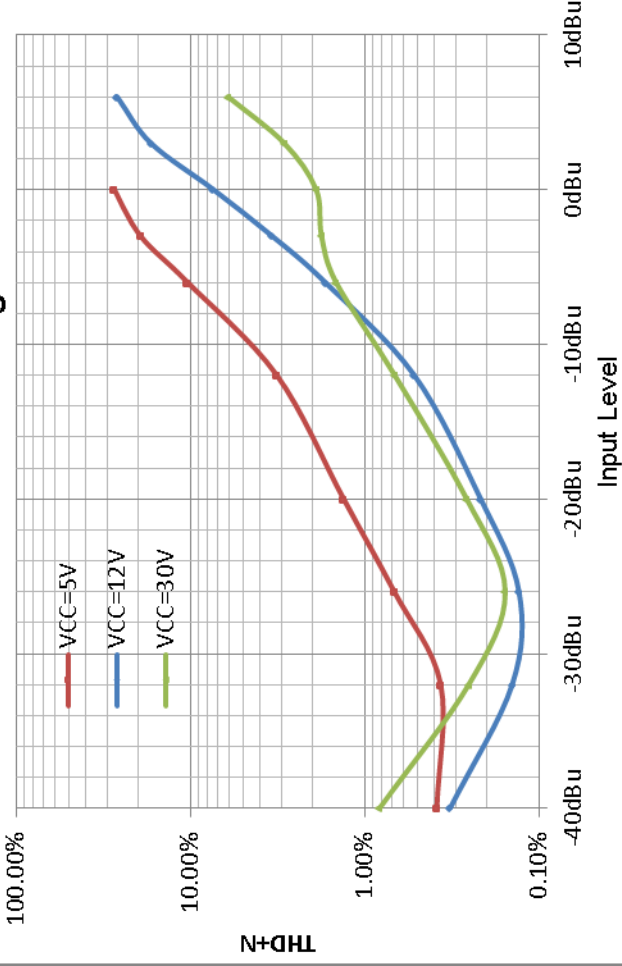
### Application notes

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)

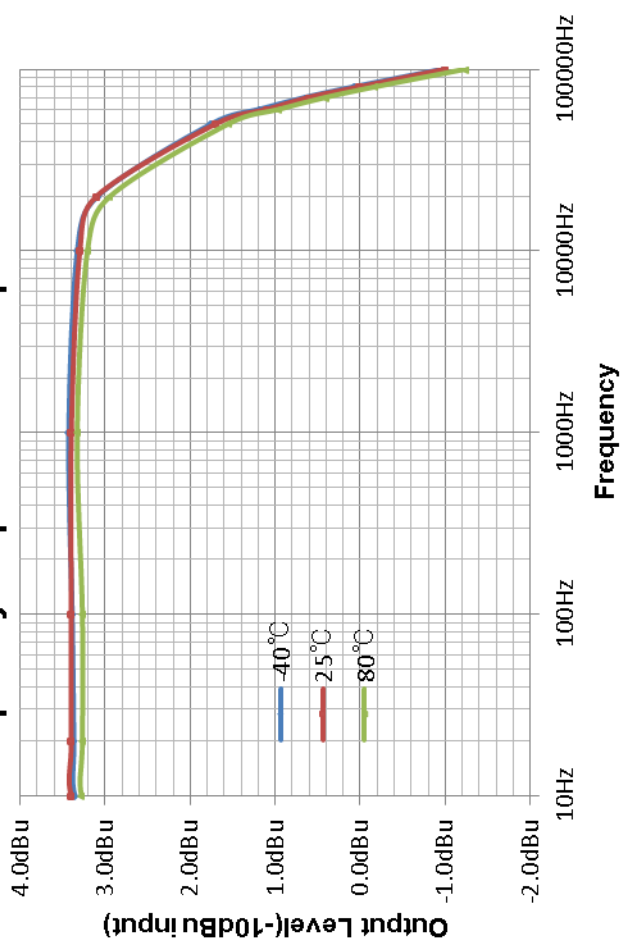
### Frequency response vs voltage



### THD+N vs voltage



### Frequency response vs temperature



### THD+N vs temperature

