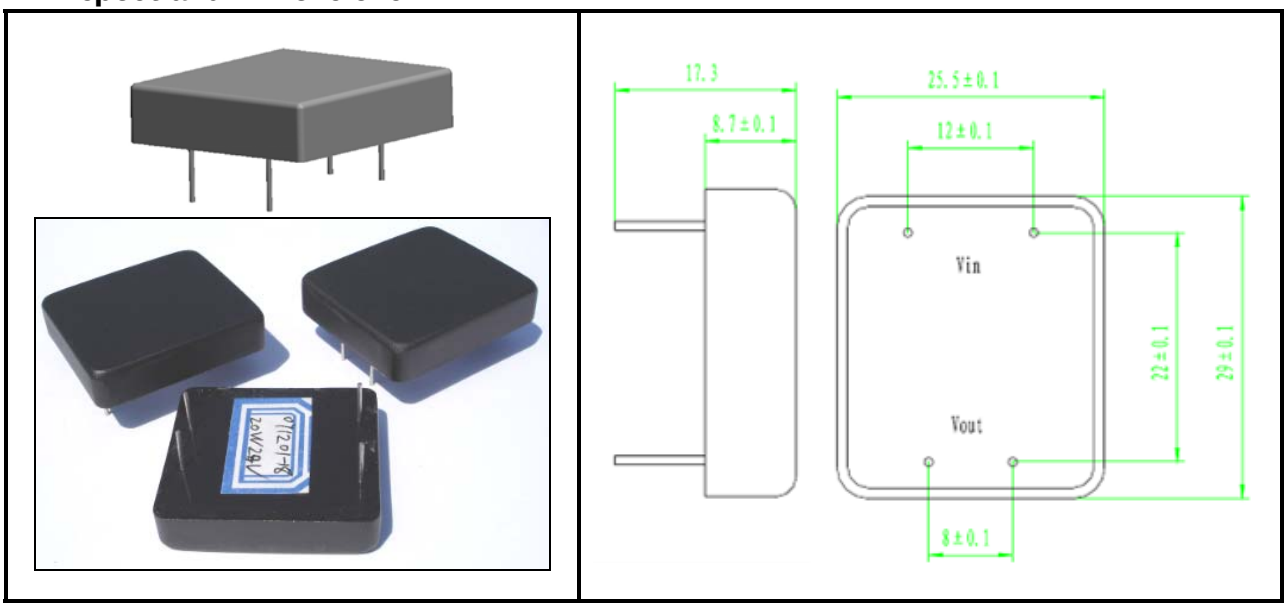
Micromechatronics Inc.
200 Innovation Blvd., Suite 155 ; State College, PA 16803-6602, USA
Phone: (814) 861-5688 ; Fax: (814) 861-1418. www.mmech.com

Product Specifications

Product Number: PT A 010 XXX IP

Product Description: 10W Series Step-Down Piezoelectric Transformer

1. Aspect and Dimensions



2. Product Number Guide

PT A 010 018 I P

Output Terminals Options:
P: Pins
L: Line

Insulation between input and output Options
M: High insulation for medical use
I: Insulation
L: Low Insulation
N: No insulation

Output Voltage Options:
010 – 10V
012 – 12V
015 – 15V
018 – 18V
024 – 24V

Output Power
010: 10W

Input:
A – AC
D48 – DC 48V
D24 – DC 24V

3. Selection Table

Table 3.1 Family of Step down PTs.

Output Voltage	Output Power				
	5W	10W	20W	30W	50W
10V	PTA005010IP	PTA010010IP	PTA020010IP	PTA030010IP	PTA050010IP
12V	PTA005012IP	PTA010012IP	PTA020012IP	PTA030012IP	PTA050012IP
15V	PTA005015IP	PTA010015IP	PTA020015IP	PTA030015IP	PTA050015IP
18V	PTA005018IP	PTA010018IP	PTA020018IP	PTA030018IP	PTA050018IP
20V			PTA020020IP	PTA030020IP	PTA050020IP
24V	PTA005024IP	PTA010024IP	PTA020024IP	PTA030024IP	PTA050024IP
28V			PTA020028IP	PTA030028IP	PTA050028IP

(*) Highlighted the 10W series covered in this Data Sheet.

4. Electrical Characteristics – 10W Series

Table 4.1 Electrical characteristic

Parameter	Symbol	Specification		Remarks
Output Power Rating	Pout	10W		Temperature rise is < 20ºC
Operating Temperature Range	T	-55 ~ 125ºC		Tested on the PT metal case
Dielectric Strength between input and output	V	> 3700 Vdc		Current < 20uA
Output Voltage Rating	Vout	10V	Part No: 010010	
		12V	Part No: 010012	
		15V	Part No: 010015	
		18V	Part No: 010018	
		24V	Part No: 010024	
Recommended Working Frequency WIndow	Freq	127 ~ 132 kHz		
Input Voltage Window	Vin	57 ~ 75 V	Part No: 010010	Measured at T_{room}
		64~76V	Part No: 010012	
		56 ~ 80 V	Part No: 010015	
		62 ~ 70 V	Part No: 010018	
		55~ 70 V	Part No: 010024	
Input Static Capacitance	Cin	3.5nF ± 10%	Part No: 010010	Measured at T_{room}
			Part No: 010012	
			Part No: 010015	
			Part No: 010018	
			Part No: 010024	
Output Static Capacitance	Cout	88 nF ± 10%	Part No: 010010	Measured at T_{room}
		56 nF ± 10%	Part No: 010012	
		34 nF ± 10%	Part No: 010015	
		27 nF ± 10%	Part No: 010018	
		16 nF ± 10%	Part No: 010024	

5. Test Circuits

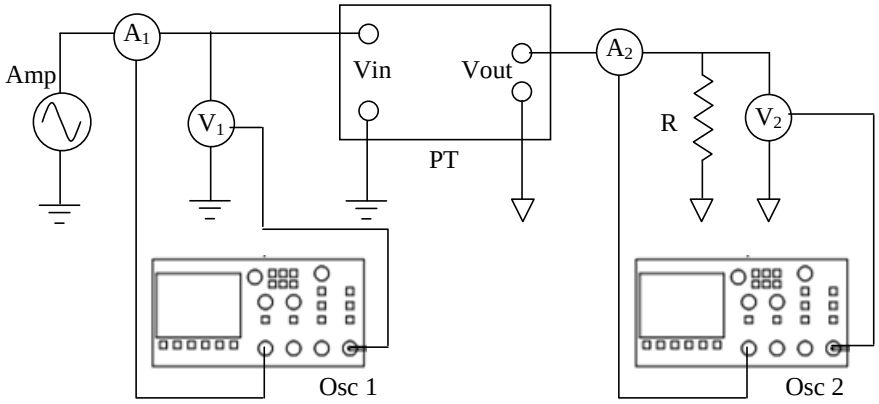


Fig. 5.1 Test circuit

Amp	Amplifier	NF HSA4052
Osc 1	Oscilloscope	Tektronix TDS754D
Osc 2	Oscilloscope	Tektronix TDS754D
A_1	Current Probe Input Current	Tektronix TCP202
V_1	Voltage Probe Input Voltage	Tektronix P5100
A_2	Current Probe Input Current	Tektronix TCP202
V_2	Voltage Probe Input Voltage	Tektronix P5100
R	Load Resistor	

6. Handling Precautions

6.1 High Voltage

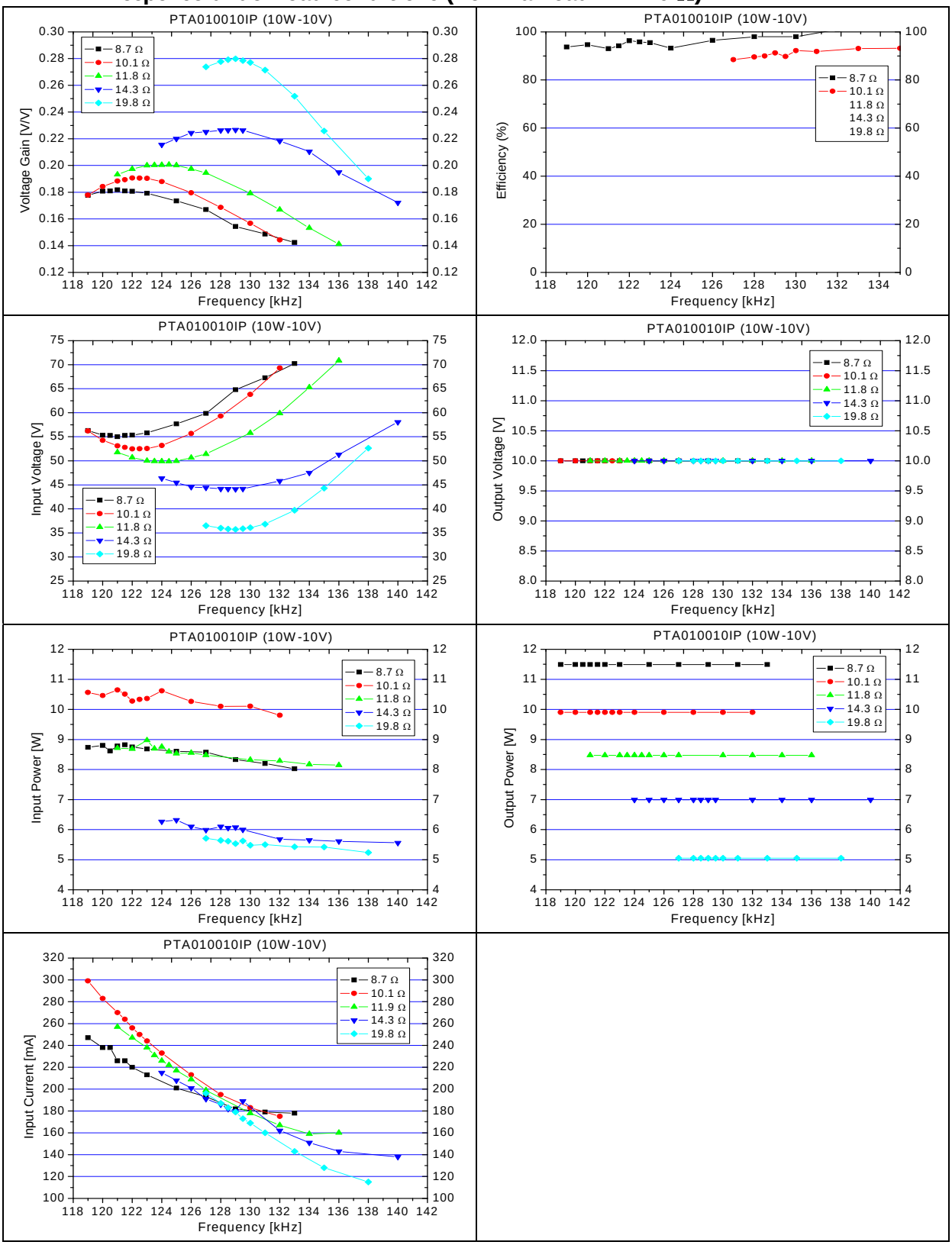
The voltage gain (Vout/Vin) of a piezoelectric transformer (PT) naturally increases when the output load tends to open circuit. As such, operating a piezoelectric transformer with the output terminals open circuited may lead to higher voltages than those nominally rated. Such a high voltage may damage the transformer and, in some cases, be dangerous to the user. Consequently, when measuring or using the PT under open circuit conditions, user is advised to keep the input voltage as low as possible to avoid any damage. When designing a circuit, an open circuit protection should be considered.

6.2 Storage and transport

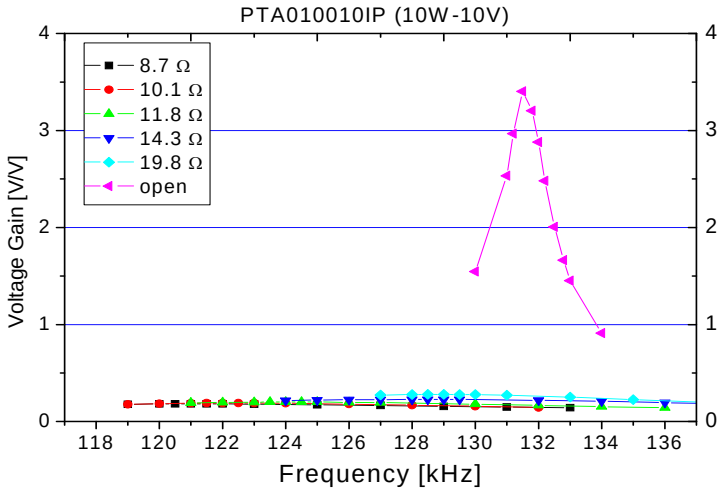
a. Avoid placing the unit under dusty environments or under gas corrosive atmospheres.
b. Keep the product in a packing material during the delivery. The product should not gain a load (weight) when you take it from the package or when you pile it up.

7. Characteristics of the PTA010010IP (Pout=10W and Vout=10V)

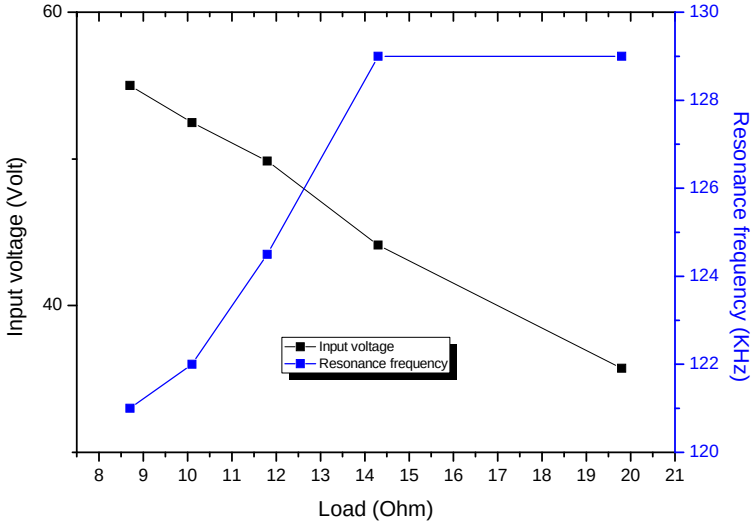
7.1 Response under load conditions (Nominal load: RL=10 Ω)



7.2 Voltage Gain under Open Circuit Conditions

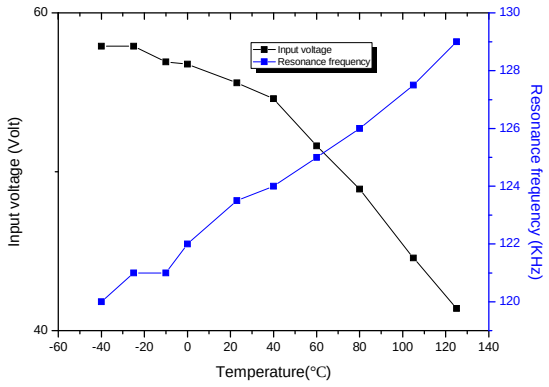


7.3 Variation of resonance frequency with the load

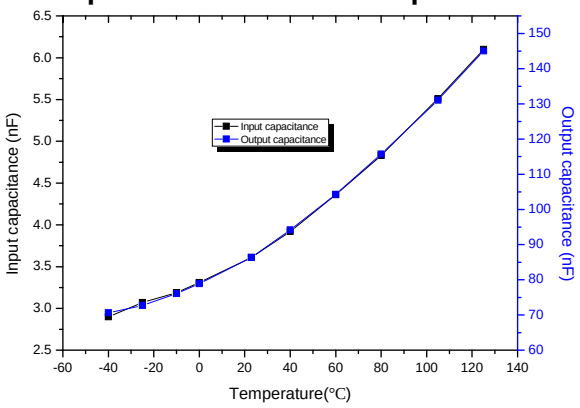


7.4 Temperature Characteristics

Variation of Vin, fres with the Temperature

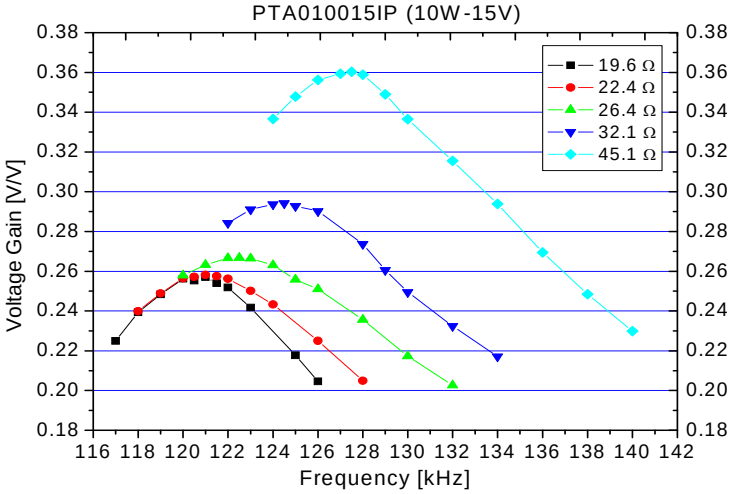


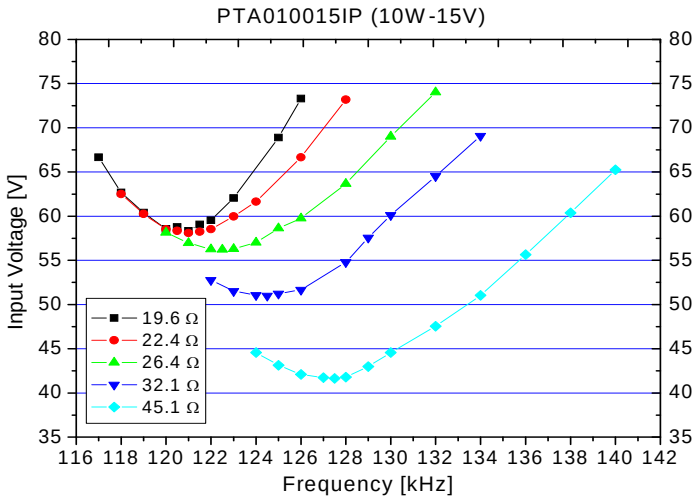
Variation of the input and output capacitances with the Temperature



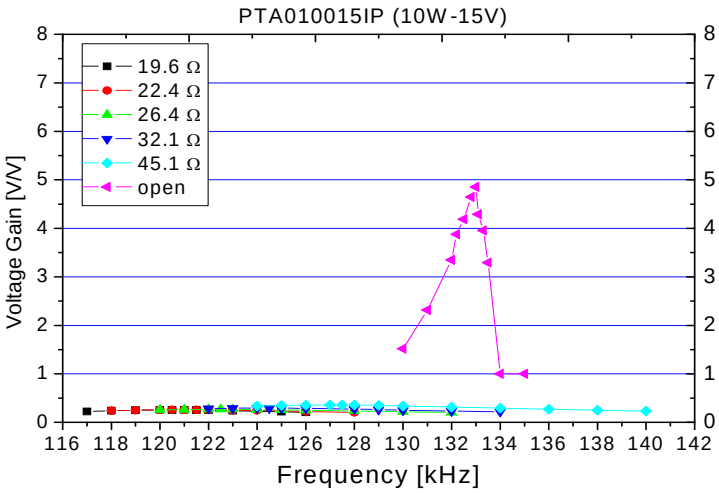
8. Characteristics of the PTA010015IP (Pout=10W and Vout=15V)

8.1 Response under load conditions (Nominal load: RL=22.5 Ω)

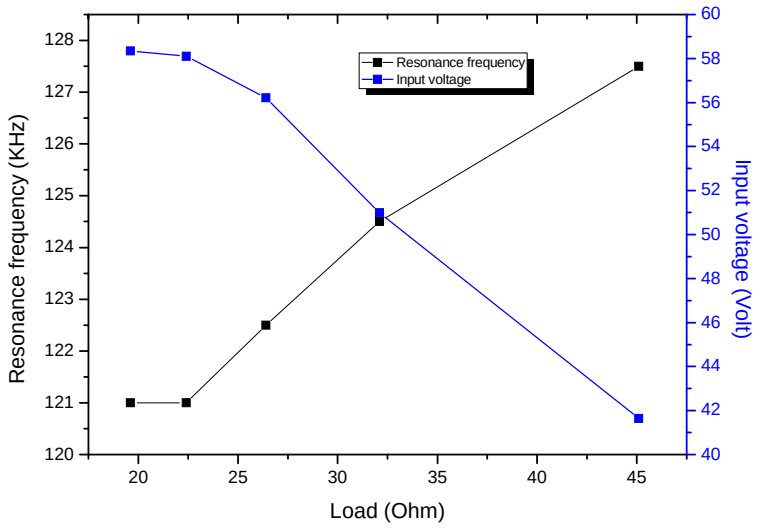




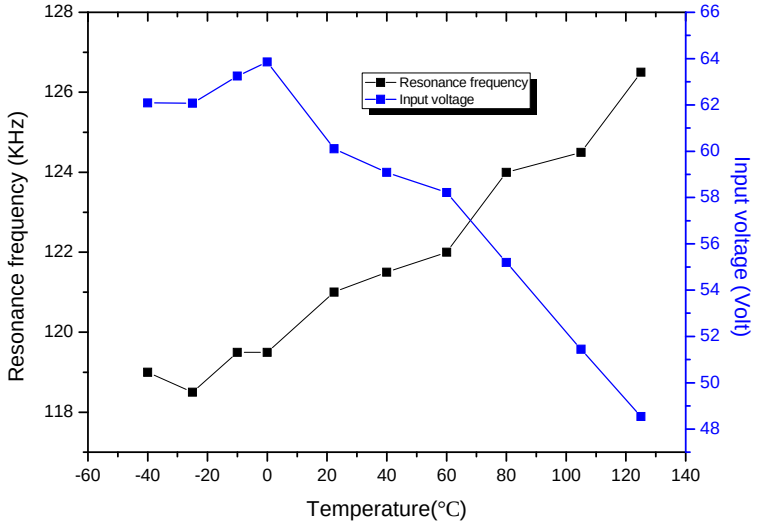
8.2 Voltage Gain under Open Circuit Conditions



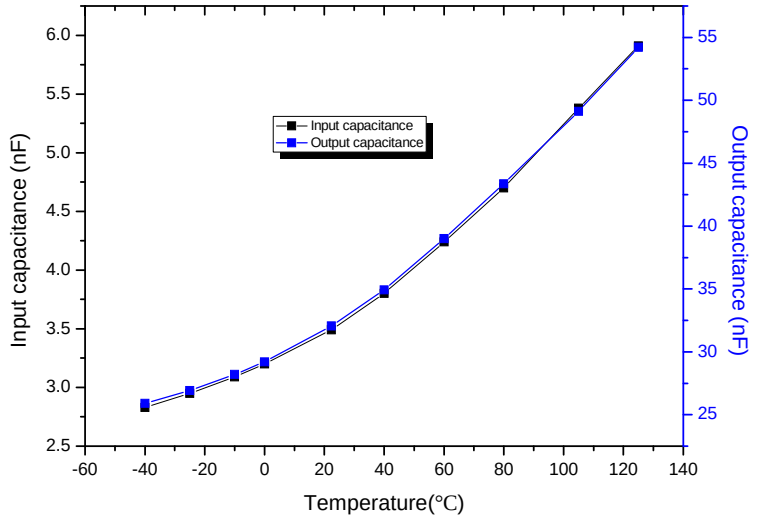
8.3 Variation of resonance frequency with the load



8.4 Variation of Vin, fres with the Temperature

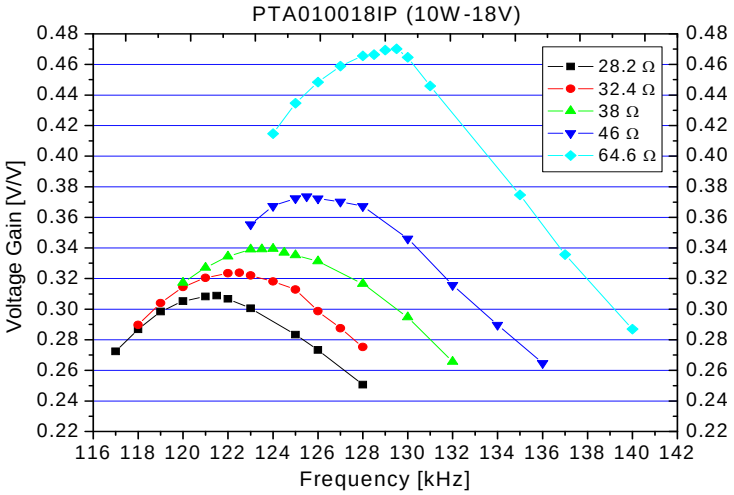


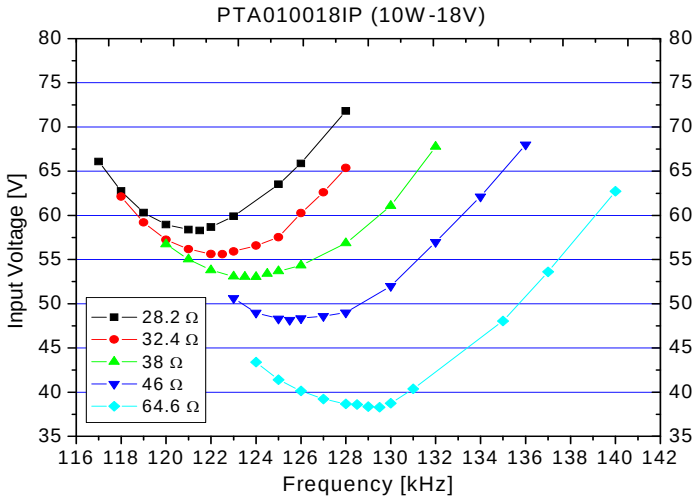
8.5 Variation of the input and output capacitances with the Temperature



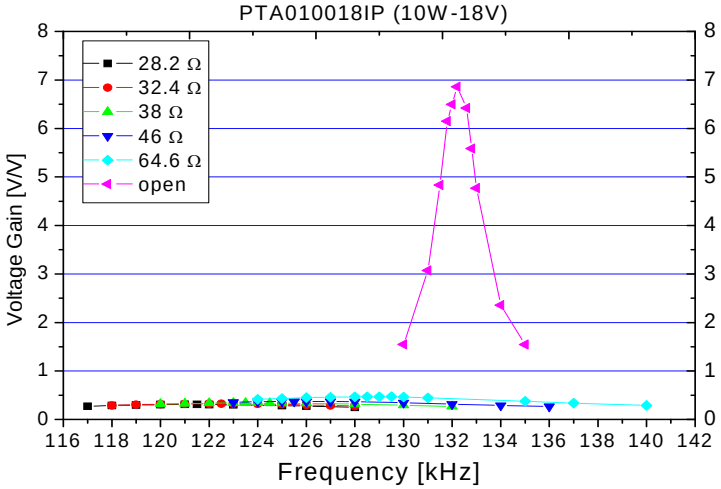
9. Characteristics of the PTA010018IP (Pout=10W and Vout=18V)

9.1 Response under load conditions (Nominal load: RL=32.4 Ω)

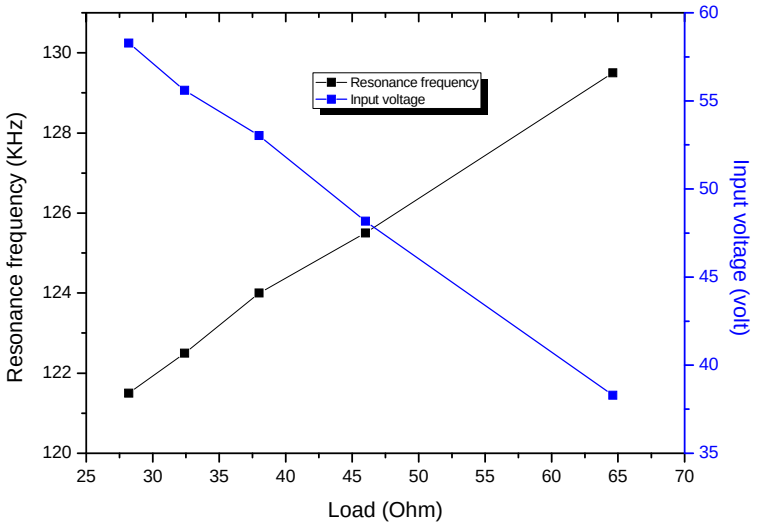




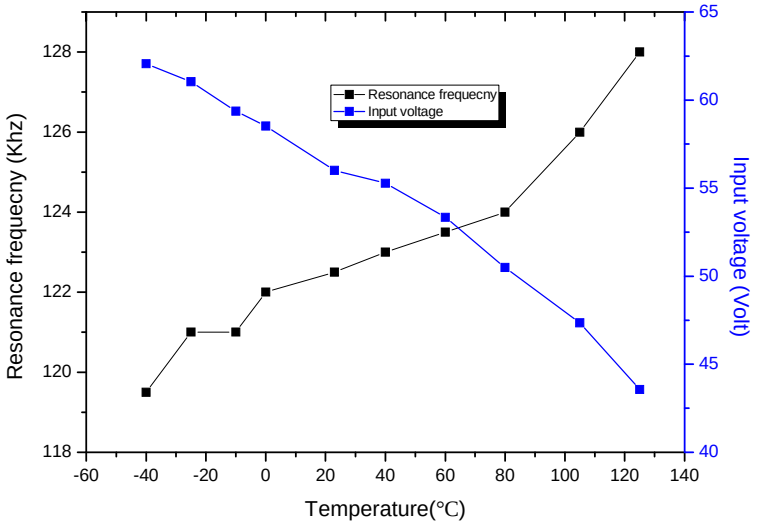
9.2 Voltage Gain under Open Circuit Conditions



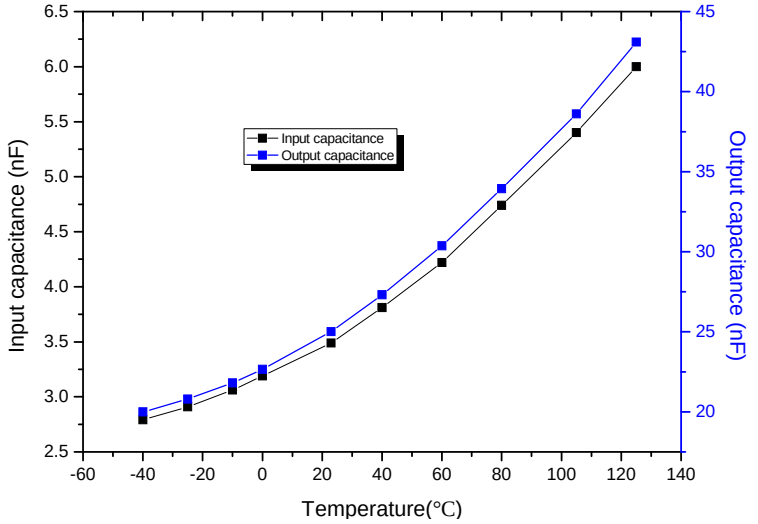
9.3 Variation of resonance frequency with the load



9.4 Variation of Vin, fres with the Temperature

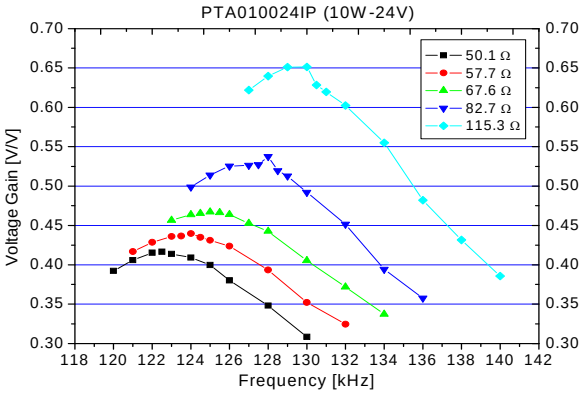


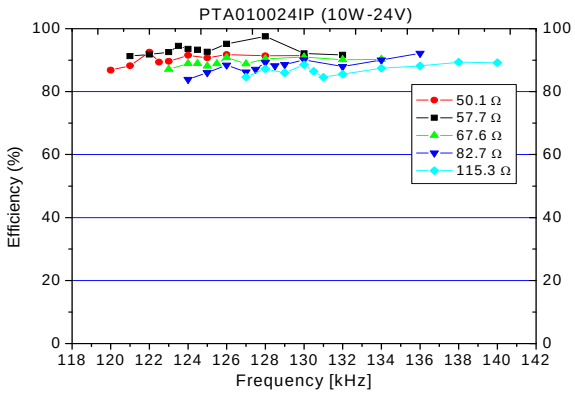
9.5 Variation of the input and output capacitances with the Temperature

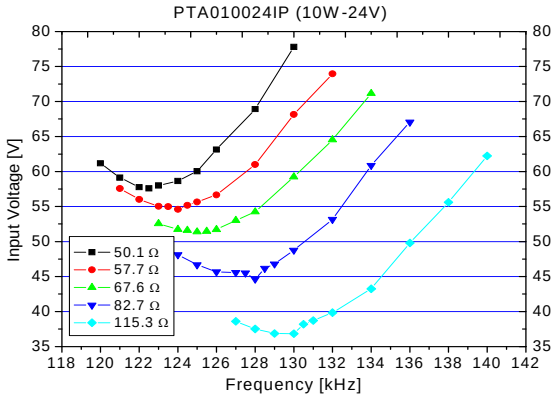


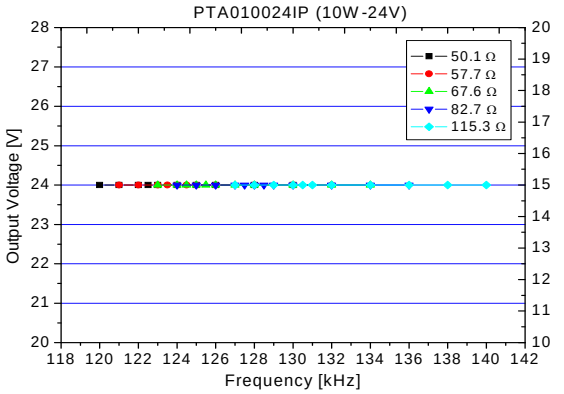
10. Characteristics of the PTA010024IP (Pout=10W and Vout=24V)

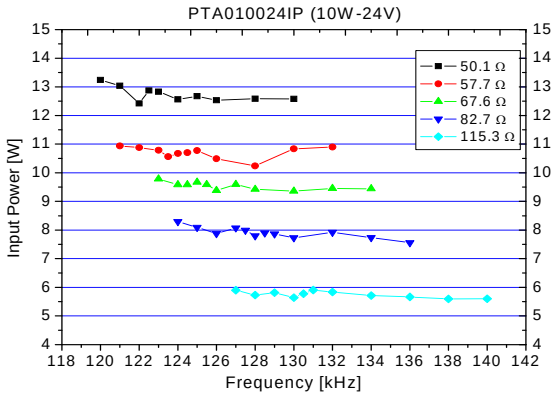
10.1 Response under load conditions (Nominal load: RL=57.6 Ω)

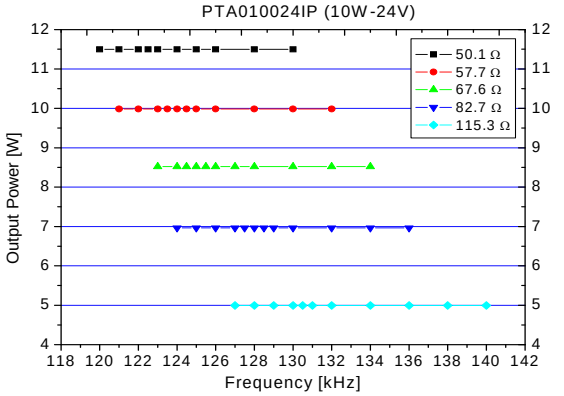


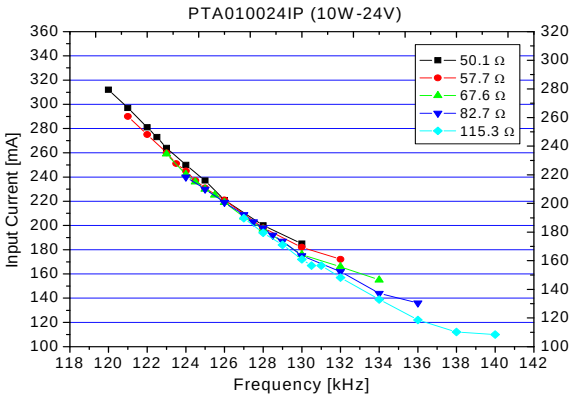




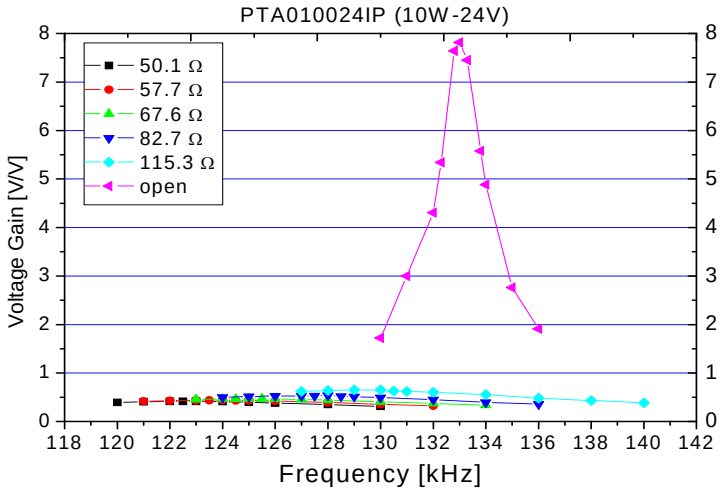




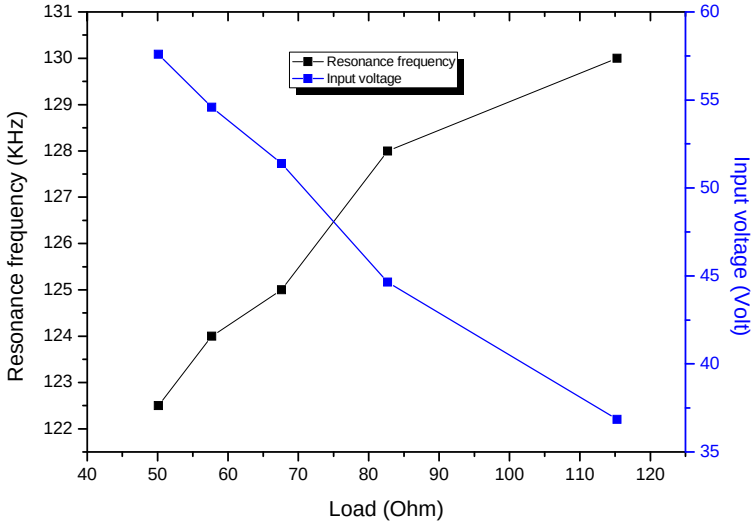




10.2 Voltage Gain under Open Circuit Conditions

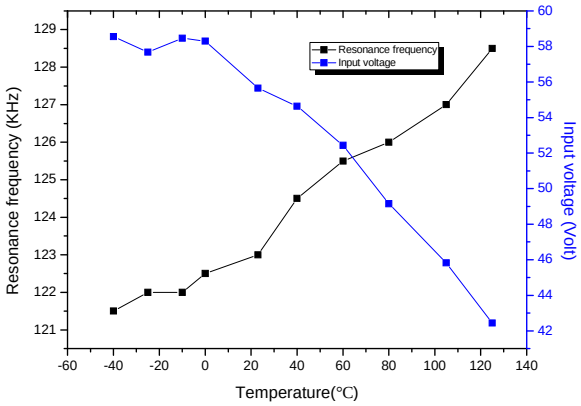


10.3 Variation of resonance frequency with the load



10.4 Temperature Characteristics

Variation of Vin, fres with the Temperature



Variation of the input and output capacitances with the Temperature