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**MAJ05VV**

## MINIATURE CRYSTAL OVEN SPECIFICATION

This specification defines the operating characteristics of a component heater. Long term reliability and stability are assured through use of premium components.

REV.	DESCRIPTION OF REVISION	REV./DWN. BY	APPROV. BY	DATE
-		TST	TST	03-01-2006

This MAJ05VV specification covers input voltages from +5 VDC to +28 VDC. The VV\*\* in the part number specifies the nominal operating voltage. If the voltage is less than +10 VDC, use a leading zero (i.e. for +5 VDC use VV = 05). The TT in this specification describes set point temperature in °C (i.e. for +75°C use TT = 75).

\*\* See the TABLE at the end of this specification for available voltages.

### 1. TEMPERATURE

- 1.1. Set point +TT °C (Customer adjustable)  
(+35°C to +95°C)  
(Set by an external resistor between the "TEMPERATURE ADJUST" Pin and the "0 VDC" Pin. See the TABLE at the end of this specification for resistor value to set the temperature.)  
(Use metal film resistors to prevent aging of the set point temperature.)

- 1.2. Initial tolerance < ±5°C @ +25°C

### 2. STABILITY

- 2.1. Ambient ±3°C from -30°C to (TT-10)°C  
2.2. Voltage ±0.5°C/±10% change  
2.3. Warm-up ±1°C in 2 minutes @ +25°C  
(Referenced to temperature at 15 minutes)

### 3. INPUT POWER

- 3.1. Voltage VV VDC (Customer specified)  
(+5 VDC to +28 VDC)  
3.2. Voltage tolerance ±10%  
3.3. Power  
a. At turn on < 6 Watts @ +25°C  
b. Slope \* -0.024 Watts/°C typical  
To calculate the typical steady state power (Pss), use the following formula.  
Pss = (TT - ambient temperature of unit)°C x 0.024 (Watts)

### 4. MECHANICAL

- 4.1. Heated cavity holds the following crystals and semi-conductors HC-35/U, T0-5, and T0-39  
4.2. Applicable series MAJ05 series  
4.3. Model number MAJ05VV (Customer specified)  
4.4. Outline drawing 125-366

\* In still air. See ISOTEMP application note 146-003 for design considerations.

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	31785	MAJ05VV	1	2	114-1249	-



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Voltage ->	5	8	10	12	15	18	20	24	28
<b>35</b>	263.28	289.28	298.12	349.86	338.97	399.67	399.67	441.80	580.04
<b>40</b>	204.07	224.27	232.49	263.28	254.77	298.12	298.12	349.86	426.43
<b>45</b>	158.69	175.27	180.43	204.07	204.07	232.49	232.49	263.28	328.21
<b>50</b>	124.07	131.37	139.97	149.90	154.91	180.43	180.43	204.07	254.77
<b>55</b>	95.51	104.92	108.47	119.24	124.07	144.92	139.97	158.69	204.07
<b>60</b>	72.56	80.44	86.20	92.01	95.51	115.64	108.47	127.71	158.69
<b>65</b>	56.36	62.84	65.21	72.56	72.56	88.52	86.20	97.85	124.07
<b>70</b>	41.13	46.51	50.26	54.24	56.36	70.06	67.57	77.69	97.85
<b>75</b>	31.69	34.72	37.86	41.13	42.88	52.25	52.25	60.60	77.69
<b>80</b>	22.35	26.20	27.49	31.69	31.69	41.13	39.50	46.51	60.60
<b>85</b>	14.61	17.78	18.84	20.01	22.35	30.29	28.89	34.72	46.51
<b>90</b>	8.09	10.71	12.60	14.61	15.66	21.18	21.18	27.49	36.23
<b>95</b>	3.29	5.58	6.42	9.87	9.87	13.55	13.55	17.78	26.20
^Temp(C)	Required external resistor (k ohms)								

To determine resistor between two temperatures use the following formula:

$$R = \text{EXP} ( ( \ln(R2/R1) \times ( Td - T1) / (T2 - T1) + \ln(R1) ) )$$

Where:

R = resistor value required for temperature Td.

Td = Temperature desired

T2 = Temperature just above Td

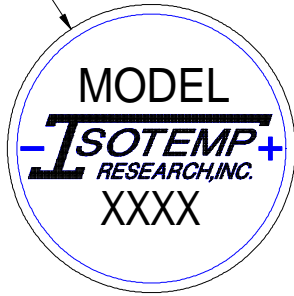
R2 = Resistor value corresponding to T2

T1 = Temperature just below Td

R1 = Resistor value corresponding to T1

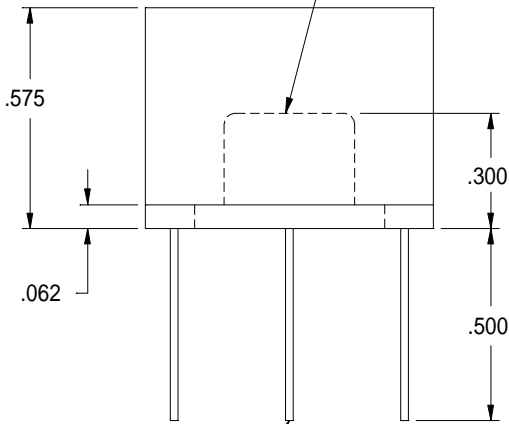
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.750 DIA.

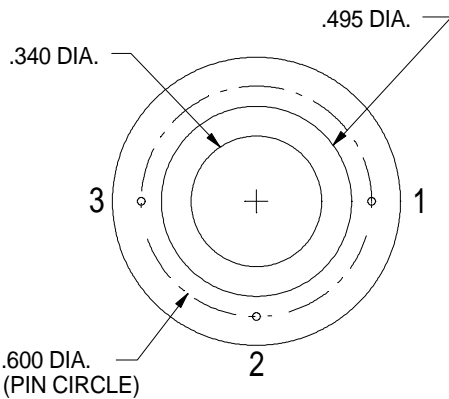


PIN CONNECTIONS	
PIN	FUNCTION
1	+VDC
2 (See Note 3)	TEMPERATURE ADJUST OR NOT CONNECTED
3	0 VDC

CRYSTAL CAVITY



.020 DIA. PIN  
(3 PLACES)



NOTE:

- CRYSTAL CAVITY IS CONNECTED TO 0 VDC
- MARKING: LABEL  
MODEL = M05VVTT  
or  
MAJ05VV  
VV = VOLTAGE  
TT = SET POINT TEMPERATURE  
XXXX = DATE CODE
- "TEMPERATURE ADJUST"  
FOR MAJ05VV MODELS  
"NOT CONNECTED"  
FOR M05VVTT MODELS

FORM NO. 120-081D



OSCILLATORS

CHARLOTTESVILLE, VIRGINIA

NAME: OUTLINE DRAWING  
(M05 & MAJ05 SERIES)

CODE I.D. NO.

31785

SCALE: 2:1

DATE: 05-07-91

DWN. BY: WEW

APPR'D. BY: TST

B

REDRAWN, NEW FORM, REVISED NOTES.

LRB

DAG

08-15-00

TOLERANCES

UNLESS OTHERWISE SPECIFIED:

ANGLES: ±1 DEGREE

FRACTIONS: ±1/32 INCH

DECIMALS: .XX ±.015, .XXX ±.010

COVER MATERIAL: GLASS-FIBRE FILLED

DIALYL PHTHALATE

BASE MATERIAL: VALOX 420 SEO BLACK

PIN MATERIAL: KOVAR WITH 60/40 SOLDER

ELECTROPLATE OVER NICKEL

FINISH: N/A

MARK: LABEL

LET

REVISION

BY

APP

DATE

DWG: 125-366  
REV: B  
SHT: 1 OF 1