# IT2200A

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## Specifications

### 1.0 SPECIFICATION REFERENCES

| Line | Parameter | Description |
|---|---|---|
| 1.1 | Model description | IT2205AE 26.000 MHz |
| 1.2 | RoHS compliant | Yes |
| 1.3 | Reference number | IT2200A-183 |
| 1.4 | Rakon part number | 508352 |
| 1.5 | Current Version | 1.01 |
| 1.6 | Holder style | Type 2 |

### 2.0 FREQUENCY CHARACTERISTICS

| Line | Parameter | Test Condition | Value | Unit |
|---|---|---|---|---|
| 2.1 | Frequency | | 26.000 | MHz |
| 2.2 | Frequency calibration | Offset from nominal frequency measured at 25°C±2°C | ±1 max | ppm |
| 2.3 | Reflow shift | Two consecutive reflows as per attached profile after 1 hour recovery at 25°C | ±1 max | ppm |
| 2.4 | Frequency stability over temperature | Referenced to the midpoint between minimum and maximum frequency value over the specified temperature range. (Note 2) | ±0.5 max | ppm |
| 2.5 | Temperature range | The operating temperature range over which the frequency stability is measured | -30 to 85 | °C |
| 2.6 | Frequency slope | Minimum of 1 frequency reading every 2°C over -20°C to 70°C (Note 2) | 0.05 max | ppm/°C |
| 2.7 | Frequency slope | Minimum of 1 frequency reading every 2°C over -30°C to 85°C (Note 2) | 0.1 max | ppm/°C |
| 2.8 | Static temperature hysteresis | Frequncy change after reciprocal temperature ramped over the operating range. Frequency measured before and after at 25°C | 0.6 max | ppm |
| 2.9 | Supply voltage stability | Supply voltage varied ±5% at 25°C | ±0.1 max | ppm |
| 2.10 | Load sensitivity | ±10% load change at 25°C | ±0.2 max | ppm |
| 2.11 | Long term stability | Frequency drift over 1 year at 25°C | ±1 max | ppm |
| 2.12 | Frequency jump magnitude | Temperature ramped through a complete orbit covering the full temperature range at a rate of up to 10°C/min (Note 9) | 20 max | ppb, p-p |

### 3.0 POWER SUPPLY

| Line | Parameter | Test Condition | Value | Unit |
|---|---|---|---|---|
| 3.1 | Supply voltage | Nominal supply voltage 1.8V | 1.71 to 1.89 | V |
| 3.2 | Current | At maximum supply voltage (Note 6) | 1.5 max | mA |

### 4.0 OSCILLATOR OUTPUT

| Line | Parameter | Test Condition | Value | Unit |
|---|---|---|---|---|
| 4.1 | Output waveform | DC coupled clipped sine-wave (Note 8) | | |
| 4.2 | Output voltage level | At minimum supply voltage (Note 6) | 0.8 min | V |
| 4.3 | Output load resistance | Refer to test circuit. Typical load 10 kΩ | 9 to 11 | kΩ |
| 4.4 | Output load capacitance | Refer to test circuit. Typical load 10pF | 9 to 11 | pF |

## 5.0 SSB PHASE NOISE

| Line | Parameter | Test Condition | Value | Unit |
|---|---|---|---|---|
| 5.1 | SSB phase noise power density at 1Hz offset | Typical value for a 26MHz oscillator at 25°C | -64 | dBc/Hz |
| 5.2 | SSB phase noise power density at 10Hz offset | Typical value for a 26MHz oscillator at 25°C | -92 | dBc/Hz |
| 5.3 | SSB phase noise power density at 100Hz offset | Typical value for a 26MHz oscillator at 25°C | -115 | dBc/Hz |
| 5.4 | SSB phase noise power density at 1kHz offset | Typical value for a 26MHz oscillator at 25°C | -135 | dBc/Hz |
| 5.5 | SSB phase noise power density at 10kHz offset | Typical value for a 26MHz oscillator at 25°C | -149 | dBc/Hz |
| 5.6 | SSB phase noise power density at 100kHz offset | Typical value for a 26MHz oscillator at 25°C | -150 | dBc/Hz |

## 6.0 ENVIRONMENTAL

| Line | Parameter | Description |
|---|---|---|
| 6.1 | Shock | Half sinewave acceleration of 100G peak amplitude for 6ms duration, 3 cycles each plain |
| 6.2 | Humidity | After 48 hours at 85°C±2°C 85% relative humidity non-condensing |
| 6.3 | Thermal shock | Exposed at -40°C for 30 minutes then 85°C for 30 minutes for a period of 5 days. |
| 6.4 | Vibration | 10G RMS from 30 Hz to 1500 Hz Random in each of the 3 axis for 4 hours, totally 12 hours |
| 6.5 | Storage temperature | -40 to 85°C |

## 7.0 MARKING

| Line | Parameter | Description |
|---|---|---|
| 7.1 | Type | Engraved |
| 7.2 | Line 1 | Frequency and crystal date code |
| 7.3 | Line 2 | Pin 1, R and TCXO date code |

## 8.0 MANUFACTURING INFORMATION

| Line | Parameter | Description |
|---|---|---|
| 8.1 | Reflow | Solder reflow processes as per profile attached. |
| 8.2 | Packaging description | Tape and reel. Standard packing quantity is 3000 units per reel |

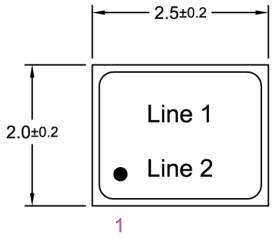
## 9.0 SPECIFICATION NOTES

| Line | Parameter | Description |
|---|---|---|
| 9.1 | Note 1 | A maximum frequency stability over the temperature is requried to be specified. Standard options are ±0.5ppm, ±1.0ppm and ±2.5ppm |
| 9.2 | Note 2 | Parts should be shielded from drafts causing unexpected thermal gradients. Temperatue changes due to ambient air currents on the oscillator can lead to short term frequency drift |
| 9.3 | Note 3 | The operating temperature range needs to be specified. The extremes for this model are -40 to 85°C |
| 9.4 | Note 4 | The maximum value is the specified. A minimum value, if present, indicates the best specification available |
| 9.5 | Note 5 | The unit will operate on any voltage between the minimum and maximum values |
| 9.6 | Note 6 | Specified for load stated in 4.3 and 4.4 at 25°C. Current consumption depends on crystal oscillation frequency. Higher frequency will result in higher current consumption and a drop in output voltage level |
| 9.7 | Note 7 | The maximum frequency tuning range depends on the design frequency and the trimming sensitivity of the crystal. Linearity performance degrades if maximum frequency tuning setting is selected |
| 9.8 | Note 8 | AC-Coupled outputs require an external capacitor, ≥ 1nF recommended |
| 9.9 | Note 9 | Frequency jump: Measured between 1 second samples. Distinguished from fluctuations and noise with Gaussian or other well known distribution |

# Drawing Name: I(V)T2200A Model Drawing (Type 2)

## MODEL DRAWING

- TYPE 2

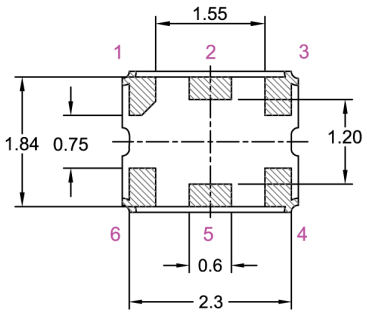



TOP VIEW

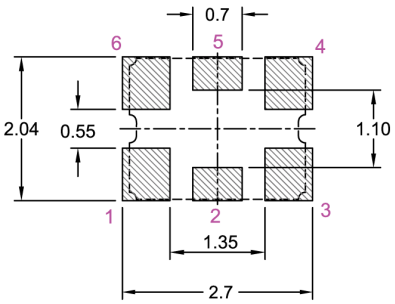
| PIN CONNECTIONS | |
|---|---|
| 1 | GND / VCO |
| 2 | NC |
| 3 | GND |
| 4 | OUT |
| 5 | NC |
| 6 | VCC |


FRONT VIEW

## RECOMMENDED PAD LAYOUT (Top View)




BOTTOM VIEW




| | | |
|---|---|---|
| TITLE: I(V)T2200A MODEL DRAWING (Type 2) | FILENAME: CAT650 | TOLERANCES: |
| RELATED DRAWINGS: | REVISION: A | XX = |
| | DATE: 25-Oct-11 | X.X = ±0.2 |
| | SCALE: 10 : 1 | X.XX = ±0.1 |
| | Millimetres | X.XXX = |
| | | X° = |
| | | Hole = |

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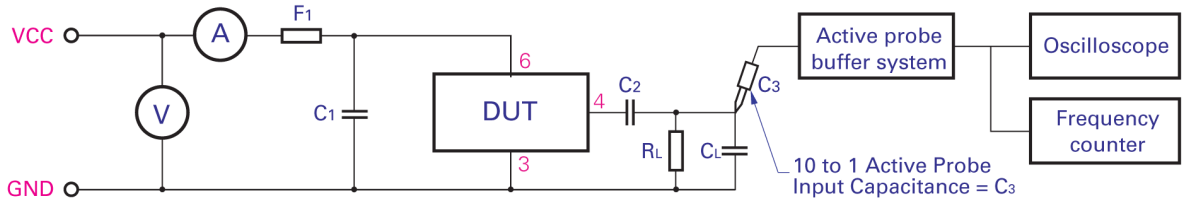
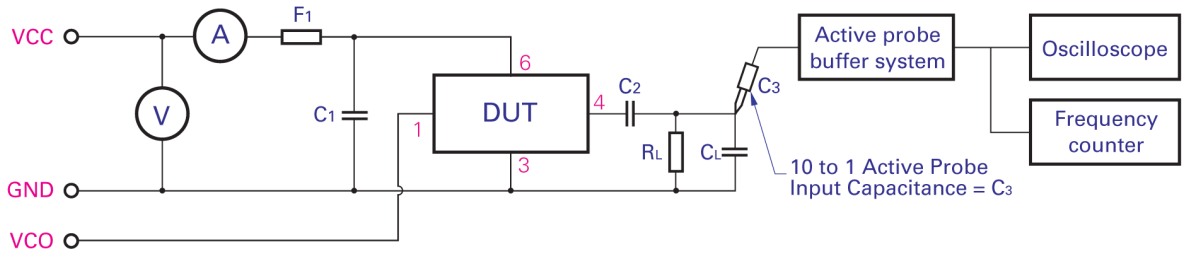
# Drawing Name: I(V)T2200A Series Test Circuit

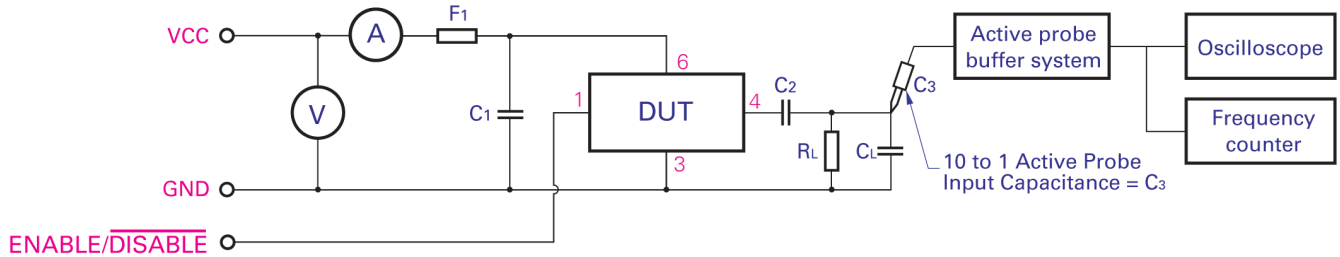
## IT22..A TEST CIRCUIT :



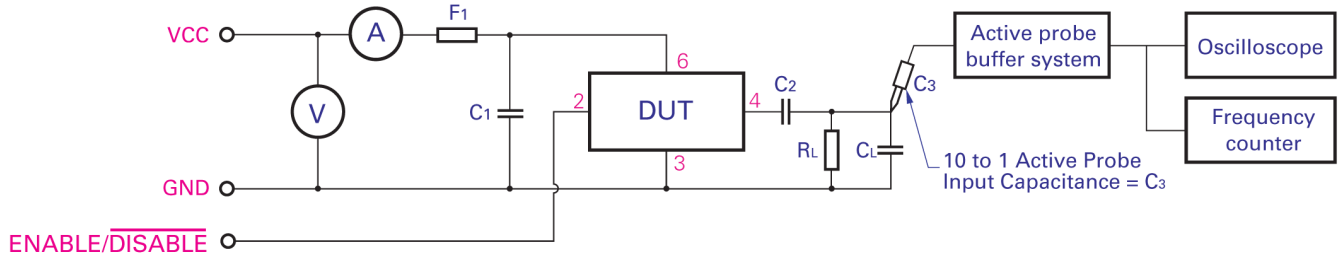

## IVT22..A TEST CIRCUIT :




## IT22..AP TEST CIRCUIT :




## IT22..AQ TEST CIRCUIT :




| | |
|---|---|
| $C_1$: 100nF<br>$C_2$: ≧ 1nF<br>$R_L$: 10K | $C_T = C_L + C_3$ ($C_3$ - Oscilloscope probe capacitance)<br>$C_T$ as stated in OSCILLATOR OUTPUT section<br>$F_1$: A ferrite bead or a resistor between 22Ω ~ 47Ω recommended. |

TITLE: I(V)T2200A SERIES TEST CIRCUIT

RELATED DRAWINGS:

FILENAME: CAT559

REVISION: B

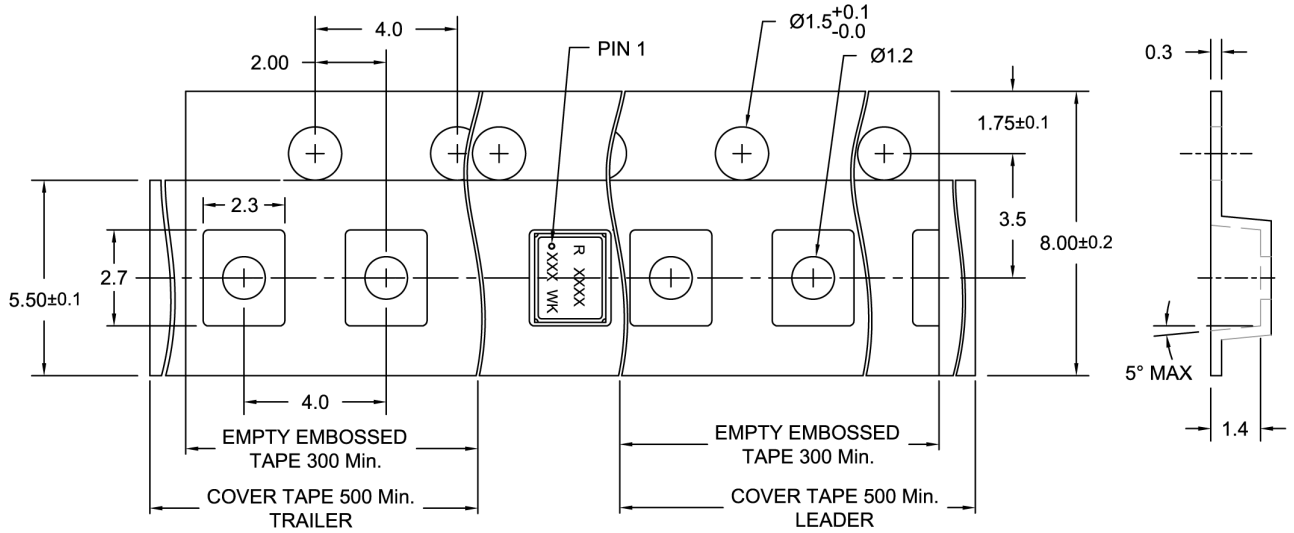
DATE: 30-May-11

SCALE: NTS

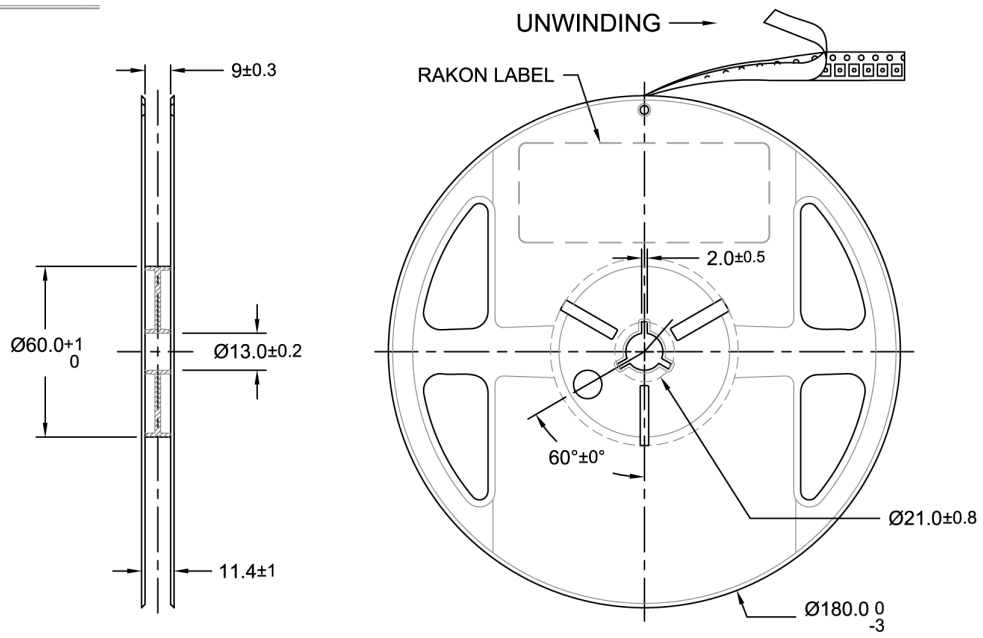
Millimetres [inch]

# Drawing Name: 2200 Series Tape & Reel (Type 2)

## TAPE DETAIL (Scale 5 : 1)




## REEL DETAIL (Scale 1 : 2.5)




| | | | |
|---|---|---|---|
| TITLE: 2200 SERIES TAPE & REEL (Type 2) | FILENAME: CAT694 | TOLERANCES: | |
| RELATED DRAWINGS: | REVISION: A | XX = | |
| | DATE: 06-Jun-12 | X.X = ±0.1 | |
| | SCALE: 5 : 1 | X.XX = ±0.05 | |
| | Millimetres | X.XXX = | |
| | | X° = | |
| | | Hole = | |

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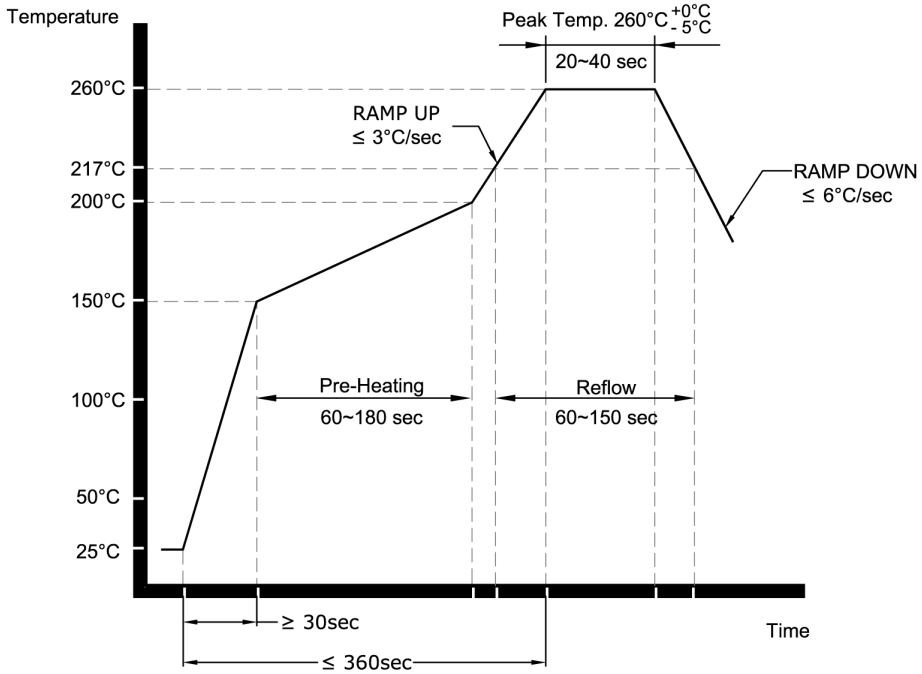
# Drawing Name: Pb-Free Reflow




NOTE:
The product has been tested to withstand the Reflow Profile shown. The Reflow Profile used to solder Rakon products is determined by the solder paste Manufacturer's specification. It is recommended that the Reflow Profile used does not exceed the one shown above.

| | |
|---|---|
| TITLE: Pb-FREE REFLOW | FILENAME: CAT541 |
| RELATED DRAWINGS: | REVISION: B |
| | DATE: 05-Sep-11 |
| | SCALE: NTS |
| | Millimetres |

# Specification History

## Current Version : 1.01

| Version | User | Change | Note | Date |
|---|---|---|---|---|
| 1.0 | System | Specification Created | | 2011-10-25 10:51 |
| 1.01 | andrew.daken | • Added image 2200 Series Tape & Reel (Type 2) | Corrected Tape and reel drawing | 2012-06-11 07:19 |