# SBTO-20
# 1MHz ~ 1GHz

- # sine wave, CMOS output
- # custom designs
- # excellent phase noise
- # very low ageing

## Standard options:

| | | | |
|---|---|---|---|
| **frequency range:** | 1MHz ~ 1GHz | | |
| **accuracy codes:** | (A) | (B) | (C) |
| temperature tolerance | ±0.5ppm | ±1.0ppm | ±2.0ppm |
| temperature range | (0 +50)°C | (-20 +70)°C | (-40 +70)°C |
| **output codes:** | (S) | | (L) |
| output | sine wave, 0dBm into 50Ω harmonics -30dBc max. | | CMOS 15pF, 45% ~ 55% <2ns max. rise and fall |
| **supply voltage codes:** | (V1)* | (V2)* | (V3)* |
| supply voltage $V_{cc}$ | +3.3Vd.c. | +5.0Vd.c. | +12.0Vd.c. |
| voltage reference option* | +3.0Vd.c. | +4.5Vd.c. | +4.5Vd.c. |

add suffix (R) for $V_{ref}$ output on pin #2

## Generic specification:

**stability:**

| | |
|---|---|
| against supply voltage change | ±0.02ppm max. for $V_{cc}$ ±5% |
| against load change | ±0.02ppm max. for load ±10% |
| ageing short term | ±0.005ppm max. per day after 30 days continuous operation |
| ageing long term | ±1.5ppm max. first year |
| voltage trim $V_t$ | ±10ppm min. typical, linearity ±5% |
| trim input impedance | 100KΩ min. |

**power supplies:**

| | | | |
|---|---|---|---|
| supply voltage $V_{cc}$ | +3.3Vd.c. | +5.0Vd.c. | +12.0Vd.c. |
| supply current | frequency, $V_{cc}$ and output load dependent | | |
| insulation resistance | 500MegΩ min., at +100Vd.c. | | |

**phase noise:**

| | |
|---|---|
| single sideband, 1Hz bandwidth | -80dBc/Hz, $f_o$+10Hz |
| | -100dBc/Hz, $f_o$+100Hz |
| | -125dBc/Hz, $f_o$+1kHz |

**temperature:**

| | | | |
|---|---|---|---|
| operating range | (0 +50)°C | (-10 +60)°C | (-40 +70)°C |
| storage range | (-40 +125)°C | (-40 +125)°C | (-40 +125)°C |

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## Environmental conditions:

| | |
|---|---|
| **mechanical shock:** | *MIL standard 202F, method 213, condition J* |
| **thermal shock:** | *MIL standard 202F, method 107, condition A* |
| **vibration:** | *MIL standard 202F, method 204, condition B* |
| **solderability:** | *5 seconds max. at +230°C, 3 seconds max at +350°C* |

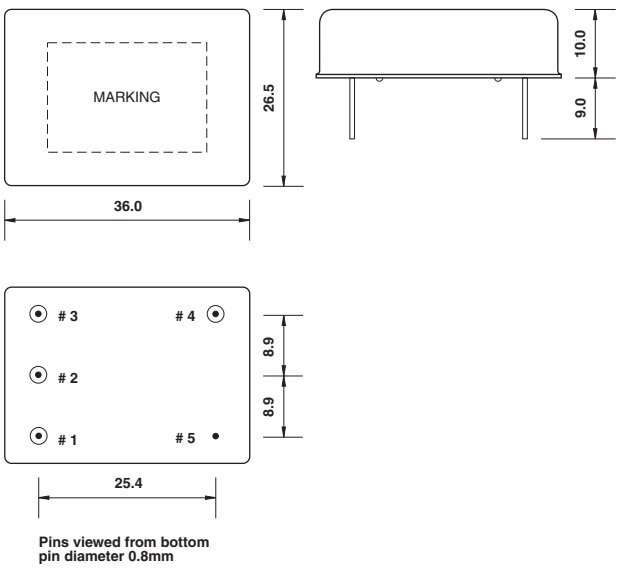
## Marking:

*frequency, date code, serial number on high temperature metalised polyester label*

## Ordering code:

| | |
|---|---|
| **standard specification:** | ***A S V2* - 6.40M*** |
| ***TA936-10*** | ***= series generic code*** |
| ***A*** | *temp. tol. and temp. range code:* ***A = ±0.5ppm(0 +50)°C*** |
| ***S*** | *output code:* ***S = sine wave output, 0dBm into 50Ω*** |
| ***V2**** | *supply voltage code:* ***V2 = +5Vd.c. supply*** |
| | **Add suffix (R) for $V_{ref}$ output on pin #2* |
| ***6.40M*** | *output frequency:* ***6.40M = 6.40MHz*** |
| ***custom specification:*** | *part number issued with custom specification and drawing* |

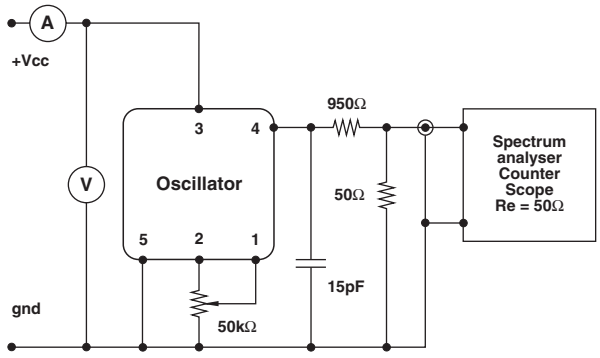
## Dimensions(mm):




## Pin connections:

| | |
|---|---|
| #1 | *trim* |
| #2 | *n.c. or trim reference voltage** |
| #3 | *+$V_{cc}$* |
| #4 | *output* |
| #5 | *ground* |

## Test circuit:




*Test circuit includes a 20:1 step down into a matched 50Ω load*

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