

### FEATURES

- Low jitter <0.6ps phase jitter
- Wide frequency Range 10.0MHz to 245.0MHz
- Quick delivery leadtime
- Low supply current <15mA at 10MHz
- Supply voltage 2.5 or 3.3Volts
- Tristate function to conserve power



(\*536' package displayed)



### DESCRIPTION

'GTQN' series oscillators are a precision frequency control component, providing a CMOS output VCXO with low current consumption, a wide frequency range with an integrated phase jitter performance of 0.6ps r.m.s. The part is available in two industry-standard packages, 7 x 5mm SMD and 5 x 3.2mm SMD.

### GENERAL SPECIFICATION

Output Logic Type:	LVC MOS / LV TTL
Frequency Range:	10.0MHz to 245.0MHz
Load:	15pF
Power Supply Voltage:	2.5±5%VDC or +3.3±10%VDC
Output Voltage 'HIGH':	0.9*V <sub>DD</sub> minimum
Output Voltage 'LOW':	0.1*V <sub>DD</sub> maximum
Frequency Stability:	±50ppm over -40° to +85°C*
Duty Cycle:	50%±2%
Rise Time:	300ps minimum**
Fall Time:	600ps maximum**
Current Consumption @+2.5V <sub>DD</sub>	
10.000MHz:	15mA
50.000MHz:	18mA
100.00MHz:	22mA
150.00MHz:	24mA
200.00MHz:	28mA
245.00MHz:	31mA
Current Consumption @+3.3V <sub>DD</sub>	
10.000MHz:	17mA
50.000MHz:	20mA
100.00MHz:	24mA
150.00MHz:	28mA
200.00MHz:	33mA
250.00MHz:	37mA
Current with output disabled:	16mA typical
Start-up Time:	10ms maximum
Ageing:	±2ppm max., first year, ±10ppm max. over 10 years.
OE Control on Pad 2	
Enable:	0.7% V <sub>DD</sub> min., or no connection
Disable:	0.3%V <sub>DD</sub> max., (high impedance).
Output Enable Time:	200ns max.
Output Disable Time:	50ns max.
Phase Jitter r.m.s.:	0.6ps typical (12kHz to 20MHz)
Phase Jitter r.m.s.:	<100fs (1.875MHz to 20MHz)

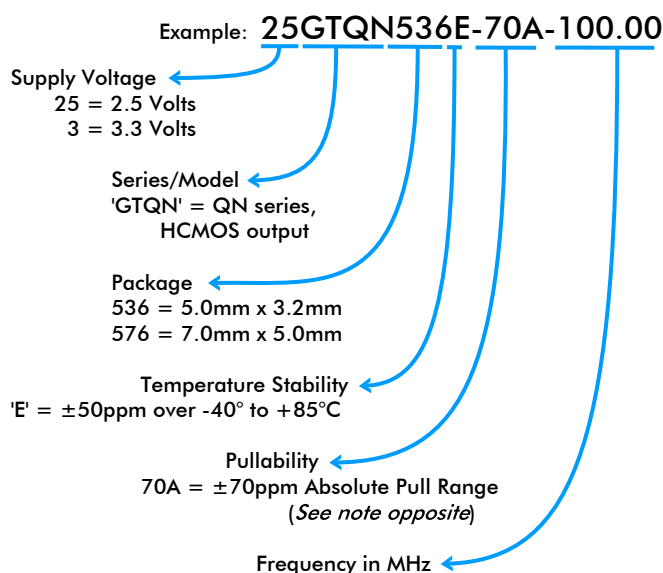
### Notes:

- \* Stability code for ±50ppm over -40° to +85°C is 'E.' Other stabilities are available, contact Euroquartz for details.
- \* **Absolute Pull Range (APR)**  
APR guarantees the PLL remains locked (enough frequency deviation range) taking into account all the conditions of a VCXO. These conditions include frequency tolerance, frequency-temperature stability, load variation, supply voltage variation and ageing of the VCXO (known as "Total VCXO Frequency Errors"). Therefore APR in ppm = (Total frequency deviation of the VCXO in ppm) - (Total frequency errors of the VCXO in ppm)
- \*\* Rise/Fall times are measured between 10% to 90%V<sub>DD</sub>

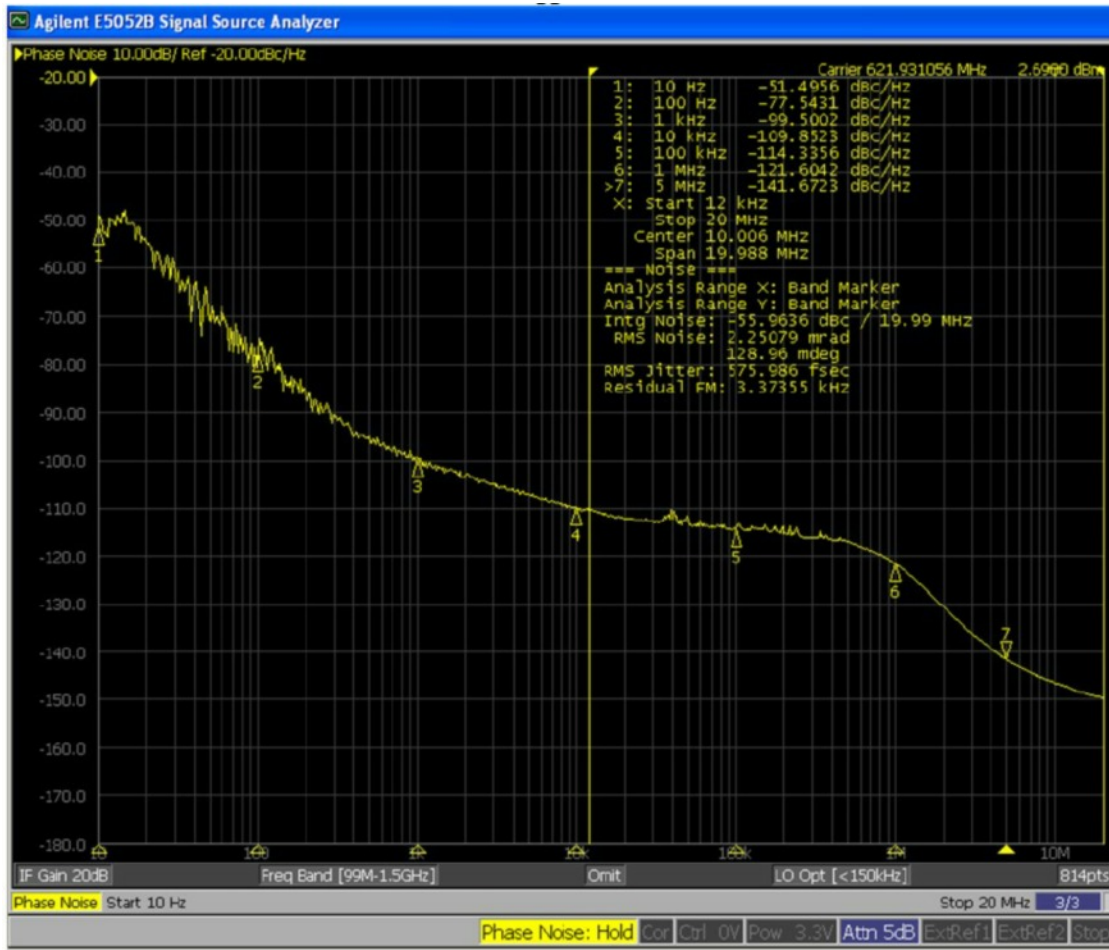
### CONTROL VOLTAGE FUNCTION (Pad 1)

Supply Voltage (V <sub>DD</sub> )	+2.5 Volts	+3.3 Volts
VCON Centre:	+1.25 Volts	+1.65 Volts
V. Control Range:	+0.2V~+2.3V	+0.3V~+3.0V
Absolute Pulling Range (APR):	±70ppm	
Linearity:	±3% typical, ±10% max.	
Transfer Function:	Positive transfer	
Absolute Voltage:	2.8 Volts Max.	4.0 Volts max.
Input Impedance:	1MΩ typical	
Bandwidth:	50kHz min., measured at -3dB	

### PART NUMBERING

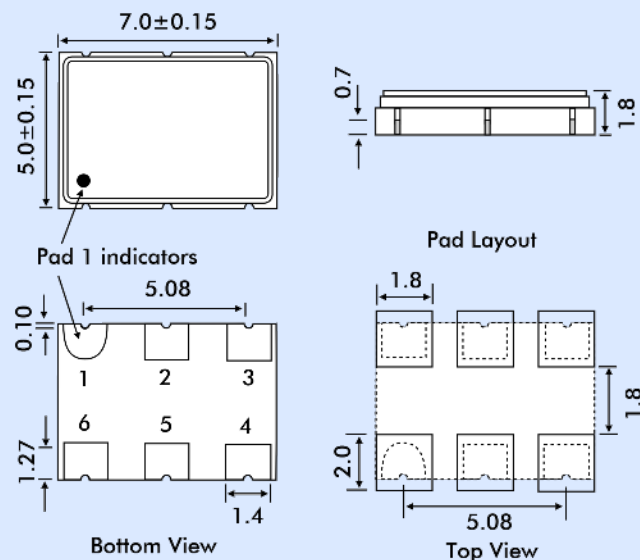


**GTQN SERIES PHASE NOISE & PHASE JITTER DATA**

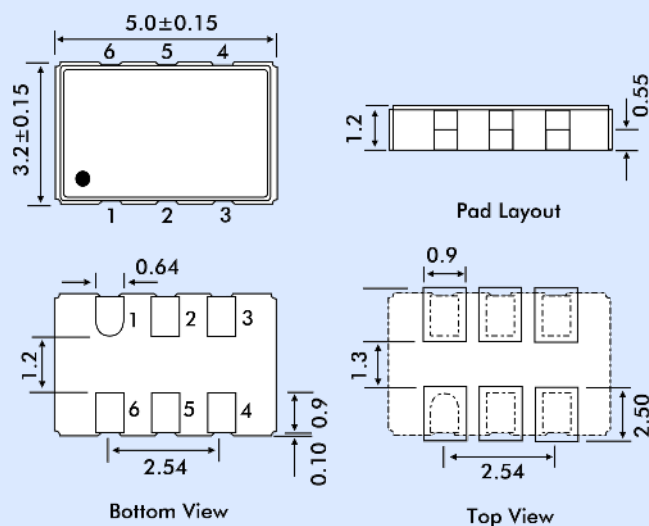


**GTQN SERIES PHASE NOISE & PHASE JITTER DATA**

	Frequency (MHz)	77.76	122.88	125.00	156.25	212.5
SSB Phase Noise Data (dBc/Hz typical)	10Hz offset	-74	-68	-69	-67	-53
	100Hz offset	-104	-98	-97	-92	-86
	1kHz offset	-121	-114	-114	-112	-109
	10kHz offset	-130	-123	-124	-121	-118
	100kHz offset	-134	-127	-129	-124	-121
	1MHz offset	-140	-138	-136	-136	-133
	5MHz offset	-157	-155	-154	-153	-151
Phase Jitter (ps) (12kHz ~ 20MHz. r.m.s.)		0.5	0.6	0.5	0.6	0.6

**OUTLINE & DIMENSIONS**
**7.0 x 5.0mm SMD Package**

**Pad Connections**

- 1 Control Voltage
- 2 OE High Enable
- 3 Ground
- 4 Output
- 5 No connection
- 6 Supply Voltage

**5.0 x 3.2mm SMD Package**

**Pad Connections**

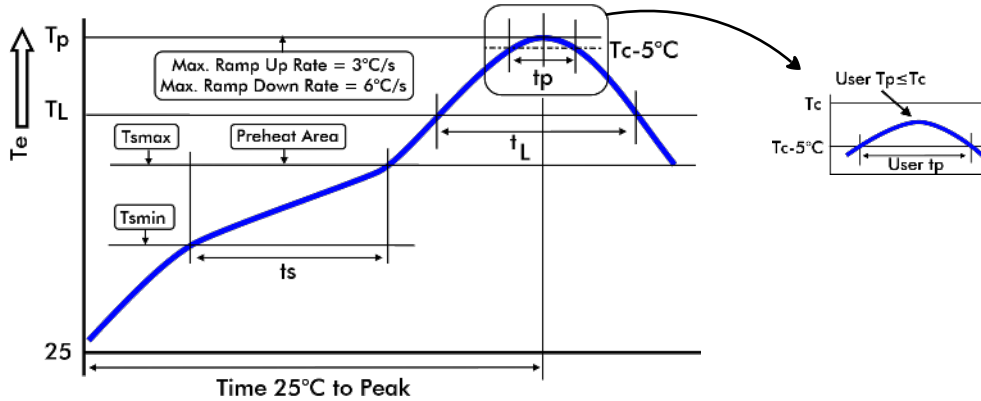
- 1 Control Voltage
- 2 OE High Enable
- 3 Ground
- 4 Output
- 5 No connection
- 6 Supply Voltage

**ENVIRONMENTAL PERFORMANCE SPECIFICATION**

<b>Environmental Approvals</b>	RoHS Compliant, Pb (lead) free in accordance with EU Directive 2002/95/EC 6/6 (2002/95EC) and WEEE (2002/96/EC). Free of halide, cadmium, hexavalent chromium, lead, mercury, PBBs and PBDEs
<b>Moisture sensitivity Level</b>	Level 1 (infinite) according to IPC/JEDEC J-STF-020D.1
<b>Second Level Interconnect</b>	'e4
<b>Storage Temperature Range</b>	-55° to +125°C
<b>Humidity</b>	85%RH, 85°C, 48 hours
<b>Fine Leak / Gross Leak</b>	MIL-STD-202F Method 1014, Cond. A / MIL-STD-883, Method 1014, Cond C.
<b>Solderability</b>	MIL-STD-202F method 208E
<b>Reflow</b>	260°C for 10s. 2 times
<b>Vibration</b>	MIL-STD-202F Method 204, 35g, 50 to 2000Hz
<b>Shock</b>	MIL-STD-202F, Method 213B, Test Cond. E, 1000gg 1/2 sine wave.
<b>Resistance to Solvents</b>	MIL-STD-202, Method 215
<b>Temperature Cyscling</b>	MIL-STD-883, Method 1010
<b>ESD Rating</b>	Human Body Model (HBM): 1500 V minimum.
<b>Pad Surface Finish</b>	Gold (Au)(0.3µm of 1.0µm) over nickel (Ni)(1.27µm to 8.89µm)
<b>Weight of the Device</b>	576 package: 0.18gm typical, 536 package: 0.09gm typical.

**RECOMMENDED SOLDER TEMPERATURE PROFILE**

Suggested Reflow Profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat/Soak - Temperature min. ( $T_s$ min.) - Temperature max. ( $T_s$ max.) - Time ( $t_s$ ) ( $T_s$ min. to $T_s$ max.)	100°C 150°C 60 to 120 seconds	150°C 200° 60 to 180 seconds
Ramp-up Rate ( $T_L$ to $T_p$ )	3°C/second max.	3°C/second max.
Liquidus temperature ( $T_L$ )	183°C	217°C
Time ( $t_L$ ) maintained above $T_L$	60 to 150 seconds	60 to 150 seconds
Peak package body temperature ( $T_p$ )	235°C	260°C
Time ( $T_p$ ) within 5°C of the classification temperature $T_c$	10 to 30 seconds	20 to 40 seconds
Ramp-down rate ( $T_p$ to $T_L$ )	6°C/second max.	6°C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.

**TEST CIRCUIT**

