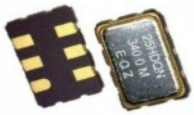
EUROQUARTZ

QN Series VCXOs

'GPQN' LVPECL Output VCXOs — 10MHz to 1450MHz

FEATURES

- **Low jitter <0.6ps phase jitter**
- **Wide frequency Range 10.0MHz to 1450.0MHz**
- **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

'GPQN' series oscillators are a precision frequency control component, providing a LVPECL 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:	LVPECL
Frequency Range:	10.0MHz to 1450.0MHz
Load:	Differential
Power Supply Voltage:	2.5±5%VDC or +3.3±10%VDC
Output Voltage 'HIGH':	V_{DD}-1.03V min., V_{DD}-0.6V max.
Output Voltage 'LOW':	V_{DD}-1.85V min., V_{DD}-1.6V max.
Frequency Stability:	±50ppm over -40° to +85°C*
Duty Cycle:	50%±2%
Rise/Fall Time:	250ps maximum**
Current Consumption @+2.5V_{DD}	
100.000MHz:	46mA
250.000MHz:	48mA
500.00MHz:	53mA
750.00MHz:	56mA
1.0GHz:	60mA
1.35GHz:	65mA
Current Consumption @+3.3V_{DD}	
100.000MHz:	48mA
250.000MHz:	50mA
500.00MHz:	55mA
750.00MHz:	59mA
1.0GHz:	62mA
1.35GHz:	68mA
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_{DD} min., or no connection
Disable:	0.3%V_{DD} 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)

CONTROL VOLTAGE FUNCTION (Pad 1)

Supply Voltage (Vdd)	+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

Example: 25GPQN536E-70A-100.00

Supply Voltage
25 = 2.5 Volts
3 = 3.3 Volts

Series/Model
'GPQN' = QN series, LVPECL output

Package
536 = 5.0mm x 3.2mm
576 = 7.0mm x 5.0mm

Temperature Stability
'E' = ±50ppm over -40° to +85°C

Pullability
70A = ±70ppm Absolute Pull Range (*See note opposite*)

Frequency in MHz

Notes:

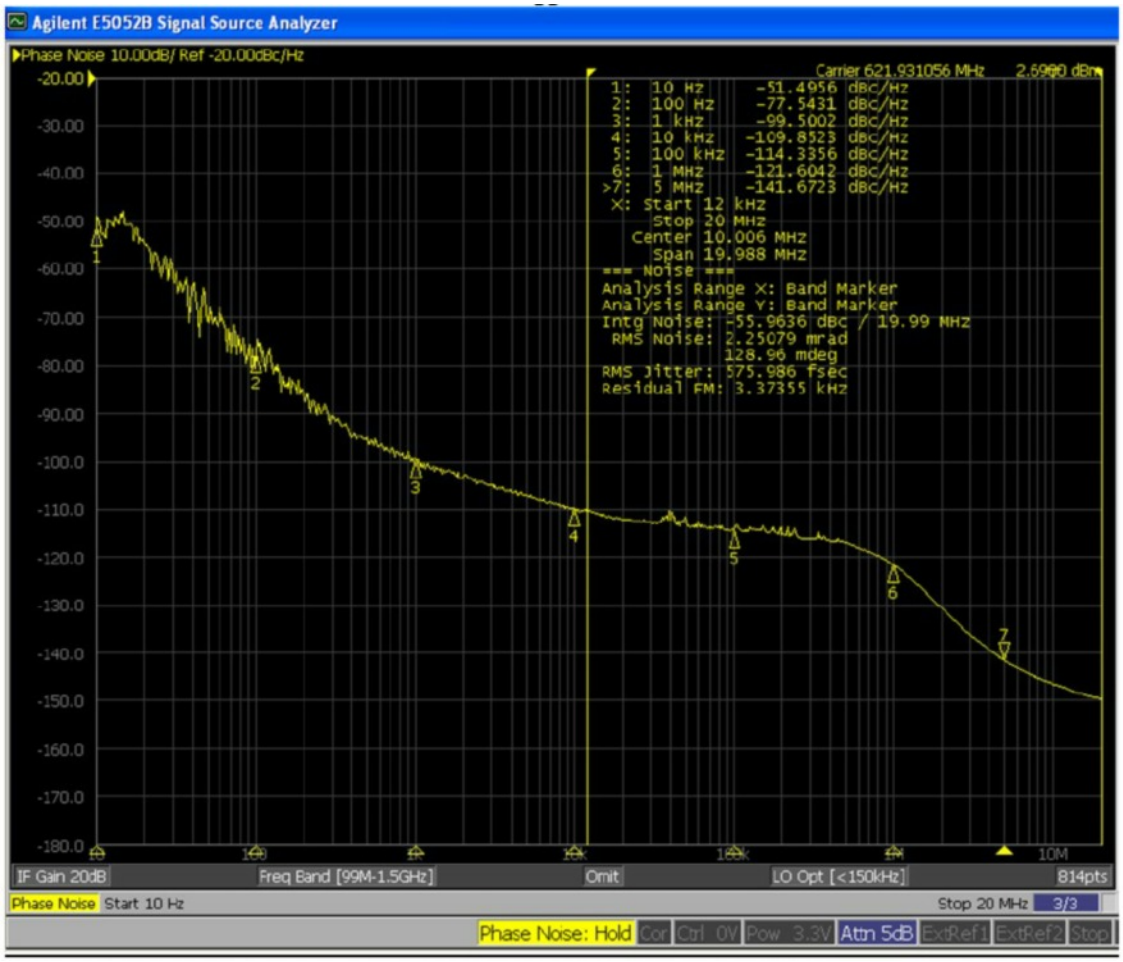
* *Stability code for ±50ppm over -40° to +85°C is 'E.' Other stabilities are available, contact Euroquartz for details.*

* ***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_{DD}*

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GPQN SERIES PHASE NOISE & PHASE JITTER DATA

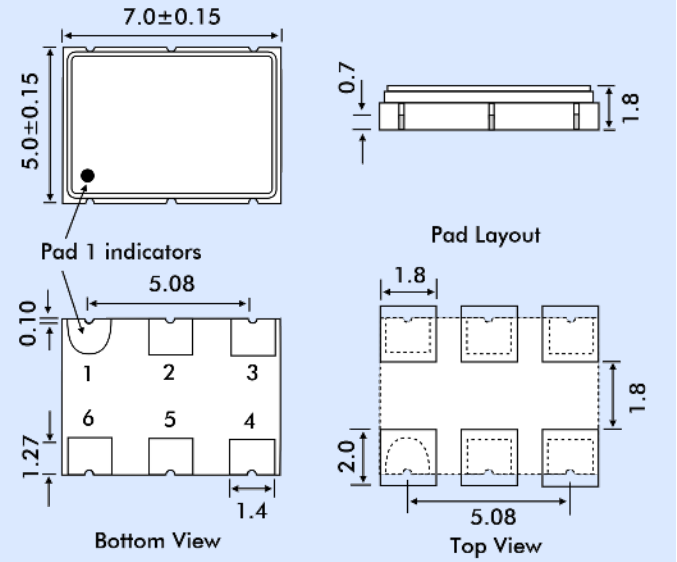


GPQN SERIES PHASE NOISE & PHASE JITTER DATA

	Frequency (MHz)	77.76	122.88	125.00	156.25	212.5	491.25	655.08	1000	1250
SSB Phase Noise Data (dBc/Hz typical)	10Hz offset	-74	-68	-69	-67	-53	-56	-51	-46	-32
	100Hz offset	-104	-98	-97	-92	-86	-87	-77	-80	-68
	1kHz offset	-121	-114	-114	-112	-109	-101	-99	-96	-94
	10kHz offset	-130	-123	-124	-121	-118	-110	-109	-105	-103
	100kHz offset	-134	-127	-129	-124	-121	-113	-114	-108	-105
	1MHz offset	-140	-138	-136	-136	-133	-125	-121	-116	-114
	5MHz offset	-157	-155	-154	-153	-151	-143	-141	-135	-136
Phase Jitter (ps) (12kHz ~ 20MHz. r.m.s.)		0.5	0.6	0.5	0.6	0.6	0.6	0.5	0.7	0.6

OUTLINE & DIMENSIONS

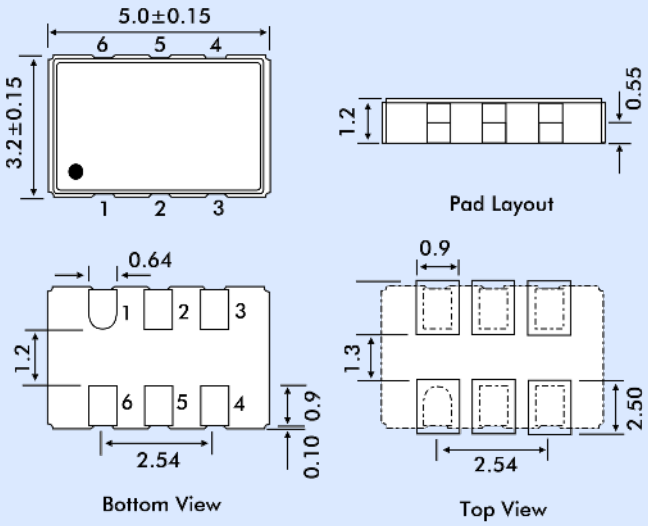
7.0 x 5.0mm SMD Package



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



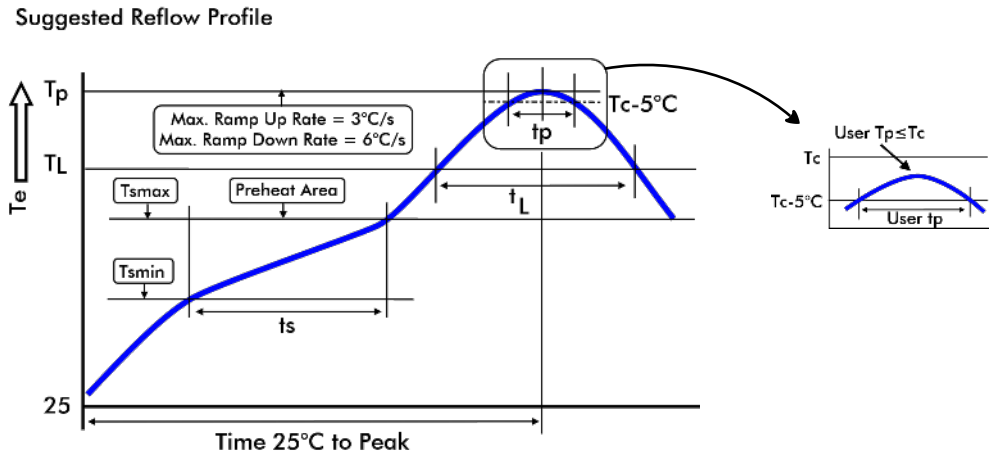
Pad Connections

1 Control Voltage
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ENVIRONMENTAL PERFORMANCE SPECIFICATION

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

RECOMMENDED SOLDER TEMPERATURE PROFILE



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat/Soak		
- Temperature min. (Ts min.)	100°C	150°C
- Temperature max. (Ts max.)	150°C	200°
- Time (ts) (Ts min. to Ts max.)	60 to 120 seconds	60 to 180 seconds
Ramp-up Rate (T_L to Tp)	3°C/second max.	3°C/second max.
Luiquidous temperature (T_L)	183°C	217°C
Time (tL) maintained above T_L	60 to 150 seconds	60 to 150 seconds
Peak package body temperature (Tp)	235°C	260°C
Time (Tp) within 5°C of the classification temperature Tc	10 to 30 seconds	20 to 40 seconds
Ramp-down rate (Tp 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

