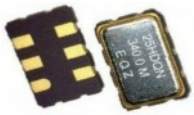
EUROQUARTZ

QF Series LVDS Oscillators

'GDQF' LVDS Output VCXOs — 10MHz to 1500MHz

FEATURES

- **Low jitter 1.2ps phase jitter**
- **Wide frequency Range 10.0MHz to 1500MHz**
- **Very short delivery leadtimes**
- **Supply voltage range 2.5V or 3.3Volts**
- **Tristate function to conserve power**



('536' package displayed)

DESCRIPTION

'GDQF' series oscillators are a precision frequency control component, providing a LVDS output VCXO with low current consumption, a wide frequency range with an integrated phase jitter performance of 1.2ps r.m.s. The part is available in two industry-standard packages, 7 x 5mm SMD, 5 x 3.2mm SMD, and 3.2 x 2.5mm SMD.

GENERAL SPECIFICATION

Output Logic Type:	LVDS
Frequency Range:	10.0MHz to 1500MHz
Load:	100Ω between OUT and OUTN
Output Logic High:	1.4V (typ.), 1.6V (max.)
Output Logic Low:	1.1V (typ.), 0.9V (min.)
Power Supply Voltage:	2.5±5%VDC or +3.3±5%VDC
Frequency Stability:	*See Stability Table*
Duty Cycle:	50%±5%
Rise Time:	0.2ns minimum**
Fall Time:	0.4ns maximum**
Current Consumption @+3.3V$_{DD}$	
750.00MHz:	49mA
1GHz:	53mA
1.35GHz:	57mA
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 1	
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.:	1.2ps typical (12kHz to 20MHz)
Storage Temperature:	-55°C to +150°C

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$_{DD}$*

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):	±80ppm (min.)	
Linearity:	±5% typical, ±10% max.	
Transfer Function:	Positive transfer	
Input Impedance:	1MΩ typical	
Bandwidth:	10kHz min., measured at -3dB	

PART NUMBERING

Example: 25GDQF536E-100N-100.00

Supply Voltage
25 = 2.5 Volts
3 = 3.3 Volts

Series/Model
'GDQF' = QF series, LVDS output

Package
326 = 3.2mm x 2.5mm
536 = 5.0mm x 3.2mm
576 = 7.0mm x 5.0mm

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

Pullability
100N = ±100ppm frequency pull range

Frequency in MHz

Phase Noise [dBc /Hz (typ.)]	Offset	10Hz	100Hz	1kHz	10kHz	100kHz	1MHz	10MHz
	156.250MHz	-55	-85	-109	-116	-118	-139	-146
	491.52MHz	-61	-86	-100	-105	-105	-126	-137

Frequency Stability Codes	Frequency Stability over Operating Temperature Range	±25 ppm	±50 ppm	±100 ppm	If non-standard, please enter the desired stabilitywith a 'C' or 'I' prefix. For Example, C20 = ±20 ppm over -10°C to +70°C I20 = ±20 ppm over -40°C to +85°C
	Commercial (-10°C to +70°C)	A	B	C	
	Industrial (-40°C to +85°C)	D	E	F	

EUROQUARTZ LIMITED Blacknell Lane CREWKERNE Somerset UK TA18 7HE
Tel: +44 (0)1460 230000 info@euroquartz.co.uk www.euroquartz.co.uk

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.

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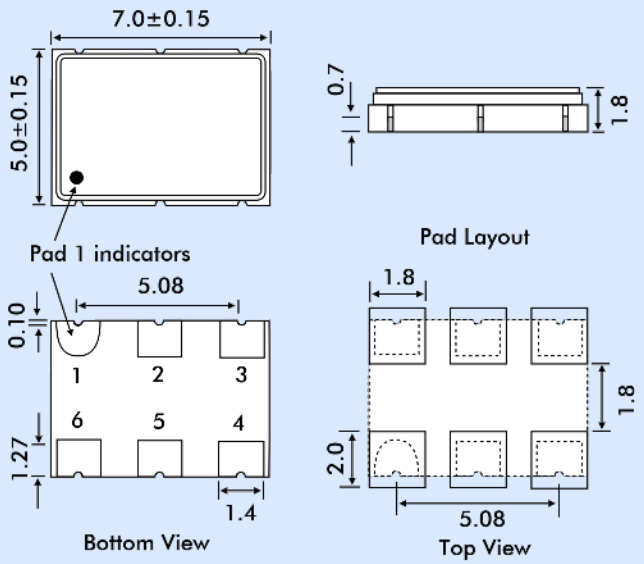
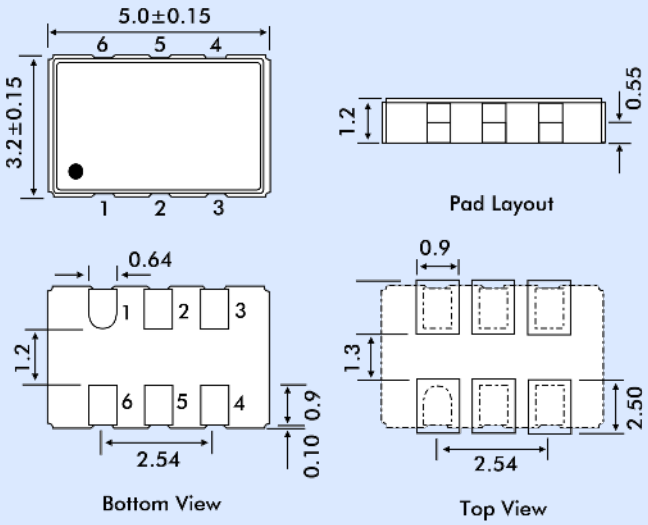
OUTLINE & DIMENSIONS

7.0 x 5.0mm SMD Package

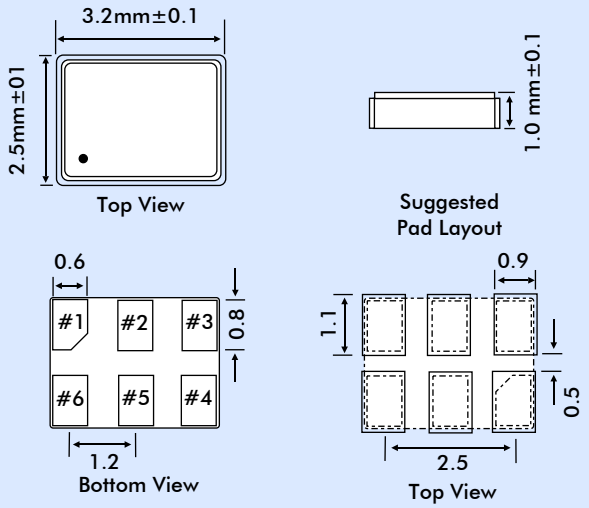


Pad Connections
1 Control Voltage
2 OE High Enable
3 Ground
4 Output
5 No connection
6 Supply Voltage

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



Pad Connections
1 VCXO
2 OE
3 Ground
4 Differential output
5 Complimentary Output
6 Supply Voltage

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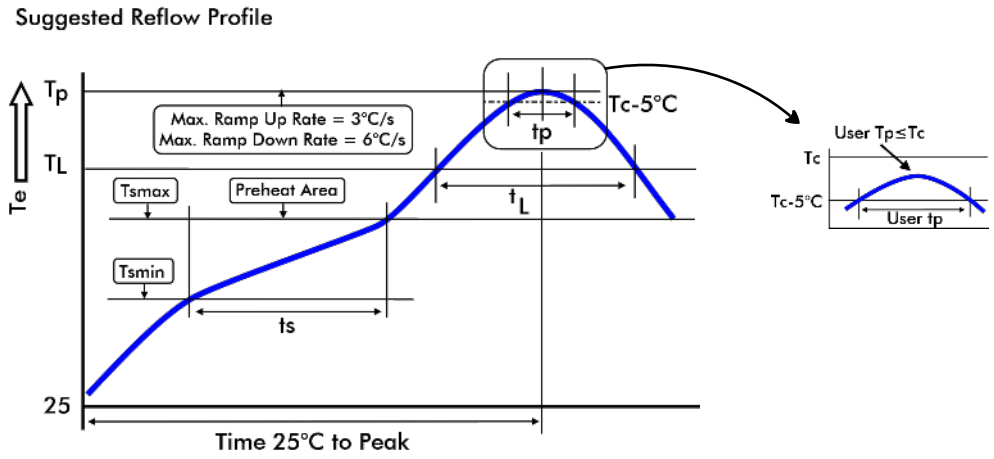
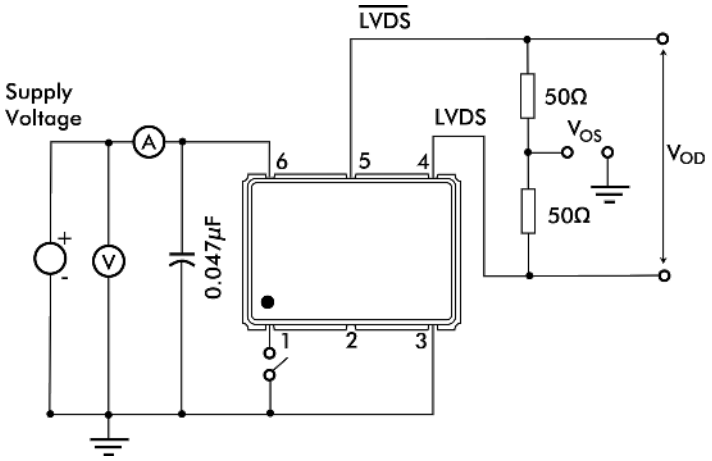
RECOMMENDED SOLDER TEMPERATURE PROFILE



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



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