

'HDQN' Specification Low Jitter Oscillators 10MHz to 1450MHz

FEATURES

- Low jitter <0.6ps phase jitter
- Wide frequency Range 10.0MHz to 1450MHz
- Low supply current <16mA at 100MHz
- Supply voltage range 2.5V or 3.3Volts
- Tristate function to conserve power



(*536' package displayed)



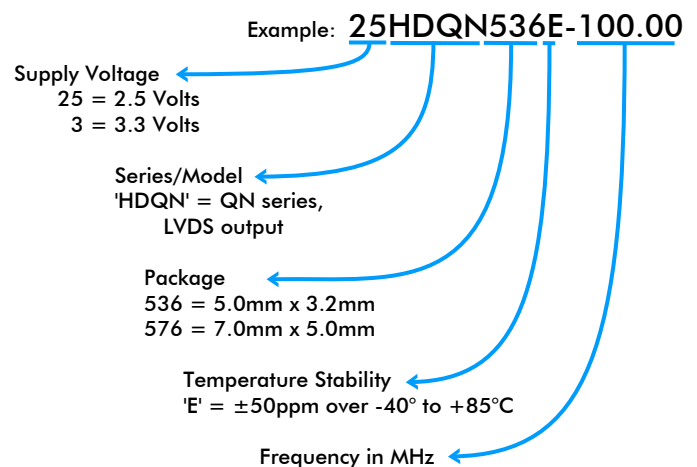
DESCRIPTION

'HDQN' series oscillators have been developed as a precision frequency control component, providing a LVDS output clock oscillator with low current consumption, wide operating frequency range and 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.

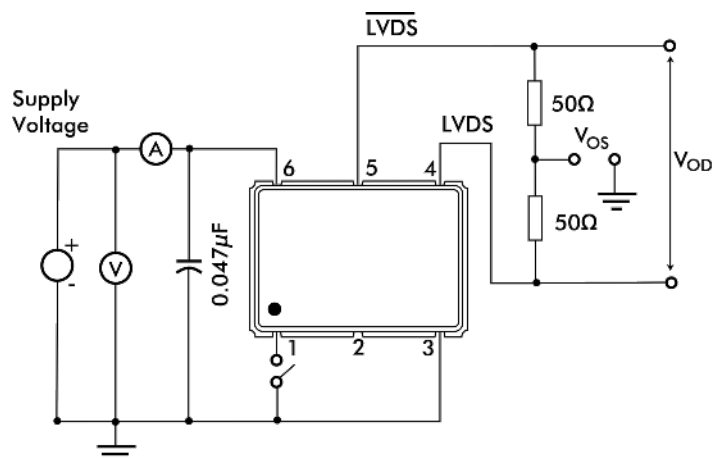
GENERAL SPECIFICATION

Output Logic Type:	LVDS
Frequency Range:	10.0MHz to 1450MHz
Load:	Differential
Power Supply Voltage:	2.5±5%VDC or +3.3±10%VDC
Differential Output Voltage:	(V _{DD}) 175mV min., 350mV typical
V _{DD} Magnitude Change (ΔV _{DD}):	50mV max.
Offset Voltage (V _{OS}):	1.25V typical
V _{OS} Magnitude Change (ΔV _{OS}):	50mV max.
Frequency Stability:	±50ppm over -40° to +85°C*
Duty Cycle:	50%±2%
Rise Time:	150ps minimum**
Fall Time:	250ps maximum**
Current Consumption @+2.5V _{DD}	
100.000MHz:	16mA
250.000MHz:	18mA
500.00MHz:	21mA
750.00MHz:	22mA
1GHz:	24mA
1.35GHz:	26mA
Current Consumption @+3.3V _{DD}	
100.000MHz:	18mA
250.000MHz:	20mA
500.00MHz:	22mA
750.00MHz:	24mA
1GHz:	26mA
1.35GHz:	28mA
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.:	0.6ps typical (12kHz to 20MHz) <100fs (1.875MHz to 20MHz)

PART NUMBERING



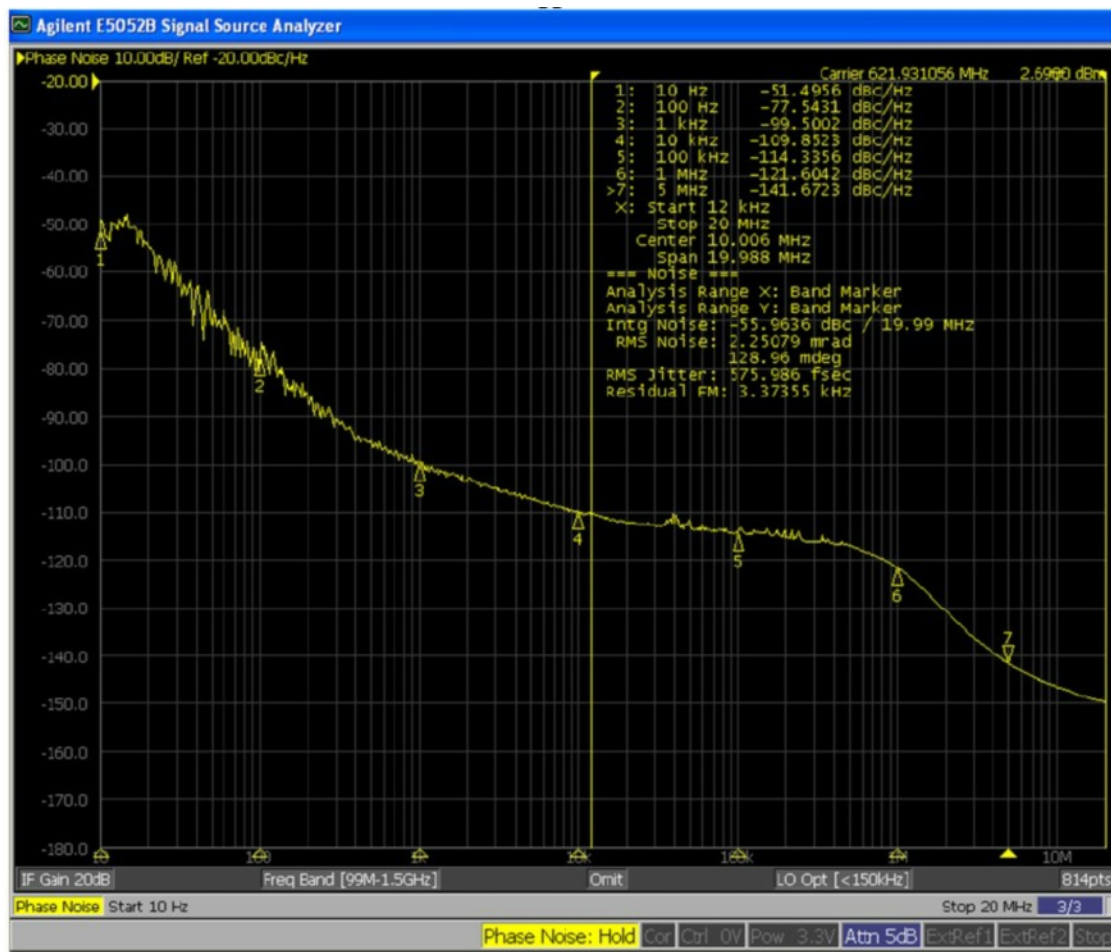
TEST CIRCUIT



Notes:

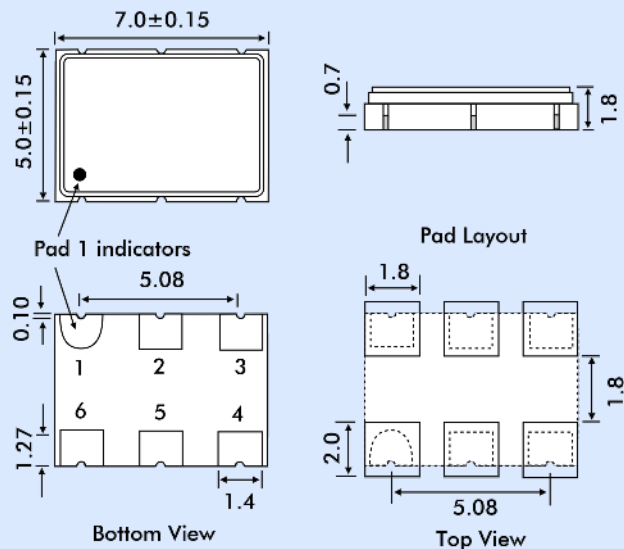
- * Stability code for ±50ppm over -40° to +85°C is 'E.' Other stabilities are available, contact Euroquartz for details.
- * Note that Frequency stability quoted is inclusive of all conditions, Calibration Tolerance at 25°C, stability over operating temperature range, 1st year ageing at 25°C, supply voltage & output load changes and shock & vibration.
- ** Rise/Fall times are measure between 10% to 90%V_{DD}

HDQN SERIES PHASE NOISE & PHASE JITTER DATA

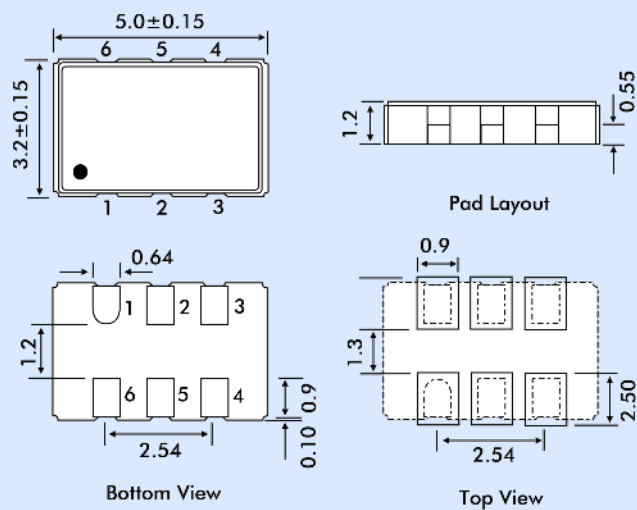


HDQN SERIES PHASE NOISE & PHASE JITTER DATA

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

5.0 x 3.2mm SMD Package

Pad Connections

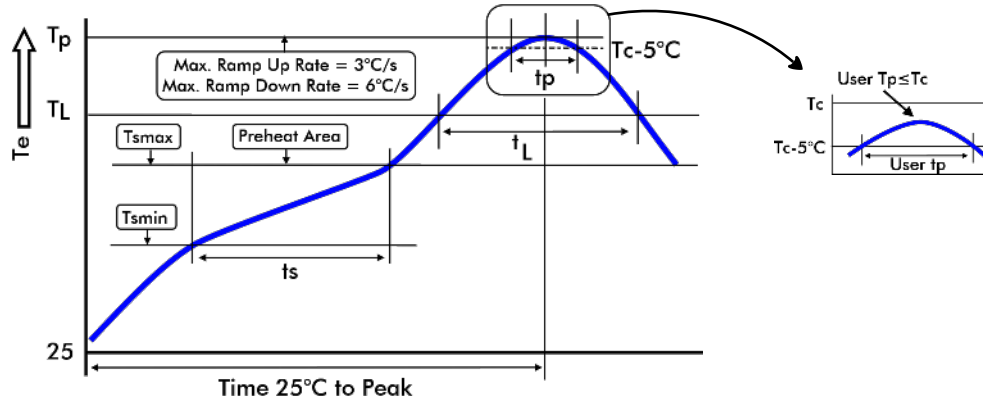
- 1 OE High Enable
- 2 No connection
- 3 Ground
- 4 Output
- 5 Output
- 6 Supply Voltage

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 of 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

Suggested Reflow Profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat/Soak		
- Temperature min. (T_s min.)	100°C	150°C
- Temperature max. (T_s max.)	150°C	200°C
- Time (t_s) (T_s min. to T_s max.)	60 to 120 seconds	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.