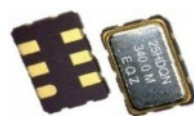


'HPQN' Specification Low Jitter Oscillators 150MHz to 1500MHz

FEATURES

- Low jitter <0.6ps phase jitter
- Wide frequency Range 150MHz to 1500MHz
- Low supply current <46mA (100MHz)
- Supply voltage range 2.5V or 3.3Volts
- Tristate function to conserve power



('536' package displayed)



Page 1 of 3

DESCRIPTION

'HPQN' series oscillators have been developed as a precision frequency control component, providing a LVPECL 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, 5 x 3.2mm SMD, and 3.2 x 2.5mm SMD.

GENERAL SPECIFICATION

Output Logic Type:	LVPECL
Frequency Range:	150MHz to 1500MHz
Load:	Differential
Power Supply Voltage:	2.5±5%VDC or +3.3±10%VDC
Output Voltage 'HIGH':	V _{DD} - 1.03V minimum V _{DD} - 0.6V maximum
Output Voltage 'LOW':	V _{DD} - 1.85V minimum V _{DD} - 1.6V maximum
Frequency Stability:	See Frequency Stability Table*
Duty Cycle:	50%±2%
Rise Time:	0.2ns minimum**
Fall Time:	0.5ns maximum**
Current Consumption	
150-250MHz:	50mA
251-750MHz:	55mA
751-1,000MHz:	57mA
1,001-1,500MHz:	60mA
Current with output disabled:	16mA typical
Start-up Time:	10ms maximum
Ageing:	±3ppm max. first year, ±2ppm max. every year thereafter
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)

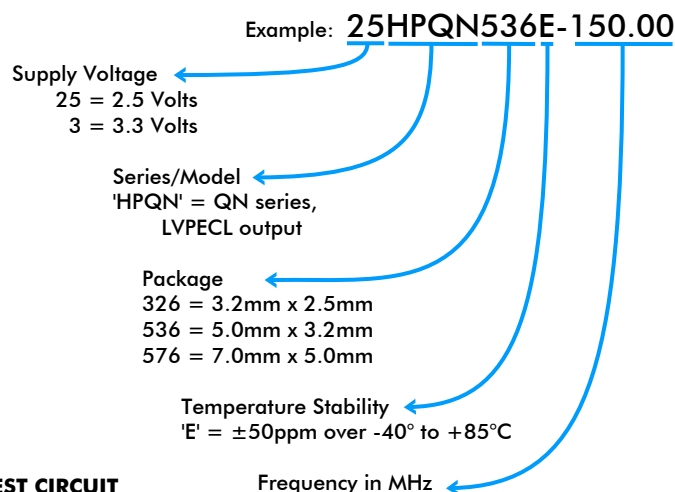
Stability ±ppm	Temperature Range °C	Order Code
25	-10 to +70	A
50	-10 to +70	B
100	-10 to +70	C
25	-40 to +85	D
50	-40 to +85	E
100	-40 to +85	F

Notes:

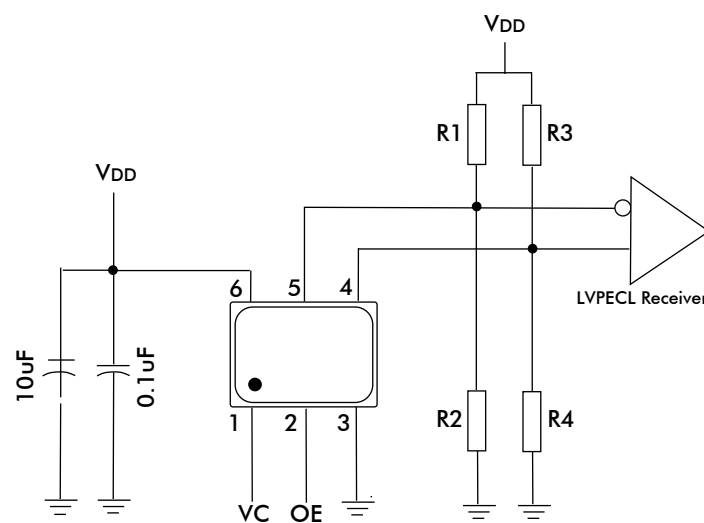
* Note that Frequency stability quoted is inclusive of all conditions, Calibration Tolerance at 25°C, stability over operating temperature range, 1st year ageing at 25°C, supply voltage & output load changes and shock & vibration.

** Rise/Fall times are measure between 20% to 80% of PECL waveform

PART NUMBERING



TEST CIRCUIT

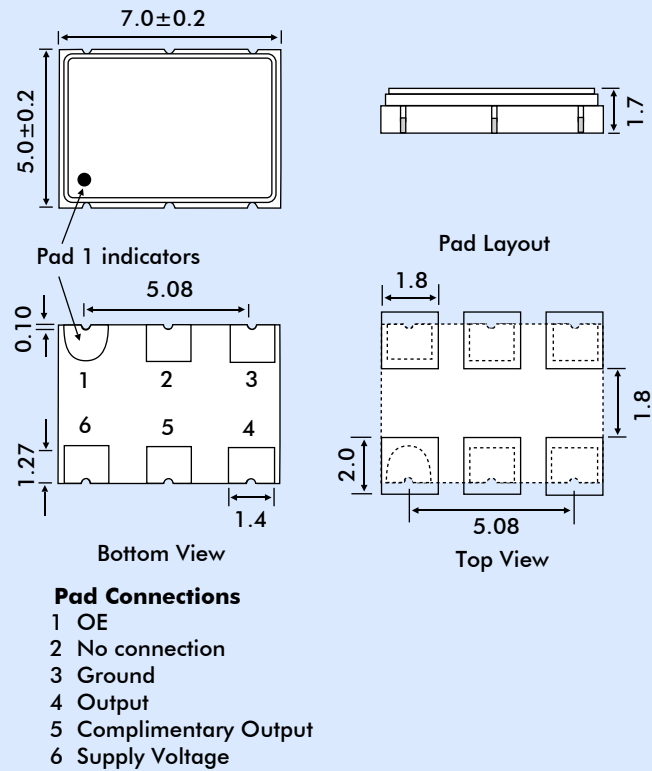
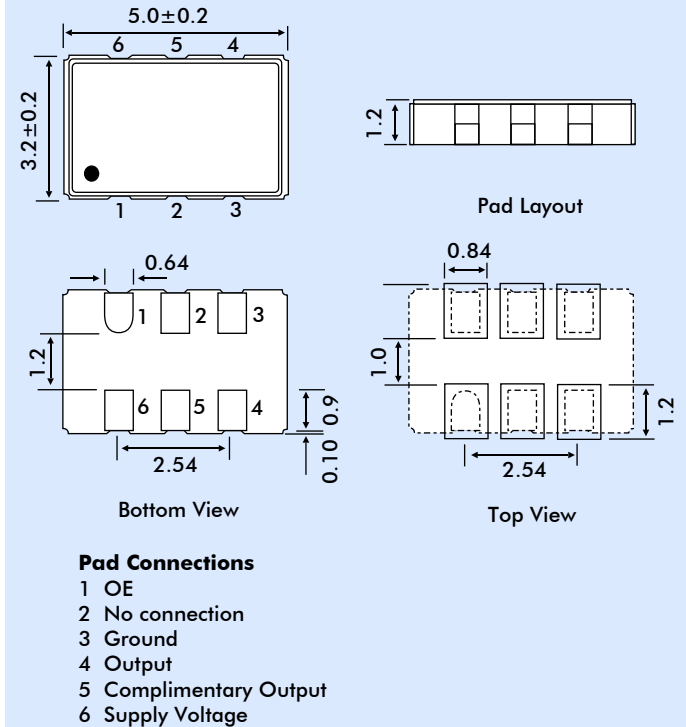
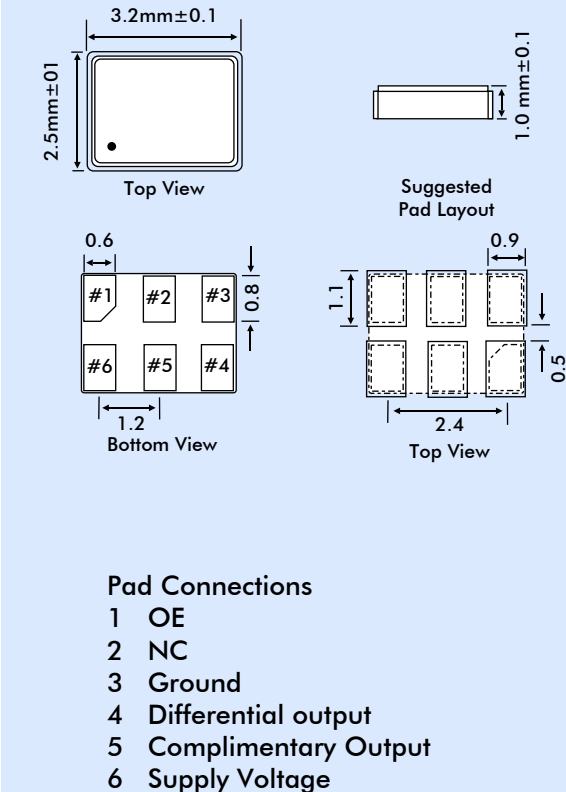


V_{DD} = 3.3v ; R1=R3=127Ω ; R2-R4=82.5Ω

V_{DD} = 2.5v ; R1=R3=250Ω ; R2-R4=62.5Ω

HPQN SERIES PHASE NOISE & PHASE JITTER DATA

SSB Phase Noise Data (dBc/Hz typical)	Frequency (MHz)	156.25	622.08
10Hz offset		-55	-48
100Hz offset		-85	-85
1kHz offset		-109	-101
10kHz offset		-116	-102
100kHz offset		-118	-103
1MHz offset		-139	-124
10MHz offset		-146	-133
Phase Jitter (ps) (12kHz ~ 20MHz. r.m.s.)		0.6	0.6

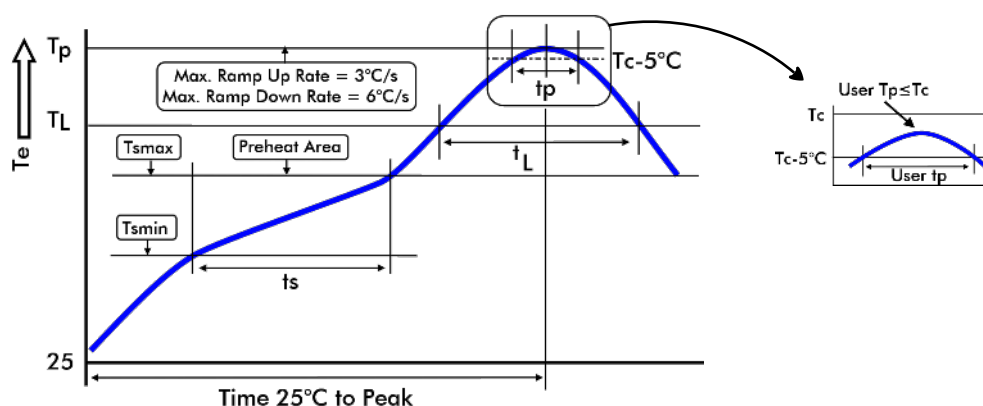
OUTLINE & DIMENSIONS**7.0 x 5.0mm SMD Package****5.0 x 3.2mm SMD Package****3.2 x 2.5mm SMD Package**

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

Suggested Reflow 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 (Tl to Tp)	3°C/second max.	3°C/second max.
Liquidous temperature (Tl)	183°C	217°C
Time (tl) maintained above Tl	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 Tl)	6°C/second max.	6°C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.