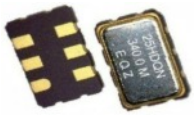
JK Series LVPECL Oscillators

'HPJK' Specification Low Jitter Oscillators 100MHz to 250MHz

FEATURES

- **LVPECL Output logic**
- **Wide frequency Range 100MHz to 250MHz**
- **Low phase RMS jitter 50fs [12kHz - 20MHz]**
- **Supply voltage range 1.8V 2.5V, 3.3Volts**
- **Tristate function to conserve power**



('536' package displayed)

DESCRIPTION

'HPJK' series oscillators have been developed as a precision frequency control component with a short lead time, providing a LVPECL output clock oscillator with low current consumption, wide operating frequency range and an integrated RMS phase jitter performance of 50fs r.m.s. Available in 4 industry-standard ceramic packages, 7 x 5mm, 5 x 3.2mm, 3.2 x 2.5mm and 2.5 x 2.0mm SMD.

GENERAL SPECIFICATION

Output Logic Type:	LVPECL
Frequency Range:	100MHz to 250MHz
Load:	50Ω into Vdd-2.0V or Thevenin Equivalent
Power Supply Voltage:	2.5±5%VDC or +3.3±10%VDC
Differential Output Voltage:	Hi: Vdd-1.085 (min.), Vdd-0.86 (max.) Lo: Vdd-1.81 (mix.), Vdd-1.62 (max.)
Frequency Stability:	*See Stability Table*
Storage Temperature:	-55°C tp +150°C
Output Swing (single-end):	400mV minimum
Duty Cycle:	50%±5%
Rise Time:	0.15 nsec typical**
Fall Time:	0.4 nssec maximum**
Current Consumption:	52mA typical, 65mA maximum
Current with output disabled:	30uA maximum
Start-up Time:	1.0ms typical, 5.0ms maximum
Ageing:	±3ppm max. first year, ±2ppm max. per year thereafter
OE Control on Pad 1	
Enable:	70% V_{DD} min., or no connection
Disable:	30%V_{DD} max., (high impedance).
Output Enable Time:	10ms max.
Output Disable Time:	0.2us max.
Phase Jitter r.m.s.:	50fsec typ., 300fsec max. (125MHz, 3.3V)

STABILITY OVER TEMPERATURE RANGE

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**

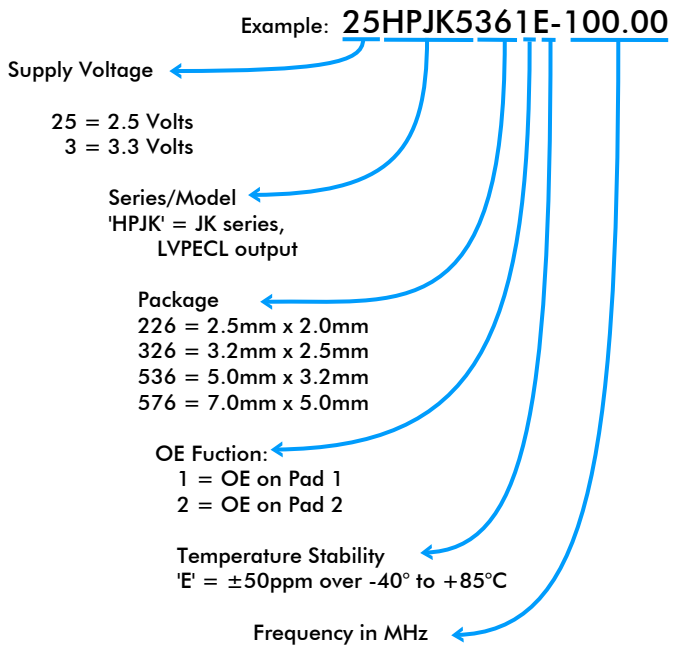
Notes:

* *Stability code for ±50ppm over -40° to +85°C is 'E.'*

* *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%V_{DD}*

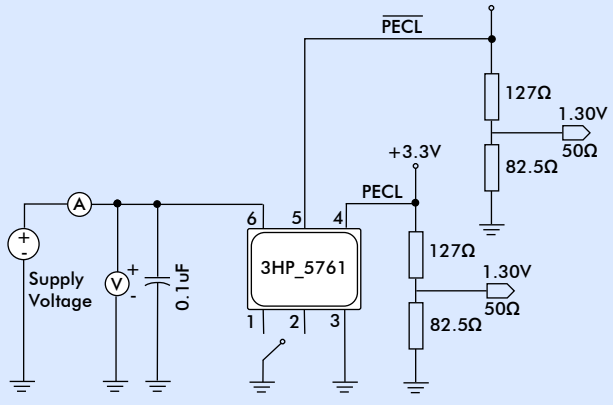
PART NUMBERING



HPJK SERIES PHASE NOISE & PHASE JITTER DATA

	Frequency (MHz)	125.00	156.25
SSB Phase Noise Data (dBc/Hz typical)	100Hz offset	-114	-108
	1kHz offset	-135	-132
	10kHz offset	-147	-141
	100kHz offset	-157	-152
	1MHz offset	-163	-160
	10MHz offset	-164	-161

TEST CIRCUIT



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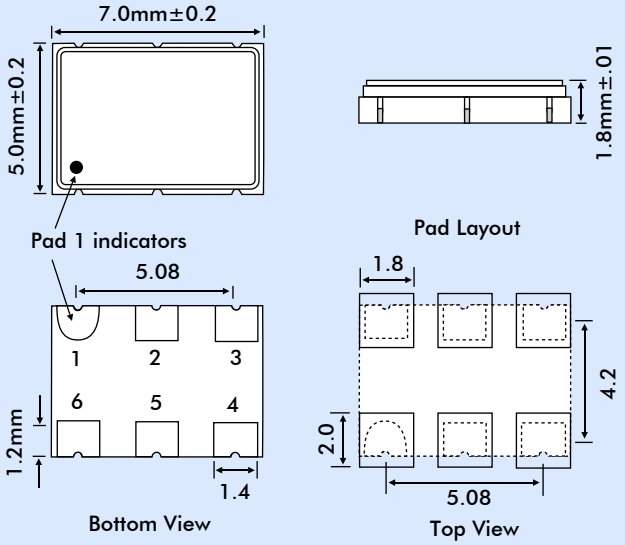
Issue 2

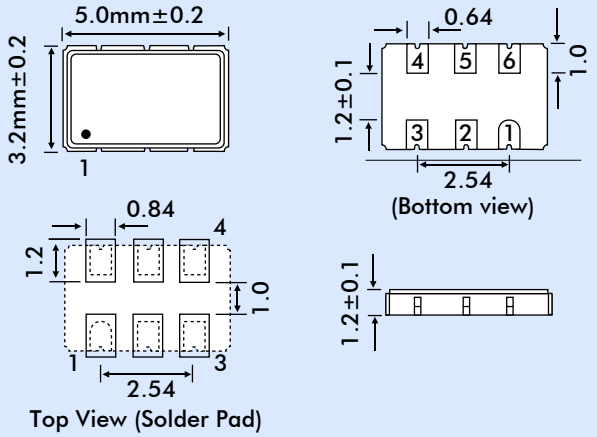
OUTLINE & DIMENSIONS

7.0 x 5.0mm SMD Package



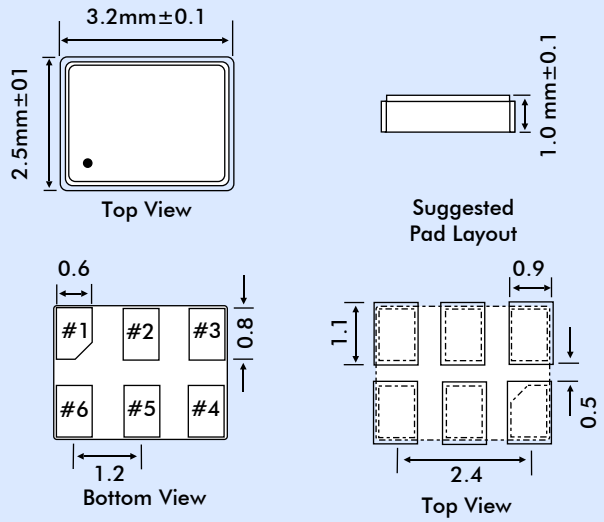
Pad Connections
1 OE High Enable
2 No connection
3 Ground
4 Output
5 Complimentary
6 Supply Voltage

5.0 x 3.2mm SMD Package



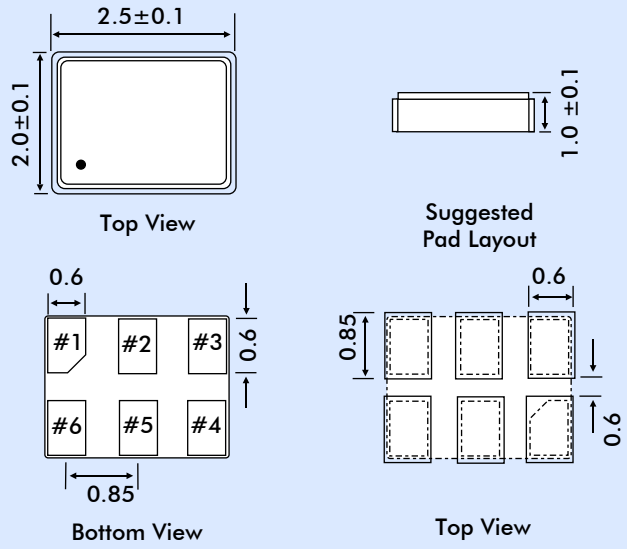
Pad Connections
1 OE High Enable
2 No connection
3 Ground
4 Output
5 Complimentary
6 Supply Voltage

3.2 x 2.5mm SMD Package



Pad Connections
1 OE
2 No connection
3 Ground
4 Output
5 Complimentary Output
6 Supply Voltage

2.5 x 2.0mm SMD Package



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

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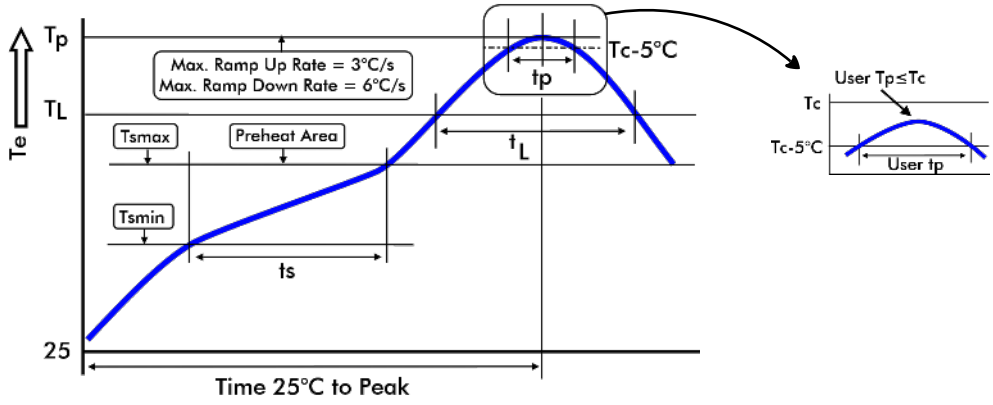
RECOMMENDED SOLDER TEMPERATURE PROFILE

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 (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.

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.