KoT cut OPAW Crystal Oscillator

Low Phase Noise / Low Phase Jitter / High Precision / 100 MHz to 1 GHz / Low g-Sensitivity / LVDS, LVPECL

PRELIMINARY

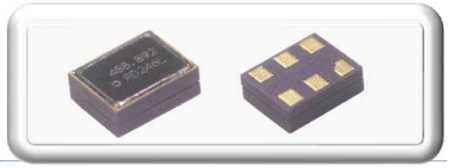
KCRO-04

KoT Cut: Trademark Registration No. 6489253 (JP)
OPAW: Trademark Registration No. 6489254 (JP)

FEATURES

- Our unique crystal oscillator, incorporating the innovative cut angle 'KoT Cut™' and the new vibration mode 'OPAW™', stands unmatched in the market.
- This proprietary technology offers exceptional frequency temperature stability, surpassing conventional AT-cut oscillators.
- Outstanding g-sensitivity characteristics.
- Unprecedented low jitter performance.
- Supports LVDS or LVPECL output.
- Covers a wide frequency range from 100 MHz to 1 GHz, suitable for various applications.

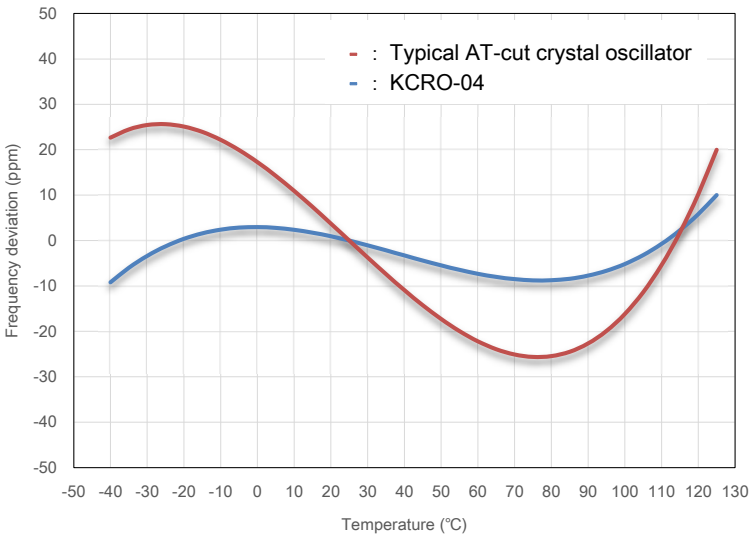
Note: 'KoT': Kerfed orthogonal plate waves for zero Temperature coefficient, 'OPAW': Orthogonal Plate Acoustic Waves



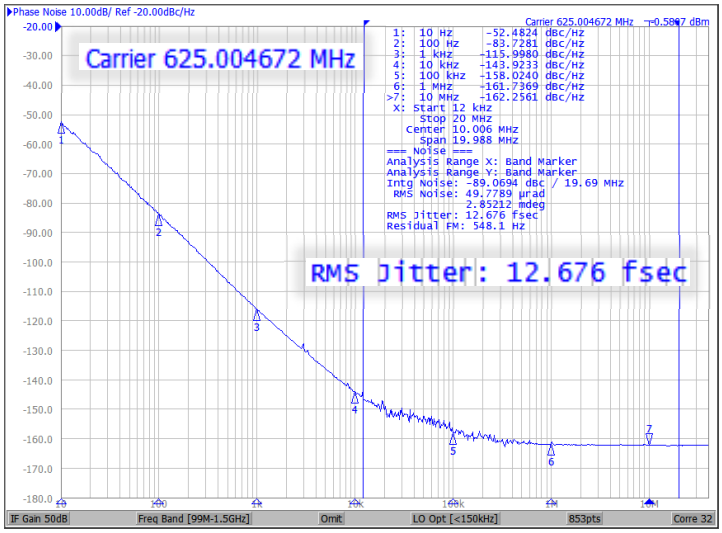
APPLICATIONS

Next-generation Ethernet (1.6TbE, 3.2TbE), Serializer/Deserializer (SerDes), High-speed data transmission (800Gbps, 1Tbps), High-speed digital signal processing (DSP), Next-generation wireless communication (Wi-Fi 7, 6G), High-precision measurement instruments, Server storage systems for data centers, High-end audio systems, High-performance computing (HPC), Supercomputers, Quantum computers, etc.

TEMPERATURE CHARACTERISTICS

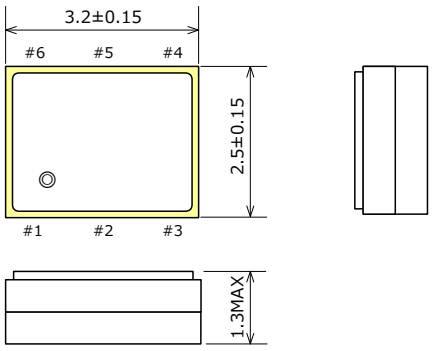


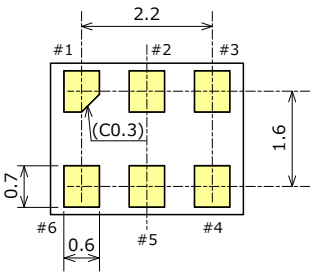
PHASE NOISE AND PHASE JITTER



OUTLINE DIMENSIONS

(Unit: mm)

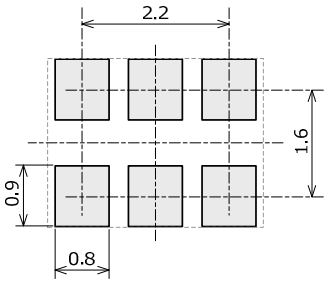




Pin#	Description
1	OE "H" or Open: Enable "L": Disable
2	NC (Open or V_{CC})
3	GND
4	Output
5	Complementary Output
6	Supply Voltage (V_{CC})

RECOMMENDED LAND PATTERN

(Unit: mm)



NOTES

- To ensure stable operation of the crystal oscillator, please implement a bypass capacitor of 0.01 µF to 0.1 µF between the Vcc and GND near the product.
- The OE pin (Pin#1) is high-impedance and is sensitive to noise, which can cause malfunctions. To prevent malfunction from external noise, it is recommended to connect the OE pin to V_{CC} when OE function is not in use.
- The NC pin (Pin#2) acts as a programming pin and is internally connected to the semiconductor. Due to its high impedance, it is also is sensitive to noise ,which can cause malfunctions.. To prevent malfunction, we recommend connecting the NC pin to V_{CC} whenever possible.

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STANDARD SPECIFICATIONS

Item		Symbol	Specifications		Remarks
Output frequency		fo	100 MHz ≤ fo < 800 MHz	800 MHz ≤ fo ≤ 1000 MHz	
Storage temperature		T_stg	-55 ℃ to 125 ℃		
Operating temperature		T_use	-40 ℃ to 125 ℃		
Frequency tolerance (including initial deviation, frequency temperature characteristics, supply voltage variation characteristics, and first year aging)		f_tol	±50 ppm MAX. (-40 ℃ to +125 ℃)		Standard
			±30 ppm MAX. (-40 ℃ to +125 ℃)		High precision option
			±20 ppm MAX. (-40 ℃ to +85 ℃)		High precision option
LVDS	Supply voltage	V_{CC}	1.8 V ± 0.09 V, 2.5 V ± 0.125 V, 3.3 V ± 0.165 V		
	Current consumption	I_{CC}	40 mA MAX.		
	Output voltage	V_{OD}	350 mV TYP.		2.5 V to 3.3 V
			350 mV TYP.	250 mV TYP.	1.8 V
	Offset voltage	V_{OS}	1.25 V TYP.		2.5 V to 3.3 V
			0.9 V TYP.		1.8 V
	LVDS load conditions	L_LVDS	100 Ω		Between output terminals
	Rise time	tr	500 ps MAX.		20 % to 80 %
	Fall time	tf	500 ps MAX.		80 % to 20 %
	Symmetry	SYM	45 % to 55 %		
LVPECL	Supply voltage	V_{CC}	2.5 V ± 0.125 V, 3.3 V ± 0.165 V		
	Current consumption	I_{CC}	80 mA MAX.		
	Output voltage	V_{OH}	Vcc - 1.03 V MIN.	-	
		V_{OL}	Vcc - 1.60 V MAX.	-	
		V_{OS}	-	Vcc - 1.25 V TYP.	Mid-level
		V_{SWG}	-	900 mV MIN.	Differential swing
	ECL load conditions	L_ECL	50 Ω		Terminated to V_{CC} - 2.0 V
	Rise time	tr	400 ps MAX.		20 % to 80 %
	Fall time	tf	400 ps MAX.		80 % to 20 %
	Symmetry	SYM	45 % to 55 %		
Input voltage		V_{IH}	85 % V_{CC} MIN.		OE terminal
		V_{IL}	15 % V_{CC} MAX.		OE terminal
Start-up time		t_str	10 ms MAX.		
Phase jitter		t_pj	70 fs TYP. (fo < 150 MHz) 50 fs TYP. (150 MHz ≤ fo < 200 MHz) 40 fs TYP. (200 MHz ≤ fo < 300 MHz) 30 fs TYP. (300 MHz ≤ fo < 400 MHz) 20 fs TYP. (400 MHz ≤ fo < 600 MHz) 15 fs TYP. (600 MHz ≤ fo < 800 MHz) 13 fs TYP. (800 MHz ≤ fo)		Offset frequency 12 kHz to 20 MHz
g-Sensitivity			2 ppb/g MAX.		

GENERAL NOTES

- The contents of this catalog are subject to change without notice.
- For specifications other than the standard ones, please contact our sales department.

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