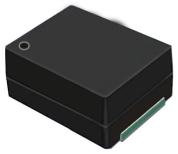
Oven Controlled Crystal Oscillators



9.7 x 7.5 x 4.3mm SMD

AOCJYR

ESD Sensitive

RoHS / RoHS II Compliant

Moisture Sensitivity Level (MSL) – 1

OVERVIEW:

Abracon's AOCJYR series of World's Smallest Profile, Surface Mount- Ovenized Quartz Crystal Oscillators are based on Proprietary Mercury™ ASIC technology, patented by Rakon. This Advanced Technology coupled with Rakon's proprietary manufacturing techniques enable ±10 ppb stability over -20°C to +70°C, with typical short-term aging of better than ±2 ppb per day.

Sophisticated Integrated Oven Control architecture ensures fast warm-up time, while minimizes initial power consumption to 350mW typical at 25°C. Further, the integration of critical functionality improves overall product reliability by reducing FIT rates 10x relative to traditional discrete OCXOs.

The AOCJYR series is offered in Industry leading 9.7 x 7.5 x 4.3 mm SMT package, while AOCJYR-DIL is available in 21.7 x 13.08 x 8.6 mm leaded hermetic package.

FEATURES:

- Compact package size: 9.7 x 7.5 x 4.3mm
- Frequency stability over temperature as low as ±10ppb over -20 to +70°C
- Low power consumption
- High reliability

APPLICATIONS:

- Stratum 3
- Small Cells
- Switches and Routers
- Time & Frequency References
- SyncE and IEEE 1588

STANDARD SPECIFICATIONS:

Parameters	Minimum	Typical	Maximum	Units	Notes
Frequency Range	5		50	MHz	
Supply Voltage (Vdd)	2.7		5.5	V	±5%
Input Power (warm-up)		1000		mW	
Input Power (steady-state)			400	mW	@25°C still air
Operable Temperature Range	-40		85	° C	
Storage Temperature Range	-55		+125	° C	
Initial Frequency Tolerance @25°C±2°C, at time of shipment			±0.5	ppm	See Note 1
Reflow Shift			±1	ppm	After 1hr recovery
Frequency Stability over Operating Temperature Range in Still Air	±10		±100	ppb	Ref. to $(F_{MAX}+F_{MIN})/2$
Slope in Still Air	±0.5		±2	ppb/°C	Temperature ramp 1°C/minute max.
Holdover Stability		<±2.5~±4		ppb	24hrs, temperature variation ≤±1°C. See Note 2
Free-run Accuracy			±4.6	ppm	All causes, 20 years life, ref. to nominal frequency.
Stability vs. Supply Voltage Change (for Freq. < 26MHz)		±10		ppb	±5% variation in Vdd, ref. to freq. @Vdd=3.3V
Load Coefficient (for Freq. < 26MHz)		±10		ppb	±5pF/10% variation in load, ref. to freq. @ 15pF load
Frequency Aging (per day)		<±2		ppb	See Note 2

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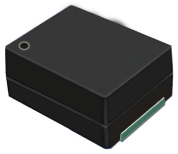

9.7 x 7.5 x 4.3mm SMD

Parameters		Minimum	Typical	Maximum	Units	Notes
Frequency Aging (long-term stability)	First Year			±1	ppm	
	10 Years			±3	ppm	
Warm-up Time			<3		minute	See Note 3
Root Allan Variance (@20MHz)			$7x10^{-11}$			@25°C, τ=1.0s
Acceleration Sensitivity			<2		ppb/g	Gamma vector of all 3 axes from 30Hz to 1500Hz
Clipped Sinewave						
Output Voltage		0.8	1.1		Vpk-pk	
Output Load			10kΩ//10pF			
HCMOS						
High-level Output Voltage (V_{OH})		90%*Vdd			V	
Low-level Output Voltage (V_{OL})				10%*Vdd	V	
Output Load		0	15	30	pF	
Rise and Fall Time (t_r, t_f)				4	ns	10% to 90%
Duty Cycle		45		55	%	At 50% level
Control Voltage (Vc)		0.5		2.5	V	
Frequency Tuning Range (over Control Voltage range)		±5			ppm	Ref. to Frequency @ Vc=1.5V
Frequency Tuning Linearity				1	%	Deviation from linear over control voltage range
Slope			+8		ppm/V	
Port Input Impedance		80			kΩ	
Modulation Bandwidth			3.5		kHz	
Phase Noise @ 24.576MHz Carrier						
@ 1	Hz offset		-55		dBc / Hz	
@ 10	Hz offset		-88		dBc / Hz	
@ 100	Hz offset		-110		dBc / Hz	
@ 1,000	Hz offset		-135		dBc / Hz	
@ 10,000	Hz offset		-148		dBc / Hz	
@ 100,000	Hz offset		-152		dBc / Hz	
@ 1,000,000	Hz offset		-153		dBc / Hz	

Note:

1. The characteristics of the component may be temporarily affected by the processes of assembly and soldering. The frequency specifications apply 48 hours after assembly. Nominal conditions apply unless otherwise stated.
2. After 30 days of continuous operation.
3. Time needed for frequency to be within ±20ppb reference to frequency after 1hour, at 25°C. Parameter is assembly and operating history dependent

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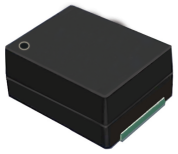

9.7 x 7.5 x 4.3mm SMD

PART IDENTIFICATION:

AOCJYR - [ ] MHz - [ ] - [ ]

Frequency	Configuration Code	Packaging
See Table below for available frequencies	See Table below for available configurations	Blank = Bulk T = Tape & Reel(1k/reel)

Table of Available Configurations

Abracon P/N	Supply Voltage (V)	Freq. Stability Over Temperature (ppb)	Slope (ppb/°C)	Operating Temperature (°C)	Output Type	Voltage Control
AOCJYR-12.800MHz-M6451LF	3.3	±25	±2.00	-40 to +85	HCMOS	Yes
AOCJYR-10.000MHz-M5625LF	3.3	±25	±2.00	-40 to +85	HCMOS	No
AOCJYR-12.800MHz-M5649LF	3.3	±20	±1.00	-40 to +85	HCMOS	No
AOCJYR-12.800MHz-M5776LF	3.3	±10	±2.00	-20 to +70	HCMOS	No
AOCJYR-19.200MHz-M6049LF	3.3	±50	±2.00	-40 to +85	HCMOS	Yes
AOCJYR-20.000MHz-M6452LF	3.3	±25	±2.00	-40 to +85	HCMOS	Yes
AOCJYR-20.000MHz-M6226LF	3.3	±20	±2.00	-20 to +85	HCMOS	No
AOCJYR-20.000MHz-M5627LF	3.3	±20	±1.00	-40 to +85	HCMOS	No
AOCJYR-20.000MHz-M6260LF	3.3	±25	±2.00	-20 to +70	HCMOS	Yes
AOCJYR-20.000MHz-M6261LF	3.3	±20	±2.00	-20 to +70	HCMOS	Yes

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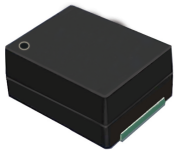

9.7 x 7.5 x 4.3mm SMD

Abracon P/N	Supply Voltage (V)	Freq. Stability Over Temperature (ppb)	Slope (ppb/°C)	Operating Temperature (°C)	Output Type	Voltage Control
AOCJYR-24.576MHz-M6069LF	3.3	±50	±2.00	-40 to +85	HCMOS	Yes
AOCJYR-24.576MHz-M6453LF	3.3	±25	±2.00	-40 to +85	HCMOS	No
AOCJYR-25.000MHz-M5857LF	3.3	±50	±2.00	-40 to +85	HCMOS	No
AOCJYR-25.000MHz-M5859LF	3.3	±50	±0.83	-40 to +85	HCMOS	No
AOCJYR-25.000MHz-M6454LF	3.3	±25	±2.00	-40 to +85	HCMOS	Yes
AOCJYR-30.720MHz-M6328LF	3.3	±25	±1.00	-30 to +85	HCMOS	Yes
AOCJYR-30.720MHz-M6455LF	3.3	±25	±2.00	-40 to +85	HCMOS	Yes
AOCJYR-38.880MHz-M6456LF	3.3	±25	±2.00	-40 to +85	HCMOS	Yes
AOCJYR-40.000MHz-M5917LF	3.3	±50	±2.00	-40 to +85	Clipped Sine	Yes
AOCJYR-40.000MHz-M6457LF	3.3	±25	±2.00	-40 to +85	HCMOS	Yes
AOCJYR-50.000MHz-M5948LF	3.3	±50	±0.83	-40 to +85	HCMOS	No
AOCJYR-20.000MHz-M5627LF	3.3	±20	±1.00	-40 to +85	HCMOS	No
AOCJYR-24.576MHz-M5834LF	3.3	±25	±2.00	-40 to +85	HCMOS	No
AOCJYR-49.152MHz-M5942LF	3.3	±40	±3.00	-40 to +85	HCMOS	No

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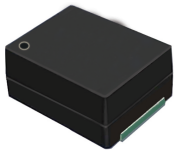

9.7 x 7.5 x 4.3mm SMD

REFERENCE DESIGN INFORMATION

Abracon P/N	Equivalent Rakon P/N	Chipset	Reference Design Chipset P/N	Keyword
AOCJYR-12.800MHz-M6451LF	M6451LF	None		IEEE1588, G.8263
AOCJYR-10.000MHz-M5625LF	M5625LF	IDT	82V3399, 82V3391, 82V3398, SyncE/SONET Sync Equipment Timing Source (SETS)	Stratum 3
AOCJYR-12.800MHz-M5649LF	M5649LF	Semtech	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522, ACS8522A, ACS8525, ACS8525A, ACS8526, ACS8527, ACS8530, ACS8595	Topsync Option
AOCJYR-12.800MHz-M5776LF	M5776LF	Semtech	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T, ACS8522BT, ACS8509, ACS8510, ACS8514, ACS8515, ACS8520, ACS8520A, ACS8522, ACS8522A, ACS8525, ACS8525A, ACS8526, ACS8527, ACS8530, ACS8595	Topsync Option
AOCJYR-19.200MHz-M6049LF	M6049LF	TI	TCI6612, TCI6614, TCI6630	Smallcell
AOCJYR-20.000MHz-M6452LF	M6452LF			IEEE1588, G.8263
AOCJYR-20.000MHz-M6226LF	M6226LF	Semtech	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T	Topsync Option
AOCJYR-20.000MHz-M5627LF	M5627LF	Semtech	ACS1790T, ACS9510, ACS9520T, ACS9522T, ACS9550, ACS9593T	TOPPort Sync Box / Topsync option
AOCJYR-20.000MHz-M6260LF	M6260LF	Semtech	ACS9522T, ACS9550, ACS9593T	Smallcell
AOCJYR-20.000MHz-M6261LF	M6261LF	Semtech	ACS9522T, ACS9550, ACS9593T	Smallcell
AOCJYR-24.576MHz-M6069LF	M6069LF	TI	TCI6612, TCI6614, TCI6630	Smallcell
AOCJYR-24.576MHz-M6453LF	M6453LF			IEEE1588, G.8263

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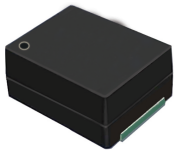

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REFERENCE DESIGN INFORMATION CONTD:

Abracon P/N	Equivalent Rakon P/N	Chipset	Reference Design Chipset P/N	Keyword
AOCJYR-25.000MHz-M5857LF	M5857LF	Broadcom	BCM560xx, BCM561xx, BCM562xx, BCM563xx, BCM564xx, BCM56440, BCM565xx, BCM566xx, BCM567xx, BCM56750, BCM568xx, BCM56850	Stratum 3
AOCJYR-25.000MHz-M5859LF	M5859LF	Broadcom	BCM560xx, BCM561xx, BCM562xx, BCM563xx, BCM564xx, BCM56440, BCM565xx, BCM566xx, BCM567xx, BCM56750, BCM568xx, BCM56851	Stratum 3, G.8262, G.8263
AOCJYR-25.000MHz-M6454LF	M6454LF			IEEE1588, G.8263
AOCJYR-30.720MHz-M6328LF	M6328LF	Cavium	CNF71xx	Stratum 3, G.8262, G.8263
AOCJYR-30.720MHz-M6455LF	M6455LF			
AOCJYR-38.880MHz-M6456LF	M6456LF			IEEE1588, G.8263
AOCJYR-40.000MHz-M5917LF	M5917LF	Mindspeed	Transcede 2000, Transcede 3000, Transcede 4000	
AOCJYR-40.000MHz-M6457LF	M6457LF			
AOCJYR-50.000MHz-M5948LF	M5948LF	Broadcom	BCM560xx, BCM561xx, BCM562xx, BCM563xx, BCM564xx, BCM56440, BCM565xx, BCM566xx, BCM567xx, BCM56750, BCM568xx, BCM56853	Stratum 3, G.8262, G.8263
AOCJYR-20.000MHz-M5627LF	M5627LF	Microsemi	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165	G.827x
AOCJYR-24.576MHz-M5834LF	M5834LF	Microsemi	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165, ZL30145, ZL30146, ZL30150, ZL30152, ZL30155, ZL30158, ZL30159, ZL30160, ZL30165, MAX24705, MAX24710, MAX24305, MAX24310, ZL30130, ZL30138, ZL30142, ZL30143, ZL30153, ZL30154, ZL30161, ZL30162, ZL30163	G.827x
AOCJYR-49.152MHz-M5942LF	M5942LF	Microsemi	ZL30152, ZL30155, ZL30157, ZL30159, ZL30160, ZL30165, ZL30145, ZL30146, ZL30150, ZL30152, ZL30155, ZL30158, ZL30159, ZL30160, ZL30165, MAX24705, MAX24710, MAX24305, MAX24310, ZL30130, ZL30138, ZL30142, ZL30143, ZL30153, ZL30154, ZL30161, ZL30162, ZL30163	G.827x

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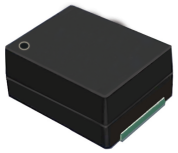

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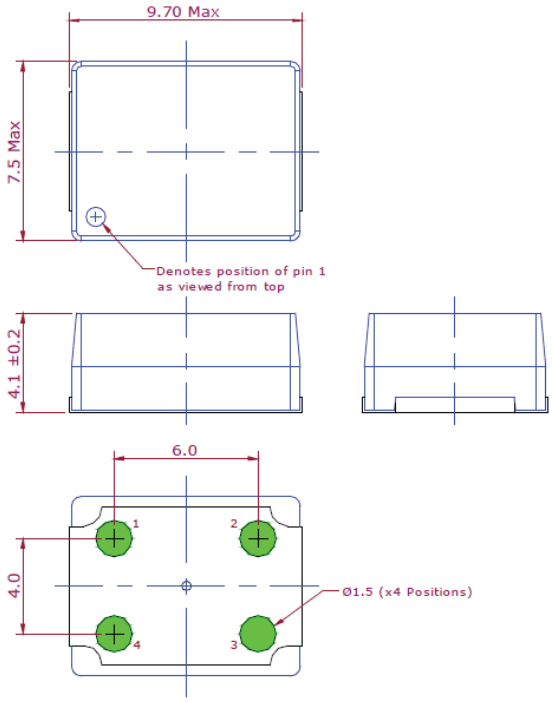
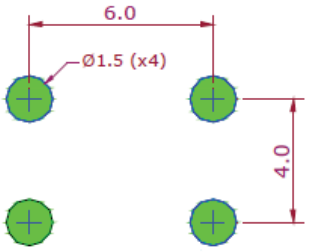
OUTLINE DIMENSION:



Dimension: mm

Recommended Land Pattern

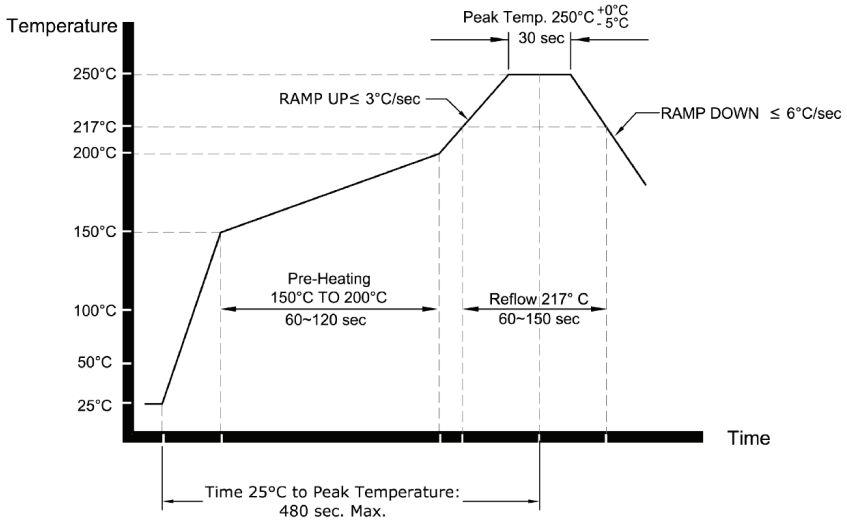


Pin	Function	
	XO	VCXO
1	NC	Control Voltage
2	Ground	
3	RF-output	
4	Supply Voltage	

Note:

1. For correct operation, decouple the supply voltage with a 10µF capacitor close to the oscillator.
2. The GND of the control voltage needs to be connected directly to pin 2 as ground lead impedance may cause performance degradation.

REFLOW PROFILE



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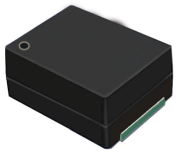
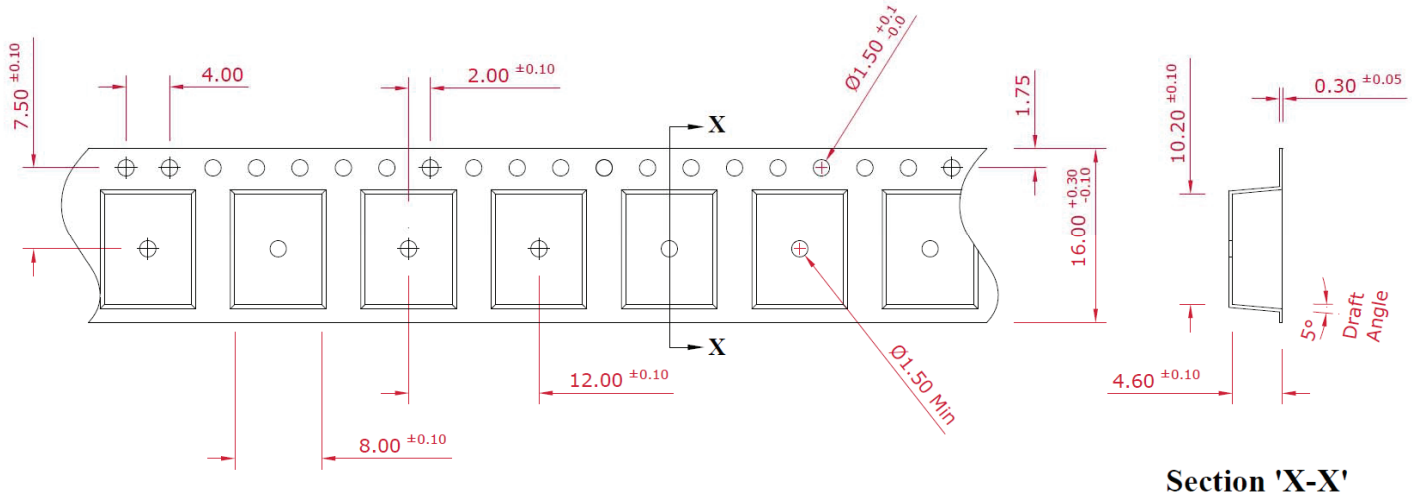


9.7 x 7.5 x 4.3mm SMD

TAPE & REEL:

Reel Size: Ø13”
Reel Qty: 1000pcs/reel



Section 'X-X'

Dimension: mm

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