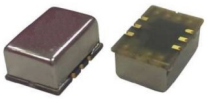
CARDINAL COMPONENTS

COSK6 Series Ovenized Oscillator



COSK6 Series
14.3 x 9.3 x 6.5 mm
6 Pad SMD Package

Features

- Ovenized Quartz Crystal High Precision Square Wave Generator
- HCMOS Output
- 3.3V nominal Supply Voltage
- 10.0 - 40.0 MHz frequency range
- Voltage control option available
- Stratum 3 (Overall ±4.6ppm inc 20 yrs aging)

Applications

SONET / SDH / DWDM
Test & Measurement
Telecom Transmission & Switching Equipment
Base Stations / Picocell
Wireless Communication Equipment
Packet Timing Protocol (e.g. 1588)

Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition
Frequency	10	-	40	MHz	Standard frequencies are 10, 12.8, 19.2, 20, 25, and 38.88MHz
Frequency Stability vs Temperature	±30	-	±50	ppb	±20ppb available over temp range –20 to 70°C
Frequency Stability vs Supply	-	-	±5	ppb	±5% voltage change
Warm-up	-	-	±0.1	ppm	In 5 minutes @ +25°C, referenced to 1 hour
Aging	-	-	±2.0	ppb	per day after 30 days
		-	±0.4	ppm	per year
	-	-	±2.0	ppm	10 years
Operating Temperature Range	-40	-	+85	°C	
Supply Voltage [1] V_{CC}	3.135	3.3	3.465	V	5.0V input voltage available
Current	-	500	600	mA	@turn on
Steady State	-	0.5	0.6	W	@ 25°C
Spurious	-	-	-60	dBc	
Phase Noise 10 Hz 100 Hz 1 kHz 10 kHz	-	-98 -126 -145 -152	-	dBc/Hz	
Storage Temperature Range	-55	-	+125	°C	
Vcontrol Range (for Vc option)	0	1.65	3.3	V	
Pullability (for Vc option)	±5	-	-	ppm	Slope positive
Input Impedance (for Vc option)	100	-	-	kΩ	

HCMOS

Parameter	Min	Typ	Max	Unit	Condition
Output Waveform		HCMOS			
“1” Level	2.4	-	-	V	
“0” Level	-	-	0.4	V	
Load	-	15	-	pF	
Duty Cycle	45	50	55	%	@1.65V

Note: [1] Place a 10nF power supply bypass capacitor next to device for correct operation

Device Marking

COSK6*xxx*	=	Model number/Part number*
*xx.xx*M	=	Frequency (M = MHz)
YMD	=	Date code (Year-Month-Day: See Table below)
z	=	Internal Code
S/N: *xxx*	=	Serial number

* A unique number is assigned for your exact specifications.
Specifications such as frequency stability, supply voltage and operating temperature range, etc. are not identified from marking.
External packaging labels and packing list will correctly identify the ordered Cardinal part number.

Codes for Date Code YMD (Year Month Day)

Code	3	4	5	6	7	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2023	2024	2025	2026	2027	Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	T	U	V	W	X	Y	Z
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Environmental / ESD Ratings

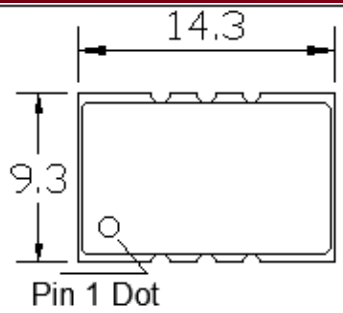
Reliability: Environmental

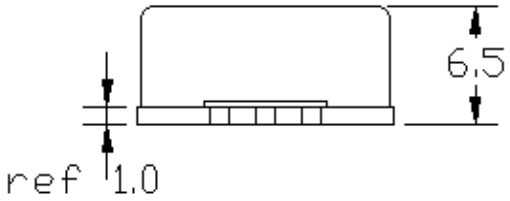
Parameter	Ref Standard	Condition
Solderability	MIL-STD-202, Method 208	
Mechanical Shock	MIL-STD-202, Method 213 Test Cond J	30g, 11ms, half-sine
Vibration	MIL-STD-202, Method 201	1.52mm p-p Total, 10 to 55 Hz
Thermal Shock	MIL-STD-202, Method 107 Test Cond B	5 cycles -65 to +125°C

Model	Min Voltage
Human Body Model	2000V
Machine Model	200V

Cardinal Components Inc. certifies this device is in accordance with the RoHS (exemptions 6c, 7c-I) and REACH directives.
Cardinal guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Mercury, PBB's, PBDE's
Moisture Sensitivity Level: 1 As defined in J-STD-020D
Second Level Interconnect code: e4
Product weight: 1.5g

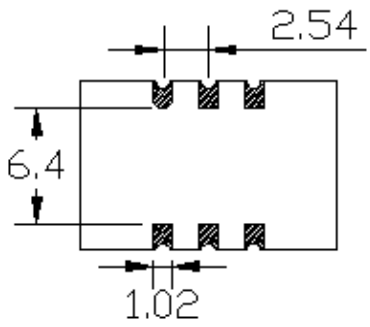
Mechanical Dimensions

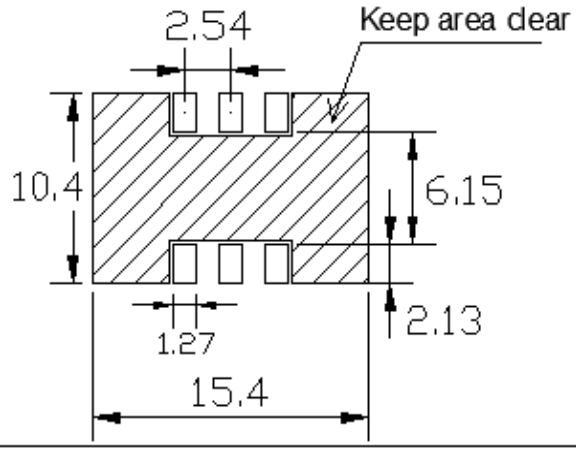




Pin Connections	
Pin	Function
1*	VC Input or N.C.
2	NC
3	Ground/Case
4	Output
5	N.C.
6	Vcc

*If Pin 1 is N.C, there is no internal connection.
Package is non-hermetic





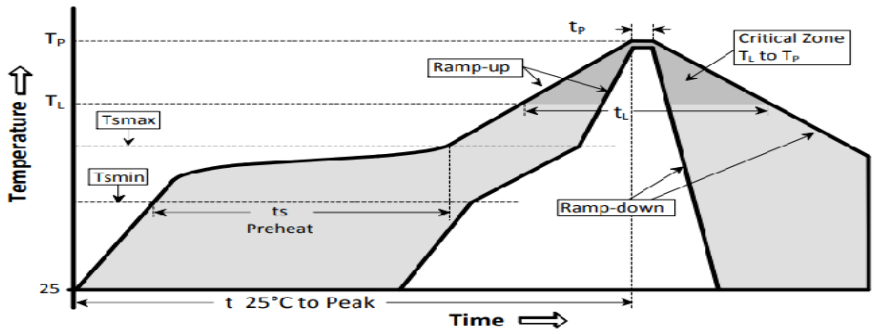
Contacts (pads): ENIG

For Optimum Jitter Performance, Cardinal recommends:

- A ground plane under the device
- Do not route large transient signals (both current and voltage) under the device
- Do not place near a large magnetic field such as a high frequency switching power supply
- Do not place near piezoelectric buzzers or mechanical fans
- Minimize air flow across the device

IR Reflow

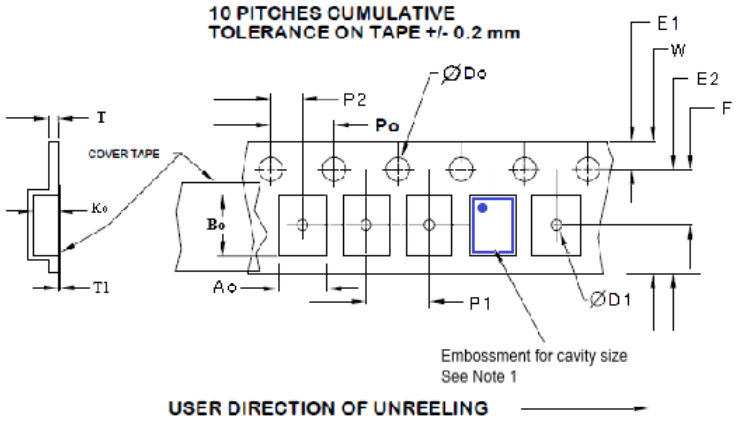
Maximum Reflow Conditions in accordance with IPC/JEDEC J-STD-020C "Pb-free"

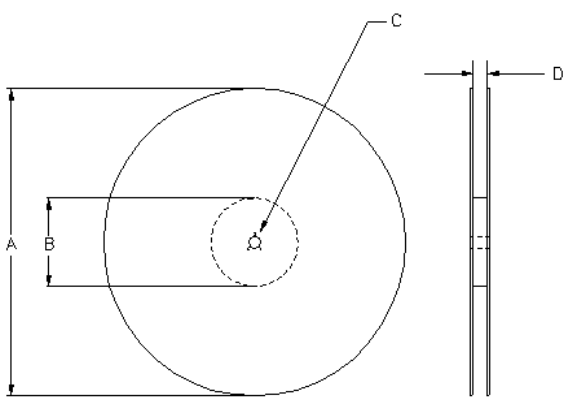


Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	(Ts_{max} to T_P)	3°C / second max	°C / s
Ramp down Rate	T_{cool}	6°C / second max	°C / s
Time 25°C to Peak Temperature	$T_{to\text{-}peak}$	8 minutes max	min
Preheat			
Temperature min	Ts_{min}	150	°C
Temperature max	Ts_{max}	200	°C
Time Ts_{min} to Ts_{max}	ts	60 - 180	sec
Soldering above liquidus			
Temperature liquidus	T_L	217	°C
Time above liquidus	t_L	60 - 150	sec
Peak temperature			
Peak Temperature	Tp	250	°C
Time within 5°C of peak temperature	tp	20 - 40	sec

Tape/Reel

Tape and Reel available for quantities of 250 to 500 per reel. 24mm tape, 16mm pitch.





Tape Variable Dimensions Table 2							
Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko
24mm	22.25	11.5 ±0.15	16.0 ±0.1	24.3	10±0.1	15±0.1	7±0.1

Dimensions in mm Drawing Not to scale

Note 1: Embossed cavity to conform to EIA– 481-B

Reel Dimensions (may vary) Table 3						
	A		B		C	D
Reel Size	Inches	mm	Inches	mm	mm	mm
13	13.0	330	4	100	13.2 ±0.2	25.0 +2.0 -0.0

Tape Constant Dimensions Table 1							
Tape Size	Do	D1	E1	Po	P2	T	T1
24mm	1.5 +0.1 -0.0	2 ±0.1	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.5 ±0.05	0.1

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