

OVEN CONTROLLED CRYSTAL OSCILLATOR UNIT IN METAL CAN THD PACKAGE, SIZE 20 X 20MM. (DIFFERENT PIN CONFIGURATION AS OCO220)

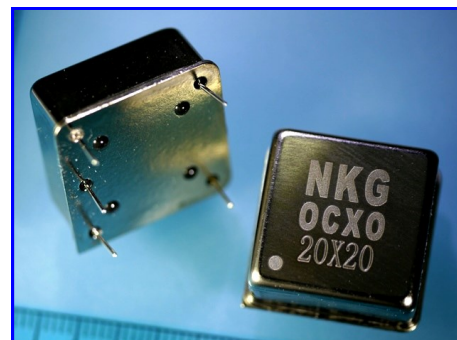
OCO221

PRODUCT FEATURES

- THD PACKAGE SIZE 20 X 20 X 11MM WITH 5 PINS.
- EXCELLENT LOW AGING RATES AND LOW PHASE NOISE.
- OPTIONAL CONTROL VOLTAGE AND REFERENCE VOLTAGE FUNCTIONS.
- LOW COST VERSION USING AT-CUT CRYSTAL IS AVAILABLE.

APPLICATIONS

- BASE STATIONS / GSM&CDMA
- TEST EQUIPMENT
- SATELLITE COMMUNICATION
- SYNTHESIZERS



PRODUCT SPECIFICATIONS

PARAMETER	SYMBOL	PARAMETER VALUES / LIMITS	CONDITIONS / REMARKS
NOMINAL FREQUENCY	F_N	5.0 ~ 100MHz	SEE NOTE 1
SUPPLY VOLTAGES	V_{DD}	3.3V OR 5.0V OR 12.0V	±5%, PLEASE CHOOSE
POWER CONSUMPTION WARM-UP AT STEADY STATE	P_{WUP}	<3.0W	—
	P_{OP}	<1.2W	@+25°C
WARM UP TIME	t_{WUP}	<180s	TO 5PPB FOR SC-CUT, TO 50PPB FOR AT-CUT
OPERATING TEMPERATURE RANGE	T_{OP}	-20~+70°C / -30~+75°C / -40~85°C	OTHER OPTIONS POSSIBLE
OUTPUT WAVEFORM LVTTLL	V_{OH}/V_{OL}	≥2.4V _{DC} / ≤0.4V _{DC}	@ OUTPUT LOAD 5 TTL INPUTS
OUTPUT WAVEFORM HCMOS	V_{OH}/V_{OL}	≥90%V _{DD} / ≤10%V _{DD}	@ OUTPUT LOAD CL = 15pF
OUTPUT WAVEFORM SINEWAVE	V_{P-P}	6dBm MIN / 10dBm MAX	@ OUTPUT LOAD RL = 50Ω

NOTE 1: TYPICAL AVAILABLE FREQUENCIES ARE: 10MHZ, 12.8MHZ, 13.0MHZ 15.36MHZ, 16.384MHZ, 19.2MHZ, 19.44MHZ, 20MHZ, 25MHZ, 26MHZ, 38.88MHZ,

FREQUENCY CHARACTERISTICS

PARAMETER	SYMBOL	SC-CUT CRYSTAL	AT-CUT CRYSTAL
FREQ. STABILITY OVER T_{OP} (NOTE 1)	$\Delta f/F_N$	±3PPB / ±5PPB / ±10PPB	±30PPB / ±50PPB / ±100PPB
SHORT TERM STABILITY	$(\Delta f/F_N)/s$	±0.01PPB/s	±0.1PPB/s
AGING RATE DAILY ANNUALLY	$(\Delta f/F_N)/d$	±0.3ppb / ±0.5ppb / ±1.0ppb	±3ppb / ±5ppb / ±10ppb
	$(\Delta f/F_N)/y$	±30ppb / ±50ppb / ±100ppb	±300ppb / ±500ppb / ±1.0ppm
VOLTAGE STABILITY ($V_{DD} \pm 5\%$)	$(\Delta f/F_N)/V$	±0.5PPB	±5PPB
FREQUENCY ADJUSTMENT (NOTE 2)	$(\Delta f/F_N)/V_C$	±0.5 ~ 1.0PPM	±5 ~ 10PPM
PHASE NOISE TYPICAL EXAMPLE FOR 10MHZ UNIT	J_{RMS}	@1HZ -98dBc/HZ	-85dBc/HZ
		@10HZ -128dBc/HZ	-115dBc/HZ
		@100HZ -150dBc/HZ	-143dBc/HZ
		@1KHZ -158dBc/HZ	-154dBc/HZ
		@10KHZ -164dBc/HZ	-164dBc/HZ
		@100KHZ -165dBc/HZ	-165dBc/HZ

NOTE 1: FREQUENCY STABILITY IS THE DEVIATIONS OVER OPERATING TEMPERATURE RANGE T_{OP} IN REFERENCE TO FREQUENCY READING @+25°C.

NOTE 2: FREQUENCY ADJUSTMENT CAPABILITY APPLIES FOR UNITS WITH THE OPTION OF CONTROL VOLTAGE V_C FUNCTION (REFER TO BELOW TABLE).

NOTE 3: FOR THE PARAMETERS IN ABOVE TABLE IS THE BEST PERFORMANCE SHOWN, OTHER OPTIONS ARE AVAILABLE, SOME DESIGNS MAY REQUIRE WIDER TOLERANCES.

OPTIONS FOR 3.3V AND 5.0V SUPPLY VOLTAGES (FOR 12V SEE NOTE 1)

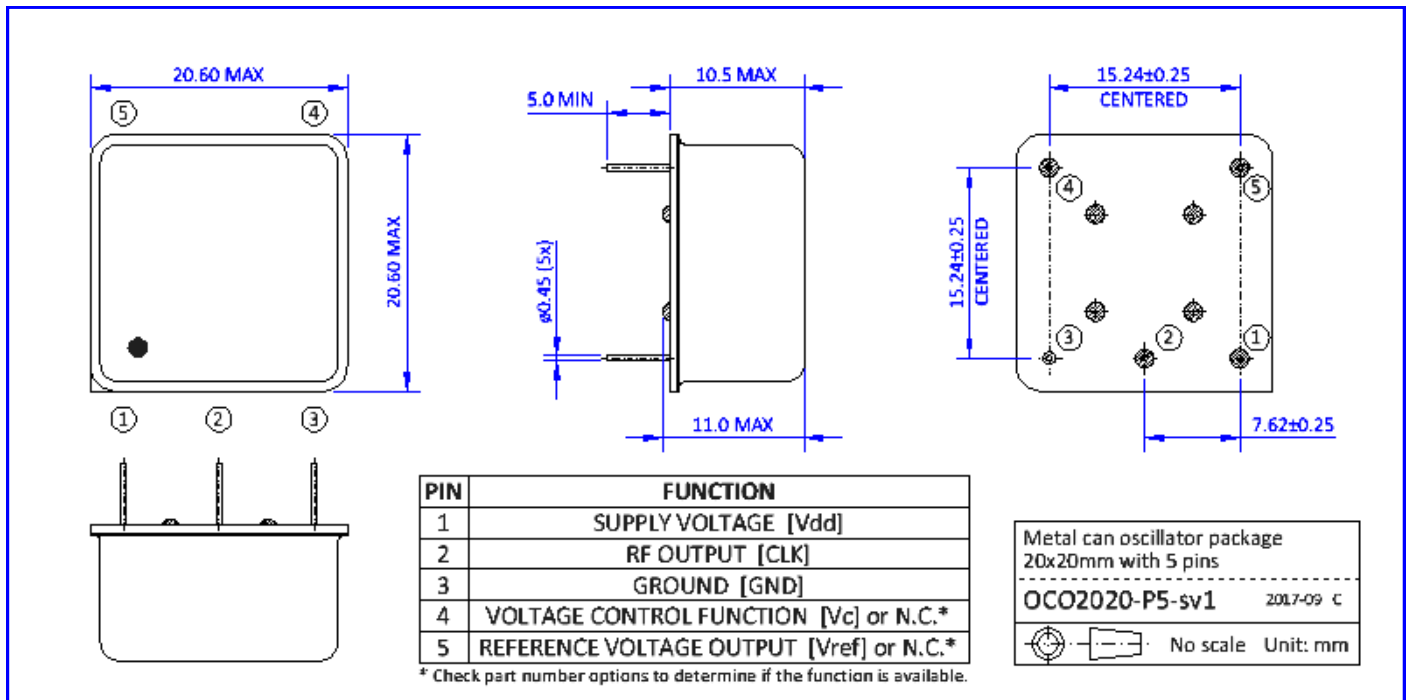
PARAMETER	SYMBOL	FOR 3.3V		FOR 5.0V	
CONTROL VOLTAGE RANGE	V_C	0 ~ 2.8V _{DC}	0 ~ 3.3V _{DC}	0 ~ 4.0V _{DC}	0 ~ 5.0V _{DC}
CONTROL CENTER VOLTAGE	V_{CEN}	1.4V _{DC}	1.65V _{DC}	2.0V _{DC}	2.5V _{DC}
REFERENCE VOLTAGE OUTPUT	V_{REF}	2.8V _{DC}	N/A	4.0V _{DC}	N/A

NOTE 1: THE V_{DD} 12V VERSION IS AVAILABLE WITH A CONTROL VOLTAGE RANGE OF 0~5V, CENTER AT 2.5V, AND OPTIONAL REFERENCE VOLTAGE OUTPUT OF 5V.

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MECHANICAL DIMENSIONS



ENVIRONMENTAL COMPLIANCE INFORMATION

- ROHS COMPLIANT PER (DIRECTIVE 2011/65/EC).
- COMPLIANT TO ROHS 2 (DIRECTIVE 2018/853) (ALSO CALLED ROHS10).
- NONE-USE OF SVHCS PER REACH IS CURRENTLY GIVEN, CONTINUOUSLY MONITORED AND UPDATED AS THE COMMISSION ISSUES NEW RELEASES.
- PRODUCT DOES NOT CONTAIN PVC (POLYVINYL CHLORIDE).
- PRODUCT DOES NOT CONTAIN PFOS/PFOA NOR BEING SAME USED TO MANUFACTURE THE COMPONENTS OF THIS PRODUCT.
- NONE-USE OF CONFLICT MINERALS PER THE DODD-FRANK WALL STREET REFORM AND CONSUMER PROTECTION ACT (WALL STREET REFORM ACT).
- MOISTURE SENSITIVITY LEVEL (MSL) 1 PER J-STD-020C.

PACKAGING INFORMATION

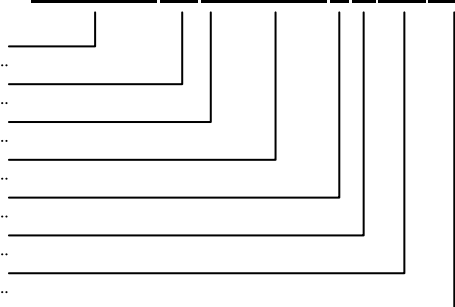
- THE UNITS ARE PACKAGED INTO AN ESD CONFORM FOAM TRAY.
- THE FOAM TRAY FITS INTO AN APPROPRIATE CARDBOARD BOX FOR SHIPMENT IN A LARGER SHIPPING CARTON.

PART NUMBER SYNTAX

PART NUMBER FAMILY (REPRESENTS PRODUCT MODEL AND PACKAGE SIZE)	
SUPPLY VOLTAGE NOMINATOR (I.E. 12= 12V, 50= 5.0V, 33= 3.3V)	
FREQUENCY STABILITY CODE (I.E. B=±50PPB, C=±100PPB, D=±30PPB, N=±5PPB, T=±10PPB)	
NOMINAL FREQUENCY (IN MHZ WITH AT LEAST THREE DIGITS AFTER DECIMAL POINT)	
OPERATING TEMPERATURE RANGE (I.E. E= -20~70°C, L= -30~75°C, W= -40~85°C)	
OUTPUT WAVE FORM INDICATOR (H= HCMOS, S= TRUE SINE WAVE, T= TTL OUTPUT)	
FREQUENCY MINIMUM PULLABILITY (OPTIONAL Vc FUNCTION) (1.0= 1.0PPM MIN)	
REFERENCE VOLTAGE OUTPUT INDICATOR (OPTIONAL, EXTENSION ADDED IF AVAILABLE)	

IF THERE IS A LARGE NUMBER OF CODES IN USE THE TABLE ABOVE MAY ONLY SHOW A FEW EXAMPLES.

OCO22133B10.000EH1.0-RV



FOR MORE INFORMATION PLEASE CONTACT US.

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