■ How to Order

LQT-□□X-□

① ② ③

(1) Model name
(2) Representative frequency
(3) Number of output

■ Specifications

Feature \ Name of Product		LQT-50X-3	LQT-60X-3	LQT-64X	LQT-100X	LQT-1KX	LQT-10KX	LQT-100KX
PIN No.	1	OUT (50Hz)	OUT (60Hz)	OUT (256Hz)	OUT (200Hz)	OUT (500Hz)	OUT (10KHz)	OUT (12.5KHz)
	2	V_{DD} (+5.0V)	V_{DD} (+5.0V)	V_{DD} (+5.0V)	V_{DD} (+5.0V)	V_{DD} (+5.0V)	V_{DD} (+5.0V)	V_{DD} (+5.0V)
	3	V_{SS} (GND)	V_{SS} (GND)	V_{SS} (GND)	V_{SS} (GND)	V_{SS} (GND)	V_{SS} (GND)	V_{SS} (GND)
	4	RESET	RESET	RESET	RESET	OUT (4KHz)	OUT (80KHz)	OUT (100KHz)
	5	OUT (12.5Hz)	OUT (15Hz)	OUT (64Hz)	OUT (50Hz)	OUT (2KHz)	OUT (40KHz)	OUT (50KHz)
	6	OUT (25Hz)	OUT (30Hz)	OUT (128Hz)	OUT (100Hz)	OUT (1KHz)	OUT (20KHz)	OUT (25KHz)
Voltage (in Operation)		5.0V(4.5 to 5.5V)				5.0V(4.5 to 5.5V)		
Output Frequency		12.5, 25, 50 Hz	15, 30, 60 Hz	64, 128, 256 Hz	50, 100, 200 Hz	500, 1K, 2K 4KHz	10K, 20K 40K, 80KHz	12.5K, 25K 50K, 100KHz
Current Consumption (at no load)		1.5mA max				1.5mA max		
Operating temperature range		−20℃ to +70℃				−20℃ to +70℃		
Frequency precision (25℃±2℃, 5V)	0	10ppm						
	1	50ppm						
	2	110ppm						
	3	0.2%						
Frequency Variation Rate	Voltage Characteristic	±0.5ppm/0.1V TYPICAL				±0.5ppm/0.1V TYPICAL		
	Temperature Characteristic	±20ppm (−10℃ to +60℃)				±20ppm (−10℃ to +60℃)		
RESET		YES				NO		
Output From		C-MOS INVERTER				C-MOS INVERTER		
Output Wave Shape		Rectangular wave 50% duty				Rectangular wave 50% duty		
Case		NO CONNECTION				NO CONNECTION		

Adjustment to frequencies other than the standard types above is possible upon request.

■Characteristics

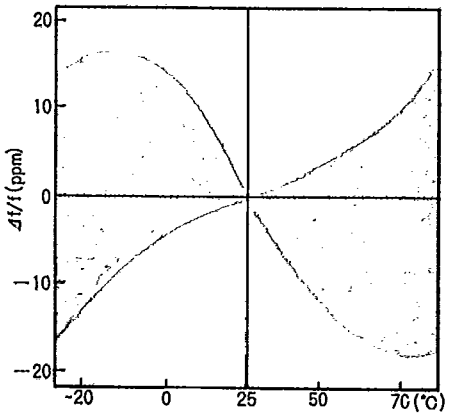


Fig. 1 Temperature - Oscillation Frequency Variation

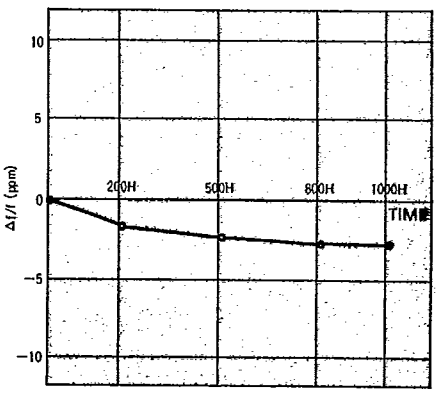


Fig. 2 High Temperature Exposure (85°C)

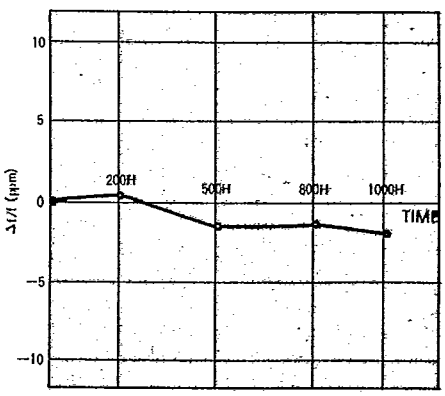


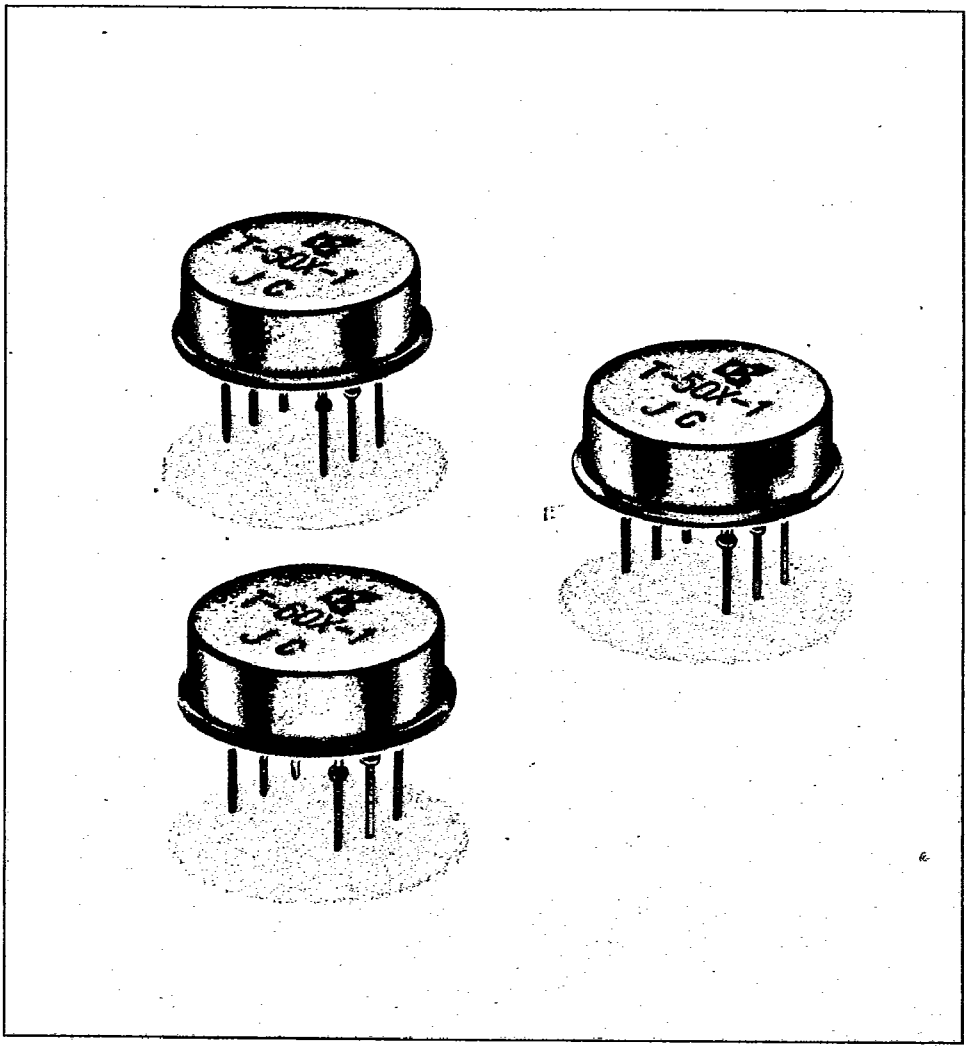
Fig. 3 Low Temperature Exposure (-40°C)

KYOCERA

CRYSTAL CLOCK OSCILLATORS

LQT Series

TBM LQT50X-1, 60X-1 are high-precision crystal oscillators composed of AT-cut crystal with excellent temperature features and low-energy, high-drive CMOS IC.
Existing power synchronization system can be revised into a high-precision crystal synchronization system with little effort, realizing improved sophistication, reliability, and global application of the system.
In particular, it has been simplified for output only of power frequencies most frequently used for high precision, high reliability, and low cost.



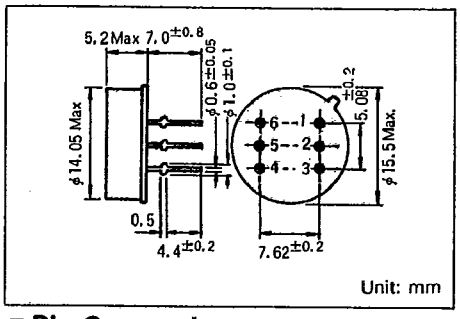
■Features

1) Revision of the oscillator to the power supply sync system produces high-precision quartz synchronization.
2) The simple function (at 50 Hz or 60 Hz) realized low price and high precision.
3) Use of CMOS IC produces high output (TTL one-gate drive possible) at low energy consumption (5.0V 0.5mA at maximum).
4) The metal package makes it easy to prevent radiation of unwanted oscillation output, and maintains high reliability.

■Applications

1) Quartz sychronization for power synchronization equipment
2) Oscillation for various high-precision timers
3) Oscillation for high-precision clocks

■ Dimensions & Pin Distribution



Unit: mm

■ Pin Connection

PIN No.	1	OUT 50Hz
	2	Vcc
	3	Vss
	4	NO CONNECTION
	5	NO CONNECTION
	6	NO CONNECTION
Case		NO CONNECTION

■ How to Order

LQT - 50 X - 1
① ② ③

① Model name
② Output frequency (50Hz or 60Hz)
③ Number of output

■Maximum Absolute Rating

Classification	Code	Rating	Unit
Voltage	Vcc	−0.3 to +7.0	V
Operation Temperature	Topr	−20 to +70	°C
Storage Temperature	Tstg	−40 to +90	°C

■ Specifications

Classification	Code	Rating	Unit	Remarks
Output Frequency	fout	50 or 60	Hz	Cosine Wave 50% Duty
Output Frequency Error	Δf/f (25℃)	0 : ±10	ppm	
		1 : ±50	ppm	
		2 : ±100	ppm	
		3 : ±0.2	%	
Frequency Temperature Characteristic	Δf/f (T)	±20Max	ppm	−10℃--+60℃ range based on Ta=25℃, Vcc=5.0V
Voltage Characteristic	Δf/f (Vcc)	±2 Typical	ppm/V	———
Range of Temperature in Operation	Topr	−20 to +70	℃	———
Range of Voltage	Vcc	+5.0±0.5	V	DC
Current Consumption (at no load)	Icc	0.5Max	mA	———
Output Current	IOH	−1.6Min	mA	Vcc=5.0V, VOH=AT3.8V
	IOH	1.6Min	mA	Vcc=5.0V, VOL=AT0.4V
Fan Out	n	TTL 1 Gate		

■Comparative Study of LQT-50X-1 and 60X-1 with LQT-50X-3 and 60X-3

		LQT-50X-1, 60X-1	LQT-50X-3, 60X-3	Unit
IOL (0.4V)	Allowance Value (Minimum)	1.6	0.5	mA
	Actual Value	6.2	1.4	mA
IOH (3.8V)	Allowance Value (Minimum)	−1.6	−0.5	mA
	Actual Value	−12.0	−0.6	mA
Current Consumption (at no load)	Maximum	0.5	1.5	mA
	Actual Value	0.2	0.9	mA
Voltage (Vst) at Oscillation Start		2.8	4.0	V
Voltage Characteristic		±2 Typical	±5 Typical	ppm/V

■Test Circuit

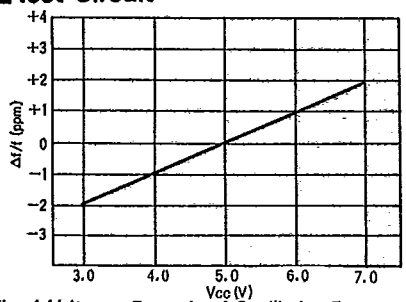


Fig. 4 Voltage - Example of Oscillation Frequency Variation Characteristic (Ta = 25°C)

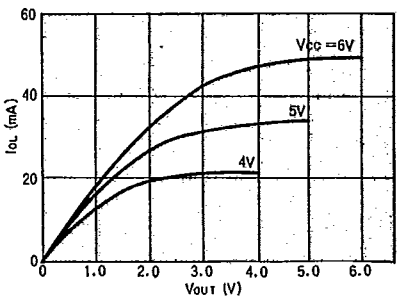


Fig. 6 Example of Vout Characteristic (Ta = 25°C)

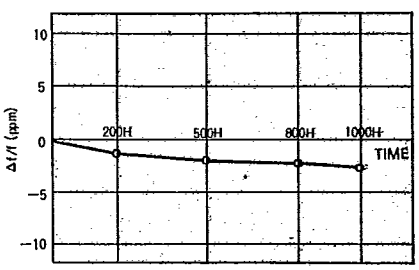


Fig. 8 High Temperature Exposure

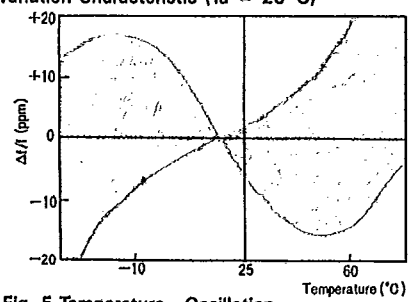


Fig. 5 Temperature - Oscillation Frequency Variation Characteristic (Vdd = 5.0V)

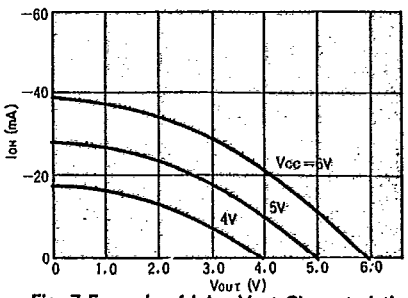


Fig. 7 Example of Ioh - Vout Characteristic (Ta = 25°C)

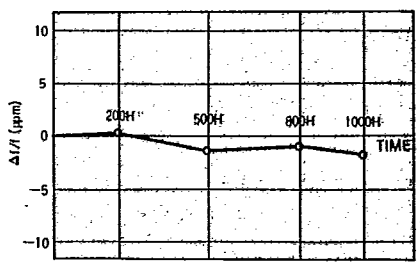


Fig. 9 Low Temperature Exposure Characteristic (Ta = 25°C)