QMC	F574T Series	Temperature Compensated Crystal Oscillators (TCXOs) TCXOs with Voltage Control Function (VCTCXOs)		MERCURY
QVM	QF574T Series	TCXOs with Voltage Control Function (VCTCXOs)	MEC	Since 1973

QMQF574T and **QVMQF574T** are QuikXOTM (quick-turn delivery) versions of the MQF574 (a TCXO) and VMQF574 (a VCTCXO) series, respectively. QuikXOTM products, either standard or custom frequencies are produced and shipped from California USA in 3 to 5 days and available at Mercury eCommerce. They are 7.0x5.0x2.5 mm SMD, the supply voltage can be either 2.5 V or 3.3 V, CMOS output logics and frequency up to 250 MHz. The 0.8 \sim 1.6 ps typical phase jitter and lower current consumption (25 mA typical for 250 MHz at 3.3 V) compared to competitions make the series ideal for multimedia, Ethernet, and networking applications.

Relevant Categories:

- For lower cost with regular lead time, please refer to the non- QuikXO[™] equivalent the MQF574T and the VMQF574T series
- For lower phase noise and phase jitter (0.6 p. sec. typical), please refer to MQN574T and VMQN574T series.
- For smaller footprint, 3.2 x 2.5 x 1.6 mm 6-pad SMD, with the same electrical performance, please refer to the MQF326T, and the VMQF326T series.

Output Logic Type	CMOS (code "T")					
TCXO Models	QMQF	574T <mark>T25</mark>	QMQF574T <mark>T33</mark>			
VCTCXO Models	QVMQ	F574T <mark>T25</mark>	QVMQF574T <mark>T33</mark>			
Frequency Range	10 ~	250 MHz	10 ~ 250 MHz			
Supply Voltage (V)	+2.5	5V ±5%	+3.3 V ±5%			
Supply Voltage (V _{DD})	Code "25"		Code " <mark>33</mark> "			
	25 MF	lz: 17 mA	10 MHz: 21 mA			
Current Consumption;	45 MF	lz: 20 mA	50 MHz: 24 mA			
typical	50 MH	lz: 21 mA	77 MHz: 25 mA			
typical	125 MHz: 24 mA		125 MHz: 29 mA			
	250 MHz: 25 mA		250 MHz: 34 mA			
Load; typical	15 pF					
Output High Voltage; V _{OH}	90% V _{DD} min.					
Output Low Voltage; Vol	10% V _{DD} max.					
Rise / Fall Time (Tr; Tf)	1.5 nS. Typ.; 3.0	0 nS. max. (10% \leftrightarrow 90% waveform)				
		± 2.0 ppm over -40 to $\pm 85^{\circ}$ C. Spec. code: " 2.0A ".				
	Operating	± 2.5 ppm over -30 to $+ 85^{\circ}$ C. Spec. code: " 2.5B ".				
	Temperature	Custom specification: The 2.0A or 2.5B is replaced with a control				
Frequency Stability vs		number assigned by Mercury.				
	Voltage Change	± 0.2 ppm max. for	a $\pm 5\%$ input voltage change			
	Load Change	± 0.2 ppm max. for a $\pm 10\%$ load condition change				

General Specifications: at Ta=+25°C

MERCURY <u>www.mercury-crystal.com</u>

Taiwan: TEL (886)-2-2406-2779, e-mail: sales-tw@mercury-crystal.com

U.S.A.: TEL (1)-909-466-0427, e-mail: <u>sales-us@MercuryUnited.com</u>

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	·	Aging at $Ta = +25^{\circ}C$ ± 2 ppm max. first-year; ± 10 ppm max. over 10 years								
	Reflo	Reflow ± 1.0 ppm max., one reflow and measured 24 hours afterward.								
Initial Calibration Tolerance (Initial Frequency Accuracy)	±1.0	± 1.0 ppm typical; ± 2.0 ppm. max. at $+25^{\circ}C \pm 2^{\circ}C$.								
Duty Cycle	50%	50% ±5%. At 50% V _{DD} .								
Current with Output Disabled	18 m	18 mA typical								
Start-up Time	5 m.	sec. max.								
Output Enable Time	200 ו	200 ns max.								
Output Disable Time	50 ns	50 ns max.								
	Frequ	Frequency (MHz) 16 25 49.152 50 54 156.250								
	Supp	ly Voltage	3.3	3.3	3.3	3.3	3.3	3.3		
		10 Hz	-92	-88	-85	-80	-77	-63		
		100 Hz	-116	-109	-108	-103	-106	-91		
Single Side-band Phase Noise		1 kHz	-131	-125	-121	-117	-119	-109		
		10 kHz	-139	-132	-126	-124	-125	-115		
(dBc / Hz; typical)	Offset	100 kHz	-140	-134	-127	-127	-126	-116		
		1 MHz	-158	-151	-146	-145	-145	-137		
		5 MHz	-163	-157	-154	-148	-153	-147		
		10 MHz	_	_	-157	-150	-157	-150		
		20 MHz	_	_	-160	-152	-160	-155		
Integrated Phase Jitter, RM 12 kHz to 20 MHz; picoseco	0.76	0.9	1.0	1.1	1.1	1.1				
· ·	trol Voltage	e Function	on Pad 1 (VCTCXOs on	ly)					
Control Voltage (V control) V_{contol} center and range: +1.5 V ± 1.0 V.						2.5 V_{DD} and	d 3.3 V _{DD}			
Frequency Pulling Range	High pull: $+8$ ppm min. for V _{contol} from 1.5 V to $+2.5$ V Low pull: -8 ppm min. for V _{contol} from 0.5 V to $+1.5$ V									
Linearity	$\pm 5\%$ typical. $\pm 10\%$ max.									
Transfer Function	Positive Transfer									
Input Impedance	500 KΩ min.									
Bandwidth	10 kHz min. Measured at -3 dB.									
			-State fund							
Output Enable (OE)	70% of V_{DD} (min.) to enable output. CMOS level. Do not leave this pin floating. If r connection is desired, please contact Mercury.						ing. If no			
Control					t. Output is hi	gh impedan	ICE.			
Output Enable Time		n. sec. max.				<u> </u>				
Output Disable Time	50 n.	sec. max.								

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Absolute Maximum Rating:

Input Voltage	-0.5 V to V _{DD} +0.5 V
Output Voltage	-0.5 V to V _{DD} $+0.5$ V
Positive Supply Voltage	4.2 V
	Human Body Model (HBM): Exceeds 2000 V. Class 2 per MIL-STD-1686C
Electrostatic Discharge	Machine Model (MM): Exceeds 120 V. Class M2 per MIL-STD-1686C.
(ESD)	Note: Power, ground, and outputs are 200 V.
	Charged-Device Model (CDM): Exceeds 2000 V. Class C6 per MIL-STD-1686C

Environmental Performance Specifications

Green Requirement	RoHS compliant, Pb (lead) free per EU Directive 2002/95/EC 6/6 (2002/95/EC) and WEEE (2002/96/EC). Free of halide, cadmium, hexavalent chromium, lead, mercury, PBB's, and PBDE's.
Moisture Sensitivity Level	Level 2 per IPC/JEDEC J-STD-020D.1
Storage temperature range	-55 to +125°C
Humidity	85% RH, 85°C, 48 hours
Fine Leak / Gross Leak	MIL-Std-883, method 1014, condition A / MIL-Std-883, method 1014, condition C
Solderability	MIL-STD-202F method 208E
Reflow	260°C for 10 sec. 2X.
Vibration	MIL-STD-202F method 204, 35G, 50 to 2000 Hz
Shock	MIL-STD-202F method 213B, test condition. E, 1000GG ¹ / ₂ sine wave
Resistance to Solvent	MIL-STD-202, method 215
Temperature Cycling	MIL-STD-883, method 1010
Pad Surface Finish	Gold (0.3 um to 1.0 um) over nickel (1.27 um to 8.89 um)

Part Number Format and Examples: Example 1: QVMQF574T33-2.0A-125.000; Example 3: QMQF574T33-xxxxx-155.520

Example 2: QMQF574T25-2.5B-148.500;

QVMQF	574	Т	33	-	2.0A	-	125.000
QMQF	574	Т	25	-	2.5B	-	148.500
QMQF	574	Т	33	-	XXXXX	-	155.520
Product Series " QMQF ": TCXO " QVMQF ": VCTCXO	Package Code " 574 ": 7.0x5.0x2.5 mm 4-pad SMD	Output Logic " T ": CMOS	Supply Voltage " 33 " for 3.3V " 25 " for 2.5V	-	"2.5B": The freq. stability is ± 2.5 ppm over -30 to $+85^{\circ}$ C "2.0A": The freq. stability is ± 2.0 ppm over -40 to $+85^{\circ}$ C "xxxxx": Custom frequency stability. A control number assigned by Mercury.	-	The nominal Frequency in MHz. 3 places or more after the decimal.

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Output OE Function on pad 2 Note: Do not leave this pad floating. If "no-connection" is desired, please contact Mercury. VDD



Phase Noise Plot of QMQF574T33-89.376 MHz, VDD = +3.3V, CMOS



Test Circuits and Output Waveforms

Duty cycle = $\left(\frac{T1}{T2}\right) * 100\%$.

Measured at 50% VDD



Package Dimensions and Recommended Solder Pad Layout

unit: (mm)



Recommended Solder Reflow Profile (per IPC/JEDEC J-STD-020D.1)



Profile Feature	Sn-Pb Eutectic Assembly	Pb-free Assembly
Preheat/Soak - Temperature min. (Ts min.) - Temperature max. (Ts max.) - Time (ts) (Ts min. to Ts max.)	100°C 150°C 60 to 120 seconds	150°C 200°C 60 to 180 seconds
Ramp-up rate (T _L to Tp)	3°C / sec. max.	3°C / sec. max.
Liquidous temperature (T _L) Time (t _L) maintained above T _L	183°C 60 to 150 seconds	217°C 60 to 150 seconds
Peak package body temperature (Tp)	235°C	260°C
Time (Tp) within 5°C of the classification temperature Tc	10 to 30 seconds	20 to 40 seconds
Ramp-down rate (Tp to T_L)	6°C / second max.	6°C / second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.

All temperatures refer to the topside of the package, measured on the package body surface.

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