

Crystal Oscillators [Programmable Quick Turn]

HTF --

**Quick - Turn
Clock Oscillators**

SMD

CMOS

1.8 V

2.5 V

3.3 V

Min.

1.0 MHz

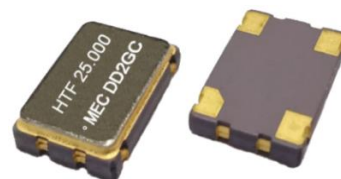
Max.

200 MHz

Features

- Short lead time. From 1 day to 1 week
- Low jitter , RMS jitter is 0.9 ps typical
- Custom frequencies can easily be configured
- 1.8V, 2.5V or 3.3V supply voltages.

0.9 ps Phase Jitter (typical)



General specifications of all available packages , at Ta=+25°C , CL=15pF

Model [Output Logic]		" HTF " series [CMOS]										
Type		HTF21		HTF22		HTF32		HTF53		HTF57		
Dimensions		2.0 * 1.6 * 0.8 mm		2.5 * 2.0 * 0.8 mm		3.2 * 2.5 * 1.0 mm		5.0 * 3.2 * 1.2 mm		7.0 * 5.0 * 1.3 mm		
Supply Voltage (V _{DD})		+1.8 V ± 5%			+2.5 V ± 10%			+3.3 V ± 10%				
Available Frequency Range		1.0 ~ 125.0 MHz			1.0 ~ 200.0 MHz			1.0 ~ 200.0 MHz				
Current Consumption		20 mA (typ.)			28 mA (typ.)			30 mA (typ.)				
		30 mA (max.)			35 mA (max.)			40 mA (max.)				
Rise Time (Tr) / Fall Time (Tf)		2.0 ns (typ.)			1.4 ns (typ.)			1.1 ns (typ.)				
10% ↔ 90% Waveform		5.0 ns (max.)			3.0 ns (max.)			3.0 ns (max.)				
Frequency Stability Codes		Frequency Stability over Operating Temperature Range			± 25 ppm	± 50 ppm	± 100 ppm	If non-standard , please enter the desired stability after the " C " or " F " represents.				
		Commercial (-20°C to +70°C)			A	B	C	For example : " C20 " ± 20 ppm over -20°C to +70°C ;				
		Industrial (-40°C to +85°C)			D	E	F	" F30 " ± 30 ppm over -40°C to +85°C				
Output Logic " High " , " 1 "		V _{DD} - 0.4V (min.)										
Output Logic " Low " , " 0 "		0.4V (max.)										
Duty Cycle		1 MHz to 150 MHz : 50% ± 5%										
		151 MHz to 200 MHz : 50% ± 10%										
Output Load		15 pF										
Start-up Time		4.5 msec (typ.) ; 10 msec (max.)										
Storage Temperature		-55°C to +150°C										
Aging at Ta=+25°C		± 3 ppm (max.) first year ; ± 2 ppm (max.) per year thereafter										
SSB Phase Noise	Offset dBc/Hz	10 Hz	100 Hz	1 kHz	10 kHz	100 kHz	1 MHz	10 MHz				
125.000 MHz @ 3.3 V		-61	-89	-110	-119	-119	-142	-149				
RMS Jitter (12kHz ~ 20 MHz)		0.9 psec (typ.)										
Output Enable / Disable Function												
Output Enable / Disable		70% of V _{DD} (min.) to Enable.										
		30% of V _{DD} (max.) to Disable.										
Pad 1 Options	Power Down Mode (code : PD)	Disable Current : 300 uA (typ.) ; 400 uA (max.)										
		Output Enable Time : 4.5 msec. (typ.) ; 10 msec. (max.)										
	OE Mode. High Enable (code : OE)	Disable Current : 18 mA (typ.) ; 22 mA (max.)										
		Output Enable Time : 10 nsec. (max.)										

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**Min.
1.0 MHz**

**Max.
200 MHz**

Part Number Format and Examples

0.9 ps Phase Jitter (typical)

		[1]	[2]	-	[3]	[4]	-	[5]	-	[6]
		Supply Voltage	Holder Type	-	Frequency Stability	T	-	Center Frequency	-	Disable Options
Examples	(1)	18	HTF57	-	B	T	-	25.000	-	PD
	(2)	25	HTF53	-	C30	T	-	100.000	-	OE
	(3)	3	HTF32	-	E	T	-	200.000	-	PD

Ex (1) : 18HTF57 - BT - 25.000 - PD [1.8V , HTF57 type , $\pm 50\text{ppm}$ @ -20°C to $+70^{\circ}\text{C}$, E/D , 25.000MHz , Power Down Mode]

Ex (2) : 25HTF53 - C30T - 100.000 - OE [2.5V , HTF53 type , $\pm 30\text{ppm}$ @ -20°C to $+70^{\circ}\text{C}$, E/D , 100.000MHz , OE Mode]

Ex (3) : 3HTF32 - ET - 200.000 - PD [3.3V , HTF32 type , $\pm 50\text{ppm}$ @ -40°C to $+85^{\circ}\text{C}$, E/D , 200.000MHz , Power Down Mode]

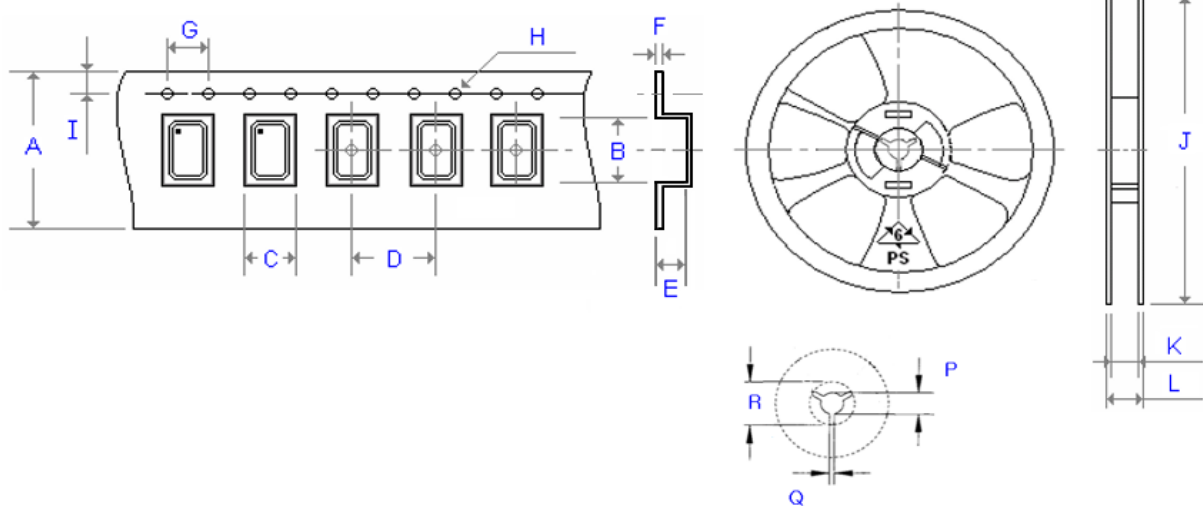
[1]	Supply voltage , " 18 " for +1.8V ; " 25 " for +2.5V ; " 3 " for +3.3V	
[2]	Holder Type	
[3]	$-20^{\circ}\text{C} \sim 70^{\circ}\text{C}$	" A " $\pm 25\text{ppm}$; " B " $\pm 50\text{ppm}$; " C " $\pm 100\text{ppm}$; If non-standard please enter the desired stability after " C " ; example " C15 " : represents $\pm 15\text{ppm}$ over -20 to $+70^{\circ}\text{C}$
	$-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$	" D " $\pm 25\text{ppm}$; " E " $\pm 50\text{ppm}$; " F " $\pm 100\text{ppm}$; If non-standard please enter the desired stability after " F " ; example " F30 " : represents $\pm 30\text{ppm}$ over -40 to $+85^{\circ}\text{C}$
[4]	" T " for Output Enable/Disable Function	
[5]	Frequency in MHz	
[6]	Pad 1 Options , " PD " Power Down Mode ; " OE " OE Mode. High Enable	

Outline Dimensions (Unit : mm) , Suggested pad Layout for SMDs

HTF21				HTF22							
Top View		Bottom View		Land Pattern		Top View		Bottom View		Land Pattern	
Side View		Pad Connections :		Pad3 : Output		Side View		Pad Connections :		Pad3 : Output	
		Pad1 : OE or PD		Pad4 : Supply Voltage				Pad1 : OE or PD		Pad4 : Supply Voltage	
		Pad2 : Ground						Pad2 : Ground		Pad4 : Supply Voltage	
HTF32				HTF53							
Top View		Bottom View		Land Pattern		Top View		Bottom View		Land Pattern	
Side View		Pad Connections :		Pad3 : Output		Side View		Pad Connections :		Pad3 : Output	
		Pad1 : OE or PD		Pad4 : Supply Voltage				Pad1 : OE or PD		Pad4 : Supply Voltage	
		Pad2 : Ground						Pad2 : Ground		Pad4 : Supply Voltage	
HTF57											
Top View		Bottom View		Land Pattern							
Side View		Pad Connections :		Pad3 : Output							
		Pad1 : OE or PD		Pad4 : Supply Voltage							
		Pad2 : Ground									

Emboss Taping and Reel Specifications

[Crystal Oscillator Units]



Carrier Type Dimensions (unit : mm) $\pm 0.3\text{mm}$

	A	B	C	D	E	F	G	H	I	pcs / reel
H21	8.00	2.30	1.90	4.00	0.90	0.25	4.00	$\varnothing 1.50$	1.75	3000
H_22	8.00	2.80	2.25	4.00	1.10	0.30	4.00	$\varnothing 1.50$	1.75	3000
H_32	8.00	3.40	2.70	4.00	1.40	0.25	4.00	$\varnothing 1.50$	1.75	3000
H_53	12.00	5.30	3.60	8.00	1.40	0.30	4.00	$\varnothing 1.50$	1.75	1000
H_57	16.00	7.30	5.30	8.00	1.90	0.30	4.00	$\varnothing 1.50$	1.75	1000
SWO	16.00	7.20	5.40	8.00	1.80	0.30	4.00	$\varnothing 1.50$	1.75	1000
H_216	8.00	2.30	1.90	4.00	0.90	0.25	4.00	$\varnothing 1.50$	1.75	3000
H_226	8.00	2.80	2.25	4.00	1.10	0.30	4.00	$\varnothing 1.50$	1.75	3000
H_326	8.00	3.40	2.70	4.00	1.40	0.25	4.00	$\varnothing 1.50$	1.75	3000
H_536	12.00	5.30	3.60	8.00	1.40	0.30	4.00	$\varnothing 1.50$	1.75	1000
H_576	16.00	7.30	5.30	8.00	1.90	0.30	4.00	$\varnothing 1.50$	1.75	1000
H_328	8.00	3.40	2.70	4.00	1.40	0.25	4.00	$\varnothing 1.50$	1.75	3000
H_538	12.00	5.40	3.60	8.00	1.70	0.30	4.00	$\varnothing 1.50$	1.75	1000
H_578	16.00	7.30	5.30	8.00	1.90	0.30	4.00	$\varnothing 1.50$	1.75	1000
H_43	24.00	11.80	10.00	16.00	5.00	0.30	4.00	$\varnothing 1.50$	1.75	500

Reel Dimensions (unit : mm) $+2.0 / -0.0\text{mm}$

	J	K	L	P	Q	R	pcs / reel
H21	180.00	9.00	12.00	13.20	2.10	-	3000
H_22	180.00	9.00	12.00	13.20	2.10	-	3000
H_32	180.00	9.00	12.00	13.20	2.10	-	3000
H_53	180.00	13.00	16.00	13.20	2.50	-	1000
H_57	180.00	17.20	19.30	13.30	2.20	22.00	1000
SWO	180.00	17.20	19.30	13.30	2.20	22.00	1000
H_216	178.00	8.40	11.40	13.30	2.50	20.50	3000
H_226	180.00	8.40	11.40	13.20	2.10	-	3000
H_326	180.00	9.00	12.00	13.20	2.10	-	3000
H_536	180.00	13.00	16.00	13.20	2.50	-	1000
H_576	180.00	17.20	19.30	13.30	2.20	22.00	1000
H_328	180.00	8.00	12.00	13.20	2.10	-	3000
H_538	180.00	13.00	16.00	13.20	2.50	-	1000
H_578	180.00	17.20	19.30	13.30	2.20	22.00	1000
H_43	330.00	24.50	29.10	13.00	2.20	17.30	500