

HEA _ _

32.768 KHz

Ultra Low Current Consumption

SMD

CMOS

15pF

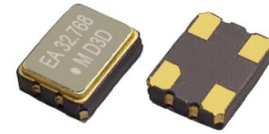
1.8 V

2.5 V

3.3 V

Features

- Suitable for wearable devices, clock counting use.
- Small package size for 2.5 x 2.0 mm
- If you require products with lower current consumption, please contact Mercury.



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

Type	" HEA " series [SMD Type]				
Model	HEA22	HEA32		HEA53	HEA57
Dimensions	2.5 * 2.0 * 0.9 mm	3.2 * 2.5 * 1.0 mm		5.0 * 3.2 * 1.2 mm	7.0 * 5.0 * 1.4 mm
Frequency Output	32.768 KHz				
Supply Voltage	1.8 V ± 10% Voltage code is " 18 "	2.5 V ± 10% Voltage code is " 25 "		3.3 V ± 10% Voltage code is " 3 "	
Current Consumption (32.768 KHz , No Load)	6 uA (typ.) 10 uA (max.)	6 uA (typ.) 10 uA (max.)		6 uA (typ.) 10 uA (max.)	
Output Logic " High " , " 1 "	1.62 V (min.)	2.25 V (min.)		2.97 V (min.)	
Output Logic " Low " , " 0 "	0.18 V (max.)	0.25 V (max.)		0.33 V (max.)	
Rise Time (Tr) / Fall Time (Tf) (10 % ↔ 90 % waveform)	7 nsec (typ.) 20 nsec (max.)	7 nsec (typ.) 20 nsec (max.)		6 nsec (typ.) 20 nsec (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 "
	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 Load	15 pF				
Start-up Time	5.0 msec. (typ.) ; 10.0 msec. (max.)				
Duty Cycle	50% ± 5%				
Output Enable / Disable Function	70% of V _{DD} (min.) to enable output.				
	30% of V _{DD} (max.) to disable output.				
	Disable current : 5 uA (max.) for OE = GND				
Storage Temperature	-55°C to +150°C				
Aging at Ta=+25°C	± 3 ppm (max.) first year ; ± 2 ppm (max.) per year thereafter				

Part Number Format and Examples

		[1]	[2]	-	[3]	[4]	-	[5]
		Supply Voltage	Holder Type		Frequency Stability	OE Function		Center Frequency
Examples	(1)	18	HEA57	-	D	T	-	32.768K
	(2)	25	HEA32	-	A	T	-	32.768K
	(3)	3	HEA22	-	E	T	-	32.768K

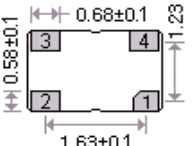
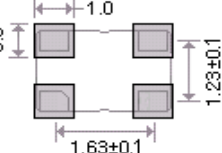
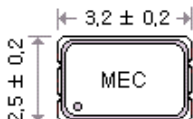
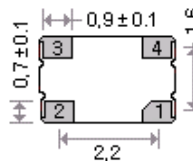
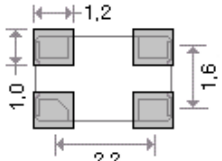
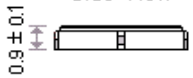
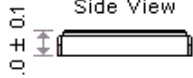
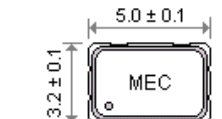
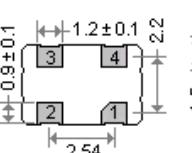
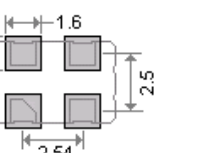
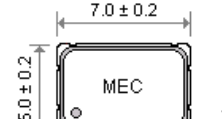
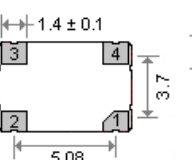
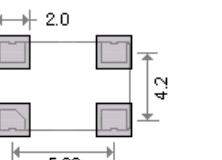
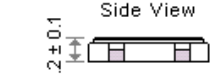
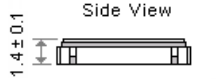
Ex (1) : 18HEA57 - DT - 32.768K [1.8V , HEA series 7050 type , $\pm 25\text{ppm}$ from -40°C to $+85^{\circ}\text{C}$, OE Function , 32.768 KHz]

Ex (2) : 25HEA32 - AT - 32.768K [2.5V , HEA series 3225 type , $\pm 25\text{ppm}$ from -20°C to $+70^{\circ}\text{C}$, OE Function , 32.768 KHz]

Ex (3) : 3HEA22 - ET - 32.768K [3.3V , HEA series 2520 type , $\pm 50\text{ppm}$ from -40°C to $+85^{\circ}\text{C}$, OE Function , 32.768 KHz]

[1]	Supply voltage " 18 " for +1.8V ; " 25 " for +2.5V ; " 3 " for +3.3V ;		
[2]	Holder Type		
[3]	-20°C ~ 70 °C	" A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm ;	
		If non-standard please enter the desired stability after " C " , example " C15 " : represents ±15ppm over -20 to +70°C	
	-40°C ~ 85 °C	" D " ± 25ppm ; " E " ± 50ppm ; " F " ± 100ppm ;	
		If non-standard please enter the desired stability after " F " , example " F30 " : represents ± 30ppm over -40 to +85°C	
[4]	" T " for OE Function , Leave this space blank if no connection on pad 1.		
[5]	Frequency " K " for KHz		

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

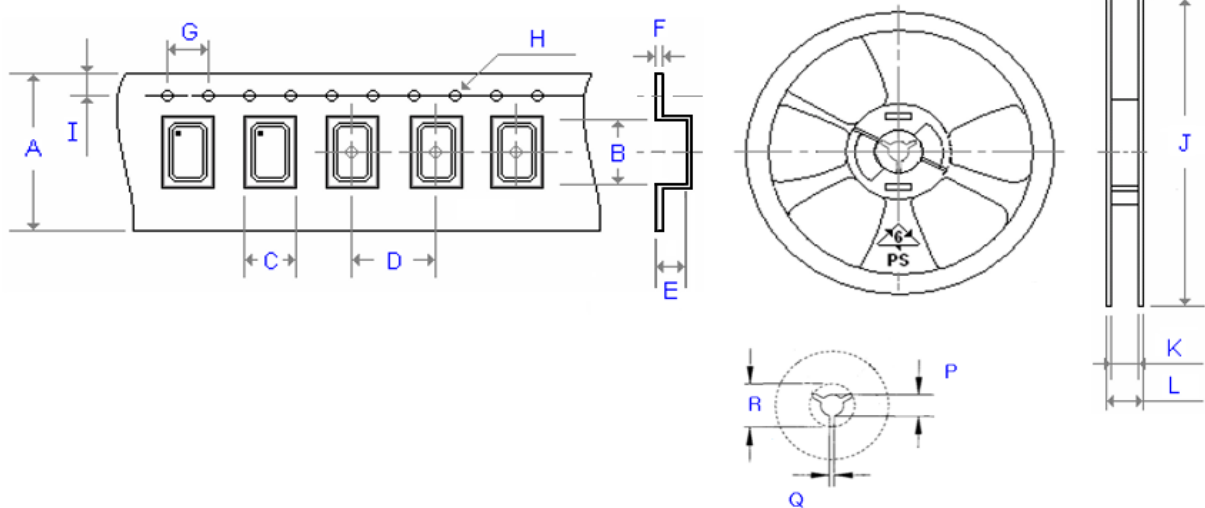
[HEA22]				[HEA32]			
Top View 	Bottom View 	Land Pattern 	Top View 	Bottom View 	Land Pattern 		
Side View 	Pad Connections : Pad 1 : OE Pad 3 : Output Pad 2 : Ground Pad 4 : Supply Voltage		Side View 	Pad Connections : Pad 1 : OE Pad 3 : Output Pad 2 : Ground Pad 4 : Supply Voltage			
[HEA53]				[HEA57]			
Top View 	Bottom View 	Land Pattern 	Top View 	Bottom View 	Land Pattern 		
Side View 	Pad Connections : Pad 1 : OE Pad 3 : Output Pad 2 : Ground Pad 4 : Supply Voltage		Side View 	Pad Connections : Pad 1 : OE Pad 3 : Output Pad 2 : Ground Pad 4 : Supply Voltage			

Test Circuit & Test Waveform

H ; H ₋ - series CMOS Test Circuit	CMOS Output Waveform

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