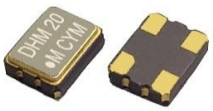
EMI Reduction Spread Spectrum Clock Oscillators

HM _ C	EMI Reduction Spread Spectrum Clock Oscillators C group	SMD	CMOS	1.8V / 2.5V / 3.3V	Min. 16 MHz	Max. 40 MHz

- Reduce electromagnetic interference (EMI) by approx. 3 dB to 12 dB
- Operates with +1.8V to +3.3V supply voltage
- 2.5 x 2.0 , 3.2 x 2.5 , 5.0 x 3.2 , 7.0 x 5.0 mm package size



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

Group	C Group			
Type	**HM22**	**HM32**	**HM53**	**HM572**
Dimemsions	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 Range	16 ~ 40 MHz		
Supply Voltage (V_{DD})	1.8 V ± 10%	2.5 V ± 10%	3.3 V ± 10%
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 / Fall Time [10% V_{DD} ↔ 90% V_{DD}]	10 nsec. (max.)	7 nsec. (max.)	7 nsec. (max.)
Current Consumption	4 mA (Max.)	5 mA (Max.)	6 mA (Max.)

Spread Type	Total%	Down Spread	Center Spread
Spread Percentage	2.0%	-2.0% (D2.0)	±1.0% (C1.0)
	1.5%	-1.5% (D1.5)	±0.75% (C0.75)
	1.0%	-1.0% (D1.0)	±0.5% (C0.5)

EMI Reduction	3 dB to 12 dB (typ.) for the main mode	
Modulation Carrier Freq. (Dither rate)	20.9 KHz (min.) ; 52.4 KHz (max.) Frequency dependent . Call for details	
Duty Cycle	50% ± 10%	
Output Waveform	CMOS	
Output Load	15pF	
Start-up Time	1.0 msec. (typ.) ; 5 msec. (max.)	
Storage Temperature	- 55°C to + 125°C	
Aging at Ta = +25°C	± 5 ppm per year (max.)	
Output Enable Function	Enable	When 70% (min.) of V_{DD} to Enable Output. (Open connection prohibit.)
	Disable	When 30% (max.) of V_{DD} to Disable Output.
	Output Enable Time : 5.0 msec. (max.) / Output Disable Time: 100 nsec. (max.)	
Frequency Stability Code (exclude modulation)	Freq. Stability over Operating Temperature Range: ± 50 ppm from -40°C to +85°C (Code is " E ")	

EMI Reduction Spread Spectrum Clock Oscillators

Part Number Format and Example

[1]	[2]	-	[3]	[4]	-	[5]	[6]	-	[7]
Supply Voltage	Holder Type		Frequency Stability	OE Function		Center Frequency	Group Type		Spread type Percentage

Examples										
	(1)	25	HM53	-	F	T	-	75.000	B	-	C2.0
	(2)	18	HM32	-	E	T	-	25.000	C	-	D1.0

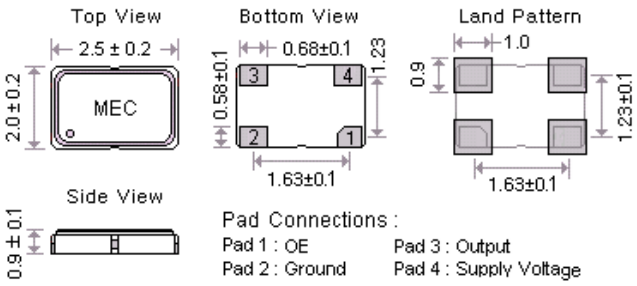
Ex (1) : 25HM53 - FT - 75.000B - C2.0 [+2.5V, HM-series, HM53 type, ±100ppm from -40°C to +85°C, OE Function, 75.000MHz, B Group, 2.0% center spread]

Ex (2) : 18HM32 - ET - 25.000C - D1.0 [+1.8V, HM-series, HM32 type, ±50ppm from -40°C to +85°C, OE Function, 25.000MHz, C Group, 1.0% down spread]

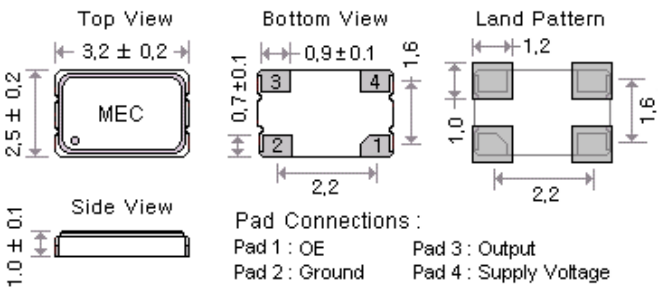
[1]	Supply voltage code : " 18 " for +1.8V , " 25 " for +2.5V , " 3 " for +3.3V	
[2]	Holder Type (HM32 , HM53)	
[3]	-10°C ~ 70 °C	" A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm
	-40°C ~ 85 °C	" D " ± 25ppm ; " E " ± 50ppm ; " F " ± 100ppm
[4]	" T " for OE Function	
[5]	Frequency in MHz	
[6]	Group " B " , " C "	
[7]	Spread type & percentage ; " C " for center spread , " D " for down spread	

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

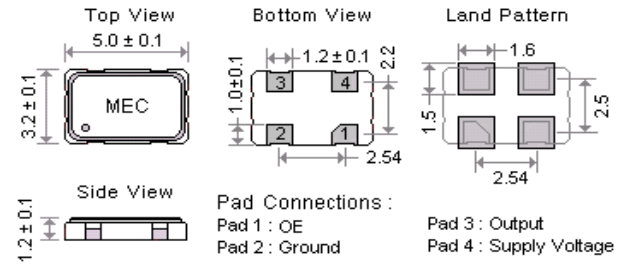
[HM22] For group : **C**



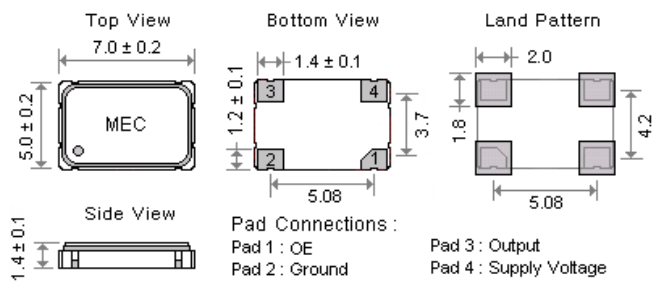
[HM32] For group : **C**



[HM53] For group : **B** **C**

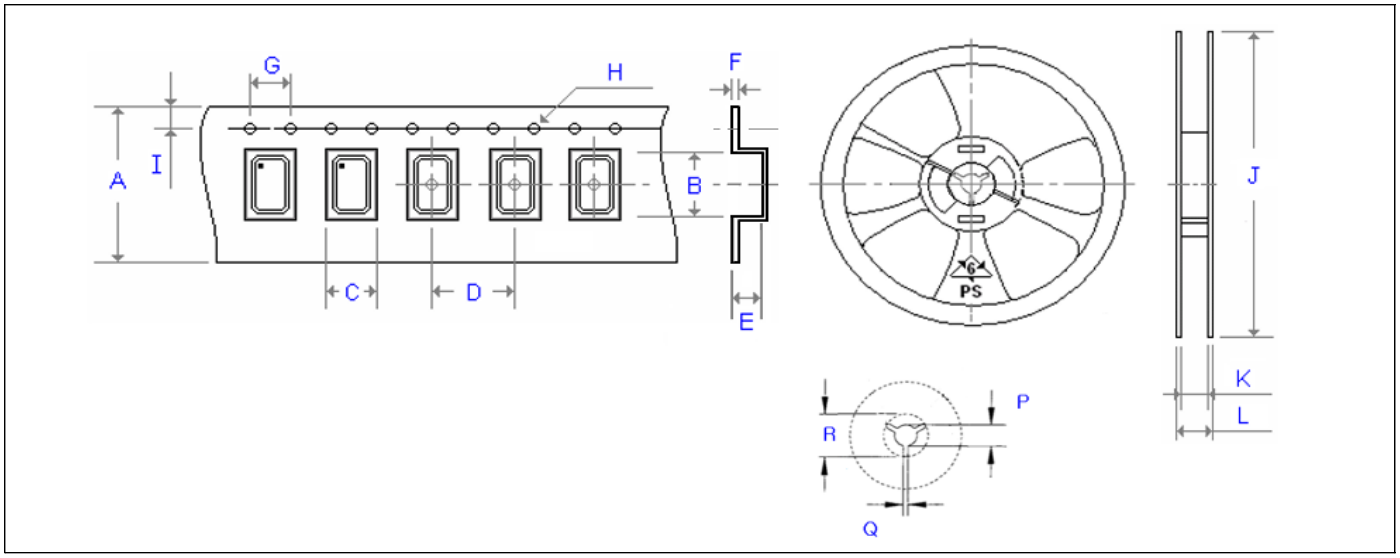


[HM572] For group : **B** **C**



Emboss Taping and Reel Specifications

[Crystal Oscillator Units]



Carrier Type Dimensions (unit : mm) ±0.3mm

	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	Ø 1.55	1.75	3000
H_22	8.00	2.80	2.25	4.00	1.10	0.30	4.00	Ø 1.50	1.75	3000
H_32	8.00	3.40	2.70	4.00	1.40	0.25	4.00	Ø 1.50	1.75	3000
H_53	12.00	5.30	3.60	8.00	1.40	0.30	4.00	Ø 1.55	1.75	1000
H_57	16.00	7.30	5.30	8.00	1.90	0.30	4.00	Ø 1.50	1.75	1000
SWO	16.00	7.20	5.40	8.00	1.80	0.30	4.00	Ø 1.55	1.75	1000
H _ 226	8.00	2.80	2.25	4.00	1.10	0.30	4.00	Ø 1.50	1.75	3000
H _ 326	8.00	3.40	2.70	4.00	1.40	0.25	4.00	Ø 1.50	1.75	3000
H _ 536	12.00	5.30	3.60	8.00	1.40	0.30	4.00	Ø 1.55	1.75	1000
H _ 576	16.00	7.30	5.30	8.00	1.90	0.30	4.00	Ø 1.50	1.75	1000
H _ 328	8.00	3.40	2.70	4.00	1.40	0.25	4.00	Ø 1.50	1.75	3000
H _ 538	12.00	5.40	3.60	8.00	1.70	0.30	4.00	Ø 1.55	1.75	1000
H _ 578	16.00	7.30	5.30	8.00	1.90	0.30	4.00	Ø 1.50	1.75	1000
H_43	24.00	11.80	10.00	16.00	5.00	0.30	4.00	Ø 1.50	1.75	500

Reel Dimensions (unit : mm) ±2mm

	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_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