

EMI Reduction Spread Spectrum Clock Oscillators

HM

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R group

Thru-Hole

SMD

CMOS

3.3V

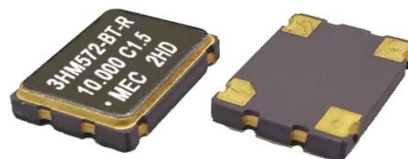
Min.

3.5 MHz

Max.

220 MHz

- Reduce electromagnetic interference (EMI) by approx. 7 dB to 16 dB
- Operates with +3.3V supply Voltage
- 5.0 x 3.2 , 7.0 x 5.0 and 11.4 x 9.6 mm package size



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

Group	R Group			
Available Packages	HM53 (5.0 * 3.2 * 1.2 mm)	HM572 (7.0 * 5.0 * 1.4 mm)	HM43 (11.4 * 9.6 * 3.0 mm)	
Frequency Range	6.0 ~ 160.0 MHz	3.5 ~ 165.0 MHz	3.5 ~ 165.0 MHz	
Supply Voltage (V _{DD})	3.3V ± 10%			
Output Waveform	CMOS			
Spread Type	Total%	Down Spread	Center Spread	
Spread Percentage	1.0%	-1.0% (D1.0)	±0.5 % (C0.5)	
	3.0%	-3.0% (D3.0)	±1.5 % (C1.5)	
EMI Reduction (EMI reduction apply to the whole spectrum.)	7 dB (min.) , 100MHz at C0.25 9 dB (min.) , 100MHz at C0.5 15 dB (min.) , 100MHz at C1.5			
Modulation Carrier Freq. (Dither rate)	6.9 KHz (min.) ; 55.5 KHz (max.) Frequency dependent . Call for details			
Output Logic " High " , " 1 "	2.4 V (min.)			
Output Logic " Low " , " 0 "	0.5 V (max.)			
Rise Time / Fall Time	4 nsec. (max.) [10% V _{DD} → 90% V _{DD}]			
Output Load	15pF			
Start-up Time	2 msec. (typ.) ; 5 msec. (max.)			
Current Consumption	3.5 ~ 30.0 MHz : 10 mA (typ.) , 15 mA (Max.)			
	30.1 ~ 80.0 MHz : 20 mA (typ.) , 25 mA (Max.)			
	80.1 ~ 120.0 MHz : 24 mA (typ.) , 30 mA (Max.)			
	120.1 ~ 165.0 MHz : 30mA (typ.) , 35 mA (Max.)			
Duty Cycle	50% ± 5%			
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.		
	Disable	When 30% (max.) of V _{DD} to Disable Output.		
	Enable / disable time: 100 nsec. (max.)			
Frequency Stability Codes (exclude modulation)	Frequ. Stability over Operating Temperature Range	± 25 ppm	± 50 ppm	± 100 ppm
	Commercial (-10°C to +70°C)	A	B	C
	Industrial (-40°C to +85°C)	D	E	F

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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)	3	HM572	-	B	T	-	10.000	R	-	C1.5
	(2)	3	HM53	-	F	T	-	75.000	B	-	C2.0
	(3)	3	HM43	-	E	T	-	25.000	R	-	D0.25

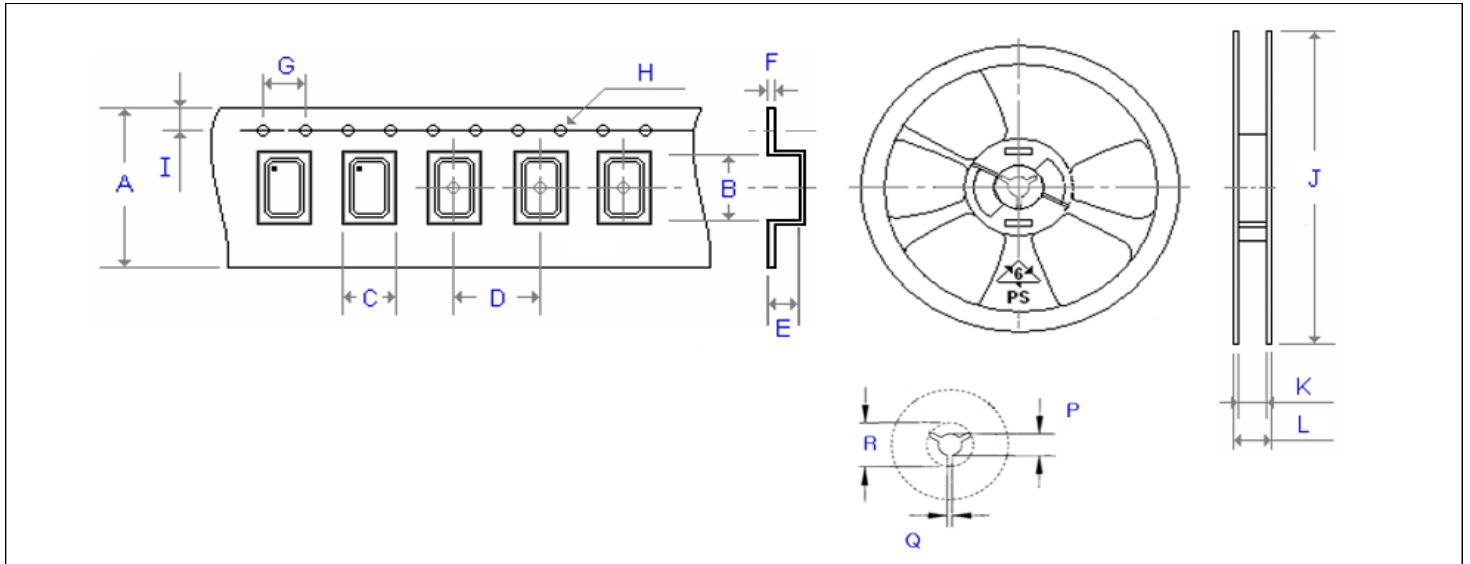
[1]	Supply voltage code : " 3 " for +3.3V
[2]	Holder Type (HM53 , HM57 or HM43)
[3]	-10°C ~ 70 °C " A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm ;
	-40°C ~ 85 °C " D " ± 25ppm ; " E " ± 50ppm ; " F " ± 100ppm ;
[4]	" T " for OE Function
[5]	Frequency in MHz
[6]	Group " R " , " B "
[7]	Spread type & percentage ; " C " for center spread , " D " for down spread

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

<p>[HM 53] For group : R B</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Top View 5.0±0.1 3.2±0.1 MEC Side View 1.2±0.1</p> </div> <div style="text-align: center;"> <p>Bottom View 1.2±0.1 2.2 2.54 1</p> </div> <div style="text-align: center;"> <p>Land Pattern 1.6 2.54 1.5</p> </div> </div> <p>Pad Connections : Pad 1 : OE Pad 2 : Ground Pad 3 : Output Pad 4 : Supply Voltage</p>	<p>[HM 572] For group : R B</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Top View 7.0±0.2 5.0±0.2 MEC Side View 1.4±0.1</p> </div> <div style="text-align: center;"> <p>Bottom View 1.2±0.1 3.7 5.08 1</p> </div> <div style="text-align: center;"> <p>Land Pattern 5.08 4.2 2.0</p> </div> </div> <p>Pad Connections : Pad 1 : OE Pad 2 : Ground Pad 3 : Output Pad 4 : Supply Voltage</p>
<p>[HM 43] For group : R B</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Top View 9.6±0.2 11.4±0.2 MEC</p> </div> <div style="text-align: center;"> <p>Side View 0.7</p> </div> <div style="text-align: center;"> <p>Bottom View 1.3±0.1 7.0±0.1 5.08 1</p> </div> </div> <p>Pad Connections : Pad 1 : OE Pad 2 : Ground Pad 3 : Output Pad 4 : Supply Voltage</p>	

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	∅ 1.50	1.75	3000
H_22	8.00	2.80	2.25	4.00	1.10	0.30	4.00	∅ 1.50	1.75	3000
H_32	8.00	3.40	2.70	4.00	1.40	0.25	4.00	∅ 1.50	1.75	3000
H_53	12.00	5.30	3.60	8.00	1.40	0.30	4.00	∅ 1.50	1.75	1000
H_57	16.00	7.30	5.30	8.00	1.90	0.32	4.00	∅ 1.50	1.75	1000
SWO	16.00	7.20	5.40	8.00	1.80	0.32	4.00	∅ 1.50	1.75	1000
H_226	8.00	2.80	2.25	4.00	1.10	0.30	4.00	∅ 1.50	1.75	3000
H_326	8.00	3.40	2.70	4.00	1.40	0.25	4.00	∅ 1.50	1.75	3000
H_536	12.00	5.30	3.60	8.00	1.40	0.30	4.00	∅ 1.50	1.75	1000
H_576	16.00	7.30	5.30	8.00	1.90	0.32	4.00	∅ 1.50	1.75	1000
H_JF328	8.00	3.40	2.70	4.00	1.40	0.25	4.00	∅ 1.50	1.75	3000
H_JF538	12.00	5.30	3.60	8.00	1.40	0.30	4.00	∅ 1.50	1.75	1000
H_JF578	16.00	7.30	5.30	8.00	1.90	0.32	4.00	∅ 1.50	1.75	1000
H_43	24.00	11.80	10.00	16.00	5.00	0.30	4.00	∅ 1.50	1.75	500

Reel Dimensions (unit : mm) ±2mm

	J	K	L	P	Q	R	pcs / reel
H21	180.00	9.00	12.000	13.00	2.50	20.20	3000
H_22	180.00	8.40	11.400	13.00	2.50	20.20	3000
H_32	180.00	9.00	12.000	13.00	2.50	20.20	3000
H_53	180.00	13.00	16.000	13.00	2.50	20.20	1000
H_57	180.00	17.20	19.300	13.00	2.50	20.20	1000
SWO	180.00	17.20	19.300	13.00	2.50	20.20	1000
H_226	180.00	8.40	11.400	13.00	2.50	20.20	3000
H_326	180.00	9.00	12.000	13.00	2.50	20.20	3000
H_536	180.00	13.00	16.000	13.00	2.50	20.20	1000
H_576	180.00	17.20	19.300	13.00	2.50	20.20	1000
H_JF328	180.00	8.00	12.000	13.00	2.50	20.20	3000
H_JF538	180.00	13.00	16.000	13.00	2.50	20.20	1000
H_JF578	180.00	17.20	19.300	13.00	2.50	20.20	1000
H_43	330.00	24.50	29.100	13.00	2.50	20.20	500

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