

### Surface Mount type

H22	H32	H53	SWO
2.5 * 2.0 * 0.95	3.2 * 2.5 * 1.0	5.0 * 3.2 * 1.2	7.0 * 5.0 * 1.4

TTL
CMOS

1.2 V	1.8 V	3.3 V
1.5 V	2.5 V	5 V

Min.
25 KHz

Max.
160 MHz

#### Applications

- CPU , Graphics , Multimedia A / V clocks
- MPEG / DVD / HDTV clocks
- Laser engine pixel / set - top clocks
- OC-3 , OC-12 , OC-48 and OC-192 clocks
- SONET / SDH / ATM clocks
- Fast Ethernet and Gigabit Ethernet clocks
- NTSC / PAL encoder / decoder clocks
- PLL / synthesizer clocks
- Fibre channel and ADSL clocks



General Specifications [ TA = +25°C , V<sub>DD</sub>= at specified voltage , Load : 15 pF ]

Model	" H22 " ; " H32 " ; " H53 " and " SWO " series [ Output Logic : T T L / CMOS ]			
	" H22 " series	" H32 " series	" H53 " series	" SWO " series
Dimensions	2.5 x 2.0 x 0.95 mm	3.2 x 2.5 x 1.0 mm	5.0 x 3.2 x 1.2 mm	7.0 x 5.0 x 1.4 mm
Available Frequency Range by Voltage	-----	1.2 V 312 KHz ~ 50 MHz	1.2 V 312 KHz ~ 50.0 MHz	1.2 V 312 KHz ~ 50 MHz
	1.8 V	1.5 V	1.5 V	1.5 V
	2.5 V	1.8 V	1.8 V	1.8 V
	3.3 V	2.5 V	2.5 V	2.5 V
	-----	3.3 V	3.3 V	3.3 V
	156.0 KHz ~ 130.0 MHz	25 KHz ~ 200 MHz	25 KHz ~ 200 MHz	25 KHz ~ 200 MHz
	-----	5.0 V	5.0 V	5.0 V
		750 KHz ~ 125 MHz	625 KHz ~ 125 MHz	187 KHz ~ 125 MHz

Supply Voltage ( V <sub>DD</sub> )	+ 1.2 V D.C.± 5%	+ 1.5 V D.C.± 5%	+ 1.8 V D.C.± 5%	+ 2.5 V D.C.± 5%	+ 3.3 V D.C.± 5%	+ 5.0 V D.C.± 10%
	code is " 12 "	code is " 15 "	code is " 18 "	code is " 25 "	code is " 3 "	code is " 5 "
High "1" ( 90% of V <sub>DD</sub> min. )	0.9 V min.	1.35 V min.	1.62 V min.	2.25 V min.	2.97 V min.	4.5 V min.
Logic Low "0" ( 10% of V <sub>DD</sub> max. )	0.1 V max.	0.15 V max.	0.18 V max.	0.25 V max.	0.33 V max.	0.5 V max.
Current Consumption	1.0 ~ 1.5 MHz 4 mA max.	0.3 ~ 1.5 MHz 4 mA max.	1.0 ~ 1.5 MHz 5 mA max.	0.3 ~ 1.5 MHz 5 mA max.	0.3 ~ 1.5 MHz 5 mA max.	0.3 ~ 1.5 MHz 5 mA max.
	1.5 ~ 20 MHz 4 mA max.	1.5 ~ 20 MHz 4 mA max.	1.5 ~ 20 MHz 8 mA max.	1.5 ~ 20 MHz 8 mA max.	1.5 ~ 20 MHz 8 mA max.	1.5 ~ 20 MHz 10 mA max.
	20.0 ~ 60.0 MHz 4 mA max.	20.0 ~ 60.0 MHz 4 mA max.	20.0 ~ 50.0 MHz 15 mA max.	20.0 ~ 50.0 MHz 15 mA max.	20.0 ~ 50.0 MHz 15 mA max.	20.0 ~ 50.0 MHz 15 mA max.
	-----	-----	50.1 ~ 160.0 MHz 22 mA max.	50.1 ~ 160.0 MHz 25 mA max.	50.1 ~ 160.0 MHz 35 mA max.	50.1 ~ 125.0 MHz 40 mA max.
Rise Time ( Tr ) / Fall Time ( Tf )	6 n sec. ( max. )	6 n sec. ( max. )	7 n sec. ( max. )	7 n sec. ( max. )	10 n sec. ( max. )	10 n sec. ( max. )
	Measured between 10% ↔ 90% of wave form ( CL = 15pF )					

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 " I " . For example : " C20 " ±20 ppm over -10°C to +70°C ; " I20 " ± 20 ppm over -40°C to +85°C
	Commercial ( -10°C to +70°C )	A	B	C	
	Industrial ( -40°C to +85°C )	D	E	F	

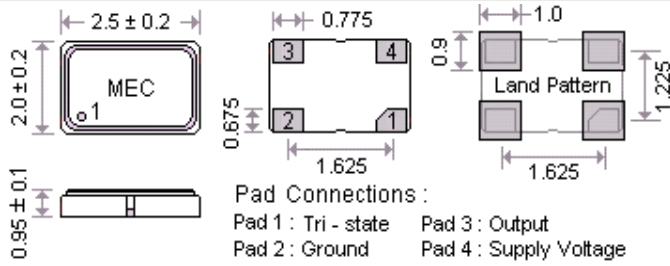
Load	15 pF ; ( 30 pF and 50 pF load are also available for +3.3V and +5.0V V <sub>DD</sub> )
Duty Cycle	Standard: 50% ± 10%; Option: 50% ± 5%. Please add "-S" at the end of the part number for ± 5% .
Start -up Time ( Ts )	1.0 ~ 32.0 MHz : 5 m sec. ( max. ) ; 32.0 ~ 160.0 MHz : 10 m sec. ( max. )
Storage Temperature	- 50°C to 100°C
Aging	± 3 ppm per year ( max. )
Tri-state Function on pad No. 1	Output is high impedance when " 0 " is applied to pin 1 . Disable time is 150 n sec. max. Add " T " in part number for Tri-State option

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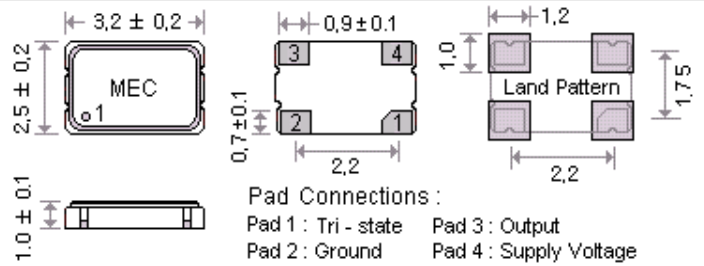
# Clock Oscillators [ TTL / CMOS ]

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

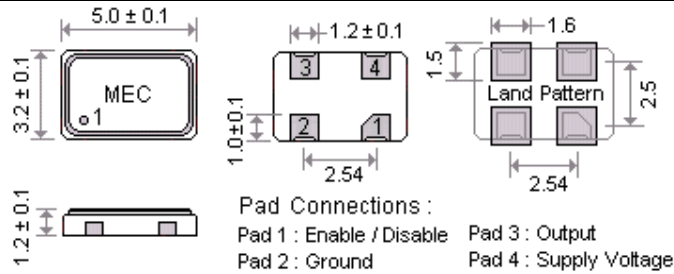
[ H22 ]



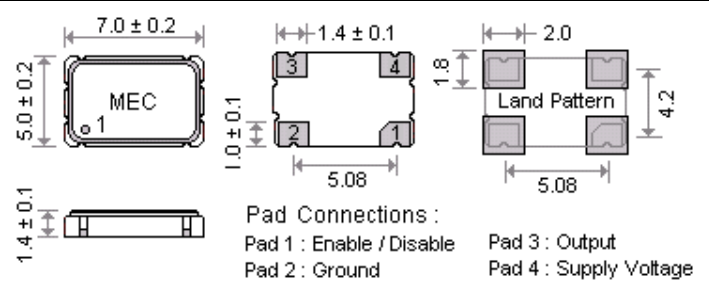
[ H32 ]



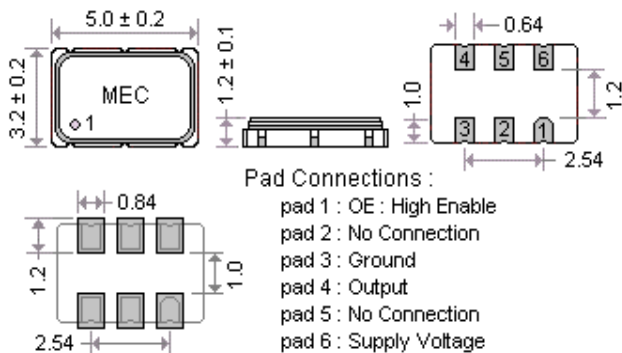
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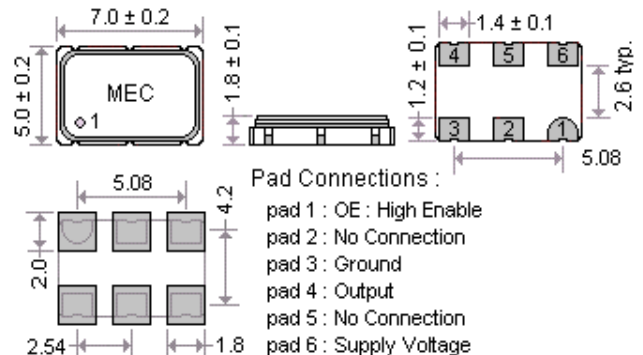
[ SWO ] , [ H\_57 ]



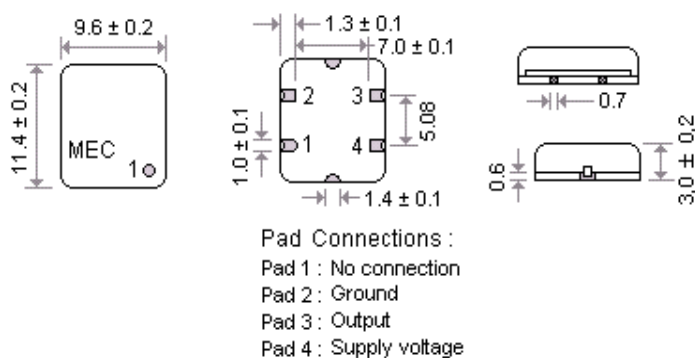
[ HTQN5361 ]



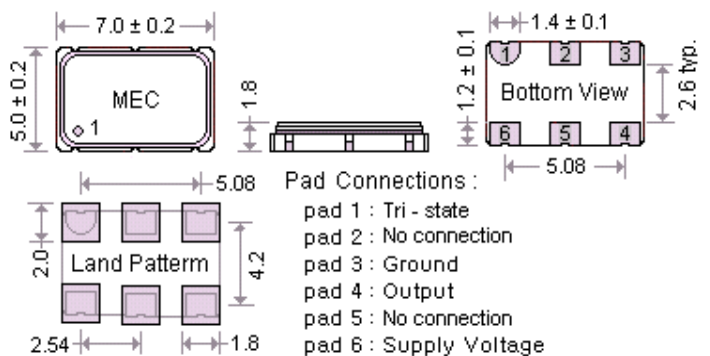
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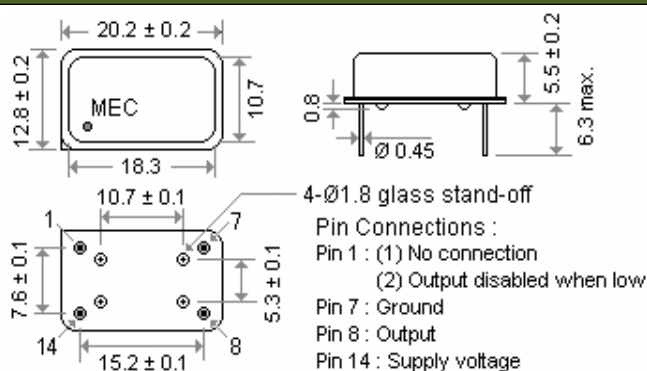
[ H43 , HV43 ]



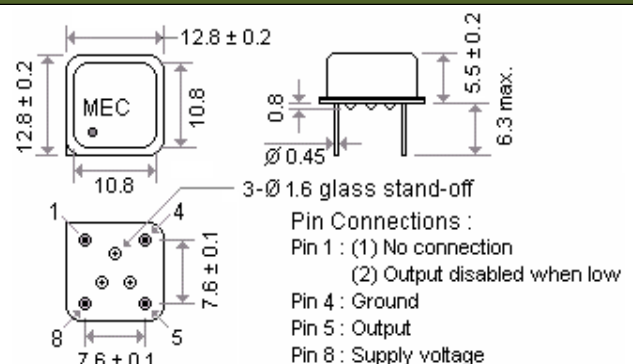
[ HV5761 ]



[ H14 , HV14 ]



[ H8 , HV8 ]



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# Part Number Formats and Product Marking Rules

## Crystal Oscillators

### Holder Type

Output Wave	Product Series	Supply Voltage	SMD types	Thru-Hole types
Square Wave CMOS	SWO	1.8/2.5/3.3/5.0	SWO	
	Hxx	1.8/2.5/3.3/5.0	xx = 42, 43, 53, 32, 22	xx = 8,14
	HVxxx	2.5/3.3	xx = 42, 43, 5761	
	HBxx	1.8/2.5/3.3/5.0	xx = 57, 53, 32	
	HCxx	1.8/2.5/3.3	xx = 57, 53, 32	
	HKxx	1.8/2.5/3.3/5.0	xx = 42, 43, 57, 53	xx = 8,14
	HNxx	1.8/2.5/3.3/5.0	xx = 57, 53	
	HRxx	1.8/2.5/3.3	xx = 57, 53, 32	
	HGxxx	1.8/2.5/3.3/5.0	xx = 5761	
	LPOxxx	3.3/5.0	-----	
HTQFxxx	3.3/5.0	xx = 5361, 5761		
HTQNxxx	3.3/5.0	xx = 5361, 5761		

xx = package code

Output Wave	Product Series	Supply Voltage	SMD types	Thru-Hole types
Square Wave LVPECL	HPKxxx	2.5/3.3	xx = 5361, 5761, 63	-----
	HPFxxx	2.5/3.3	xx = 5761, 63	
	HPWxxx	3.3	xx = 5361, 5761, 63	
	HPQFxxx	2.5/3.3	xx = 5361, 5761, 63	
Square Wave LVDS	HPQNxxx	2.5/3.3	xx = 5361, 5761, 63	-----
	HDKxxx	2.5/3.3	xx = 5361, 5761, 63	
	HDFxxx	2.5/3.3	xx = 5761, 63	
	HDWxxx	3.3	xx = 5361, 5761, 63	
True Sine	HDQFxxx	2.5/3.3	xx = 5361, 5761, 63	-----
	HDQNxxx	2.5/3.3	xx = 5361, 5761, 63	
	HSRxxx	2.8/3.0/5.0	xx = 42, 43, 53, 57	
	HSxxx	3.3/5.0	-----	xx = 14

xx = package code

### Part Number Format

[ 1 ]	[ 2 ]	[ 3 ]	[ 4 ]	[ 5 ]	[ 6 ]
Supply Voltage	Holder Type	G	Frequency Stability	T	Center Frequency

EX.	(1)	5	H14	G	-	C30	-	10.000
	(2)	3	HDW5761		-	E	-	156.250

Ex (1): 5H14G-C30-10.000 [ 5.0V, H14 type, RoHS, ±30ppm from -10°C to 70°C, 10.000MHz ]

Ex (2): 3HDW5761-E-156.250 [ 3.3V, ( HDW5761 type, Tri-state on pin 1 ), RoHS, ±50ppm from -40°C to 85°C, 156.250MHz ]

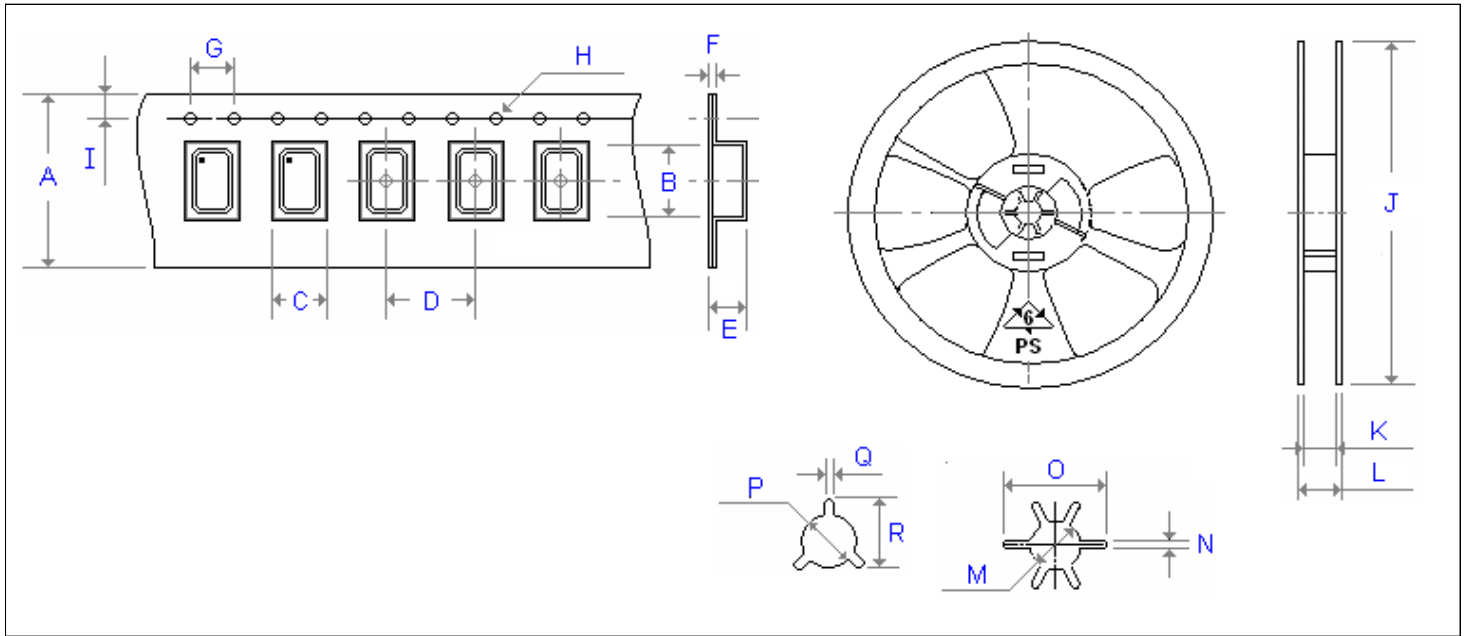
[ 1 ]	Supply voltage, " 1 " for +1.0V ; " 12 " for +1.2V ; " 18 " for +1.8V ; " 25 " for +2.5V ; " 28 " for +2.8V ; " 3 " for +3.3V ; " 5 " for +5.0V
[ 2 ]	Holder Type [ 3 ] Please add " G " after the " type code " for RoHS compliant ( Does not apply to SWO, H_53, H_32, H22, H_576_, H_534 series )
[ 4 ]	-10°C ~ 70 °C " A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm ; If non-standard please enter the desired stability after " C ", for example " C15 " : represents ±15ppm over -10 to +70°C
	-40°C ~ 85 °C " D " ± 25ppm ; " E " ± 50ppm ; " F " ± 100ppm ; If non-standard please enter the desired stability after " I ", for example " I20 " : represents ±20ppm over -40 to +85°C
[ 5 ]	" T " for Tri-state, Leave this space blank if no connection on pin 1 or pad 1.
[ 6 ]	Frequency in MHz ( Assigned by Mercury if customer spec, Ex (1) : S ---- duty cycle ± 5%, Ex : " - S " (2) : 50p ---- output load 50pF, Ex : " - 50p " )

### Production Marking Rules

H8, H14, LPO14, H42, H43	SWO, H53 marking rules	H32 marking rules	H22 marking rules
<p>Suffix " G " for RoHS compliant</p> <p>Hole type ←</p> <p>Input Voltage ←</p> <p>" 18 " for +1.8V</p> <p>" 25 " for +2.5V</p> <p>" 28 " for +2.8V</p> <p>" 33 " for +3.3V</p> <p>" 5 " for +5.0V</p> <p>Pin # 1 indicator (Year) : 2010 - 0, 2011 - 1</p> <p>Stability : Table 1</p> <p>" T " : Tri-state</p> <p>Frequency</p> <p>lot code</p> <p>(Month) : Table 2</p>	<p>XX,XXX</p> <p>MECXXXXXX</p> <p>Pin # 1 indicator</p> <p>Stability --Table 1</p> <p>lot code</p> <p>(Month) --- Table 2</p> <p>(Year) --- 2010 --- 0</p> <p>Input Voltage</p>	<p>Freq.</p> <p>Stability --Table 1</p> <p>Pin # 1 indicator</p> <p>Input Voltage --- Table 3</p> <p>(Month) --- Table 2</p> <p>(Year) --- 2010 -- 0</p>	<p>Stability</p> <p>Freq. - Table 1</p> <p>Pin # 1 indicator</p> <p>Input Voltage (Year) - Table 3 - 2010 - 0</p>
<p>HP_5761, HD_5761, HCK5761</p> <p>H_QF5761, H_QN5761, HG5761</p>	<p>H ( A, B, C, K, N, R, SR ) 57</p> <p>H ( A, B, C, K, N, R, SR ) 53</p>	<p>H ( B, C, R ) 32</p>	<p>HA32 - 32.768 KHz</p>
<p>Product Series</p> <p>H_5761</p> <p>XX,XXX</p> <p>MECXXXXXX</p> <p>Pin # 1 indicator</p> <p>Stability --Table 1</p> <p>Input Voltage --- Table 3</p> <p>(Month) --- Table 2</p> <p>(Year) --- 2010 - 0, 2011 - 1</p>	<p>Product Series</p> <p>H_XX,XXX</p> <p>MECXXXXXX</p> <p>Pin # 1 indicator</p> <p>Stability --Table 1</p> <p>Input Voltage --- Table 3</p> <p>(Month) --- Table 2</p> <p>(Year) --- 2010 - 0, 2011 - 1</p>	<p>Product Series</p> <p>XX,XX</p> <p>M XXX</p> <p>Pin # 1 indicator</p> <p>Input Voltage --- Table 3</p> <p>(Month) --- Table 2</p> <p>(Year) --- 2010 -- 0</p>	<p>Product Series</p> <p>A 32.XX</p> <p>M XXX</p> <p>Pin # 1 indicator</p> <p>Input Voltage --- Table 3</p> <p>(Month) --- Table 2</p> <p>(Year) --- 2010 -- 0</p>
<p>Table 1</p> <p>-10°C ~ 70 °C</p> <p>" A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm ;</p> <p>If non-standard please enter the desired stability after " C ", for example " C10 " : ± 10ppm</p> <p>-40°C ~ 85 °C</p> <p>" D " ± 25ppm ; " E " ± 50ppm ; " F " ± 100ppm ;</p> <p>If non-standard please enter the desired stability after " I ", for example " I10 " : ± 10ppm</p>			
<p>Table 2</p> <p>Month Code</p> <p>1 A 2 B 3 C 4 D 5 E 6 F 7 G 8 H 9 I 10 J 11 K 12 L</p>	<p>Table 3</p> <p>Input Voltage</p> <p>Tri - State</p> <p>5.0 V B 3.3 V D 2.8 V F 2.5 V H 1.8 V J 1.5 V L 1.2 V N 1.0 V P</p>		

# Emboss Taping and Reel Specifications

[ Crystal Oscillator Units ]



Carrier Type Dimensions ( unit : mm )

	A	B	C	D	E	F	G	H	I	pcs / reel
H_22	8.0	2.7	2.3	4.0	1.2	0.3	4.0	Ø 1.0	1.8	3000
H_32	8.0	3.4	2.7	4.0	1.4	0.25	4.0	Ø 1.5	1.75	3000
H_53	12.0	5.3	3.6	8.0	1.4	0.3	4.0	Ø 1.5	1.75	1000
H_57	16.0	7.2	5.4	8.0	1.8	0.3	4.0	Ø 1.5	1.75	1000
SWO	16.0	7.2	5.4	8.0	1.8	0.3	4.0	Ø 1.5	1.75	1000
H_576	16.0	7.2	5.4	8.0	1.8	0.3	4.0	Ø 1.5	1.75	1000
HP_576	16.0	7.2	5.4	8.0	1.8	0.3	4.0	Ø 1.5	1.75	1000
HD_576	16.0	7.2	5.4	8.0	1.8	0.3	4.0	Ø 1.5	1.75	1000
H_42	24.1	12.4	10.3	16.0	5.1	0.3	4.0	Ø 1.45	1.8	500
H_43	24.1	12.4	10.3	16.0	5.1	0.3	4.0	Ø 1.45	1.8	500

Reel Dimensions ( unit : mm )

	J	K	L	M	N	O	P	Q	R	pcs / reel
H_22	180.0	9.0	12.0	13.2	2.2	22.0	-	-	-	3000
H_32	180.0	12.8	17.0	13.2	2.2	22.0	-	-	-	3000
H_53	180.0	16.5	19.6	-	-	-	13.4	2.5	19.5	1000
H_57	180.0	16.5	19.6	-	-	-	13.4	2.5	19.5	1000
SWO	180.0	16.5	19.6	-	-	-	13.4	2.5	19.5	1000
H_576	180.0	16.5	19.6	-	-	-	13.4	2.5	19.5	1000
HP_576	180.0	16.5	19.6	-	-	-	13.4	2.5	19.5	1000
HD_576	180.0	16.5	19.6	-	-	-	13.4	2.5	19.5	1000
H_42	330.0	30.0	25.0	-	-	-	13.4	2.5	19.5	500
H_43	330.0	30.0	25.0	-	-	-	13.4	2.5	19.5	500

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