

High Frequency Ultra-low Jitter Crystal Oscillators [Quick - turn Oscillators , 150 ~ 2,100 MHz]



H_JFN

CMOS / Differential

SMD

1.8 V

2.5 V

3.3 V

Min.

150 MHz

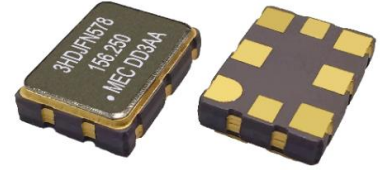
Max.

2,100 MHz

Features

- High Frequency Range : 150 ~ 2,100 MHz
- Ultra-low RMS Jitter : 150 fsec (typ.) @ 3.3 V , 156.250 MHz
- 3.2 x 2.5mm and 5.0 x 3.2mm and 7.0 x 5.0mm Package Size
- Next-Day sample for Prototypes

150 fsec typical Phase Jitter



General specifications , at Ta = +25°C

Model	HTJFN	HPJFN	HDJFN	HCJFN	HQJFN
Output Logic	CMOS	PECL	LVDS	HCSL	CML
Supply Voltage (V _{DD})	+ 1.8 V ± 5%	--	+ 1.8 V ± 5% (*)	+ 1.8 V ± 5%	+ 1.8 V ± 5%
	+ 2.5 V ± 10%	+ 2.5 V ± 10%	+ 2.5 V ± 10%	+ 2.5 V ± 10%	+ 2.5 V ± 10%
	+ 3.3 V ± 10%	+ 3.3 V ± 10%	+ 3.3 V ± 10%	+ 3.3 V ± 10%	+ 3.3 V ± 10%
Available Frequency Range	150 ~ 250 MHz	150 ~ 2,100 MHz	150 ~ 2,100 MHz	150 ~ 700 MHz	150 ~ 2,100 MHz
Output Load	15pF	50 Ω into V _{DD} - 2V or Thevenin equivalent	100 Ω	50 Ω to GND	50 Ω to V _{DD}
Output Logic " High " , " 1 "	90% V _{DD} (min.)	V _{DD} - 1.165 V (min.) V _{DD} - 0.8 V (max.)	V _{DD} : 1.4V (typ.) V _{DD} : 1.6 V (max.)	V _{DD} : 0.66V (min.) V _{DD} : 1.15 V (max.)	V _{DD} - 0.085V (min.) V _{DD} = max.
Output Logic " Low " , " 0 "	10% V _{DD} (max.)	V _{DD} - 2.0 V (min.) V _{DD} - 1.55 V (max.)	V _{DD} : 1.1 V (typ.) V _{DD} : 0.9 V (min.)	V _{DD} : -0.15V (min.) V _{DD} : 0.15V (max.)	V _{DD} - 0.6V (min.) V _{DD} - 0.32V (max.)
Output Voltage Swing	---	595 mV (min.) 930 mV (max.)	250 mV (min.) 450 mV (max.)	450 mV (min.) 700 mV (typ.)	200 mV (min.) 600 mV (typ.)
Current Consumption (V _{DD} = + 3.3 V)	75 mA (typ.)	100 mA (typ.)	75 mA (typ.)	94 mA (typ.)	70 mA (typ.)
	90 mA (max.)	120 mA (max.)	90 mA (max.)	115 mA (max.)	85 mA (max.)
Disable Current	62 mA (typ.)	99 mA (typ.)	74 mA (typ.)	93 mA (typ.)	69 mA (typ.)
Rise Time / Fall Time (20% to 80% Waveform)	5.0 nsec. (max.) (10% to 90%)	0.4 nsec. (max.)	0.4 nsec. (max.)	0.4 nsec. (max.)	0.4 nsec. (max.)

Frequency Stability Codes	Frequency 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
Duty Cycle	50 % ± 5%			
Start-up Time	5 msec (typ.) ; 10 msec. (max.)			
RMS Jitter (typ.) (12 KHz to 20 MHz)	156.250 MHz : 159 fsec. ; 491.520 MHz : 155 fsec. ; 644.530 MHz : 151 fsec. ; 2,000 MHz : 163 fsec.			
Storage Temperature	-55°C to + 150°C			
Aging at Ta = +25°C	+ 3 ppm (max.) for first year ; ± 2 ppm (max.) per year thereafter			
Enable / Disable Function on Pad1	80% of V _{DD} (min.) to enable output.			
	20% of V _{DD} (max.) to disable output.			
Enable / Disable Time	2.5 msec. (max.) / 10 usec. (max.)			

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2.5 V

3.3 V

Min.

150 MHz

Max.

2,100 MHz

Part Number Format and Example

[1]	[2]	[3]	[4]	[5]	[6]	-	[7]	-	[8]
Supply Voltage	OSC Type	Output Waveform	Series	Package Size	OE Function		Frequency Stability		Center Frequency
Example 3	H	D	JFN	578	1	-	E	-	644.530

EX : 3HDJFN5781 - E - 644.530 [+3.3V, HDJFN type, LVDS output, 7.0x5.0mm 8pad, OE on pad1, ±50ppm from -40 to +85 °C, 644.530 MHz]

[1]	Supply voltage, " 18 " for +1.8V ; " 25 " for +2.5V ; " 3 " for +3.3V								
[2]	OSC Type, " H " : XO								
[3]	Output Waveform, " T " : CMOS ; " P " : PECL ; " D " : LVDS ; " C " : HCSL ; " Q " : CML								
[4]	JFN Series								
[5]	Package Size, " 328 " : 3.2 x 2.5 mm 8pad ; " 538 " : 5.0 x 3.2 mm 8pad ; " 578 " : 7.0 x 5.0 mm 8pad								
[6]	" 1 " : OE function on pad # 1								
[7]	-10°C ~ 70 °C " A " ± 25ppm ; " B " ± 50ppm ; " C " ± 100ppm								
	-40°C ~ 85 °C " D " ± 25ppm ; " E " ± 50ppm ; " F " ± 100ppm								
[8]	Frequency in MHz								

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

H_JFN328	H_JFN538	H_JFN578
Top View: 3.2 ± 0.1, 2.5 ± 0.1, 0.85, 0.95, 2.85, 0.7, 1.95 Bottom View: 0.65, 0.5, 1.65, 2.5, 1.0 ± 0.1 Land pattern: 0.85, 0.95, 2.85, 0.7, 1.95 Side View: 1.0 ± 0.1	Top View: 5.0 ± 0.2, 3.2 ± 0.2, 0.64, 0.64, 2.54, 4.1, 2.2 Bottom View: 1.0, 0.64, 0.64, 2.54, 0.7, 1.4 ± 0.1 Land pattern: 0.84, 0.8, 2.54, 4.1, 2.2 Side View: 1.4 ± 0.1	Top View: 7.0 ± 0.2, 5.0 ± 0.2, 1.4, 1.4, 5.08, 5.7, 4.2 Bottom View: 1.3, 1.4, 1.0, 3.7, 1.2, 1.8 ± 0.1 Land pattern: 1.8, 1.4, 5.08, 5.7, 4.2 Side View: 1.8 ± 0.1

Pad Connections :

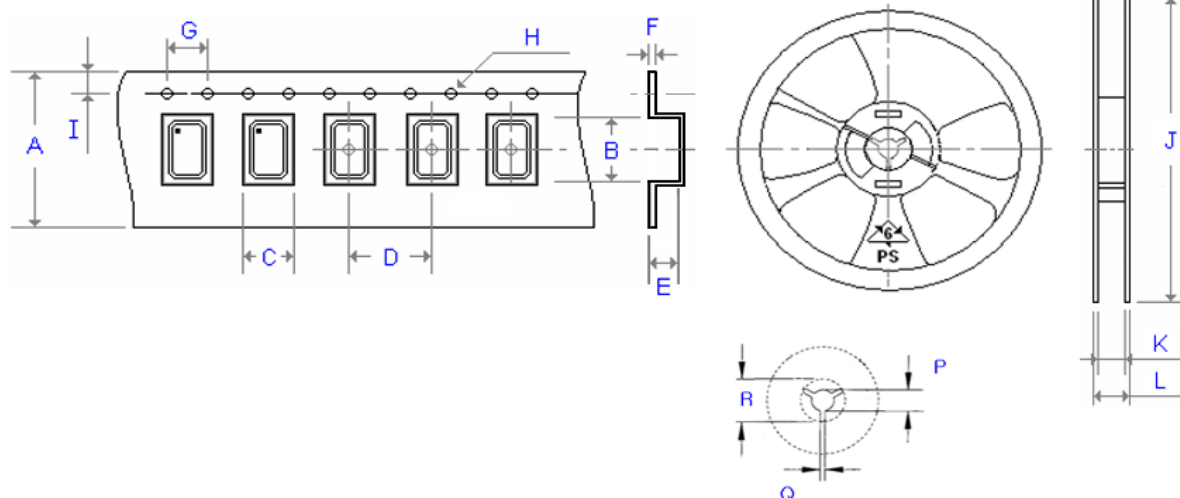
Pad 1 : Output Enable	Pad 2 : No Connection	Pad 3 : Ground	Pad 4 : CMOS : Output , Differential : Output
Pad 5 : CMOS : No Connection , Differential : Complementary	Pad 6 : Supply Voltage	Pad 7 , Pad 8 : Do Not Connect	

Test Circuits

CMOS	HCSL	LVDS Test Circuits for 2.5V and 3.3V
VDD, 10uF, 0.1uF, 15 pF, NC, OE, NC	VDD, 10uF, 0.1uF, 33Ω, 33Ω, 50Ω, 50Ω, OE, NC	VDD, 10uF, 0.1uF, 100Ω, OE, NC
PECL	CML	LVDS Test Circuits for 1.8V only (*)
VDD, 10uF, 0.1uF, R1, R3, R2, R4, LVPECL Receiver, OE, NC V_{DD} = 3.3V ; R1 = R3 = 127 Ω ; R2 = R4 = 82.5 Ω V_{DD} = 2.5V ; R1 = R3 = 250 Ω ; R2 = R4 = 62.5 Ω	VDD, 10uF, 0.1uF, 50Ω, 50Ω, OE, NC	VDD, 10uF, 0.1uF, 50Ω, 50Ω, V_{ocm} 1.2V, OE, NC

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 1.50	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 1.50	1.75	1000
H_57	16.00	7.30	5.30	8.00	1.90	0.32	4.00	Ø 1.50	1.75	1000
SWO	16.00	7.20	5.40	8.00	1.80	0.32	4.00	Ø 1.50	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 1.50	1.75	1000
H_576	16.00	7.30	5.30	8.00	1.90	0.32	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	5.30	3.60	8.00	1.40	0.30	4.00	Ø 1.50	1.75	1000
H_578	16.00	7.30	5.30	8.00	1.90	0.32	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	12.000	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_328	180.00	8.00	12.000	13.00	2.50	20.20	3000
H_538	180.00	13.00	16.000	13.00	2.50	20.20	1000
H_578	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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