



PLETRONICS HC44J Series 2.5V HCSL Clock Oscillator



HC44JW
3.2 x 2.5 x 0.9 mm
LCC Ceramic Package

Features

- Quartz crystal controlled Precision Square Wave Oscillator
- HCSL Output
- Enable/Disable Function on pad 1
- Low Jitter
- 2.5V nominal Supply Voltage
- 100 - 175 MHz Frequency Range

Applications

Driving A/Ds, D/As, FPGAs
Fibre Channel
Ethernet, GbE, SynchE
Medical
Storage Area Networking
COTS
Telecom
PON

Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition
Frequency Range ²	100	-	175	MHz	
Frequency Stability vs. Temperature ² $\pm 20 = 20^*$, $\pm 25 = 44$, $\pm 50 = 45$	± 20	-	± 50	ppm	Includes supply voltage change, load change, aging for 1 year at 25°C \pm 2°C, shock, vibration and temperatures. *Limited frequencies, see pg 2
Operating Temperature Range ²	-10 -20 -40 -40 -40	-	+70 +70 +85 +105 +125	°C	Standard range Extended range C option Extended range E option Extended range G option Extended range H option
Supply Voltage ^{1,2} V _{CC}	2.25	2.5	2.75	V	
Supply Current I _{CC}	-	-	50	mA	
Output Waveform	HCSL				
Output High Level V _{OH}	0.6	-	0.9	V	
Output Low Level V _{OL}	-0.15	-	0.15	V	
Output Swing	0.45	-	-	V	
Output T _{RISE} and T _{FALL}	-	-	0.6	ns	0.175 ~ 0.525V
Startup Time	-	-	5	ms	Time for output to reach specified frequency
Duty Cycle	45	-	55	%	At 50% of output pk-pk
V _{DISABLE} V _{IL}	-	-	30	%V _{CC}	Referenced to ground
V _{ENABLE} V _{IH}	70	-			
Enable Input Pull-up Resistance	30	70	150	kΩ	Pad 1 = Gnd
Enable Time	-	-	5	ms	Time for output to reach a logic high state
Disable Time	-	-	200	ns	Time for output to reach a high Z state
Standby Current	-	-	30	μA	Pad 1 low, device disabled
Jitter	-	0.05	0.1	ps	12 kHz to 20 MHz offset
Phase Noise 1 kHz 10 kHz 100 kHz 1 MHz 20 MHz	-	-130 -153 -161 -163 -164	-	dBc/Hz	25°C \pm 2°C at 100.0 MHz
Storage Temperature Range	-55	-	+125	°C	

Notes: Specifications with Pad 1 E/D open circuit

¹ Place an appropriate power supply bypass capacitor next to device for correct operation

² Specified by part number



PLETRONICS HC44J Series 2.5V HCSL Clock Oscillator

Part Number

Series Model	Frequency Stability		Operating Temperature Range	Supply Voltage V _{CC}	Frequency in MHz	Optional T&R Packaging code
HC44	45	J	E	W	- 100.0M	-XX
	45 = ± 50 ppm (STD) 44 = ± 25 ppm 20* = ± 20 ppm		Blank = -10 to +70°C (STD) C = -20 to +70°C E = -40 to +85°C G = -40 to +105°C H = -40 to +125°C	W = 2.5V ± 10%	100-175 MHz	T1K = 1000 per Reel Blank = 3000pcs (standard reel qty)

* Contact PLE sales for limited frequencies. Full frequency range available which excludes aging.
Temperature Options G and H apply to ±50ppm stability

Device Marking

PFFF.FH
• YMDxxx

P = Pletronics
FFF.F = Frequency in MHz
H = HCSL Output
YMD = Date Code, All other markings are internal codes

Note: Specifications such as frequency stability, supply voltage and operating temperature range, etc. are not identified from marking.
External packaging labels and packing list will correctly identify the ordered Pletronics part number.

Codes for Date Code YMD (Year Month Day)

Code	3	4	5	6	7	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2023	2024	2025	2026	2027	Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Code	H	J	K	L	M	N	P	R	T	U	V	W	X	Y	Z	
Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	

Package Labeling

P/N Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII

RoHS Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Arial



RoHS Compliant

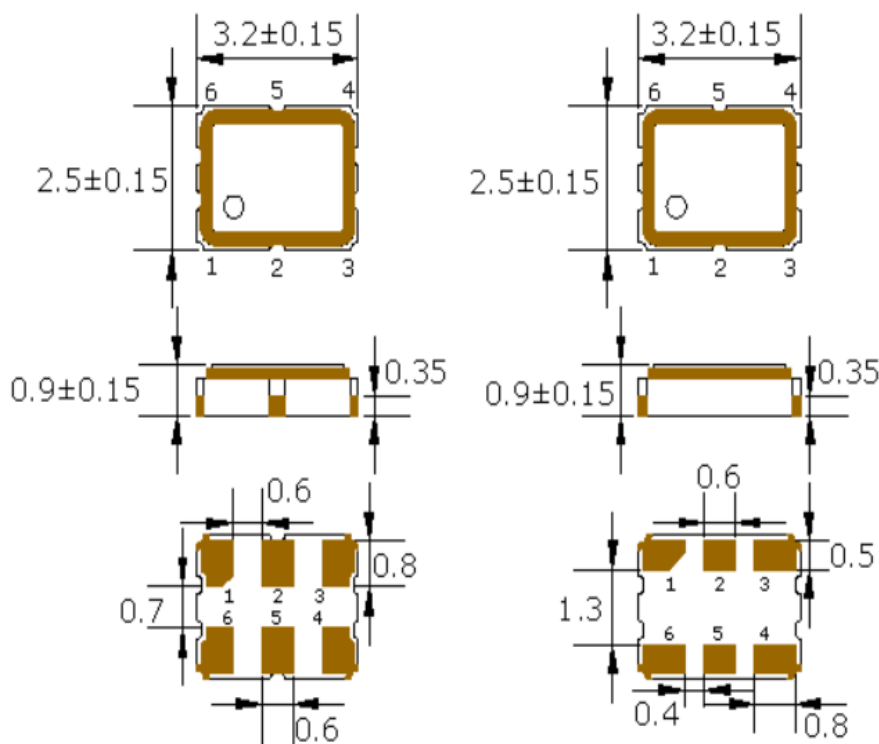
2nd Lvl Interconnect
Category=e4

Max Safe Temp=260C for 10s 2X Max

Pletronics Inc. certifies this device is in accordance with the RoHS and REACH directives.

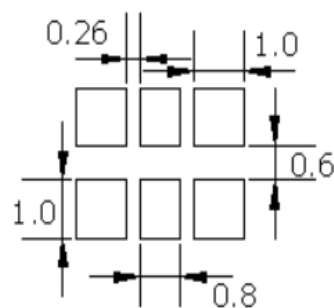
Pletronics Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
Weight of the Device: 0.028 grams
Moisture Sensitivity Level: 1 As defined in J-STD-020D
Second Level Interconnect code: e4

Mechanical Dimensions



Pin Connections	
PIN#	Function
1	Enable/Disable
2	No connect
3	Ground/Lid
4	Output
5	Output N
6	Vcc

ENABLE/DISABLE	
PIN1	Output
V _{IH} /Open	Active
V _{IL} /Gnd	Disabled/Tristate



Dimensions in mm

Pad Layout

Disclaimer: Recommended layout shown.
Adjust layout as needed for individual
process requirements.

Contacts (pads): Gold (0.3 to 1.0 μm) over Nickel (1.27 to 8.89 μm)

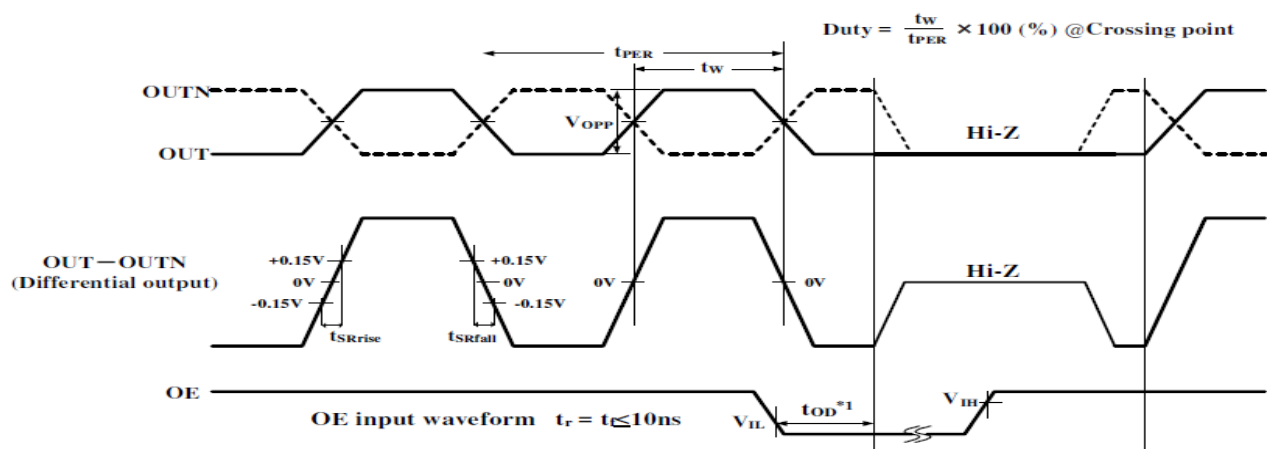
For Optimum Jitter Performance, Pletronics recommends:

- A ground plane under the device
- Do not route large transient signals (both current and voltage) under the device
- Do not place near a large magnetic field such as a high frequency switching power supply
- Do not place near piezoelectric buzzers or mechanical fans



Diagram illustrating the electrical connections for the UUT (Unit Under Test) during testing:

- Pin 1 (E/D):** Connected to a logic high signal.
- Pin 3 (Gnd):** Connected to ground.
- Pin 4 (OUT):** Connected to a common output node through a resistor labeled $0 \sim 33 \text{ ohms}^*$.
- Pin 5 (OUTN):** Connected to the same common output node through a resistor labeled $0 \sim 33 \text{ ohms}^*$.
- Pin 6 (Vcc):** Connected to Vcc and has a $0.01 \mu\text{F}$ capacitor connected to ground.
- Output Node:** The common output node is connected to two 50 ohms loads (labeled $Z_o 50 \text{ ohms}$) and has a 50 ohms resistor connected to ground.
- Note:** * Used to help reduce overshoot.



Pg 4

Temperature Profile	Symbol	Condition	Unit
Average ramp-up rate	($T_{s_{max}}$ to T_P)	3°C / second max	°C / s
Ramp down Rate	T_{cool}	6°C / second max	°C / s
Time 25°C to Peak Temperature	$T_{to-peak}$	8 minutes max	min
Preheat			
Temperature min	$T_{S_{min}}$	150	°C
Temperature max	$T_{S_{max}}$	200	°C
Time $T_{S_{min}}$ to $T_{S_{max}}$	ts	60 – 180	sec
Soldering above liquidus			
Temperature liquidus	T_L	217	°C
Time above liquidus	t_L	60 – 150	sec
Peak temperature			
Peak Temperature	T_P	260	°C
Time within 5°C of peak temperature	tp	20 – 40	sec



PLETRONICS HC44J Series 2.5V HCSL Clock Oscillator

Important Notice

Pletronics Incorporated (PLE) reserves the right to make corrections, improvements, modifications and other changes to this product at anytime. PLE reserves the right to discontinue any product or service without notice. Customers are responsible for obtaining the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to PLE's terms and conditions of sale supplied at the time of order acknowledgment.

PLE warrants performance of this product to the specifications applicable at the time of sale in accordance with PLE's limited warranty. Testing and other quality control techniques are used to the extent PLE deems necessary to support this warranty. Except where mandated by specific contractual documents, testing of all parameters of each product is not necessarily performed.

PLE assumes no liability for application assistance or customer product design. Customers are responsible for their products and applications using PLE components. To minimize the risks associated with the customer products and applications, customers should provide adequate design and operating safeguards.

PLE products are not designed, intended, authorized or warranted to be suitable for use in life support applications, weapons, weapon systems or space applications, devices or systems or other critical applications that may involve potential risks of death, personal injury or severe property or environmental damage. Inclusion of PLE products in such applications is understood to be fully at the risk of the customer. Use of PLE products in such applications requires the written approval of an appropriate PLE officer. Questions concerning potential risk applications should be directed to PLE.

PLE does not warrant or represent that any license, either express or implied, is granted under any PLE patent right, copyright, artwork or other intellectual property right relating to any combination, machine or process which PLE product or services are used. Information published by PLE regarding third-party products or services does not constitute a license from PLE to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from PLE under the patents or other intellectual property of PLE.

Reproduction of information in PLE data sheets or web site is permissible only if the reproduction is without alteration and is accompanied by associated warranties, conditions, limitations and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. PLE is not responsible or liable for such altered documents.

Resale of PLE products or services with statements different from or beyond the parameters stated by PLE for that product or service voids all express and implied warranties for the associated PLE product or service and is an unfair or deceptive business practice. PLE is not responsible for any such statements.

Contacting Pletronics Inc.

Pletronics, Inc.
19013 36th Ave. West
Lynnwood, WA 98036-5761
U.S.A.

Tel: 425.776.1880
Fax: 425.776.2760
email: ple-sales@pletronics.com
URL: www.pletronics.com