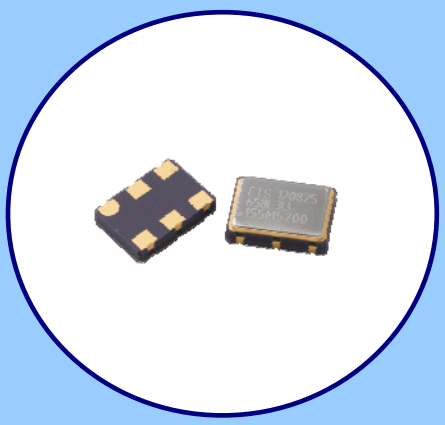
Model 637

Low Jitter
LVPECL or LVDS Clock Oscillator

FEATURES

- **Standard 7.0mm x 5.0mm, 6-Pad Surface Mount Package**
- **Low Phase Jitter, 0.5ps RMS Maximum**
- **LVPECL or LVDS Output**
- **Fundamental and 3rd Overtone Crystal Designs**
- Frequency Range 19.44 – 320 MHz
- Frequency Stability ±50 ppm Standard
- Operating Voltages +2.5Vdc or +3.3Vdc
- Operating Temperature to -40°C to +85°C
- Output Enable Standard
- Tape & Reel Packaging Standard, EIA-418
- **RoHS/Green Compliant [6/6]**



APPLICATIONS

Model 637 is ideal for applications such as broadband access, SerDes, Ethernet/Gigabit Ethernet, SONET/SDH and optical networking.

ORDERING INFORMATION

637 □ □ □ □ □ □ □ □ □

OUTPUT TYPE
- P = LVPECL - Pin 1 Enable [std]
- L = LVDS - Pin 1 Enable [std]
- E = LVPECL - Pin 2 Enable [opt]
- V = LVDS - Pin 2 Enable [opt]

FREQUENCY
- Product Frequency Code [1]

FREQUENCY STABILITY
- 6 = ± 20 ppm [2]
- 5 = ± 25 ppm
- 3 = ± 50 ppm
- 2 = ± 100 ppm

PACKAGING
- T - 1k pcs./reel

SUPPLY VOLTAGE
- 2 = 2.5 Vdc
- 3 = 3.3 Vdc

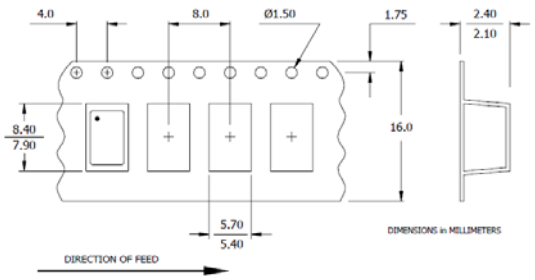
OPERATING TEMPERATURE RANGE
- A = -10°C to +60°C
- C = -20°C to +70°C
- I = -40°C to +85°C [2]

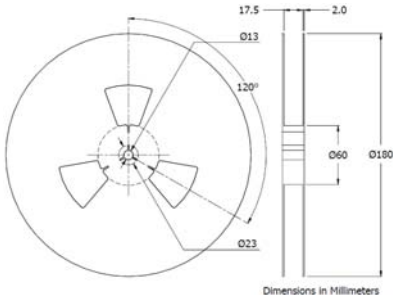
1] Refer to document 016-1454-0, Frequency Code Tables.
3-digits required for frequencies below 100MHz and 4-digits for frequencies 100MHz or greater.
2] Consult factory for availability of 6I Stability/Temperature combination.

Not all performance combinations and frequencies may be available.
Contact your local CTS Representative or CTS Customer Service for availability.

PACKAGING INFORMATION [reference]

Device quantity is 1k pcs. maximum per 180mm reel.





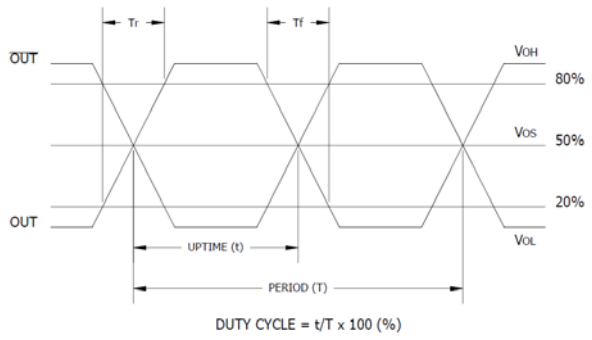
ELECTRICAL CHARACTERISTICS

	PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
ELECTRICAL PARAMETERS	Maximum Supply Voltage	V_{CC}	-	-0.5	-	5.0	V
	Storage Temperature	T_{STG}	-	-40	-	+100	°C
	Frequency Range						
	LVPECL	f_O	-	19.44	-	320	MHz
	LVDS			80.00	-	320	
	Frequency Stability	$\Delta f/f_O$	All Inclusive, see Note 1.	-	-	20, 25, 50, 100	± ppm
			1st year aging	-	-	3	
	Operating Temperature						
	Commercial	T_A	-	-20	25	+70	°C
	Industrial			-40		+85	
	Supply Voltage	V_{CC}	± 5 %	2.38	2.5	2.63	V
				3.14	3.3	3.47	
	Supply Current						
	LVPECL	I_{CC}	Maximum Load	-	-	88	mA
	LVDS			-	-	65	
	Start Up Time	T_S	Application of V_{CC}	-	2	5	ms
	Phase Jitter	tjrms	Bandwidth 12 kHz - 20 MHz	-	0.3	0.5	ps
	Period Jitter RMS	pjrms	-	-	2.1	-	
	Period Jitter Pk-Pk		-	-	22	-	
	Enable Function		Standby				V
	Enable Input Voltage	V_{IH}	Pin 1 or 2 Logic '1', Output Enabled	0.7*V_{CC}	-	-	
	Disable Input Voltage	V_{IL}	Pin 1 or 2 Logic '0', Output Disabled	-	-	0.3*V_{CC}	
	Disable Time	T_{PLZ}	Pin 1 or 2 Logic '0' , Output Disabled	-	-	200	ns
	Enable Time	T_{PLZ}	Pin 1 or 2 Logic '1', Output Enabled	-	-	2	ms
	LVPECL WAVEFORM						
	Output Load	R_L	Terminated to V_{CC} - 2.0V	-	50	-	Ohms
	Output Duty Cycle	SYM	@ V_{CC} - 1.3V	45	-	55	%
	Output Voltage Levels						
	Logic '1' Level	V_{OH}	PECL Load, -20°C to +70°C	V_{CC} - 1.025	-	V_{CC} - 0.880	V
	Logic '0' Level	V_{OL}	PECL Load, -20°C to +70°C	V_{CC} - 1.810	-	V_{CC} - 1.620	
	Logic '1' Level	V_{OH}	PECL Load, -40°C to +85°C	V_{CC} - 1.085	-	V_{CC} - 0.880	V
	Logic '0' Level	V_{OL}	PECL Load, -40°C to +85°C	V_{CC} - 1.830	-	V_{CC} - 1.555	
	Rise and Fall Time	T_R, T_F	@ 20% - 80% Levels	-	0.3	0.7	ns
	LVDS WAVEFORM						
	Output Load	R_L	Between Outputs	-	100	-	Ohms
	Output Duty Cycle	SYM	@ 1.25V	45	-	55	%
	Differential Output Voltage	V_{OD}	R_L = 100 Ohms	247	350	454	mV
	Offset Voltage	V_{OS}	LVDS Load	1.125	1.25	1.375	V
	Output Voltage Levels						
	Logic '1' Level	V_{OH}	LVDS Load	-	1.43	1.6	V
	Logic '0' Level	V_{OL}	LVDS Load	0.9	1.1	-	
	Rise and Fall Time	T_R, T_F	@ 20% - 80% Levels	-	0.4	0.7	ns

Notes:

1. Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and 1st year aging.

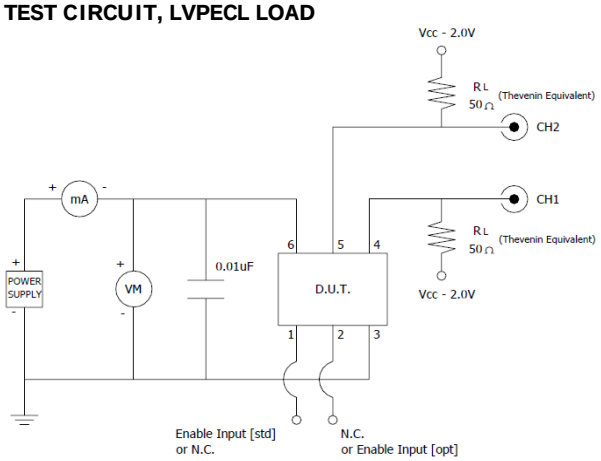
LVPECL/LVDS OUTPUT WAVEFORM



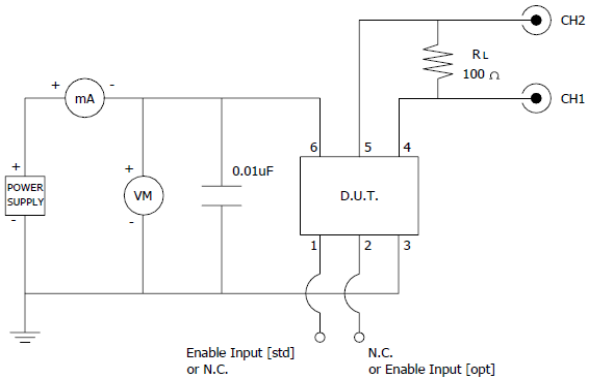
ENABLE TRUTH TABLE

PIN 1 or Pin 2	PIN 4 & 5
Logic '1'	Output
Open	Output
Logic '0'	High Z

TEST CIRCUIT, LVPECL LOAD

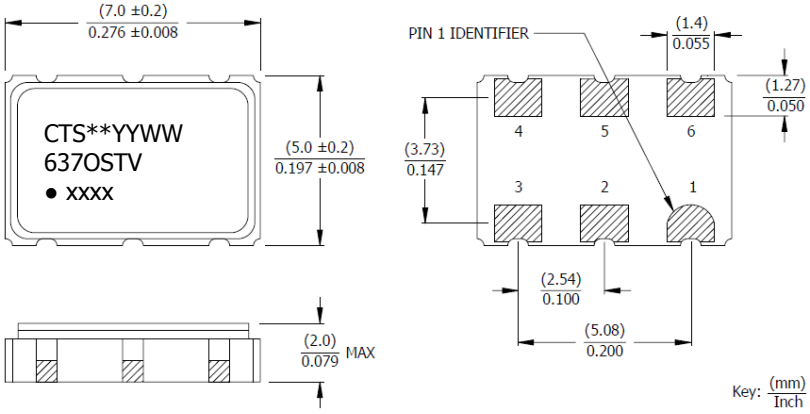


TEST CIRCUIT, LVDS LOAD



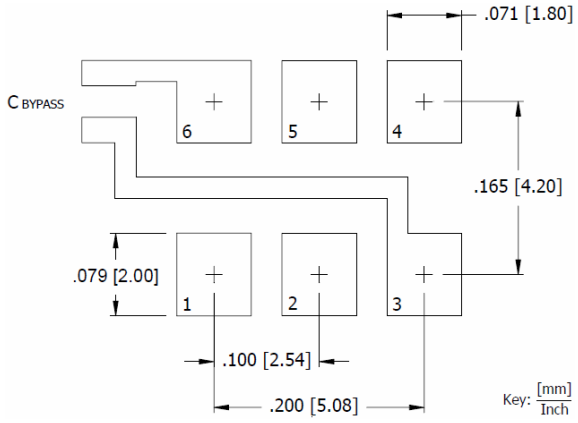
MECHANICAL SPECIFICATIONS

PACKAGE DRAWING



SUGGESTED SOLDER PAD GEOMETRY

C_{BYPASS} should be ≥ 0.01 uF.



MARKING INFORMATION

1. ** - Manufacturing Site Code.
2. YYWW – Date code, YY – year, WW – week.
3. O – Output Type. P or E = LVPECL, L or V = LVDS.
4. ST – Frequency stability/temperature code. [Refer to Ordering Information.]
5. V – Voltage code. 3 = 3.3V, 2 = 2.5V
6. xxxx – Frequency Code.
   3-digits, frequencies below 100MHz
   4-digits, frequencies 100MHz or greater.

Refer to document 016-1454-0, Frequency Code Tables.

NOTES

1. Complete CTS part number, frequency value and date code information must appear on reel and carton labels.
2. Termination pads [e4]. Barrier-plating is nickel [Ni] with gold [Au] flash plate.
3. Reflow conditions per JEDEC J-STD-020; 260°C maximum, 20 seconds.
4. MSL = 1.

D.U.T. PIN ASSIGNMENTS

PIN	SYMBOL	DESCRIPTION
1	EOH or N.C.	Enable [std] or No Connect
2	N.C. or EOH	No Connect or Enable [opt]
3	GND	Circuit & Package Ground
4	Output	RF Output
5	Output	Complimentary RF Output
6	V_{CC}	Supply Voltage