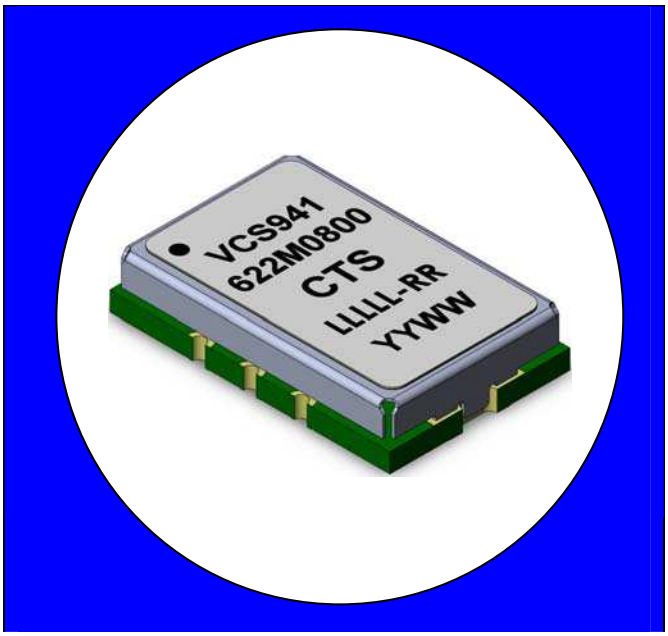
VCS941

Low Kv, 9x14mm VCSO

APPLICATIONS

Frequency Translation and Jitter Attenuation
SONET/ SDH
10 GbE
WiMAX
Base Stations/ Picocells
DAC clocking



FEATURES

- Low Tuning Gain Transfer
- Industry Standard 9x14mm SMT Footprint
- +3.3 Vdc Supply Voltage
- -40℃ to 85℃ Temp. Range
- LVPECL differential outputs
- ± 50ppm Absolute Pull Range (APR)
- Output Enable/Disable Function
- SAW resonator
- Extremely Low Jitter
-

DESCRIPTION

Surface mount 9x14mm VCSO operating at 3.3V supply with complementary LVPECL outputs for use in datacom, telecom, and DAC clock applications.

ELECTRICAL SPECIFICATIONS

Parameter	Conditions & Remarks	Min	Typical	Max	Unit
Operating Conditions					
Nominal Frequency	f_{NOM}	460	460.8, 491.52, 622.08, 644.5313, 666.514, 669.3266 693.483, 768	1000	MHz
Operating Temperature Range		-40	-	85	℃
Storage Temperature Range		-55	-	125	℃
Supply Voltage	V_{CC}; ±5%	3.135	3.300	3.465	Vdc
Supply Current	I_{cc}; Max. V_{CC}; T_A = 25°C load = 50Ω to V_{CC} – 2V	-	60	70	mA
Load	output to V_{CC} -2V	-	50	-	Ω
Frequency Stability					
Frequency vs. Temperature	ref to T_A = 25°C; V_C = constant	-	+20 -160	-	ppm
Electronic Frequency Control					
Input Impedance	Z_i	50	100	-	kΩ
Control Voltage Range	V_C ; positive monotonic transfer	0.3	-	3.0	Vdc
Gain Transfer	Kv	-	180	-	ppm/V
Absolute Pull Range	APR; all causes (see Note 1)	± 50	-	-	ppm
Modulation Bandwidth	-3dB ref. 100Hz	-	50	-	kHz
Linearity	Deviation from best linear fit	-	2	10	%

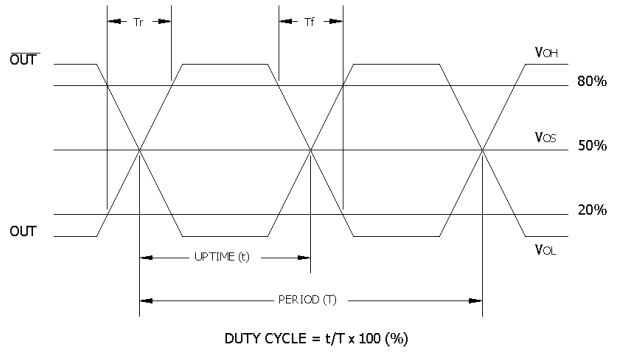
NOTE 1: Minimum guaranteed frequency shift ($\Delta f/f_{NOM}$) under all conditions (temperature, aging, supply voltage, load) for 15 years at an average effective operating temperature of +55℃

• • • CTS Electronic Components, Inc. • 171 Covington Drive • Bloomingdale, IL 60108 • • •
• • • www.ctscorp.com • • •

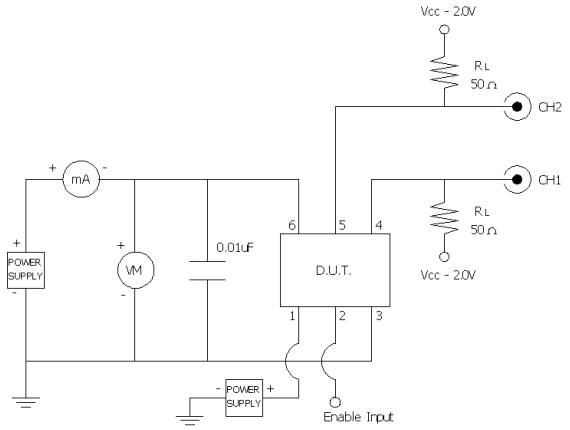
ELECTRICAL SPECIFICATIONS (Continued)

Parameter	Conditions & Remarks		Min	Typical	Max	Unit
Output Parameters						
Output Signal				LVPECL		
Amplitude		V_{OL}	-	-	V_{CC}-1.620	Vdc
		V_{OH}	V_{CC}-1.025	-	-	
Rise/Fall Times	20% to 80%		-	250	400	ps
Duty Cycle	@ 50% of output signal		45	50	55	%
Start up time	to reach 90% of final amplitude		-	-	10	ms
Phase Noise	Typical for 622.08 MHz	100Hz	-	-85	-	dBc/Hz
		1kHz	-	-110	-	dBc/Hz
		10kHz	-	-140	-	dBc/Hz
		100kHz	-	-143	-	dBc/Hz
		1MHz	-	-143	-	dBc/Hz
Phase Jitter	12kHz to 20MHz (calculated from 622 MHz Phase Noise)		-	0.16	0.3	ps RMS
	50kHz to 80MHz (calculated from 622 MHz Phase Noise)		-	0.16	0.3	ps RMS

LVPECL OUTPUT WAVEFORM



TEST CIRCUIT, LVPECL LOAD

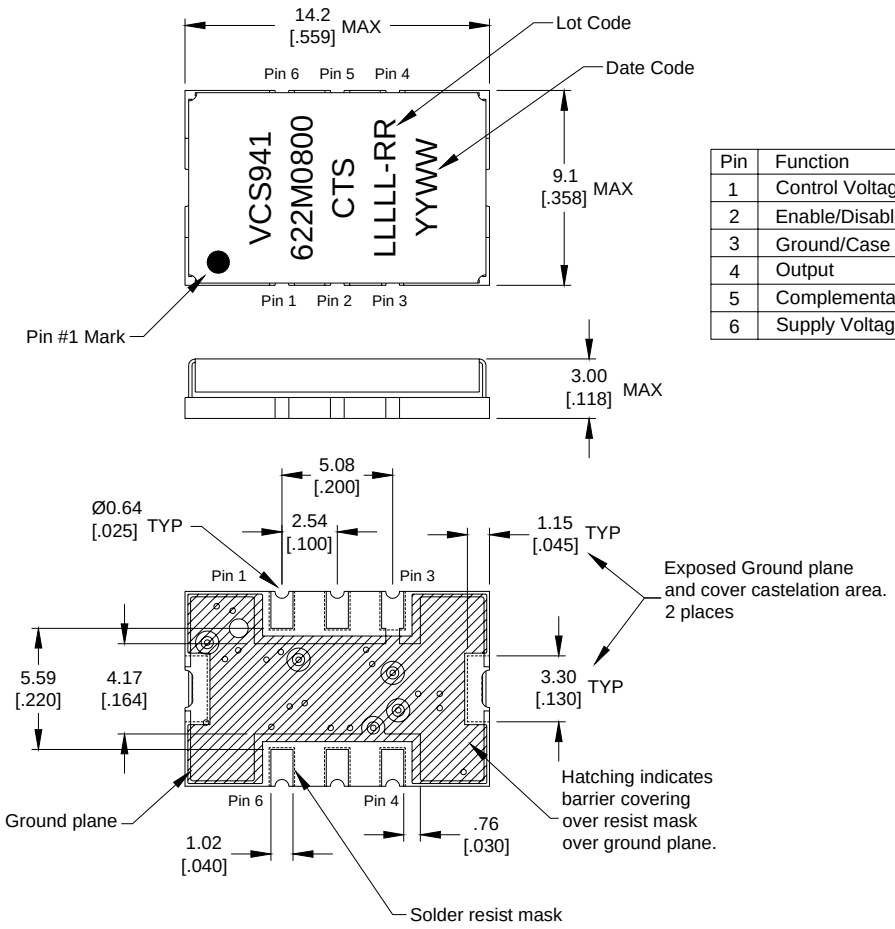


OUTPUT ENABLE/DISABLE LOGIC			
Pad 2		**Pad 4**	**Pad 5**
Low "0"	outputs disabled	PECL Low	PECL High
Open	outputs enabled	Output	Comp. Output
High "1"	outputs enabled	Output	Comp. Output

• • • CTS Electronic Components, Inc. • 171 Covington Drive • Bloomingdale, IL 60108 • • •
• • • www.ctscorp.com • • •

MECHANICAL SPECIFICATIONS

PACKAGE DRAWING



Pin	Function
1	Control Voltage - Vc
2	Enable/Disable Control
3	Ground/Case
4	Output
5	Complementary Output
6	Supply Voltage - Vcc

All dimensions are in MM [Inches].

All dimensions are Nominal unless otherwise specified.

Lead Termination Finish: Gold Flash, <10 micro inch, over Ni plated Cu.

Lead Termination Finish: Gold flash, <10 micro inch, over 100 micro inch minimum Ni plated Cu

Co-Planarity (from seating plane): 0.1 [0.004] maximum

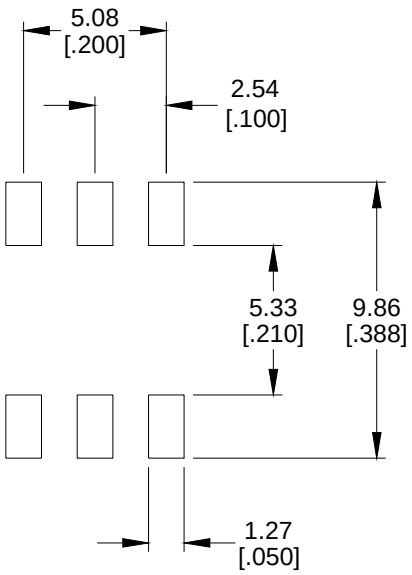
Dimensions in mm and [inches]

PAD FUNCTION

1 - Control Voltage - V_C
2 - Enable/Disable Control
3 - Ground/Case
4 - Output
5 - Complementary Output
6 - Supply Voltage - V_{CC}

• • • CTS Electronic Components, Inc. • 171 Covington Drive • Bloomingdale, IL 60108 • • •
• • • www.ctscorp.com • • •

SUGGESTED SOLDER PAD GEOMETRY



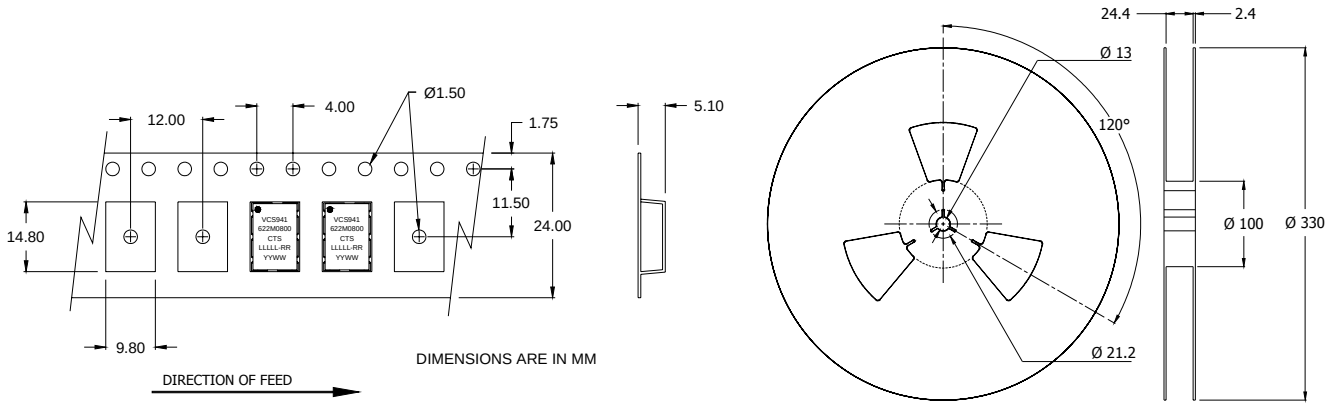
Dimensions are in mm and [inches].

MAXIMUM SOLDERING PROFILE

Temperature	217℃	260℃ (Absolute max temperature)
Time	60-150 sec	10 sec. max

Note: Part is not designed to be reflowed in an inverted position.

TAPE AND REEL INFORMATION



Device quantity is 1000 pieces max. per 330mm reel.

• • • CTS Electronic Components, Inc. • 171 Covington Drive • Bloomingdale, IL 60108 • • •
• • • www.ctscorp.com • • •

ENVIRONMENTAL SPECIFICATIONS

This product is capable of operating within the following environmental conditions:

Operating Temperature	-40 to +85 °C
Storage Temperature	-55 to 125°C
Humidity	95% Relative humidity max @ 40°C
Atmospheric Pressure	730 to 780 mm Hg
Moisture Sensitivity	Level 1
RoHS	Fully compliant to RoHS Directive 2002/95/EC

Model 941 Part Number Generator:

P/N example: VCS941-622M0800

• • • CTS Electronic Components, Inc. • 171 Covington Drive • Bloomingdale, IL 60108 • • •
• • • www.ctscorp.com • • •