SPEC. NO.: SCO-B228

OSC SPECIFICATION

Customer :

Customer P/N :

Agent :

Agent Code :

SIWARD P/N : OSC813250-SCO-B228

Customer Approval :

希華晶體科技股份有限公司
SIWARD CRYSTAL TECHNOLOGY CO., LTD.

業務部/ SALE DEPARTMENT
TEL: (04)25347909
FAX: (04)25327885 / 25337396
URL HTTP://www.siward.com.tw

品質保證部/ QUALITY ASSURANCE DEPT.
TEL: (04)25347909 EXT 1340/1341

研發部/R & D DEPT.
TEL: (04)25347909 EXT 1534

Address:1-1,LANE 111,JUNG-SHAN RD.,SEC.3, TANTZU HSING,TAICHUNG 427,TAIWAN,R.O.C.

DATE : 2026/06/02

Approved By : Cat Wu

Checked By : Angel Hsu

Designer : Scott Lin

Rev.	Description of Revision History	Date	Designer	Checked By
1	New Publication	2009/04/27	Scott Lin	Angel Hsu
2	MODIFY Marking(Date code Description)(104K1408-004)	2014/08/29	Scott Lin	Angel Hsu

SPEC. NO.: SCO-B228

OSC SPECIFICATION

1. Description : Crystal Oscillator

2. Center Frequency : 25.000000 MHz

3. Dimension & Drawing No. : OSC81 ; CXO-012

4. Packing Style : TP-102

5. Measurement Circuit :

6. Absolute Maximum Ratings :

Item	Symbol	Rating	Unit	Condition
Supply Voltage	Vcc	-0.6 to 6	V	
Storage Temperature	Tstg	-55 to 125	℃	

7. Electrical Characteristics :

[1] Operating Conditions :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Supply Voltage	Vcc	3.135	3.3	3.465	V	
Operating Temp. Range	Topt	-40		85	℃	
Load(Capacitance)	C	13.5	15	16.5	pF	
Tri-state(standby function)	Vih	2.97		Vdd	V	Oscillation Enable
Tri-state(standby function)	Vil	GND		0.33	V	Oscillation Disable

[2] Frequency Stability :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Frequency Stability	dF/Fo	-25		25	ppm	Include Freq. Tolerance, Temp., Supply voltage, Load.
Frequency Tolerance	dF/Fo				ppm	Refer to Center Frequency @25±3℃
Vs. Temperature	dF/Fo				ppm	
Vs. Supply Voltage	dF/F25				ppm	
Vs. Load	dF/F25				ppm	
Vs. Aging	dF/F25	-5		5	ppm	PER YEAR (AT 25℃ ± 5℃)

[3] Electrical Performance :

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Output Waveform						Square / HCMOS
Current Consumption	Icc			13	mA	
Output Level Logic 1	Voh	2.97			V	
Output Level Logic 0	Vol			0.33	V	
Duty Cycle	D.C	45	50	55	%	@ 1.65 V
Rise/Fall Time	Tr/Tf			10	nS	
Start Time				10	mS	@+3.135V

dF/Fo: Frequency Deviation Refer to Center Frequency

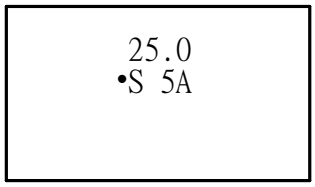
dF/F25: Frequency Deviation Refer to 25 ℃ Frequency

8. Marking : Laser

＊5A: YEAR -> 5 (Last 1 digit of the year) MONTH -> A

MONTH : 1 2 3 4 5 6 7 8 9 10 11 12

CODE : A B C D E F G H J K L M

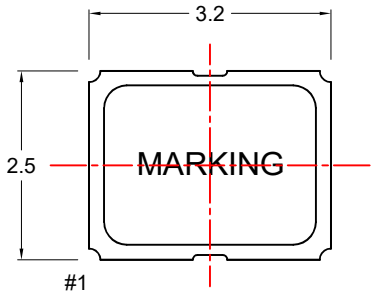


9. Remark :

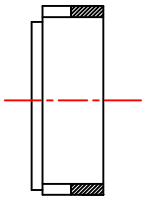
＊The component complies with Moisture Sensitivity Level(MSL)-Level 1 defined on JEDEC J-STD-020 standard.

＊Lead Free,RoHS Compliant

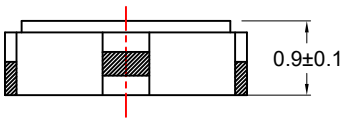
TOP VIEW



SIDE VIEW



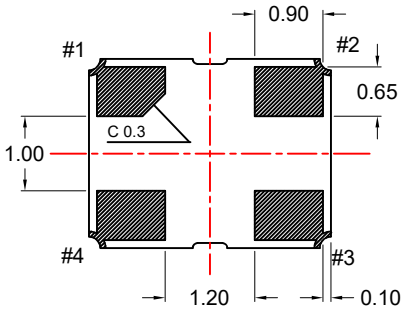
FRONT VIEW



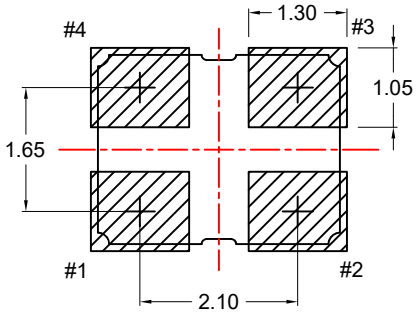
Terminal	Connection
#1	Tri-state or N.C
#2	GND
#3	Output
#4	Vcc

Tri-state Function	
Tri-state pin	Output
High or Floating	Active
Low	Hi-Impedance

BOTTOM VIEW



LAND PATTERN (REFERENCE)

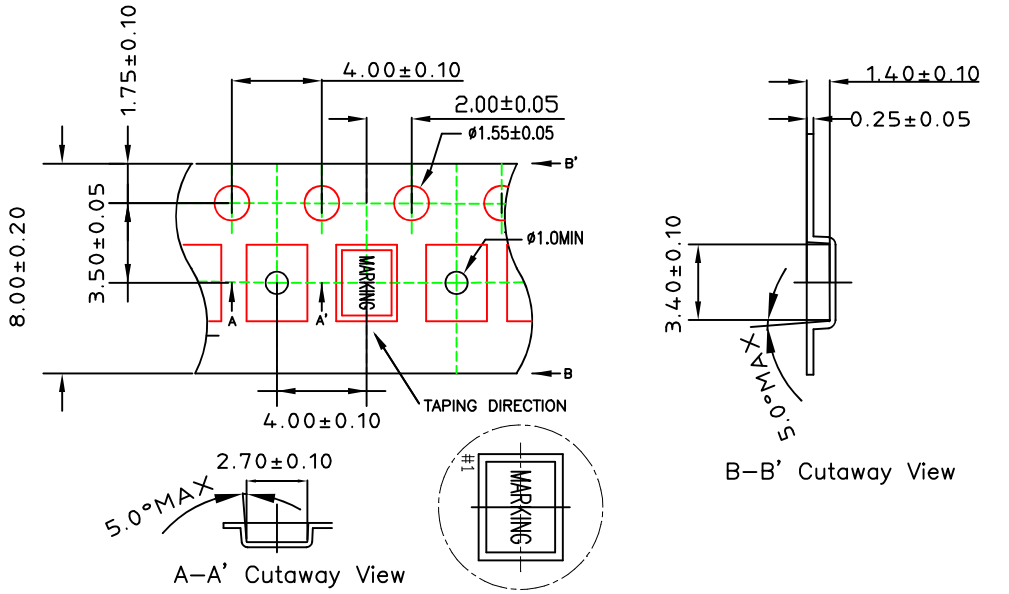


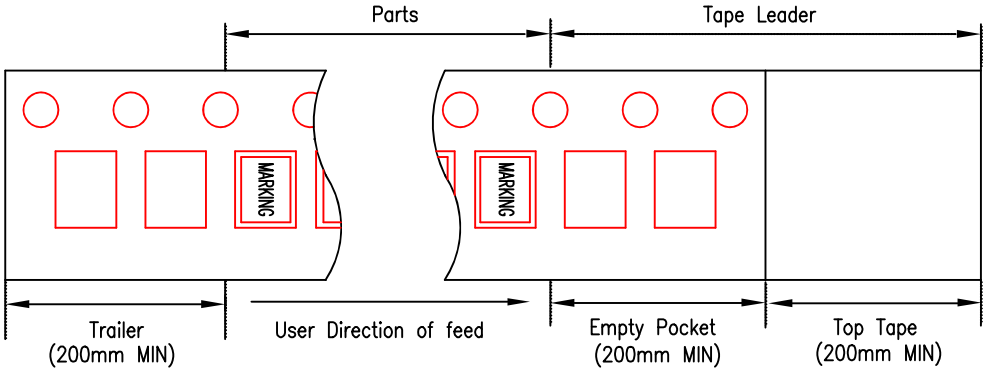
5	STANDARDIZED FORMAT	'23.08.09	DRAWING NAME		OSC81		Tolerance
4	ADD TOP & BOTTOM VIEW	'12.08.13	DRAWING NO.		CXO-012		X.X = ±0.15 X.XX = ±0.13
1	NEW EDITION	'04.03.02	SCALE	10:1	UNIT	mm	X.XXX = X° =
NO.	MODIFY CONTENTS	DATE	APPROVE	Andy	DESIGNER	Ruolan	

SIWARD TND 2023/10/20 ver. 05

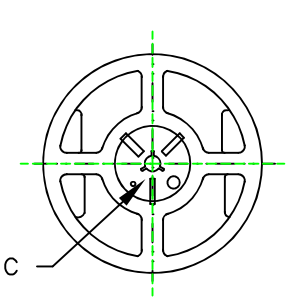
"X.X" represents the common tolerance value for dimensions on the drawing. If there are differences, they will be individually marked.

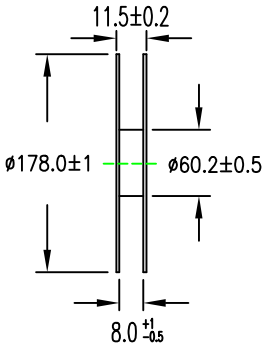
1.CARRIER TYPE



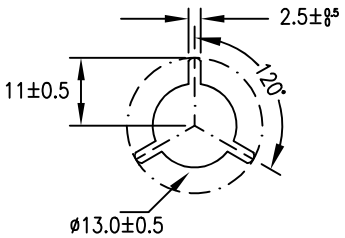


2.REEL : 3000PCS





C.ENLARGE



7	ADD PIN1 MARK & DELETE DOT MARK	'24.09.18	DRAWING NAME	OSC 3225 REEL PACKING		
6	MODIFY TOLERANCE	'21.12.07	DRAWING NO.	TP-102		
1	NEW EDITION	'04.04.12	SCALE		UNIT	mm
NO.	MODIFY CONTENTS	DATE	APPROVE	Andy	DESIGNER	Emma

SWARD
TND
2024/9/24
ver. 07

OSC	RELIABILITY SPECIFICATION
REFER TO	JIS C 6710
APPLICATION	SMD TYPE

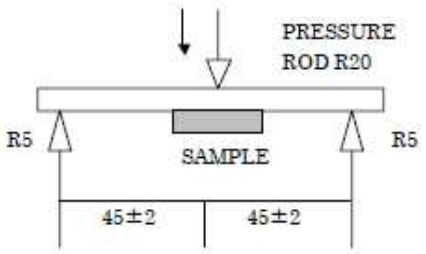
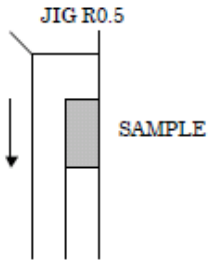
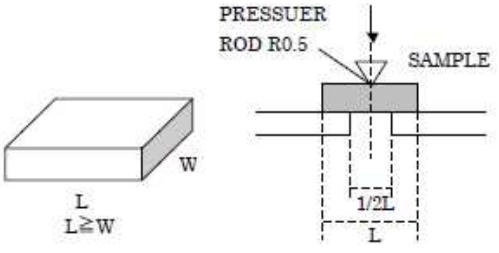
ENVIRONMENTAL PERFORMANCE

ITEM	CONDITION	SPECIFICATIONS
1.AGING ON POWER	TEMPERATURE:85±3℃ TIME:720H±12H. VOLTAGE:SUPPLY VOLTAGE Vcc MEASURE UNDER THE STABILIZED THE ENVIRONMENT.	CLAUSE ITEM 7 SHALL BE SATISFIED.
2.HIGH TEMPERATURE STORAGE	STORED AT 85±3℃ FOR 500±12H. THEN 25±2℃ OVER 2 H BEFORE TESTING.	SAME AS ABOVE.
3. LOW TEMPERATURE STORAGE	STORED AT –40±3℃ FOR 500±12H. THEN 25±2℃ OVER 2 H BEFORE TESTING.	SAME AS ABOVE.
4. HIGH TEMP. & HUMIDITY	STORED AT 60±3℃ AND HUMIDITY 90～95% FOR 500±12 H. THEN 25±2℃ OVER 2 H BEFORE TESTING.	SAME AS ABOVE.
5. TEMPERATURE CYCLE	THE OSC UNIT SHALL BE SUBJECTED TO 100 SUCCESSIVE CHANGE OF TEMPERATURE CYCLES, THEN 25 ±2℃ OVER 2 H BEFORE TESTING, EACH CYCLE AS BELLOW： TEMPERATURE — DURATION 1. -40+0/-6℃ — 30±3 MINUTES 2. 25℃±2℃ — 2～3 MINUTES 3. 85+4/-0℃ — 30 ±3 MINUTES 4. 25℃±2℃ — 2～3 MINUTES	SAME AS ABOVE.

MECHANICAL PERFORMANCE

ITEM	CONDITIONS	SPECIFICATIONS
6. SOLDERABILITY	THE LEAD IS IMMERSED IN A 260±5℃ SOLDER BATH WITHIN 2±0.5 SECONDS.	A NEW UNIFORM COATING OF SOLDER SHALL COVER A MINIMUM 95% OF THE SURFACE
7. RESISTANCE TO SOLDERING HEAT	REFLOW CHART AS ATTACH SHEET. TWICE PASS.	CLAUSE ITEM 7 SHALL BE SATISFIED.
8. GROSS LEAK	STANDARD SAMPLE FOR AUTOMATIC GROSS LEAK DETECTOR, TEST PRESSURE: 0.2 Mpa	PRESSURE GAP LESS THAN 1*1E-4 Pa・m³/sec
9. FINE LEAK	HELIUM BOMBING 5.0～5.5 Kgf / cm² FOR 2 HOURS	LEAK RATE LESS THAN 1*1E-9 Pa・m³/sec
10. VIBRATION	FREQUENCY：10～55Hz, AMPLITUDE (TOTAL EXCURSION)：1.5mm (10Hz~36Hz), ：4G (36Hz~55Hz) SWEEP TIME ：1MIN./ 1oct DIRECTION TIME ：2Hrs for each X, Y, Z axis	CLAUSE ITEM 7 SHALL BE SATISFIED.

SIWARD
TND
2020/4/6
ver. 06

OSC	RELIABILITY SPECIFICATION	
REFER TO	JIS C 6710	
APPLICATION	SMD TYPE	
MECHANICAL PERFORMANCE		
ITEM	CONDITIONS	SPECIFICATIONS
11. FREE FALL	FREE DROPPING FROM 100 cm HEIGHT, 3 TIMES ON A HARD WOODEN BOARD.	CLAUSE ITEM 7 SHALL BE SATISFIED.
12. TERMINAL STRENGTH	SHALL BE PRESSURIZED AT A SPEED OF APPROX.0.5mm/sec IN THE DIRECTION INDICATED BY THE ARROW UNTIL THE BENDING WIDTH REACHES 3mm AND HELD FOR 5 SECONDS. 	SAME AS ABOVE.
13. STICKING TENDENCY	A R0.5 JIG SHALL BE USED TO APPLY A 10N DEAD LOAD IN THE DIRECTION INDICATED BY THE ARROW TO THE ELEMENT AND RETAIN IT FOR 10 SECONDS. 	SAME AS ABOVE.
14. ELEMENT ASSEMBLY STRENGTH	A R0.5 PRESSURIZED BAR SHALL BE USED TO APPLY A 10N LOAD IN THE CENTER OF ELEMENT AND RETAIN IT FOR 10 SECONDS. 	SAME AS ABOVE.

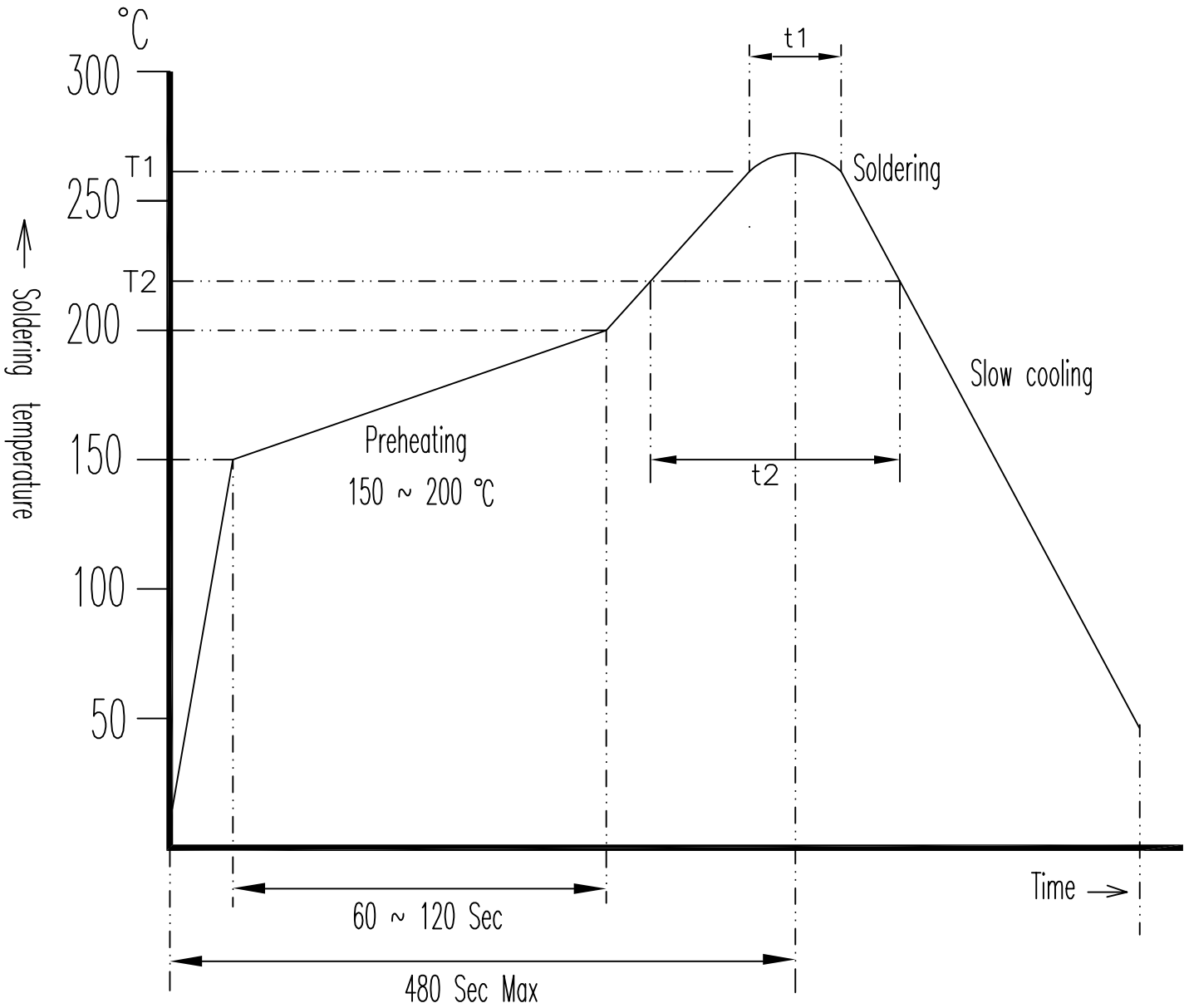
SIWARD
TND
2020/4/6
ver. 06

OSC	RELIABILITY SPECIFICATION
REFER TO	JIS C 6710
APPLICATION	SMD TYPE

ENVIRONMENTAL PERFORMANCE
FREQUENCY STABILITY (ITEM.1-5)：△F

Series	Freq. Tolerance below ± 30 ppm	Freq. Tolerance above ± 30 ppm
△F	± 3 ppm	± 5 ppm

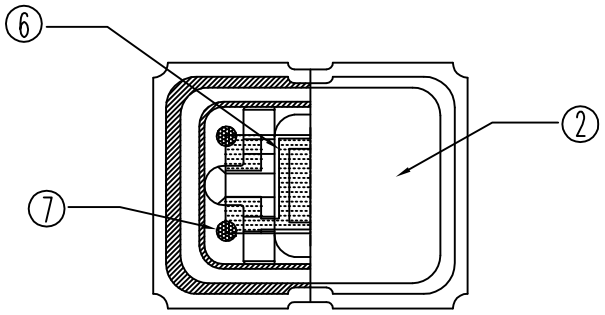
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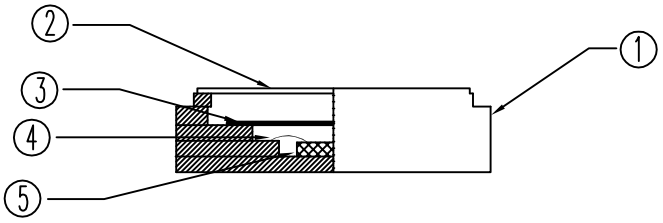


Application \ Temperature/Time	T1/t1	T2/t2
Lead Free	260±5°C/10±5 Sec	217°C Min/60~150 Sec
Non Lead Free	240±5°C/10±5 Sec	183°C Min/60~150 Sec

NO.	MODIFY CONTENTS	DATE
6	MODIFY Preheating&Temperature/Time	'13.08.29
5	MODIFY DRAWING NAME	'07.07.06
1	NEW ISSUANCE	'99.12.10

DRAWING NAME	QUARTZ DEVICE SMD REFLOW CHART		
DRAWING NO.	FLOW-004		
SCALE		UNIT	
APPROVE	John	DESIGNER	Benson





PART NAME		MATERIAL	PART NAME		MATERIAL	PART NAME		MATERIAL
1	BASE	CERAMIC	4	WIRE	Au	7	ADHESIVES	SILVER GLUE
2	LID	Co	5	IC	CHIP			
3	BLANK	QUARTZ	6	ELECTRODE	Metal			

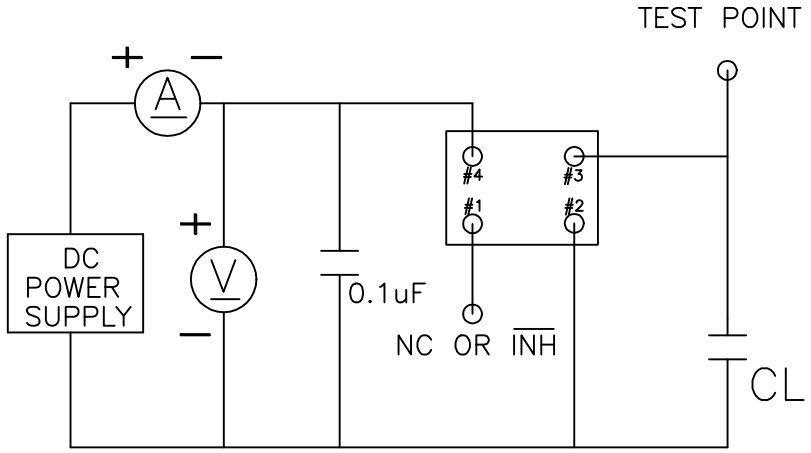
NO.	MODIFY CONTENTS	DATE
4	MODIFY ELECTRODE MATERIAL	'09.01.15
3	MODIFY WIRE MATERIAL	'08.02.22
1	NEW EDITION	'04.07.22

DRAWING NAME	3.2X2.5 OSC CUTAWAY VIEW		
DRAWING NO.	CUT-C-015		
SCALE		UNIT	
APPROVE	Steve	DESIGNER	Olive

<CMOS>

TEST CIRCUIT

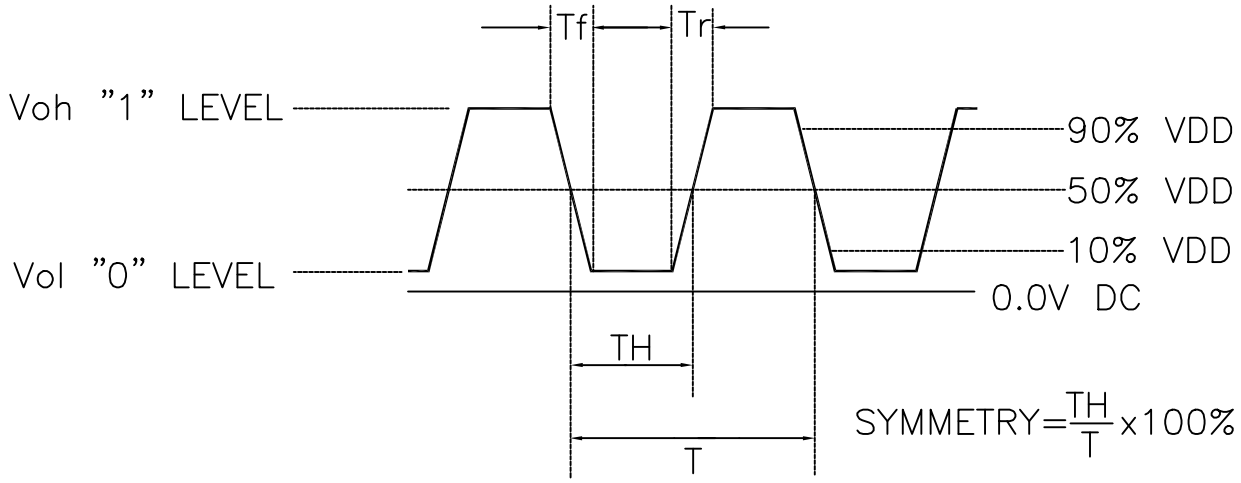
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* CL= pF(INCLUDING PROBE AND JIG CAPACITANCE)

OUTPUT WAVEFORM

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			DRAWING NAME	TEST CIRCUIT(CXO-012,014)			
2	MODIFY DRAWING NAME	'06.02.15	DRAWING NO.	CR-083			
1	NEW EDITION	'04.07.22	SCALE			UNIT	
NO.	MODIFY CONTENTS	DATE	APPROVE	Casta		DESIGNER	Olive