RoHS Compliant

APPROVAL SHEET

Issued No. : SLOA231106

DESCRIPTION	:	**SMD 3225 XO HCSL OUTPUT**
NOMINAL FREQ.	:	**100.000000 MHz**
TAITIEN P/N	:	**A0186-L-001-3**
TAITIEN MODEL	:	
REVISION	:	**4**
DATE	:	**12/01/2023**

Approval	Checked by	Prepared by
	Dick Lin	Irene Chiou

CUSTOMER	:	
CUSTOMER P/N	:	

Customer Signature
Approved:
Date:

REVISION HISTORY

Rev.	Revised Page	Revision Content	Date	Ref. No.	Reviser
01	N/A	Initial Released	10/13/2023	N/A	Eason Lee
02	Page.5	Update jitter	11/02/2023	N/A	Eason Lee
03	Page.5	Update RMS Phase Jitter 0.2ps (typ.)	11/15/2023	N/A	Eason Lee
04	Page.5	Update Period Jitter & Cycle to cycle jitter	11/27/2023	N/A	Eason Lee

CONTENT

ATTACHMENT

■ ELECTRICAL CHARACTERISTICS

➢ FREQUENCY

	Parameter	Min.	Typ.	Max.	Units	Remarks
1-1	Nominal Frequency		100.000000		MHz	
1-2	Frequency stability (Overall)	-25		+25	ppm	Frequency stability includes frequency tolerance@25℃ and frequency stability vs. operating temperature range and voltage variance.
1-3	Aging	-3		+3	ppm	Frequency drift in first year @25℃
1-4	Operating Temperature range	-40		+105	°C	The operating temperature range over which the frequency stability is measured.
1-5	Storage Temperature range	-55		+125	°C	

➢ POWER SUPPLY

	Parameter	Min.	Typ.	Max.	Units	Remarks
2-1	Supply voltage	1.71	1.8	1.89	V	
2-2	Current			30	mA	At maximum supply voltage
2-3	Standby current			10	uA	OE pin Low and disable frequency output

➢ INPUT

	Parameter		Min.	Typ.	Max.	Units	Remarks
3-1	OE (Tri-State)	Output enable	0.7V_{DD}			V	High or floating(*Note1): Enable frequency output
3-2		Output disable and High-Impedance			0.3V_{DD}	V	Low: Disable frequency output

*Note 1 : A pull-up resistor of <30kΩ between the OE pin and V_{DD} is recommended in a high noise environment.

➢ OUTPUT

	Parameter		Min.	Typ.	Max.	Units	Remarks
4-1	Output waveform			HCSL			
4-2	Duty Cycle		45	50	55	%	
4-3	Start Time				10	mSec	
4-4	Transition Time : Rise/Fall Time				0.6	nSec	
4-5	Output Level	Output High(Logic "1")	0.55		1	V	
4-6		Output Low(Logic "0")			0.15	V	
4-7	Output Load			50Ω			To GND

➢ JITTER

	Parameter	Min.	Typ.	Max.	Units	Remarks
5-1	RMS Phase Jitter		0.2	0.3	pSec	(12KHz - 20MHz)
5-2	Cycle to cycle jitter			40	pSec	
5-3	Long-term jitter (10K cycles)			60	pSec	

➢ PHASE NOISE

	Parameter	Min.	Typ.	Max.	Units	Remarks
6-1	100Hz offset		-90		dBc/Hz	
6-2	1KHz offset		-120		dBc/Hz	
6-3	10KHz offset		-130		dBc/Hz	
6-4	100KHz offset		-140		dBc/Hz	

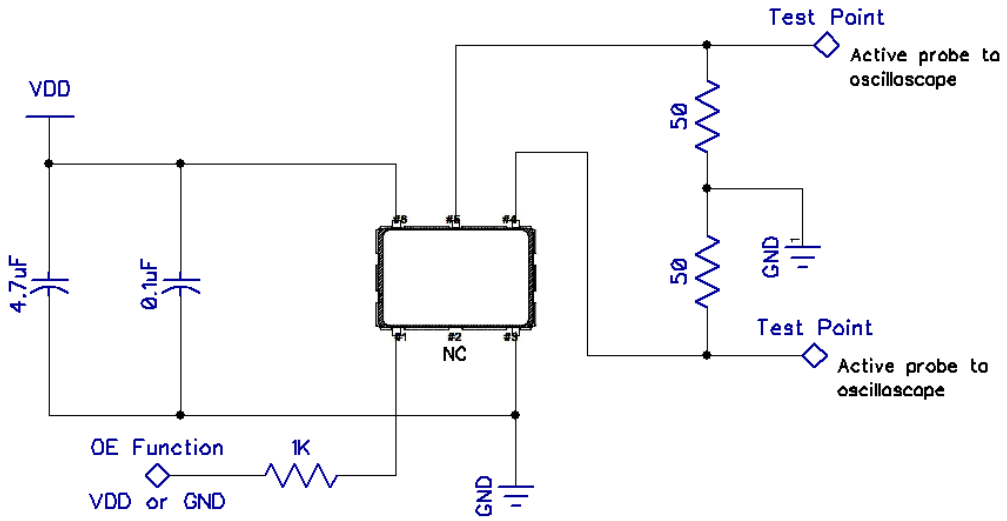
■ CUSTOMER SPECIAL REQUIREMENT

7-1	

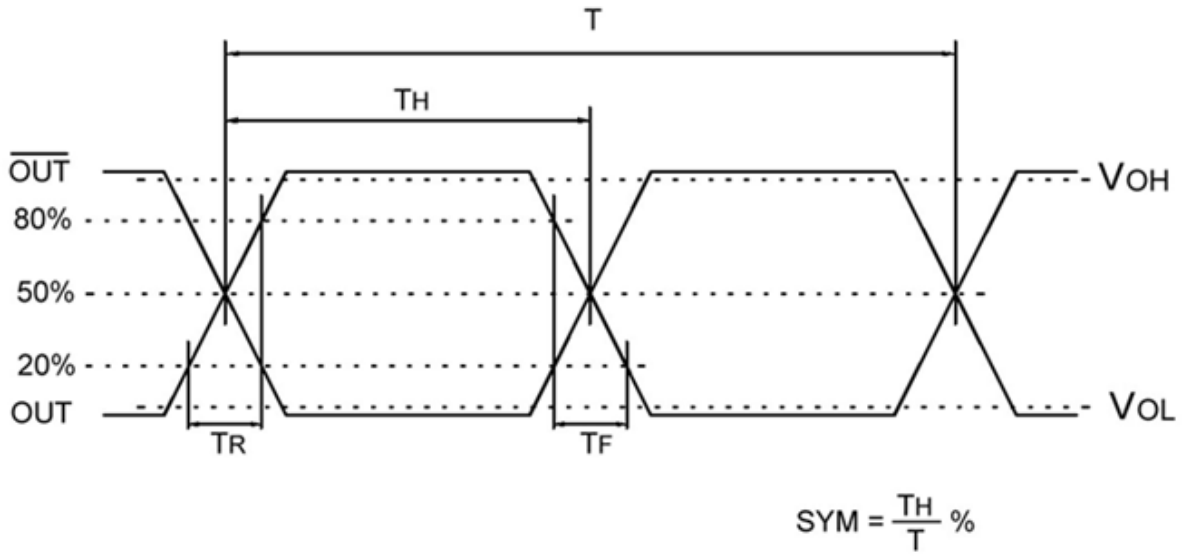
■ ENVIRONMENTAL & RELIABILITY SPECIFICATIONS

	Parameter	Reference Std.	Remarks
8-1	Thermal Shock	MIL-STD-883H 1010.8 Condition B	-55℃, 125℃; soak time is 10 mins, with total 200 cycles
8-2	Damp Heat	JESD22-A101	85℃/85% RH for 500 hrs
8-3	Low Temp Storage	IEC 60068-2-1	-55℃ for 500 hrs
8-4	Drop Test	IEC 60068-2-32	70, 80, 100cm,each height for 3 times on hardboard
8-5	Mechanical Shock	MIL-STD-883H 2002.5 Condition B	1500g, half-sine, 0.5ms, each axis for 3 times.
8-6	Vibration Test	MIL-STD-883H 2007.3 Condition A	10~2000Hz, 1.52mm, 20g, each axis for 4 hrs

■ TEST CIRCUIT (HCSL LOAD)



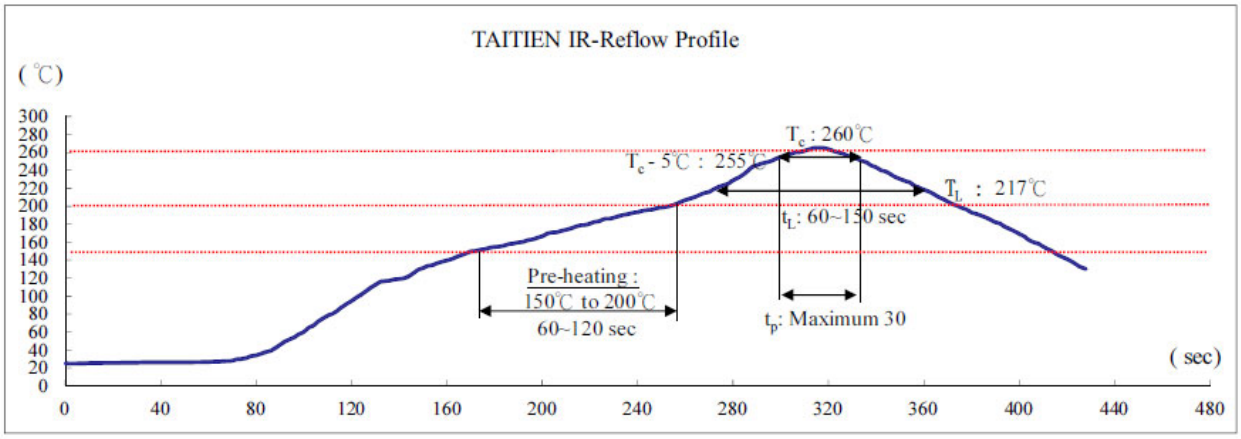
■ OUTPUT WAVEFORM (HCSL LOAD)



RECOMMENDED IR REFLOW PROFILE

IR REFLOW PROFILE OF CERAMIC SMD PRODUCTS FOR Pb FREE PROCESS

TAITIEN ELECTRONICS CO., LTD.

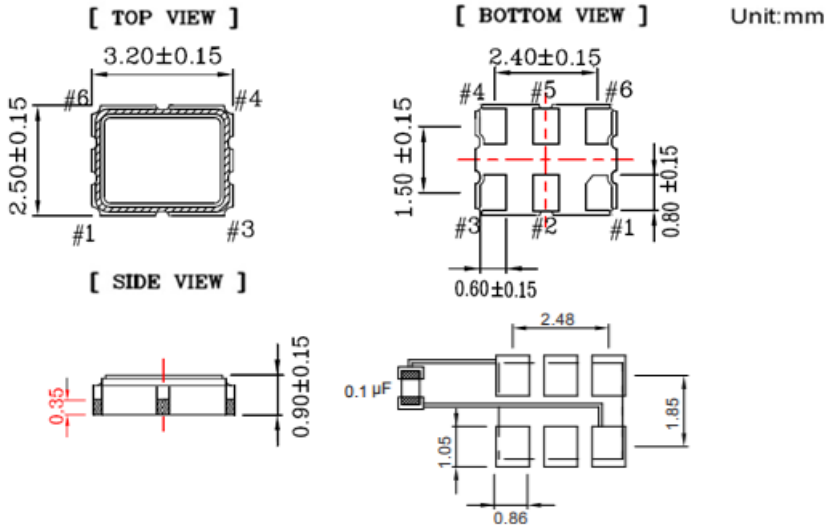


Reference Standard: JEDEC-STD 020
Test conditions: Pre-heating : 150℃ to 200℃, 60~120secs.
Liquidous temperature (T_L) & Time (t_L): Heating : 217℃, 60~150sec.
T_c is 260 ℃ and time t_p is 30 seconds,
T_c : classification temperature ; the maximum body temperature at which the component manufacturer guarantees the component MSL as noted on the caution and/or bar code label per J-STD-033.
t_p : time within 5 ℃ of the specified classification temperature (T_c).

**The peak temperature must not exceed 260 ℃. The time t_p above 255 ℃ must not exceed (Max.) 30 seconds.

■ PRODUCT DIMENSIONS

➢ DIMENSIONS



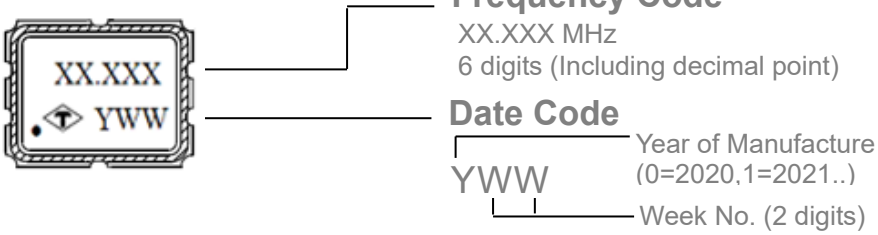
To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

➢ PIN FUNCTIONS

NO	Name	Type	Function and Remarks
1	OE (Tri-state)	Input	Output control pin. Reference as below table Input level / Oscillation / Outputs "H" / Enable / Enable: Specified frequency "L" / Disable / Disable: Hi-Z
2	N.C.	-	Non-connect
3	GND	Power-	GND pin
4	OUT	Output	Frequency output
5	$\overline{OUT}$	Output	Frequency output, inversion #4
6	V_{DD}	Power+	Power Supply, V_{DD} pin

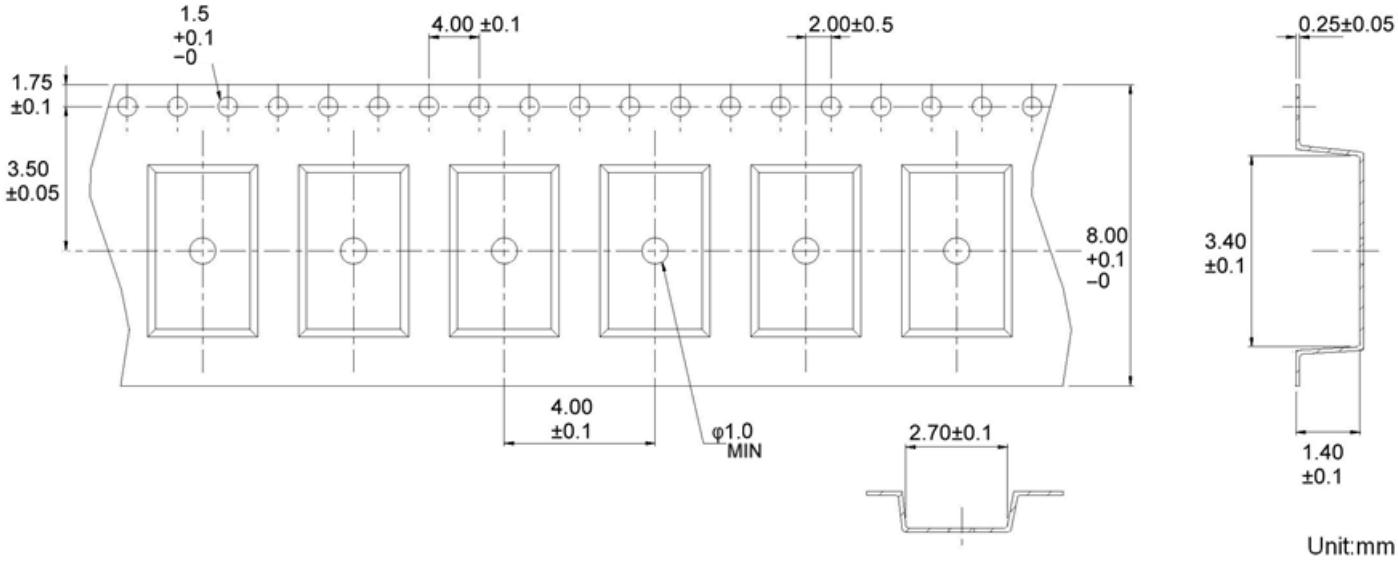
■ PRODUCT IDENTIFICATION (MARKING)

➢ PROCEDURE : LASER

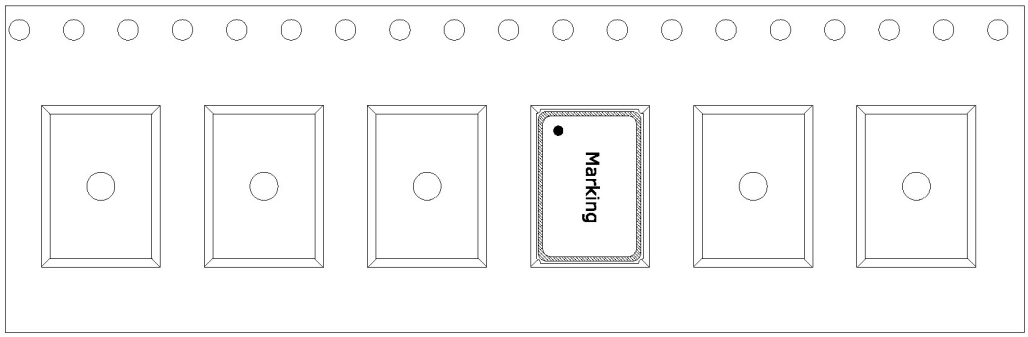


■ PACKAGE INFORMATION

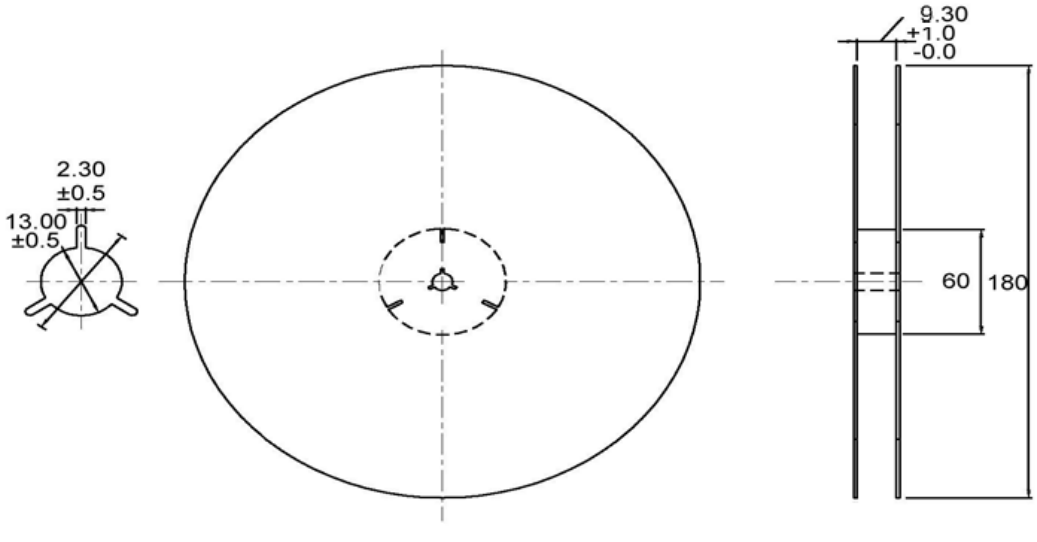
➢ TAPE (CARRIER) DIMENSIONS



➢ THE DIRECTION OF PACKING



➢ REEL DIMENSIONS



■ ATTACHMENT

➢ ELECTRICAL CHARACTERISTICS TEST

TAITIEN ELECTRONICS CO., LTD.

Products Test Data

Test Date: 11/29/2023 SPEC NO: A0186L0013 Order NO: TW1-231100027-001

Frequency (MHz): 100 Product Model: OAKRDJHTNF

NO	Frequency (MHz)	(ppm)	Idd (mA)	Istby (uA)	Tri-State	Rise (nSec)	Fall (nSec)	Duty (%)		Start_T (mSec)	
Max.		10	30	10	Y	0.6	0.6	55		10	
Min.		-10						45			
1	100.0004612	4.612	14.48	0.806	OK	0.155	0.165	49.12	50.88	0.1	OK
2	100.0004749	4.749	14.39	0.507	OK	0.152	0.165	48.88	51.12	1.278	OK
3	100.0003948	3.948	14.31	0.61	OK	0.154	0.159	48.94	51.06	0.1	OK
4	100.0005696	5.696	14.11	0.637	OK	0.155	0.167	48.55	51.45	0.1	OK
5	100.0005355	5.355	14.55	0.598	OK	0.155	0.167	48.95	51.05	0.1	OK
6	100.0004962	4.962	14.5	0.598	OK	0.157	0.165	49.19	50.81	0.1	OK
7	100.0006424	6.424	14.62	0.649	OK	0.149	0.166	48.76	51.24	0.1	OK
8	100.0004551	4.551	14.54	0.714	OK	0.154	0.169	48.91	51.09	0.258	OK
9	100.0005204	5.204	14.5	0.702	OK	0.153	0.166	48.94	51.06	0.1	OK
10	100.0005963	5.963	14.66	0.507	OK	0.155	0.17	49.13	50.87	0.599	OK
11	100.0003255	3.255	14.3	1.04	OK	0.157	0.169	49.03	50.97	0.1	OK
12	100.0003983	3.983	14.36	0.832	OK	0.149	0.168	48.84	51.16	0.1	OK
13	100.0004836	4.836	14.6	0.767	OK	0.158	0.163	49.06	50.94	0.1	OK
14	99.9991544	-8.456	14.69	0.598	OK	0.153	0.168	48.8	51.2	0.346	OK
15	100.0003	3	14.52	0.897	OK	0.157	0.164	48.86	51.14	0.1	OK
AVG:		3.87	14.48	0.70		0.15	0.17	48.93	51.07	0.24	
STD:		3.42	0.15	0.14		0.00	0.00	0.16	0.16	0.31	

CA(%): 38.72

CP: 0.98 34.32

CPK: 0.60 34.32

Test Number: 15

OK_QTY: 15

NG_QTY: 0

Other Informations:

Orders NO:TW1-231100027-001

PN NO:TAR-231100033-001

DateCode:

Customer NO:

Customer PN:

A0186

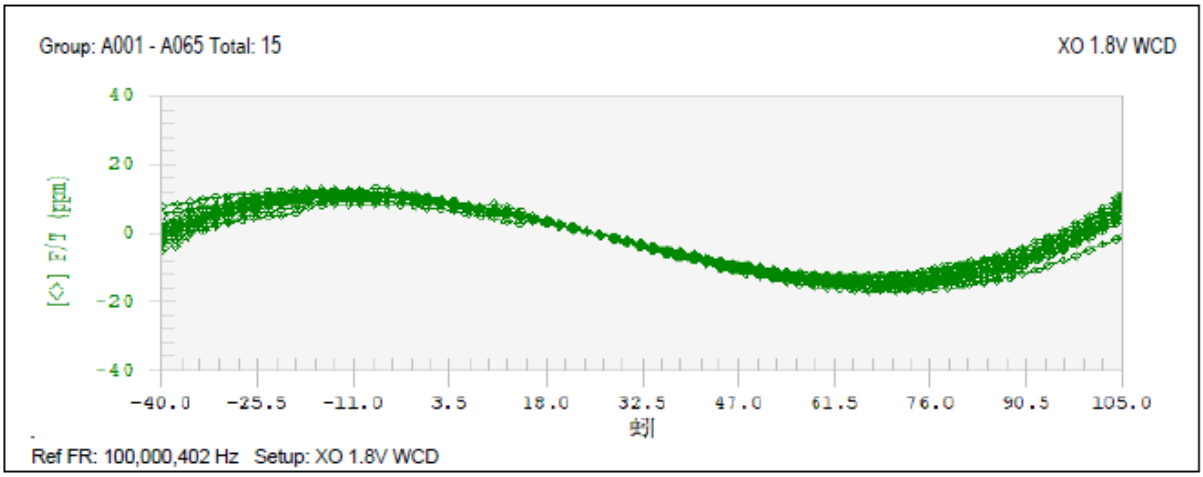
Customer PO:

TTE231102001

Supervisor: Dick Lin **Inspector:** 劉育修

■ ATTACHMENT

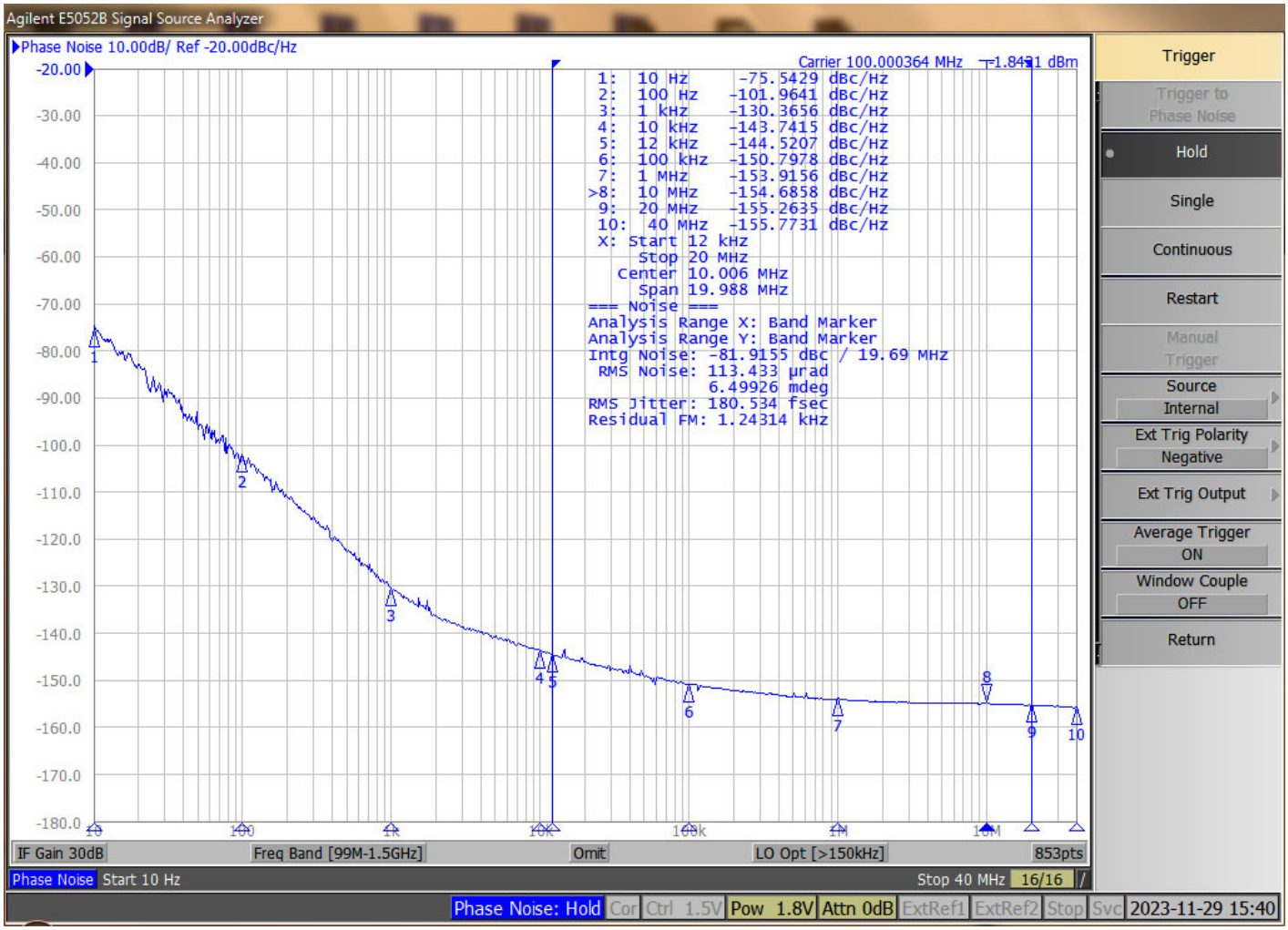
➢ TEMPERATURE CHARACTERISTICS TEST



Supervisor: Dick Lin **Inspector:** 劉育修

■ ATTACHMENT

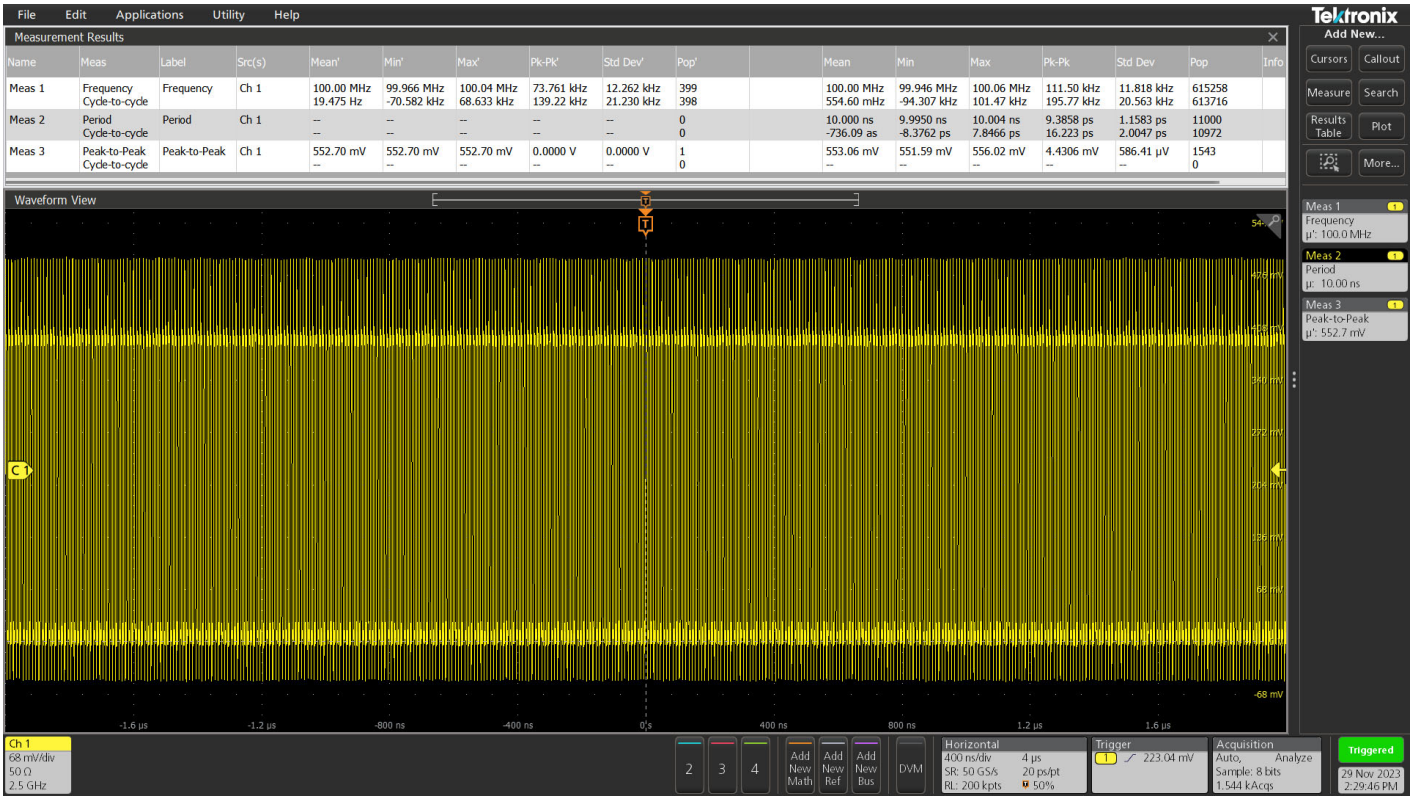
➢ PHASE NOISE



Supervisor: Dick Lin **Inspector:** Irene Chiou

■ ATTACHMENT

➢ JITTER



Supervisor: Dick Lin **Inspector:** Wade

■ ATTACHMENT

➢ MATERIAL DATA SHEET

Product Information

Product Name: OA TYPE
Product Descriptio OAKRDJHTNF-100.000000 MHz
Product Weight: 35.14 ± 20% mg

Part Name	Homogeneous Materials	Component - Chemical element	Material Mass(mg/pcs)	Substance Percentage (%)	CAS No.
BASE	Ceramic	Al2O3	12.850000	92.57	1344-28-1
		CaO	0.090000	0.65	1305-78-8
		Cr2O3	0.100000	0.72	1308-38-9
		MgO	0.080000	0.58	1309-48-4
		Mo	0.130000	0.94	7439-98-7
		SiO2	0.630000	4.54	7631-86-9
	Metallizing	Mo	0.110000	2.93	7439-98-7
		W	3.650000	97.07	7440-33-7
	Plate-Au	Au	0.160000	100.00	7440-57-5
		Tl	0.000003	0.00	7440-28-0
	Plate-Ni	Co	0.120000	20.34	7440-48-4
		Ni	0.470000	79.66	7440-02-0
	Seal Ring	Co	0.380000	16.96	7440-48-4
		Fe	1.210000	54.02	7439-89-6
		Ni	0.650000	29.02	7440-02-0
	Solder	Ag	0.630000	85.14	7440-22-4
		Cu	0.110000	14.86	7440-50-8
Cover	Kovar	C	0.002000	0.02	1333-86-4
		Co	1.709000	18.00	7440-48-4
		Fe	5.050000	53.18	7439-89-6
		Mn	0.047000	0.50	7439-96-5
		Ni	2.659000	28.00	7440-02-0
		Si	0.028000	0.30	7440-21-3
Blank	Quartz	SiO2	0.500000	100.00	14808-60-7
IC	Silicon	Al	0.001200	0.80	7429-90-5
		As	0.000001	0.00	7440-38-2
		B	0.000000	0.00	7440-42-8
		Cu	0.000003	0.00	7440-50-8
		P	0.000001	0.00	7723-14-0
		Si	0.148566	99.04	7440-21-3
		Tl	0.000130	0.09	7440-32-6
		W	0.000098	0.07	7440-33-7
Adhesive	Epoxy	1,4-bis(2,3 epoxypropoxy)butane	0.123750	7.50	2525-79-8
		Ag	1.237500	75.00	7440-22-4
		dapsone	0.041250	2.50	80-08-0
		Reaction product: bisphenol-F-(epichlorhydrin); epoxy resin (number average molecular weight ? 700) (old)	0.247500	15.00	9003-36-5
Adhesive	Silver Paste	Ag	1.221000	74.00	7440-22-4
		Silicone resin	0.264000	16.00	63148-62-9
		SiO2	0.165000	10.00	14808-60-7
Electrode	Metal-Ni	Ni	0.007000	4.25	7440-02-0
Electrode	Metal-Au	Au	0.220225	95.75	7440-57-5
Bond Wire	Gold	Au	0.100000	100.00	7440-57-5

This component is compliant with the European RoHS material requirements.