

Handling Instructions

■ Soldering

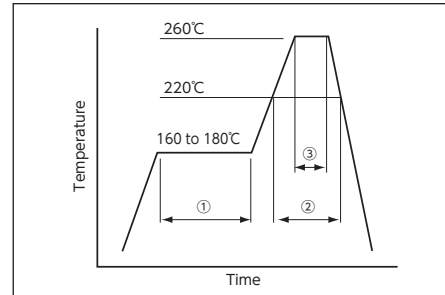
Our products are designed so they may withstand the same standard reflow soldering temperatures as most other electronics components. However, if the reflow temperature is higher than our specification allows, the performance may be affected. Avoid soldering the product at temperatures higher than specified.

For the reflow temperature profile of SMD products, refer to the figure below.

①	Preheat	160 to 180°C	120sec.
②	Primary heat	220°C	60sec
③	Peak	260°C	10sec. max.

※ The reflow temperature profile may vary depending on the product model, specifications and frequency range. Refer to the individual product specifications for details.

Reflow Temperature Profile
(Available for lead free soldering)



■ Cleaning

- General cleaning solutions or ultrasonic cleaning may be used to clean our crystal products, but verification tests are recommended prior to use.
- Tuning fork crystals resonate at frequency bands that are close to the washing frequency of ultrasonic cleaning machines and this may cause resonance deterioration in the crystal. Therefore the use of ultrasonic cleaning machines to clean tuning fork crystals should be avoided. After applying ultrasonic cleaning, the functionality of crystals should be verified by testing the performance of the end product.

■ Shock

Crystal products are designed to resist shock, but if the products receive excessive shocks or are dropped on the ground, be sure to check for any damages before using.

■ Mounting

<SMD crystal products>

Surface mount crystals are designed to be compatible with most automatic mounting processes, but some processes may exert excessive shock which may damage the crystal. Therefore test mounting of the crystal prior to mass production is necessary. If there is a possibility that PCB may be warped, make sure the warping is not to such a degree that the crystal products' operating characteristics or soldering conditions will be negatively affected. Avoid mounting and processing by Ultrasonic welding because this method has a possibility of an excessive vibration spreading inside the crystal products and becoming the cause of characteristic deterioration and not oscillating.

<Lead type>

When bending, forming, or mounting leaded crystal products be careful not to put too much pressure on the glassed part of the base, as it may crack and negatively affect the crystals' performance.

■ Storage

Storing crystal products at high temperatures or high humidity may deteriorate the soldering condition of pins. Do not store in direct sunlight or damp environments.

■ Others

<Crystal Resonators>

- When excessive voltage is applied to crystal resonators, their performance may be affected or the crystal blank may be damaged. When handling the product, use the product within the specifications provided.
- Negative resistance determines the tolerance margin of a circuit that oscillates the resonator. We recommend that the negative resistance be at least five times the standard series resistance for standard applications.

<Crystal Oscillators>

- C-MOS is used for internal circuit of crystal oscillators. To prevent latch-up phenomena or static electricity, take careful note.
- Some crystal oscillators do not have internally connected bypass capacitors. When using the product, use a capacitor with a good high frequency characteristic of 0.01μ F between Vcc and GND (e.g. Ceramic chip capacitor) and connect it at the shortest possible distance. For details, refer to the specifications of each individual product.

<Monolithic Crystal Filters>

- Take care so that the input pin and the output pin do not close on the PCB.
- If the floating capacity of a PCB (on which a crystal filter is to be mounted) is too large, circuit tuning may be required to cancel out the excess floating capacity.
- When excessive voltage is applied to crystal filters, their performance may be affected or the crystal blank may be damaged. When handling the product, use at its input level equal to or less than -10dBm.

RoHS/ELV Compliant Lead-free and Halogen-free products from KDS.

KDS is fully committed to environmental protection and has been proactively working to comply with the major environmental regulations such as RoHS Directive (Directive of the Restriction of the use of certain Hazardous Substances : 2011/65/EU and (EU) 2015/863), ELV Directive (End-of-Life Vehicles Directive : 2000/53/EC) and Halogen-free activities etc. The below spreadsheet provide the current status of the product compliance in each environmental regulations. Please visit our website for the latest information.(<https://www.kds.info>)

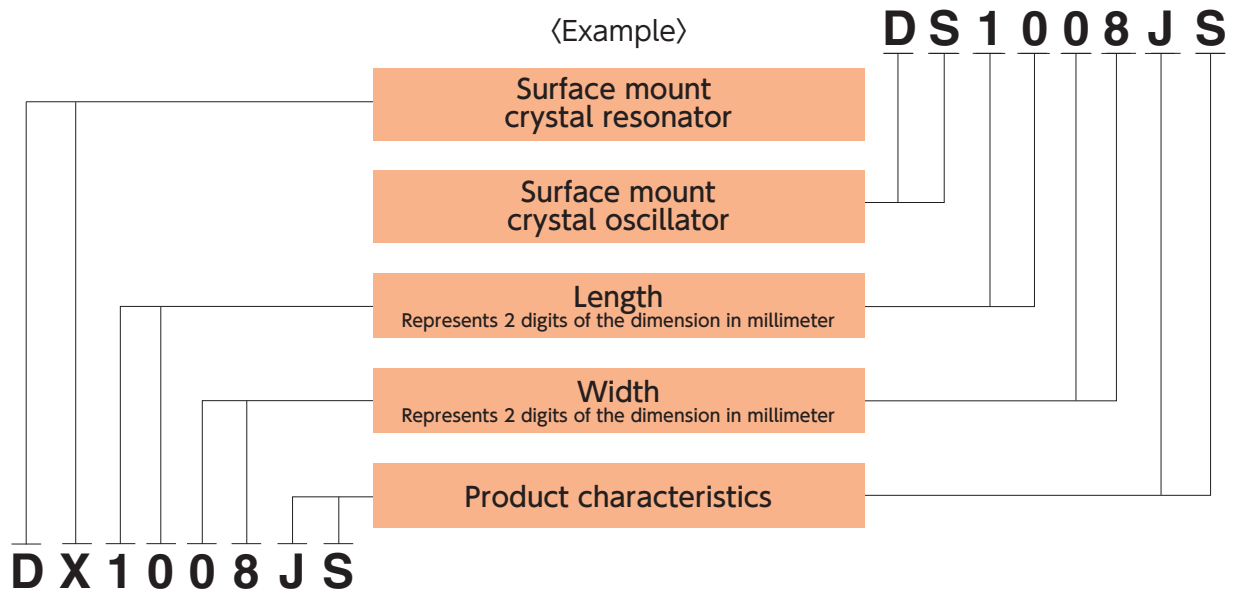
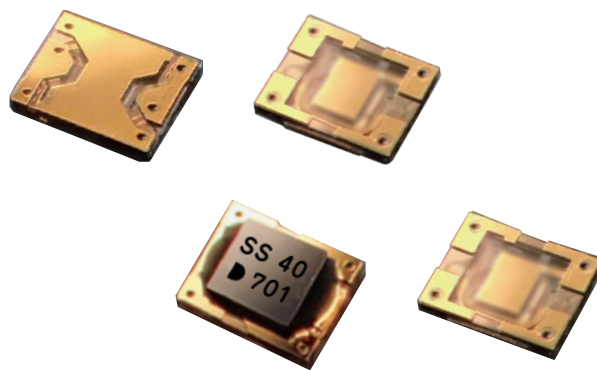
As of sept.30.2023

	Type	RoHS/ELV Compliant	Halogen-free	Pb-free	Materials of pin	Note
Crystal Resonators/ MHz Band Crystal Resonators	DX1008J SERIES	○	○	○	Ni/Au	
	DSX1210A	○	○	○	Ni/Au	
	DSX1612S	○	○	○	Ni/Au	
	DSX211S, DSX211SH	○	○	○	Ni/Au	
	DSX221SH	○	○	○	Ni/Au	
	DSX321SH	○	○	○	Ni/Au	
	DSX210GE	○	○	Pb in sealing-glass	Ni/Au	Pb in sealing-glass is exempted from RoHS/ELV Directive. ^(*)
	DSX320GE	○	○	Pb in sealing-glass	Ni/Au	Pb in sealing-glass is exempted from RoHS/ELV Directive. ^(*)
	DSX211G	○	○	Pb in sealing-glass	Ni/Au	Pb in sealing-glass is exempted from RoHS/ELV Directive. ^(*)
	DSX321G, DSX321GK	○	○	Pb in sealing-glass	Ni/Au	Pb in sealing-glass is exempted from RoHS/ELV Directive. ^(*)
Tuning Fork Crystal Resonators/ kHz Band Crystal Resonators	DSX530GA	○	○	Pb in sealing-glass	Ni/Au	Pb in sealing-glass is exempted from RoHS/ELV Directive. ^(*)
	DT-26, DT-261	○	○	○	Sn	
	DT-38, DT-381	○	○	○	Sn	
	DMX-26S	○	○	High temperature solder	Sn	High temperature solder used inside the product is exempted from RoHS/ELV Directive. ^(*)
	DST1210A	○	○	○	Ni/Au	
	DST1610A	○	○	○	Ni/Au	
	DST210AC	○	○	○	Ni/Au	
Crystal Resonators with dedicated temperature sensor/ MHz Band Crystal Resonators	DST310S	○	○	○	Ni/Au	
	DSR1210ATH	○	○	○	Ni/Au	
	DSR1612ATH	○	○	○	Ni/Au	
	DSR2115TH	○	○	○	Ni/Au	
Temperature Compensated Crystal Oscillators (TCXO)	DSR2215TH	○	○	○	Ni/Au	
	DSA/DSB1612 SERIES	○	○	○	Ni/Au	
	DSA/DSB211 SERIES	○	○	○	Ni/Au	
	DSA/DSB221 SERIES	○	○	○	Ni/Au	
	DSA/DSB321 SERIES	○	○	○	Ni/Au	
	DSA/DSB535 SERIES	○	○	○	Ni/Au	
	DSK1612ATD	○	○	○	Ni/Au	
Real Time Clock Module (RTC)	DSK321STD	○	○	○	Ni/Au	
	DD3225TS, DD3225TR	○	○	○	Ni/Au	
Simple Packaged Crystal Oscillators (SPXO)	DD3225TS, DD3225TR	○	○	○	Ni/Au	
	DS1008J SERIES	○	○	○	Ni/Au	
	DSO1612AR	○	○	○	Ni/Au	
	DSO211S SERIES	○	○	○	Ni/Au	
	DSO221S SERIES	○	○	○	Ni/Au	
	DSO223S SERIES	○	○	○	Ni/Au	
	DSO321S SERIES	○	○	○	Ni/Au	
	DSO323S SERIES	○	○	○	Ni/Au	
	DSO531S SERIES	○	○	○	Ni/Au	
	DSO533 SERIES	○	○	○	Ni/Au	
Voltage Controlled Crystal Oscillators (VCXO)	DLO555MBA	○	○	○	Sn	
	DSO751S SERIES	○	○	○	Ni/Au	
	DSO753S SERIES	○	○	○	Ni/Au	
	DSV221SV	○	○	○	Ni/Au	
Monolithic Crystal Filters	DSV321S	○	○	○	Ni/Au	
	DSF334 SERIES	○	○	○	Ni/Au	
	DSF444 SERIES	○	○	○	Ni/Au	
	DSF633 SERIES	○	○	○	Ni/Au	
	DSF753 SERIES	○	○	○	Ni/Au	

* RoHS Directive and ELV Directive exemptions are granted for high temperature solder, lead content in low-melting glass of DSX-G Series.

Quartz Devices

Arkh.Series



Ark.3G SERIES

About Arkh.Series



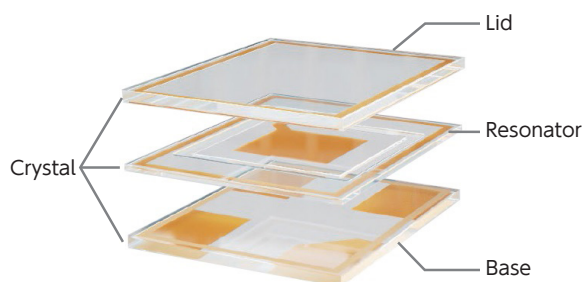
Ark. Series

The Arkh Series is a device with an unprecedented new structure developed as the third generation following the lead type and the surface-mount type.

The brand name "Arkh" is taken from the ancient Greek word "Arkhitekton", which is the origin of the English word "Architecture". It is not just a structure, but contains the desire to emphasize that it is the origin of crystal devices with a completely new structure.

About the Structure of the Arkh Series

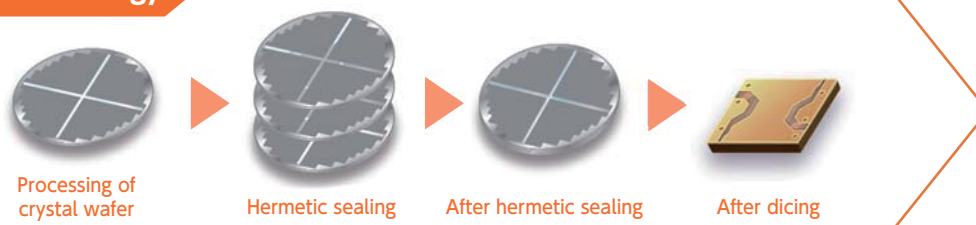
<Ark.3G>



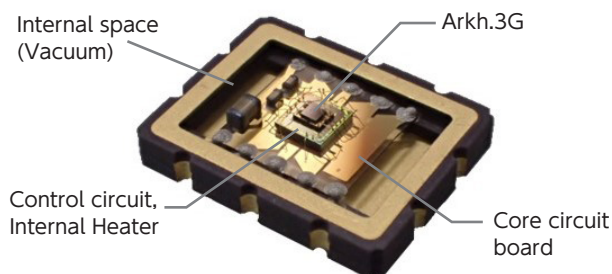
The Ark.3G is an ultra-compact and thin device realized by WLP (Wafer Level Package) technology and is arranged in a three-layer structure consisting of a lid, resonator, and base, the host of which is quartz crystal. With the outlines of the resonator and other parts having been formed by a photolithographic process, three quartz crystal wafers are bonded and diced into a waferlevel package. Thus the holder and resonator parts are formed into an integrated structure without the use of a conductive adhesive.

This design has solved the challenges that the conventional structure needed to meet for product size reduction, namely, improved accuracy in conductive adhesive application and the provision of a margin for ensuring a quartz crystal element mounting location. Additionally, it is possible to reduce quality risks by carrying out processes ranging from wafer cleaning to bonding in a vacuum environment.

WLP technology



<Ark.5G>



The Ark.5G is an ultra-compact and low-power OCXO by embedding the ultra-small Arkh.3G oscillator in its core. The core of the conventional product is generally under atmospheric pressure. But the new core structure is maintained in a vacuum, which eliminates the effects of thermal convection. The conventional products are unsuitable for mass production due to their complicated structures and large numbers of components, but the design of Arkh.5G facilitates assembling on a fully automatic production line, which will enable us to supply in large numbers.

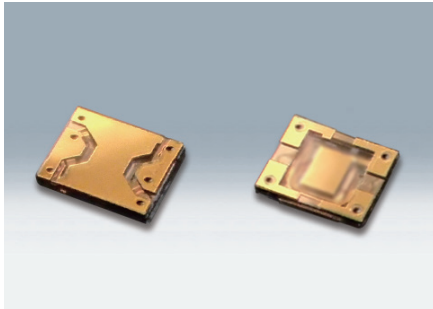
About Mounting and Usage of the Arkh.Series

The Arkh.Series can be soldered to circuit boards with a pick-and-place machine in the conventional manner. The Arkh.3G can also be built into an IC package or used for wire bonding or molding.

*Note that, as with conventional products, the Arkh.3G is subject to resonance fracture or damage, depending on conditions such as ultrasonic cleaning and molding pressure. Therefore, it is necessary to check the Arkh.3G in advance under your particular operating conditions.

SMD Crystal Resonators / MHz Band Crystal Resonators

DX1008JS



Actual size □

■ Features

- 1008 size, height 0.12mm
Unprecedented extremely low-profile package using a novel structure
- Composed only of quartz crystal plates and metallic films without the use of a ceramic base
- Long-term high resistance to aging, due to avoiding the use of an organic conductive adhesive
- Reduced risk of the inclusion of foreign matter due to assembly in a vacuum environment



■ Applications

- Mobile communications and short-range wireless modules
- Wearable devices
- Automotive multimedia devices

■ Standard Specification

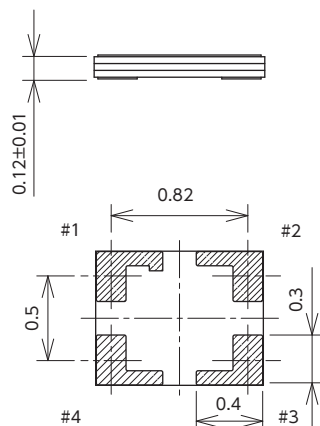
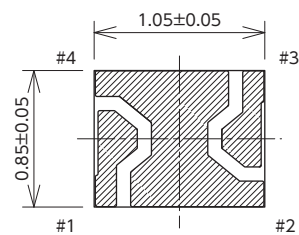
Item \ Type	DX1008JS		
Frequency Range	48 to 52MHz	52 to 96MHz	96 to 120MHz
Overtone Order	Fundamental		
Load Capacitance	8pF, 10pF, 12pF		
Drive Level	10μW (100μW max.)		
Frequency Tolerance	±20×10 ⁻⁶ (at 25°C)		±100×10 ⁻⁶ (at 25°C)
Series Resistance	100Ω max.	60Ω max.	40Ω max.
Frequency Characteristics over Temperature	±30×10 ⁻⁶ / -30 to +85°C (Ref.To 25°C)		
Storage Temperature Range	-40 to +85°C		
Packing Unit (1)	3000pcs./reel (φ 180)		

(1) Moisture prevention packing is unnecessary.
Moisture Sensitivity Level: LEVEL1 (IPC/JEDEC J-STD-033)

Consult our sales representative for other specifications

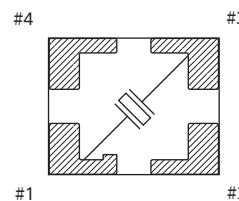
[mm]

■ Dimensions



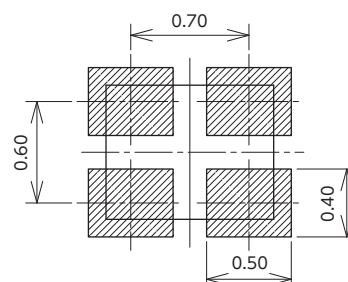
■ Internal Connections

〈Top View〉



■ Recommended Land Pattern

〈Top View〉



SMD Crystal Resonators / MHz Band Crystal Resonators

DX1008JT

NEW



■ Features

- 1008 size, height 0.18mm
Unprecedented extremely low-profile package using a novel structure
- Composed only of quartz crystal plates and metallic films without the use of a ceramic base
- Long-term high resistance to aging, due to avoiding the use of an organic conductive adhesive



■ Applications

- Mobile communications and short-range wireless modules
- Wearable devices
- Automotive multimedia devices

■ Standard Specification

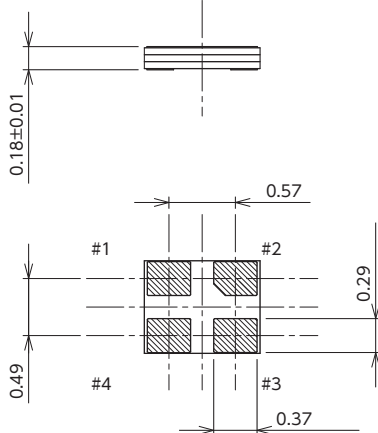
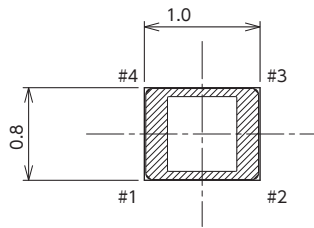
Item	Type	DX1008JT	
Frequency Range		59.97MHz	76.8MHz
Overtone Order		Fundamental	
Load Capacitance		5pF, 8pF, 10pF, 12pF	
Drive Level		10μW (100μW max.)	
Frequency Tolerance		±20×10 ⁻⁶	
Series Resistance		60Ω max.	50Ω max.
Frequency Characteristics over Temperature		±30×10 ⁻⁶ / -30 to +85°C (Ref.To 25°C)	
Storage Temperature Range		-40 to +85°C	
Packing Unit (1)		3000pcs./reel (φ180)	

(1) Moisture prevention packing is unnecessary.
Moisture Sensitivity Level: LEVEL1 (IPC/JEDEC J-STD-033)

Consult our sales representative for other specifications

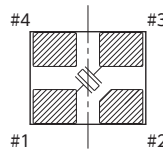
[mm]

■ Dimensions



■ Internal Connections

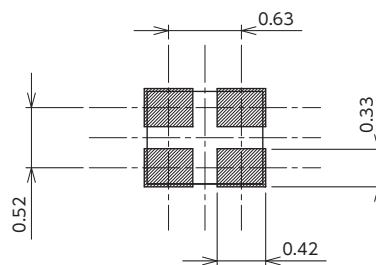
〈Top View〉



Pin Connection	
Pin No.	Connection
#1	Xtal
#2	GND
#3	Xtal
#4	GND

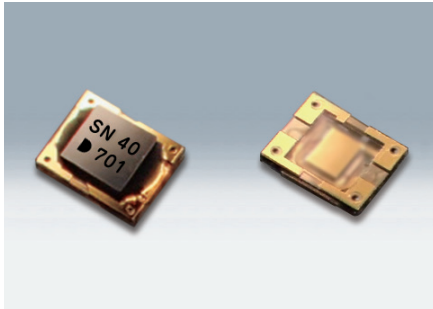
■ Recommended Land Pattern

〈Top View〉



SMD Crystal Oscillators

DS1008JN



Actual size □

■ Features

- 1008 size, height 0.22mm
Unprecedented extremely low-profile package using a novel structure
- Available frequency range : 1 to 100MHz
- Low Supply Voltage : 0.9V/ 1.2V/ 1.3V/ 1.5V typ.
- 3-state function
- Available up to 100MHz by using AT cut fundamental resonator.
Low jitter provides for high performance.



■ Applications

- Medical camera
- Wearable devices
- IoT devices
- Automotive multimedia device

[Function Code]
DS1008JN E A

E : 1.5V	A : ±100×10 ⁻⁶
F : 1.3V	B : ±50×10 ⁻⁶
G : 1.2V	C : ±30×10 ⁻⁶
H : 0.9V	E : ±20×10 ⁻⁶

■ Standard Specification

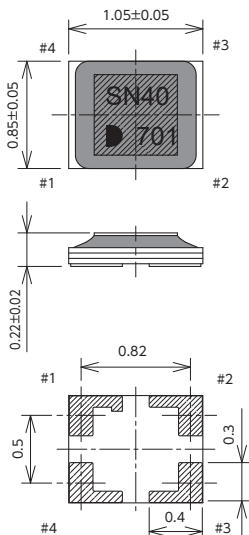
Item	Type	Function Code		Output Frequency Range (MHz)	Legend	Spec.			Unit	Condition					
		Supply Voltage	Frequency Tolerance			min.	typ.	max.							
Supply Voltage		E	*	1 ≤ f ₀ ≤ 100	V _{cc}	1.4	1.5	1.6	V						
		F				1.2	1.3	1.4							
		G				1.1	1.2	1.3							
		H				0.8	0.9	1.0							
Frequency Tolerance (Includes frequency tolerance at room temperature.)	*	A	*	*	f _{tol}	—	—	±100	ppm	-40 to +125°C	-20 to +70°C				
		B				—	—	±50		(Standard Operating Temperature Range)					
		C				—	—	±30							
		E				—	—	±20							
Current Consumption	E	*	80 ≤ f ₀ ≤ 100	l _{cc}		—	—	3.1	mA	No Load					
						50 ≤ f ₀ < 80	—	—				2.7			
						1 ≤ f ₀ < 50	—	—				2.2			
						F	*	80 ≤ f ₀ ≤ 100				—	—	2.8	
												50 ≤ f ₀ < 80	—	—	2.5
												1 ≤ f ₀ < 50	—	—	2.1
	G	*	80 ≤ f ₀ ≤ 100	—	—	2.7									
				50 ≤ f ₀ < 80	—	—	2.4								
				1 ≤ f ₀ < 50	—	—	2.0								
	H	*	80 ≤ f ₀ ≤ 100	—	—	2.3									
				50 ≤ f ₀ < 80	—	—	2.1								
				1 ≤ f ₀ < 50	—	—	1.8								
Stand-by Current (#1 pin "L" Level)	*	*	*	l _{std}	—	—	0.02	mA							
Load Condition	*	*	*	L _{CMOS}	—	—	15	pF							
Symmetry	*	*	*	SYM	40	50	60	%	at 50%						
Rise and Fall Time	*	*	*	tr, tf	—	—	5	ns	10 to 90% V _{cc} Level						
Output Enable Time	*	*	*	tPZL	—	—	2	ms							
Output Disable Time	*	*	*	tPLZ	—	—	200	ns							
OE Pin 1 Level Input Voltage	*	*	*	V _{IH}	V _{cc} × 0.8	—	—	V							
OE Pin 0 Level Input Voltage	*	*	*	V _{IL}	—	—	V _{cc} × 0.2	V							
Packing Unit (1)	3000pcs./reel(φ180)														

(1) Moisture prevention packing

Consult our sales representative for other specifications

[mm]

■ Dimensions



Pin Connection

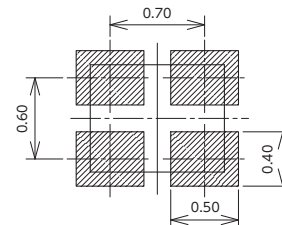
Pin No.	Connection
#1	OE (Output Enable)
#2	GND
#3	Output
#4	V _{cc}

Function

#1 Input	#3 Output condition
H	Oscillation out
Open	Oscillation out
L	High Z

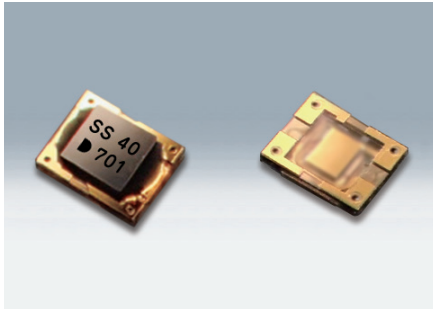
■ Recommended Land Pattern

<Top View>



SMD Crystal Oscillators

DS1008JS



Actual size □

■ Features

- 1008 size, height 0.22mm
Unprecedented extremely low-profile package using a novel structure
- Available frequency range : 1 to 100MHz
- Supply Voltage : +1.8V to +3.3V
- 3-state function
- Available up to 100MHz by using AT cut fundamental resonator.
Low jitter provides for high performance.



■ Applications

- Mobile communications and short-range wireless modules
- Wearable devices
- Automotive multimedia device

[Function Code]

DS1008JS A A

A : 3.3V	↑	A : ±100×10 ⁻⁶
B : 2.8V	↑	B : ±50×10 ⁻⁶
C : 2.5V	↑	C : ±30×10 ⁻⁶
D : 1.8V	↑	E : ±20×10 ⁻⁶

■ Standard Specification

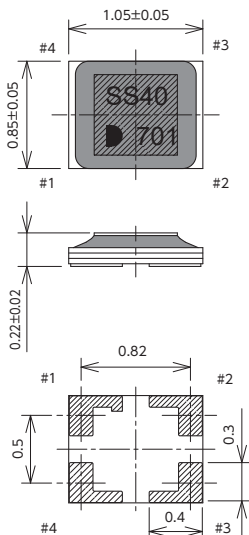
Item	Type	Function Code		Output Frequency Range (MHz)	Legend	Spec			Unit	Condition		
		Frequency Tolerance	Frequency Tolerance			min.	typ.	max.				
Supply Voltage	A	*	*	1 ≤ f ₀ ≤ 100	V _{cc}	3.0	3.3	3.6	V			
	B					2.6	2.8	3.0				
	C					2.25	2.5	2.75				
	D					1.6	1.8	2.0				
Frequency Tolerance (Includes frequency tolerance at room temperature.)	*	*	A	*	f _{tol}	-	-	±100	ppm	-40 to +125°C	-20 to +70°C (Standard Operating Temperature Range)	
						B	-	-				±50
						C	-	-				±30
						E	-	-				±20
Current Consumption	A	*	*	80 ≤ f ₀ ≤ 100	I _{cc}	-	-	4.9	mA	No Load		
				48 ≤ f ₀ < 80		-	-	4.2				
				1 ≤ f ₀ < 48		-	-	3.1				
	B	*	80 ≤ f ₀ ≤ 100	48 ≤ f ₀ < 80		-	-	4.2				
				1 ≤ f ₀ < 48		-	-	3.7				
				80 ≤ f ₀ ≤ 100		-	-	2.7				
	C	*	48 ≤ f ₀ < 80	1 ≤ f ₀ < 48		-	-	3.9				
				80 ≤ f ₀ ≤ 100		-	-	3.4				
				1 ≤ f ₀ < 48		-	-	2.6				
	D	*	80 ≤ f ₀ ≤ 100	1 ≤ f ₀ < 48		-	-	3.1				
				48 ≤ f ₀ < 80		-	-	2.8				
				1 ≤ f ₀ < 48		-	-	2.1				
Stand-by Current (#1 pin "L" Level)	*	*	*	I _{std}	-	-	0.01	mA				
Load Condition	*	*	*	L _{CMOS}	-	-	15	pF				
Symmetry	*	*	*	SYM	45	50	55	%	at 50% V _{cc} f ₀ < 60MHz			
Rise and Fall Time	*	*	*	tr, tf	-	-	5	ns	10 to 90% V _{cc} Level			
Output Enable Time	*	*	*	tPZL	-	-	2	ms				
Output Disable Time	*	*	*	tPLZ	-	-	200	ns				
OE Pin 1 Level Input Voltage	*	*	*	V _{IH}	V _{cc} × 0.8	-	-	V				
OE Pin 0 Level Input Voltage	*	*	*	V _{IL}	-	-	V _{cc} × 0.2	V				
Packing Unit (1)	3000pcs./reel(φ180)											

(1) Moisture prevention packing

Consult our sales representative for other specifications

[mm]

■ Dimensions



Pin Connection

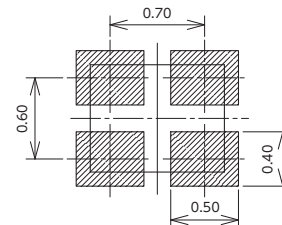
Pin No.	Connection
#1	OE (Output Enable)
#2	GND
#3	Output
#4	V _{cc}

Function

#1 Input	#3 Output condition
H	Oscillation out
Open	Oscillation out
L	High Z

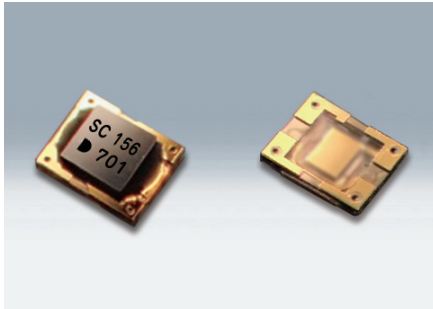
■ Recommended Land Pattern

<Top View>



SMD Differential Output Crystal Oscillators

DS1008JC/DS1008JK/DS1008JJ



Actual size ◻

■ Features

- 1008 size, height 0.24mm
Unprecedented extremely low-profile package using a novel structure
- Available frequency range : 156.25MHz
- HD-LVDS output (DS1008JC)
- LV-PECL out put (DS1008JK)
- LVDS output (DS1008JJ)
- By using AT cut fundamental resonator, low jitter provides for high performance.



■ Applications

- Optical transmission device

■ Standard Specification

Item	Type	Legend	DS1008JC	DS1008JK	DS1008JJ	Condition
Output Specification	—		HD-LVDS	LV-PECL	LVDS	
Output Frequency Range	f _o		156.25MHz			
Supply Voltage	V _{cc}		+3.3V±0.165V		+2.5V±0.125V / +3.3V±0.165V	
Frequency Tolerance (Includes frequency tolerance at room temperature.)	f _{tol}		±100×10 ⁻⁶ max.			-40 to +85°C
Current Consumption	I _{cc}		35mA max.	57mA max.	26mA max.	
Load Condition	Load-R		100Ω (Output-OutputN, DC Cut)	50Ω to V _{cc} -2.0V	100Ω (Output-OutputN)	
Symmetry	SYM		45 to 55%			at outputs cross point
0 Level Output Voltage	V _{OL}		—	V _{cc} -1.81 to V _{cc} -1.62	—	
1 Level Output Voltage	V _{OH}		—	V _{cc} -1.025 to V _{cc} -0.88	—	
Rise and Fall Time	t _r , t _f		0.4ns max	0.5ns max	0.4ns max	20 to 80% Output-OutputN
Differential Output Voltage	V _{OD1} , V _{OD2}		0.500 to 1.000V	—	0.247 to 0.454V	
Change to V _{OD}	ΔV _{OD}		—	—	50mV	ΔV _{OD} =ABS(V _{OD1} -V _{OD2})
Offset Voltage	V _{OS}		—	—	1.125 to 1.375V	Output, OutputN Offset Voltage
Offset to V _{OS}	ΔV _{OS}		—	—	50mV	Magnitude Change V _{OS}
Start Up Time	T _{st}		2ms			
Period Jitter (1)	t _{RMS}		2.5ps typ.			
	tp-p		22ps typ.			Peak to peak
Phase Jitter (2)	tpj		0.1ps max.		0.12ps max.	f _o offset: 12kHz to 20MHz @ +25°C
Packing Unit (3)			3000pcs./reel (φ180)			

(1) Measured WAVECREST DTS-2075

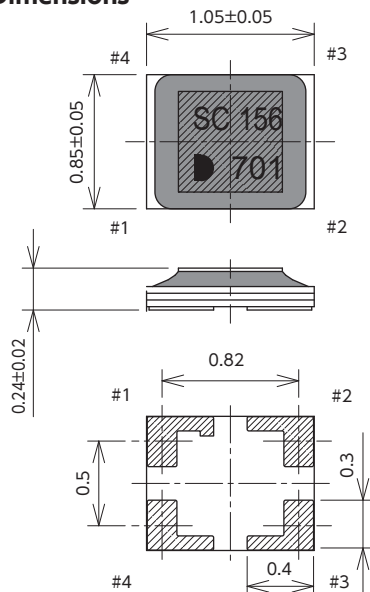
(2) Measured Keysight Technologies E5052B

(3) Moisture prevention packing

Consult our sales representative for other specifications

[mm]

■ Dimensions

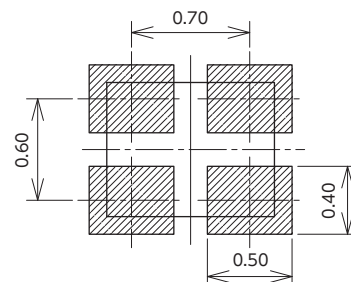


Pin Connection

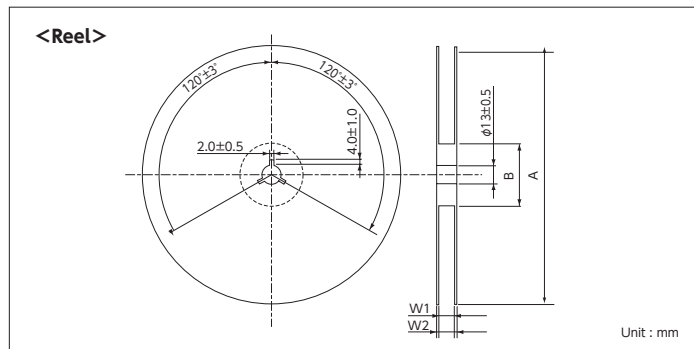
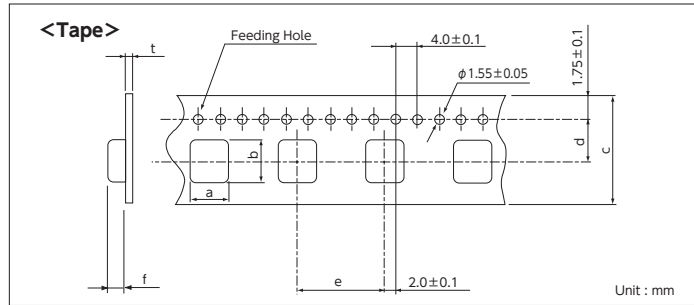
Pin No.	Connection
#1	GND
#2	OutputN
#3	Output
#4	V _{cc}

■ Recommended Land Pattern

<Top View>



Emboss Carrier Tape (SMD Crystal Oscillators)



Standard Specification

VC-TCXO/TCXO

TYPE	a	b	c	d	e	f	t	A	B	W1	W2
DSA/DSB535SGA DSA535SGB	3.5 ±0.1	5.4 ±0.1	12.0 ±0.2	5.50 ±0.1	8.0 ±0.1	1.7 ±0.1	0.30 ±0.05	φ330 ±2	φ100 ±1	13.5 ±1.0	18.5 max.
DSK321STD DSA/DSB321SDN	2.8 ±0.1	3.5 ±0.1	8.0 ±0.2	3.50 ±0.05	4.0 ±0.1	1.5 ±0.1	0.25 ±0.05	φ180 +0/-3	φ60 +1/-0	9.0 ±0.3	11.4 ±1.0
DSA/DSB221SDN DSB221SJA	2.3 ±0.1	2.8 ±0.1	8.0 ±0.2	3.50 ±0.05	4.0 ±0.1	1.15 ±0.1	0.30 ±0.05	φ180 +0/-3	φ60 +1/-0	9.0 ±0.3	11.4 ±1.0
DSA/DSB211SDN/SP DSB211SJA	1.95 ±0.10	2.35 ±0.10	8.0 ±0.2	3.50 ±0.05	4.0 ±0.1	0.85 ±0.1	0.20 ±0.05	φ180 +0/-3	φ60 +1/-0	9.0 ±0.3	11.4 ±1.0
DSA/DSB1612SDN	1.4 ±0.10	1.8 ±0.10	8.0 ±0.2	3.50 ±0.05	4.0 ±0.1	0.7 ±0.1	0.25 ±0.05	φ180 +0/-3	φ60 +1/-0	9.0 ±0.3	11.4 ±1.0
DSK1612ATD	1.45 ±0.10	1.8 ±0.1	8.0 ±0.2	3.50 ±0.05	4.0 ±0.1	0.75 ±0.10	0.25 ±0.05	φ180 +0/-3	φ60 +1/-0	9.0 ±0.3	11.4 ±1.0

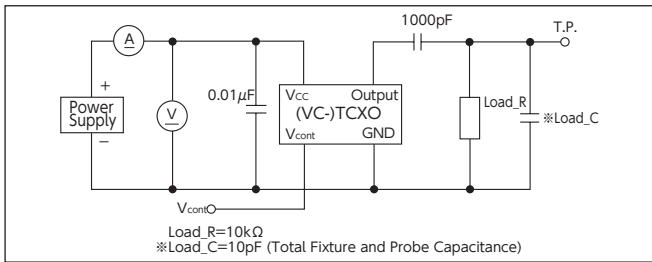
SPXO/VCXO/RTC

TYPE	a	b	c	d	e	f	t	A	B	W1	W2
DSO751SR DSO751SBM DSO753SK/SJ/SD	5.5 ±0.1	7.9 ±0.1	16.0 ±0.3	7.5 ±0.1	8.0 ±0.1	2.4 ±0.1	0.30 ±0.05	φ254 ±2	φ80 ±0.5	17.0 ±0.5	21.0 ±1.0
DSO531SR DSO531SBM DSO533SK/SJ	3.6 ±0.1	5.45 ±0.1	12.0 ±0.2	5.50 ±0.05	8.0 ±0.1	1.55 ±0.10	0.30 ±0.05	φ180 +0/-3	φ60 +1/-0	13.0 ±0.3	15.4 ±1.0
DD3225TS DD3225TR DSO323SK/SJ/SD DSO321SR/SH/SY/SRS DSO321SBM DSV321SV	2.8 ±0.1	3.5 ±0.1	8.0 ±0.2	3.50 ±0.05	4.0 ±0.1	1.5 ±0.1	0.25 ±0.05	φ180 +0/-3	φ60 +1/-0	9.0 ±0.3	11.4 ±1.0
DSO221SR/SH/SY/SX/SXF DSO221SBM DSO223SK/SJ/SD DSV221SV	2.3 ±0.1	2.8 ±0.1	8.0 ±0.2	3.50 ±0.05	4.0 ±0.1	1.15 ±0.10	0.30 ±0.05	φ180 +0/-3	φ60 +1/-0	9.0 ±0.3	11.4 ±1.0
DSO211SX/SXF	1.85 ±0.10	2.25 ±0.10	8.0 ±0.2	3.50 ±0.05	4.0 ±0.1	0.95 ±0.10	0.25 ±0.05	φ180 +0/-3	φ60 +1/-0	9.0 ±0.3	11.4 ±1.0
DSO1612AR	1.4 ±0.1	1.8 ±0.1	8.0 ±0.2	3.50 ±0.05	4.0 ±0.1	0.7 ±0.1	0.25 ±0.05	φ180 +0/-3	φ60 +1/-0	9.0 ±0.3	11.4 ±1.0
DS1008JS/JN/JC/JK/JJ	1.0 ±0.05	1.2 ±0.05	8.0 ±0.2	3.50 ±0.05	4.0 ±0.1	0.45 ±0.05	0.20 ±0.05	φ180 +0/-3	φ60 +1/-0	9.0 ±0.3	11.4 ±1.0

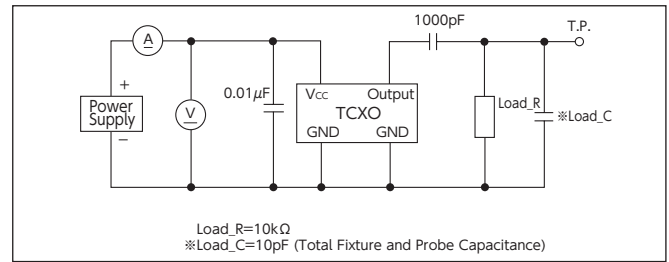
- * 1: To indicate product name and other information, place those information on a label, and affix the label on one side of the flange.
 2: DSA/DSB535SGA, DSA535SGB: reel φ180 available.

Measurement Circuit (Crystal Oscillators)

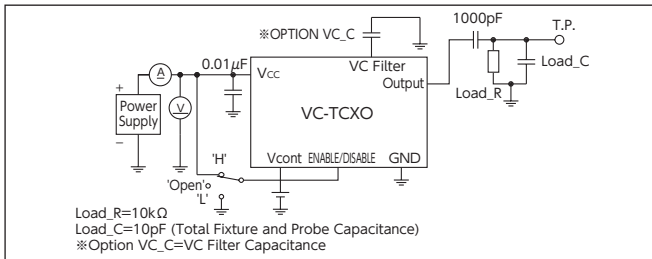
VC-TCXO (DSA***SDN, SP)



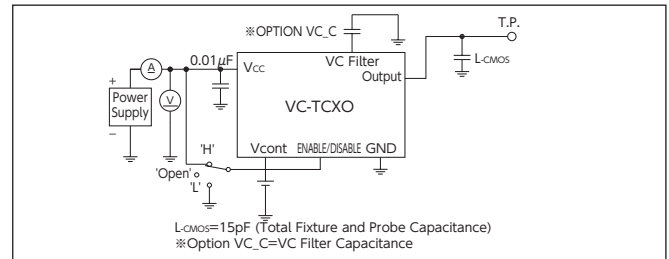
TCXO (DSB***SDN, SP)



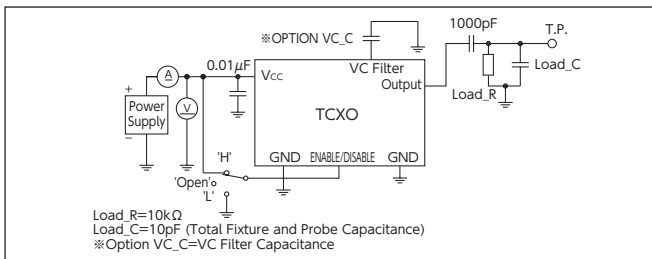
DSA535SGA, DSA535SGB (Clipped Sine)



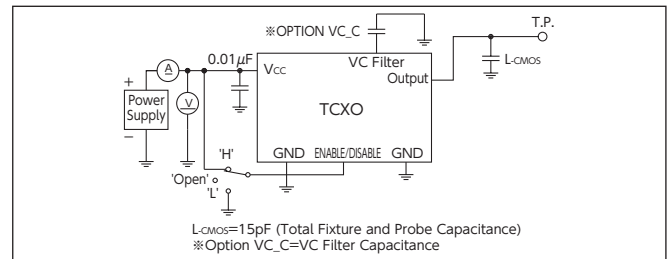
DSA535SGA, DSA535SGB (CMOS)



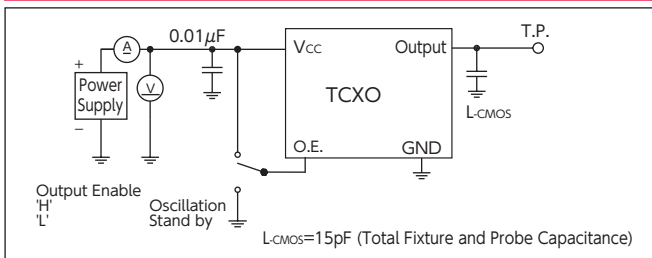
DSB535SGA (Clipped Sine)



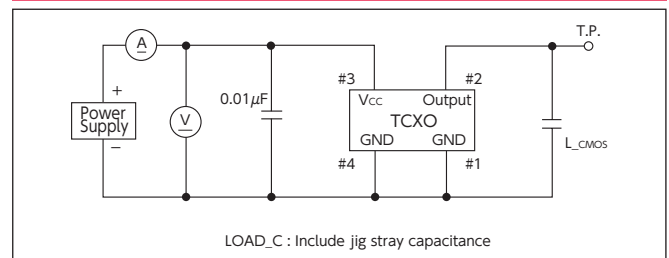
DSB535SGA (CMOS)



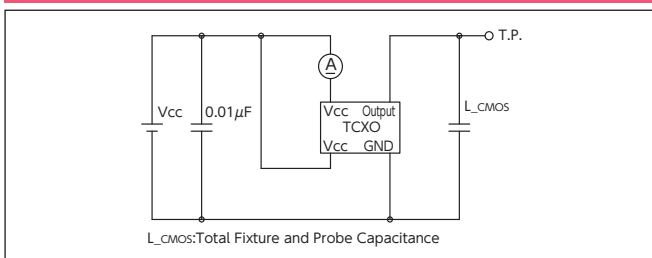
DSB211SJA, 221SJA



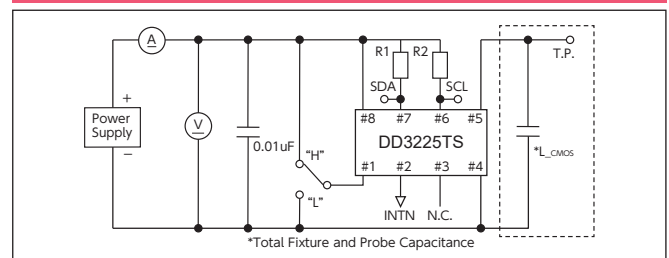
DSK1612ATD



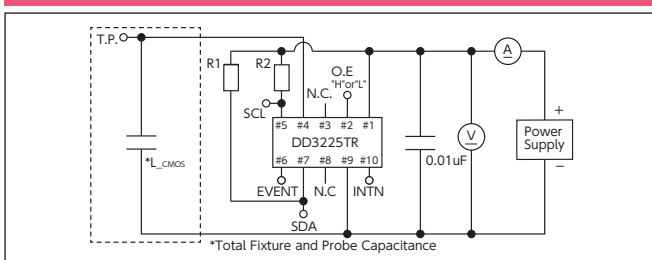
DSK321STD



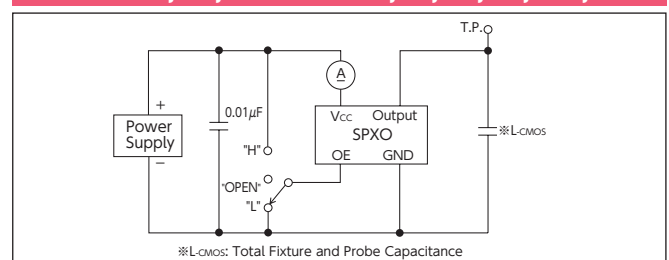
DD3225TS



DD3225TR

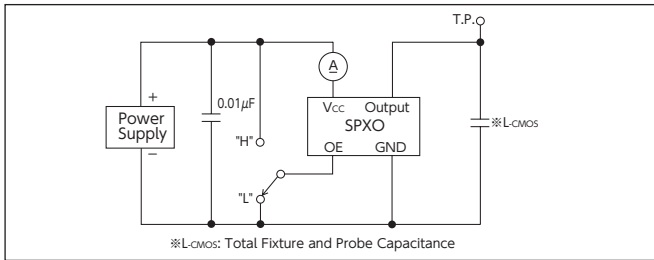


DS1008JS, JN, DSO***AR, SR, SH, SY, SRS, SBM

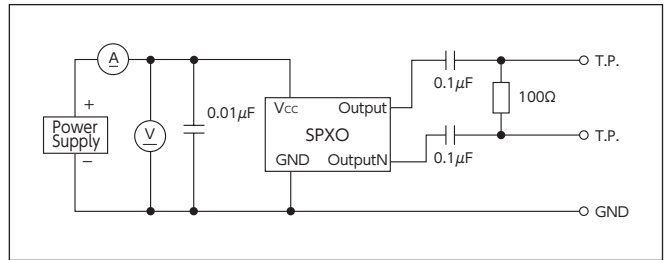


Measurement Circuit (Crystal Oscillators)

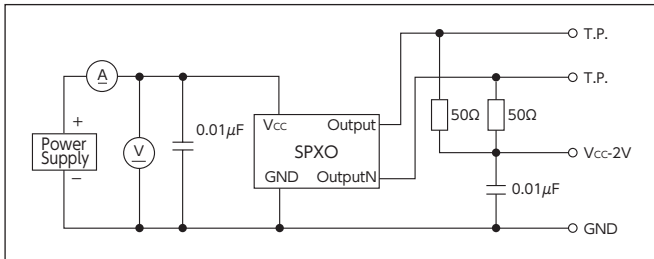
DSO***SX, SXF



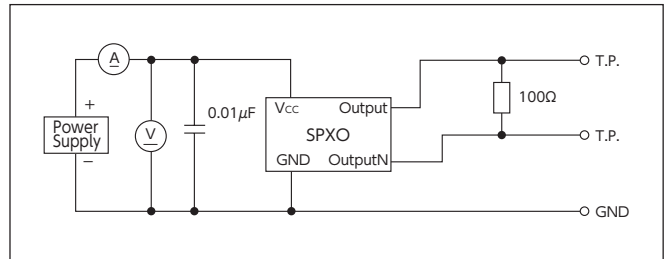
DS1008JC



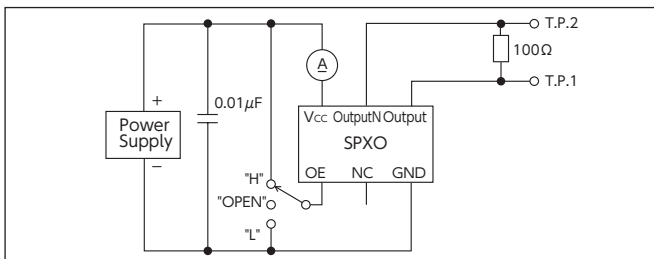
DS1008JK



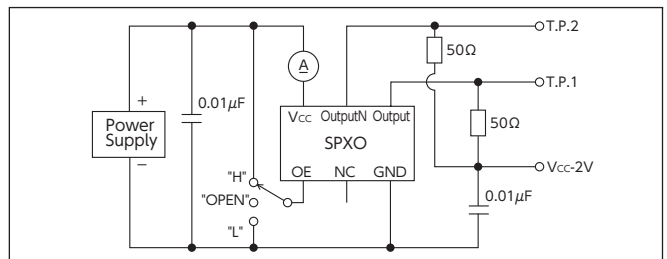
DS1008JJ



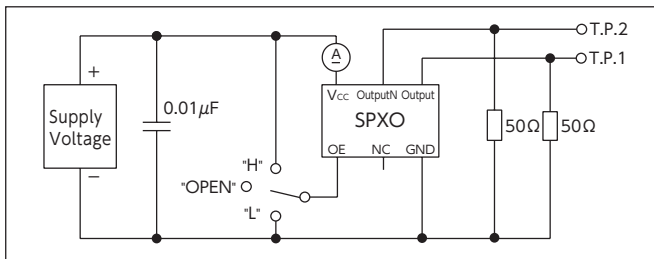
DSO223SJ, DSO323SJ, DSO533SJ, DSO753SJ



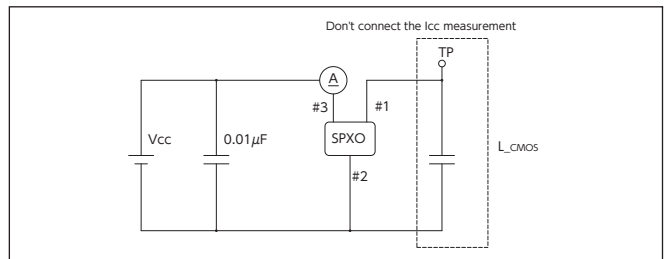
DSO223SK, DSO323SK, DSO533SK, DSO753SK



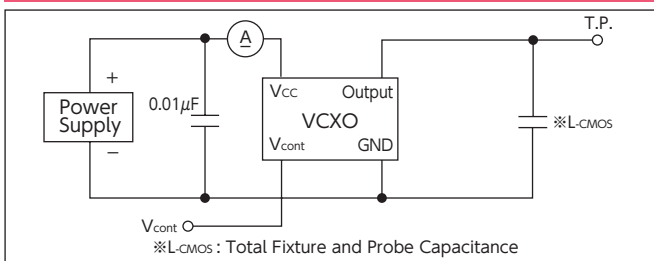
DSO223SD, DSO323SD, DSO753SD



DLO55MBA

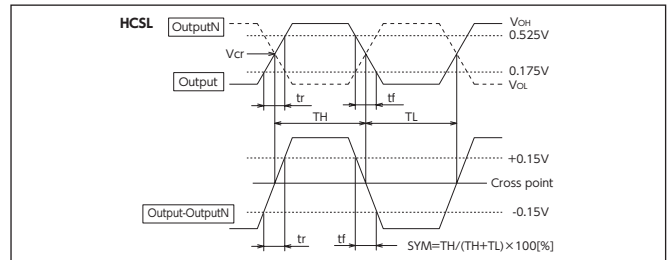
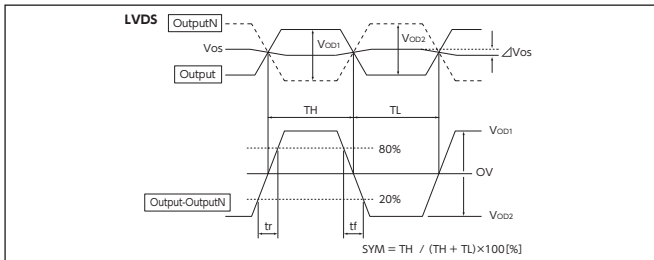
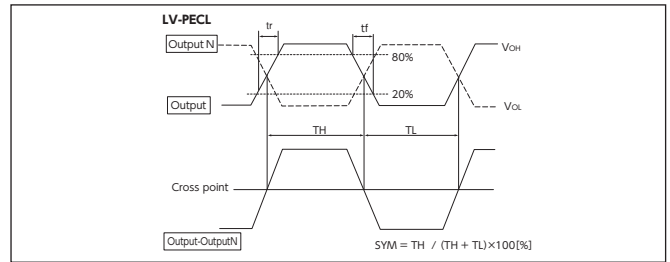
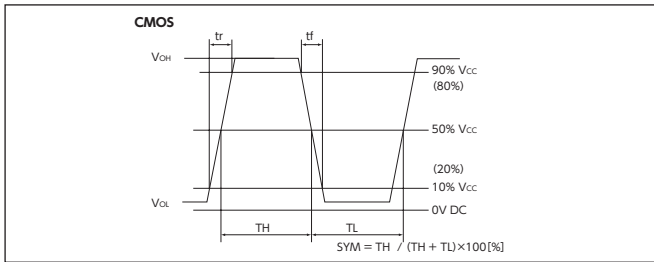


DSV221SV, 321SV



Measurement Circuit

Output Wave Form



Input and Output Conditions

