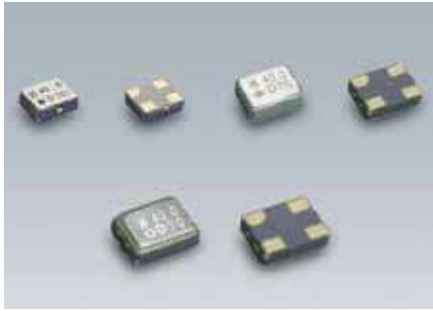


SMD Crystal Oscillators

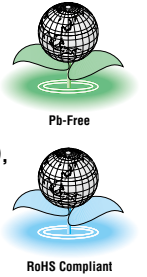
DSO211AH/DSO221SH/DSO321SH



Actual size DSO211AH □ DSO221SH □
DSO321SH □

■ Features

- Supply Voltage: 1.8V/2.5V/2.8V/3.3V
- Low phase noise: $f_{out} \pm 1\text{kHz} -145 \text{ dBc/Hz(Typ.)}$
 $f_{out} \pm 100\text{kHz} -158 \text{ dBc/Hz(Typ.)}$
- Low profile: 0.72mm(DSO211AH), 0.815mm(DSO221SH), 1.1mm(DSO321SH)
- AEC-Q100 Compliant
- 3-state function



■ Applications

- WiLAN, WiMAX, Bluetooth
- DVC, HDTV, Blu-ray Disk
- PC peripherals, gaming equipment, audio equipment
- Automotive multimedia device

[Function Code]

DSO****H A A

A : 3.3V	A : $\pm 100 \times 10^{-6}$
M : 3.0V	B : $\pm 50 \times 10^{-6}$
B : 2.8V	C : $\pm 30 \times 10^{-6}$
C : 2.5V	D : $\pm 25 \times 10^{-6}$
D : 1.8V	E : $\pm 20 \times 10^{-6}$

[Type]

DSO211AH	2016 size
DSO221SH	2520 size
DSO321SH	3225 size

■ Standard Specification

When requesting the product, please select the model and function code of your request.

Item	Function Code		Output Frequency Range (MHz)	Legend	Spec.				Condition
	Supply Voltage	Frequency tolerance			min.	Typ.	max.	Unit	
Supply Voltage	A	*	DSO211AH $1.2 \leq f_o \leq 80$ DSO221/321SH $3.5 \leq f_o \leq 52$	V _{cc}	+3.0	+3.3	+3.6	V	
	M	*			+2.7	+3.0	+3.3		
	B	*			+2.6	+2.8	+3.0		
	C	*			+2.25	+2.5	+2.75		
Frequency Tolerance (Includes frequency tolerance at room temperature.)	D	*	DSO211AH $1.2 \leq f_o \leq 80$ DSO221/321SH $3.5 \leq f_o \leq 52$	f _{tol}	+1.6	+1.8	+2.0	X10 ⁻⁶	-40~+85°C -10~+70°C (Standard Operating Temperature Range)
	A	*			-100	-	+100		
	B	*			-50	-	+50		
	C	*			-30	-	+30		
	D	*			-25	-	+25		
Current Consumption	A,M	*	DSO211AH $1.2 \leq f_o \leq 60\text{MHz}$ $60 < f_o \leq 80\text{MHz}$ DSO221/321SH $1.2 \leq f_o \leq 60\text{MHz}$ $60 < f_o \leq 80\text{MHz}$ DSO321SH $1.2 \leq f_o \leq 60\text{MHz}$ $60 < f_o \leq 80\text{MHz}$	I _{cc}	-	-	4.0	mA	No Load
	B	*			-	-	5.0		
	C	*			-	-	3.6		
					-	-	4.5		
	D	*			-	-	3.4		
Stand-by Current (#1 pin "L" Level)	*	*	*	I _{std}	-	-	10	μA	
	*	*	*	L _{CMOS}	-	-	15	pF	
Load Condition	*	*	*	SYM	45	50	55	%	at 50% V _{cc}
0 Level Output Voltage	*	*	*	V _{OL}	-	-	V _{cc} × 0.1	V	
1 Level Output Voltage	*	*	*	V _{OH}	V _{cc} × 0.9	-	-	V	
Rise and Fall Time	*	*	*	tr, tf	-	-	6 (5)	ns	10~90% V _{cc} Level (20~80% V _{cc} Level)
OE Pin 0 Level Input Voltage	*	*	*	V _{IL}	-	-	V _{cc} × 0.2	V	
OE Pin 1 Level Input Voltage	*	*	*	V _{IH}	V _{cc} × 0.8	-	-	V	
Output Disable Time	*	*	*	t _{PLZ}	-	-	150	ns	
Output Enable Time	*	*	*	t _{PZL}	-	-	5	ms	
Phase Noise	A,M,B,C	*	DSO211AH $1.2 \leq f_o \leq 60\text{MHz}$	PHN	-	-145	-	dBc/Hz	Offset 1kHz
	D	*			-	-140	-		
	A,M,B,C	*	DSO221/321SH $60 < f_o \leq 80\text{MHz}$		-	-135	-		
	D	*			-	-135	-		
	A,M,B,C	*	DSO321SH $1.2 \leq f_o \leq 60\text{MHz}$		-	-158	-		
	D	*			-	-152	-		
A,M,B,C	*	DSO321SH $60 < f_o \leq 80\text{MHz}$	-	-155	-				
D	*		-	-150	-				
Period Jitter (1)	*	*	*	t _{RMS}	-	2.4	-	ps	σ
Total Jitter (1)	*	*	*	t _{p-p}	-	23	-	ps	Peak to peak
Phase Jitter	*	*	$40 \leq f_o \leq 80$ $10 \leq f_o < 40$	t _{PL}	-	34	-	ps	t _{DJ+n} * t _{RJ} n=1.41 (BER=1 * 10 ⁻¹²) (2) f _o offset: 12kHz~20MHz f _o offset: 12kHz~5MHz
Packing Unit	2000pcs./reel(φ180)								

- (1) Measured WAVECREST DTS-2075
(2) t_{DJ}:Deterministic jitter t_{RJ}:Random jitter

Consult our sales representative for other specifications.

■ Dimensions [mm]

DSO211AH	DSO221SH	DSO321SH
<p>Model Code: H</p> <p>Frequency: 40.0</p> <p>Pin Connections: #1 OE(Output Enable) #2 GND #3 Output #4 Vcc</p> <p>Function: #1 Input #3 Output condition H Oscillation out Open Oscillation out L High Z</p> <p>Dimensions: 2.0±0.1, 1.6±0.1, 0.72±0.08, 1.25, 0.95, 0.55, 1.1, 1.4, 0.9, 0.8</p> <p>Recommended Land Pattern <Top View></p>	<p>Model Code: H</p> <p>Frequency: 40.0</p> <p>Pin Connections: #1 OE(Output Enable) #2 GND #3 Output #4 Vcc</p> <p>Function: #1 Input #3 Output condition H Oscillation out Open Oscillation out L High Z</p> <p>Dimensions: 2.5±0.15, 2.0±0.15, 0.815±0.08, 1.58, 1.23, 0.68, 1.7, 1.35, 1.0, 0.85</p> <p>Recommended Land Pattern <Top View></p>	<p>Model Code: H</p> <p>Frequency: 40.0</p> <p>Pin Connections: #1 OE(Output Enable) #2 GND #3 Output #4 Vcc</p> <p>Function: #1 Input #3 Output condition H Oscillation out Open Oscillation out L High Z</p> <p>Dimensions: 3.2±0.15, 2.5±0.15, 1.1±0.2, 2.1, 1.65, 0.9, 2.2, 1.75, 1.2, 0.95</p> <p>Recommended Land Pattern <Top View></p>