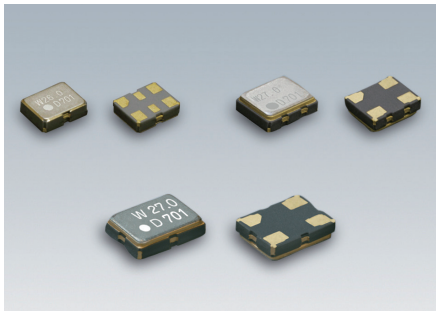
SMD Crystal Oscillators〈For Automotive〉

DSO213AW/DSO221SW/DSO321SW



Actual size DSO213AW DSO221SW DSO321SW

■Features

- Offers narrow deviation: ±30×10⁻⁶ (−40~+105℃), ±15×10⁻⁶ (−40~+85℃), ±12×10⁻⁶ (−30~+85℃), ±10×10⁻⁶ (−20~+70℃)
- Low profile: 0.53mm(DSO213AW)
- AEC-Q100 Compliant

Pb-Free

RoHS/ELV Compliant

■ Applications

- Multimedia devices such as car navigation systems and car audio
- Automotive radio applications such as Bluetooth, wireless LAN and automotive camera

[Type]

DSO213AW	2016 size
DSO221SW	2520 size
DSO321SW	3225 size

[Function Code]

DSO****W A C

A : 3.3V
M : 3.0V
B : 2.8V
C : 2.5V
D : 1.8V

M : ±40×10⁻⁶
C : ±30×10⁻⁶
F : ± 15×10⁻⁶
G : ± 12×10⁻⁶
H : ± 10×10⁻⁶

■ Standard Specification

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

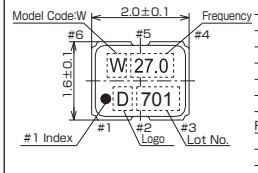
Item	Function Code: Supply Voltage	Function Code: Frequency tolerance	Output Frequency Range (MHz)	Legend	Spec.: min.	typ.	max.	Unit	Condition
Supply Voltage	A	*	3 (3.25)≦fo≦60 ( )→DSO213AW	Vcc	+3.0	+3.3	+3.6	V	
	M				+2.7	+3.0	+3.3		
	B				+2.6	+2.8	+3.0		
	C				+2.25	+2.5	+2.75		
	D				+1.6	+1.8	+2.0		
Frequency Tolerance (Includes frequency tolerance at room temperature.)	*	M		f_tol	−40	−	+40	×10⁻⁶	−40~+110℃
		C			−30	−	+30		−40~+105℃
		F			−15	−	+15		−40~+85℃
		G			−12	−	+12		−30~+85℃
		H			−10	−	+10		−20~+70℃
Current Consumption	A,M	*	3 (3.25)≦fo≦32 ( )→DSO213AW	Icc	−	−	+3.2	mA	No Load
	B				−	−	+2.8		
	C				−	−	+2.5		
	D				−	−	+2.2		
	A,M	*	32<fo≦40		−	−	+3.6		
	B				−	−	+3.2		
	C				−	−	+3.0		
	D				−	−	+2.5		
	A,M	*	40<fo≦48		−	−	+4.0		
	B				−	−	+3.5		
	C				−	−	+3.3		
	D				−	−	+2.8		
	A,M	*	48<fo≦60		−	−	+4.5		
	B				−	−	+4.0		
	C				−	−	+3.8		
	D				−	−	+3.2		
Stand-by Current(#1 pin "L" Level)	*	*	*	I_std	−	−	10	μA	
Load Condition	*	*	*	L_CMOS	−		15	pF	
Symmetry	*	*	*	SYM	45	50	55	%	at 50% VCC
0 Level Output Voltage	*	*	*	VOL	−	−	Vcc×0.1	V	
1 Level Output Voltage	*	*	*	VOH	Vcc×0.9	−	−		
Rise and Fall Time	*	*	*	tr, tf	−	−	6 (5)	ns	10~90% Vcc Level (20~80% Vcc Level)
OE Pin 0 Level Input Voltage	*	*	*	VIL	−	−	Vcc×0.2	V	
OE Pin 1 Level Input Voltage	*	*	*	VIH	Vcc×0.8	−	−		
Output Disable Time	*	*	*	tPLZ	−	−	200	ns	
Output Enable Time	*	*	3 (3.25)≦fo≦40 ( )→DSO213AW	tPZL	−	−	2	ms	
			40<fo≦60		−	−	3		
Phase Noise	*	*	3 (3.25)≦fo≦15 ( )→DSO213AW	−	−	−140	−	dBc/Hz	Offset 1kHz
			15<fo≦26		−	−134	−		
			26<fo≦40		−	−130	−		
			40<fo≦60		−	−125	−		
			3 (3.25)≦fo≦60 ( )→DSO213AW		−	−153	−		Offset 100kHz
Period Jitter (1)	*	*	*	tRMS	−	2.4	−	ps	σ
			*	tp-p	−	23	−		Peak to peak
Total Jitter (1)	*	*	*	tTL	−	34	−	ps	tDJ+n×tRJ n=14.1(BER=1×10⁻¹²) (2)
Phase Jitter	*	*	40≦fo≦60	tpj	−	−	1	ps	fo offset:12kHz ~ 20MHz
			10≦fo<40						fo offset:12kHz ~ 5MHz
Reliability	AEC-Q100								
Packing Unit	DSO213AW/DSO221SW: 3000pcs./reel(φ180), DSO321SW: 2000pcs./reel(φ180)								

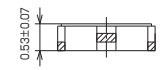
(1) Measured WAVECREST DTS-2075 (2) tDJ:Deterministic jitter tRJ:Random jitter

Consult our sales representative for other specifications.

■ DSO213AW [mm]

■ Dimensions





Pin Connections

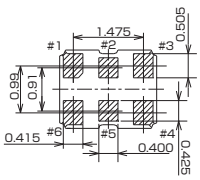
Pin No.	Connection
#1	OE(Output Enable)
#2	N.C.
#3	GND
#4	Output
#5	N.C.
#6	Vcc

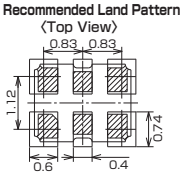
Function

#1 Input	#4 Output condition
H	Oscillation out
Open	Oscillation out
L	High Z

#2 Pin, #5 Pin are recommended to be connected to GND.

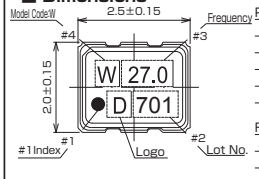
■ Recommended Land Pattern 〈Top View〉

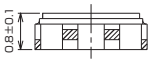




■ DSO221SW [mm]

■ Dimensions





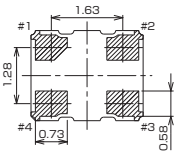
Pin Connections

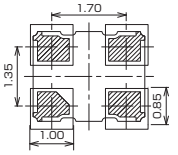
Pin No.	Connection
#1	OE(Output Enable)
#2	GND
#3	Output
#4	Vcc

Function

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

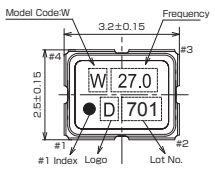
■ Recommended Land Pattern 〈Top View〉

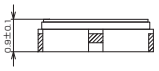




■ DSO321SW [mm]

■ Dimensions





Pin Connections

Pin No.	Connection
#1	OE(Output Enable)
#2	GND
#3	Output
#4	Vcc

Function

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

■ Recommended Land Pattern 〈Top View〉