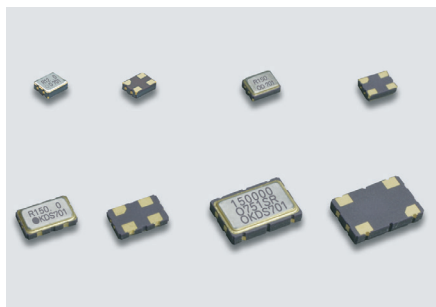


SMD Crystal Oscillators

DSO221SR/DSO321SR/DSO531SR/DSO751SR



Actual size DSO221SR DSO321SR
DSO531SR DSO751SR

Features

- Low current consumption: 8mA max (167MHz, 3.3V)
- Supply Voltage: 1.8V/2.5V/2.8V/3.0V/3.3V
- Offers Narrow deviation: $\pm 20 \times 10^{-6} / \pm 30 \times 10^{-6} / \pm 50 \times 10^{-6} / \pm 100 \times 10^{-6}$
- Available up to 167MHz by using AT cut fundamental resonator.
- Low jitter provides for high performance.
- Low profile: 0.815mm(DSO221SR), 1.1mm(DSO321SR/DSO531SR), 1.5mm(DSO751SR)
- AEC-Q200 Compliant (Option: Equivalent to AEC-Q100) (DSO221SR/DSO321SR)
- CMOS Level Output



[Type]	DSO221SR	2520 size
	DSO321SR	3225 size
	DSO531SR	5032 size
	DSO751SR	7349 size

[Function Code]

DSO***SR

A A

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

A : $\pm 100 \times 10^{-6}$
B : $\pm 50 \times 10^{-6}$
C : $\pm 30 \times 10^{-6}$
D : $\pm 25 \times 10^{-6}$
E : $\pm 20 \times 10^{-6}$

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	*	$0.2 \leq f_0 \leq 167$	V _{CC}	+3.0	+3.3	+3.6	V		
	M		$0.2 \leq f_0 \leq 167$		+2.7	+3.0	+3.3			
	B		$0.2 \leq f_0 \leq 157$		+2.6	+2.8	+3.0			
	C		$0.2 \leq f_0 \leq 157$		+2.25	+2.5	+2.75			
	D		$0.2 \leq f_0 \leq 80$		+1.6	+1.8	+2.0			
Frequency Tolerance (Includes frequency tolerance at room temperature.)	*	A	$0.2 \leq f_0 \leq 167$	f _{tol}	-100	-	+100	$\times 10^{-6}$	-40 to +85°C	-10 to +70°C (Standard Operating Temperature Range)
		B	$0.2 \leq f_0 \leq 125$		-50	-	+50			
		C	$0.2 \leq f_0 \leq 80$		-30	-	+30			
		D	$0.2 \leq f_0 \leq 80$		-25	-	+25			
		E	$0.2 \leq f_0 \leq 50$		-20	-	+20			
Current Consumption	A,M	*	$0.2 \leq f_0 < 32$	I _{CC}	-	-	1.8	mA	No Load	
			$32 \leq f_0 < 54$		-	-	2.5			
			$54 \leq f_0 < 80$		-	-	5.0			
			$80 \leq f_0 < 125$		-	-	6.0			
			$125 \leq f_0 \leq 167$		-	-	8.0			
	B	*	$0.2 \leq f_0 < 32$		-	-	1.8			
			$32 \leq f_0 < 54$		-	-	2.5			
			$54 \leq f_0 < 125$		-	-	5.0			
			$125 \leq f_0 \leq 157$		-	-	7.0			
	C	*	$0.2 \leq f_0 < 32$		-	-	1.5			
			$32 \leq f_0 < 54$		-	-	2.0			
			$54 \leq f_0 < 125$		-	-	4.0			
$125 \leq f_0 \leq 157$			-	-	6.0					
D	*	$0.2 \leq f_0 < 32$	-	-	1.0					
		$32 \leq f_0 < 54$	-	-	1.4					
		$54 \leq f_0 \leq 80$	-	-	3.0					
Stand-by Current (#1 pin "L" Level)	*	*	*	I _{std}	-	-	10	μ A		
Load Condition	*	*	*	L _{CMOS}	-	-	15	pF		
	A,M	*	$0.2 \leq f_0 \leq 80$		-	-	30			
Symmetry	*	*	$f_0 < 50$	SYM	45	50	55	%	50% V _{CC} Level	
			$f_0 \geq 50$		40	50	60			
0 Level Output Voltage	*	*	*	V _{OL}	-	-	V _{CC} × 0.1	V		
1 Level Output Voltage	*	*	*	V _{OH}	V _{CC} × 0.9	-	-			
Rise and Fall Time	A,M,B,C	*	$0.2 \leq f_0 \leq 54$	tr, tf	-	-	5(4)	ns	L _{CMOS} : 15pF 10 to 90% V _{CC} Level (20 to 80% V _{CC} Level)	
	D		$0.2 \leq f_0 \leq 54$		-	-	7(6)			
	*		$54 < f_0 < 100$		-	-	4(3)			
	*		$100 \leq f_0 \leq 167$		-	-	3(2.5)			
	A,M		$0.2 \leq f_0 \leq 54$		-	-	10			
	A,M		$54 < f_0 \leq 80$		-	-	6			
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	-	-			
Output Disable Time	*	*	*	t _{PLZ}	-	-	150	ns		
Output Enable Time	*	*	*	t _{PZL}	-	-	1			
Period Jitter (1)	*	*	*	t _{RMS}	-	2.2	-	ps	σ Peak to peak	
					t _{p-p}	-	20			
Total Jitter (1)	*	*	*	t _{TL}	-	31	-	ps	t _{DJ} +n×t _{RJ} n=14.1 (BER=1×10 ⁻¹²) (2) fo offset: 12kHz to 20MHz fo offset: 12kHz to 5MHz	
Phase Jitter	*	*	$40 \leq f_0 \leq 167$	tpj	-	-	1			
			$10 \leq f_0 < 40$							
Packing Unit (3)	DSO221SR, DSO321SR: 2000pcs./reel (φ 180) , DSO531SR: 1000pcs./reel (φ 180) , DSO751SR: 1000pcs./reel (φ 254)									

(1) Measured WAVECREST DTS-2075

(2) t_{DJ} : Deterministic jitter t_{RJ} : Random jitter

(3) Moisture prevention packing is unnecessary.

Moisture Sensitivity Level : Level 1 (IPC/JEDEC J-STD-033)

Consult our sales representative for other specifications.

SMD Crystal Oscillators

DSO221SR/DSO321SR/DSO531SR/DSO751SR

Applications

- PC, gaming equipment
- DSC, DVD, Blu-ray, HDTV, DVC, HDD
- WiMAX
- Camera module
- GbEthernet
- Automotive multimedia device

Dimensions

[mm]

Model	Dimensions (mm)	Pin Connections	Function	Recommended Land Pattern (Top View)																		
DSO221SR		<table border="1"> <tr><th>Pin No.</th><th>Connection</th></tr> <tr><td>#1</td><td>OE(Output Enable)</td></tr> <tr><td>#2</td><td>GND</td></tr> <tr><td>#3</td><td>Output</td></tr> <tr><td>#4</td><td>Vcc</td></tr> </table>	Pin No.	Connection	#1	OE(Output Enable)	#2	GND	#3	Output	#4	Vcc	<table border="1"> <tr><th>#1 Input</th><th>#3 Output condition</th></tr> <tr><td>H</td><td>Oscillation out</td></tr> <tr><td>Open</td><td>Oscillation out</td></tr> <tr><td>L</td><td>High Z</td></tr> </table>	#1 Input	#3 Output condition	H	Oscillation out	Open	Oscillation out	L	High Z	
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