



SMD Quartz Crystal

Automotive Grade 3225, 2520, 2016

Features

- Small Footprint
- RoHS Compliant
- Automotive Application

Table 1: General Specifications

Parameter/ Package	3225	2520	2016
Frequency Range	8.0 MHz ~ 200.0 MHz	12.0 MHz ~ 60.0 MHz	20.0 MHz ~ 54.0 MHz
Mode of Oscillation	Fundamental & Overtone	Fundamental	Fundamental
Frequency Tolerance at 25°C	Select from Table 3		
Operating Temperature Range (OTR)	Select from Table 4		
Temperature Stability	Select from Table 4		
Equivalent Series Resistance (ESR)	Select from Table 2		
Drive Level	10 μ Watts (typ.) 100 μ Watts (max.)		
Resonance Condition	XXS – Series, XXP – Parallel with xx pF (for parallel, please specify the xx value in pF)		
Storage Temperature Range	-50°C to +105°C		
Aging @ 25°C	± 3 ppm / Year (max.)		

Table 2: Mode of Oscillation/ Equivalent Series Resistance

3225			2520			2016		
Frequency Range (MHz)	Mode of Oscillation	ESR (max.)	Frequency Range (MHz)	Mode of Oscillation	ESR (max.)	Frequency Range (MHz)	Mode of Oscillation	ESR (max.)
8.0 ~ 9.9	Fundamental	600 Ω	12.0 ~ 15.9	Fundamental	300 Ω	20.0 ~ 23.9	Fundamental	120 Ω
10.0 ~ 11.9	Fundamental	200 Ω	16.0 ~ 29.9	Fundamental	100 Ω	24.0 ~ 29.9	Fundamental	100 Ω
12.0 ~ 29.9	Fundamental	100 Ω	30.0 ~ 60.0	Fundamental	70 Ω	30.0 ~ 37.9	Fundamental	80 Ω
30.0 ~ 54.0	Fundamental	60 Ω				38.0 ~ 54.0	Fundamental	60 Ω
40.0 ~ 200.0	3 rd Overtone	80 Ω						

Table 3: Frequency Tolerance at 25°C

Code	Tolerance	Code	Tolerance
D	±10 ppm	H	±30 ppm
E	±15 ppm	H5	±35 ppm
F	±20 ppm	M	±50 ppm
G	±25 ppm	K	±100 ppm

Table 4: Temperature Stability

OTR Code	Stability Code	D	E	F	G	H	H5	M	K
		Temperature Stability	±10 ppm	±15 ppm	±20 ppm	±25 ppm	±30 ppm	±35 ppm	±50 ppm
Operating Temperature Range	0°C to +60°C								
	-10°C to +60°C								
	-10°C to +70°C								
	-20°C to +70°C								
	-30°C to +80°C								
	-30°C to +85°C								
	-40°C to +85°C								
	-40°C to +105°C								
	-40°C to +125°C								
	J3								

Table 5: Environmental Specifications

Vibration	Frequency: 20 Hz ~ 200 Hz Amplitude: 1.52 mm peak, Acceleration: 20g Vibration waveform: Sine waveform Duration: 4 minutes each, 4 Cycles, 3 directions (X, Y, Z)
Drop Test	Method of Drop: Free Drop Dropping Floor: Hard wood board, 3cm/ min. Height: 75 cm ±1.0 cm No. of Drops: 3

Denotes Available Denotes not Available

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Mechanical Specifications

	3225	2520	2016
Top View			
Side View			
Bottom View			

Chamfered pad is pad no. 1 or pad no. 4

Chamfered pad is pad no. 1 or pad no. 3

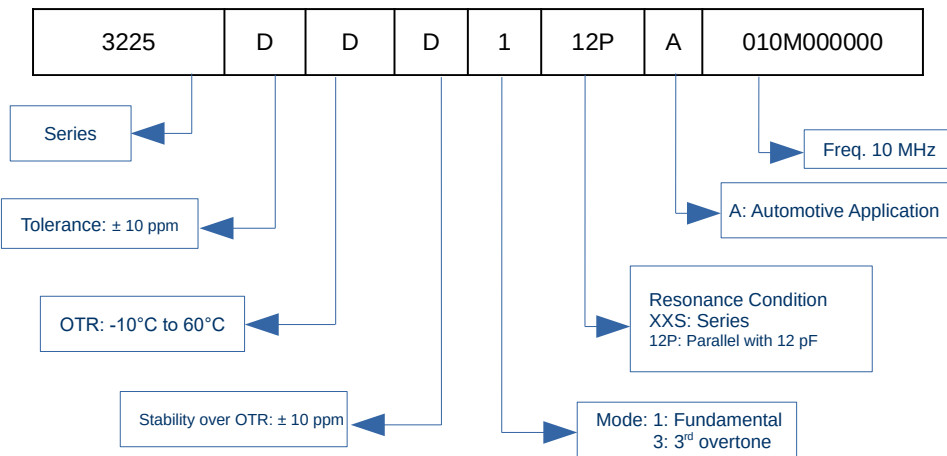
Chamfered pad is pad no. 2 or pad no. 4

▲ All dimensions are in mm.
Tolerance is ± 0.1 mm,
unless otherwise specified.

Pad Connections:
Pad 1, 3: Crystal
Pad 2, 4: Ground

Ordering Information

Example



Specifications subject to change without notice

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Note: Not all combination of options are available. Other specifications may be available upon request.

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