

SELECTION GUIDE

Ark.3G series

Crystal resonators

Crystal oscillators

Monolithic crystal filters

Optical products

MEMS oscillators



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Crystal Resonators



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Icons **CE** Consumer Equipment **IE** Industrial Equipment **TC** Mobile Phone, Wireless Communication **AE** Automotive Electronics

SMD Crystal Resonators / MHz Band Crystal Resonators

Type	Actual Size	Size (mm)			Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-6}$) @+25°C	Frequency Characteristics over Temperature ($\times 10^{-6}$)	Operating Temperature Range (°C)	Load Capacitance (pF)	Drive Level ($\mu\text{w(max.)}$)	Lid	Recommended Application	Catalog Page
		L	W	H (max.)									
DX1008JS		1.0	0.8	0.13	48, 52, 80, 96, 120	± 20	± 30	-30 to +85	8, 10, 12	10 (100)	Crystal	CE TC	7
DSX1210A		1.2	1.0	0.3	32 to 96	± 20	± 30	-30 to +85	8, 10, 12	10 (100)	Metal	CE TC	15
DSX1612S		1.6	1.2	0.4	24 to 54	± 20	± 30	-30 to +85	8, 10, 12	10 (100)	Metal	CE TC	16
DSX1612SL		1.6	1.2	0.33	32 to 52								
DSX211S		2.05	1.65	0.5	24 to 50, 80, 96 24 to 50	± 20 ± 30	± 30 ± 100	-30 to +85 -40 to +125	8, 10, 12	10 (200) 10 (100)	Metal	CE IE TC AE	17 76
DSX211SH		2.05	1.65	0.5	24 to 50	± 20 ± 30	± 30 ± 100	-30 to +85 -40 to +125	8, 10, 12	10 (100)	Metal	CE IE TC AE	17 76
DSX221SH		2.5	2.0	0.5	12 to 54								
DSX321SH		3.2	2.5	0.75	12 to 50								
DSX210GE		2.2	1.6	1.0	16 to 64	± 30	± 100	-40 to +125	8, 10, 12	10 (100)	Ceramic	AE	72
DSX211G		2.0	1.6	0.8	20 to 64	± 20 ± 30	± 30 ± 100	-30 to +85 -40 to +125	8, 10, 12	10 (100)	Ceramic	CE IE TC AE	18 72
DSX221G		2.5	2.0	0.9	12 to 64	± 20 ± 30	± 30 ± 100	-30 to +85 -40 to +125	8, 10, 12	10 (200)	Ceramic	CE IE TC AE	19 73
DSX320G		3.2	2.5	1.0	12 to 64	± 30	± 100	-40 to +125	8, 10, 12	10 (200)	Ceramic	AE	74
DSX320GE		3.2	2.5	1.1	7.9 to 12								
DSX321G		3.2	2.5	0.9	12 to 64	± 20 ± 30	± 30 ± 100	-30 to +85 -40 to +125	8, 10, 12	10 (200)	Ceramic	CE IE TC AE	20 74
DSX321GK		3.2	2.5	1.0	7.9 to 12								
DSX530GA			5.0	3.2	1.2	7 to 54/45 to 70 7 to 54	± 30	± 50 ± 100	-30 to +85 -40 to +125	8, 10, 12	10 (300)/10 (500) 10 (300)	Ceramic	CE IE AE
DSX530GK	5.0		3.2	1.2	8 to 54	± 30	± 100	-40 to +125	8, 10, 12	10 (300)	Ceramic	AE	75
SMD-49		11.0	4.6	4.5	4, 8	± 30	± 100	-40 to +125	8, 10, 12	10 (300)	Metal	AE	78

SMD Crystal Resonators with dedicated temperature sensor / MHz Band Crystal Resonators

Type	Actual Size	Size (mm)			Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-6}$) @+25°C	Frequency Characteristics over Temperature ($\times 10^{-6}$)	Operating Temperature Range (°C)	Load Capacitance (pF)	Drive Level ($\mu\text{w(max.)}$)	Lid	Recommended Application	Catalog Page
		L	W	H (max.)									
DSR1612ATH		1.64	1.24	0.65	38.4, 52, 76.8	± 10	± 12	-30 to +85	7, 8	10 (100)	Metal	TC	22
DSR211ATH		2.0	1.6	0.65	19.2	± 10	± 12 ± 30	-30 to +85 -40 to +105	7, 8	10 (100)	Metal	TC AE	22 77
DSR211STH		2.0	1.6	0.8 (0.65)	19.2, 26, (38.4) 19.2, (38.4)	± 10	± 12 ± 30	-30 to +85 -40 to +105	7, 8	10 (100)	Metal	TC AE	
DSR221STH		2.5	2.0	1.0	19.2, 26 19.2	± 10	± 12 ± 20	-30 to +85 -40 to +105	7, 8	10 (100)	Metal	TC AE	

SMD Tuning Fork Crystal Resonators / kHz Band Crystal Resonators

Type	Actual Size	Size (mm)			Frequency Range (kHz)	Frequency Tolerance ($\times 10^{-6}$) @+25°C	Series resistance (k Ω max.)	Operating Temperature Range (°C)	Load Capacitance (pF)	Drive Level ($\mu\text{w(max.)}$)	Package	Recommended Application	Catalog Page
		L	W	H (max.)									
DST1210A		1.25	1.05	0.35	32.768	± 20	80	-40 to +85	7, 9, 12.5	0.1 (0.2)	Ceramic	CE TC	23
DST1610A		1.6	1.0	0.5	32.768	± 20	80	-40 to +85	7, 9, 12.5	0.1 (0.5)	Ceramic	CE TC	24 79
DST1610AL		1.6	1.0	0.35									
DST210AC		2.0	1.2	0.55	32.768	± 20	80 120	-40 to +85 -40 to +125	7, 9, 12.5	0.1 (0.5)	Ceramic	CE TC AE	24 79
DST310S		3.2	1.5	0.85	32.768	± 20	50, 80 80, 120	-40 to +85 -40 to +125	7, 9, 12.5	0.2 (1.0)	Ceramic	CE IE TC AE	25 79
DST311S													
DMX-26S		8.0	3.8	2.5	30 to 90	± 20	50 50, 80	-40 to +85 -40 to +125	7, 9, 12.5	1.0 (2.0)	Plastic	CE AE	26 79

Tuning Fork Crystal Resonators / kHz Band Crystal Resonators

Type	Actual Size	Size (mm)			Frequency Range (kHz)	Frequency Tolerance ($\times 10^{-6}$) @+25°C	Series resistance (k Ω max.)	Operating Temperature Range (°C)	Load Capacitance (pF)	Drive Level ($\mu\text{w(max.)}$)	Package	Recommended Application	Catalog Page
		L	W	H (max.)									
DT-26		$\phi 2.0$	$\phi 2.0$	6.0	32.768	± 20 (GRADE A) ± 30 (GRADE B)	40	-10 to +60	12.5	1.0 (2.0)	Cylinder	CE IE	27
DT-261					28 to 90								
DT-38					32.768								
DT-381					20 to 90								

Monolithic Crystal Filters



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Icons ■ IE Industrial Equipment ■ TC Mobile Phone, Wireless Communication

Monolithic Crystal Filters

Type	Actual Size	Size (mm)			Frequency Range (MHz)	Operating Temperature Range (°C)	Overtone Order	Pole	Pass Bandwidth (kHz min./3dB)	Recommended Application	Catalog Page
		L	W	H (max.)							
DSF334SAF		3.0	3.0	1.1	45 to 130	-20 to +70	Fundamental	2	±3.5, ±7.5, ±15	■ TC	96
DSF334SAO					100 to 160		3rd				
DSF334SCF					60 to 130		Fundamental	3			
DSF444SAF		3.8	3.8	1.1	40 to 130		Fundamental	2			
DSF444SAO					100 to 160		3rd				
DSF444SCF					60 to 130		Fundamental	3			
DSF444SCO					100 to 160	3rd					
DSF753SAF		7.0	5.0	1.5	16 to 90	-20 to +70	Fundamental	2	±3.5, ±7.5, ±15	■ IE ■ TC	98
DSF753SAO					60 to 160		3rd				
DSF753SCF					20 to 130		Fundamental	3			
DSF753SCO					90 to 160		3rd				
DSF753SBF					30 to 70		Fundamental	4			
DSF633SDF		6.0	3.5	1.3	44 to 130		-20 to +70	Fundamental			
DSF753SDF		7.0	5.0	1.5	20 to 130	98					

Optical Products



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Optical Thin Film

Type	Features	Applications	Catalog Page
IR Double Cut Filter	Infrared Absorbing Glass Type + Infrared Cut Coating Type	Color compensation	100
Dual Pass Filters	Transmitting at both the near-infrared region and the visible light region	Color compensation	101

■ IR Double Cut Filter (IR Cut Filter)

"IR Double Cut Filter" is designed with the absorptive material and coating which blocks the transmission of the infrared. It comes with improved transmittance rate at visible light range, blocks near infrared light range and reduces the flares.

■ Dual Pass Filters (Dual Band Pass Filters)

"Dual Pass filter" is a filter that has a transmission range of the near-infrared region and the visible light region. This filter is suitable to the surveillance cameras for shooting day and night continuously.

Crystal Oscillators



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Icons: **VC** Voltage Control Function **Stb** Stand-by Function **2OP** Two Output Function
CE Consumer Equipment **IE** Industrial Equipment **TC** Mobile Phone, Wireless Communication **AE** Automotive Electronics

Temperature Compensated Crystal Oscillators (TCXO/VC-TCXO)

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Characteristics over Temperature ($\times 10^{-6}$)	Operating Temperature Range (°C)	Supply Voltage (V)	Function	Recommended Application	Catalog Page
		L	W	H (max.)								
DSA1612SDN		1.6	1.2	0.55	CS	16 to 60	-40 to +85	+1.68 to +3.5	VC	IE TC	34, 35 88, 89	
DSB1612SDN												
DSB1612SDNB												
DSB1612WA												
DSA211SDN		2.0	1.6	0.8	CS	12.288 to 52	-40 to +85	+1.68 to +3.5	VC	IE TC	34, 35 88, 89	
DSB211SDN												
DSB211SDNB												
DSA221SDN												
DSB221SDN		2.5	2.0	0.9	CS	9.6 to 52	-40 to +85	+1.68 to +3.5	VC	IE TC	34, 35 88, 89	
DSB221SDNB												
DSA321SDN												
DSB321SDN												
DSB321SDNB		3.2	2.5	1.0	CS	12.288 to 52	-40 to +105	+1.68 to +3.5	VC	AE	87	
DSA211SP												
DSB211SP												
DSA221SP												
DSB221SP		2.0	1.6	0.7	CMOS	13 to 52	-40 to +105	+1.7 to +3.6	Stb	IE TC AE	41 - 90	
DSB211JA												
DSB211SLB												
DSB221SLB												
DSB321SLB		2.0	1.6	0.7	CS	12.288 to 40	-40 to +85	+1.1 to +1.4	Stb	TC	40	
DSB211SLB												
DSB221SLB												
DSB321SLB												
DSA222MAA		2.5	2.0	0.8	CS/CS	13 to 52	-30 to +85	+2.3 to +3.63	VC Stb 2OP	TC	36, 37	
DSB222MAA												
DSA222MAB												
DSB222MAB												
DSA535SC		5.0	3.2	1.5	CS	10 to 30	-30 to +85	+2.3 to +5.5	VC	TC	38	
DSB535SC												
DSA535SD												
DSB535SD												
DSA535SG		5.0	3.2	1.2	CS or CMOS	10 to 40	-40 to +85	+2.7 to +5.5	VC Stb	IE TC	39	
DSB535SG												
DSA535SG												
DSB535SG												

Clock Oscillators (SPXO)

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-6}$) <small>(Includes frequency tolerance at room temperature.)</small>	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (mA)	Recommended Application	Catalog Page		
		L	W	H (max.)										
DS1008JS		1.05	0.85	0.24	CMOS	1.0 to 100	± 50	-40 to +125	+1.6 to +3.3	1.8	IE TC	8		
DSO1612AR		1.6	1.2	0.58	CMOS	0.584375 to 80	± 50 ± 100	-40 to +85 -40 to +125	+1.6 to +3.6	1.4 to 3.8	IE TC AE	50 82		
DSO211AR		2.0	1.6	0.8	CMOS	0.4 to 80	± 50 ± 100	-40 to +85 -40 to +125	+1.6 to +3.6	1.0 to 5.0 2.5 to 6.0	IE TC AE	51 82		
DSO221SR		2.5	2.0	0.895	CMOS	0.2 to 167	± 50 ± 100	-40 to +85 -40 to +125	+1.6 to +3.6	1.0 to 8.0 2.5 to 8.0	IE TC AE	52, 53 83		
DSO321SR	3.2	2.5	1.2											
DSO531SR	5.0	3.2	1.2											
DSO751SR	7.3	4.9	1.7											
DSO211AN		2.0	1.6	0.8	CMOS	9.6 to 80	± 50	-40 to +85	+0.8 to +1.6	1.2 to 6.8	IE TC	48		
DSO221SN	2.5	2.0	0.895											
DSO321SN	3.2	2.5	1.2											
DSO221SY		2.5	2.0	0.895	CMOS	1.049 to 8.5	± 35 ± 50	-40 to +85	+1.6 to +3.6	0.7	IE TC AE	54 85		
DSO321SY	3.2	2.5	1.2											
DSO211AB		2.0	1.6	0.8	CMOS	3.25 to 52	± 50	-40 to +85	+5.0	8.0	IE IE	49		
DSO221SBM	2.5	2.0	0.895											
DSO321SBM	3.2	2.5	1.2	0.7 to 90					± 50	-40 to +85			+3.3	4.0 to 8.0
DSO321SBN														
DSO321SVN	5.0	3.2	1.2	0.7 to 90					± 50	-40 to +85			+3.3	2.0 to 6.0
DSO531SBM														
DSO531SBN	7.3	4.9	1.7	0.7 to 90					± 50	-40 to +85			+5.0	4.0 to 8.0
DSO531SVN														
DSO751SBM	7.0	5.0	2.2	170 to 230					± 50	-20 to +70			+3.3	70
DSO751SBN														
DSO751SVN	7.0	5.0	2.2	170 to 230	± 50	-20 to +70	+3.3	70						
DSO751SVN														
DSO753HV		7.0	5.0	2.2	CMOS	170 to 230	± 50	-20 to +70	+3.3	70	IE TC	58		
DLO555MB		5.0	4.0	5.0	CMOS	0.75 to 54	$\pm 50, \pm 100$	-10 to +85	+1.6 to +5.5	8.0	IE IE	59		

Low Phase Noise Crystal Oscillators (SPXO)

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-9}$) (Includes frequency tolerance at room temperature.)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (mA)	Recommended Application	Catalog Page
		L	W	H (max.)								
DSO211AH		2.0	1.6	0.8	CMOS	1.2 to 80	± 50 ± 80	-40 to +85 -40 to +105	+1.6 to +3.6	2.8 to 5.0	CE TC AE	45 80
DSO221SH		2.5	2.0	0.895	CMOS	3.5 to 52	± 50	-40 to +85	+1.6 to +3.6	2.8 to 5.0	CE TC	45
DSO321SH		3.2	2.5	1.2	CMOS	1.5 to 80	± 50 ± 100	-40 to +85 -40 to +125	+1.6 to +5.5 +1.6 to +3.6	2.8 to 9.1 3.7 to 9.1	CE TC AE	46 81
DSO531SHH		5.0	3.2	1.2	CMOS	20 to 50	± 50	-40 to +85	+1.6 to +3.6	2.9 to 7.7	CE TC	47

Differential Output Crystal Oscillators (SPXO)

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-9}$) (Includes frequency tolerance at room temperature.)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (mA)	Recommended Application	Catalog Page
		L	W	H (max.)								
DSO223SD		2.5	2.0	0.95	HCSL	13.5 to 167	± 50 ± 80	-40 to +85 -40 to +105	+2.5, +3.3	30	CE IE TC AE	55
DSO223SJ					LVDS					20		
DSO223SK					LV-PECL					45		
DSO323SD		3.2	2.5	1.2	HCSL	13.5 to 212.5 13.5 to 167	± 50 ± 80	-40 to +85 -40 to +105	+2.5, +3.3	35	CE IE TC AE	86
DSO323SJ					LVDS					30		
DSO323SK					LV-PECL					50 45		
DSO533SJ		5.0	3.2	1.2	LVDS	13.5 to 212.5	± 50	-40 to +85	+2.5, +3.3	20	CE IE TC	56
DSO533SK					LV-PECL					50		
DSO753SD					HCSL					35		
DSO753SJ		7.3	4.9	1.7	LVDS	212.5 to 350	± 50	-20 to +70	+2.5, +3.3	20	CE IE	57
DSO753SK					LV-PECL					50		
DSO753HJ					LVDS					70		
DSO753HK		7.0	5.0	2.2	LV-PECL					90	IE TC	58

Voltage Controlled Crystal Oscillators (VCXO)

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-9}$) (Includes frequency tolerance at room temperature.)	Operating Temperature Range (°C)	Frequency Adjustment Range ($\times 10^{-9}$)	Supply Voltage (V)	Current Consumption (mA)	Recommended Application	Catalog Page
		L	W	H (max.)									
DSV211AV		2.0	1.6	0.8	CMOS	12 to 80	± 40	-30 to +85	± 100 ± 125	+2.8, +3.3	9.4, 13.6	CE	60
DSV221SV		2.5	2.0	0.895	CMOS	6.75 to 90					3.0 to 13.5		
DSV321SR		3.2	2.5	1.2	CMOS	13.5 to 54	± 40	-30 to +85	± 100 ± 125	+1.8 +2.8, +3.3	2.0, 3.0	CE	61
DSV321SV					CMOS	6.75 to 90					3.0 to 12		
DSV323SV					CMOS	6.75 to 170					12, 25		
DSV531SB		5.0	3.2	1.4	CMOS	5.0 to 50	± 50	-10 to +70	± 100	+5.0 +3.3	15	CE	62
DSV532SB					CMOS	1.25 to 80					10, 15		
DSV531SV					CMOS	4.0 to 50					15		
DSV532SV					CMOS	2.0 to 170					12, 25		
DSV753SB		7.3	4.9	1.7	CMOS	4.0 to 50	± 50	-40 to +85	± 100	+5.0 +3.3	15	CE	64
DSV753SV					CMOS	2.0 to 170					12, 25		
DSV753HV		7.0	5.0	2.2	CMOS	170 to 230	± 50	-20 to +70	± 100	+3.3	70	CE TC	65

Differential Output Voltage Controlled Crystal Oscillators (VCXO)

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-9}$) (Includes frequency tolerance at room temperature.)	Operating Temperature Range (°C)	Frequency Adjustment Range ($\times 10^{-9}$)	Supply Voltage (V)	Current Consumption (mA)	Recommended Application	Catalog Page
		L	W	H (max.)									
DSV323SD		3.2	2.5	1.2	HCSL	80 to 170	± 50	-40 to +85	± 100	+3.3	40	CE TC	63
DSV323SJ					LVDS						30		
DSV323SK					LV-PECL						50		
DSV753SD		7.3	4.9	1.7	HCSL	80 to 170	± 50	-40 to +85	± 100	+3.3	40	CE	64
DSV753SJ					LVDS						30		
DSV753SK					LV-PECL						50		
DSV753HJ		7.0	5.0	2.2	LVDS	170 to 350	± 50	-20 to +70	± 100	+3.3	70	CE TC	65
DSV753HK					LV-PECL						90		
DSV753CJ		7.0	5.0	2.2	LVDS	350 to 700	± 50	-20 to +70	± 100	+3.3	60	CE TC	66
DSV753CK					LV-PECL						80		

Oven Controlled Crystal Oscillator (OCXO)

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Characteristics over Temperature ($\times 10^{-9}$)	Operating Temperature Range (°C)	Supply Voltage (V)	Power Consumption (W)	Tolerance ($\times 10^{-9}$)	vs. Aging ($\times 10^{-9}$)	Function	Recommended Application	Catalog Page
		L	W	H (max.)											
DLC117	-	25.4	25.4	13.5	CMOS	10 to 20	± 20	-20 to +70	+3.3, +5.0	1.0 (equilibrium)	± 100	± 100	VC	CE IE	44

Real Time Clock Module (RTC) / kHz Band TCXO

Type	Actual Size	Size (mm)			Output	Frequency Range (kHz)	Frequency Tolerance ($\times 10^{-9}$) (Includes frequency tolerance at room temperature.)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (μ A)	Temperature Compensated Type	Recommended Application	Catalog Page
		L	W	H (max.)									
DSK324SR		3.2	2.5	1.0	CMOS	32.768	± 5.0	-40 to +85	+1.3 to +5.5	2.0, 4.0	Digital	CE IE AE	43-92
DSK321STD		3.2	2.5	1.0	CMOS	32.768	± 5.0	-40 to +85	+1.3 to +5.5	2.0 to 3.2	Digital	CE IE AE	42-91

kHz Band SPXO

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-9}$) (Includes frequency tolerance at room temperature.)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (μ A)	Recommended Application	Catalog Page
		L	W	H (max.)								
DSO221SR (kHz)		2.5	2.0	0.895	CMOS	32.768 to 50	± 100	-40 to +125	+1.6 to +5.5	65 to 120	AE	84
DSO321SR (kHz)		3.2	2.5	1.2	CMOS	32.768	± 35 ± 50	-40 to +85	+1.6 to +3.6	18	CE TC AE	54 85
DSO221SY (kHz)		2.5	2.0	0.895	CMOS	32.768	± 35 ± 50	-40 to +85	+1.6 to +3.6	18	CE TC AE	54 85

MEMS Oscillators



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Icons **CE** Consumer Equipment **IE** Industrial Equipment **TC** Mobile Phone, Wireless Communication

kHz Band MEMS Oscillator

Type	Actual Size	Size (mm)			Output	Frequency Range (kHz)	Frequency Characteristics over Temperature ($\times 10^{-6}$)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (μ A typ.)	Recommended Application	Catalog Page
		L	W	H (max.)								
MO1532		1.5	0.8	0.6	NanoDrive™ LVC MOS	32.768	± 100	-10 to +70 -40 to +85	+1.2 to +3.63	+0.90	CE TC	106
MO1534		1.5	0.8	0.6	NanoDrive™ LVC MOS	0.001 to 32.768	± 100	-10 to +70 -40 to +85	+1.2 to +3.63	+0.90	CE TC	107
		2.0	1.2	0.6								
MO1569		1.5	0.8	0.6	LVC MOS	0.001 to 462	± 50	-40 to +85	+1.62 to +3.63	+2.0 μ A (100kHz)	CE TC	106
MO1630		2.0	1.2	0.6	LVC MOS	32.768	± 150	-40 to +105	+1.5 to +3.63	+1.00	CE TC	106

kHz Band Temperature Compensated MEMS Oscillators

Type	Actual Size	Size (mm)			Output	Frequency Range (kHz)	Frequency Characteristics over Temperature ($\times 10^{-6}$)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (μ A typ.)	Recommended Application	Catalog Page	
		L	W	H (max.)									
MO1552		1.5	0.8	0.6	NanoDrive™ LVC MOS	32.768	$\pm 5/\pm 10/\pm 20$ over temp.	-40 to +85	+1.5 to +3.63	+0.99	CE TC	106	
MO1566					LVC MOS				± 3 all inclusive	+1.8			+4.5
MO1568					LVC MOS				± 5 all inclusive After Overmold/ Underfill	+1.62 to +3.63			+8.0 μ A (100kHz)
MO1576					LVC MOS				± 5 all inclusive				

Low Power MEMS Oscillators

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-6}$) (Includes frequency tolerance at room temperature.)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (mA typ.)	Recommended Application	Catalog Page
		L	W	H (max.)								
MO8008		2.0	1.6	0.8	LVC MOS	$\pm 20, \pm 25, \pm 50$	-40 to +85	+1.62 to +1.98, +2.25 to +3.63	+3.1 to +5.4 (+0.6 to +1.0 μ A stby)	CE IE	108	
		2.5	2.0	0.8								
		3.2	2.5	0.8								
MO8009		7.0	5.0	1.0	LVC MOS	115 to 137						
MO8021		1.5	0.8	0.6	LVC MOS	1.0 to 26	± 100	-40 to +85	+1.71 to +1.89, +2.25 to +3.63	+0.006 to +0.34 (+0.9 μ A stby)	CE TC	107

MEMS Oscillators for Clock

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-6}$) (Includes frequency tolerance at room temperature.)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (mA typ.)	Recommended Application	Catalog Page
		L	W	H (max.)								
MO2001		2.9	2.8	1.3	LVC MOS	1.0 to 110	$\pm 20, \pm 25, \pm 50$	-40 to +85	+1.62 to +1.98, +2.25 to +3.63	+3.6 to +5.4 (+0.6 to +1.0 μ A stby)	CE IE	108
MO2002					LVC MOS	115 to 137						

Low Phase Jitter MEMS Oscillators

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-6}$) (Includes frequency tolerance at room temperature.)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (mA typ.)	Recommended Application	Catalog Page
		L	W	H (max.)								
MO8208		2.7	2.4	0.8	LVC MOS	1.0 to 80	$\pm 10, \pm 20, \pm 25, \pm 50$	-40 to +85	+2.25 to +3.63	+29 to +36 (+10 μ A stby)	CE IE	110
		3.2	2.5	0.8								
		5.0	3.2	0.8								
MO8209		7.0	5.0	1.0	LVC MOS	80 to 220						
MO9120		3.2	2.5	0.8	LVPECL LVDS	25 to 212.5	$\pm 10, \pm 20, \pm 25, \pm 50$	-40 to +85	+2.25 to +3.63	+54 to +69	CE IE	109
MO9121		5.0	3.2	0.8		1.0 to 220						
MO9122		7.0	5.0	1.0		220 to 625						
MO9365		3.2	2.5	0.8	LVPECL LVDS HCSL	32 Standard Frequencies	$\pm 10, \pm 20, \pm 25, \pm 50$	-40 to +85 -40 to +105	+2.25 to +3.63	+76 to +84	CE IE	109
MO9366		5.0	3.2	0.8		1.0 to 220						
MO9367		7.0	5.0	1.0		220 to 725						

High Temperature MEMS Oscillators

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-6}$) (Includes frequency tolerance at room temperature.)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (mA typ.) (+1.0 μ A stby)	Recommended Application	Catalog Page
		L	W	H (max.)								
MO1618		2.0	1.6	0.8	LVC MOS	33 Standard Frequencies	$\pm 20, \pm 25, \pm 30, \pm 50$	-40 to +125	+1.62 to +1.98, +2.25 to +3.63	CE IE	111	
MO8918		2.5	2.0	0.8		1.0 to 110						
MO8919		3.2	2.5	0.8		115 to 137						
MO8920		5.0	3.2	0.8		1.0 to 110						
MO8921		7.0	5.0	1.0		119 to 137						

High Temperature MEMS Oscillators for Clock

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-6}$) (Includes frequency tolerance at room temperature.)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (mA typ.) (+1.0 μ A stby)	Recommended Application	Catalog Page
		L	W	H (max.)								
MO2018		2.9	2.8	1.3	LVC MOS	1.0 to 110	$\pm 20, \pm 25, \pm 30, \pm 50$	-40 to +85	+1.62 to +1.98, +2.25 to +3.63	CE IE	111	
MO2019						115 to 137		-55 to +125				
MO2020						1.0 to 110						
MO2021						119 to 137						

Voltage Controlled MEMS Oscillators

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-6}$) (Includes frequency tolerance at room temperature.)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (mA typ.)	Recommended Application	Catalog Page
		L	W	H (max.)								
MO3372		3.2	2.5	0.8	LVPECL LVDS HCSL	1.0 to 220	$\pm 10, \pm 25, \pm 50$	-40 to +85	+2.25 to +3.63	+76 to +84	CE IE	112
MO3373		5.0	3.2	0.8		220 to 725		-40 to +105				
MO3807		2.7	2.4	0.8	LVC MOS	30 Standard Frequencies	$\pm 25, \pm 50$	-40 to +85	+1.71 to +1.89, +2.25 to +3.63	+29 to +36 (+10 μ A stby)	CE IE	113
MO3808		3.2	2.5	0.8		1.0 to 80						
MO3809		5.0	3.2	0.8		80 to 220						
MO3809		7.0	5.0	1.0								

Digitally Controlled MEMS Oscillators

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-6}$) (Includes frequency tolerance at room temperature.)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (mA typ.)	Recommended Application	Catalog Page
		L	W	H (max.)								
MO3907		3.2	2.5	0.8	LVC MOS	1.0 to 220	$\pm 10, \pm 25, \pm 50$	-40 to +85	+1.71 to +1.89, +2.25 to +3.63	+29 to +36 (+10 μ A stby)	CE IE	114
MO3921		5.0	3.2	0.8								
MO3922		7.0	5.0	1.0								

Temperature Compensated MEMS Oscillators

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Characteristics over Temperature ($\times 10^{-6}$)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (mA typ.)	Recommended Application	Catalog Page
		L	W	H (max.)								
MO5021		3.2	2.5	0.8	LVPECL LVDS	1.0 to 220	± 5.0	-40 to +85	+2.25 to +3.63	+54 to +69	CE IE	116
MO5022		5.0	3.2	0.8		220 to 625						
MO5155		5.0	3.2	1.0	Clipped Sinewave (1 to 60 MHz) LVC MOS	10 std. GNSS Freq.	$\pm 0.5, \pm 1.0, \pm 2.5$	-40 to +85 -40 to +105	+2.25 to +3.63	+40 to +45	CE IE	115
MO5156						1.0 to 60						
MO5157						60 to 220						
MO5356						1.0 to 60						
MO5357						60 to 220						

MEMS Oscillators with Spread Spectrum Function

Type	Actual Size	Size (mm)			Output	Frequency Range (MHz)	Frequency Tolerance ($\times 10^{-6}$) (Includes frequency tolerance at room temperature.)	Operating Temperature Range (°C)	Supply Voltage (V)	Current Consumption (mA typ.)	Recommended Application	Catalog Page
		L	W	H (max.)								
MO9002		5.0	3.2	0.8	LVPECL LVDS CML HCSL	1.0 to 220	$\pm 25, \pm 50$	-40 to +85	+1.71 to +1.89, +2.25 to +3.63	+48 to +75	CE IE	117
MO9002		7.0	5.0	1.0								
MO9003		2.5	2.0	0.8	LVC MOS	1.0 to 110	$\pm 50, \pm 100$	-40 to +85	+1.71 to +1.89, +2.25 to +3.63	+3.2 to +4.1 (+0.4 to +4.3 μ A stby)	CE IE	117
MO9003		3.2	2.5	0.8								
MO9003		5.0	3.2	0.8								
MO9003		7.0	5.0	1.0								
MO9005		2.0	1.6	0.8	LVC MOS	1.0 to 141	$\pm 20, \pm 25, \pm 50$	-40 to +85	+1.62 to +1.98, +2.25 to +3.63	+5.0 to +6.5 (+0.4 to +4.3 μ A stby)	CE IE	117
MO9005		2.5	2.0	0.8								
MO9005		3.2	2.5	0.8								



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