ASDMB series

Plastic SMD MEMS Clock Oscillator

Description

The Abracon ASDMB series is a programmable MEMS oscillator, offered in various supply voltages. This series features low power consumption, a wide frequency range, excellent phase noise, tight stabilities, and short lead times for industrial, consumer, and other applications. The ASDMB series comes in a 2.5 x 2.0 mm compact package with a CMOS output.

Features

- Low Power Consumption
- Exceptional Stability +/- 10ppm Over Temp. at -40 to +105°C
- Compact QFN Plastic Packaging
- REACH/RoHS II Compliant | MSL Level 1

Typical Applications

- CCD Clock for VTR Camera
- Equipment Connected to PCs
- Low Profile Equipment
- Computers and Peripherals
- Portable Electronics
- Consumer Electronics
- Vibrant, Shock-Prone & Humid Environments for Industrial Equipment

Key Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Notes
Range Frequency:	1.0		150	MHz	
Operating Temperature	0		+70	°C	See options
Storage Temperature	-55		+150	°C	
Overall Frequency Stability [Note 1]	-50		+50	ppm	See options
Supply Voltage (Vdd)	+1.8 ~ +3.3			V	
Output Load:			15, 25, or 40	pF	See options
	10			kΩ	
Symmetry:	45		55	%	@1/2Vdd
Startup Time:		1.5	3.0	ms	
Disable Time:		20	100	ns	
Disable Stand-by Current:			15	uA	
Tri-state Function (Stand-by) :	"1" (VIH≥0.75*Vdd) or Open: Oscillation			V	
	"0" (VIL<0.25*Vdd) : Hi Z				
Aging:	-5.0		+5.0	ppm	First year @25℃

Note 1: Includes post reflow frequency accuracy, temperature stability, load pulling and power supply variation.

Key Electrical Specifications – Vdd = 1.8V+/-0.15V

Parameters		Min.	Typ.	Max.	Units	Notes
Supply Current (no load):	1.0 to 39.9999MHz		5	15	mA	CL=0pF RL=∞ T=25°C (Standard CL: 15pF)
	40.0 to 79.9999MHz		6	15	mA	
	80.0 to 124.9999MHz		7	15	mA	
	125.0 to 150MHz		8	15	mA	
	1.0 to 39.9999MHz		6	15	mA	CL=0pF RL=∞ T=25°C (CL option: 25pF)
	40.0 to 79.9999MHz		7	15	mA	
	80.0 to 124.9999MHz		8	15	mA	
	125.0 to 150MHz		9	15	mA	
	1.0 to 39.9999MHz		7	15	mA	CL=0pF RL=∞ T=25°C (CL option: 40pF)
	40.0 to 79.9999MHz		8	15	mA	
	80.0 to 124.9999MHz		9	15	mA	
	125.0 to 150MHz		10	15	mA	
Output Voltage:	VOH	0.8*Vdd			V	CL=15, 25, 40pF
	VOL			0.2*Vdd	V	
Rise Time: Fall Time:	Tr		1.8	3.0	ns	CL=15pF; T=25°C 20%/80%*VDD
	Tf		1.0	3.0	ns	
	Tr		1.5	3.0	ns	CL=25pF; T=25°C 20%/80%*VDD
	Tf		1.2	3.0	ns	
	Tr		1.4	3.0	ns	CL=40pF; T=25°C 20%/80%*VDD
	Tf		1.1	3.0	ns	
Cycle to Cycle Jitter:			60		ps	F=100MHz
Period Jitter RMS:			10		ps	F=100MHz

Key Electrical Specifications – Vdd = 2.5V+/-0.2V

Parameters		Min.	Typ.	Max.	Units	Notes
Supply Current (no load):	1.0 to 39.9999MHz		6	15	mA	CL=0pF RL=∞ T=25°C (Standard CL: 15pF)
	40.0 to 79.9999MHz		7	15	mA	
	80.0 to 124.9999MHz		8	15	mA	
	125.0 to 150MHz		9	15	mA	
	1.0 to 39.9999MHz		7	15	mA	CL=0pF RL=∞ T=25°C (CL option: 25pF)
	40.0 to 79.9999MHz		8	15	mA	
	80.0 to 124.9999MHz		9	15	mA	
	125.0 to 150MHz		10	15	mA	
	1.0 to 39.9999MHz		8	16	mA	CL=0pF RL=∞ T=25°C (CL option: 40pF)
	40.0 to 79.9999MHz		9	16	mA	
	80.0 to 124.9999MHz		10	16	mA	
	125.0 to 150MHz		11	16	mA	
Output Voltage:	VOH	0.8*Vdd			V	CL=15, 25pF
	VOL			0.2*Vdd	V	
	VOH	0.9*Vdd			V	CL=40pF
	VOL			0.1*Vdd	V	
Rise Time: Fall Time:	Tr		1.0	2.0	ns	CL=15pF; T=25°C 20%/80%*VDD
	Tf		0.9	2.0	ns	
	Tr		1.1	2.0	ns	CL=25pF; T=25°C 20%/80%*VDD
	Tf		0.9	2.0	ns	
	Tr		1.0	2.0	ns	CL=40pF; T=25°C 20%/80%*VDD
	Tf		0.9	2.0	ns	
Cycle to Cycle Jitter:			50		ps	F=100MHz
Period Jitter RMS:			5		ps	F=100MHz

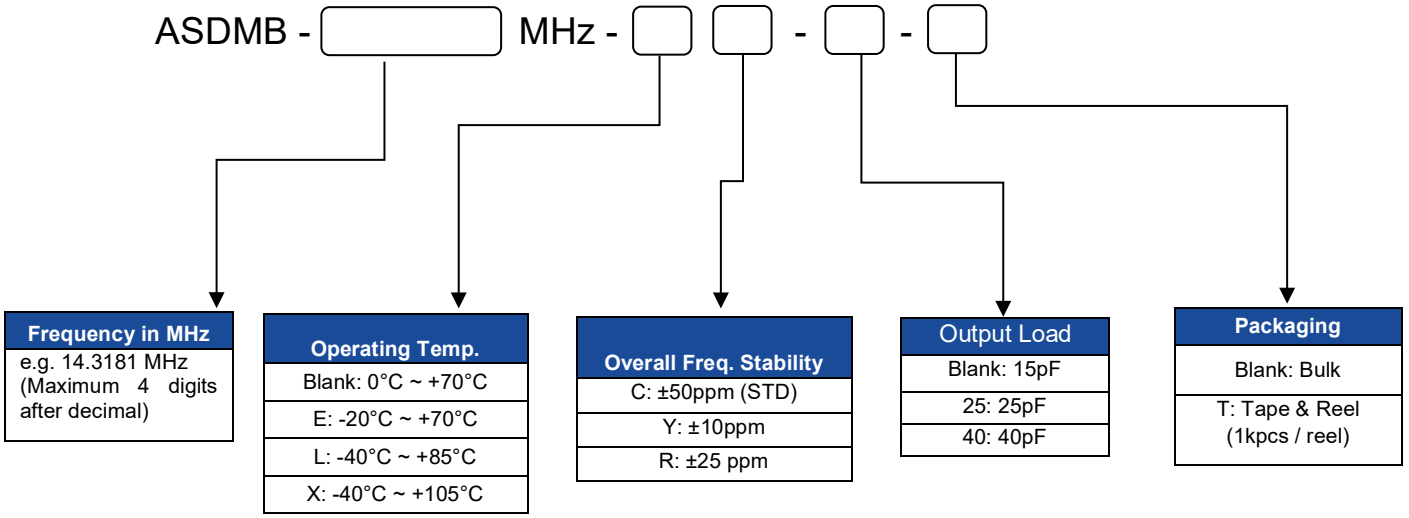
Key Electrical Specifications – Vdd = 3.3V +/-0.3V

Parameters		Min.	Typ.	Max.	Units	Notes
Supply Current (no load):	1.0 to 39.9999MHz		7	15	mA	CL=0pF RL=∞ T=25°C (Standard CL: 15pF)
	40.0 to 79.9999MHz		8	15	mA	
	80.0 to 124.9999MHz		9	15	mA	
	125.0 to 150MHz		10	15	mA	
	1.0 to 39.9999MHz		8	16	mA	CL=0pF RL=∞ T=25°C (CL option: 25pF)
	40.0 to 79.9999MHz		9	16	mA	
	80.0 to 124.9999MHz		10	16	mA	
	125.0 to 150MHz		11	16	mA	
	1.0 to 39.9999MHz		8	16	mA	CL=0pF RL=∞ T=25°C (CL option: 40pF)
	40.0 to 79.9999MHz		9	16	mA	
	80.0 to 124.9999MHz		10	16	mA	
	125.0 to 150MHz		11	16	mA	
Output Voltage:	V_{OH}	0.8*Vdd			V	CL=15pF
	V_{OL}			0.2*Vdd	V	
	V_{OH}	0.9*Vdd			V	CL=25, 40pF
	V_{OL}			0.1*Vdd	V	
Rise Time: Fall Time:	Tr		1.0	2.0	ns	CL=15pF; T=25°C 20%/80%*VDD
	Tf		0.9	2.0	ns	
	Tr		1.0	2.0	ns	CL=25pF; T=25°C 20%/80%*VDD
	Tf		0.9	2.0	ns	
	Tr		0.8	2.0	ns	CL=40pF; T=25°C 20%/80%*VDD
	Tf		0.8	2.0	ns	
Cycle to Cycle Jitter:			50		ps	F=100MHz
Period Jitter RMS:			5		ps	F=100MHz

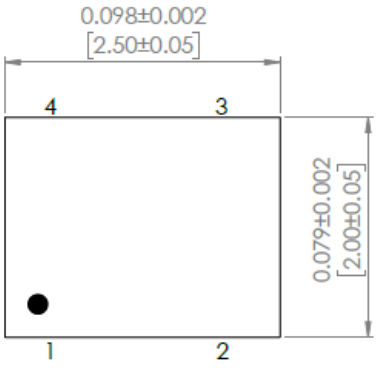
Absolute Maximum Ratings

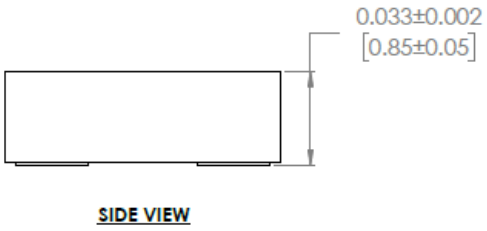
Item	Min.	Max.	Units
Supply voltage	-0.3	+4.0	V
Input voltage	-0.3	Vdd+0.3	V
Junction Temp.		+150	°C
Storage Temp.	-55	+150	°C
Soldering Temp.		+260	°C
ESD HBM MM CDM		 4,000 400 1,500	V

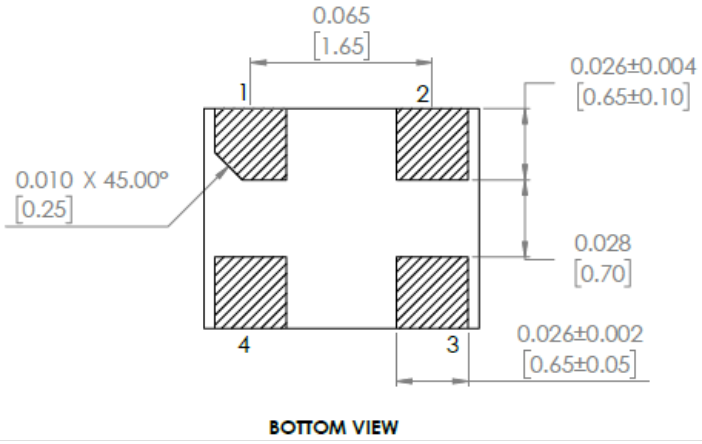
Options and Part Identification

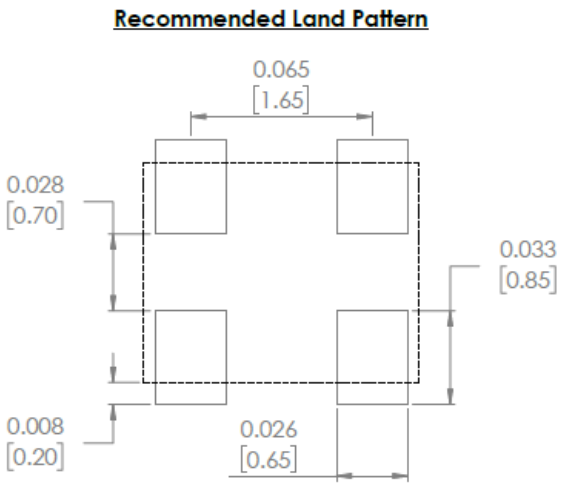


Mechanical Dimensions









Pin#	Function
1	Standby
2	GND
3	Output
4	Vdd

Note: Recommend using 0.01uf bypass capacitor between PIN 2 and 4.

Dimensions: Inches [mm]

Reflow Profile [JEDEC J-STD-020]

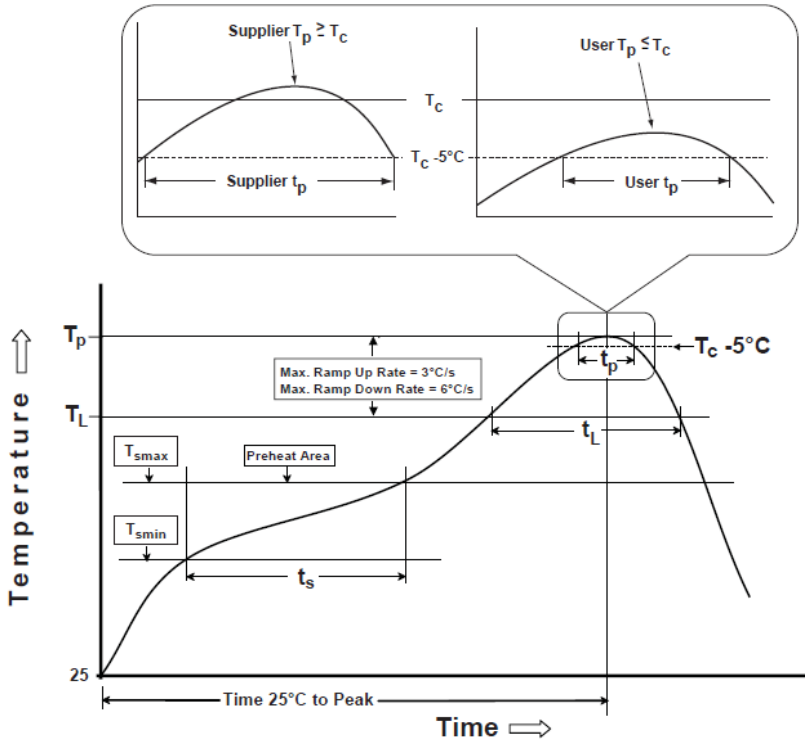


Table 1

SnPb Eutectic Process Classification Temperatures (T_c)		
Package Thickness	**Volume mm³ <350**	**Volume mm³ ≥350**
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2

Pb-Free Process Classification Temperatures (T_c)			
Package Thickness	**Volume mm³ <350**	**Volume mm³ 350-2000**	**Volume mm³ >2000**
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

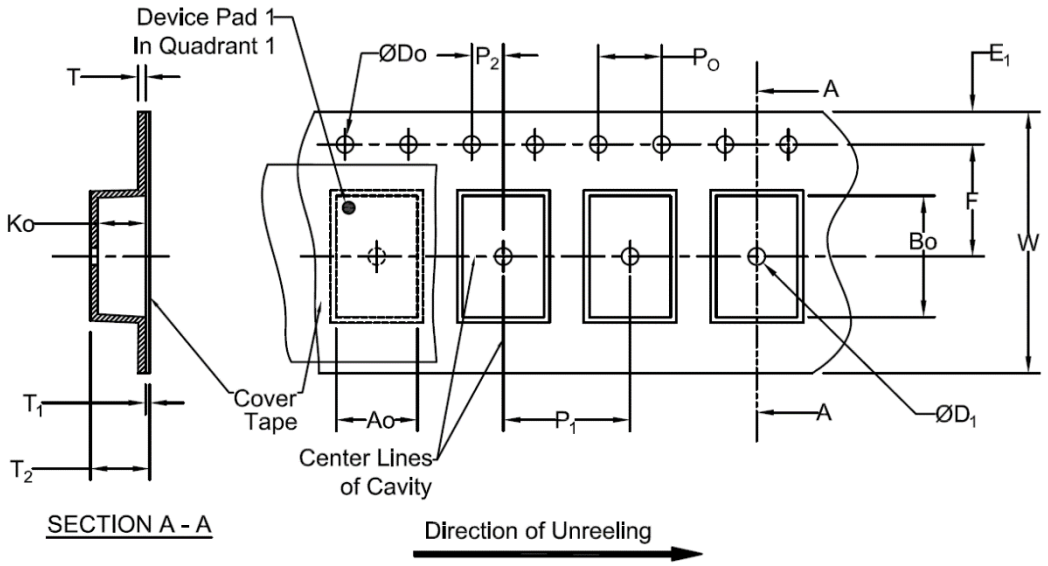
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T_{smin})	100°C	150°C
Temperature maximum (T_{smax})	150°C	200°C
Time (T_{smin} to T_{smax}) (t_s)	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate (T_{smax} to T_P)	3°C/sec. max	3°C/sec. max
Liquidous temperature (T_L)	183°C	217°C
Time at liquidous (t_L)	60 - 150 sec.	60 - 150 sec.
Peak package body temperature (T_P)*	**see Table 1**	**see Table 2**
Time (t_p)** within 5°C of the specified classification temperature (T_C)	20 sec.	30 sec.
Ramp-down rate (T_p to T_{smax})	6°C/sec. max	6°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max
Reflow cycles	2 max	2 max

*Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

**Tolerance for time at peak profile temperature (t_p) is defined as supplier minimum and a user maximum.

Packaging

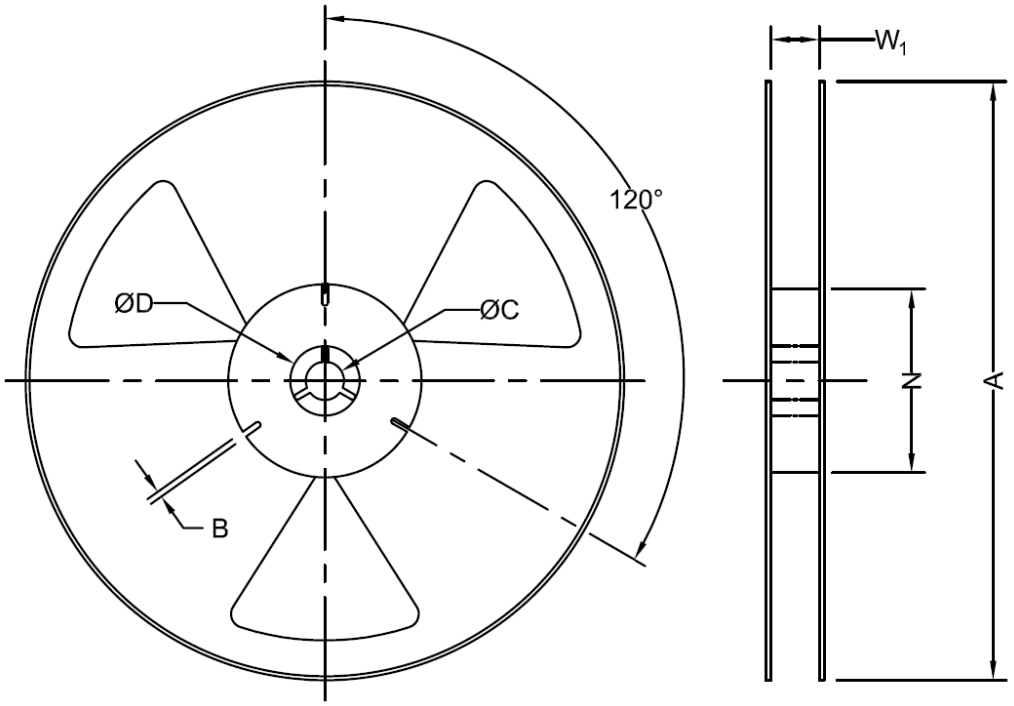
T: 1,000pcs/reel (D=180mm)



Tape Specifications (mm)							
Width	Ao	Bo	Do	D_1 (Min)	E_1	F	Ko
8mm	*	*	1.5+0.1/-0.0	1.0	1.75±0.1	3.5±0.05	*
Width	P1	P2	P0	T (Max)	T1 (Max)	T2 (Max)	W (Max)
8mm	4.0±0.1	2.0±0.05	4.0±0.1	0.6	0.1	2.5	8.3

***Note: Compliant to EIA-481**

Dimension: mm



Reel Specifications (mm)							
Width	Qty/Reel	A (Nom)	B (Min)	C (Min)	D (Min)	N (Min)	*W_1
8mm	1000	178	1.5	13.0+0.5/-0.2	20.2	50	8.4+1.5/-0.0

***Note: Measured at Hub**

Dimension: mm

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

ABRACON:

ASDMB-10.000MHZ-LY-T ASDMB-10.000MHZ-XY-T ASDMB-100.000MHZ-LY-T ASDMB-100.000MHZ-XY-T ASDMB-11.0592MHZ-LY-T ASDMB-11.0592MHZ-XY-T ASDMB-12.000MHZ-LY-T ASDMB-12.000MHZ-XY-T ASDMB-125.000MHZ-LY-T ASDMB-125.000MHZ-XY-T ASDMB-133.333MHZ-LY-T ASDMB-133.333MHZ-XY-T ASDMB-14.31818MHZ-LY-T ASDMB-14.31818MHZ-XY-T ASDMB-14.7456MHZ-LY-T ASDMB-14.7456MHZ-XY-T ASDMB-150.000MHZ-LY-T ASDMB-150.000MHZ-XY-T ASDMB-18.432MHZ-XY-T ASDMB-19.200MHZ-LY-T ASDMB-19.200MHZ-XY-T ASDMB-20.000MHZ-LY-T ASDMB-20.000MHZ-XY-T ASDMB-24.000MHZ-LY-T ASDMB-24.000MHZ-XY-T ASDMB-24.576MHZ-LY-T ASDMB-24.576MHZ-XY-T ASDMB-25.000MHZ-LY-T ASDMB-25.000MHZ-XY-T ASDMB-26.000MHZ-LY-T ASDMB-26.000MHZ-XY-T ASDMB-27.000MHZ-LY-T ASDMB-27.000MHZ-XY-T ASDMB-29.4912MHZ-LY-T ASDMB-29.4912MHZ-XY-T ASDMB-3.6864MHZ-LY-T ASDMB-3.6864MHZ-XY-T ASDMB-30.000MHZ-LY-T ASDMB-30.000MHZ-XY-T ASDMB-32.000MHZ-LY-T ASDMB-32.000MHZ-XY-T ASDMB-33.000MHZ-LY-T ASDMB-33.000MHZ-XY-T ASDMB-33.333MHZ-LY-T ASDMB-33.333MHZ-XY-T ASDMB-4.000MHZ-LY-T ASDMB-4.000MHZ-XY-T ASDMB-44.000MHZ-LY-T ASDMB-44.000MHZ-XY-T ASDMB-48.000MHZ-LY-T ASDMB-48.000MHZ-XY-T ASDMB-50.000MHZ-LY-T ASDMB-50.000MHZ-XY-T ASDMB-60.000MHZ-LY-T ASDMB-60.000MHZ-XY-T ASDMB-7.3728MHZ-LY-T ASDMB-7.3728MHZ-XY-T ASDMB-75.000MHZ-LY-T ASDMB-75.000MHZ-XY-T ASDMB-8.000MHZ-LY-T ASDMB-8.000MHZ-XY-T ASDMB-80.000MHZ-LY-T ASDMB-80.000MHZ-XY-T ASDMB-16.000MHZ-LY-T ASDMB-16.000MHZ-XY-T ASDMB-1.544MHZ-LC-T ASDMB-1.8432MHZ-LC-T ASDMB-10.000MHZ-LC-T ASDMB-12.000MHZ-LC-T ASDMB-14.7456MHZ-LC-T ASDMB-16.000MHZ-LC-T ASDMB-18.432MHZ-LC-T ASDMB-19.200MHZ-LC-T ASDMB-20.000MHZ-LC-T ASDMB-24.000MHZ-LC-T ASDMB-24.576MHZ-LC-T ASDMB-25.000MHZ-LC-T ASDMB-26.000MHZ-LC-T ASDMB-27.000MHZ-LC-T ASDMB-29.4912MHZ-LC-T ASDMB-3.6864MHZ-LC-T ASDMB-30.000MHZ-LC-T ASDMB-32.000MHZ-LC-T ASDMB-33.000MHZ-LC-T ASDMB-33.333MHZ-LC-T ASDMB-4.000MHZ-LC-T ASDMB-48.000MHZ-LC-T ASDMB-50.000MHZ-LC-T ASDMB-60.000MHZ-LC-T ASDMB-7.3728MHZ-LC-T ASDMB-8.000MHZ-LC-T ASDMB-20.000MHZ-40-T ASDMB-25.000MHZ-T ASDMB-24.000MHZ-EC-T ASDMB-29.500MHZ-LR-T ASDMB-12.000MHZ-EC-T ASDMB-75.000MHZ-EC-T ASDMB-25.000MHZ-EC-T ASDMB-50.000MHZ-40-T ASDMB-25.000MHZ-LR-T