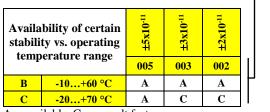
ULTRA PRECISION ULTRA SHORT-TERM STABILITY AND LOW PHASE NOISE DOCXO MV336

Features:

- Standard frequencies: 5.0 MHz and 10.0 MHz
- Ultra low phase noise level close to the carrier
- Stability vs. temperature: up to $\pm 2x10^{-11}$
- *High long-term stability: up to* ±1x10⁻⁸/year
- Short term stability (Allan deviation): up to 8x10⁻¹⁴ per
- 1 sec

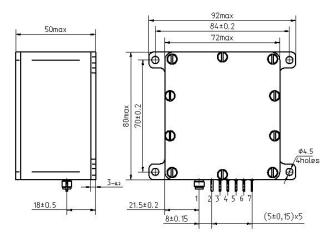
- Power supply: 12 V
- Available as RoHS
- Analog, digital or no frequency control
- Warranty period 2 years from the date of shipment
- Should be stored in a temperature controlled room in original packaging only

ORDERING GUIDE: MV336-B 003 D-10.0MHz-1-A-1S/1.2E-13-10S/2E-13-100S/3E-13



A – available, C – consult factory

For other temperature ranges see designation at the end of Data Sheet



Pin	Function								
	Analog frequency adjustment	Digital frequency adjustment	No frequency adjustment						
1	Output signal SMA	Output signal SMA	Output signal SMA						
2	Ground (case)	Ground (case)	Ground (case)						
3	Control voltage input	LDAC*	NC						
4	Ground for control voltage input	SCLK	NC						
5	NC	DIN	NC						
6	Reference voltage output	CS *	NC						
7	Power supply	Power supply	Power supply						

* Pins pulled up to 5 V through 10 kOhm

Vibrations:	
Frequency range	10-200 Hz
Acceleration	5 g
Shock:	75 g/3±1 ms
Humidity @ 25°C	<mark></mark>

			-	Fi	equency ac	ljustment		
Availability of certain aging values								
					an	alog		
				D	dig	gital		
	E ±3x10 ⁻⁸ /year					ncy control	,	
D	±2x10 ⁻⁸ /ye	ar			unt	uned		
C	±1x10 ⁻⁸ /ye	ar		' -	no frequency control			
							_	
				Standard	frequency			
	Phase noise,	10 MHz			5 MHz			
dBc/Hz:		1		2	1	2*		
	0.1 Hz	< -9		< -94	< -96	< -100		
	<u>0.1 Hz</u>	<-1		<-124	<-126	< -130		
	10 Hz	< -1		≤ <u>147</u>	<u> </u>	< -150		
	10 Hz	<-1		< -157	<-154	< -158		
	1000 Hz	<-1		< -163	< -162	< -165		
	1000 Hz	<-1		< -164	<-163	< -166	_	
*	preliminary in				<-105	< -100	_	
_	preminary m	101 1114	uon	L				
	Shor	t term	stal	bility (Allan d	leviation)			
Per 10 sec Per 100 s								
	Dan 1 ana		P	er 10 sec	Per 10(sec*	1	
	Per 1 sec			er 10 sec (option)	Per 10(opti			
	Per 1 sec	13)						
	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13	3)	(< 2x	(option) x10 ⁻¹³ (2E-13)	(optic) < 3x10 ⁻¹³	on)		
	< 1.2x10 ⁻¹³ (1.2E-	3)	(< 2x	(option)	(optic) < 3x10 ⁻¹³	on) (3E-13)		
	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13	3) 1) <	(< 2x	(option) x10 ⁻¹³ (2E-13)	(optic) < 3x10 ⁻¹³	on) (3E-13)		
	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13 < 9x10 ⁻¹⁴ (9E-14	3) 1) <	(< 2x	(option) x10 ⁻¹³ (2E-13)	(opti < 3x10 ⁻¹³ (< 1.5x10 ⁻¹³ (000) (3E-13) (1.5E-13)	10.6	
	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13 < 9x10 ⁻¹⁴ (9E-14	3)) <)	(< 2x < 1.3	(option) x10 ⁻¹³ (2E-13) x10 ⁻¹³ (1.3E-13)	(opti < 3x10 ⁻¹³ (< 1.5x10 ⁻¹³ ((3E-13) (3E-13) (1.5E-13) ±300x		
	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13 < 9x10 ⁻¹⁴ (9E-14 < 8x10 ⁻¹⁴ (8E-14	3)) <) uracy v	(< 2x < 1.3	(option) x10 ⁻¹³ (2E-13) x10 ⁻¹³ (1.3E-13)	(opti < 3x10 ⁻¹³ < 1.5x10 ⁻¹³ ; R ; -	(1.5E-13) (1.5E-13) (1.5E-13) ±300x ±5x10	0 ⁻⁷	
1	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13) < 9x10 ⁻¹⁴ (9E-14) < 8x10 ⁻¹⁴ (8E-14) nitial tuning acc f frequency contained.	3) 4) < 4) uracy v trol	(< 2x < 1.3 with	(option) (10 ⁻¹³ (2E-13) x10 ⁻¹³ (1.3E-13) different types	(opti < 3x10 ⁻¹³ (< 1.5x10 ⁻¹³ (< 1.5x10 ⁻¹³ (- - - A / D	on) 3E-13) (1.5E-13) ±300x ±5x10 ±5x10	0 ⁻⁷ 0 ⁻⁸	
	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13) < 9x10 ⁻¹⁴ (9E-14) < 8x10 ⁻¹⁴ (8E-14) nitial tuning acc of frequency cont Frequency stability	3) 4) < 4) uracy v trol ity vs. 1	(< 2x < 1.3 with	(option) (10 ⁻¹³ (2E-13) x10 ⁻¹³ (1.3E-13) different types changes (±5%)	(opti < 3x10 ⁻¹³ (< 1.5x10 ⁻¹³ (< 1.5x10 ⁻¹³ (- - - A / D	on) 3E-13) 1.5E-13) ±300x ±5x10 (±5x10 (±5x10) (±2x1) (±2x1)	0 ⁻⁷ 0 ⁻⁸ .0 ⁻¹¹	
I c H H	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13) < 9x10 ⁻¹⁴ (9E-14) < 8x10 ⁻¹⁴ (8E-14) nitial tuning acc of frequency cont frequency stability frequency	3) 4) < 4) < trol ity vs. 1 ity vs. 1	< 23 < 1.3 with	(option) (10 ⁻¹³ (2E-13) (10 ⁻¹³ (1.3E-13) different types changes (±5%) er supply chanş	(opti < 3x10 ⁻¹³ < 1.5x10 ⁻¹³ < 1.5x10 ⁻¹³	$ \begin{array}{c} \text{on} \\ \text{3E-13} \\ \text{1.5E-13} \\ \hline $	0 ⁻⁷ 0 ⁻⁸ .0 ⁻¹¹ .0 ⁻¹¹	
	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13) < 9x10 ⁻¹⁴ (9E-14) < 8x10 ⁻¹⁴ (8E-14) nitial tuning acc of frequency cont frequency stability frequency stability arm-up time weight the statement of the statement of the statement of t	3) 4) < 4) trol ity vs. 1 ithin a	< 23 < 1.3 with	(option) (10 ⁻¹³ (2E-13) (10 ⁻¹³ (1.3E-13) different types changes (±5%) er supply chanş	(opti < 3x10 ⁻¹³ < 1.5x10 ⁻¹³ < 1.5x10 ⁻¹³	$ \begin{array}{c c} \hline (n) & \\ (3E-13) & \\ (1.5E-13) & \\ \pm 300x & \\ \pm 5x10 & \\ \pm 5x10 & \\ (\pm 5x10 & \\ (\pm 5x10 & \\ (\pm 2x1 & \\ (\pm 2x$	0 ⁻⁷ 0 ⁻⁸ 0 ⁻¹¹ 0 ⁻¹¹ nin	
	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13) < 9x10 ⁻¹⁴ (9E-14) < 8x10 ⁻¹⁴ (9E-14) < 8x10 ⁻¹⁴ (8E-14) ritial tuning acc f frequency cont frequency stability frequency stability frequency stability warm-up time w ower supply (U, source supply (U, source supply) (U	3) 4) 4) 4) 4) 4) 4) 4) 4) 4) 4	< 23 < 1.3 with load powe	(option) (10 ⁻¹³ (2E-13) (10 ⁻¹³ (1.3E-13) different types changes (±5%) er supply chang acy of <±5x10 ⁻¹	(option (0)) = (0,0)	$\begin{array}{c} \textbf{3E-13} \\ \textbf{3E-13} \\ \textbf{1.5E-13} \\ \textbf{\pm} \textbf{5x10} \\ \textbf{5x10} \\ \textbf{\pm} \textbf{5x10} \\ 5x$	0 ⁻⁷ 0 ⁻⁸ 0 ⁻¹¹ 0 ⁻¹¹ nin 1%	
	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13) < 9x10 ⁻¹⁴ (9E-14) < 8x10 ⁻¹⁴ (8E-14) itial tuning acc of frequency stability frequency stability arm-up time we ower supply (U, Steady state curr	3) 4) 4) 4) 4) 4) 4) 4) 4) 4) 4	(< 2x < 1.3y with load powe	(option) (10 ⁻¹³ (2E-13) (10 ⁻¹³ (1.3E-13) different types changes (±5%) er supply chang acy of <±5x10 ⁻¹ nption @ +25 ⁰	(option (0)) = (0,0)	$\begin{array}{c} \textbf{3E-13} \\ \textbf{3E-13} \\ \textbf{1.5E-13} \\ \textbf{\pm} \textbf{5x10} \\ \textbf{5x10} \\ \textbf{\pm} \textbf{5x10} \\ 5x$	0 ⁻⁷ 0 ⁻⁸ 0 ⁻¹¹ 0 ⁻¹¹ nin 1%	
	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13) < 9x10 ⁻¹⁴ (9E-14) < 8x10 ⁻¹⁴ (8E-14) itial tuning acc of frequency stability Frequency stability Frequency stability Warm-up time w Power supply (U, Steady state curr Peak current con	3) 4) 	(< 2xx < 1.3 with load powe ccur nsum	(option) (10 ⁻¹³ (2E-13) (10 ⁻¹³ (1.3E-13)) different types changes (±5%) er supply chang acy of <±5x10 ⁻¹ nption @ +25 ⁰ luring warm-u	(option (0)) = (0,0)	$\begin{array}{c} \textbf{3E-13} \\ \textbf{3E-13} \\ \textbf{1.5E-13} \\ \textbf{\pm} \textbf{5x10} \\ \textbf{5x10} \\ \textbf{\pm} \textbf{5x10} \\ 5x$	0 ⁻⁷ 0 ⁻⁸ 0 ⁻¹¹ 0 ⁻¹¹ nin 1% mA	
	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13) < 9x10 ⁻¹⁴ (9E-14) < 8x10 ⁻¹⁴ (8E-14) itial tuning acc of frequency stability frequency stability requency stability warm-up time we ower supply (Us steady state curr cak current con operating temper	3) 4) 4) 4) 4) 4) 4) 4) 4) 4) 4	(< 2x < 1.3y with load nsum some	(option) (10 ⁻¹³ (2E-13) (13E-13) different types changes (±5%) er supply chang acy of <±5x10 ⁻¹³ (±5x10 ⁻¹³) (±5x10 ⁻¹³	(opti < 3x10 ⁻¹³ (< 1.5x10 ⁻¹³ (< 1.5x10 ⁻¹³ ($\begin{array}{c} \textbf{on} \\ \textbf{3E-13} \\ \textbf{1.5E-13} \\ 1.5$	0 ⁻⁷ 0 ⁻⁸ 0 ⁻¹¹ 0 ⁻¹¹ nin 1% mA	
	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13) < 9x10 ⁻¹⁴ (9E-14) < 8x10 ⁻¹⁴ (8E-14) itial tuning acc of frequency stability frequency stability requency stability warm-up time we ower supply (Us steady state curr reak current con perating temper Peak current con	3) 4) 4) 4) 4) 4) 4) 4) 4) 4) 4	(< 2x < 1.3x with load powe ccur nsum ion d <0 °C	(option) (10 ⁻¹³ (2E-13) (1) ⁻¹³ (1.3E-13) different types changes (±5%) er supply chang acy of <±5x10 ⁻¹³ (±5x10 ⁻¹³) er supply chang acy of <±5x10 ⁻¹³ (±5x10 ⁻¹³) (±5x10 ⁻¹³) (±5x1	(opti < 3x10 ⁻¹³ (< 1.5x10 ⁻¹³ (< 1.5x10 ⁻¹³ ($\begin{array}{c} \textbf{on} \\ \textbf{3E-13} \\ \textbf{1.5E-13} \\ 1.5$	0 ⁻⁷ 0 ⁻⁸ 0 ⁻¹¹ 0 ⁻¹¹ nin 1% mA mA	
	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13) < 9x10 ⁻¹⁴ (9E-14) < 8x10 ⁻¹⁴ (9E-14) < 8x10 ⁻¹⁴ (8E-14) nitial tuning acc f frequency stability frequency stability and the stability frequency	a) uracy v trol ity vs. 1 ity vs. 1 ithin a) ent cor sumpti rature 2	(< 2x < 1.3x with load powe ccur nsum ion d <0 °C	(option) (10 ⁻¹³ (2E-13) (1) ⁻¹³ (1.3E-13) different types changes (±5%) er supply chang acy of <±5x10 ⁻¹³ (±5x10 ⁻¹³) er supply chang acy of <±5x10 ⁻¹³ (±5x10 ⁻¹³) (±5x10 ⁻¹³) (±5x1	(opti < 3x10 ⁻¹³ (< 1.5x10 ⁻¹³ (< 1.5x10 ⁻¹³ ($\begin{array}{c} \begin{array}{c} 1 \\ 3E-13 \\ 1.5E-13 \\ 1.$	0 ⁻⁷ 0 ⁻⁸ 0 ⁻¹¹ nin 1% mA mA mA	
	< 1.2x10 ⁻¹³ (1.2E- < 1x10 ⁻¹³ (1E-13) < 9x10 ⁻¹⁴ (9E-14) < 8x10 ⁻¹⁴ (8E-14) itial tuning acc of frequency stability frequency stability requency stability warm-up time we ower supply (Us steady state curr reak current con perating temper Peak current cont and the state current context of the state current current context of the state current current context	a) uracy v trol ity vs. 1 ity vs. 1 ithin a) ent cor sumpti rature 2	(< 2x < 1.3x with load powe ccur nsum ion d <0 °C	(option) (10 ⁻¹³ (2E-13) (1) ⁻¹³ (1.3E-13) different types changes (±5%) er supply chang acy of <±5x10 ⁻¹³ (±5x10 ⁻¹³) er supply chang acy of <±5x10 ⁻¹³ (±5x10 ⁻¹³) (±5x10 ⁻¹³) (±5x1	(opti < 3x10 ⁻¹³ (< 1.5x10 ⁻¹³ (< 1.5x10 ⁻¹³ ($\begin{array}{c} \begin{array}{c} 1 \\ 3E-13 \\ 1.5E-13 \\ 1.$	0 ⁻⁷ 0 ⁻⁸ 0 ⁻¹¹ nin 1% mA mA mA	

Level	≥ +4 dBm					
Load	30 Ohm ± 5%					
Harmonics	≤ -30 dBc					
Frequency pulling range (for A and	$\geq \pm 3 \times 10^{-7} *$					
Analog frequency control with exten	05 V					
Analog frequency control with refer	+5 V					
Digital frequency control by SPI protocol						
DAC type MAX5719 (20 bit)						

* sufficient to compensate aging during 10 years

Additional notes:

For non-standard operating temperature ranges please use the following two letters designations (first letter for the lower limit, second letter for the upper limit), °C:

Е	F	G	Н	J	K	L	Μ	Ν	Р	Q	R	S	Т	
-40	-30	-20	-10	0	+10	+30	+40	+45	+50	+55	+60	+65	+70	l



Tel.:+7-812-350-9243; 332-5032. Fax:+7-812-350-7290. e-mail: sale@morion.com.ru

25

Due to continuous development and improvement Morion, Inc. reserves the right to modify design or specifications of its products without prior notice