

# TMO-M50S

Holdover up to 1.5  $\mu$ s / 24 hours

**Time Module  
Preliminary**



## Features

- Applications: Base station, Clock Reference, 5G
- High frequency stability vs. temperature ( $\leq \pm 5 \times 10^{-11}$ )

Parameter	Specification			
	TMO-M50S5		TMO-M50S12	
Frequency Range	5 MHz up to 100 MHz			
Standard Frequency	10.0000 MHz			
Frequency Accuracy	1 x 10 <sup>-12</sup>			
<b>Supply Voltage [ Vdc ]</b>	<b>Code</b>		<b>Vdc</b>	
	5		5.0 V $\pm$ 5%	
	12		12.0 V $\pm$ 5%	
<b>Current Consumption [ Idc ]</b>	<b>5 Vdc</b>		<b>12 Vdc</b>	
Warm up current	< 1500 mA		< 600 mA	
Steady state current @25°C	< 700 mA		< 300 mA	
<b>Frequency Stability</b>	<b>Code</b>	<b>OTR</b>	<b>°C</b>	<b>Code</b>
vs Operating Temperature Range [ OTR ]	EK	0 to +70		50p
	JK	-20 to +70		n10
				n20
<b>Holdover Capability</b>	<b>Code</b>		<b>Holdover</b>	
$\Delta T = \pm 2^\circ\text{C}$ , after 7 days turn ON	R		1.0 $\mu$ s / 8 hours	
	S		2.0 $\mu$ s / 8 hours	
	T		1.5 $\mu$ s / 24 hours	
<b>GNSS Receiver</b>	<b>Code</b>		<b>GNSS receiver</b>	
GPS, Beidou, GLONASS, Galileo	U		Included	
	V		Without	
<b>G-sensitivity</b>	<b>Code</b>		<b>G-sens per axis</b>	
Standard	Blank		< 3ppb/g	
Low-Gsens	G		< 1.5ppb/g	

## Ordering Guide: TMO-M50S5-EKn10-T-U-G-L 10MHz

RF Output Signal	Sine wave		
Output Level	5 $\pm$ 2dBm / Load 50 $\Omega$		
Harmonics & Spurious	-30dBc / -70dBc		
<b>Phase Noise @ 25°C</b>		<b>Standard</b>	<b>Low Phase Noise *</b>
10 MHz carrier frequency	10 Hz	$\leq -115$ dBc/Hz	$\leq -125$ dBc/Hz
Static conditions	100 Hz	$\leq -135$ dBc/Hz	$\leq -145$ dBc/Hz
*Low Phase Noise only available with Vdc 12V	1 kHz	$\leq -145$ dBc/Hz	$\leq -158$ dBc/Hz
	10 kHz	$\leq -147$ dBc/Hz	$\leq -162$ dBc/Hz
	100 kHz	$\leq -150$ dBc/Hz	$\leq -165$ dBc/Hz
<b>Short Term Stability [ Allan Variance ]</b>	$\leq 1 \times 10^{-11}$ @ 1s		
<b>1pps Output Signal</b>	<b>LVC MOS</b>		
Output Level	$V_{OH} > 2.4$ V $V_{OL} < 0.5$ V		
Pulse width	10 ms		
<b>1pps Input Reference</b>	<b>LVC MOS</b>		
Output Level	$V_{OH} > 2.4$ V $V_{OL} < 0.5$ V		
State Input Lock	> 2.4 V @ < 5 mA Load		
State Holdover	< 0.5 V @ < 5 mA Load		
<b>Lock Status Indicator</b>			
Module Locked	> 2.4 V @ < 5 mA Load		
Module Holdover	< 0.5 V @ < 5 mA Load		

Note 1: unless otherwise specified conditions are @ 25°C still air

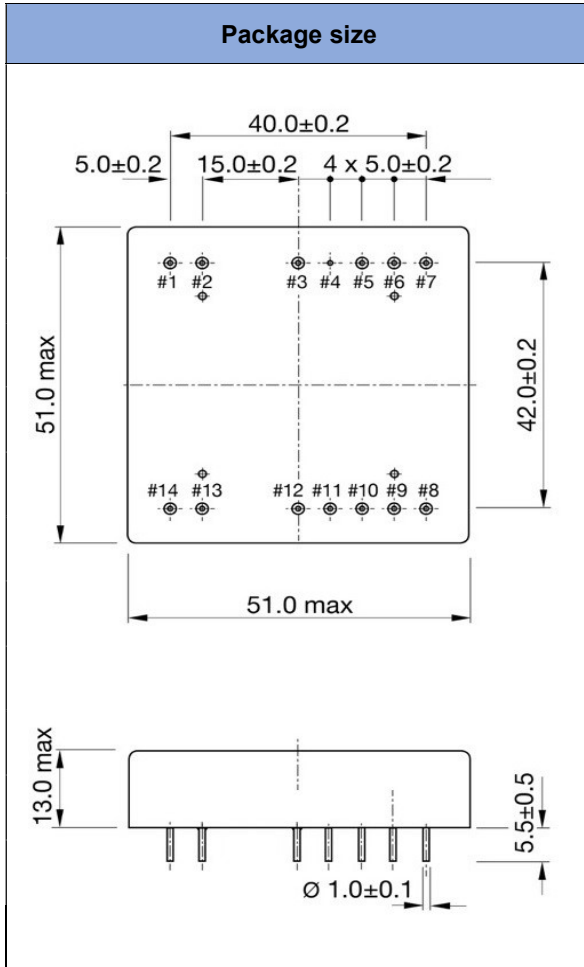
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Environmental test	
vibration	acceleration: 5 g; 10 Hz up to 200 Hz and down to 10 Hz; all 3 axes
shock	75 g, half-sine, 3 ms



Pin#	Pin Function
1	NC
2	NC
3	Vdc
4	GND
5	LOCK OUTPUT
6	NC
7	TX OUTPUT
8	STATE INPUT
9	NC
10	1pps INPUT
11	GND
12	1pps OUTPUT
13	GND
14	10 MHz OUTPUT

## MARKING



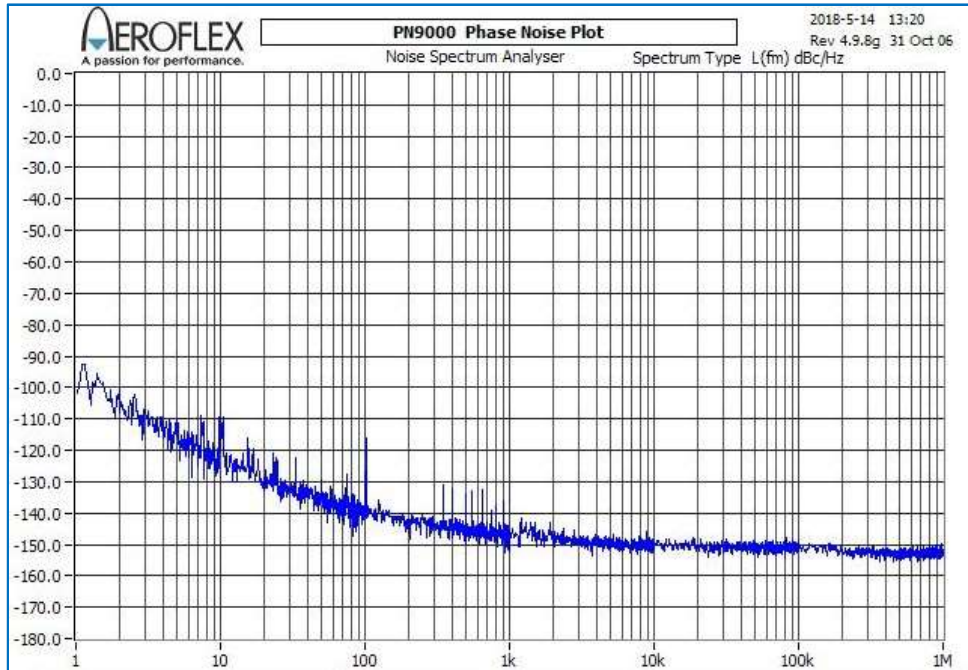
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## Phase Noise



## Holdover 24 hours

