

HIGH STABILITY RUBIDIUM STANDARDS

SERIAL PRODUCTION AT MORION, INC.

Features:

- High reliability;
- Aging up to $\pm 4.0 \times 10^{-12}$ /day, up to $\pm 2.0 \times 10^{-10}$ /year;
- Stability vs. temperature up to $\pm 1.0 \times 10^{-10}$;
- Short term stability (Allan deviation) per 1 s up to 5×10^{-12} ;
- Optimal solution for a wide range of telecom and test & measurement applications.



ORDERING EXAMPLE: FE-5680A [Opt. 03, 28]

Standard parameters			FE-5650A	FE-5680A
Type			10, SIN	10, SIN
Output frequency, MHz			10, SIN	10, SIN
Short term stability (Allan deviation) (after 2 hours of continuous operation):	1 s		$< 1.4 \times 10^{-11}$	
	10 s		$< 5 \times 10^{-12}$	
	100 s		$< 2 \times 10^{-12}$	
Operating temperature range (extended range – see options)			$-5^{\circ}\text{C} \dots +50^{\circ}\text{C}$	
Stability vs. temperature within operating temperature range			$< \pm 3 \times 10^{-10}$ (up to $\pm 1 \times 10^{-10}$ with option 32)	
Frequency stability vs. power supply changes within $U_s \pm 0,25 \text{ V}$ (for 15...18 V supply)			$< \pm 2 \times 10^{-11}$	
Retrace (2 hours ON – 6 hours OFF – 2 hours ON)			$< \pm 5 \times 10^{-11}$	
Digital frequency control range (via RS232)			$\pm 1 \times 10^{-7}$	
Aging:				
	– per day		$< \pm 2 \times 10^{-11}$ (up to $< \pm 4 \times 10^{-12}$ with opt.28)	
	– per year		$< \pm 2 \times 10^{-9}$ (up to $< \pm 2 \times 10^{-10}$ with opt. 29)	
Power supply, V			5 & 15...18	15...18
			two power supplies	single power supply
Power consumption @ 25°C, W		– steady state:		
		15 V	12	15
		5 V	2	-
		–warm-up period:		
		15 V	34	36
		5 V	2	-
Warm-up time @ 25°C, min:				
	– to lock		< 5	
	– within accuracy @ $< 2 \times 10^{-9}$		< 12	
	– within accuracy @ $< 5 \times 10^{-10}$		< 24	
Harmonic suppression, dBc			> 30	
Spurs in $\pm 5 \text{ MHz}$ BW, dBc			< -60	
Phase noise at offset, dBc/Hz (after 2 hours of continuous operation):		10 Hz	< -100	< -100
		100 Hz	< -125	< -125
		1000 Hz	< -145	< -145
Life time			> 10 years	
Warranty			2 years	
Package size, mm			37x77x76	25x102x139
Random vibration				
	- frequency rage, Hz		20-2000	
	- acceleration, g		10	
Shock, g/ms			40/11 \pm 4	
Non-operating temperature range			$-55 \dots +75^{\circ}\text{C}$	
Humidity			80%	
Pressure, Pa (mm Hg)			6×10^4 (450)	

HIGH STABILITY RUBIDIUM STANDARDS

SERIAL PRODUCTION AT MORION, INC.

Available options	
Output	
03	5 MHz
04	15 MHz (only for FE-5650A)
04A	20 MHz (only for FE-5650A)
04B	5-15 MHz (any frequency, only for FE-5650A, < - 135 dBc/Hz @ 1000 Hz)
21	Increased output RF level: 1.0 V (+13 dBm), into 50±5 Ohm load
69	1 PPS output
Frequency stability	
28	Aging <±4x10 ⁻¹² /day (after 24...72 hours of continuous operation), Aging <±5x10 ⁻¹⁰ /year (after 30 days of continuous operation)
29	Aging <±2x10 ⁻¹⁰ /year (after 1 year of continuous operation)
Frequency control	
35	0...5 V Analog tuning within range of 7x10 ⁻⁹ (p-p)
Short term stability (Allan deviation)	
31	<5x10 ⁻¹² per 1 s; <2x10 ⁻¹² per 10 s; <6x10 ⁻¹³ per 100 s
31A	<8x10 ⁻¹² per 1 s; <3x10 ⁻¹² per 10 s; <1x10 ⁻¹² per 100 s
Power supply	
20	15...18 V single power supply option for FE-5650A. Standard for FE-5680A
25	22 – 32 V single power supply option for FE-5650A. N/A for FE-5680A.

PLEASE CONTACT US FOR FULL LIST OF OPTIONS

Not all combinations of options are available.

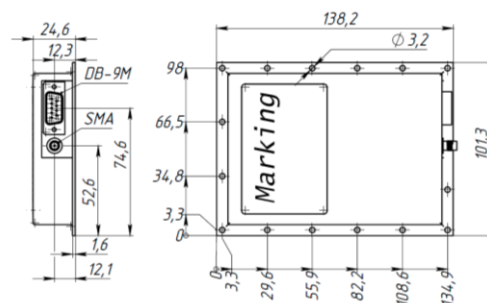
Operating temperature range									
Option	40	39	38	37	36	41	42	43	44
FE-5650A	-55°C	-40°C	-30°C	-20°C	-10°C	+55°C	+60°C	+65°C	+71°C
FE-5680A	-55°C	-40°C	-30°C	-20°C	-10°C	+55°C	+60°C	+65°C	NA

Pin assignment:

Pin	Assignment
J1-1	+ 15 V or + 22...32 V – for option 25
J1-2	Ground (case)
J1-3	Lock indicator
J1-4	+ 5 V (for FE-5650A, excluding option 20) or NC (for FE-5680A & FE-5650A option 20)
J1-5	Ground (case)
J1-6	NC or 1PPS output for option 69
J1-7	NC
J1-8	Remote digital control via RS-232. Data Rx or Analog voltage input for option 35
J1-9	Remote digital control via RS-232. Data Tx or NC for option 35.
J2	RF output, SMA F

Package drawing:

FE-5680A



FE-5650A

