

Magnetron Cavity Frequency Rubidium Standard (MCFRS)

High Precision & Performance Source



Telecom | Navigation | Broadcast | Defense | Instrument

Applications

Package: (all dimensions in millimeters)

The general information for the mechanical interface of the MCFRS unit is given in the package drawing of Fig. 4-3

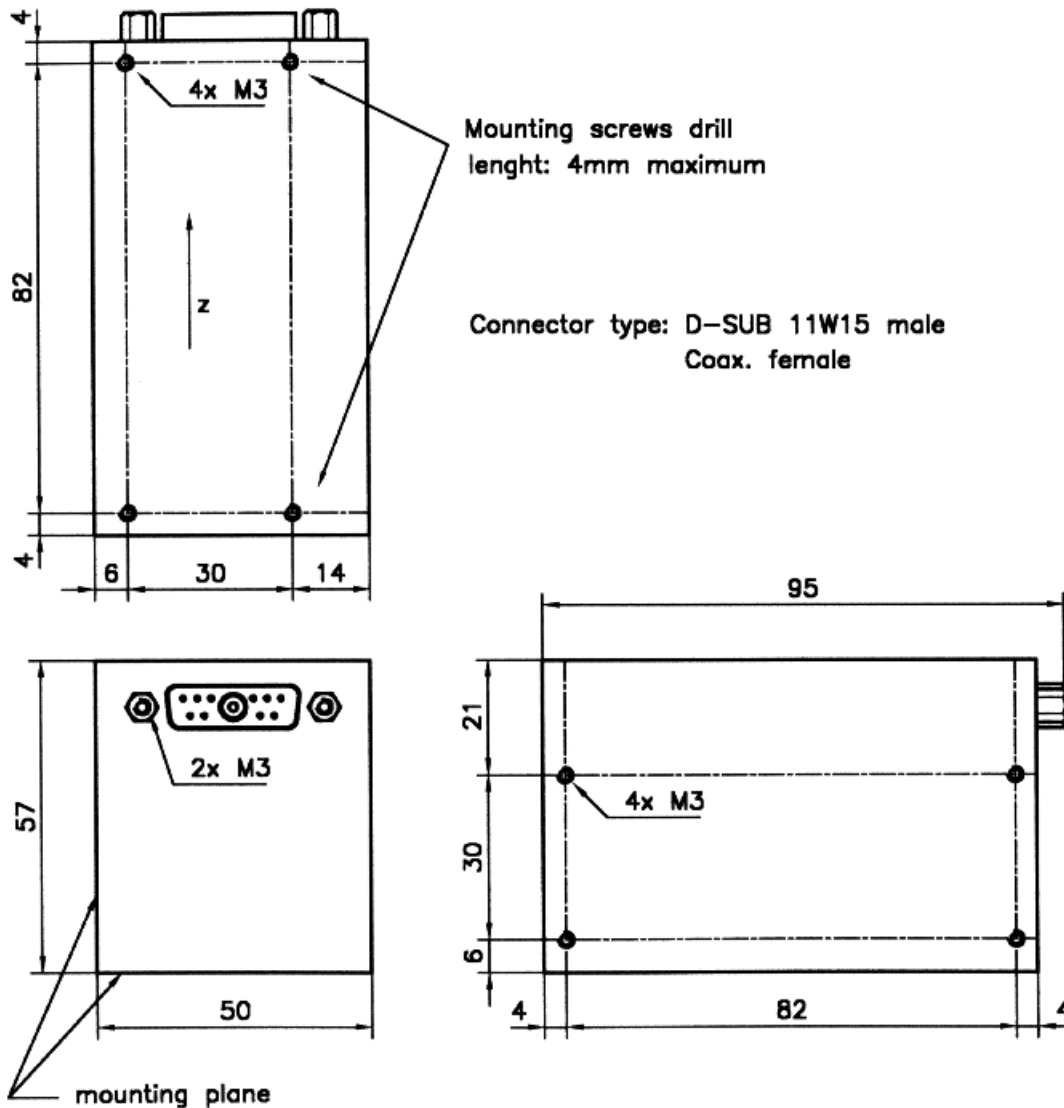
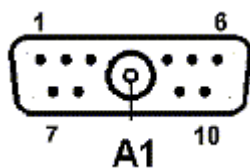


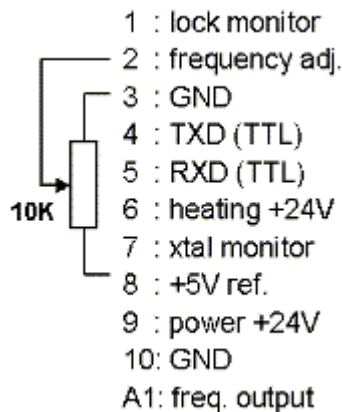
Fig. 4.3

PIN FUNCTION LAYOUT:

The complete pin layout for the sub-D connector is given in figure 4.4 :



Connector front view Fig. 4.4



SPECIFICATIONS**ELECTRICAL:**

Type	MCFRS	
	Standard version	Options
Frequency	10 MHz	Optional 20 MHz / 5 MHz
Frequency change within operating temperature range (Thermal chamber with air flow)		
MCFRS-01	$\leq 2 \times 10^{-10}$ over -0°C to $+60^{\circ}\text{C}$ ($\leq \pm 1 \times 10^{-10}$ typical ref. to 25°)	$\leq \pm 1.5 \times 10^{-10}$ over -20°C to $+65^{\circ}\text{C}$ operating range (option code E) $\leq \pm 1 \times 10^{-10}$ over -25°C to $+65^{\circ}\text{C}$ operating range (option code G)
MCFRS-02	$\leq 3 \times 10^{-10}$ over -5°C to $+60^{\circ}\text{C}$ ($\leq \pm 1.5 \times 10^{-10}$ typical ref. to 25°)	same options as MCFRS-01
Long term stability : (measured after 2 months of continuous operation)	MCFRS-01 MCFRS-02	
	$\pm 4 \times 10^{-11}$ / month $\pm 1 \times 10^{-10}$ / month	Option code A : contact factory. no option for MCFRS-02
Short term stability	Standard 3×10^{-11} / 1 s 1×10^{-11} / 10 s 3×10^{-12} / 100 s	Improved short term stability (Option code S , MCFRS-01 only) 1×10^{-11} / 1 s 3×10^{-12} / 10 s 1×10^{-12} / 100 s
Phase noise (10 MHz)	-70 dBc/Hz at 1 Hz -80 dBc/Hz at 10 Hz -115 dBc/Hz at 100 Hz -135 dBc/Hz at 1 kHz -140 dBc/Hz at 10 kHz	(Option code S , MCFRS-01 only) -80 dBc/Hz at 1 Hz -100 dBc/Hz at 10 Hz
Frequency retrace (in stable temperature, gravity, pressure and magnetic field conditions)	$< 5 \times 10^{-11}$ within 1 h after 24 h off	$< 2 \times 10^{-11}$ within 1 h after 24 h off (Option code O)
Warm-up time [minutes]	Standard version 5×10^{-10} after 10' at $+25^{\circ}\text{C}$	fast warm-up (Option code F) 5×10^{-10} after 5' at $+25^{\circ}\text{C}$
Analog frequency adjustment For stable operation, an external voltage adjust. value shall be applied (DC voltage of 0 to 5V) Typically: the cursor pin of a $10\text{k}\Omega$ variable resistor connected between pins 3 and 8 can provide this adjustment voltage (see figure 4.4)	$2.5 \times 10^{-9} \pm 20\%$	Large analog frequency tuning $5 \times 10^{-9} \pm 20\%$ (option code O)
Digital frequency adjustment through serial RS-232 port.	$\pm 2.5 \times 10^{-8}$ (resolution: 2×10^{-10}) 2.5×10^{-9} (resolution: 1×10^{-11}) $\pm 20\%$	
Output level	sinewave $0.5\text{V}_{\text{rms}} \pm 10\%$, 50 ohms	
Return loss	-20dB	
Harmonics	< -30 dBc	
Subharmonics	< -60 dBc	
Spurious $f_0 \pm 100\text{kHz}$	< -80 dBc	
Supply voltage	22 V to 28 V	

Type	MCFRS	
	Standard version	Options
Input power	warm up : 15W at 24V -20° C: <10 W +25° C: <8 W +65° C: <5 W	warm up : 25W at 24V (with option code F) -20° C: <10 W +25° C: <8 W +65° C: <5 W
Electrical Protection power +24V Heating +24V RF output TxD output Xtal mon. output 5V ref output RxD input Frequency adjust input Lock monitor	An internal diode protects against reverse polarity connection Protected against a reversed polarity connection <0.5s ESD and short-cut protected ESD and short-cut protected ESD and short-cut protected ESD and short-cut protected ESD protected ESD protected Over current protected	

ENVIRONMENTAL (for other Environmental qualifications, consult factory)

Magnetic field sensitivity	< 1 x 10 ⁻¹⁰ / Gauss
Storage Temperature	- 55°C to + 85°C
Operating temperature	-25°C to +65°C (65°C is the maximal temperature of the thermal chamber with air flow around the unit)
Overall Environment Effects * (Altitude,Vibration,Shocks)	Meets or exceeds MIL-T-28800B for Type III, class 5 equipment
Humidity	RTCA/DO-160C hot humidity, 35°C, 95% relative humidity
Helium concentration sensitivity	< 1 x 10 ⁻¹⁰ per ppm of Helium concentration changes
g-tip-over test	< 2 x 10 ⁻¹¹ / g on X and Y axis < 2 x 10 ⁻¹⁰ / g on Z axis

PHYSICAL

Size	50 x 57 x 90 mm. (2.0 x 2.25 x 3.5 inches)
Weight	470 g max. (1.025 Lbs. max)
Volume	¼ liter (16 cubic inches)
Connector	10 male contacts / 1 female coaxial contact. Mate with ITT Cannon Series DAM11W1. Specify "Option C" to your order to get a mating connector.

Ordering Information :

