FUJITSU SEMICONDUCTOR
DATA SHEET

DS04-21709-1E

ASSP

Piezoelectric VCO (4 to 30 MHz)

M2 Series (F100)

■ DESCRIPTION

The M2 series (F100) of VCO (Voltage Controlled Oscillator) apply to the frequency range 4-30 MHz.

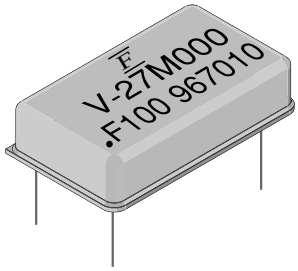
The M2 series of VCO have a high reliability and wide controllable frequency ranges using a $LiTaO_3$ piezoelectric single crystal with high electromechanical coupling coefficient. Output level applies to CMOS type for digital interface.

■ FEATURES

- Wide frequency controllable range (Over than ±2000 ppm)
- High carrier noise ratio
- Excellent temperature stability
- CMOS output level
- High reliability due to hermetic seal

■ PACKAGE

14 pin DIP size, Metal can package



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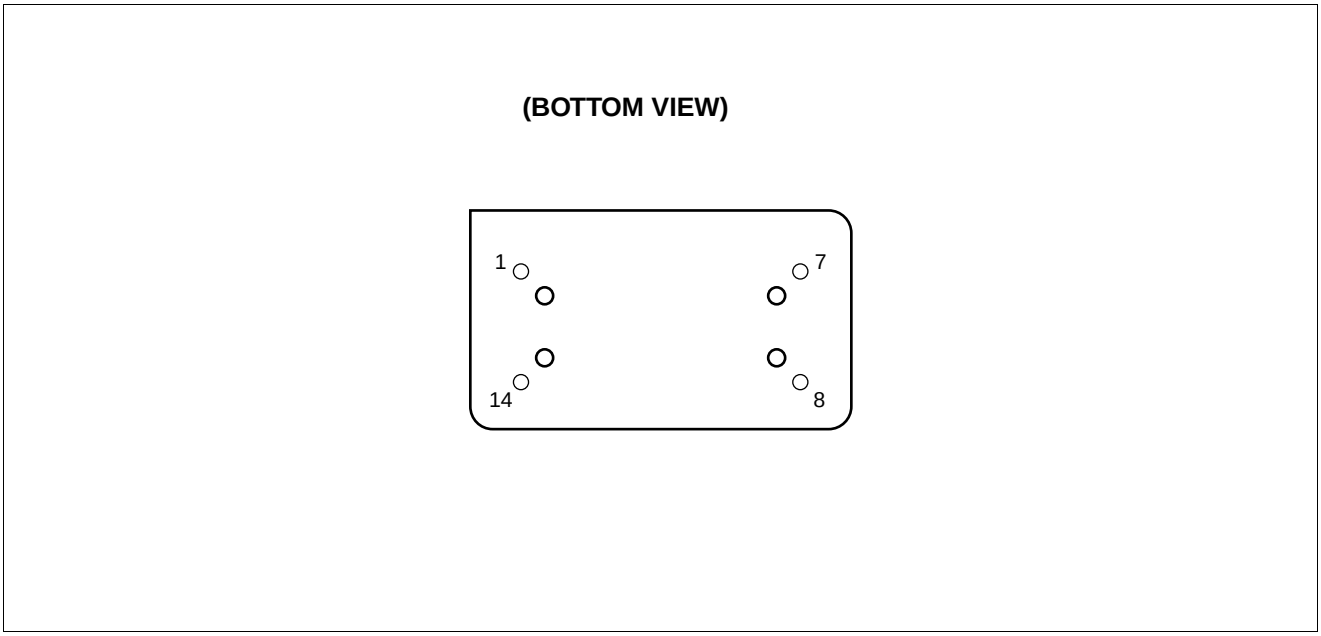
■ PIN ASSIGNMENT



■ PIN DESCRIPTIONS

Pin Number	Symbol	Functions
1	V_{IN}	Input (Control voltage)
7	GND	Ground
8	V_{OUT}	Output
14	V_{CC}	V_{CC}

■ ABSOLUTE MAXIMUM RATINGS (See WARNING)

Parameter	Symbol	Rating	Unit
Power supply voltage	V_{CC}	–0.5 to +7.0	V
Control voltage	V_{IN}	–0.5 to +7.0	V
Operating temperature	T_a	–10 to +70	°C
Storage temperature	T_{stg}	–40 to +100	°C
Frequency range	—	+4 to +30	MHz

WARNING: Permanent device damage may occur if the above **Absolute Maximum Ratings** are exceeded. Functional operation should be restricted to the conditions as detailed in the operational sections of this data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

■ RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Value	Unit
Power supply voltage	V_{CC}	+4.75 to +5.25	V
Control voltage	V_{IN}	+0.0 to +5.0	V
Operating temperature	T_a	–10 to +70	°C

■ STANDARD FREQUENCIES

Frequency	Application	Part number
12.288 MHz	For audio	FAR-M2DB-12M288-F100
13.500 MHz	For video	FAR-M2DB-13M500-F100
14.318 MHz	For video	FAR-M2DB-14M318-F100
18.432 MHz	For audio	FAR-M2DB-18M432-F100
21.053 MHz	For video	FAR-M2DB-21M053-F100
24.576 MHz	For audio	FAR-M2DB-24M576-F100
25.175 MHz	For video	FAR-M2DB-25M175-F100
27.000 MHz	For video	FAR-M2DB-27M000-F100
28.636 MHz	For video	FAR-M2DB-27M636-F100

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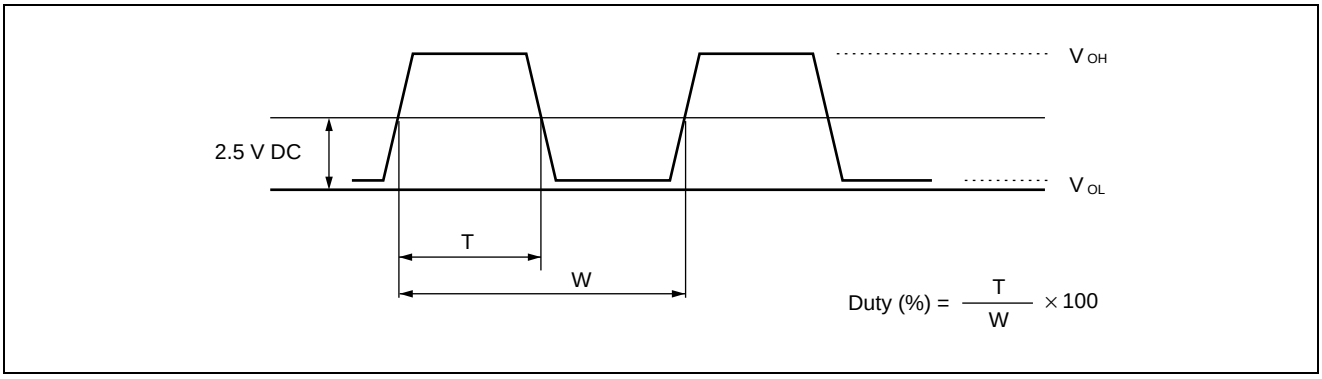
■ ELECTRICAL CHARACTERISTICS

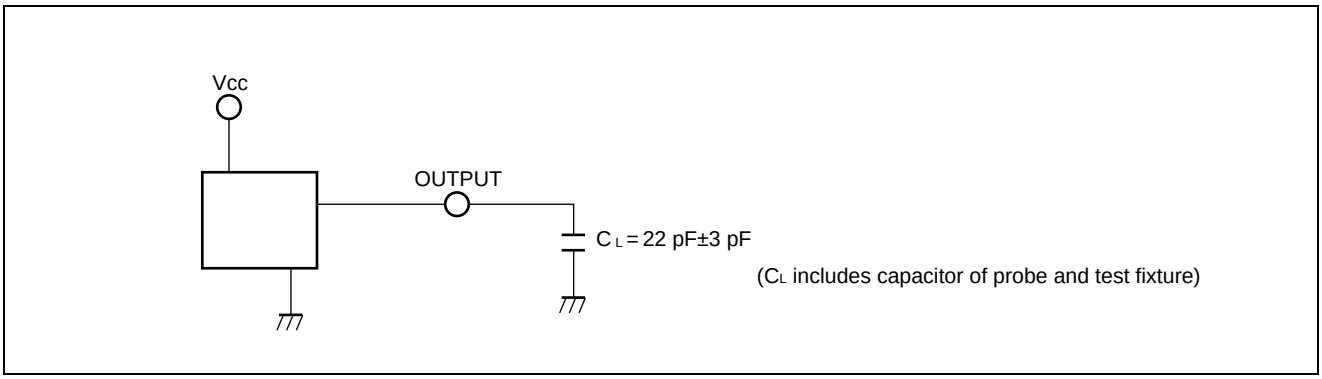
Unless otherwise specified Ta = +25 °C, V_{CC} = +5.0 V

Parameter		Symbol	Condition	Value			Unit	Remarks
				Min.	Typ.	Max.		
Current consumption		I_{CC}	Without load	—	9.0	15	mA	
Output voltage	"H"	V_{OH}	V_{IN} = 2.5 V	V_{CC} –0.5	5.0	—	V	
	"L"	V_{OL}	V_{IN} = 2.5 V	—	0	+0.5	V	
Duty ratio		DUTY	V_{IN} = 2.5 V	40	50	60	%	*
Initial deviation of oscillation frequency		Δf_O	V_{IN} = 2.5 V	–500	—	+500	ppm	
Oscillation frequency		f_H	V_{IN} = 4.5 V	+1600	—	—	ppm	Nominal frequency reference
		f_L	V_{IN} = 0.5 V	—	—	–1600	ppm	
Frequency stability		$\Delta f(V_{CC})$	V_{CC} = 4.75 V to 5.25 V V_{IN} = 2.5 V	–100	—	+100	ppm	V_{CC} = 5.0 V reference
Frequency stability with temperature		$\Delta f(Ta)$	V_{IN} = 2.5 V (f_O < 23 MHz)	–500	—	+500	ppm	25°C reference
			V_{IN} = 2.5 V ($f_O \geq$ 23 MHz)	–400	—	+600	ppm	Ta = –10 to +70°C

* : Duty Ratio



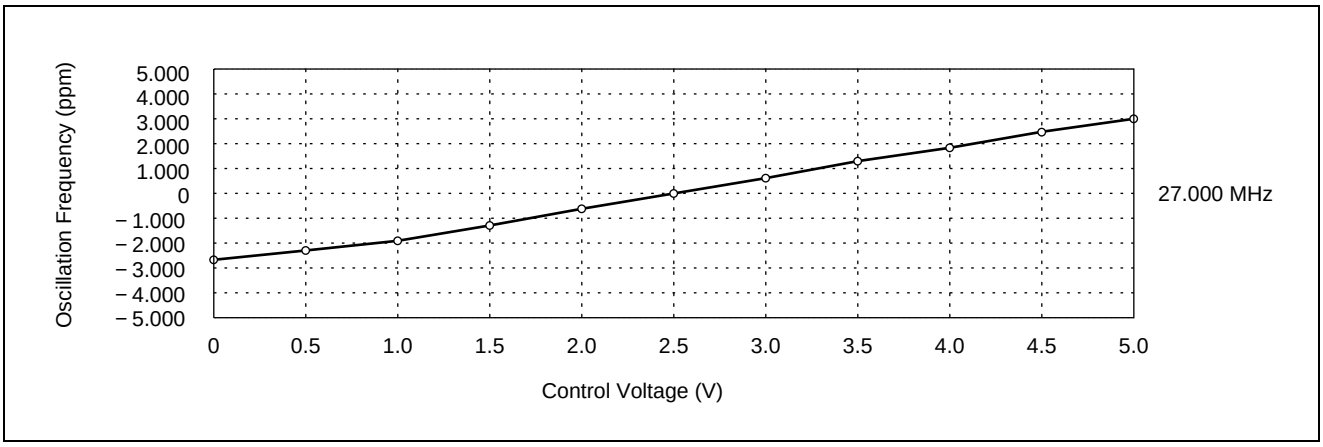
■ MEASURMENT CIRCUIT



■ TYPICAL CHARACTERISTICS

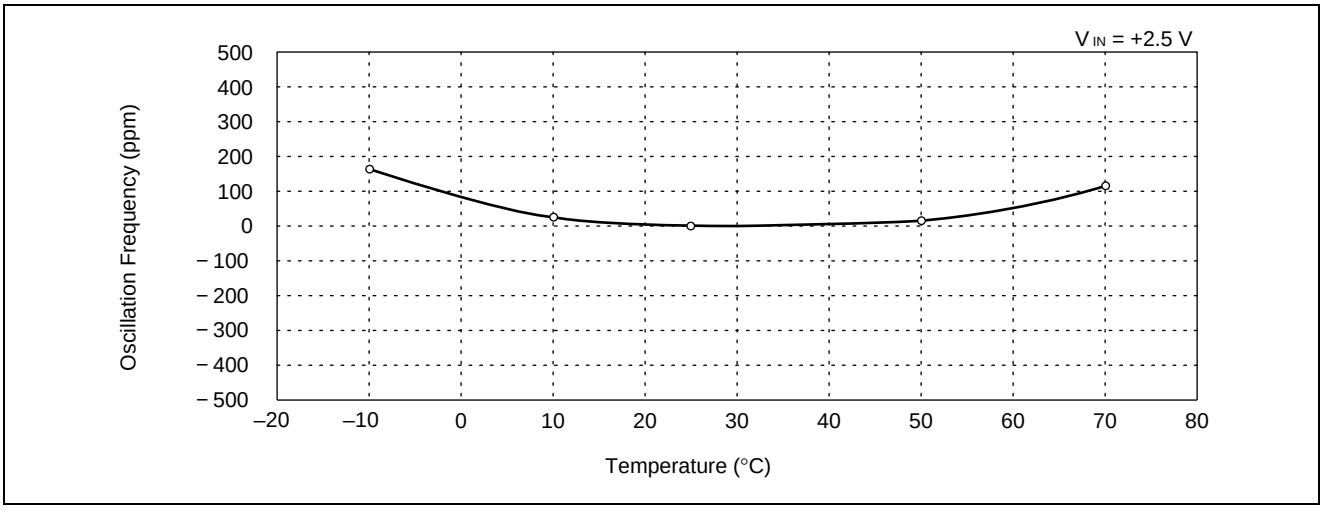
Part number : FAR-M2DB-27M000-F100

1. Oscillation Frequency vs. Control Votage



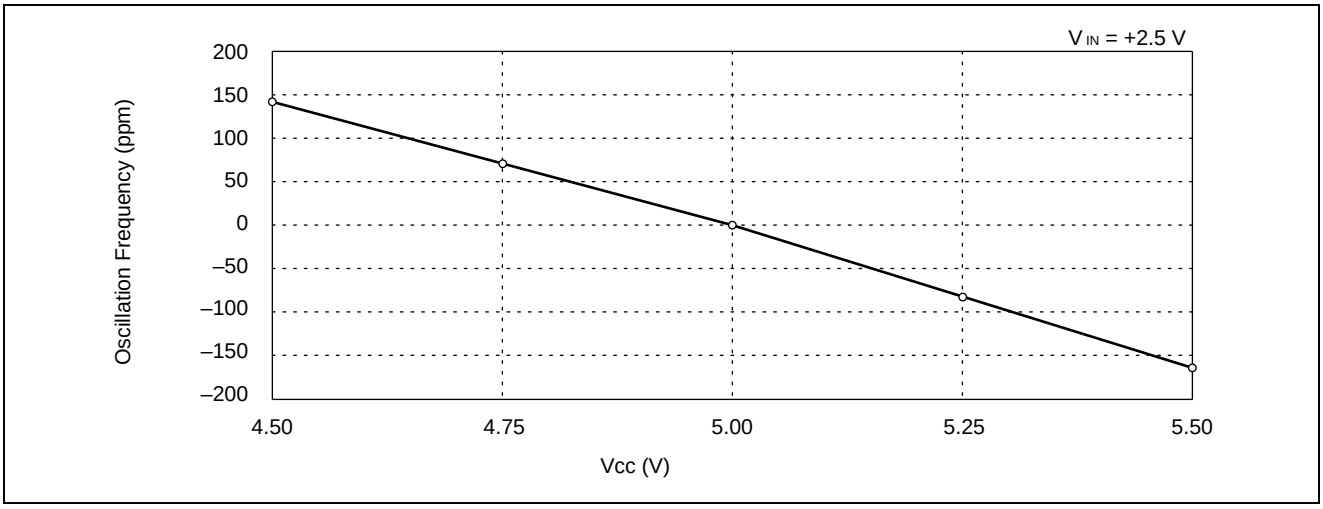
2. Frequency Stability With Temperature

(Ta = +25°C reference)



3. Frequency Stability vs. Vcc

(VCC = +50 reference)



M2 Series (F100)

■ PART NUMBER DESIGNATION

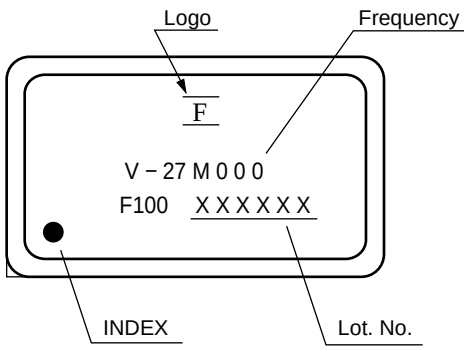
[Designation example]

FAR – M2DB – □□□□□□ – F100
*

* : Frequency designation : Specify the nominal frequency in six alphanumeric characters.
Enter M at the decimal point.

[Example] 27.000 MHz → 27M000

■ MARKING



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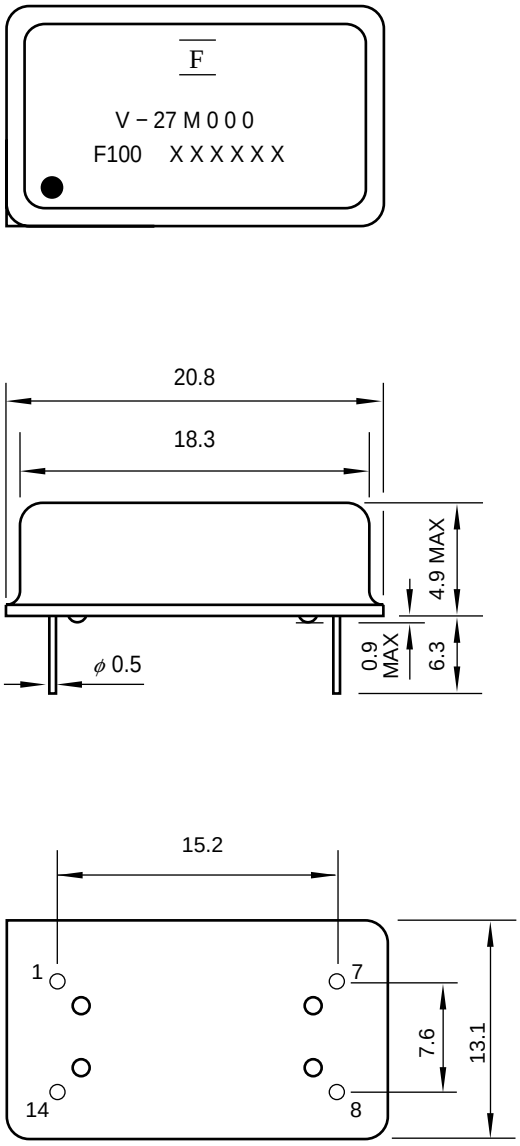
■ PACKAGE DIMENSION



Dimensions in mm.

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