

FX-102

Frequency Translator

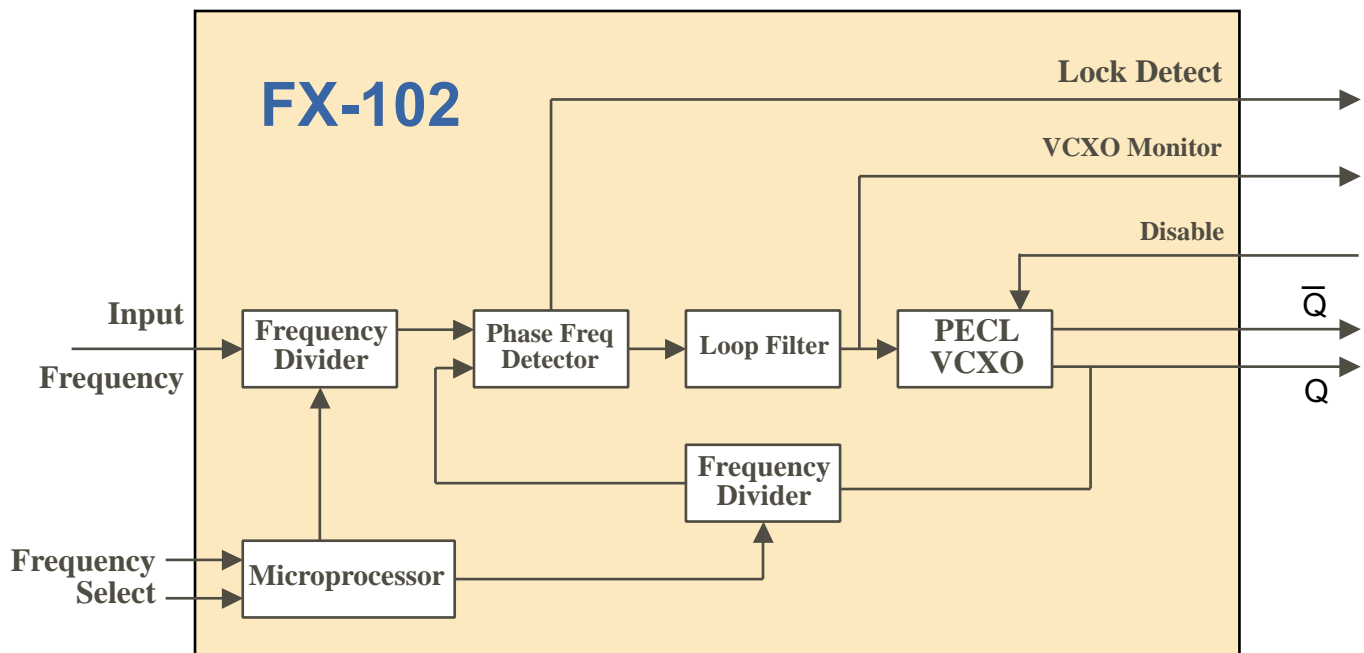


Features

- Output frequencies up to 155.52 MHz
- Low Jitter PECL Output
- Locked to specified Input frequency, e.g. 8 kHz
- Single 5.0 Vdc or 3.3 Vdc supply
- Lock / Loss of Signal Alarm
- 1" x 0.8" x 0.2", Surface Mount (FR4 base)

Applications

- SONET / SDH / ATM / DSL-PON interconnects
- 8 kHz/16.384 MHz/19.44 MHz to 155.52 MHz



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Description

Vectron's FX-102 is a crystal based frequency translator which is used to translate any input frequency such as 8 kHz, 1.544 MHz, 2.048 MHz, 19.440 MHz etc. to any specific frequency from 77.76 to 155.52 MHz. The input frequency does not have to be a 50/50% duty cycle and as an example can be an 8 kHz signal with a logic high "on time" of only 1us, such as a BITS clock. The FX-102 also has the ability to translate up to any of 4 different input frequencies to one common output frequency, such as input frequencies of 8 kHz and 1.544 MHz and 19.44 MHz and any other frequency between 333 Hz and 155.52 MHz translating them to any specific output frequency from 77.76 MHz to 155.52 MHz.

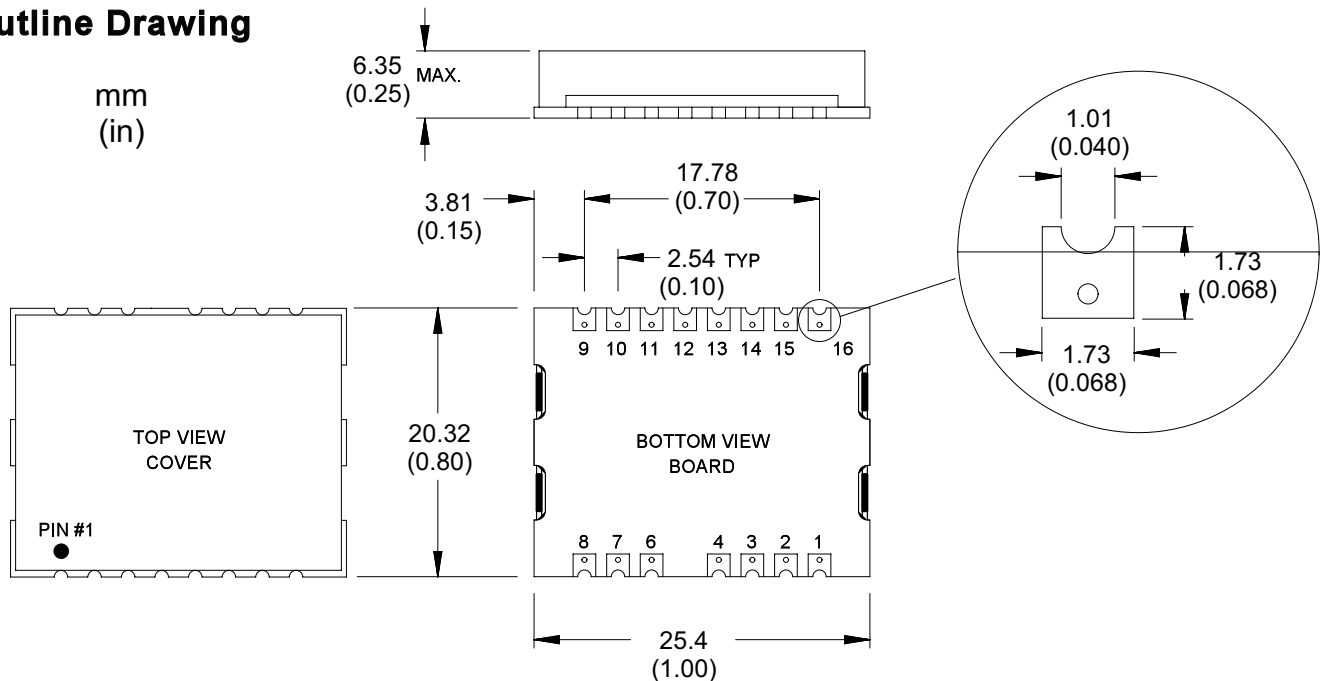
The "Input Frequency tracking capability" is the total amount of input frequency deviation in which the FX-102 is guaranteed to track or translate. As an example, a typical input clock would be 8 kHz \pm 20 ppm. The FX-102 is guaranteed to track at least \pm 40 ppm of error over temperature/aging/ power supply and is more than twice what most applications require. The PLL control voltage is brought out through a 470K ohm resistor. This would allow for the use of external circuitry (analog comparators or an A/D converter plus a processor) to detect when the control voltage is getting close to the limits of the pull range.

Performance Characteristics

Parameter	Symbol	Minimum	Typical	Maximum	Units
Supply Voltage, C = 5 Vdc D = 3.3 Vdc	V _{DD} V _{DD}	4.75 3.15	5.00 3.30	5.25 3.45	Vdc Vdc
Supply Current	I _{DD}		45	70	mA
Input Signal, A = HCMOS D = PECL	CLKIN CLKIN		HCMOS PECL		--- ---
OUTPUT, F = Comp PECL	---	---	PECL	---	---
V _{OH} (Temp Range C = 0°C to +70°C)	V _{OH}	V _{DD} -1.025		V _{DD} -0.880	V
V _{OL} (Temp Range C = 0°C to +70°C)	V _{OL}	V _{DD} -1.810		V _{DD} -1.620	V
V _{OH} (Temp Range F = -40°C to +85°C)	V _{OH}	V _{DD} -1.085		V _{DD} -0.880	V
V _{OL} (Temp Range F = -40°C to +85°C)	V _{OL}	V _{DD} -1.830		V _{DD} -1.555	V
Rise / Fall Time	t _R /t _F		0.5	1	ns
Output Symmetry	Sym	45		55	%
Jitter Generation, rms (12 kHz to 20 MHz)			<0.5	1	ps
Jitter Generation, rms(cycle to cycle method)			3		ps
Min Pulse Width @ 8 kHz		1			us
Input Frequency Tracking Capability (Can translate a Stratum 1,2,3,3E,4 or SONET Min source)	APR	+/-40			ppm
Operating Temperature		Temp Range C = 0°C to +70°C Temp Range F = -40°C to +85°C			
Size		See page 3 for outline Drawings and Dimensions			

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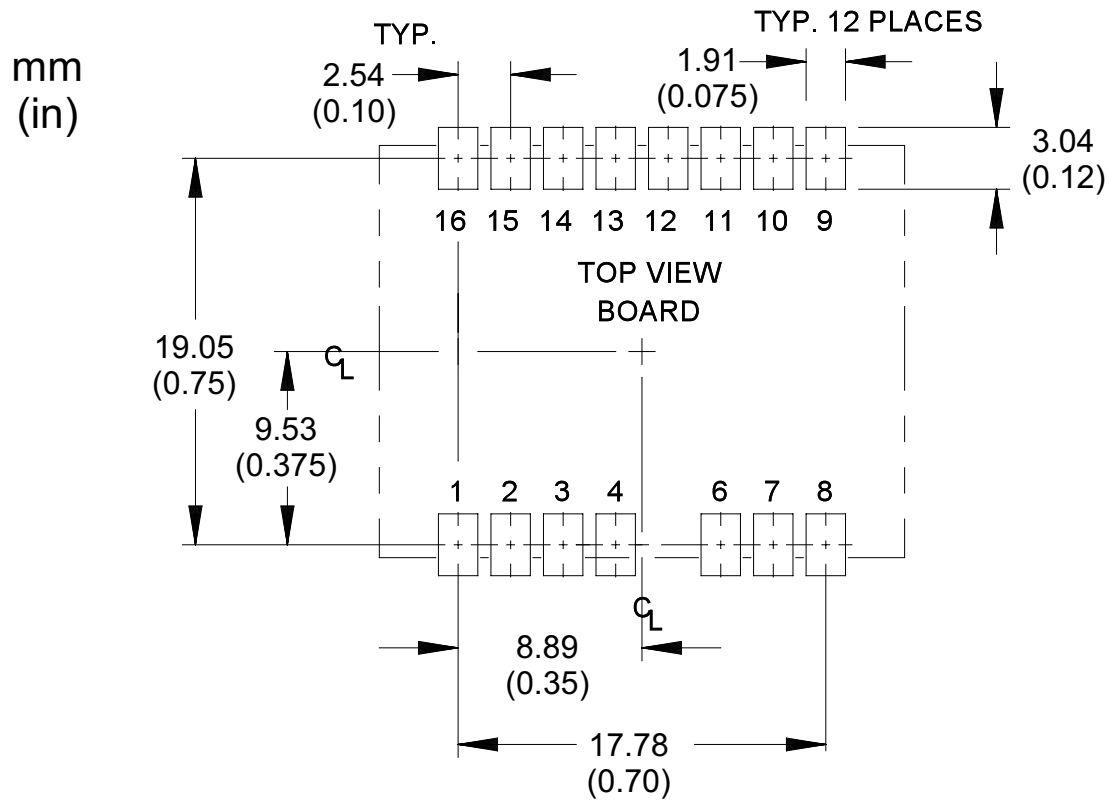
Outline Drawing



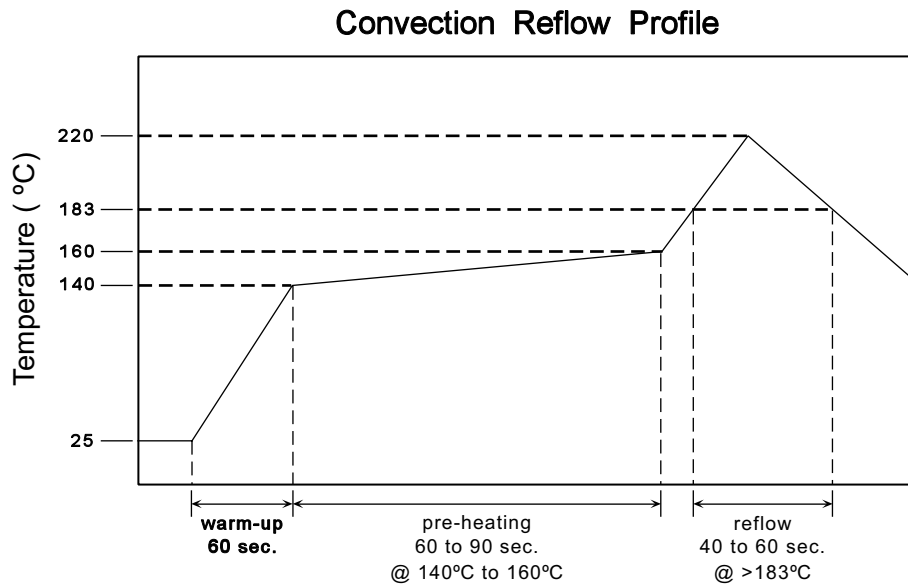
Pin	Symbol	Function
1	CLKIN	Input Frequency
2	GND	Ground
3	LD (Output)	Lock Detect Logic "1" indicates a locked condition and requires a couple hundred pF capacitor to ground to operate correctly. Logic "0" indicates that no input signal is detected and can be used as a loss-of-signal alarm. Toggles when not locked.
4	Monitor (Output)	PLL/ VCXO control voltage Under locked conditions, should be >0.3V and <3.0 V for the 3.3 volt option or >0.5V and <4.5V for the 5 volt option. Input frequency may be out of range if voltage exceeds these limits.
5	NC	No Connection
6	NC	No Connection
7	GND	Ground
8	Disable (Input)	Disables Output Logic "1" = Output disabled Logic "0" (or no connect) = Output enabled
9	OUT	VCXO Output (PECL)
10	COUT	Complementary VCXO Output (PECL)
11	NC	No Connection
12	Select A	Do not Exceed V _{dd} (NC for one input frequency)
13	Select B	Do not Exceed V _{dd} (NC for one or two input frequencies)
14	NC	No Connection
15	GND	Ground
16	V _{DD}	Power Supply Voltage (5 Vdc or 3.3 Vdc)

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Recommended Land Pattern



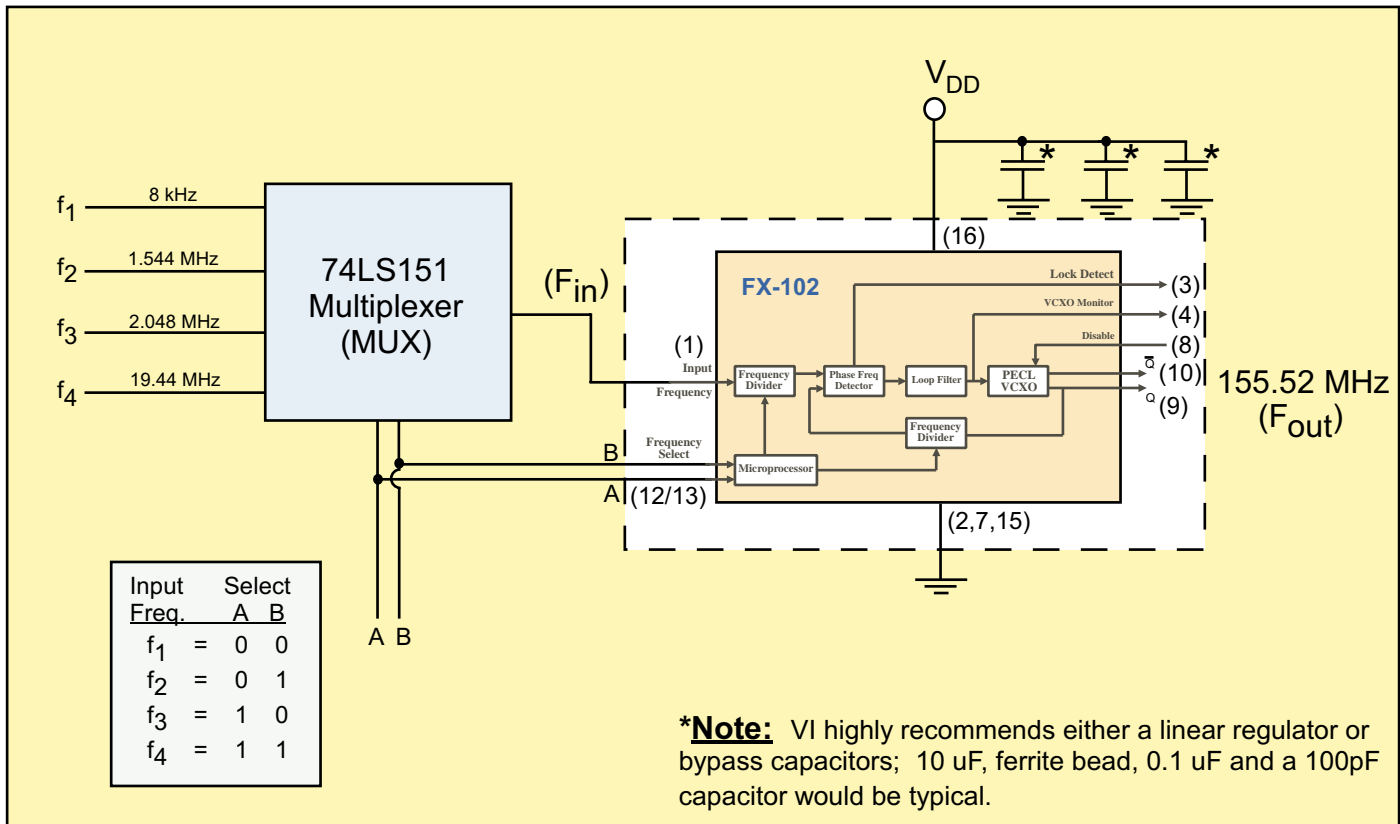
Recommended Reflow Profile



NOTE: This FX-102 should not be subjected to a wash process that will immerse it in solvents. NO CLEAN is the recommended procedure.

FX-102 Frequency Translator

Typical Application



All components outside the dotted line box are user supplied components and/or connections. This is just one possible configuration of the FX-102. For additional information about your specific needs please contact our Factory.

FAQ's

Q: What are the different input frequencies Available?

A: The FX-102 is able to handle any input frequency between 333 Hz and 155.52 MHz. (A list of standard frequencies is available on page 7.)

Q: How many different input frequencies can a specific FX-102 accept?

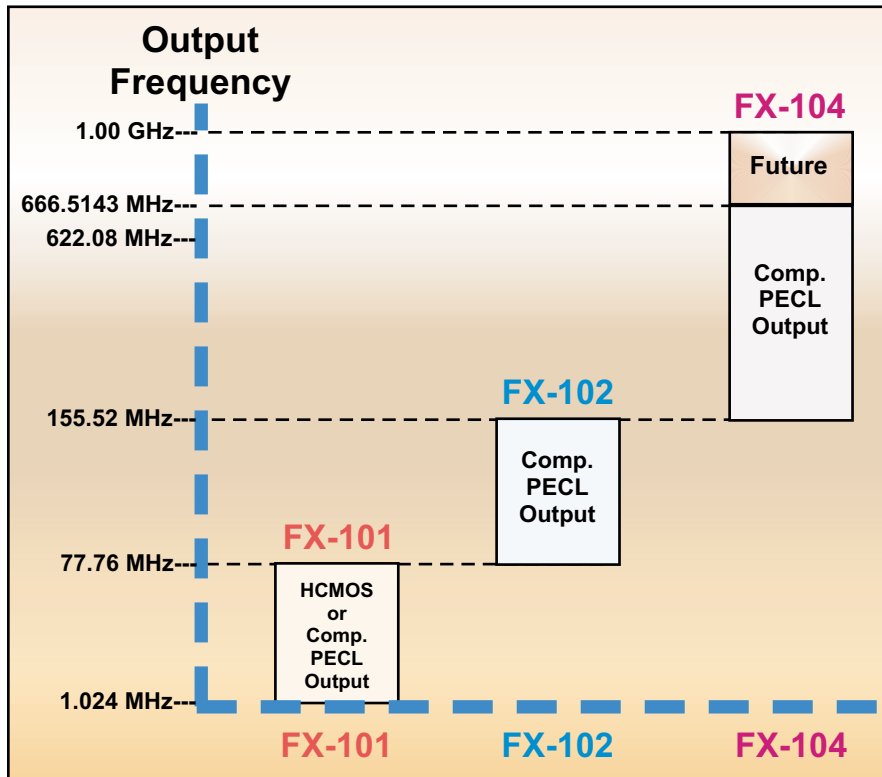
A: Each FX-102 can be programmed to accept up to 4 different frequencies.

Q: If there is only one input pin, how can your unit accept 4 different frequencies?

A: The customer is required to supply a multiplexer which would switch between the different input frequencies. The multiplexers' select pins would need to be sync'd to the select pins of the FX-102. (The drawing above illustrates this configuration.)

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FX-100 Series Selection Guide



Handling Precautions

Although protection circuitry has been designed into this device, proper precautions should be taken to avoid exposure to electrostatic discharge (ESD) during handling and mounting. VI employs a human-body model (HBM) and a charged-device model (CDM) for ESD-susceptibility testing and protection design evaluation. ESD voltage thresholds are dependent on the circuit parameters used to define the mode.

Although no industry-wide standard has been adopted for the CDM, a standard HBM (resistance = 1500 ohms, capacitance = 100pf) is widely used and therefore can be used for comparison purposes. The HBM ESD threshold presented here was obtained by using these circuit parameters.

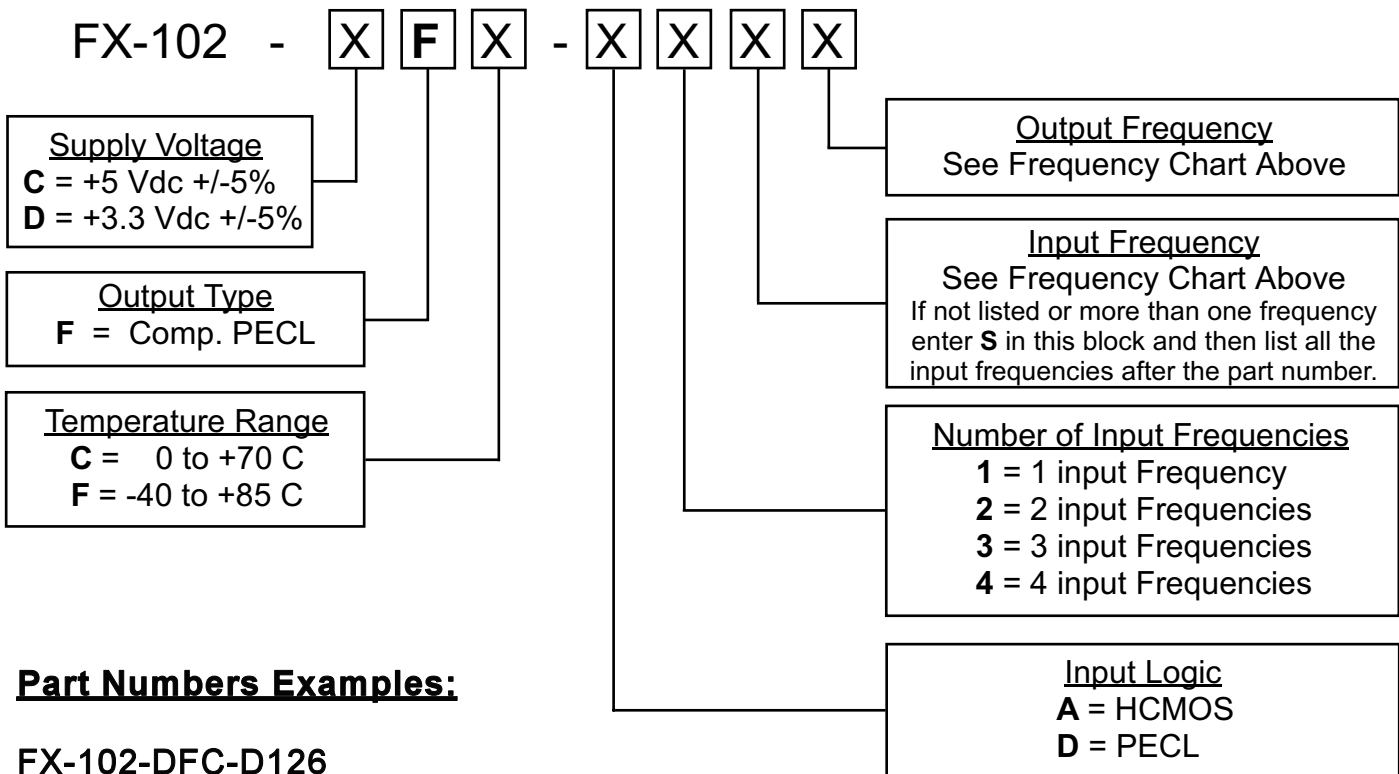
ESD Threshold Voltage		
Model	Threshold	Unit
Human-Body (HBM)	500	V min
Charged-Device	500	V min

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Standard Frequencies

333 Hz	A	8.192 MHz	L	51.84 MHz	0
2 kHz	B	13.00 MHz	M	61.44 MHz	1
8 kHz	C	16.384 MHz	N	77.76 MHz	2
16 kHz	D	19.44 MHz	P	82.944 MHz	3
64 kHz	E	20.48 MHz	R	112 MHz	4
1.024 MHz	F	26.00 MHz	T	139.264 MHz	5
1.544 MHz	H	27.00 MHz	W	155.52 MHz	6
2.048 MHz	J	38.88 MHz	X		
4.096 MHz	K	44.736 MHz	Y	Special SCD	S

How to Order



Part Numbers Examples:

FX-102-DFC-D126

FX-102-DFF-A4S6 - 8 kHz, 1.544MHz, 2.048MHz, 19.44MHz

Visit Our Website at www.vectron.com

For additional information please contact:



www.vectron.com

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