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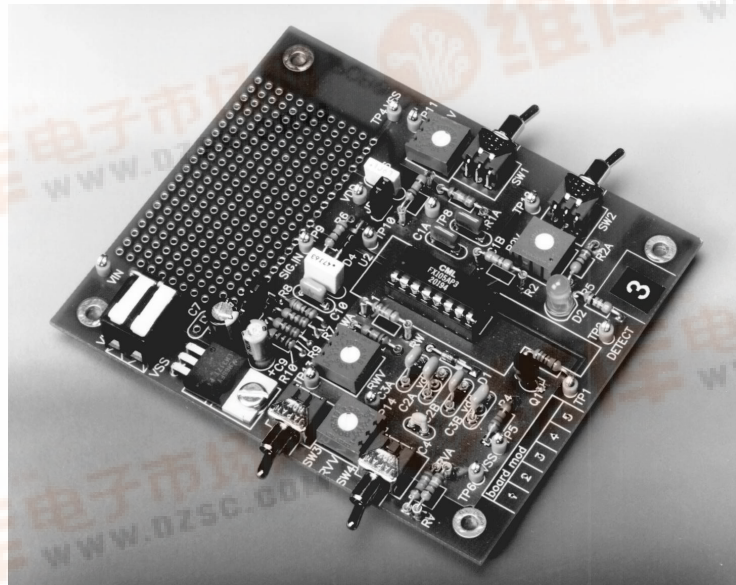
EV1050 Evaluation Kit User Manual

UM1050/2 October 1998

Advance Information

1.0 Features

- For FX105A Product Evaluation
- Easy Access to Test Points
- Easily Adjustable Centre Frequency, Bandwidth and Timing
- Simple Component Selection with Excel Spreadsheet Enclosed
- On-Board Regulator
- User's Prototyping Area



1.1 Brief Description

The EV1050 Evaluation Kit comprises a single board containing an FX105A. Switches select variable resistors for adjusting the detect frequency, bandwidth and response time. Many of the fixed components are socketed so that they can be changed by the user.

The EV1050 board is powered from a single 8 - 35V external dc power supply; an on-board regulator sets 3.0V or 5.0V operation. An LED indicates the status of the detect output.

The supply current of the FX105A may be measured by removing the appropriate jumper. Test points are provided for the signal input, the VCO output and the detect output. A user prototyping area is provided.

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Note: As this product is still in development, it is likely that a number of changes and additions will be made to this specification. Items marked TBD or left blank will be included in later issues. Information in this data sheet should not be relied upon for final product design.

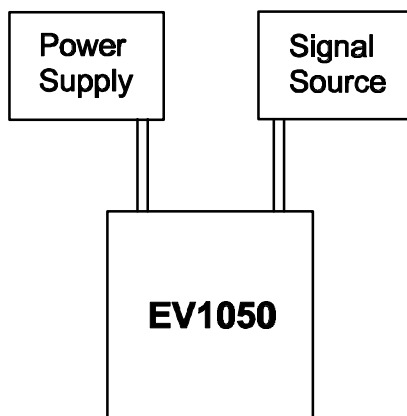


Figure 1 Block Diagram

1.2 Preliminary Information

1.2.1 Laboratory Equipment

The following laboratory equipment is needed to use this evaluation kit:

1.2.1.1 8 - 35V dc power supply.

1.2.1.2 An input signal source.

1.2.2 Handling Precautions

Like most evaluation kits, this product is designed for use in office and laboratory environments. The following practices will help ensure its proper operation.

1.2.2.1 Static Protection

This product uses low power CMOS circuits which may be damaged by electrostatic discharge. Partially damaged circuits may function erroneously, leading to misleading results. Observe ESD precautions at all times when handling this product.

1.2.2.2 Contents - Unpacking

Please ensure that you have received all of the items listed on the separate information sheet (EK1050) and notify CML within 7 working days if the delivery is incomplete.

1.3 Quick Start

This section provides instructions for users who wish to experiment immediately with the evaluation kit. A fuller description of the kit and its use appears later in this document.

1.3.1 Setting-Up

THE EV1050 COMES PRE-CONFIGURED FOR OPERATION AT 5.0V.

To select 3.0V operation, short circuit JP1 with an insulated jumper socket.

WHEN THE SWITCHES (SW1 TO SW4) ARE SET TO USE THE FIXED VALUE RESISTORS, THE EV1050 DETECTS A 440 Hz SIGNAL WITH A 6% (APPROX.) BANDWIDTH.

The default settings in the spreadsheet reflect the fixed component values used in the EV1050.

1.3.2 Operation

Apply an input signal between testpoint TP9 and V_{SS} . The detect output can be monitored at testpoints TP1 or TP2 and is indicated by LED D2.

Select R1V with switch SW1 to adjust f_0 .

Select R2V with switch SW2 and RVV with switch SW4 to adjust the bandwidth.

Select RWV with switch SW3 to adjust the response and de-response times.

For all switches, setting the paddle away from the prototype area selects variable resistors and setting the paddle towards prototype area selects fixed resistors. Please refer to the FX105A data sheet for further information on the operation of this integrated circuit and for details of the circuit design equations which govern the choice of component values.

1.3.3 Spreadsheet

An Excel spreadsheet has been included with this kit to simplify the selection of component values. The design requirements should be entered into column "B" in the area shaded green on the spreadsheet. The calculations will be automatically updated and intermediate results are shown in the non-shaded area of column "B".

A convenient value for C1A and C1B is chosen (these values should be identical) and the corresponding value of R1 is read from column "F" in the same row. Column "G" indicates whether this choice of values is "OK" or "out of range". In the latter case, the FX105A will probably still operate, but the actual component values may require adjustment from the calculated spreadsheet values.

The choice of component values for (C2A, C2B, RV) and (C3A, C3B, RW) is made in the same way. Note that it is not necessary to use the same row for (C2A, C2B, RV) and (C3A, C3B, RW) as was used for (C1A, C1B, R1). The value of R2 is shown in column "B".

The choice of C4 is made by reading the value in column "K" on the same row as was used for choosing the (C2A, C2B, RV) values.

This spreadsheet can only approximate to the actual component values required. Please note that some device parameters (particularly V_{TH}) can vary from one silicon batch to another, and in turn will cause a variation in detector performance. Component values should be carefully chosen to optimise this performance spread.

1.4 Signal Lists

CONNECTOR PINOUT - POWER				
Connector Ref.	Connector Pin No.	Signal Name	Signal Type	Description
J1	1	V_{SS}	Power	0V power from external power supply.
	2	V_{IN}	Power	+ve power from external power supply.

TEST POINTS		
Test Point Ref.	Default Measurement	Description
TP1	0V	Detect output
TP2	V_{DD}	Detect output LED
TP3	8 - 35V	V_{IN} connection.
TP4	0V	V_{SS} connection.
TP5	0V	V_{SS} connection.
TP6	0V	V_{SS} connection.
TP7	3.0V or 5.0V	V_{DD} connection.
TP8	2640Hz	VCO, monitoring here may affect VCO frequency.
TP9	-	Signal input.
TP10	$V_{DD}/2$	Signal input at FX105A.
TP11	-	Used with arrow mark on R1 for measurement of R1V.
TP12	-	Used with arrow mark on R2 for measurement of R2V.
TP13	-	Used with arrow mark on RW for measurement of RWV.
TP14	-	Used with arrow mark on RV for measurement of RVV.

JUMPERS			
Link Ref.	Positions	Default Position	Description
JP1	1-2	o/c	Sets $V_{DD} = 3.0V$ (closed) or $V_{DD} = 5.0V$ (open)
JP2	1-2	s/c	Remove to measure I_{DD} of FX105A.

SWITCHES			
Switch Ref.	Positions	Default Position	Description
SW1	1-2/2-3	1-2	R1 Select: Fixed [R1A] (default) or Variable [R1V]
SW2	1-2/2-3	1-2	R2 Select: Fixed [R2A] (default) or Variable [R2V]
SW3	1-2/2-3	2-3	RW Select: Fixed [RWA] (default) or Variable [RWV]
SW4	1-2/2-3	2-3	RV Select: Fixed [RVA] (default) or Variable [RVV]

The circuit diagram illustrates the FX105AP3 microcontroller system. The main board features an FX105AP3 microcontroller (U2) with various pins connected to components. The input section includes a 1N4001 diode (D3) and a 33uF capacitor (C8) connected to a blank input. The output section includes a 1N4001 diode (D4) and a 1uF capacitor (C10) connected to VDD. The microcontroller is powered by VDD and GND. The system also includes a 12x20 pin header (PROTO_12*20) connected to VDD and GND. The main board is connected to a 12x20 pin header (PROTO_12*20) which is connected to a 12x20 pin header (PROTO_12*20) connected to VDD and GND.

Figure 2 Evaluation Board - Circuit Schematic

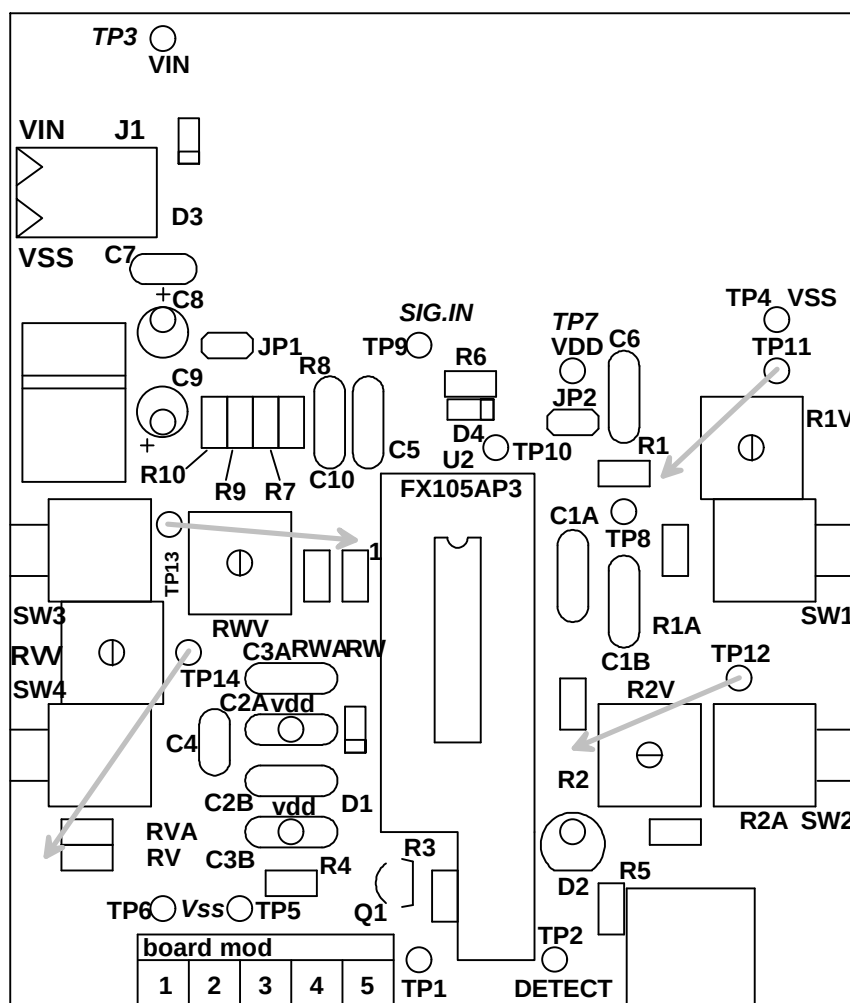


Figure 3 Evaluation Board - Layout

1.6 Detailed Description

1.6.1 Hardware Description

JP1 is used to select the operating voltage. Open circuit selects 5.0V operation (default) and short circuit selects 3.0V operation.

- 1.6.1.1 Discrete components around the FX105A which the user may wish to alter are socketed. Required values for a particular application can be calculated from the formulae given in the FX105A datasheet.

Alternatively, a spreadsheet is provided in this kit to aid the user in selecting component values. The required circuit parameters are entered in the green area and suggested component values are shown to the right of the spreadsheet.

1.6.1.2 I_{DD} Measurement

The current consumption of the FX105A may be measured by removing the jumper on JP2 and replacing it with a multimeter.

1.7 Performance Specification

1.7.1 Electrical Performance

Absolute Maximum Ratings

Exceeding these maximum ratings can result in damage to the Evaluation Kit.

	Min.	Max.	Units
Supply ($V_{IN} - V_{SS}$)	-0.3	40.0	V
Supply ($V_{DD} - V_{SS}$)	-0.3	7.0	V
Voltage on any connector pin to V_{SS}	-0.3	$V_{DD} + 0.3$	V
Current into or out of V_{IN} and V_{SS} pins	0	+1.5	A
Storage Temperature	-10	+70	°C
Operating Temperature	+10	+35	°C

Operating Limits

Correct operation of the Evaluation Kit outside these limits is not implied.

	Notes	Min.	Max.	Units
Supply ($V_{IN} - V_{SS}$)		8.0	35.0	V
Supply ($V_{DD} - V_{SS}$)		3.0	5.5	V
Operating Temperature		+10	+35	°C

Operating Characteristics

For the following conditions unless otherwise specified:

$V_{DD} = 3.0V$ or $5.0V$, $T_{amb} = +25^{\circ}C$.

	Notes	Min.	Typ.	Max.	Units
DC Parameters					
I_{DD}	1	-	-	10	mA

Notes: 1. Not including any current drawn from the board connector pins by external circuitry.

Operating Characteristics - Timing Diagrams

For FX105A timing information and operating characteristics, refer to the relevant CML Data Sheet.

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This notification is relevant product information to which it is attached.

Company contact information is as below:



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