

iC-HF EVAL HF1D

EVALUATION BOARD DESCRIPTION

ORDERING INFORMATION

| Type | Order Designation | Description Options |
|---|-------------------|------------------------|
| Evaluation Board | iC-HF EVAL HF1D | iC-HF Evaluation Board |
| <p>ready to operate: <i>Encoder Link Sequence</i> and power down available through on-board microcontroller and buttons.</p> | | |

BOARD HF1D AND TERMINAL DESCRIPTION

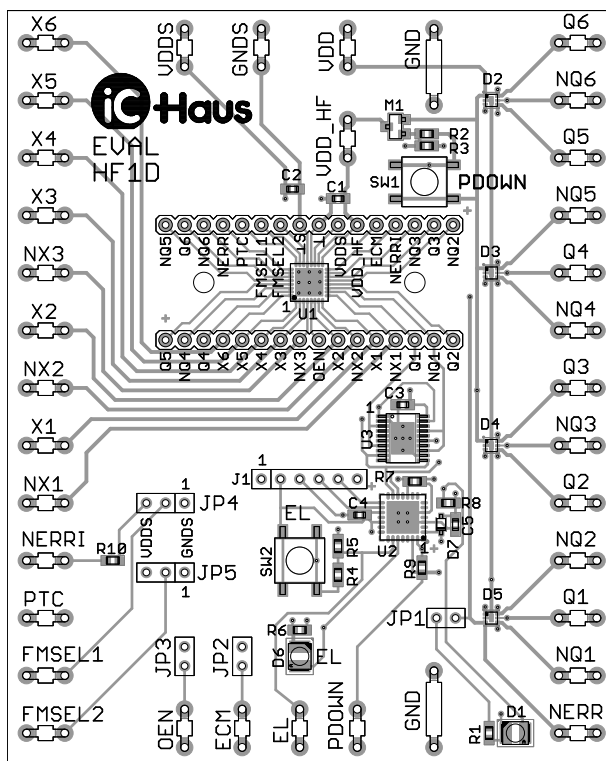


Figure 1: Component side (size 100 mm x 80 mm)

TERMINAL DESCRIPTION

| | |
|--------|---|
| J1 | <i>Encoder Link</i> generator programming interface |
| J2 | iC-HF device signals |
| J3 | iC-HF device signals |
| VDD | Digital Supply |
| GND | Digital Ground |
| VDDS | Switched Power Supply output |
| GNDS | Switched Ground output |
| X1 | Channel 1 positive input |
| NX1 | Channel 1 negative input |
| X2 | Channel 2 positive input |
| NX2 | Channel 2 negative input |
| X3 | Channel 3 positive input |
| NX3 | Channel 3 negative input |
| X4 | Channel 4 positive input |
| X5 | Channel 5 positive input |
| X6 | Channel 6 positive input |
| Q1 | Channel 1 positive output |
| NQ1 | Channel 1 negative output |
| Q2 | Channel 2 positive output |
| NQ2 | Channel 2 negative output |
| Q3 | Channel 3 positive output |
| NQ3 | Channel 3 negative output |
| Q4 | Channel 4 positive output |
| NQ4 | Channel 4 negative output |
| Q5 | Channel 5 positive output |
| NQ5 | Channel 5 negative output |
| Q6 | Channel 6 positive output |
| NQ6 | Channel 6 negative output |
| NERR | Error Output (low active) |
| NERRI | Error Input (low active) |
| PTC | PT configuration output |
| FMSEL1 | Function Mode Select 1 input |
| FMSEL2 | Function Mode Select 2 input |
| OEN | Output Enable input |
| ECM | Enable <i>Encoder Link state</i> input |

iC-HF EVAL HF1D

EVALUATION BOARD DESCRIPTION

CIRCUIT DESCRIPTION

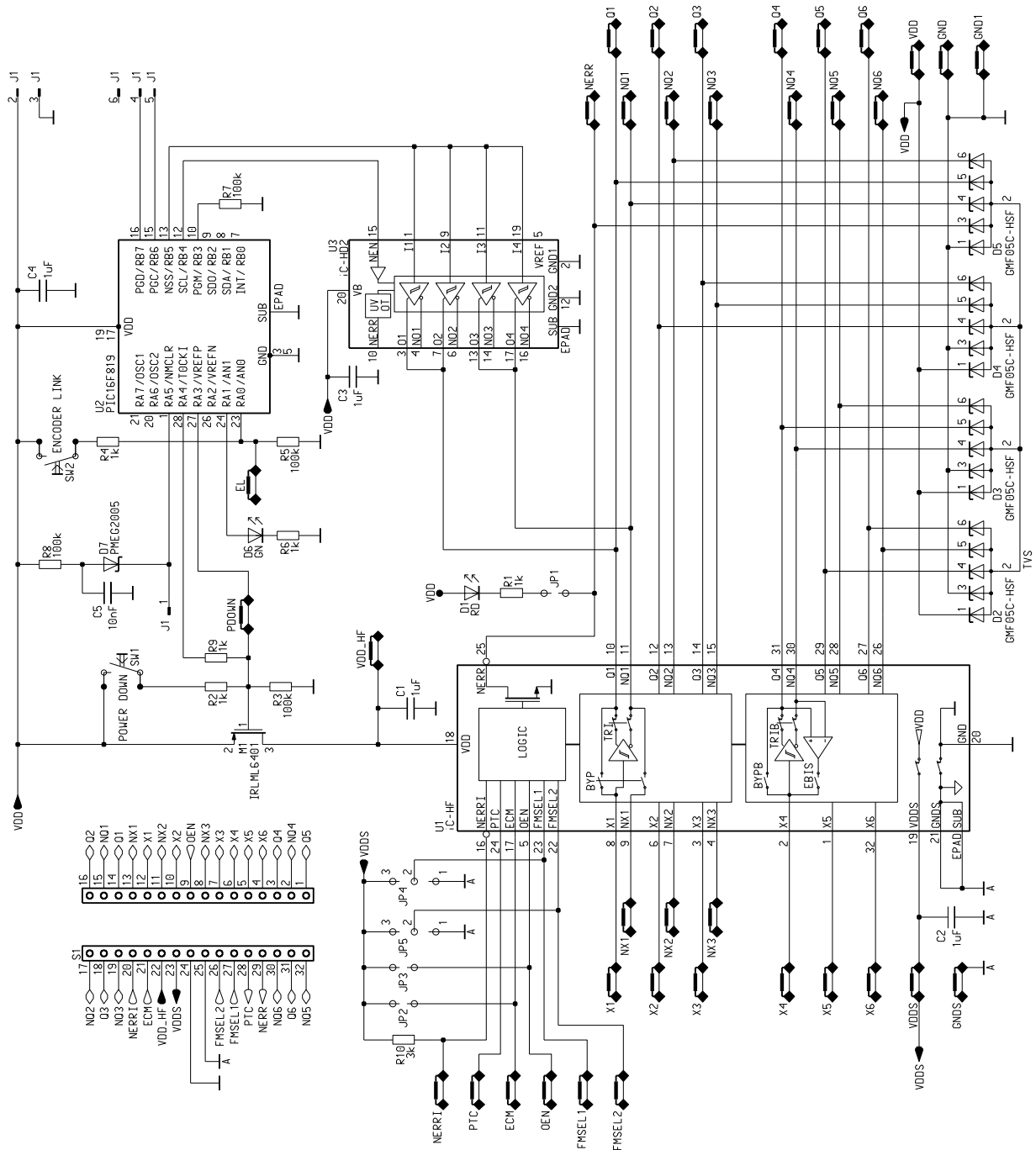


Figure 2: Circuit diagram

iC-HF EVAL HF1D

EVALUATION BOARD DESCRIPTION



Rev A1, Page 3/6

ASSEMBLY PART LIST

| Device | Value (typical) | Comment |
|---|----------------------------|--|
| PCB | HF1D | |
| C1, C2, C3, C4 | 1 μ F | Tolerance 10% X7R 16 V SMD 0603 |
| C5 | 10 nF | Tolerance 10% X7R 16V SMD 0603 |
| D1 | LS-T67K | NERR LED red, SMD PLCC2 |
| D2, D3, D4, D5 | GMF05C-HSF | TVS array SMD SOT363 |
| D6 | LG-T67K | <i>Encoder Link</i> LED green, SMD PLCC2 |
| D7 | PMEG2005A | SMD SOD323 |
| M1 | IRLML6401 | VDD Switch SMD SOT23 |
| R1, R2, R4, R6, R9 | 1k Ω | Tolerance 1% SMD 0603 |
| R3, R5, R7, R8 | 100k Ω | Tolerance 1% SMD 0603 |
| R10 | 3k Ω | Tolerance 1% SMD 0603 |
| SW1, SW2 | Switch B3S | Push button SMD |
| U1 | iC-HF | 6-CHAN. RS422 Encoder Link SMD QFN32 |
| U2 | PIC16F819 | PIC Microcontroller SMD QFN28 |
| U3 | iC-HD2 | Line driver SMD TSSOP20 |
| ECM, EL, FMSEL1, FMSEL2, GNDS, NERR, NERRI, Q1...6, NQ1...6, X1...6, NX1...3, OEN, PDOWN, PTC, VDD, VDDS, VDD_HF | Jumperlink 34 | TH 200mil |
| GND, GND1 | Jumperlink 2 | TH 400mil |
| JP1, JP2, JP3 | CONN 3 SLLP10972G | TH W2X1 |
| JP4, JP5 | CONN 2 SLLP10973G | TH W3X1 |
| J1 | CONN 0 | TH W6X1 |
| S1_1, S1_2 | CONN 0 | TH S16X1 |
| RF1, RF2, RF3, RF4 | 12,7 mm x 12,7 mm x 5,6 mm | Rubberfoot |

iC-HF EVAL HF1D

EVALUATION BOARD DESCRIPTION



Rev A1, Page 4/6

BOARD AND CONNECTOR PINOUT

J1: PIC programmer interface

6-pin Connector pads

| PIN | Name | Function |
|---------|------|--------------------------|
| 1 ... 6 | | PIC programmer interface |

J2: iC-HF signals

16-pin Connector - female

| PIN | Name | Function |
|-----|------|---------------------------|
| 29 | Q5 | Channel 5 positive output |
| 30 | NQ4 | Channel 4 negative output |
| 31 | Q4 | Channel 4 positive output |
| 32 | X6 | Channel 6 positive input |
| 1 | X5 | Channel 5 positive input |
| 2 | X4 | Channel 4 positive input |
| 3 | X3 | Channel 3 positive input |
| 4 | NX3 | Channel 3 negative input |
| 5 | OEN | Output Enable input |
| 6 | X2 | Channel 2 positive input |
| 7 | NX2 | Channel 2 negative input |
| 8 | X1 | Channel 1 positive input |
| 9 | NX1 | Channel 1 negative input |
| 10 | Q1 | Channel 1 positive output |
| 11 | NQ1 | Channel 1 negative output |
| 12 | Q2 | Channel 2 positive output |

J3: iC-HF signals

16-pin Connector - female

| PIN | Name | Function |
|-----|--------|--|
| 13 | NQ2 | Channel 2 negative output |
| 14 | Q3 | Channel 3 positive output |
| 15 | NQ3 | Channel 3 negative output |
| 16 | NERRI | Error Input (low active) |
| 17 | ECM | Enable <i>Encoder Link state</i> input |
| 18 | VDD | Power Supply Voltage |
| 19 | VDDS | Switched Power Supply output |
| 20 | GND | Ground |
| 21 | GNDS | Switched Ground output |
| 22 | FMSEL2 | Function Mode Select 2 input |
| 23 | FMSEL1 | Function Mode Select 1 input |
| 24 | PTC | PT configuration output |
| 25 | NERR | Error Output (low active) |
| 26 | NQ6 | Channel 6 negative output |
| 27 | Q6 | Channel 6 positive output |
| 28 | NQ5 | Channel 5 negative output |

JUMPER DESCRIPTION

| Jumper | Pin 1 | Pin 2 | Pin 3 | Default Setting |
|--------|-------|--------|-------|-----------------|
| JP1 | NERR | D1 LED | n.a. | 1-2 jumpered |
| JP2 | ECM | VDDS | n.a. | 1-2 open |
| JP3 | OEN | VDDS | n.a. | 1-2 jumpered |
| JP4 | GNDS | FMSEL1 | VDDS | 1-2 jumpered |
| JP5 | GNDS | FMSEL2 | VDDS | 1-2 jumpered |

BUTTON DESCRIPTION

| Button | Label | Default Setting |
|--------|-------|--|
| SW1 | PDOWN | Interrupts iC-HF VDD supply through transistor M1 |
| SW2 | EL | Triggers <i>Encoder Link Sequence</i> generated through the microcontroller U2 |

ENCODER LINK SEQUENCE GENERATOR

The eval board HF1D has an on board **Encoder Link** generator. This generator creates the precise timing sequence on Q1 and NQ1 to switch into the *Encoder Link state*.

Startup indication

The *Encoder Link Sequence* Generator indicates its startup by a short blink sequence on LED D6 after the power up.

The *Encoder Link Sequence* Generator is based on a microcontroller and the iC-HD2 line driver.

The microcontroller does detect the power up cycle and the power down.

Multiple *Encoder Link Sequence* can be executed with the **Encoder Link** generator.

Even with the iC-HF in the *Encoder Link state* the *Encoder Link Sequence* can still be executed with the **Encoder Link** generator.

Encoder Link Sequence Execution indication

The *Encoder Link Sequence* LED D6 indicates the executed *Encoder Link Sequence* by permanent light after the power up.

A power down will reset the LED D6.

Reverse polarity protection test setup

The *Encoder Link Sequence* Generator is on board and can be deactivated and protected for a reverse polarity protection test:

- Do connect the VDD pin with GND and provide the supply at VDD_HF.
- A reverse polarity supply may only be provided at the iC-HF related pins.
- A reverse polarity supply may not be provided at the iC-HF related pin VDD.
- A reverse polarity supply may not be provided at the *Encoder Link Sequence* Generator related pins:
 - EL
 - PDOWN

Encoder Link Sequence Execution for external iC-HF

To use the *Encoder Link Sequence* Generator for an external iC-HF device and not with the on board present iC-HF You need to remove or deactivate the iC-HF on board.

To deactivate the on board iC-HF use the following jumper configuration:

| Jumper | Pin 1 | Pin 2 | Pin 3 | Default Setting |
|--------|-------|-------|-------|-----------------|
| JP2 | ECM | VDDS | n.a. | 1-2 open |
| JP3 | OEN | VDDS | n.a. | 1-2 open |

The on-chip pull-down resistors will deactivate the output and disable the *Encoder Link* sensitivity of the on-board iC-HF.

iC-HF EVAL HF1D

EVALUATION BOARD DESCRIPTION



Rev A1, Page 6/6

RELATED DOCUMENTS

- iC-HF description and documentation → <http://www.ichaus.com/HF>

REVISION HISTORY

| Rev | Notes | Pages affected |
|-----|-----------------|----------------|
| A1 | Initial version | |

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