



AE-1

**8-Input Alarm ANI Encoder Module
(DTMF, 5-Tone, 2-Tone)**

Manual Revision: 2013-03-21

**Covers Software Revisions:
AE-1: 1.2**

**Covers Hardware Revisions:
AE-1: 7287D**

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SPECIFICATIONS

Operating Voltage	+5.5 – 15 VDC
Operating Current	<3 mA
Momentary Output	100 mA
PTT Output Current	100 mA
Audio Output Level	1V RMS
Audio Output Impedance	10KΩ/22KΩ
Operating Temperature	-30° to +60° C
Dimensions	0.84" x 1.55" x 0.2"

GENERAL INFORMATION

Midian's AE-1 is an 8-input alarm ANI encoder that can send alarm notifications via a two-way radio using DTMF, 5-Tone or 2-Tone signaling. Each alarm input has a high and a low state. Each state can send a different tone sequence. For example when the input is taken to ground the AE-1 can send "12341" to indicate a door is open or a light is off, when the input floats high the unit can send "12342" to indicate a door is closed or a light is on. These tone sequences can be decoded and displayed by Midian's ADD-100, ADD-200, CAD-100, CAD-200, DDU-100, DDU-200, TRC-100 and TRC-200 DTMF and 5-Tone ANI display decoders.

Common applications for the AE-1 include the monitoring of:

- Entries (doors, gates, etc.)
- Lighting
- Back-up power
- Equipment status
- Fire or carbon monoxide sensors

Another application of the AE-1 is for turning equipment on and off using tone signaling. This could work with Midian's RD-1, RD-10, TTD-4, UD-1B and UED-1B products.

HARDWARE INSTALLATION

Be certain to follow standard anti-static procedures when handling any of Midian's products.

P1:1 – Green – TX Tone Out – Connect to the modulator circuit. Use high impedance point in the radio. If generating CTCSS, use the CTCSS point in the modulator.

P1:2 – Red – +5.5 – 15 VDC – Connect to switched B+ in the radio.

P1:3 – Brown – COR/COS – Connect to point in the squelch or CTCSS circuit that changes logic level when carrier is received. **Note:** If the COR Input is not connected, program the unit for a COR polarity of ground.

P1:4 – Black – Ground – Connect to the nearest ground point.

P1:5 – Blue – Alert Tone/Speaker Audio – Connect to high side of the speaker. This provides Time-Out Timer, Penalty, and Go Ahead tones. When using 20-40 Ohm speakers, the onboard resistor in series with Q3 should be sufficient. When attaching this lead to a 4-8 Ohm speaker, add a 100-Ohm resistor in series with the lead to limit current.

P1:9 – White – PTT Out – Connect to the PTT switch of the radio. The PTT Output gives an open-collector to ground when activated and is rated at 200 mA continuous.

P1:11 – Gray – Program Enable

P1:12 – Orange/White – Program Input

P1:13 – Violet – Alarm Input #08 – When taken low this input will transmit the alarm message programmed in the matching low register in the programming software. When taken high this input will transmit the alarm message programmed in the matching high register.

P2:1 – Green – Ground – Connect to a common ground.

P2:2 – Red – Alarm Input #07 – See instructions above for Alarm Input #08.

P2:3 – Brown – Alarm Input #06 – See instructions above for Alarm Input #08.

P2:4 – Black – Alarm Input #05 – See instructions above for Alarm Input #08.

P2:5 – Blue – Alarm Input #04 – See instructions above for Alarm Input #08.

P2:7 – Yellow – Alarm Input #03 – See instructions above for Alarm Input #08.

P2:8 – Green/White – Alarm Input #02 – See instructions above for Alarm Input #08.

P2:9 – White – Alarm Input #01 – See instructions above for Alarm Input #08.

HARDWARE ALIGNMENT

For the TX Audio Output in a wide band system, set the modulation pot R30 to 3.3 KHz (66% of 5 KHz) of deviation per EIA specifications. For the TX Audio Output in a narrow band system, set the modulation pot R30 to 1.65 KHz (66% of 2.5 KHz) of deviation per EIA specifications. Set CTCSS deviation to 750 Hz – 1 kHz.

PRODUCT PROGRAMMING

Midian's AE-1 is programmed using the KL-4 programmer. Please reference the KL-4 manual for setup instructions of the KL-4 hardware and MPS software. From the product selection screen in the MPS software, select the appropriate product name from the list and click OK.

Set the parameters of the AE-1 to fit the application. If any clarifications on a feature are required, move the mouse cursor over the feature name until the question mark appears and right click, a definition of the feature will be shown.

After entering the parameters, save the file by going to File - Save As. Enter the file name in the File Name block and click Save. Saving the file will allow for quick and easy reprogramming of units.

Plug the unit into the P5 connector on the KL-4. Press and hold the PTT button then press and hold the Power button and within 5 seconds click "Program Unit" in the menu bar to send the file to the product. After programming is completed, release the PTT and Power buttons and unplug the unit from the KL-4.

Please note that the AE-1 is non-readable.

The screenshot shows a software window titled "AE-1: C:\Program Files\Midian\MPS\MPS_v4_10\ae1.dft". The window is divided into two main sections: "ALARM INPUTS" and "PARAMETERS".

ALARM INPUTS: This section contains eight rows, each representing an "ALARM ANI INPUT" from #01 to #08. Each row has two input fields: "LOW" and "HIGH". The values for the first row are LOW: #1230*1# and HIGH: #1230*0#. The other rows follow a similar pattern with different numbers (e.g., #1231, #1232, #1233, #1234, #1235, #1236, #1237).

PARAMETERS: This section contains several configuration options, each with a text input field or a dropdown menu:

- Alarm ANI Format: DTMF (dropdown)
- ANI Time 1: 50 (text input)
- ANI Time 2: 50 (text input)
- Alarm Input Debounce: 0.5 (text input)
- Delay Between Alarms: 3.0 (text input)
- Key-Up Delay: 0.4 (text input)
- Queing Signal Delay: 1 Second (dropdown)
- COR/COS Polarity: +V (dropdown)
- CTCSS Tone: 0.0 Hz (dropdown)
- CTCSS Attenuation Code: -18 dB (dropdown)

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Alarm ANI Input #01 – #08 (Low or High): Enter the desired DTMF, 5-Tone or 2-Tone sequence for the low and/or high state of the connected input. This field can be up to 12 digits in length for DTMF or 5-Tone or a 3-digit cap code for 2-Tone.

Alarm ANI Format: Select the desired tone signaling format from DTMF, 5-Tone (CCIR, EEA, EIA, ZVEI, DZVEI, DDZVEI, NATEL, MODAT) or 2-Tone (Motorola Quick Call 2, Reach or GE Type 99).

ANI Time 1: For 5-Tone and 2-Tone, this time controls the timing of the first tone. This can be used to create a preamble tone. For DTMF this controls the “Tone On” time. If nothing is entered, this will default to industry standard timings. This time is set in milliseconds. Midian does not recommend using a tone time faster than 30 msec per tone.

ANI Time 2: For 5-Tone and 2-Tone, this controls the timing of all tones following the first tone. If nothing is entered, this will default to Tone Time #1. For DTMF this controls the gap time. If nothing is entered, this will default to industry standard timings. This time is set in milliseconds. Midian does not recommend using a tone time faster than 30 msec per tone.

Alarm Input Debounce: This sets the amount of time the input must change state before it will send the Alarm ANI sequence.

Delay Between Alarms: This time separates sequential inputs from going out immediately after each other for the amount of time programmed in this register from 0.0 to 9.9 seconds.

Key-Up Delay: Enter a time of 0.0 to 9.9 seconds. This is the time from when PTT is asserted until the Alarm ANI is generated.

Queuing Signal Delay: The unit will monitor the COR input until it has been inactive for the time entered here and then it will transmit the alarm sequences.

COR/COS Polarity: This should be set to match the active COR polarity of the connected radio. This enables the unit to queue the alarm in case of a busy channel.

CTCSS Tone: Not used.

CTCSS Attenuation Code: Not used.

OPERATION

Sending an Alarm ANI: The AE-1 is capable of encoding alarm ANI's in DTMF, 5-Tone or 2-Tone. Each of the 8 inputs has two associated programming registers (high and low), which correspond to the state of the wired input. When an input changes state for longer than the Alarm Input Debounce time the unit will assert the PTT output to key the connected two-way radio. Once the Key-Up Delay expires the unit will then generate the programmed ANI sequence, corresponding to the state of the input, out the TX Audio Output to the connected two-way radio.

It is not necessary to have a tone sequence programmed into both the low and high fields, if it is desired to have either a low or high sequence encoded per input.

Busy Channel: When the unit goes to send an Alarm ANI and the COR input is in the active state, the unit will wait for the COR input to go inactive for the time set in the Queuing Signal Delay field and then send the Alarm ANI.

Multiple Alarms: If multiple alarms occur simultaneously or immediately after one another the unit will send the first alarm and then wait for the time to expire programmed into the Delay Between Alarms field. This prevents the first ANI from going out and immediately transmitting another ANI if another input changes state.

TECHNICAL NOTES

5-Tone: It is not recommended to encode 5-Tone faster than 30 milliseconds per tone.

MIDIAN CONTACT INFORMATION

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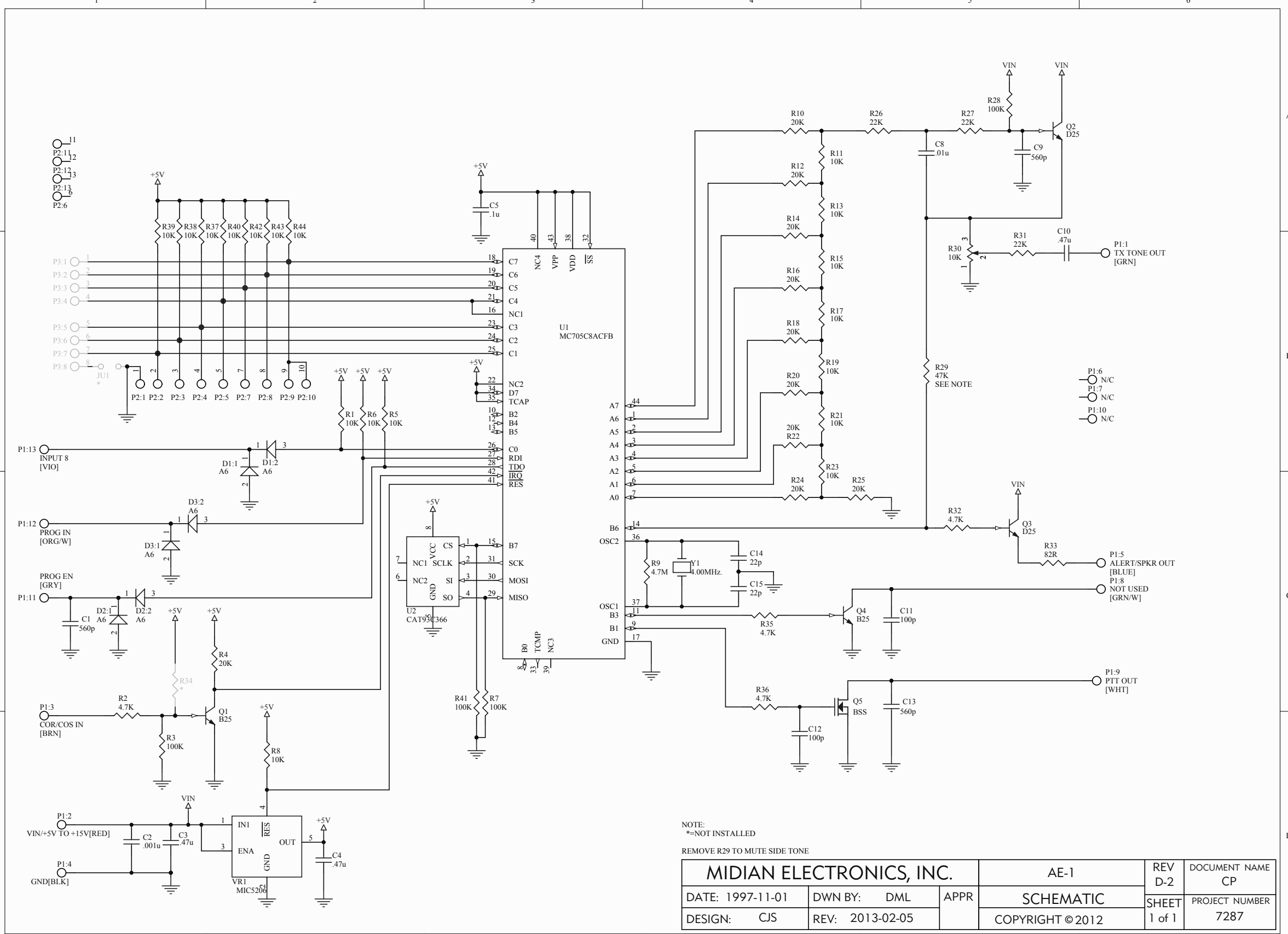
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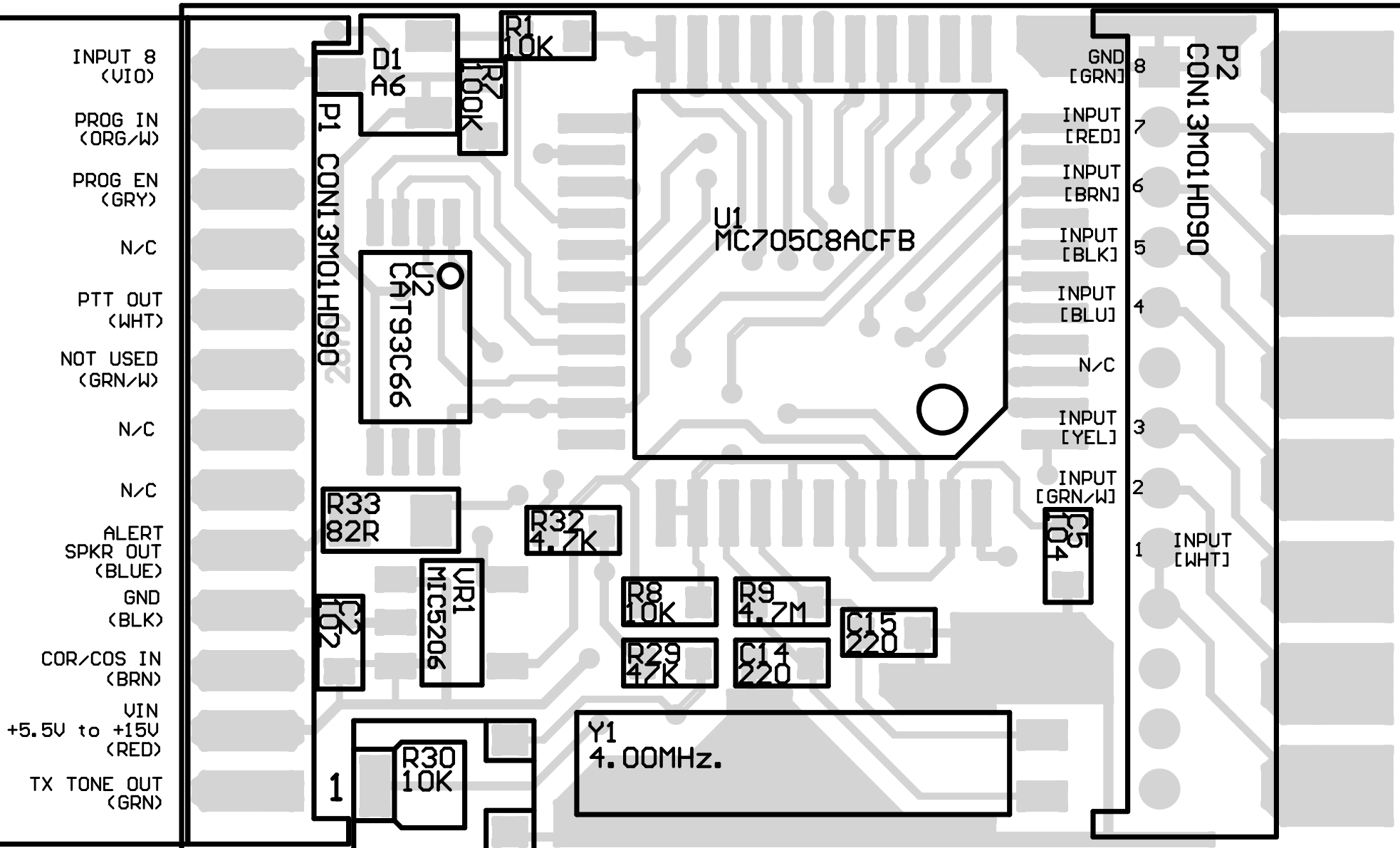


NOTE:
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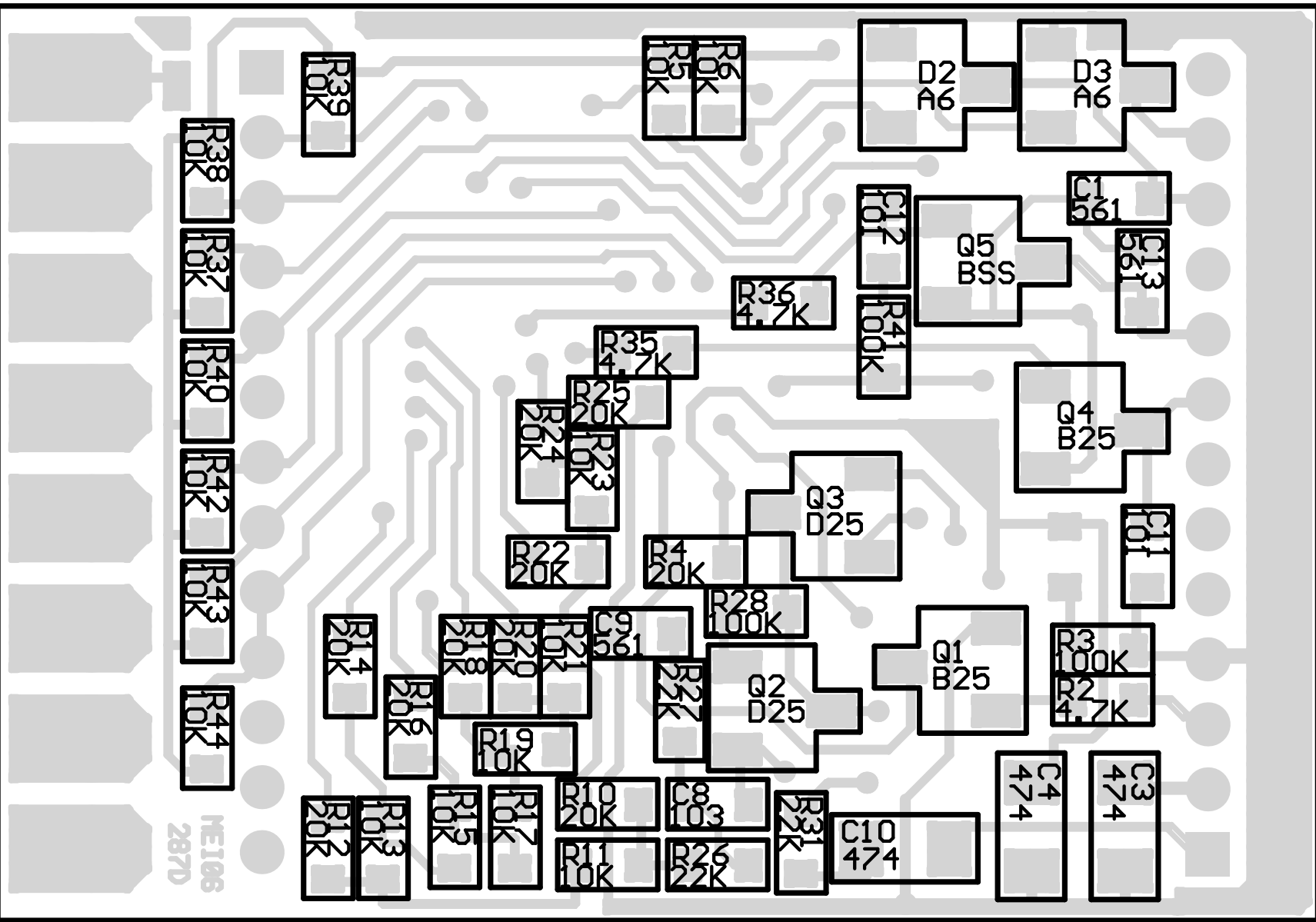
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