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保密宣告
(Classified Info.)

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Data Sheet

AWI5822

5.8GHz Wireless Receiver IC

| | | | |
|---------------|-----------|------------|----------------|
| 承認 | 承認 | 品保 | 工程 |
| Dr. T.H. Chen | Ben Huang | Sandy Chen | Shih Chuan Lin |
| Approve | Approve | QA | E/E |



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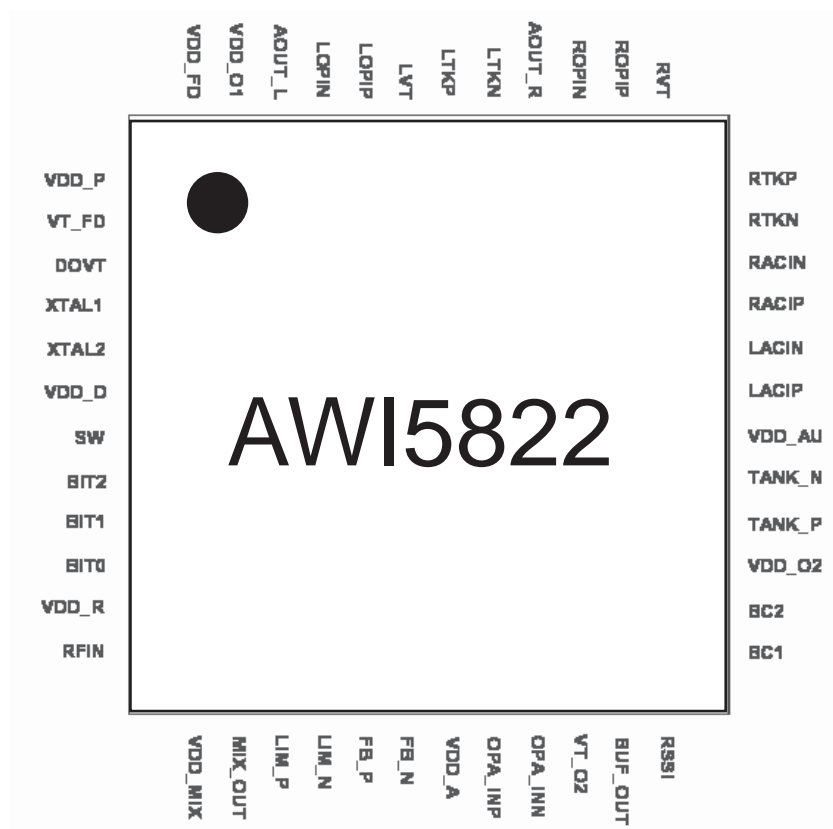
Product Description

The AWI5822 is an integrated single chip receiver designed for analog A/V sender and wideband digital FSK receiver operating in the 5.8GHz ISM band. The receiver IC consists of a fully integrated frequency synthesizer, LNA, Mixer, IF Amplifier, PLL FM Demodulator, Audio Demodulator and Audio OP Amplifier. The IC is provided in 48-lead QFN7X7 package and is designed to provide a fully functional FM/FM receiver.

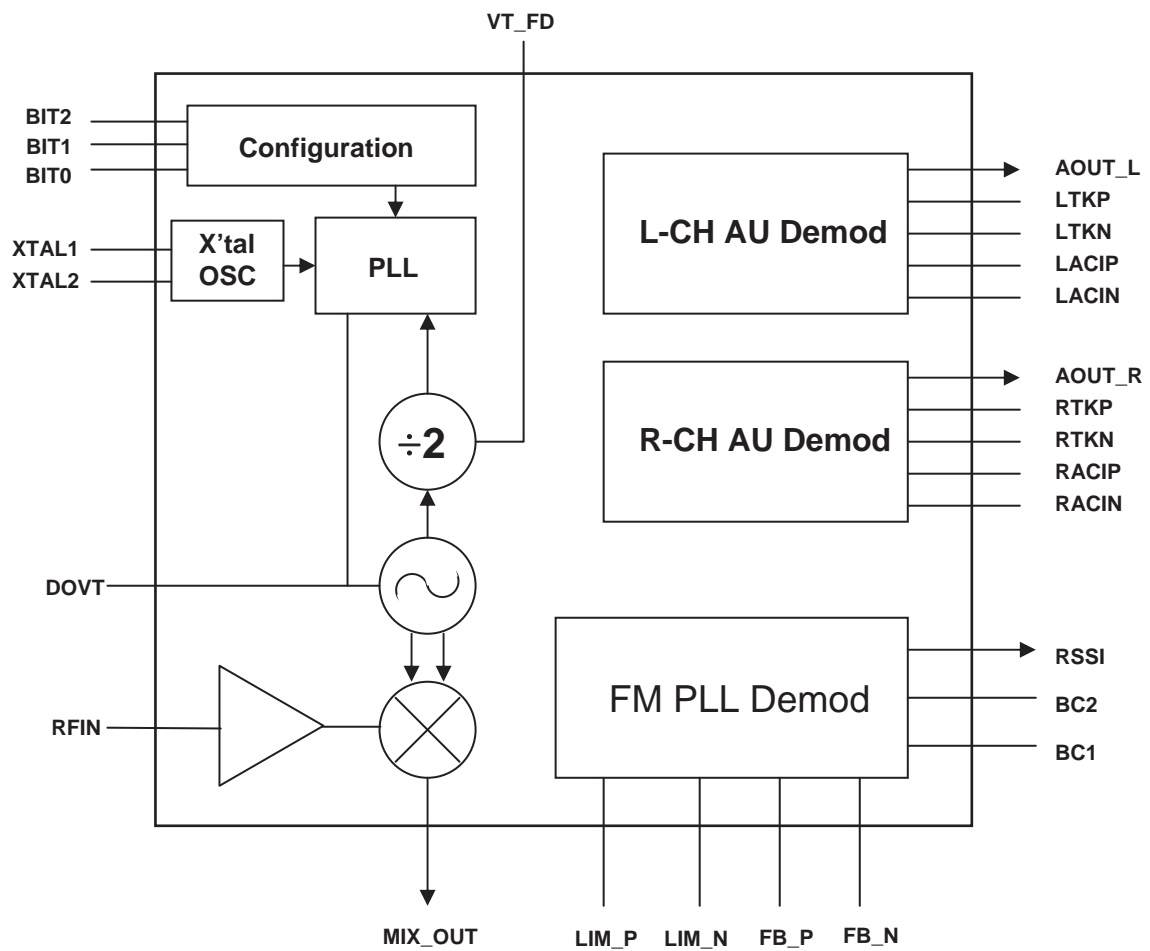
Main Features

- 3.6V power Supply (Typical)
- Wideband PLL demodulator for adjustment-free production
- 7 channels operation for analog A/V sender and digital FSK transmission applications
- Channel select by use of either a DIP switch or a tact switch for a set of pre-defined frequencies
- Integrated stereo Sound Demodulator and Audio OP Amplifiers

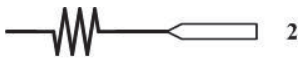

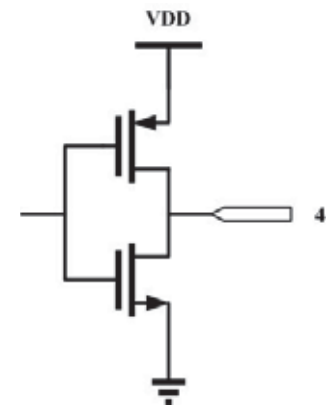
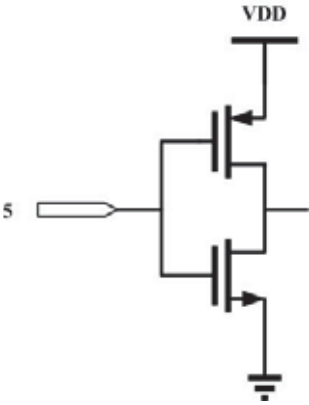
Pin Configurations

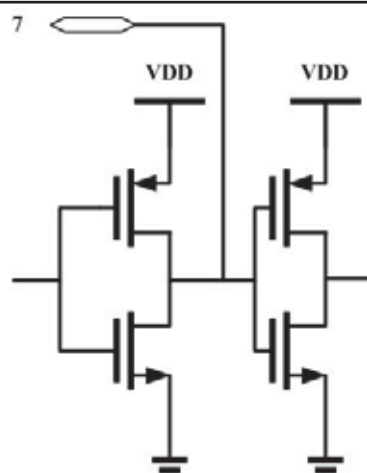
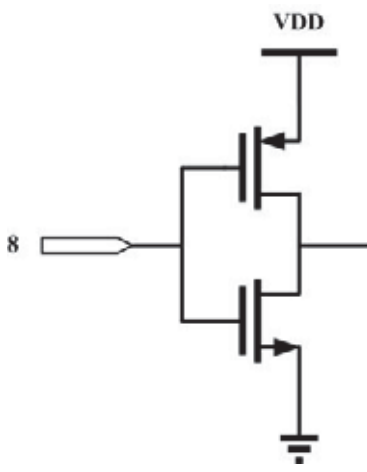


Receiver Block Diagram

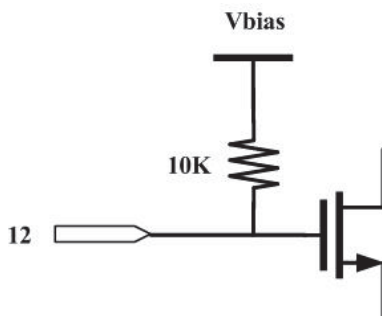
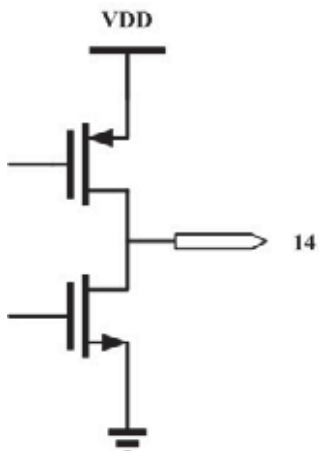


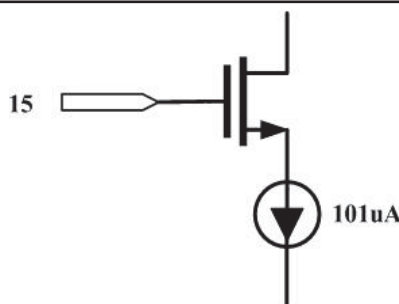
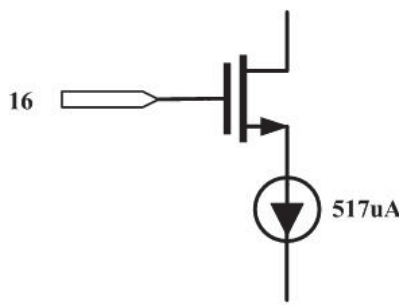
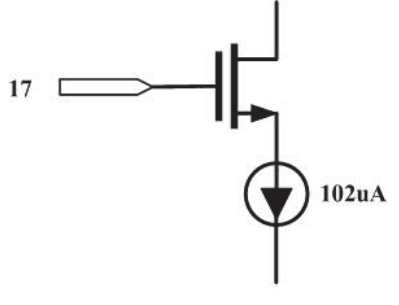
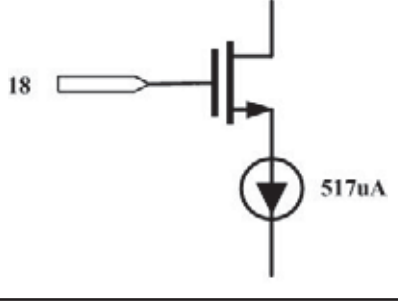
Pin Descriptions

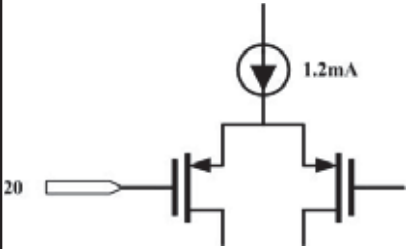
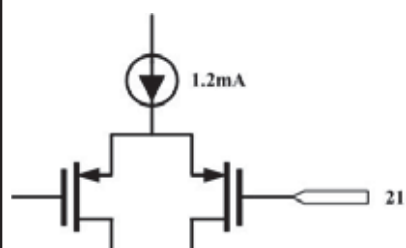

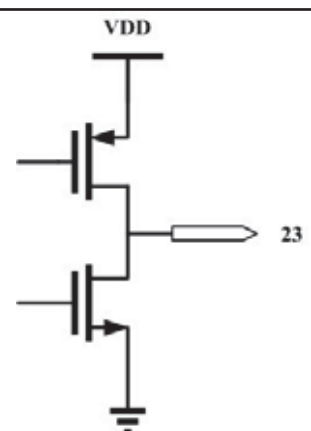
| Pin No. | Name | Description | Equivalent Schematic |
|---------|-------|---|---|
| 1 | VDD_P | Prescaler Power Supply : Suggestion value of bypass capacitor C2 is 100pF. | |
| 2 | VT_FD | 5.3GHz Injection Locked Frequency Divider Tuning Voltage Typical range of Vt is 0.4~1.4V |  |
| 3 | DOVT | 5.3GHz LO Tuning Voltage Control Input : Typical range of Vt is 0.35 ~ 1.6V. |  |
| 4 | XTAL1 | One of the two connection pins of external crystal See Note1 |  |
| 5 | XTAL2 | One of the two connection pins of external crystal See Note1 |  |

| Pin No. | Name | Description | Equivalent Schematic |
|---------|-------|--|--|
| 6 | VDD_D | Digital CKT Power Supply : Suggestion value of bypass capacitor C6 is 0.1uF. | |
| 7 | SW | Either PIN7(SW) or the settings of BIT0, BIT1, BIT2 (when PIN7 is grounded) can be used to select the channel out of a set of pre-defined channel frequencies. PIN7(SW) is normal high and each pull low will advance one channel in the pre-defined channel sequence (CH1, CH2 ..., CH7, CH1 ...) See Note2 |  |
| 8 | BIT2 | MSB of the 3 Bits CH Selection PIN. If PIN7(SW) is grounded, PIN8 is normal high and enabled when pull low. If use PIN7(SW) to select channel, PIN8 outputs the selected channel status according to the operation of PIN7(SW). A series resistor R30 of 47K Ω and a shunt capacitor C62 of 0.068uF are recommended. See Note2 |  |

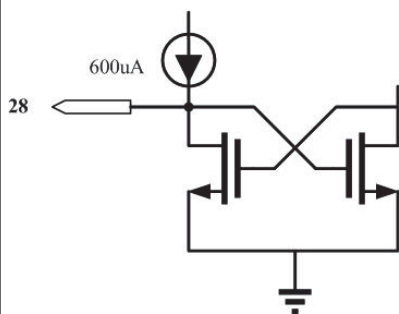
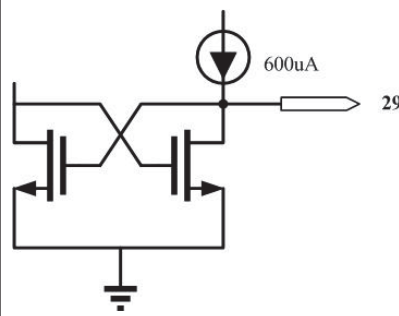
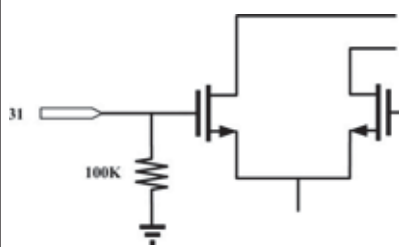
| Pin No. | Name | Description | Equivalent Schematic |
|---------|-------|--|----------------------|
| 9 | BIT1 | <p>One of the 3 Bits CH Selection PIN.</p> <p>If PIN7(SW) is grounded, PIN9 is normal high and enabled when pull low. If use PIN7(SW) to select channel, PIN9 outputs the selected channel status according to the operation of PIN7(SW). A series resistor R29 of 47KΩ and a shunt capacitor C63 of 39pF are recommended. See Note2</p> | |
| 10 | BIT0 | <p>LSB of the 3 Bits CH Selection PIN.</p> <p>If PIN7(SW) is grounded, PIN10 is normal high and enabled when pull low. If use PIN7(SW) to select channel, PIN10 outputs the selected channel status according to the operation of PIN7(SW). A series resistor R28 of 47KΩ and no shunt capacitor are recommended. See Note2</p> | |
| 11 | VDD_R | <p>RF Power Supply :</p> <p>Suggestion value of bypass capacitor C65 is 4.7pF.</p> | |

| Pin No. | Name | Description | Equivalent Schematic |
|---------|---------|--|---|
| 12 | RF_IN | RF Input to Internal LNA See Note3 |  |
| 13 | VDD_MIX | Mixer Power Supply : Suggestion values of bypass capacitors C52 and C36 are 1nF and 10pF. | |
| 14 | MIX_OUT | Mixer Output : The impedance level of MIX_OUT (PIN14) and IF Filter is 50Ω. |  |

| Pin No. | Name | Description | Equivalent Schematic |
|---------|-------|---|--|
| 15 | LIM_P | Limiting Amplifier Positive Input |  |
| 16 | LIM_N | Limiting Amplifier Negative Input |  |
| 17 | FB_P | Limiting Amplifier Feedback Input (Positive node) |  |
| 18 | FB_N | Limiting Amplifier Feedback Input (Negative node) |  |

| Pin No. | Name | Description | Equivalent Schematic |
|---------|---------|--|---|
| 19 | VDD_A | Demodulator Power Supply : Suggestion values of bypass capacitors C28 and C31 are 100pF and 0.01uF. | |
| 20 | OPA_INP | OPA Positive Input |  |
| 21 | OPA_INN | OPA Negative Input |  |
| 22 | VT_O2 | 480MHz VCO Tuning Voltage Control Input : Typical range of Vt is 0.9 ~ 1.3V. |  |
| 23 | BUF_OUT | Demodulated Signal Output |  |


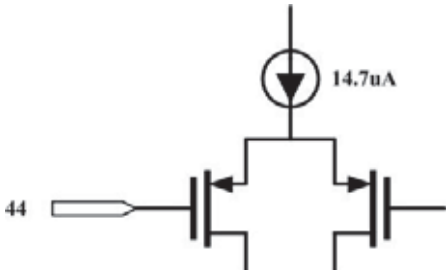
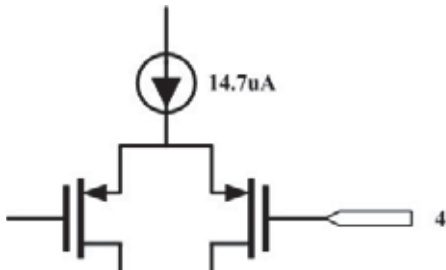
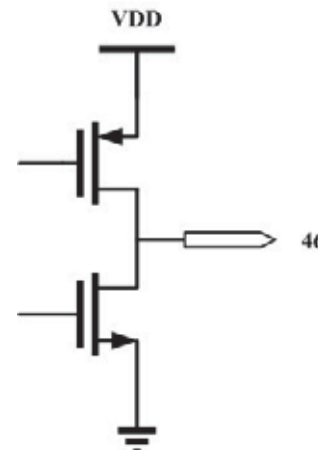
| Pin No. | Name | Description | Equivalent Schematic |
|---------|--------|--|----------------------|
| 24 | RSSI | <p>RSSI Output :</p> <p>The RSSI output voltage is inversely proportional to input signal strength. Typical range of RSSI voltage is 0.3 ~ 1.9V.</p> | |
| 25 | BC1 | <p>480MHz VCO Frequency Tuning Control Bit : 1C (C: unit capacitance)</p> <p>Internal pull high, set PIN25 Low to add the extra tuning capacitance.</p> <p>See Note4</p> | |
| 26 | BC2 | <p>480MHz VCO Frequency Tuning Control Bit : 2C (C: unit capacitance)</p> <p>Internal pull high, set PIN26 Low to add the extra tuning capacitance.</p> <p>See Note4</p> | |
| 27 | VDD_O2 | <p>480MHz VCO Power Supply :</p> <p>Suggestion value of bypass capacitor C39 is 100pF.</p> | |

| Pin No. | Name | Description | Equivalent Schematic |
|---------|--------|---|--|
| 28 | TANK_P | <p>One of the two connection pins for external Tank components of 480MHz VCO.</p> <p>Shorter traces for the interconnection of L and C are recommended. Suggestion values of L4 and C47 are 22nH and 2pF.</p> |  |
| 29 | TANK_N | <p>One of the two connection pins for external Tank components of 480MHz VCO.</p> <p>Shorter traces for the interconnection of L and C are recommended. Suggestion values of L4 and C48 are 22nH and 2pF.</p> |  |
| 30 | VDD_AU | <p>Audio Power Supply :</p> <p>Suggestion value of bypass capacitor C3 is 0.1uF.</p> | |
| 31 | LACIP | <p>6.0MHz Limiting Amplifier Positive Input</p> |  |

| Pin No. | Name | Description | Equivalent Schematic |
|---------|-------|---|----------------------|
| 32 | LACIN | 6.0MHz Limiting Amplifier Negative Input | |
| 33 | RACIP | 6.5MHz Limiting Amplifier Positive Input | |
| 34 | RACIN | 6.5MHz Limiting Amplifier Negative Input | |
| 35 | RTKN | <p>One of the two connection pins for external Tank components of 6.5MHz VCO.</p> <p>Shorter traces for the interconnection of L and C are recommended. Suggestion values of L1 and C34 are 33uH and 6.8pF.</p> | |

| Pin No. | Name | Description | Equivalent Schematic |
|---------|-------|---|----------------------|
| 36 | RTKP | <p>One of the two connection pins for external Tank components of 6.5MHz VCO.</p> <p>Shorter traces for the interconnection of L and C are recommended. Suggestion values of L1 and C34 are 33uH and 6.8pF.</p> | |
| 37 | RVT | <p>6.5MHz VCO Tuning Voltage Control Input :</p> <p>The range of V_t is 1.1 ~ 1.5V.</p> | |
| 38 | ROPIP | Positive Input of Right CH Audio OPA | |
| 39 | ROPIN | Negative Input of Right CH Audio OPA | |

| Pin No. | Name | Description | Equivalent Schematic |
|---------|--------|---|----------------------|
| 40 | AOUT_R | Audio Output of Right CH Audio OPA | |
| 41 | LTKN | <p>One of the two connection pins for external Tank components of 6.0MHz VCO.</p> <p>Shorter traces for the interconnection of L and C are recommended. Suggestion values of L2 and C44 are 33uH and 10pF.</p> | |
| 42 | LTKP | <p>One of the two connection pins for external Tank components of 6.0MHz VCO.</p> <p>Shorter traces for the interconnection of L and C are recommended. Suggestion values of L2 and C44 are 33uH and 6.8pF.</p> | |

| Pin No. | Name | Description | Equivalent Schematic |
|---------|--------|--|---|
| 43 | LVT | 6.0MHz VCO Tuning Voltage Control Input : Typical range of V_t is 1 ~ 1.4V. |  |
| 44 | LOPIP | Positive Input of Left CH Audio OPA |  |
| 45 | LOPIN | Negative Input of Left CH Audio OPA |  |
| 46 | AOUT_L | Audio Output of Left CH Audio OPA |  |

| Pin No. | Name | Description | Equivalent Schematic |
|---------|--------|---|----------------------|
| 47 | VDD_O1 | 5.3GHz VCO Power Supply : Typical range of VDD_O1 is 4.05 ~ 4.1V. Suggestion value of bypass capacitor C14 is 100pF | |
| 48 | VDD_FD | 5.3GHz Injection Locked Frequency Divider Power Supply : Suggestion value of bypass capacitor C1 is 100pF. | |

Maximum Rating

| Parameter | Maximum Rating | Units |
|----------------------|----------------|-------|
| Supply Voltage (VDD) | 5 | V |
| Storage Temperature | -20 ~ +85 | °C |

Note : This device is ESD sensitive. Handling and assembly of this device should only be done at proper ESD protection environment.

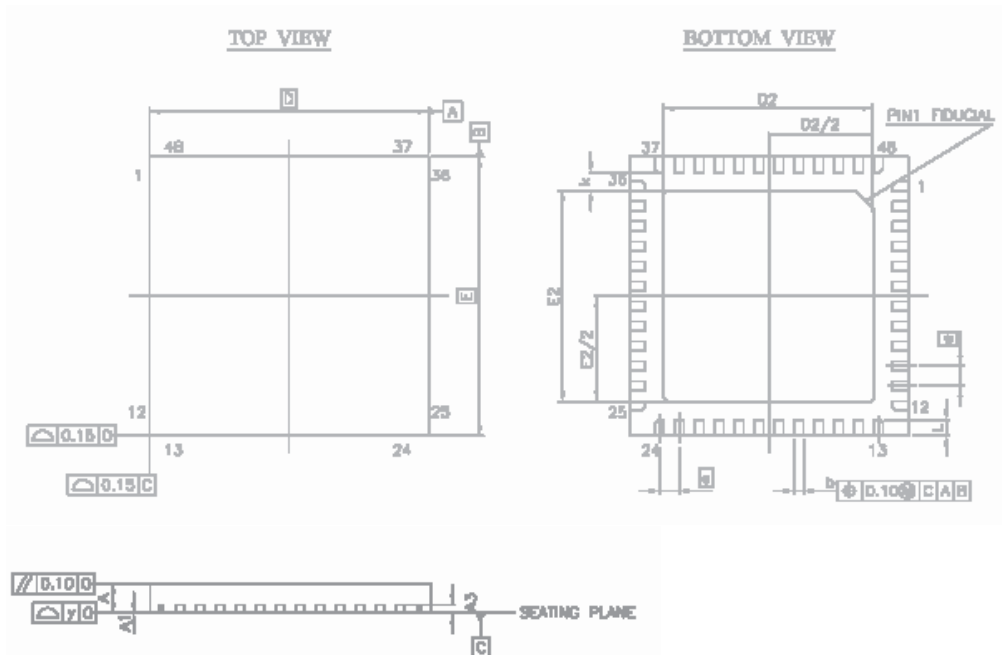
Electrical Characteristics

| Parameter | Description | Min. | Typ. | Max. | Unit |
|-------------------------------|----------------------|---|------|------|-------|
| Operation Temperature | | -10 | | 75 | °C |
| Supply Voltage | | | 3.6 | 4.5 | V |
| Current Consumption | | | 140 | | mA |
| RF Frequency | | 5740, 5760, 5780, 5800, 5820, 5840, 5860MHz | | | MHz |
| LO Frequency | | 5260, 5280, 5300, 5320, 5340, 5360, 5380MHz | | | MHz |
| Sensitivity | | | -70 | | dBm |
| IF Frequency | | | 480 | | MHz |
| RF Gain (LNA & Mixer) | | | 17 | | dB |
| Reference Frequency | | | 8 | | MHz |
| Crystal Accuracy | | | 30 | | ppm |
| RSSI Voltage | @ RFIN : -70~-10 dBm | 0.5 | | 2.5 | V |
| Demodulation | | | FM | | |
| Demodulator Input Sensitivity | | | -50 | | dBm |
| Demodulator Output Level | @ F.D.: ± 2MHz | | 120 | | mVp-p |



Package Information

QFN 48 Outline Dimensions



| SYMBOL | DIMENSION (MM) | | | DIMENSION (MIL) | | |
|--------|----------------|------|------|-----------------|------|------|
| | MIN. | NOM. | MAX. | MIN. | NOM. | MAX. |
| A | 0.70 | 0.75 | 0.80 | 27.6 | 29.5 | 31.5 |
| A1 | 0 | 0.02 | 0.05 | 0 | 0.79 | 1.97 |
| A2 | 0.203 REF | | | 8 REF | | |
| b | 0.18 | 0.25 | 0.30 | 7.1 | 9.8 | 11.8 |
| D | 7.00 BSC | | | 276 BSC | | |
| D2 | 5.10 | 5.20 | 5.30 | 201 | 205 | 209 |
| E | 7.00 BSC | | | 276 BSC | | |
| E2 | 5.10 | 5.20 | 5.30 | 201 | 205 | 209 |
| e | 0.50 BSC | | | 19.7 BSC | | |
| k | 0.20 | | | 7.9 | | |
| L | 0.30 | 0.40 | 0.50 | 11.8 | 15.7 | 19.7 |
| y | 0.08 | | | 3.15 | | |