

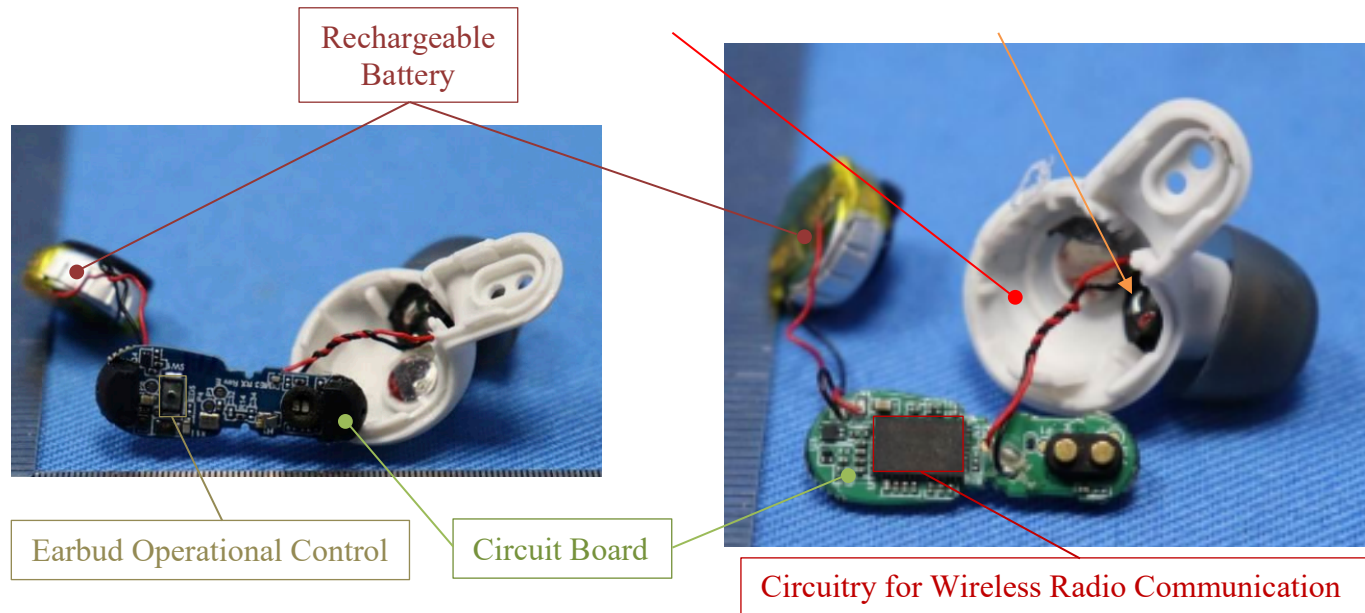
Earin v. Skullcandy
C.A. 24-275-RGA-SRF (D. Del.)
US 9,402,120 Infringement Contentions:
Skullcandy Dime 3 True Wireless Earbuds

See <https://www.skullcandy.com/collections/earbuds>.

Claim 20	Evidence of Infringement
20. A wireless earbud having an idle mode and an operational mode, the wireless earbud comprising:	To the extent the preamble is interpreted to be limiting, the Skullcandy Dime 3 True Wireless Earbuds (“Accused Products”) literally satisfy this preamble, as explained in the limitation-by-limitation analysis below. On information and belief, and based on publicly available information, the Accused Products have an idle mode and an operational mode. When the Accused Products are in their charging case they are in idle mode and when they are removed from the charging case they enter operational mode. “AUTO POWER ON & POWER OFF: Remove your earbuds from the case and you will hear the power on "ping" tone and the LEDs will turn blue for 2 seconds. This will indicate they have automatically powered on. When your earbuds are placed correctly into the charge case, they will always power off as long as the case battery is charged. The earbud LEDs will show solid RED to indicate they are powered off and charging, and will remain RED until fully charged. Once charged the earbud LEDs will turn off.” See https://info.skullcandy.com/Support?Dest=hc%2Fen-us%2Farticles%2F17629153827735-Dime-3.

- a) an earbud housing;
- b) a loudspeaker element;
- c) a rechargeable battery; and
- d) at least one main printed circuit board having disposed thereon circuitry for wireless radio communication, audio codec and earbud operation control;

The Accused Products contain an earbud housing, a loudspeaker element, a rechargeable battery, and at least one main printed circuit board with circuitry for wireless radio communication, audio codec, and earbud operation control.



See <https://fccid.io/Y22-S2DCW/Internal-Photos/Internal-photos-6573817>.

“Internally, 6mm dynamic drivers deliver a frequency response of 20Hz to 20kHz. The earbuds are compatible with Bluetooth 5.3 but support only the SBC code [...] the on-ear controls aren’t capacitive touch and are instead physical buttons. The entire outer panel presses in, which means you have to hold the stem between your fingers to avoid the eartips pressing deeper into your ear.” See <https://www.pcmag.com/reviews/skullcandy-dime-3>.

SKDY 000674 identifies that the Dime 3 earbuds use Bluetooth Codecs SBC and Bluetooth Version BT5.1. Meanwhile, the product manual and FAQ on the product page state that Dime 3 earbuds use Bluetooth Version 5.3 (“WHICH VERSION OF BLUETOOTH DOES DIME 3 USE? Bluetooth® version 5.3.” See <https://info.skullcandy.com/Support?Dest=hc%2Fen-us%2Farticles%2F17629153827735-Dime-3>.”).

“Skullcandy's Dime 3 true wireless earbuds come with 20 hours of total battery, a built-in microphone, sweat and water resistant construction, Tile tracking technology, and Bluetooth® 5.3 connectivity.” See <https://www.skullcandy.com/products/dime-3-true-wireless-earbuds>.

“To help you get the best sound quality from your content, Dime 3 features three preset EQ modes:

- Music Mode
- Bass Boost Mode
- Podcast Mode

To switch between EQ modes, press the button on either earbud 4 times. A voice prompt will notify you each time your EQ mode changes.” See <https://info.skullcandy.com/Support?Dest=hc%2Fen-us%2Farticles%2F17629153827735-Dime-3>.

e) wherein the circuitry is configured for automatic power preservation by: e.1) detecting connection of said battery to a charger and in response entering the idle mode, wherein existing connections to a second wireless earbud and to a wireless audio streaming host device will be disconnected; and	The circuitry of the Accused Products is configured for automatic power preservation by detecting the connection between the battery and the charger and in response entering idle mode, such that the connection to a second wireless earbud and to a wireless audio streaming host device are disconnected. “AUTO POWER ON & POWER OFF: Remove your earbuds from the case and you will hear the power on "ping" tone and the LEDs will turn blue for 2 seconds. This will indicate they have automatically powered on. When your earbuds are placed correctly into the charge case, they will always power off as long as the case battery is charged. The earbud LEDs will show solid RED to indicate they are powered off and charging, and will remain RED until fully charged. Once charged the earbud LEDs will turn off.” See https://info.skullcandy.com/Support?Dest=hc%2Fen-us%2Farticles%2F17629153827735-Dime-3. Device testing of the Accused Product confirms that when the earbuds are placed in the charging case, they enter an idle mode, whereby the Accused Product earbuds disconnect from each other and from any connected wireless streaming host device. For example, the Accused Product accomplishes this at least by automatically turning off when the earbuds are placed in the charger.
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e.2) detecting disconnection of said battery from said charger and in response entering the operational mode by:	The circuitry of the Accused Products is configured for automatic power preservation by detecting the disconnection between the battery and the charger and in response entering operational mode. “AUTO POWER ON & POWER OFF: Remove your earbuds from the case and you will hear the power on "ping" tone and the LEDs will turn blue for 2 seconds. This will indicate they have automatically powered on. When your earbuds are placed correctly into the charge case, they will always power off as long as the case battery is charged. The earbud LEDs will show solid RED to indicate they are powered off and charging, and will remain RED until fully charged. Once charged the earbud LEDs will turn off.” See https://info.skullcandy.com/Support?Dest=hc%2Fen-us%2Farticles%2F17629153827735-Dime-3. Device testing of the Accused Product confirms that when the earbuds are removed from the charging case they automatically turn on and enter an operational mode as detailed in elements e.2.i-e.2.v.
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e.2.i) attempting a true wireless stereo, TWS, reconnection with the second wireless earbud;

The circuitry of the Accused Products is configured for automatic power preservation by detecting the disconnection between the battery and the charger and in response entering operational mode by attempting a TWS reconnection with the second earbud.

The Accused Product are “True Wireless Earbuds.”

True Wireless Earbuds

DIME® 3

See, <https://www.skullcandy.com/products/dime-3-true-wireless-earbuds?variant=42411339382841>, and click “Technical Specifications.”

“NO AUDIO IN ONE EAR? Let’s re-sync your earbuds by first placing both of them into the charge case and ensuring the LEDs both turn red. **Then simply remove both earbuds together, if the stereo audio stream hasn’t been fixed, please follow the instructions below.**” See

<https://info.skullcandy.com/Support?Dest=hc%2Fen-us%2Farticles%2F17629153827735-Dime-3>.

“We call this Solo Mode. Both the left and right earbuds of Sesh ANC Active can be used in solo mode. To use Solo Mode and you’ve previously paired to your earbuds, simply remove either earbud from the charging dock and this solo earbud will function with both phone calls and music. If you are initially pairing only one earbud, simply follow the same initial pairing steps above and you’re good to go. **To use both earbuds again, simply remove the other bud from the dock at any time, you will hear the power on “pling” tone, and your audio begins to seamlessly stream back into Stereo mode.**” See

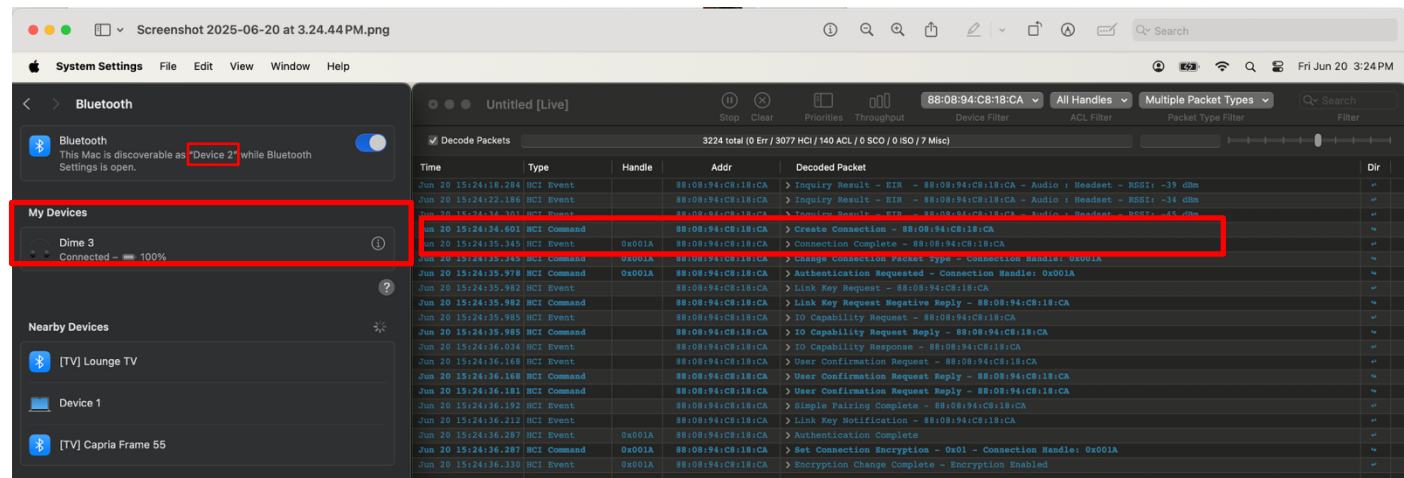
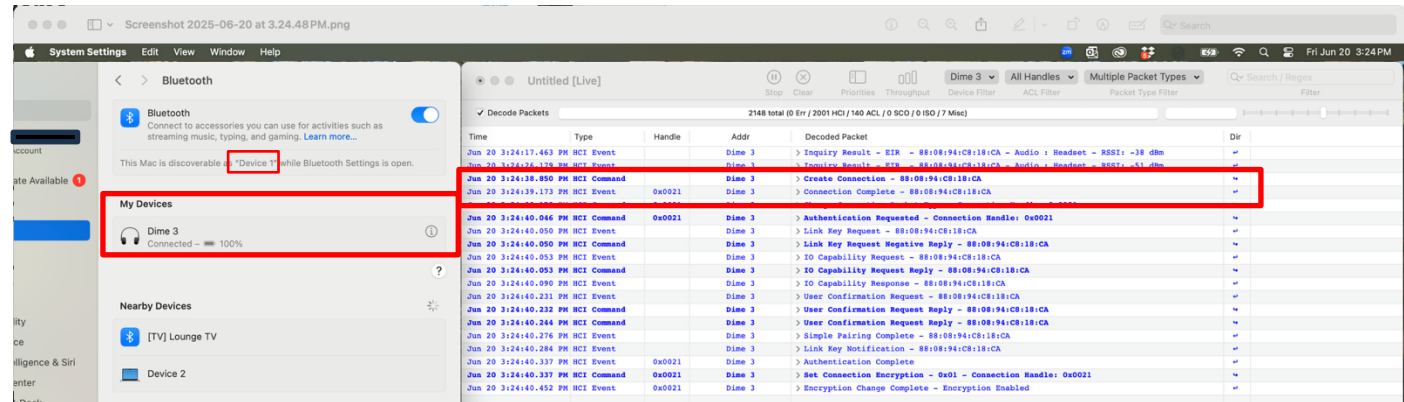
<https://info.skullcandy.com/Support?Dest=hc%2Fen-us%2Farticles%2F17629153827735-Dime-3>

e.2.ii) if the attempt is successful, operating the wireless earbud as a TWS audio receiver and otherwise operating the wireless earbud as a mono wireless audio receiver;	The circuitry of the Accused Products is configured for automatic power preservation by detecting the disconnection between the battery and the charger and in response entering operational mode by attempting a TWS reconnection with the second earbud and if that attempt is successful, operating the wireless earbud as a TWS audio receiver, or operating the wireless earbud as a mono wireless audio receiver. “We call this Solo Mode. Both the left and right earbud of Dime 3 can be used in solo mode. To use Solo Mode when you’ve previously paired your earbuds to your device, simply remove either earbud from the charge case and it will function with both phone calls and music. If you are pairing to a device for the first time with only one earbud, simply follow the same initial pairing steps above and you’ll be good to go. To use both earbuds again, simply remove the other earbud from the case at any time. You will hear the power on “ping” tone, and your audio will begin to seamlessly stream back in Stereo mode.” See https://info.skullcandy.com/Support?Dest=hc%2Fen-us%2Farticles%2F17629153827735-Dime-3
e.2.iii) if operated as a TWS audio receiver, determining whether the wireless earbud is a master device or a slave device with respect to the second wireless earbud;	The circuitry of the Accused Products is configured for automatic power preservation by detecting the disconnection between the battery and the charger and in response entering operational mode by attempting a TWS reconnection with the second earbud and if operated as a TWS audio receiver, determining whether the wireless earbud is a master device or a slave device with respect to the second wireless earbud. “Truly wireless earbuds designate one earbud as the primary receiver, and the other becomes the secondary receiver.” See https://hifigo.com/blogs/tws/tws-101-what-makes-a-good-set-of-true-wireless-earbuds. “WHAT IS THE BENEFIT OF THE MASTER ROLE SWITCHING FEATURE AND FUNCTIONALITY? This allows both the LEFT and RIGHT bud to act as the Master bud, which allows more media controls and features to be activated from either side. Functions such as, play/pause, answer call/hang up call, Activate Assistant, and switching between EQ modes can be controlled on both the LEFT and RIGHT bud, simplifying the user experience. This feature also allows you to utilize either the LEFT or RIGHT bud in Mono Mode, rather than being limited to just one specific side.” See https://support.skullcandy.com/hc/en-us/articles/1500010379401-Jib-True-2. See, also, for example, Bluetooth Core Specification Version 5.3, particularly in relation to the Link Layer, which defines the roles of central and peripheral devices (the terms “central” and “peripheral” replaced the terms “master” and “slave” in the Bluetooth 5.3 specification).

e.2.iv) if the wireless earbud is determined to be a master device, attempting to reconnect with the wireless audio streaming host device and other known wireless audio streaming host devices if applicable; and	The circuitry of the Accused Products is configured for automatic power preservation by detecting the disconnection between the battery and the charger and in response entering operational mode by attempting a TWS reconnection with the second earbud and if operated as a TWS audio receiver, and the wireless earbud is determined to be a master device, attempting to reconnect with the wireless audio streaming host device and other known wireless audio streaming devices if applicable. “Now that you’ve paired to multiple devices, each time you power on your earbuds they will automatically pair to the 2 most recently paired devices.” See https://info.skullcandy.com/Support?Dest=hc%2Fen-us%2Farticles%2F17629153827735-Dime-3. [INTENTIONALLY LEFT BLANK]
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Device testing also confirms that limitation e.2.iv is met:

The “wireless streaming host device” (hereafter “test Device 1”) and “other known wireless audio streaming host device” (hereafter “test Device 2”) were paired to the Accused Product (Bluetooth Address 88:08:94:C8:18:CA).



When the earbuds are placed back in their case, they enter an idle mode and disconnect from test Device 1 and test Device 2 (see element e.1 above).

The top screenshot shows the macOS System Settings app with the Bluetooth pane open. Under 'My Devices', 'Dime 3' is listed as 'Not Connected'. A red box highlights this entry. The bottom screenshot shows the Wireshark network protocol analyzer with a packet capture of Bluetooth traffic. The packet list on the right shows a sequence of events for Device 3 (88:08:94:C8:18:CA), including Inquiry, Create Connection, Connection Complete, Authentication, Link Key Request, and Mode Change. A red box highlights the final two packets: 'Mode Change - Sniff Mode - 498.75 ms - Handle: 0x0021' and 'Disconnection Complete - Success'.

The bottom screenshot shows the macOS System Settings app with the Bluetooth pane open. Under 'My Devices', 'Dime 3' is listed as 'Not Connected'. A red box highlights this entry. The bottom screenshot shows the Wireshark network protocol analyzer with a packet capture of Bluetooth traffic. The packet list on the right shows a sequence of events for Device 1 (88:08:94:C8:18:CA), including Inquiry, Create Connection, Connection Complete, Authentication, Link Key Request, and Mode Change. A red box highlights the final two packets: 'Mode Change - Sniff Mode - 500 ms - Handle: 0x001A' and 'Disconnection Complete - Success'.

Thereafter, when the Accused Product is removed from its charging case, it enters an operational mode (see elements e.2-e.2.iii above) and automatically attempts to reconnect with test Device 1 and test Device 2 as shown by the “Connect Request” exchange between the Accused Product and test Device 1 and test Device 2.

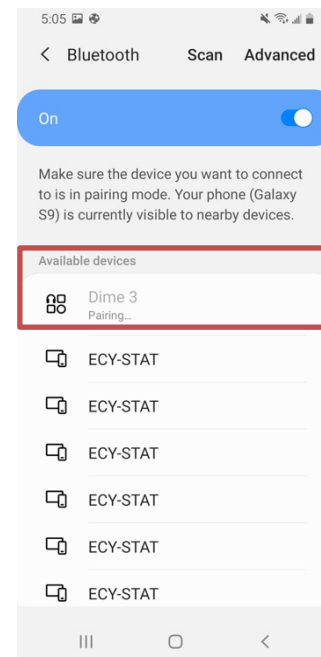
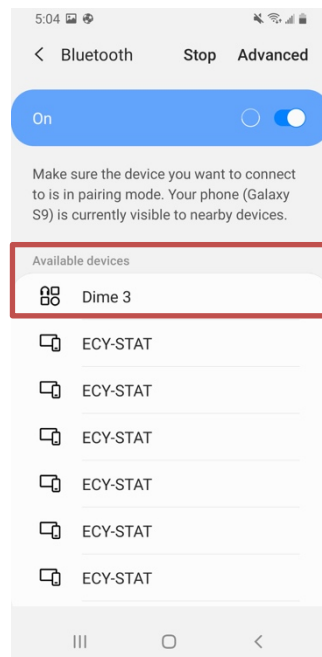
The top screenshot shows the Mac's System Settings Bluetooth window. Under 'My Devices', 'Dime 3' is listed as 'Connected' with 100% battery. A red box highlights 'Dime 3'. To the right, a Wireshark packet capture titled 'Untitled [Live]' shows a Bluetooth connection sequence. A red box highlights a series of packets starting with 'Jun 20 3:25:46.327 PM HCI Event' and 'Decoded Packet' showing 'Connection Request - 88:08:94:CB:18:CA'. The bottom screenshot shows the same System Settings window, but 'Dime 2' is now listed as 'Connected' with 100% battery. A red box highlights 'Dime 2'. The corresponding Wireshark capture shows a similar connection sequence, with a red box highlighting the 'Connection Request' packet from 'Jun 20 15:25:47.150 PM HCI Event'.

e.2.v) if reconnection with the wireless audio streaming host device fails, **initiate a pairing procedure with the wireless audio streaming host device and other known wireless audio streaming host devices** if applicable.

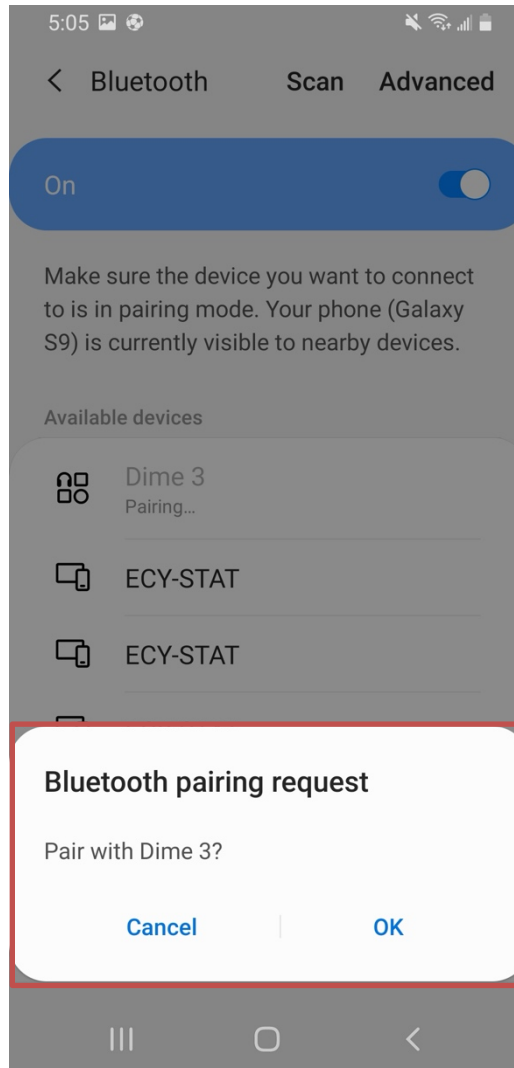
The circuitry of the Accused Products is configured for automatic power preservation by detecting the disconnection between the battery and the charger and in response entering operational mode by attempting a TWS reconnection with the second earbud and if reconnection with the wireless audio streaming host device fails, initiating a pairing procedure with the wireless audio streaming host device and other known wireless audio streaming devices if applicable.

“Now that you’ve paired to multiple devices, **each time you power on your earbuds they will automatically pair to the 2 most recently paired devices.**” See <https://info.skullcandy.com/Support?Dest=hc%2Fen-us%2Farticles%2F17629153827735-Dime-3>.

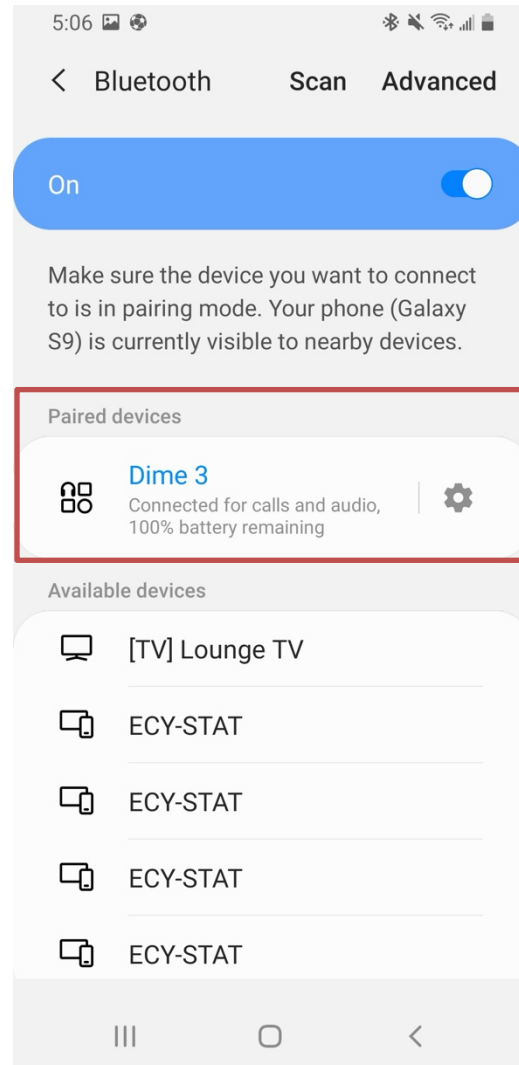
The following series of screengrabs demonstrate the Accused Products’ initiation of a pairing procedure when reconnection with the wireless audio streaming host device fails. First, the Accused Product earbuds are paired with an Android device (the “wireless audio streaming host device”). This screengrab shows the Accused Products being available to pair with an Android device:



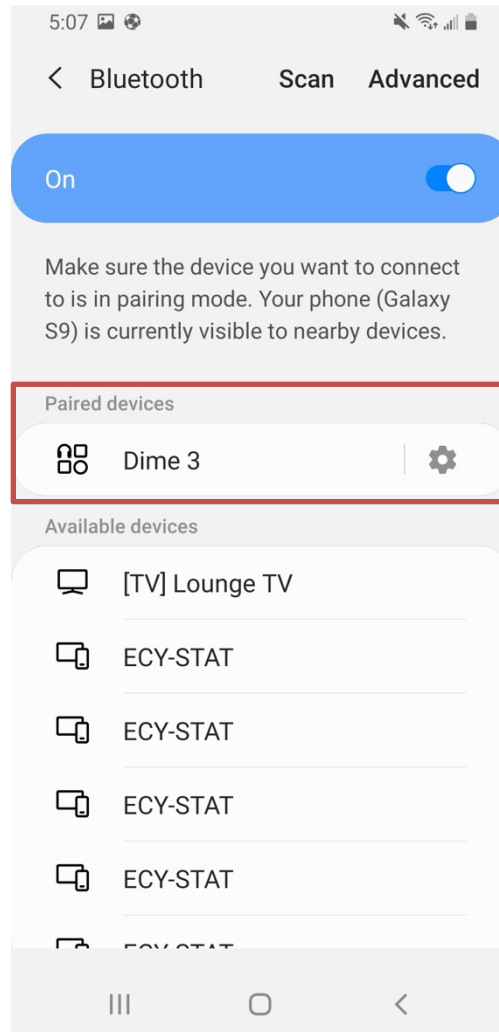
Following the initial pairing between the Android device and the Accused Product the Android will show a pair screen.



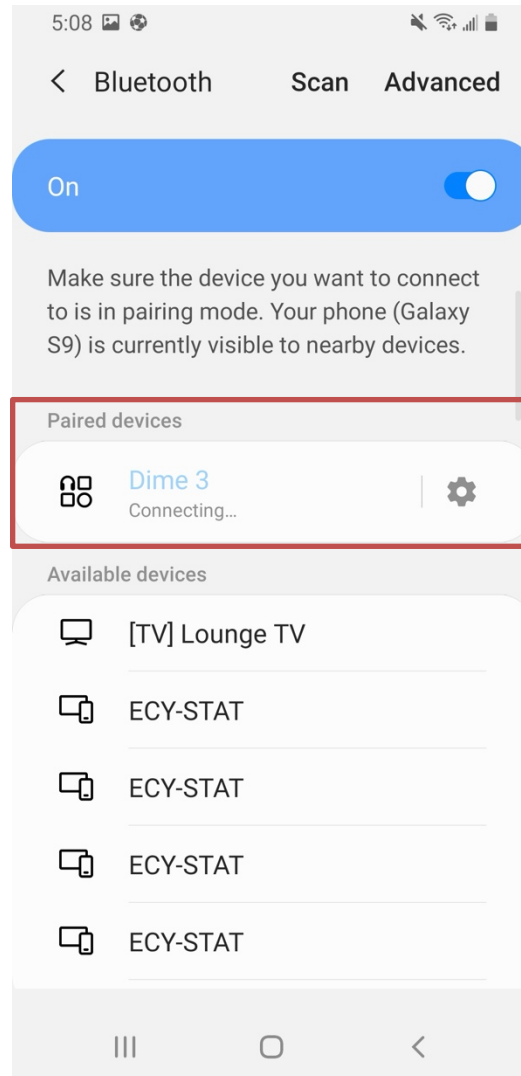
Once the pairing is complete the Android device will show that it is paired with the Accused Product.



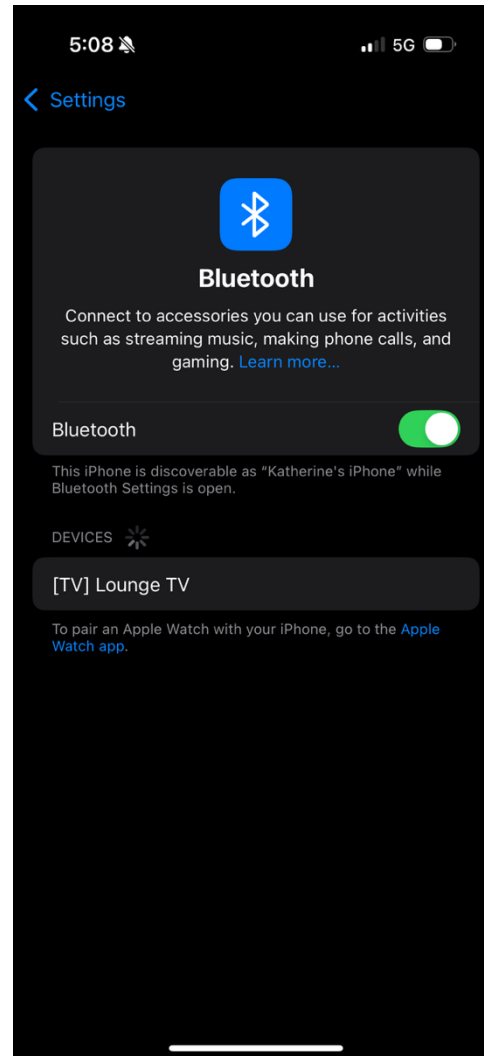
When the Accused Product earbuds are put back into the charging case and then removed again the Android device will show that the earbuds are available devices for reconnecting.



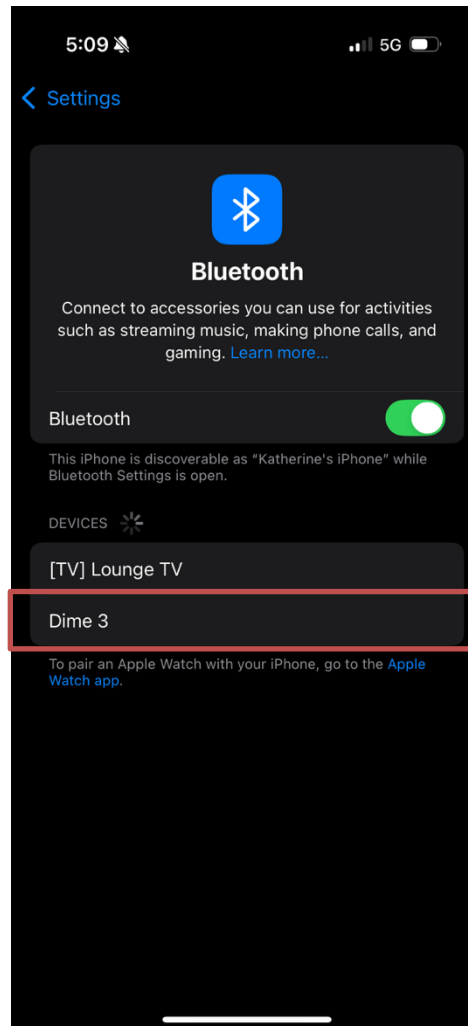
The Accused Product will then automatically reconnect to the Android device.



When the Android device is connected to the Accused Products the earbuds are undetectable by an iPhone.



If, however, the Android device's Bluetooth is switched off when the Accused Product earbuds are taken out of their case, thereby causing reconnection with the wireless audio streaming host to fail, the Accused Product initiates a pairing procedure and advertises to other devices, including, for example, the iPhone to which the Accused Product was previously undetectable.

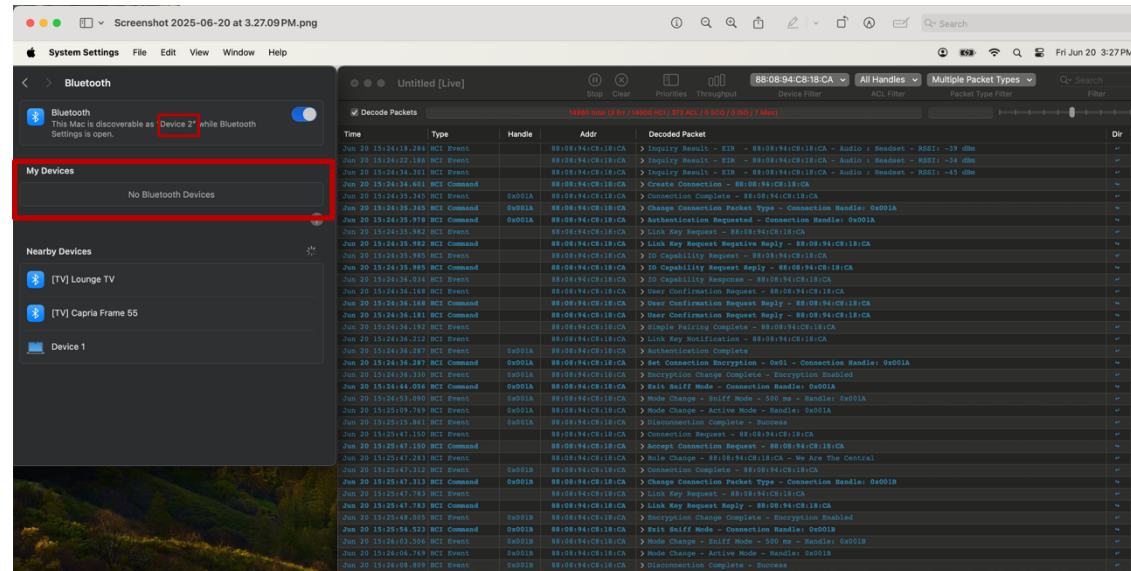
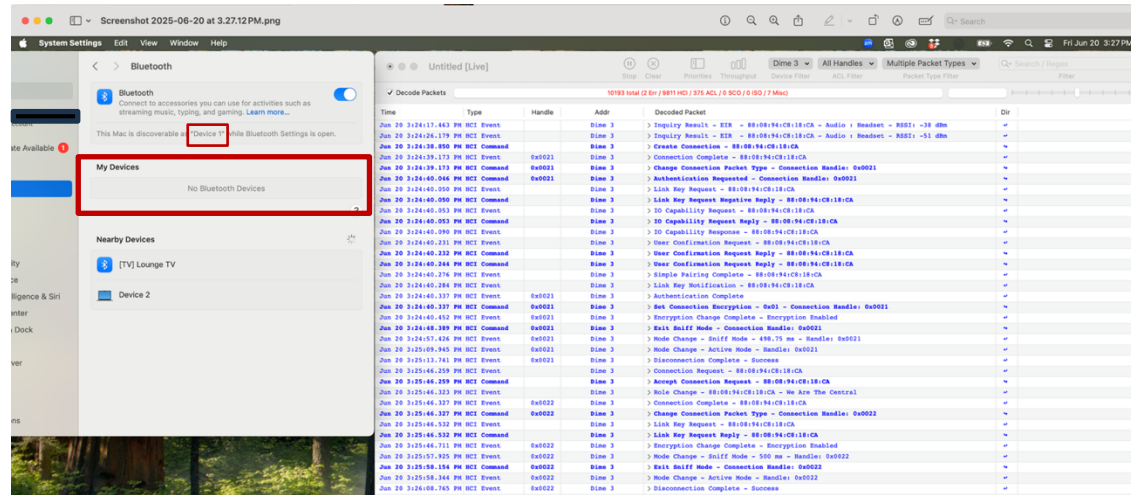


Likewise, testing confirms that the Accused Product attempts to reconnect with a previously paired device (as described above for element e.2.iv), for example, in response to an inquiry. If that reconnection fails, then the Accused Product initiates a pairing procedure with the previously paired device by advertising to previously paired devices instead of attempting to reconnect.

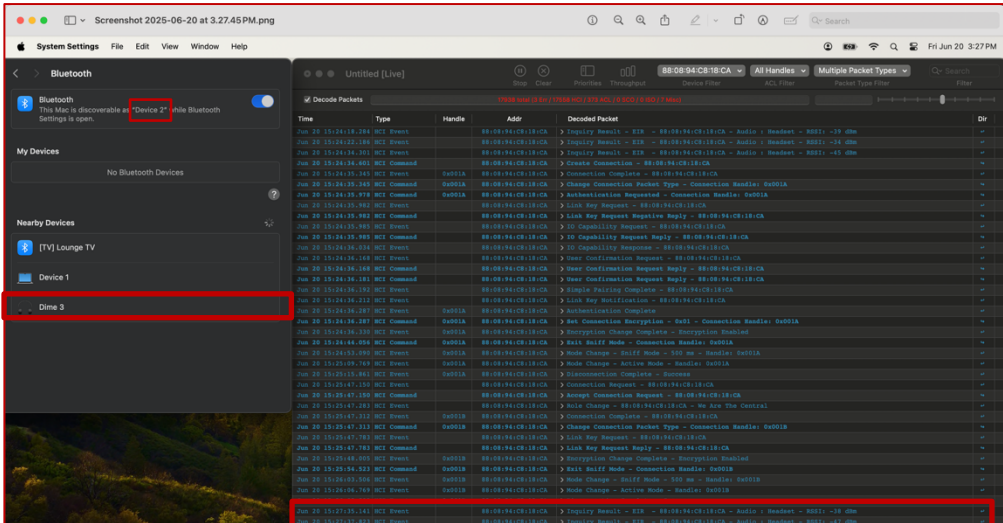
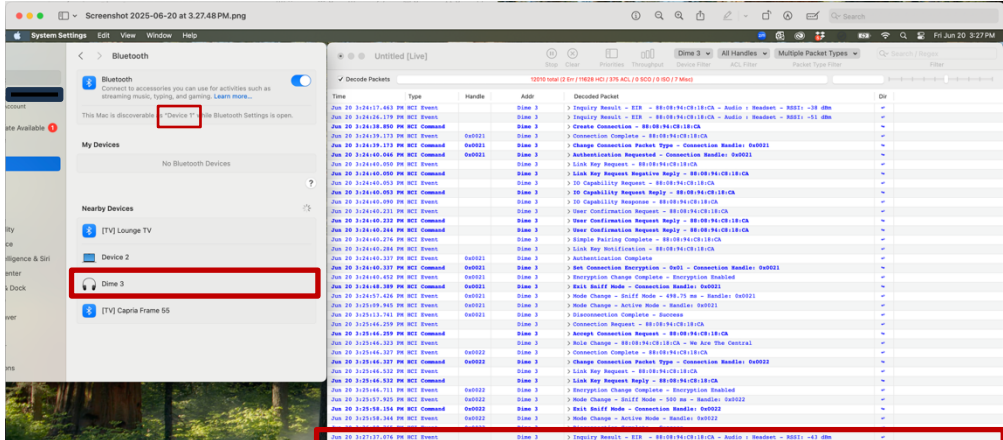
For example, test Device 1 and test Device 2 were previously paired to the Accused Product. Thereafter, as was shown above for element e.2.iv, the Accused Product attempts automatically to reconnect with test Device 1 and test Device 2 as shown by the “Connection Request” exchange between the Accused Product and test Device 1 and test Device 2, for example, in response to an inquiry.

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If the Accused Product fails to reconnect with test Device 1 and test Device 2 (for example, if the Accused Product is no longer in test Device 1's or test Device 2's paired devices list as shown below):



Then the reconnection with test Device 1 and test Device 2 fails and the Accused Product initiates a pairing procedure with test Device 1 and test Device 2 by advertising itself using, for example, the “Inquiry Result” message as shown below.



21. The wireless earbud as defined in claim 20, wherein the circuitry for wireless radio communication is compliant with one or more of Bluetooth, AirPlay, PlayFi, Miracast, WiDi, DLNA or Wi- Fi Direct.	The Accused Products meet the limitations of the Claim 20, as detailed above. Further, the Accused Products have circuitry for wireless radio communication that is compliant with the Bluetooth standard. “Internally, 6mm dynamic drivers deliver a frequency response of 20Hz to 20kHz. The earbuds are compatible with Bluetooth 5.3 but support only the SBC code [...] the on-ear controls aren’t capacitive touch and are instead physical buttons. The entire outer panel presses in, which means you have to hold the stem between your fingers to avoid the eartips pressing deeper into your ear.” See https://www.pcmag.com/reviews/skullcandy-dime-3. “Skullcandy's Dime 3 true wireless earbuds come with 20 hours of total battery, a built-in microphone, sweat and water resistant construction, Tile tracking technology, and Bluetooth® 5.3 connectivity.” See https://www.skullcandy.com/products/dime-3-true-wireless-earbuds. SKDY 000674 identifies that the Dime 3 earbuds use Bluetooth Codecs SBC and Bluetooth Version BT5.1. Meanwhile, the product manual and FAQ on the product page state that Dime 3 earbuds use Bluetooth Version 5.3 (“WHICH VERSION OF BLUETOOTH DOES DIME 3 USE? Bluetooth® version 5.3.” See https://info.skullcandy.com/Support?Dest=hc%2Fen-us%2Farticles%2F17629153827735-Dime-3”).
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