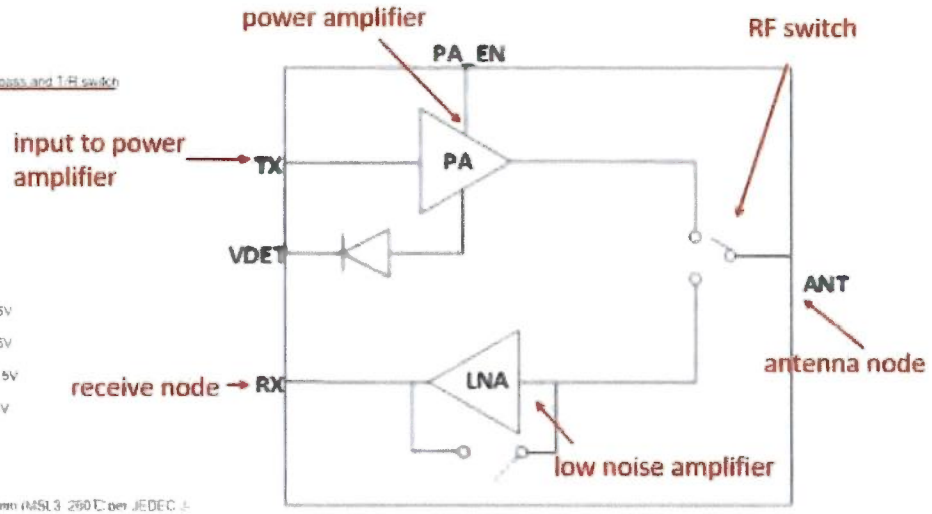
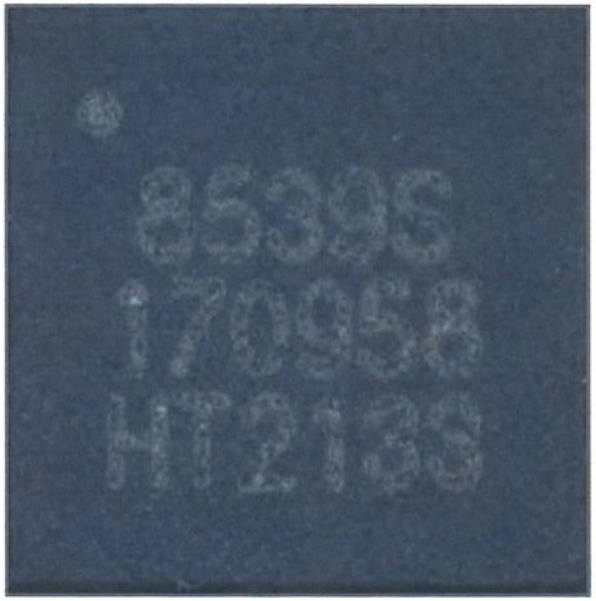
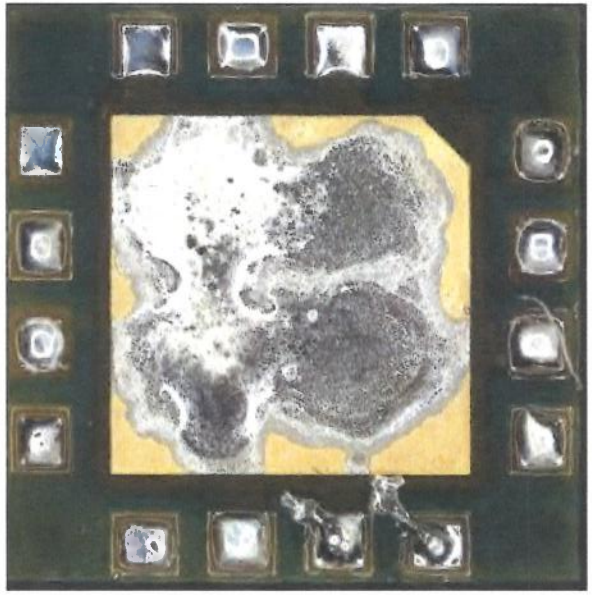
Claim	KCT8539S
	For example, the KCT8539S has an RF switch (indicated by the corresponding red arrow in the figure below) that selectively allows either transmission or reception of signals.[4] The KCT product description describes the switch as a "T/R switch" (indicated by the red underlining in the text below). The figure below also shows the power amplifier (indicated by the corresponding red arrow below), the antenna node (indicated by the corresponding red arrow below), the receive node (indicated by the corresponding red arrow below), the low noise amplifier (indicated by the corresponding red arrow below), and the input to the power amplifier (indicated by the corresponding red arrow below). **Specifications** Integrated 802.11ax 5GHz PA, LNA with bypass and T/R switch Fully-matched input and output Integrated power detector Transmit gain: 30dB at 5V Receive gain: 14dB at 5V Noise Figure: 2.6dB at 5V Output power +17dBm @ -43dB DEVM, HE160/MCS11, 5V +20dBm @ -40dB DEVM, HE160/MCS11, 5V +21.5dBm @ -35dB DEVM, VHT80/MCS9, 5V +22.5dBm @ -30dB DEVM, HT20/MCS7, 5V ESD protection circuitry on all PINs Minimal external components required Small package: LGA-16L 3mmx3mmx0.85mm (MSL3, 260°C per JEDEC J-STD-020) RoHS and REACH Compliant  *See, e.g.*, KCT8539S product description and simplified block diagram, https://perma.cc/DA7F-4CED.

[4] *See* https://perma.cc/DA7F-4CED.

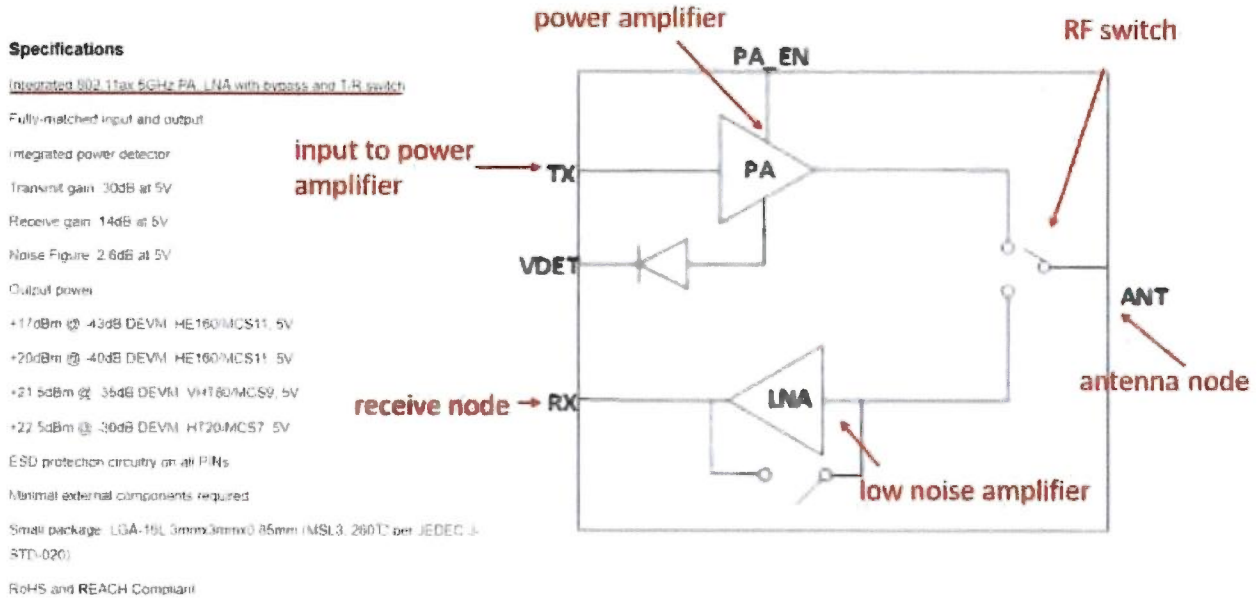
Claim	KCT8539S
	For example, the photos below show the exterior of the KCT8539S device die package, front (left) and back (right).   *See, e.g.* photo of the KCT8539S product, exterior of package, front (left) and back (right).
7[A] providing an RF device including a first switch circuit connected between an antenna node and a transmit node, a second switch	The KCT8539S provides an RF device including a first switch circuit connected between an antenna node and a transmit node, a second switch circuit connected between the antenna node and a receiver node, a first capacitor connected in series with the first switch circuity between the first switch circuit and the antenna node, a second capacitor connected in series with the second switch circuit between the second switch circuit and the antenna node, and a first shunt arm connected to the first switch circuit and the transmit node, the first shunt arm including a third switch circuit connected to ground. *See also*, claims 1[pre]-1[F], 7[pre].

Claim	KCT8539S
circuit connected between the antenna node and a receiver node, a first capacitor connected in series with the first switch circuity between the first switch circuit and the antenna node, a second capacitor connected in series with the second switch circuit between the second switch circuit and the antenna node, and a first shunt arm connected to the first switch circuit and the transmit node, the first shunt arm including a third switch circuit connected to ground;	

Claim	KCT8539S
7[B] controlling an RF switch of the RF device by placing the first switch circuit in an ON state and placing the third switch circuit in an OFF state; and	The KCT8539S controls an RF switch of the RF device by placing the first switch circuit in an ON state and placing the third switch circuit in an OFF state. For example, the KCT8539S has an RF switch (indicated by the corresponding red arrow in the figure below) that selectively allows either transmission or reception of signals.[5] The KCT product description describes the switch as a "T/R switch" (indicated by the red underlining in the text below). The figure below also shows the power amplifier (indicated by the corresponding red arrow below), the antenna node (indicated by the corresponding red arrow below), the receive node (indicated by the corresponding red arrow below), the low noise amplifier (indicated by the corresponding red arrow below), and the input to the power amplifier (indicated by the corresponding red arrow below).

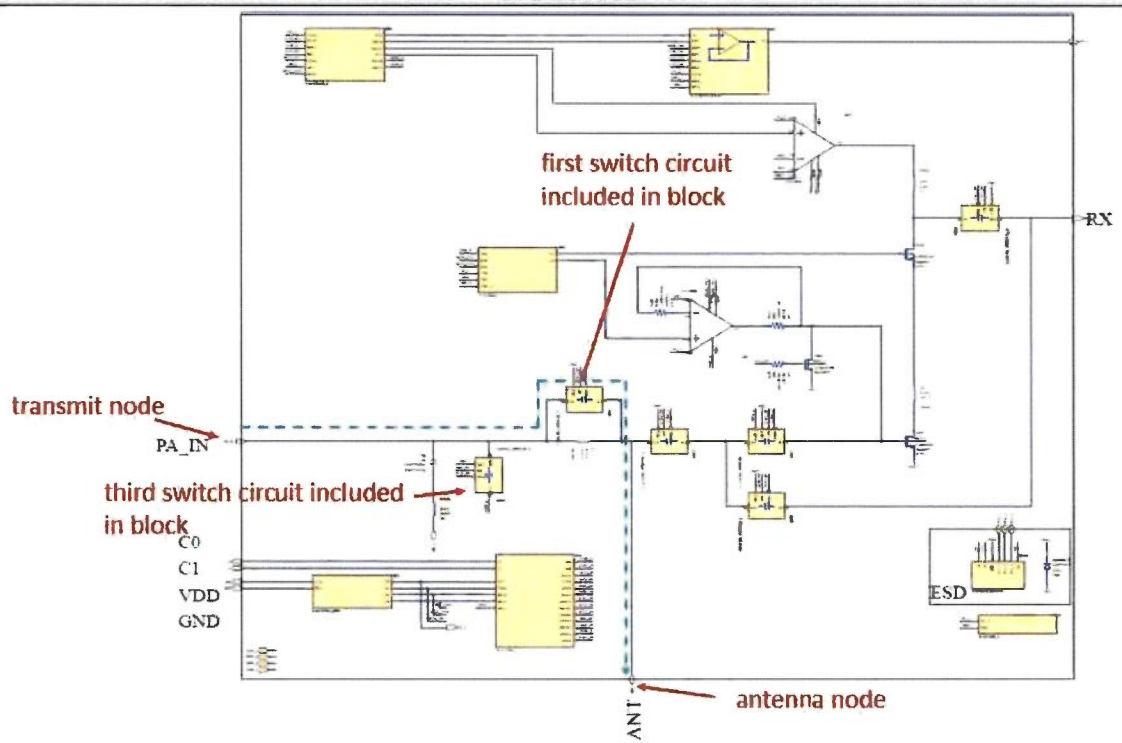
[5] *See* https://perma.cc/DA7F-4CED.

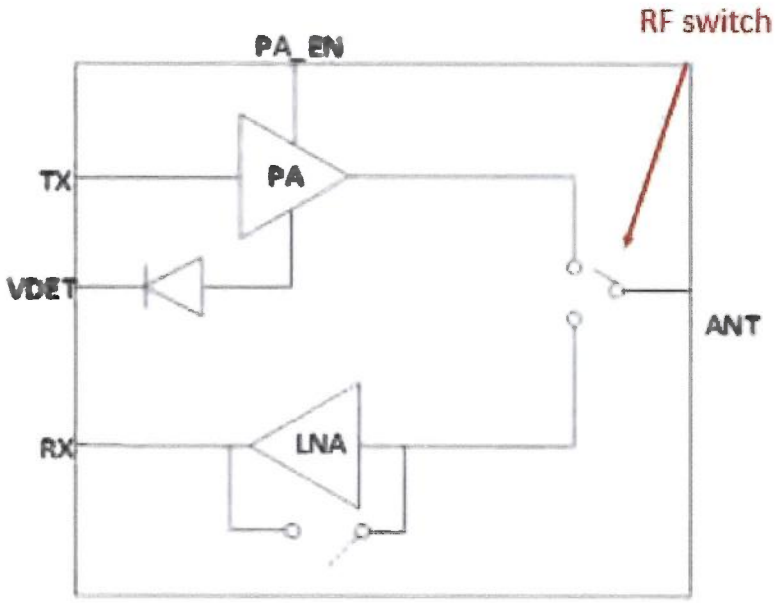
Claim	KCT8539S

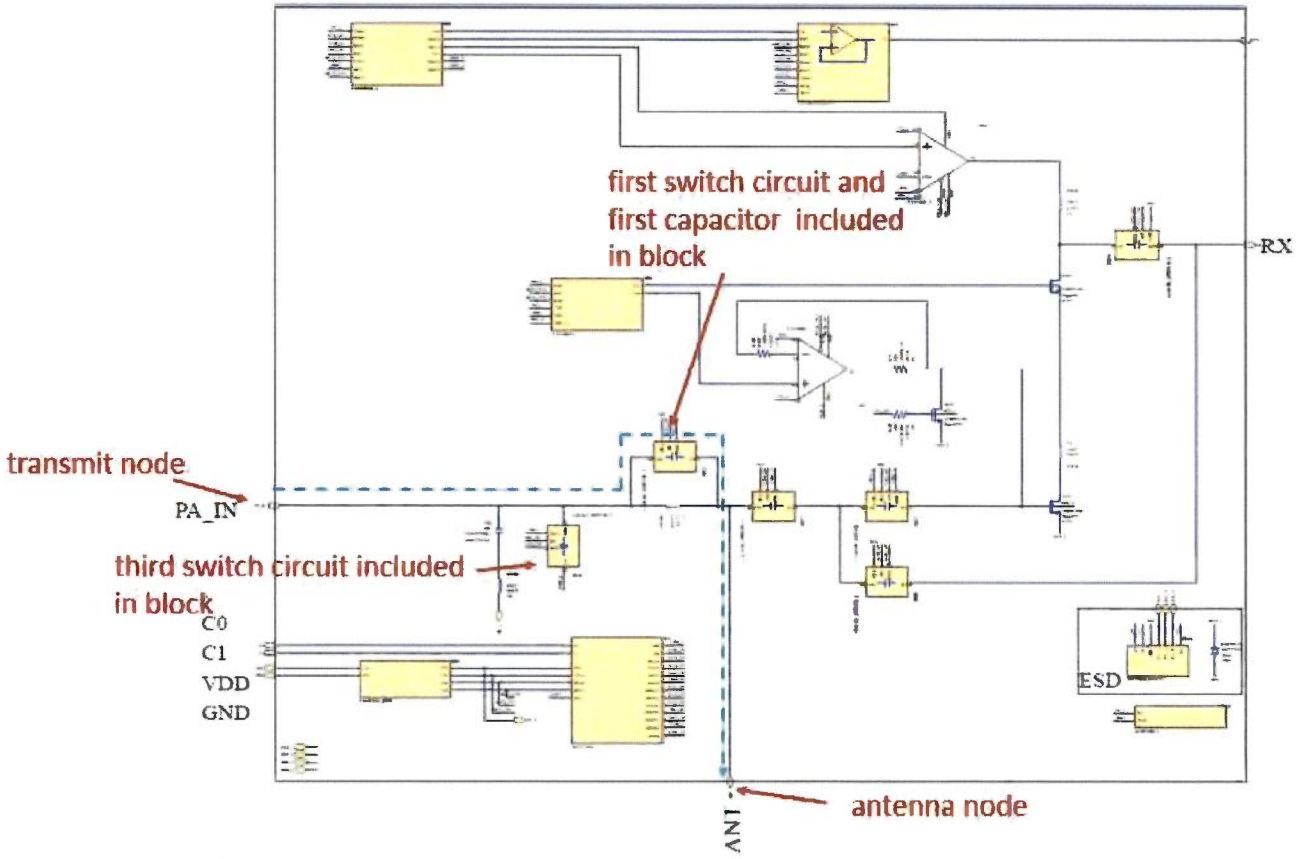


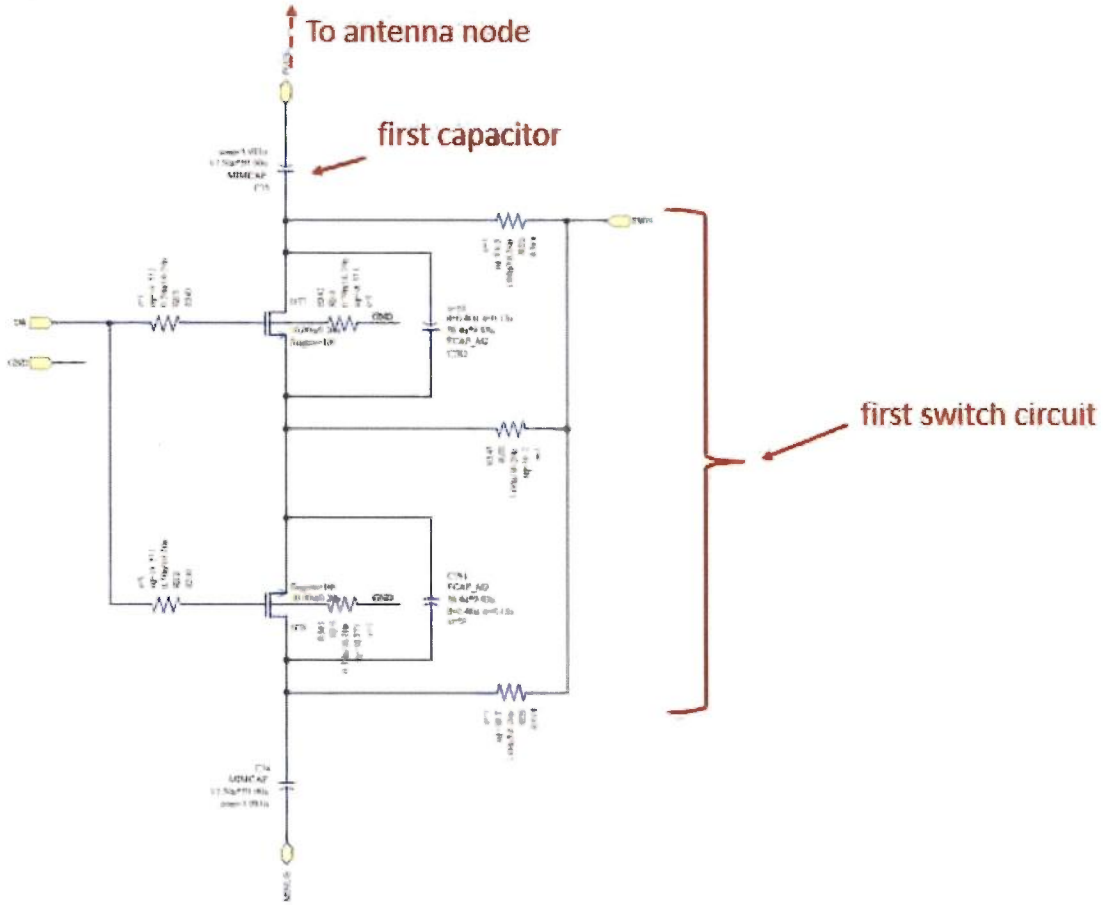
See, e.g., KCT8539S product description and simplified block diagram, https://perma.cc/DA7F-4CED.

For example, during use, the RF switch of the KCT8539S works by turning ON the first switch circuit (indicated by the corresponding red arrow below) while turning OFF the third switch circuit (indicated by the corresponding red arrow below) to allow a signal to pass through the first switch circuit. This allows the signal to be transmitted from the transmit node (indicated by the corresponding red arrow below) to the antenna node (indicated by the corresponding red arrow below) as shown by the path of the green dashed line below.

Claim	KCT8539S
	 *See, e.g.*, reverse engineered circuit schematic of the KCT8539S product's low noise amplifier die, identifying the antenna node, first capacitor, first switch circuit, third switch circuit, and transmit node. *See also*, claim 7[pre].
7[C] inhibiting a low-frequency blocker signal from mixing with	The KCT8539S inhibits a low-frequency blocker signal from mixing with a fundamental-frequency signal in the RF switch using the first capacitor.

Claim	KCT8539S
a fundamental-frequency signal in the RF switch using the first capacitor.	For example, during use, the first capacitor inhibits a low frequency blocker signal from mixing with a fundamental frequency signal in the RF switch (indicated by the corresponding red arrow below).  *See, e.g.*, KCT8539S simplified block diagram, https://perma.cc/DA7F-4CED. For example, in the KCT8539S, the positioning of the first capacitor (indicated by the corresponding red arrow pointing to the corresponding block below) between the antenna node (indicated by the corresponding red arrow below) and the first switch circuit (indicated by the corresponding arrow pointing to the corresponding block below) performs this function. The first capacitor filters the low frequency signal because the low frequency signal, in contrast to a high frequency signal, allows the capacitor time to charge. This charging process stops the low

Claim	KCT8539S
	frequency signal from continuing along the signal path during transmission (indicated by the green dashed line below).  *See, e.g.*, reverse engineered circuit schematic of the KCT8539S product's low noise amplifier die, identifying the antenna node, first capacitor, first switch circuit, third switch circuit, and transmit node.

Claim	KCT8539S
	For example, in this expanded view of the block containing the first capacitor and first switch circuit, the first capacitor (indicated by the corresponding red arrow below) is between the antenna node (indicated by the corresponding red arrow below) and the first switch circuit (indicated by the corresponding arrow pointing to the corresponding red bracket below). 

Claim	KCT8539S
	See, e.g., reverse engineered circuit schematic of the KCT8539S product showing the first switch circuit and first capacitor on the low noise amplifier die.

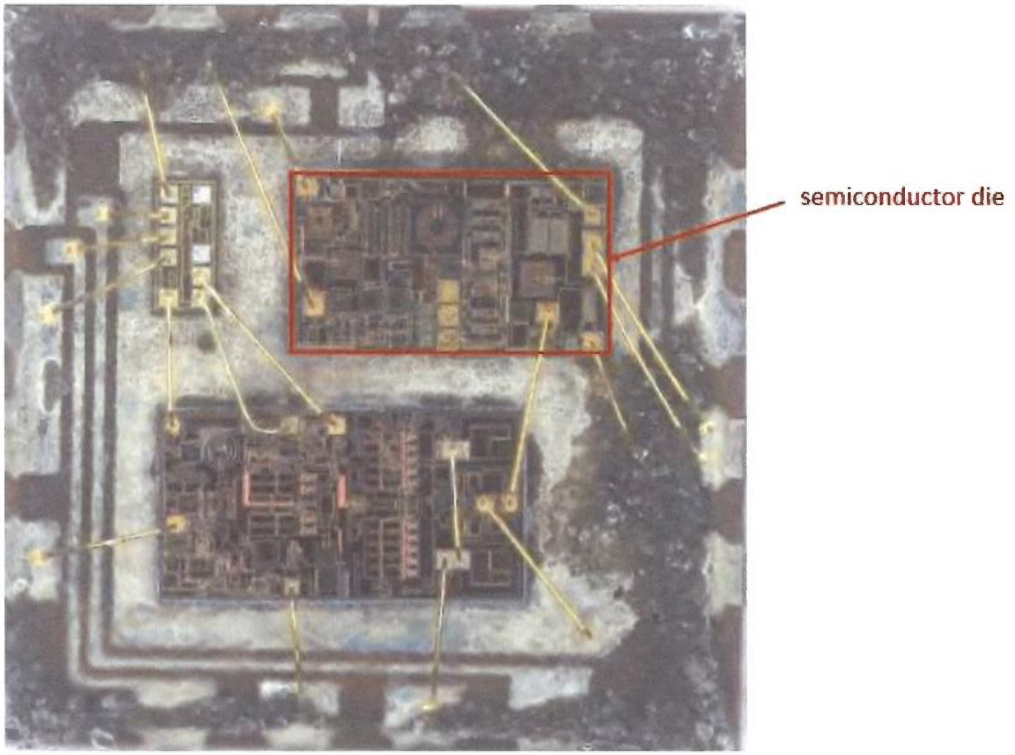
EXHIBIT 21

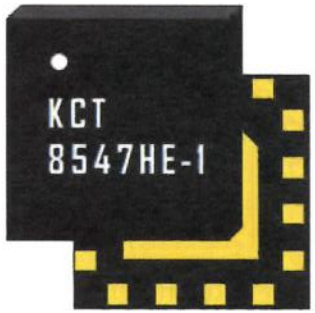
EXHIBIT 21
SKYWORKS SOLUTIONS, INC.'S INFRINGEMENT CHART
KCT8547HE
U.S. Patent No. 9,450,579
Independent Claims 1 and 7

Skyworks Solutions, Inc. ("Skyworks") provides this exemplary claim chart for independent claims 1 and 7 of U.S. Patent No. 9,450,579 (the "'579 patent") applied to Kangxi Communication Technologies (Shanghai) Co., Ltd's and Grand Chip Labs, Inc.'s (collectively, "KCT") KCT8547HE product. The disclosures in this claim chart directed to the KCT8547HE are also more broadly directed to any sale, offer for sale, use, or importation of the KCT8547HE in the U.S., including in an end product such as a wireless router or as a standalone product that is not incorporated in an end product.

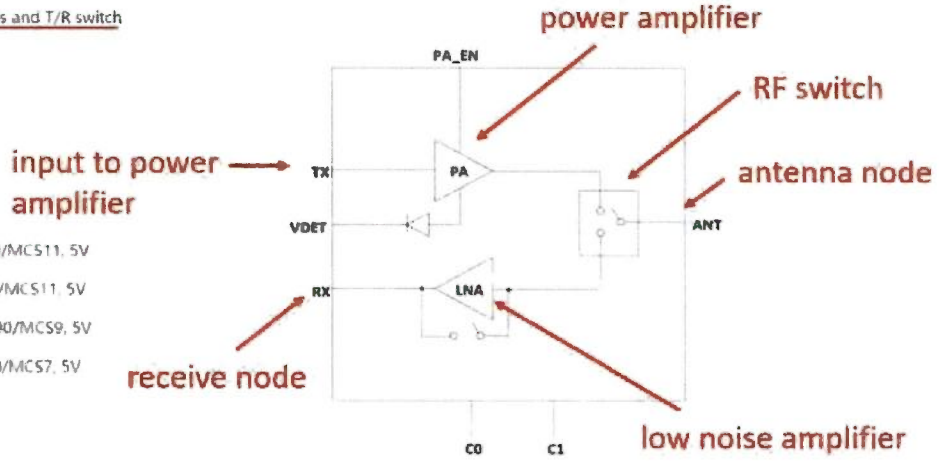
The claim chart below demonstrates infringement by comparing each element of the charted claims to corresponding components, aspects, and/or features of the KCT8547HE product. This claim chart is not intended to constitute an expert report on infringement. This claim chart includes information provided by way of example, and not by way of limitation.

The analysis set forth below is based only upon information from publicly available sources regarding the KCT8547HE product. Further analysis of non-public information during fact discovery will likely assist in identifying all infringing features and functionalities used by KCT in the KCT8547HE product. Accordingly, Skyworks reserves the right to supplement this infringement analysis once such information is made available to Skyworks. Further, Skyworks reserves the right to supplement this infringement analysis, as appropriate, upon issuance of an order construing any terms recited in the asserted claims or as other circumstances so merit.

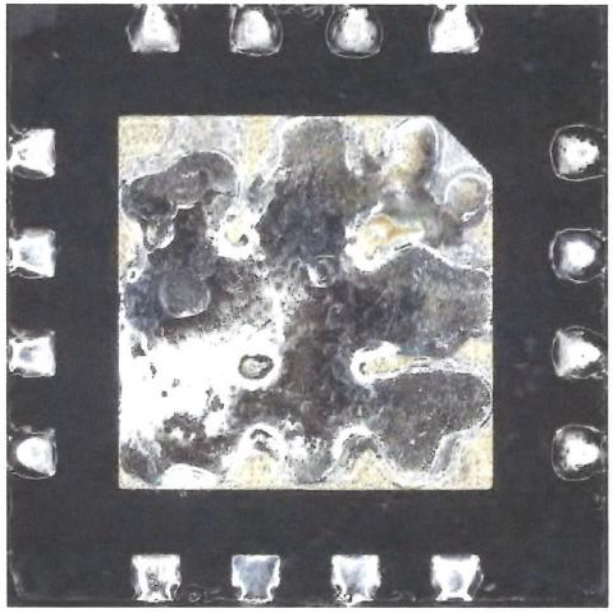
Claim	KCT8547HE
1[pre] A semiconductor die comprising:	To the extent that the preamble is limiting, the KCT8547HE comprises a semiconductor die. For example, the KCT8547HE has a semiconductor die, highlighted by the red box below.  *See, e.g.*, photo of the KCT8547HE product identifying the semiconductor die.

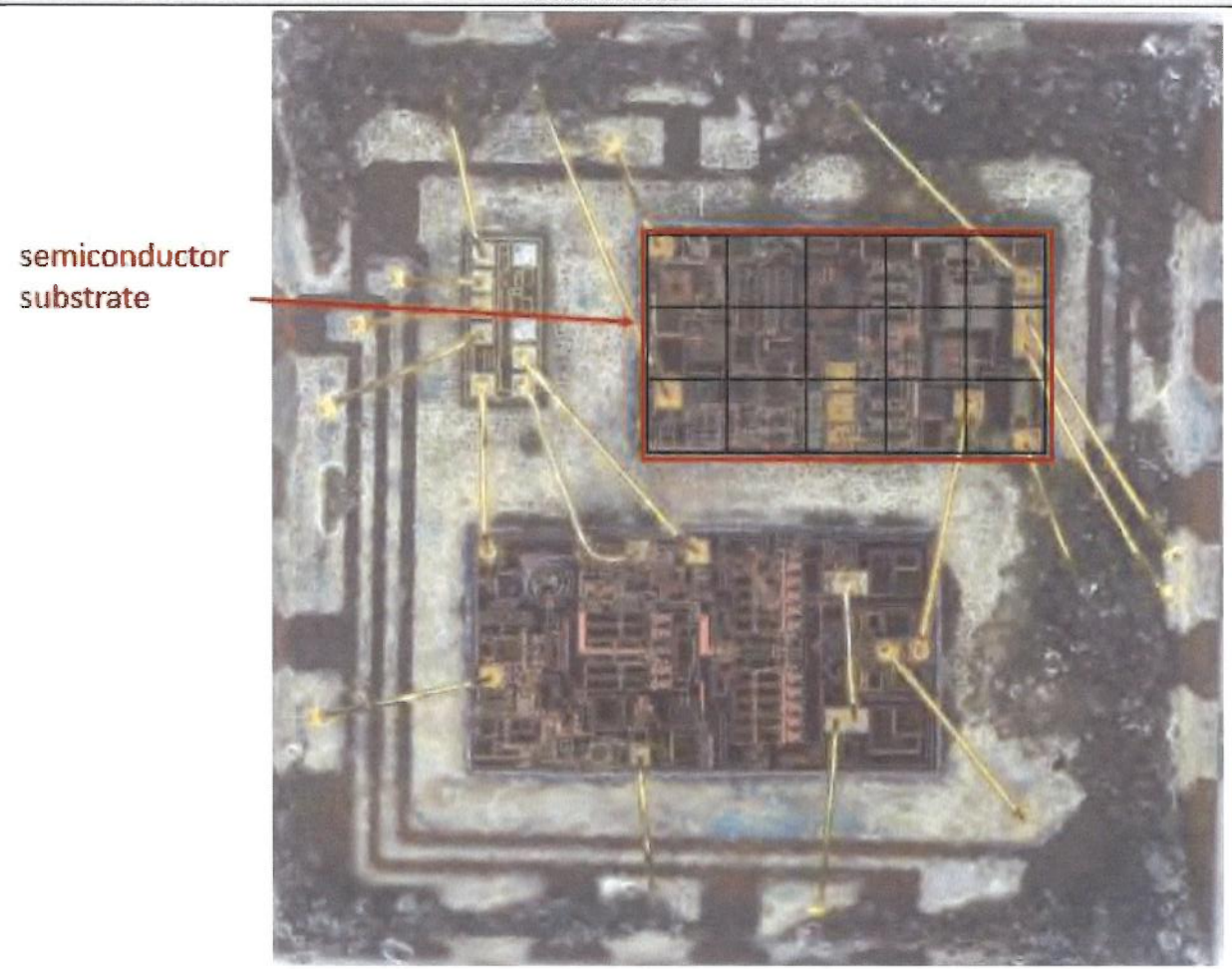
Claim	KCT8547HE
	For example, the KCT8547HE product description below states that the KCT8547HE is an "RF Front-end Module" that is a "highly integrated RF Front-End Integrated Circuit incorporat[ing] key RF functionality needed for IEEE 802.11a/n/ac/ax WLAN systems operating in the 5.15-5.95GHz range."[1]  KCT8547HE-1 **5GHz Mid Power 802.11ax RF Front-end Module** **Introduction** KCT8547HE-1 is a highly integrated RF Front-End Integrated Circuit incorporates key RF functionality needed for IEEE 802.11a/n/ac/ax WLAN systems operating in the 5.15-5.95GHz range. KCT8547HE-1 integrates a high-efficiency high-linearity power amplifier (PA), a low noise amplifier (LNA) with bypass, the associated matching network and harmonic filters all in one device. KCT8547HE-1 has simple and low-voltage control logic, and requires minimal external components. A power detector is also integrated for accurately monitoring of output power from the PA. KCT8547HE-1 is assembled in a compact, low-profile 3x3x0.55mm 16-lead MIS package. KCT8547HE-1 is the ideal RF front-end solution for implementing 5GHz high-power WLAN systems supporting multiple standards including 802.11a/n/ac/ax. *See, e.g.*, KCT8547HE product description, https://perma.cc/GV2Y-HD8A.

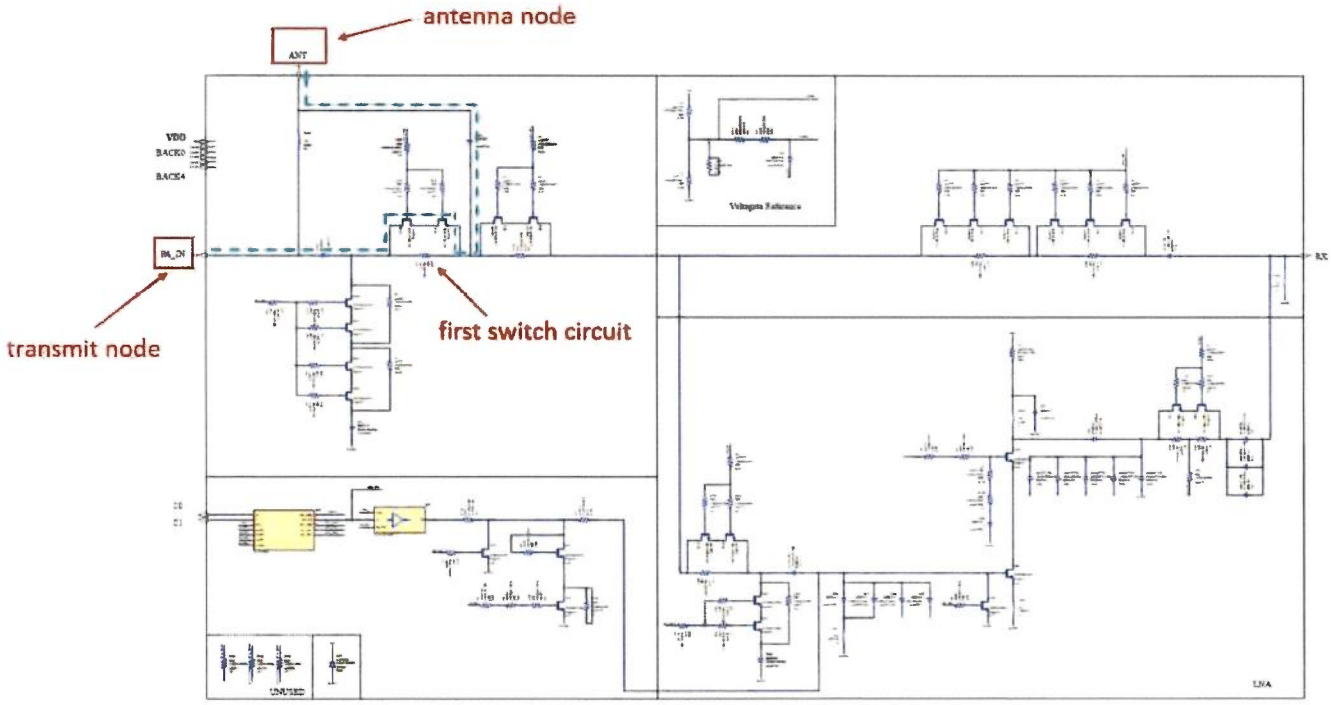
[1] *See* https://perma.cc/GV2Y-HD8A.

Claim	KCT8547HE
	For example, the KCT8547HE has an RF switch (indicated by the corresponding red arrow in the figure below) that selectively allows either transmission or reception of signals.[2] The KCT product description describes the switch as a "T/R switch" (indicated by the red underlining in the text below). The figure below also shows the power amplifier (indicated by the corresponding red arrow below), the antenna node (indicated by the corresponding red arrow below), the receive node (indicated by the corresponding red arrow below), the low noise amplifier (indicated by the corresponding red arrow below), and the input to the power amplifier (indicated by the corresponding red arrow below). **Specifications** Integrated 802.11ax 5GHz PA, LNA with bypass and T/R switch Fully-matched input and output Integrated power detector Transmit gain: 29dB at 5V Receive gain: 16dB at 5V Noise Figure: 1.6dB at 5V Output power: +17dBm @ -43dB EVM, HE160/MCS11, 5V +19dBm @ -40dB EVM, HE160/MCS11, 5V +20.5dBm @ -35dB EVM, VHT80/MCS9, 5V +21.5dBm @ -30dB EVM, HT20/MCS7, 5V Integrated 2.4GHz Notch Filter ESD protection circuitry on all PINs Simplified external components required Small package: MIS-16L 3mm x 3mm x0.55mm MSL1, 260°C per JEDEC J-STD-020 ROHS and REACH Compliant 

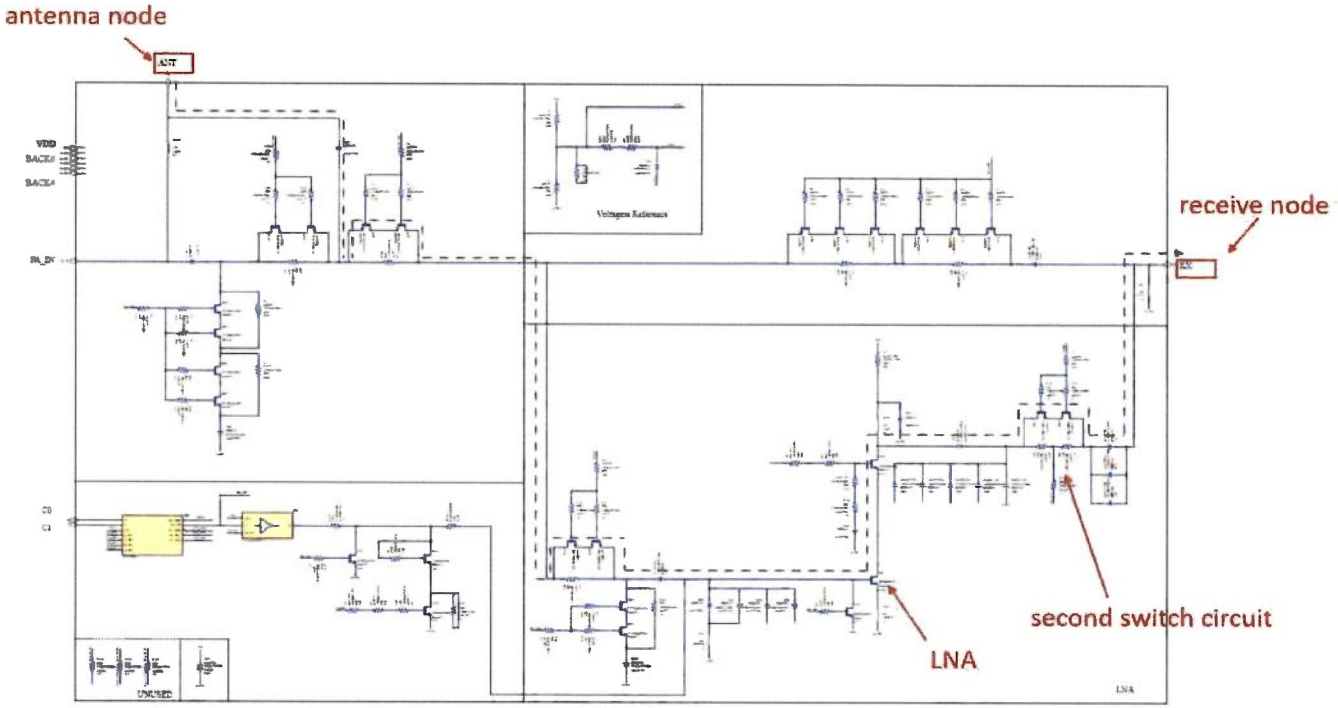
[2] *See* https://perma.cc/GV2Y-HD8A.

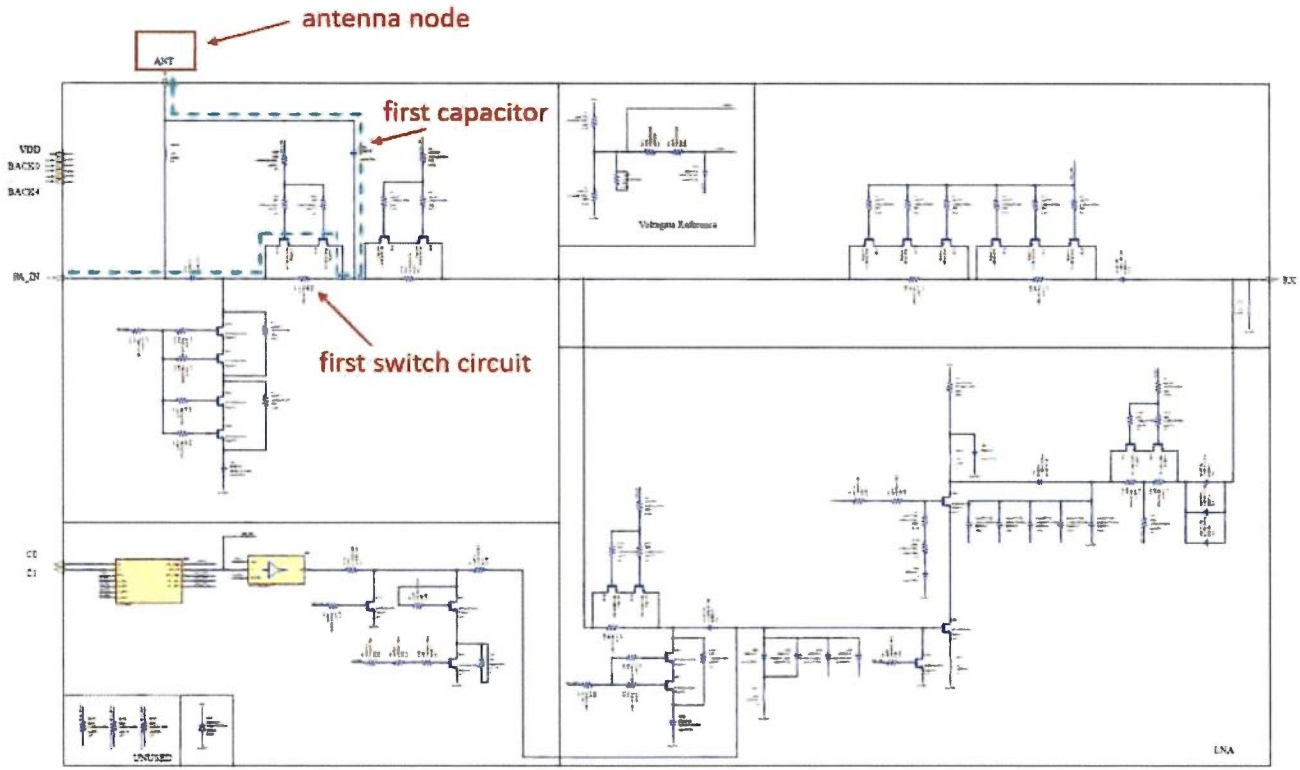
Claim	KCT8547HE
	See, e.g., KCT8547HE product description and simplified block diagram, https://perma.cc/GV2Y-HD8A. For example, the photos below show the exterior of the KCT8547HE device die package, front (left) and back (right).   *See, e.g.* photo of the KCT8547HE product, exterior of package, front (left) and back (right).
1[A] a semiconductor substrate;	The KCT8547HE comprises a semiconductor substrate. For example, a semiconductor substrate for the KCT8547HE (indicated by black grid lines below) is the material upon which the devices on the die are fabricated.

Claim	KCT8547HE
	 *See, e.g.*, photo of the KCT8547HE product, annotated to show the location of the semiconductor substrate.

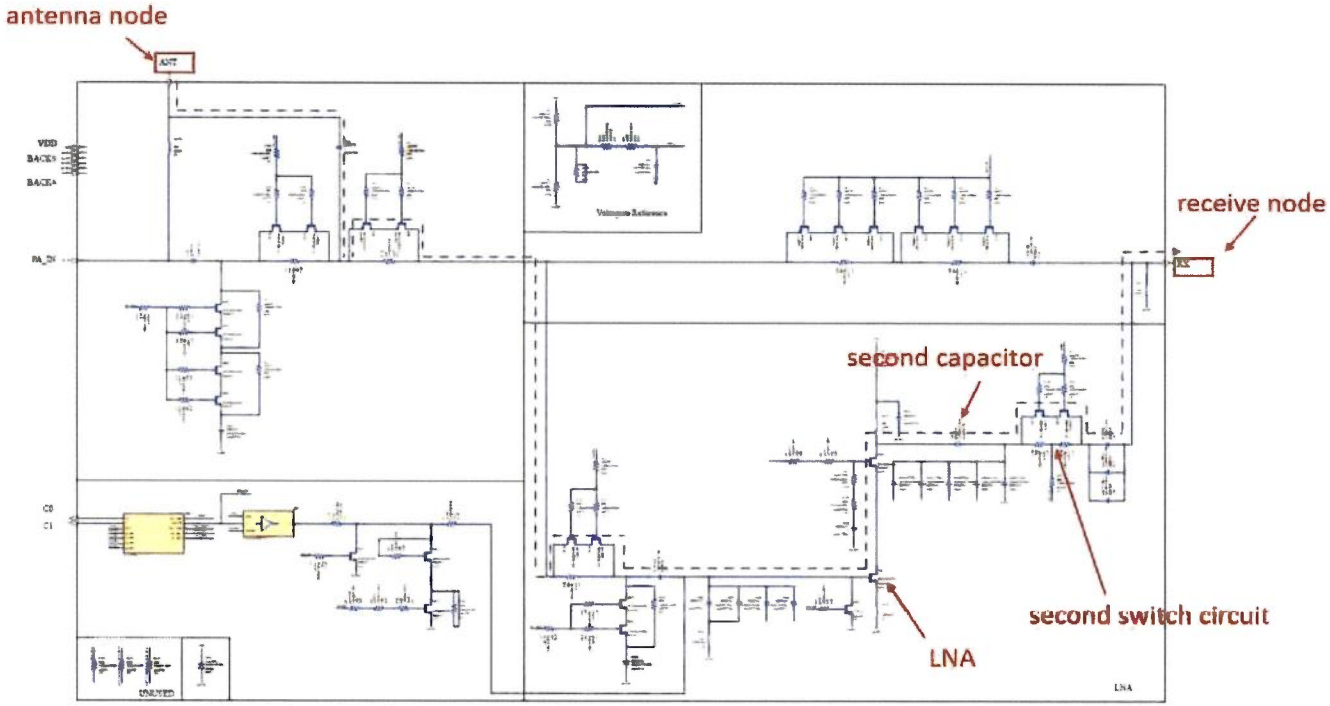
Claim	KCT8547HE
1[B] a first switch circuit formed on the semiconductor substrate connected between an antenna node and a transmit node;	The KCT8547HE comprises a first switch circuit formed on the semiconductor substrate connected between an antenna node and a transmit node. For example, in the KCT8547HE, the first switch circuit (identified by the corresponding red arrow below) is connected between the antenna node ("ANT," highlighted by the red box) and the transmit node ("PA IN," highlighted by the red box). In transmit mode, the signal path from the transmit node, through the first switch circuit, and to the antenna node is shown by the dashed green line below. The first switch circuit is formed on the semiconductor substrate. 

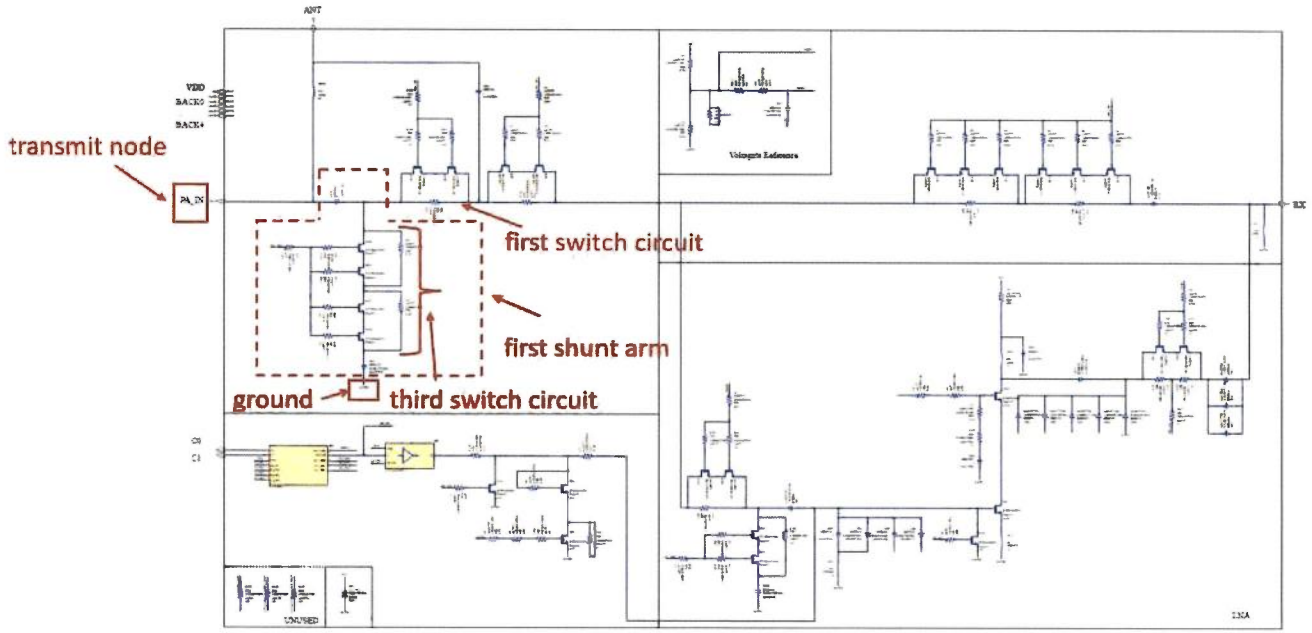
Claim	KCT8547HE
	See, e.g., reverse engineered circuit schematic of the KCT8547HE product's low noise amplifier die, annotated to show the location of a first switch circuit, transmit node, and antenna node. *See also*, 1[pre]-1[A].
1[C] a second switch circuit formed on the semiconductor substrate and connected between the antenna node and a receive node;	The KCT8547HE comprises a second switch circuit formed on the semiconductor substrate and connected between the antenna node and a receive node. For example, in the KCT8547HE, the second switch circuit (indicated by the corresponding red arrow below) is connected between the antenna node ("ANT," highlighted by the red box) and the receive node ("RX," highlighted by the corresponding red box below). In receive mode, the approximate signal path from the antenna node (ANT) to the receive node (RX) through the low noise amplifier (LNA) (indicated by the corresponding red arrow below) is shown by the purple dashed line in the figure below. The second switch circuit is formed on the semiconductor substrate.

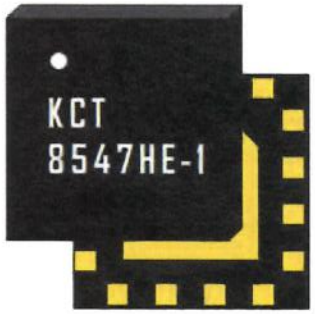
Claim	KCT8547HE
	 *See, e.g.*, reverse engineered circuit schematic of the KCT8547HE product's low noise amplifier die, annotated to show the location of a second switch circuit, receive node, low noise amplifier (LNA), and antenna node. *See also*, 1[pre]-1[A].
1[D] a first capacitor formed on the semiconductor substrate and	The KCT8547HE comprises a first capacitor formed on the semiconductor substrate and connected in series with the first switch circuit between the first switch circuit and the antenna node. For example, in the KCT8547HE, the first capacitor (indicated by the corresponding red arrow below) is formed on the semiconductor substrate and is connected in series with the first switch circuit (indicated by the corresponding

Claim	KCT8547HE
connected in series with the first switch circuit between the first switch circuit and the antenna node;	red arrow below). The approximate signal path during transmit mode is shown by the green dashed line in the figure below. In addition, the first capacitor is located between the first switch circuit and the antenna node (ANT) (indicated by the corresponding red arrow below).  *See, e.g.*, reverse engineered circuit schematic of the KCT8547HE product's low noise amplifier die, annotated to show the location of a first switch circuit, first capacitor, and antenna node.

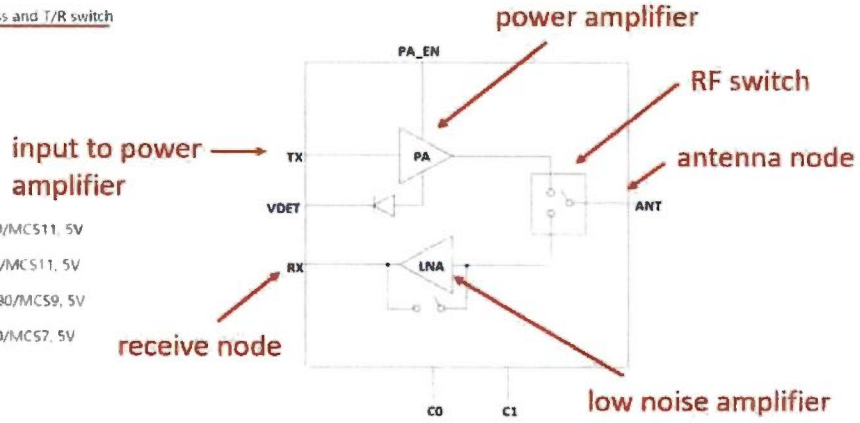
Claim	KCT8547HE
	See also, 1[A].
1[E] a second capacitor formed on the semiconductor substrate and connected in series with the second switch circuit between the second switch circuit and the antenna node; and	The KCT8547HE comprises a second capacitor formed on the semiconductor substrate and connected in series with the second switch circuit between the second switch circuit and the antenna node. For example, in the KCT8547HE, the second capacitor (indicated by the corresponding red arrow below) is formed on the semiconductor substrate and is connected in series with the second switch circuit (indicated by the corresponding red arrow below). In receive mode, the approximate signal path from the antenna node (ANT) (indicated by the corresponding red arrow below) to the receive node (RX) (indicated by the corresponding red arrow below) through the low noise amplifier (LNA) (indicated by the corresponding red arrow below) is shown by the purple dashed line in the figure below. In addition, the second capacitor is located between the second switch circuit and the antenna node (ANT).

Claim	KCT8547HE
	 *See, e.g.*, reverse engineered circuit schematic of the KCT8547HE product's low noise amplifier die, annotated to show the second capacitor, low noise amplifier (LNA), second switch circuit, receive node, and antenna node. *See also*, 1[A].
1[F] a first shunt arm formed on the semiconductor substrate and	The KCT8547HE comprises a first shunt arm formed on the semiconductor substrate and connected to the first switch circuit and the transmit node, the first shunt arm including a third switch circuit connected to ground. For example, in the KCT8547HE, the first shunt arm (indicated by the dashed line box below) is formed on the semiconductor substrate and is connected to the first switch circuit (indicated by the corresponding red arrow

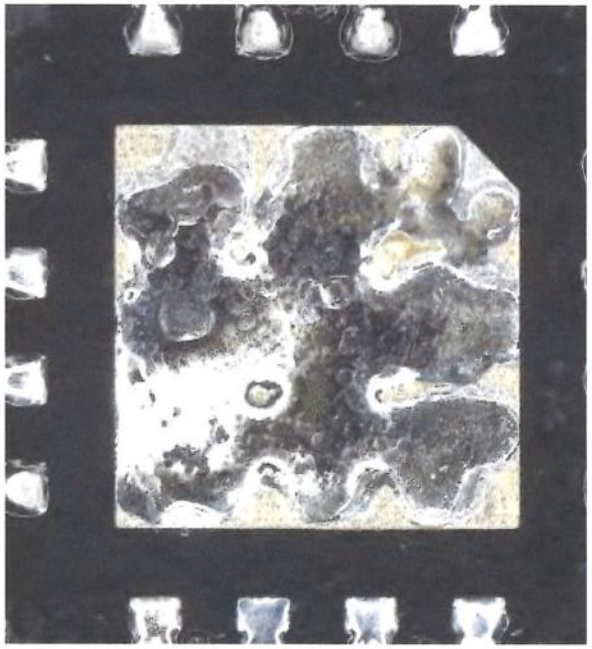
Claim	KCT8547HE
connected to the first switch circuit and the transmit node, the first shunt arm including a third switch circuit connected to ground.	below) and the transmit node (PA IN) (highlighted by a red box). The first shunt arm includes a third switch circuit (indicated by the corresponding red bracket below) connected to ground (BACK3) (indicated by the corresponding red arrow below).  *See, e.g.*, reverse engineered circuit schematic of the KCT8547HE product's low noise amplifier die identifying the transmit node, the first switch circuit, first shunt arm, third switch circuit, and ground. *See also*, 1[A].
7[pre]. A method for operating a radio-frequency	To the extent that the preamble of claim 7 is limiting, the KCT8547HE performs a method for operating a radio-frequency (RF) device, comprising the steps shown below and for claim elements 7[A]-7[C].

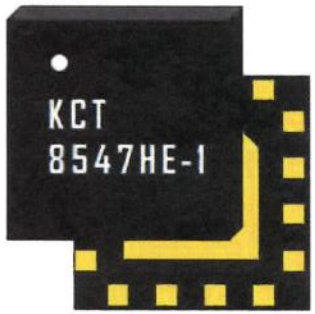
Claim	KCT8547HE
(RF) device, the method comprising:	For example, the KCT8547HE product description below states that the KCT8547HE is an "RF Front-end Module" that is a "highly integrated RF Front-End Integrated Circuit incorporat[ing] key RF functionality needed for IEEE 802.11a/n/ac/ax WLAN systems operating in the 5.15-5.95GHz range."[3]  KCT8547HE-1 **5GHz Mid Power 802.11ax RF Front-end Module** **Introduction** KCT8547HE-1 is a highly integrated RF Front-End Integrated Circuit incorporates key RF functionality needed for IEEE 802.11a/n/ac/ax WLAN systems operating in the 5.15-5.95GHz range. KCT8547HE-1 integrates a high-efficiency high-linearity power amplifier (PA), a low noise amplifier (LNA) with bypass, the associated matching network and harmonic filters all in one device. KCT8547HE-1 has simple and low-voltage control logic, and requires minimal external components. A power detector is also integrated for accurately monitoring of output power from the PA. KCT8547HE-1 is assembled in a compact, low-profile 3x3x0.55mm 16-lead MIS package. KCT8547HE-1 is the ideal RF front-end solution for implementing 5GHz high-power WLAN systems supporting multiple standards including 802.11a/n/ac/ax. *See, e.g.*, KCT8547HE product description, https://perma.cc/GV2Y-HD8A.

[3] *See* https://perma.cc/GV2Y-HD8A.

Claim	KCT8547HE
	For example, the KCT8547HE has an RF switch (indicated by the corresponding red arrow in the figure below) that selectively allows either transmission or reception of signals.[4] The KCT product description describes the switch as a transmit/receive "T/R switch" (indicated by the red underlining in the text below). The figure below also shows the power amplifier (indicated by the corresponding red arrow below), the antenna node (indicated by the corresponding red arrow below), the receive node (indicated by the corresponding red arrow below), the low noise amplifier (indicated by the corresponding red arrow below), and the input to the power amplifier (indicated by the corresponding red arrow below). **Specifications** Integrated 802.11ax 5GHz PA, LNA with bypass and T/R switch Fully-matched input and output Integrated power detector Transmit gain: 29dB at 5V Receive gain: 16dB at 5V Noise Figure: 1.6dB at 5V Output power: +17dBm @ -43dB EVM, HE160/MCS11, 5V +19dBm @ -40dB EVM, HE160/MCS11, 5V +20.5dBm @ -35dB EVM, VHT80/MCS9, 5V +21.5dBm @ -30dB EVM, HT20/MCS7, 5V Integrated 2.4GHz Notch Filter ESD protection circuitry on all PINs Simplified external components required Small package: MIS-16L 3mm x 3mm x0.55mm MSL1 260°C per JEDEC J-STD-020 ROHS and REACH Compliant  *See, e.g.*, KCT8547HE product description and simplified block diagram, https://perma.cc/GV2Y-HD8A.

[4] *See* https://perma.cc/GV2Y-HD8A.

Claim	KCT8547HE
	For example, the photos below show the exterior of the KCT8547HE device die package, front (left) and back (right).   *See, e.g.* photo of the KCT8547HE product, exterior of package, front (left) and back (right).
7[A] providing an RF device including a first switch circuit connected between an antenna node and	The KCT8547HE provides an RF device including a first switch circuit connected between an antenna node and a transmit node, a second switch circuit connected between the antenna node and a receiver node, a first capacitor connected in series with the first switch circuity between the first switch circuit and the antenna node, a second capacitor connected in series with the second switch circuit between the second switch circuit and the antenna node, and a first shunt arm connected to the first switch circuit and the transmit node, the first shunt arm including a third switch circuit connected to ground.

Claim	KCT8547HE
a transmit node, a second switch circuit connected between the antenna node and a receiver node, a first capacitor connected in series with the first switch circuity between the first switch circuit and the antenna node, a second capacitor connected in series with the second switch circuit between the second switch circuit and the antenna node, and a first shunt arm connected to the first switch circuit and the transmit node, the first shunt arm including a third switch	For example, the KCT8547HE is an RF device. The KCT8547HE product description below states that the KCT8547HE is an "RF Front-end Module" that is a "highly integrated RF Front-End Integrated Circuit incorporat[ing] key RF functionality needed for IEEE 802.11a/n/ac/ax WLAN systems operating in the 5.15-5.95GHz range."[5]  KCT8547HE-1 **5GHz Mid Power 802.11ax RF Front-end Module** **Introduction** KCT8547HE-1 is a highly integrated RF Front-End Integrated Circuit incorporates key RF functionality needed for IEEE 802.11a/n/ac/ax WLAN systems operating in the 5.15-5.95GHz range. KCT8547HE-1 integrates a high-efficiency high-linearity power amplifier (PA), a low noise amplifier (LNA) with bypass, the associated matching network and harmonic filters all in one device. KCT8547HE-1 has simple and low-voltage control logic, and requires minimal external components. A power detector is also integrated for accurately monitoring of output power from the PA. KCT8547HE-1 is assembled in a compact, low-profile 3x3x0.55mm 16-lead MIS package. KCT8547HE-1 is the ideal RF front-end solution for implementing 5GHz high-power WLAN systems supporting multiple standards including 802.11a/n/ac/ax. *See, e.g.*, KCT8547HE product description, https://perma.cc/GV2Y-HD8A.

[5] *See* https://perma.cc/GV2Y-HD8A.

Claim	KCT8547HE
circuit connected to ground;	*See also*, claims 1[pre]-1[F], 7[pre].
7[B] controlling an RF switch of the RF device by placing the first switch circuit in an ON state and placing the third switch circuit in an OFF state; and	The KCT8547HE controls an RF switch of the RF device by placing the first switch circuit in an ON state and placing the third switch circuit in an OFF state. For example, the KCT8547HE has an RF switch (indicated by the corresponding red arrow in the figure below) that selectively allows either transmission or reception of signals.[6] The KCT product description describes the switch as a "T/R switch" (indicated by the red underlining in the text below). The figure below also shows the power amplifier (indicated by the corresponding red arrow below), the antenna node (indicated by the corresponding red arrow below), the receive node (indicated by the corresponding red arrow below), the low noise amplifier (indicated by the corresponding red arrow below), and the input to the power amplifier (indicated by the corresponding red arrow below).

[6] *See* https://perma.cc/GV2Y-HD8A.

Claim	KCT8547HE

Specifications

Integrated 802.11ax 5GHz PA, LNA with bypass and T/R switch

Fully-matched input and output

Integrated power detector

Transmit gain: 29dB at 5V

Receive gain: 16dB at 5V

Noise Figure: 1.6dB at 5V

Output power: +17dBm @ -43dB EVM, HE160/MCS11, 5V

+19dBm @ -40dB EVM, HE160/MCS11, 5V

+20.5dBm @ -35dB EVM, VHT80/MCS9, 5V

+21.5dBm @ -30dB EVM, HT20/MCS7, 5V

Integrated 2.4GHz Notch Filter

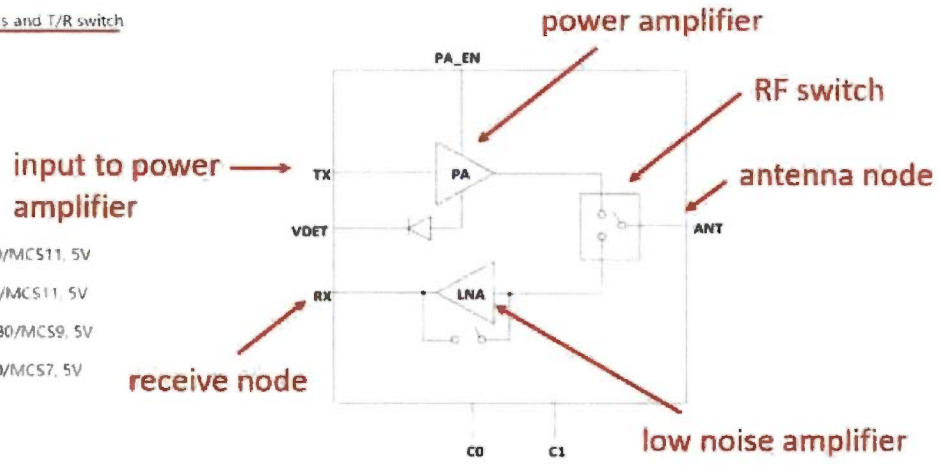
ESD protection circuitry on all PINs

Simplified external components required

Small package: MIS-16L 3mm x 3mm x0.55mm

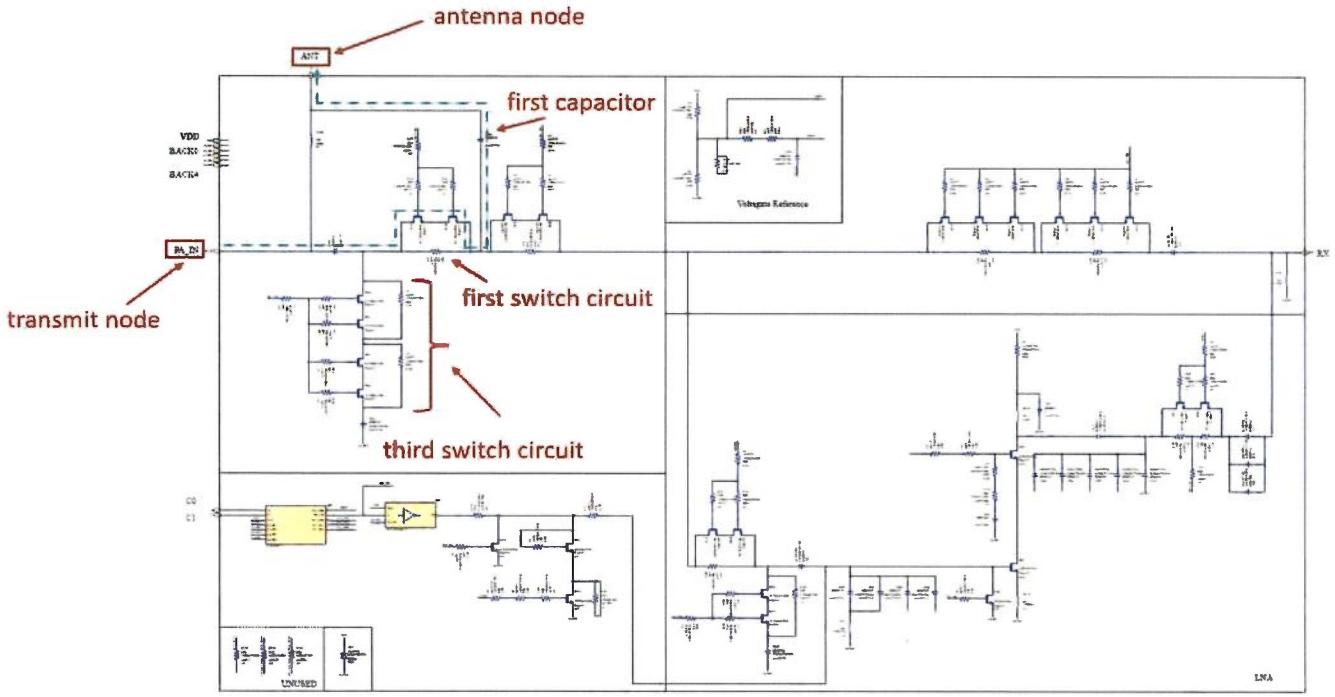
MSL1 260°C per JEDEC J-STD-020

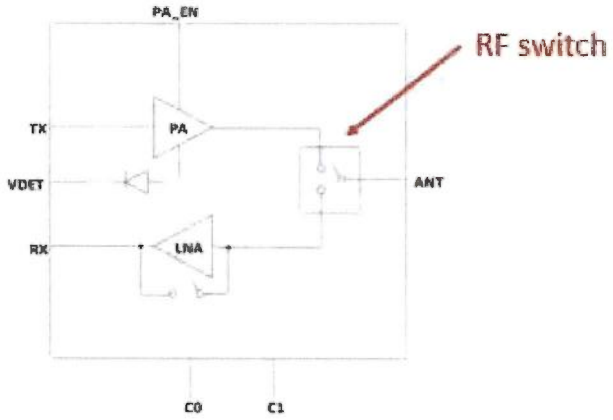
ROHS and REACH Compliant



See, e.g., KCT8547HE product description and simplified block diagram, https://perma.cc/GV2Y-HD8A.

For example, during use, the RF switch of the KCT8547HE works by turning ON the first switch circuit (indicated by the corresponding red arrow below) while turning OFF the third switch circuit (indicated by the corresponding red arrow below) to allow a signal to pass through the first switch circuit. This allows the signal to be transmitted from the transmit node (indicated by the corresponding red arrow below) to the antenna node (indicated by the corresponding red arrow below) as shown by the path of the green dashed lines below.

Claim	KCT8547HE
	 *See, e.g.*, reverse engineered circuit schematic of the KCT8547HE product's low noise amplifier die, identifying the antenna node, first capacitor, first switch circuit, third switch circuit, and transmit node. *See also*, claim 7[pre].
7[C] inhibiting a low-frequency blocker signal from mixing with a fundamental-frequency signal	The KCT8547HE inhibits a low-frequency blocker signal from mixing with a fundamental-frequency signal in the RF switch using the first capacitor. For example, during use, the first capacitor inhibits a low frequency blocker signal from mixing with a fundamental frequency signal in the RF switch (indicated by the corresponding red arrow below).

Claim	KCT8547HE
in the RF switch using the first capacitor.	 *See, e.g.*, KCT8547HE simplified block diagram, https://perma.cc/GV2Y-HD8A. For example, in the KCT8547HE, the positioning of the first capacitor (indicated by the corresponding red arrow below) between the antenna node (indicated by the corresponding red arrow below) and the first switch circuit performs this function. The first capacitor filters the low frequency signal because the low frequency signal, in contrast to a high frequency signal, allows the capacitor time to charge. This charging process stops the low frequency signal from continuing along the signal path during transmission (indicated by the green dashed line below).

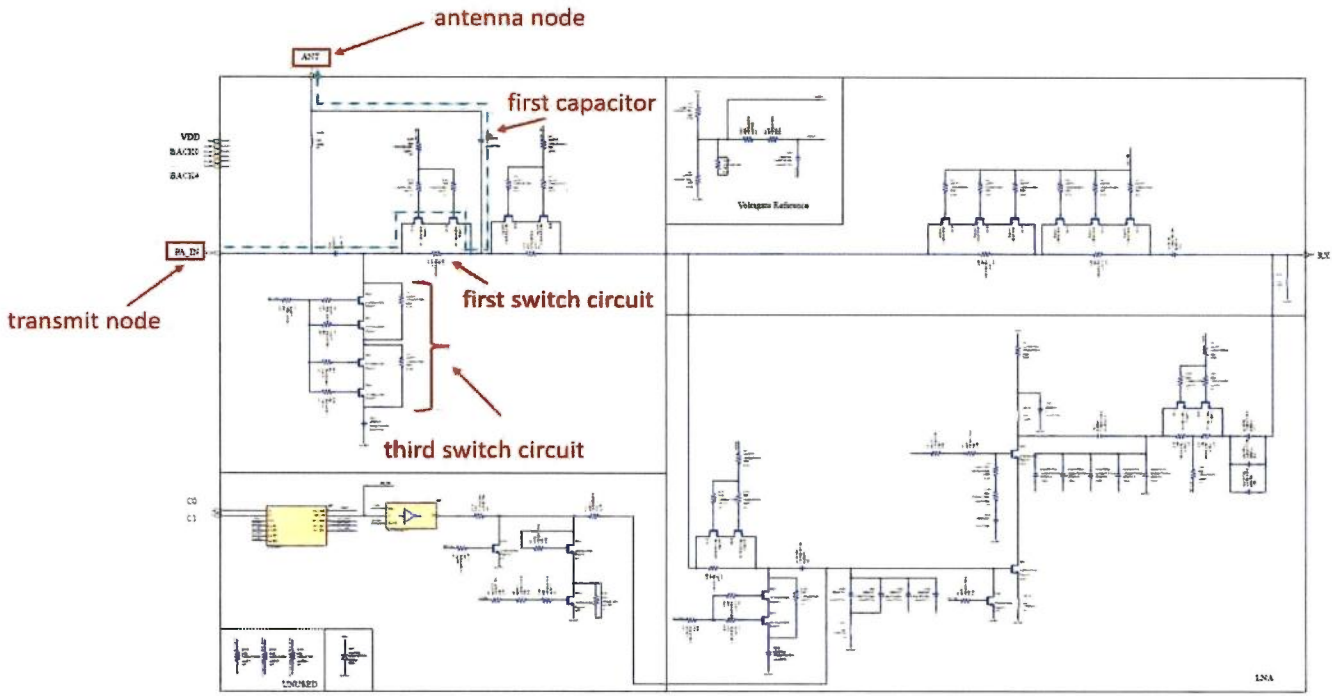
Claim	KCT8547HE
	 *See, e.g.*, reverse engineered circuit schematic of the KCT8547HE product's low noise amplifier die, identifying the antenna node, first capacitor, first switch circuit, third switch circuit, and transmit node.

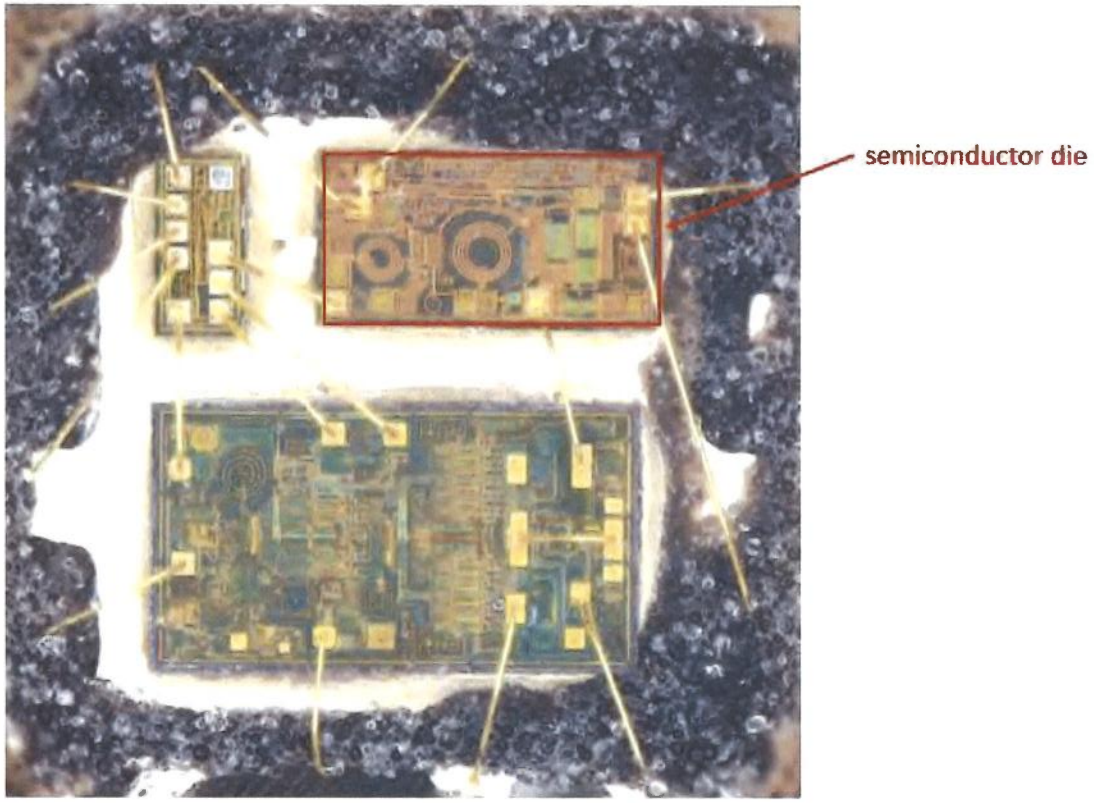
EXHIBIT 22

EXHIBIT 22
SKYWORKS SOLUTIONS, INC.'S INFRINGEMENT CHART
KCT8576HE
U.S. Patent No. 9,450,579
Independent Claims 1 and 7

Skyworks Solutions, Inc. ("Skyworks") provides this exemplary claim chart for independent claims 1 and 7 of U.S. Patent No. 9,450,579 (the "'579 patent") applied to Kangxi Communication Technologies (Shanghai) Co., Ltd's and Grand Chip Labs, Inc.'s (collectively, "KCT") KCT8576HE product. The disclosures in this claim chart directed to the KCT8576HE are also more broadly directed to any sale, offer for sale, use, or importation of the KCT8576HE in the U.S., including in an end product such as a wireless router or as a standalone product that is not incorporated in an end product.

The claim chart below demonstrates infringement by comparing each element of the charted claims to corresponding components, aspects, and/or features of the KCT8576HE product. This claim chart is not intended to constitute an expert report on infringement. This claim chart includes information provided by way of example, and not by way of limitation.

The analysis set forth below is based only upon information from publicly available sources regarding the KCT8576HE product. Further analysis of non-public information during fact discovery will likely assist in identifying all infringing features and functionalities used by KCT in the KCT8576HE product. Accordingly, Skyworks reserves the right to supplement this infringement analysis once such information is made available to Skyworks. Further, Skyworks reserves the right to supplement this infringement analysis, as appropriate, upon issuance of an order construing any terms recited in the asserted claims or as other circumstances so merit.

Claim	KCT8576HE
1[pre] A semiconductor die comprising:	To the extent that the preamble of claim 1 is limiting, the KCT8576HE comprises a semiconductor die. For example, the KCT8576HE has a semiconductor die, highlighted by the red box below.  *See, e.g.*, photo of the KCT8576HE product showing three dies identifying the semiconductor die.

Claim	KCT8576HE
	For example, the KCT8576HE product description below states that the KCT8576HE is an "RF Front-end Module" that "incorporates key RF functionality needed for IEEE 802.11a/n/ac/ax WLAN systems operating in the 5.15-5.95GHz range."[1]

KCT8576HE

5GHz Mid-High Power 802.11ax RF Front-end Module

Introduction

KCT8576HE is a highly integrated RF front-end integrated circuit incorporates key RF functionality needed for IEEE 802.11a/n/ac/ax WLAN systems operating in the 5.15-5.95GHz range. KCT8576HE integrates a high-efficiency, high-linearity power amplifier (PA), a low noise amplifier (LNA) with bypass, the associated matching network, LO rejection, and harmonic filters all in one device.

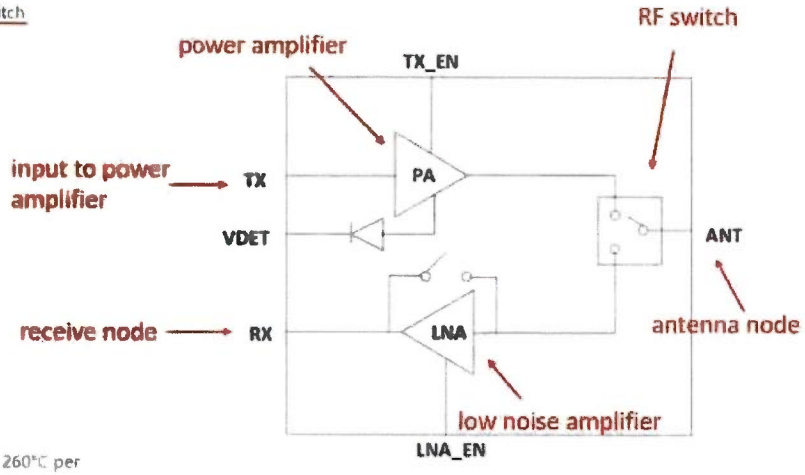
KCT8576HE has simple and low-voltage control logic, and requires minimal external components. A power detector is also integrated for accurately monitoring of output power from the PA.

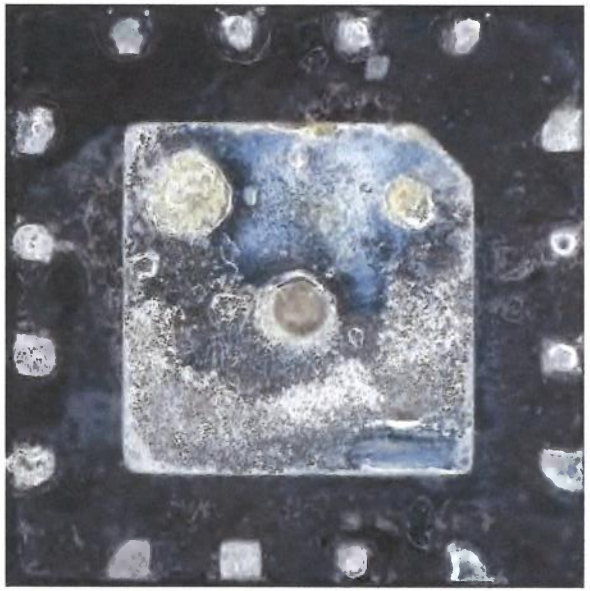
KCT8576HE is assembled in a compact, low-profile 2.5x2.5x0.55mm 16-lead QFN package. KCT8576HE is the ideal RF front-end solution for implementing 5GHz high-power WLAN systems supporting multiple standards including 802.11a/n/ac/ax.

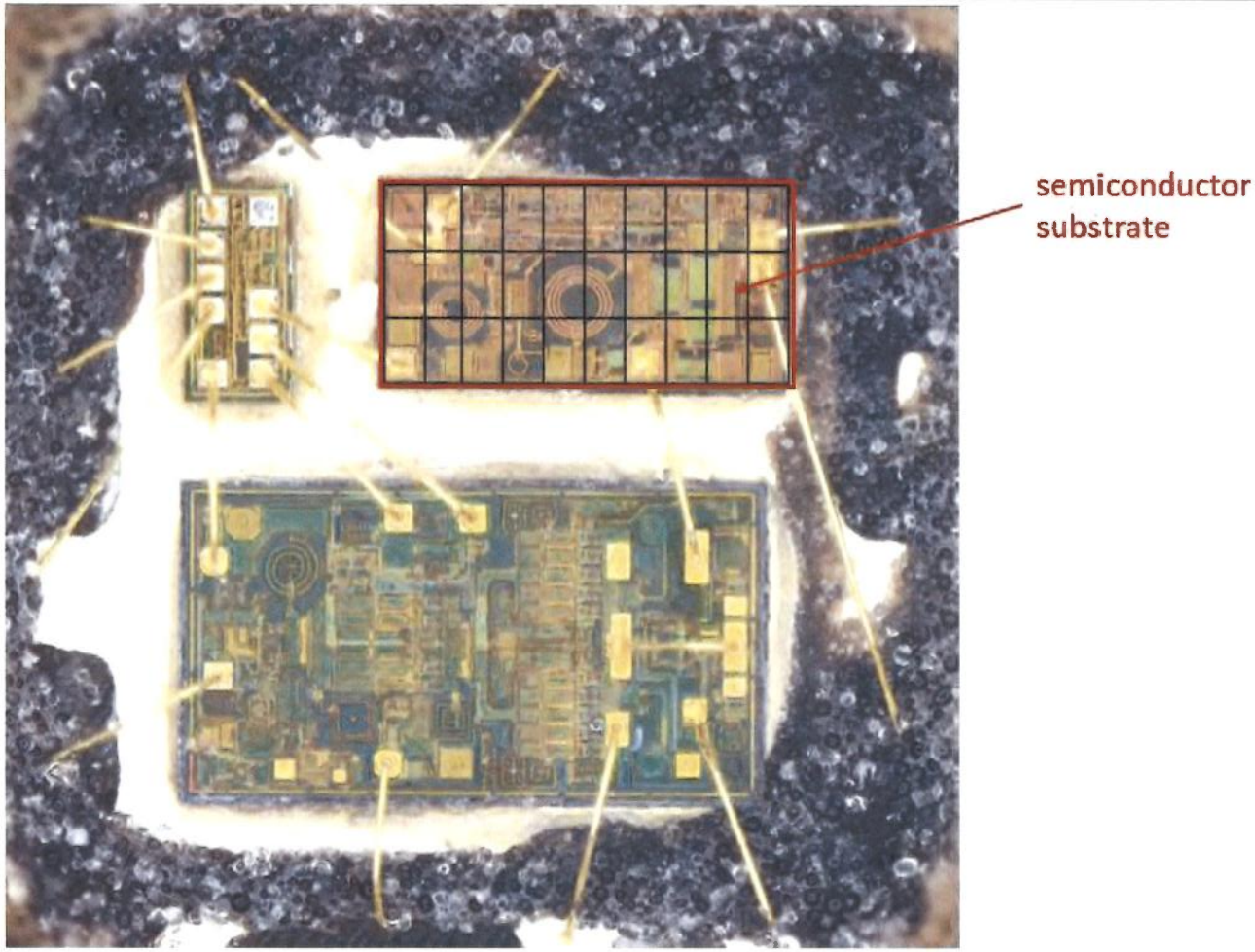
See, e.g., KCT8576HE product description, https://perma.cc/N2ZN-83UW.

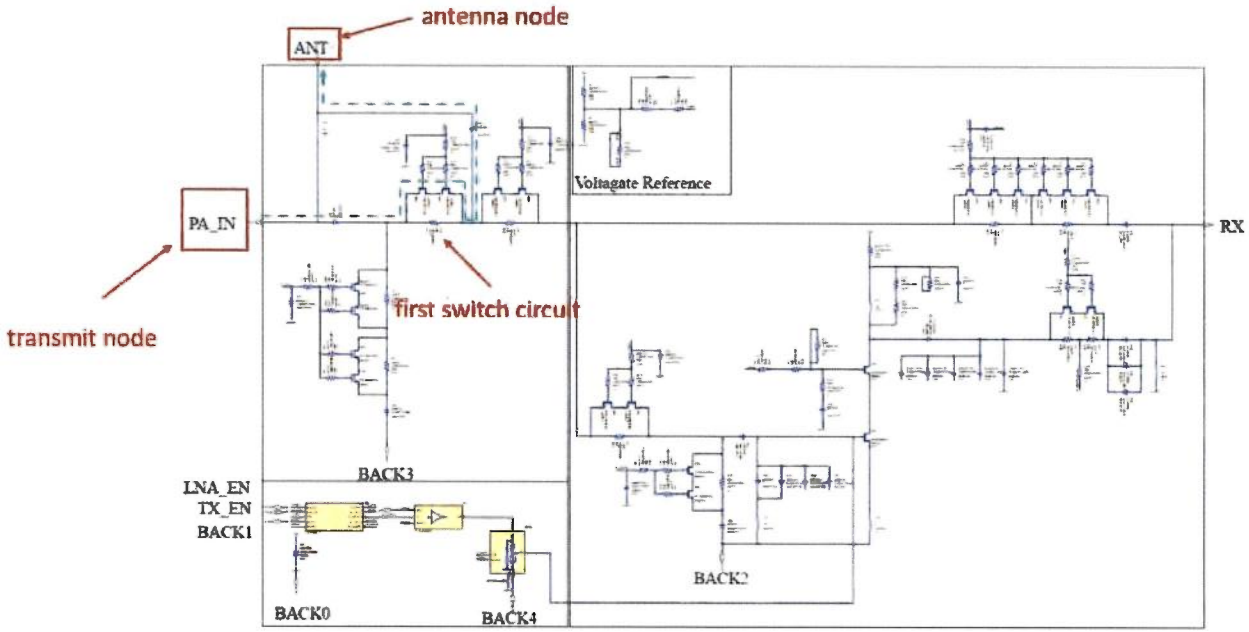
For example, the KCT8576HE has an RF switch (indicated by the corresponding red arrow in the figure below) that selectively allows either transmission or reception of signals.[2] The KCT product description describes the switch as a "T/R switch" (indicated by the red underlining in the text below). The figure below also shows the power amplifier (indicated by the corresponding red arrow below), the antenna node (indicated by the corresponding red arrow below), the receive node (indicated by the corresponding red arrow below), the low noise amplifier (indicated by the corresponding red arrow below), and the input to the power amplifier (indicated by the

[1] *See* https://perma.cc/N2ZN-83UW.
[2] *See* https://perma.cc/N2ZN-83UW.

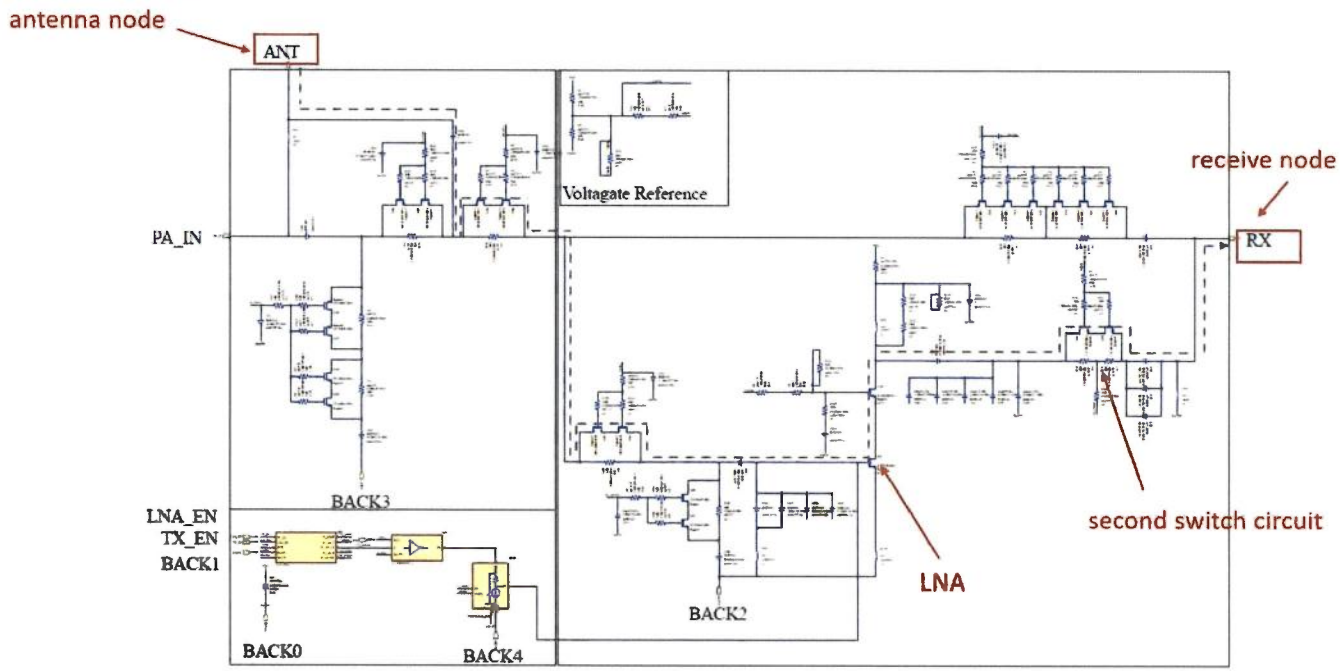
Claim	KCT8576HE
	corresponding red arrow below). **Specifications** Integrated 802.11ax 5GHz PA, LNA with bypass and T/R switch Integrated power detector Transmit gain: 30.5dB at 5V Receive gain: 15.5dB at 5V Noise Figure: 1.8dB at 5V Output power: +18dBm @ -43dB EVM, HE160/MCS11, 5V +21dBm @ -40dB EVM, HE160/MCS11, 5V +23dBm @ -35dB EVM, VHT80/MCS9, 5V +24dBm @ -30dB EVM, HT20/MCS7, 5V ESD protection circuitry on all PINs Small package: QFN-16L, 2.5mm x 2.5mm x0.55mm (MSL3, 260°C per JEDEC J-STD-020) RoHS and REACH compliant  *See, e.g.*, KCT8576HE product description and simplified block diagram, https://perma.cc/N2ZN-83UW. For example, the photos below show the exterior of the KCT8576HE device die package, front (left) and back (right).

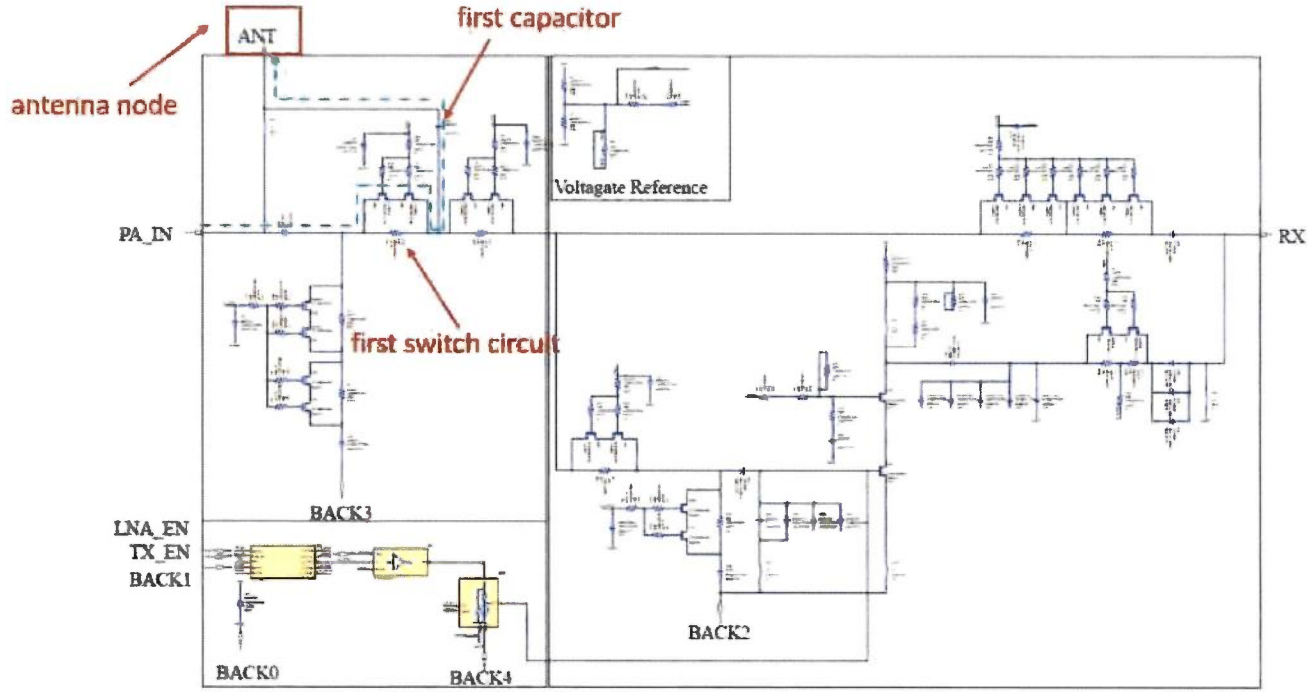
Claim	KCT8576HE
	  *See, e.g.* photos of the KCT8576HE product.
1[A] a semiconductor substrate;	The KCT8576HE comprises a semiconductor substrate. For example, a semiconductor substrate for the KCT8576HE (indicated by black grid lines below) is the material upon which the devices on the die are fabricated.

Claim	KCT8576HE
	 *See, e.g.*, photo of the KCT8576HE product, annotated to show the location of the semiconductor substrate.

Claim	KCT8576HE
1[B] a first switch circuit formed on the semiconductor substrate connected between an antenna node and a transmit node;	The KCT8576HE comprises a first switch circuit formed on the semiconductor substrate connected between an antenna node and a transmit node. For example, in the KCT8576HE, the first switch circuit (identified by the corresponding red arrow below) is connected between the antenna node ("ANT," highlighted by the red box) and transmit node ("PA IN," highlighted by the red box). In transmit mode, the signal path from the transmit node, through the first switch circuit, and to the antenna node is shown by the green dashed line below. The first switch circuit is formed on the semiconductor substrate.  *See, e.g.*, reverse engineered circuit schematic of the KCT8576HE product's low noise amplifier die, annotated to

Claim	KCT8576HE
	show the location of a first switch circuit, antenna node, and transmit node. *See also*, 1[pre]-1[A].
1[C] a second switch circuit formed on the semiconductor substrate and connected between the antenna node and a receive node;	The KCT8576HE comprises a second switch circuit formed on the semiconductor substrate and connected between the antenna node and a receive node. For example, in the KCT8576HE, the second switch circuit (indicated by the corresponding red arrow below) is connected between the antenna node ("ANT," highlighted by the red box) and the receive node ("RX," highlighted by the corresponding red box below). In receive mode, the approximate signal path from the antenna node (ANT) to the receive node (RX) through the low noise amplifier (LNA) is shown by the purple dashed line in the figure below. The second switch circuit is formed on the semiconductor substrate.

Claim	KCT8576HE
	 *See, e.g.*, reverse engineered circuit schematic of the KCT8576HE product's low noise amplifier die, annotated to show the location of a second switch circuit, receive node, low noise amplifier (LNA), and antenna node. *See also*, 1[pre]-1[A].
1[D] a first capacitor formed on the semiconductor substrate and connected in	The KCT8576HE comprises a first capacitor formed on the semiconductor substrate and connected in series with the first switch circuit between the first switch circuit and the antenna node. For example, in the KCT8576HE, the first capacitor (indicated by the corresponding red arrow below) is formed on the semiconductor substrate and is connected in series with the first switch circuit (indicated by the corresponding red arrow below). The approximate signal path during transmit mode is shown by the green dashed line in the

Claim	KCT8576HE
series with the first switch circuit between the first switch circuit and the antenna node;	figure below. In addition, the first capacitor is located between the first switch circuit and the antenna node (ANT) (indicated by the corresponding red arrow below).  *See, e.g.*, reverse engineered circuit schematic of the KCT8576HE product's low noise amplifier die, annotated to show the location of a first switch circuit, first capacitor, and antenna node. *See also*, 1[A].
1[E] a second	The KCT8576HE comprises a second capacitor formed on the semiconductor substrate and connected in series

Claim	KCT8576HE
capacitor formed on the semiconductor substrate and connected in series with the second switch circuit between the second switch circuit and the antenna node; and	with the second switch circuit between the second switch circuit and the antenna node. For example, in the KCT8576HE, the second capacitor (indicated by the corresponding red arrow below) is formed on the semiconductor substrate and is connected in series with the second switch circuit (indicated by the corresponding red arrow below). In receive mode, the approximate signal path from the antenna node (ANT) (indicated by the corresponding red arrow below) to the receive node (RX) (indicated by the corresponding red arrow below) through the low noise amplifier (LNA) (indicated by the corresponding red arrow below) is shown by the purple dashed line in the figure below. In addition, the second capacitor is located between the second switch circuit and the antenna node (ANT).