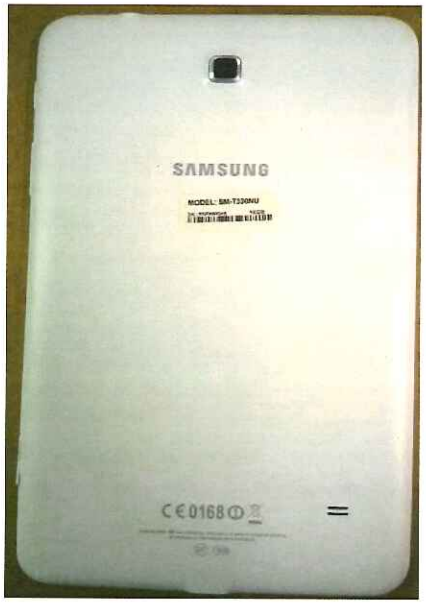
UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
37. A capacitive responsive electronic switching circuit for a controlled device comprising: an oscillator providing a periodic output signal having a predefined frequency, wherein an oscillator voltage is greater than a supply voltage; a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a closely spaced array of input touch terminals of a keypad, the input touch terminals comprising first and second input touch terminals; the first and second touch terminals defining areas for an operator to provide an input by	The Accused Devices[1] each contain a touchscreen interface operated through a touch controller, e.g., the Melfas-200 Series Touch Controller ("microcontroller"), as confirmed through tear down and testing. 

[1] Nartron has identified the following Samsung products as "Accused Products" that infringe the Asserted Claims: Samsung 8 inch, 10 inch, and 12 inch tablet products made or sold in the United States, including the Samsung Galaxy Tab S 8.4 inch, Samsung Galaxy Tab 4 8.0 inch, Samsung Galaxy Tab S 8.4 inch, Samsung Galaxy Note 8.0 inch, Samsung Galaxy Tab S 10.5 inch, Samsung Galaxy Tab 4 10.1 inch, Samsung Galaxy Note 10.1 inch, Samsung Galaxy Tab 4 NOOK 10.1 inch, Samsung Galaxy Tab 2 10.1 inch, and Samsung Galaxy Note Pro 12.2 inch. For the purposes of locating where each element of each Asserted Claim is found within each Accused Product, Nartron contends that each Accused Product contains substantially the same elements, located in substantially the same place and configuration, as the example provided in this chart.

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
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U.S. Patent No. 5,796,183 C1 and C2
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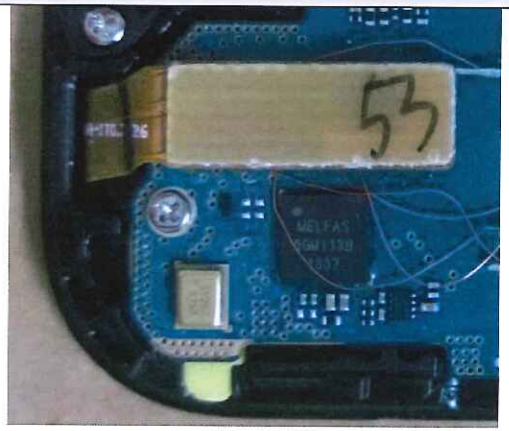
proximity and touch; and a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said first and second touch terminals, said detector circuit being responsive to signals from said oscillator via said microcontroller and a presence of an operator's body capacitance to ground coupled to said first and second touch terminals when proximal or touched by the operator to provide a control output signal for actuation of the controlled device, said detector circuit being configured to generate said control output signal when the operator is proximal or touches said second touch terminal after the operator is proximal or touches said first touch terminal. 38. The capacitive responsive electronic switching circuit as defined in claim 37, wherein	 Publicly available data sheets for the Melfas-200 Series Touch Controller show an oscillator. The presence of an oscillator providing periodic output signals was confirmed through testing. In addition, all oscillators have a predefined frequency. To confirm, testing was conducted on the Accused Devices, which was accomplished as follows: Microprobes were used on the sensing IC as shown in photographs below of the testing set-up:

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feedback to the operator is provided by an indicator activated by the microcontroller after the operator touches the second touch terminal.	  

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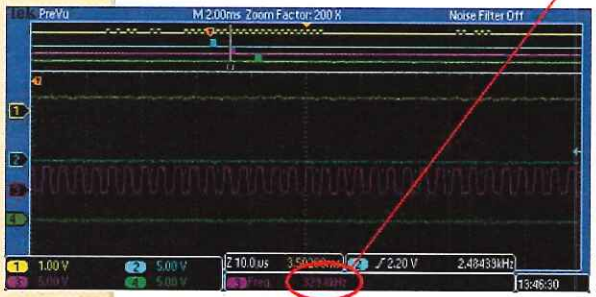
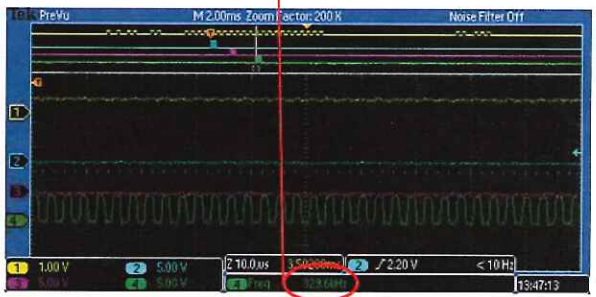
	Testing confirms the presence of each limitation as shown in the diagrams below: an oscillator providing a periodic output signal having a predefined frequency;  Figure 1: Periodic Output Signal  Figure 2: Frequency of 1st Measured Drive (330.8kHz)  Figure 3: Frequency of 2nd Measured Drive (329.8kHz)  Figure 4: Frequency of 3rd Measured Drive (329.6kHz)

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U.S. Patent No. 5,796,183 C1 and C2
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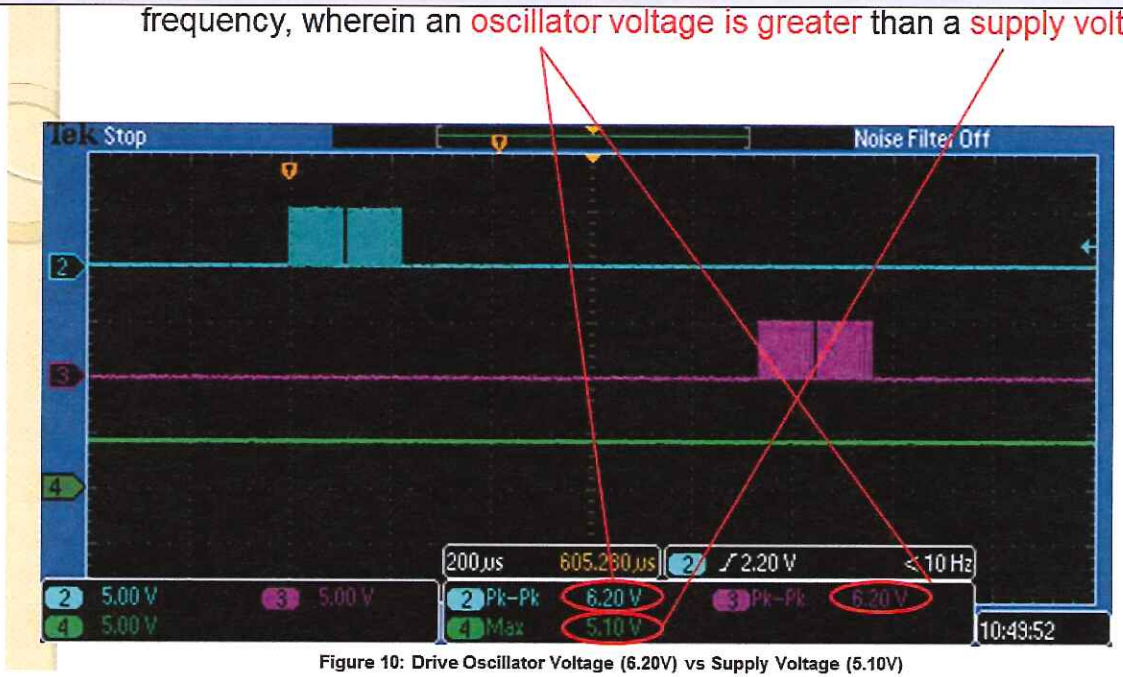
	frequency, wherein an oscillator voltage is greater than a supply voltage;  Figure 10: Drive Oscillator Voltage (6.20V) vs Supply Voltage (5.10V)

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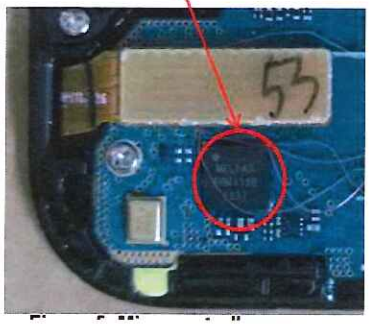
Claim Language	*Accused Product*
	• a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a closely spaced array of input touch terminals of a keypad,



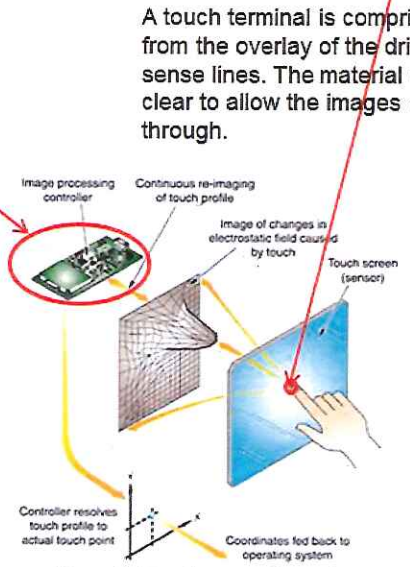


Figure 6: Touchscreen Operation

Figure 7: Touch Terminals

The Samsung touchscreen having touch terminals (comprised of a grid pattern resulting from the overlay of the drive lines over the capacitive sense lines) form a keypad visible on the touchscreen, at least when the device displays the a keypad on the touchscreen for use in inputting letters, numbers, or symbols. Should Samsung contend that the Samsung touchscreen is not literally a keyboard, then Nartron contends that the Samsung touchscreen meets the keyboard limitation under the doctrine of equivalents, i.e., the differences between a keypad and the Samsung touchscreen are insubstantial and/or the Samsung touchscreen performs substantially the same function (providing a means for a user to input information into a computing device using his or her

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
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	fingers) in substantially the same way (fingers touching an area(s) of a screen vs. depressing a key) to achieve substantially the same result (input information to a computing device). "[S]electively providing signal output frequencies" is shown in the diagrams below: 

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

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	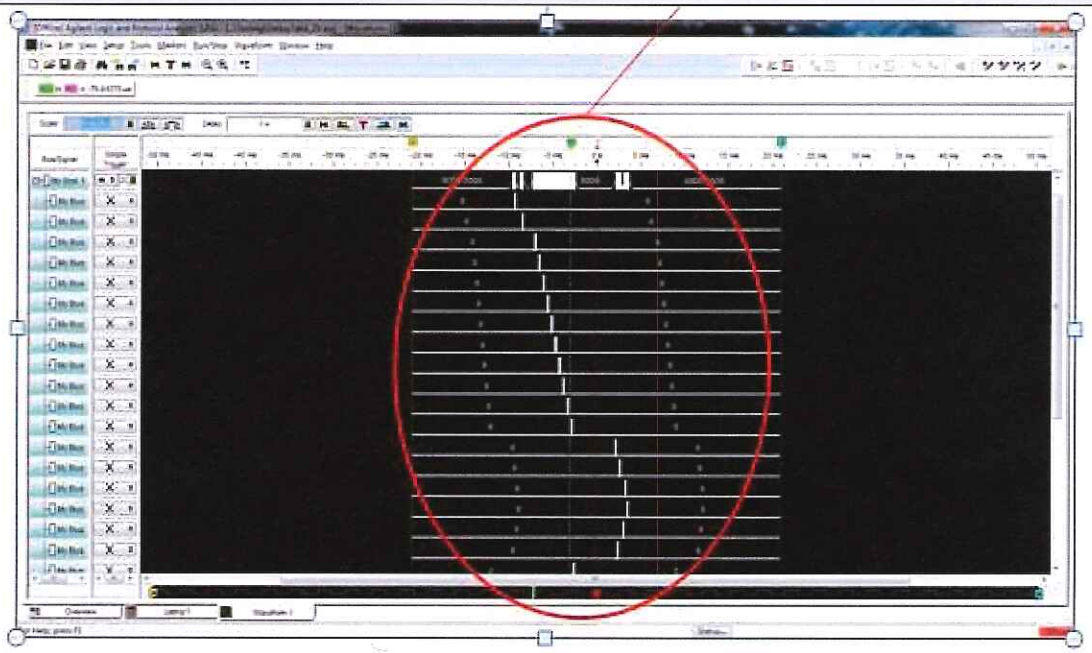

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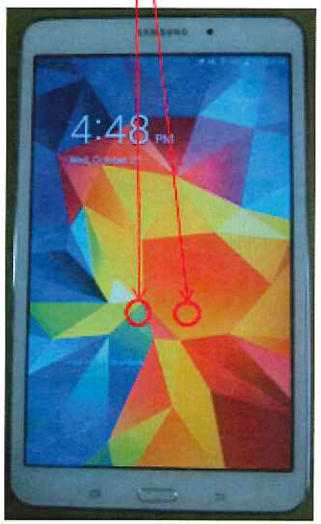
Claim Language	*Accused Product*
	• the first and second input touch terminals defining areas for an operator to provide an input by proximity and touch; and 

Claim Language	*Accused Product*
	• a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said first and second touch terminals, said detector circuit being responsive to signals from said oscillator via said microcontroller and a presence of an operator's body capacitance to ground coupled to said first and second touch terminals when proximal or touched by the operator to provide a control output signal for actuation of the controlled keypad device, Figure 12 shows the periodic output signal for processing touch. Response to the touch is seen in Video 1 on Slide 3.  Figure 12: Periodic Output Signal Testing confirms that the touch controller receives signals from the oscillator, and responds to a capacitance touch of the screen to provide a control output signal for actuation of the controlled device. Testing further confirms that the controller generates an output signal when a user touches a second touch terminal of the touch screen after the user touches a first touch terminal. [Claim 38]: When a user performs a capacitive touch, the microcontroller may respond with a visual or audio indication in the form of, e.g., changing the page the user is looking at or by highlighting the icon of the application to be opened. The indication can also be physical in form, e.g., vibrations. This demonstrates that the Accused Devices contain electronic circuits that respond to a capacitive touch.

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
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39. The capacitive responsive electronic switching circuit as defined in claim 37, wherein said detector circuit compares a sensed body capacitance change caused by the body capacitance decreasing a second touch terminal signal on the detector to ground when proximate to the second touch terminal to a threshold level to generate the control output signal, and wherein feedback to the operator is provided by an indicator activated by the microcontroller after the operator touches the second touch terminal.	The detector circuit is responsive to the operator's body capacitance to ground. The detector circuit generates a control output signal when the operator touches a first touch terminal and then touches a second touch terminal. This can be seen in Figure 12 above and in the accompanying video 1 on Slide 3. This shows the signal output resulting from a sensed body capacitance change caused by the body capacitance decreasing a second touch terminal signal on the detector to ground. More specifically, during testing Nartron observed that this control output signal is generated when a sensed body capacitance change caused by the body capacitance decreasing the second touch terminal signal on the detector to ground when proximate to the second touch terminal is compared to a threshold level. Decreasing the second touch terminal to ground was tested by using a capacitor to simulate a touch with one side of the capacitor tied to ground. For example, the feedback to the operator may be shown through the "swipe screen to unlock" process. When the user touches the screen, the finger creates a capacitive connection on a single terminal. When the user then slides the finger to the second terminal, the detector circuit registers the touch from first to second terminals to unlock the phone, changing the page at which the user is looking.

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
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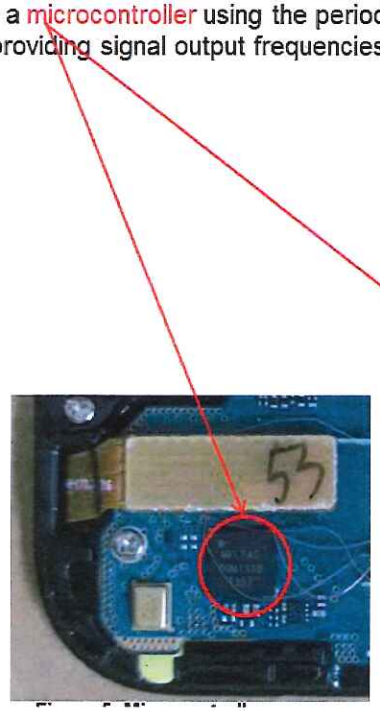
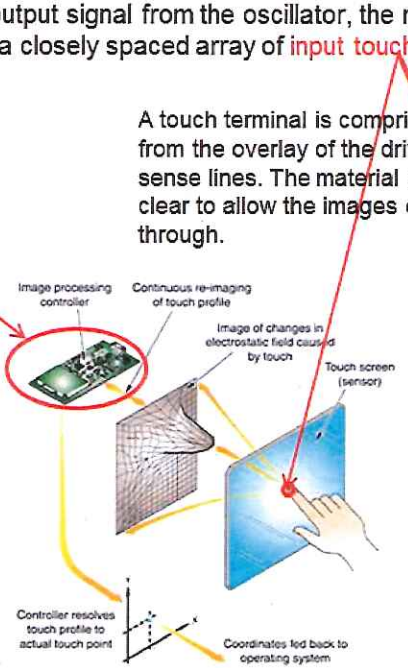
	• a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a closely spaced array of input touch terminals of a keypad,   Figure 6: Touchscreen Operation  Figure 7: Touch Terminals
40. A capacitive responsive electronic switching circuit comprising: an oscillator providing a periodic output signal having a predefined	The Accused Devices each contain a touchscreen interface operated though a touch controller, e.g., the Melfas-200 Series Touch Controller ("microcontroller"), as confirmed through tear down and testing.

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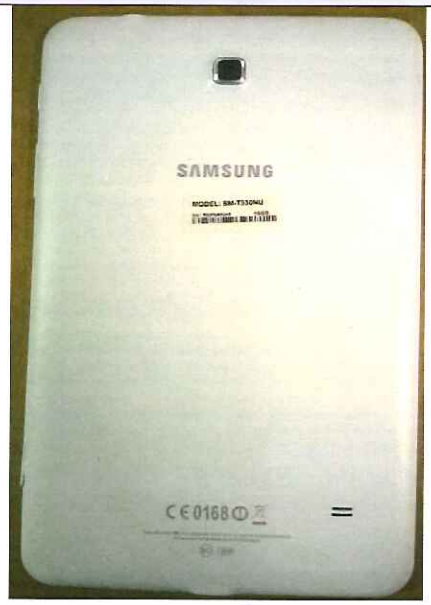
frequency; a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a plurality of small sized input touch terminals of a keypad, wherein the selectively providing comprises the microcontroller selectively providing a signal output frequency to each row of the plurality of small sized input touch terminals of the keypad; the plurality of small sized input touch terminals defining adjacent areas on a dielectric substrate for an operator to provide inputs by proximity and touch; and a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said input touch terminals, said detector circuit being responsive to signals from said oscillator via said microcontroller and a	

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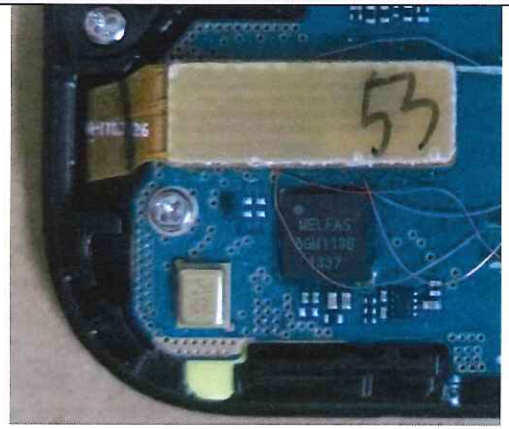
presence of an operator's body capacitance to ground coupled to said touch terminals when proximal or touched by the operator to provide a control output signal, wherein said predefined frequency of said oscillator and said signal output frequencies are selected to decrease a first impedance of said dielectric substrate relative to a second impedance of any contaminate that may create an electrical path on said dielectric substrate between said adjacent areas defined by the plurality of small sized input touch terminals, and wherein said detector circuit compares a sensed body capacitance change to ground proximate an input touch terminal to a threshold level to prevent inadvertent generation of the control output signal.	 Publicly available data sheets for the Melfas-200 Series Touch Controller show an oscillator. The presence of an oscillator providing periodic output signals was confirmed through testing. In addition, all oscillators have a predefined frequency. To confirm, testing was conducted on the Accused Devices, which was accomplished as follows: Microprobes were used on the sensing IC as shown in photographs below of the testing set-up:

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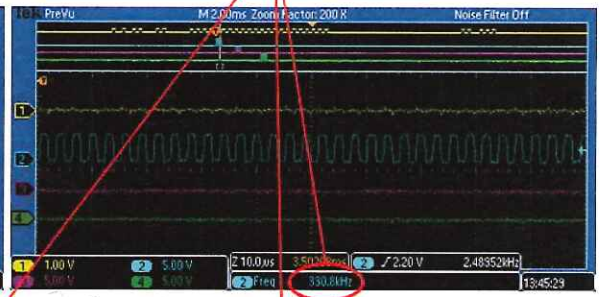
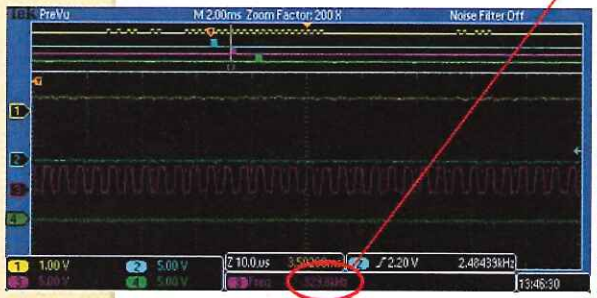
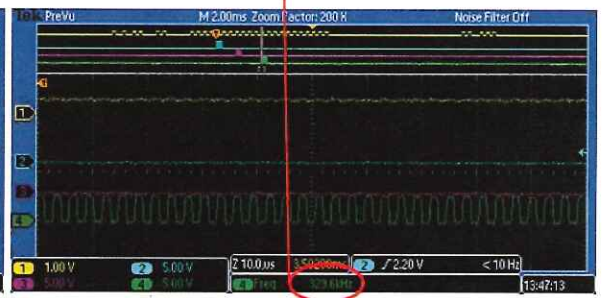
	Testing confirms the presence of each limitation as shown in the diagrams below: an oscillator providing a periodic output signal having a predefined frequency;  Figure 1: Periodic Output Signal  Figure 2: Frequency of 1st Measured Drive (330.8kHz)  Figure 3: Frequency of 2nd Measured Drive (329.8kHz)  Figure 4: Frequency of 3rd Measured Drive (329.6kHz)

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Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
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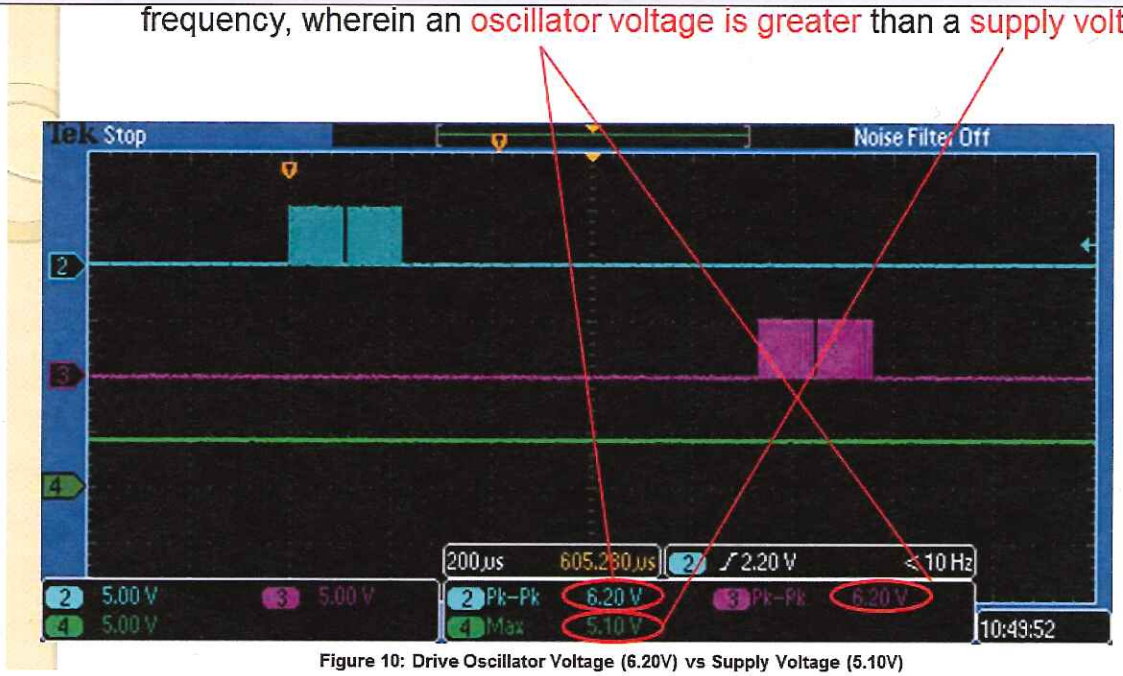
	frequency, wherein an oscillator voltage is greater than a supply voltage;  Figure 10: Drive Oscillator Voltage (6.20V) vs Supply Voltage (5.10V)

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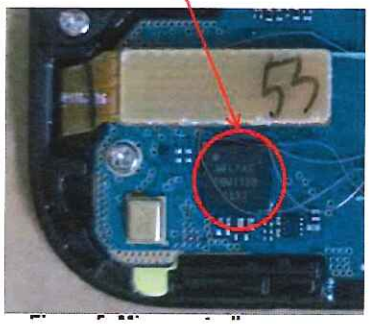
Claim Language	*Accused Product*
	• a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a closely spaced array of input touch terminals of a keypad,



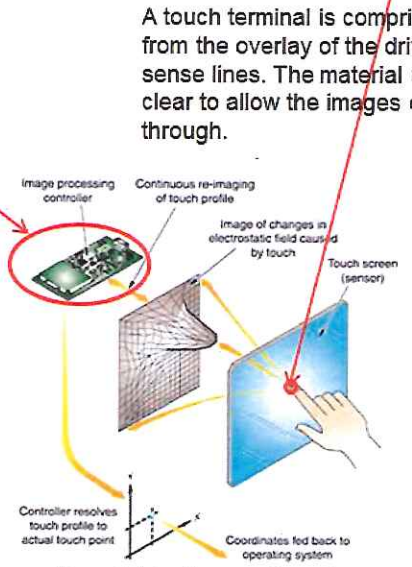


Figure 6: Touchscreen Operation

Figure 7: Touch Terminals

The Samsung touchscreen having touch terminals (comprised of a grid pattern resulting from the overlay of the drive lines over the capacitive sense lines) form a keypad visible on the touchscreen, at least when the device displays the a keypad on the touchscreen for use in inputting letters, numbers, or symbols. Should Samsung contend that the Samsung touchscreen is not literally a keyboard, then Nartron contends that the Samsung touchscreen meets the keyboard limitation under the doctrine of equivalents, i.e., the differences between a keypad and the Samsung touchscreen are insubstantial and/or the Samsung touchscreen performs substantially the same function (providing a means for a user to input information into a computing device using his or her fingers) in substantially the same way (fingers touching an area(s) of a screen vs. depressing a key) to achieve

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	substantially the same result (input information to a computing device). "[S]electively providing signal output frequencies" is shown in the diagrams below: 

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	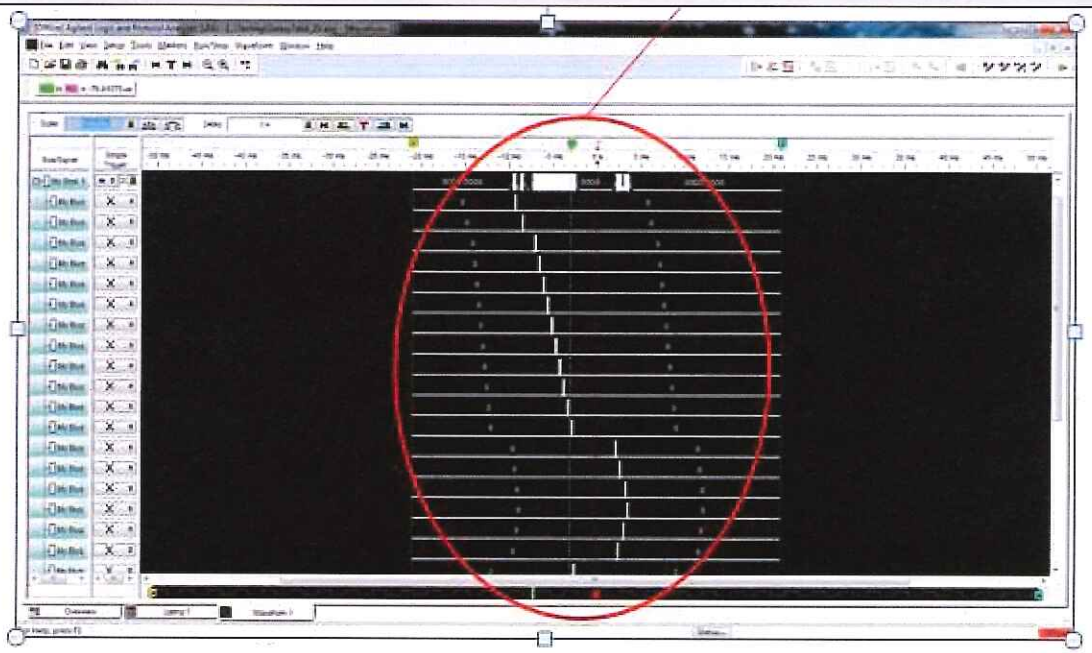

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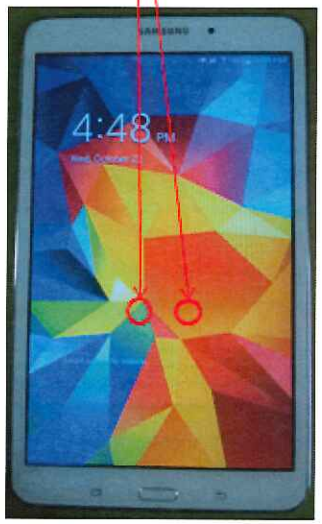
	• the first and second input touch terminals defining areas for an operator to provide an input by proximity and touch; and 

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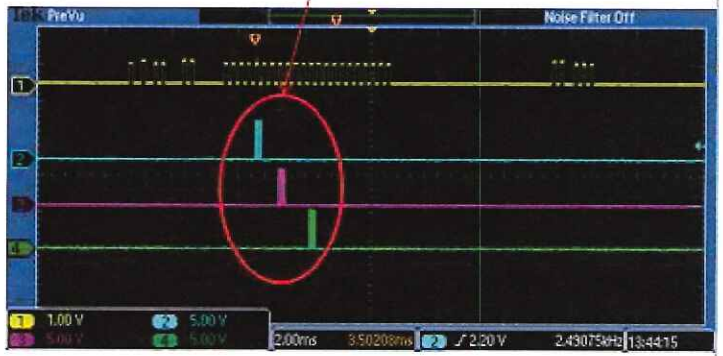
	• a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said first and second touch terminals, said detector circuit being responsive to signals from said oscillator via said microcontroller and a presence of an operator's body capacitance to ground coupled to said first and second touch terminals when proximal or touched by the operator to provide a control output signal for actuation of the controlled keypad device, Figure 12 shows the periodic output signal for processing touch. Response to the touch is seen in Video 1 on Slide 3.  **Figure 12: Periodic Output Signal** Testing confirms that the touch controller receives signals from the oscillator, and responds to a capacitance touch of the screen to provide a control output signal for actuation of the controlled device. Testing further confirms that the controller generates an output signal when a user touches a second touch terminal of the touch screen after the user touches a first touch terminal. When a user performs a capacitive touch, the microcontroller may respond with a visual or audio indication in the form of, e.g., changing the page the user is looking at or by highlighting the icon of the application to be opened. The indication can also be physical in form, e.g., vibrations. This demonstrates that the Accused Devices contain electronic circuits that respond to a capacitive touch.

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	Further, Nartron currently believes, based on the publicly-available information disclosed herein, and testing, that said predefined frequency of said oscillator and said signal output frequencies are selected to decrease a first impedance of said dielectric substrate relative to a second impedance of any contaminate that may create an electrical path on said dielectric substrate between said adjacent areas defined by the plurality of small sized input touch terminals, and wherein said detector circuit compares a sensed body capacitance change to ground proximate an input touch terminal to a threshold level to prevent inadvertent generation of the control output signal. This was confirmed during testing by using a capacitor with one end tied to ground, turning on the phone, and touching a second time to simulate a changed body capacitance above a threshold level.
41. The capacitive responsive electronic switching circuit as defined in claim 40, wherein each signal output frequency selectively provided to each row of the plurality of small sized input touch terminals of the keypad is selected from a plurality of Hertz values. 43. The capacitive responsive electronic switching circuit as defined in claim 41, wherein the plurality of Hertz values comprises Hertz values greater than 100kHz.	Nartron currently believes, based on the publicly-available information disclosed herein, and testing, that each signal output frequency selectively provided to each row of the plurality of small sized input touch terminals of the keypad is selected from a plurality of Hertz values. This was confirmed during testing by observing the output frequencies during start up. When the device is powered up, the scans through different frequencies and then selects one frequency as the output frequency. The testing described above confirms that the plurality of Hertz values are greater than 100kHz.

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
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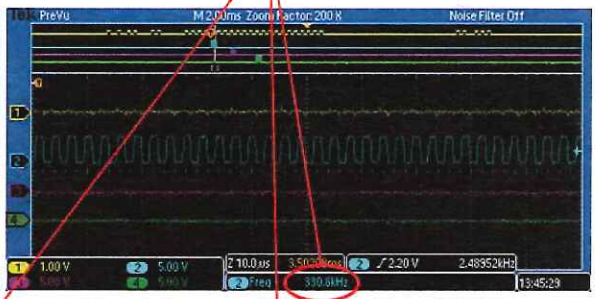
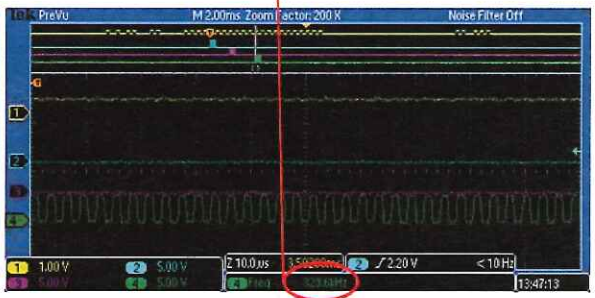
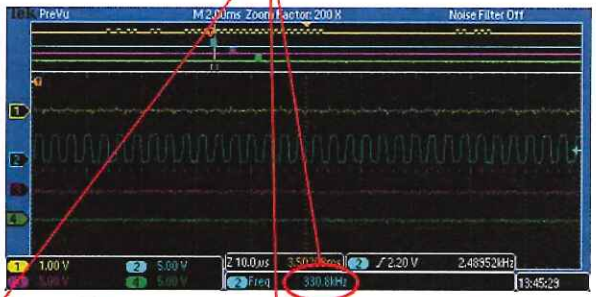
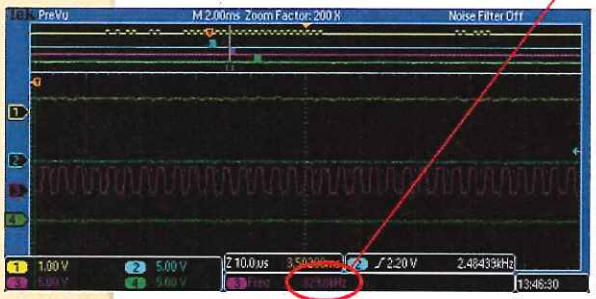
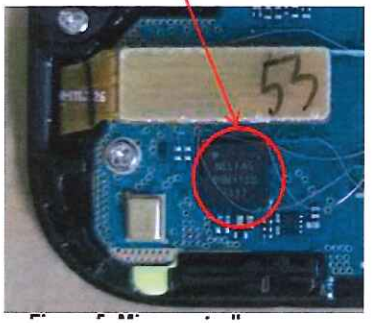
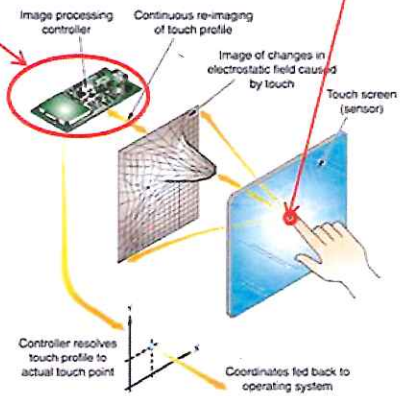
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	an oscillator providing a periodic output signal having a predefined frequency;  Figure 1: Periodic Output Signal  Figure 2: Frequency of 1st Measured Drive (330.8kHz)  Figure 3: Frequency of 2nd Measured Drive (329.8kHz)  Figure 4: Frequency of 3rd Measured Drive (329.6kHz)
45. The capacitive responsive electronic switching circuit as defined in claim 40, wherein each signal output frequency selectively provided to each row of the plurality of small sized	The testing described above confirms that each output frequency has the same Hertz value.

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
input touch terminals of the keypad has a same Hertz value.	an oscillator providing a periodic output signal having a predefined frequency;  Figure 1: Periodic Output Signal  Figure 2: Frequency of 1st Measured Drive (330.8kHz)  Figure 3: Frequency of 2nd Measured Drive (329.8kHz)  Figure 4: Frequency of 3rd Measured Drive (329.6kHz)
47. The capacitive responsive electronic switching circuit as defined in claim 40, wherein the sensed body capacitance change to ground proximate the input touch terminal is caused by the	The detector circuit is responsive to the operator's body capacitance to ground. The detector circuit generates a control output signal when the operator touches a first touch terminal and then touches a second touch terminal. This can be seen in Figure 12 above and in the accompanying video 1 on Slide 3. This shows the signal output resulting from a sensed body capacitance change caused by the body capacitance decreasing a second touch terminal signal on the detector to ground. More specifically, during testing Nartron observed that this control output signal is generated when a sensed body capacitance change caused by the body capacitance decreasing the

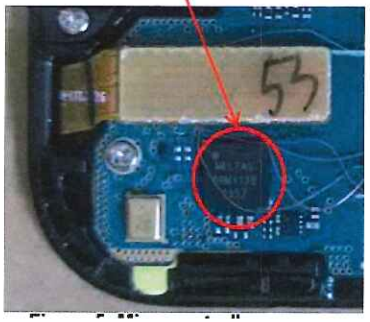
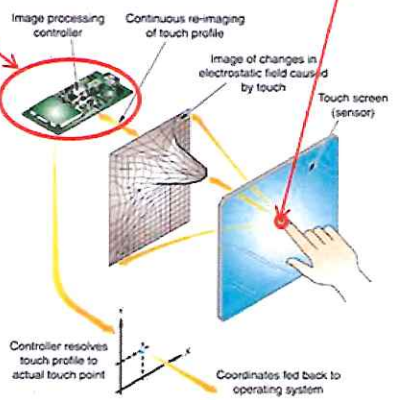
UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
operator's body capacitance decreasing an input touch terminal signal on the detector circuit, and wherein the sensed body capacitance change to ground is compared to a second threshold level to generate the control output signal.	second touch terminal signal on the detector to ground when proximate to the second touch terminal is compared to a threshold level. Decreasing the second touch terminal to ground was tested by using a capacitor to simulate a touch with one side of the capacitor tied to ground. For example, this may be shown through the "swipe screen to unlock" process. When the user touches the screen, the finger creates a capacitive connection on a single terminal. When the user then slides the finger to the second terminal, the detector circuit registers the touch from first to second terminals to unlock the phone, changing the page at which the user is looking. • a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a closely spaced array of input touch terminals of a keypad,   Figure 6: Touchscreen Operation  Figure 7: Touch Terminals

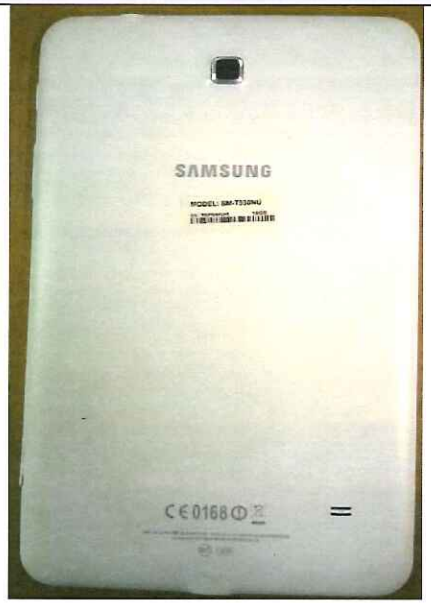
UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
48. The capacitive responsive electronic switching circuit as defined in claim 40, wherein the sensed body capacitance change to ground proximate the input touch terminal is caused by the operator's body capacitance decreasing an input touch terminal signal amplitude on the detector circuit, and wherein the sensed body capacitance change to ground is compared to a second threshold level to generate the control output signal.	The detector circuit is responsive to the operator's body capacitance to ground. The detector circuit generates a control output signal when the operator touches a first touch terminal and then touches a second touch terminal. This can be seen in Figure 12 above and in the accompanying video 1 on Slide 3. This shows the signal output resulting from a sensed body capacitance change caused by the body capacitance decreasing a second touch terminal signal on the detector to ground. More specifically, during testing Nartron observed that this control output signal is generated when a sensed body capacitance change caused by the body capacitance decreasing the second touch terminal signal on the detector to ground when proximate to the second touch terminal is compared to a threshold level. Decreasing the second touch terminal to ground was tested by using a capacitor to simulate a touch with one side of the capacitor tied to ground. For example, this may be shown through the "swipe screen to unlock" process. When the user touches the screen, the finger creates a capacitive connection on a single terminal. When the user then slides the finger to the second terminal, the detector circuit registers the touch from first to second terminals to unlock the phone, changing the page at which the user is looking.

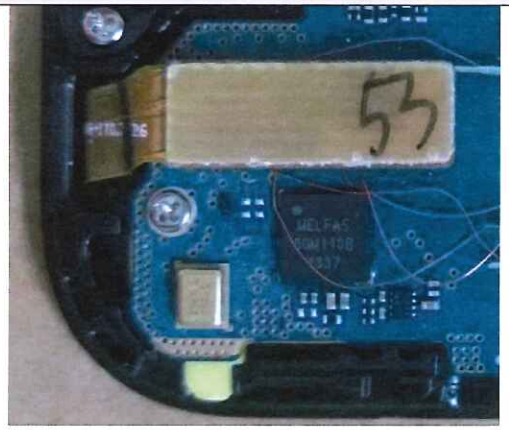
UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	• a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a closely spaced array of input touch terminals of a keypad,   Figure 6: Touchscreen Operation  Figure 7: Touch Terminals
61. A capacitive responsive electronic switching circuit comprising: an oscillator providing a periodic output signal having a predefined	The Accused Devices each contain a touchscreen interface operated though a touch controller, e.g., the Melfas-200 Series Touch Controller ("microcontroller"), as confirmed through tear down and testing.

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
frequency; a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a plurality of small sized input touch terminals of a keypad, wherein the selectively providing comprises the microcontroller selectively providing a signal output frequency to each row of the plurality of small sized input touch terminals of the keypad, and wherein a peak voltage of the signal output frequencies is greater than a supply voltage; the plurality of small sized input touch terminals defining adjacent areas on a dielectric substrate for an operator to provide inputs by proximity and touch; and a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said input touch terminals, said	

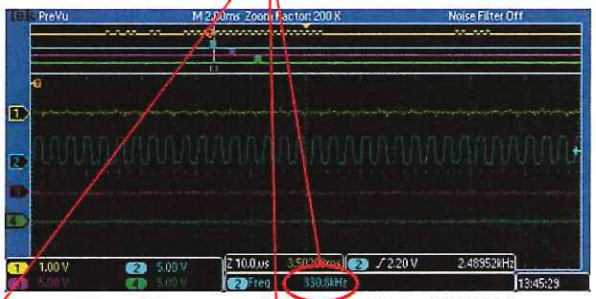
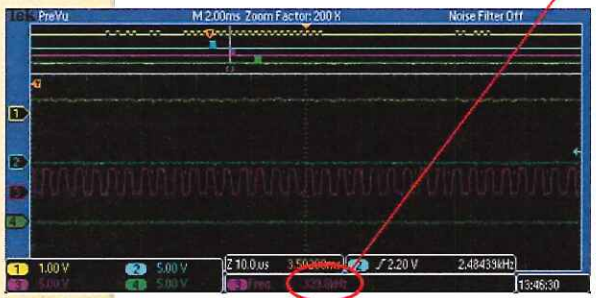
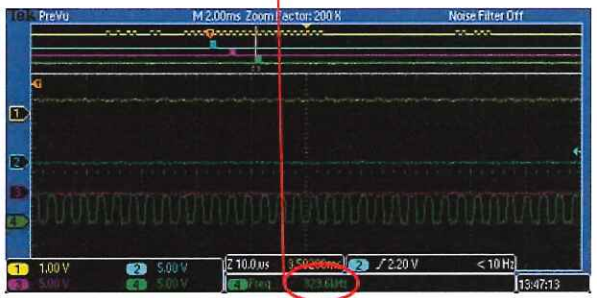
UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
detector circuit being responsive to signals from said oscillator via said microcontroller and a presence of an operator's body capacitance to ground coupled to said touch terminals when proximal or touched by the operator to provide a control output signal, wherein said predefined frequency of said oscillator and said signal output frequencies are selected to decrease a first impedance of said dielectric substrate relative to a second impedance of any contaminate that may create an electrical path on said dielectric substrate between said adjacent areas defined by the plurality of small sized input touch terminals, and wherein said detector circuit compares a sensed body capacitance change to ground proximate an input touch terminal to a threshold level to prevent inadvertent generation of the control output signal.	 Publicly available data sheets for the Melfas-200 Series Touch Controller show an oscillator. The presence of an oscillator providing periodic output signals was confirmed through testing. In addition, all oscillators have a predefined frequency. To confirm, testing was conducted on the Accused Devices, which was accomplished as follows: Microprobes were used on the sensing IC as shown in photographs below of the testing set-up:

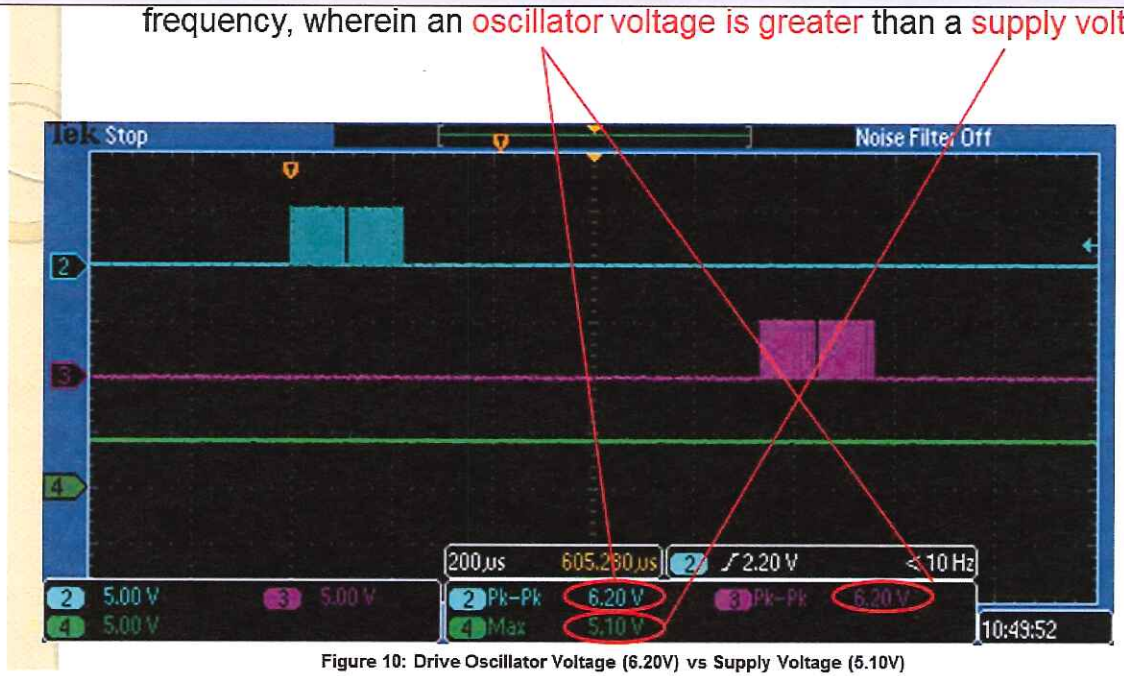
UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	  

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

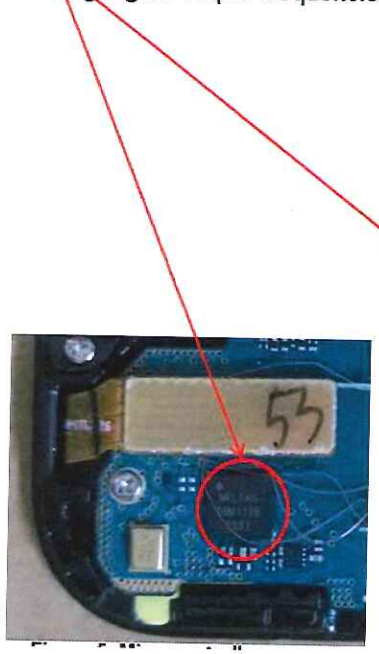
Claim Language	*Accused Product*
	Testing confirms the presence of each limitation as shown in the diagrams below: an oscillator providing a periodic output signal having a predefined frequency;  Figure 1: Periodic Output Signal  Figure 2: Frequency of 1st Measured Drive (330.8kHz)  Figure 3: Frequency of 2nd Measured Drive (329.8kHz)  Figure 4: Frequency of 3rd Measured Drive (329.6kHz)

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	frequency, wherein an oscillator voltage is greater than a supply voltage;  Figure 10: Drive Oscillator Voltage (6.20V) vs Supply Voltage (5.10V)

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	• a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a closely spaced array of input touch terminals of a keypad,



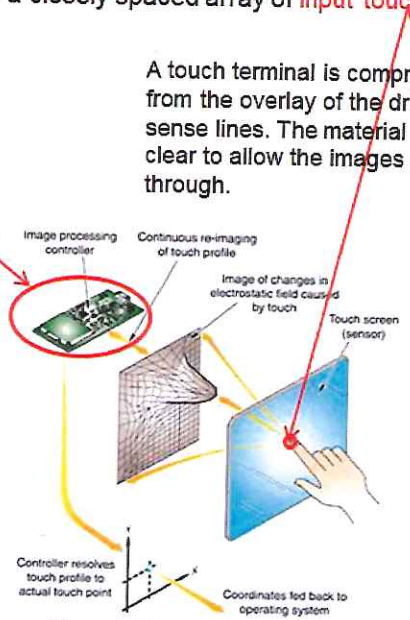


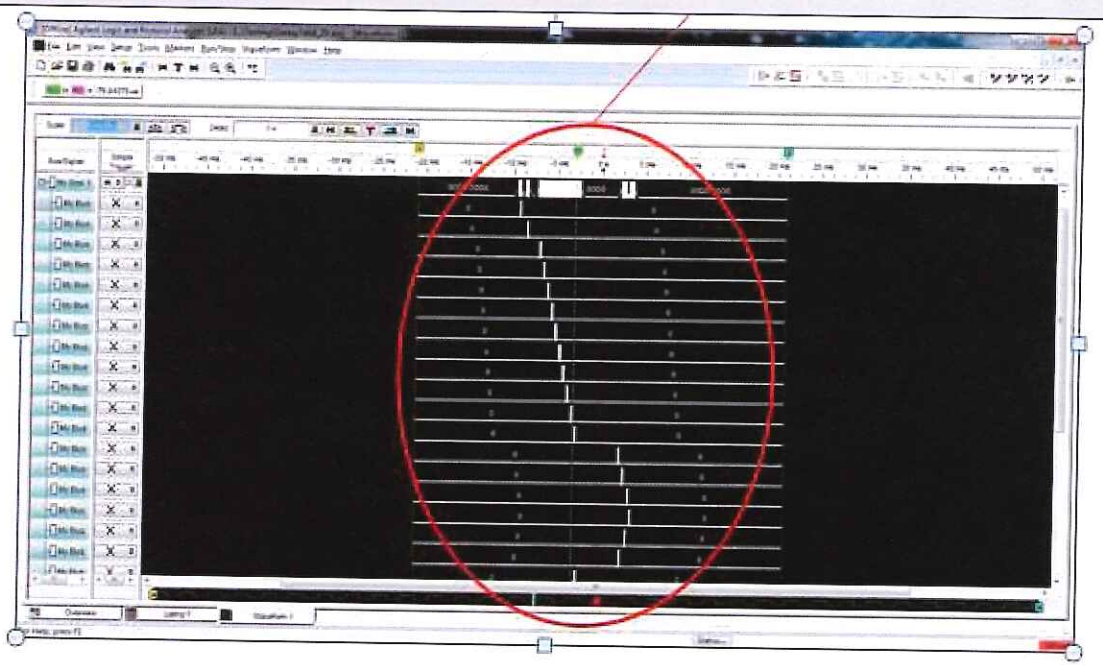
Figure 6: Touchscreen Operation

Figure 7: Touch Terminals

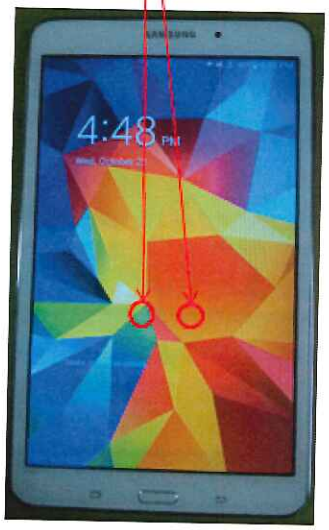
The Samsung touchscreen having touch terminals (comprised of a grid pattern resulting from the overlay of the drive lines over the capacitive sense lines) form a keypad visible on the touchscreen, at least when the device displays the a keypad on the touchscreen for use in inputting letters, numbers, or symbols. Should Samsung contend that the Samsung touchscreen is not literally a keyboard, then Nartron contends that the Samsung touchscreen meets the keyboard limitation under the doctrine of equivalents, i.e., the differences between a keypad and the Samsung touchscreen are insubstantial and/or the Samsung touchscreen performs substantially the same function (providing a means for a user to input information into a computing device using his or her fingers) in substantially the same way (fingers touching an area(s) of a screen vs. depressing a key) to achieve

Claim Language	*Accused Product*
	substantially the same result (input information to a computing device). "[S]electively providing signal output frequencies" is shown in the diagrams below: 

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	• the first and second input touch terminals defining areas for an operator to provide an input by proximity and touch; and 

Claim Language	*Accused Product*
	• a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said first and second touch terminals, said detector circuit being responsive to signals from said oscillator via said microcontroller and a presence of an operator's body capacitance to ground coupled to said first and second touch terminals when proximal or touched by the operator to provide a control output signal for actuation of the controlled keypad device,

Figure 12 shows the periodic output signal for processing touch. Response to the touch is seen in Video 1 on Slide 3.

Figure 12: Periodic Output Signal

Testing confirms that the touch controller receives signals from the oscillator, and responds to a capacitance touch of the screen to provide a control output signal for actuation of the controlled device. Testing further confirms that the controller generates an output signal when a user touches a second touch terminal of the touch screen after the user touches a first touch terminal.

When a user performs a capacitive touch, the microcontroller may respond with a visual or audio indication in the form of, e.g., changing the page the user is looking at or by highlighting the icon of the application to be opened. The indication can also be physical in form, e.g., vibrations. This demonstrates that the Accused Devices contain electronic circuits that respond to a capacitive touch.

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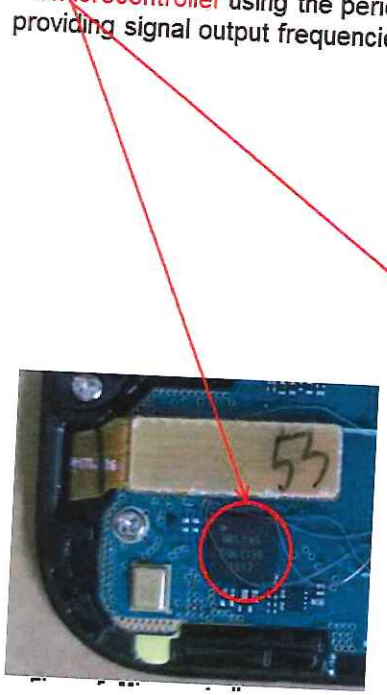
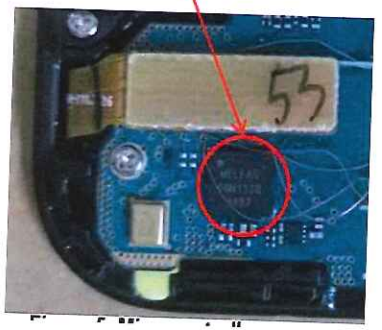
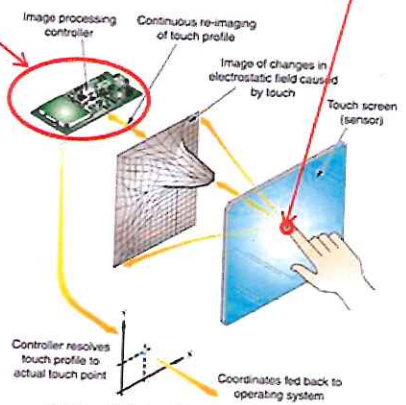
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	Nartron currently believes, based on the publicly-available information disclosed herein, including testing, that said predefined frequency of said oscillator and said signal output frequencies are selected by Samsung to decrease a first impedance of said dielectric substrate relative to a second impedance of any contaminate that may create an electrical path on said dielectric substrate between said adjacent areas defined by the plurality of small sized input touch terminals. Nartron further currently believes, based on the publicly-available information disclosed herein, including testing, that said detector circuit compares a sensed body capacitance change to ground proximate an input touch terminal to a threshold level to prevent inadvertent generation of the control output signal. This was confirmed during testing by using a capacitor with one end tied to ground, turning on the phone, and touching a second time to simulate a changed body capacitance above a threshold level.
62. The capacitive responsive electronic switching circuit as defined in claim 61, wherein the sensed body capacitance change to ground proximate the input touch terminal is caused by the operator's body capacitance decreasing an input touch terminal signal on the detector circuit, and wherein the sensed body capacitance change to ground is compared to a second threshold level to generate the control output signal.	The detector circuit is responsive to the operator's body capacitance to ground. The detector circuit generates a control output signal when the operator touches a first touch terminal and then touches a second touch terminal. This can be seen in Figure 12 above and in the accompanying video 1 on Slide 3. This shows the signal output resulting from a sensed body capacitance change caused by the body capacitance decreasing a second touch terminal signal on the detector to ground. More specifically, during testing Nartron observed that this control output signal is generated when a sensed body capacitance change caused by the body capacitance decreasing the second touch terminal signal on the detector to ground when proximate to the second touch terminal is compared to a threshold level. For example, this may be shown through the "swipe screen to unlock" process. When the user touches the screen, the finger creates a capacitive connection on a single terminal. When the user then slides the finger to the second terminal, the detector circuit registers the touch from first to second terminals to unlock the phone, changing the page at which the user is looking.

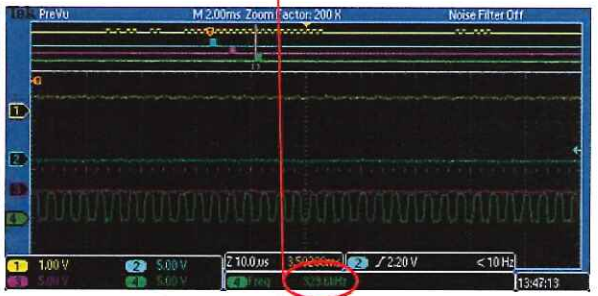
Claim Language	*Accused Product*
	• a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a closely spaced array of input touch terminals of a keypad,  Figure 6: Touchscreen Operation  Figure 7: Touch Terminals
63. The capacitive responsive electronic switching circuit as defined in claim 61, wherein the sensed body capacitance change to ground proximate the input touch terminal is caused by the operator's body capacitance decreasing an input touch	The detector circuit is responsive to the operator's body capacitance to ground. The detector circuit generates a control output signal when the operator touches a first touch terminal and then touches a second touch terminal. This can be seen in Figure 12 above and in the accompanying video 1 on Slide 3. This shows the signal output resulting from a sensed body capacitance change caused by the body capacitance decreasing a second touch terminal signal on the detector to ground. More specifically, during testing Nartron observed that this control output signal is generated when a sensed body capacitance change caused by the body capacitance decreasing the second touch terminal signal on the detector to ground when proximate to the second touch terminal is compared to a threshold level. Decreasing the second touch terminal to ground was tested by using a capacitor to simulate a

Claim Language	*Accused Product*
terminal signal amplitude on the detector circuit, and wherein the sensed body capacitance change to ground is compared to a second threshold level to generate the control output signal.	touch with one side of the capacitor tied to ground. During the test, the capacitance value was set to a point that did not trigger a response and then increased until a response was triggered. For example, this may be shown through the "swipe screen to unlock" process. When the user touches the screen, the finger creates a capacitive connection on a single terminal. When the user then slides the finger to the second terminal, the detector circuit registers the touch from first to second terminals to unlock the phone, changing the page at which the user is looking. • a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a closely spaced array of input touch terminals of a keypad, A touch terminal is comprised a grid pattern resulting from the overlay of the drive lines over the capacitive sense lines. The material used to create these lines is clear to allow the images on the screen to shine through.   Figure 6: Touchscreen Operation  Figure 7: Touch Terminals

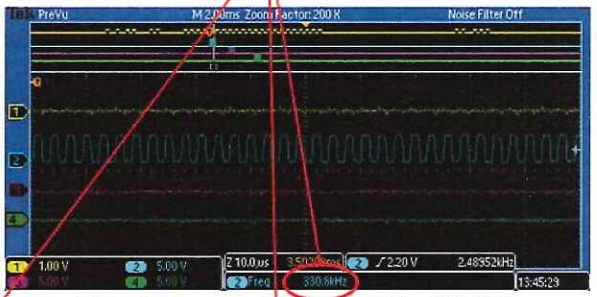
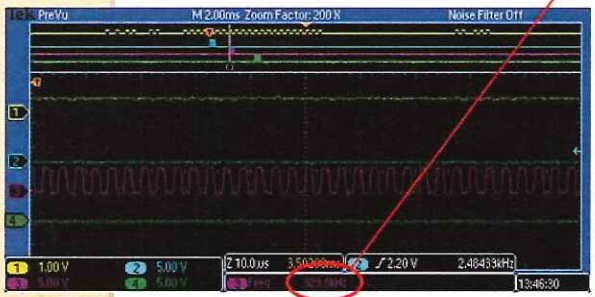
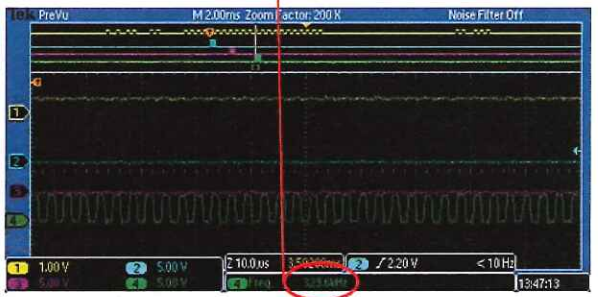
UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

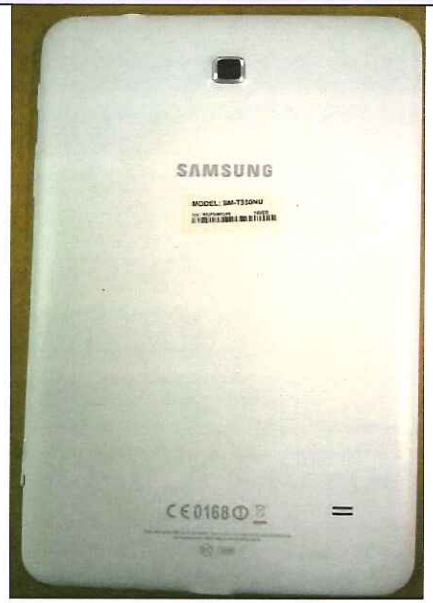
Claim Language	*Accused Product*
64. The capacitive responsive electronic switching circuit as defined in claim 61, wherein the supply voltage is a battery supply voltage.	Public documents show the supply voltage of the Accused Devices can be a battery supply voltage. For example, **Battery*** Battery Type And Size — 3.8 Volt, Lithium-Ion, 4450mAh (http://www.samsung.com/us/support/owners/product/SM-T330NDWAXAR.)
65 The capacitive responsive electronic switching circuit as defined in claim 61, wherein the supply voltage is a voltage regulator supply voltage.	Public documents show the Accused Devices may include, e.g., AC adapters, which use voltage regulators to regulate the supply voltage provided to the Accused Device.
66. The capacitive responsive electronic switching circuit as defined in claim 61, wherein each signal output frequency selectively provided to each row of the plurality of small sized input touch terminals of the keypad has a same Hertz value.	The testing described above confirms that each output frequency has the same Hertz value.

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

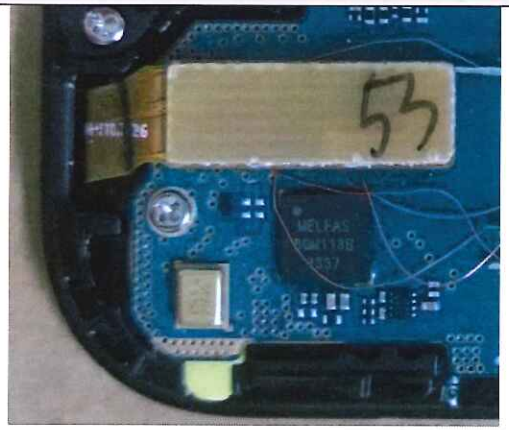
Claim Language	*Accused Product*
	an oscillator providing a periodic output signal having a predefined frequency;  Figure 1: Periodic Output Signal  Figure 2: Frequency of 1st Measured Drive (330.8kHz)  Figure 3: Frequency of 2nd Measured Drive (329.8kHz)  Figure 4: Frequency of 3rd Measured Drive (329.6kHz)
69. The capacitive responsive electronic switching circuit as defined in claim 67, wherein the plurality of Hertz values comprises Hertz values greater	The testing described above confirms that the plurality of Hertz values are greater than 100kHz.

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
than 100kHz.	an oscillator providing a periodic output signal having a predefined frequency;  Figure 1: Periodic Output Signal  Figure 2: Frequency of 1st Measured Drive (330.8kHz)  Figure 3: Frequency of 2nd Measured Drive (329.8kHz)  Figure 4: Frequency of 3rd Measured Drive (329.6kHz)
83. A capacitive responsive electronic switching circuit for a controlled keypad device comprising: an oscillator providing a periodic	The Accused Devices each contain a touchscreen interface operated though a touch controller, e.g., the Melfas-200 Series Touch Controller ("microcontroller"), as confirmed through tear down and testing.

Claim Language	*Accused Product*
output signal having a predefined frequency; a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a closely spaced array of input touch terminals of a keypad, the input touch terminals comprising first and second input touch terminals, wherein a peak voltage of the signal output frequencies is greater than a supply voltage; the first and second input touch terminals defining areas for an operator to provide an input by proximity and touch; and a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said first and second touch terminals, said detector circuit being responsive to signals from said oscillator via said microcontroller and a presence of an operator's	

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
body capacitance to ground coupled to said first and second touch terminals when proximal or touched by the operator to provide a control output signal for actuation of the controlled keypad device, said detector circuit being configured to generate said control output signal when the operator is proximal or touches said second touch terminal after the operator is proximal or touches said first touch terminal.	 Publicly available data sheets for the Melfas-200 Series Touch Controller show an oscillator. The presence of an oscillator providing periodic output signals was confirmed through testing. In addition, all oscillators have a predefined frequency. To confirm, testing was conducted on the Accused Devices, which was accomplished as follows: Microprobes were used on the sensing IC as shown in photographs below of the testing set-up:

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
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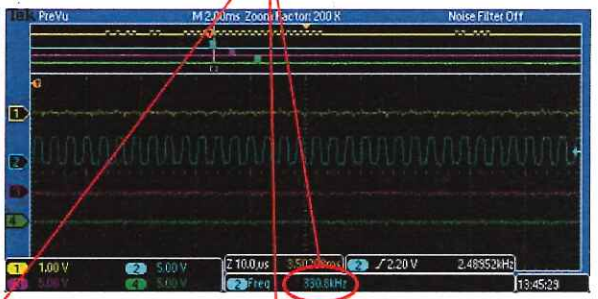
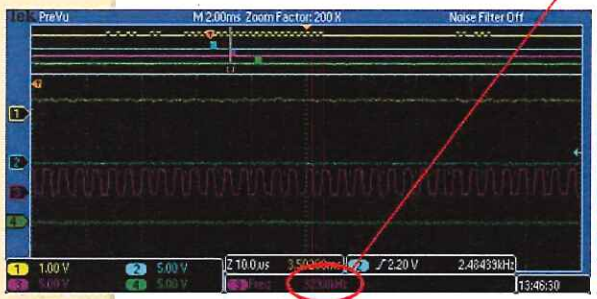
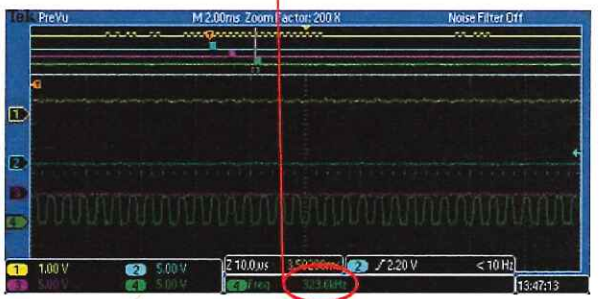
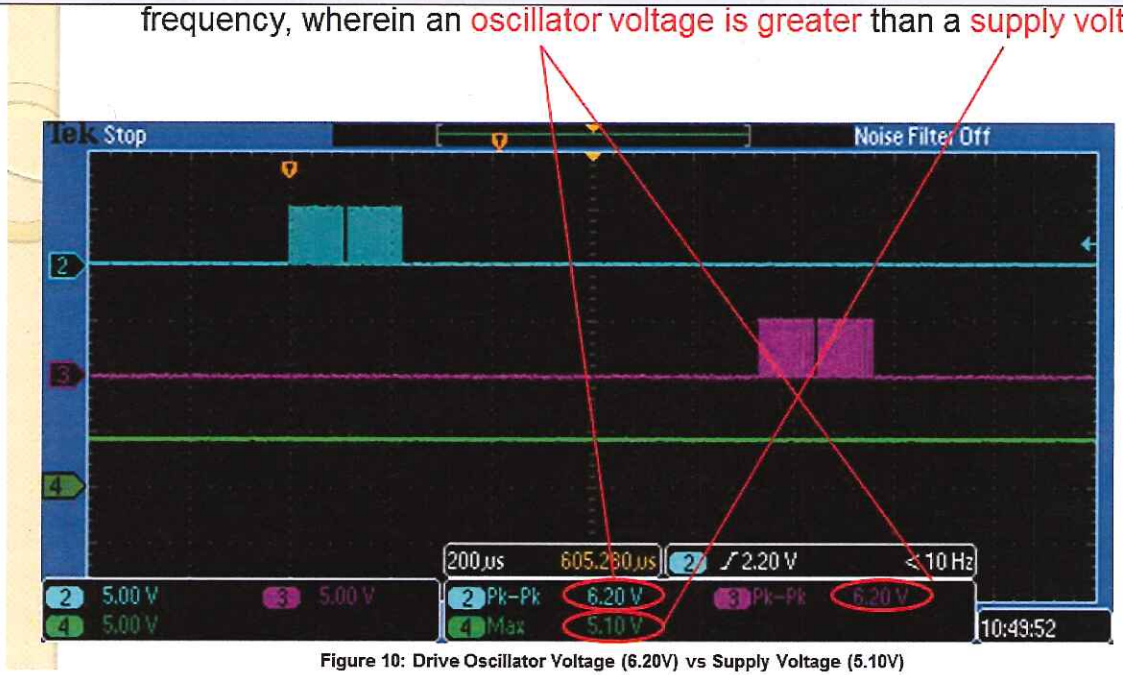
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	  

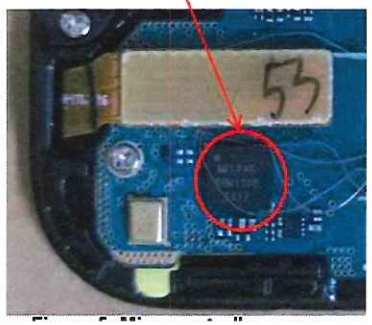
Claim Language	*Accused Product*
	Testing confirms the presence of each limitation as shown in the diagrams below: an oscillator providing a periodic output signal having a predefined frequency;  Figure 1: Periodic Output Signal  Figure 2: Frequency of 1st Measured Drive (330.8kHz)  Figure 3: Frequency of 2nd Measured Drive (329.8kHz)  Figure 4: Frequency of 3rd Measured Drive (329.6kHz)

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	frequency, wherein an oscillator voltage is greater than a supply voltage;  Figure 10: Drive Oscillator Voltage (6.20V) vs Supply Voltage (5.10V)

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	• a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a closely spaced array of input touch terminals of a keypad,



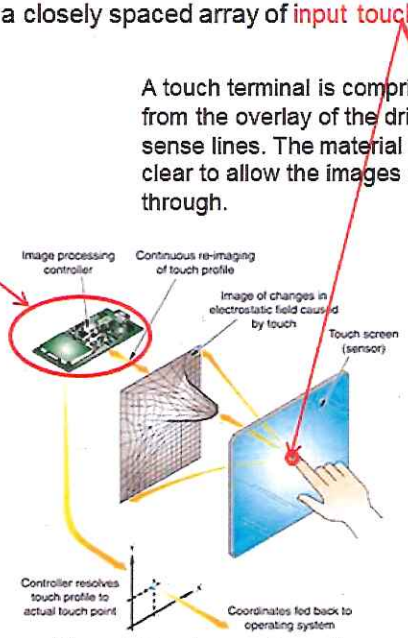


Figure 6: Touchscreen Operation

Figure 7: Touch Terminals

The Samsung touchscreen having touch terminals (comprised of a grid pattern resulting from the overlay of the drive lines over the capacitive sense lines) form a keypad visible on the touchscreen, at least when the device displays the a keypad on the touchscreen for use in inputting letters, numbers, or symbols. Should Samsung contend that the Samsung touchscreen is not literally a keyboard, then Nartron contends that the Samsung touchscreen meets the keyboard limitation under the doctrine of equivalents, i.e., the differences between a keypad and the Samsung touchscreen are insubstantial and/or the Samsung touchscreen performs substantially the same function (providing a means for a user to input information into a computing device using his or her fingers) in substantially the same way (fingers touching an area(s) of a screen vs. depressing a key) to achieve

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
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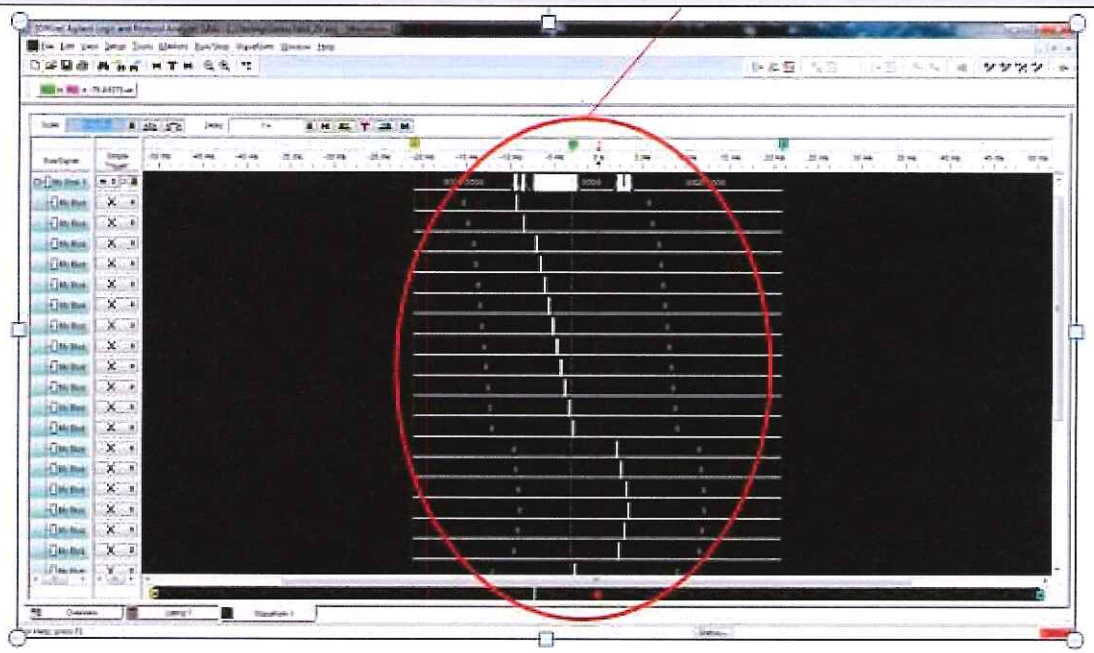
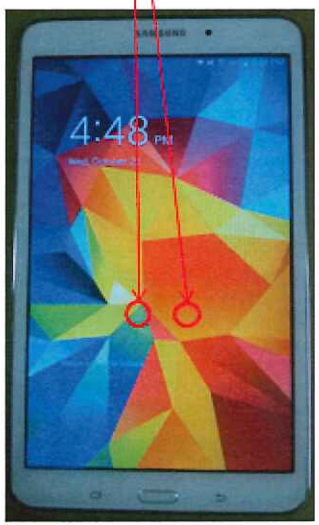
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	substantially the same result (input information to a computing device). "[S]electively providing signal output frequencies" is shown in the diagrams below: 

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	• the first and second input touch terminals defining areas for an operator to provide an input by proximity and touch; and 

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
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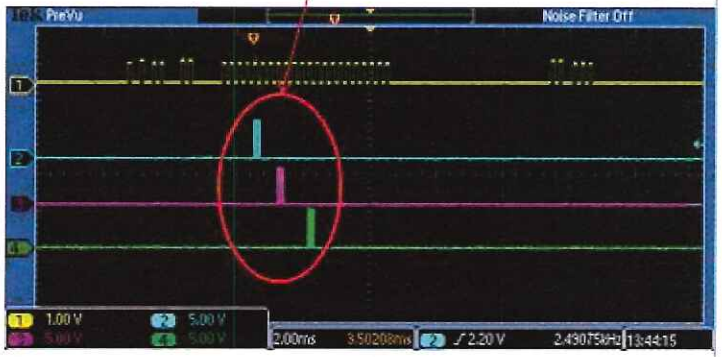
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	• a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said first and second touch terminals, said detector circuit being responsive to signals from said oscillator via said microcontroller and a presence of an operator's body capacitance to ground coupled to said first and second touch terminals when proximal or touched by the operator to provide a control output signal for actuation of the controlled keypad device, Figure 12 shows the periodic output signal for processing touch. Response to the touch is seen in Video 1 on Slide 3.  Figure 12: Periodic Output Signal Testing confirms that the touch controller receives signals from the oscillator, and responds to a capacitance touch of the screen to provide a control output signal for actuation of the controlled device. Testing further confirms that the controller generates an output signal when a user touches a second touch terminal of the touch screen after the user touches a first touch terminal. When a user performs a capacitive touch, the microcontroller may respond with a visual or audio indication in the form of, e.g., changing the page the user is looking at or by highlighting the icon of the application to be opened. The indication can also be physical in form, e.g., vibrations. This demonstrates that the Accused Devices contain electronic circuits that respond to a capacitive touch.

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
84. The capacitive responsive electronic switching circuit as defined in claim 83, wherein the detector circuit is configured to inhibit the control output signal unless the operator is proximal or touches said second touch terminal after the operator is proximal or touches said first touch terminal.	The detector circuit is responsive to the operator's body capacitance to ground. The detector circuit generates a control output signal when the operator touches a first touch terminal and then touches a second touch terminal. For example, this may be shown through the "swipe screen to unlock" process. When the user touches the screen, the finger creates a capacitive connection on a single terminal. When the user then slides the finger to the second terminal, the detector circuit registers the touch from first to second terminals to unlock the phone, changing the page at which the user is looking. Conversely, the detector circuit is configured to inhibit the control output signals when the operator is not proximal to or does not touch said second touch terminal. In the example above, the screen may not unlock unless the operator is proximal to or touches the second touch terminal.
85. The capacitive responsive electronic switching circuit as defined in claim 83, wherein the signal output frequencies have a same Hertz value.	The testing described above confirms that each output frequency has the same Hertz value.

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
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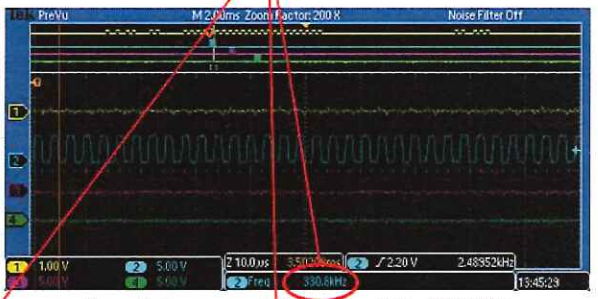
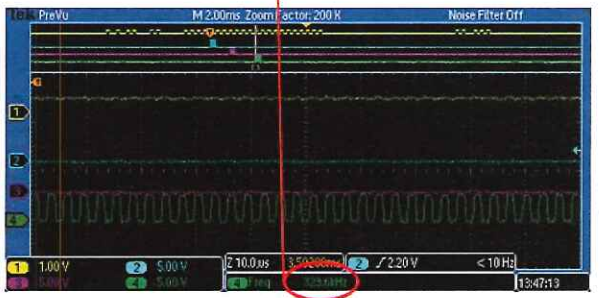
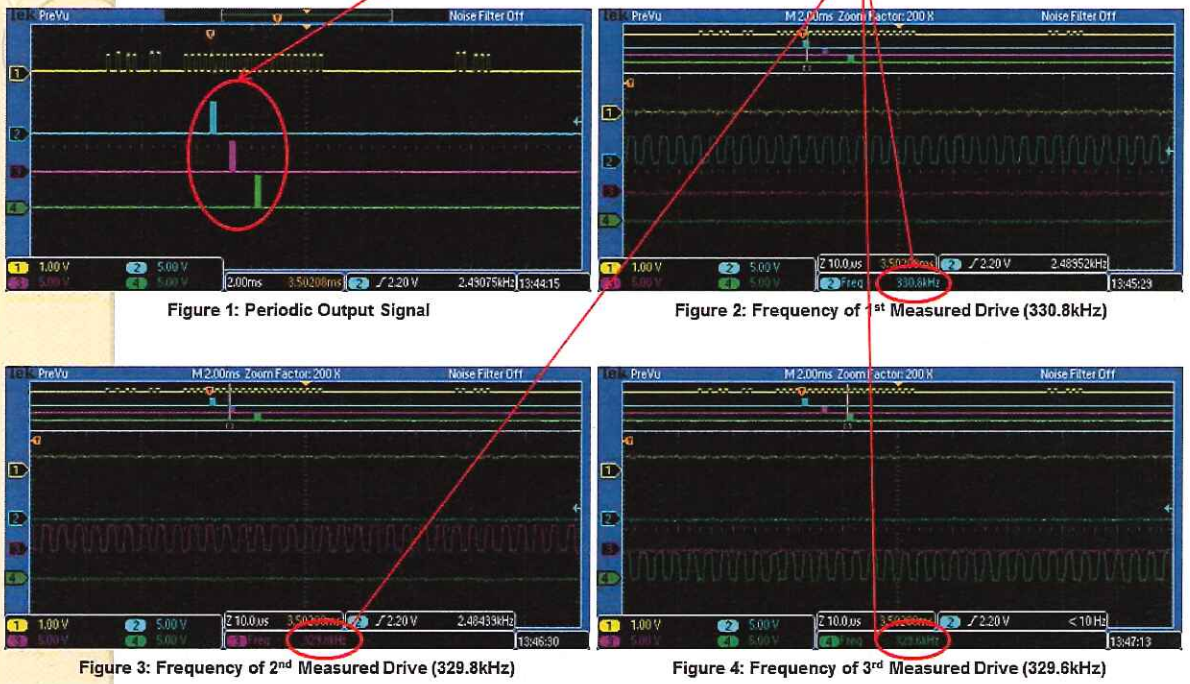
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

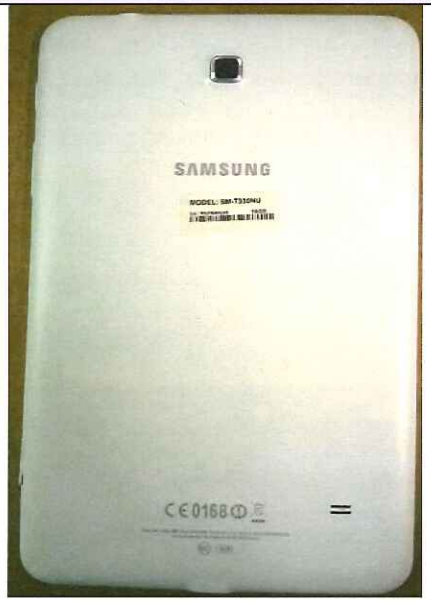
Claim Language	*Accused Product*
	an oscillator providing a periodic output signal having a predefined frequency;  Figure 1: Periodic Output Signal  Figure 2: Frequency of 1st Measured Drive (330.8kHz)  Figure 3: Frequency of 2nd Measured Drive (329.8kHz)  Figure 4: Frequency of 3rd Measured Drive (329.6kHz)
88. The capacitive responsive electronic switching circuit as defined in claim 86, wherein the plurality of Hertz values comprises Hertz values greater	The testing described above confirms that the plurality of Hertz values are greater than 100kHz.

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
than 100kHz.	an oscillator providing a periodic output signal having a predefined frequency;  Figure 1: Periodic Output Signal Figure 2: Frequency of 1st Measured Drive (330.8kHz) Figure 3: Frequency of 2nd Measured Drive (329.8kHz) Figure 4: Frequency of 3rd Measured Drive (329.6kHz)
90. The capacitive responsive electronic switching circuit as defined in claim 83, wherein the supply voltage is a battery supply voltage.	Public documents show the supply voltage of the Accused Devices can be a battery supply voltage. For example,

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	Battery* Battery Type And Size 3.8 Volt, Lithium-Ion, 4450mAh (http://www.samsung.com/us/support/owners/product/SM-T330NDWAXAR.)
91. The capacitive responsive electronic switching circuit as defined in claim 83, wherein the supply voltage is a voltage regulator supply voltage.	Public documents show the Accused Devices may include, e.g., AC adapters, which use voltage regulators to regulate the supply voltage provided to the Accused Device.
94. A capacitive responsive electronic switching circuit for a controlled keypad device comprising: an oscillator providing a periodic output signal having a predefined frequency; a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a closely	The Accused Devices each contain a touchscreen interface operated though a touch controller, e.g., the Melfas-200 Series Touch Controller ("microcontroller"), as confirmed through tear down and testing.

Claim Language	*Accused Product*
spaced array of input touch terminals of a keypad, wherein the selectively providing comprises the microcontroller selectively providing a signal output frequency to each row of the closely spaced array of input touch terminals of the keypad, the input touch terminals comprising first and second input touch terminals, and wherein a peak voltage of the signal output frequencies is greater than a supply voltage; the first and second input touch terminals defining areas for an operator to provide an input by proximity and touch; and a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said first and second touch terminals, said detector circuit being responsive to signals from said oscillator via said microcontroller and a presence of an operator's body capacitance to ground	

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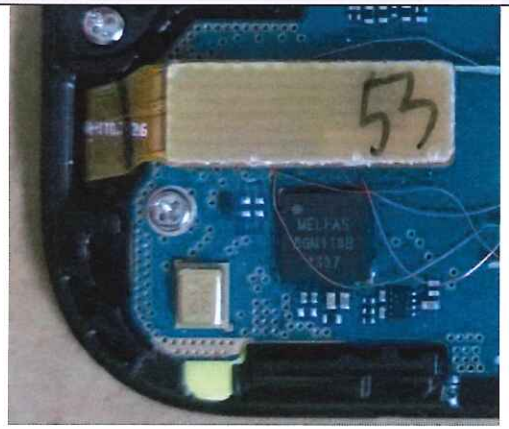
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
coupled to said first and second touch terminals when proximal or touched by the operator to provide a control output signal for actuation of the controlled keypad device, said detector circuit being configured to generate said control output signal when the operator is proximal or touches said second touch terminal after the operator is proximal or touches said first touch terminal.	 Publicly available data sheets for the Melfas-200 Series Touch Controller show an oscillator. The presence of an oscillator providing periodic output signals was confirmed through testing. In addition, all oscillators have a predefined frequency. To confirm, testing was conducted on the Accused Devices, which was accomplished as follows: Microprobes were used on the sensing IC as shown in photographs below of the testing set-up:

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Claim Language	*Accused Product*
	  

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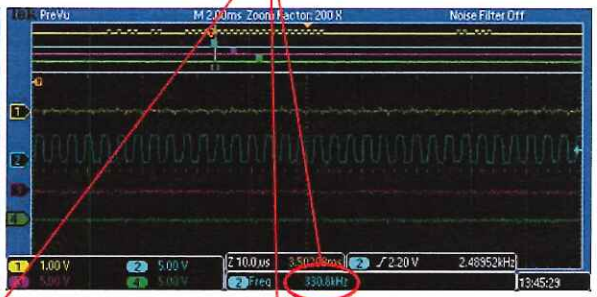
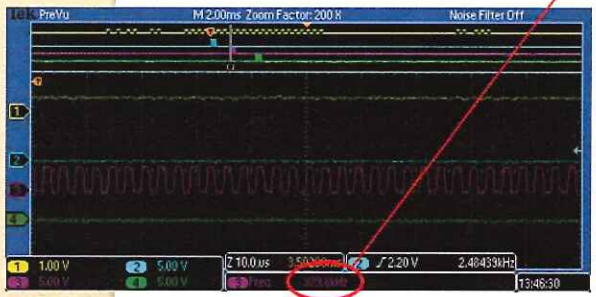
Claim Language	*Accused Product*
	Testing confirms the presence of each limitation as shown in the diagrams below: an oscillator providing a periodic output signal having a predefined frequency;  Figure 1: Periodic Output Signal  Figure 2: Frequency of 1st Measured Drive (330.8kHz)  Figure 3: Frequency of 2nd Measured Drive (329.8kHz)  Figure 4: Frequency of 3rd Measured Drive (329.6kHz)

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Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
	frequency, wherein an oscillator voltage is greater than a supply voltage;  Figure 10: Drive Oscillator Voltage (6.20V) vs Supply Voltage (5.10V)

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
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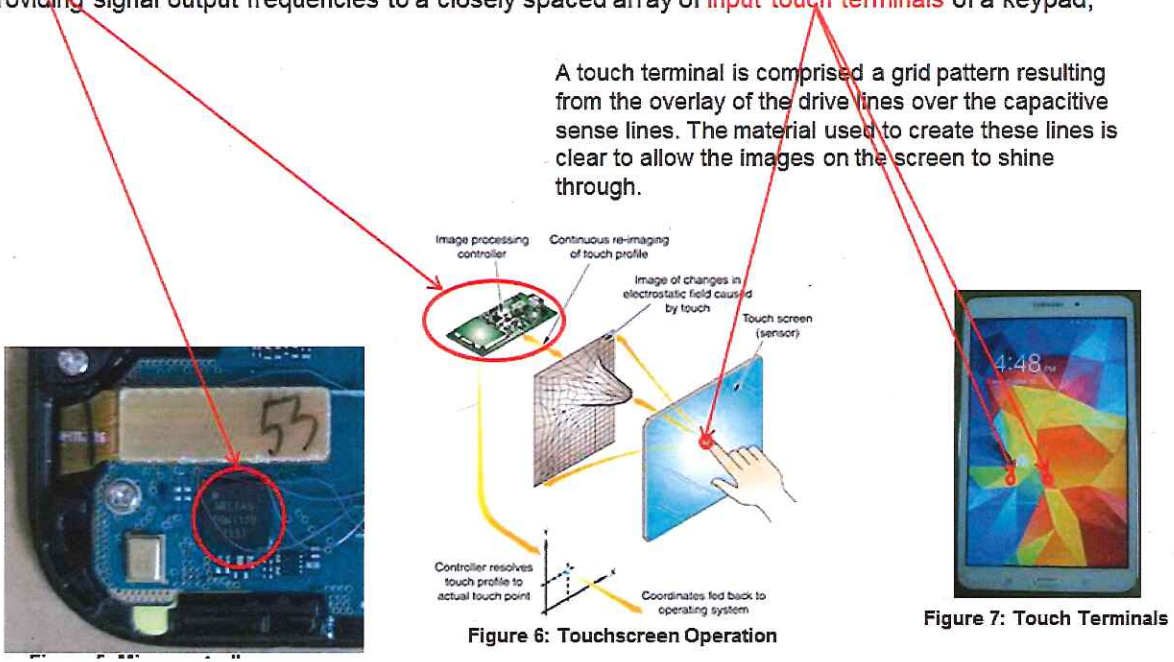
Claim Language	*Accused Product*
	• a microcontroller using the periodic output signal from the oscillator, the microcontroller selectively providing signal output frequencies to a closely spaced array of input touch terminals of a keypad,  Figure 6: Touchscreen Operation Figure 7: Touch Terminals The Samsung touchscreen having touch terminals (comprised of a grid pattern resulting from the overlay of the drive lines over the capacitive sense lines) form a keypad visible on the touchscreen, at least when the device displays the a keypad on the touchscreen for use in inputting letters, numbers, or symbols. Should Samsung contend that the Samsung touchscreen is not literally a keyboard, then Nartron contends that the Samsung touchscreen meets the keyboard limitation under the doctrine of equivalents, i.e., the differences between a keypad and the Samsung touchscreen are insubstantial and/or the Samsung touchscreen performs substantially the same function (providing a means for a user to input information into a computing device using his or her fingers) in substantially the same way (fingers touching an area(s) of a screen vs. depressing a key) to achieve

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Claim Language	*Accused Product*
	substantially the same result (input information to a computing device). "[S]electively providing signal output frequencies" is shown in the diagrams below: 

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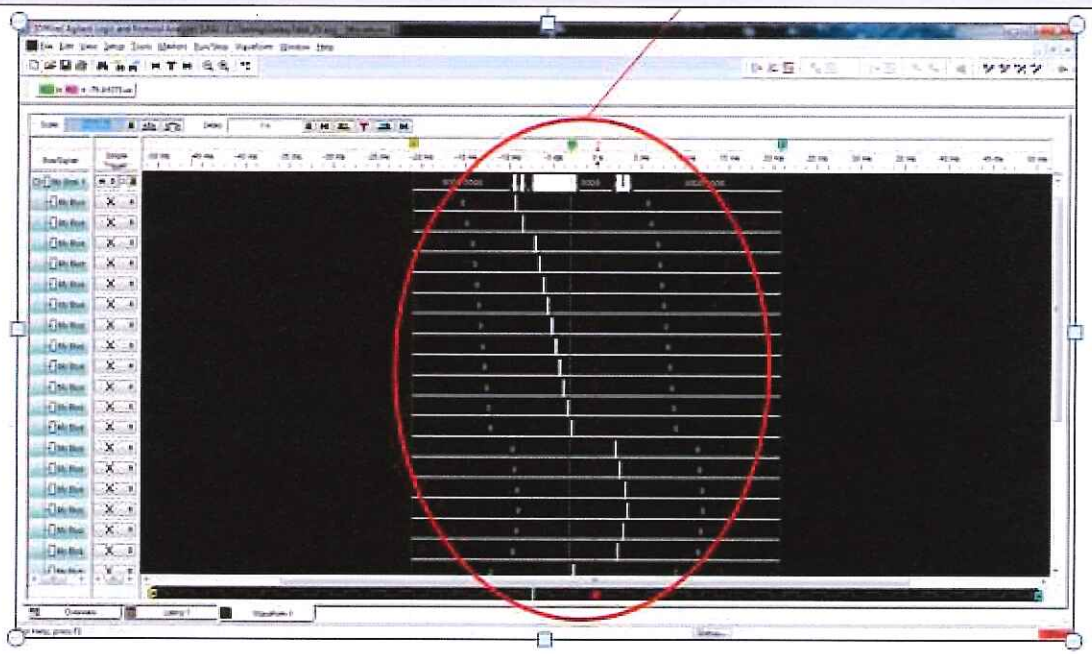
Claim Language	*Accused Product*
	

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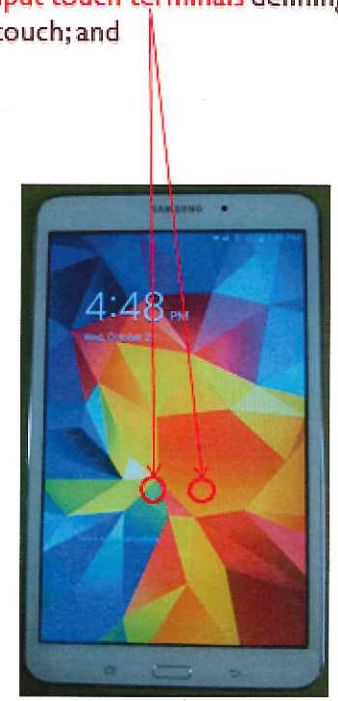
Claim Language	*Accused Product*
	• the first and second input touch terminals defining areas for an operator to provide an input by proximity and touch; and 

Claim Language	*Accused Product*
	• a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said first and second touch terminals, said detector circuit being responsive to signals from said oscillator via said microcontroller and a presence of an operator's body capacitance to ground coupled to said first and second touch terminals when proximal or touched by the operator to provide a control output signal for actuation of the controlled keypad device,

Figure 12 shows the periodic output signal for processing touch. Response to the touch is seen in Video 1 on Slide 3.

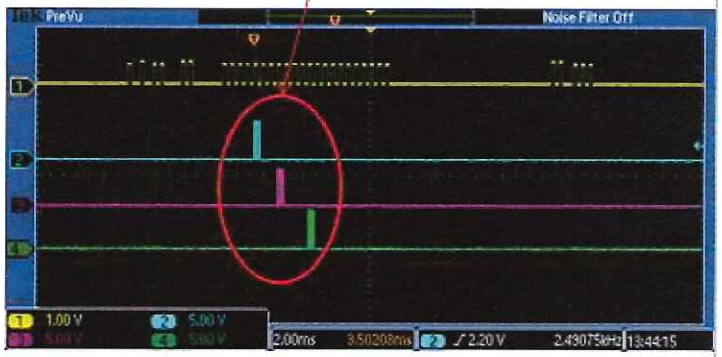
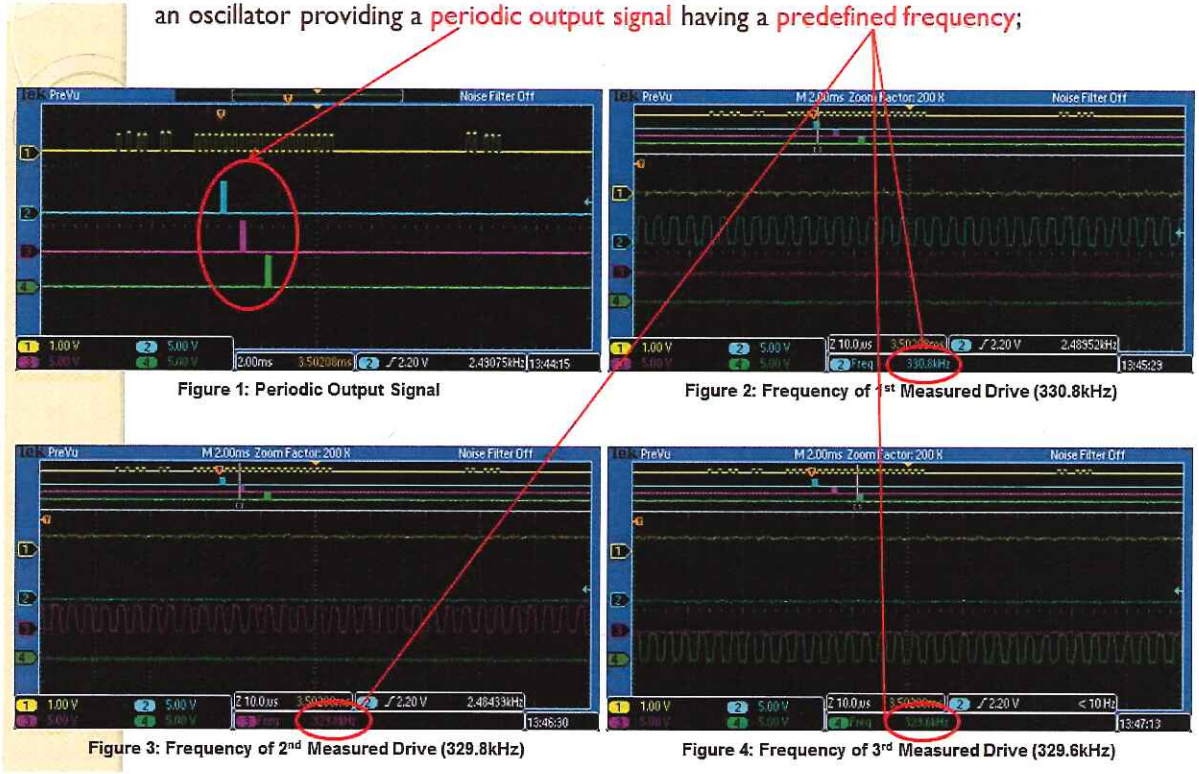


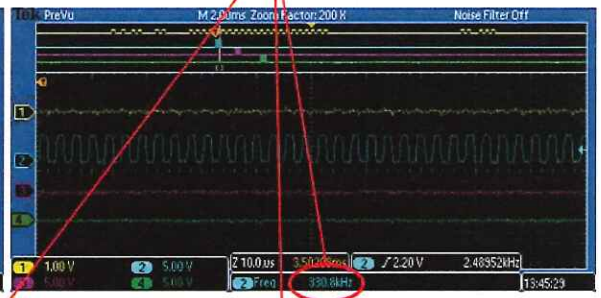
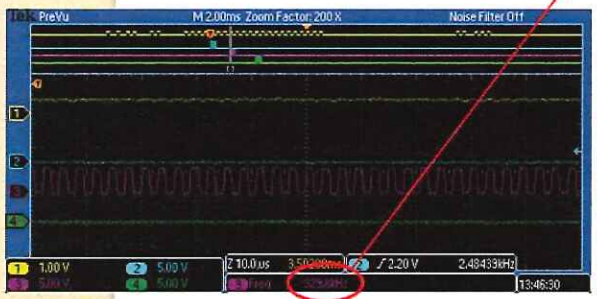
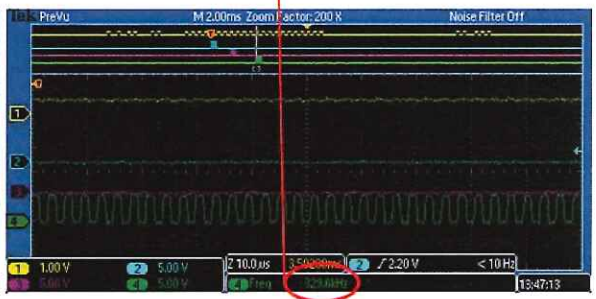
Figure 12: Periodic Output Signal

Testing confirms that the touch controller receives signals from the oscillator, and responds to a capacitance touch of the screen to provide a control output signal for actuation of the controlled device. Testing further confirms that the controller generates an output signal when a user touches a second touch terminal of the touch screen after the user touches a first touch terminal.

When a user performs a capacitive touch, the microcontroller may respond with a visual or audio indication in the form of, e.g., changing the page the user is looking at or by highlighting the icon of the application to be opened. The indication can also be physical in form, e.g., vibrations. This demonstrates that the Accused Devices contain electronic circuits that respond to a capacitive touch.

UUSI, LLC D/B/A Nartron v. Samsung Elecs. Co., Ltd. and Samsung Elecs. Am., Inc.
Case No. 1:15-cv-00146-JTN (W.D. Mich.)
U.S. Patent No. 5,796,183 C1 and C2
Nartron's Response to Samsung's Interrogatory No. 16

Claim Language	*Accused Product*
96. The capacitive responsive electronic switching circuit as defined in claim 94, wherein each signal output frequency selectively provided to each row of the closely spaced array of input touch terminals of the keypad has a same Hertz value.	The testing described above confirms that each output frequency has the same Hertz value.  Figure 1: Periodic Output Signal Figure 2: Frequency of 1st Measured Drive (330.8kHz) Figure 3: Frequency of 2nd Measured Drive (329.8kHz) Figure 4: Frequency of 3rd Measured Drive (329.6kHz)
97. The capacitive responsive electronic switching circuit as defined in claim 94, wherein each signal output frequency	Nartron currently believes, based on the publicly-available information disclosed herein, and testing, that each signal output frequency selectively provided to each row of the plurality of small sized input touch terminals of the keypad is selected from a plurality of Hertz values. This was confirmed during testing by observing the output frequencies during start up. When the device is powered up, the scans through different frequencies and

Claim Language	*Accused Product*
selectively provided to each row of the plurality of small sized input touch terminals of the keypad is selected from a plurality of Hertz values. 99. The capacitive responsive electronic switching circuit as defined in claim 97, wherein the plurality of Hertz values comprises Hertz values greater than 100kHz.	then selects one frequency as the output frequency. The testing described above confirms that the plurality of Hertz values are greater than 100kHz. an oscillator providing a periodic output signal having a predefined frequency;  Figure 1: Periodic Output Signal  Figure 2: Frequency of 1st Measured Drive (330.8kHz)  Figure 3: Frequency of 2nd Measured Drive (329.8kHz)  Figure 4: Frequency of 3rd Measured Drive (329.6kHz)

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Claim Language	*Accused Product*
101. The capacitive responsive electronic switching circuit as defined in claim 94, wherein the supply voltage is a battery supply voltage.	Public documents show the supply voltage of the Accused Devices can be a battery supply voltage. For example, **Battery*** Battery Type And Size — 3.8 Volt, Lithium-Ion, 4450mAh (http://www.samsung.com/us/support/owners/product/SM-T330NDWAXAR.)
102. The capacitive responsive electronic switching circuit as defined in claim 94, wherein the supply voltage is a voltage regulator supply voltage.	Public documents show the Accused Devices may include, e.g., AC adapters, which use voltage regulators to regulate the supply voltage provided to the Accused Device.