

Facet Technology Corp. v. Mobileye Global, Inc., Case No. 2:24-cv-00058-RWS-RSP
Plaintiff's Preliminary Infringement Contention Claim Chart for U.S. Patent No. 9,335,255

Plaintiff Facet Technology Corp. (“Facet” or “Plaintiff”) presently contends that Defendant Mobileye Global, Inc. (“Mobileye” or “Defendant”) infringes Claims 12-15, 17 (the “Asserted Claims”) of U.S. Patent No. 9,355,255 (“’255 Patent”) directly and indirectly. This chart sets forth Plaintiff’s preliminary infringement contentions relating to the Asserted Claims and the Accused Instrumentalities. Exemplary Accused Instrumentalities are referenced here, and they are listed in Plaintiff’s Disclosure of Preliminary Infringement Contentions with as much specificity as possible. In general terms, the Accused Instrumentalities are Mobileye’s Lane Departure Warning (“LDW”) Technologies such as Mobileye EyeQ3 and Mobileye EyeQ4 Systems-on-Chip (SOCs) implemented into various vehicle manufacturer’s vehicles. To the extent that other of Mobileye’s products and services include/integrate functionality described below, Plaintiff intends to include those products/applications within the scope of Accused Instrumentalities. The Accused Instrumentalities encompass any predecessor or successor product or service or unnamed related product or service that includes the functionality described below. Plaintiff intends to include within the scope of the Accused Instrumentalities all other of Mobileye’s systems, services, software, and products that provide substantially identical functionality or services to those detailed in this infringement claim chart.

These contentions articulate the structures and acts that constitute direct infringement of the ’255 Patent and identify specifically where each element of each asserted claim is found within each Accused Instrumentality. Exemplary references to publicly available descriptions of Mobileye’s product and service information are provided where appropriate. Exemplary references to specific Accused Instrumentalities are not intended and should not be read to exclude Accused Instrumentalities not specifically identified. As discovery proceeds, these contentions and the specific components identified here as meeting certain claim elements or performing certain claim steps may change in view of claim construction and additional information made available to Plaintiff.

The Mobileye processing platforms for road marker detection are described in U.S. Patent No. 8,254,635 (the “’635 Patent”) and U.S. Patent No. 7,566,851 (the “’851 Patent”), which are referenced below. The ’635 Patent has an EFD on October 5, 2009, was published on July 8, 2010 and issued on August 28, 2012. The ’851 Patent has an EFD on March 24, 2006, was published on September 27, 2007 and issued on July 28, 2009. These patents are referenced and relied upon to provide supportive descriptions for Mobileye functionality.

Additional information, in particular source code, executable software, software specifications, training materials, and functional design documents are expected to provide further details about the implementation of accused functionality and specific information upon which Plaintiff will rely in proving infringement. Plaintiff will supplement these preliminary infringement contentions after receiving access to that information and may supplement or amend in light of the Court’s claim constructions.

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'255 Asserted Claims	Where each element is found within each Accused Instrumentality
Claim 12. An automated method of assessing reflective surfaces disposed along a roadway comprising:	Plaintiff contends the preamble is not limiting because it describes a purpose or intended use of the claimed subject matter. In the event the preamble is found to impose a meaningful limitation on the scope of the claim, the Accused Instrumentalities perform the claimed method. The Accused Instrumentalities provide a method for assessing reflective surfaces disposed along a roadway and are implemented by more than 50 vehicle manufacturers. https://www.mobileye.com/technology/eyeq-chip/ Mobileye describes the system operation on its website and in videos.

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'255 Asserted Claims	Where each element is found within each Accused Instrumentality
	 Lane Departure Warning (LDW) Home > technology > Lane Departure Warning  Why We Need It A large proportion of crash fatalities and serious injuries are caused by run-off-road crashes, which typically start with unintended lane departure. In fact, 60% of road accident fatalities are due to unintentional lane departure.  How It Works The system sends a visual and audio alert when there is a lane deviation without signaling. https://ims.mobileye.com/fleets/us/technology/lane-departure-warning/

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	LANE DEPARTURE WARNINGS (LDW) The LDW provides an alert when the vehicle unintentionally departs from the driving lane. An unintentional departure is defined by departing from the driving lane without using the turn signals. If the turn signals are used when changing lanes, an alert is not generated. • Active when driving 35 mph or faster. • Issues a series of short, sharp beeps • Displays the corresponding lane that has been crossed.  The LDW will not issue alerts when: • Lanes are unmarked or poorly marked. • The speed of the vehicle is less than 35 mph. • The appropriate turn signal is activated.

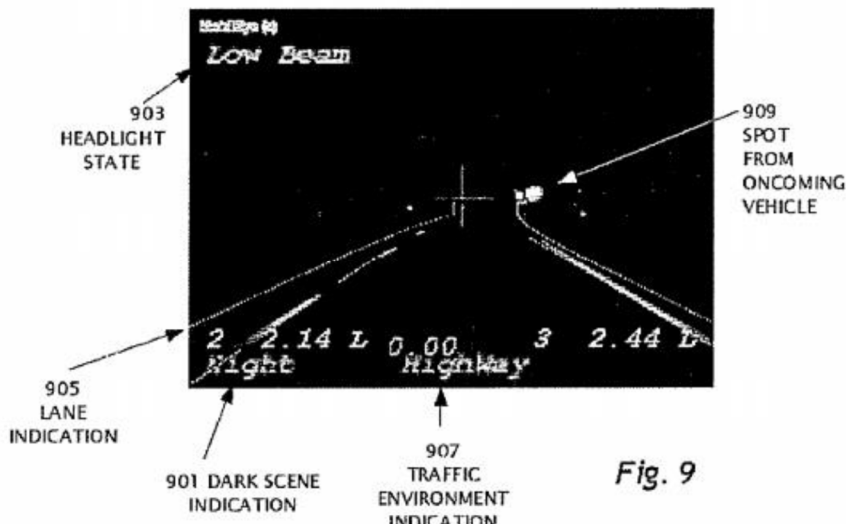
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	https://www.munichre.com/content/dam/munichre/contentlounge/website-pieces/documents/Munich-Re-FAQ_0518.pdf/_jcr_content/renditions/original.media_file.download_attachment.file/Munich-Re-FAQ_0518.pdf  LDW FAQs: <i>When does the Mobileye LDW initiate?</i> The LDW is only active when driving 35 mph or faster. The LDW provides an alert when the vehicle unintentionally departs from the driving lane. An unintentional departure is defined by departing from the driving lane without using the turn signals. If the turn signals are used when changing lanes, an alert is not generated. <i>Does Mobileye keep displaying the LDW until I fully travel into a new lane?</i> No, the EyeWatch Display holds the warning for a second or two, but it does not sustain the warning until you are completely in the new lane. However, this could appear to happen based on the speed of travel. The EyeWatch will turn off the warning if you activate the turn signal or after a few seconds. <i>Id.</i>

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'255 Asserted Claims	Where each element is found within each Accused Instrumentality
	Overall, below is depicted Mobileyes LDW system, as implemented in a GM vehicle, which infringes at least Claim 12, as evidenced herein:  1 Forward-facing Camera Module 2 LDW/LKS Electronic Control Unit (ECU) 3 Headlamp ECU 4 Headlamps 5 Connection between lighting system and sensing system Observation Angle for locating and assessing retroreflective pavement markers
12(a). activating a light source as the light source is traversed along a roadway to illuminate an area that includes at least one reflective surface on a road marker, the road marker	The Accused Instrumentalities perform “activating a light source as the light source is traversed along a roadway to illuminate an area that includes at least one reflective surface on a road marker, the road marker having a reflective characteristic.” The operation of Mobileye’s lane detection system used in GM LKA/LDW systems when operated at night was shown during Mobileye’s CES 2020 presentation. (Mobileye CES 2020 presentation slides, available at:

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having a reflective characteristic;	https://dl1io3yog0oux5.cloudfront.net/_c76321f1f4db2603fa6259cf9d8961f3/intel/db/861/7795/pdf/Mobileye-CES-2020-presentation.pdf FIG. 9 of the '851 Patent assigned to Mobileye depicts a monitor output of a lane departure warning system and a vehicle control system at night while the vehicle's headlights are in a low beam state:  Fig. 9 The Mobileye system relies on headlights to function properly at night as described in the '851 Patent: “In well lit road scenes, headlights are always set (step 23) to low beam. However, at night with a dark road scene, headlight control sets (step 23) to high beam or low beam depending on the presence oncoming and/or preceding vehicles or streetlights.” ('851 Patent, col 7, ll. 44-48). The '851 Patent further discusses the dependence of the Mobileye system on headlights for dark scenes: “In method 30, when a dark scene is detected (step 301), e.g. at night without sufficient lighting method 30 is used to control headlights (step 23). Otherwise, the scene is ‘lit’ and the headlights are switched to a low beam state.” ('851 Patent, col. 8, ll. 3-6).

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	The '635 Patent assigned to Mobileye includes a discussion of the night mode of operation implementing a headlight control algorithm: "In 'Night Mode' the automatic high beam control (AHC) algorithm is active and the gain and exposure settings for the automatic high beam control (AHC) image frame 3 are set by the automatic high beam control (AHC) algorithm." ('635 Patent, col. 13, ll. 17-20). The '635 Patent includes disclosure of different camera configurations for day operation and night-mode operation: "The camera parameter of the second portion of the image frames is set substantially differently between day mode operation during the day and night-mode operation during the night. Optionally the camera parameter of the second portion is set substantially differently during dusk for dusk-mode operation than during the day-mode operation and/or the camera parameter of the second portion is set substantially differently during dusk for dusk-mode operation than during the night-mode operation." ('635 Patent, col. 5, ll. 35-43). The '635 Patent also includes a discussion of the dusk mode of operation: "The typical dusk scene has the following characteristics: Scene is sort of lit (day like). The AHC function is not active and the AHC frame slot image frame 3 may be controlled by the traffic sign recognition algorithm. Cars are switching on lights LED duty cycle changes. If we are in 'Dusk Mode', as determined by the LDW frame exposure (decision box 220 in FIG. 2 c) the TSR frame (image frame 2) settings are adjusted using the AGC day algorithm. This is a typical scenario where we will have to deal with low light from in front." ('635 Patent, col. 16, ll. 54-64). This claim element is met in whole or in part by software and Defendant has not yet produced any of its documents or source code. Plaintiff reserves the right to amend or supplement this contention after claim construction and after it has had sufficient time to inspect Defendant's documents and to inspect the source code for the Accused Instrumentalities.
12(b). determining a plurality of light intensity values with at least one intensity sensor directed to cover a field of view which	The Accused Instrumentalities perform "determining a plurality of light intensity values with at least one intensity sensor directed to cover a field of view which includes at least a portion of the area illuminated by the light source."

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includes at least a portion of the area illuminated by the light source; and;	The ’851 Patent assigned to Mobileye discusses an image sensor traversed along a roadway: “According to the present invention there is provided a method in a computerized system including an image sensor mounted in a moving vehicle. The image sensor captures image frames consecutively in real time. In one of the image frames, a spot is detected of measurable brightness; the spot is matched in subsequent image frames.” (’851 Patent, col. 3, ll. 36-41). This claim element is met in whole or in part by software and Defendant has not yet produced any of its documents or source code. Plaintiff reserves the right to amend or supplement this contention after claim construction and after it has had sufficient time to inspect Defendant’s documents and to inspect the source code for the Accused Instrumentalities.
12(c). using a computer processing system configured to:	The Accused Instrumentalities perform “using a computer processing system.” The ’635 Patent describes Mobileye’s driver assistance system: “According to an embodiment of the present invention there is provided a driver assistance system including an image sensor including multiple picture elements (pixels). An image processor connects to the image sensor. The image processor is adapted for receiving image frames from the image sensor. The image sensor and the image processor are adapted for mounting on a vehicle.” (’635 Patent, col. 6, ll. 38-44). This claim element is met in whole or in part by software and Defendant has not yet produced any of its documents or source code. Plaintiff reserves the right to amend or supplement this contention after claim construction and after it has had sufficient time to inspect Defendant’s documents and to inspect the source code for the Accused Instrumentalities.
12(d). identify a portion of at least one light intensity value of the plurality of light intensity values associated with one of the at least one reflective	The Accused Instrumentalities “identify a portion of at least one light intensity value of the plurality of light intensity values associated with one of the at least one reflective surface of the road marker.” The ’851 Patent describes Mobileye’s use classification of light sources, such as road markers: “A spot imaged from a light source, for example a spot 43 as image of a streetlight appears different or has a different texture than a spot 45 as image of a reflection of a traffic sign. The spot from a light source typically has fuzzy edges and a bright center (almost Gaussian in cross section). Spot 45 image of a traffic sign at medium

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surface of the road marker; and	distance has typically sharper edges and uniform appearance inside. A classifier trained on examples of light sources and traffic signs can produce correct classification rates with confidence above 85%.” (’851 Patent, col. 9, ll. 14-22). This claim element is met in whole or in part by software and Defendant has not yet produced any of its documents or source code. Plaintiff reserves the right to amend or supplement this contention after claim construction and after it has had sufficient time to inspect Defendant’s documents and to inspect the source code for the Accused Instrumentalities.
12(e). analyze the portion of the at least one light intensity value of the plurality of light intensity values to determine an assessment for the reflective characteristic of the road marker.	The Accused Instrumentalities “analyze the portion of the at least one light intensity value of the plurality of light intensity values to determine an assessment for the reflective characteristic of the road marker.” The ’635 Patent discloses assessing road markers based on color information: “Color information could also be used for classifying lane marking types (white, yellow, orange and blue are typical some examples). In fact, without color information, some lane mark color and road surface configurations make the lane marks invisible or with very low contrast when imaged in monochrome.” (’635 Patent, col. 17, ll. 56-60). This claim element is met in whole or in part by software and Defendant has not yet produced any of its documents or source code. Plaintiff reserves the right to amend or supplement this contention after claim construction and after it has had sufficient time to inspect Defendant’s documents and to inspect the source code for the Accused Instrumentalities.
Claim 13. The automated method of claim 12, wherein activating a light source comprises synchronizing activation of a plurality of light sources to optimize light intensity reflected from the road marker.	See Claim 12 above. The Accused Instrumentalities perform “activating a light source comprises synchronizing activation of a plurality of light sources to optimize light intensity reflected from the road marker.” FIG. 9 of the ’851 Patent assigned to Mobileye depicts a monitor output of a lane departure warning system and a vehicle control system at night while the vehicle’s headlights are in a low beam state:

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	The Mobileye system relies on headlights to function properly at night as described in the '851 Patent: “In well lit road scenes, headlights are always set (step 23) to low beam. However, at night with a dark road scene, headlight control sets (step 23) to high beam or low beam depending on the presence oncoming and/or preceding vehicles or streetlights.” ('851 Patent, col 7, ll. 44-48). The '851 Patent further discusses the dependence of the Mobileye system on headlights for dark scenes: “In method 30, when a dark scene is detected (step 301), e.g. at night without sufficient lighting method 30 is used to control headlights (step 23). Otherwise, the scene is ‘lit’ and the headlights are switched to a low beam state.” ('851 Patent, col. 8, ll. 3-6). The '635 Patent assigned to Mobileye includes a discussion of the night mode of operation implementing a headlight control algorithm: “In ‘Night Mode’ the automatic high beam control (AHC) algorithm is active and the gain and exposure settings for the automatic high beam control (AHC) image frame 3 are set by the automatic high beam control (AHC) algorithm.” ('635 Patent, col. 13, ll. 17-20).

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	The '635 Patent includes disclosure of different camera configurations for day operation and night-mode operation: “The camera parameter of the second portion of the image frames is set substantially differently between day mode operation during the day and night-mode operation during the night. Optionally the camera parameter of the second portion is set substantially differently during dusk for dusk-mode operation than during the day-mode operation and/or the camera parameter of the second portion is set substantially differently during dusk for dusk-mode operation than during the night-mode operation.” ('635 Patent, col. 5, ll. 35-43). The '635 Patent also includes a discussion of the dusk mode of operation: “The typical dusk scene has the following characteristics: Scene is sort of lit (day like). The AHC function is not active and the AHC frame slot image frame 3 may be controlled by the traffic sign recognition algorithm. Cars are switching on lights LED duty cycle changes. If we are in ‘Dusk Mode’, as determined by the LDW frame exposure (decision box 220 in FIG. 2 c) the TSR frame (image frame 2) settings are adjusted using the AGC day algorithm. This is a typical scenario where we will have to deal with low light from in front.” ('635 Patent, col. 16, ll. 54-64). This claim element is met in whole or in part by software and Defendant has not yet produced any of its documents or source code. Plaintiff reserves the right to amend or supplement this contention after claim construction and after it has had sufficient time to inspect Defendant’s documents and to inspect the source code for the Accused Instrumentalities.
Claim 14. The automated method of claim 12, wherein activating a light source comprises activating a single light source.	See Claim 12 above. The Accused Instrumentalities perform “activating a light source comprises activating a single light source.” The operation of Mobileye’s lane detection system used in GM LKA/LDW systems when operated at night was shown during Mobileye’s CES 2020 presentation. (Mobileye CES 2020 presentation slides, available at: https://dl.io3yog0oux5.cloudfront.net/_c76321f1f4db2603fa6259cf9d8961f3/intel/db/861/7795/pdf/Mobileye-CES-2020-presentation.pdf)

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	FIG. 9 of the '851 Patent assigned to Mobileye depicts a monitor output of a lane departure warning system and a vehicle control system at night while the vehicle's headlights are in a low beam state: Fig. 9 The Mobileye system relies on headlights to function properly at night as described in the '851 Patent: “In well lit road scenes, headlights are always set (step 23) to low beam. However, at night with a dark road scene, headlight control sets (step 23) to high beam or low beam depending on the presence oncoming and/or preceding vehicles or streetlights.” ('851 Patent, col 7, ll. 44-48). The '851 Patent further discusses the dependence of the Mobileye system on headlights for dark scenes: “In method 30, when a dark scene is detected (step 301), e.g. at night without sufficient lighting method 30 is used to control headlights (step 23). Otherwise, the scene is ‘lit’ and the headlights are switched to a low beam state.” ('851 Patent, col. 8, ll. 3-6). The '635 Patent assigned to Mobileye includes a discussion of the night mode of operation implementing a headlight control algorithm: “In ‘Night Mode’ the automatic high beam control (AHC) algorithm is active and

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	the gain and exposure settings for the automatic high beam control (AHC) image frame 3 are set by the automatic high beam control (AHC) algorithm.” (’635 Patent, col. 13, ll. 17-20). The ’635 Patent includes disclosure of different camera configurations for day operation and night-mode operation: “The camera parameter of the second portion of the image frames is set substantially differently between day mode operation during the day and night-mode operation during the night. Optionally the camera parameter of the second portion is set substantially differently during dusk for dusk-mode operation than during the day-mode operation and/or the camera parameter of the second portion is set substantially differently during dusk for dusk-mode operation than during the night-mode operation.” (’635 Patent, col. 5, ll. 35-43). The ’635 Patent also includes a discussion of the dusk mode of operation: “The typical dusk scene has the following characteristics: Scene is sort of lit (day like). The AHC function is not active and the AHC frame slot image frame 3 may be controlled by the traffic sign recognition algorithm. Cars are switching on lights LED duty cycle changes. If we are in ‘Dusk Mode’, as determined by the LDW frame exposure (decision box 220 in FIG. 2 c) the TSR frame (image frame 2) settings are adjusted using the AGC day algorithm. This is a typical scenario where we will have to deal with low light from in front.” (’635 Patent, col. 16, ll. 54-64). This claim element is met in whole or in part by software and Defendant has not yet produced any of its documents or source code. Plaintiff reserves the right to amend or supplement this contention after claim construction and after it has had sufficient time to inspect Defendant’s documents and to inspect the source code for the Accused Instrumentalities.
Claim 15. The automated method of claim 12, further comprising determining a luminance value utilizing the plurality of light intensity values and a characterization profile of	See Claim 12 above. The Accused Instrumentalities perform “determining a luminance value utilizing the plurality of light intensity values and a characterization profile of the at least one light intensity sensor.” The ’635 Patent discloses determining luminance values based on light values compared against a histogram (e.g., a characterization profile) of collected data from sensors. The ’635 Patent discloses “[t]o detect the particular situation of bright roads due to low sun, histograms of the two small regions ‘A’ and ‘B’ are

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the at least one light intensity sensor.	compared to the histogram of the road region C. If the low sun is behind, then the image above the horizon is bright. If the low sun is in front, then the image above the horizon is dark. The actual comparison is done by running an SVM classifier on the 32 bin histogram values of the 3 regions together with the exposure and gain settings of the current image, the average brightness of the pixels above the regions A, B and C and the average brightness of the pixels below the region C.” ('635 Patent, col. 14, ll. 39-49). This claim element is met in whole or in part by software and Defendant has not yet produced any of its documents or source code. Plaintiff reserves the right to amend or supplement this contention after claim construction and after it has had sufficient time to inspect Defendant's documents and to inspect the source code for the Accused Instrumentalities.
Claim 17. An automated system for assessing reflective surfaces disposed along a roadway comprising:	Plaintiff contends the preamble is not limiting because it describes a purpose or intended use of the claimed subject matter. In the event the preamble is found to impose a meaningful limitation on the scope of the claim, the Accused Instrumentalities contain the accused system.

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	The image is a blue rectangular advertisement for Mobileye's EyeQ™ System-on-Chip. It features the 'EyeQ™' logo in white at the top left. Below it, the text 'The System-on-Chip for Automotive Applications' is written in white. At the bottom, a paragraph in white text states: 'Mobileye's proven leadership is based on our EyeQ™ System-on-Chip. More than 50 vehicle manufacturers have chosen EyeQ™ for its ability to support complex and computationally intense vision tasks, while meeting optimal, ambitious power-performance-cost targets.' https://www.mobileye.com/technology/eyeq-chip/ Mobileye describes the system operation on its website and in videos.

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	 Lane Departure Warning (LDW) Home > Technology > Lane Departure Warning  Why We Need It A large proportion of crash fatalities and serious injuries are caused by run-off-road crashes, which typically start with unintended lane departure. In fact, 60% of road accident fatalities are due to unintentional lane departure.  How It Works The system sends a visual and audio alert when there is a lane deviation without signaling. https://ims.mobileye.com/fleets/us/technology/lane-departure-warning/

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	LANE DEPARTURE WARNINGS (LDW) The LDW provides an alert when the vehicle unintentionally departs from the driving lane. An unintentional departure is defined by departing from the driving lane without using the turn signals. If the turn signals are used when changing lanes, an alert is not generated. • Active when driving 35 mph or faster. • Issues a series of short, sharp beeps • Displays the corresponding lane that has been crossed.  The LDW will not issue alerts when: • Lanes are unmarked or poorly marked. • The speed of the vehicle is less than 35 mph. • The appropriate turn signal is activated.

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	https://www.munichre.com/content/dam/munichre/contentlounge/website-pieces/documents/Munich-Re-FAQ_0518.pdf/_jcr_content/renditions/original.media_file.download_attachment.file/Munich-Re-FAQ_0518.pdf  LDW FAQs: <i>When does the Mobileye LDW initiate?</i> The LDW is only active when driving 35 mph or faster. The LDW provides an alert when the vehicle unintentionally departs from the driving lane. An unintentional departure is defined by departing from the driving lane without using the turn signals. If the turn signals are used when changing lanes, an alert is not generated. <i>Does Mobileye keep displaying the LDW until I fully travel into a new lane?</i> No, the EyeWatch Display holds the warning for a second or two, but it does not sustain the warning until you are completely in the new lane. However, this could appear to happen based on the speed of travel. The EyeWatch will turn off the warning if you activate the turn signal or after a few seconds. <i>Id.</i>

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	Overall, below is depicted Mobileyes LDW system, as implemented in a GM vehicle, which infringes at least Claim 12, as evidenced herein:  1 Forward-facing Camera Module 2 LDW/LKS Electronic Control Unit (ECU) 3 Headlamp ECU 4 Headlamps 5 Connection between lighting system and sensing system Observation Angle for locating and assessing retroreflective pavement markers
17(a). a light source that is traversed along a roadway to illuminate an area that includes at least one reflective surface on a road marker, the road marker	See Claim 12(a) above. This claim element is met in whole or in part by software and Defendant has not yet produced any of its documents or source code. Plaintiff reserves the right to amend or supplement this contention after claim construction and after it has had sufficient time to inspect Defendant's documents and to inspect the source code for the Accused Instrumentalities.

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having a reflective characteristic;	
17(b). means for determining a plurality of light intensity values directed to cover a field of view which includes at least a portion of the area illuminated by the light source; and	See Claim 12(b) above. This claim element is met in whole or in part by software and Defendant has not yet produced any of its documents or source code. Plaintiff reserves the right to amend or supplement this contention after claim construction and after it has had sufficient time to inspect Defendant's documents and to inspect the source code for the Accused Instrumentalities.
17(c). a computer processing system configured to:	See Claim 12(c) above. This claim element is met in whole or in part by software and Defendant has not yet produced any of its documents or source code. Plaintiff reserves the right to amend or supplement this contention after claim construction and after it has had sufficient time to inspect Defendant's documents and to inspect the source code for the Accused Instrumentalities.
17(d). identify a portion of at least one light intensity value of the plurality of light intensity values associated with one of the at least one reflective surface of the road marker; and	See Claim 12(d) above. This claim element is met in whole or in part by software and Defendant has not yet produced any of its documents or source code. Plaintiff reserves the right to amend or supplement this contention after claim construction and after it has had sufficient time to inspect Defendant's documents and to inspect the source code for the Accused Instrumentalities.
17(e). analyze the portion of the at least one light intensity value of the plurality of light intensity values to determine an assessment for the	See Claim 12(e) above. This claim element is met in whole or in part by software and Defendant has not yet produced any of its documents or source code. Plaintiff reserves the right to amend or supplement this contention after claim construction and after it has had sufficient time to inspect Defendant's documents and to inspect the source code for the Accused Instrumentalities.

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reflective characteristic of the road marker.	