

09-6-4

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Radio Frequency Signals Testing Summary		
Application	Symbol	Results/Comments
FM	⊙	• No significant affect
Cellular Phone	⊙	• Increase the cellular signal path losses by 1.3 dB to 1.8 dB • Large network of towers would result in negligible impact
TPMS	⊙	• No significant affect
Garage Door Opener	⊙	• Range reduced by about 30% under the sun visor position. • No Significant affect for the center console location • No impact for home link system with transmitter in other area
RKE	⊙	• Range reduced by about 5% to 10% on average. • Impact only occurs when signal comes directly from the front.
GPS	⊙	• Antenna gain reduced about -0.5 dB to -2.0 dB • IP mount requires much larger FSS window than glass mount
Solar Performance	⊙	• Deletion results in a 0.7 percentage point reduction in the overall windshield Total Solar Energy Reflected • over 5 times more effective at reflecting solar energy than green windshield.

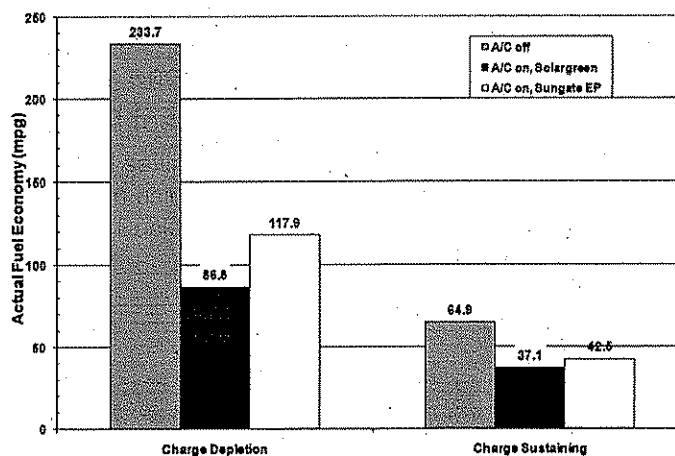
Testing conducted on a current vehicle with no modification to installed devices, with standard deletions for all but the GPS antenna location

Manufacturing Readiness	
<ul style="list-style-type: none"> <li>• Sungate has been commercial for 20 years</li> <li>• Sungate EP is ready               <ul style="list-style-type: none"> <li>- Samples produced at manufacturing plant</li> <li>- Small volumes can be produced today</li> <li>- Cost-effectiveness requires further investment</li> </ul> </li> <li>• Coated glass can be sold to other glass makers               <ul style="list-style-type: none"> <li>- Currently happens in architectural market</li> <li>- Uncoated glass traded in automotive market</li> <li>- Sungate and Sungate EP are both available</li> </ul> </li> <li>• Manufacturing capacity exists or can be added               <ul style="list-style-type: none"> <li>- Current market has excess capacity</li> <li>- For 2014, capacity can be added</li> </ul> </li> </ul>	

## Future Technologies

- Heat load in vehicle is independent of drive train technology
- Heat in the cabin has to be removed
- Lower heat coming in → less heat to remove → less energy used
- Recent testing on PHEV confirms value
  - Fuel savings of > 6 mpg on PHEV in city cycle, when using AC with Sungate EP on Windshield and Backlite

## Heat Load Reduction Impact on PHEV



Actual Fuel Economy, City Drive Cycle