GLOBALFOUNDRIES v. TSMC et al

Fact Sheet

Plaintiffs (2):
- GLOBALFOUNDRIES US Inc. (U.S. cases)
- GLOBALFOUNDRIES Dresden Module One Limited Liability Company & Co. KG (German cases)

Defendants (20):
- Foundry: Taiwan Semiconductor Manufacturing Company Ltd. (TSMC)
- Fabless chip designers: Apple, Broadcom, Mediatek, nVidia, Qualcomm, Xilinx
- Electronic component distributors: Avnet/EBV, Digi-key, Mouser
- Consumer product: Arista, ASUS, BLU, Cisco, Google, HiSense, Lenovo, Motorola, TCL, OnePlus

GF Patents in the cases (16):
The technologies at issue relate to the advanced semiconductor devices and methods of manufacturing those devices.

See table on next page for details.

Accused Infringing Technologies (5):
- TSMC 7nm, 10nm, 12nm, 16nm, 28nm

Courts/Tribunals (5) and Complaints (25)
- U.S. International Trade Commission (“ITC”) – 2 complaints (i.e. lawsuits)
- U.S. District Court for the District of Delaware – 6 complaints
- U.S. District Court for the Western District of Texas – 13 complaints
- Regional Court of Mannheim (“Landgericht Mannheim”) – 2 complaints
- Regional Court of Düsseldorf (“Landgericht Düsseldorf”) – 2 complaints

see pp. 3-4 for details
<table>
<thead>
<tr>
<th>Patent No.</th>
<th>Title</th>
<th>Inventors</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 8,823,178</td>
<td>Bit Cell With Double Patterned Metal Layer Structures</td>
<td>Juhan Kim, Mahbub Rashed</td>
</tr>
<tr>
<td>US 8,581,348</td>
<td>Semiconductor device with transistor local interconnects</td>
<td>Mahbub Rashed, Steven Soss, Jongwook Kye, Irene Y. Lin, James Benjamin Gulle, Chinh Nguyen, Jeff Kim, Marc Tarabbi, Yuansheng Ma, Yunfei Deng, Rod Augur, Seung-Hyun Rhee, Scott Johnson, Subramani Kengeri, Suresh Venkatesan</td>
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<tr>
<td>US 9,355,910</td>
<td>Semiconductor device with transistor local interconnects</td>
<td>Mahbub Rashed, Irene Y. Lin, Steven Soss, Jeff Kim, Chinh Nguyen, Marc Tarabbi, Scott Johnson, Subramani Kengeri, Suresh Venkatesan</td>
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<tr>
<td>US 7,425,497</td>
<td>Introduction of metal impurity to change workfunction of conductive electrodes</td>
<td>Michael P. Chudzik, Bruce B. Doris, Supratik Guha, Rajaro Jammy, Vijay Narayanan, Vamsi K. Paruchuri, Yun Y. Wang, Keith Kwong Hon Wong</td>
</tr>
<tr>
<td>US 8,598,633</td>
<td>Semiconductor device having contact layer providing electrical connections</td>
<td>Marc Tarabbi, James B. Gulle, Mahbub Rashed, David S. Doman, Irene Y. Lin, Ingolf Lorenz, Larry Ho, Chinh Nguyen, Jeff Kim, Jongwook Kye, Yuansheng Ma, Yunfei Deng, Rod Augur, Seung-Hyun Rhee, Jason E. Stephens, Scott Johnson, Subramani Kengeri, Suresh Venkatesan</td>
</tr>
<tr>
<td>US 6,518,167</td>
<td>Method of forming a metal or metal nitride interface layer between silicon nitride and copper</td>
<td>Lu You, Matthew S. Buynoski, Paul R. Besser, Jeremias D. Romero, Pin-Chun, Connie Wang, Minh Q. Tran</td>
</tr>
<tr>
<td>US 8,039,966</td>
<td>Structures of and methods and tools for forming in-situ metallic/dielectric caps for interconnects</td>
<td>Chih-Chao Yang, Chao-Kun Hu</td>
</tr>
<tr>
<td>US 7,750,418</td>
<td>Introduction of metal impurity to change workfunction of conductive electrodes</td>
<td>Michael P. Chudzik, Bruce B. Doris, Supratik Guha, Rajaro Jammy, Vijay Narayanan, Vamsi K. Paruchuri, Yun Y. Wang, Keith Kwong Hon Wong</td>
</tr>
<tr>
<td>US 8,936,986</td>
<td>Methods of forming finfet devices with a shared gate structure</td>
<td>Andy C. Wei, Dae Geun Yang</td>
</tr>
<tr>
<td>US 8,912,603</td>
<td>Semiconductor device with stressed fin sections</td>
<td>Scott Laning, Frank Scott Johnson</td>
</tr>
<tr>
<td>US 7,378,357</td>
<td>Multiple dielectric FinFET structure and method</td>
<td>William F. Clark, Jr., Edward J. Nowak</td>
</tr>
<tr>
<td>US 9,105,643</td>
<td>Bit cell with double patterned metal layer structures</td>
<td>Juhan Kim, Mahbub Rashed</td>
</tr>
<tr>
<td>US 9,082,877</td>
<td>Complementary metal oxide semiconductor (CMOS) device having gate structures connected by a metal gate conductor</td>
<td>Yue Liang, Dureseti Chidambaram, Brian J. Greene, William K. Henson, Unoh Kwon, Shreesh Narasimha, and Xiaojun Yu</td>
</tr>
<tr>
<td>DE 102011002769</td>
<td>Hybrid contact structure with low aspect ratio contacts in a semiconductor device</td>
<td>Kai Frohberg, Ralf Richter</td>
</tr>
<tr>
<td>DE 102011004320</td>
<td>Complementary transistors comprising high-k metal gate electrode structures and epitaxially formed semiconductor materials in the drain and source areas</td>
<td>Gunda Beernink, Markus Lenski</td>
</tr>
<tr>
<td>DE 102012219375</td>
<td>Semiconductor device with transistor local interconnects</td>
<td>Mahbub Rashed, Irene Y. Lin, Steven Soss, Jeff Kim, Chinh Nguyen, Marc Tarabbi, Scott Johnson, Subramani Kengeri, Suresh Venkatesan</td>
</tr>
</tbody>
</table>
Complete List of Complaints to be Filed Monday August 26

ITC #1
- Complaint against TSMC, Mediatek, Qualcomm, Xilinx, Avent, Digi-key, Mouser, TCL, HiSense, Google, Motorola, BLU, OnePLus asserting ‘603 Luning, ‘418 Chudzik, and ‘986 Wei primarily directed to 7nm and 16nm

ITC #2
- Complaint against TSMC, Apple, Broadcom, nVidia, Cisco, Arista, Lenovo, ASUS asserting ‘178 Kim, ‘643 Kim, ‘357 Clark, and ‘877 Liang directed to 7nm, 10nm, 12nm, 16nm, 28nm

Western District of Texas (13)
Asserting the same patents asserted in the ITC
- Complaint against TSMC, MediaTek, Hisense on ‘603 Luning, ‘418 Chudzik, and ‘986 Wei primarily directed to 16nm
- Complaint against TSMC, Qualcomm, OnePlus on ‘603 Luning primarily directed to 7nm
- Complaint against Avnet on ‘603 Luning, ‘418 Chudzik, and ‘986 Wei primarily directed to 16nm
- Complaint against Google on ‘603 Luning and ‘986 Wei primarily directed to 16nm
- Complaint against TSMC, and Apple, ‘178 Kim, ‘643 Kim, ‘357 Clark, and ‘877 Liang, primarily directed to 7nm, 10nm, 16nm
- Complaint against TSMC, Broadcom, and Arista, ‘178 Kim, ‘643 Kim, ‘357 Clark, and ‘877 Liang, primarily directed to 16nm
- Complaint against TSMC, NVIDIA, and Lenovo, ‘178 Kim, ‘643 Kim, ‘357 Clark, and ‘877 Liang, primarily directed to 12nm
- Complaint against TSMC, NVIDIA, and Asus, ‘178 Kim, ‘643 Kim, ‘357 Clark, and ‘877 Liang, primarily directed to 16nm
- Complaint against TSMC and Cisco, ‘178 Kim, ‘643 Kim, ‘357 Clark, and ‘877 Liang, primarily directed to 16nm

Asserting different patents than those patents asserted in the ITC
- Complaint against TSMC, Qualcomm, OnePlus on ‘910 Rashed, primarily directed to 7nm

District of Delaware (6)
Asserting the same patents asserted in the ITC
- Complaint against Xilinx, Mouser on ‘603 Luning, ‘418 Chudzik, and ‘986 Wei primarily directed to 16nm
- Complaint against TCL on ‘418 Chudzik primarily directed to 28nm
- Complaint against Motorola on ‘603 Luning primarily directed to 7nm

Asserting different patents than those patents asserted in the ITC

August 25, 2019
- Complaint against TCL on ’497 Chudzik primarily directed to 28nm
- Complaint against Motorola on ’910 Rashed, primarily directed to 7nm

**Dusseldorf (2):**

- Complaint against Apple Inc. on the 3 German patents
- Complaint against Qualcomm Inc. on the 3 German patents

**Mannheim (2):**

- Complaint against Apple Retail Germany BV & Co KG (runs the Apple stores in Germany) on the 3 German patents
- Complaint against EBV Electronics GmbH & Co KG (Avnet subsidiary) on 2 German patents