



# **120Hz Display Display Technology for Motion Deblurring**

**MediaTek White Paper  
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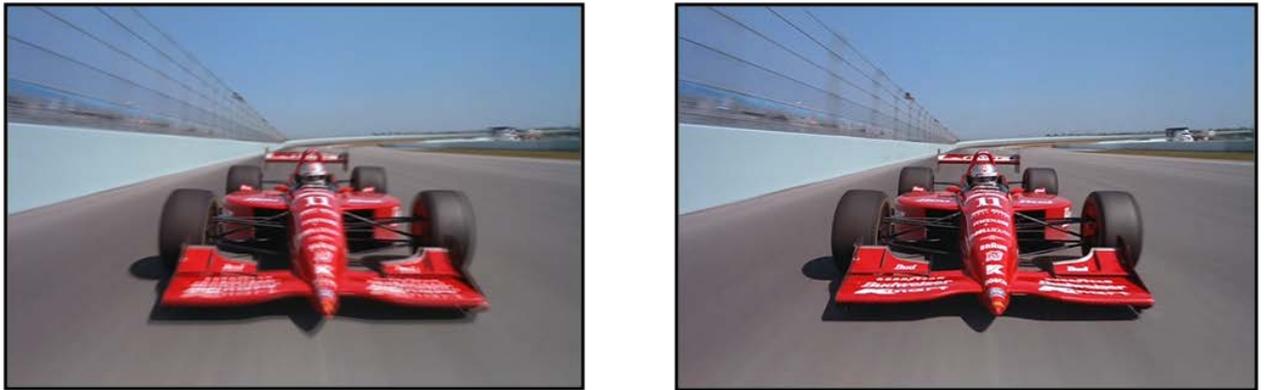
## Worldwide First Mobile 120Hz Display Technology

MediaTek believes display quality—excellent motion clearness and fast touch responsiveness—significantly enhances user experience. To provide perfect user experience, MediaTek unveiled the first worldwide mobile 120Hz display solution for mobile devices, using 120Hz refresh rate to display 120 frames-per-second (fps) generated by MediaTek's platform.

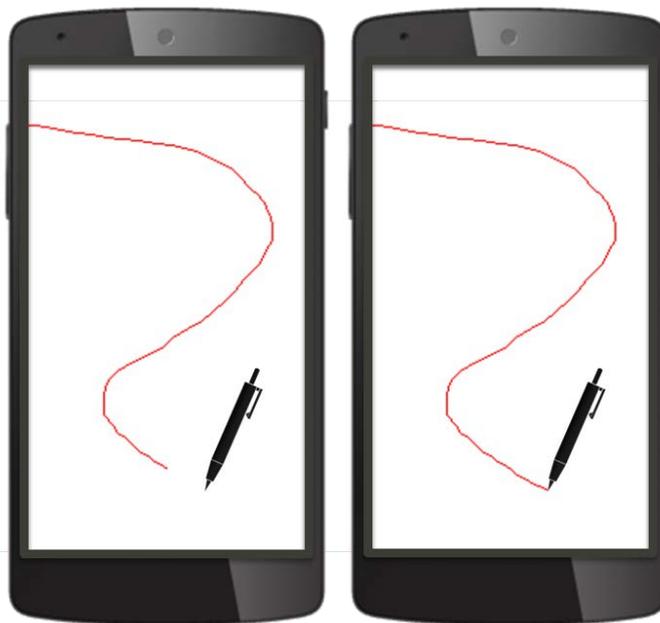
The 120Hz display improves motion clearness, especially on web browsing, video playback and 3D gaming scenarios. In the Video playback scenario, MediaTek also applies 120Hz **ClearMotion™** for frame rate conversion. ClearMotion technology eliminates motion jitter and ensures smooth video playback. 120Hz display also shortens the response time which can also increasing user experience. The images below demonstrate these features.



**Figure 1. Motion Deblurring : Traditional 60Hz vs. MediaTek 120Hz**



**Figure 2. 60Hz vs. 120Hz ClearMotion**



**Figure 3. Response time of 60Hz vs. 120Hz**

## **Solutions**

MediaTek applies many world leading multimedia technologies to achieve 120Hz display in mobile devices. We also bring premium functions, such as overdrive for motion deblurring and ClearMotion for frame rate conversion, from TV to mobile devices. In video playback scenarios, ClearMotion technology compensates the video source to 120fps to make the video motion smoother.

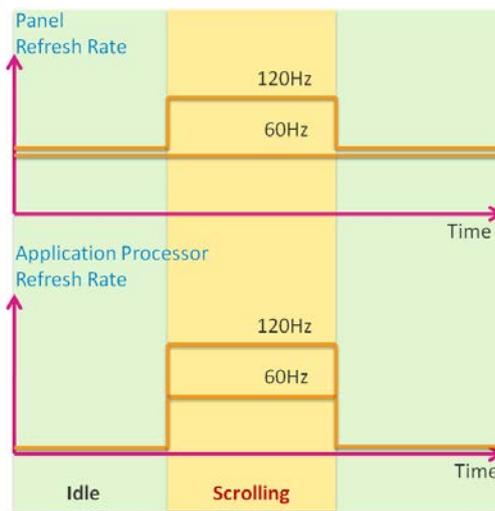
We apply **SmartSwitch™** to optimize power consumption by automatically switching proper refresh rate depends on current scenarios, that makes the refresh rate keeps 120Hz only when scenarios are 120Hz-related, otherwise are switched back to 60Hz.

**Worldwide First Hardware Overdrive**

120Hz eliminates motion blur artifacts by doubling the refresh rate. To speed up the LCD pixel transitions, we apply overdrive function to meet the transition requirement by using higher voltage on the pixels. MediaTek is the first AP to apply hardware overdrive, which allows LCD pixel transition time meet 120Hz requirement.

**SmartSwitch Technology**

For power saving, 120Hz display applies SmartSwitch technology to reduce power consumption. SmartSwitch dynamically switches display refresh rate between 60Hz and 120Hz, depending on user scenarios. For example, SmartSwitch automatically detects and switches refresh rate to 120Hz in 120Hz-related scenarios such as web browsing, video playback or 3D gaming, but switches back to 60Hz in non-120Hz-related scenarios such as idle, phone calls or camera capture scenarios.



**Figure 4. SmartSwitch**

**System-wide 120Hz Signal**

The MediaTek 120Hz technology generates real systemwide 120Hz vsync signal. This also shortens the response time from generating a new frame to updating on the display panel.

**Leadership in Display Technology**

MediaTek 120Hz display has achieved several world-leading records:

- The first 120Hz Displays on Smartphones/Tablets
- The first 120Hz MEMC Frame Rate Compression on Smartphones/Tablets (ClearMotion)
- The first overdrive Hardware on Smartphones/Tablets
- The first scenario-based switch refresh rate (SmartSwitch)

## Conclusion

MediaTek is the worldwide first company which brings 120Hz display technology to mobile product. MediaTek's product lines equipped with 120Hz display including TV, Smartphones, Tablets, and more to come. 120Hz technology has excellent quality with motion deblurring and response time which brings better multimedia user experience. MediaTek will keep striving for excellence in display viewing experience.

