



Beijing Choice chooses ADI *iCoupler* digital isolators vs. optocouplers for integrated power and signal isolation within its ultracompact patient monitors

Beijing Choice, one of the largest manufacturers of medical devices in China, is renowned for the quality, precision, and reliability of its portable patient monitors. Used in over 10,000 hospitals and clinics around the world today, the company's full-featured MMED6000DP series of patient monitors equip medical professionals with the flexibility to monitor patients in medical facilities and in the field with ease and precision, thereby enabling timely, highly informed patient care decisions, regardless of the patient setting.



Beijing Choice's MMED6000DP-M7 patient monitor.

Having previously relied on optocouplers for digital isolation within these systems, Beijing Choice's design team sought an alternative digital isolator solution that would enable them to overcome the performance, integration complexity, size, and cost constraints imposed by conventional optocouplers. Furthermore, the new isolation solution platform would need to provide up to 5 kV isolation—well beyond the 1 kV to 2.5 kV isolation commonly required by this class of medical device—to ensure the highest possible safety and reliability.

Utilizing ADI *iCoupler*® digital isolators with integrated dc-to-dc converters, Beijing Choice's designers were equipped to achieve up to a 4× improvement in data rate and timing specifications while simultaneously shrinking the form factor of its patient monitors. *iCoupler* devices forego the LEDs and photodiodes used in traditional



optocouplers and, instead, utilize high speed CMOS and monolithic air core transformer technologies to dramatically reduce component count, design complexity, and cost.

The ADI digital isolators selected by Beijing Choice feature ADI's advanced *isoPower*® technology, an extension of ADI's *iCoupler* technology, which seamlessly integrates power supply isolation with digital signal isolation. Designed to enable power transfer across an isolation barrier using microtransformers, the combination of *iCoupler* and *isoPower* technologies enables both signal and power to be integrated into a single tiny surface-mount package with isolation up to 5 kV—perfectly optimized to accommodate Beijing Choice's patient monitors. By eliminating the need for separate, isolated dc-to-dc converters, Beijing Choice's designers further reduced component count to free up board space for high value components that underpin the patient monitors' rich set of high precision monitoring capabilities spanning pulse oximetry, electrocardiography (ECG), non-invasive blood pressure (NIBP) measurement, and beyond.

“The combination of ADI's advanced *iCoupler* and *isoPower* technologies afforded us an optimal isolation platform that conventional optocouplers simply can't match.”

Feng Xu, Chief Engineer, Beijing Choice