

# NanoCycler

## One-Stop NAND Characterization

### Fully Scalable Affordable Task-Optimized Equipment

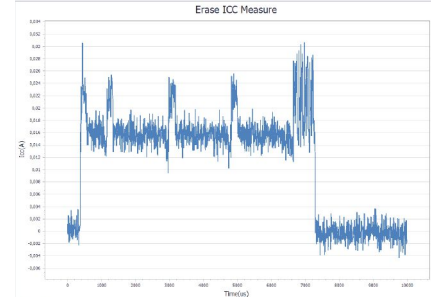
#### Test per Package



- Per-socket test flow and temperature
  - Accurate and fast thermal control
- Scalable architecture (1..84 sockets)
  - Networking with central database

#### Datasheet Validation

- At-speed (up to 2.4GT/sec) operation
- ONFI 5 support
- Timing shoo and measurements
- Power profiling



#### Fast Introduction and Learning



- Easy and flexible programming (Python or C++)
- ONFI command library plus complex test operations
- Flexibility to implement vendor-specific commands
  - Native connection to data analysis

## Fast Track to Your SSD

# flexibility, performance, best cost of ownership to understand NAND and optimize your SSD

Feature	STD800	HS16	HS24
Protocols	<ul style="list-style-type: none"> <li>NV-SDR, NV-DDR, NV-DDR2, NV-DDR3</li> <li>NV-LPDDR4 (HS24 only, from Q1/2023)</li> </ul>		
Package	<ul style="list-style-type: none"> <li>BGA132/152</li> </ul>		<ul style="list-style-type: none"> <li>BGA132/152</li> <li>BGA154</li> </ul>
Max Transfer Rate Timing Modes	<ul style="list-style-type: none"> <li>800 MT/sec</li> <li>TM 0 - 10</li> </ul>	<ul style="list-style-type: none"> <li>1.6 GT/sec</li> <li>TM 0 - 15</li> </ul>	<ul style="list-style-type: none"> <li>2.4 GT/sec</li> <li>TM 0 - 19</li> </ul>
Pattern Generator	<ul style="list-style-type: none"> <li>High quality pseudo-random</li> <li>Zero overhead</li> <li>User pattern from file</li> </ul>		
Data Collection	<ul style="list-style-type: none"> <li>Zero overhead fail bit counter per chunk or per page</li> <li>Separated 0-&gt;1 and 1-&gt;0 fail capture</li> <li>Full bitmap upload to PC disk</li> </ul>		
Timing Analyzer	<ul style="list-style-type: none"> <li>1 usec signal capture</li> </ul>	<ul style="list-style-type: none"> <li>1 nsec edge placement</li> <li>20 nsec signal capture</li> </ul>	
Voltages	<ul style="list-style-type: none"> <li>Jumper selectable level</li> <li>Programmable on/off</li> </ul>	<ul style="list-style-type: none"> <li>Programmable level</li> <li>Programmable on/off</li> <li>Vccq: 0.95V .. 1.9V, 1000mA</li> <li>Vcc: 1.0V .. 3.8V, 500mA</li> <li>Vpp: 10V .. 14V, 100mA</li> </ul>	
Current Measurement	<ul style="list-style-type: none"> <li>shunt resistors for external probe</li> </ul>	<ul style="list-style-type: none"> <li>Waveform capture</li> <li>Peak and average capture</li> <li>2k sample buffer</li> <li>Hardware averaging</li> <li>50 nsec sampling</li> <li>1mA resolution</li> </ul>	
Temperature Control	<ul style="list-style-type: none"> <li>room temperature to 125 °C (can be placed in 0°C chamber)</li> <li>1°C accuracy</li> <li>heating and cooling speed approx. 8 minutes in full range</li> </ul>		
Architecture	<ul style="list-style-type: none"> <li>Development station (single socket)</li> <li>Desktop system (6 sockets)</li> <li>Rack-based system (24 or 48 sockets on 4 or 8 shelves)</li> <li>High-density system (84 sockets on 7 shelves)</li> <li>Each socket can run independent test: different test program, device type, temperature profile, asynchronous start and stop</li> <li>Device tracking information shared among systems</li> </ul>		

