

# 4080 Series Parametric Testers

4082A Parametric Test System &  
4082F Flash Memory Cell Parametric Test System

## Industry-Standard Parametric Test System over Decades

Leading-edge technologies demand high performance semiconductor devices available at the lower cost of test in high volume manufacturing. Keysight offers the higher throughput and superior measurement performance by 4082A parametric test system with the easiest migration path from 4070 tester including guaranteed 4070/SPECS program compatibilities and data correlations. 4082F flash memory cell parametric test system provides the fast and precise measurements with the built-in semiconductor pulse generator unit (SPGU), cost-effective pulse generator and optional high-frequency switching matrix.



### Need to Upgrade your 4070 Series Testers?

If you use 4070 Series tester without any service and support agreements, you have a chance to get back to professional service and support by upgrading to 4080 Series. Contact Keysight to discuss if you want to upgrade from 4070 to 4080 Series by reusing some of your system components with longer support life.

## Keysight 4080 Series: Parametric Test System Total Solution

Keysight 4080 Series offers a wide range of measurement capabilities required for fundamental parametric test. You can easily perform DC and capacitance measurements such as  $V_{th}$ ,  $I_{ds}$ ,  $I_{doff}$ , and  $C_{ox}$ , to name just a few. 4080 Series supports three types of SMU (Source Monitor Unit) for DC measurement. Several other instruments options, such as a digital voltmeter (DVM), a spectrum analyzer and an LCR meter, provide the enhanced measurement capabilities.

### Hardware, Software, Accessories, and Professional Services

You might think the 4080 Series parametric tester as a hardware integrated system with system cabinet and test head, however, there are more essential system elements of software, accessories, and professional service by Keysight technical experts.

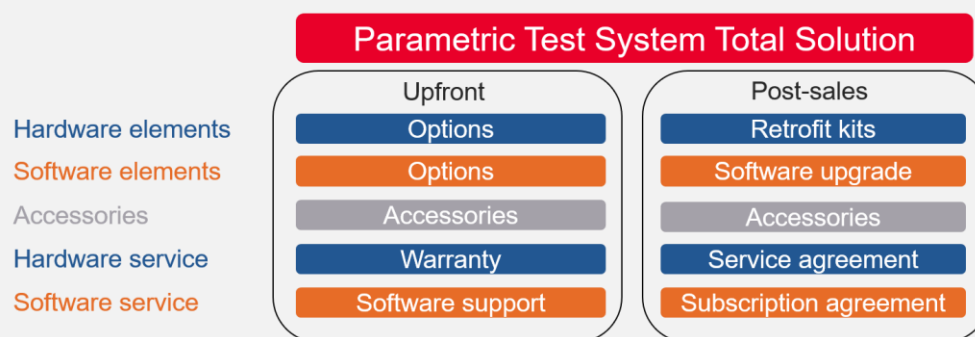


Figure 1. Parametric Test System Total Solution

## 4080 Series as Single Offer of Total Solution

Keysight also offers solution support and training as professional services to provide a quicker start up, maximize your productivity, and minimize downtime of systems. Keysight experts have deep domain knowledge of test equipment, software, standards, and regulations. Service and solutions from Keysight provide truly trusted systems that you can rely on the measurements you make, through the proactively structure an on-site service plan that can include an on-site repair service, a remote response team, a scheduled calibration services, or timely software updates.

- Upfront purchase: configuring available hardware and software options along with some professional Application Engineer (AE) consulting and Customer Engineer (CE) uptime service such as installation, repair, and calibration.
  - Hardware warranty and service agreements are essential for first 12 months and available to extend to 36 months.
  - Software subscription service is offered for first 36 months as required.
- Post-sales: upgrading hardware and software with available retrofit kits and professional AE or CE services. Renewals of service agreement are available with both hardware services and software subscription.

## Hardware Elements

4080 Series has the test head and system cabinet to use with the probers in semiconductor wafer production line. Most of hardware elements are configurable per your test needs and test structure design to maximize the production capacity and for the highest throughput to archive.

### 4080 Series Models

Choose from two models for your parametric test requirements.

Model	Key functions
4082A	<p><b>Parametric Test System</b></p> <ul style="list-style-type: none"> <li>• Source Monitor Unit selectable from medium power (MPSMU), high power (HPSMU) and high resolution (HRSMU)</li> <li>• Synchronous and asynchronous parallel test can improve the throughput with VMT (Virtual Multiple Testhead) software.</li> <li>• 1 fA and 0.1 <math>\mu</math>V measurement resolution</li> <li>• Optional HS-CMU (High Speed Capacitance Measurement Unit)</li> <li>• Optional ring oscillator measurement</li> </ul>
4082F	<p><b>Flash Memory Cell Parametric Test System</b></p> <ul style="list-style-type: none"> <li>• Same measurement capabilities with 4082A</li> <li>• Integrated High Voltage Semiconductor Pulse Generation Unit (HV-SPGU)               <ul style="list-style-type: none"> <li>○ Up to 10 channels</li> <li>○ <math>\pm 40</math> V output capability</li> <li>○ Two or three level pulsing on each channel</li> <li>○ ALWG (arbitrary linear waveform generation) function</li> </ul> </li> </ul>

### More Hardware Elements to Configure 4080 Series

These are also configurable for the test parameters and test structure design of your wafer.

Selection	Upfront	Post-sales
Pin board (from 12 to 48)	Standard, High Resolution	Retrofittable
Test resources	Source Monitor Unit (SMU), Digital multimeter, LCR meter, Spectrum analyzer, HS-CMU, HV-SPGU, Pulse generator, HF matrix with pulse switch	Retrofittable
System controller	Industrial PC (Linux)	Retrofittable

## Software Elements

4080 Series has the dedicated system controller with Linux operating system (Red Hat Enterprise Linux). This controller has the 4080 system software with fundamental capabilities to operate and control the 4080 test system. The controller can be installed with the optional but essential software such as SPECS and SPECS-FA effective in managing the semiconductor wafer production and factory automation with 4080 Series.

### Keysight SPECS (Semiconductor Proces Evaluation Core Software)

Keysight SPECS is a test shell for Linux-based 4080 Series with code compatibility of test plans and algorithms from 4070 Series. You can minimize the transition cost, utilize existing 4070 codes, and lower the cost of ownership with the latest low-cost Linux environment.

### Keysight SPECS-FA (Factory Automation)

Keysight SPECS-FA, the factory automation version of Keysight SPECS test shell.

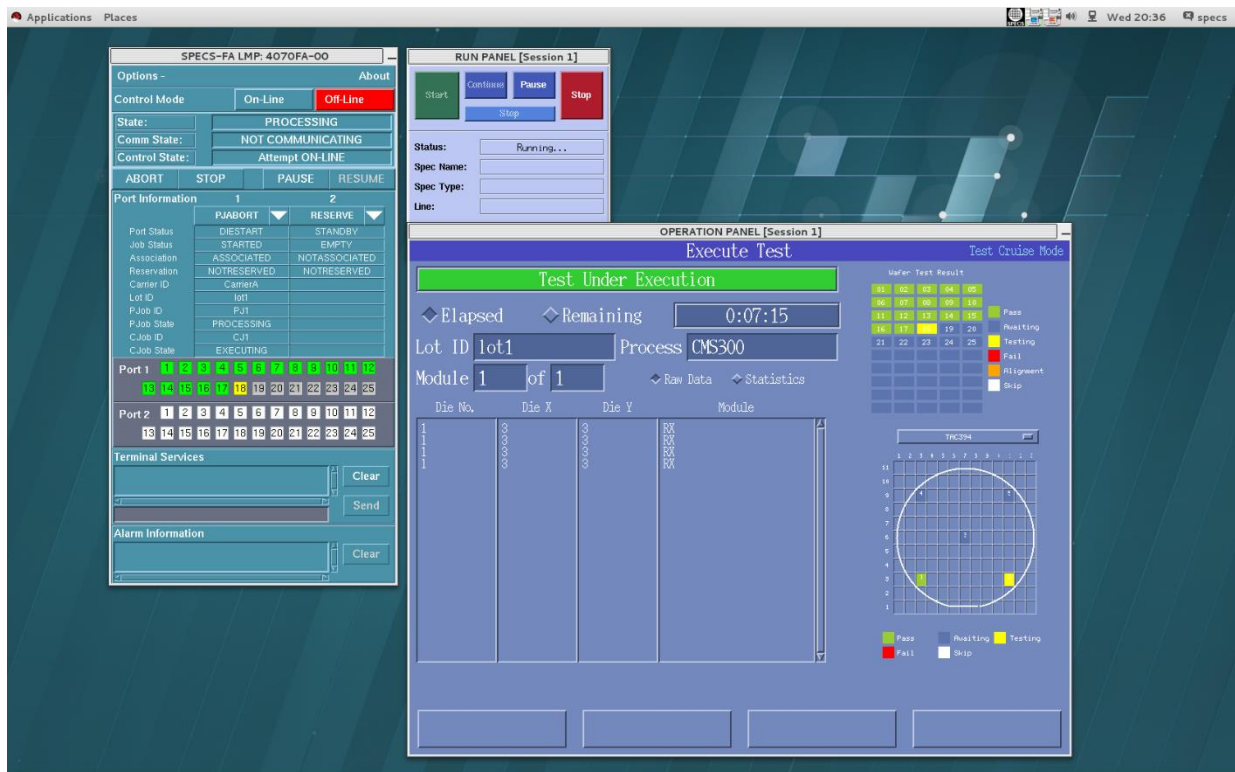


Figure 2. SPECS-FA operation panel

### Offline Debug Environment of SPECS & SPECS-FA

For test plan development and debug purpose, offline SPECS and SPECS-FA environment (running without live connection to 4080 Series parametric test system) is available for optional purchase.

## Virtual Multiple Testhead (VMT) Technology to Improve Measurement Throughput

All 4080 Series testers can enable this advanced asynchronous parallel test technology online with a software licensing. This technology allows separate measurement tasks to run independently. Unlike conventional parallel test schemes, no measurement time is ever wasted. As soon as one set of resources finishes making a measurement it can immediately start the next measurement. Net efficiency is like having independent multiple test heads in a single tester and greatly improves measurement throughput.

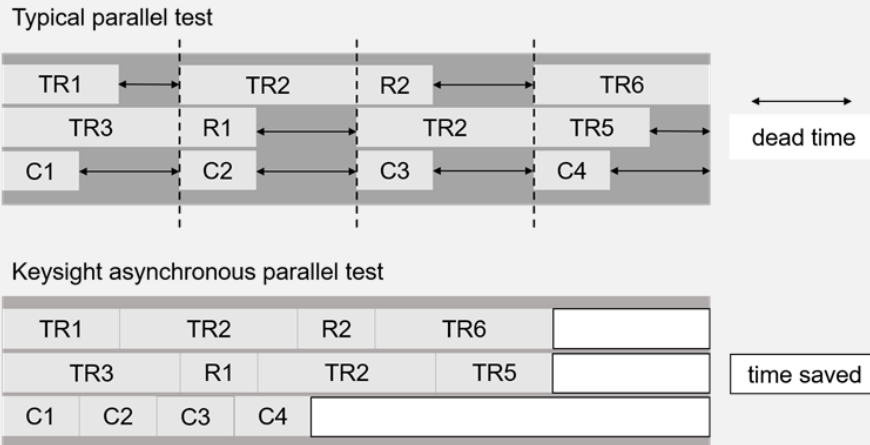


Figure 3. Asynchronous Parallel Test with Keysight VMT

## Available Software Options

There are available options for 4080 Series system software, SPECS and SPECS-FA as follows.

- Software media on CD-ROM
- Paper manuals (English, Japanese)

## Software with Subscription Service

4080 Series system software, SPECS and SPECS-FA have offered 36 months subscription service for each new tester at purchase. When the software media option is purchased, 36-month software media subscription is available.

1. Software License-To-Use (LTU) subscription service
2. Software media subscription service

To maintain the software with the latest enhancements and defect fixes, Keysight recommends renewing the software update subscription with 4080 Series system software, SPECS and SPECS-FA. You can access to the latest software within the subscription service as well as the remote technical support calls to local Keysight AE experts.

## Accessories

Optional accessories are available for 4080 Series. All accessories are orderable with 4080 Series and retrofittable as post-sales.

They are typically used for specific purpose to make the 4080 Series test system more robust for any unwanted failures or additional features with additional components like adapter and fixture.

Selectable Accessories	
Pin boards for spare	Universal test fixture
SMU for spare	Performance check fixture for low current probe card
Breakdown protector	Non-Kelvin personality board
ESD resistor box <sup>1</sup>	Cable extension fixture
Passage for purge air	WGFMU integration kit
Test fixture adapter	



<sup>1</sup> All new 4080 Series includes ESD resistor boxes as mandatory accessories.

## Keysight Professional Services

Keysight offers numbers of services to complete the parametric tester solution including;

### **On-site installation services**

This is a standard service for every new parametric test system at purchase. Keysight Customer Engineer (CE) will install the system at on-site. Before installing the system, Keysight CE also performs site verification as pre-installation process.

### **Warranty and extended services**

12 months of on-site repair service is offered as a standard warranty. Extended warranty service agreements are also available for sale.

### **Calibration services**

12 months of on-site calibration service agreement is offered with the parametric test system. Extended calibration service agreements are also available for sale.

### **Productivity assistance**

Customers can choose the term of productivity assistance from a day to required terms Keysight professional Application Engineer (AE) consulting services.

### **Application software support**

Keysight AE consulting is also available for specific deliverables such as software customization, software program conversion or software program optimization to assist customers programming for additional test parameters, and/or throughput improvement by optimizing software design.

### **Startup assistance**

To correctly set up the parametric test system and check through all purchased functions to operate as soon as possible, Keysight Customer Engineer (CE) can help your smooth production ramp up with the startup assistance.

### **Training (on-site, Keysight office, or remote)**

Various trainings are provided by each region or country to meet your local needs. Contact to the training coordinator in your region or country to see what trainings are available and get a quote of the right ones in local price.

### **Post-sales professional service**

Keysight offers all above consulting services for post-sales as well. Feel free to contact Keysight representative if you need additional needs for new operator trainings and/or for tester throughput improvements for lowering cost of test.

### **Post-sales service agreement and contract renewal**

When the initial service agreements of hardware and software subscription are expiring, Keysight contract sales team will propose you for renewals based on your current system configuration. Request your renewal quote to secure and maintain the parametric test system up and running with the minimized downtime.

## Upgrading Your 4080 Series Parametric Test System

In case you want to upgrade 4080 Series hardware elements, you can purchase several retrofit kits and necessary AE/CE consulting service as a customized single order.

- Model number: N9170U
- Description: Hardware retrofit set for parametric test system
  - Includes hardware retrofit kits and professional AE/CE services as solution upgrade package

Solution Upgrade Package	Available Retrofit Selections
Hardware elements	Pin boards, SMUs, HF matrix & pulse switch, test resources, rack mount kits
Accessories	Test fixture adapter, performance check fixture, breakdown protector
Professional services	AE consulting service with training and software CE uptime service and custom solutions

## Conclusion

All parametric test designers want to improve the throughput and minimize any production downtime for the better cost of test in semiconductor wafer productions. To overcome some typical but difficult process test challenges in your semiconductor wafer production, Keysight offers the total solution on parametric test not only with hardware and software but with professional AE and CE consulting service for your 4080 Series Parametric Test System.

If you need any technical consulting service on throughput improvement and/or advice on service agreements to reduce the unwanted downtime, contact Keysight as we offer the various professional service as agreement and per-incident consultation to maximize your productivity and production capacity.

Learn more at: [www.keysight.com](http://www.keysight.com)

For more information on Keysight Technologies' products, applications, or services, please contact your local Keysight office. The complete list is available at: [www.keysight.com/find/contactus](http://www.keysight.com/find/contactus)

