



## Find the best IP for your project: The ultimate guide to eSilicon Navigator

*It can be quite challenging and time consuming to find the right semiconductor IP for your project. You've got to find IP that does not consume too much power, meets your performance target, has the lowest leakage when your product goes on standby, and last but not least, IP that occupies the least amount of expensive real estate on your chip. How can you accomplish such a task without having to navigate through complex documentation or engage in time-consuming evaluations?*

### eSilicon Introduces On-Demand IP

People are more connected than ever. The Internet offers fantastic opportunities for global collaboration and partnership. On-demand services are weaving their way into our lives on so many levels. Why not take advantage of the Internet to improve how you design your chip?

As an IP provider, eSilicon is delivering more than just IP and a datasheet. eSilicon's Navigator tool allows you to quickly search, compare, evaluate and purchase all of eSilicon's standard, off-the-shelf IP in a secure online environment, providing you with immediate access to an extensive portfolio of IP for your project. The online tool allows real-time power, performance and area (PPA) data generation of your chosen IP and features, which is an excellent starting point for conducting a self-review at any time.

After you browse ChipEstimate.com and find some eSilicon IP that looks like it might be a fit for your chip, Navigator gives you a single point of entry for diving deeper and exploring your IP solutions 24/7, bringing new levels of flexibility and ease of use.

Once you've identified the best IP for your chip, Navigator allows you to go one step further. You can upload a purchase order and procure the IP completely online. With the latest enhancements to Navigator, the long process of searching, requesting information, evaluating and procuring IP can now be reduced from weeks to days.

Navigator is a paradigm shift that's changing the way we select and purchase IP. If you're new to Navigator and feel overwhelmed with all the features, here are six easy steps to get you started.

#### **Step 1: Browse**

There are three ways to navigate through our IP portfolio on Navigator. Go to the "Browse" tab and you can search for IP by foundry, technology and architecture using the left menu. You can also search for IP by using keywords in the keyword search box if you know exactly what you need, for example, "TCAM" or "high-speed four port." Lastly, you can fine-tune your IP selection by using the buttons in the center of the page to choose foundry, technology, flavor, etc. (See Figure 1.)

#### **Step 2: Compare**

Now that you have a better idea of what's available in our portfolio and may have shortlisted a few IPs, the next question is

Figure 1: Navigator “Browse” Window

whether these IPs will meet your requirements. Do you need a low-power or a high-speed architecture? Will the high-speed IP consume too much power? If you select the low-power architecture, will it run fast enough? The “Compare” page is the best place to start your analysis. You can select a specific pre-defined memory configuration or a range of configurations and options for comparison. Once you have selected your instances, you can view the PPA (power, performance, area) comparison in a graphical chart. The Y- and X-axes of the chart are fully configurable to display area, power, leakage or performance. You can also download the data into a CSV file for further evaluation. (See Figures 2 and 3.)

### Step 3: Generate

While the Compare page gives you a pretty good idea of the IP that meets your needs, the “Generate” step allows you to generate front-end views of the IP with your unique configuration and options for further evaluation. In this step, you can upload a memory list (up to 200 instances) with unique configurations and options for your project and generate a complete PPA list of your memory subsystem. This gives you an opportunity to analyze the total power and area of the complete memory subsystem as well as identify specific instances that do not meet desired requirements.

### Step 4: Download

If you’ve made it this far, you now have your very own IP library on Navigator. This unique list of front-end views will be listed on the “My IP” page. This list is unique to your personal account and will not be accessible to other users. Your memory subsystem attributes and data are completely private. (See Figure 4.)

### Step 5: Quote

Now that you’ve downloaded and explored different sets of front-end views and found the perfect memory instance combination for your chip, it’s time to purchase the back-end views. You can choose to purchase a memory compiler if you have multiple instances generated from the same compiler or simply purchase a single memory instance, at a lower cost, if that’s all you need. Memory compilers can be added to the shopping cart from the ‘Browse’ page and memory instances can be added from the ‘My IP’ page. An executable quotation from eSilicon can be generated directly from the shopping cart instantly. (See Figure 5.)

### Step 6: Purchase

Once you’re ready to complete the purchase, simply upload a signed quote and purchase order to Navigator. Back-end views of your IP will be generated, packaged and delivered via secure FTP when ready. (See Figure 6.)

Welcome to the new era of semiconductor IP selection, evaluation and purchasing.

### University Research Support

eSilicon standard, off-the-shelf IP and I/Os listed in Navigator are free to universities who are creating MPWs for research purposes (no production or commercial use). You can see a [list of free semiconductor IP and I/Os](#) on the eSilicon website.

### Learn More

You can [learn more about the STAR online tool suite](#) or [request a free STAR account online](#). If you already have a STAR account, but Navigator isn’t activated, email [star@esilicon.com](mailto:star@esilicon.com) and we’ll enable it for you.

Figure 2: Navigator “Compare” Window with IP Selected

**Add Instances to Compare**

System instances: My instances

Foundry: DONGBU LFOUNDRY SAMSUNG **SMIC** TSMC

Technology node (nm): **28** 40

Flavor: **HK**

Memory type: **TCAM**

Architecture: **High Density**

Memory configuration: NW NB CM  
 ALL **32** ALL 12 ALL 1

Memory configuration options: Redundancy  
 ALL **r** n

PVT selection:

PVT Power			PVT Timing		
<b>FFG_125_0.99</b>	FF_40_0.99	FF_0_0.99	FFG_125_0.99	<b>FF_40_0.99</b>	FF_0_0.99
FF_125_0.99	SSG_0_0.81	SS_40_0.81	FF_125_0.99	SSG_0_0.81	SS_40_0.81
SS_0_0.81	SS_125_0.81	TT_25_0.9	SS_0_0.81	SS_125_0.81	TT_25_0.9
TT_85_0.9			TT_85_0.9		

Figure 3: Navigator “Compare” Window with Power and Area Plotted

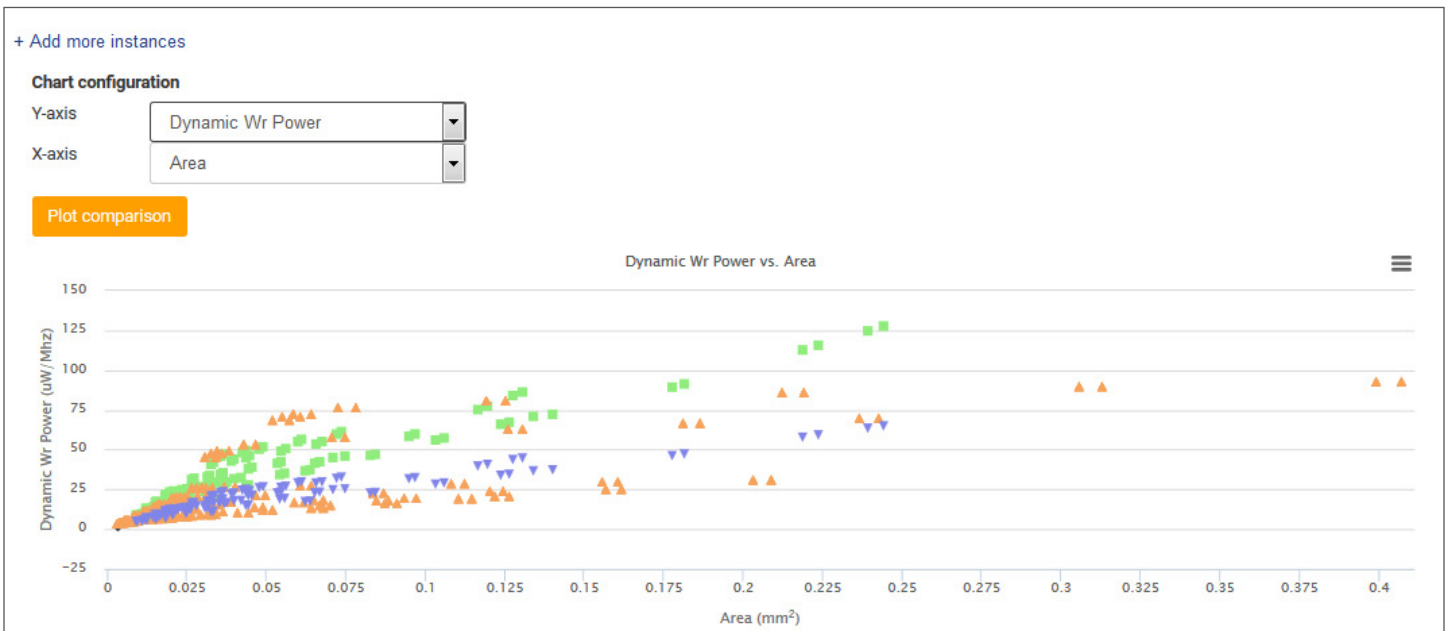







Figure 4: Navigator “My IP” Window

My IP

Search by keywords  

Memory  Other IP

Name	Status	Date	Origin
 ts_16ffll_tcam_111_hs_f_t_sul_gl_1024x160x1_r	Ready for FE download	2016-09-16 04:19:23	Manual
 ts_16ff_rf_211_hs_f_hc8t_sulas_16x4x1_pbn	Ready for FE download	2016-09-16 04:17:10	Manual
 ts_28hpc_sr_222_hs_f_hc6t_shpah_64x4x4_g	In-progress...	2016-09-16 04:16:28	Manual
 ts_28hpm_hd_tcam_32x12x1_n	Ready for FE download	2016-09-16 04:16:14	Manual

< 1 >









Figure 5: Navigator “Create a Quote” Window

Create a Quote 

Quote Name \*

Item Description	Type	Price	Actions
Samsung 14LPP High Speed Dual Port (DP) SRAM Compiler	Compiler		
Samsung 14LPP High Speed Single Port (SP TCAM) Ternary CAM Compiler	Compiler		
Samsung 14LPP 1.8V Oxide 1.8V/2.5V/3.3V General Purpose IO Library	IO Library		
Maintenance & Support fee for 1 year  [A fixed rate will be added if you have selected products that are licensed without charge]	<input type="button" value="No"/> <input checked="" type="button" value="Fixed"/>		

By submitting your request to generate the Quote, you certify that you and your employer agree to the [Navigator Terms of Use](#).

Figure 6: Navigator “Purchase” Window



Figure 7: Navigator IP Detail Window

The screenshot shows the eSilicon STAR Navigator interface. The top navigation bar includes 'Try & Buy IP', 'Optimize Design', 'Quote & Compare', and 'Track WIP'. The main header displays the eSilicon STAR logo and the word 'Navigator'. Below the header, there are tabs for 'Browse', 'Compare', 'Generate', 'My IP', and 'My Quotes', along with a shopping cart icon showing '2 items'. The breadcrumb trail reads 'Home / Try & Buy IP / STAR Navigator / Browse'. On the left, a sidebar lists various IP types under 'By IP Type', including Memory Products (66), Ternary CAM (7), and IO Products (15). The main content area features a large 'TCAM' title, a 'Product status: Front-end available' message, and a blue 'Generate memory instance PPA evaluation' button. To the right, the product name 'Samsung 14LPP High Speed Single Port (SP TCAM) Ternary CAM Compiler' is displayed, followed by a list of 'FEATURES' and 'OPTIONS'.

**TCAM**

Product status: Front-end available

Generate memory instance PPA evaluation

Add to Cart

**Samsung 14LPP High Speed Single Port (SP TCAM) Ternary CAM Compiler**

**FEATURES:**

- Typical operation voltage 0.8V.
- Completely static operation.
- Match/Miss flag.
- Valid bit per entry.
- All registered outputs and inputs, except ce. Other control test and redundant pins are noted in the pin description table.
- DFT with alternate test pins and built-in I/O wrapper, pipelined register scan.
- Read Latency = 1, Write Latency = 0. Compare Flag Latency = 2, Compare Match Address Latency = 2.
- Read and Write must wait one cycle to start after compare command is issued.
- Chip select (ce) control pin for read, write and compare operations.
- Built-in spare column(s) (1 to 4 single-bit-wide columns, depending on TCAM size) and shift logic for redundancy.
- Match\_in inputs for selecting rows to participate in compare mode.
- Mask input for bit-write and masked-key search capability.
- RTL BIST for Design-For-Test is supplied for each TCAM macro.

**OPTIONS:**

- Priority Encoder (PE) for multiple hit lines with multiple hit flag (qmhit) for TCAMs with the PE option.
- Direct-hitline out (qmatch\_out[w-1:0]) for TCAMs without the PE option.
- Redundant columns (Use in repair mode) for TCAMs with redundancy option.
- Partial Pipeline Search with first stage is 12, 20 and 40 BITS for above 80 bit-TCAM.

**eSilicon Headquarters**  
 2130 Gold Street, Suite 100  
 San Jose, CA 95002  
[www.esilicon.com](http://www.esilicon.com)  
<https://star.esilicon.com>  
[sales@esilicon.com](mailto:sales@esilicon.com)  
[ipbu@esilicon.com](mailto:ipbu@esilicon.com)  
[star@esilicon.com](mailto:star@esilicon.com)

Phone: 1.408.635.6300  
 U.S. & Canada Toll Free:  
 1.877.7.MY-CHIP  
 (1.877.769.2447)

© 2016 eSilicon Corporation. All rights reserved. This publication is protected by copyright and international treaty. No part of this publication may be reproduced in any form by any means without prior written authorization from eSilicon Corporation. eSilicon is a registered trademark, and the eSilicon logo is a trademark, of eSilicon Corporation. All other trademarks mentioned herein are the property of their respective owners. 20161024