

CyberShuttle FAQ

Q#1: Whom should I contact for CyberShuttle related questions?

Please contact your account manager, account CE or the captain of each shuttle. The name list of each captain is available on TSMC-Online. (TSMC-Online > Business Transactions > CyberShuttle: Information Center > Shuttle Schedule & Captain List) Or, simply email to cybershuttle@tsmc.com.

Q#2: What is CyberShuttle?

CyberShuttle is formerly known as MPW, which stands for "Multi-Project Wafer". CyberShuttle provides a regularly launched test vehicle for various customers to share a mask set for fast prototyping.

Q#3: What are CyberShuttle's features?

- Shuttle launch time is pre-scheduled.
- Masks and wafers are processed at a priority higher than the normal pilot run.
- TSMC's leading technologies are available, including 45nm, 55nm, 65nm, 80nm, 90nm.
- Bare dice, shuttle wafers, or ceramic packaged samples are deliverables.

Q#4: How do I benefit from CyberShuttle?

- Reduced prototyping mask cost.
- Reduced wafer cost. CyberShuttle accepts customer's orders as small as only 40 dice (equivalent to one 8-inch wafer) or 100 dice (equivalent to one 12-inch wafer).
- Fast prototyping speed. (CyberShuttle masks and wafers are processed at the priority of higher than hot run.)

Q#5: How do I sign up and use CyberShuttle?

Step 1. Contact your TSMC representative (your account manager) to set up an account for using TSMC-Online (online.tsmc.com).

Step 2. Log on to TSMC-Online and read through the introduction of CyberShuttle. (TSMC-Online > Business Transactions > CyberShuttle > Information Center)

Step 3. If you like to join the program, please read through the user's guide on TSMC-Online and learn how to reserve CyberShuttle. (TSMC-Online > User's Guide > CyberShuttle Reservation System)

Step 4. Make your CyberShuttle reservations (TSMC-Online > Business Transactions > CyberShuttle > Make Reservation)

After your submission of CyberShuttle reservation request, there will be emails sent to all parties involved, including account managers, customer service manager, customer support, and captains to handle your requests. You will learn from emails about what to do next.

Q#6: Where can I get the CyberShuttle schedule?

TSMC-Online > Business Transactions > CyberShuttle: Information Center > Shuttle Schedule & Captain List.

Q#7: When is CyberShuttle schedule announced?

Shuttle tape-in schedules are announced semi-annually. At the beginning of every March, shuttle schedules for the second half of the year will be given. At the beginning of every September, shuttle schedules for the first half of next year will be given.

Q#8: How many chips can I order for my CyberShuttle tape-out?

Minimum: 40 bare dice if the wafers are processed in an 8-inch Fab
100 bare dice if the wafers are processed in a 12-inch Fab

Q#9: How much will I pay for CyberShuttle? What is the block size?

CyberShuttle is a prototyping service based on mask sharing by multiple customers. The reticle is divided into many unit blocks, which are taken by various customers to carry out the designs. The block size definition varies among different technologies. **(1 block is 9 mm² for 45nm, 12 mm² for 55nm & 65nm, 16 mm² for 80nm & 90nm, and 25 mm² for all others, namely 0.11um, 0.13um, 0.15um, 0.16um, 0.18um, 0.25um, and 0.35um technologies).** For each reservation, you need to order at least 1 block. If your chip size is larger than 1 block, then you need to order extra blocks. The block number is calculated by chip area, regardless of the dimensions in length and width, for example, for a 0.13um chip with chip size of 7mm x 6mm is calculated as 1.68 blocks.

When you pay the price of mask blocks, you are entitled to get 40 bare dice from an 8-inch shuttle, or 100 bare dice from a 12-inch shuttle. The samples beyond 40 (or 100) need surcharge for extra wafers. The calculation of extra wafers is as follows.

For 8-in wafers, we offer 40 samples for every extra wafer ordered.

(# of extra wafers needed) = [(# of samples) – 40]/40

For 12-in wafers, we offer 100 samples for every extra wafer ordered.

(# of extra wafers needed)= [(# of samples) – 100]/100

A surcharge for ceramic packaging, shuttle wafer form delivery, extra die-saw, corner split and super hot run will be added if applicable.

Q#10: Is there anything particular that I need to do if my CyberShuttle tape-out has fewer metal layers and does not have some optional layers?

No. Please just state how many metal layers are required and which optional mask layers (like medium/low VT, ESD) are needless, captains will make the arrangement. Take 0.18 um Logic for example. The maximum metal layer number is 6, and we accept 1P3M, 1P4M, 1P5M and 1P6M designs. If your design has 5M, in order to meet the requested metal density for each metal mask layer, we cannot leave blank area on Metal-6. Therefore, we will copy your Metal-5 pattern on Metal-6 mask. However, your wafers will be run separately from 1P6M wafers to ensure that only 5 metals are deposited.

Q#11: Do I need to add seal ring around my CyberShuttle design by myself?

You may choose to add seal ring by yourself or ask TSMC to do it for you. Just specify what you want on the online tape-out form. However, if you include multiple designs in one tape-out, you need to add seal ring and scribe line in between those designs by yourself to prevent from die crack.

Q#12: When can I make, modify or cancel CyberShuttle reservations?

The date that TSMC announces for each shuttle is called the tape-in date, which is the deadline for customers to deliver their PO, designs and tape-out forms. Please make or cancel your reservations at least 7 days before the tape-in date. After reservation, you may modify it until the tape-in date, however, if you increase the device area and there is not enough space available, the status of your approved reservation will go back to pending for approval.

Q#13: What if there is no block available for my CyberShuttle reservation?

When there is no block available, you can still make reservations. The only difference is that your account manager cannot approve your reservation request and secure a slot on the shuttle right away. You will have to wait until someone cancels its approved reservation. Nevertheless, captains will always try their best to squeeze every pending reservations. You may pass on your concerns to your account manager for a pending reservation if you want to be sure.

Q#14: Why I cannot make CyberShuttle reservations?

You will be not able to make a reservation only when the shuttle cut-off date for reservation is due, that is the shuttle tape-in date is less than 7 days away from the current date. Please contact your account manager or the shuttle captain immediately if you have such problems.

Q#15: Will TSMC run DRC/LVS check for my CyberShuttle tape-out?

No, TSMC CyberShuttle does not provide DRC or LVS check services. Customers should run DRC/LVS checks by themselves and ensure their designs are DRC/LVS clean. If you really need TSMC's help, please contact your TSMC account manager at least 7 days before the tape-in date. A surcharge might apply for this service.

Q#16: What if I need TSMC IP/libraries for a CyberShuttle tape-out?

Please contact your TSMC account manager, and deliver your GDS to TSMC for IP/library merge in advance so that the merged GDS file can meet the tape-in deadline. Normally it takes 3 working days for IP/library merge. Captains do not handle IP/library merge, please do not deliver your GDS without IP/library merge to captains.

Q#17: What should I deliver for a CyberShuttle tape-out?

- Send PO to TSMC sales office
- FTP the GDS file to ftp.tsmc.com.tw (after the merge of IP/library, if applicable)
- Fill in the online tape-out form
- Mail the package bonding diagram to captains if you need packaging at TSMC

Except for package bonding diagram, you need to deliver all the above items by the tape-in deadline.

Q#18: Can I ask for mask revision for a CyberShuttle tape-out?

Yes. Although we always encourage customers to take the next CyberShuttle due to its simpler CyberShuttle operations, we can still manage to provide mask revision if you feel it is

desperately needed. Please contact your account manager and the shuttle captain for the request.

Q#19: Can I do mask jobview for my CyberShuttle tape-out? What if I find something wrong with the design then?

If you specify on the online tape-out form that eJobView is needed, you will receive an eJobView email notice from our system when eJobView is ready. Since CyberShuttle accommodates many customers and is running at high priority, we cannot wait for all customers' confirmation before mask making. If you should find the need of changing GDS file, please make the request to the shuttle captain as soon as possible. You will need to pay for extra masks and wafers if they have already been made. If masks have not been made, there will be no surcharge needed.

Q#20: Can I have my CyberShuttle chips packaged at TSMC?

Yes. Bare dice or packaged samples are CyberShuttle deliverables. We ship packaged parts or bare dice at your choice. Please just select the package type you need when you fill out the reservation form. TSMC only provide ceramic packages for CyberShuttle tape-outs. Please refer to "TSMC-Online > Assembly & Test > Assembly – Ceramic Capability" for specs details.

Q#21: Can I have my CyberShuttle chips delivered in wafer form?

Yes. TSMC has developed a solution to clearly remove circuits from other customers. You can use this shuttle wafer to develop your own testing program with reduced verification efforts and time required. The available chip number on shuttle wafers will be at least 40 for 8" shuttle and 100 for 12" shuttle and ink dots will be performed if the dice is out of visual inspection. This service requires addition charge and cycle time. Please contact your account manager for more detail information.

Q#22: Can I have my CyberShuttle chips tested at TSMC?

No, TSMC does not offer either chip probing (CP) or final testing (FT) to CyberShuttle samples.

Q#23: What is the minimum die thickness for CyberShuttle chips?

The standard CyberShuttle die thickness after backside grinding is 12 mils regardless of technology and wafer size. If you need thinner chips, please contact captains first for risk assessment. There might be surcharge needed.

Q#24: May I have corner split on my CyberShuttle tape-out?

Yes, TSMC provides charged split service for all CyberShuttle technologies except 45nm and 55nm. On CyberShuttle reservation form, there is a question for split service. Once you specify to have process split, the shuttle captain will follow it accordingly.

Q#25: Can I have my CyberShuttle chips smaller than one block size after die-saw?

Yes. Unit block size is for the purpose of pricing only. We cut the dice according to the window size stated on the online tape-out form.

Q#26: If I have multiple designs that can fit in one unit block, would TSMC cut those designs separately for me?

Yes. Starting Sep04, TSMC CyberShuttle offers extra dicing service. There is a question about extra dicing on the reservation form along with detailed explanations.

Q#27: What is the CyberShuttle die size after die-saw?

It will be slightly larger than your design due to the addition of seal ring and scribe line.

Q#28: When can I get the samples for my CyberShuttle tape-out?

The cycle time commitment from tape-in to sample shipping can be found at "TSMC-Online > Business Transactions > CyberShuttle: Information Center > Cycle Time Commitment". When the CyberShuttle wafers are started, you will receive an email notice from the shuttle captain. The notice will indicate the committed out date. Also, you are able to see the wafer progress at "TSMC-Online > Business Transactions > CyberShuttle: Lot Summary".

Q#29: Is there any guarantee on yield for my CyberShuttle tape-out?

TSMC CyberShuttle guarantees all delivered samples meet the requirements of TSMC's WAT (wafer acceptance test) and OQA (outgoing quality assurance). However, CyberShuttle customers cannot claim TSMC for the following reasons, which are not due to TSMC's errors in mask making and wafer processing.

- Poor yield
- Poor device performance (such as speed, operation voltage, leakage, etc)
- Poor reliability

Q#30: What if my CyberShuttle tape-out is mis-operated by TSMC? What is the compensation?

When there is mis-operation by TSMC, TSMC will be responsible for the making of new masks and wafers, and compensate customers with another batch of good samples at the priority of super hot run.

Q#31: Can I place repeat orders? That is, if the received samples are good, can I ask TSMC to use the same masks to make more samples for me?

Yes. Although we always encourage customers to order enough sample quantity at the tape-in period, we do accept customers' repeat orders with the following rules.

1. Deadline: Repeat orders must be placed no later than 6 months after the shipping of the first batch of samples, because the masks and backup wafers will be scrapped after the deadline.
2. Order Quantity: If the extra wafers at hand, which have either completed FAB process or are banked somewhere in the process, cannot meet the quantity of your repeat order, and thus new wafer-start is needed, you will need to order at least 120 dice (i.e. 3 pieces) of 8" wafers or 300 dice (i.e. 3 pieces) of 12" wafers.

Q#32: When will TSMC scrap CyberShuttle masks/wafers?

CyberShuttle masks and wafers do not belong to any customer. They are owned by TSMC for the purpose of protecting all customers' intellectual properties. Six months after the shipping of samples, the masks and backup wafers will be scrapped.

Q#33: How fast is CyberShuttle run? Can I ask to use Super Hot Run on CyberShuttle?

The priority of standard CyberShuttle is higher than normal pilot run (Hot Run), and second only to SHR (Super Hot Run). If your shuttle tape-out needs SHR, please contact TSMC Account Manager or Customer Support. Please note that SHR is subject to an additional charge and not always available due to limited quota.

Q#34: Why I see some undesired mask layers in the e-jobview notice?

CyberShuttle e-jobview notice may include some layers that are not desired by your product. We add them for pattern density and other engineering considerations. (For example, 0.13um process can have 8 metal layers at maximum. If your product has only 7 metals, we will relocate your metal-7 design to the top metal layer metal-8 mask, and duplicate your metal-6 design on metal-7 mask.) These mask layers added by captains will not be used on the wafers for your product. When performing e-jobview, please review only those layers that appear on the online tape-out form of your shuttle product.