

# TriCor Flash Cards

# SD/microSD & CFast Product Line

CF & CFast



SD & microSD



# SD Card Speed Class Overview

The SDA has determined four rating standards

| Minimum Sequential Write Speed | Speed Class |                 |                         | Corresponding Video Format |
|--------------------------------|-------------|-----------------|-------------------------|----------------------------|
|                                | Speed Class | UHS Speed Class | Video Speed Class (NEW) |                            |
| 90MB/Sec                       |             |                 | V90                     | 8K Video                   |
| 60MB/Sec                       |             |                 | V60                     |                            |
| 30MB/Sec                       |             | 3               | V30                     | 4K Video                   |
| 10MB/Sec                       | 10          | 1               | V10                     |                            |
| 6MB/sec                        | 6           |                 | V6                      | Full HD / HD Video         |
| 4MB/sec                        | 4           |                 |                         |                            |
| 2MB/sec                        | 2           |                 |                         | Standard Video             |

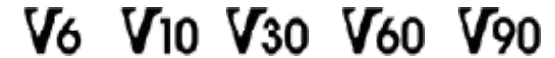
- **Normal Speed Class**



- **UHS Speed Class**



- **Video Speed Class**



- **Application Performance Class**



# Application Performance Class

## Running Smartphone Applications

- Addresses the growing need for optimized SD cards to store apps and app data



























- Defines minimum required sequential and random performance levels to support features such as Android's Adoptable Storage

## SD App Performance Class (A1 & A2)

| Application Performance | Pictograph | Minimum Random Read Performance | Minimum Random Write Performance | Minimum Sustained Sequential Performance |
|-------------------------|------------|---------------------------------|----------------------------------|--|
| Class 1 (A1)<br>SD 5.1  | <b>A1</b>  | 1500 IOPS                       | 500 IOPS                         | 10 MB/s                                  |
| Class 2 (A2)<br>SD 6.0  | <b>A2</b>  | 4000 IOPS                       | 2000 IOPS                        | 10 MB/s                                  |

# SD Card Controllers & Features

■ Mass Production  
■ In Development

|                |                     | Q3 2017  | Q4 2017  | Q1 2018  | Q2 2018  |
|----------------|---------------------|--|--|--|--|
| 8k Video       | Professional UHS-II | PS8036, 15nm pSLC<br>16~128GB, R280/W245<br>   |  |  |  |
|                |                     | PS8036, 15nm MLC<br>32~256GB, R280/W90<br>     |  |  |  |
| 4k Video       | Professional UHS-I  | PS8210, 15nm MLC<br>8~512GB, R95/W90<br>       | PS8131, 3D TLC<br>32GB ~ 64GB<br>R100/W50<br>(R2500/W1500 IOPS)<br>  | PS8131, 3D TLC: 128GB ~ 256GB<br>3D pSLC: 2GB ~ 64GB,<br>R100/W80<br>(R2500/W1500 IOPS)<br>  | TBD<br>  |
|                |                     | PS8039, 15nm MLC<br>16~128GB, R95/W45<br>      |  |  |  |
| Full HD Video  | Consumer Mainstream | PS8210, 15nm TLC<br>16~64GB, R80/W20<br>       |  | PS8130, 3D BiCS3 TLC<br>32GB ~ 512GB,<br>R90/W20<br>   |  |
|                |                     | PS8130, 3D BiCS2 TLC<br>32~256GB, R90/W20<br>  |  |  |  |
| Standard Video | Consumer Value      | PS8039, 15nm MLC<br>Up to 8GB, R70/W10<br>     | PS8131, 3D TLC<br>32GB~64GB<br>R45<br>                               |  |  |
|                |                     | PS8039, 15nm TLC<br>Up to 8GB, R45<br>         |  |  |  |

# microSD Controllers & Features

■ Mass Production  
■ In Development

|                           |                     | Q3 2017  | Q4 2017  | Q1 2018  | Q2 2018       |
|---------------------------|---------------------|--|--|--|---------------|
| 8k Video <b>V90</b>       | Professional UHS-II | <b>PS8036</b> , 15nm pSLC<br>16~128GB, R280/W245<br>U3 10                            |  |  |               |
|                           |                     | <b>PS8036</b> , 15nm MLC<br>32~128GB, R280/W90<br>U3 10                              |  |  |               |
| 4k Video <b>V60</b>       |                     |  |  |  |               |
| Full HD Video <b>V30</b>  | Professional UHS-I  | <b>PS8210</b> , 15nm MLC<br>8~64GB, R95/W90<br>U3 10                                 | <b>PS8131</b> , 3D TLC<br>32GB ~ 64GB<br>R100/W50<br>(R2500/W1500 IOPS)<br>U3 10 <b>A1</b> | <b>PS8131</b> , 3D TLC: 128GB ~ 256GB<br>3D pSLC: 2GB ~ 64GB,<br>R100/W80<br>(R2500/W1500 IOPS)<br>U3 10 <b>A1</b> | TBD <b>A2</b> |
|                           |                     |  |  |  |               |
| Standard Video <b>V10</b> | Consumer Mainstream | <b>PS8210</b> , 15nm TLC<br>16~64GB, R80/W20<br>(R2000/W500 IOPS)<br>U1 10 <b>A1</b> |  |  |               |
|                           |                     | <b>PS8130</b> , 3D BiCS2 TLC<br>32~256GB, R90/W20<br>U1 10                           |  | <b>PS8130</b> , 3D BiCS3 TLC<br>32GB ~ 512GB,<br>R90/W20<br>U1 10  |               |
| Consumer Value            | Consumer Value      | <b>PS8039</b> , 15nm TLC<br>32~128GB, R80/W20<br>U1 10                               |  |  |               |
|                           |                     | <b>PS8039</b> , 15nm TLC<br>Up to 8GB, R45<br>4                                      | <b>PS8131</b> , 3D TLC<br>32GB~64GB<br>R45<br>4  |  |               |

# Special Features

## PS8131 MaxIOPS+

The PS8131 MaxIOPS+ solution is the new generation of A1 solutions with double the write IOPS performance, supporting 3D NAND Flash. With 10 times more endurance, it ensures the perfect usage of Android's adoptable storage feature.

# A1

### Features

|                              |                  |            |
|------------------------------|------------------|------------|
| <b>Controller</b>            | PS8131 (MP Now!) | TBA (2018) |
| <b>APP Performance Class</b> | A1               | A2         |
| <b>NAND Class</b>            | 3D TLC           | TBA        |
| <b>Capacity</b>              | Up to 256GB      | TBA        |

## TBA MaxIOPS+

The next generation of App Performance Class solutions - TBA soon!

# A2

# Embedded Memory Card Solutions

|              | PS8210  | PS8229   | PS8210  | PS8229   |
|--------------|---|--|---|--|
| Interface    | SD3.0/ UHS-I  | SD6.0/ UHS-I   | <b>SD3.0/ UHS-I</b>   | SD6.0/ UHS-I   |
| L x W x H    | 11.0 x 15.0 x 1.0mm   | 11.0 x 15.0 x 1.0mm  | 24.0 x 32.0 x 2.1mm   | 24.0 x 32.0 x 2.1mm  |
| Channel      | 2   | 1  | 2   | 1  |
| ECC Capacity | BCH   | LDPC   | BCH   | LDPC   |
| Capacity     | SLC: 128MB~4GB<br>MLC: 4~64GB   | 3D TLC: 16~512GB   | SLC: 128MB~32GB<br>MLC: 4~128GB   | 3D TLC: 16GB~1TB   |
| Performance  | SLC up to 20/20 MB/s<br>MLC up to 95/90 MB/s  | Up to 100/100MB/s (TBD)  | SLC up to 65/55 MB/s<br>MLC up to 95/90 MB/s  | Up to 100/100MB/s (TBD)  |
| OP Temp      | Wide temp: -40~ 85 °C; Extend temp -25~ 85 °C; Commercial temp.: 0~ 70 °C   |  |   |  |
| Features     | <ul style="list-style-type: none"> <li>• SMART tool</li> <li>• pSLC (PesudoSLC)</li> <li>• Power Loss Protection</li> <li>• Advanced wear-leveling</li> <li>• Auto- Read Refresh</li> </ul> | <ul style="list-style-type: none"> <li>• SMART tool</li> <li>• Power Loss Protection</li> <li>• Auto- Read Refresh</li> <li>• End to end data path protection</li> <li>• Power on self test circuit</li> </ul> | <ul style="list-style-type: none"> <li>• SMART tool</li> <li>• pSLC (PesudoSLC)</li> <li>• Power Loss Protection</li> <li>• Advanced wear-leveling</li> <li>• Auto- Read Refresh</li> </ul> | <ul style="list-style-type: none"> <li>• SMART tool</li> <li>• Power Loss Protection</li> <li>• Auto- Read Refresh</li> <li>• End to end data path protection</li> <li>• Power on self test circuit</li> </ul> |