

***RoHS Compliant***

# **USB Flash Drive**

***EH322 Product Specifications***

**July 13, 2017**

**Version 1.4**



**Apacer**  
*Access the best*

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## FEATURES:

- **USB3.0 Super Speed compatible, and backward compatible with USB2.0 & interface**
  - USB3.0 max. transfer rate: 5.0 Gbps
  - Backward compatible with 480Mbps & 12 Mbps
- **Capacity**
  - SLC: 256, 512 MB  
1, 2, 4, 8, 16, 32 GB
  - MLC: 8, 16, 32, 64, 128 GB
- **Performance\***
  - SLC**
    - Sequential read: up to 80 MB/s
    - Sequential write: up to 70 MB/s
  - MLC**
    - Sequential read: up to 195 MB/s
    - Sequential write: up to 95 MB/s
- **Flash Management**
  - Built-in hardware ECC
  - Power saving implemented
  - S.M.A.R.T.
  - Power Failure Management
- **Temperature Range**
  - Operating:
    - Standard: 0°C to 70°C
    - Extended: -40°C to 85°C
  - Storage: -40°C to 85°C
- **Power Consumption\***
  - Operating voltage: 5V
- **SLC**
  - Active mode: 225 mA
  - Idle mode: 65 mA
- **MLC**
  - Active mode: 275 mA
  - Idle mode: 80 mA
- **RoHS Compliant**
- **USB Bus-Powered Capability**
- **NAND Flash Type: SLC/MLC**
- **Dimensions: 59.0 x 18.4 x 9.1, unit: mm**

\*Varies from capacities. Performance and power consumption addressed here are typical and vary from configurations and platforms.

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## 1. General Description

Apacer USB3.0 Handy FLASH Drive EH353 is ultra high-performance flash disk drive designed offering portable storage solutions or external memory expansion. This new generation USB flash drive is compatible with the latest USB specification – USB3.0 Super Speed, with a maximum transfer rate of 5.0 Gbps. The connector is backward employable with USB2.0 and USB1.1 interfaces as well. With compliance with USB3.0 specification, this USB drive can deliver up to 195 MB/s outstanding performance. Reliability wise, the USB comes with built-in hardware ECC to ensure data integrity. This product is well suited for portable flash storage applications while operating at minimal power consumption.

### 1.1 Performance-optimized USB Controller

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#### 1.1.1 Power Saving Implemented

The internal controller of the USB model is designed with power saving implementations, allowing the device to operate at low power consumption.

#### 1.1.2 Program RAM Architect

The internal Program RAM implementation allows the host to upgrade firmware codes anytime when needed.

#### 1.1.3 Error Correction Code (ECC)

The UFD utilizes 1-bit Error Detection Code (EDC) and Error Correction Code (ECC).

#### 1.1.4 S.M.A.R.T.

S.M.A.R.T. is an abbreviation for Self-Monitoring, Analysis and Reporting Technology, a self-monitoring system that provides indicators of drive health as well as potential disk problems. It serves as a warning for users from unscheduled downtime by monitoring and displaying critical drive information. Ideally, this should allow taking proactive actions to prevent drive failure and make use of S.M.A.R.T. information for future product development reference.

#### 1.1.5 Power Failure Management

Power disruption may occur when users are storing data into the SSD. In this urgent situation, the controller would protect firmware table and the data written to flash from data loss in the event of power off. Apacer power failure management maintains data correctness and increases the reliability of the data stored in the NAND Flash memory.

## 2. General Specifications

### 2.1 SLC

<b>Interface</b>	Super-speed USB3.0 compliant; backward compatible with USB 2.0 and USB 1.1								
<b>Performance* (MB/s)</b>		<b>256MB</b>	<b>512MB</b>	<b>1GB</b>	<b>2GB</b>	<b>4GB</b>	<b>8GB</b>	<b>16GB</b>	<b>32GB</b>
	<b>Read (MB/s)</b>	60	60	65	65	65	80	80	80
	<b>Write (MB/s)</b>	10	21	40	40	50	65	70	70
<b>Temperature</b>	0 to 70°C ;								
<b>Power consumption**</b>	Active: 225 mA Idle: 65 mA								
<b>MTBF</b>	2,000,000 hours								

Note:

Results may vary from flash configurations or host system settings.

\*Sequential performance is based on CrystalDiskMark 5.2.1 with file size 1,000MB.

\*\*Active power is an average power measurement performed using CrystalDiskMark with 128KB sequential read/write transfers.

### 2.2 MLC

<b>Interface</b>	Super-speed USB3.0 compliant; backward compatible with USB 2.0 and USB 1.1						
<b>Performance*</b>		<b>8GB</b>	<b>16GB</b>	<b>32GB</b>	<b>64GB</b>	<b>128GB***</b>	
	<b>Read (MB/s)</b>	95	195	190	195	190	195
	<b>Write (MB/s)</b>	28	55	49	95	95	80
<b>Temperature</b>	0 to 70°C						
<b>Power consumption**</b>		<b>8GB</b>	<b>16GB</b>	<b>32GB</b>	<b>64GB</b>	<b>128GB</b>	
	<b>Active</b>	165	270	265	275	265	175
	<b>Idle</b>	75	85	80	80	55	35
<b>MTBF</b>	1,000,000 hours						

Note:

Results may vary from flash configurations or host system settings.

\*Sequential performance is based on CrystalDiskMark 5.2.1 with file size 1,000MB.

\*\*Active power is an average power measurement performed using CrystalDiskMark with 128KB sequential read/write transfers.

\*\*\*Values on the left are measured on 512Gb x2 while those on the right are measured on 1Tb x1.

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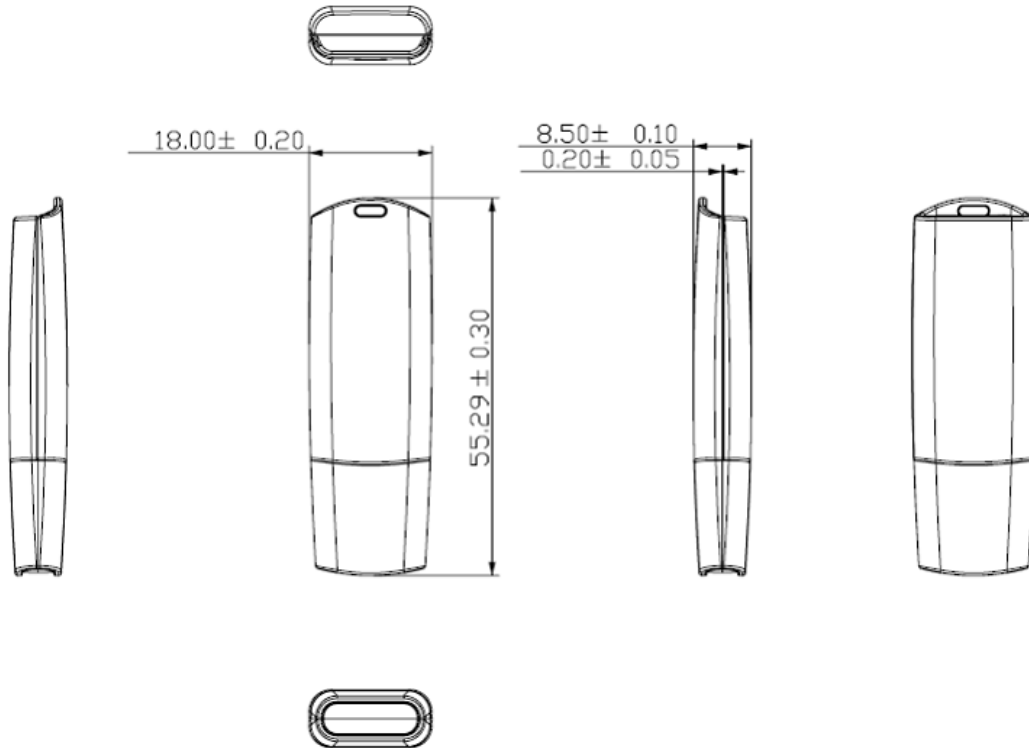
### 3. Absolute Maximum Rating

**Caution: Absolute Maximum Stress Ratings** – Applied conditions greater than those listed under “Absolute Maximum Stress Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these conditions or conditions greater than those defined in the operational sections of this data sheet is not implied. Exposure to absolute maximum stress rating conditions may affect device reliability.

**Table 3-1** Absolute Stress Rating

Parameters	Conditions
Required power supply	4.5-5.5V
Operating temperature	0°C to 70°C (Standard) -40°C to 85°C (Extended)
Storage temperature	-40°C to 85°C

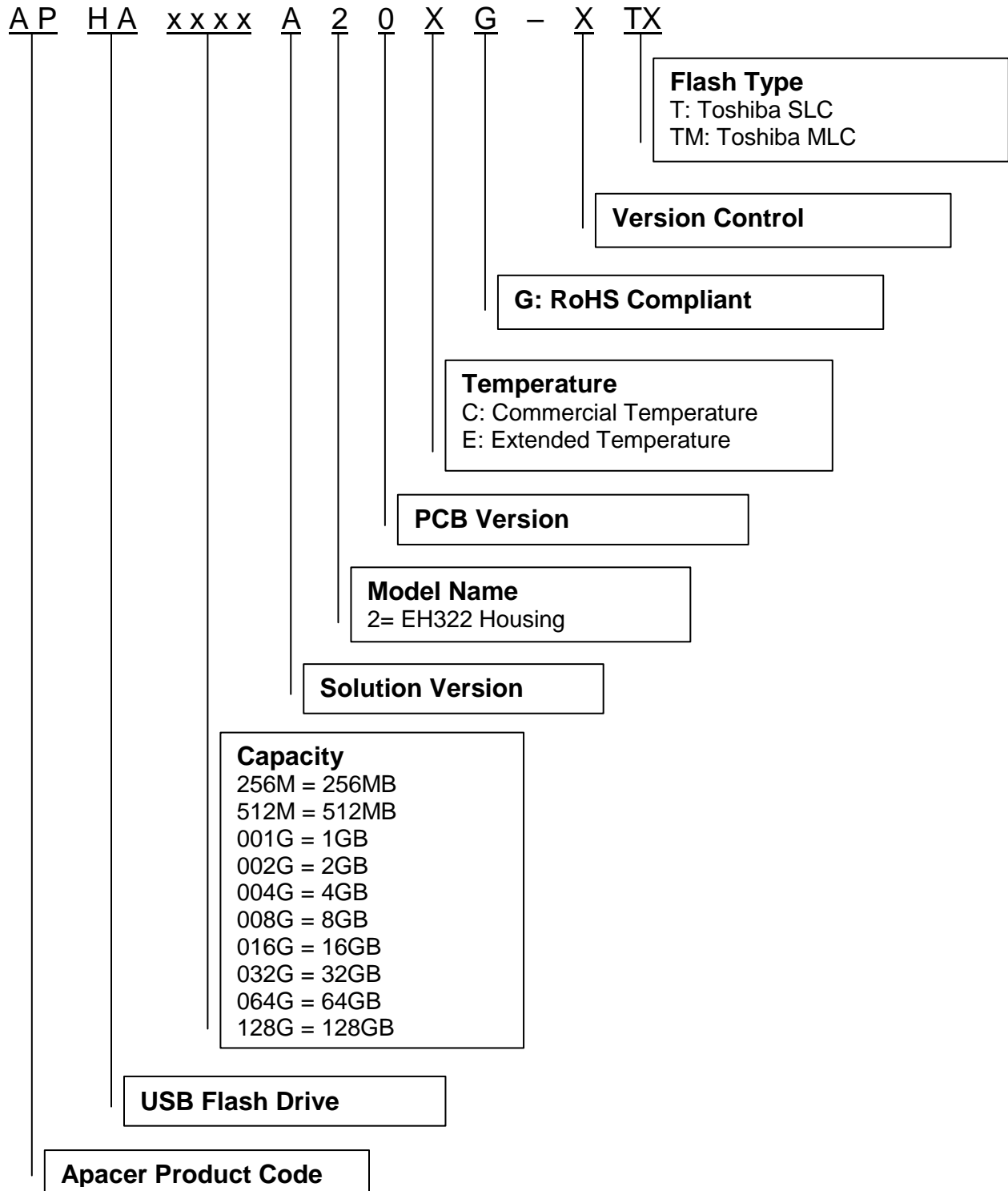
## 4. Physical Dimensions



Unit: mm

## 5. Product Ordering Information

### 5.1 Product Code Designations



## 5.2 Valid Combinations

### 5.2.1 EH322 (SLC)

Capacity	Standard Temp.	Extended Temp.
256MB	APHA256MA20CG-2T	APHA256MA20EG-2T
512MB	APHA512MA20CG-2T	APHA512MA20EG-2T
1GB	APHA001GA20CG-2T	APHA001GA20EG-2T
2GB	APHA002GA20CG-2T	APHA002GA20EG-2T
4GB	APHA004GA20CG-2T	APHA004GA20EG-2T
8GB	APHA008GA20CG-2T	APHA008GA20EG-2T
16GB	APHA016GA20CG-2T	APHA016GA20EG-2T
32GB	APHA032GA20CG-2T	APHA032GA20EG-2T

### 5.2.2 EH322 (MLC)

Capacity	Standard Temp.	Extended Temp.
8GB	APHA008GA20CG-3TM	APHA008GA20EG-3TM
16GB	APHA016GA20CG-3TM	APHA016GA20EG-3TM
32GB	APHA032GA20CG-3TM	APHA032GA20EG-3TM
64GB	APHA064GA20CG-3TM	APHA064GA20EG-3TM
128GB	APHA128GA20CG-3TM	APHA128GA20EG-3TM*
		APHA128G4LCEG-3TM*

**Note:** APHA128GA20EG-3TM represents the SSD manufactured based on 512Gb x2 while APHA128G4LCEG-3TM based on 1Tb x1.

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## Revision History

Revision	Description	Date
1.0	First Release	04/20/2015
1.1	<ul style="list-style-type: none"><li>● Modified performance and power consumption data for MLC models.</li><li>● Updated valid combinations for SLC and MLC models.</li></ul>	09/17/2015
1.2	<ul style="list-style-type: none"><li>● Revised model name from AH322 to EH322.</li><li>● Revised product ordering information.</li></ul>	10/14/2015
1.3	Added S.M.A.R.T. and Power Failure Management to Features	10/3/2016
1.4	<ul style="list-style-type: none"><li>- Added 512Gb x2 &amp; 1Tbx1 on MLC 128GB performance and power consumption</li><li>- Updated product ordering information for MLC 128GB</li></ul>	7/13/2017

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## Global Presence

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