

SQフラッシュ SQ RAM

OKAMOTO

岡本無線電機
アプリケーション部

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Self-Management

Industrial Reliability

Flexible Customization

Security Inside

2666 MHz

ADVANTECH
SQFlash

32Gbs

Advantech Industrial Standard Storage and Memory

Industrial Design

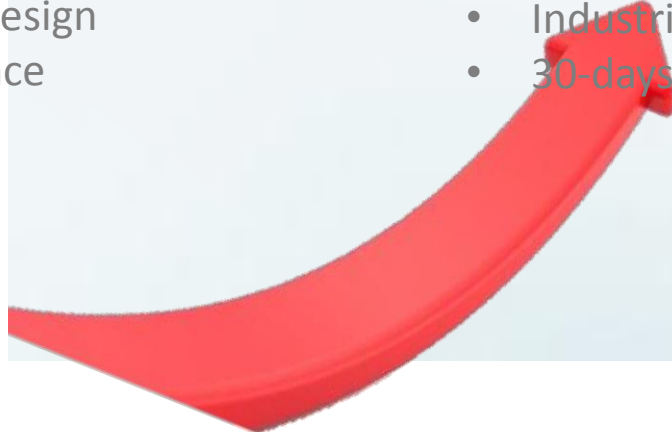


Industrial Service

Industrial Service

- Original IC selection
- Controller and firmware early access
- EMI/ESD proved circuit design
- JEDEC standard compliance

- Proactive design-in and after sell service
- Prompt and localized technical support
- Industrial business scale
- 30-days customization service



Original IC Selection

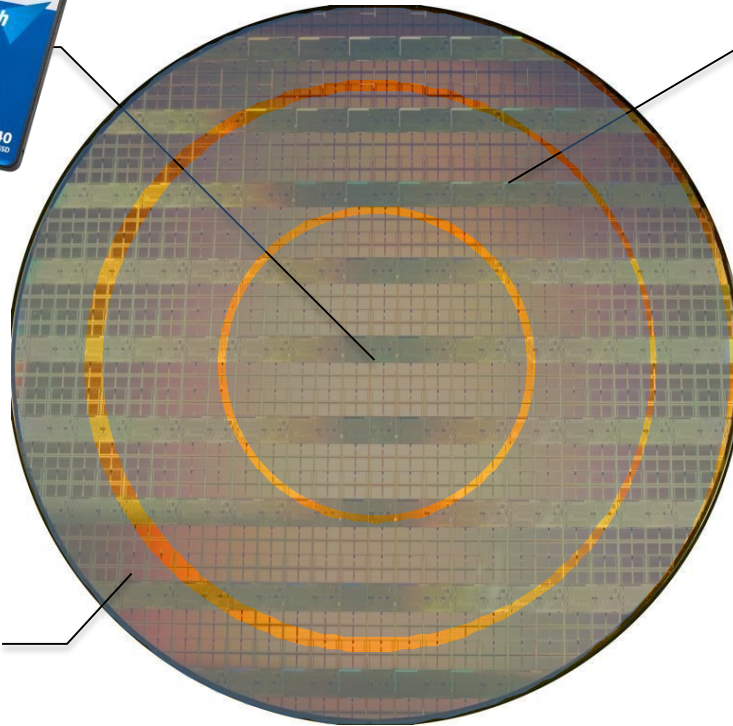
Tier 1

- Flash maker own brand SSD
- BIN 1 original package IC



Tier 2

- BIN 2 original package IC
- Wafer for package house



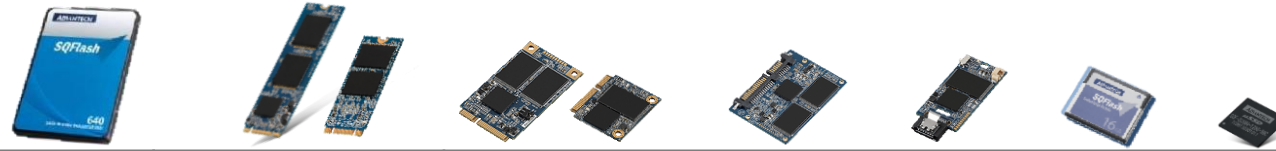
Tier 3

- Downgrade wafer package
- Ink die

Recycle

- Disassembled from used products...

SATA 640 – Embedded Series



Product Series	Embedded 2.5" SSD	Embedded M.2 SSD	Embedded Modules				
Model Name	SQF-S25	SQF-SM4 / SQF-SM8	SQF-SMS / SQF-SHM	SQF-SLM	SQF-SDM	SQF-S10	SQF-SUS
Transfer Protocol	SATA 6Gb/s						
Connector	7 + 15 pin SATA	M.2 B + M Key	Mini PCIe with SATA pin-out	7 + 15 pin SATA	7-pin Female	CFast Type-I	Onboard
Flash Vendor	Toshiba						
Flash Type	Ultra MLC / MLC / 3D NAND						Ultra MLC / MLC
Capacity	16GB ~ 1TB (SM4/SHM up to 512GB, SDM/S10/SUS up to 256GB)						
ECC	LDPC with advanced ECC						
Add-on	HW write protect					SW write protect	
Op. Temp.	0 ~ 70° C / -40 ~ 85° C						
SQFlash Utility	GUI management tool & SW API pack.						

SQFlash On-Board Storage Selections



Product Series		eMMC	UFS	SATA μSSD	PCIe μSSD
Model Name		SQF-MMC	SQF-FU5	SQF-SUS	SQF-CUS
Interface		eMMC 5.1	HS-Gear 3 x2, 2 Lanes	SATA III	PCIe Gen3 x2, 2 Lanes
Flash Support		MLC/ uMLC/ BiCS 3	BiCS 3	MLC/ uMLC/ BiCS 3	BiCS 3
Package		100 balls-14 x 18mm 153 balls-11.5 x 13mm	153 balls-11.5 x 13mm	156 Balls-16 x 20mm	291 Balls-16 x 20mm
Capacity		4GB ~ 256GB	32GB ~ 256GB	32GB ~ 256GB	128GB ~ 512GB
Performance ¹		Read: up to 310 MB/s Write: up to 200 MB/s	Read: up to 970 MB/s Write: up to 530 MB/s	Read: up to 550 MB/s Write: up to 490 MB/s	Read: up to 1,550 MB/s Write: up to 950 MB/s
New Tech.		FFU ² ,PSA ³ ,PON ⁴	TBD	E2EDPP ⁵ ,RAID ECC, SmartZIP ⁸	HMB ⁶ ,E2EDPP, RAID ECC
Op. Temp.		Automotive:-40 ~ 105°C Industrial: -40 ~ 85°C Commercial : 0 ~ 70°C	Automotive:-40 ~ 105°C Industrial: 40 ~ 85°C Commercial : 0 ~ 70°C	Industrial: -40 ~ 85°C Commercial : 0 ~ 70°C	Industrial: -40 ~ 85°C Commercial : 0 ~ 70°C
Power Consumption	Active	~1 W	~1.5 W	~1.5 W	~2.5 W
	Idle	~0.5 mW	~0.5 mW	~300 mW	~20 mW
Application		Entry level ARM based device	High-end level ⁷ ARM based device	X86 based device (NB, IPC, Tablet)	X86 based device (NB, Server)

1. Performance may vary depending on test condition & platform

2. FFU: Field Firmware Update

3. PSA: Production State Awareness

4. PON: Power Off Notification

5. E2EDPP: End-to-End Data Path Protection

6. HMB: Host Memory Buffer

7. Snapdragon 835, 845, Helio X30, Exynos 8890, 8895, Kirin 955, 960

8. SmartZIP: Technology for lower WAF and enhance endurance

SQFlash SD Card

Stable and Reliable Storage Solution for IoT and Edge Sense / Computing

- Wide capacity range from 128MB to 1TB.
- OP temp: Standard -25~85 °C
Industrial -40~85 °C
- High and stable R/W performance
(page mode support)
- Industrial Grade SLC/ UMLC / MLC / 3D NAND
for reliable storage solution
- Fix BOM and over 3 years longevity



SQFlash SD Card Selections



Model Name	SQF-ISD/MSD 21	SQF-ISD/MSD D1	SQF-ISD/MSD D2
Interface	SD6.X/ UHS-I	SD6.X/ UHS-I	SD6.X/ UHS-I
Flash Support	SLC / UMLC/ MLC	BiCS 3	BiCS 4
Package	11.0 x 15.0 x 1.0mm (microSD) 24.0 x 32.0 x 2.1mm (SD)	11.0 x 15.0 x 1.0mm (microSD) 24.0 x 32.0 x 2.1mm (SD)	11.0 x 15.0 x 1.0mm (microSD) 24.0 x 32.0 x 2.1mm (SD)
Capacity	SLC: 128 MB ~ 32GB UMLC: 4GB ~ 64 GB MLC: 8GB ~ 128 GB	BiCS 3 : 32GB ~ 256GB	BiCS 4 : 64GB ~ 1TB
Performance	Read: up to 95 MB/s Write: up to 90 MB/s	Read: up to 100 MB/s Write: up to 90 MB/s	Read: up to 100 MB/s Write: up to 80 MB/s
ECC mode	BCH	Smart ECC	LDPC
Op. Temp.	Standard: -25 ~ 85°C Industrial: -40 ~ 85°C		
New Tech.	<ul style="list-style-type: none"> • SMART tool • Power Loss Protection • Advanced wear-leveling • Auto- Read Refresh • CPRM* optional 	<ul style="list-style-type: none"> • SMART tool • Power Loss Protection • Auto- Read Refresh • CPRM optional 	<ul style="list-style-type: none"> • SMART tool • Power Loss Protection • Auto- Read Refresh • E2E data path protection • Power on self test circuit • CPRM optional
Product State	<ul style="list-style-type: none"> • Longevity to ~2021 	<ul style="list-style-type: none"> • CS sample Q1'19 	<ul style="list-style-type: none"> • CS sample Q2'19

*CPRM: Content Protection for Recordable Media

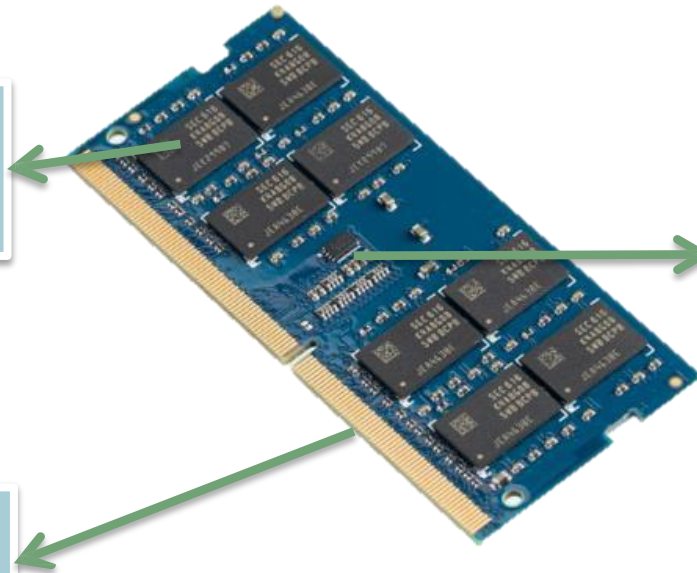
SQRAM – Hardware Industrial Grade Design

JEDEC Qualified
Advantech **SQR**

Original IC
Samsung/Hynix/
Micron

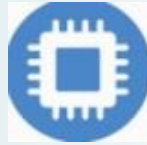
EEPROM with
Thermal Sensor

30u"
Golden Finger

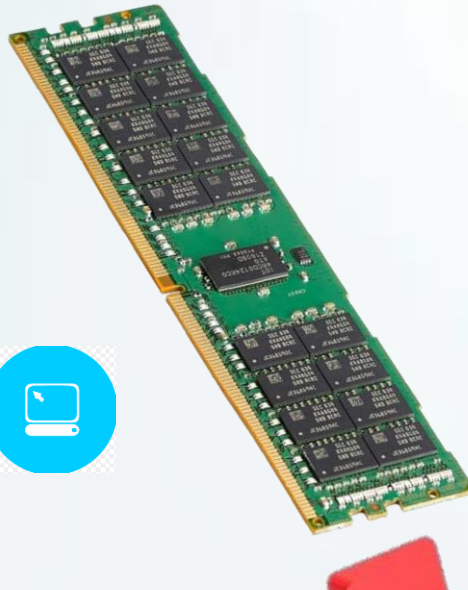


Design Reliability & Compatibility

- **Fixed BOM/ Die generation**



SQRAM fixed die, IC generation for 3 year longevity for product management and quality control



- **Rigorous Burn-In Program**

Temp. test: -20 ~ 85oC / - 40 ~ 85oC
Humidity: 0 ~ 90%



- **Compatibility Test**

Function Test verified by DQA Dept. with different generation chipset and platform to ensure compatibility

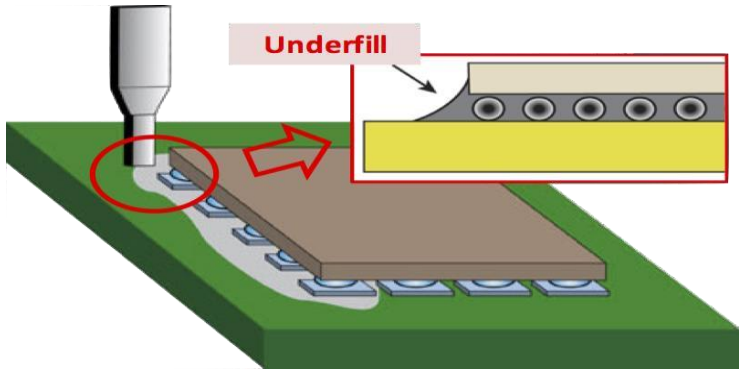


- **100% Test**

SQRAM ensure 100% memory are undergo strict test before shipment with reliable quality



カスタマイズサービス

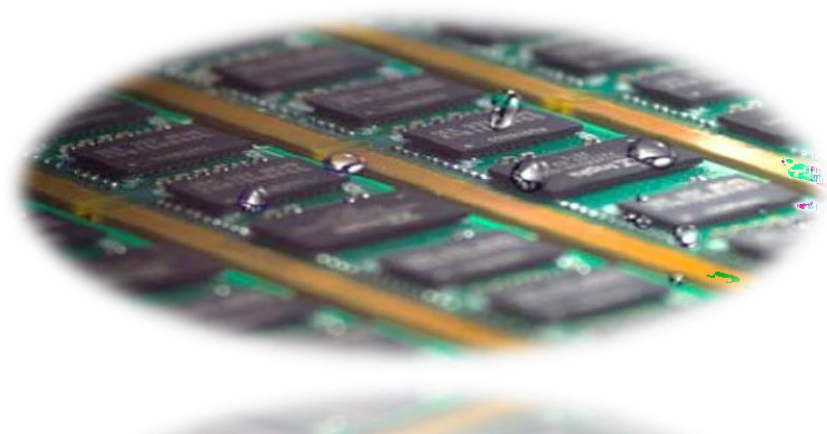


アンダーフィル

- Embedded systems reliability enhancement option
- Outstanding protection for solder joints against various mechanical strains such as shock, drop and vibration is delivered
- Product quality is improved, and product life is extended.

絶縁保護コーティング

- Acrylics/ Silicone from major coating material supplier HumiSeal
- True conformability with uniform thickness range: 0.03mm~ 0.13 mm
- Water, corrosion, acid, and base resistance



SGRAM - Comprehensive Product Portfolio

DDR1/DDR2
800/667

組込向け

SQR-SD1N/ SQR-SD2N
DDR1/ DDR2
SO DIMM
512MB/1GB

堅牢設計

Wide Temperature
SQR-SD4I/ SQR-SD3I
-20~85/-40~85C
2/4/8/16/32GB*

サーバー

R DIMM
SQR-RD4N
DDR4-3200/2933
8/16/32GB

DDR3
1866/1600

SQR-SD3N/SQR-UD3N
SO DIMM/UDIMM
2/4/8GB

Rugged DIMM
SQR-YD4I/ SQR-YD4N
With Screw hole
Military verification

LR DIMM
SQR-LD4N
DDR4 - 3200/2666
32/64GB

DDR4
3200/2933

SQR-SD4N/SQR-UD4N
SO DIMM/UDIMM
2/4/8/16/ 32GB

Thermal Series
SQR-HS4N
With Heat Sink
16/32GB

ECC DIMM
SQR-UD4(E)
DDR4 - 2666/2400
4/8/16/32GB

Full spectrum of SQRAM memory



KIOSK



POS



Industrial Automation



Transportation



Defense



Medical



Surveillance



Telecom



Server



Unbuffered DIMM

SO DIMM

ECC DIMM

Registered DIMM

LR DIMM

VLP DIMM

Rugged DIMM



ADVANTECH



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OKAMOTO ELECTRONICS CORPORATION

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