



ASX Announcement

September 2019 Quarter Update

- Akida™ (AKD1000) product development nearing completion
 - Akida Intellectual Property marketing includes significant customer discussions
 - Akida Design Workshop scheduled 1 November 2019 Perth, Western Australia
 - Cash Balance as of 30 September 2019 US\$9.54M
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San Francisco, California – 30 October 2019: BrainChip Holdings Ltd (ASX: BRN), a leading provider of ultra-low power, high performance edge AI technology, provides the following update for the quarter ending 30 September 2019 to accompany the Company's Appendix 4C lodged with the ASX.

The Company ended the September quarter with US\$9.54M in cash. For the December 2019 quarter the Company forecasts recurring operating expenses of US\$2.65M which includes an increase in marketing expenses for collateral material and event expenses in advance of the Akida product release. Total cash outflows of US\$4.15M are expected for the quarter which includes non-recurring expenses associated with the Akida device development. Total cash receipts for the September quarter were immaterial. The Company continues to control expenses, primarily employee headcount, while completing the Akida development.

Recent Company Press Releases

22 October 2019: the Company was awarded a patent over the use of libraries in neural networking systems. Two provisional patents, with multiple claims, are currently in process which cover the innovations in the Akida design.

15 October 2019: Anil Mankar, Chief Development Officer and Founder, would be introducing the Akida™ Neuromorphic System-on-Chip to audiences at the Linley Fall Processor Conference October 23 and 24 at the Hyatt Regency Hotel in Santa Clara, California.

13 October 2019: a Developer and Data Scientist Workshop is to be held in Perth, Western Australia on 1 November 2019. Qualified developers and data scientists have been invited to attend the workshop at the Ernst & Young facility at Tank Stream Labs. The workshop will focus on implementations of Convolutional Neural Networks converted to Event-Based Neural Networks and the development of Native Spiking Neural Networks.

3 October 2019: the Company announced the retention of ActualTech Media and JPR Communications to inform key decision makers about the Company's innovative



technology. The introduction of Akida (AKD1000) will mark a major milestone for the Company and introduce a new breed of fully integrated neural networking neuromorphic devices. AKD1000 incorporates all the functions necessary to run a neural network on-chip as either an Event-Based CNN or a native Spiking Neural Network (SNN). This includes the neural fabric, a Central Processing Unit complex (CPU) and integrated memory for weights and activations.

2 October 2019: Peter Van der Made, CTO and founder of BrainChip, was to speak to audiences at two industry events, discussing the flagship Akida technology. At the events Mr van der Made presented the Akida device architecture in detail, and provided demonstrations of the device in several applications including a Dynamic Vision Sensor (DVS) native SNN, a standard CMOS image sensor and data processing for Cybersecurity. Current neuromorphic devices are Deep Learning Accelerators (DLAs) that provide acceleration of the multiply and accumulates functions necessary for existing Convolutional Neural Networks but do not integrate the neural network or provide training, inference and edge learning.

24 September 2019: Louis DiNardo, CEO of BrainChip, was accepted into Forbes Technology Council, an invitation-only community for CEO, CIO, CTO, and technology executives. The Forbes Technology Council provides the Company broad reach through a highly regarded public format to introduce the Company to customers and investors.



The Company is pleased to provide some additional detail and background on the Company's activities below.

Akida Product Development

Logic design for the Akida device has been completed and the development is now in synthesis and physical design. Verification, package design, test hardware and software development will be completed in parallel with physical design and wafer fabrication.

The Company expects to begin wafer fabrication within the coming months and provide engineering samples in early calendar year 2020. Costs associated with the development and manufacturing of the Akida device are included in the Company's budgeted expenses for the December 2019 and March 2020 quarters.

Akida development partnership:

- The Company is working with SocioNext on the development and manufacturing of Akida. SocioNext is the former Fujitsu and Panasonic Application Specific Integrated Circuit (ASIC) business.



- SocioNext is the world's second largest supplier of ASICs and a leader in technology development. Working with Socionext provides the Company access to world-class engineering talent, reduces development risk and improves time-to-market for the Akida device.
- SocioNext will provide the Company finished goods; packaged, tested and marked for shipment to end customers.
- The Company expects to inventory product at a third-party logistics partner in Japan.

Akida Sales and Marketing

The Company continues to prioritize engineering, sales and marketing resources on potential customers for the Akida NSoC and IP.

The Company focuses exclusively on edge applications for both IP and the Akida device. Edge applications include use cases where data is acquired by a variety of transducers and a benefit is derived by processing the information at the transducer, rather than sending all data to an enterprise data center or cloud for processing. By providing analytics and correlation at the edge an AI enabled edge device reduces system latency, frees system bus bandwidth and system processor capacity.

Akida NSoC and IP opportunities include:

- Vision sensor manufacturers, module suppliers and automobile manufacturers for Advanced Driver Assistance Systems (ADAS), Autonomous Vehicles (AV) and AR/VR. This includes leading providers of CMOS image sensors, Dynamic Vision Sensors and Lidar
- Industrial Internet-of-Things suppliers for preventive maintenance and various edge applications
- Acoustic analysis for hearing assisted and smart home devices in "key word" spotting
- Enterprise edge providers in video management and cybersecurity for threat detection
- Laptop computers and cellphones manufacturers for voice and gesture recognition

BrainChip Studio Sales and Marketing

The Company continues to market its BrainChip Studio product to OEMs in the surveillance and security market as well as the gaming and factory automation industries.

BrainChip Studio opportunities include:

- Gaming – the Company has an exclusive agreement with Gaming Partners International which was acquired by Angel Koda in Kyoto Japan. Subsequent to



the merger GPI/Angel is evaluating BrainChip's vision system for commercialization in game and currency security.

- Cloud and Enterprise Video Analytics – the Company is engaged with world leaders in storage and server technology for end-to-end (data center to edge) solutions as well as leaders in cloud based analytics.

The Company is proceeding with the Akida product development and engagements with early access manufacturers to bring a first-in-kind product to market. The Akida NSoC enables AI Edge solutions for high-growth, high-volume applications that have been difficult to achieve with existing AI architectures.

The Company competes with other well-financed private companies and time-to-market and performance are paramount for success. The Akida device for AI Edge applications is a major technology advancement and the intellectual property is now available to license with engineering samples of the Akida device expected in early calendar 2020.

About BrainChip Holdings Ltd (ASX: BRN)

BrainChip is a global technology company that has developed a revolutionary advanced neural networking processor that brings artificial intelligence to the edge in a way that existing technologies are not capable. The solution is high performance, small, ultra-low power and enables a wide array of edge capabilities that include local training, learning and inference. The Company markets an innovative event-based neural network processor that is inspired by the spiking nature of the human brain and implements the network processor in an industry standard digital process. By mimicking brain processing BrainChip has pioneered a spiking neural network, called Akida, which is both scalable and flexible to address the requirements in edge devices. At the edge, sensor inputs are analyzed at the point of acquisition rather than transmission to the cloud or a datacenter. Akida is designed to provide a complete ultra-low power AI Edge Network for vision, audio and smart transducer applications. The reduction in system latency provides faster response and a more power efficient system that can reduce the large carbon footprint datacenters. Additional information is available at <https://www.brainchipinc.com>.

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Appendix 4C

Quarterly report for entities subject to Listing Rule 4.7B

Name of entity

BrainChip Holdings Ltd

ABN

64 151 159 812

Quarter ended ("current quarter")

30 September 2019

Consolidated statement of cash flows	Current quarter \$US'000	Year to date (9 months) \$US'000
1. Cash flows from operating activities		
1.1 Receipts from customers	4	191
1.2 Payments for		
(a) research and development	(1,777)	(3,654)
(b) product manufacturing and operating costs	-	(275)
(c) advertising and marketing	(168)	(700)
(d) leased assets	-	-
(e) staff costs	(365)	(1,109)
(f) administration and corporate costs	(320)	(1,326)
1.3 Dividends received (see note 3)	-	-
1.4 Interest received	30	61
1.5 Interest and other costs of finance paid	(3)	(8)
1.6 Income taxes paid	-	-
1.7 Government grants and tax incentives (non-Aus)	-	-
1.8 Other	-	-
1.9 Net cash from / (used in) operating activities	(2,599)	(6,820)

Consolidated statement of cash flows		Current quarter \$US'000	Year to date (9 months) \$US'000
2.	Cash flows from investing activities		
2.1	Payments to acquire:		
	(a) property, plant and equipment	(2)	(21)
	(b) businesses (see item 10)	-	-
	(c) investments	-	-
	(d) intellectual property	-	-
	(e) other non-current assets:		
	Intangible Assets – Patents and Licenses	(23)	(227)
2.2	Proceeds from disposal of:		
	(a) property, plant and equipment		
	(b) businesses (see item 10)	-	-
	(c) investments	-	-
	(d) intellectual property	-	-
	(e) other non-current assets	-	-
2.3	Cash flows from loans to other entities	-	-
2.4	Dividends received (see note 3)	-	-
2.5	Other	-	-
2.6	Net cash from / (used in) investing activities	(25)	(248)

3.	Cash flows from financing activities		
3.1	Proceeds from issues of shares	7,394	7,394
3.2	Proceeds from issue of convertible notes	-	2,565
3.3	Proceeds from exercise of share options	-	-
3.4	Transaction costs related to issues of shares, convertible notes or options	(484)	(496)
3.5	Proceeds from borrowings	-	-
3.6	Repayment of borrowings	-	-
3.7	Transaction costs related to loans and borrowings	-	-
3.8	Dividends paid	-	-

Consolidated statement of cash flows		Current quarter \$US'000	Year to date (9 months) \$US'000
3.9	Other (provide details if material)	(46)	(159)
3.10	Net cash from / (used in) financing activities	6,864	9,304

4.	Net increase / (decrease) in cash and cash equivalents for the period		
4.1	Cash and cash equivalents at beginning of quarter/year to date	5,520	7,544
4.2	Net cash from / (used in) operating activities (item 1.9 above)	(2,599)	(6,820)
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(25)	(248)
4.4	Net cash from / (used in) financing activities (item 3.10 above)	6,864	9,304
4.5	Effect of movement in exchange rates on cash held	(223)	(243)
4.6	Cash and cash equivalents at end of quarter	9,537	9,537

5.	Reconciliation of cash and cash equivalents at the end of the quarter (as shown in the consolidated statement of cash flows) to the related items in the accounts	Current quarter \$US'000	Previous quarter \$US'000
5.1	Bank balances	9,537	5,520
5.2	Call deposits	-	-
5.3	Bank overdrafts	-	-
5.4	Other (provide details)	-	-
5.5	Cash and cash equivalents at end of quarter (should equal item 4.6 above)	9,537	5,520

6. Payments to directors of the entity and their associates

6.1 Aggregate amount of payments to these parties included in item 1.2

6.2 Aggregate amount of cash flow from loans to these parties included in item 2.3

6.3 Include below any explanation necessary to understand the transactions included in items 6.1 and 6.2

**Current quarter
\$US'000**

187

-

Payment of non-executive director fees and executive director salaries.

7. Payments to related entities of the entity and their associates

7.1 Aggregate amount of payments to these parties included in item 1.2

7.2 Aggregate amount of cash flow from loans to these parties included in item 2.3

7.3 Include below any explanation necessary to understand the transactions included in items 7.1 and 7.2

**Current quarter
\$US'000**

329

-

Salaries and fees paid to related parties identified as key management personnel, excluding directors noted in 6 above.

8. Financing facilities available
Add notes as necessary for an understanding of the position

8.1 Loan facilities

8.2 Credit standby arrangements

8.3 Other (please specify)

8.4 Include below a description of each facility above, including the lender, interest rate and whether it is secured or unsecured. If any additional facilities have been entered into or are proposed to be entered into after quarter end, include details of those facilities as well.

**Total facility
amount at quarter
end
\$US'000**
**Amount drawn at
quarter end
\$US'000**

-

-

22

-

-

-

BrainChip SAS has a secured overdraft facility with Credit Agricole, France, to the value of 20,000 Euros which incurs interest at 8.02%.

9.	Estimated cash outflows for next quarter	\$US'000
9.1	Research and development	2,836*
9.2	Product manufacturing and operating costs	-
9.3	Advertising and marketing	384
9.4	Leased assets	-
9.5	Staff costs	402
9.6	Administration and corporate costs	513
9.7	Other	
	- Acquisition of property, plant & equipment	
	- Payments of lease liabilities	16
9.8	Total estimated cash outflows	4,150

**Includes \$1,500,000 of third party expenses associated with the Akida device development*

10.	Acquisitions and disposals of business entities (items 2.1(b) and 2.2(b) above)	Acquisitions	Disposals
10.1	Name of entity	-	-
10.2	Place of incorporation or registration	-	-
10.3	Consideration for acquisition or disposal	-	-
10.4	Total net assets/(liabilities)	-	-
10.5	Nature of business	-	-

1.1 Compliance statement

- 1 This statement has been prepared in accordance with accounting standards and policies which comply with Listing Rule 19.11A.
- 2 This statement gives a true and fair view of the matters disclosed.

Sign here:

Date: 31 October 2019

Company secretary

Print name: Kim Clark

Notes

1. The quarterly report provides a basis for informing the market how the entity's activities have been financed for the past quarter and the effect on its cash position. An entity that wishes to disclose additional information is encouraged to do so, in a note or notes included in or attached to this report.
2. If this quarterly report has been prepared in accordance with Australian Accounting Standards, the definitions in, and provisions of, *AASB 107: Statement of Cash Flows* apply to this report. If this quarterly report has been prepared in accordance with other accounting standards agreed by ASX pursuant to Listing Rule 19.11A, the corresponding equivalent standard applies to this report.
3. Dividends received may be classified either as cash flows from operating activities or cash flows from investing activities, depending on the accounting policy of the entity.