密级状态：绝密(　　)　秘密(　　)　内部(　)　公开(√)

Security Class: Top-Secret (　　)　Secret (　　)　Internal (　)　Public (√)

RK3399_SDK 性能指标说明文档

RK3399_SDK_Performance_Instruction

（技术部，第二系统产品部）

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文件状态： Status： [　] 正在修改 [　]Modifying [√] 正式发布 [√]Released	当前版本： Current Version:	V2.0
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	完成日期： Finish Date:	2018-08-23
	审　　核： Auditor:	
	完成日期： Finish Date:	2018-08-23

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版 本 历 史 Revision History

版本号 Version no.	作者 Author	修改日期 Revision Date	修改说明 Revision description	备注 Remark
V1.0	黄国椿 Huang Guochun	2017.12.28	初始版本 Initial version release.	
V2.0	黄国椿 Huang Guochun	2018.08.23	更新 antutu7.1.3 跑分和千兆以太网测试数据 Update the test data of antutu7.1.3 and Gigabit Ethernet.	

目 录 Contents

1 简介 Overview

本文主要介绍 RK3399 性能相关指标。

This document mainly introduces RK3399 performance related indicators.

2 Antutu v7.1.3 Benchmark

Antutu v7.1.3	Item	RK3399 A72x2+A53x4 LP3 : 800MHz 1.8GHz/1.4GHz GPU : 800MHz Android 8.1 2048x1536	RK3399 A72x2+A53x4 LP4 : 800MHz 1.8GHz/1.4GHz GPU : 800MHz Android 8.1 1920x1200
Score	Total Score	**110995**	**104357**
GPU	GPU Score	**23816**	**22956**
	Marooned	3814	3744
	Coastline	6553	6624
	Refinely	13449	12588
UX	UX Score	**40146**	**38785**
	UX Data Secure	5305	4946
	UX Data process	6228	6037
	UX Image processs	15850	15210
	UX User Experience	12763	12592
CPU	CPU Score	**41623**	**35094**

	CPU Mathematics	10606	9716
	CPU Common Use	4724	4890
	CPU Multi-Core	26293	20488
MEM	MEM Score	**5410**	**7522**
	Ram	1762	1917
	Rom	3648	5605

3 Geekbench 4 v4.0.0 Benchmark

Geekbench V4-4.0.0	RK3399N (A72x2+A53x4) (LP3=912/GPU=800)MHz (A72=2.0/A53=1.5) GHz 2048x1536、Android 7.1		RK3399N (A72x2+A53x0) (LP3=912/GPU=800) MHz (A72=2.0/A53=1.5)GHz 2048x1536、Android 7.1		RK3399N (A72x0+A53x4) (LP3=912/GPU=800) MHz (A72=2.0/A53=1.5)GHz 2048x1536、Android 7.1		RK3399N (A72x0+A53x2) (LP3=912/GPU=800) MHz (A72=2.0/A53=1.5)GHz 2048x1536、Android 7.1	
CPU	**Single Core**	**Multi Core**	**Single Core**	**Multi Core**	**Single Core**	**Multi Core**	**Single Core**	**Multi Core**
Total	**1405**	**2935**	**1400**	**2181**	**575**	**1563**	**567**	**899**
Compute (RenderScript)	**1696**		**1006**		**808**		**413**	

4 Geekbench 4 Ranking

Geekbench V4-4.0.0	RK3399 (A72x2+A53x4) (2.0/1.5)GHz Android 7.1		MT8693 (A72x2+A53x4) (2.0/1.6)GHz Android 5.1		Exynos 8890 CUSx4+A53x4 (2.3/1.5)GHz Android 6.0		Qualcomm S835 Kryo280x4+A53x4 (2.45/1.7)GHz Android 7.0		Nvidia K1 A15x4 2.22GHz Android 7.0		RK3288 A17x4 1.8GHz Android 6.0		RK3399 (A72x0+A53x4) (2.0/1.5)GHz Android 7.1	
CPU	Single	Multi	Single	Multi	Single	Multi	Single	Multi	Single	Multi	Single	Multi	Single	Multi
Total	1452	3005	1514	3171	1504	4992	1996	6657	1085	2986	1028	2920	575	1563

Note：Data is from Geekbench website.

5 GFXBench v4.0.12 Benchmark

GFXBench 4.0.12	OpenGL ES	RK3399N (A72x2+A53x4) LP3=912MHz DVFS GPU(800)MHz DVFS CPU(2.0/1.5)GHz	RK3399N (A72x2+A53x4) LP3=912MHz Fixed GPU(800)MHz DVFS CPU(2.0/1.5	RK3399N (A72x2+A53x0) LP3=912MHz DVFS GPU(800)MHz DVFS CPU(2.0/1.5	RK3399N (A72x0+A53x4) LP3=912MHz DVFS GPU(800)MHz DVFS CPU(2.0/1.5

		2048x1536、Android 7.1	)GHz 2048x1536、Android 7.1	)GHz 2048x1536、Android 7.1	)GHz 2048x1536、Android 7.1
Car Chase	3.1	3.8	3.8	3.8	3.8
1080P Car Chase Offscreen	3.1	5.2	5.2	5.2	5.0
Manhattan 3.1	3.1	6.9	7.0	7.0	6.9
1080P Manhattan 3.1 offscreen	3.1	10.0	10.0	10.0	10.0
Manhattan	3.0	11.0	11.0	11.0	11.0
1080P Manhattan offscreen	3.0	16.0	16.0	16.0	16.0
T-Rex	2.0	27.0	27.0	26.0	27.0
1080P T-Rex offscreen	2.0	35.0	34.0	35.0	34.0
Tessellation	3.1	18.0	18.0	18.0	18.0
1080P Tessellation offscreen	3.1	25.0	24.0	25.0	25.0
ALU 2	3.0	9.8	9.9	9.9	9.8
1080P ALU 2 offscreen	3.0	14.0	14.0	14.0	14.0
Driver Overhead 2	3.0	7.3	7.4	7.3	4.1
1080P Driver Overhead 2 offscreen	3.0	7.3	7.4	7.3	4.1
Texturing (Mtexel/s)	3.0	2258.0	2257.0	2259.0	2258.0

1080P Texturing offscreen	3.0	2249.0	2246.0	2246.0	2242.0
Render Quality (1080P, mB PSNR)	2.0	3310.0	3310.0	3310.0	3310.0
Render Quality (high precision)	2.0	4045.0	4045.0	4045.0	4045.0

6 PCIe – SATA performance

PCIe-to-SATA （RK3399）			
Chip: ASMedia1061R / SATA HDD: WestDigital 5400rpm			
Tool: Linux dd (bs=1M count=200000) / hdparm			
Mode	**hdparm read MBps**	**dd Read MBps**	**dd Write MBps**
AHCI	145	145	146
RAID0	277	277	277
RAID1	146	147	147
SPAN	146	146	146

7 PCIe – SSD performance

Tool: FIO / Platform: RK3399 EVB3/ PCIe X4
SSD:Samsung SM961 / payload:256

				PCIE 1.0		PCIE 2.0	
Item	iodepth	thread	ioengine	Perf	avg. IOPS	Perf	avg. IOPS
1M sequential-read	4	1	libaio	790MB/s		1.53GB/s	
1M sequential-write	4	1	libaio	780MB/s		1.26GB/s	
4K random-write	64	6	libaio		194K		209K
8K random-write	64	6	libaio		98K		106K
16K random-write	64	6	libaio		49K		48K
4K random-read	64	6	libaio		170K		246K
8K random-read	64	6	libaio		94K		175K
16K random-read	64	6	libaio		45K		81K

Note：Configuration: PCIe V2.1, Gen2, 4x

8 eMMC – performance

eMMC performance （RK3399）		
Tool: dd (bs=1M count=2000)		
Item	eMMC 5.1	eMMC 4.51
dd read	220 MBps	110 MBps
dd write	86 MBps (Toshiba 32G)	86 MBps (Toshiba 32G)

* The write performance depends on eMMC chip very much.

Note：Configuration: eMMC version is 5.1 in RK3399, while 4.51 in RK3288.

9 clpeak-R01

RK3399	RK3399
T864	T864
Linux （GPU 变频）	Linux (GPU 定频)
Platform: ARM Platform	Platform: ARM Platform
Device: Mali-T860	Device: Mali-T860
Driver version : 1.2 (Linux ARM64)	Driver version : 1.2 (Linux ARM 64)
Compute units : 4	Compute units : 4
Clock frequency : 200~800 MHz	Clock frequency : 800 MHz
Global memory bandwidth (GBPS)	Global memory bandwidth (GBPS)
float : 3.22	float : 3.69
float2 : 6.11	float2 : 5.94
float4 : 7.46	float4 : 7.07
float8 : 6.29	float8 : 5.97
float16 : 5.86	float16 : 5.49
Single-precision compute (GFLOPS)	Single-precision compute (GFLOPS)
float : 25.16	float : 25.11
float2 : 45.37	float2 : 45.65
float4 : 45.68	float4 : 45.69
float8 : 41.67	float8 : 41.69
float16 : 46.44	float16 : 46.41

half-precision compute (GFLOPS)	half-precision compute (GFLOPS)
half : 22.97	half : 23.14
half2 : 50.09	half2 : 50.31
half4 : 98.95	half4 : 98.69
half8 : 93.51	half8 : 93.61
half16 : 92.95	half16 : 92.96
Double-precision compute (GFLOPS)	Double-precision compute (GFLOPS)
double : 5.14	double : 6.47
double2 : 3.28	double2 : 3.28
double4 : 20.98	double4 : 20.98
double8 : 20.66	double8 : 20.66
double16 : 20.41	double16 : 20.41
Integer compute (GIOPS)	Integer compute (GIOPS)
int : 20.16	int : 20.20
int2 : 50.04	int2 : 49.71
int4 : 47.22	int4 : 47.54
int8 : 48.79	int8 : 48.86
int16 : 41.48	int16 : 41.50
Kernel launch latency : 102.36 us	Kernel launch latency : 94.40 us

Note：GPU only

10 Gigabit Ethernet rate

Upstream rate	Downstream rate
784 Mbits/sec	851Mbits/sec