

# Android10\_CDD\_ GMS\_Go\_Introduction

# 修改历史 Revision History

版本号 Version	日期 Date	注释 Notes
V1.0	2019/11/15	初稿

# 文档信息 Document Information



适用产品信息 Chip Platform	适用版本信息 OS Version	关键字 Keyword
SC9863A\ SC9832E\ SC7731E\T610\T618	Android 10 & Android 10 Go	CDD GMS

- Q CDD(Android Compatibility Definition Document)
- Q GMS Requirements

	CDD Requirements	GMS Requirements
Goal	Ensure compatibility and developers expectation is met	Ensure best user experience on GMS
Form factor	Any	Handheld/Tablet
Visibility	Public to all	Available only to those signed the contract (MADA)

- Q Go Intro

- 3.5.1. App Restriction SRtoMUST , 不允许程序 静默改动 AppOpsManager , 而是必须经过用户主动修改。
- 7.3.10. Biometric Sensors ( Strong , Weak and Convenience )
- 7.6.2. Application Shared Storage ( App API level 29 storage 权限限制 )
- 9.1 Permissions
  - 数据权限保护(请保持现有AppOpsManager AOSP implementation)
  - 位置保护Location ( 请遵循原生运行态权限 )
  - determine/estimate the device's location (such as SSID, BSSID or Cell ID)
  - 强烈建议App被verifyboot保护
  - 默认情况下 , 状态栏如果超过3个图标 , 则必须在状态栏显示正在使用的权限。
  - Runtime permission 控制(including but not limited to accelerometer, gyroscope, light sensor, barometer, proximity sensor, location sensors, and connectivity sensors)
- 9.8. Privacy
  - 保护the device serial number , IMEI / MEID, SIM serial number ,
  - PackageManager.FEATURE\_BACKUP ( 建议使用Google云备份支持 )
  - Location/Wifi&BT scan 用户提示
  - 9.8.3. Connectivity MUST NOT open TCP/IP listen sockets for any applications
- 9.9 Encryption requirements ( FBE 强制 )
- 9.11. Keys and Credentials ( 安全锁定屏幕功能 , Unisoc默认支持 )



- 3.2.2. Build Parameters/C-0-1 table Update the format of 3.2.2. Build Parameters: For VERSION.INCREMENTAL ( 请不要随意修改，默认符合 )
  - 在android.os.build下的参数是通过prop参数获得，而这些参数是在build阶段
  - `$(intermediate_system_build_prop): $(BUILDINFO_SH) $(BUILDINFO_COMMON_SH) $(INTERNAL_BUILD_ID_MAKEFILE) $(BUILD_SYSTEM)/version_defaults.mk $(system_prop_file) $(INSTALLED_ANDROID_INFO_TXT_TARGET) $(API_FINGERPRINT)`
  - 主要脚本由：
    - `BUILDINFO_SH := build/make/tools/buildinfo.sh`
    - `BUILDINFO_COMMON_SH := build/make/tools/buildinfo_common.sh`

- Audio
  - 5.4.1 Raw Audio Capture , 5.4.X. Microphone Information Reporting , 5.4.4 Audio Recording
  - 5.6 Audio Latency , 5.10. Professional Audio , 7.8.2.2. Digital Audio Ports
- GPU
  - Vulkan 1.1
  - OpenGL ES
- Camera
  - 7.5.4 Camera API requirement & Behavior , Resolution
- Multimedia
  - 2.2.2 Multimedia, 2.3.2 Multimedia, 2.5.2 Multimedia, 5.1.1 Audio Encoding, 5.1.2 Audio Decoding ,5.1.3 Audio Codecs Details, 5.2 Video Encoding, 5.3 Video Decoding
- Telephony , Connectivity , Sensor

- Trademark logo update
  - MUST be new Android 10+ DEVICES, MUST for new Android 9 DEVICES on or after Jan 1, 2020



- Android OS Version Wordmark

**android 10**

- Core Apps
  - Maps Go and Nav Go apps required for 512MB Android Go devices 【2019 , 3<sup>rd</sup> Sep】
  - Gallery Go required for Android Go devices 【2019 , 4th , Nov】
  - YouTube Music replaces Google Play Music 【2019 , 4th , Nov】
  - Momochrome: MUST for Android 7.0 ~ 9 builds , Trichrome: MUST for Android 10 builds
  - Digital Wellbeing and Parental Controls , MUST for all Android 9/10 PRODUCTS and OS upgrades
  - Gesture navigation , New DEVICES launching with Android 10 or higher



# 主要GMS提示 – Mainline&Treble&安全

- Mainline Updates(Play Update) is GMS requirement
- Treble
  - Device partition requirements
    - Dynamic partition , Fastbootd support
    - Userdata checkpointing (UDC)
    - Boot image format
    - Partition requirements for CPUs supporting device trees
  - Kernel upgrade requirements (目前Unisoc全系芯片 kernel 4.19)
  - Kernel build toolchain requirements ( 64bit kernel built with a Clang/LLVM based compiler )
  - Interface requirements ( compatibility\_matrix )
  - Android10 CTS/VTS testing requirement changes

Test Suite	Test with	Build	Dynamic System Update	Debug ramdisk	Device state	Notes
CTS	OEMs system	User			Locked	
CTSonGSI	GSI	User	Y		Locked	
VTS	GSI	user	Y	Y	unlocked	with root

- GMS express plus(安全提示)
  - All 3rd party app should be published on the Google Play Store
  - No 1st/3rd party app should have package installation permission

## All the Android10 Chipsets

- SC9863A(8\*A55 , 28nm )
- SC7731E(4\*A7, 28nm)
- SC9832E(4\*A53, 28nm)
- T610(2\*A75+6\*A55, 12nm)
- T618(2\*A75+6\*A55, 12nm,VDSP,AI)

- Full SOC support GMS Express
- Continuous \*TS testing
- Fine-tuned Go Configuration
- Monthly Integration Security/Mainline Update
- GMS Requirement Changes Guarantee
- Features (Tee, G-depth, Security, wellbeing, GOTA, PAI, Gesture, ETC)
- 3PL Service

- Reduce development overhead and complexity
- Shorten development time, certification time and time-to-market
- Build and maintain more secure devices
- Free Certification For GMS Express Plus
- Providing support for GMS express 2.0

Key events	<ul style="list-style-type: none"><li>· Established in Nov 2018</li><li>· First certification completed in Dec 2018</li></ul>
Contact window	<ul style="list-style-type: none"><li>· Shenzhen, China</li></ul>
Build type	<ul style="list-style-type: none"><li>· Express Plus</li><li>· Express Plus + EEA(type 4c)</li><li>· Express 2.0</li></ul>
Partner	<ul style="list-style-type: none"><li>· Support any Unisoc customer</li></ul>
Service	<ul style="list-style-type: none"><li>· Software certification</li><li>· Brand approval</li><li>· GMS Requirement</li><li>· Pre-test technical support</li></ul>

- Google Android Q Go 标准

Chipset	Google performance	Persist process	Google default cache free	Launcher	SystemUI	Memory Total
s9863a	923 ms, 15.6	> 80 MB	562 MB	>30 MB	>45 MB	867 MB
sp7731e	1304 ms, 22.2	> 80 MB	629 MB	>30 MB	>45 MB	911 MB
sp9832e	975 ms, 16.5	> 80 MB	605 MB	>30 MB	>45 MB	889 MB
google sandard	< 1650 ms, 28s	< 100 MB	> 430 MB	< 50 MB	< 75 MB	CDD HD+ 592 MB

- P->Q 内存变化，在优化情况下，剩余内存差距不大。App整体变大，Swap整体变大
- P->Q 性能指标相当，冷启动Unisoc方案略优于P
- Lay HAL，极限情况节省26MB

source	hidl service
aosp	<a href="#">android.hardware.wifi@1.0-service-lazy</a>
	<a href="#">android.hardware.cas@1.1-service-lazy</a>
	<a href="#">android.hardware.drm@1.0-service-lazy</a>
	<a href="#">android.hardware.drm@1.2-service-lazy.widevine</a>
	<a href="#">android.hardware.drm@1.2-service-lazy.clearkey</a>
	<a href="#">android.hardware.light@2.0-service-lazy</a>
	android.hardware.camera.provider
unisoc	<a href="#">vendor.sprd.hardware.broadcastradio@2.0-service</a>
	<a href="#">android.hardware.bluetooth@1.0-service.unisoc-lazy</a>

- Zram write back 对长时间待机手机可以节省 50 ~ 70MB内存。目前Google推荐的默认参数对EMMC使用寿命影响较低，如需使用更激进的方案请考虑EMMC读写上限。
- LMK 切换至 LMKD 性能相当

Device RAM	Partner Choice	IsLowRAMDevice = true	IsLowRAMDevice = false
512	Required Go	GMS Go device (follow GMS section 15)	Not allowed
1 GB	Required Go	GMS Go device (follow GMS section 15)	Not allowed
<= 2 GB	Optional Go	GMS Go device (follow GMS section 15)	GMS Standard device (follow Standard GMS rules)

## 2GB RAM Go device configuration

1. Play Store
2. Youtube
3. Google Go
4. Chrome
5. Google Maps
6. Google Photos
7. Gmail Go
8. Google Drive
9. Duo

## LowRam flag 不变

1. 多用户
2. VR
3. Android Auto
4. WearOs
5. MultiDisplay
6. 分屏

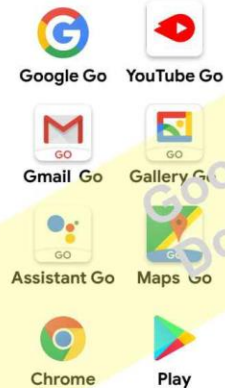
# Android Q Go 2GB RAM Go Device Configuration

android 

## Android Go on 2GB allows for a robust suite of Google first party apps

Given the increased memory size on 2GB Go, we will switch to many of the full 1P apps as part of the GMS package

- \* Android Auto
- \* Wear OS
- \* Work Profile
- \* Picture in picture
- \* Launcher widgets
- \* Data saver
- \* Split screen
- \* Multi display
- \* VR mode
- \* Multi-user



<2GB Go

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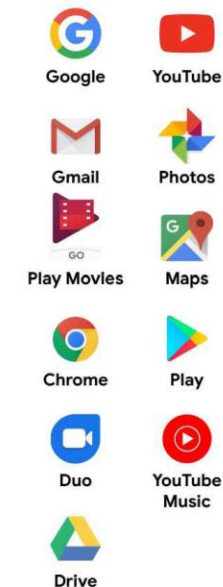


=2GB Go

Platform features

- Android Auto
- Wear OS
- Work Profile
- Picture in picture
- Launcher widgets
- Data saver
- Split screen
- Multi display
- VR mode
- Multi-user

REQUIRED  
Pre-installed Apps



Standard Android



- Android 10 CDD
  - <https://source.android.com/compatibility/10/android-10-cdd>
- GMS requirement
  - [https://support.google.com/androidpartners\\_gms/answer/7351400?hl=en&ref\\_topic=9252245](https://support.google.com/androidpartners_gms/answer/7351400?hl=en&ref_topic=9252245)
- Partner Marketing Hub
  - <https://partnermarketinghub.withgoogle.com/#/>

THANKS



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