QC 平台 QCS605 camera 驱动调试步骤

初步调试时，需要修改 LINUX/android/vendor 目录，和LINUX/android/kernal/msm-4.9目录。下面分别说明各个目录的具体过程。

Cmera 调试分4个部分，module , sensor,flash,eeprom。其中flash（闪光灯） 和eeprom（保存厂家调参数据），在初始阶段可以等camera bring up 后再调试。或者有的项目没有flash或对效果要求不高，不需要调试。

本文，主要调试module 和 sensor。

一 ，调试Vendor目录，这里面是QC的私有代码。主要修改.mk文件和.xml文件，具体如下：

1. 修改 chi-cdk/cdk/tools/buildbins.yaml：

需要删除的部分，由于没有这些设备，所以最好删除，以免影响调试，例如非OV8856的设备：

-- com.qti.sensormodule.ofilm\_imx376:

- - sensor/default/imx376/imx376\_sensor.xml

- - module/ofilm\_imx376\_module.xml

- - actuator/default/dw9800\_actuator.xml

- - flash/back\_sensor\_flash.xml

需要保留的设备，例如要调试OV8856：

- com.qti.sensormodule.truly\_ov8856:

- sensor/default/ov8856/ov8856\_sensor.xml

- module/truly\_ov8856\_module.xml

- eeprom/truly\_cmb433/cmb433\_eeprom.xml

1. 修改 chi-cdk/product.mk:

同样删除不需要的设备：

-PRODUCT\_PACKAGES += com.qti.sensor.ov13880

保留要调试的设备：

PRODUCT\_PACKAGES += com.qti.sensor.ov8856

1. 修改 chi-cdk/vendor/Android.mk

删除不需要的设备：

-include $(CAMX\_VENDOR\_PATH)/sensor/default/ov13880/build/android/Android.mk

保留需要调试的设备：

include $(CAMX\_VENDOR\_PATH)/sensor/default/ov8856/build/android/Android.mk

1. 修改 chi-cdk/vendor/module/truly\_ov8856\_module.xml:

修改此文件是调试的关键，因为module是camera的主要组成部分。

<moduleConfiguration description="Module configuration">

<!--CameraId is the id to which DTSI node is mapped.

Typically CameraId is the slot Id for non combo mode. -->

- <cameraId>2</cameraId>

+ <cameraId>0</cameraId>

<!--Name of the module integrator -->

<moduleName>truly</moduleName>

<!--Name of the sensor in the image sensor module -->

@@ -35,7 +35,7 @@

<chromatixName>truly\_ov8856</chromatixName>

<!--Position of the sensor module.

Valid values are: REAR, FRONT, REAR\_AUX, FRONT\_AUX, EXTERNAL -->

- <position>FRONT</position>

+ <position>REAR</position>

<!--CSI Information -->

<CSIInfo description="CSI Information">

<laneAssign>0x3210</laneAssign>

此次调试时，只修改了 <cameraID> 与 <position>

1. 修改chi-cdk/vendor/sensor/default/ov8856/ov8856\_sensor.xml:

此文件主要配置sensor 的info和上电时序，上电时序在0V8856的datasheet里面有详细的说明。

<slaveInfo>

<!--Name of the sensor -->

<sensorName>ov8856</sensorName>

<!--8-bit or 10-bit write slave address

For External Sensors for which camx needs not probe the slave address shoule be as 0 -->

<slaveAddress>32</slaveAddress>

<!--Register address / data size in bytes -->

<regAddrType range="[1,4]">2</regAddrType>

<!--Register address / data size in bytes -->

<regDataType range="[1,4]">2</regDataType>

<!--Register address for sensor Id -->

<sensorIdRegAddr>12299</sensorIdRegAddr>

<!--Sensor Id -->

<sensorId>34906</sensorId>

<!--Mask for sensor id. Sensor Id may only be few bits -->

<sensorIdMask>4294967295</sensorIdMask>

<!--I2C frequency mode of slave

Supported modes are: STANDARD (100 KHz), FAST (400 KHz), FAST\_PLUS (1 MHz), CUSTOM (Custom frequency in DTSI) -->

<i2cFrequencyMode>FAST</i2cFrequencyMode>

<!--Sequence of power configuration type and configuration value required to control power to the device -->

<powerUpSequence>

<!--Power setting configuration

Contains: configType, configValue and delay in milli seconds -->

<powerSetting>

<!--Power configuration type

Supported types are: MCLK, VANA, VDIG, VIO, VAF, RESET, STANDBY -->

<configType>RESET</configType>

<!--Configuration value for the type of configuration -->

<configValue>0</configValue>

<!--Delay in milli seconds -->

<delayMs>30</delayMs>

</powerSetting>

<!--Power setting configuration

Contains: configType, configValue and delay in milli seconds -->

<powerSetting>

<!--Power configuration type

Supported types are: MCLK, VANA, VDIG, VIO, VAF, RESET, STANDBY -->

<configType>VANA</configType>

<!--Configuration value for the type of configuration -->

<configValue>0</configValue>

<!--Delay in milli seconds -->

<delayMs>30</delayMs>

</powerSetting>

<!--Power setting configuration

Contains: configType, configValue and delay in milli seconds -->

<powerSetting>

<!--Power configuration type

Supported types are: MCLK, VANA, VDIG, VIO, VAF, RESET, STANDBY -->

<configType>VDIG</configType>

<!--Configuration value for the type of configuration -->

<configValue>0</configValue>

<delayMs>30</delayMs>

</powerSetting>

<!--Power setting configuration

Contains: configType, configValue and delay in milli seconds -->

<powerSetting>

<configType>VIO</configType>

<configValue>0</configValue>

<delayMs>30</delayMs>

</powerSetting>

<powerSetting>

<configType>MCLK</configType>

<configValue>24000000</configValue>

<delayMs>10</delayMs>

</powerSetting>

<powerSetting>

<configType>RESET</configType>

<configValue>1</configValue>

<delayMs>30</delayMs>

</powerSetting>

</powerUpSequence>

<!--Sequence of power configuration type and configuration value required to control power to the device -->

<powerDownSequence>

<!--Power setting configuration

Contains: configType, configValue and delay in milli seconds -->

<powerSetting>

<!--Power configuration type

Supported types are: MCLK, VANA, VDIG, VIO, VAF, RESET, STANDBY -->

<configType>MCLK</configType>

<!--Configuration value for the type of configuration -->

<configValue>0</configValue>

<!--Delay in milli seconds -->

<delayMs>1</delayMs>

</powerSetting>

<!--Power setting configuration

Contains: configType, configValue and delay in milli seconds -->

<powerSetting>

<!--Power configuration type

Supported types are: MCLK, VANA, VDIG, VIO, VAF, RESET, STANDBY -->

<configType>RESET</configType>

<configValue>0</configValue>

<!--Delay in milli seconds -->

<delayMs>1</delayMs>

</powerSetting>

<!--Power setting configuration

Contains: configType, configValue and delay in milli seconds -->

<powerSetting>

<configType>VIO</configType>

<configValue>0</configValue>

<!--Delay in milli seconds -->

<delayMs>0</delayMs>

</powerSetting>

<!--Power setting configuration

Contains: configType, configValue and delay in milli seconds -->

<powerSetting>

<!--Power configuration type

Supported types are: MCLK, VANA, VDIG, VIO, VAF, RESET, STANDBY -->

<configType>VDIG</configType>

<!--Configuration value for the type of configuration -->

<configValue>0</configValue>

<!--Delay in milli seconds -->

<delayMs>0</delayMs>

</powerSetting>

<!--Power setting configuration

Contains: configType, configValue and delay in milli seconds -->

<powerSetting>

<!--Power configuration type

Supported types are: MCLK, VANA, VDIG, VIO, VAF, RESET, STANDBY -->

<configType>VANA</configType>

<configValue>0</configValue>

<delayMs>0</delayMs>

</powerSetting>

</powerDownSequence>

6、添加文件夹 vendor/tuning/ov8856\_c7project，此文件夹，为QC或者OV提供，为芯片sensor的各种参数。软件开发，只需把此文件放到相应目录即可。

1. 调试boot目录：
2. 修改文件：arch/arm64/boot/dts/qcom/sdm670-camera-sensor-mtp.dtsi:

regulator-max-microvolt = <1352000>;

regulator-enable-ramp-delay = <135>;

enable-active-high;

- gpio = <&pm660l\_gpios 4 0>;

+ //gpio = <&pm660l\_gpios 28 0>;

+ gpio = <&tlmm 28 0>;

pinctrl-names = "default";

- pinctrl-0 = <&camera\_rear\_dvdd\_en\_default>;

+ pinctrl-0 = <&camera\_rear\_dvdd>;

vin-supply = <&pm660\_s6>;

};

@@ -104,9 +105,11 @@

regulator-enable-ramp-delay = <233>;

enable-active-high;

gpio = <&tlmm 8 0>;

+ //gpio = <&tlmm 145 0>;//leon

+

pinctrl-names = "default";

pinctrl-0 = <&cam\_sensor\_rear\_vana>;

- vin-supply = <&pm660l\_bob>;

+ vin-supply = <&pm660l\_bob>; //leon

};

};

@@ -227,8 +230,8 @@

&cam\_sensor\_rear2\_active>;

pinctrl-1 = <&cam\_sensor\_mclk1\_suspend

&cam\_sensor\_rear2\_suspend>;

- gpios = <&tlmm 14 0>,

- <&tlmm 28 0>;

+ gpios = <&tlmm 14 0>;

+ // <&tlmm 28 0>;

gpio-reset = <1>;

gpio-req-tbl-num = <0 1>;

gpio-req-tbl-flags = <1 0>;

@@ -288,10 +291,10 @@

sensor-position-roll = <270>;

sensor-position-pitch = <0>;

sensor-position-yaw = <180>;

- led-flash-src = <&led\_flash\_rear>;

+ //led-flash-src = <&led\_flash\_rear>;

actuator-src = <&actuator\_rear>;

- ois-src = <&ois\_rear>;

- eeprom-src = <&eeprom\_rear>;

+ //ois-src = <&ois\_rear>;

+ //eeprom-src = <&eeprom\_rear>;

cam\_vio-supply = <&camera\_vio\_ldo>;

cam\_vana-supply = <&camera\_vana\_ldo>;

cam\_vdig-supply = <&camera\_rear\_ldo>;

@@ -367,6 +370,8 @@

clock-rates = <24000000>;

};

1. 修改arch/arm64/boot/dts/qcom/sdm670-pinctrl.dtsi:

cam\_sensor\_rear\_vana: cam\_sensor\_rear\_vana {

/\* AVDD LDO \*/

mux {

- pins = "gpio8";

+ pins = "gpio8";//8 leon

function = "gpio";

};

config {

- pins = "gpio8";

+ pins = "gpio8";//8 leon

+ bias-disable; /\* No PULL \*/

+ drive-strength = <16>; /\* 2 MA \*/

+ };

+ };

+ camera\_rear\_dvdd: camera\_rear\_dvdd{

+ /\* DVDD LDO \*/

+ mux {

+ pins = "gpio28";

+ function = "gpio";

+ };

+

+ config {

+ pins = "gpio28";

bias-disable; /\* No PULL \*/

drive-strength = <2>; /\* 2 MA \*/

};

1. 修改arch/arm64/boot/dts/qcom/sdm670-regulator.dtsi:

@@ -425,6 +425,7 @@

regulator-max-microvolt = <2950000>;

qcom,init-voltage = <1800000>;

qcom,init-mode = <RPMH\_REGULATOR\_MODE\_LPM>;

+ regulator-always-on;

};

};

@@ -463,6 +464,7 @@

regulator-max-microvolt = <2950000>;

qcom,init-voltage = <1800000>;

qcom,init-mode = <RPMH\_REGULATOR\_MODE\_LPM>;

+ regulator-always-on;

};

};

@@ -542,6 +544,7 @@

regulator-max-microvolt = <3008000>;

qcom,init-voltage = <2850000>;

qcom,init-mode = <RPMH\_REGULATOR\_MODE\_LPM>;

+ regulator-always-on;

};

};