

Modifikasi Device Tree QCS404

1. Seluruh file device tree QCS404 yang dapat dimodifikasi ada di path berikut:

```
$<work_dir>/LE.UM.4.1.2/apps_proc/kernel/msm-4.14/arch/arm64/boot/dts/qcom/
```

\$<work_dir> adalah path relative untuk directory source code Qualcomm.

2. Untuk memodifikasi device tree terkait fungsi LED, edit file:

```
qcs405-circular-pca9956.dtsi
```

Berikut ini adalah file hasil modifikasi untuk board DVT1:

```
/*
 * Copyright (c) 2018, The Linux Foundation. All rights reserved.
 *
 * This program is free software; you can redistribute it and/or modify
 * it under the terms of the GNU General Public License version 2 and
 * only version 2 as published by the Free Software Foundation.
 *
 * This program is distributed in the hope that it will be useful,
 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
 * GNU General Public License for more details.
 */

/* Customized for DVT-1 Bahasa Kita */

&i2c_2 {
    status = "ok";
    qcom,clk-freq-out = <100000>;

    /* PCA9956B LED Drivers */
    nxp-ledseg-i2c@69 {
        #address-cells = <1>;
        #size-cells = <0>;
        compatible = "nxp,pca9956b";
        reg = <0x69>;
        pca9956b,support_initialize = <1>;
        pca9956b,model = <0x09>;
        pca9956b,model2 = <0x05>;

        pca9956b,ledout0 = <0xAA>;
        pca9956b,ledout1 = <0xAA>;
        pca9956b,ledout2 = <0xAA>;
        pca9956b,ledout3 = <0xFF>;
        pca9956b,ledout4 = <0xFF>;
        pca9956b,ledout5 = <0xFF>;
        pca9956b,defaultiref = <0x2f>;
        out0@0 {
            label = "ledsec3_b";
            reg = <0x0>;
        };
        out1@1 {
            label = "ledsec3_g";
            reg = <0x1>;
        };
        out2@2 {
            label = "ledsec3_r";
            reg = <0x2>;
        };
    };
};
```

```
out3@3 {
    label = "ledsec5_b";
    reg = <0x3>;
};
out4@4 {
    label = "ledsec5_g";
    reg = <0x4>;
};
out5@5 {
    label = "ledsec5_r";
    reg = <0x5>;
};
out6@6 {
    label = "ledsec7_b";
    reg = <0x6>;
};
out7@7 {
    label = "ledsec7_g";
    reg = <0x7>;
};
out8@8 {
    label = "ledsec7_r";
    reg = <0x8>;
};
out9@9 {
    label = "ledsec9_b";
    reg = <0x9>;
};
out10@10 {
    label = "ledsec9_g";
    reg = <0xA>;
};
out11@11 {
    label = "ledsec9_r";
    reg = <0xB>;
};
out12@12 {
    label = "ledsec11_b";
    reg = <0xC>;
};
out13@13 {
    label = "ledsec11_g";
    reg = <0xD>;
};
out14@14 {
    label = "ledsec11_r";
    reg = <0xE>;
};
out15@15 {
    label = "ledsec13_b";
    reg = <0xF>;
};
out16@16 {
    label = "ledsec13_g";
    reg = <0x10>;
};
out17@17 {
    label = "ledsec13_r";
    reg = <0x11>;
};
out18@18 {
    label = "ledsec16_b";
    reg = <0x12>;
};
};
```

```

        out19@19 {
            label = "ledsec16_g";
            reg = <0x13>;
        };
        out20@20 {
            label = "ledsec16_r";
            reg = <0x14>;
        };
        out21@21 {
            label = "ledsec1_b";
            reg = <0x15>;
        };
        out22@22 {
            label = "ledsec1_g";
            reg = <0x16>;
        };
        out23@23 {
            label = "ledsec1_r";
            reg = <0x17>;
        };
    };
};

```

Ada beberapa point yang perlu diperhatikan, yaitu:

- Pastikan nxp-ledseg-i2c sesuai dengan address I2C untuk LED Driver PCA9956B dari NXP. Perhatikan baris berikut:

```
nxp-ledseg-i2c@69
```

Nilai 69 pada baris tersebut adalah konfigurasi address I2C yang digunakan pada board DVT1. Apabila dilakukan perubahan konfigurasi address I2C, maka ubah nilai tersebut sesuai dengan nilai yang tertera pada datasheet LED Driver PCA9956B dari NXP.

- Pastikan label masing-masing LED sudah sesuai untuk mengatur pattern ketika LED menyala. Perhatikan baris berikut:

```

out0@0 {
    label = "ledsec3_b";
    reg = <0x0>;
};
out1@1 {
    label = "ledsec3_g";
    reg = <0x1>;
};
out2@2 {
    label = "ledsec3_r";
    reg = <0x2>;
};

```

Label ini memiliki format:

```
"ledsec<number>_<color>"
```

Perhatikan nilai number dan color. Pastikan bahwa satu number harus memiliki color b (blue), g (green), dan r (red).

3. Untuk memodifikasi device tree terkait fungsi audio seperti microphone dan speaker, edit file:

```
qcs405-wsa-audio-overlay.dtsi
```

Berikut ini adalah file hasil modifikasi untuk board DVT1:

```
/*
 * Copyright (c) 2018-2019, The Linux Foundation. All rights reserved.
 *
 * This program is free software; you can redistribute it and/or modify
 * it under the terms of the GNU General Public License version 2 and
 * only version 2 as published by the Free Software Foundation.
 *
 * This program is distributed in the hope that it will be useful,
 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
 * GNU General Public License for more details.
 */

/* Customized for DVT-1 Bahasa Kita */

&q6core {
    wsa_swr_gpios: wsa_swr_clk_data_pinctrl {
        compatible = "qcom,msm-cdc-pinctrl";
        pinctrl-names = "aud_active", "aud_sleep";
        pinctrl-0 = <&wsa_swr_clk_active &wsa_swr_data_active>;
        pinctrl-1 = <&wsa_swr_clk_sleep &wsa_swr_data_sleep>;
        qcom,lpi-gpios;
    };

    wsa_spkr_en_1_2: wsa_spkr_en_1_2_pinctrl {
        compatible = "qcom,msm-cdc-pinctrl";
        pinctrl-names = "aud_active", "aud_sleep";
        pinctrl-0 = <&wsa_en_1_2_active>;
        pinctrl-1 = <&wsa_en_1_2_sleep>;
    };

    cdc_dmic01_gpios: cdc_dmic01_pinctrl {
        compatible = "qcom,msm-cdc-pinctrl";
        pinctrl-names = "aud_active", "aud_sleep";
        pinctrl-0 = <&cdc_dmic01_clk_active &cdc_dmic01_data_active>;
        pinctrl-1 = <&cdc_dmic01_clk_sleep &cdc_dmic01_data_sleep>;
        qcom,lpi-gpios;
    };

    cdc_dmic23_gpios: cdc_dmic23_pinctrl {
        compatible = "qcom,msm-cdc-pinctrl";
        pinctrl-names = "aud_active", "aud_sleep";
        pinctrl-0 = <&cdc_dmic23_clk_active &cdc_dmic23_data_active>;
        pinctrl-1 = <&cdc_dmic23_clk_sleep &cdc_dmic23_data_sleep>;
        qcom,lpi-gpios;
    };
};

&q6core {
    bolero: bolero-cdc {
        compatible = "qcom,bolero-codec";
        clock-names = "lpass_core_hw_vote";
        clocks = <&lpass_core_hw_vote 0>;
        qcom,num-macros = <2>;
    };
};

&qcs405_snd {
    qcom,model = "qcs405-wsa-snd-card";
    qcom,va-bolero-codec = <1>;
    qcom,wsa-bolero-codec = <1>;
    asoc-codec = <&stub_codec>, <&bolero>;
};
```

```

asoc-codec-names = "msm-stub-codec.1", "bolero_codec";
qcom,wsa-max-devs = <1>;
qcom,wsa-devs = <&wsa881x_0211>, <&wsa881x_0212>,
               <&wsa881x_0213>, <&wsa881x_0214>;
qcom,wsa-aux-dev-prefix = "SpkrLeft", "SpkrRight",
                          "SpkrLeft", "SpkrRight";
qcom,cdc-dmic01-gpios = <&cdc_dmic01_gpios>;
qcom,cdc-dmic23-gpios = <&cdc_dmic23_gpios>;
qcom,audio-routing =
    "VA DMIC0", "VA MIC BIAS1",
    "VA MIC BIAS1", "Digital Mic0",
    "VA DMIC1", "VA MIC BIAS1",
    "VA MIC BIAS1", "Digital Mic1",
    "VA DMIC2", "VA MIC BIAS1",
    "VA MIC BIAS1", "Digital Mic2",
    "VA DMIC3", "VA MIC BIAS1",
    "VA MIC BIAS1", "Digital Mic3",
    "SpkrLeft IN", "WSA_SPK1 OUT",
    "SpkrRight IN", "WSA_SPK2 OUT",
    "WSA_SPK1 OUT", "VA_MCLK",
    "WSA_SPK2 OUT", "VA_MCLK";
};

#include "qcs405-vb-bolero.dtsi"
#include "qcs405-wsa-bolero.dtsi"
#include "qcs405-wsa881x.dtsi"

```

Ada beberapa point yang perlu diperhatikan, yaitu:

- Pastikan cdc_dmic_gpios sesuai dengan microphone yang terpasang pada board. Perhatikan baris berikut:

```

cdc_dmic01_gpios: cdc_dmic01_pinctrl {
    compatible = "qcom,msm-cdc-pinctrl";
    pinctrl-names = "aud_active", "aud_sleep";
    pinctrl-0 = <&cdc_dmic01_clk_active &cdc_dmic01_data_active>;
    pinctrl-1 = <&cdc_dmic01_clk_sleep &cdc_dmic01_data_sleep>;
    qcom,lpi-gpios;
};

cdc_dmic23_gpios: cdc_dmic23_pinctrl {
    compatible = "qcom,msm-cdc-pinctrl";
    pinctrl-names = "aud_active", "aud_sleep";
    pinctrl-0 = <&cdc_dmic23_clk_active &cdc_dmic23_data_active>;
    pinctrl-1 = <&cdc_dmic23_clk_sleep &cdc_dmic23_data_sleep>;
    qcom,lpi-gpios;
};

```

Pada board DVT1, microphone terpasang pada cdc_dmic_gpio 0, 1, 2, dan 3.

- Pastikan wsa-max-devs sesuai dengan jumlah amplifier (wsa) yang terpasang. Perhatikan baris berikut:

```
qcom,wsa-max-devs = <1>;
```

Pada board DVT1, jumlah amplifier (wsa) terpasang adalah 1.

- Pastikan audio-routing sesuai dengan audio yang terpasang pada board. Perhatikan baris berikut:

```

qcom,audio-routing =
    "VA DMIC0", "VA MIC BIAS1",
    "VA MIC BIAS1", "Digital Mic0",

```

Sesuaikan VA DMIC dan VA MIC BIAS sesuai dengan konfigurasi microphone.