KBA-170125195022

[Thermal]how to limit charging current

Applicable platform:

MSM8953, MSM8952, MSM8996, MSM8998,SDM660,SDM630,SDM450 / Generic

Issue/problem description:

Battery charigng management restricts the maximum allowed battery charging current. Below method is applicable to every chipset for battery charging limitation (BCL).

Issue Analysis:

Firstly, you could get the default thermal engine config via “adb shell thermal-engine -o”.

--- new a file as [#Conf file] shows, like thermal-engine.conf as below instance.

root@msm8909:/ # thermal-engine -o

SENSOR : ALIAS

tsens_tz_sensor4 : cpu1-3

tsens_tz_sensor3 : cpu0-2

tsens_tz_sensor0 : pop_mem

debug

#Conf file: /system/etc/thermal-engine.conf

Second, add below section into thermal-engine.conf.

[BATTERY_CHARGING_CTRL]
algo_type monitor
sampling 1000
sensor xo_therm
thresholds 41000 43000
thresholds_clr 39000 41000
actions battery battery
action_info 0 1

you could know more about the configuration format and parameters definition via vendor\qcom\proprietary\thermal-engine\readme.txt.

- to be noticed, algo_type should be without # in front of it for adding new thermal section, otherwise it would not work. #algo_type means the section was not created dynamically.
- *.dtsi qcom,thermal-mitigation = <1500 700 600 0>; => means the charging mitigation , mapping to action_info of battery. For this instances, 700mA Icharger points to 1 of action_info.
- You should adjust the parameters, especially fine-tune thresholds/thresholds_clr to balance between thermal and charging performance/time.

Anyway, you MUST output to confirm whether it works via below cmd:
adb shell stop thermal-engine
adb shell start thermal-engine
adb shell thermal-engine -o

Via logcat, you would see below new section is created.

03-14 18:54:29.517 I/ThermalEngine(17461): Created section 'BATTERY_CHARGING_CTRL'

03-14 18:54:29.517 I/ThermalEngine(17461): Algo Type 'monitor'

03-14 18:54:29.517 I/ThermalEngine(17461): Parsing section BATTERY_CHARGING_CTRL

03-14 18:54:29.517 I/ThermalEngine(17461): Found field 'sampling'

03-14 18:54:29.517 I/ThermalEngine(17461): Found field 'sensor'

03-14 18:54:29.517 I/ThermalEngine(17461): Found field 'thresholds'

03-14 18:54:29.517 I/ThermalEngine(17461): Found field 'thresholds_clr'

03-14 18:54:29.517 I/ThermalEngine(17461): Found field 'actions'

03-14 18:54:29.517 I/ThermalEngine(17461): Found field 'action_info'

Also you could edit source code for final change as well.
vendor\qcom\proprietary\thermal-engine\thermal_monitor-data.c(thermal_monitor-data-8916.c)

```
{
        .desc = "BATTERY-CHARGE-MONITOR",
        .algo_type = MONITOR_ALGO_TYPE,
        .data.tm = {
                .sensor = "xo_therm",
                .sampling_period_ms = 1000,
```

```
                .num_thresholds = 2,
                ._n_thresholds = 2,
                ._n_to_clear = 2,
                ._n_actions = 2,
                ._n_action_info = 2,
                .t[0] = {
                        .lvl_trig = 41000,
                        .lvl_clr = 39000,
                        .num_actions = 1,
                        .actions[0] = {
                                .device = "battery",
                                .info = 0,
                        },
                },
                .t[1] = {
                        .lvl_trig = 43000,
                        .lvl_clr = 41000,
                        .num_actions = 1,
                        .actions[0] = {
                                .device = "battery",
                                .info = 1,
                        },
                }
        },
},
```