Thermal binning

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Thermal binning

Problem statement

Same SoC - different packaging technology

- SKUs for different markets
- Differences in Thermal interface material
    - TIM1: Material between silicon die and package lid (inside package)
    - TIM2: Material between top of package and heatsink (system side)
- Differences in Thermal conductivity (W/mK)
    - Higher-K gives better conductivity
- Different junction temperature (Tj)

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Proposal

- Fuse mask as thermal-bin DT property
  - similar to opp-supported-hw for cpu frequency

```
qfprom@<addr> {
        thermal_bin: thermal-bin@<addr) {
                reg = <0xfoobar 0x2>;
                bits = <5 6>;
};
```

thermal-bin proposals

```
/thermal
    nvmem-cells = <&thermal_bin>;
    nvmem-cell-names = ”thermal_bin";

    /gpu-0-thermal
        /trips
            /trip0
                 temperature = <95000>;
                 . . .
                 thermal-bin = <0x1>;
            /trip1
                 temperature = <110000>;
                 thermal-bin = <0x2>;
         /maps
            /map0
                 trip = <&trip0>;
            /map1
                 trip = <&trip1>;
```

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    /gpu-0-thermal
        /trips
            /trip0
                 temperature = <95000>;
                 . . .
                 thermal-bin = <0x1>;
            /trip1
                 temperature = <110000>;
                 thermal-bin = <0x2>;
         /maps
            /map0
                 trip = <&trip0>;
            /map1
                 trip = <&trip1>;
```

```
thermal-bin = <0x1>;
/trips
    /trip0
        temperature = <95000> <110000>;
```

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/thermal
    nvmem-cells = <&thermal_bin>;
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    /gpu-0-thermal
        /trips
            /trip0
                temperature = <95000>;
                . . .
                thermal-bin = <0x1>;
            /trip1
                temperature = <110000>;
                thermal-bin = <0x2>;
         /maps
            /map0
                trip = <&trip0>;
            /map1
                trip = <&trip1>;
```

```
thermal-bin = <0x1>;
/trips
    /trip0
        temperature = <95000> <110000>;



/maps
    /map0
        trip = <&trip0>;
        cooling-device = <&gpu -1 -1>
        thermal-bin = <0x1>;
    /map1
        trip = <&trip1>;
        thermal-bin = <0x2>;
```

Thank you

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