A Transponder is the element that sends and receives the optical

signal from a DWDM network. A transceiver can host one or more transceivers. A transceiver can be seen as a pair of transmitter and receiver, as defined in [G.698.2].

A transponder is typically characterized by its

data rate and the maximum distance the signal can travel. Channel

frequency, per channel input power, FEC and Modulation are also

associated with a transponder.

From a path computation point of

view, the selection of the compatible configuration of the source and the destination tranceivers

is an important factor for optical signal to traverse

through the DWDM network.

There are three main approaches (named as “mode” in the model) to determine optical signal compatibility:

**Application Code**: An application code represents a standard G.698.2 optical interface specification towards the realization of transversely compatible DWDM systems. Two transceivers supporting the same application code and a line system matching the constraints, defined in ITU-T G.698.2, for that application code will interoperate.

**Organizational Mode**: An organizational mode represents a non-standard optical interface specification towards the realization of transversely compatible DWDM systems. Two transceivers supporting the same organizational mode and a line system matching the constraints, defined by the organization which owns the mode, for that organizational will interoperate. These organizations can be MSA-Groups, Operators, System vendors, component vendors etc.

**Explicit mode**: The explicit mode allows to encode, explicitly, any subset of parameters e.g., FEC type, Modulation type, etc, to enable a controller entity to check for interoperability by means outside of this draft. It shall be noted that using the explicit encoding does not guarantee interoperability between two transceivers even in case of identical parameter definitions. The explicit mode shall therefore be used with care, but it could be useful when no common Application Codes or Organizational Modes exist or the constraints of common Application Codes or Organizational Modes cannot be met by the line system.

The YANG model described in Section 3 defines the optical transceiver properties. They are divided between:

1. Optical transceiver capabilities, showing how it can be configured
2. Current transceiver setting, showing how it is currently configured.

As for part A, the transceiver capabilities are represented by the set of modes supported by the transceiver. Each mode must follow only one of the “modes” defined above (choice in the YANG model). However, a transceiver support any mix of different modes.

The properties of a transceiver’s mode are:

* supported transmitter tuning range with min/max nominal central frequency [f\_tx\_min, f\_tx\_max]
* supported transmitter tunability grid, the minimum difference in frequency between two adjacent channels (in GHz)
* supported transmitter power range [p\_tx-min, p\_tx\_max] x channel
* supported receiver power range [p\_rx-min, p\_rx\_max] x channel
* supported maximum total power, rx power for all the channels

These optical transceiver mode properties are explicitly defined in the model for explicit and organizational modes, while they are implicitly defined for the application codes.

The set of optical impairment limits, e.g., min OSNR, max PMD, max CD, max PDL, Q-factor limit, are explicitly defined for the explicit modes and implicitly defined for the organizational modes and application codes.

It is possible that the parameters setting defined for an explicit mode represents also the implicit configuration for some organization modes or application codes. The “supported-mode” containers defines two different list of pointers to the application codes and organizational modes supported by an explicit mode.

About part B, the “Current transponder setting” is the configuration related to any OTSi generated by a transceiver attached to a specific transponder.

For any OTSi there is a pointer to the related configured “Transponder/ transceiver” and the configured “mode” with implicit/explicit attributes depending of the mode, and an instance related settings of variable parameters like current emitter power, current carrier-frequency, etc. This permits to distinguish mode-characteristics from variable parameters, i.e. actual carrier-frequency is variable (configurable within the boundaries defined by the mode).

Here below a table to represent, list of parameters used in case of “explicit” mode and how is different mode can report the values of these attributes, explicit in the YANG model or implicit as referenced by Application Code or Operational mode value.

|  |  |  |
| --- | --- | --- |
| Mode | min/max nominal central frequency  tunability grid  min\_spacing  transmitter power range  receiver power range  maximum channel  power on receiver  max total power on receiver | Other parameters |
| Application code | Implicit | Implicit |
| Organizational mode | Explicit | Implicit |
| Explicit mode | explicit | Explicit |