

**Table 45–71a—CAUI-4 chip-to-module recommended CTLE register bit definitions**

Bit(s)	Name	Description	R/W <sup>a</sup>
1.179.15:5	Reserved	Value always 0, writes ignored	RO
1.179.4:1	Recommended CTLE peaking	4 3 2 1 1 1 x x = reservedReserved 1 0 1 x = reservedReserved 1 0 0 1 = 9 dB 1 0 0 0 = 8 dB 0 1 1 1 = 7 dB 0 1 1 0 = 6 dB 0 1 0 1 = 5 dB 0 1 0 0 = 4 dB 0 0 1 1 = 3 dB 0 0 1 0 = 2 dB 0 0 0 1 = 1 dB 0 0 0 0 = reservedReserved	R/W
1.179.0	Reserved	Value always 0, writes ignored	RO

<sup>a</sup>R/W = Read/Write, RO = Read only

**45.2.1.92a.1 Recommended CTLE peaking (1.179.4:1)**

The value of these bits sets the CTLE peaking value recommended by a host that implements the optional CAUI-4 chip-to-module interface defined in Annex 83E (see 83E.3.1.6). The module may optionally use this information to adjust its CTLE setting.

**45.2.1.92b CAUI-4 chip-to-chip transmitter equalization, receive direction, lane 0 register (Register 1.180)**

The assignment of bits in the CAUI-4 chip-to-chip transmitter equalization, receive direction, lane 0 register is shown in Table 45–71b. The transmitter, receive direction, is the transmitter that sends data towards the PCS.

**Table 45–71b—CAUI-4 chip-to-chip transmitter equalization, receive direction, lane 0 register bit definitions**

Bit(s)	Name	Description	R/W <sup>a</sup>
<del>1.180.15:5</del>	<del>Reserved</del>	<del>Value always 0, writes ignored</del>	<del>RO</del>
<u>1.180.15</u>	<u>Request flag</u>	<u>1 = Change in equalization is requested</u> <u>0 = No change in equalization is requested</u>	<u>RO</u>
<u>1.180.14:12</u>	<u>Post-cursor request</u>	<u>14 13 12</u> <u>1 1 1 Reserved</u> <u>1 1 0 Reserved</u> <u>1 0 1 Requested eq c1 = 5 (c1) weight -0.25</u> <u>1 0 0 Requested eq c1 = 4 (c1) weight -0.2</u> <u>0 1 1 Requested eq c1 = 3 (c1) weight -0.15</u> <u>0 1 0 Requested eq c1 = 2 (c1) weight -0.1</u> <u>0 0 1 Requested eq c1 = 1 (c1) weight -0.05</u> <u>0 0 0 Requested eq c1 = 0 (c1) weight 0</u>	<u>RO</u>

**Table 45–71b—CAUI-4 chip-to-chip transmitter equalization, receive direction, lane 0 register bit definitions (*continued*)**

Bit(s)	Name	Description	R/W <sup>a</sup>
<a href="#">1.180.11:10</a>	<a href="#">Pre-cursor request</a>	<a href="#">11 10</a> <a href="#">1 1</a> <i>Requested eq cml = 3 (c(-1) weight -0.15)</i> <a href="#">1 0</a> <i>Requested eq cml = 2 (c(-1) weight -0.1)</i> <a href="#">0 1</a> <i>Requested eq cml = 1 (c(-1) weight -0.05)</i> <a href="#">0 0</a> <i>Requested eq cml = 0 (c(-1) weight 0)</i>	RO
<a href="#">1.180.9:7</a>	<a href="#">Post-cursor remote setting</a>	<a href="#">9 8 7</a> <a href="#">1 1 1</a> Reserved <a href="#">1 1 0</a> Reserved <a href="#">1 0 1</a> <i>Remote eq cl = 5 (c(1) weight -0.25)</i> <a href="#">1 0 0</a> <i>Remote eq cl = 4 (c(1) weight -0.2)</i> <a href="#">0 1 1</a> <i>Remote eq cl = 3 (c(1) weight -0.15)</i> <a href="#">0 1 0</a> <i>Remote eq cl = 2 (c(1) weight -0.1)</i> <a href="#">0 0 1</a> <i>Remote eq cl = 1 (c(1) weight -0.05)</i> <a href="#">0 0 0</a> <i>Remote eq cl = 0 (c(1) weight 0)</i>	R/W
<a href="#">1.180.6:5</a>	<a href="#">Pre-cursor remote setting</a>	<a href="#">6 5</a> <a href="#">1 1</a> <i>Remote eq cml = 3 (c(-1) weight -0.15)</i> <a href="#">1 0</a> <i>Remote eq cml = 2 (c(-1) weight -0.1)</i> <a href="#">0 1</a> <i>Remote eq cml = 1 (c(-1) weight -0.05)</i> <a href="#">0 0</a> <i>Remote eq cml = 0 (c(-1) weight 0)</i>	R/W
<a href="#">1.180.4:2</a>	Post-cursor <a href="#">local</a> setting	<a href="#">4 3 2</a> <a href="#">1 1 1</a> = Reserved <a href="#">1 1 0</a> = Reserved <a href="#">1 0 1</a> <i>Local eq cl = 5 (c(1) weight -0.25)</i> <a href="#">1 0 0</a> <i>Local eq cl = 4 (c(1) weight -0.2)</i> <a href="#">0 1 1</a> <i>Local eq cl = 3 (c(1) weight -0.15)</i> <a href="#">0 1 0</a> <i>Local eq cl = 2 (c(1) weight -0.1)</i> <a href="#">0 0 1</a> <i>Local eq cl = 1 (c(1) weight -0.05)</i> <a href="#">0 0 0</a> <i>Local eq cl = 0 (c(1) weight 0)</i>	R/W
<a href="#">1.180.1:0</a>	Pre-cursor <a href="#">local</a> setting	<a href="#">1 0</a> <a href="#">1 1</a> <i>Local eq cml = 3 (c(-1) weight -0.15)</i> <a href="#">1 0</a> <i>Local eq cml = 2 (c(-1) weight -0.1)</i> <a href="#">0 1</a> <i>Local eq cml = 1 (c(-1) weight -0.05)</i> <a href="#">0 0</a> <i>Local eq cml = 0 (c(-1) weight 0)</i>	R/W

<sup>a</sup>R/W = Read/Write, RO = Read only

**45.2.1.92b.1 [Request flag \(1.180.15\)](#)**

The value of this bit indicates the value of the variable *Request flag* in the lane 0 CAUI-4 receiver in the receive direction (see 83D.3.3.2). This indicates whether the CAUI-4 chip-to-chip device is issuing a request to change the remote transmitter equalization in the CAUI-4 chip-to-chip lane 0 transmitter in the receive direction. If a lane 0 CAUI-4 receiver in the receive direction is not present in the package then the value returned for this bit should be zero.

**45.2.1.92b.2 [Post-cursor request \(1.180.14:12\)](#)**

The value of these bits indicates the value of the variable *Requested\_eq\_cl* in the lane 0 CAUI-4 receiver in the receive direction (see 83D.3.3.2). When *Request flag* is equal to 1, this value indicates the weight of the post-cursor coefficient c(1) which is requested for the transmitter equalization in the CAUI-4 chip-to-chip lane 0 transmitter in the receive direction.

#### 45.2.1.92b.3 Pre-cursor request (1.180.11:10)

The value of these bits indicates the value of the variable *Requested\_eq\_cm1* in the lane 0 CAUI-4 receiver in the receive direction (see 83D.3.3.2). When *Request\_flag* is equal to 1, this value indicates the weight of the pre-cursor coefficient  $c(-1)$  which is requested for the transmitter equalization in the CAUI-4 chip-to-chip lane 0 transmitter in the receive direction.

#### 45.2.1.92b.4 Post-cursor remote setting (1.180.9:7)

The value of these bits sets the variable *Remote\_eq\_c1* for the lane 0 CAUI-4 receiver in the receive direction (see 83D.3.3.2). This is used by a CAUI-4 receiver that implements the optional transmitter equalization feedback as an indication of the weight of the post-cursor coefficient  $c(1)$  being used in lane 0 of the CAUI-4 transmitter in the receive direction (see 83D.3.1.1). It may be used to generate values for the request flag and the request bits. If a lane 0 CAUI-4 receiver in the receive direction is not present in the package then these bits have no effect.

#### 45.2.1.92b.5 Pre-cursor remote setting (1.180.6:5)

The value of these bits sets the variable *Remote\_eq\_cm1* for the lane 0 CAUI-4 receiver in the receive direction (see 83D.3.3.2). This is used by a CAUI-4 receiver that implements the optional transmitter equalization feedback as an indication of the weight of the pre-cursor coefficient  $c(-1)$  being used in lane 0 of the CAUI-4 transmitter in the receive direction (see 83D.3.1.1). It may be used to generate values for the request flag and the request bits. If a lane 0 CAUI-4 receiver in the receive direction is not present in the package then these bits have no effect.

#### 45.2.1.92b.6 Post-cursor local setting (1.180.4:2)

~~The value of these bits sets the post-cursor coefficient  $c(1)$  for the CAUI-4 chip-to-chip transmitter equalization for the lane 0 CAUI-4 transmitter in the receive direction (see 83D.3.1.1).~~

The value of these bits sets the variable *Local\_eq\_c1* for the lane 0 CAUI-4 transmitter in the receive direction (see 83D.3.1.1 and Table 83D-3), which controls the weight of the transmitter equalization post-cursor coefficient  $c(1)$ . If a lane 0 CAUI-4 transmitter in the receive direction is not present in the package then these bits have no effect.

#### 45.2.1.92b.7 Pre-cursor local setting (1.180.1:0)

~~The value of these bits sets the pre-cursor coefficient  $c(-1)$  for the CAUI-4 chip-to-chip transmitter equalization for the lane 0 CAUI-4 transmitter in the receive direction (see 83D.3.1.1).~~

The value of these bits sets the variable *Local\_eq\_cm1* for the lane 0 CAUI-4 transmitter in the receive direction (see 83D.3.1.1 and Table 83D-2), which controls the weight of the transmitter equalization pre-cursor coefficient  $c(-1)$ . If a lane 0 CAUI-4 transmitter in the receive direction is not present in the package then these bits have no effect.

#### 45.2.1.92c CAUI-4 chip-to-chip transmitter equalization, receive direction, lane 1 through lane 3 registers (Registers 1.181, 1.182, 1.183)

The CAUI-4 chip-to-chip transmitter equalization, receive direction, lane 1 through lane 3 registers are defined similarly to register 1.180 (which is used for lane 0, see 45.2.1.92b) but for lanes 1 through 3 respectively. The transmitter, receive direction, is the transmitter that sends data towards the PCS.

**45.2.1.92d CAUI-4 chip-to-chip transmitter equalization, transmit direction, lane 0 register (Register 1.184)**

The assignment of bits in the CAUI-4 chip-to-chip transmitter equalization, transmit direction, lane 0 register is shown in Table 45–71c. The transmitter, transmit direction, is the transmitter that sends data towards the PMD.

**Table 45–71c—CAUI-4 chip-to-chip transmitter equalization, transmit direction, lane 0 register bit definitions**

Bit(s)	Name	Description	R/W <sup>a</sup>
<del>1.184.15:5</del>	<del>Reserved</del>	<del>Value always 0, writes ignored</del>	<del>RO</del>
<u>1.184.15</u>	<u>Request flag</u>	<u>1 = Change in equalization is requested</u> <u>0 = No change in equalization is requested</u>	<u>RO</u>
<u>1.184.14:12</u>	<u>Post-cursor request</u>	<u>14 13 12</u> <u>1 1 1 Reserved</u> <u>1 1 0 Reserved</u> <u>1 0 1 Requested eq c1 = 5 (c(1) weight -0.25)</u> <u>1 0 0 Requested eq c1 = 4 (c(1) weight -0.2)</u> <u>0 1 1 Requested eq c1 = 3 (c(1) weight -0.15)</u> <u>0 1 0 Requested eq c1 = 2 (c(1) weight -0.1)</u> <u>0 0 1 Requested eq c1 = 1 (c(1) weight -0.05)</u> <u>0 0 0 Requested eq c1 = 0 (c(1) weight 0)</u>	<u>RO</u>
<u>1.184.11:10</u>	<u>Pre-cursor request</u>	<u>11 10</u> <u>1 1 Requested eq cm1 = 3 (c(-1) weight -0.15)</u> <u>1 0 Requested eq cm1 = 2 (c(-1) weight -0.1)</u> <u>0 1 Requested eq cm1 = 1 (c(-1) weight -0.05)</u> <u>0 0 Requested eq cm1 = 0 (c(-1) weight 0)</u>	<u>RO</u>
<u>1.184.9:7</u>	<u>Post-cursor remote setting</u>	<u>9 8 7</u> <u>1 1 1 Reserved</u> <u>1 1 0 Reserved</u> <u>1 0 1 Remote eq c1 = 5 (c(1) weight -0.25)</u> <u>1 0 0 Remote eq c1 = 4 (c(1) weight -0.2)</u> <u>0 1 1 Remote eq c1 = 3 (c(1) weight -0.15)</u> <u>0 1 0 Remote eq c1 = 2 (c(1) weight -0.1)</u> <u>0 0 1 Remote eq c1 = 1 (c(1) weight -0.05)</u> <u>0 0 0 Remote eq c1 = 0 (c(1) weight 0)</u>	<u>R/W</u>

**Table 45–71c—CAUI-4 chip-to-chip transmitter equalization, transmit direction, lane 0 register bit definitions (*continued*)**

Bit(s)	Name	Description	R/W <sup>a</sup>
1.184.6:5	Pre-cursor remote setting	6 5 1 1 <u>Remote eq cml</u> = 3 (c(-1) weight -0.15) 1 0 <u>Remote eq cml</u> = 2 (c(-1) weight -0.1) 0 1 <u>Remote eq cml</u> = 1 (c(-1) weight -0.05) 0 0 <u>Remote eq cml</u> = 0 (c(-1) weight 0)	R/W
1.184.4:2	Post-cursor <u>local</u> setting	4 3 2 1 1 1 = Reserved 1 1 0 = Reserved 1 0 1 <u>Local eq cl</u> = 5 (c(1) weight -0.25) 1 0 0 <u>Local eq cl</u> = 4 (c(1) weight -0.2) 0 1 1 <u>Local eq cl</u> = 3 (c(1) weight -0.15) 0 1 0 <u>Local eq cl</u> = 2 (c(1) weight -0.1) 0 0 1 <u>Local eq cl</u> = 1 (c(1) weight -0.05) 0 0 0 <u>Local eq cl</u> = 0 (c(1) weight 0)	R/W
1.184.1:0	Pre-cursor <u>local</u> setting	1 0 1 1 <u>Local eq cml</u> = 3 (c(-1) weight -0.15) 1 0 <u>Local eq cml</u> = 2 (c(-1) weight -0.1) 0 1 <u>Local eq cml</u> = 1 (c(-1) weight -0.05) 0 0 <u>Local eq cml</u> = 0 (c(-1) weight 0)	R/W

<sup>a</sup>R/W = Read/Write, RO = Read only

#### 45.2.1.92d.1 Request flag (1.184.15)

The value of this bit indicates the value of the variable *Request\_flag* in the lane 0 CAUI-4 receiver in the transmit direction (see 83D.3.3.2). This indicates whether the CAUI-4 chip-to-chip device is issuing a request to change the remote transmitter equalization in the CAUI-4 chip-to-chip lane 0 transmitter in the transmit direction. If a lane 0 CAUI-4 receiver in the transmit direction is not present in the package then the value returned for this bit should be zero.

#### 45.2.1.92d.2 Post-cursor request (1.184.14:12)

The value of these bits indicates the value of the variable *Requested\_eq\_cl* in the lane 0 CAUI-4 receiver in the transmit direction (see 83D.3.3.2). When *Request\_flag* is equal to 1, this value indicates the weight of the post-cursor coefficient c(1) which is requested for the transmitter equalization in the CAUI-4 chip-to-chip lane 0 transmitter in the transmit direction.

#### 45.2.1.92d.3 Pre-cursor request (1.184.11:10)

The value of these bits indicates the value of the variable *Requested\_eq\_cml* in the lane 0 CAUI-4 receiver in the transmit direction (see 83D.3.3.2). When *Request\_flag* is equal to 1, this value indicates the weight of the pre-cursor coefficient c(-1) which is requested for the transmitter equalization in the CAUI-4 chip-to-chip lane 0 transmitter in the transmit direction.

#### 45.2.1.92d.4 Post-cursor remote setting (1.184.9:7)

The value of these bits sets the variable *Remote\_eq\_cl* for the lane 0 CAUI-4 receiver in the transmit direction (see 83D.3.3.2). This is used by a CAUI-4 receiver that implements the optional transmitter equalization feedback as an indication of the weight of the post-cursor coefficient c(1) being used in lane 0 of the CAUI-4 transmitter in the transmit direction (see 83D.3.1.1). It may be used to generate values for the request flag

and the request bits. If a lane 0 CAUI-4 receiver in the transmit direction is not present in the package then these bits have no effect.

#### **45.2.1.92d.5 Pre-cursor remote setting (1.184.6:5)**

The value of these bits sets the variable *Remote\_eq\_cm1* for the lane 0 CAUI-4 receiver in the transmit direction (see 83D.3.3.2). This is used by a CAUI-4 receiver that implements the optional transmitter equalization feedback as an indication of the weight of the pre-cursor coefficient  $c(-1)$  being used in lane 0 of the CAUI-4 transmitter in the transmit direction (see 83D.3.1.1). It may be used to generate values for the request flag and the request bits. If a lane 0 CAUI-4 receiver in the transmit direction is not present in the package then these bits have no effect.

#### **45.2.1.92d.6 Post-cursor local setting (1.184.4:2)**

~~The value of these bits sets the post-cursor coefficient  $c(1)$  for the CAUI-4 chip-to-chip transmitter equalization for the lane 0 CAUI-4 transmitter in the transmit direction (see 83D.3.1.1).~~

The value of these bits sets the variable *Local\_eq\_c1* for the lane 0 CAUI-4 transmitter in the transmit direction (see 83D.3.1.1 and Table 83D-3), which controls the weight of the transmitter equalization post-cursor coefficient  $c(1)$ . If a lane 0 CAUI-4 transmitter in the transmit direction is not present in the package then these bits have no effect.

#### **45.2.1.92d.7 Pre-cursor local setting (1.184.1:0)**

~~The value of these bits sets the pre-cursor coefficient  $c(-1)$  for the CAUI-4 chip-to-chip transmitter equalization for the lane 0 CAUI-4 transmitter in the transmit direction (see 83D.3.1.1).~~

The value of these bits sets the variable *Local\_eq\_cm1* for the lane 0 CAUI-4 transmitter in the transmit direction (see 83D.3.1.1 and Table 83D-2), which controls the weight of the transmitter equalization pre-cursor coefficient  $c(-1)$ . If a lane 0 CAUI-4 transmitter in the transmit direction is not present in the package then these bits have no effect.

#### **45.2.1.92e CAUI-4 chip-to-chip transmitter equalization, transmit direction, lane 1 through lane 3 registers (Registers 1.185, 1.186, 1.187)**

The CAUI-4 chip-to-chip transmitter equalization, transmit direction, lane 1 through lane 3 registers are defined similarly to register 1.184 (which is used for lane 0, see 45.2.1.92d) but for lanes 1 through 3 respectively. The transmitter, transmit direction, is the transmitter that sends data towards the PMD.