PMI MODEL: PLA-14D65G15G35G-20DB-SFF-250W IS AN INTEGRATED LIMITER AND ATTENUATOR THAT OPERATES AT 14.65 TO 15.35 GHz. THE INSERTION LOSS IS 3.5 dB MAXIMUM AND OFFERS 20 dB OF ATTENUATION CONTROL VIA A SINGLE LINE TTL SIGNAL. THIS MODEL IS DESIGNED TO HANDLE 125 WATTS PEAK HAVING A PULSE WIDTH OF 40 us AND AN AVERAGE POWER OF 12.5 WATTS.

March 19, 2018

Designed By: PMI Engineering

Tested & Reported By: Sebastian Palacio
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TEST DATA ON PLA-14D65G15G35G-20DB-SFF-250W

DESCRIPTION

PMI MODEL: PLA-14D65G15G35G-20DB-SFF-250W IS AN INTEGRATED LIMITER AND ATTENUATOR THAT OPERATES AT 14.65 TO 15.35 GHz. THE INSERTION LOSS IS 3.5 dB MAXIMUM AND OFFERS 20 dB OF ATTENUATION CONTROL VIA A SINGLE LINE TTL SIGNAL. THIS MODEL IS DESIGNED TO HANDLE 250 WATTS PEAK HAVING A PULSE WIDTH OF 40 µS AND AN AVERAGE POWER OF 25 WATTS.

SPECIFICATIONS

- FREQUENCY RANGE: 14.65 TO 15.35 GHz
- INSERTION LOSS: 3.5 dB MAX
- PEAK POWER HANDLING: 250 W MAX
- PULSE WIDTH: 40 µS TYP
- AVERAGE POWER: 25 W MAX
- ATTENUATION: LOGIC TTL "0" – 0 dB ATTENUATION
- ATTENUATION FLATNESS: ±1 dB MAX
- ATTENUATION ACCURACY: ±1 dB MAX
- P1dB LIMITING THRESHOLD: +5 dBm MIN
- FLAT LEAKAGE: +12 dBm MAX
- SWITCHING SPEED: 90 ns @ 50% TTL TO 10% RF VOLTAGE MAX
- CONTROL LOGIC: TTL COMPATIBLE
- PHASE MATCH: 180° MAX (UNIT TO UNIT)
- DC CONSUMPTION: 150 mA MAX EACH FOR +5 V & -15 V
- VSWR: 2.0:1 MAX @ -10 dBm INPUT
- RF CONNECTORS: REMOVABLE SMA FEMALE (J2 – RF INPUT & J1 – RF OUTPUT)
- FINISH: 0.003 SILVER PLATE OVER COPPER FLASH IAW QQ-S-385 TYPE 1, GRADE A

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS

- TEMPERATURE: -55 °C TO +85 °C (OPERATING)
- HUMIDITY: MIL-STD-810F
- SHOCK: MIL-STD-810F, METHOD 616.5, PROCEDURE 1
- VIBRATION: MIL-STD-810F, METHOD 514.5
- ALTITUDE: MIL-STD-810F, METHOD 520.2, PROCEDURE 3
- TEMPERATURE CYCLE: MIL-STD-810F, METHOD 501.4, 502.4

NOTE: SPECIFICATIONS WILL VARY OVER OPERATING TEMPERATURE.
NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION.

*PENDING ECN, RELEASE UPDATED REV. UPON CUSTOMER’S APPROVAL OF TEST RESULTS*

Page 3 of 22
Revised Technical Specifications (updated 1 Dec 2017 v2)

B) Electrical Specifications

1) Frequency Range : 14.65 to 15.35GHz
2) Insertion Loss : 3.59dB max @ -10dBm input and 0dB attenuation (3 temp)
3) Peak Power Handling

<table>
<thead>
<tr>
<th>S/n</th>
<th>Condition</th>
<th>Peak Power Handling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low Temp (-55 degC)</td>
<td>100W max@ 0dB and 20dB attenuation at 10% duty cycle</td>
</tr>
<tr>
<td>2</td>
<td>Room Temp (+25 degC)</td>
<td>125W max@ 0dB and 20dB attenuation at 10% duty cycle</td>
</tr>
<tr>
<td>3</td>
<td>High Temp (+85 degC)</td>
<td>100W max@ 0dB and 20dB attenuation at 10% duty cycle</td>
</tr>
</tbody>
</table>

4) Pulse Width : 40μS (typ) @ 0dB and 20dB attenuation at 10% duty cycle

5) Average Power :

<table>
<thead>
<tr>
<th>S/n</th>
<th>Condition</th>
<th>Average Power Handling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low Temp (-55 degC)</td>
<td>10W max@ 0dB and 20dB attenuation at 10% duty cycle</td>
</tr>
<tr>
<td>2</td>
<td>Room Temp (+25 degC)</td>
<td>12.5W max@ 0dB and 20dB attenuation at 10% duty cycle</td>
</tr>
<tr>
<td>3</td>
<td>High Temp (+85 degC)</td>
<td>10W max@ 0dB and 20dB attenuation at 10% duty cycle</td>
</tr>
</tbody>
</table>

6) Attenuation : Logic TTL “0” = 0dB attenuation
                 Logic TTL “1” = 20dB attenuation

7) Attenuation Flatness : ±1dB max

8) Attenuation Accuracy : ±1dB max

9) P1dB Limiting Threshold : +5dBm min

10) Flat Leakage : +12dBm max @ 0dB attenuation and

<table>
<thead>
<tr>
<th>S/n</th>
<th>Condition</th>
<th>Power Handling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low Temp (-55 degC)</td>
<td>100W max</td>
</tr>
<tr>
<td>2</td>
<td>Room Temp (+25 degC)</td>
<td>125W max</td>
</tr>
<tr>
<td>3</td>
<td>High Temp (+85 degC)</td>
<td>100W max</td>
</tr>
</tbody>
</table>

11) Switching Speed : 90ns max @ 50% TTL to 10% RF voltage
                     @ 50% TTL to 90% RF voltage

12) Control Logic : TTL compatible

13) Phase Matching : ±5 deg max (unit to unit)

14) DC Consumption : 150mA max each for +5V and -15V

15) VSWR : 2.0:1 max @ -10dBm input

Mechanical Specifications

1) RF Connectors : Removable SMA Female (J2 is RF input and J1 is RF output)
2) DC/Control Connectors : Pins/ledthrough
3) Outline : See drawing
4) Surface finish : Silver plating

Environmental Specifications

1) Operating temperature : -55 degC to +85 degC
2) Storage temperature : -55 degC to +125 degC
## TEST DATA ON
PLA-14D65G15G35G-20DB-SFF-250W

<table>
<thead>
<tr>
<th>TEST ITEM NO</th>
<th>PARAMETERS</th>
<th>SPECIFIED VALUE</th>
<th>TEST MEASUREMENT</th>
<th>TEST RESULT</th>
<th>QA QC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Frequency Range</td>
<td>14.65 To 15.35 GHz</td>
<td>14.65 To 15.35 GHz</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Insertion Loss</td>
<td>3.59 dB Max&lt;sup&gt;1&lt;/sup&gt;</td>
<td>3.5 dB</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Power Handling</td>
<td>100 W (-55°C &amp; +85°C) / 125 W (+25°C) Max&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Pass</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Pulse Width</td>
<td>40 µs Typ&lt;sup&gt;2&lt;/sup&gt;</td>
<td>40 µs</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Average Power</td>
<td>10 W (-55°C &amp; +85°C) / 12.5 W (+25°C) Max&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Pass</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Attenuation Flatness</td>
<td>±1 dB Max&lt;sup&gt;1&lt;/sup&gt;</td>
<td>±0.1 dB</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Attenuation Accuracy</td>
<td>±1 dB Max&lt;sup&gt;1&lt;/sup&gt;</td>
<td>±0.1 dB</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>P1dB Limiting Threshold</td>
<td>+5 dBm Min</td>
<td>7.7 dBm</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Flat Leakage</td>
<td>+12 dBm Max&lt;sup&gt;3&lt;/sup&gt;</td>
<td>+20 dBm</td>
<td>FAIL</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Switching Speed</td>
<td>90 ns, 50% TTL To 10% RF Max</td>
<td>20 ns</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Phase Matching</td>
<td>15° Max Between Units @ 0 dB</td>
<td>0° - REF.</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>DC Consumption</td>
<td>+5 V @ 150 mA Max</td>
<td>32 mA</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>DC Consumption</td>
<td>-15 V @ 150 mA Max</td>
<td>26 mA</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>VSWR</td>
<td>2.0:1 Max @ -10 dBm Input</td>
<td>1.89:1</td>
<td>Pass</td>
<td></td>
</tr>
</tbody>
</table>

1. @ -10 dBm Input & 0 dB Attenuation
2. @ 0 dB & 20 dB Attenuation with 10% Duty Cycle
3. @ 0 dB Attenuation & 100 W (-55°C & +85°C) / 125 W (+25°C) Max.

QA/QC Approval: __________________________ Date: __________________________
PL21778/1744 (Reference Unit)

Insertion Loss, Return Loss (IN/OUT) & Phase Matching

@ +25 Degrees C
@ +85 Degrees C
TEST DATA ON
PLA-14D65G15G35G-20DB-SFF-250W

@ -55 Degrees C
TEST DATA ON
PLA-14D65G15G35G-20DB-SFF-250W

Attenuation, Attenuation Flatness, Attenuation Accuracy, Return Loss (IN/OUT) & Phase Matching

@ +25 Degrees C
@ -55 Degrees C
Switching Speed

Green Trace – TTL Signal
Blue Trace – RF Signal
FLAT LEAKAGE TEST

Input Power vs Output Power
15GHz / +25 Degrees C

Input Power vs Output Power
15GHz / +85 Degrees C

Input Power vs Output Power
15GHz / -55 Degrees C
# Test Data

## On

**PLA-14D65G15G35G-20DB-SFF-250W**

Customer: Precision Technologies

SO No: SO16-116

Model No: PLA-14D65G15G35G-20DB-SFF-250W

Serial No: PL21779/1744

Temperature: -55°C, +25°C, +85°C

Date: 3/19/2018

Drawing No: 27629633 Rev: B1

---

<table>
<thead>
<tr>
<th>TEST ITEM NO</th>
<th>PARAMETERS</th>
<th>SPECIFIED VALUE</th>
<th>TEST MEASUREMENT</th>
<th>TEST RESULT</th>
<th>QA QC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Frequency Range</td>
<td>14.65 To 15.35 GHz</td>
<td>14.65 To 15.35 GHz</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Insertion Loss</td>
<td>3.59 dB Max&lt;sup&gt;1&lt;/sup&gt;</td>
<td>3.5 dB</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Power Handling</td>
<td>100 W (-55°C &amp; +85°C) / 125 W (+25°C) Max&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Pass</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Pulse Width</td>
<td>40 µs Typ&lt;sup&gt;2&lt;/sup&gt;</td>
<td>40 µs</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Average Power</td>
<td>10 W (-55°C &amp; +85°C) / 12.5 W (+25°C) Max&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Pass</td>
<td>Pass</td>
<td></td>
</tr>
</tbody>
</table>
| 6 | Attenuation | Logic TTL “0” = 0 dB  
Logic TTL “1” = 20 dB | Pass | Pass | |
| 7 | Attenuation Flatness | ±1 dB Max | ±0.18 dB | Pass | |
| 8 | Attenuation Accuracy | ±1 dB Max | ±0.16 dB | Pass | |
| 9 | P1dB Limiting Threshold | +5 dBm Min | 8.3 dBm | Pass | |
| 10 | Flat Leakage | +12 dBm Max<sup>3</sup> | +20 dBm | FAIL | |
| 11 | Switching Speed | 90 ns, 50% TTL To 10% RF Max  
90 ns, 50% TTL To 90% RF Max | 20 ns  
50 ns | Pass | |
| 12 | Phase Matching | 15° Max Between Units @ 0 dB  
15° Max Between Units @ 20 dB | -2.2° / +1.4°  
-0° / +2.2° | Pass | |
| 13 | DC Consumption | +5 V @ 150 mA Max | 32 mA | Pass | |
| 14 | DC Consumption | -15 V @ 150 mA Max | 26 mA | Pass | |
| 15 | VSWR | 2.0:1 Max @ -10 dBm Input | 1.94:1 | Pass | |

---

1. @ -10 dBm Input & 0 dB Attenuation
2. @ 0 dB & 20 dB Attenuation with 10% Duty Cycle
3. @ 0 dB Attenuation & 100 W (-55°C & +85°C) / 125 W (+25°C) Max.

QA/QC Approval: __________________________       Date: __________________________

---

Page 14 of 22
PL21779/1744 (Temperature Performance Against Reference Unit)

Insertion Loss, Return Loss (IN/OUT) & Phase Matching

@ +25 Degrees C
@ +85 Degrees C
@ -55 Degrees C

Test data on PLA-14D65G15G35G-20DB-SFF-250W

Status Ch 1: S21/M C 2-Port LCL
Attenuation, Attenuation Flatness, Attenuation Accuracy, Return Loss (IN/OUT) & Phase Matching

@ +25 Degrees C
@ +85 Degrees C

TEST DATA
ON
PLA-14D65G15G35G-20DB-SFF-250W
@ -55 Degrees C

![Graphs and Data](image-url)

### Test Data on PLA-14D65G15G35G-20DB-SFF-250W

<table>
<thead>
<tr>
<th>Stimulus</th>
<th>Start (GHz)</th>
<th>Stop (GHz)</th>
<th>dB Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>S11</td>
<td>14.65000000</td>
<td>15.350000</td>
<td>-56.46dB</td>
</tr>
<tr>
<td>S21</td>
<td>14.65000000</td>
<td>15.350000</td>
<td>-56.46dB</td>
</tr>
<tr>
<td>S22</td>
<td>14.65000000</td>
<td>15.350000</td>
<td>-56.46dB</td>
</tr>
</tbody>
</table>

Status: CH 1: S21/M

---

7311-F Grove Road Frederick, MD 21704 USA Phone: (301)662-5019 Fax: (301)662-1731
Email: sales@pmi-rf.com
Switching Speed

**Green Trace – TTL Signal**

**Blue Trace – RF Signal**
FLAT LEAKAGE TEST

Input Power vs Output Power
15GHz / +25 Degrees C

Input Power vs Output Power
15GHz / +85 Degrees C

Input Power vs Output Power
15GHz / -55 Degrees C