KGL4216
10-Gbps T-Flip Flop IC
0.2µm Gate Length GaAs MESFET Technology

February 2000

Oki Semiconductor
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10-Gbps GaAs T-Flip Flop IC

INTRODUCTION

Oki Semiconductor’s KGL4216 is a 10-Gbps T-Flip Flop IC designed for ultra high-speed digital communications systems. The KGL4216 uses 0.2-µm gate length GaAs MESFETs and Oki’s unique MCFF (Memory Cell type Flip Flop) technology to achieve operations of over 11-GHz. The KGL4216 is available as a 24-pin ceramic packaged device. Due to the KGL4216’s high sensitivity, capacitive coupling is recommended for the KGL4216’s I/O connections.

FEATURES

- High-speed operation: 11-Gbps data rate (min)
- Low-power dissipation: 400 mW (typ.) using 2-V power-supply
- 0.2-µm gate length GaAs MESFET process
- MCFF (Memory Cell type Flip Flop) technology
- 24-pin ceramic package

APPLICATION

- High-speed optical communication systems: 10 Gbps
- High-speed test equipment
### ELECTRICAL CHARACTERISTICS

**Absolute Maximum Ratings**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>$V_{DD}$</td>
<td>-0.3</td>
<td>2.3</td>
<td>V</td>
</tr>
<tr>
<td>Clock Input Voltage</td>
<td>$V_C$</td>
<td>-0.3</td>
<td>1.5</td>
<td>V</td>
</tr>
<tr>
<td>Clock Reference Bias Voltage</td>
<td>$V_R$</td>
<td>-0.3</td>
<td>1.5</td>
<td>V</td>
</tr>
<tr>
<td>Temperature at Package Base under Bias</td>
<td>$T_s$</td>
<td>-45</td>
<td>100</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{st}$</td>
<td>-45</td>
<td>125</td>
<td>°C</td>
</tr>
</tbody>
</table>

Exceeding these maximum ratings could cause immediate damage or lead to permanent deterioration of the device.

**Electrical Characteristics**

$V_{DD} = 2 \text{ V } \pm 0.1 \text{ V}, T_s = 0^\circ \text{C to } 70^\circ \text{C}$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Operating Frequency Range</td>
<td>OFR</td>
<td>11</td>
<td></td>
<td></td>
<td>GHz</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>$P_W$</td>
<td>0.4</td>
<td>0.5</td>
<td></td>
<td>W</td>
</tr>
<tr>
<td>Clock Input Voltage Swing</td>
<td>$V_i$</td>
<td>0.3</td>
<td>0.8</td>
<td>1.2</td>
<td>Vpp</td>
</tr>
<tr>
<td>Output Voltage Swing</td>
<td>$V_o$</td>
<td>0.4</td>
<td>0.6</td>
<td>0.8</td>
<td>Vpp</td>
</tr>
</tbody>
</table>
PACKAGE DIMENSIONS

(Units: mm)

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Description</th>
<th>Pin No.</th>
<th>Description</th>
<th>Pin No.</th>
<th>Description</th>
<th>Pin No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND</td>
<td>7</td>
<td>GND</td>
<td>13</td>
<td>GND</td>
<td>19</td>
<td>CR</td>
</tr>
<tr>
<td>2</td>
<td>Q</td>
<td>8</td>
<td>GND</td>
<td>14</td>
<td>GND</td>
<td>20</td>
<td>VDD</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>9</td>
<td>GND</td>
<td>15</td>
<td>GND</td>
<td>21</td>
<td>VDD</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
<td>10</td>
<td>NC</td>
<td>16</td>
<td>GND</td>
<td>22</td>
<td>GND</td>
</tr>
<tr>
<td>5</td>
<td>QN</td>
<td>11</td>
<td>NC</td>
<td>17</td>
<td>OK</td>
<td>23</td>
<td>GND</td>
</tr>
<tr>
<td>6</td>
<td>GND</td>
<td>12</td>
<td>NC</td>
<td>18</td>
<td>GND</td>
<td>24</td>
<td>GND</td>
</tr>
</tbody>
</table>
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