NanoSpeed™ Switch Driver for NP and NF Type Switches

(Protected by U.S. patent 7,403,677B1 and pending patents)

Product Description

The NSDR series of drivers provide high voltage of signals to drive the NS, NP and NF series of solid state switches. The push-pull output design ensures fast transition for both rising and falling edges with the high repeat rate, and it is especially suitable for driving capacitive switch loads.

The standard driver controls one individual switch. Drivers that control multiple switches also are available, please call Sales at (781) 935-1200.

Performance Specifications

<table>
<thead>
<tr>
<th>Specs</th>
<th>Min</th>
<th>Typical</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rising Time ($T_r$)&lt;sup&gt;[1]&lt;/sup&gt;</td>
<td>NP &amp; NS type</td>
<td>85</td>
<td>100</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>NF type</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falling Time ($T_f$)&lt;sup&gt;[1]&lt;/sup&gt;</td>
<td>NP &amp; NS type</td>
<td>85</td>
<td>100</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>NF type</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switch Time (Rise, $S_r$)&lt;sup&gt;[2]&lt;/sup&gt;</td>
<td>NP &amp; NS type</td>
<td>315</td>
<td>350</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>NF type</td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switch Time (Fall, $S_f$)&lt;sup&gt;[2]&lt;/sup&gt;</td>
<td>NP &amp; NS type</td>
<td>315</td>
<td>350</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>NF type</td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repetition Rate&lt;sup&gt;[3]&lt;/sup&gt;</td>
<td>0</td>
<td>1</td>
<td>MHz</td>
<td></td>
</tr>
<tr>
<td>Pulse Width</td>
<td>1.0</td>
<td></td>
<td>us</td>
<td></td>
</tr>
<tr>
<td>Control Input (TTL pulse)</td>
<td>0</td>
<td>5</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Power Consumption&lt;sup&gt;[4]&lt;/sup&gt;</td>
<td>1</td>
<td>5</td>
<td>12</td>
<td>W</td>
</tr>
<tr>
<td>Power Supply</td>
<td>12</td>
<td></td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-5</td>
<td>70</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40</td>
<td>80</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Electrical Connector</td>
<td>SMA</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note:

[1]: Transition time between 10% and 90% change of optical intensity.
[2]: Duration from begin of electronic signal to end of optical intensity change when driving switch.
[3]: 1MHz repeat rate may not be available for some type of switches.
[4]: The power consumption highly depends on the repeat rate. The maximum power consumption is defined for 1MHz operation.
NanoSpeed™ Switch Driver for NP and NF Type Switches

Response Time Definition

Response Time (Measured @ 500kHz)
NanoSpeed™ Switch Driver for NP and NF Type Switches

100kHz Drivers for NS and NP type Dual-stage 1x1 switches
NanoSpeed™ Switch Driver for NP and NF Type Switches

500kHz Driver for NS 1x1 Switch and 1MHz driver for NP 1x1 Switch
NanoSpeed™ Switch Driver for NP and NF Type Switches

100kHz Driver for NS Dual-stage 1x2 and 200kHz driver for NP Dual-stage 1x2
NanoSpeed™ Switch Driver for NP and NF Type Switches

1x1/1x2,2x2 NF Type Switch Mounted on 1MHz

NF Driver is completed with a special power supply with 110-220AC power input. It consumes about 10W at the fastest repetition operation.
## NanoSpeed™ Switch Driver for NP and NF Type Switches

### Ordering Information

<table>
<thead>
<tr>
<th>NSDR-</th>
<th>Switch type</th>
<th>Configuration</th>
<th>Repeat rate</th>
<th>Switch QTY</th>
<th>Channel # (1)</th>
<th>Control Mode (2)</th>
<th>Power supply</th>
</tr>
</thead>
</table>
|       | NS, dual-stage = 2S       | 1x1, 1x2, 2x1, 2x2 = 1a  
1x3, 3x1 = 3a  
1x4, 4x1 = 4a  
Special = 00 | 5kHz = 5  
100kHz = 6  
500kHz = 9 | Single switch = 1  
Multiple-switch = G | Standard  
(single channel) = 1  
N parallel channel = N  
Special = 0 | TTL = 1  
Special = 0 | 12VDC = 1  
Special = 0 |
|       | NP, single stage = 1P     | 1x1, 1x2, 2x1, 2x2 = 1a  
1x3, 3x1 = 3a  
1x4, 4x1 = 4a  
Special = 00 | 10kHz = L  
200kHz = M  
1MHz = H  
Special = 0 | Single switch = 1  
Multiple-switch = G | Standard  
(single channel) = 1  
N parallel channel = N  
Special = 0 | TTL = 1  
Special = 0 | 12VDC = 1  
110VAC (3) = A  
Special = 0 |

[1]: Multiple-channel version is designed for the module with multiple switches on driving PCB.  
[2]: USB, RS232 control mode is also available for low repeat rate operation <5kHz. Please contact sales.  
[3]: 110AVC power supply is only for NF type switches.