Product Standards

PGA26E06BA
PGA26E06BA

A. ABSOLUTE MAXIMUM RATINGS ( $T_j = 25 \degree C$, unless otherwise specified )

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Symbol</th>
<th>Values</th>
<th>Unit</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drain-source voltage ( DC ) *1</td>
<td>VDSS</td>
<td>- - 600</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Drain-source voltage ( pulse ) *2</td>
<td>VDSP</td>
<td>- - 750</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Gate-source voltage ( DC ) *1</td>
<td>VGSS</td>
<td>-10 - -</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Gate current ( DC ) *1</td>
<td>IG</td>
<td>- - 50</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Gate current ( pulse ) *3,4</td>
<td>IGP</td>
<td>- - 1.5</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Electric gate charge</td>
<td>QGP</td>
<td>- - 32</td>
<td>nC</td>
<td>$f=200kHz$</td>
</tr>
<tr>
<td>7</td>
<td>Drain current ( DC ) ( $T_c = 25\degree C$ ) *1</td>
<td>ID</td>
<td>- - 31</td>
<td>A</td>
<td>Figure 4</td>
</tr>
<tr>
<td>8</td>
<td>Drain reverse current ( DC ) ( $T_c = 25\degree C$ ) *1</td>
<td>IDR</td>
<td>- - 31</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Drain current ( pulse ) *5 ( $T_c = 25\degree C$ )</td>
<td>ID pulse</td>
<td>- - 61</td>
<td>A</td>
<td>Figure 4</td>
</tr>
<tr>
<td>10</td>
<td>Drain reverse current ( pulse ) *5 ( $T_c = 25\degree C$ )</td>
<td>IDR pulse</td>
<td>- - 61</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Power dissipation ( $T_c = 25\degree C$ )</td>
<td>PD</td>
<td>- - 125</td>
<td>W</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Junction temperature</td>
<td>Tj</td>
<td>-55 - 150</td>
<td>$\degree C$</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Storage temperature</td>
<td>Tstg</td>
<td>-55 - 150</td>
<td>$\degree C$</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Drain-source voltage slope</td>
<td>dv/dt</td>
<td>- - 200</td>
<td>V/ns</td>
<td></td>
</tr>
</tbody>
</table>

[Special instructions]
*1 : Please use this product to meet a condition of $T_j$ within 150 $\degree C$.
*2 : Spike duty cycle $D < 0.1$, spike duration $< 1us$, total spike time $< 1hour$.
*3 : $V_{GSS}$ is defined as $(V_{CC} - V_{plateau}) / R_{gon}$, as shown in Figure A.
  
  $V_{plateau}$ is the voltage between Gate and Kelvin Source.
*4 : Please use this product to meet both a maximum gate current and a maximum gate pulse charge
  of $IGP(1.5A)$ and $Q(32nC)$ respectively, as shown in Figure H.
*5 : Pulse width limited by $Tj_{max}$.
### B. ELECTRICAL CHARACTERISTICS  \( ( T_j = 25 \, ^\circ C \), unless otherwise specified )

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Symbol</th>
<th>Measurement Condition</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drain cut-off current</td>
<td>IDSS</td>
<td>VDS=600 V, VGS=0 V, Tj=25 (^\circ)C</td>
<td>-</td>
<td>-</td>
<td>100</td>
<td>(\mu A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VDS=600 V, VGS=0 V, Tj=150 (^\circ)C</td>
<td>-</td>
<td>100</td>
<td>-</td>
<td>(\mu A)</td>
</tr>
<tr>
<td>2</td>
<td>Gate-source leakage current</td>
<td>IGSS</td>
<td>VGS=-3 V</td>
<td>-1</td>
<td>-</td>
<td>-</td>
<td>(\mu A)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VDS=0 V</td>
<td>-</td>
<td>100</td>
<td>-</td>
<td>(\mu A)</td>
</tr>
<tr>
<td>3</td>
<td>Gate forward voltage</td>
<td>VGSF</td>
<td>IGS=26.1 mA, Tj=25 (^\circ)C</td>
<td>2.8</td>
<td>3.5</td>
<td>4.2</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>open drain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Gate threshold voltage</td>
<td>VTH</td>
<td>VDS=10 V, IDS=2.6 mA</td>
<td>0.9</td>
<td>1.2</td>
<td>1.6</td>
<td>V</td>
</tr>
<tr>
<td>5</td>
<td>Drain-source on-state resistance</td>
<td>RDS(on)</td>
<td>IGS=26.1 mA, IDS=8 A, Tj=25 (^\circ)C</td>
<td>-</td>
<td>56</td>
<td>65</td>
<td>m(\Omega)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IGS=26.1 mA, IDS=8 A, Tj=150 (^\circ)C</td>
<td>-</td>
<td>110</td>
<td>-</td>
<td>m(\Omega)</td>
</tr>
<tr>
<td>6</td>
<td>Gate resistance</td>
<td>RG</td>
<td>(f=100MHz), open drain</td>
<td>-</td>
<td>0.6</td>
<td>-</td>
<td>(\Omega)</td>
</tr>
<tr>
<td>7</td>
<td>Transfer conductance</td>
<td>gfs</td>
<td>VDS=8 V, IDS=8 A</td>
<td>-</td>
<td>32</td>
<td>-</td>
<td>S</td>
</tr>
<tr>
<td>8</td>
<td>Input capacitance</td>
<td>Ciss</td>
<td>VDS=400 V</td>
<td>-</td>
<td>405</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td>9</td>
<td>Output capacitance</td>
<td>Coss</td>
<td>VGS=0 V, (f=1 , MHz)</td>
<td>-</td>
<td>71</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td>10</td>
<td>Reverse transfer capacitance</td>
<td>Crss</td>
<td>VDS=0-480 V</td>
<td>-</td>
<td>0.4</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td>11</td>
<td>Turn-on delay time</td>
<td>td(on)</td>
<td>VDD=400 V</td>
<td>-</td>
<td>3.7</td>
<td>-</td>
<td>ns</td>
</tr>
<tr>
<td>12</td>
<td>Rise time</td>
<td>tr</td>
<td>(IDS=8 , A) (Figure A, Figure B)</td>
<td>-</td>
<td>5.6</td>
<td>-</td>
<td>ns</td>
</tr>
<tr>
<td>13</td>
<td>Turn-off delay time</td>
<td>td(off)</td>
<td>Vcc=12 V, (R_{gon}=6.2 , \Omega, \ R_{goff}=4.7 , \Omega, \ R_{g}=680 , \Omega, \ C_{s}=1500 , pF)</td>
<td>-</td>
<td>5.5</td>
<td>-</td>
<td>ns</td>
</tr>
<tr>
<td>14</td>
<td>Fall time</td>
<td>tf</td>
<td></td>
<td>-</td>
<td>2.4</td>
<td>-</td>
<td>ns</td>
</tr>
<tr>
<td>15</td>
<td>Effective output capacitance</td>
<td>Co(er)</td>
<td>VDS=0-480 V</td>
<td>-</td>
<td>87</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td>16</td>
<td>Effective output capacitance</td>
<td>Co(tr)</td>
<td>VDS=0-480 V</td>
<td>-</td>
<td>106</td>
<td>-</td>
<td>pF</td>
</tr>
</tbody>
</table>
## C. GATE CHARGE CHARACTERISTICS (Tj = 25 °C, unless otherwise specified)

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Symbol</th>
<th>Measurement Condition</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gate charge</td>
<td>Qg</td>
<td>VDD = 400 V, IDS = 8 A</td>
<td>-</td>
<td>5.0</td>
<td>-</td>
<td>nC</td>
</tr>
<tr>
<td>2</td>
<td>Gate-source charge</td>
<td>Qgs</td>
<td>(Figure C, Figure D)</td>
<td>-</td>
<td>0.9</td>
<td>-</td>
<td>nC</td>
</tr>
<tr>
<td>3</td>
<td>Gate-drain charge</td>
<td>Qgd</td>
<td>VDD = 400 V, IDS = 8 A</td>
<td>-</td>
<td>2.6</td>
<td>-</td>
<td>nC</td>
</tr>
<tr>
<td>4</td>
<td>Gate plateau voltage</td>
<td>V plateau</td>
<td>VDD = 400 V, IDS = 8 A</td>
<td>-</td>
<td>1.7</td>
<td>-</td>
<td>V</td>
</tr>
</tbody>
</table>

## D. REVERSE CONDUCTING CHARACTERISTICS (Tj = 25 °C, unless otherwise specified)

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Symbol</th>
<th>Measurement Condition</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Source-drain forward voltage</td>
<td>VSD</td>
<td>VGS = 0 V, ISD = 8 A</td>
<td>-</td>
<td>2.1</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>2</td>
<td>Reverse recovery charge</td>
<td>Qrr</td>
<td>VDS = 400 V, ISD = 8 A</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>nC</td>
</tr>
<tr>
<td>3</td>
<td>Reverse recovery time</td>
<td>trr</td>
<td>ISD = 8 A</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>ns</td>
</tr>
<tr>
<td>4</td>
<td>Peak reverse recovery current</td>
<td>Irmm</td>
<td>ISD = 8 A</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>Output charge</td>
<td>Qoss</td>
<td>ISD = 8 A</td>
<td>-</td>
<td>45</td>
<td>-</td>
<td>nC</td>
</tr>
</tbody>
</table>

## E. THERMAL RESISTANCE CHARACTERISTICS

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Symbol</th>
<th>Measurement Condition</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thermal resistance (junction to case)</td>
<td>Rth(j-c)</td>
<td></td>
<td>-</td>
<td>-</td>
<td>1.0</td>
<td>°C/W</td>
</tr>
<tr>
<td>2</td>
<td>Thermal resistance (junction to ambient) *1</td>
<td>Rth(j-a)</td>
<td></td>
<td>-</td>
<td>-</td>
<td>46</td>
<td>°C/W</td>
</tr>
<tr>
<td>3</td>
<td>Reflow soldering temperature</td>
<td>Tsold</td>
<td>reflow MSL3</td>
<td>-</td>
<td>-</td>
<td>260</td>
<td>°C</td>
</tr>
</tbody>
</table>

[Notes]
*1: Device mounted on four layers epoxy PCB (6.45 cm² copper area and 70 μm thickness).
Equivalent circuit / Electrical characteristics

1, 2, 3, 4 : Drain
5, 6, 9 : Source
7 : Kelvin Source
8 : Gate

Notice:
Please connect SK pin to gate driver.

Figure 1: Pin layout / Equivalent circuit

Figure 2: Maximum power dissipation

Figure 3: Transient thermal impedance

Figure 4: Safe operating area Tc = 25 °C

Figure 5: Safe operating area Tc = 125 °C
[Precautions for Use]

1) The product has risks for break-down or burst or giving off smoke in following conditions. Avoid the following use. Fuse should be added at the input side or connect zener diode between Gate pin and GND, etc as a countermeasure to pass regulatory Safety Standard. Concrete countermeasure could be provided individually. However, customer should make the final judgment.

   (1) Reverse the Drain pin and gate pin connection to the power supply board.
   (2) Drain pin short to Kelvin Source pin and Source pin.
   (3) Drain pin short to Gate pin.
   (4) Gate pin open.
Outline

Unit: mm

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>DIMENSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>MIN  1.15</td>
</tr>
<tr>
<td>A1</td>
<td>MIN  0.00</td>
</tr>
<tr>
<td>A2</td>
<td>MIN  0.40</td>
</tr>
<tr>
<td>b</td>
<td>MIN  0.90</td>
</tr>
<tr>
<td>D</td>
<td>MIN  7.90</td>
</tr>
<tr>
<td>D1</td>
<td>MIN  6.84</td>
</tr>
<tr>
<td>D2</td>
<td>MIN  0.40</td>
</tr>
<tr>
<td>E</td>
<td>MIN  7.90</td>
</tr>
<tr>
<td>E1</td>
<td>MIN  0.90</td>
</tr>
<tr>
<td>E2</td>
<td>MIN  3.10</td>
</tr>
<tr>
<td>E3</td>
<td>MIN  2.70</td>
</tr>
<tr>
<td>e</td>
<td>MIN  2.00</td>
</tr>
</tbody>
</table>
## Revision History

<table>
<thead>
<tr>
<th>Revision No</th>
<th>Date</th>
<th>Description of change</th>
</tr>
</thead>
<tbody>
<tr>
<td>000</td>
<td>2018-08-21</td>
<td>1st edition</td>
</tr>
</tbody>
</table>
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(6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. We do not guarantee quality for disassembled products or the product re-mounted after removing from the mounting board.

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