Toshiba Semiconductor News

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Small Signal Device

New!! Information

Click here for the product page of SSM10N961L.

Low ON-resistance N-channel common drain MOSFET with 30V breakdown voltage is suitable for USB-equipped devices and battery pack protection

SSM10N961L

Product Features

- **30V breakdown voltage**
  SSM10N961L is available for the mobile power supply line of load switch and for Note book PCs’ and tablets’ Li-Ion battery pack protection which require over 12V resistance.

- **Small and thin package**
  SSM10N961L is small and thin package: TCSPAG-341501 “1.47mm×3.37mm [typ] / t=0.11mm [typ]”
  It contributes to high-density mounting of device.

- **Low ON-resistance**
  RSS(ON) : 9.9 mΩ (Typ.) @VGS = 10 V
  RSS(ON) : 13.6 mΩ (Typ.) @VGS = 4.5 V

By comibing with the TCK42xG series, a load switch circuit with reverse current protection and a power multiplexer circuit capable of switching between MBB*¹ and BBM*² operations can be designed.

It helps to shrink the designing / developing term of devices.

SSM10N961L’s reference design will be released in November.
launching new series of DTMOSVI/HSD product

**Description**

We launch the DTMOS/HSD Series “TK042N65Z5” / “TK095N65Z5”, a new-generation super-junction structure power MOSFET with high speed recovery type for switching power supplies of industrial equipment.

The DTMOS VI “HSD” series has the same recovery characteristics as the previous generation DTMOS IV “HSD” series and reduces high-temperature IDSS. It also has high-speed switching characteristics based on the DTMOS VI design. Compared to the existing TK62N60W5 “Note 1”, the TK042N65Z5 reduces high-temperature IDSS by approximately 90% “Note 2” and the figure of merit: “drain-source on-resistance” × “Gate-drain charge” by approximately 70% “Note 2”. This makes it possible to improve the conversion efficiency of switching power supplies.

“Note1” DTMOS IV “HSD” series, “Note2” Actual measurement comparison

**Features**

- High speed body diode
- Reduced High Temperature IDSS
- High speed switching (lower R\(_{\text{DS(ON)}}\)×Q\(_{\text{gd}}\))

**Product Spec**

(Ta=25°C unless otherwise specified)

<table>
<thead>
<tr>
<th>Part number</th>
<th>(Ta=25°C unless otherwise specified)</th>
</tr>
</thead>
<tbody>
<tr>
<td>absolute maximum ratings</td>
<td>TK042N65Z5</td>
</tr>
<tr>
<td>Drain-source breakdown voltage V(_{\text{DSS}}) (V)</td>
<td>650</td>
</tr>
<tr>
<td>Drain current (DC) I(_{\text{D}}) (A)</td>
<td>55</td>
</tr>
<tr>
<td>Channel temperature T(_{\text{ch}}) (°C)</td>
<td>150</td>
</tr>
<tr>
<td>drain-source on-resistance R(_{\text{DS(ON)}}) (mΩ)</td>
<td>42</td>
</tr>
<tr>
<td>V(_{\text{GS(0)}})=10V</td>
<td></td>
</tr>
<tr>
<td>total gate charge Q(_{\text{gs}}) (nC)</td>
<td>typ.</td>
</tr>
<tr>
<td>gate-drain charge Q(_{\text{gd}}) (nC)</td>
<td>typ.</td>
</tr>
<tr>
<td>input capacitance C(_{\text{iss}}) (pF)</td>
<td>typ.</td>
</tr>
<tr>
<td>reverse recovery time t(_{\text{rr}}) (ns)</td>
<td>typ.</td>
</tr>
<tr>
<td>Package</td>
<td>TO-247</td>
</tr>
<tr>
<td>size (mm)</td>
<td>typ.</td>
</tr>
</tbody>
</table>

**Schedule**

- Mass production in Dec/2023

**Features**

- High speed body diode
- Reduced High Temperature IDSS
- High speed switching (lower R\(_{\text{DS(ON)}}\)×Q\(_{\text{gd}}\))

**Package**

- TO-247
- Size (mm) typ. 15.9×20.95, t=5.02

**Efficiency graph**

- DTMOSIV(HSD) TK042N65Z5
- DTMOSⅥ(HSD) TK095N65Z5
- Circuit Topology: LLC Converter
- Test Condition: Vin=380V, Vout=54V
- Iout~7.5A, Pout~1485W
Photorelays have a variety of advantages, and replacement from mechanical relays is progressing, but there are some points that must be taken into consideration in comparison with mechanical relays when they are used in high-frequency circuits such as semiconductor testers and measuring instrument applications. In this notes, you can refer to such points.

**TLP3475W (NEW) High Frequency Characteristics**

We compare TLP3475W (new product) and TLP3475S (conventional product) about frequency characteristics of (1) and (2). The TLP3475W is suitable for handling high-frequency signals.

### (1) Pass-through characteristics (S-parameters)

- **TLP3475W**
  - Insertion loss: -3.0 dB
  - Can be used at 20GHz or higher
  - Has a resonance point and difficult to use above 20GHz

- **TLP3475S**
  - Insertion loss: -2.8 dB

TLP3475W is better due to less loss.

### (2) Eye pattern (PCI Express 2.0 (Gen2) 16Gbps)

- **TLP3475W**
  - Eye size image
  - *100%
  - Long and wide lead to good transmission characteristics
  - Risetime: 35ps

- **TLP3475S**
  - Eye size image
  - 85%*<sup>*</sup>
  - *Eye size image

<table>
<thead>
<tr>
<th>Opening Width</th>
<th>5.9ps</th>
<th>5.8ps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening Height</td>
<td>0.71V</td>
<td>0.63V</td>
</tr>
</tbody>
</table>
**Sensor**

**Linear Image Sensor**

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**New!! Information**

★Please click below to watch sensor product video.

- Toshiba Web  [Click here!](https://www.toshiba.co.jp/e/products/sensor/)
- YouTube  [https://www.youtube.com/watch?v=OigLmFfo1jc](https://www.youtube.com/watch?v=OigLmFfo1jc)

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**High Intensity Resistant Sensor Chip “ET4KK0-S” for LDS**

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### Strength

- High-speed
- High Intensity Resistant

>>Able to measure strong reflection light from short distance without overflow.

### Application

- Robot Cleaner, Total Station etc.

### Under Development (CY24/Q2 CS)

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<table>
<thead>
<tr>
<th>Strength</th>
<th>TCD1254GFG</th>
<th>TCD1103GFG</th>
<th>ET4KK0-S</th>
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</thead>
<tbody>
<tr>
<td>Pixel number</td>
<td>2,500</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Pixel size (μm)</td>
<td>5.25 x 64</td>
<td>5.5 x 64</td>
<td>5.25 x 50</td>
</tr>
<tr>
<td>Data Rate (MAX,MHz)</td>
<td>2</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Signal Output Polarity</td>
<td>–</td>
<td>–</td>
<td>+</td>
</tr>
<tr>
<td>Power Supply (V)</td>
<td>3.0-5.0</td>
<td>3.0-4.0</td>
<td>3.15-3.45</td>
</tr>
<tr>
<td>Power (MAX,mV)</td>
<td>60</td>
<td>48</td>
<td>105</td>
</tr>
<tr>
<td>Saturation Voltage (MIN,mV)</td>
<td>700</td>
<td>450</td>
<td>900</td>
</tr>
<tr>
<td>Package size (mm)</td>
<td>19.0 x 6.0 x 2.2 16pin GLCC</td>
<td>15.2 x 6.0 x 2.2 16pin GLCC</td>
<td>16.0 x 3.5 x 1.9 16pin GLCC</td>
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<tr>
<td>Additional Feature</td>
<td>Timing Generator Electronic Shutter</td>
<td>Timing Generator Electronic Shutter</td>
<td>Timing Generator Electronic Shutter Overflow Drain</td>
</tr>
</tbody>
</table>

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*1 LDS : Laser Distance Sensor

*2 This product is sensor chip. Please contact us if you need a PKG version.