MOSFET portfolio designed for VoIP applications

Diodes Incorporated has extended its family of MOSFETs tailored for VoIP communication equipment.

The DMN6068 and DMN6066 are avalanche rugged and designed for driving transformers in the DC-DC converter stage of Subscriber Line Interface Circuits (SLIC).

These MOSFETs combined with a transformer allow a wide range of battery voltage ($V_{BAT}$) to be efficiently converted in the SLIC. This eliminates high voltage external power supplies that are bulky and expensive.

SLICs are the gateway for VoIP applications in the exchange and can be used for interfacing with a wide range of end equipment including Cable (EMTA), DSL modems (IAD) and Analog Terminal Adaptors. As well as Private Branch Exchanges including IP-PBX.

VoIP enables a lower total cost of ownership whilst providing more services to the end-user.

**The Diodes’ Advantage**

- High Pulse Current ($I_{DM}$)
  - With high $I_{DM}$ handling capabilities, the MOSFETs can drive the transformer to deliver the required RING and TIP currents

- Avalanche rugged
  - These MOSFETs have been designed to withstand the high pulse avalanche energy that will be induced by the transformer during switching transition.

- Low gate charge ($Q_g$) and input capacitance ($C_{iss}$)
  - Low $Q_g$ and $C_{iss}$ means that these MOSFETs can be driven with minimal or no buffering. This simplifies the SLIC design and reduces component count and cost. These MOSFETs are capable of being driven at low logic level voltages.

- AEC-Q101, “Green” and RoHS Compliant
  - These MOSFETs are qualified to AEC-Q101 standard, are RoHS compliant and have insignificant levels of halogens or antimony compounds.

**Circuit Function**

For generating the $V_{BAT}$ required for driving the RING and TIP linefeed output of SLICs, an on-board DC-DC converter using MOSFET-transformer is the most suitable.

- Increased Efficiency
  - The MOSFET and transformer DC-DC conversion has a greater power efficiency than the equivalent solution using a bipolar transistor (BJT) and inductor. Typically the efficiency can be increased from 67% to 80%.

- Low DC supply voltage ($V_{DC}$)
  - The MOSFET and transformer is the preferred solution for SLICs with low $V_{DC}$.

www.diodes.com
New Product Announcement

DMN6068
DMN6066

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60V MOSFETs for transformer based DC-DC converters

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Pack</th>
<th>V_{DS} (V)</th>
<th>P_{TH} (W)</th>
<th>I_{DSS} (A)</th>
<th>R_{DS(ON)} max (mΩ) @ V_{GS}</th>
<th>C_{ISS} Typ (pF)</th>
<th>Q_{G} Typ (nC) @5V</th>
<th>Q_{G} Typ (nC) @10V</th>
<th>E_{AS} UIS (Note 1)</th>
<th>New Products</th>
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<tbody>
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<td>TO252-3L</td>
<td>60</td>
<td>8.5</td>
<td>8.5</td>
<td>22.2</td>
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<td>68</td>
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<td>SOT223</td>
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<td>66</td>
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<td>750</td>
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<td>-</td>
<td>650</td>
<td>169</td>
<td>-</td>
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Notes:
1. Single pulse avalanche energy (E_{AS}) testing using an Unclamped Inductive Switch (UIS) test in production.
2. E_{AS} = 37.5mJ with UIS conditions of L = 3.00mH, I_{AS} = 5.0A, R_{G} = 25Ω, V_{DD} = 50V, starting T_{J} = 25°C.
3. Rugged by design. Not tested, but if required 100% UIS test can be implemented same as Note 4.
4. E_{AS} = 73mJ with UIS conditions of L = 4.83mH, I_{AS} = 5.5A, R_{G} = 25Ω, V_{DD} = 100V, starting T_{J} = 25°C.
5. E_{AS} = 55mJ with UIS conditions of L = 5.95mH, I_{AS} = 4.3A, R_{G} = 25Ω, V_{DD} = 100V, starting T_{J} = 25°C.

Click on the Part Name for the datasheet.