

Power semiconductor switch

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graph TD; A[Power semiconductor switch] --> B[Based on number of terminals]; B --> C[2- terminals]; B --> D[3- terminals]; B --> E[4- terminals]; C --> F[Diodes Si, SiC]; C --> G[Diac]; D --> H[BJTs base control]; D --> I[MOSFETs gate control]; E --> J[IGBT with Kelvin emitter]; E --> K[Cascode structure Si MOSFET+GaN HEMT];
```

*Based on
number of
terminals*

2- terminals

3- terminals

4- terminals

Diodes (Si, SiC)

Diac

BJTs (base
control)

MOSFETs (gate
control)

IGBT with Kelvin
emitter

Cascode structure
(Si MOSFET+GaN
HEMT)

Power semiconductor switch

```
graph TD; A[Power semiconductor switch] --> B[Based on number of layers/junctions]; B --> C[2- layer]; B --> D[3- layers]; B --> E[4- layers]; C --> F[Diodes]; D --> G[BJTs, MOSFETs]; E --> H[GTOs, SCR];
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*Based on number of
layers/junctions*

2- layer

Diodes

3- layers

BJTs, MOSFETs

4- layers

GTOs, SCR

Power semiconductor switch

```
graph TD; A[Power semiconductor switch] --> B[Based on controllability]; B --> C[Uncontrolled]; B --> D[Semi controlled]; B --> E[Fully controlled]; C --> F[Diodes Si, SiC]; D --> G[SCR]; E --> H[IGBTs and MOSFETs];
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*Based on
controllability*

Uncontrolled

Diodes (Si, SiC)

Semi controlled

SCR

Fully controlled

IGBTs and MOSFETs

Power semiconductor switch

```
graph TD; A[Power semiconductor switch] --> B[Single quadrant]; A --> C[Two quadrant]; A --> D[Four quadrant]; A -.-> E["Based on quadrant of operation"]; B --> F[Diodes]; C --> G[Current bidirectional]; C --> H[Voltage bidirectional]; D --> I[Combination of switches]; G --> J[MOSFETs]; H --> K[Transistor with series diode];
```

*Based on
quadrant of
operation*

Single
quadrant

Diodes

Two quadrant

Current
bidirectional

MOSFETs

Voltage
bidirectional

Transistor
with series
diode

Four quadrant

Combination of
switches