Product Preview
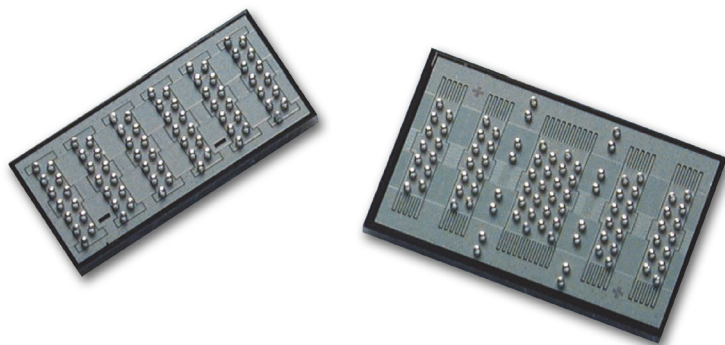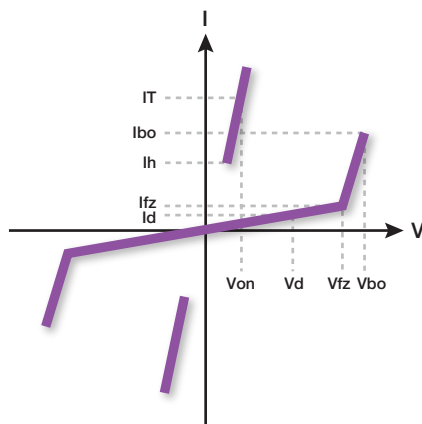
Surge Protection Devices

Microsemi's surge protection devices protect implantable medical devices from damage resulting from an external defibrillation event. The ZL70571, ZL70572, ZL70573, ZL70574, and ZL70588 form a family of high-performance surge protection devices for implantable medical electronics. Optimized for fast turn-on and extremely low leakage current, the ICs ensure high performance and reliability, as well as an easy route to compliance with the EN-45502 and EN-50061 specifications. Microsemi's family of surge protection devices includes variants to support a range of application requirements for number of terminals and operating voltage:

- The ZL70574 and ZL70588 are seven-terminal devices for triple-chamber pacemakers

- The ZL70571 is a five-terminal devices for dual-chamber pacemakers

- The ZL70573 is a six-terminal device optimized for size-critical applications

- The ZL70572 is a five-terminal device for neurostimulators

Enhanced Performance

- Extremely fast turn-on
- Extremely low leakage allows terminals to be connected in parallel to the device being protected

Eases Design

- Variants with five, six, or seven terminals support a range of application requirements
- Very small size supports trend for miniaturization

Applications

- Pacemakers
- Neurostimulators

Packaging and Availability

- Package: Solder bumped die or wire-bondable bare die
- Sample availability: Now

Superior Quality

- QA procedures based on MIL-PRF-38535
- Wafer-level traceability
- Lot acceptance testing included
- 100% burn-in capability

Customer Support

Microsemi's surge protection devices are supported by a team of application design engineers with extensive medical system design experience.

Performance Characteristics

	ZL70571	ZL70572	ZL70573	ZL70574/88
Vfz min (V)	9.0	17.0	9.0	9.0
Vbo max (V)	12.2	19.5	12.0	12.0
Size (mm²)	12.2	12.2	7.6	8.8

Microsemi

ZL70571/72/73/74/88

Implantable medical electronics such as pacemakers and neurostimulators are used to treat a wide range of illnesses including bradycardia, tachycardia, Parkinson's disease, chronic pain, and muscle spasticity. To maintain reliability, these implantable devices must be able to withstand electrical surges, such as those caused by medical treatments like external defibrillation.

The diagram shown below of a dual-chamber pacemaker demonstrates how the ZL70571 device protects sensitive circuitry from transient currents. Designed with extremely low leakage during normal pacing voltages, the terminals of the ZL70571 are connected in parallel with those of the protected pacemaker pins.

When the voltage between the terminals rises to a dangerous level, the device rapidly turns on and shunts the current.

Surge suppression occurs through a self-triggering thyristor-diode, coupled with a diode between each branch-input and common node. When a transient current is forced between two terminals, the positive terminal is clamped to the common node by the diode of one branch, and the negative terminal to the forward voltage of the thyristor-diode on the other branch. The low on-voltage of the thyristor ensures that voltage remains at a safe value during the transient.

Extremely fast turn-on and low leakage current eases compliance with regulations EN-45502 for active implantable medical devices, and EN-50061 for implantable cardiac pacemakers.

Typical Dual-Chamber Pacemaker
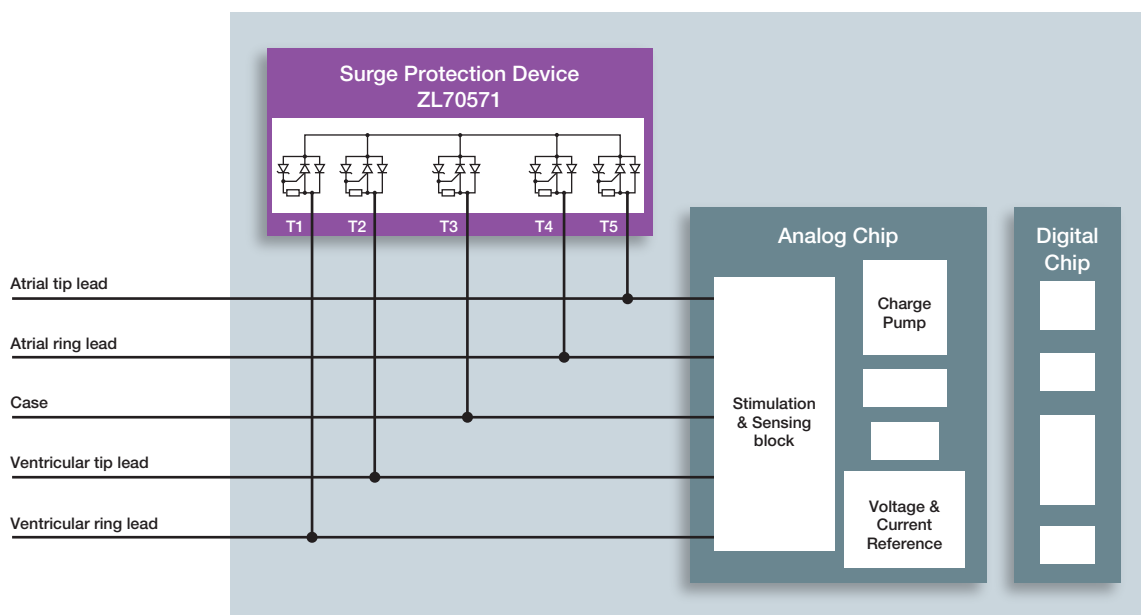
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