



DIODA DAYA

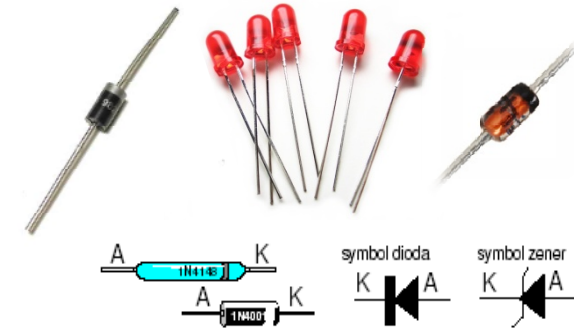
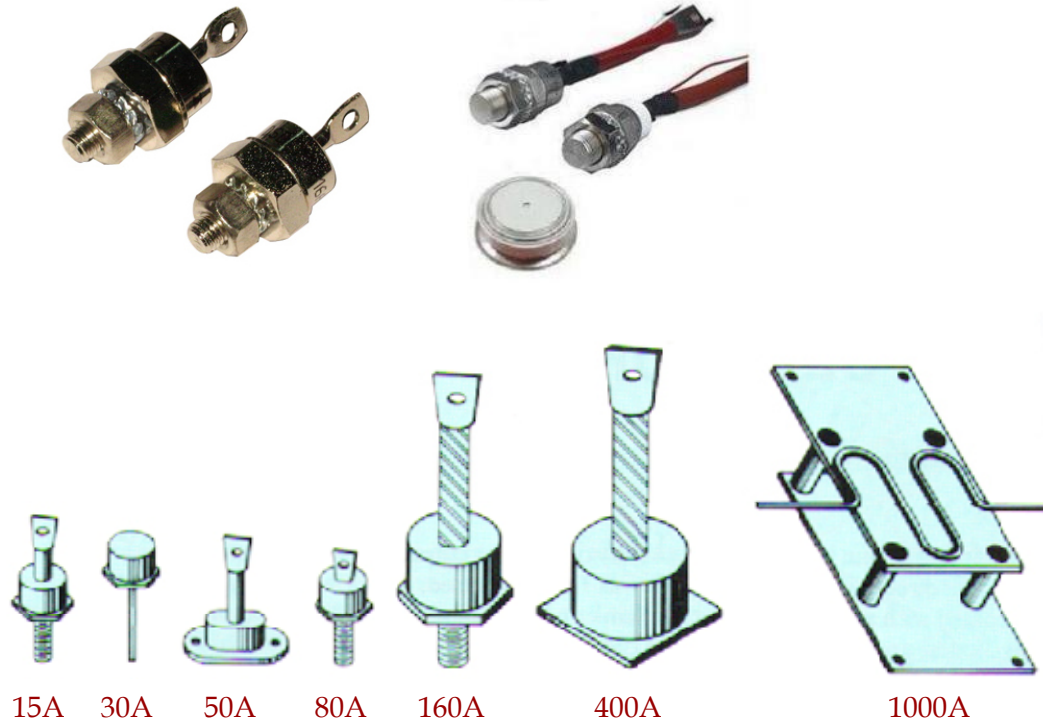
(Power Diode)



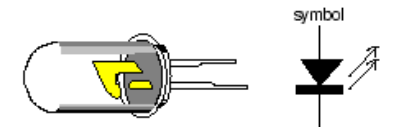
Andi Hasad
andihasad@yahoo.com

TEKNIK ELEKTRO (D-3)
UNIVERSITAS ISLAM "45" BEKASI

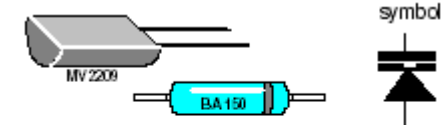
Dioda Daya Vs Dioda Sinyal



DIODA DAN ZENER



LIGHT EMITTING DIODE

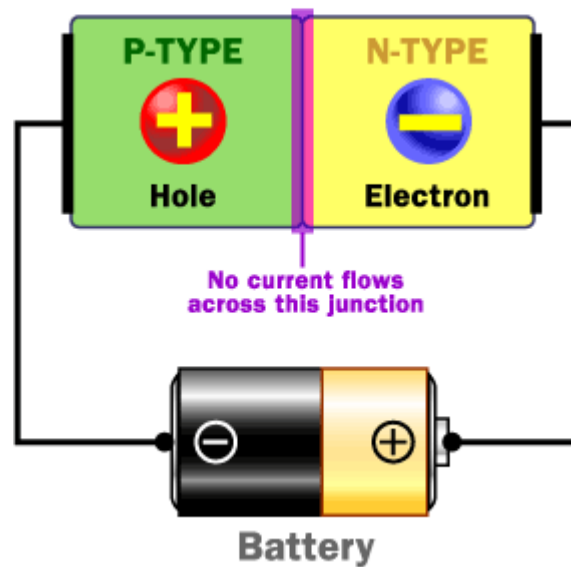
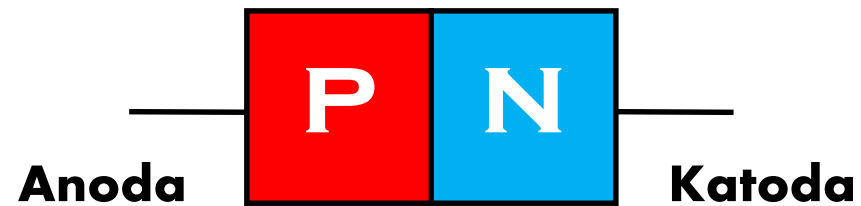
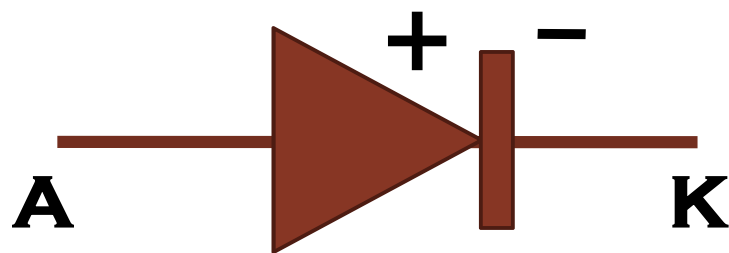


DIODA VARACTOR

Perbedaan dioda daya dibandingkan dioda sinyal *pn-junction* :

- Memiliki daya yang besar
- Kemampuan menangani tegangan dan arus yang lebih besar
- Respon frekuensi (kecepatan pensaklaran) lebih rendah dibanding dioda sinyal

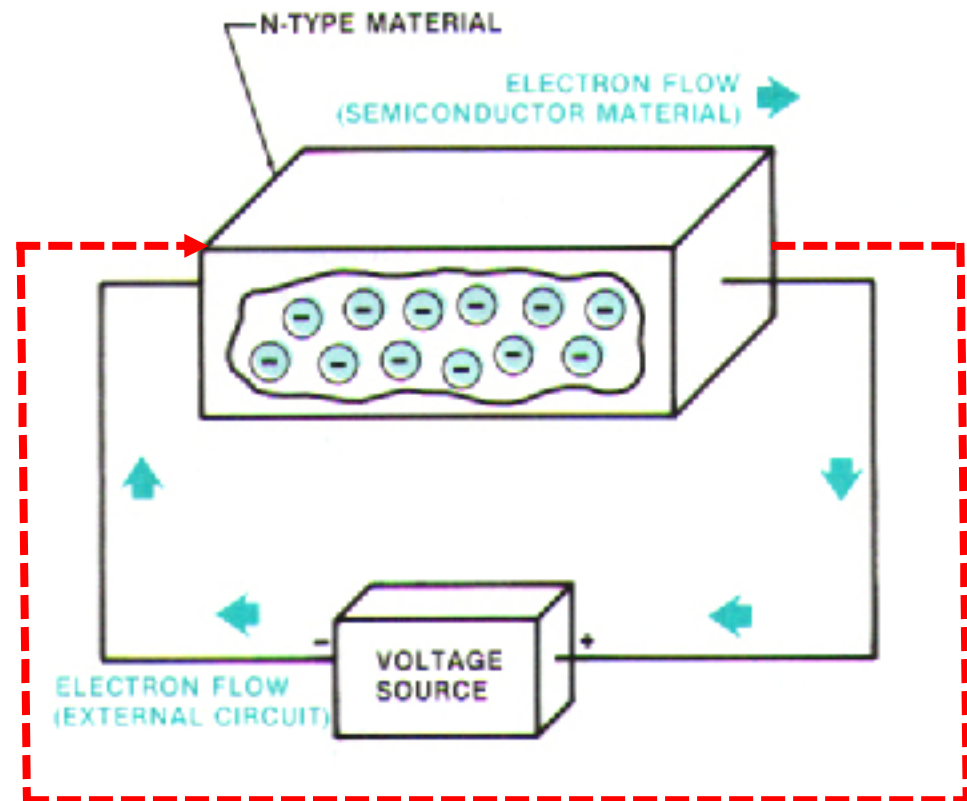
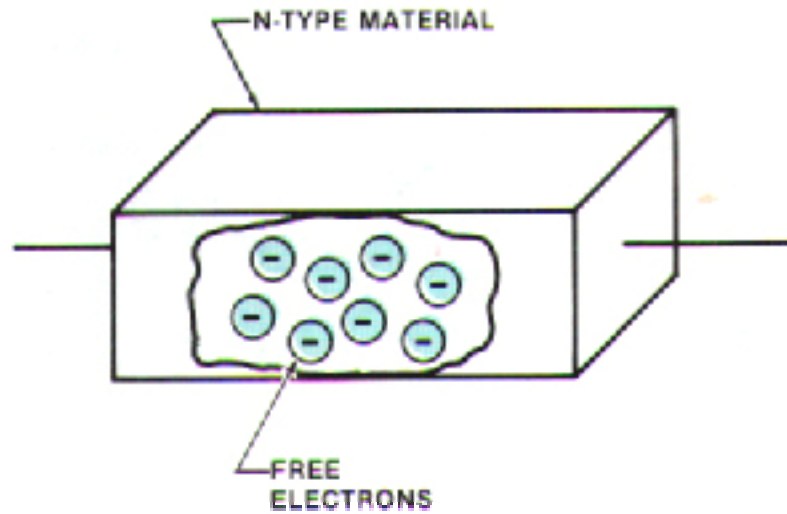
Simbol Dioda Daya



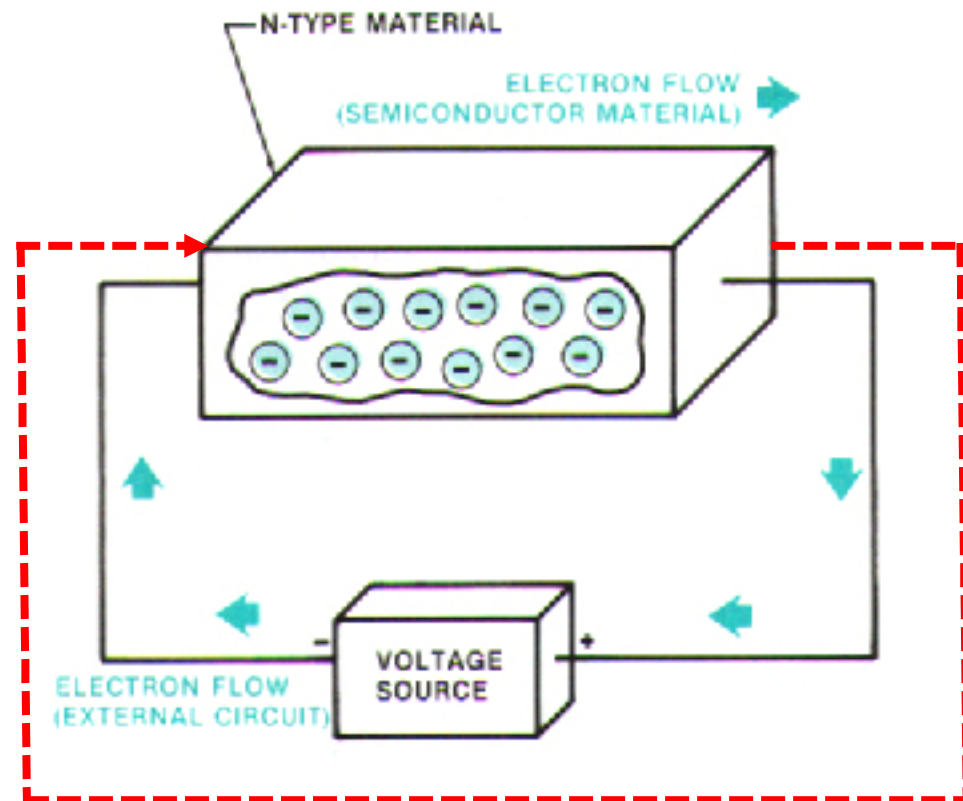
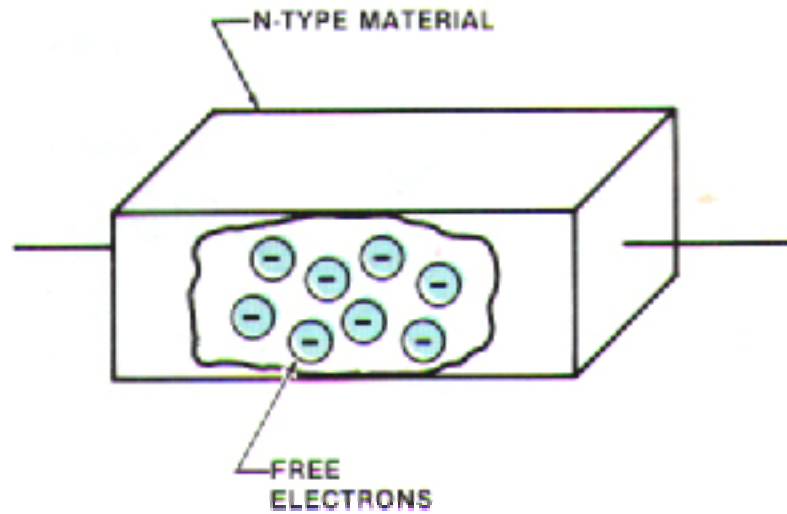
Semikonduktor ?

Konduktor	Semikonduktor	Isolator
Resistansi rendah		Resistansi tinggi
Banyak elektron bebas	Beberapa (sebagian) elektron bebas	Tidak ada elektron bebas

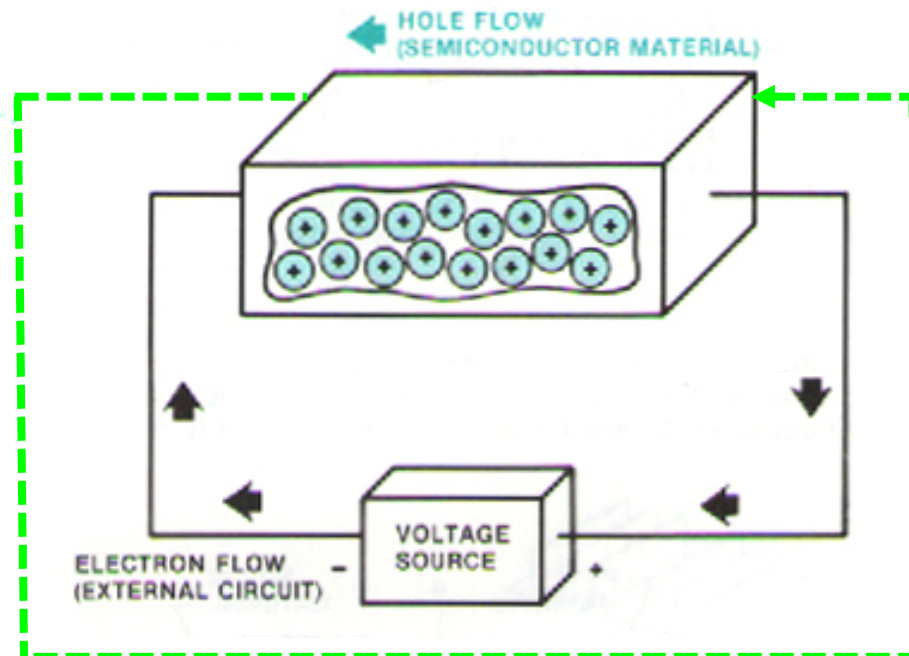
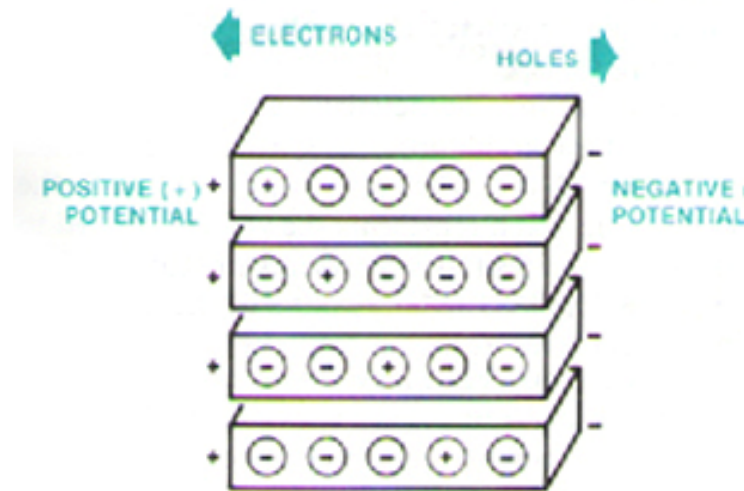
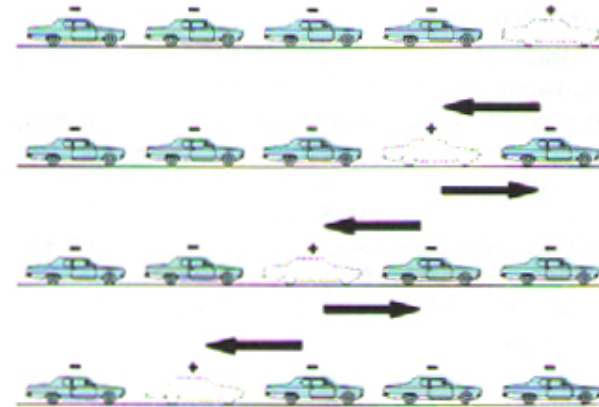
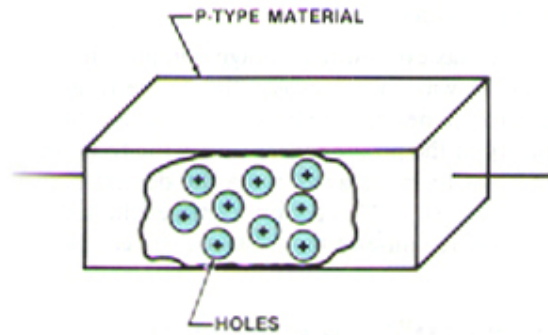
Material Semikonduktor Tipe-N



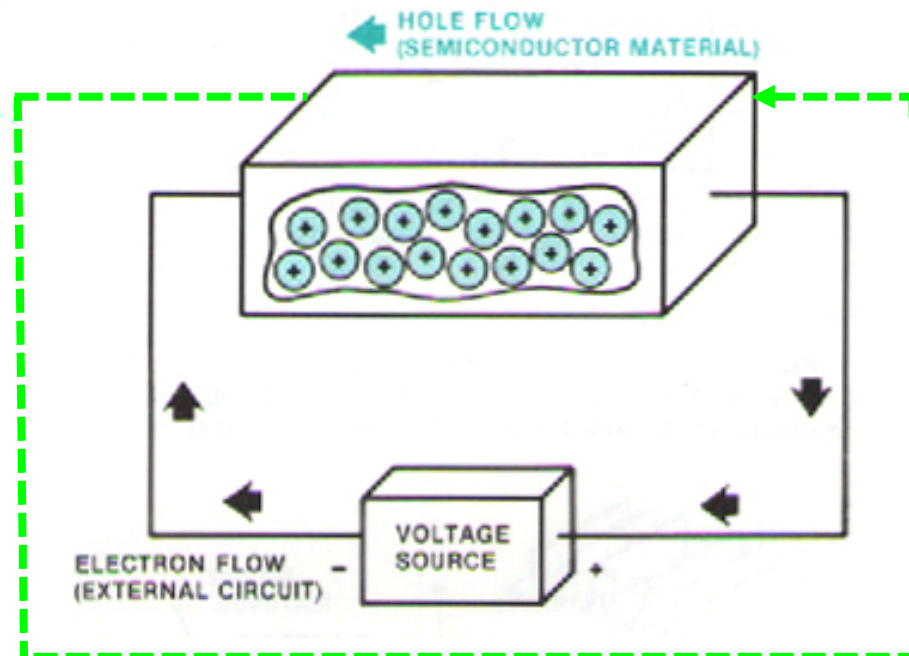
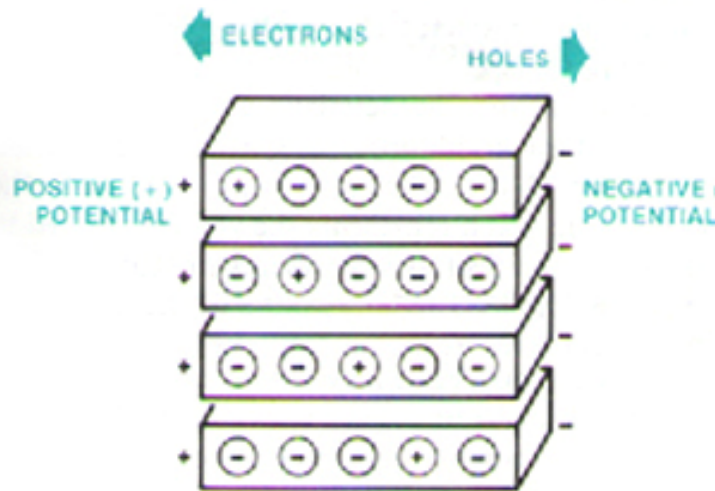
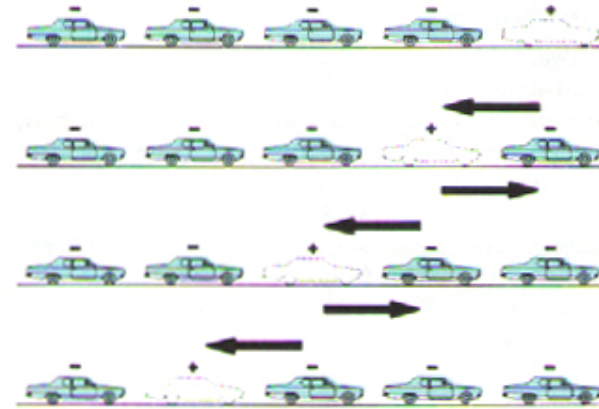
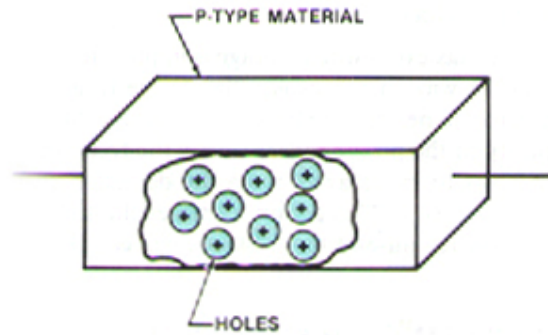
Material Semikonduktor Tipe-N



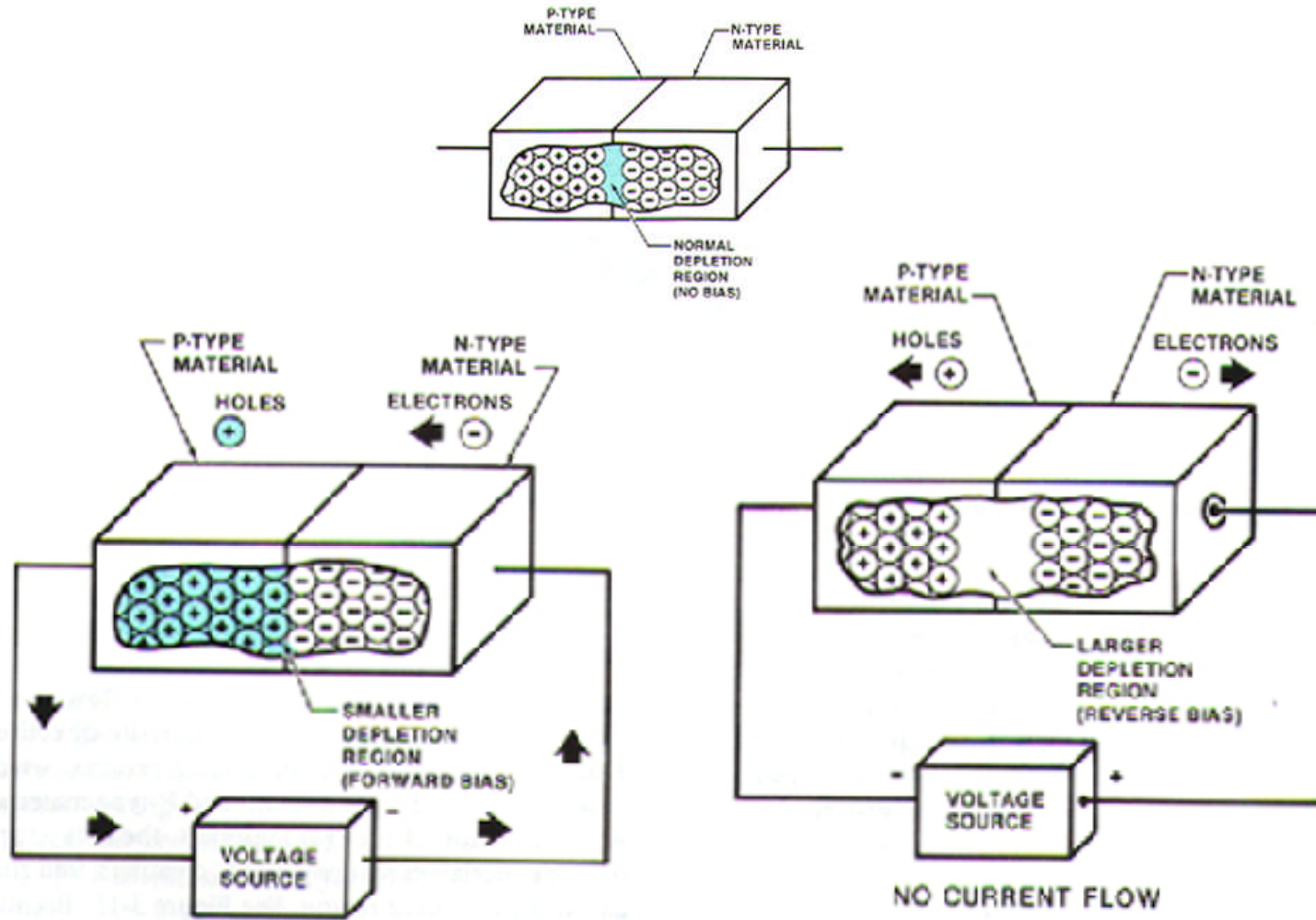
Material Semikonduktor Tipe-P



Material Semikonduktor Tipe-P



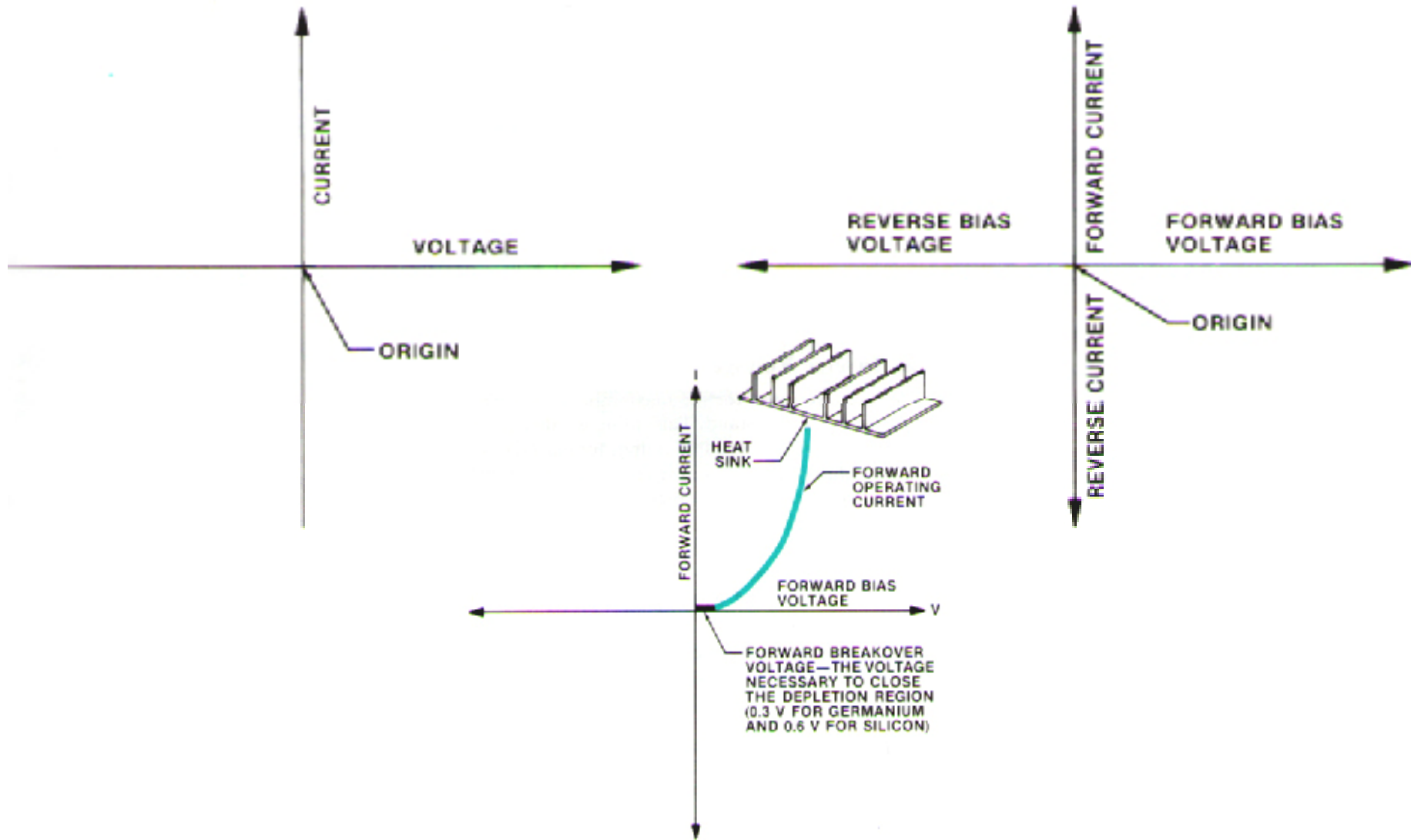
Forward and Reverse Bias Dioda Daya



Forward Bias

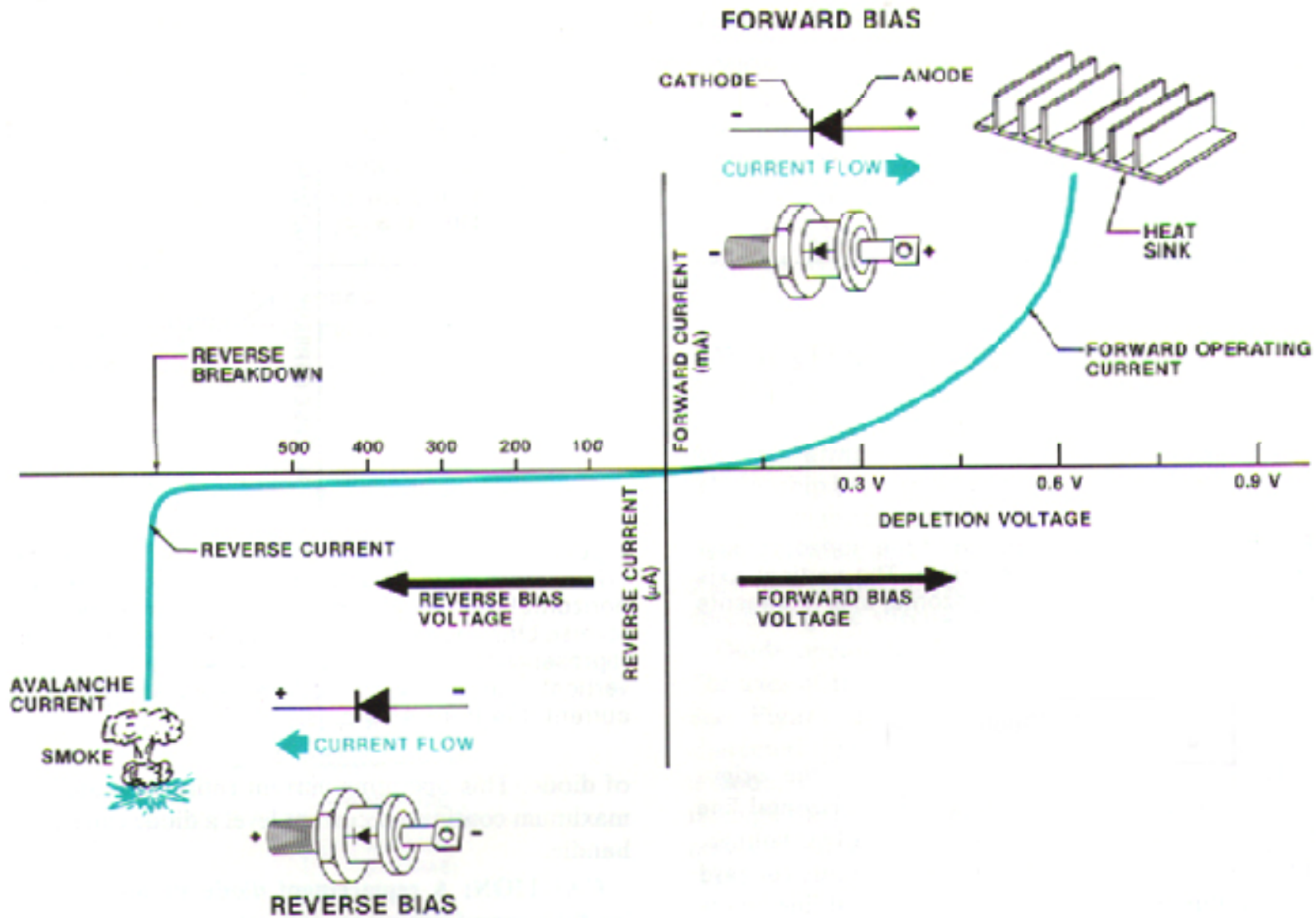
Reverse Bias

Karakteristik Operasi Dioda (1)

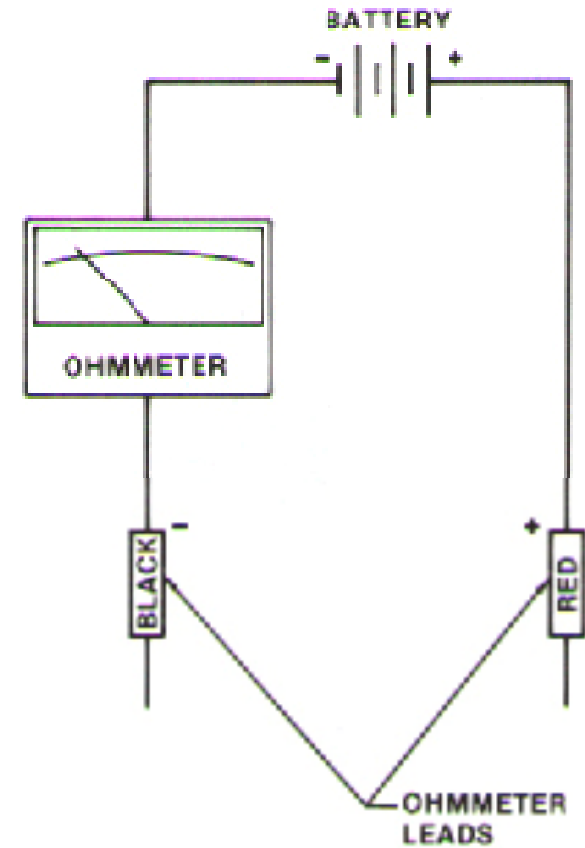
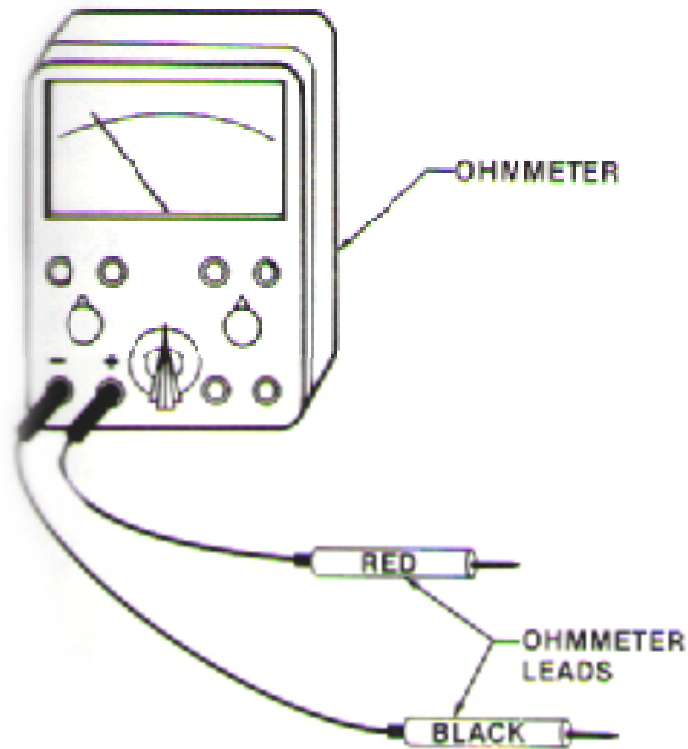


Forward Operating Current

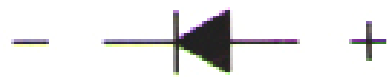
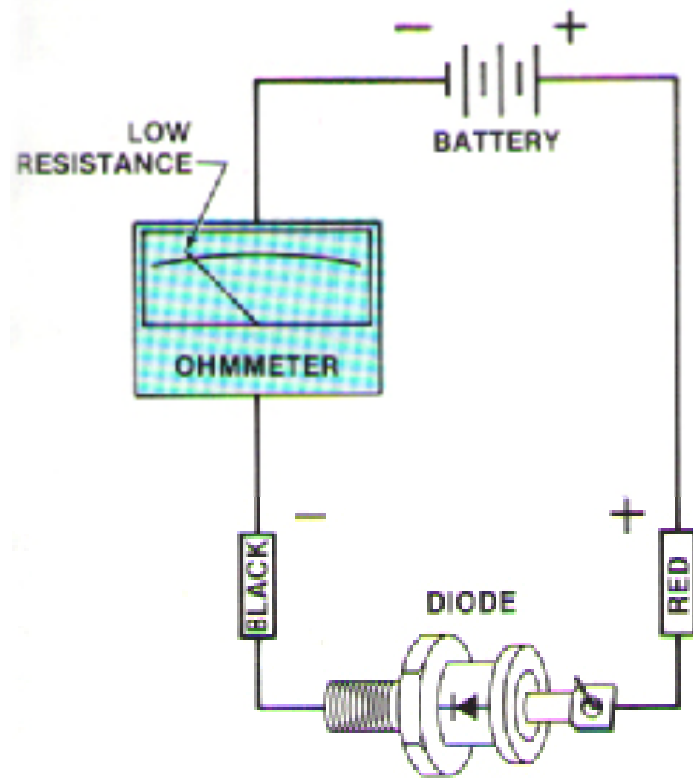
Karakteristik Operasi Dioda (2)



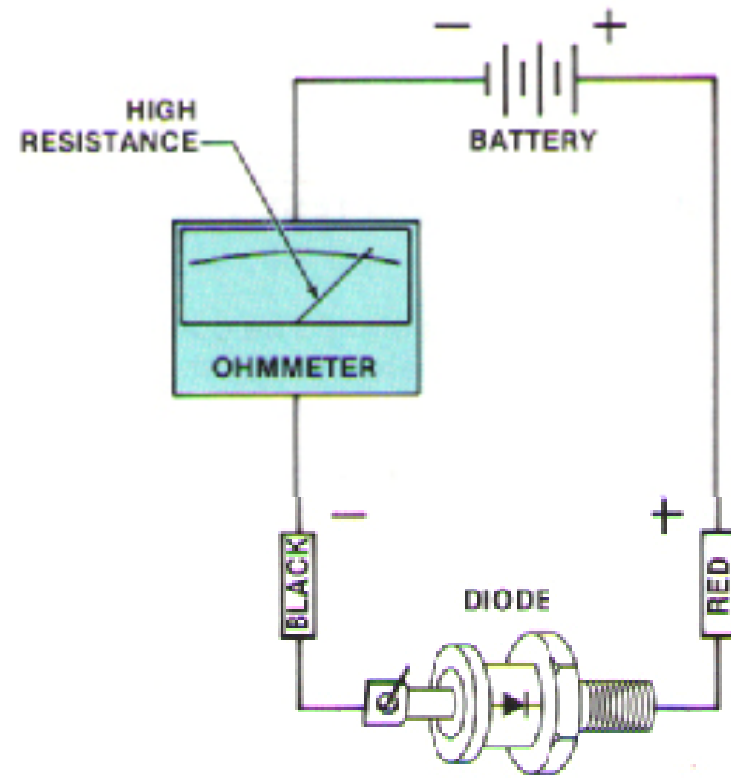
Menguji Dioda Daya (1)



Menguji Dioda Daya (2)

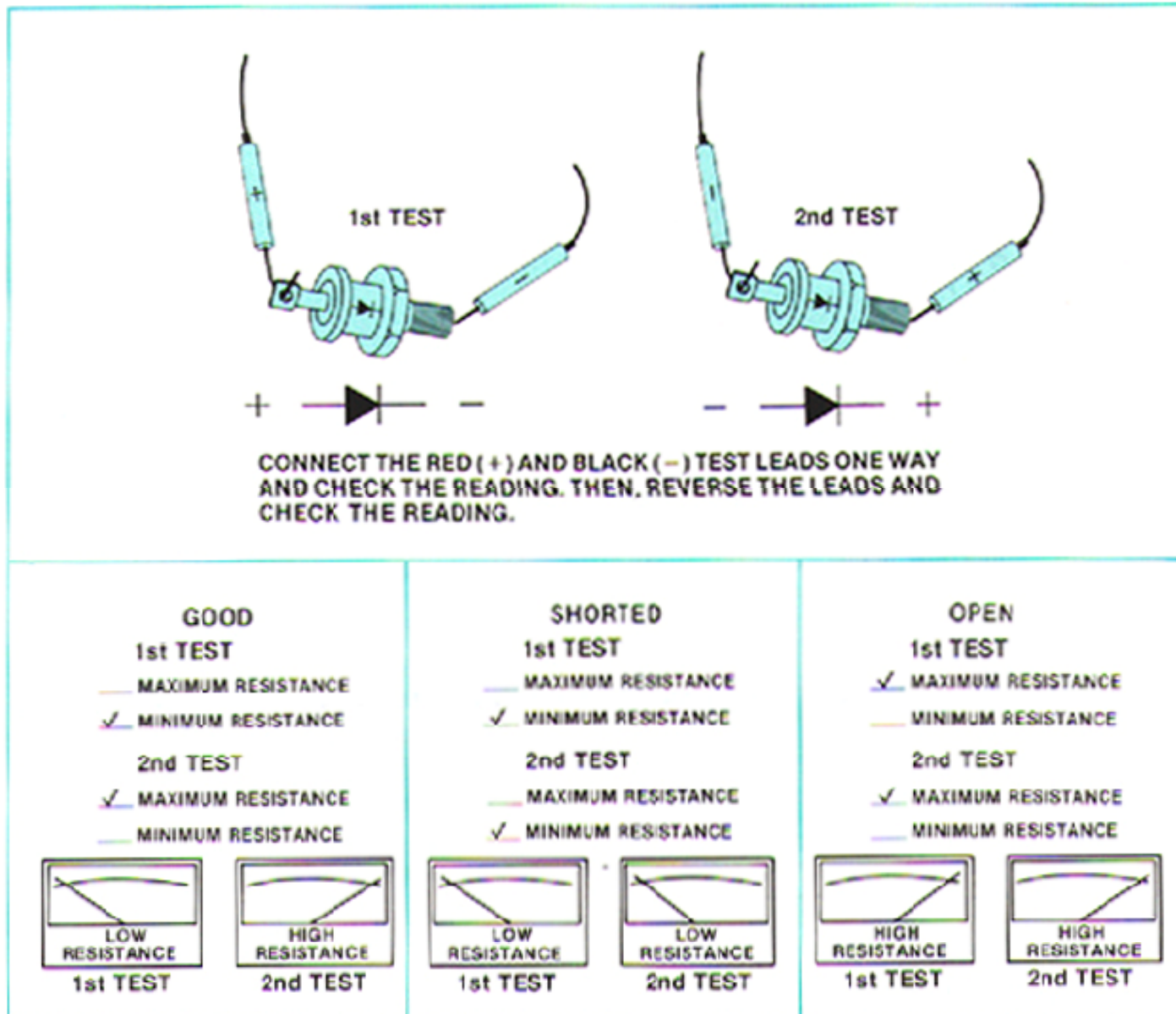


FORWARD BIAS

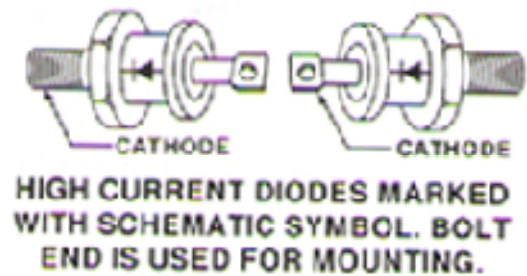
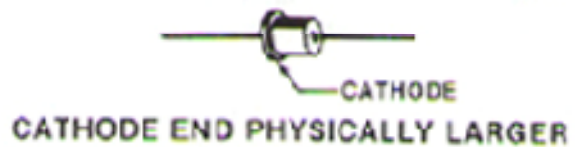
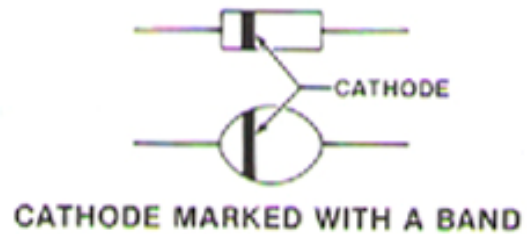
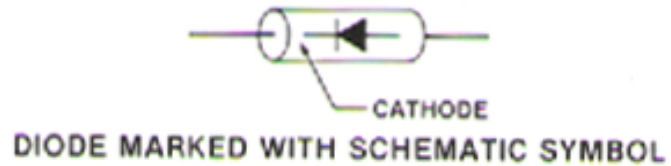


REVERSE BIAS

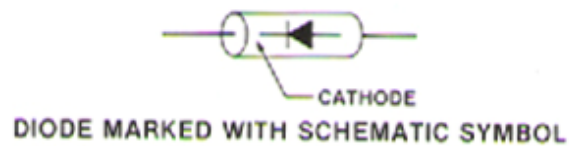
Menguji Dioda Daya (3)



Manufaktur Dioda Daya



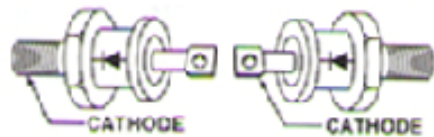
Tipe Dioda Daya



CATHODE MARKED WITH A BAND



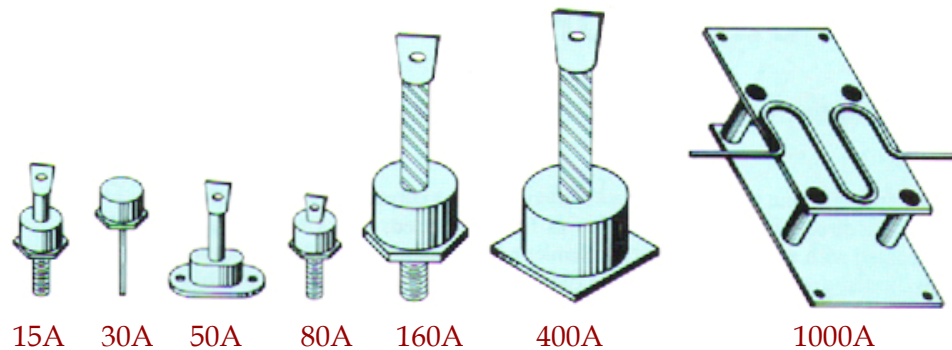
CATHODE END PHYSICALLY LARGER



HIGH CURRENT DIODES MARKED WITH SCHEMATIC SYMBOL. BOLT END IS USED FOR MOUNTING.



1. Dioda Umum atau Serbaguna
2. Dioda Pemulihan Cepat
3. Dioda Schottky



Dioda Umum / Serbaguna

- ❑ Waktu pemulihan mundur relatif tinggi, biasanya 25 us
- ❑ Digunakan untuk aplikasi kecepatan rendah (waktu pemulihan tidak kritis)
- ❑ Arus 1 - ribuan Ampere, tegangan 50 V - 5 kV
- ❑ Secara umum dibuat dengan difusi
- ❑ Tipe campuran (alloy) dari penyearah yang digunakan untuk suplay daya pengelasan
 - ✓ Paling efektif pembiayaannya
 - ✓ Kasar
 - ✓ Memiliki tingkat kemampuan 300 V - 1000 V



Dioda Pemulihan Cepat

- ❑ Waktu pemulihan rendah kurang dari 5 μ s
- ❑ Digunakan untuk konverter dc-dc dan dc-ac
- ❑ Arus 1 - ratusan Ampere, tegangan 50 V- 3 kV
- ❑ Untuk tingkat tegangan di atas 400 V, dibuat dengan difusi dan waktu pemulihan mundur diatur oleh difusi platina / emas
- ❑ Untuk tingkat tegangan di bawah 400 V, dioda epiktasi lebih cepat dibanding dioda difusi
- ❑ Dioda pemulihan cepat memiliki lebar basis yang tipis, yang menghasilkan waktu pemulihan ulang kurang dari 50 ns

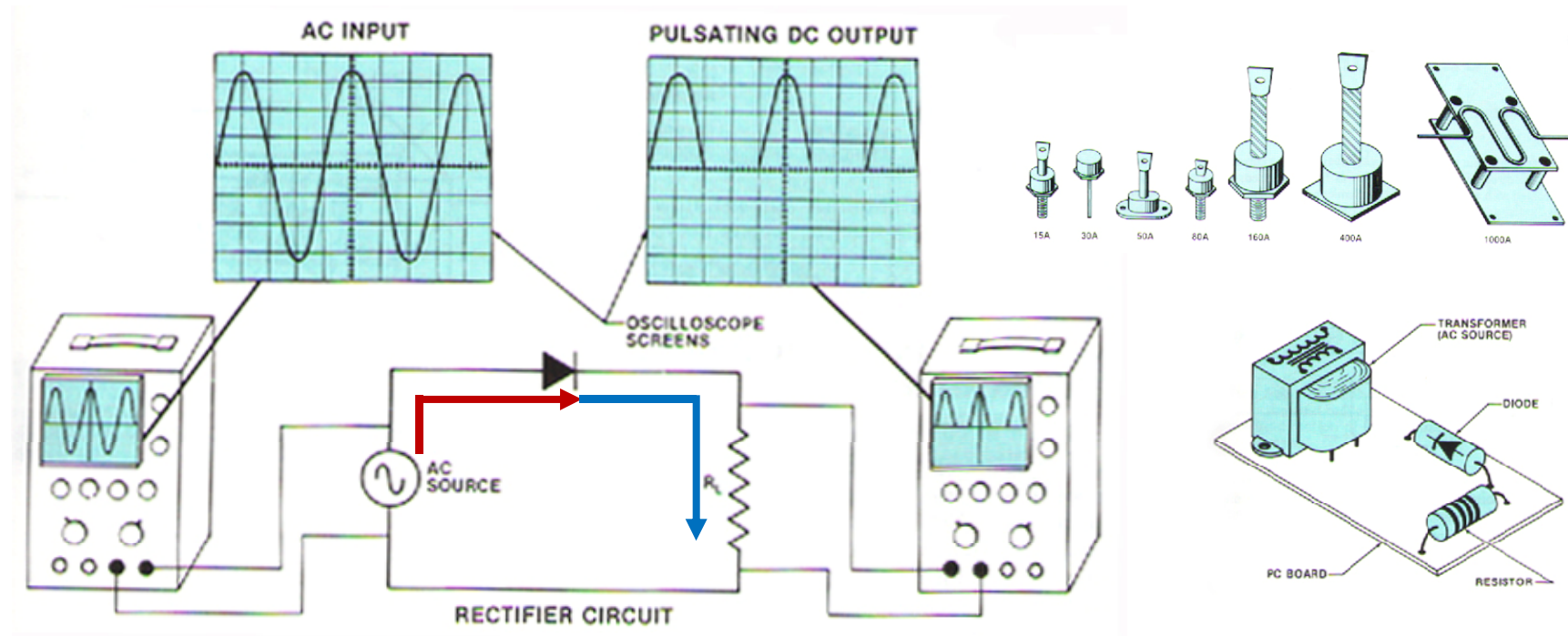


Dioda Schottky

- ❑ Masalah pengisian penyimpan pn *junction* dapat diminimalkan bahkan dihilangkan dalam dioda ini
- ❑ Pengisian pemulihan jauh lebih kecil daripada dioda pn *junction* yang ekuivalen.
- ❑ Dioda schottky memiliki tegangan jatuh yang relatif kecil
- ❑ Arus bocor lebih tinggi daripada dioda pn *junction* , olehnya itu tegangan maksimum yang diizinkan dibatas 100 V
- ❑ Tingkat arus bervariasi 1 - 300 A
- ❑ Ideal digunakan untuk arus tinggi, tegangan rendah catu daya dc. Meskipun demikian dioda ini juga diterapkan pada catu daya arus kecil untuk meningkatkan efisiensi.



Aplikasi Dioda Daya (1)



Aplikasi dioda daya selain sebagai saklar dalam penyearah :

- Freewheeling* dalam regulator saklar
- Pengisian balik kapasitor dan transfer energi antar komponen
- Isolasi tegangan
- Balikan energi dari beban ke sumber daya

Aplikasi Dioda Daya (2)

APPLICATION NOTE 90

Negative-Output Boost Regulator Has High Efficiency

Abstract: In this design note a switching regulator, the MAX634, operates with a charge pump to produce an adjustable, regulated, negative output voltage with high efficiency. The circuit converts 5V to an adjustable negative output of -12V to -22V for use as a backplane bias supply for LCDs.

The circuit of **Figure 1** converts 5V to an adjustable output of -12V to -22V, suitable for use as a backplane-bias supply for LCDs. The circuit includes a switching regulator that boosts the input voltage to a high positive voltage (top of Q3), and a charge pump that converts this level to the negative output voltage. The scheme provides good load regulation and allows use of an economical, low-side, n-channel MOSFET switch (Q3). Efficiency (90% or so for the entire output range) surpasses that of most inverting-topology converters

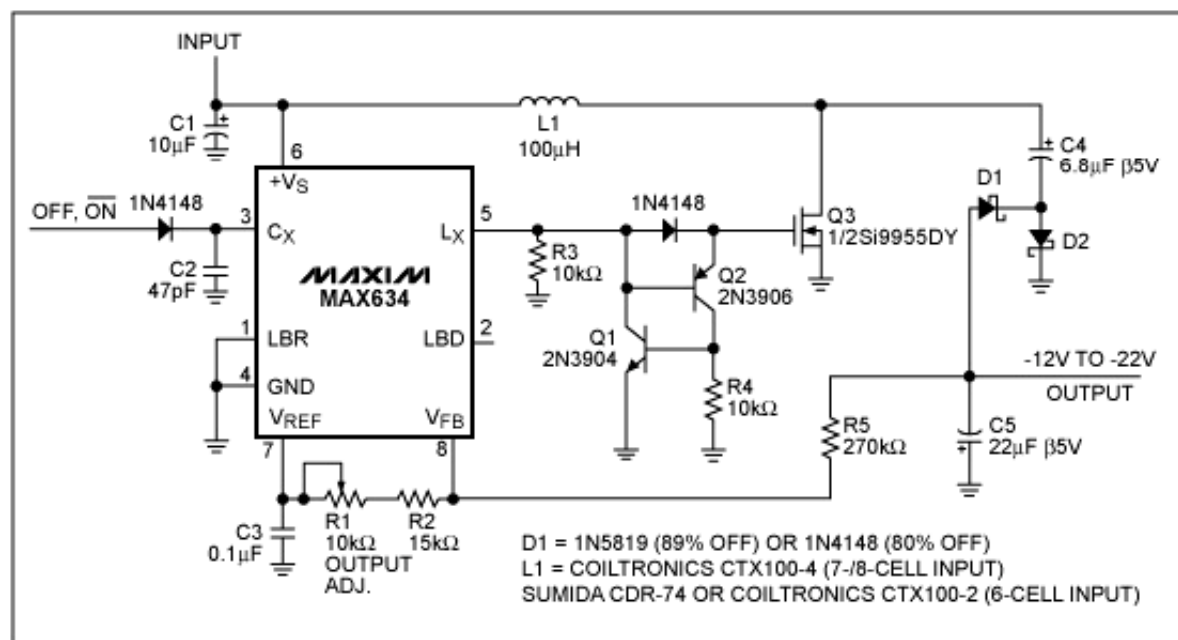


Figure 1. This switching regulator operates with a discrete-component charge pump (D1, D2, C4, and C5) to produce an adjustable, regulated, negative output voltage.

Sumber : <http://www.maxim-ic.com/>

Aplikasi Dioda Daya (3)



Fiber-coupled diode lasers of the LDF series offering 100 to 10,000 W output power deliver the laser beam to the workpiece through an optical fiber

laserline

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- Diode Laser Modules
- Pump Sources
- Direct Diode Lasers
- Custom Lasers
- Optics
- Options & Additional Components

Multiple Station Operation with Fiber Lasers

The diode lasers of the LDF series are particularly well suited to multiple station operation with beam switches and fibers of up to 50 m in length.

The beam switch is integrated in the laser head and may also be added later, as customer requirements in production increase. It is equipped with an integrated status monitor and beam absorber.

The mobility and compactness of the diode lasers allow for completely new redundancy strategies in multiple station operation.

Processing Optics with Fiber Lasers

There are currently two diameters of processing optics available for fiber-coupled diode lasers: 25 mm (1") and 50 mm (2"). Both can be easily complemented with sensors for process monitoring and control, for example, for weld seam monitoring.

The spot dimensions of the fiber-coupled lasers can be adjusted within a wide range to suit the particular application and can also be widened using special homogenization optics to form a uniform rectangle, line or square.

Special Processes with Fiber Lasers

Thanks to standardized fiber connectors, other manufacturer's specialized processing heads such as welding optics, cutting heads or nozzles for cladding, can easily be used together with diode lasers from Laserline.

- production
- Mobile, fiber-coupled diode lasers of up to 10,000 W power
- Extremely reliable
- Flexible, modular laser
- Optional beam switch



Sumber : <http://www.laserline-inc.com/>

DAFTAR PUSTAKA



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Terima Kasih



*Apa yang saya lihat ..., saya lupa
Apa yang saya dengar..., saya ingat
Apa yang saya kerjakan..., saya pahami.*