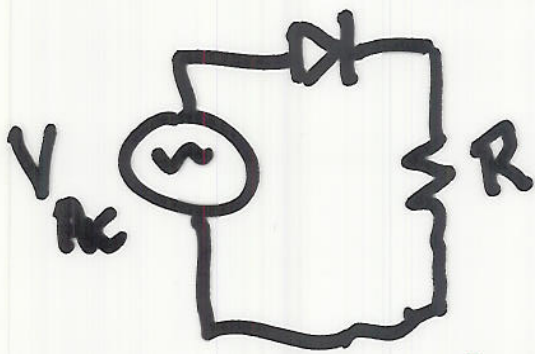


Diodes

1-6



$\frac{1}{2}$ Wave rectifier

PEAKS Kill!
Solid state in "0-NO-seconds"
Peak inverse voltage: $\sqrt{2} V_{ac}$
across diode rms

Peak Forward Current: $\frac{\sqrt{2} V_{rms}}{R}$

$$I_{AV} = \frac{I_{pk}}{2\pi} \int_0^{\pi \text{ or } T/2} \sin \omega t \, dt \approx \frac{1}{\pi} I_{peak}$$

Diodes for AC Mains

USA: 120, 240
Distribution: 208/120

Europe:
380/220

480/7 600/?

Local Lines: 2 - 13.6 KV

Long Lines: 130 KV \rightarrow MV

SW of solid state at 6KV now available

480
240

660
347

160

$\frac{1}{2}$ wave
rectifier

Figure 21-9 Basic rules governing diode behavior.



$V_D \approx 0$
 $I_D = ?$



$V_D < 0$
 $I_D = ?$



$V_D > V_{forward} \approx 1-3V$
for power diode



Self shift off
 $I=0$

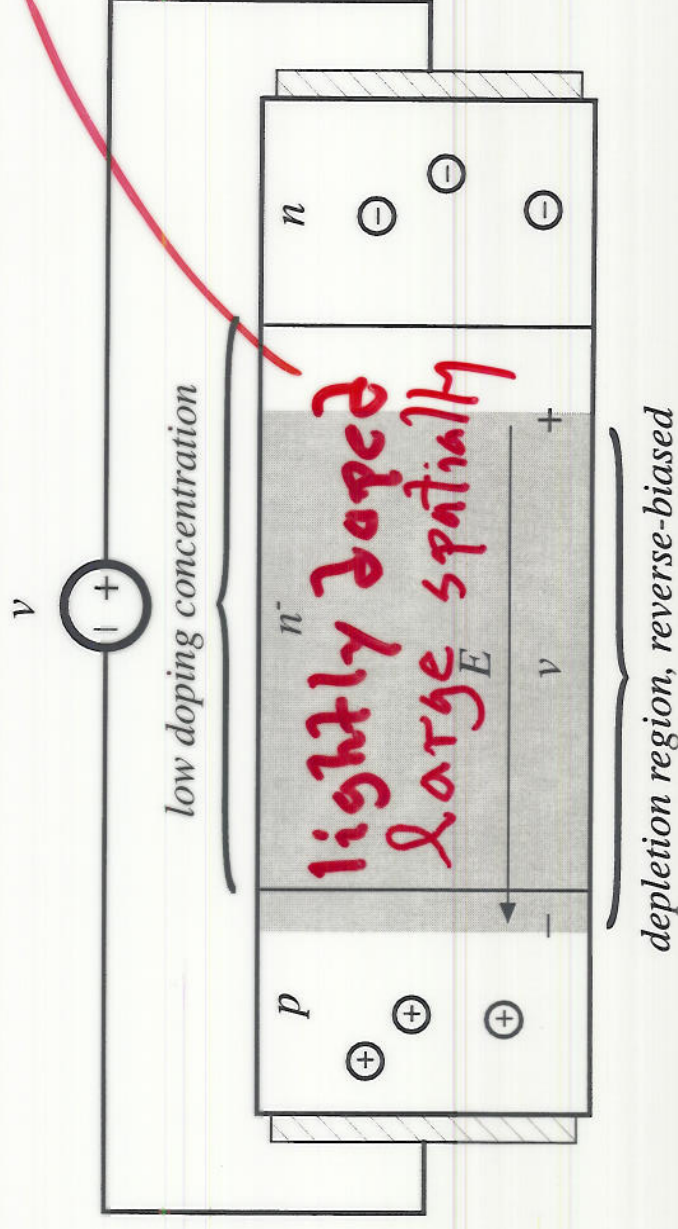
Fig 4.24 Pg 75

4.2.1. Power diodes

PIN structure

↖ ? i means

A power diode, under reverse-biased conditions:



V_{off} is larger with PIN structure



more than solutions. enabling possibilities.

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Products | Applications | Our Focus | Contact | News | Order Site M

Home > Products >

Power Conditioning > Standard Rectifier (trr more than 500ns) > 1N4137

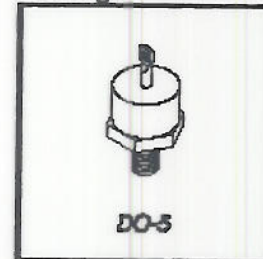
1N4137 (#2439)

RFQ/Sample

Standard Rectifier (trr more than 500ns)

| | | | |
|----------|---------------------|-----------|------------|
| Division | Colorado | Datasheet | COE-26.PDF |
| Mil-Spec | (none) | | |
| Shipping | (none) | Qual Data | (none) |
| Config | • Standard Polarity | | |

Package



| Absolute Maximum Ratings | Symbol | Max | Unit |
|---------------------------|-----------|------|------|
| Output Current | I_o | 70 | A |
| Reverse Voltage | V_{rwm} | 400 | V |
| Max Forward Surge Current | I_{FSM} | 1050 | A |

| Electrical Characteristics | Symbol | Min | Typ | Max | Unit |
|---|----------|-----|-----|------|---------------|
| Forward Voltage | | | | | |
| ($T_A=25^\circ\text{C}$, $I_F=200\text{ A}$) | V_F | | | 1.25 | V |
| Reverse Leakage Current | | | | | |
| ($V_{rwm}=400\text{ V}$, $T_A=25^\circ\text{C}$) | I_R | | | 25 | μA |
| Reverse Recovery Time | t_{rr} | | | 5000 | nsec |

THIS DIODE HAS
A 2x MARGIN
I WOULD PROBABLY BE
BETTER ESPECIALLY IF
IT DIDN'T COST MUCH
MORE.

