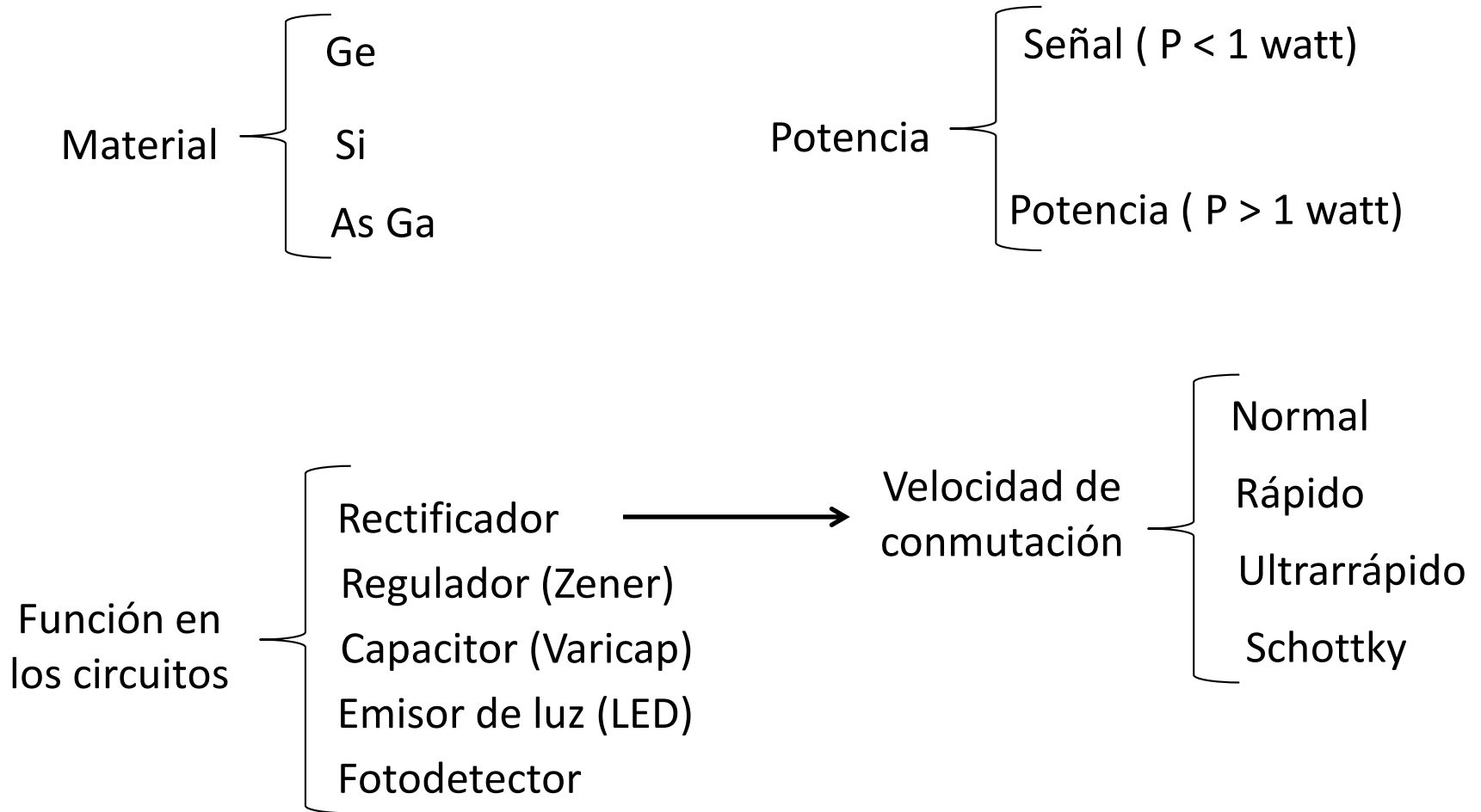
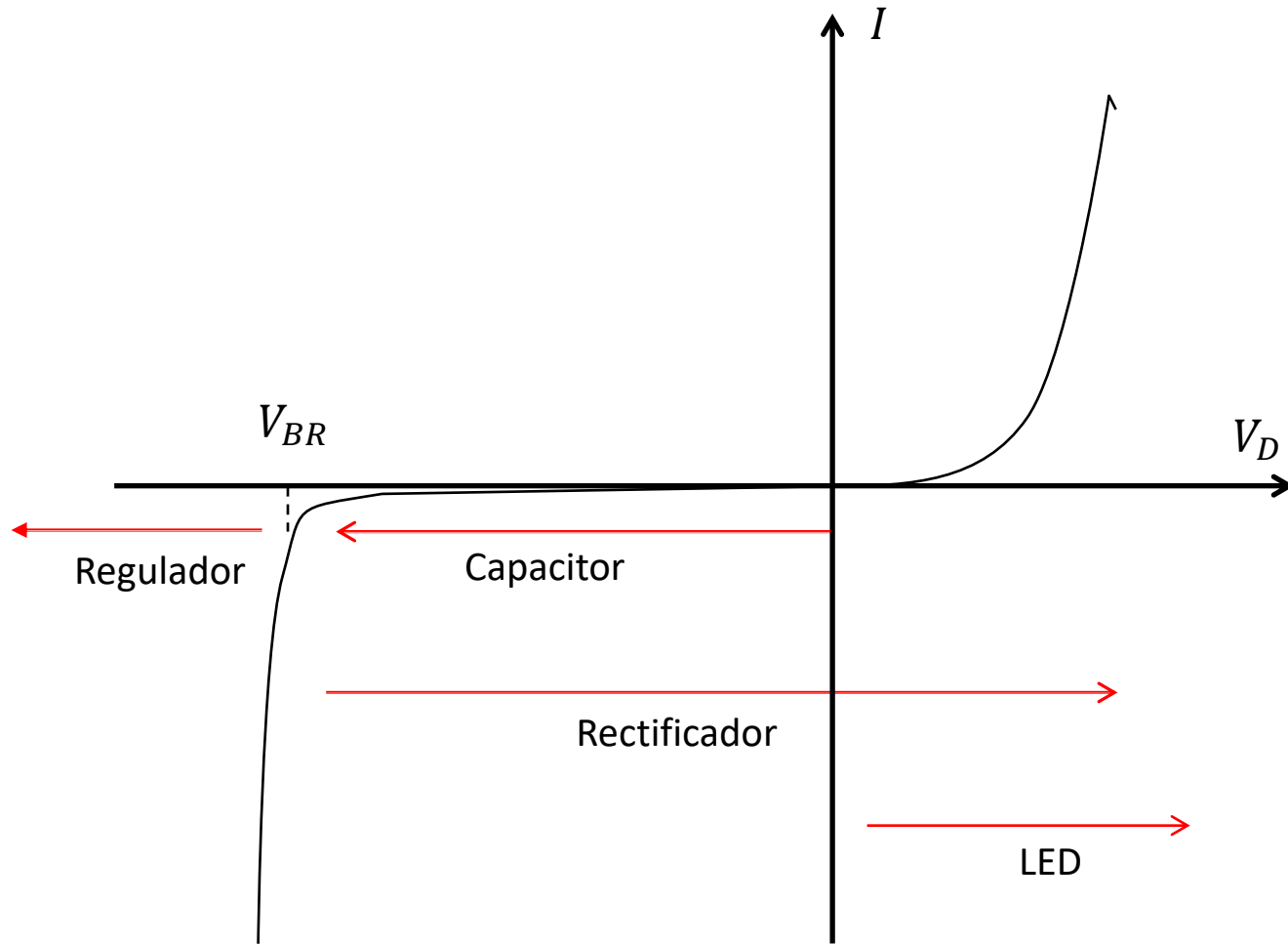


CLASIFICACION DE LOS DIODOS

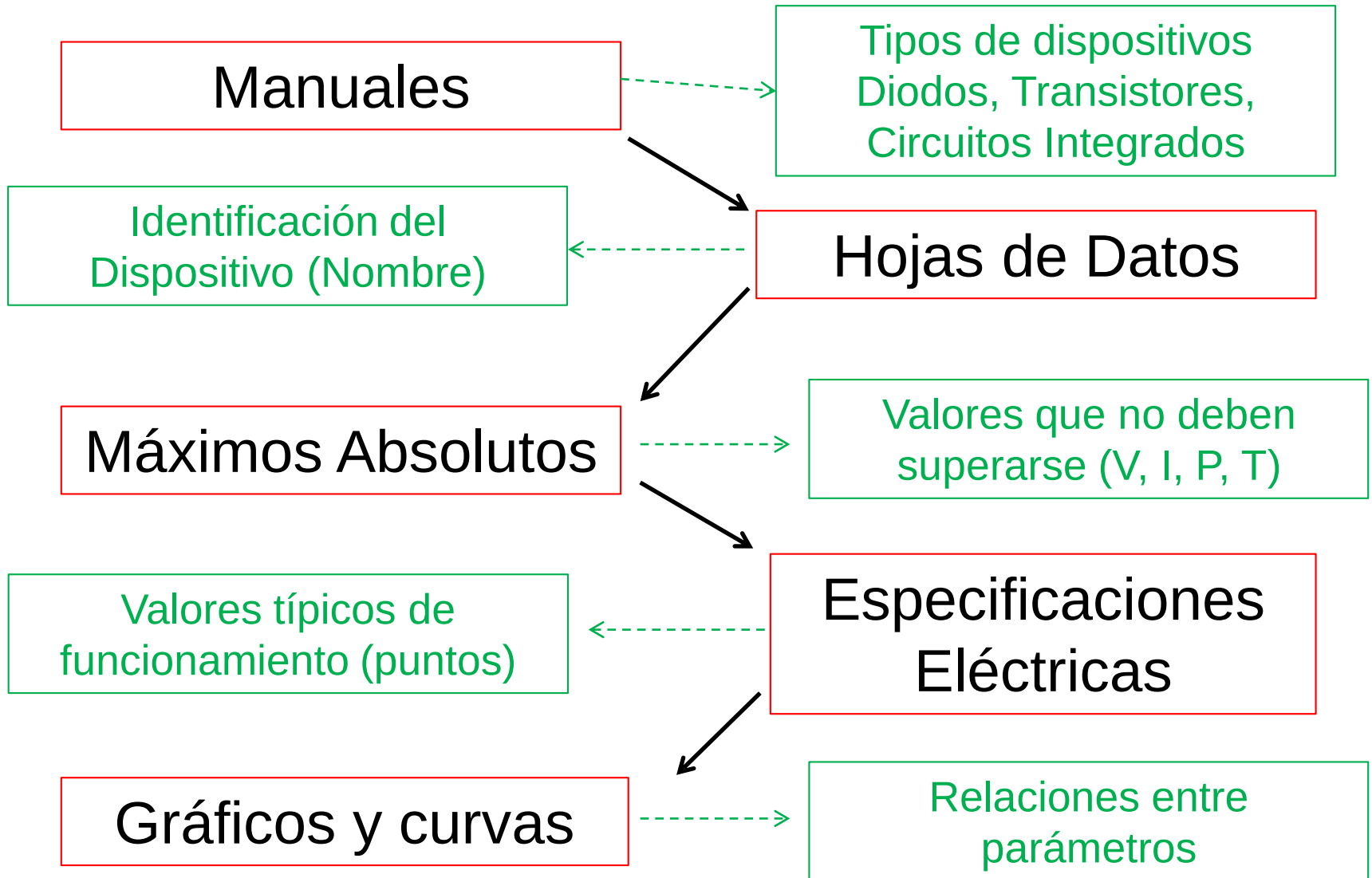


ZONA DE FUNCIONAMIENTO DE CADA TIPO DE DIODO

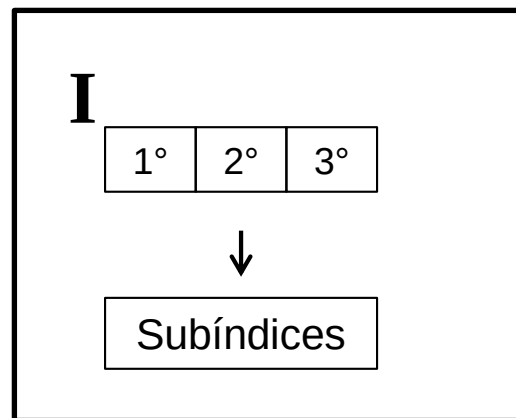
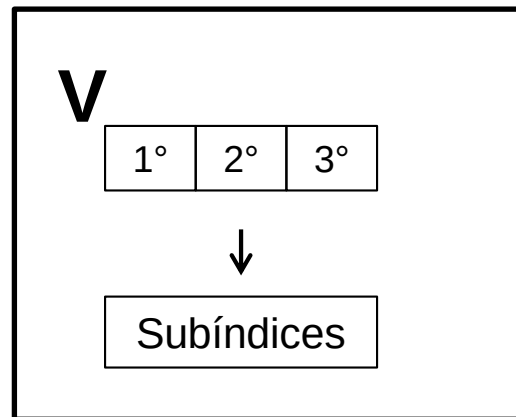
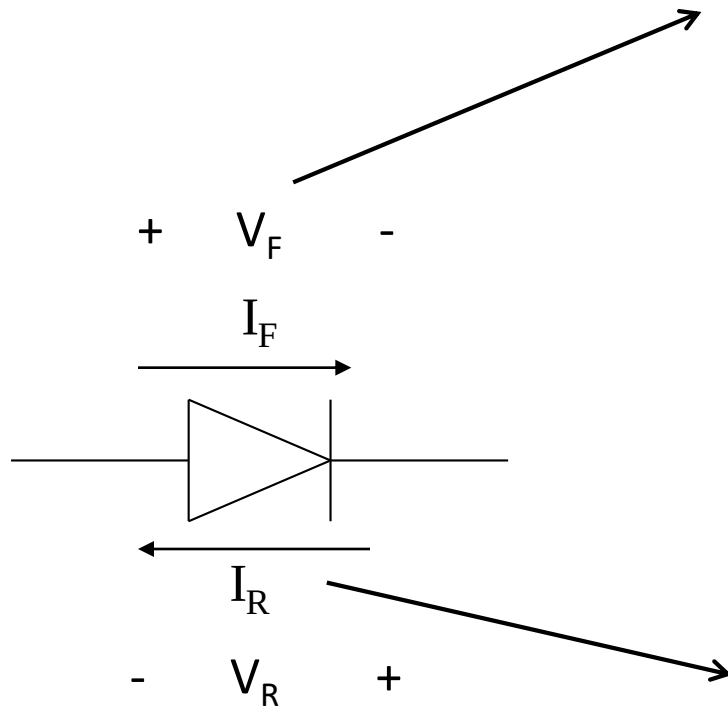


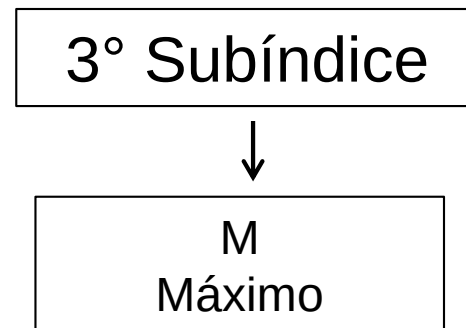
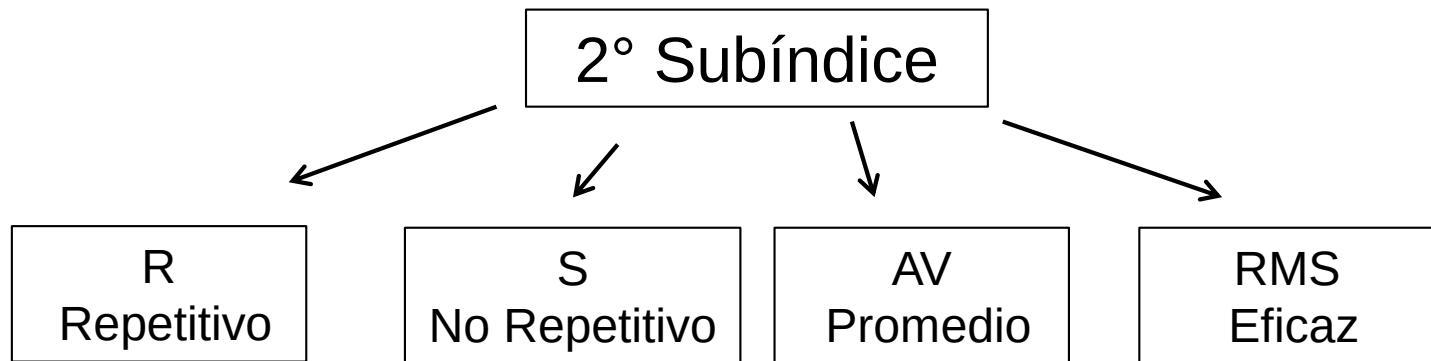
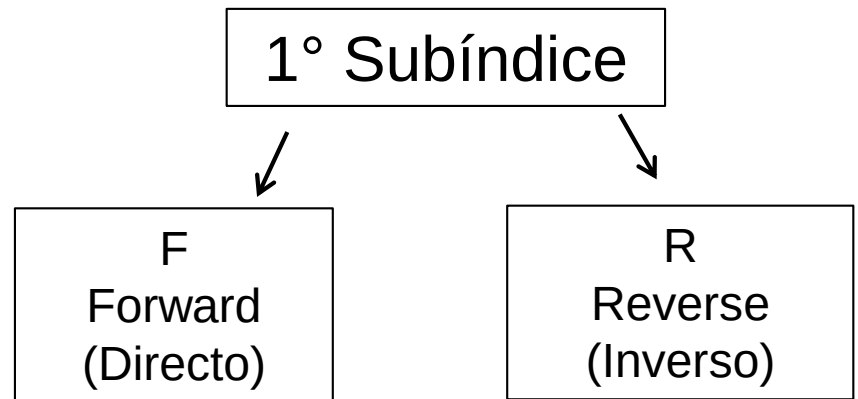
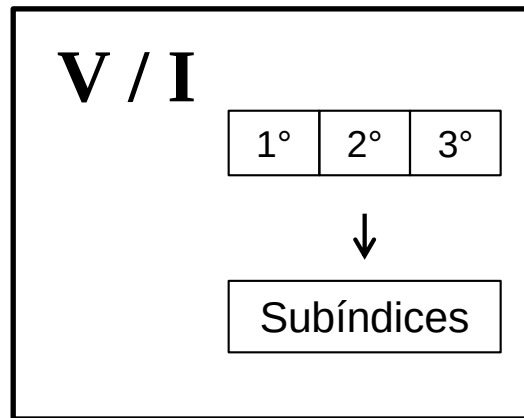
ESPECIFICACION DE DISPOSITIVOS

SEMICONDUCTORES



Convenciones de tensiones y corrientes





V_{RRM}

I_{FSM}



1N4001 - 1N4007

Features

- Low forward voltage drop.
- High surge current capability.



DO-41

COLOR BAND DENOTES CATHODE

General Purpose Rectifiers (Glass Passivated)

Absolute Maximum Ratings*

$T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value							Units
		4001	4002	4003	4004	4005	4006	4007	
V_{RRM}	Peak Repetitive Reverse Voltage	50	100	200	400	600	800	1000	V
$I_{F(AV)}$	Average Rectified Forward Current, .375 " lead length @ $T_A = 75^{\circ}C$	1.0							A
I_{FSM}	Non-repetitive Peak Forward Surge Current 8.3 ms Single Half-Sine-Wave	30							A
T_{stg}	Storage Temperature Range	-55 to +175							$^{\circ}C$
T_J	Operating Junction Temperature	-55 to +175							$^{\circ}C$

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

Electrical Characteristics

$T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Device							Units
		4001	4002	4003	4004	4005	4006	4007	
V_F	Forward Voltage @ 1.0 A	1.1							V
I_{rr}	Maximum Full Load Reverse Current, Full Cycle $T_A = 75^\circ\text{C}$	30							μA
I_R	Reverse Current @ rated V_R $T_A = 25^\circ\text{C}$ $T_A = 100^\circ\text{C}$	5.0 500							μA μA
C_T	Total Capacitance $V_R = 4.0\text{ V}$, $f = 1.0\text{ MHz}$	15							pF

Thermal Characteristics

Symbol	Parameter	Value	Units
P_D	Power Dissipation	3.0	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	50	$^{\circ}\text{C/W}$

Typical Characteristics

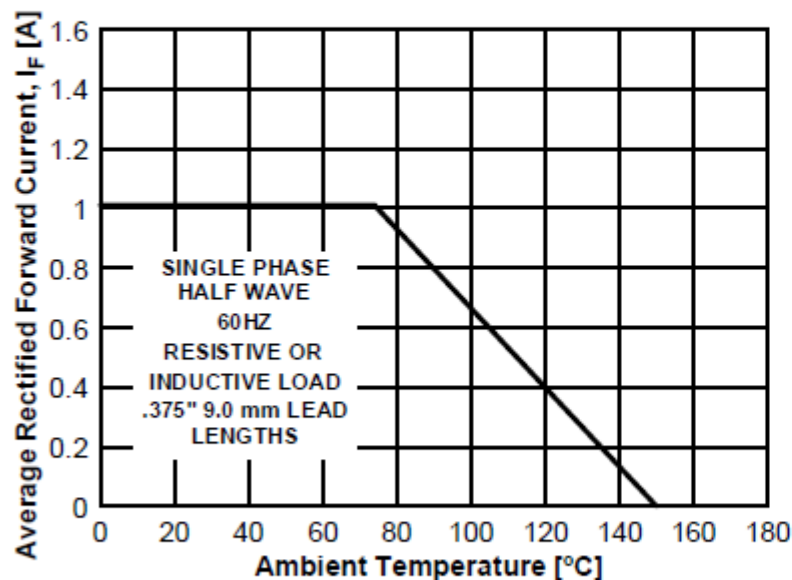


Figure 1. Forward Current Derating Curve

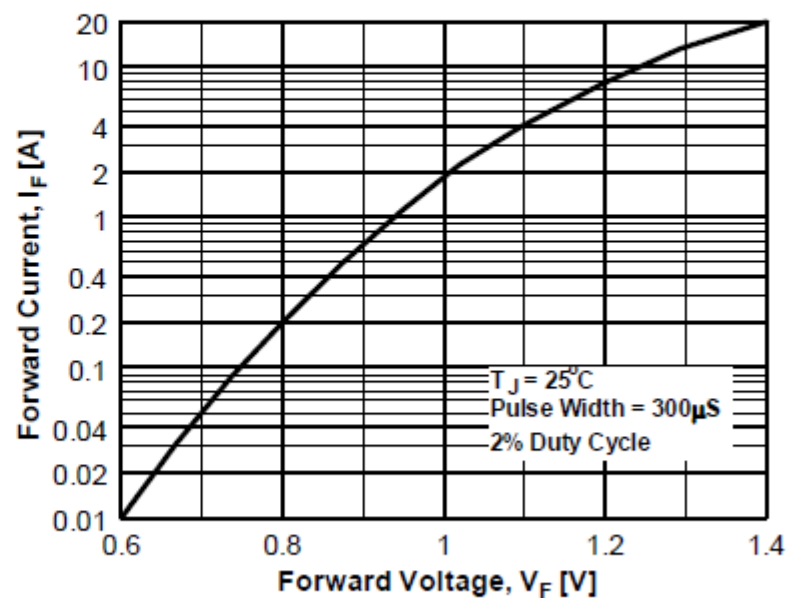


Figure 2. Forward Voltage Characteristics

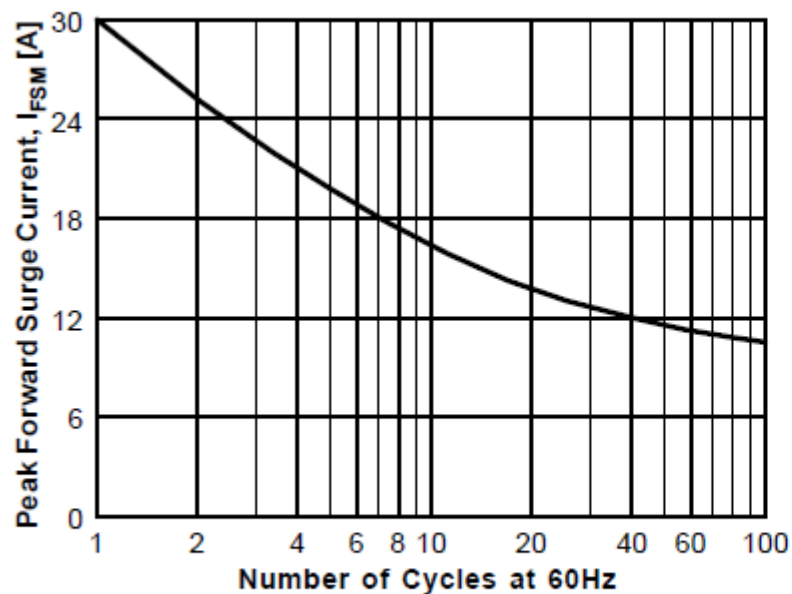


Figure 3. Non-Repetitive Surge Current

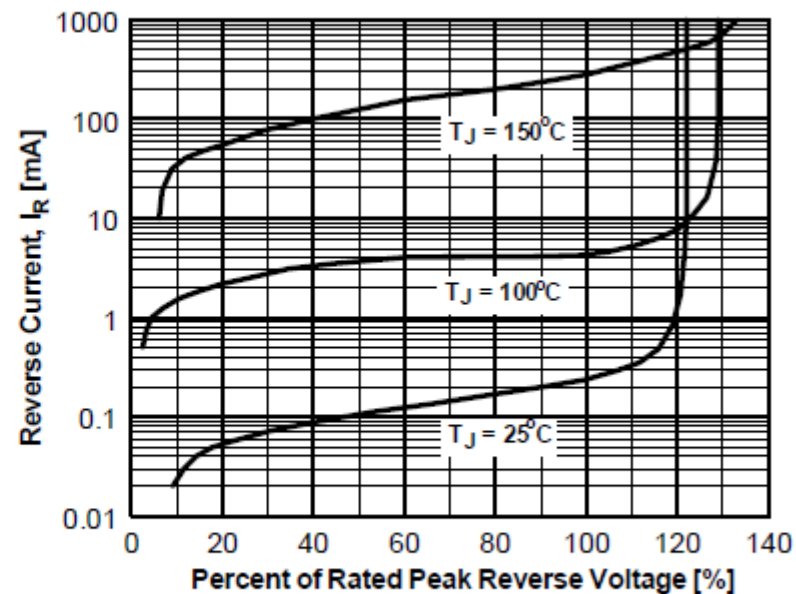


Figure 4. Reverse Current vs Reverse Voltage



1N4001 thru 1N4007

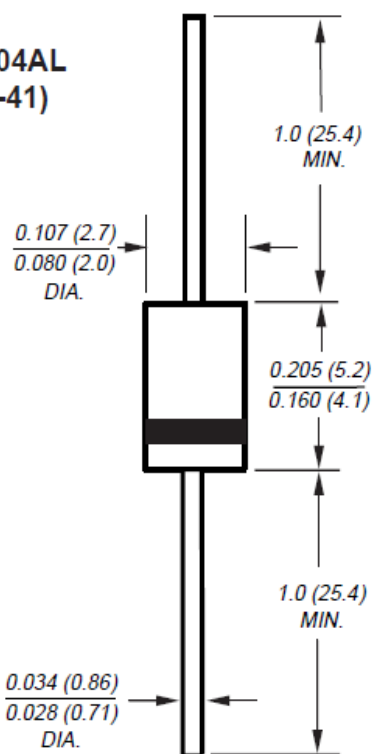
Vishay Semiconductors
formerly General Semiconductor



**DO-204AL
(DO-41)**

General Purpose Plastic Rectifier

Reverse Voltage
50 to 1000V
Forward Current 1.0A



NOTE: Lead diameter is 0.026 (0.66) / 0.023 (0.58) for suffix "E" part numbers

Features

- Plastic package has Underwriters Laboratories Flammability Classification 94V-0
- Construction utilizes void-free molded plastic technique
- Low reverse leakage
- High forward surge capability
- High temperature soldering guaranteed: 350°C/10 seconds, 0.375" (9.5mm) lead length, 5 lbs. (2.3kg) tension

Mechanical Data

Case: JEDEC DO-204AL, molded plastic body

Terminals: Plated axial leads, solderable per MIL-STD-750, Method 2026

Polarity: Color band denotes cathode end

Mounting Position: Any

Weight: 0.012 oz., 0.3 g

Maximum Ratings & Thermal Characteristics Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symb.	1N 4001	1N 4002	1N 4003	1N 4004	1N 4005	1N 4006	1N 4007	Unit
Maximum repetitive peak reverse voltage	V _{RRM}	50	100	200	400	600	800	1000	V
* Maximum RMS voltage	V _{RMS}	35	70	140	280	420	560	700	V
* Maximum DC blocking voltage	V _{DC}	50	100	200	400	600	800	1000	V
* Maximum average forward rectified current 0.375" (9.5mm) lead length at T _A = 75°C	I _{F(AV)}	1.0							A
* Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) T _A = 75°C	I _{FSM}	30							A
* Maximum full load reverse current, full cycle average 0.375" (9.5mm) lead length T _L = 75°C	I _{R(AV)}	30							μA
Typical thermal resistance ⁽¹⁾	R _{θJA} R _{θJL}	50 25							°C/W
* Maximum DC blocking voltage temperature	T _A	+150							V
* Operating junction and storage temperature range	T _J , T _{STG}	-50 to +175							°C

Electrical Characteristics Ratings at 25°C ambient temperature unless otherwise specified.

Maximum instantaneous forward voltage at 1.0A	V _F	1.1							V
* Maximum DC reverse current T _A = 25°C at rated DC blocking voltage T _A = 125°C	I _R	5.0 50							μA
Typical junction capacitance at 4.0V, 1MHz	C _J	15							pF

Note: (1) Thermal resistance from junction to ambient at 0.375" (9.5mm) lead length, P.C.B. mounted *JEDEC registered values

1N4001 thru 1N4007

Vishay Semiconductors
formerly General Semiconductor



Ratings and Characteristic Curves ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig. 1 – Forward Current Derating Curve

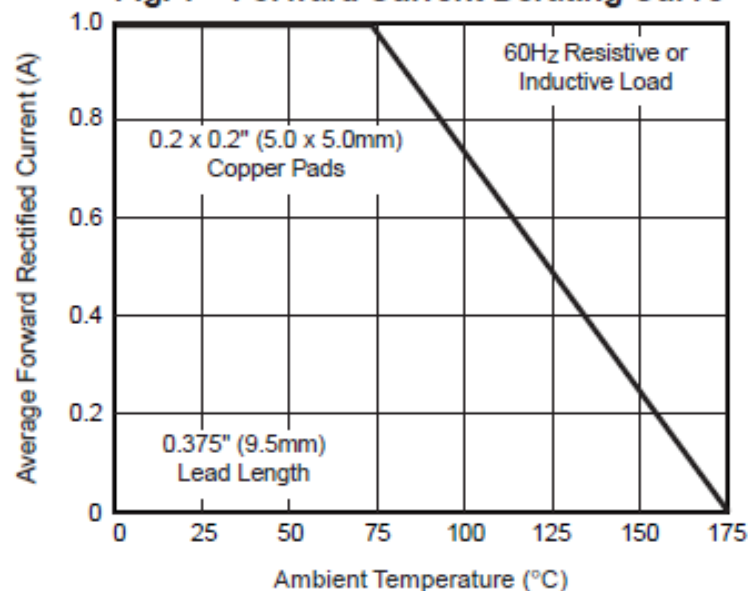


Fig. 2 – Maximum Non-Repetitive
Peak Forward Surge Current

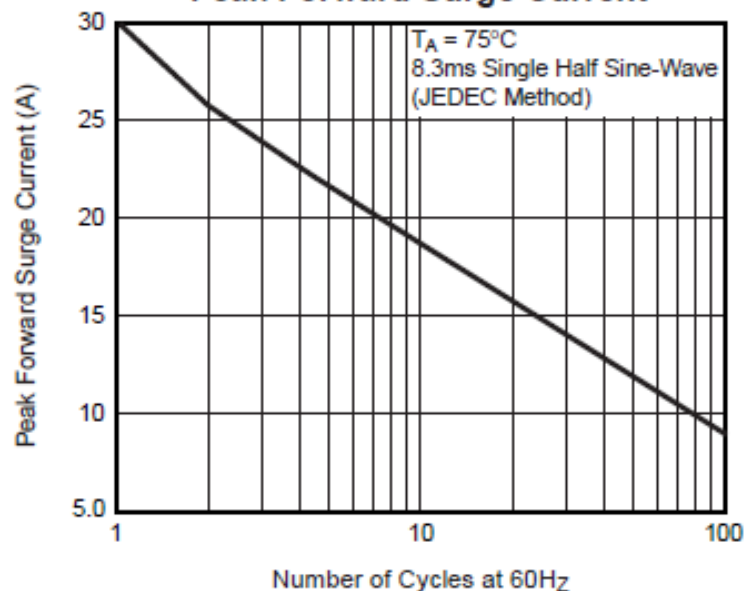


Fig. 3 – Typical Instantaneous Forward Characteristics

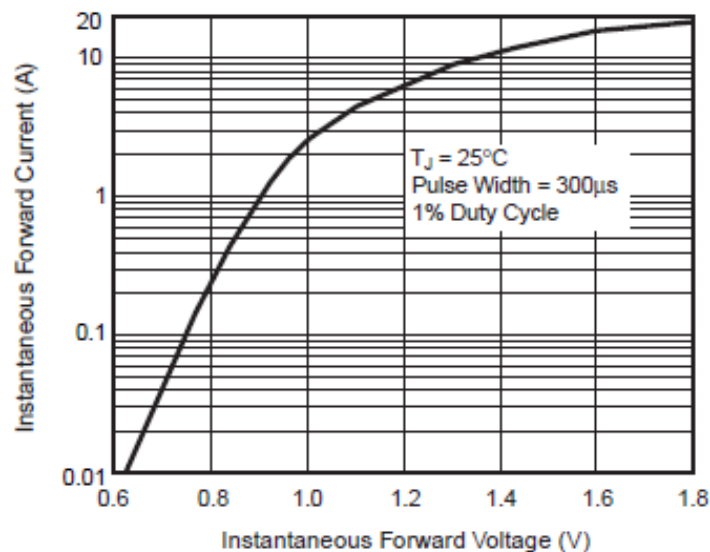


Fig. 4 – Typical Reverse Characteristics

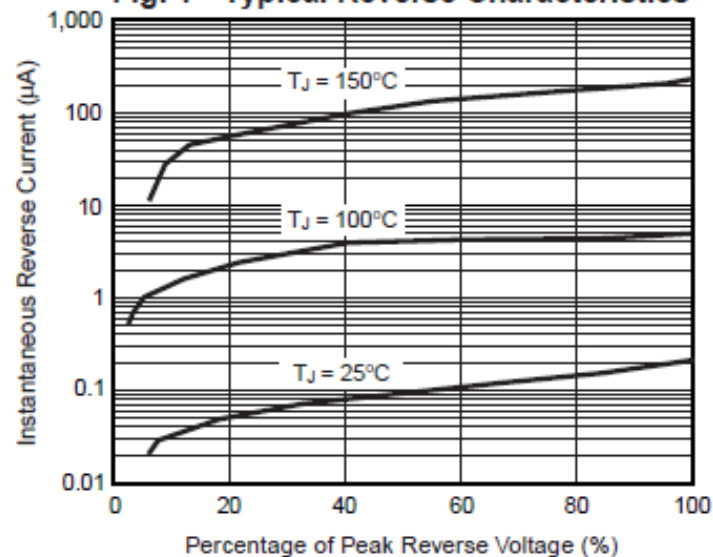


Fig. 5 – Typical Junction Capacitance

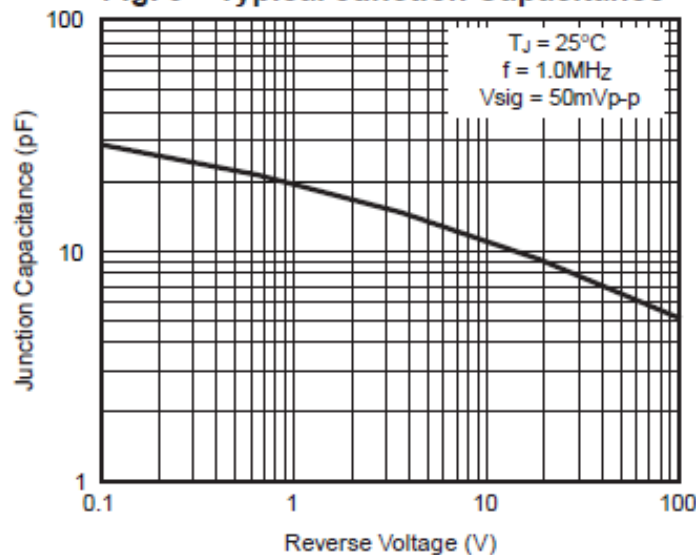
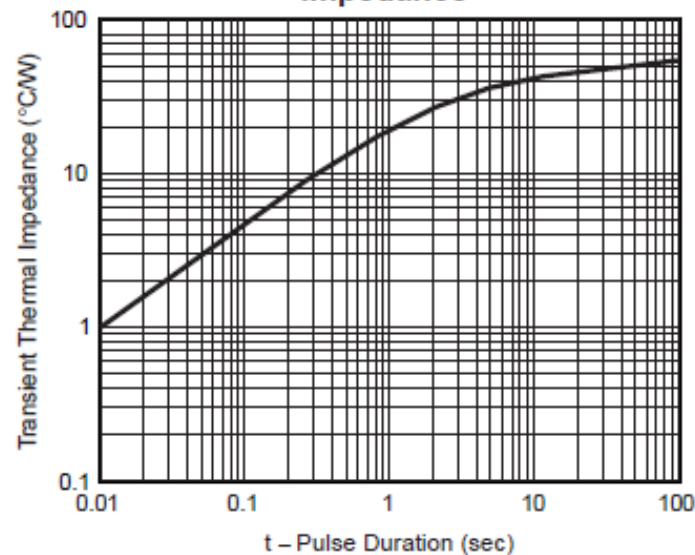


Fig. 6 – Typical Transient Thermal Impedance





Silicon Power Zener Diodes

Features

- Silicon Planar Power Zener Diodes
- For use in stabilizing and clipping circuits with high power rating.
- Standard Zener voltage tolerance suffix "A" for $\pm 5\%$ tolerance. Other Zener voltages and tolerances are available upon request.

Applications

Voltage stabilization



Mechanical Data

Case: DO-41 Glass Case

Weight: approx. 350 mg

Packaging Codes/Options:

TR / 5k per 13 " reel , 25k/box

TAP / 5k per Ammo mag. (52 mm tape), 25k/box

Absolute Maximum Ratings

$T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Power dissipation	$T_{amb} \leq 50\text{ }^{\circ}\text{C}$	P_{Diss}	1	W
Z-current		I_Z	P_V/V_Z	mA
Junction temperature		T_j	200	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	- 65 to + 200	$^{\circ}\text{C}$
Junction ambient	$l = 9.5\text{ mm (3/8")}$, $T_L = \text{constant}$	R_{thJA}	100	K/W

1N4728A to 1N4764A



Vishay Semiconductors

Electrical Characteristics

1N4728A...1N4764A

Partnumber	Nominal Zener Voltage ¹⁾	Test Current	Maximum Dynamic Impedance			Maximum Reverse Leakage Current		Surge current	Maximum Regulator Current ²⁾
	$V_Z @ I_{ZT}$	I_{ZT}	$Z_{ZT} @ I_{ZT}$	$Z_{ZK} @ I_{ZK}$	I_{ZK}	I_R	Test Voltage V_R	$I_R @ T_{amb} = 25\text{ }^{\circ}\text{C}$	$I_{ZM} @ T_{amb} = 50\text{ }^{\circ}\text{C}$
	V	mA	Ω	Ω	mA	μA	V	mA	mA
1N4728A	3.3	76	10	400	1	100	1	1380	276
1N4729A	3.6	69	10	400	1	100	1	1260	252
1N4730A	3.9	64	9	400	1	50	1	1190	234
1N4731A	4.3	58	9	400	1	10	1	1070	217
1N4732A	4.7	53	8	500	1	10	1	970	193
1N4733A	5.1	49	7	550	1	10	1	890	178
1N4734A	5.6	45	5	600	1	10	2	810	162
1N4735A	6.2	41	2	700	1	10	3	730	146
1N4736A	6.8	37	0.5	700	1	10	4	660	133
1N4737A	7.5	34	0	700	0.5	10	5	605	121
1N4738A	8.2	31	0.5	700	0.5	10	6	550	110
1N4739A *	9.1	28	0	700	0.5	10	7	500	100
1N4740A *	10	25	7	700	0.25	10	7.6	454	91
1N4741A *	11	23	8	700	0.25	5	8.4	414	83
1N4742A *	12	21	9	700	0.25	5	9.1	380	76
1N4743A *	13	19	10	100	0.25	5	9.9	344	69
1N4744A *	15	17	14	700	0.25	5	11.4	304	61
1N4745A *	16	15.5	16	700	0.25	5	12.2	285	57
1N4746A *	18	14	20	750	0.25	5	13.7	250	50
1N4747A *	20	12.5	22	750	0.25	5	15.2	225	45
1N4748A *	22	11.5	23	750	0.25	5	16.7	205	41
1N4749A *	24	10.5	25	750	0.25	5	18.2	190	38
1N4750A *	27	9.5	35	750	0.25	5	20.6	170	34
1N4751A *	30	8.5	40	1000	0.25	5	22.8	150	30



www.vishay.com

1N5221B to 1N5267B

Vishay Semiconductors

Small Signal Zener Diodes



FEATURES

- Silicon planar power Zener diodes
- Standard Zener voltage tolerance is $\pm 5\%$
- These diodes are also available in MiniMELF case with the type designation TZM5221 to TZM5267, SOT-23 case with the type designations MMBZ5225 to MMBZ5267 and SOD-123 case with the types designations MMSZ5225 to MMSZ5267
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Voltage stabilization

PRIMARY CHARACTERISTICS

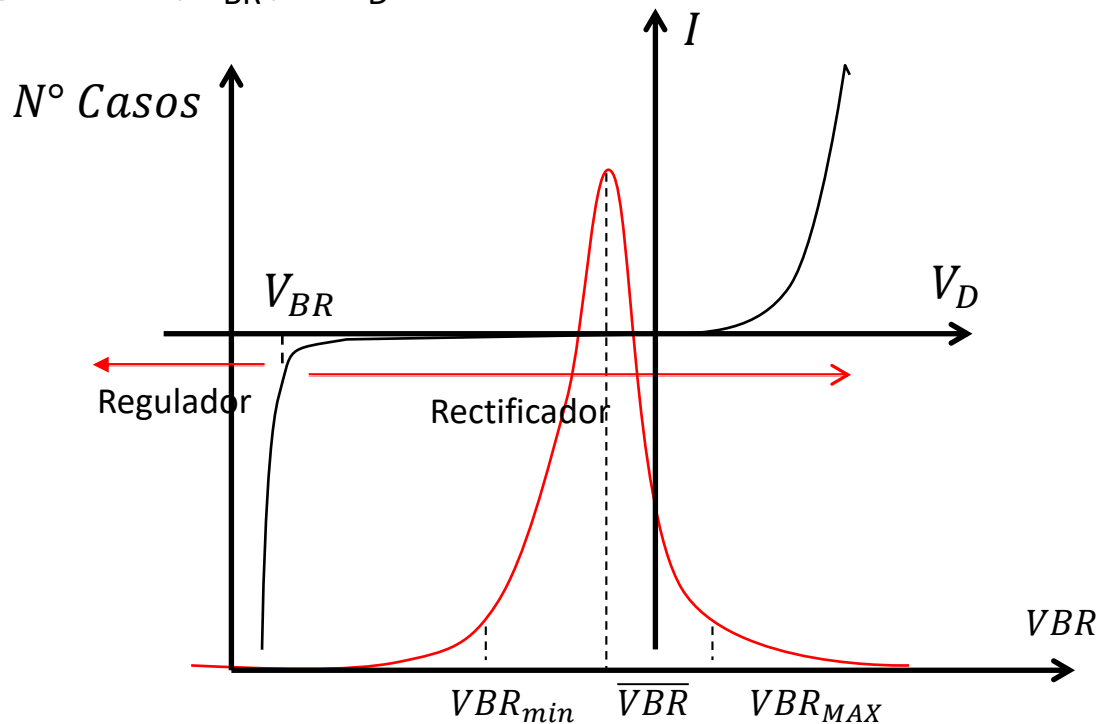
PARAMETER	VALUE	UNIT
V_Z range nom.	2.4 to 75	V
Test current I_{ZT}	1.7 to 20	mA
V_Z specification	Thermal equilibrium	
Int. construction	Single	

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	$T_L \leq 25\text{ }^{\circ}\text{C}$	P_{tot}	500	mW
Zener current		I_Z	P_{tot}/V_Z	mA
Thermal resistance junction to ambient air	$l = 4\text{ mm}$, $T_L = \text{constant}$	R_{thJA}	300	K/W
Junction temperature		T_j	175	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	- 65 to + 175	$^{\circ}\text{C}$
Forward voltage (max.)	$I_F = 200\text{ mA}$	V_F	1.1	V

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)								
PART NUMBER	ZENER VOLTAGE RANGE ⁽¹⁾	TEST CURRENT		REVERSE LEAKAGE CURRENT		DYNAMIC RESISTANCE $f = 1\text{ kHz}$		TEMPERATURE COEFFICIENT
	V_Z at I_{ZT1}	I_{ZT1}	I_{ZT2}	I_R at V_R		Z_Z at I_{ZT1} ⁽¹⁾	Z_{ZK} at I_{ZT2}	α_{VZ}
	V	mA		μA	V	Ω		%/K
	NOM.			MAX.		MAX.	MAX.	TYP.
1N5221B	2.4	20	0.25	100	1	30	1200	- 0.085
1N5222B	2.5	20	0.25	100	1	30	1250	- 0.085
1N5223B	2.7	20	0.25	75	1	30	1300	- 0.08
1N5224B	2.8	20	0.25	75	1	30	1400	- 0.08
1N5225B	3	20	0.25	50	1	29	1600	- 0.075
1N5226B	3.3	20	0.25	25	1	28	1600	- 0.07
1N5227B	3.6	20	0.25	15	1	24	1700	- 0.065
1N5228B	3.9	20	0.25	10	1	23	1900	- 0.06
1N5229B	4.3	20	0.25	5	1	22	2000	0.055
1N5230B	4.7	20	0.25	5	2	19	1900	0.03
1N5231B	5.1	20	0.25	5	2	17	1600	0.03
1N5232B	5.6	20	0.25	5	3	11	1600	0.038
1N5233B	6	20	0.25	5	3.5	7	1600	0.038
1N5234B	6.2	20	0.25	5	4	7	1000	0.045
1N5235B	6.8	20	0.25	3	5	5	750	0.05
1N5236B	7.5	20	0.25	3	6	6	500	0.058
1N5237B	8.2	20	0.25	3	6.5	8	500	0.062
1N5238B	8.7	20	0.25	3	6.5	8	600	0.065

Diodo Rectificador VS Diodo Regulador (ZENER)

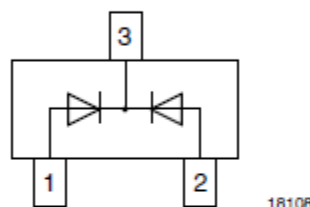
- La misma fabricación
- Distintas zonas de trabajo
 - Rectificador $|V_{BR}| > V_D$
 - Regulador $|V_{BR}| < V_D$
- Distintas especificaciones en
 - Máximos Absolutos
 - Características Eléctricas



**BB814-V-GH**

Vishay Semiconductors

Dual Varicap Diode



MECHANICAL DATA

Case: SOT-23

Weight: approx. 8.1 mg

Packaging codes/options:

08/3 k per 7" reel (8 mm tape), 15 k/box

FEATURES

- Silicon epitaxial planar diode
- Common cathode
- AEC-Q101 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Find out more about Vishay's Automotive Grade Product requirements at: www.vishay.com/applications

APPLICATIONS

- Tuning of separate resonant circuits
- Push-pull circuits in FM range
- Especially for car radios

AUTOMOTIVE
GRADERoHS
COMPLIANTGREEN
(5-2008)**

PARTS TABLE

PART	TYPE DIFFERENTIATION	ORDERING CODE	TYPE MARKING	REMARKS
BB814-1-V-GH	$V_{RRM} = 20\text{ V}$, $C_{D2} = 43\text{ pF to }45.5\text{ pF}$	BB814-1-V-GH-08	SG1	Tape and reel
BB814-2-V-GH	$V_{RRM} = 20\text{ V}$, $C_{D2} = 44.5\text{ pF to }46.5\text{ pF}$	BB814-2-V-GH-08	SG2	Tape and reel

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Repetitive peak reverse voltage		V_{RRM}	20	V
Reverse voltage		V_R	18	V
Forward current		I_F	50	mA

THERMAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Junction temperature		T_j	125	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	- 55 to + 150	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)							
PARAMETER	TEST CONDITIONS	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Reverse current	$V_R = 16\text{ V}$		I_R			20	nA
	$V_R = 16\text{ V}, T_j = 60\text{ }^{\circ}\text{C}$		I_R			200	nA
Diode capacitance ⁽¹⁾	$V_R = 2\text{ V}$	BB814-1-V-GH	C_{D2}	43		45.5	pF
		BB814-2-V-GH	C_{D2}	44.5		46.5	pF
	$V_R = 8\text{ V}$	BB814-1-V-GH	C_{D8}	19.1		21.95	pF
		BB814-2-V-GH	C_{D8}	19.75		22.70	pF
Capacitance ratio	$V_R = 2\text{ V}, 8\text{ V}, f = 1\text{ MHz}$		C_{D2}/C_{D8}	2.05		2.25	
Series resistance	$C_D = 38\text{ pF}, f = 100\text{ MHz}$		R_s			0.5	Ω

Note

⁽¹⁾ In the reverse voltage range of $V_R = (2\text{ V to } 8\text{ V})$ for diodes 4 taped in sequence the max. deviation is 3 %

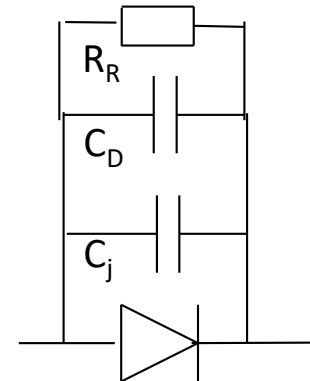
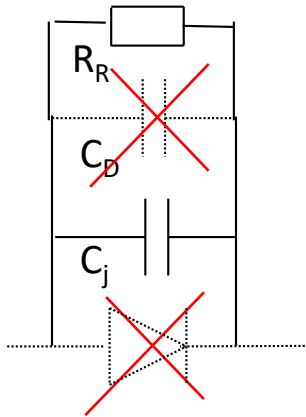
Capacidad de Juntura (C_j) vs Capacidad de Difusión (C_D)

$$C_j \sim pF (10^{-12})$$

$$C_D \sim \mu F (10^{-6})$$

C_j esta presente siempre en polarización directa e inversa

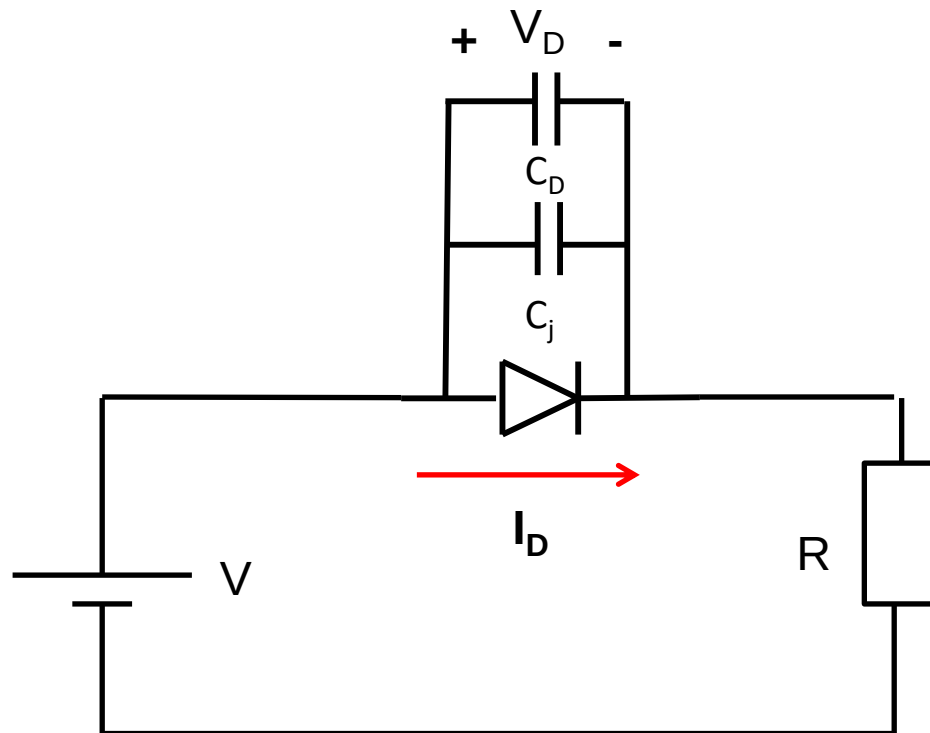
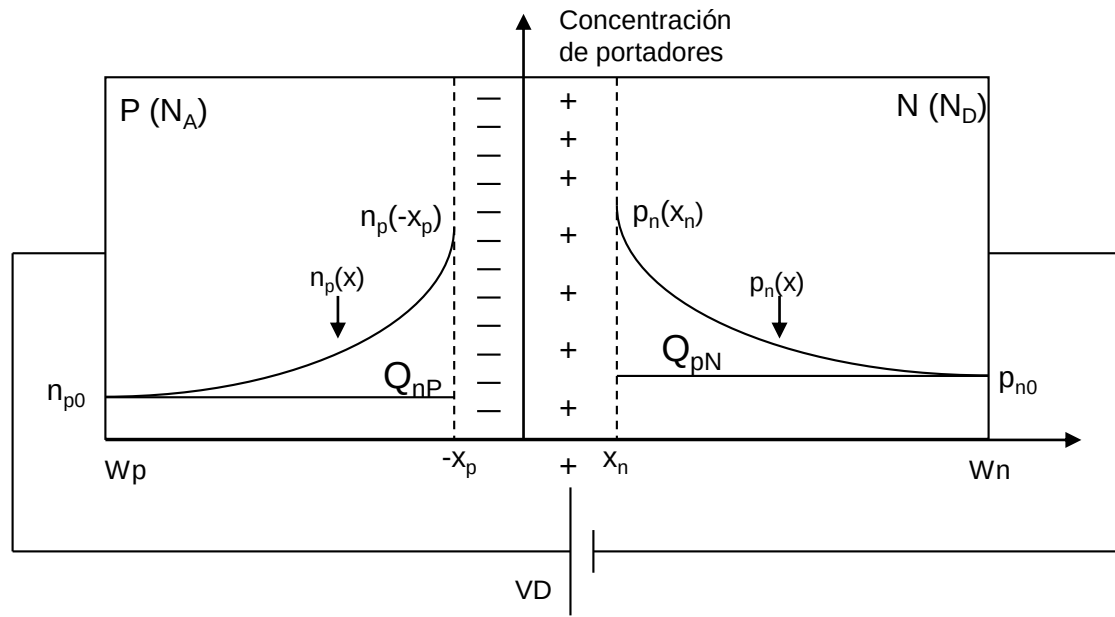
C_D solo esta presente en polarización directa



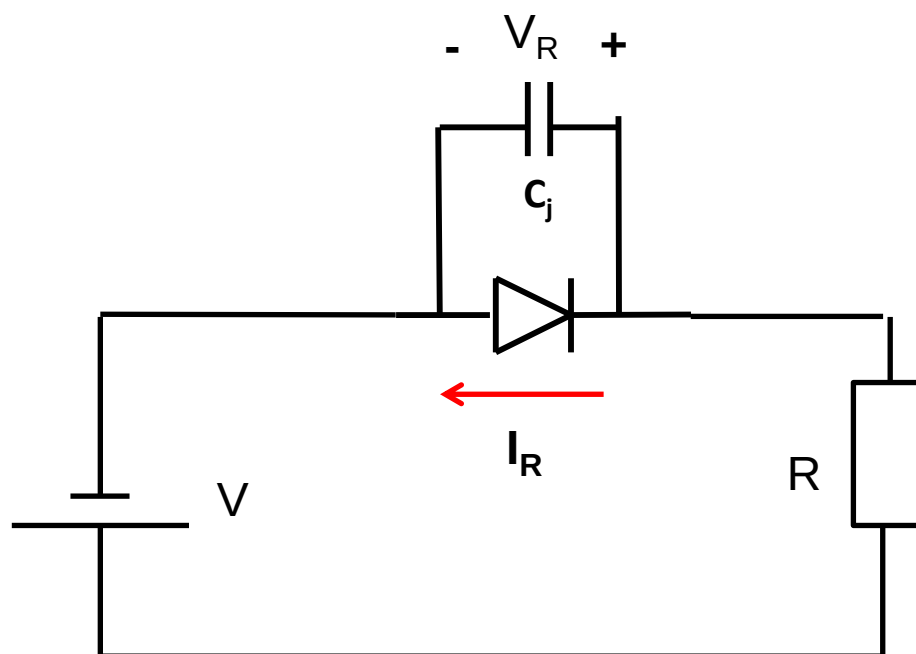
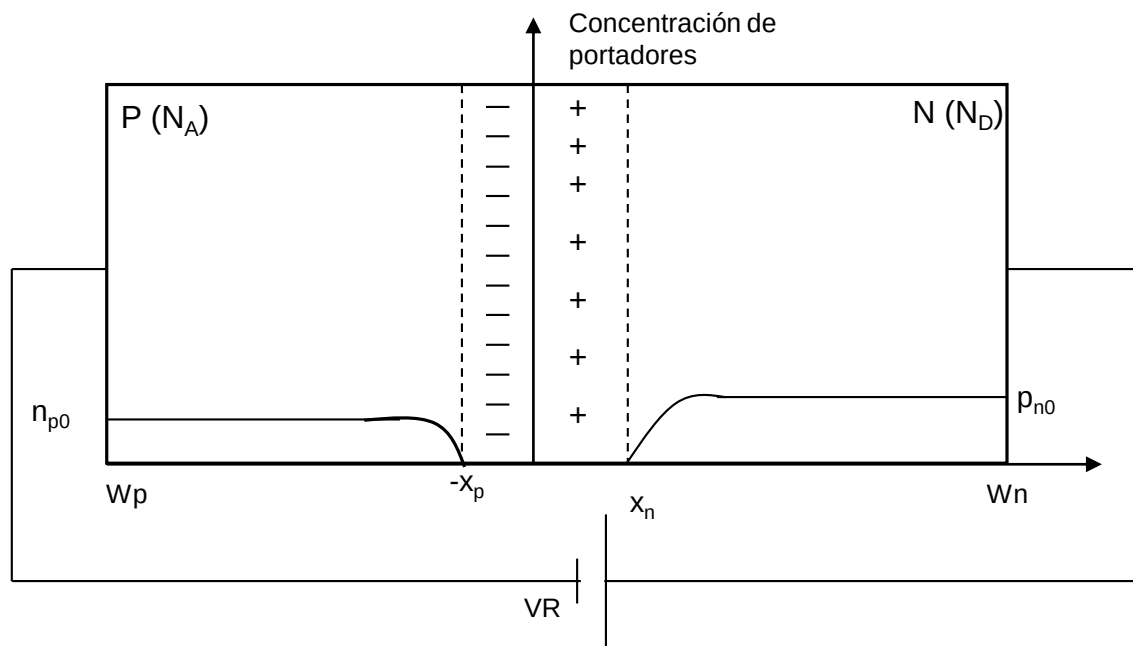
$$Q \text{ (Factor de calidad)} = \omega C_j R_R$$

$$Q \text{ (Factor de calidad)} = \omega (C_D + C_j) (R_R \parallel r_d)$$

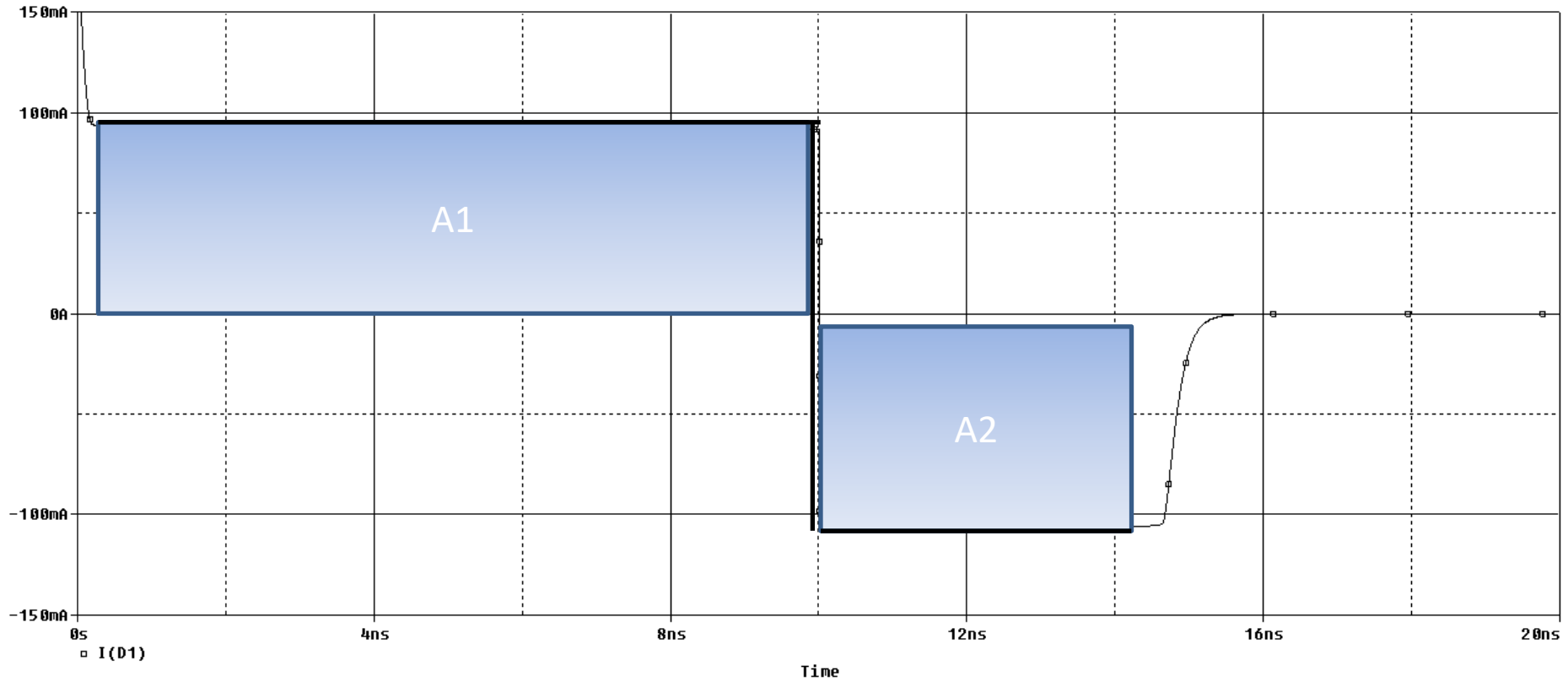
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MAXIMA FRECUENCIA DE RECTIFICACION



Debe ser $A1 \gg A2$

$$\frac{T}{2} \gg t_{rr}$$

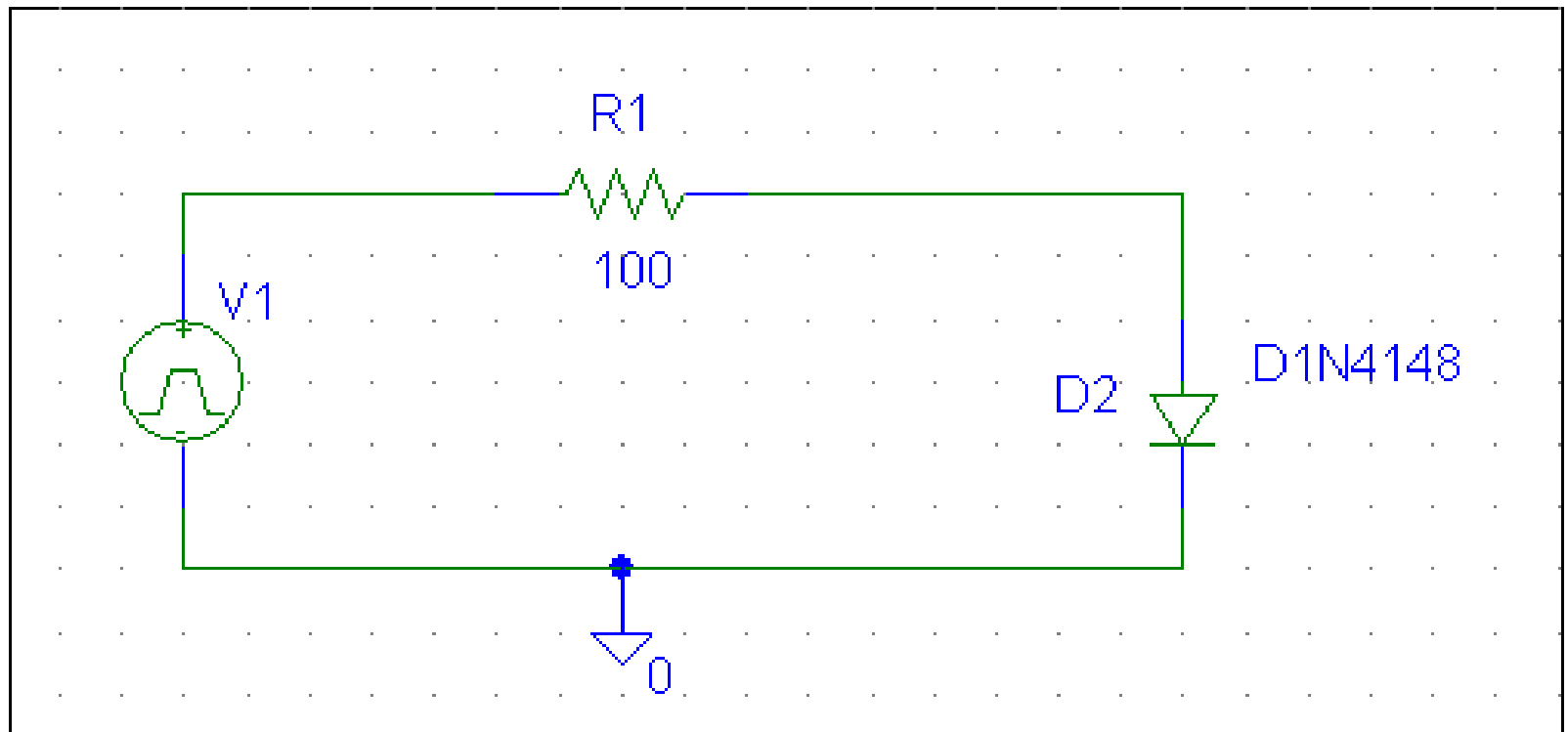
$$\frac{T}{2} = 10t_{rr}$$

$$T = 20t_{rr}$$

$$f = \frac{1}{T}$$

$$f_{max} \leq \frac{1}{20t_{rr}}$$

Tiempo de recuperación t_{rr}



HOJAS DE DATOS DIODOS

1- Rectificador Diodo 1N4001

2 – Rectificador de potencia 20TT100

3 – Rectificador rapido GI810

4 – Diodo zener

5 – Diodo Varicap

Ver la carpeta Datashet de Dropbox y pasar los archivos

Notas Finales

1. Diodos Rectificadores

a) Tiempo de recuperacion trr (maxima frec.)