

Silicon Diode

BYG80F

300V/2.3A

DATASHEET

OEM – Philips

Source: Philips Databook 1999

Ultra fast low-loss controlled avalanche rectifiers

BYG80 series

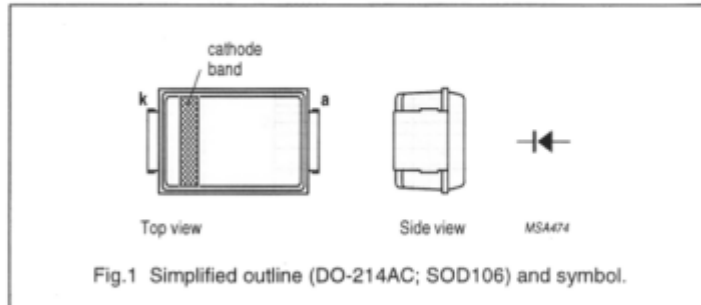
FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Guaranteed avalanche energy absorption capability
- UL 94V-O classified plastic package
- Shipped in 12 mm embossed tape.

DESCRIPTION

DO-214AC surface mountable package with glass passivated chip.

The well-defined void-free case is of a transfer-moulded thermo-setting plastic.



LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage				
	BYG80A		–	50	V
	BYG80B		–	100	V
	BYG80C		–	150	V
	BYG80D		–	200	V
	BYG80F		–	300	V
	BYG80G		–	400	V
	BYG80J		–	600	V
V_R	continuous reverse voltage				
	BYG80A		–	50	V
	BYG80B		–	100	V
	BYG80C		–	150	V
	BYG80D		–	200	V
	BYG80F		–	300	V
	BYG80G		–	400	V
	BYG80J		–	600	V
$I_{F(AV)}$	average forward current	$T_{tp} = 100\text{ °C}$; see Figs 2, 3 and 4 averaged over any 20 ms period; see also Figs 17, 18 and 19			
	BYG80A to D		–	2.4	A
	BYG80F; BYG80G		–	2.3	A
	BYG80J		–	2.0	A
$I_{F(AV)}$	average forward current	$T_{amb} = 60\text{ °C}$; Al_2O_3 PCB mounting (see Fig.27); see Figs 5, 6 and 7 averaged over any 20 ms period; see also Figs 17, 18 and 19			
	BYG80A to D		–	1.25	A
	BYG80F; BYG80G		–	1.15	A
	BYG80J		–	0.95	A

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SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{F(AV)}$	average forward current	$T_{amb} = 60\text{ °C}$; epoxy PCB mounting (see Fig.27); see Figs 5, 6 and 7 averaged over any 20 ms period; see also Figs 17, 18 and 19	-	0.95	A
	BYG80A to D		-	0.85	A
	BYG80F; BYG80G BYG80J		-	0.65	A
I_{FRM}	repetitive peak forward current	$T_{tp} = 100\text{ °C}$; see Figs 8, 9 and 10	-	21	A
	BYG80A to D		-	21	A
	BYG80F; BYG80G BYG80J		-	18	A
I_{FRM}	repetitive peak forward current	$T_{amb} = 60\text{ °C}$; Al_2O_3 PCB mounting; see Figs 11, 12 and 13	-	11	A
	BYG80A to D		-	11	A
	BYG80F; BYG80G BYG80J		-	9	A
I_{FRM}	repetitive peak forward current	$T_{amb} = 60\text{ °C}$; epoxy PCB mounting; see Figs 14, 15 and 16	-	8	A
	BYG80A to D		-	8	A
	BYG80F; BYG80G BYG80J		-	6	A
I_{FSM}	non-repetitive peak forward current	$t = 8.3\text{ ms}$ half sine wave; $T_j = 25\text{ °C}$ prior to surge; $V_R = V_{RRMmax}$	-	36	A
	BYG80A to D BYG80F; BYG80G; BYG80J		-	32	A
E_{RSM}	non-repetitive peak reverse avalanche energy	$L = 120\text{ mH}$; $T_j = T_{jmax}$ prior to surge; inductive load switched off	-	10	mJ
T_{stg}	storage temperature		-65	+175	°C
T_j	junction temperature	see Fig.20	-65	+175	°C

ELECTRICAL CHARACTERISTICS $T_j = 25\text{ °C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	$I_F = 1\text{ A}$; $T_j = T_{jmax}$; see Figs 21, 22 and 23	-	-	0.67	V
	BYG80A to D		-	-	0.73	V
	BYG80F; BYG80G BYG80J		-	-	0.96	V
V_F	forward voltage	$I_F = 1\text{ A}$; see Figs 21, 22 and 23	-	-	0.93	V
	BYG80A to D		-	-	0.98	V
	BYG80F; BYG80G BYG80J		-	-	1.20	V

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SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)R}$	reverse avalanche breakdown voltage	$I_R = 0.1 \text{ mA}$				
	BYG80A		55	-	-	V
	BYG80B		110	-	-	V
	BYG80C		165	-	-	V
	BYG80D		220	-	-	V
	BYG80F		330	-	-	V
	BYG80G		440	-	-	V
	BYG80J		675	-	-	V
I_R	reverse current	$V_R = V_{RRMmax}$; see Figs 24 and 25	-	-	10	μA
I_R	reverse current	$V_R = V_{RRMmax}$; $T_J = 165 \text{ }^\circ\text{C}$; see Figs 24 and 25	-	-	100	μA
	BYG80A to D BYG80F; BYG80G and J		-	-	150	μA
t_{rr}	reverse recovery time	when switched from $I_F = 0.5 \text{ A}$ to $I_R = 1 \text{ A}$; measured at $I_R = 0.25 \text{ A}$; see Fig.29	-	-	25	ns
	BYG80A to D BYG80F; BYG80G and J		-	-	50	ns
C_d	diode capacitance	$f = 1 \text{ MHz}$; $V_R = 0$; see Fig.26	-	90	-	pF
	BYG80A to D		-	70	-	pF
	BYG80F; BYG80G BYG80J		-	65	-	pF
$\left \frac{dI_R}{dt} \right $	maximum slope of reverse recovery current	when switched from $I_F = 1 \text{ A}$ to $V_R \geq 30 \text{ V}$ and $dI_F/dt = -1 \text{ A}/\mu\text{s}$; see Fig.28	-	-	3	$\text{A}/\mu\text{s}$
	BYG80A to D BYG80F; BYG80G and J		-	-	4	$\text{A}/\mu\text{s}$

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-tp}$	thermal resistance from junction to tie-point		25	K/W
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	100	K/W
		note 2	150	K/W

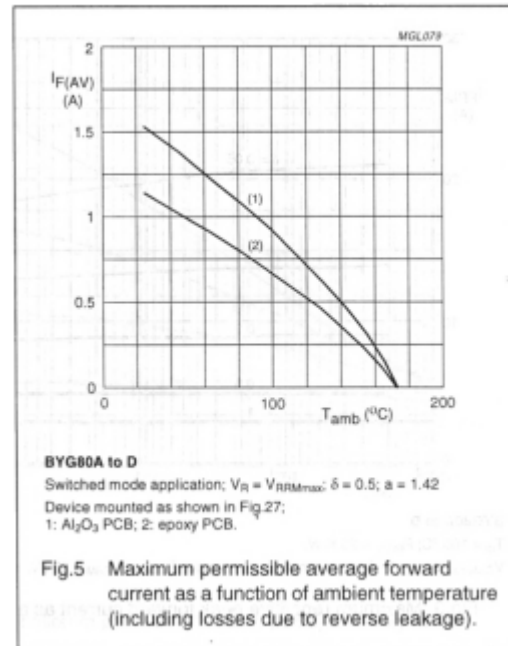
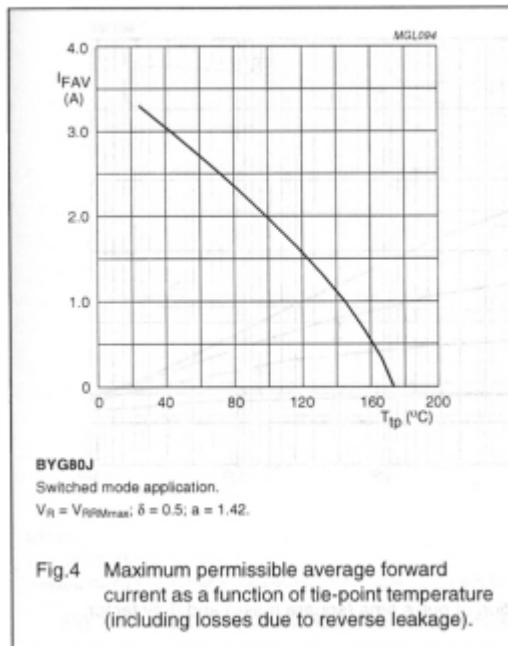
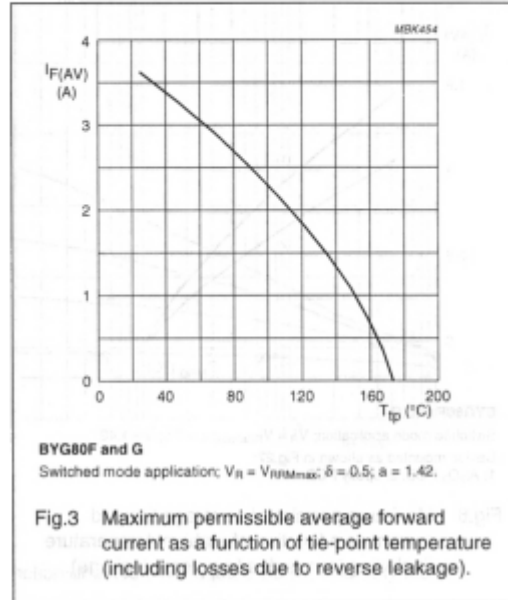
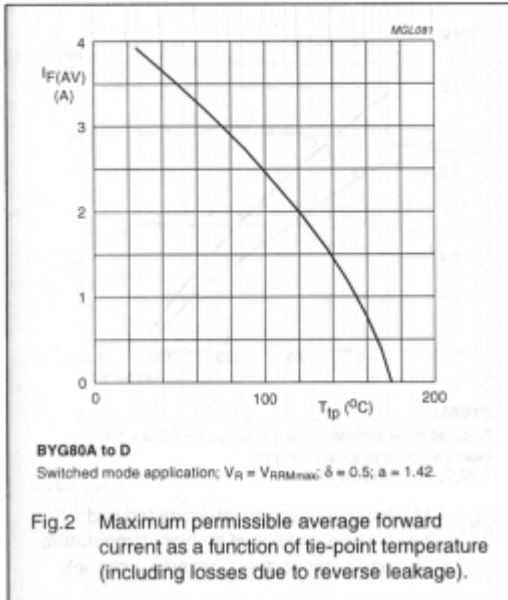
Notes

1. Device mounted on Al_2O_3 printed-circuit board, 0.7 mm thick; thickness of copper $\geq 35 \mu\text{m}$, see Fig.27.
2. Device mounted on epoxy-glass printed-circuit board, 1.5 mm thick; thickness of copper $\geq 40 \mu\text{m}$, see Fig.27.
For more information please refer to the 'General Part of Handbook SC01'.

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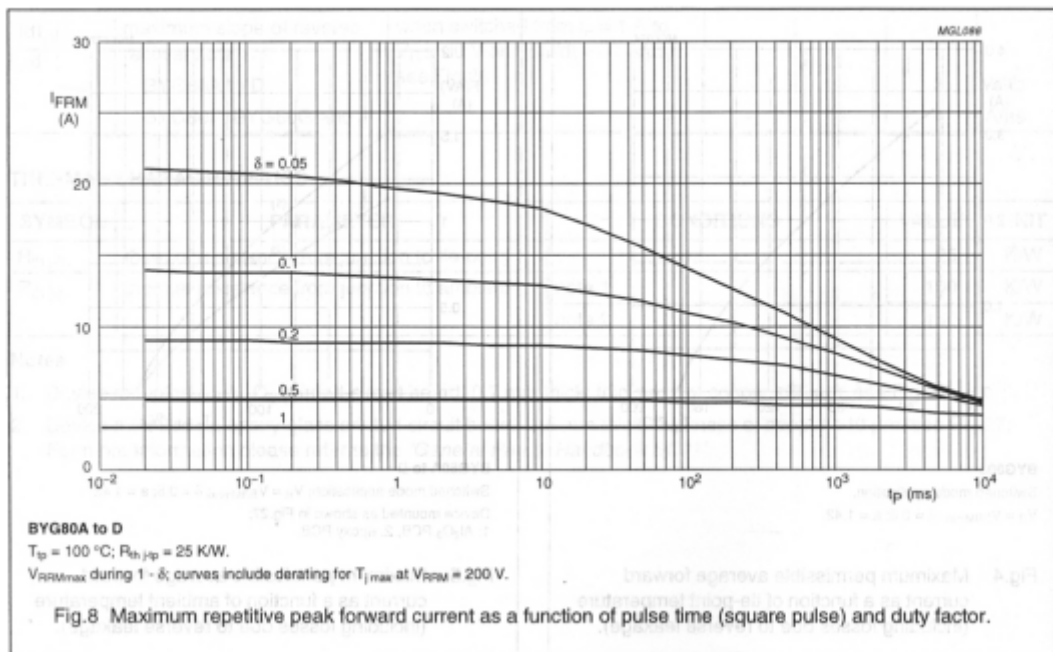
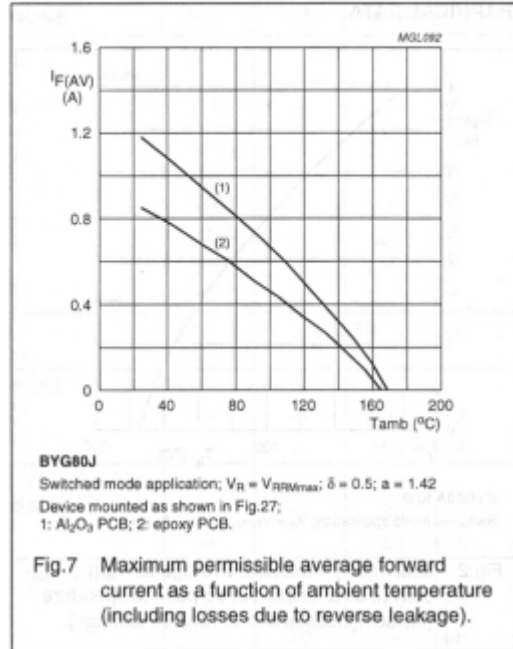
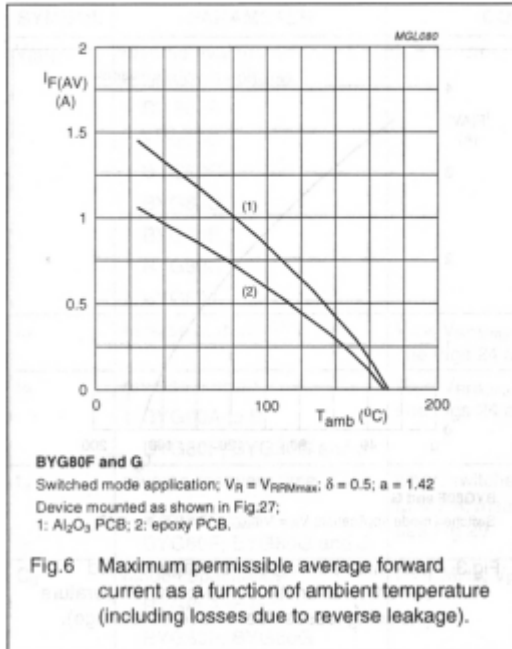
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GRAPHICAL DATA



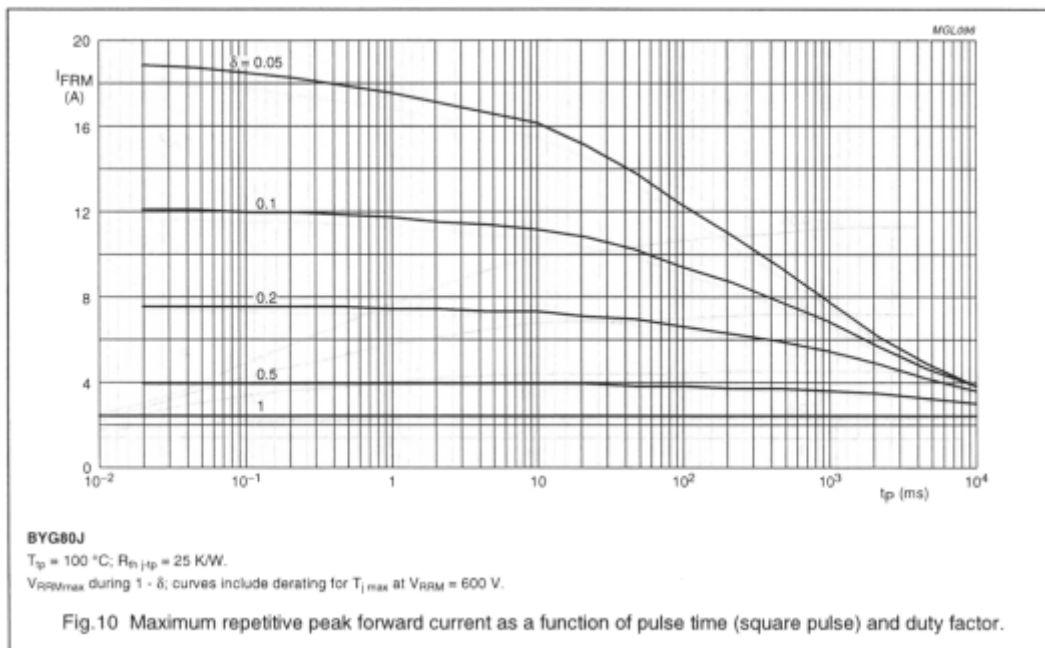
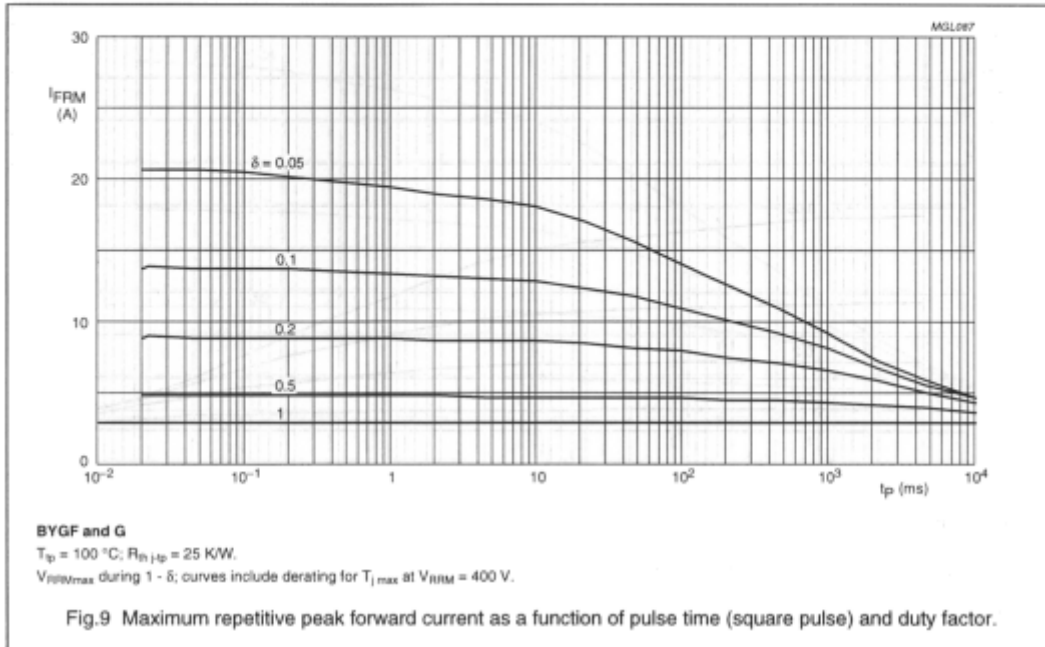
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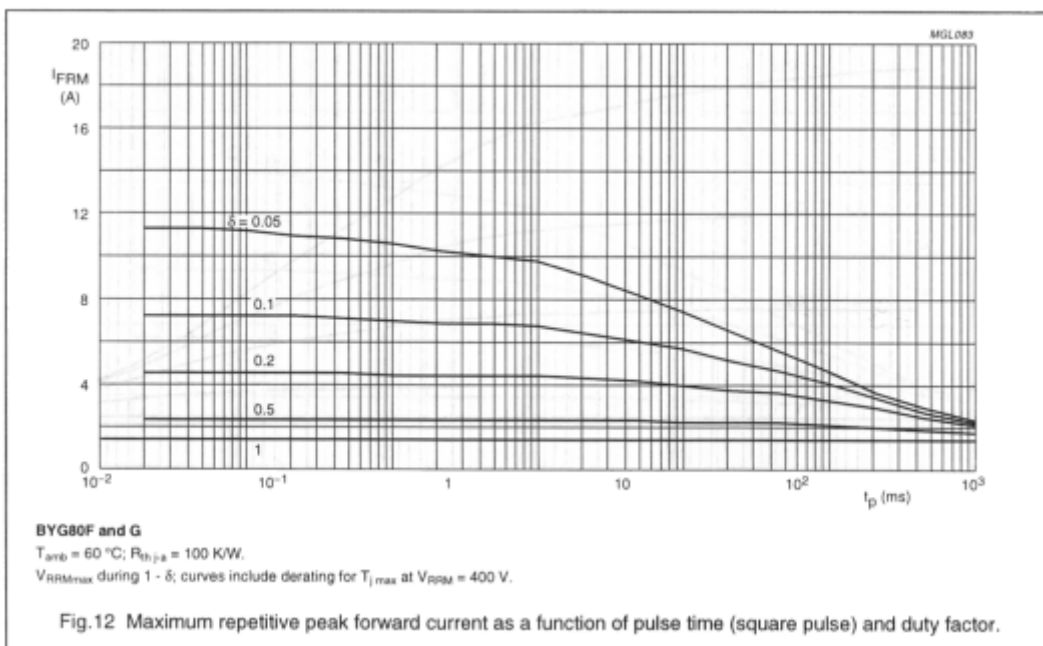
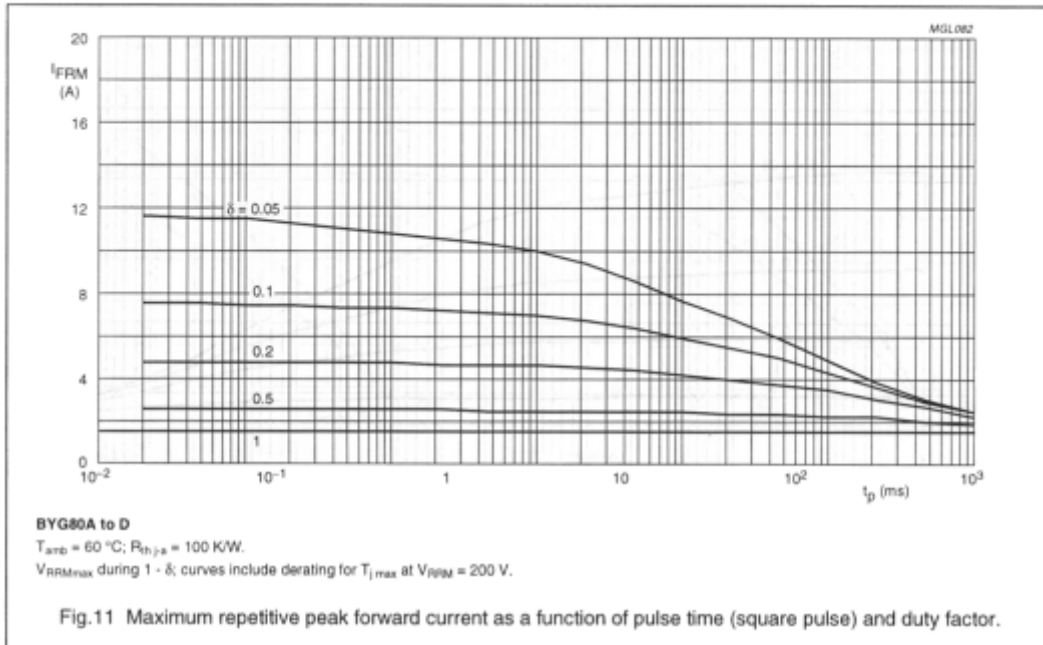
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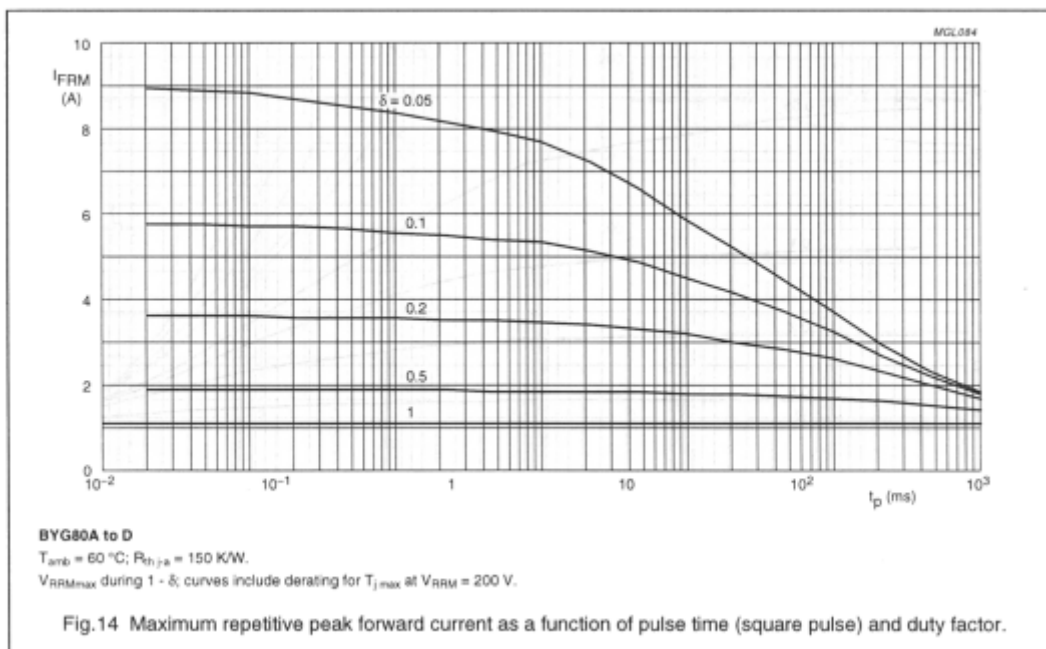
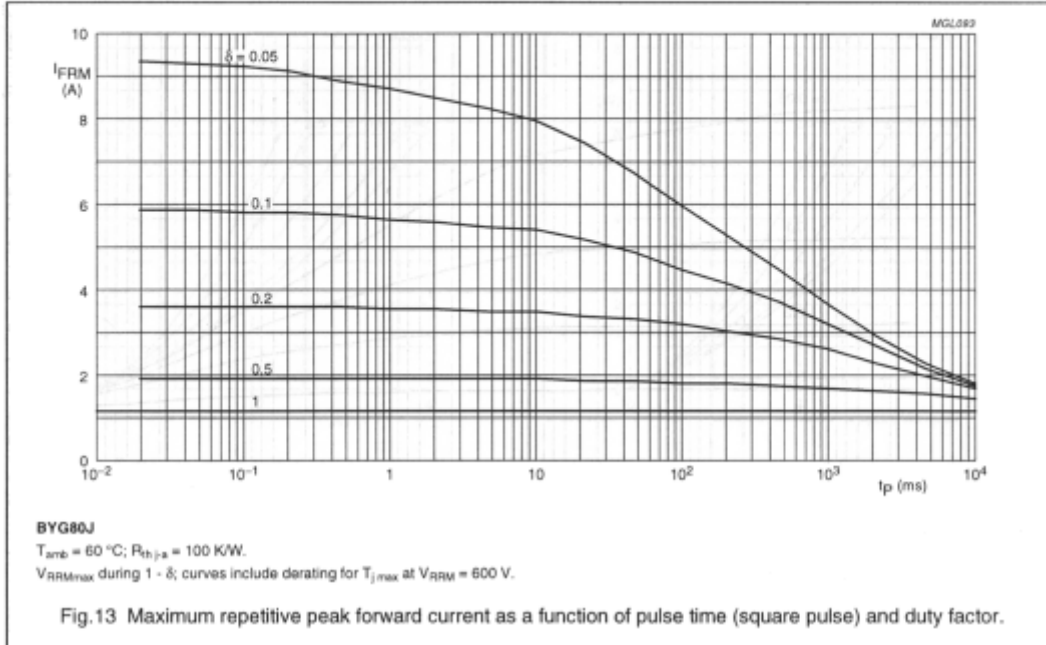
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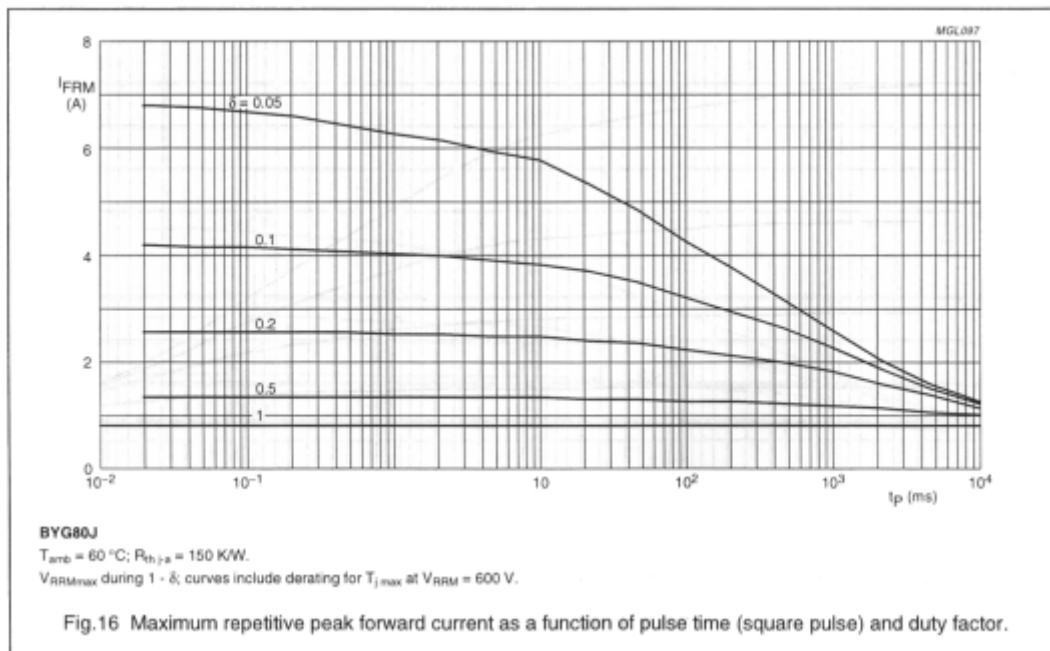
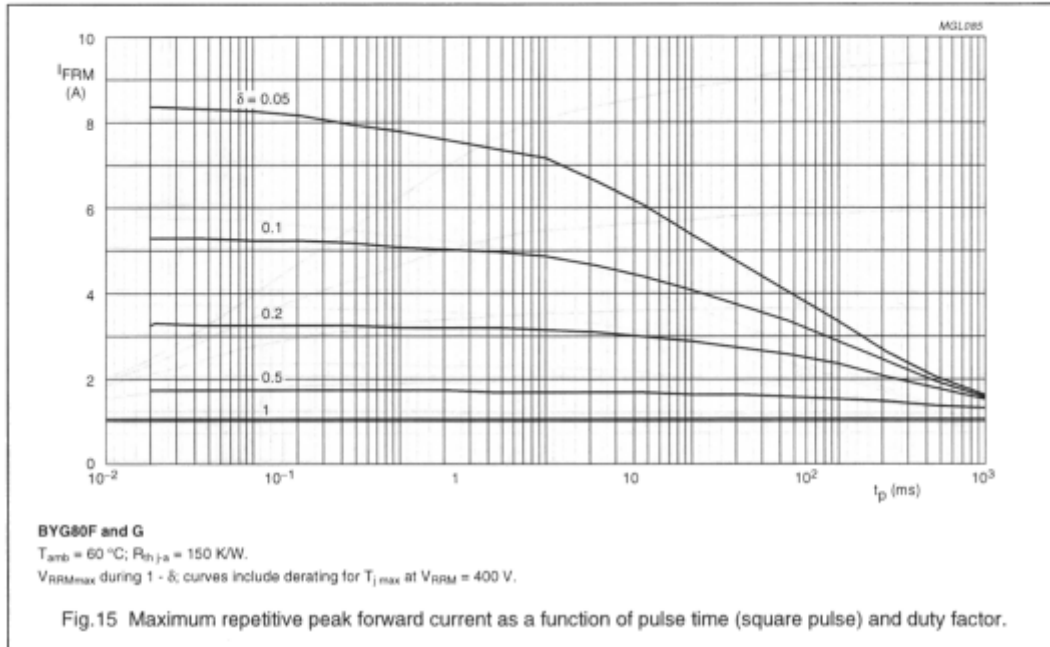
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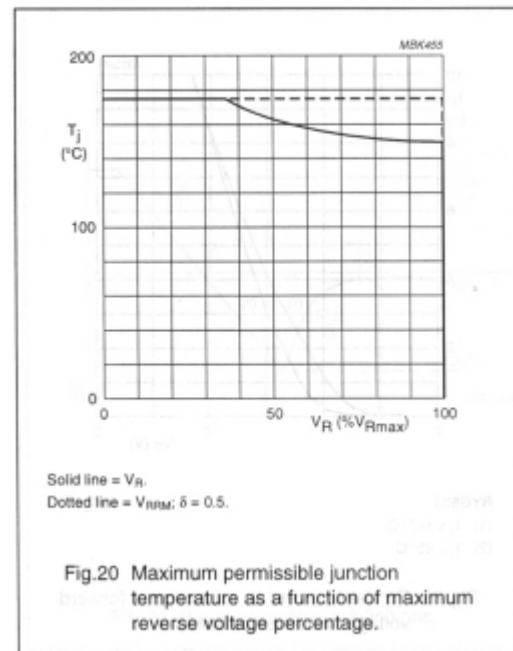
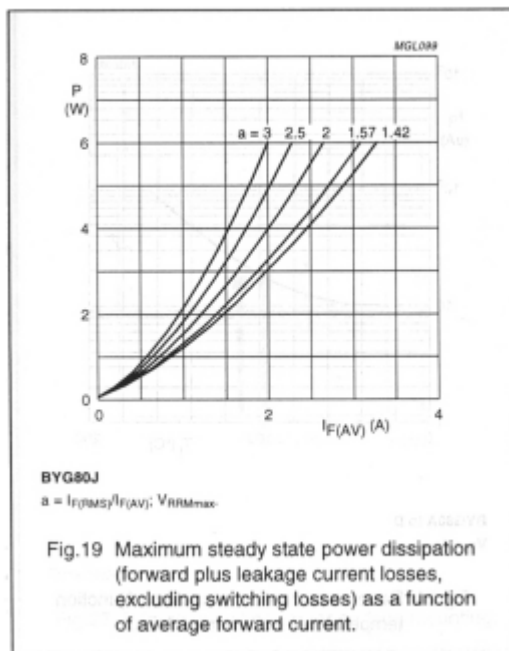
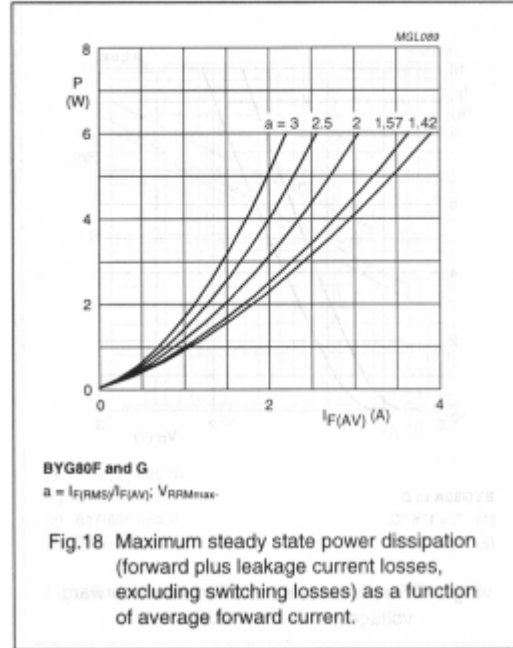
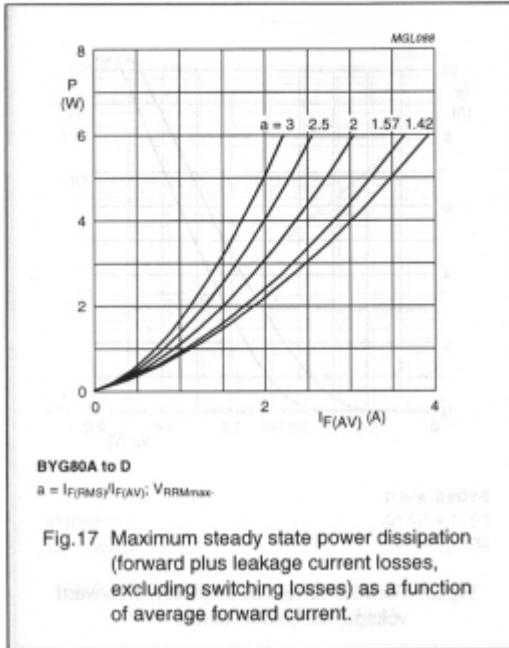
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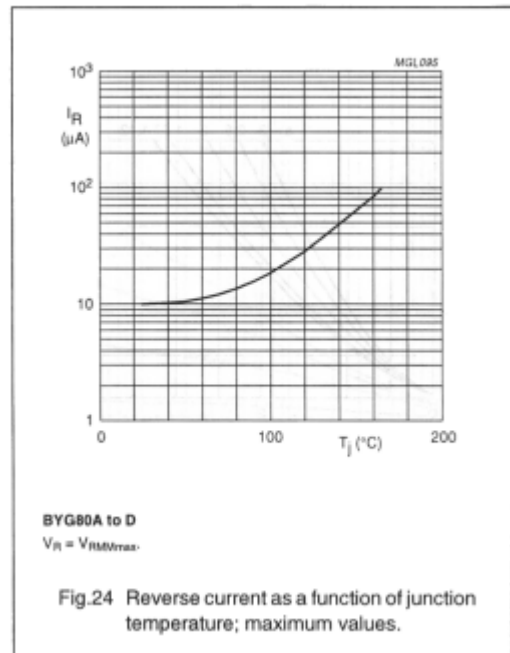
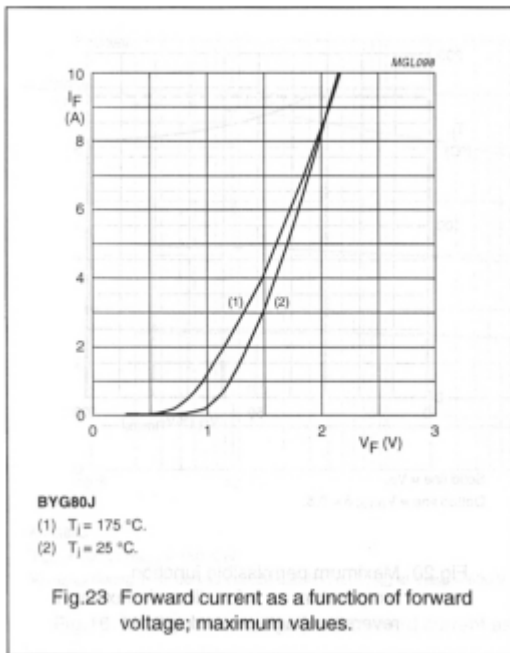
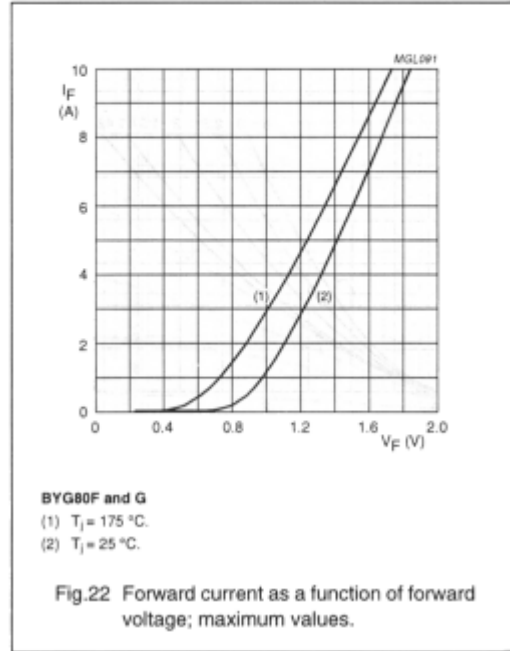
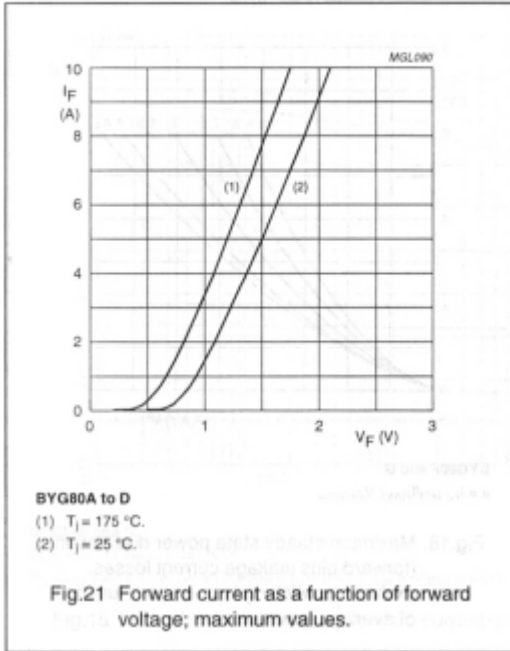
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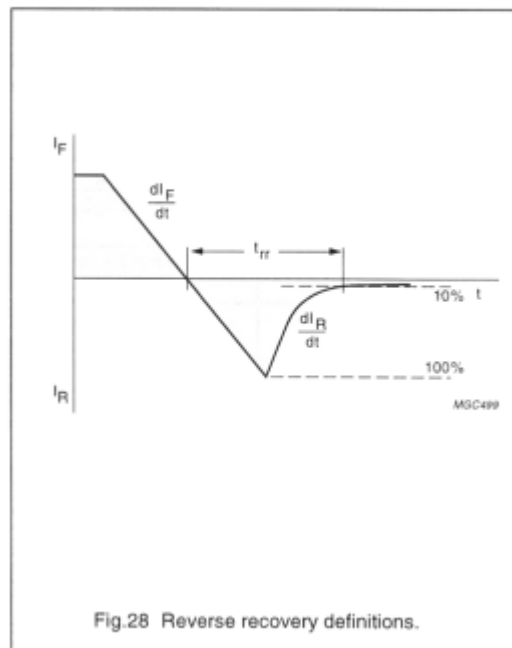
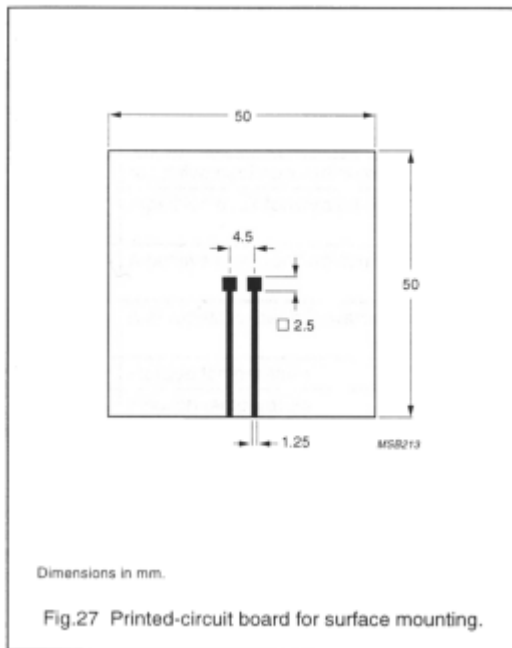
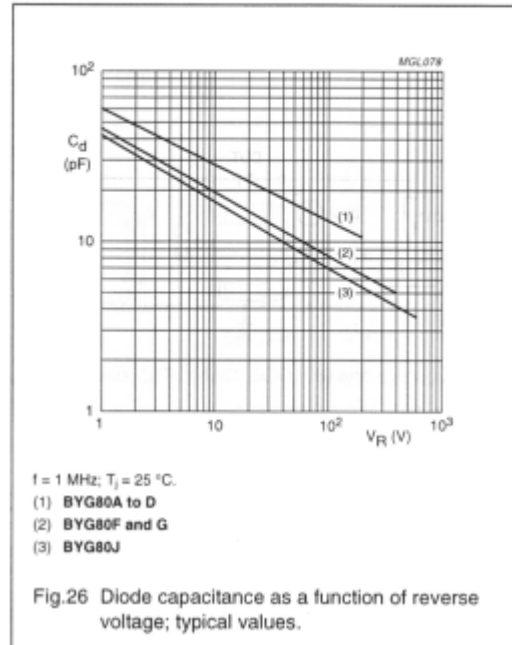
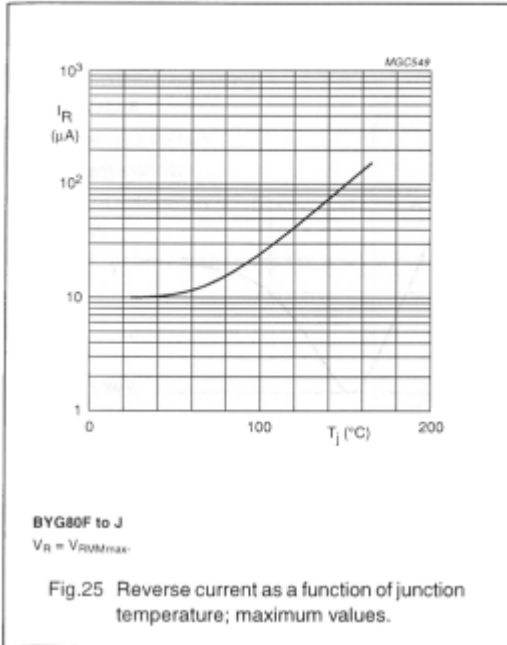
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