

AUG 06 1990

INTERNATIONAL RECTIFIER **IOR**

# 150HF(R)/200HF(R)... SERIES

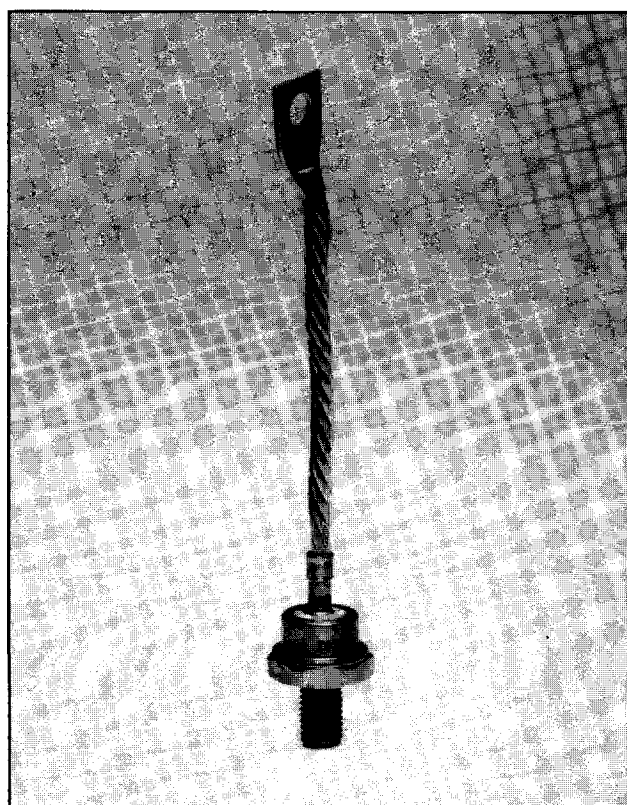
## 150/200 Amp Average Medium Power Silicon Rectifier Diodes

### Features

- Wide current range
- High surge current capabilities
- Types up to 1600V  $V_{RRM}$
- Stud cathode and stud anode version
- Standard JEDEC types
- Diffused junction

### Description

This range of medium power general purpose rectifier diodes is designed for battery chargers, converters, power supplies, machine tool controls.



### Major ratings and characteristics

Parameter	150HF...	200HF...	Units
$I_{F(AV)}$	150	200	A
@ $T_c$	125	125	°C
$I_{FSM}$ @ 50Hz	2900	3700	A
@ 60Hz	3040	3870	A
$I^2t$ @ 50Hz	42050	68450	A <sup>2</sup> s
@ 60Hz	38400	62500	A <sup>2</sup> s
$V_{RRM}$	200 to 1600		V
$T_J$	-40 to 180		°C

## ELECTRICAL SPECIFICATIONS

## Voltage ratings

Type number	Voltage code	$V_{RRM}$ , maximum repetitive peak reverse voltage $T_J = T_J \text{ Max.}$	$V_{RRM}$ , maximum non-repetitive peak reverse voltage $T_J = T_J \text{ Max.}$	$I_{RRM}$ Max @ rated $V_{RRM}$ $T_J = T_J \text{ Max.}$
		(V)	(V)	(mA)
150HF(R)20/200HF(R)20	20	200	300	15
150HF(R)40/200HF(R)40	40	400	500	15
150HF(R)60/200HF(R)60	60	600	700	15
150HF(R)80/200HF(R)80	80	800	900	15
150HF(R)100/200HF(R)100	100	1000	1100	15
150HF(R)120/200HF(R)120	120	1200	1300	15
150HF(R)140/200HF(R)140	140	1400	1500	15
150HF(R)160/200HF(R)160	160	1600	1700	15

## Forward Conduction

Parameters	150HF	200HF	Units	Conditions	
$I_{F(AV)}$ @ $T_C$ Maximum average forward current	150	200	A	180° Sine Conduction angle	
	125	125	°C		
$I_{F(RMS)}$ Maximum RMS current	235	314	A		
$I_{FSM}$ Maximum peak, one-cycle non-repetitive forward current Initial $T_J = T_J \text{ max.}$	2900	3700	A	$t = 10\text{ms}$	100% $V_{RRM}$ reapplied
	3040	3870	A	$t = 8.3\text{ms}$	
	3450	4400	A	$t = 10\text{ms}$	No voltage reapplied
	3610	4610	A	$t = 8.3\text{ms}$	
$I^2t$ Maximum $I^2t$ for fusing Initial $T_J = T_J \text{ max.}$	42050	68450	A <sup>2</sup> s	$t = 10\text{ms}$	100% $V_{RRM}$ reapplied
	38400	62490	A <sup>2</sup> s	$t = 8.3\text{ms}$	
	59470	96800	A <sup>2</sup> s	$t = 10\text{ms}$	No voltage reapplied
	54290	88370	A <sup>2</sup> s	$t = 8.3\text{ms}$	
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	594.7	968	kA <sup>2</sup> √s	$I^2t$ for time $t_x = I^2\sqrt{t} \times \sqrt{t_x}; 0.1 \leq t_x \leq 10\text{ms}$	
$V_{F(TO)}$ High-level of threshold voltage	1.14	1.04	V	$T_J = 180^\circ\text{C}, (\pi \times I_{(AV)} < I < 20 \times \pi \times I_{(AV)})$	
$V_{F(TO)2}$ Low-level of threshold voltage	0.95	0.85	V	$T_J = 180^\circ\text{C}, (16.7\% \times \pi \times I_{(AV)} < I < \pi \times I_{(AV)})$	
$r_{th1}$ High-level of forward slope resistance	0.78	0.59	mΩ	$T_J = 180^\circ\text{C}, (\pi \times I_{(AV)} < I < 20 \times \pi \times I_{(AV)})$	
$r_{th2}$ Low-level of forward slope resistance	1.13	0.85	mΩ	$T_J = 180^\circ\text{C}, (16.7\% \times \pi \times I_{(AV)} < I < \pi \times I_{(AV)})$	
$V_{FM}$ Maximum forward voltage drop	-	1.45	V	$T_J = 25^\circ\text{C}, I_{FM} = 628\text{A}_{pk}$	
	1.53	-	V	$T_J = 25^\circ\text{C}, I_{FM} = 471\text{A}_{pk}$	

## Thermal and Mechanical Specifications

Parameters	150HF	200HF	Units	Conditions
$T_J$ Junction temperature range	-40 to 180		°C	
$T_{stg}$ Storage temperature range	-55 to 180		°C	
$R_{thJC}$ Max. thermal resistance junction to case	0.22	0.17	K/W	DC operation
$R_{thCS}$ Max. thermal resistance, case to heatsink	0.08	0.08	K/W	Mounting surface, smooth, flat and greased
wt Approximate weight	100		g	
T Mounting Torque ± 10%	10		Nm	
Max. constant accel.	6000 g		m/s <sup>2</sup>	Stud outwards
Case style	DO-205AC (DO-30) / DO-205AA (DO-8)			

$\Delta R_{th}$  Conduction (per junction)

(The following table shows the increment of thermal resistance  $R_{thJ-C}$  when devices operate at different conduction angles than DC.)

Conduction angle	Sinusoidal conduction		Rectangular conduction		Units	Conditions
	150HF...	200HF...	150HF...	200HF...		
180°	0.045	0.045	0.037	0.037	K/W	
120°	0.056	0.056	0.061	0.061	K/W	
90°	0.073	0.073	0.079	0.079	K/W	
60°	0.102	0.102	0.105	0.105	K/W	
30°	0.154	0.154	0.156	0.156	K/W	

ORDERING INFORMATION TABLE

Device Code

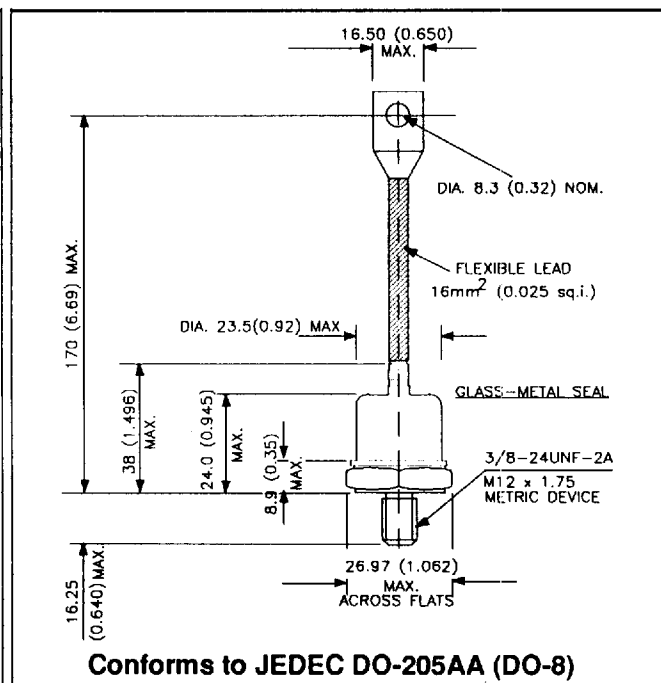
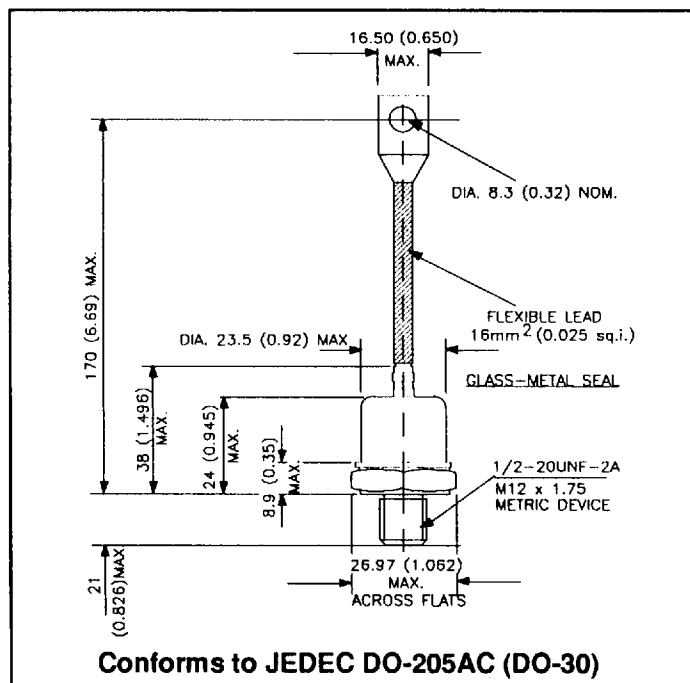


- 1** - Basic Part Number
- 2** - Missing = Cathode-to-case  
R = Anode-to-case
- 3** - Voltage code (See Voltage ratings Table)
- 4** - Outline (See Table)
- 5** - Leads and terminal designator:  
S = Isolated lead  
B = Flag terminal  
None = Non isolated lead

OUTLINE

- None = Stud base UNF threads  
DO-30 (DO-205AC) 1/2" 20 UNF-2A
- M = Stud base metric threads  
DO-30 (DO-205AC) M12 x 1.75
- W = Stud base UNF threads  
DO-8 (DO-205AA) 3/8" 24 UNF-2A  
(Contact Factory)
- F = Flat base (Contact Factory)
- K = Flat square base (Contact Factory)

OUTLINE TABLE



All dimensions in millimetres (inches)



Fig. 1 - CURRENT RATINGS CHARACTERISTICS

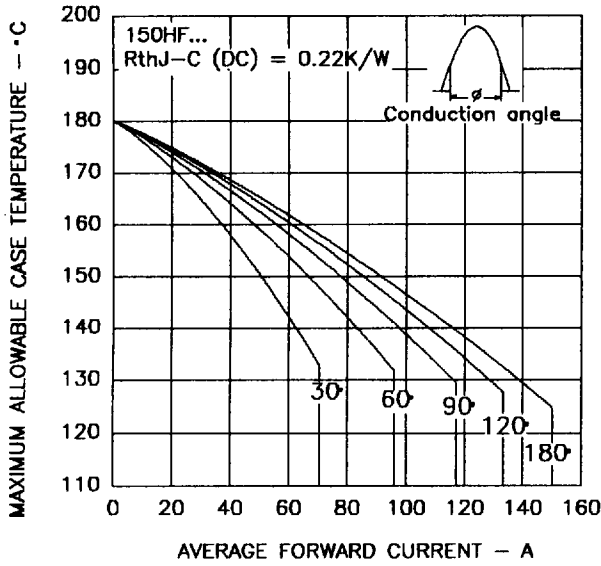


Fig. 2 - CURRENT RATINGS CHARACTERISTICS

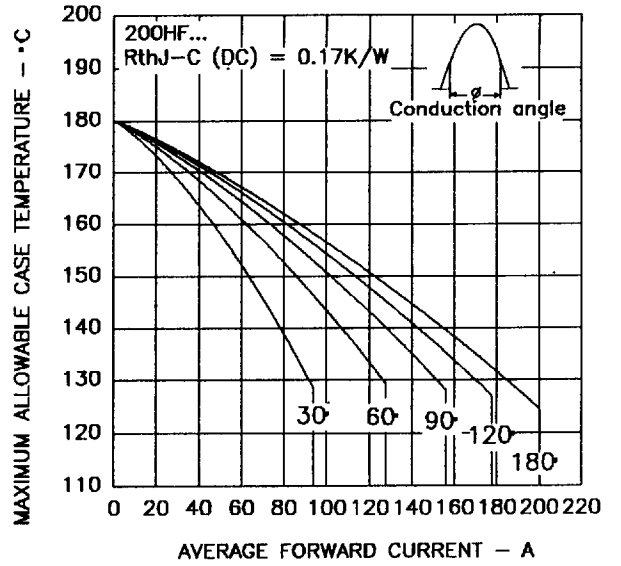


Fig. 3 - CURRENT RATINGS CHARACTERISTICS

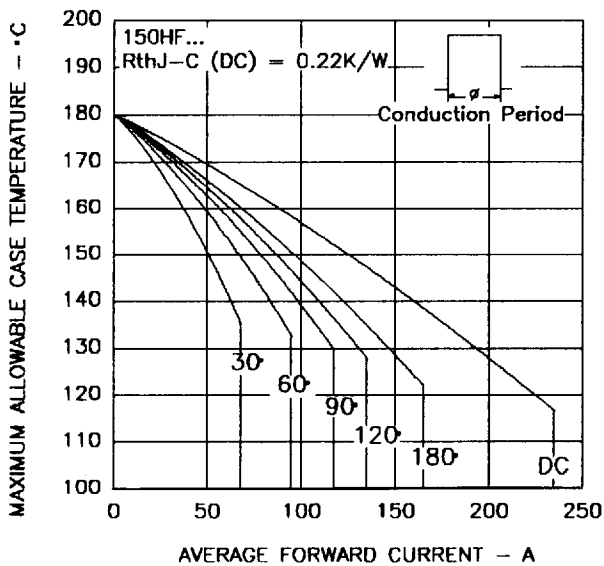


Fig. 4 - CURRENT RATINGS CHARACTERISTICS

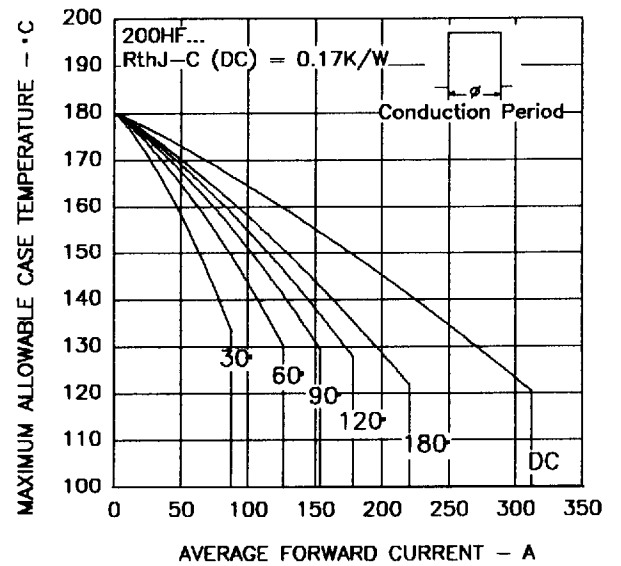


Fig. 5 - FORWARD POWER LOSS CHARACTERISTICS

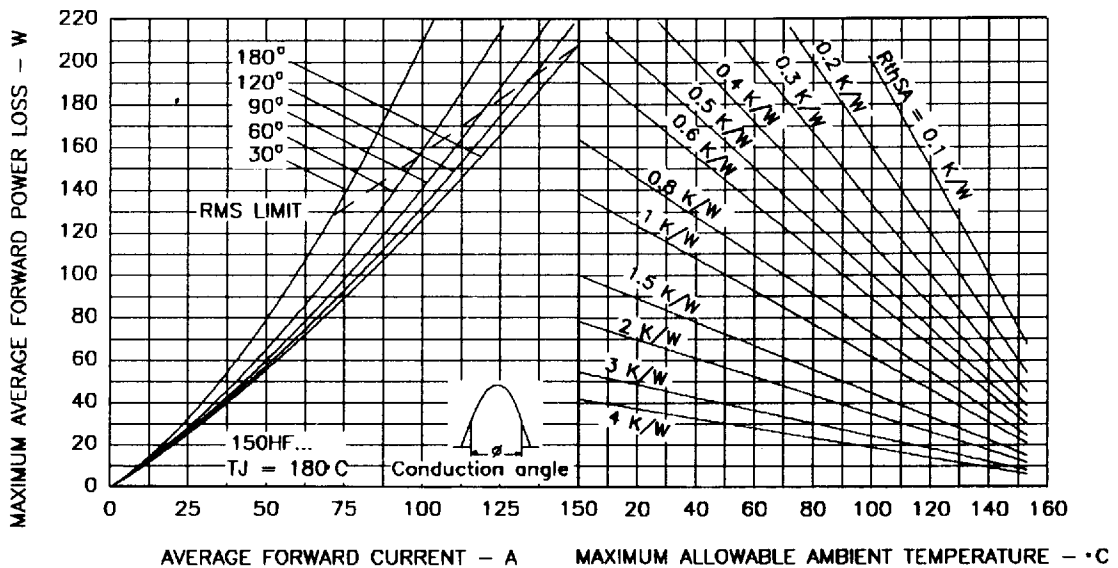


Fig. 6 - FORWARD POWER LOSS CHARACTERISTICS

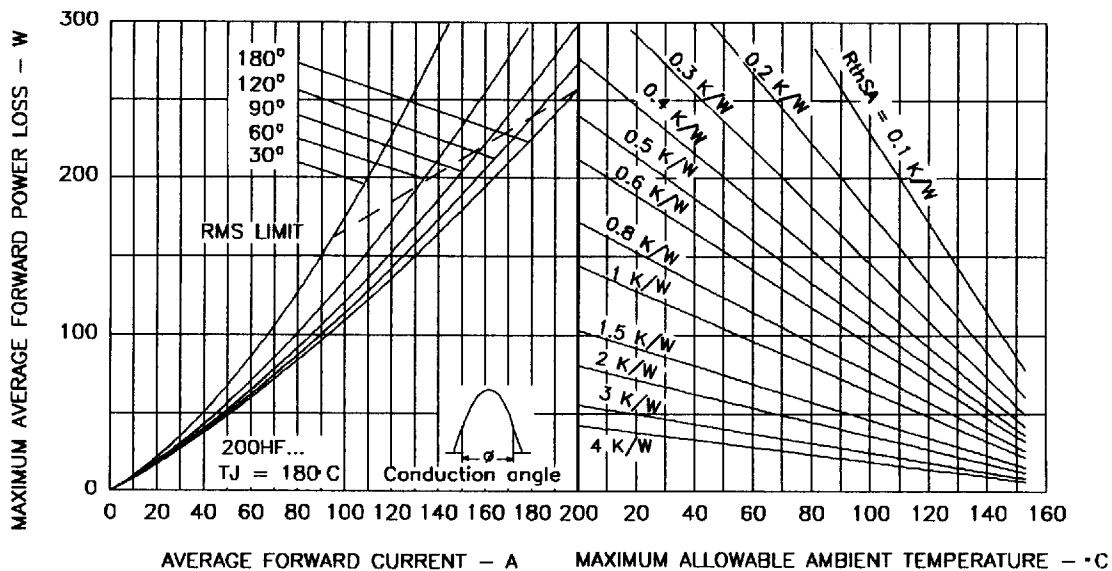


Fig. 7 - FORWARD POWER LOSS CHARACTERISTICS

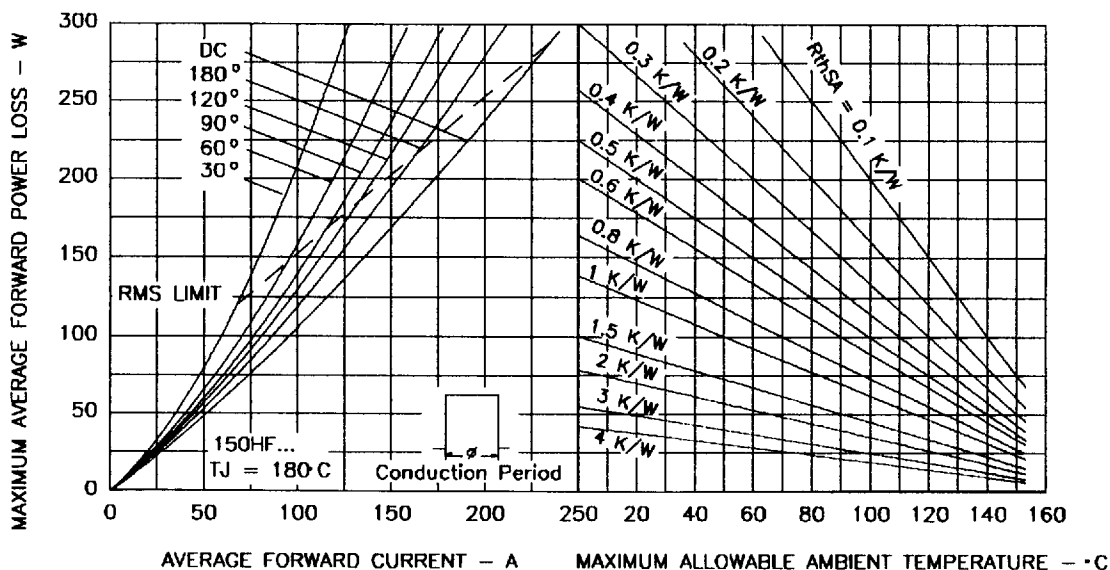
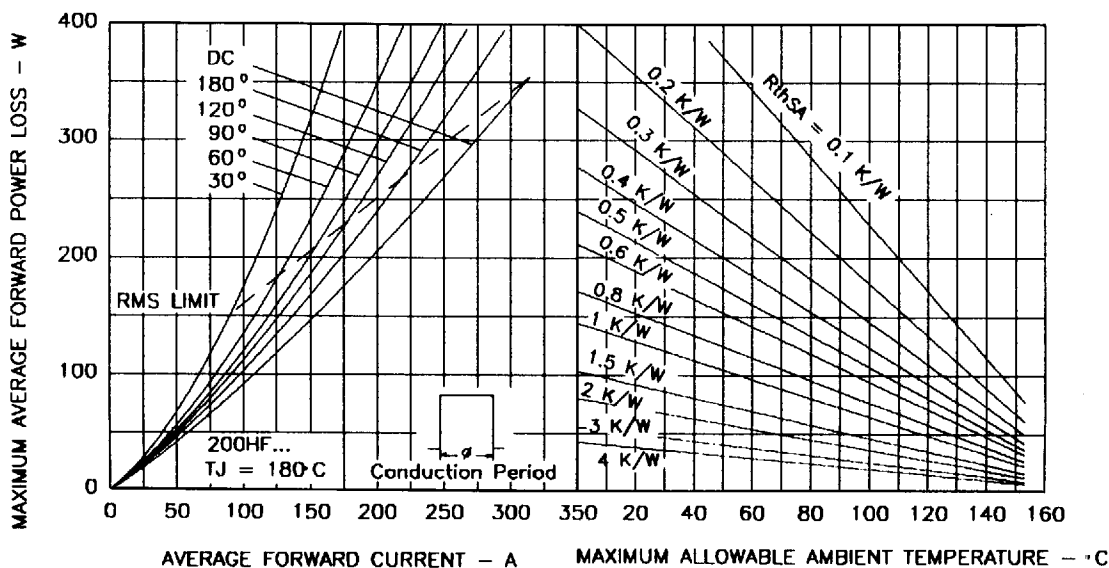


Fig. 8 - FORWARD POWER LOSS CHARACTERISTICS



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Fig. 9 - MAXIMUM NON-REPETITIVE SURGE CURRENT

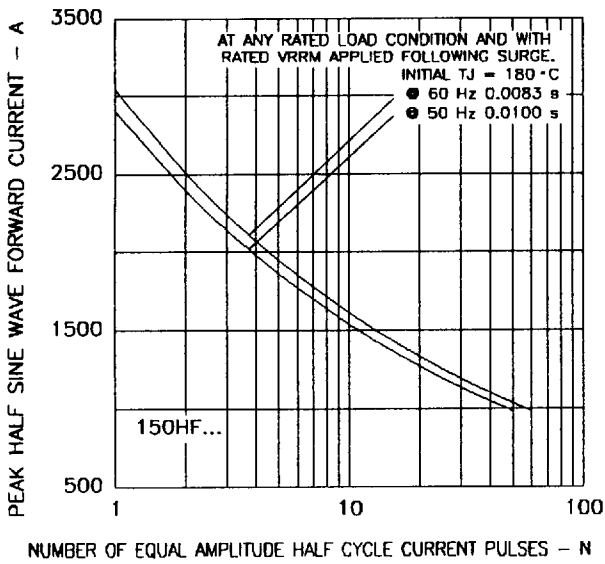


Fig. 10 - MAXIMUM NON-REPETITIVE SURGE CURRENT

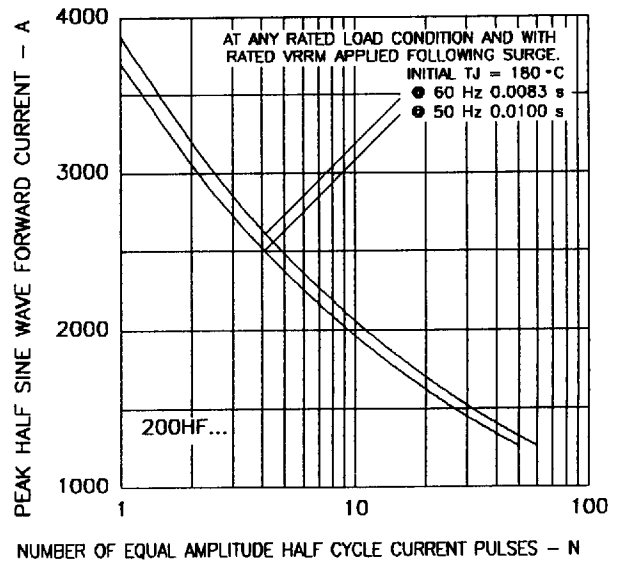


Fig. 11 - MAXIMUM NON-REPETITIVE SURGE CURRENT

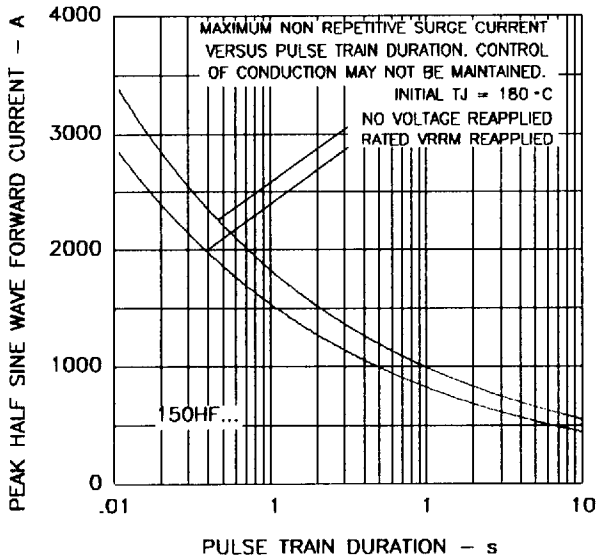


Fig. 12 - MAXIMUM NON-REPETITIVE SURGE CURRENT

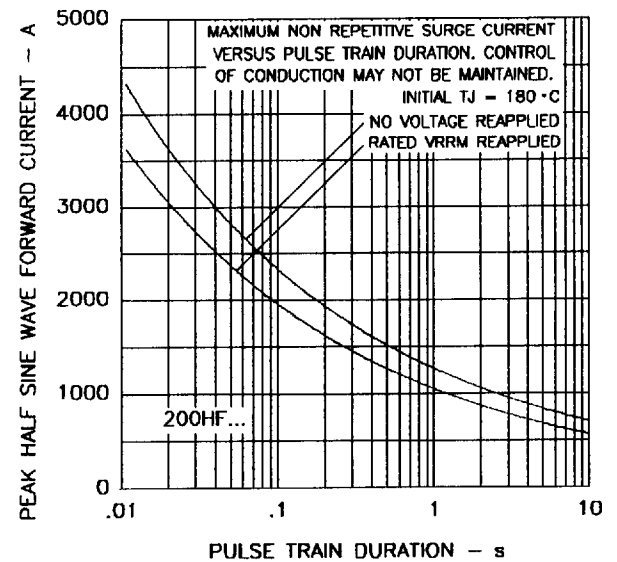


Fig. 13 - FORWARD VOLTAGE DROP CHARACTERISTICS

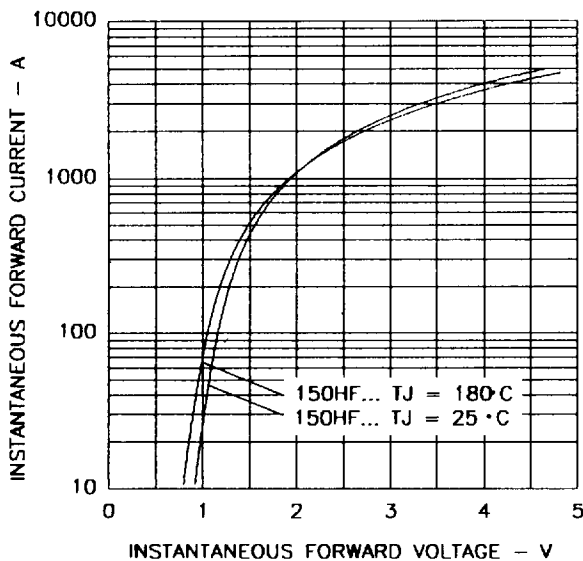
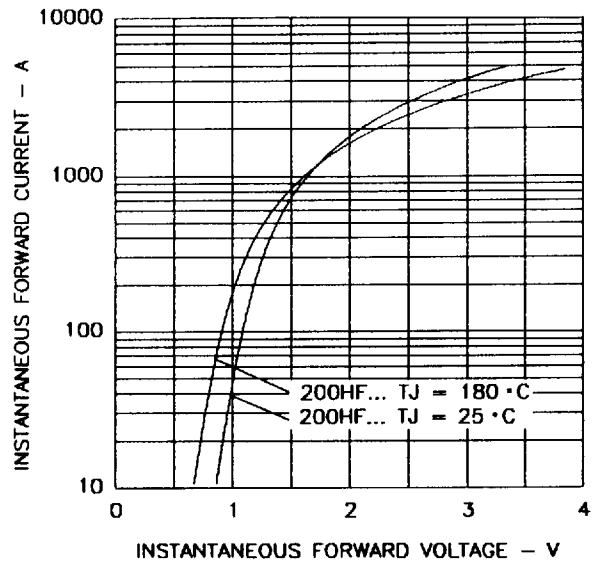


Fig. 14 - FORWARD VOLTAGE DROP CHARACTERISTICS



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Fig. 15 - THERMAL IMPEDANCE  $Z_{thjc}$  CHARACTERISTICS

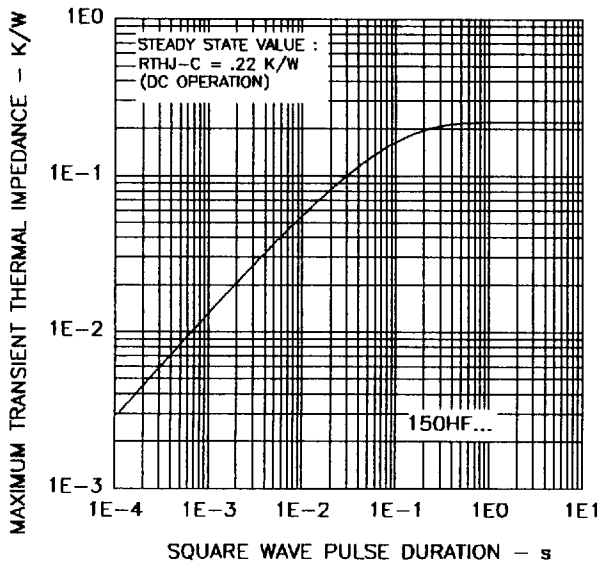


Fig. 16 - THERMAL IMPEDANCE  $Z_{thjc}$  CHARACTERISTICS

