DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

70HF(R) Series

STANDARD RECOVERY DIODES
70 AMP

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

Parameter	Symbol	Test Conditions	70HF(R)		Units
			10 to 120	140 to 160	
Maximum average forward current	$I_{F(AV)}$		70 @ T_C = 140°C	70 @ T_C = 110°C	Amps
Maximum RMS forward current	$I_{F(RMS)}$		110	110	Amps
Maximum peak, on cycle, non-repetitive forward surge current	I_{FSM}	@ 50Hz @ 60Hz	1200 1250	1200 1250	Amps
Maximum I^2t for fusing	I^2t	@ 50Hz @ 60Hz	7100 6450	7100 6450	A^2s
Maximum repetitive peak reverse voltage	V_{RRM}		100-1200	1400 to 1600	Volts
Junction temperature range	T_J		-65 to +180	-65 to +150	°C

ELECTRICAL CHARACTERSITICS (T_A = 25°C unless otherwise specified)

Part number	Maximum repetitive peak reverse voltage	Maximum non-repetitive peak reverse voltage	Minimum avalanche voltage	Maximum reverse current at $T_J = T_J$ maximum
	V_{RRM}	V_{RSM}	$V_{R(BR)}$	I_{RRM}
	Volts	Volts	Volts	mA
70HF10(R)	100	200	200	15
70HF20(R)	200	300	300	
70HF40(R)	400	500	500	
70HF60(R)	600	720	725	9
70HF80(R)	800	960	950	
70HF100(R)	1000	1200	1150	
70HF120(R)	1200	1440	1350	
70HF140(R)	1400	1650	1550	4.5
70HF160(R)	1600	1900	1750	

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FORWARD CONDUCTION

Parameter	Symbol	Test Conditions			70HF(R) 10 to 120	70HF(R) 140 to 160	Units
Maximum average forward current at case temperature	$I_{F(AV)}$	180° conduction, half sine wave			70 @ T_C = 140°C	70 @ T_C = 110°C	Amps
Maximum RMS forward current	$I_{F(RMS)}$				110	110	
Maximum peak, one cycle, non-repetitive forward surge current	I_{FSM}	t = 10ms	No voltage reapplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	1200		Amps
		t = 8.3ms			1250		
		t = 10ms	100% V_{RRM} reapplied		1000		
		t = 8.3ms			1050		
Maximum I^2t for fusing	I^2t	t = 10ms	No voltage reapplied	Sinusoidal half wave, initial $T_J = T_J$ maximum	7100		A^2s
		t = 8.3ms			6450		
		t = 10ms	100% V_{RRM} reapplied		5000		
		t = 8.3ms			4550		
Maximum $I^2\sqrt{t}$ for fusing	$I^2\sqrt{t}$	T = 0.1ms to 10ms, no voltage reapplied			71000		$A^2\sqrt{s}$
Low level value of threshold voltage	$V_{F(TO)1}$	(16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum			0.79		Volts
High level value of threshold voltage	$V_{F(TO)2}$	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			1.00		Volts
Low level value of forward slope resistance	r_{f1}	(16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ maximum			2.33		mΩ
High level value of forward slope resistance	r_{f2}	(I > π x $I_{F(AV)}$), $T_J = T_J$ maximum			1.53		mΩ
Maximum forward voltage drop	V_{FM}	I_{pk} = 220A, T_J = 25°C, t_p = 400µs rectangular wave			1.35	1.46	Volts
THERMAL CHARACTERISTICS							
Maximum junction and storage temperature range	T_J, T_{stg}				-65 to 180	-65 to 150	°C
Maximum thermal resistance, junction to case	R_{thJC}	DC operation			0.45		K/W
Thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth, flat and greased			0.25		K/W
Maximum allowable mounting torque (+0%, -10%)		Not lubricated thread, tighting on nut (1)			3.4 (30)		N-m (lbf-in)
		Lubricated thread, tighting on nut (1)			2.3 (20)		
		Not lubricated thread, tighting on hexagon (2)			4.2 (37)		
		Lubricated thread, tighting on hexagon (2)			3.2 (28)		

Note 1: Recommended for pass through-holes.
Note 2: Recommended for holed threaded heatsinks.

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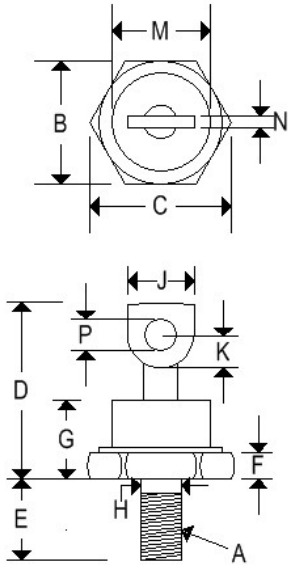
ΔRthJC Conduction

Conduction angle	Sinusoidal conduction	Rectangular conduction	Test conditions	Units
180°	0.08	0.06	$T_J = T_{J\ maximum}$	K/W
120°	0.10	0.11		
90°	0.13	0.14		
60°	0.19	0.20		
30°	0.30	0.30		

*The table above shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC

MECHANICAL CHARACTERISTICS

Case	DO-5 (R)
Marking	Alpha numeric
Polarity	Cathode is stud
Reverse polarity	Anode is stud



	DO-5(R)			
	Inches		Millimeters	
	Min	Max	Min	Max
A	¼-28 UNF2A threads			
B	0.669	0.688	16.990	17.480
C	-	0.794	-	20.160
D	-	1.000	-	25.400
E	0.422	0.453	10.720	11.510
F	0115	0.200	2.920	5.080
G	-	0.450	-	11.430
H	0.220	0.249	5.580	6.320
J	0.250	0.375	6.350	9.530
K	0.156	-	3.960	-
M	-	0.667	-	16.940
N	0.030	0.080	0.760	2.030
P	0.140	0.175	3.560	4.450

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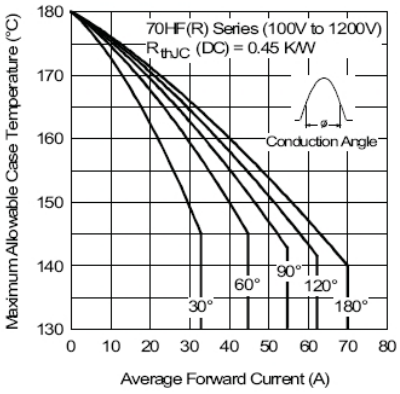

Fig. 1 - Current Ratings Characteristics

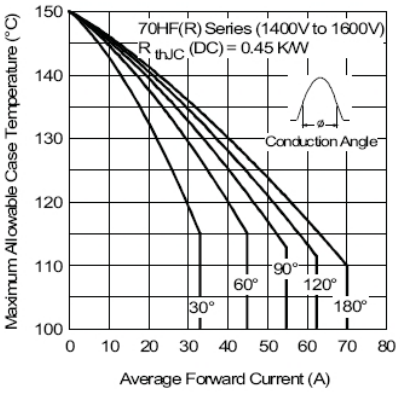

Fig. 3 - Current Ratings Characteristics

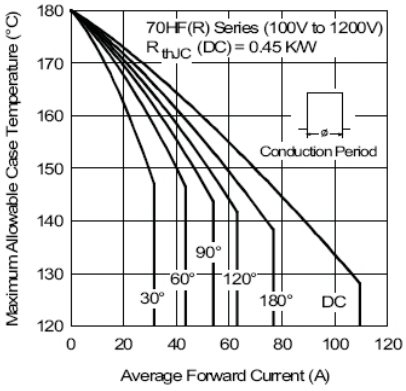

Fig. 2 - Current Ratings Characteristics

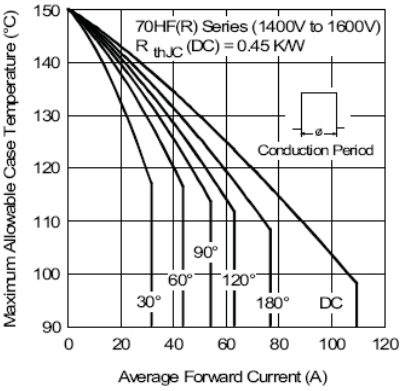

Fig. 4 - Current Ratings Characteristics

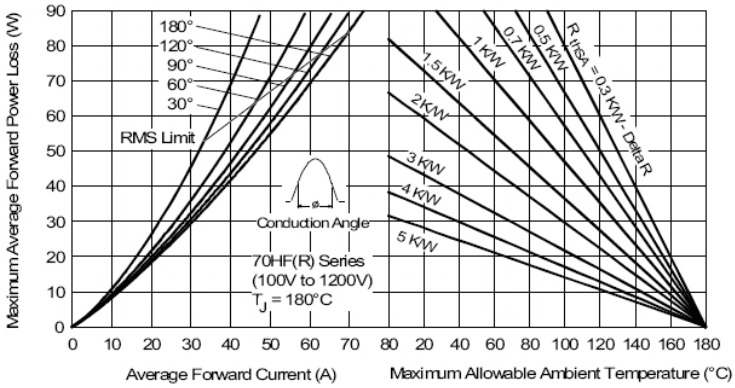

Fig. 5 - Forward Power Loss Characteristics

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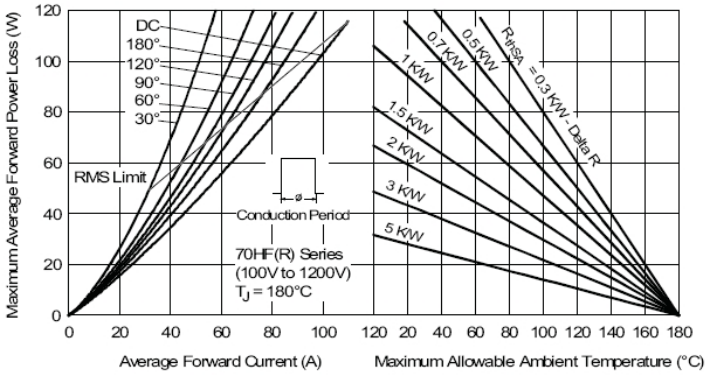

Fig. 6 - Forward Power Loss Characteristics

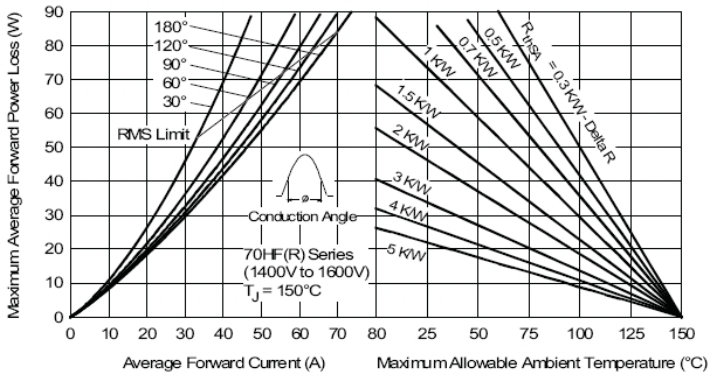

Fig. 7 - Forward Power Loss Characteristics

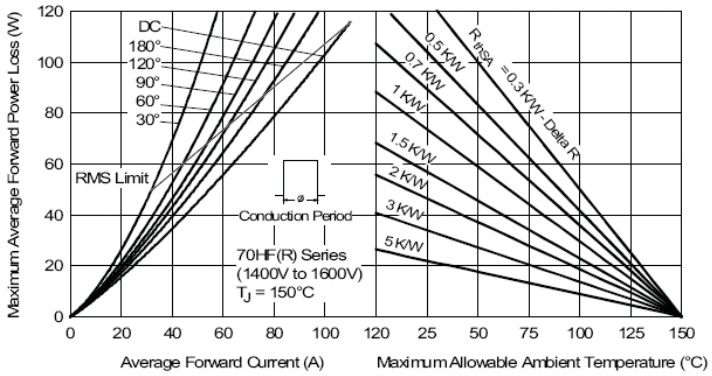

Fig. 8 - Forward Power Loss Characteristics

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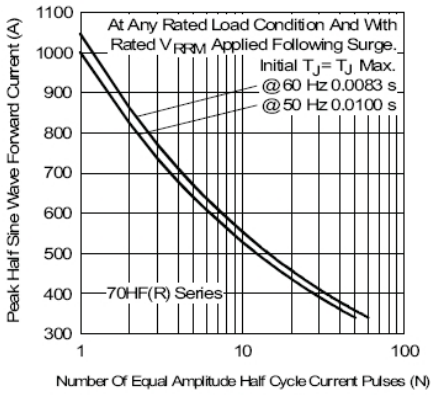

Fig. 9 - Maximum Non-Repetitive Surge Current

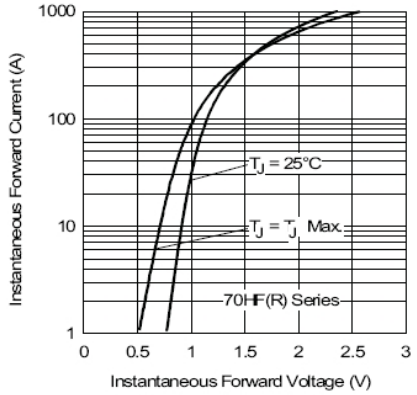

Fig. 11 - Forward Voltage Drop Characteristics

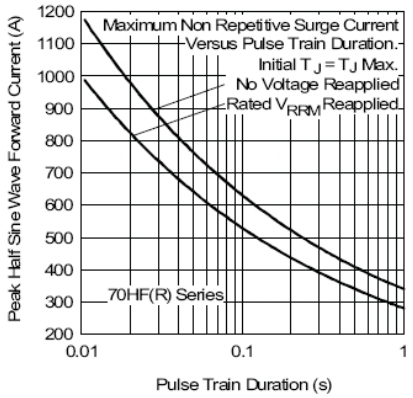

Fig. 10 - Maximum Non-Repetitive Surge Current

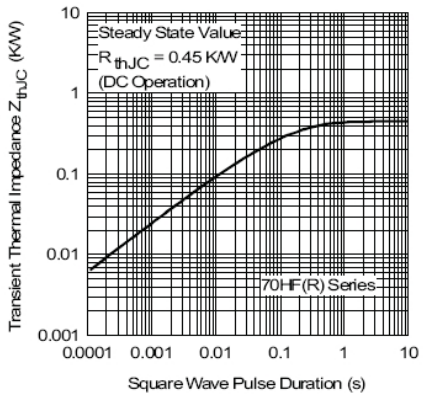

Fig. 12 - Thermal Impedance Z_{thJC} Characteristics

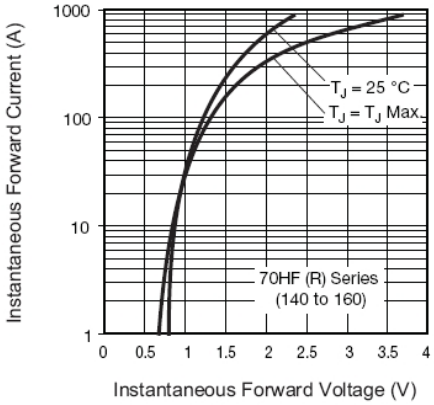

Fig. 13 - Forward Voltage Drop Characteristics