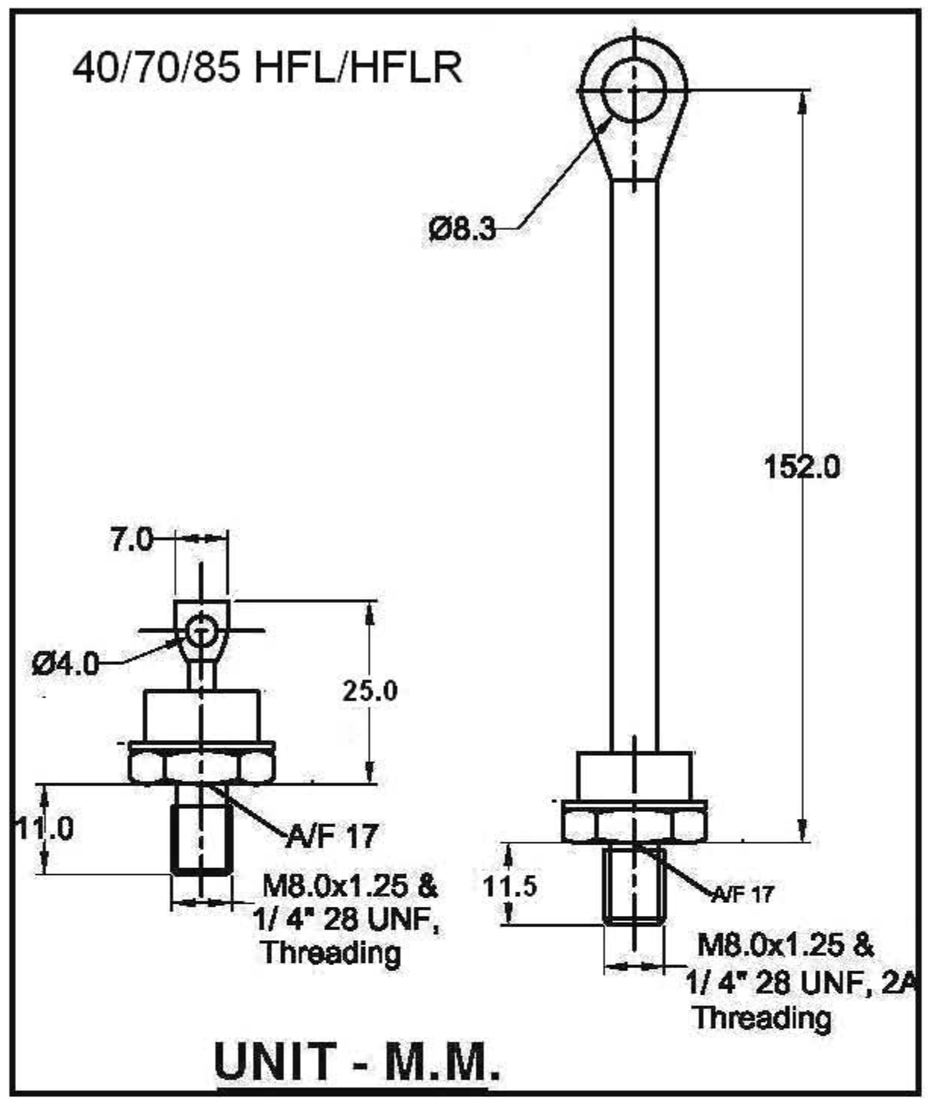
Ruttonsha International Rectifier Ltd.

SILICON RECTIFIERS

40A,70A and 85A Fast Recovery Rectifier



Features

- Short reverse recovery time
- Low stored Charge
- Wide current range
- Excellent surge capabilities.
- Stud cathode and stud anode versions.
- Types up to 1000V V_{RRM}

Major Ratings and Characteristics :-

PARAMETERS	40HFL...	70HFL...	85HFL...	UNITS
$I_{(FAV)}$ @Max T_C	40 @ 75	70 @ 75	85 @ 75	A °C
$I_{(FSM)}$ 50Hz	400	700	1100	A
I^2t 50Hz	800	2450	6050	A^2s
t_{rr} range	500			ns
V_{RRM} range	100 to 1000			V
T_J range	-40 to 150			°C

Electrical Specifications
Reverse Voltage Ratings

Part number ①	V_{RRM} maximum peak repetitive reverse voltage V	V_{RSM}, maximum peak non-repetitive reverse voltage V	I_{FM} maximum peak reverse current at rated V_{RRM}	
			T_J = 25°C mA	T_J = 150°C mA
40HFL 10	100	150	0.1	10
40HFL 20	200	300	0.1	10
40HFL 40	400	500	0.1	10
40HFL 60	600	700	0.1	10
40HFL 80	800	900	0.1	10
40HFL 100	1000	1100	0.1	10
70HFL 10	100	150	0.1	15
70HFL 20	200	300	0.1	15
70HFL 40	400	500	0.1	15
70HFL 60	600	700	0.1	15
70HFL 80	800	900	0.1	15
70HFL 100	1000	1100	0.1	15
85HFL 10	100	150	0.1	20
85HFL 20	200	300	0.1	20
85HFL 40	400	500	0.1	20
85HFL 60	600	700	0.1	20
85HFL 80	800	900	0.1	20
85HFL 100	1000	1100	0.1	20

① Type listed are cathode case, for anode case add "R" to code, i.e. 40HFLR10, 70 HFLR10 etc.

Reverse Recovery Characteristics

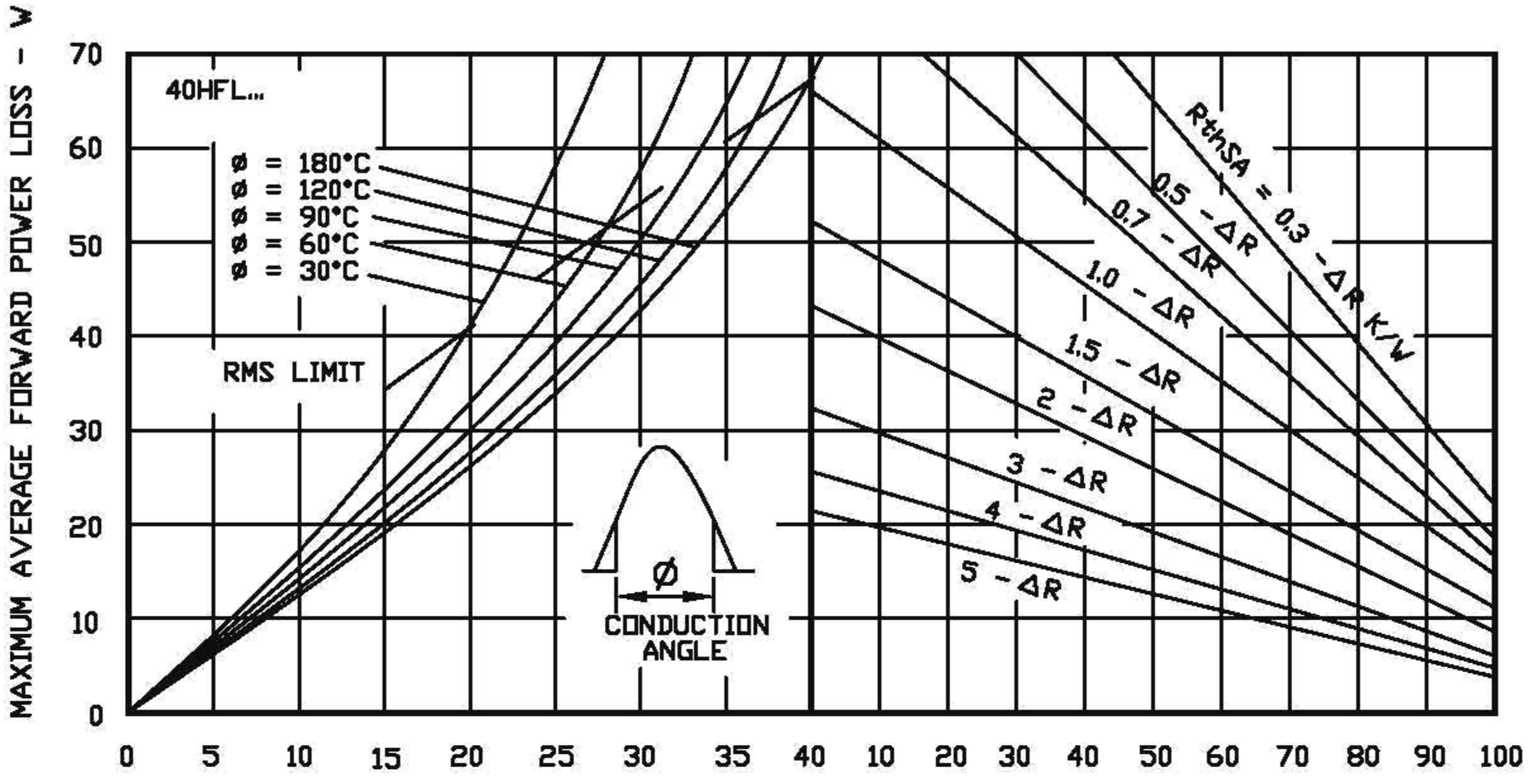
	40HFL...	70HFL...	85HFL...	UNITS	CONDITIONS
t_{rr} Maximium reverse recovery time	500	500	500	ns	T_J = 25°C, I_F = 1A to V_R = 30V - $dI_{F/dt}$ = 100A/µs

Forward Conduction

	Parameter	40HFL	70HFL	85HFL	Units	Conditions	
$I_{F(AV)}$	Max. average forward current	40	70	85	A	180° conduction, half sine wave, max. T_J = 75°C	
$I_{F(RMS)}$	Max RMS Forward current	63	110	134	A		
I_{FRM}	Max. peak repetitive forward current	220	380	470	A	Sinusoidal half- wave, 30° conduction	
I_{FSM}	Max. peak, one-cycle non-repetitive forward current	400	700	1100	A	t = 10 ms	Sinusoidal half- wave 100% V_{RRM} reapplied, Inital T_J=T_J max,
I^2t	Maximum I^2t for fusing	800	2450	6050	A^2s	t = 10 ms	100% V_{RRM} reapplied Inital T_J=T_J max
$V_{F(TO)}$	Max. value of threshold voltage	1.08	1.085	1.128	V	T_J=125° C	
r_F	Max. value of forward slope resistance	20.0	10.0	2.11	mΩ		
V_{FM}	Maximum peak forward voltage	1.95	1.85	1.75	V	T_J=25° C, I_{FM} = π x $I_{F(AV)}$	

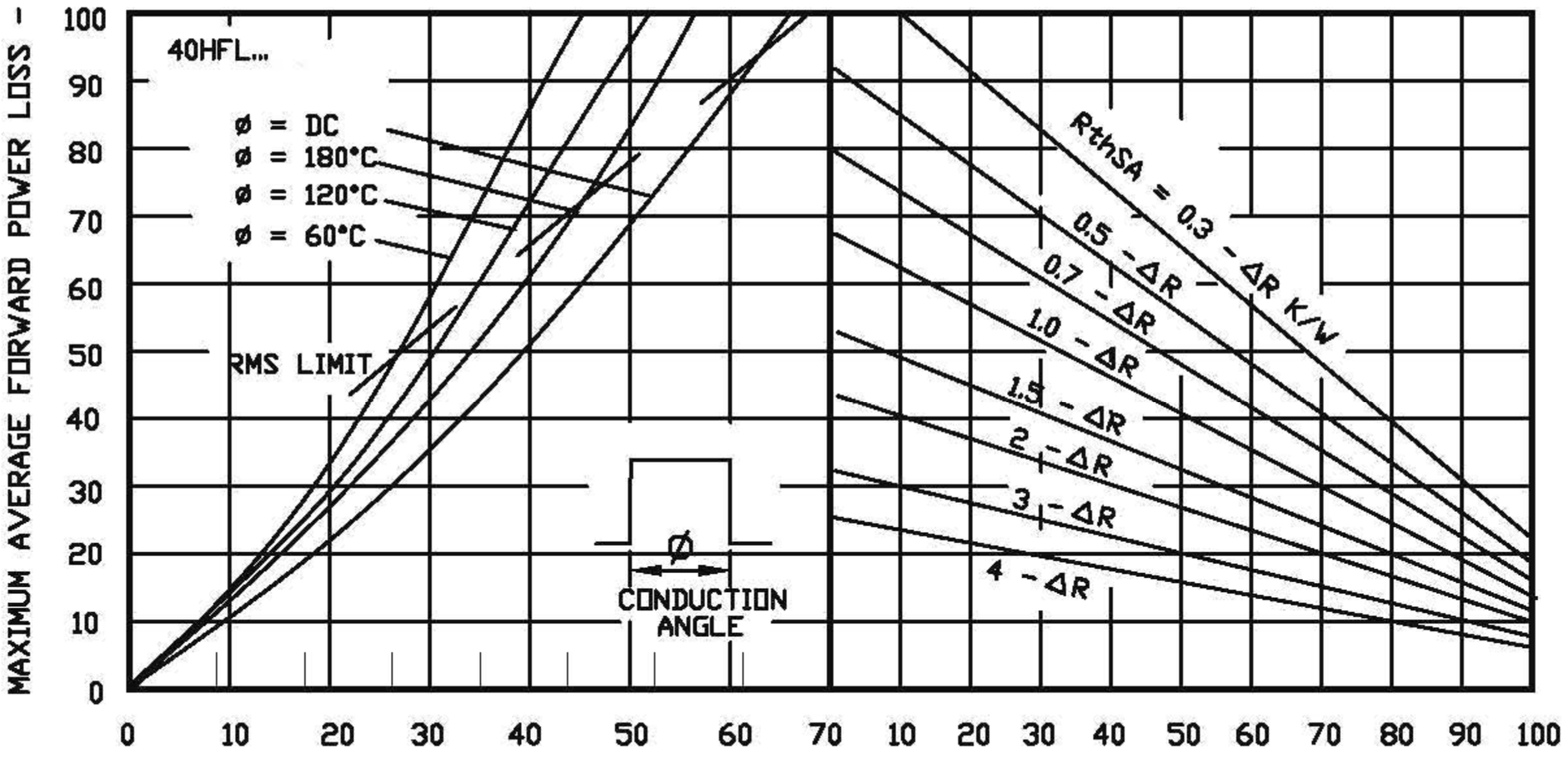
Thermal and Mechanical Specification

	Parameter		40HFL	70HFL	85HFL	Units	Conditions
T_J	Junction operating temperature range		-40 TO 150			°C	
T_{stg}	storage temperature range		-40 TO 150			°C	
R_{thJC}	Max.internal thermal resistance,jun. to case		0.60	0.36	0.30	K/W	DC operation
R_{thCS}	Max. thermal resistance,case to heatsink		0.25			K/W	Mounting surface,smooth,flat & greased
T	Mounting torque	to nut	20(27)			lbf·in	Lubricated threads
	10%		0.23(0.29)			kgf·m	(non-lubricated threads)
			2.2(2.7)			N·m	
		to device	22			lbf·in	
			0.25			kgf·m	
			2.5			N·m	
wt	Aproximate weight		25(0.88)			g(oz)	
	Outline		(DO-5)				



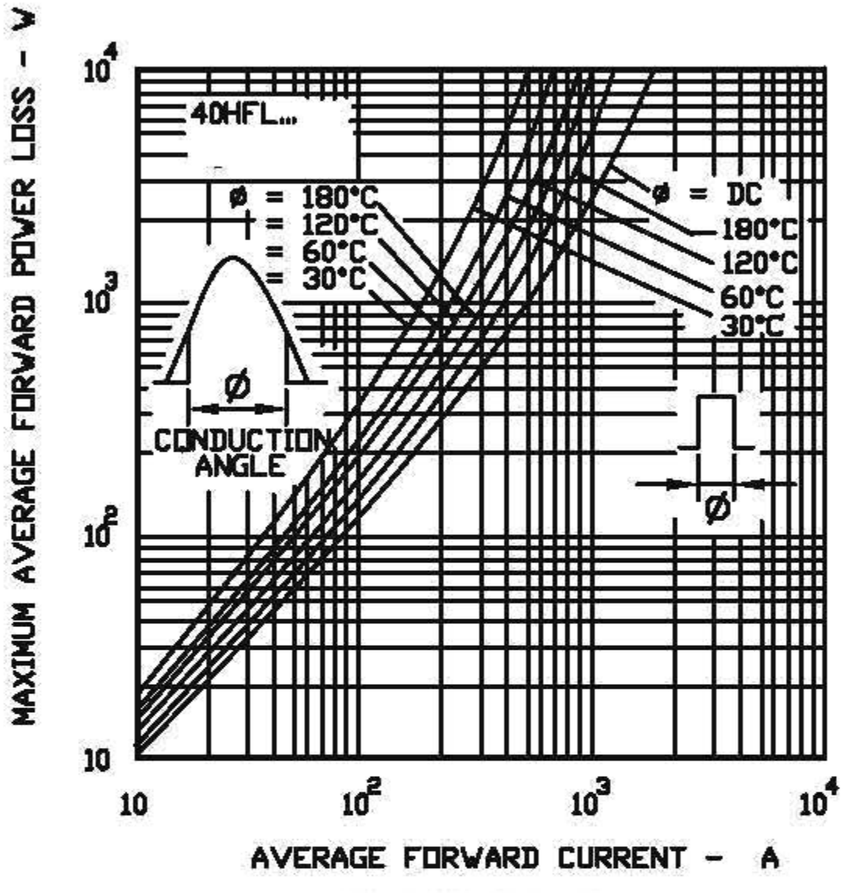
·CURRENT RATING NOMOGRAM (SINUSOIDAL WAVEFORMS) 40HFL SERIES

Conduction angle-ø	ΔR K/W
180°	0.14
120°	0.15
90°	0.20
60°	0.31
30°	0.53

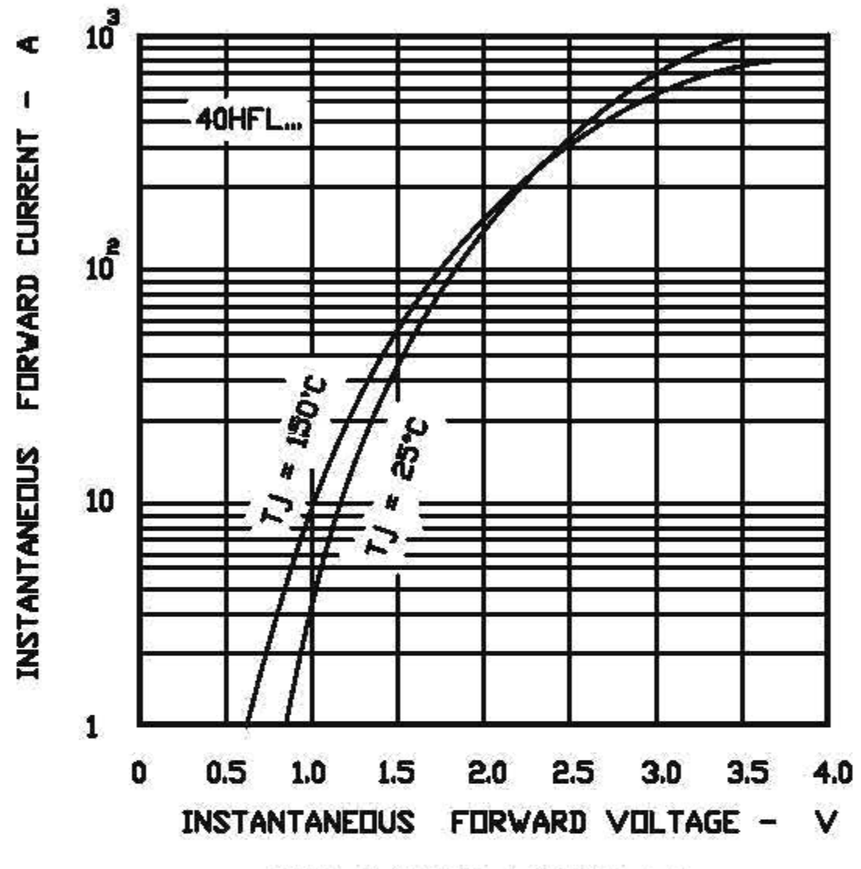


·CURRENT RATING NOMOGRAM (RECTANGULAR WAVEFORMS) 40HFL SERIES

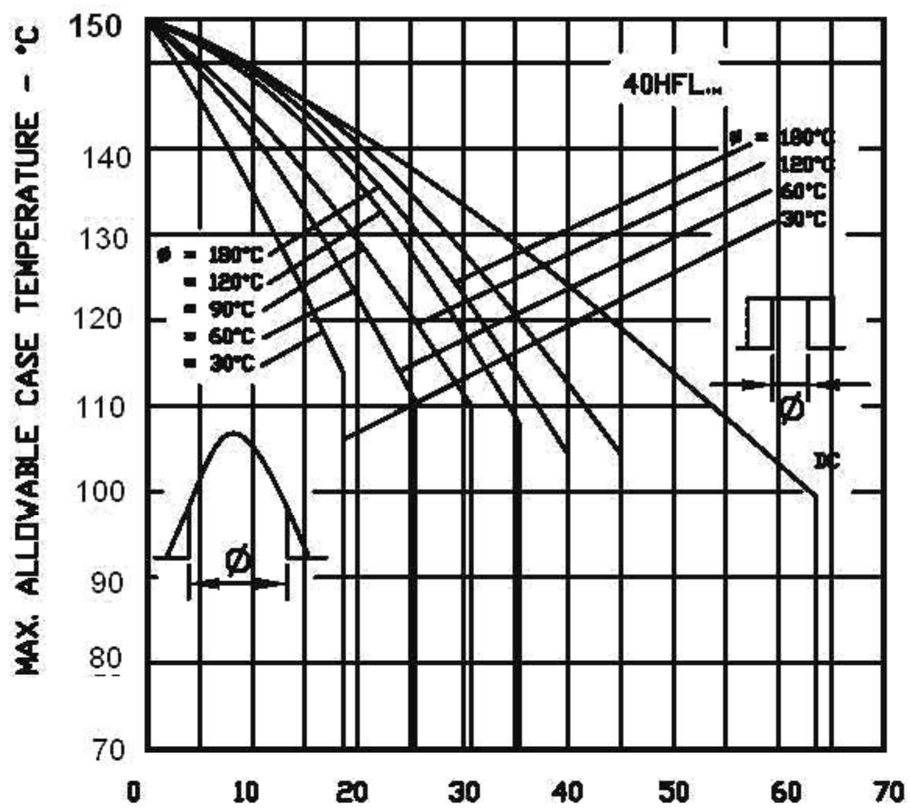
Conduction angle-ø	ΔR K/W
DC	0
180°	0.08
120°	0.14
60°	0.30



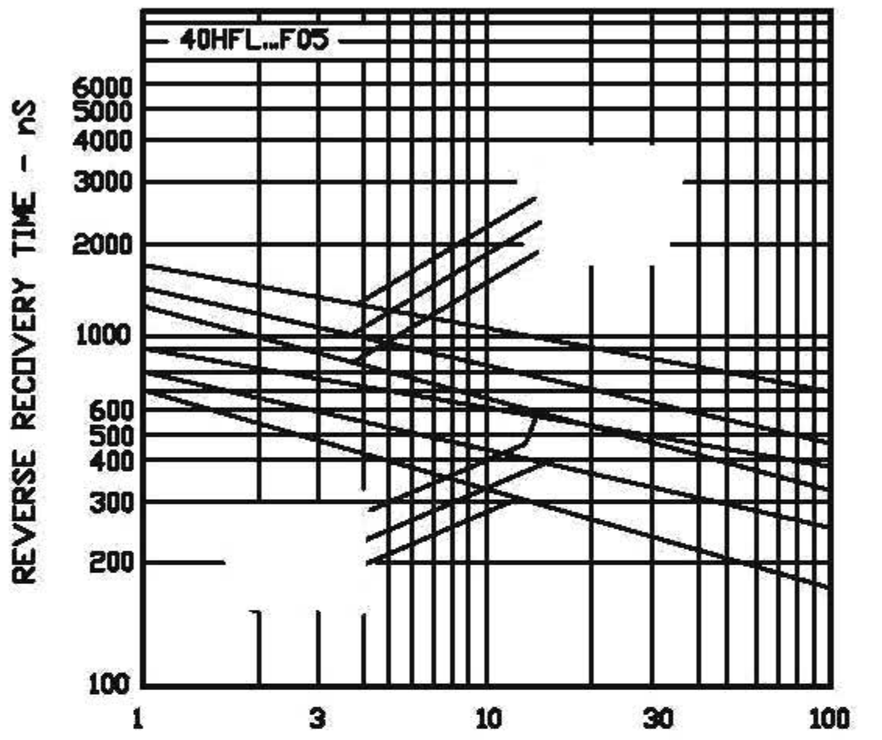
MAX. FORWARD POWER LOSS Vs
AVERAGE FORWARD CURRENT, 40HFL SERIES



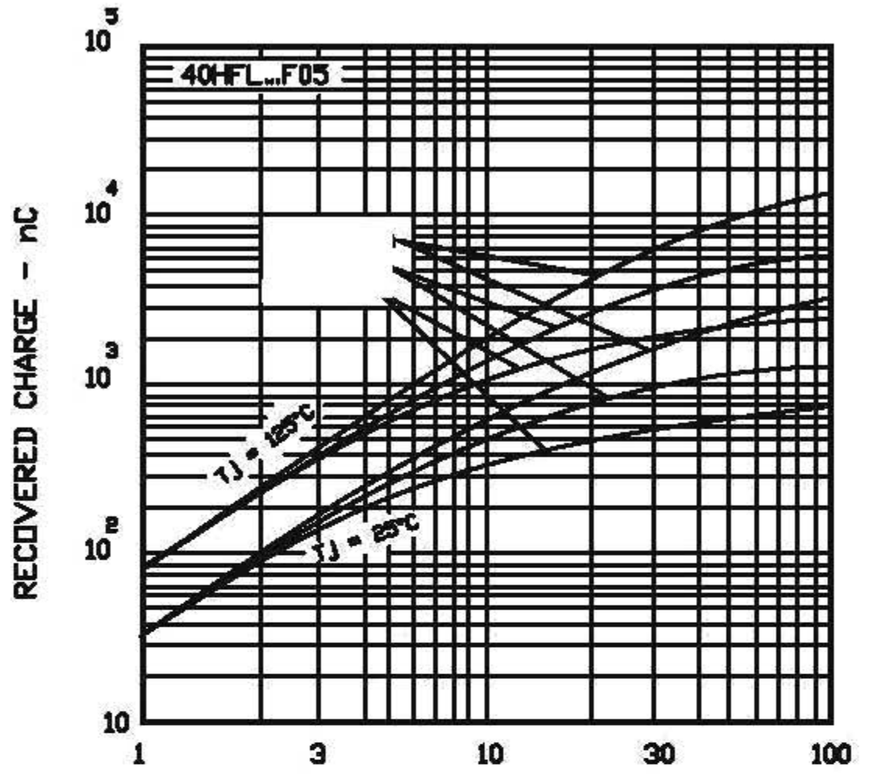
MAX. FORWARD VOLTAGE Vs.
FORWARD CURRENT, 40HFL SERIES



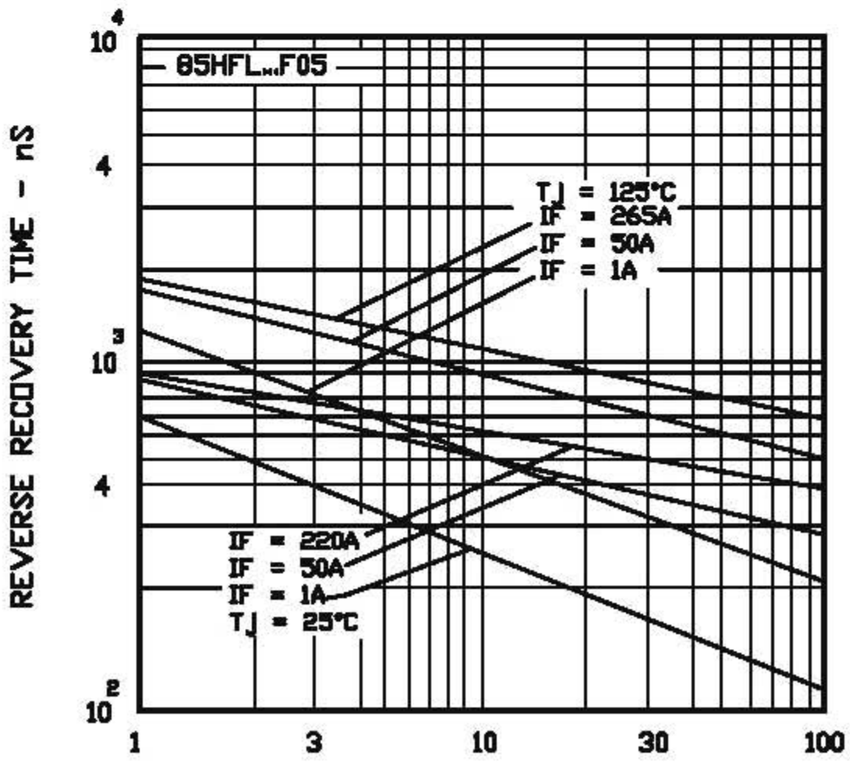
AVERAGE FORWARD CURRENT Vs MAX.
ALLOWABLE CASE TEMPERATURE, 40HFL SERIES



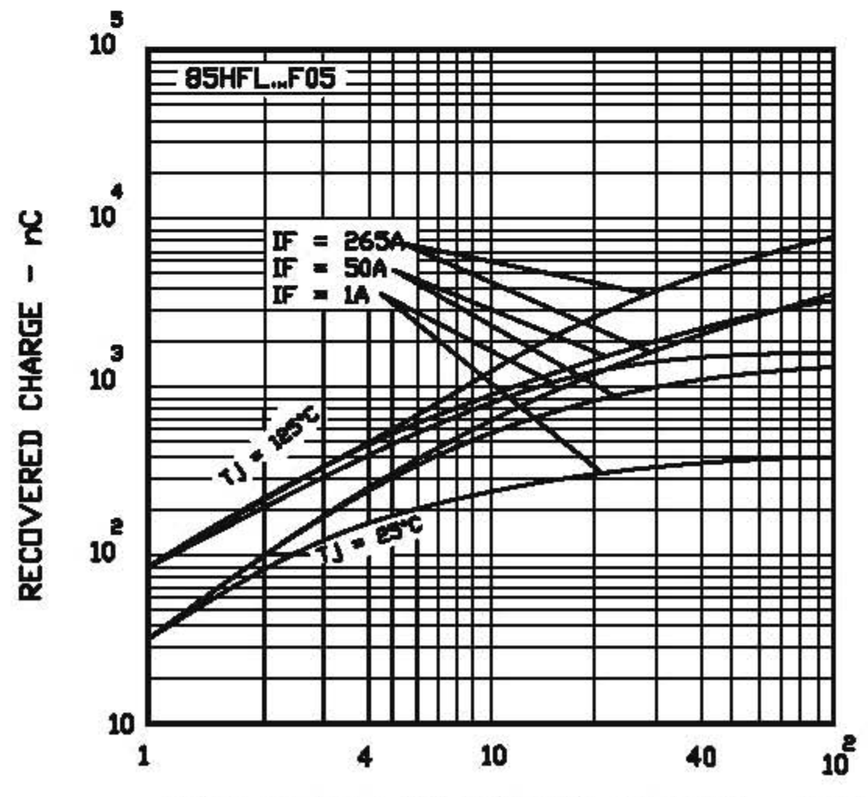
MAX. REVERSE RECOVERY TIME Vs. RATE OF FALL OF FORWARD CURRENT, 40HFL..F05 SERIES



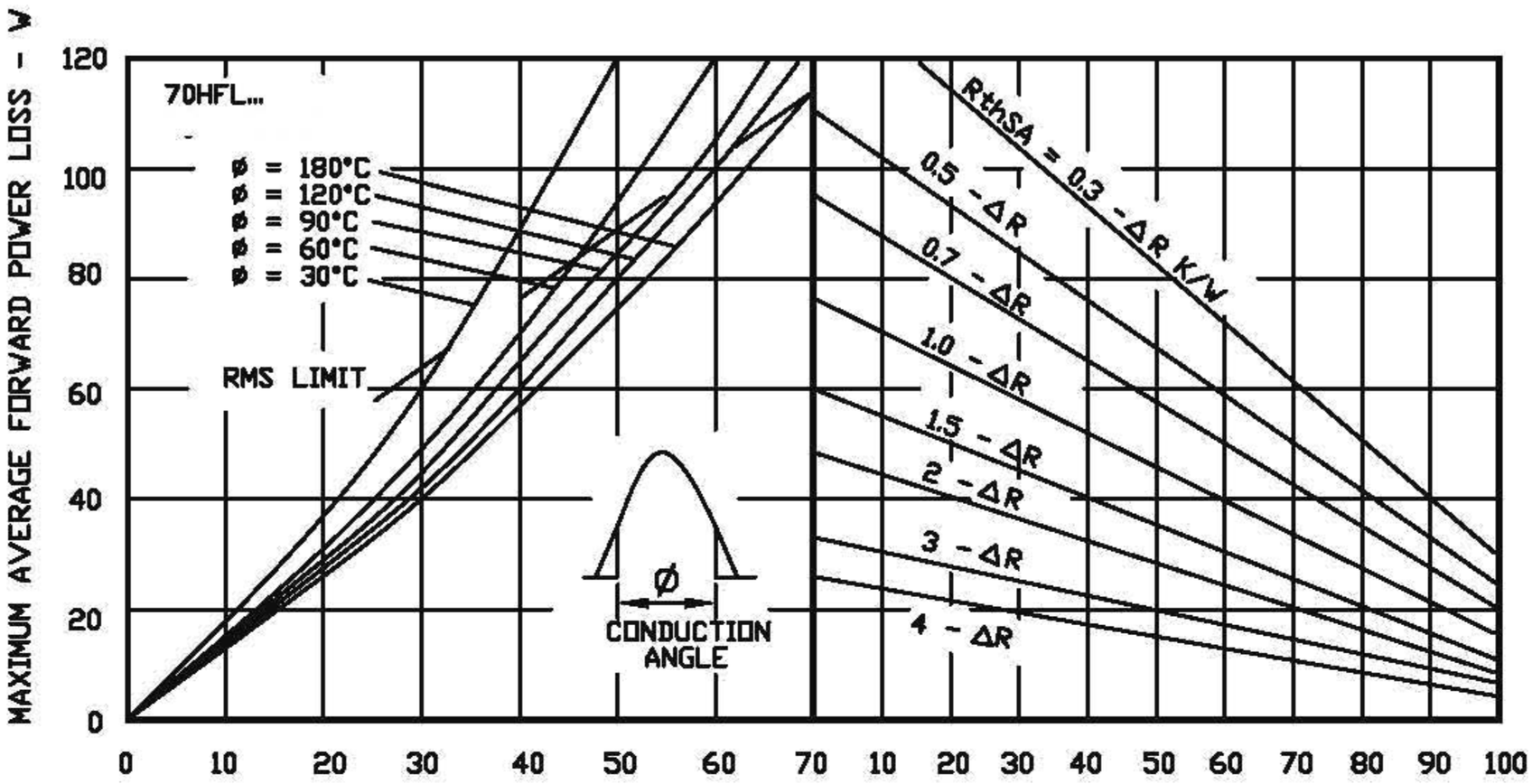
MAX. RECOVERED CHARGE Vs. RATE OF FALL OF FORWARD CURRENT, 40HFL..F05 SERIES



MAX. REVERSE RECOVERY TIME Vs. RATE OF FALL OF FORWARD CURRENT, 85HFL..F05 SERIES

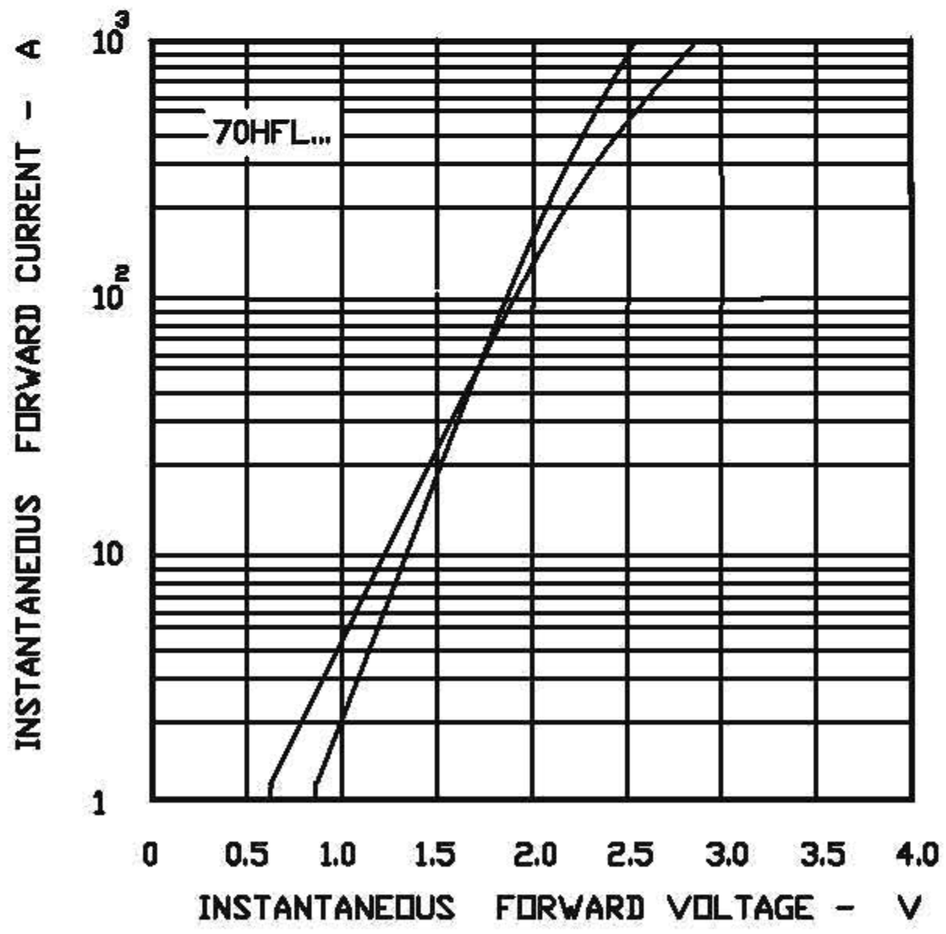


MAX. RECOVERED CHERGE Vs. RATE OF FALL OF FORWARD CURRENT, 85HFL..F05 SERIES

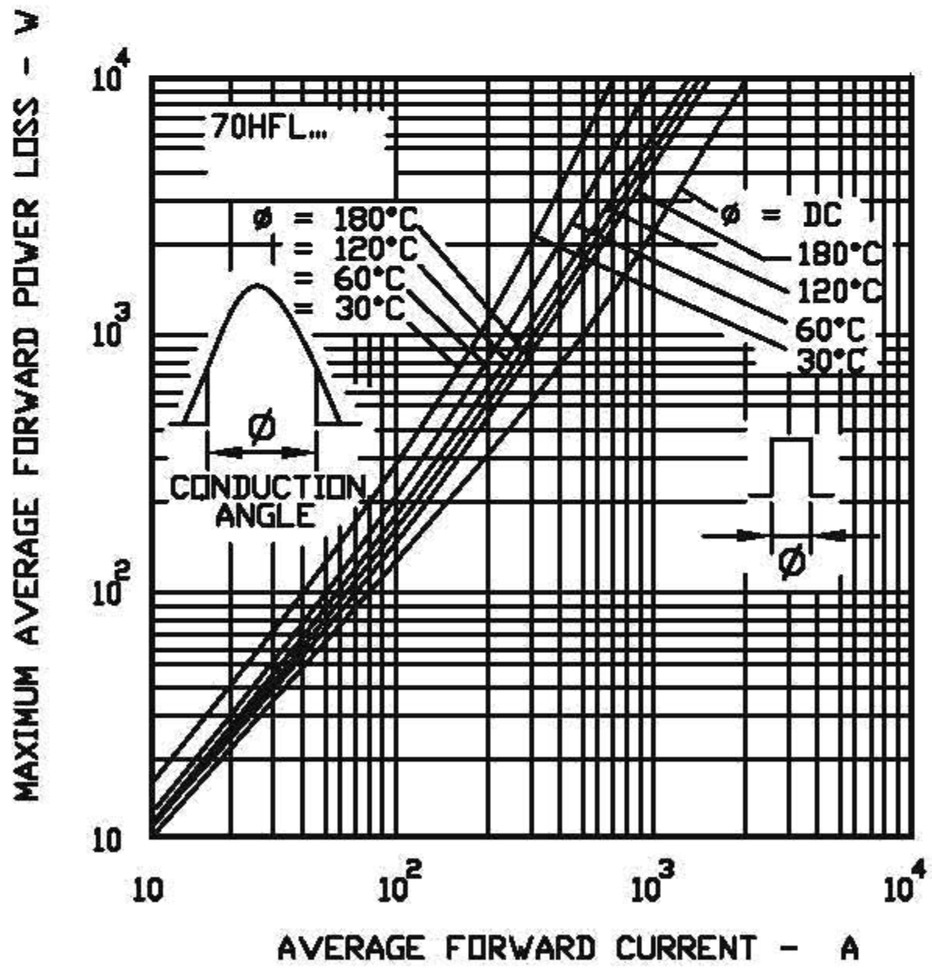


Conduction angle-ø	ΔR K/W
180°	0.08
120°	0.09
90°	0.12
60°	0.18
30°	0.32

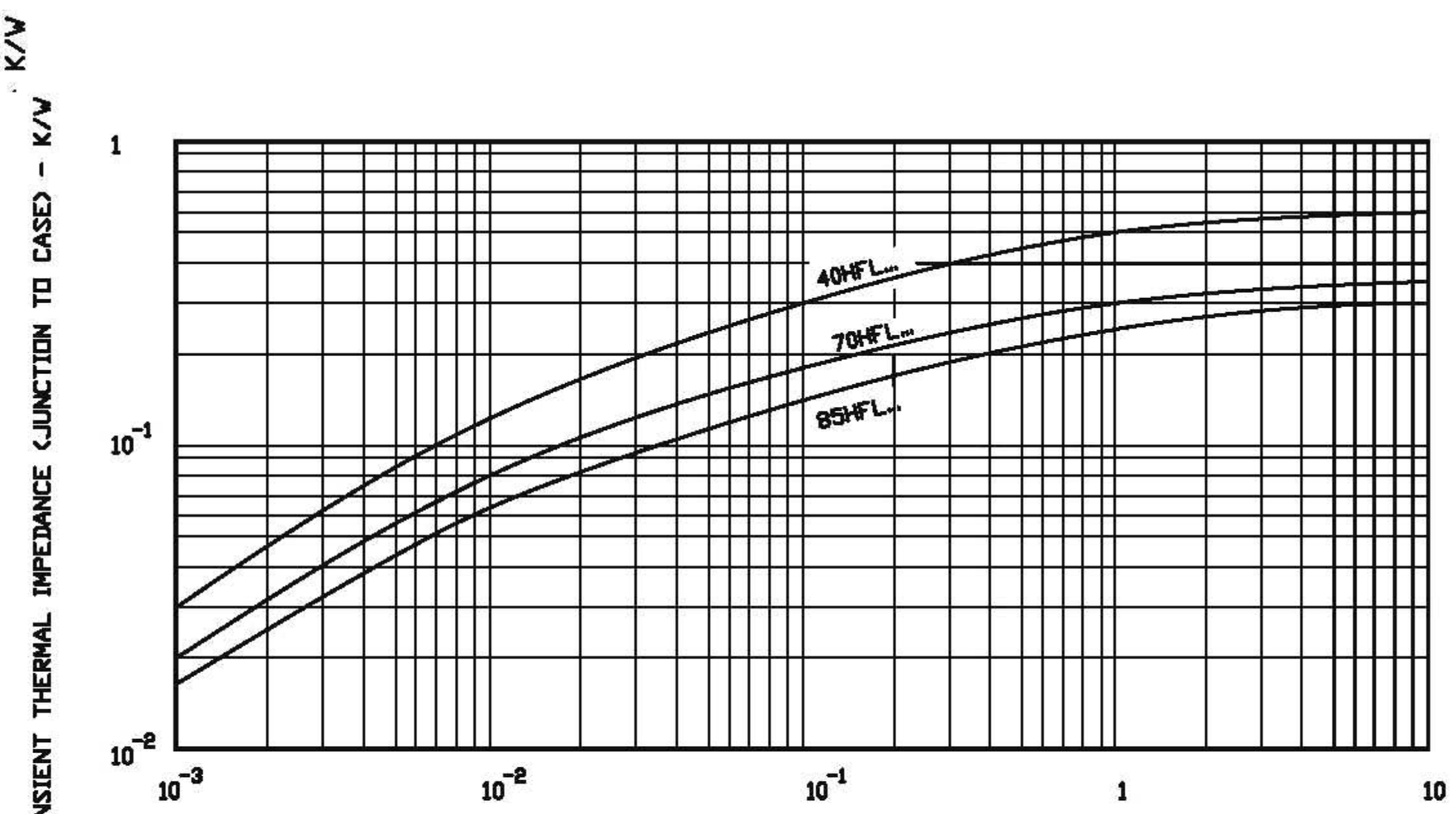
CURRENT RATING NOMOGRAM (SINUSOIDAL WAVEFORMS) 70HFL SERIES



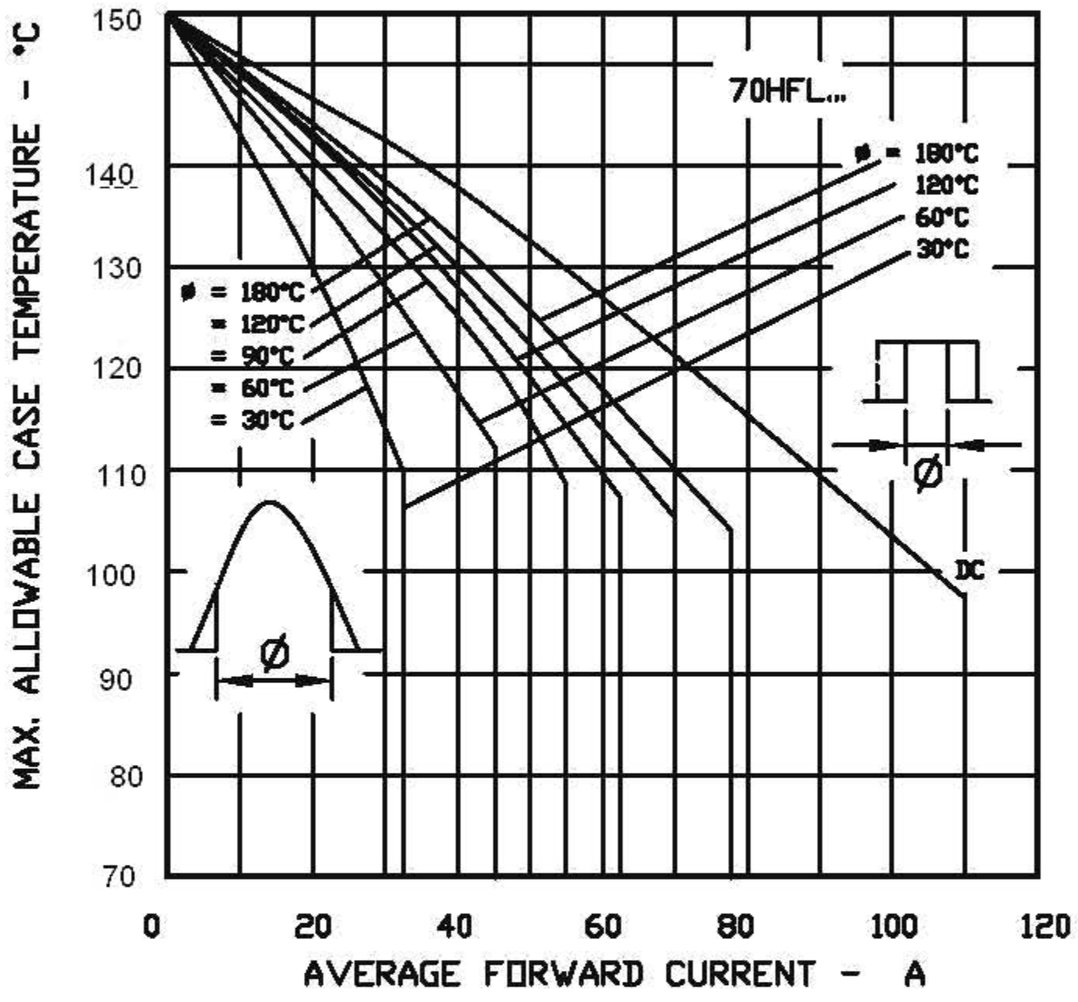
·MAX. FORWARD VOLTAGE Vs.
FORWARD CURRENT, 70HFL SERIES



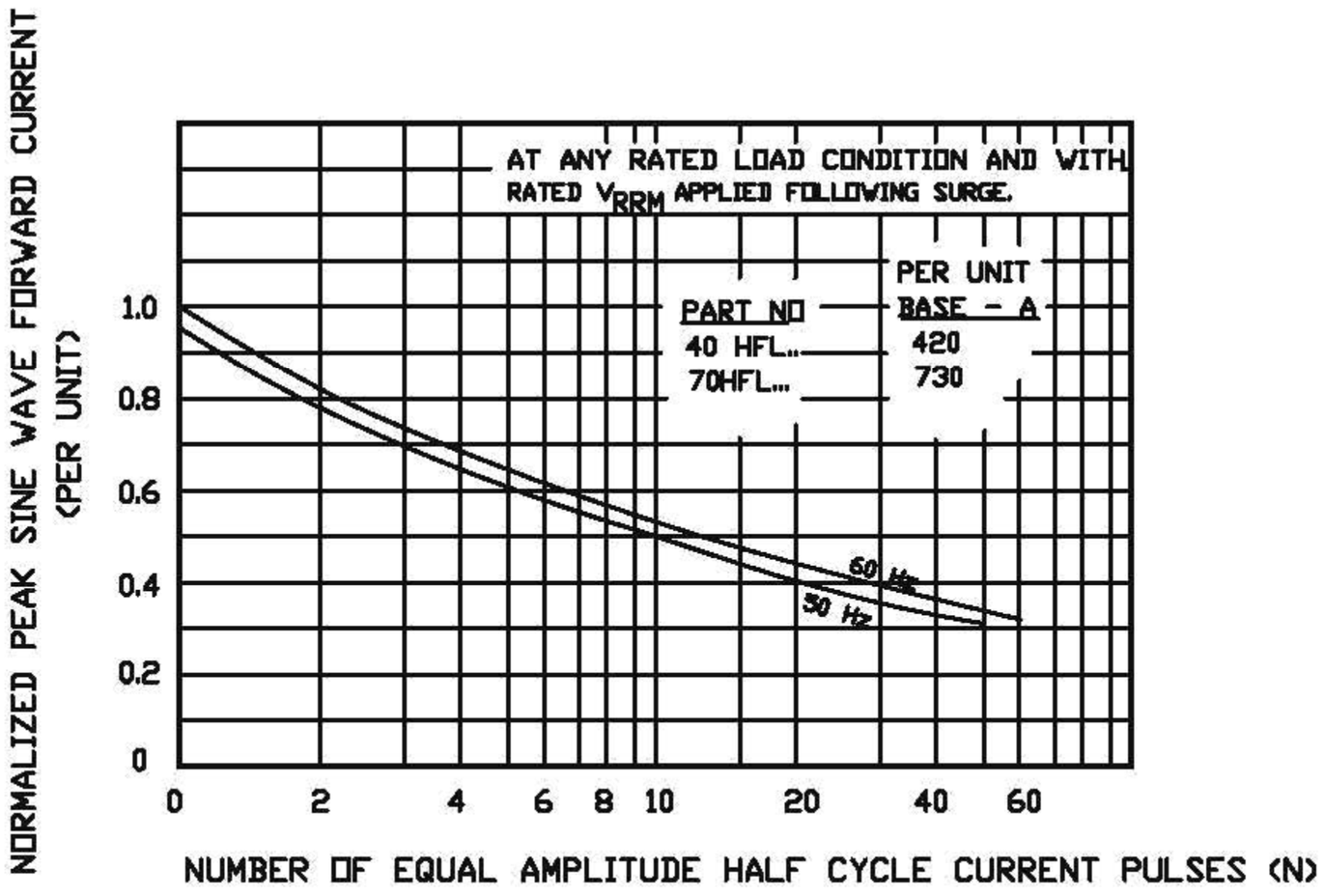
·MAX. FORWARD POWER LOSS Vs
AVERAGE FORWARD CURRENT, 70HFL SERIES



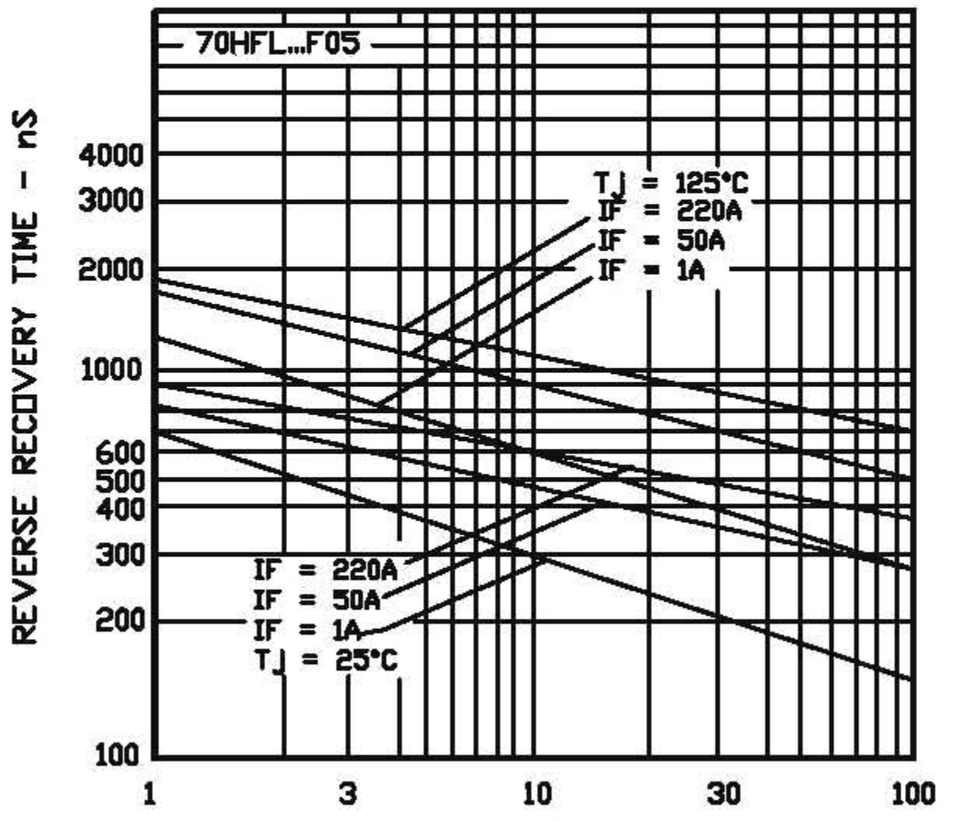
·MAX. TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE Vs. PULSE DURATION, ALL SERIES



AVERAGE FORWARD CURRENT Vs MAX.
ALLOWABLE CASE TEMPERATURE, 70HFL SERIES



MAX. NON-REPETITIVE SURGE CURRENT Vs
NUMBER OF CURRENT PULSES, ALL SERIES



MAX. REVERSE RECOVERY TIME Vs. RATE OF FALL OF FORWARD CURRENT, 70HFL..F05 SERIES

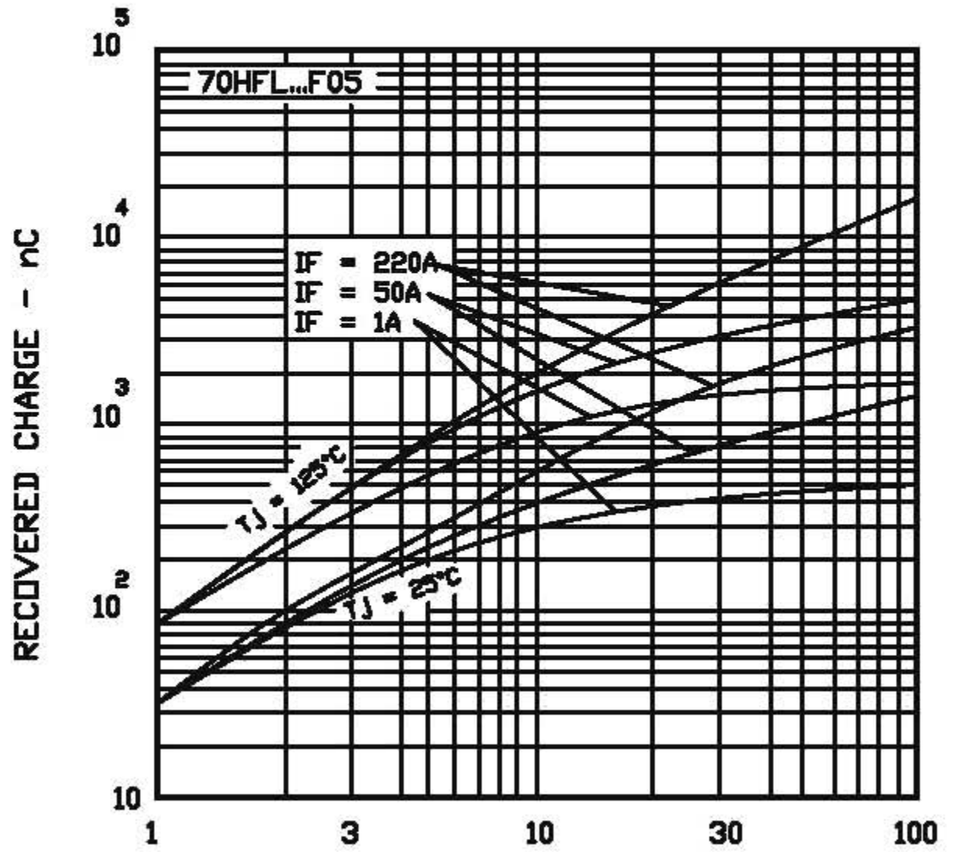
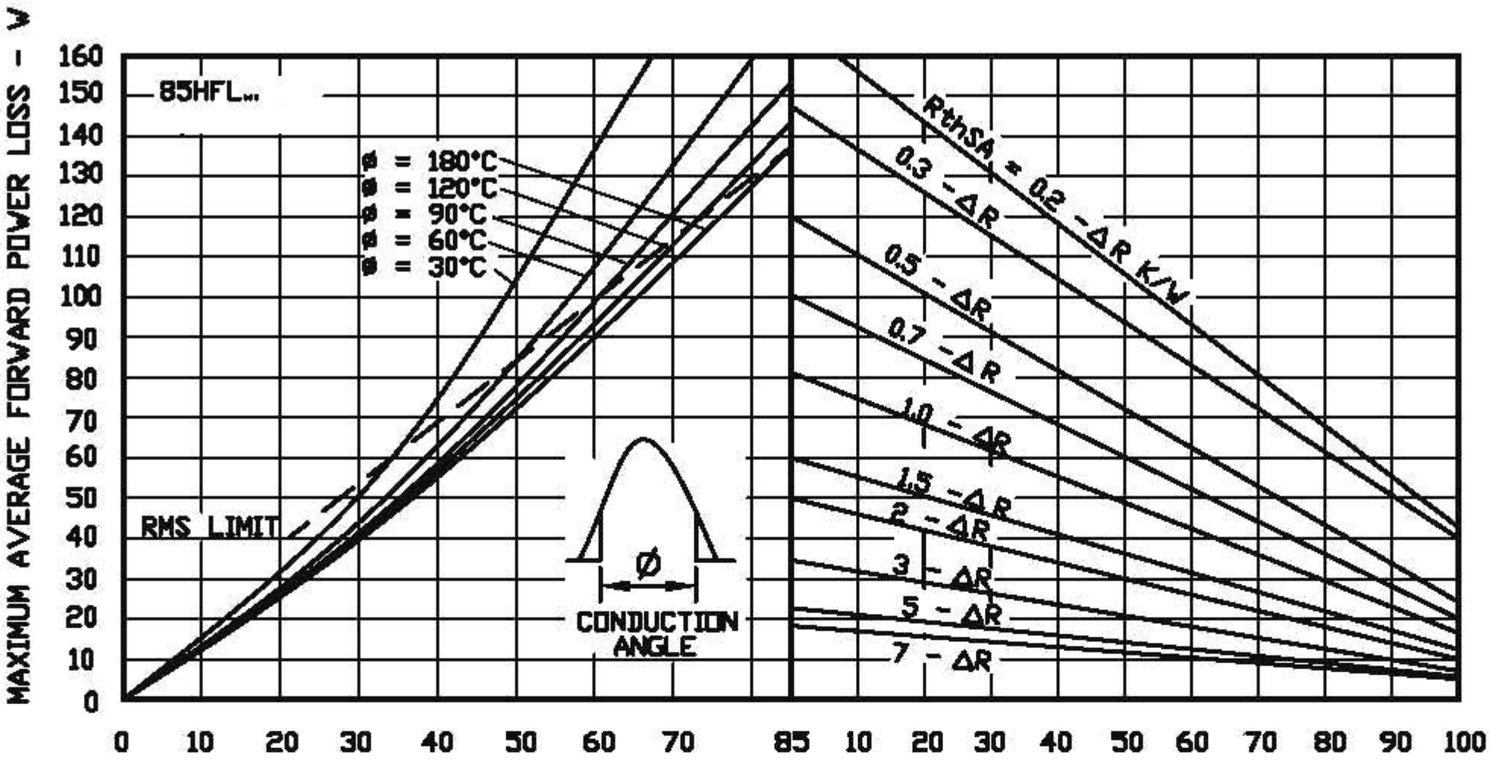
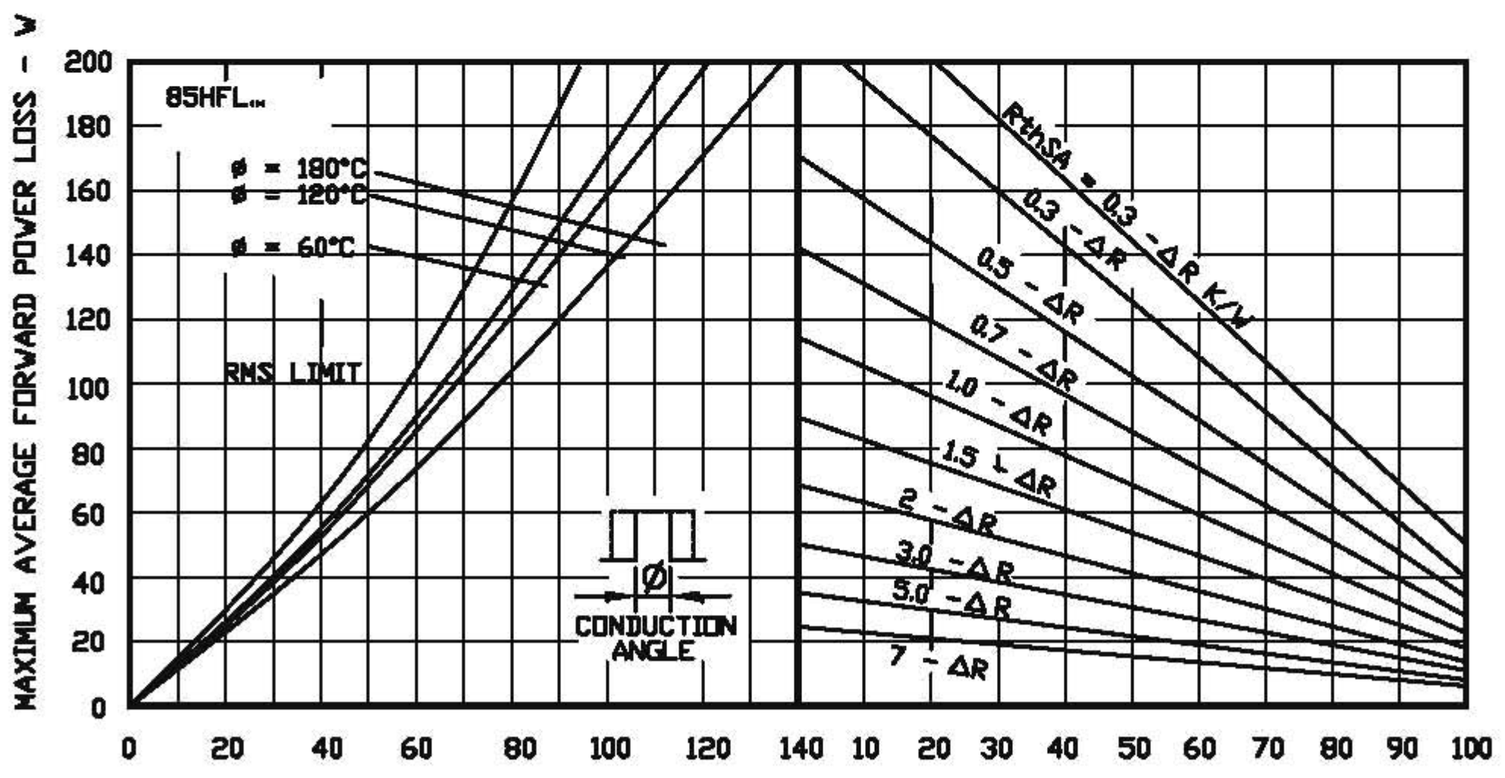


Fig.20-MAX. RECOVERED CHERGE Vs. RATE OF FALL OF FORWARD CURRENT, 70HFL..F05 SERIES



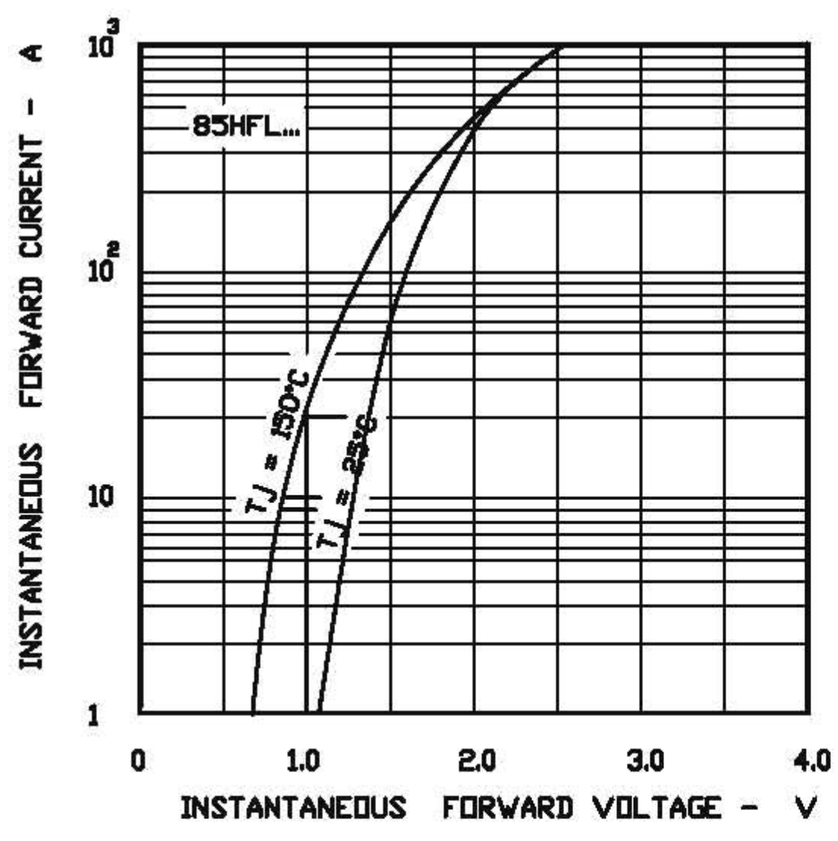
Conduction angle-ø	ΔR K/W
180°	0.06
120°	0.08
90°	0.10
60°	0.16
30°	0.26

·CURRENT RATING NOMOGRAM (SINUSOIDAL WAVEFORMS) 85HFL SERIES

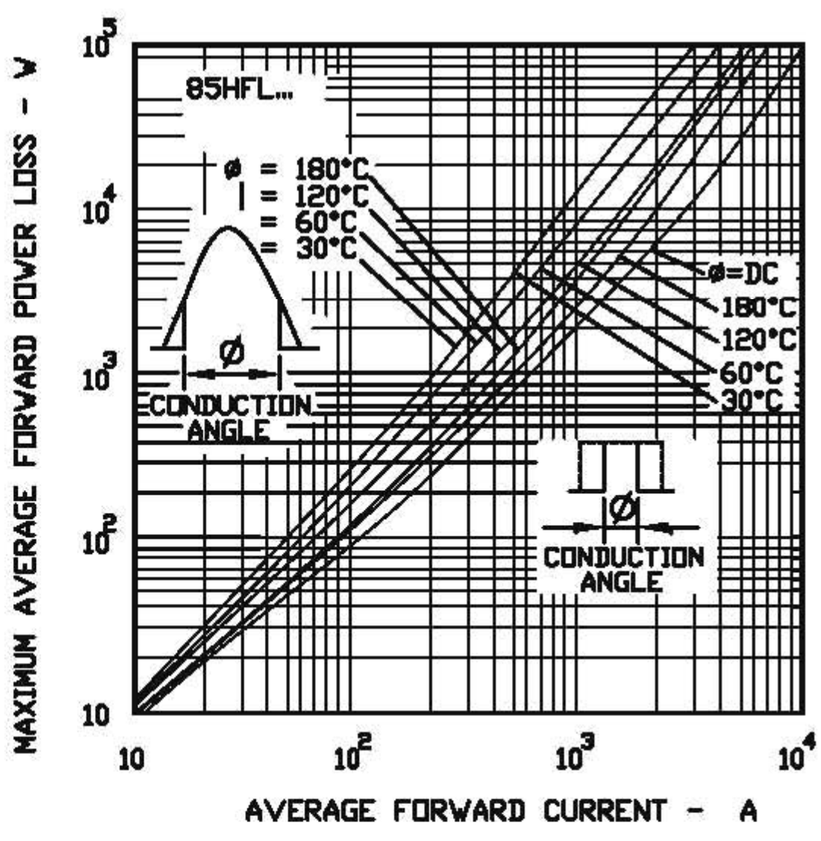


Conduction angle-ø	ΔR K/W
DC	0
180°	0.04
120°	0.06
60°	0.15

CURRENT RATING NOMOGRAM (RECTANGULAR WAVEFORMS) 85HFL SERIES



MAX. FORWARD VOLTAGE Vs.
FORWARD CURRENT, 85HFL SERIES



MAX. FORWARD POWER LOSS Vs
AVERAGE FORWARD CURRENT, 85HFL SERIES