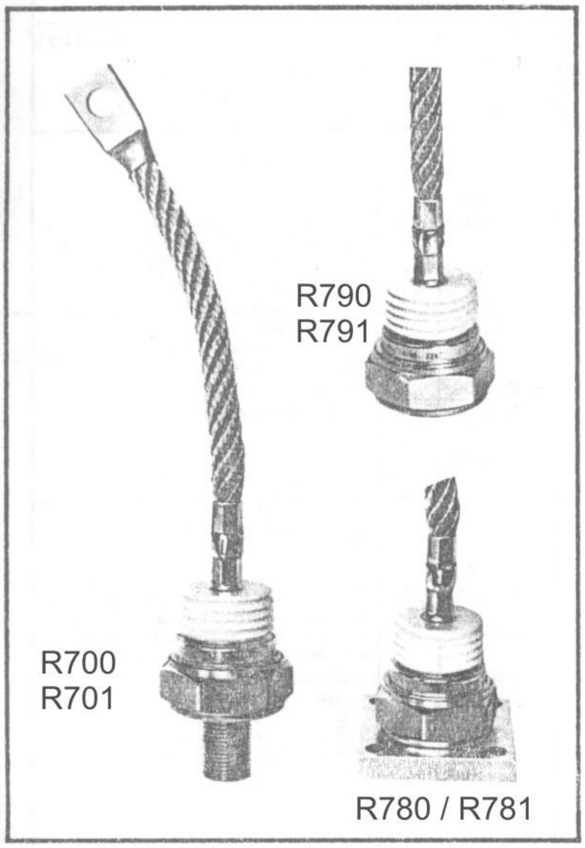
Westinghouse



Silicon Rectifier Diodes

Standard Polarity - Type R700, R780, R790
Reverse Polarity - Type R701, R781, R791
580 to 1200A RMS
245 to 500A AVE

Features

- standard and reverse polarities
- all diffused design
- low thermal impedance
- high RMS current capability
- high voltage availability
- high surge current ratings
- special electrical selection for parallel and series operation
- high reliability and military type qualification
- glazed ceramic seal gives high voltage creepage and strike paths

The Westinghouse CBE construction technique provides a thermal fatigue-free device by eliminating solder joints and a thermal cycling capability in excess of 100.000 thermal cycles.

Ordering Information

Obtain optimum device performance for your application by selecting proper order code from the table below. **(For Numbering System, refer to Technical Informations page 7).**

Type	Voltage		Current		Recovery Time		Recovery Time Circuit		Leads	
Code	V_{RRM} (V)	Code	I_{FAV} (A)	Code	Typical t_{rr} (μs)	Code	Circuit	Code	Case	Code
Standard	100	**01**	245	**25**	15	X		X	R70	UA
Polarity	200	**02**	315	**32**	13				R78	UA
R700	300	**03**	440	**44**	11				R79	UA
R780	400	**04**	500	**50**	9					
R790	500	**05**								
	600	**06**								
Reverse	700	**07**								
Polarity	800	**08**								
R701	900	**09**								
R781	1000	**10**								
R791	1100	**11**								
	1200	**12**								
	1300	**13**								
	1400	**14**								
	1500	**15**								
	1600	**16**								
	1700	**17**								
	1800	**18**								
	1900	**19**								
	2000	**20**								
	2200	**22**								
	2400	**24**								
	2600	**26**								
	2800	**28**								
	3000	**30**								
	3200	**32**								
	3400	**34**								
	3600	**36**								
	3800	**38**								
	4000	**40**								

Example : Standard polarity, R79 case, rated at 245 amps average with V_{RRM} = 3200 Volts. Order as R7903225XXUA

R790	32	25	X	X	UA

Example : Reverse polarity, R78 case, rated at 500 amps average with V_{RSM} = 1400 Volts. Order as R7811250XXUA

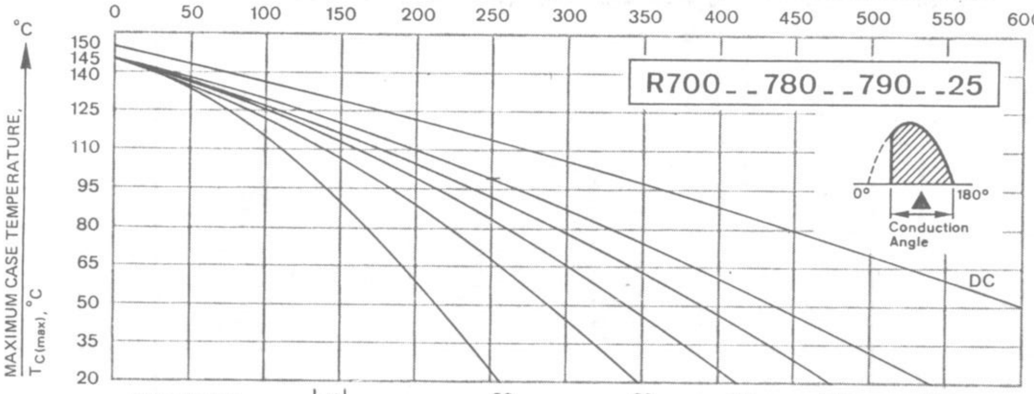
R781	12	50	X	X	UA

Type	CHARACTERISTIC	SYMBOL	UNIT	MIN.	TYP.	MAX.	ORDER CODE	TEST CONDITIONS
Current								Sinusoidal wave form 180° conduction angle
								Tj = + 150°C
R700--25 R780--25 R790--25	RMS for all conduction angles	I_{FRMS}	A			580		
	Average forward	I_{FAV}	A			245	25	Tc = + 100°C under test conditions assumes a thermal resistance $R_{(th)\,CA}$ of less than 0.160°C/W and an ambient temperature of + 40° C.
	Peak surge non-repetitive 10 ms	I_{FSM}	A			9000		No voltage reapplied
	Peak surge non-repetitive 1 ms	I_{FSM}	A			15500		No voltage reapplied
	Peak surge non-repetitive 10 ms	I_{FSM}	A			8000		50 % voltage reapplied
	Peak surge non-repetitive 10 ms	I_{FSM}	A			7000		100 % voltage reapplied
	I^2t for fusing ⩾ 10 ms	I^2t	A^2s			245000		100 % voltage reapplied
	$I^2\sqrt{t}$ for fusing ⩽ 10 ms	$I^2\sqrt{t}$	$A^2\sqrt{s}$			4050000		No voltage reapplied
	Threshold voltage	$V_{(TO)}$	V			1.30		
	Slope resistance	r_T	mΩ			0.60		
								Tj = + 150°C
R700--32 R780--32 R790--32	RMS for all conduction angles	I_{FRMS}	A			750		
	Average forward	I_{FAV}	A			315	32	Tc = + 100°C under test conditions assumes a thermal resistance $R_{(th)\,CA}$ of less than 0.150°C/W and an ambient temperature of + 40°C.
	Peak surge non-repetitive 10 ms	I_{FSM}	A			10200		No voltage reapplied
	Peak surge non-repetitive 1 ms	I_{FSM}	A			18160		No voltage reapplied
	Peak surge non-repetitive 10 ms	I_{FSM}	A			9200		50 % voltage reapplied
	Peak surge non-repetitive 10 ms	I_{FSM}	A			8000		100 % voltage reapplied
	I^2t for fusing ⩾ 10 ms	I^2t	A^2s			320000		100 % voltage reapplied
	$I^2\sqrt{t}$ for fusing ⩽ 10 ms	$I^2\sqrt{t}$	$A^2\sqrt{s}$			5202000		No voltage reapplied
	Threshold voltage	$V_{(TO)}$	V			0.90		
	Slope resistance	r_T	mΩ			0.52		
								Tj = + 175°C
R700--44 R780--44 R790--44	RMS for all conduction angles	I_{FRMS}	A			900		
	Average forward	I_{FAV}	A			440	44	Tc = + 110°C under test conditions assumes a thermal resistance $R_{(th)\,CA}$ of less than 0.130°C/W and an ambient temperature of + 40°C.
	Peak surge non-repetitive 10 ms	I_{FSM}	A			11500		No voltage reapplied
	Peak surge non-repetitive 1 ms	I_{FSM}	A			20400		No voltage reapplied
	Peak surge non-repetitive 10 ms	I_{FSM}	A			10300		50 % voltage reapplied
	Peak surge non-repetitive 10 ms	I_{FSM}	A			9000		100 % voltage reapplied
	I^2t for fusing ⩾ 10 ms	I^2t	A^2s			405000		100 % voltage reapplied
	$I^2\sqrt{t}$ for fusing ⩽ 10 ms	$I^2\sqrt{t}$	$A^2\sqrt{s}$			6612500		No voltage reapplied
	Threshold voltage	$V_{(TO)}$	V			0.80		
	Slope resistance	r_T	mΩ			0.42		
								Tj = + 190°C
R700--50 R780--50 R790--50	RMS for all conduction angles	I_{FRMS}	A			1200		
	Average forward	I_{FAV}	A			500	50	Tc = + 125°C under test conditions assumes a thermal resistance $R_{(th)\,CA}$ of less than 0.160°C/W and an ambient temperature of + 40°C.
	Peak surge non-repetitive 10 ms	I_{FSM}	A			12800		No voltage reapplied
	Peak surge non-repetitive 1 ms	I_{FSM}	A			22700		No voltage reapplied
	Peak surge non-repetitive 10 ms	I_{FSM}	A			11500		50 % voltage reapplied
	Peak surge non-repetitive 10 ms	I_{FSM}	A			10000		100 % voltage reapplied
	I^2t for fusing ⩾ 10 ms	I^2t	A^2s			500000		100 % voltage reapplied
	$I^2\sqrt{t}$ for fusing ⩽ 10 ms	$I^2\sqrt{t}$	$A^2\sqrt{s}$			8192000		No voltage reapplied
	Threshold voltage	$V_{(TO)}$	V			0.70		
	Slope resistance	r_T	mΩ			0.32		
	RMS for all conduction angles	I_{FRMS}	A					
	Average forward	I_{FAV}	A					
	Peak surge non-repetitive 10 ms	I_{FSM}	A	RESERVED FOR FUTURE PRODUCT INTRODUCTION				No voltage reapplied
	Peak surge non-repetitive 1 ms	I_{FSM}	A					No voltage reapplied
	Peak surge non-repetitive 10 ms	I_{FSM}	A					50 % voltage reapplied
	Peak surge non-repetitive 10 ms	I_{FSM}	A					100 % voltage reapplied
	I^2t for fusing ⩾ 10 ms	I^2t	A^2s					100 % voltage reapplied
	$I^2\sqrt{t}$ for fusing ⩽ 10 ms	$I^2\sqrt{t}$	$A^2\sqrt{s}$					No voltage reapplied
	Threshold voltage	$V_{(TO)}$	V					
	Slope resistance	r_T	mΩ					

	CHARACTERISTIC	SYMBOL	UNIT	MIN.	TYP.	MAX.	ORDER CODE	TEST CONDITIONS
Voltage							Refer to ordering information	Sinusoidal wave form 180° conduction angle.
	Repetitive peak reverse	V_{RRM}						$V = V_{RRM}$
	R700, R780, R790 - - 25		V	100		**4000**		$T_j = +150°C$
	R700, R780, R790 - - 32		V	100		**3000**		$T_j = +150°C$
	R700, R780, R790 - - 44		V	100		**2200**		$T_j = +175°C$
	R700, R780, R790 - - 50		V	100		**1200**		$T_j = +190°C$
	Non repetitive peak reverse for all voltage classes	V_{RSM}	V			V_{RRM} + 200		Non-recurrent voltage ≤ 5 ms $T_j = +25°C$ $V = V_{RRM} + 200$ Volts
Switching	Reverse Recovery Time	t_{rr}	μs					$T_j = +25°C$ $I_{FM} = 1100$ A tp = 138 μs dir/dt = 25A/μs
	R700, R780, R790 - - 25				15			
	R700, R780, R790 - - 32				13			
	R700, R780, R790 - - 44				11			
	R700, R780, R790 - - 50				9			
	Recovered charge	Q_s	μC					$T_j = +25°C$ $I_{FM} = 400$A tp = 250 μs dir/dt = 5A/μs
	R700, R780, R790 - - 25				1200			
	R700, R780, R790 - - 32				900			
	R700, R780, R790 - - 44				600			
	R700, R780, R790 - - 50				300			
Thermal	Operating junction temperature	T_j	°C					
	R700, R780, R790 - - 25			− 55		+ 150		
	R700, R780, R790 - - 32			− 55		+ 150		
	R700, R780, R790 - - 44			− 55		+ 175		
	R700, R780, R790 - - 50			− 55		+ 190		
	Operating storage temperature for all types	T_{STG}	°C	− 55		+ 200		
	Thermal resistance junction to case for stud technology type R700	$R_{(th)JC}$	°C/W			**0.100**		D.C.
						0.110		180° conduction angle ⋂, ⊓
	(For flat base technologies Types R780, R790 multiply by 0.90)					0.115		120° conduction angle ⋂, ⊓
						0.120		90° conduction angle ⋂, ⊓
						0.125		60° conduction angle ⋂, ⊓
						0.130		30° conduction angle ⋂, ⊓
	Thermal resistance **case to heat sink**	$R_{(th)CS}$	°C/W					Lubricated heat sink cleaned surface finish 30-60μ in, flat to .001.
	− for R700					0.030		
	− for R780, R790					0.020		
	Recommended thermal resistance heat sink to ambient	$R_{(th)SA}$	°C/W			0.135		Air cooling = 1000 LFM
						0.600		Natural cooling
	Recommended thermal resistance junction to ambient for R700 $R_{(th)JA} = R_{(th)JC} + R_{(th)CS} + R_{(th)SA}$	$R_{(th)JA}$	°C/W			0.280		Air cooling = 1000 LFM 180° conduction angle sinusoidal wave form $T_A = +40°C$
Others	Repetitive peak reverse current	I_{RRM}	mA					$V = V_{RRM}$
	R700, R780, R790 - - 25					50		$T_j = +150°C$
	R700, R780, R790 - - 32					50		$T_j = +150°C$
	R700, R780, R790 - - 44					50		$T_j = +175°C$
	R700, R780, R790 - - 50					50		$T_j = +190°C$

Note - All Datas are Valid for Both Standard and Reverse Polarities.

Figure 1 – Case Temperature vs Forward Current, Half-Wave Sinusoid, for Various Conduction Angles.



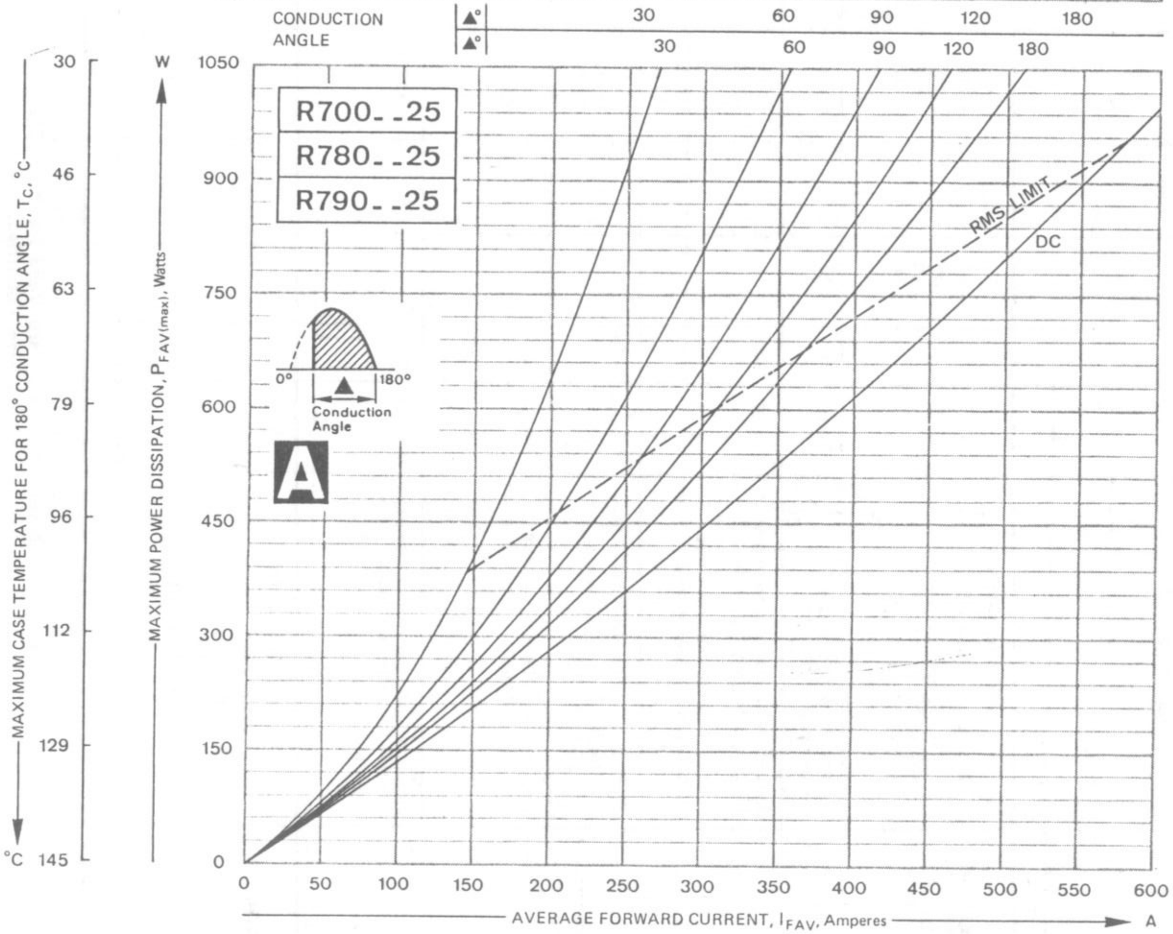


Figure 2 – Power Dissipation vs Forward Current, Half-Wave Sinusoid, for Various Conduction Angles.

NOMOGRAPH for DETERMINATION of ALLOWABLE OPERATING LOADS.

GRAPH **A** IN COMBINATION WITH GRAPH **B** MAY BE USED TO DETERMINE :

1. **Allowable** I_{AV} vs. a specific junction-to-ambient thermal resistance ($R_{(th)JA}$) and specified ambient temperature.
2. **Maximum allowable junction-to-ambient thermal resistance** ($R_{(th)JA}$) for a specified I_{AV} and specified ambient temperature.
3. **Maximum allowable ambient temperature** for a specified I_{AV} and a specified junction-to-ambient thermal resistance ($R_{(th)JA}$).

In determining the junction-to-ambient thermal resistance ($R_{(th)JA}$), attention must be given to selecting the correct junction-to-case thermal resistance ($R_{(th)JC}$) which is related to the conduction angle to be considered (refer to page 3, Thermal Data).

To calculate the required heat sink thermal resistance, use :

$$R_{(th)SA} = R_{(th)JA} - \left[R_{(th)JC\,(\text{conduction angle})} + R_{(th)CS} \right]$$

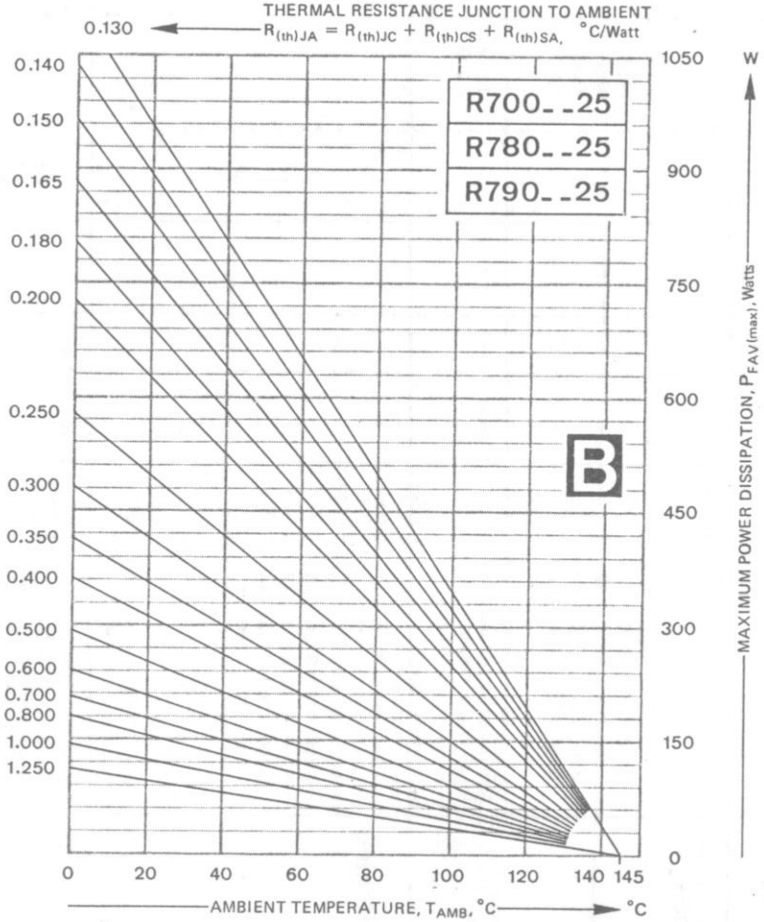
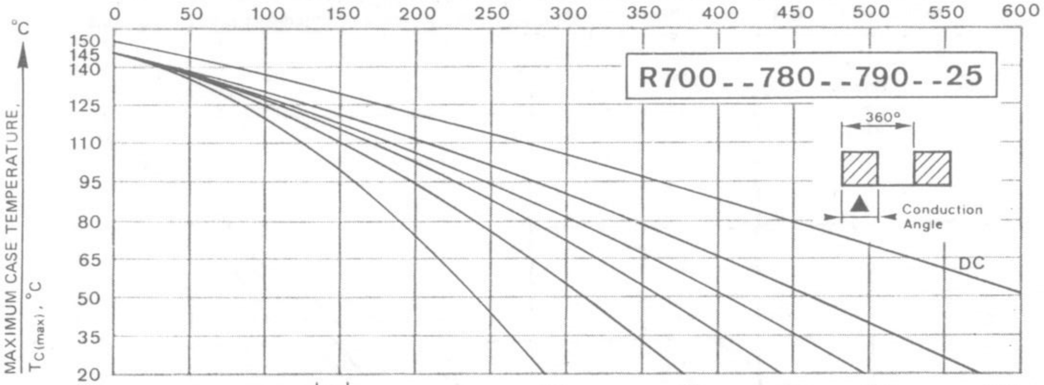


Figure 3 – Maximum Allowable Power Dissipation vs Ambient Temperature for Various Thermal Resistances Junction to Ambient.

Figure 4 – Case Temperature vs Forward Current, Rectangular Wave, for Various Conduction Angles.



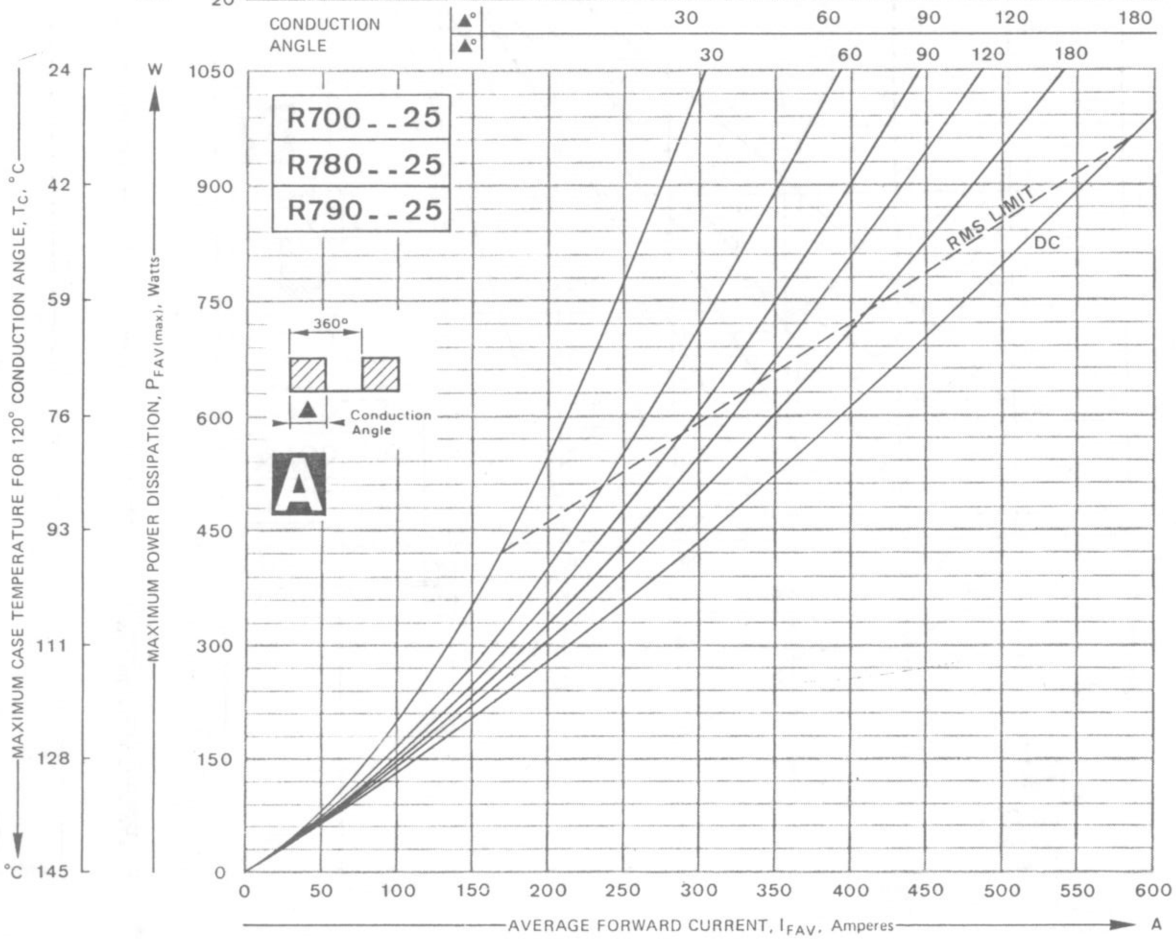


Figure 5 – Power Dissipation vs Forward Current, Rectangular Wave, for Various Conduction Angles.

HOW TO USE THE NOMOGRAPH.

For solution to (1) enter graph **B** at the specified T_A. Draw a vertical line to the specified $R_{(th)JA}$ line. Draw a horizontal line left to the power dissipation curve associated with the conduction angle considered in graph **A**. Drawing a vertical line down to the I_{AV} axis provides the desired answer.

For solution to (2) enter graphs **A** and **B** at the specified values. Draw two vertical lines. At the point where the drawn line and the power dissipation curve intersect, draw a horizontal line to the right. The intersection of the two drawn lines in graph **B** is one point on the desired junction-to-ambient thermal resistance line. If this point falls between two lines, use the lower value of $R_{(th)JA}$.

For a solution to (3) simply reverse the path of the solution proposed for (1).

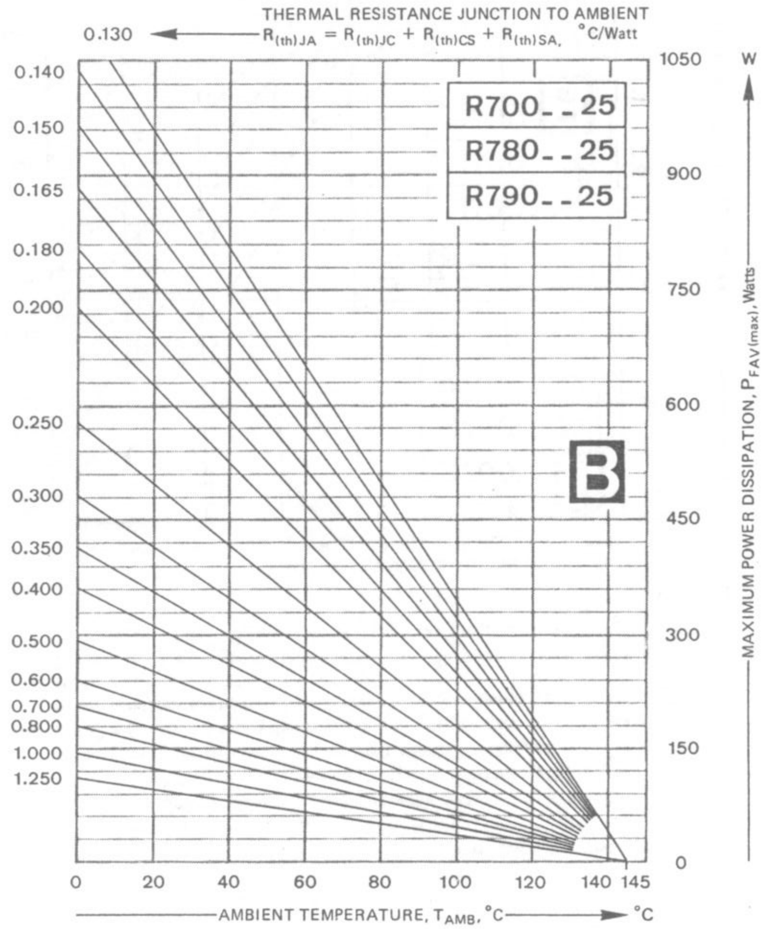
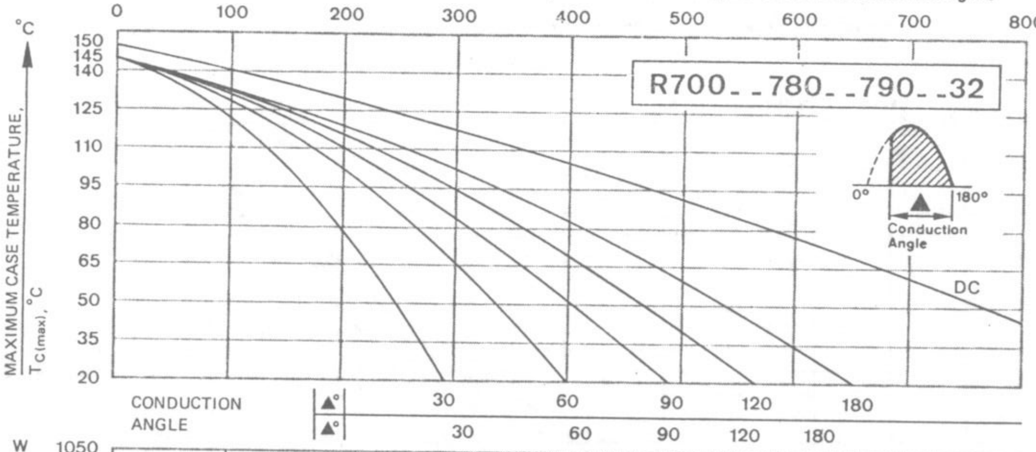


Figure 6 – Maximum Allowable Power Dissipation vs Ambient Temperature for Various Thermal Resistances Junction to Ambient.

Figure 7 – Case Temperature vs Forward Current, Half-Wave Sinusoid, for Various Conduction Angles.



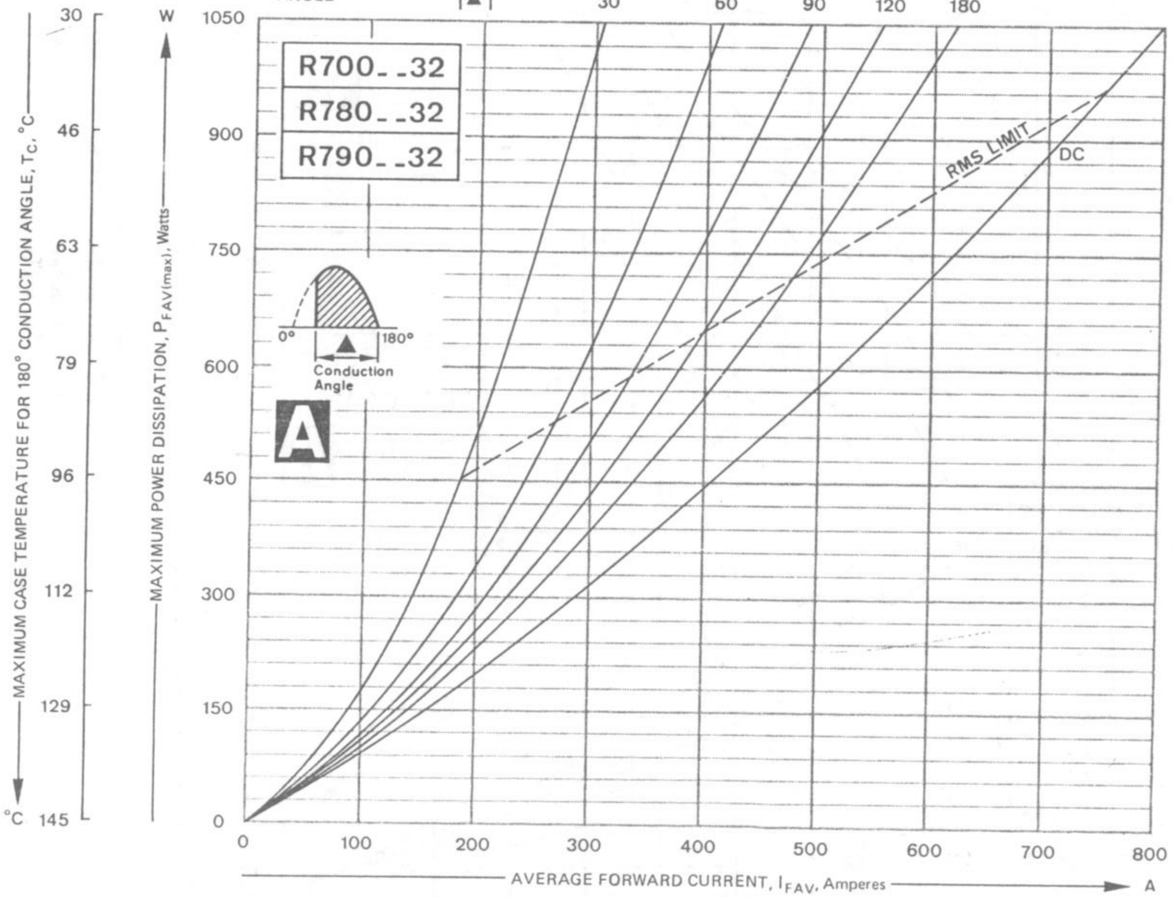


Figure 8 – Power Dissipation vs Forward Current, Half-Wave Sinusoid, for Various Conduction Angles.

NOMOGRAPH for DETERMINATION of ALLOWABLE OPERATING LOADS.

GRAPH **A** IN COMBINATION WITH GRAPH **B** MAY BE USED TO DETERMINE :

1. Allowable I_{AV} vs. a specific junction-to-ambient thermal resistance ($R_{(th)JA}$) and specified ambient temperature.
2. **Maximum allowable junction-to-ambient thermal resistance** ($R_{(th)JA}$) for a specified I_{AV} and specified ambient temperature.
3. **Maximum allowable ambient temperature** for a specified I_{AV} and a specified junction-to-ambient thermal resistance ($R_{(th)JA}$).

In determining the junction-to-ambient thermal resistance ($R_{(th)JA}$), attention must be given to selecting the correct junction-to-case thermal resistance ($R_{(th)JC}$) which is related to the conduction angle to be considered (refer to page 3, Thermal Data).

To calculate the required heat sink thermal resistance, use :

$$R_{(th)SA} = R_{(th)JA} - \left[R_{(th)JC}\,(\text{conduction angle}) + R_{(th)CS} \right]$$

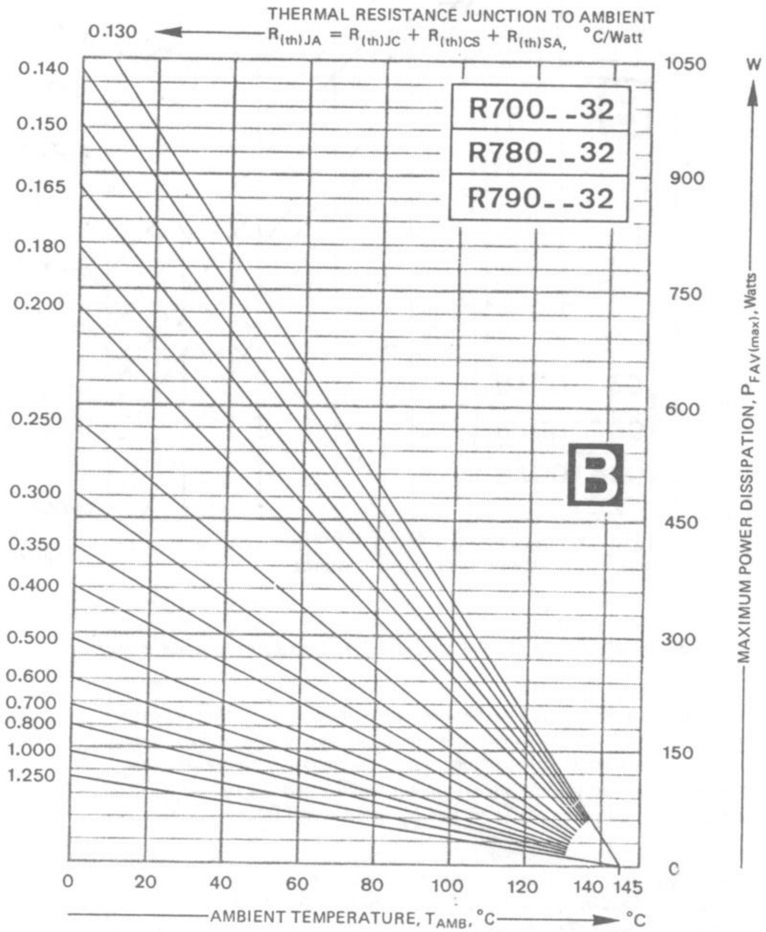
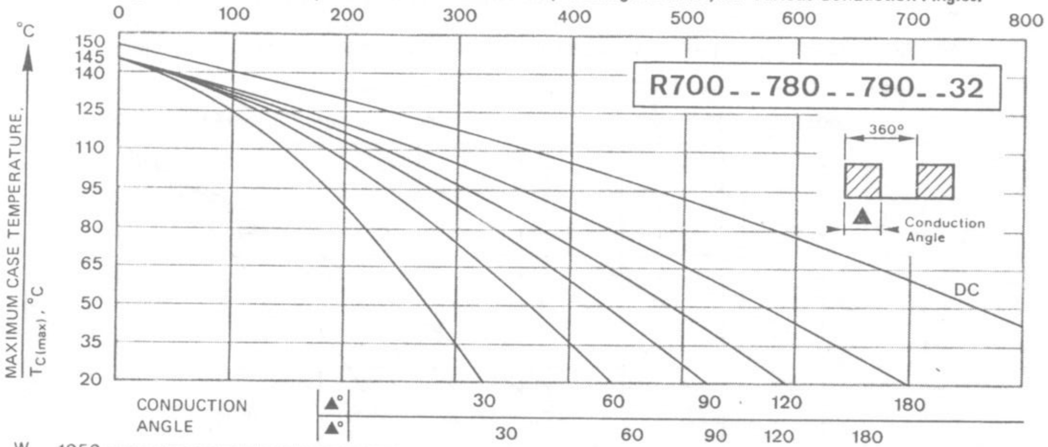


Figure 9 – Maximum Allowable Power Dissipation vs Ambient Temperature for Various Thermal Resistances Junction to Ambient.

Figure 10 – Case Temperature vs Forward Current, Rectangular Wave, for Various Conduction Angles.



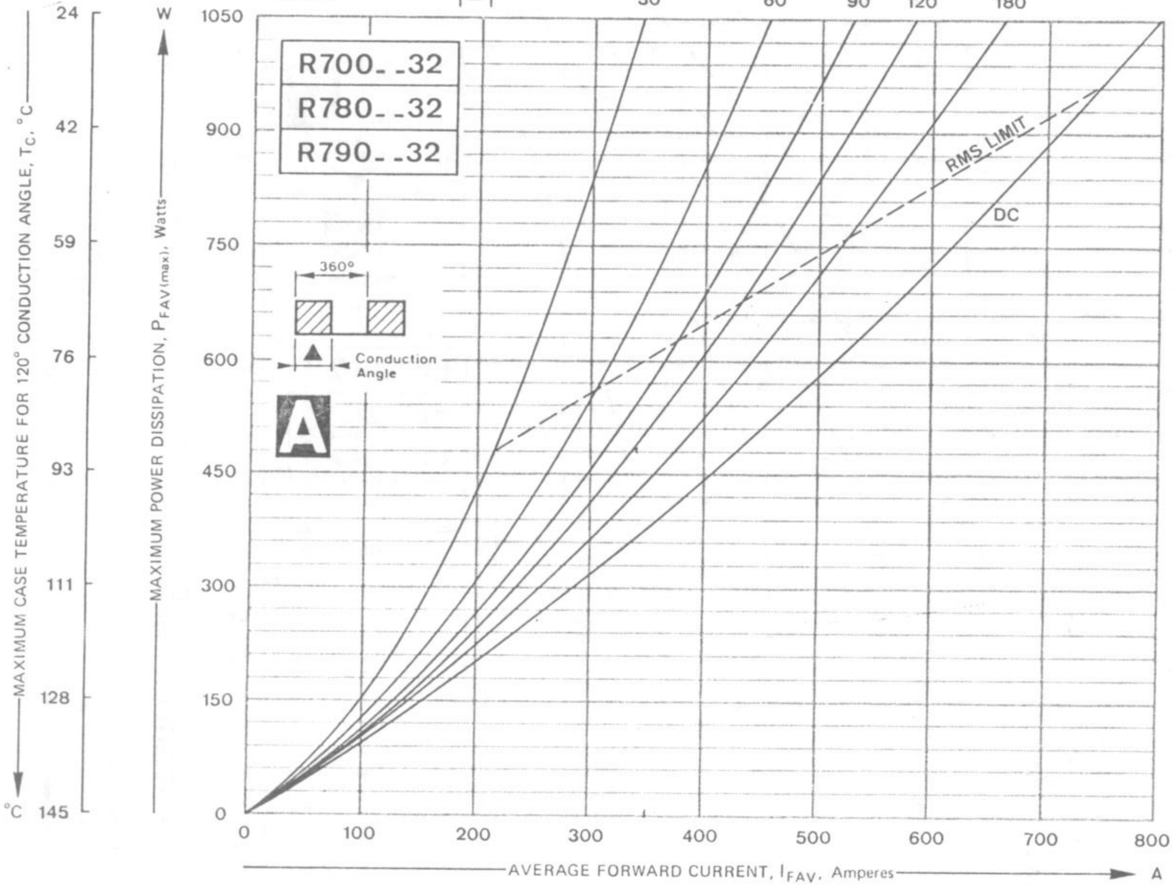


Figure 11 – Power Dissipation vs Forward Current, Rectangular Wave, for Various Conduction Angles.

HOW TO USE THE NOMOGRAPH.

For solution to (1) enter graph **B** at the specified T_A. Draw a vertical line to the specified $R_{(th)JA}$ line. Draw a horizontal line left to the power dissipation curve associated with the conduction angle considered in graph **A**. Drawing a vertical line down to the I_{AV} axis provides the desired answer.

For solution to (2) enter graphs **A** and **B** at the specified values. Draw two vertical lines. At the point where the drawn line and the power dissipation curve intersect, draw a horizontal line to the right. The intersection of the two drawn lines in graph **B** is one point on the desired junction-to-ambient thermal resistance line. If this point falls between two lines, use the lower value of $R_{(th)JA}$.

For a solution to (3) simply reverse the path of the solution proposed for (1).

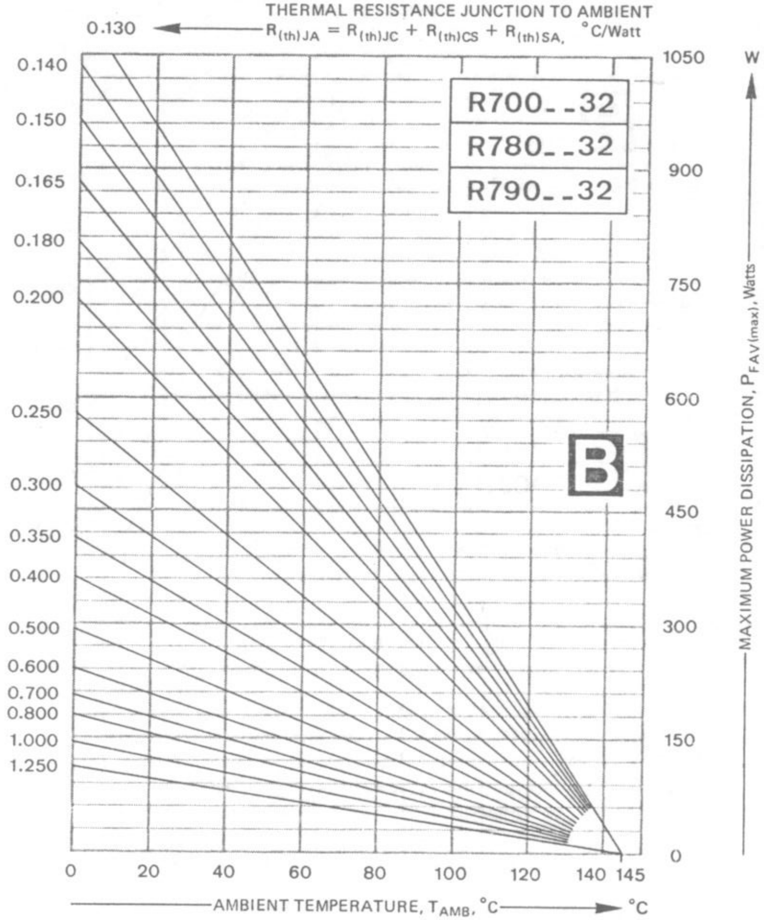
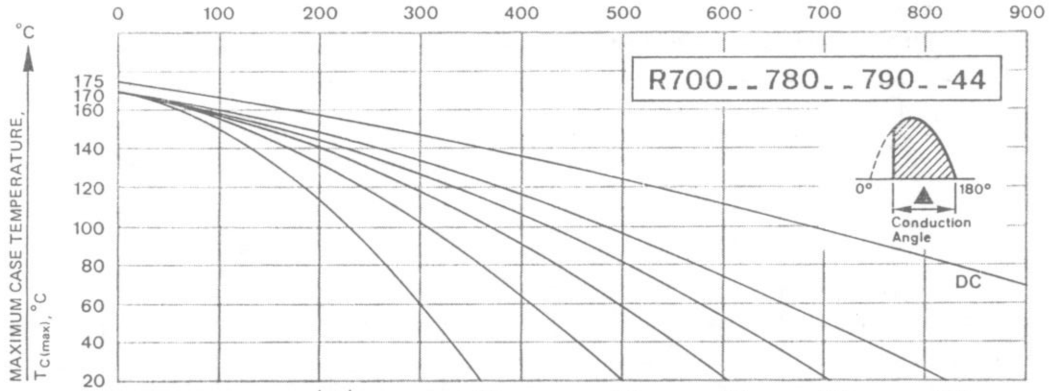


Figure 12 – Maximum Allowable Power Dissipation vs Ambient Temperature for Various Thermal Resistances Junction to Ambient.

Figure 13 – Case Temperature vs Forward Current, Half-Wave Sinusoid, for Various Conduction Angles.



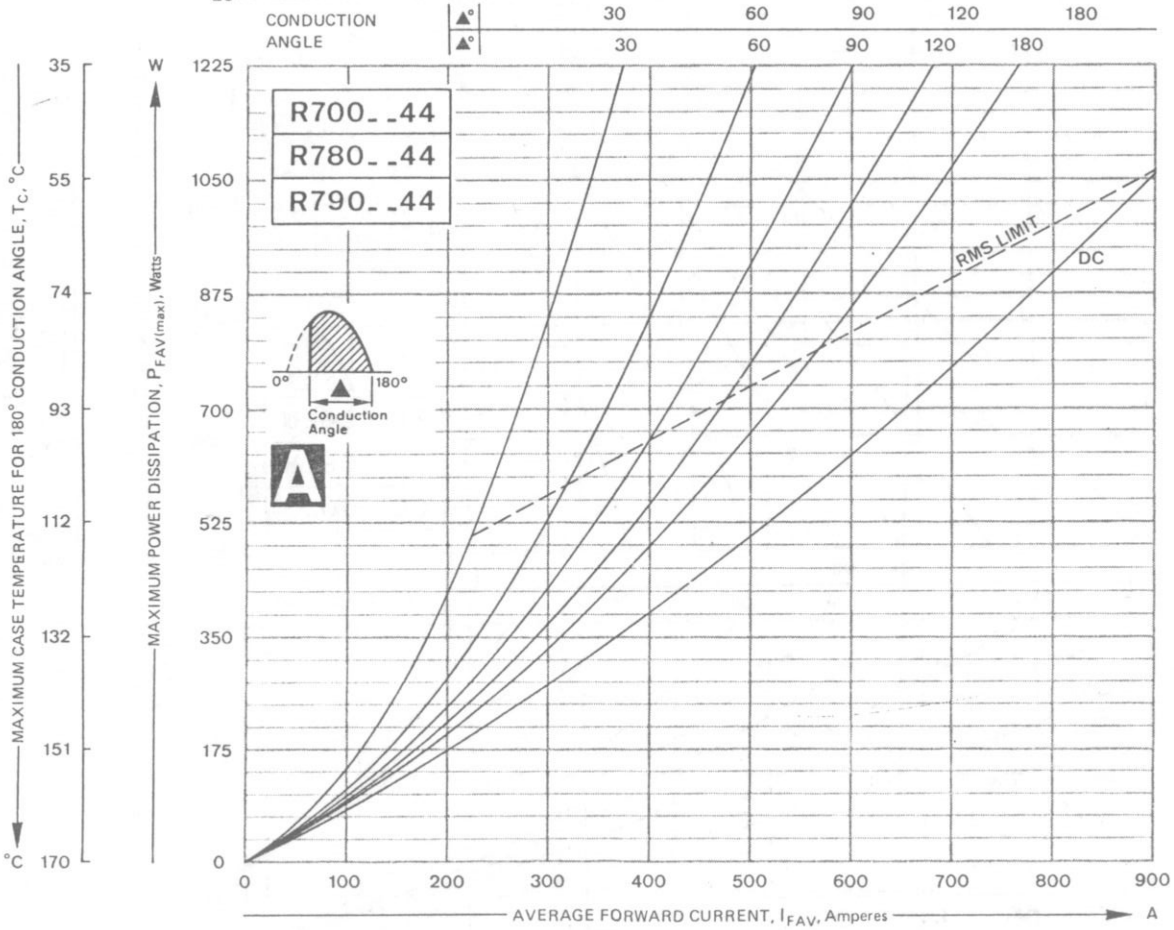


Figure 14 – Power Dissipation vs Forward Current, Half-Wave Sinusoid, for Various Conduction Angles.

NOMOGRAPH for DETERMINATION of ALLOWABLE OPERATING LOADS.

GRAPH **A** IN COMBINATION WITH GRAPH **B** MAY BE USED TO DETERMINE :

1. **Allowable** I_{AV} vs. a specific junction-to-ambient-thermal resistance ($R_{(th)JA}$) and specified ambient temperature.
2. **Maximum allowable junction-to-ambient thermal resistance** ($R_{(th)JA}$) for a specified I_{AV} and specified ambient temperature.
3. **Maximum allowable ambient temperature** for a specified I_{AV} and a specified junction-to-ambient thermal resistance ($R_{(th)JA}$).

In determining the junction-to-ambient thermal resistance ($R_{(th)JA}$), attention must be given to selecting the correct junction-to-case thermal resistance ($R_{(th)JC}$) which is related to the conduction angle to be considered (refer to page 3, Thermal Data).

To calculate the required heat sink thermal resistance, use :

$$R_{(th)SA} = R_{(th)JA} - \left[R_{(th)JC}\left(\frac{\text{conduction}}{\text{angle}}\right) + R_{(th)CS}\right]$$

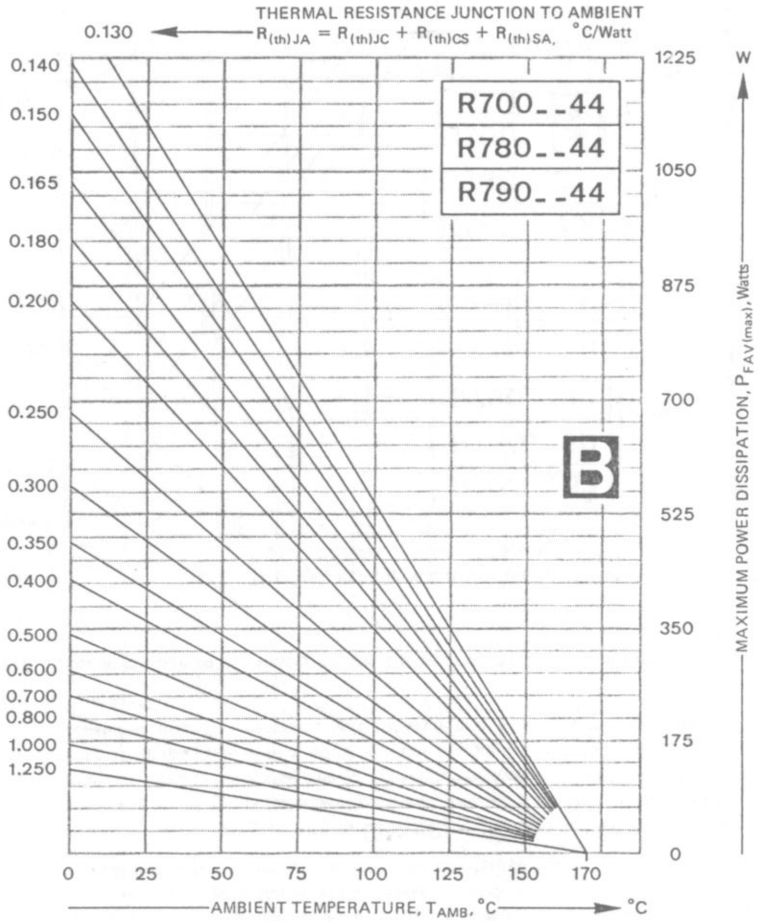


Figure 15 – Maximum Allowable Power Dissipation vs Ambient Temperature for Various Thermal Resistances Junction to Ambient.

Figure 16 – Case Temperature vs Forward Current, Rectangular Wave, for Various Conduction Angles.

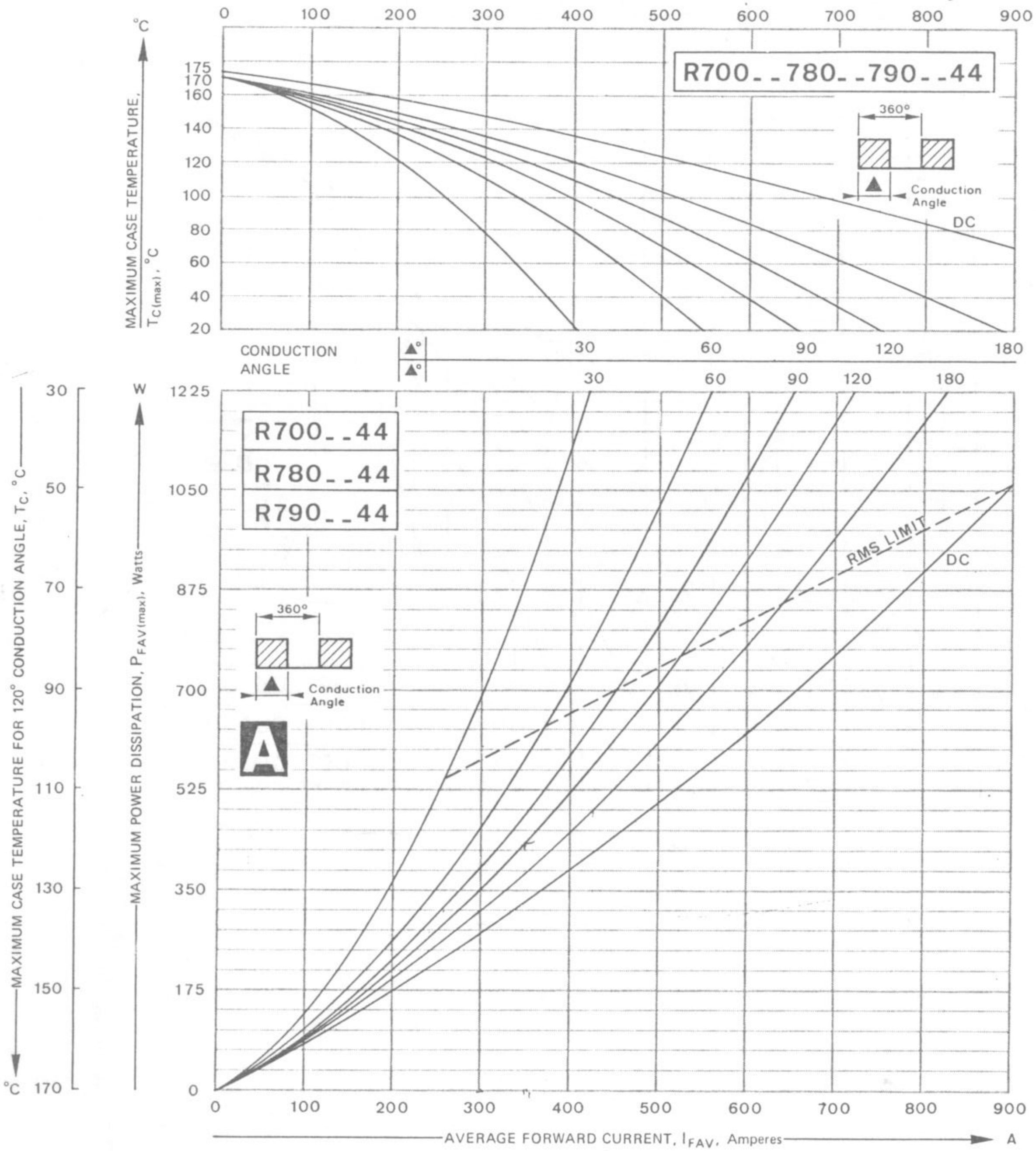


Figure 17 – Power Dissipation vs Forward Current, Rectangular Wave, for Various Conduction Angles.

HOW TO USE THE NOMOGRAPH.

For solution to (1) enter graph **B** at the specified T_A. Draw a vertical line to the specified $R_{(th)JA}$ line. Draw a horizontal line left to the power dissipation curve associated with the conduction angle considered in graph **A**. Drawing a vertical line down to the I_{AV} axis provides the desired answer.

For solution to (2) enter graphs **A** and **B** at the specified values. Draw two vertical lines. At the point where the drawn line and the power dissipation curve intersect, draw a horizontal line to the right. The intersection of the two drawn lines in graph **B** is one point on the desired junction-to-ambient thermal resistance line. If this point falls between two lines, use the lower value of $R_{(th)JA}$.

For a solution to (3) simply reverse the path of the solution proposed for (1).

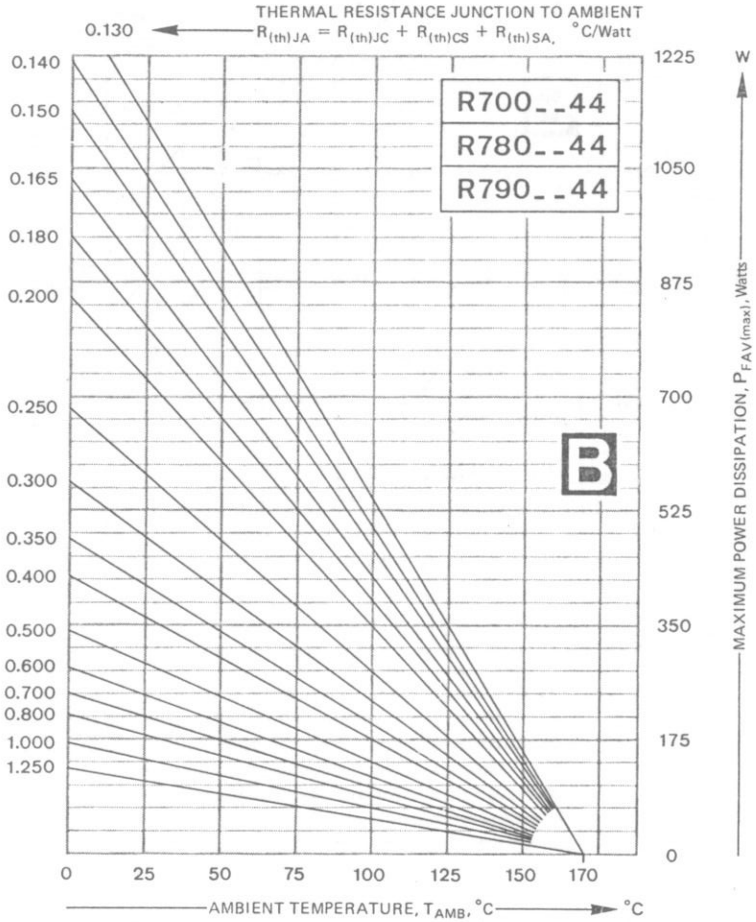
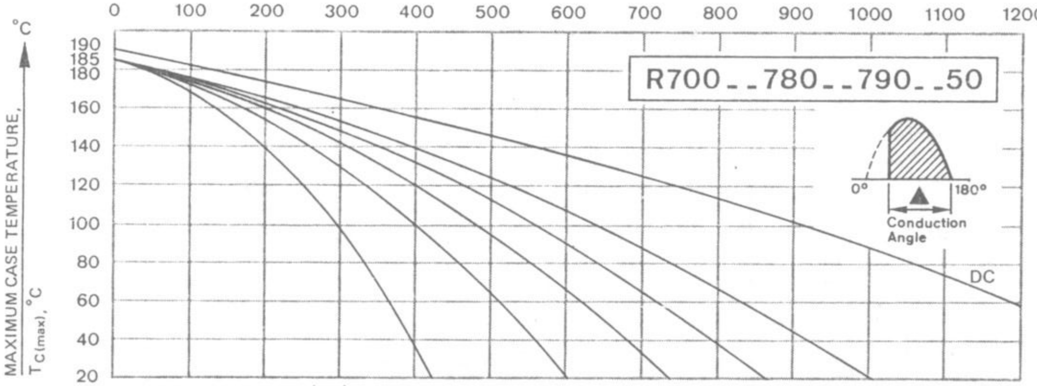


Figure 18 – Maximum Allowable Power Dissipation vs Ambient Temperature for Various Thermal Resistances Junction to Ambient.

Figure 19 – Case Temperature vs Forward Current, Half-Wave Sinusoid, for Various Conduction Angles.



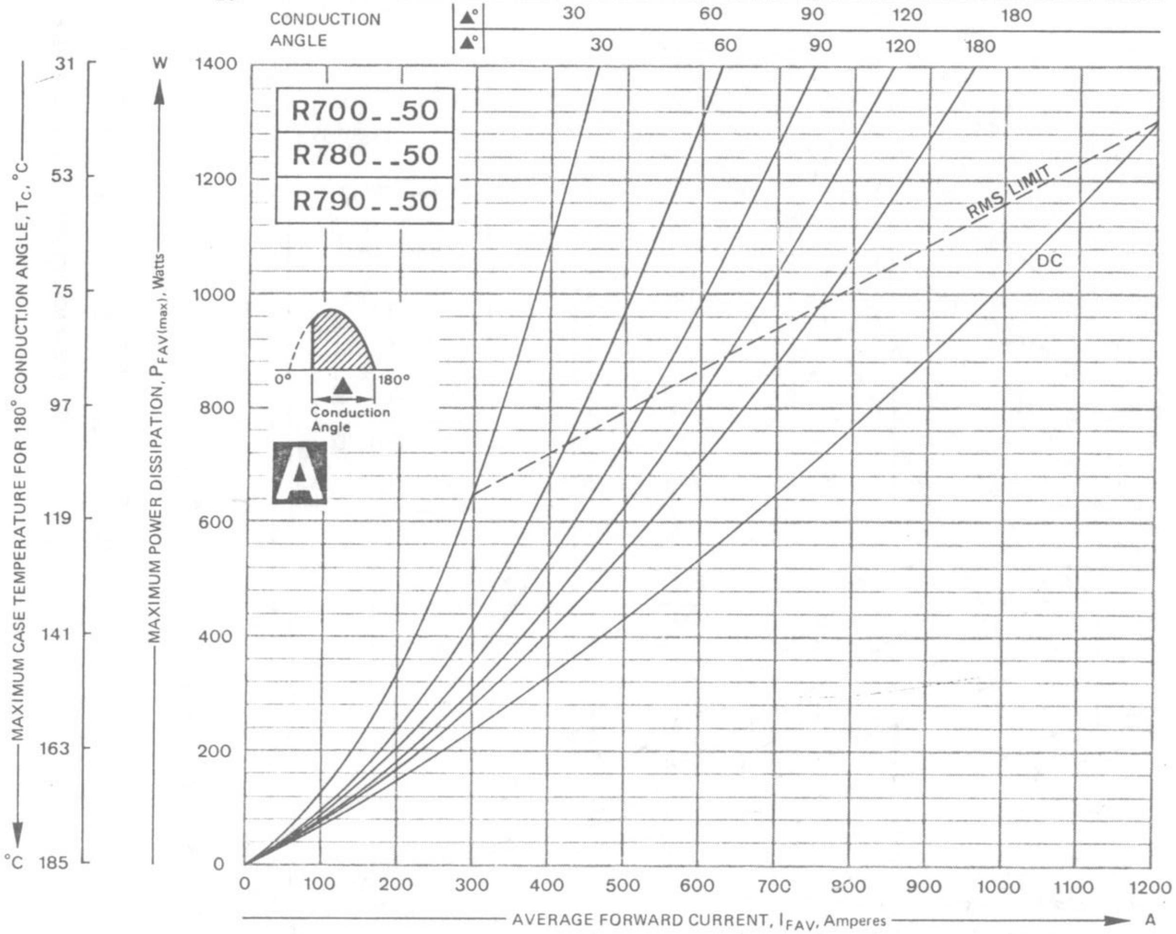


Figure 20 – Power Dissipation vs Forward Current, Half-Wave Sinusoid, for Various Conduction Angles.

NOMOGRAPH for DETERMINATION of ALLOWABLE OPERATING LOADS.

GRAPH **A** IN COMBINATION WITH GRAPH **B** MAY BE USED TO DETERMINE :

1. **Allowable** I_{AV} vs. a specific junction-to-ambient thermal resistance ($R_{(th)\,JA}$) and specified ambient temperature.
2. **Maximum allowable junction-to-ambient thermal resistance** ($R_{(th)\,JA}$) for a specified I_{AV} and specified ambient temperature.
3. **Maximum allowable ambient temperature** for a specified I_{AV} and a specified junction-to-ambient thermal resistance ($R_{(th)\,JA}$).

In determining the junction-to-ambient thermal resistance ($R_{(th)JA}$), attention must be given to selecting the correct junction-to-case thermal resistance ($R_{(th)\,JC}$) which is related to the conduction angle to be considered (refer to page 3, Thermal Data).

To calculate the required heat sink thermal resistance, use :

$$R_{(th)SA} = R_{(th)JA} - \left[R_{(th)JC}\left(\text{conduction angle}\right) + R_{(th)CS} \right]$$

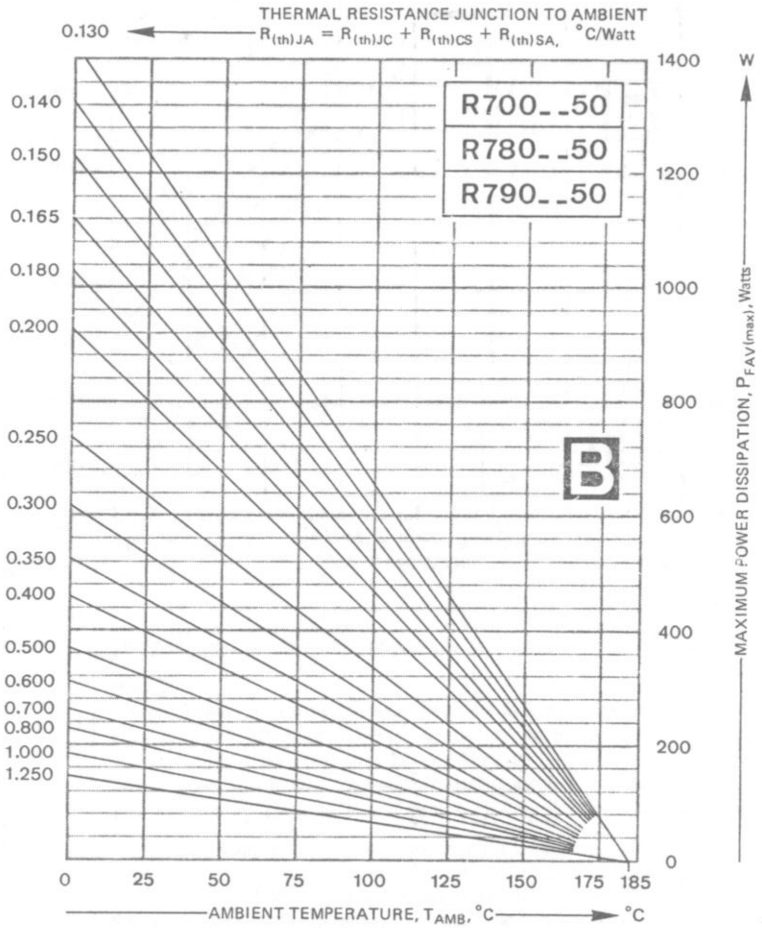
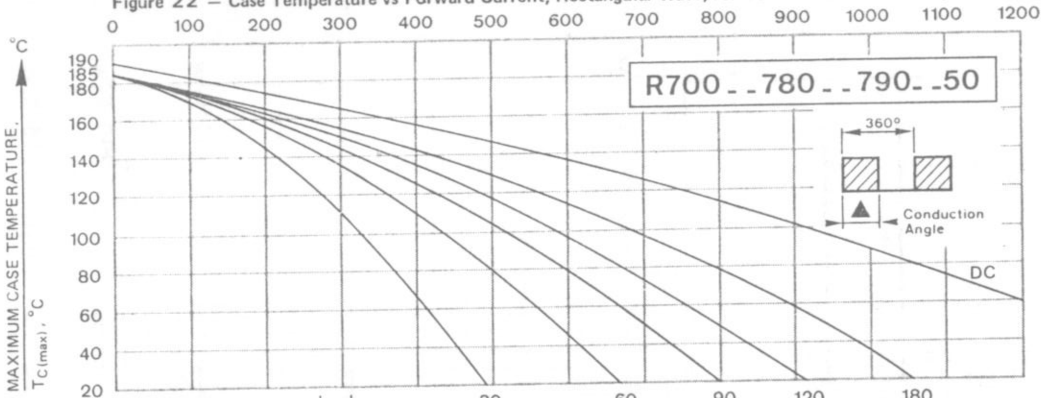


Figure 21 – Maximum Allowable Power Dissipation vs Ambient Temperature for Various Thermal Resistances Junction to Ambient.

Figure 22 – Case Temperature vs Forward Current, Rectangular Wave, for Various Conduction Angles.



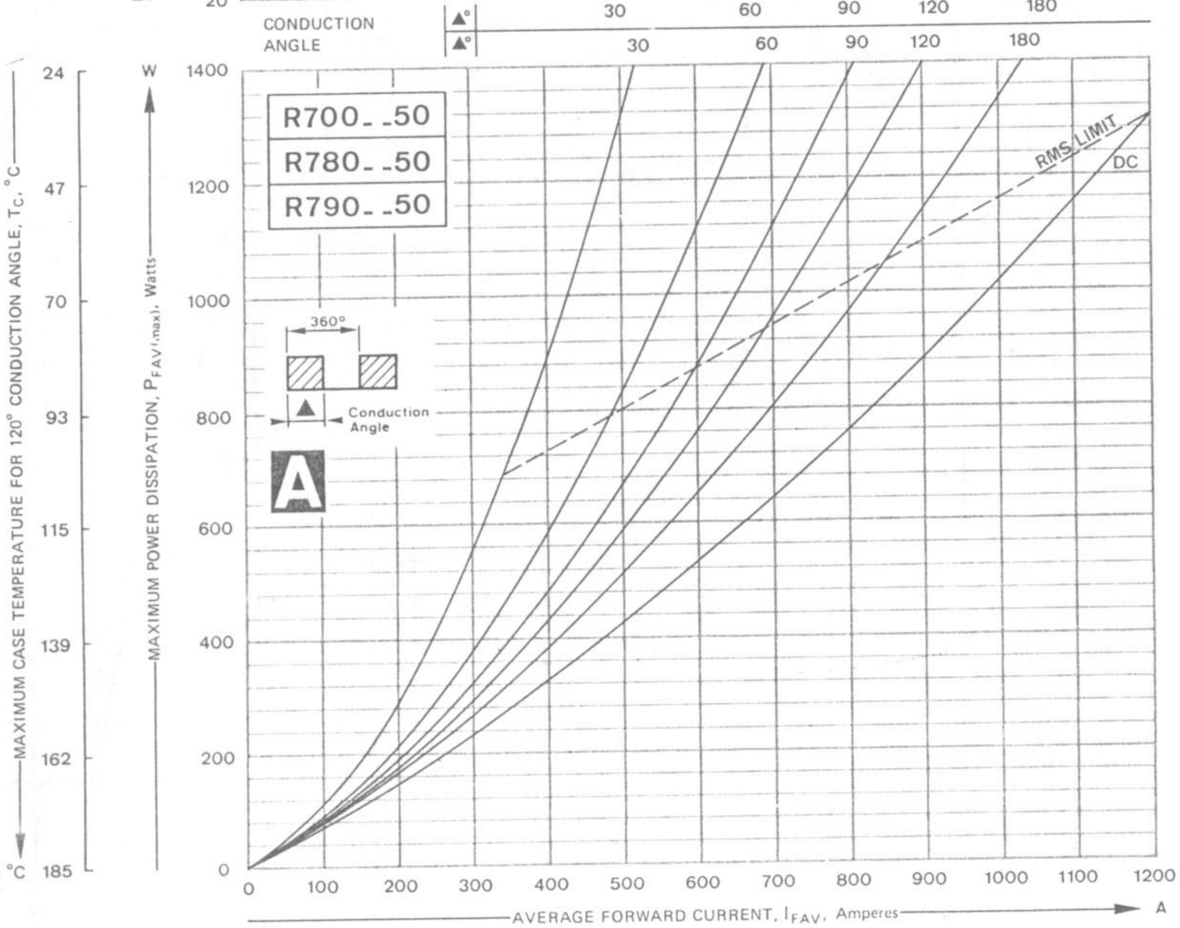


Figure 23 – Power Dissipation vs Forward Current, Rectangular Wave, for Various Conduction Angles.

HOW TO USE THE NOMOGRAPH.

For solution to (1) enter graph **B** at the specified T_A. Draw a vertical line to the specified $R_{(th)JA}$ line. Draw a horizontal line left to the power dissipation curve associated with the conduction angle considered in graph **A**. Drawing a vertical line down to the I_{AV} axis provides the desired answer.

For solution to (2) enter graphs **A** and **B** at the specified values. Draw two vertical lines. At the point where the drawn line and the power dissipation curve intersect, draw a horizontal line to the right. The intersection of the two drawn lines in graph **B** is one point on the desired junction-to-ambient thermal resistance line. If this point falls between two lines, use the lower value of $R_{(th)JA}$.

For a solution to (3) simply reverse the path of the solution proposed for (1).

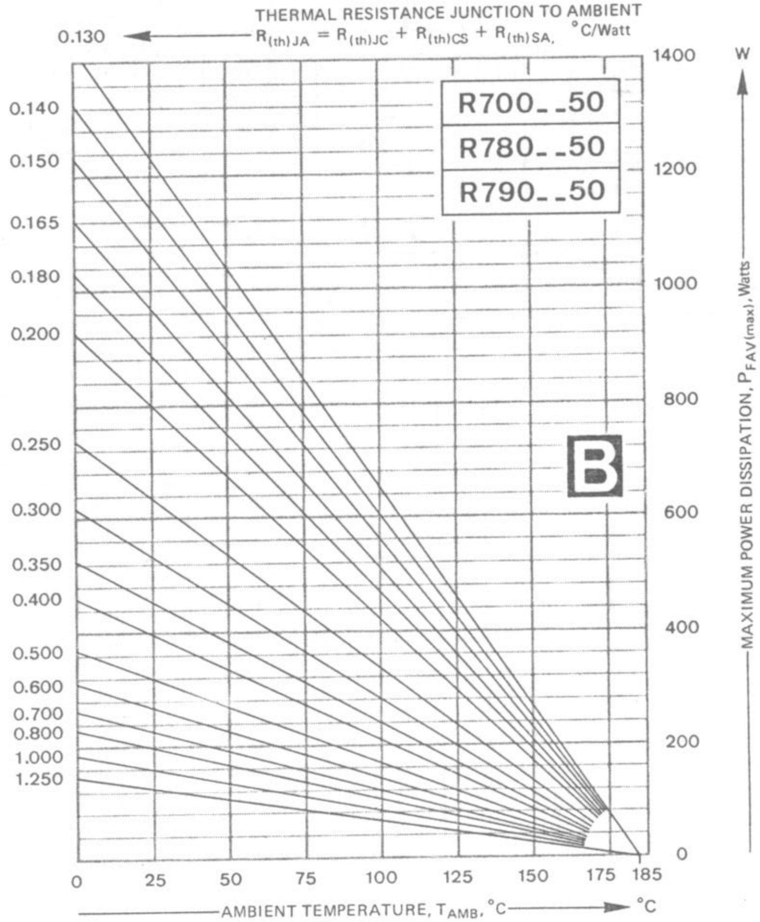


Figure 24 – Maximum Allowable Power Dissipation vs Ambient Temperature for Various Thermal Resistances Junction to Ambient.

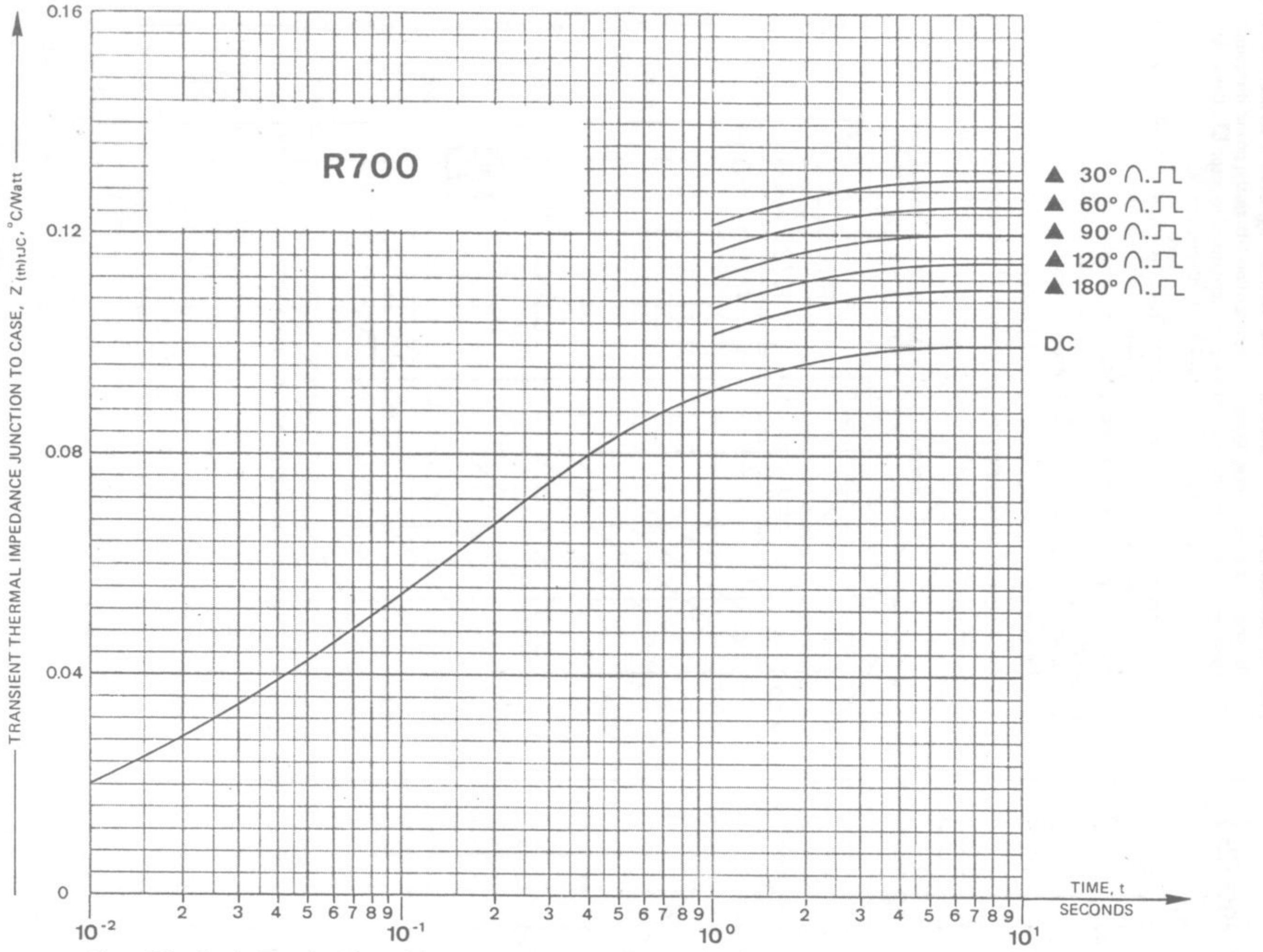


Figure 25 – Device Transient Thermal Impedance vs Time for Various conduction Angles Half-Wave Sinusoid and Rectangular Wave

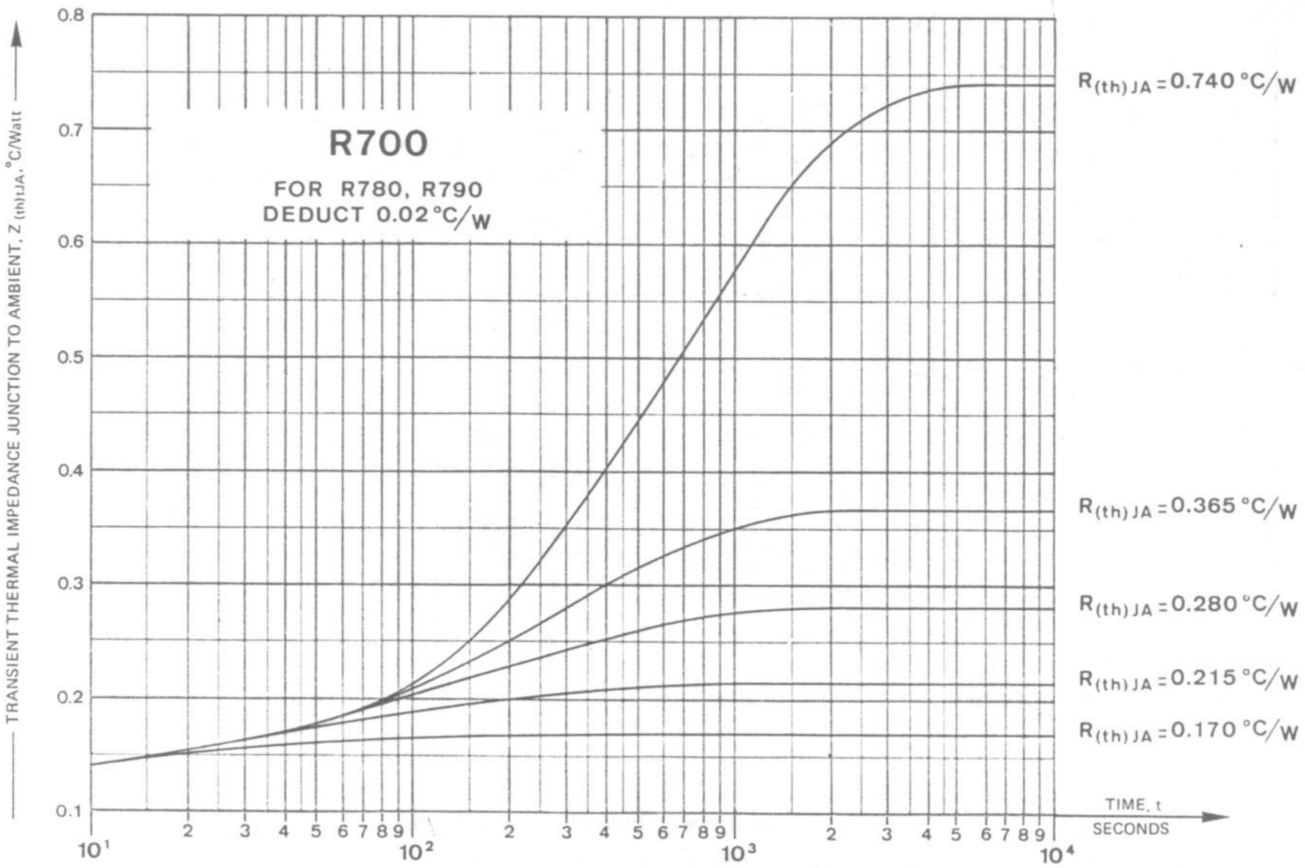


Figure 26 – Transient Thermal Impedance vs Time for Various Heat Sink Thermal Resistances, Half-Wave Sinusoid 180° Conduction Angle

Junction temp.	Surge and Fusing limits	V_{RRM} reapplied 0% A	V_{RRM} reapplied 100% B	Type
+ 150°C	I_{FSM} 10 ms I^2t 10 ms $I^2t \geqslant 10$ ms	9 000 A 405 000 A^2 s	7 000 A 245 000 A^2 s	R 700 - - 25 R 780 - - 25 R 790 - - 25
+ 150°C	I_{FSM} 10 ms I^2t 10 ms $I^2t \geqslant 10$ ms	10 200 A 520 200 A^2 s	8 000 A 320 000 A^2 s	R 700 - - 32 R 780 - - 32 R 790 - - 32
+ 175°C	I_{FSM} 10 ms I^2t 10 ms $I^2t \geqslant 10$ ms	11 500 A 661 250 A^2 s	9 000 A 405 000 A^2 s	R 700 - - 44 R 780 - - 44 R 790 - - 44
+ 190°C	I_{FSM} 10 ms I^2t 10 ms $I^2t \geqslant 10$ ms	12 800 A 819 200 A^2 s	10 000 A 500 000 A^2 s	R 700 - - 50 R 780 - - 50 R 790 - - 50

This nomograph may be used to determine :

1. **Maximum allowable surge current** following rated load conditions for a specified surge duration from 1 to 50 cycles, sinusoidal wave form 180° conduction angle.
2. **Maximum allowable sub-cycle surge current** with or without reverse voltage reapplied after surge from 1 to 10 milliseconds pulse width.

   Note – The sub-cycle surge curves are given following the concept $I^2\sqrt{t} = K$
3. **I^2t limitation** from 1 to 10 milliseconds pulse width without reverve voltage reapplied.

For solution to (1) use the formula :
$I_{FMS\ (10\ ms)}$ B x **Multiplier** at the specified number of cycles

For solution to (2) use the formula :
$I_{FMS\ (10\ ms)}$ A or B x **Multiplier** at the specified pulse width duration

For solution to (3) use the formula :
$I^2t_{\ (10\ ms)}$ A x **Multiplier** at the specified pulse width duration

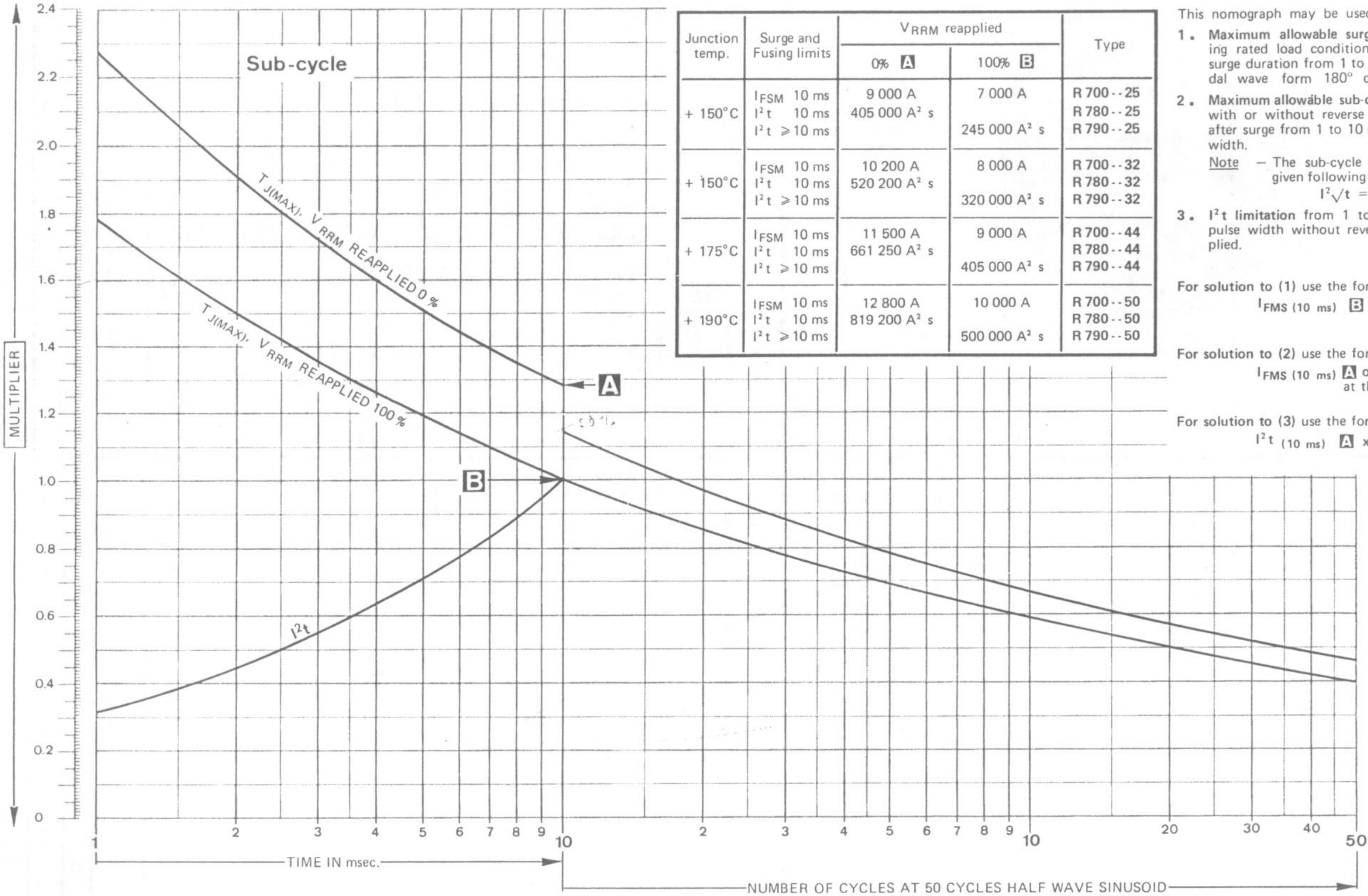


Figure 27 – Nomograph for Maximum Allowable Surge, Peak Sub-Cycle Surge and I^2t

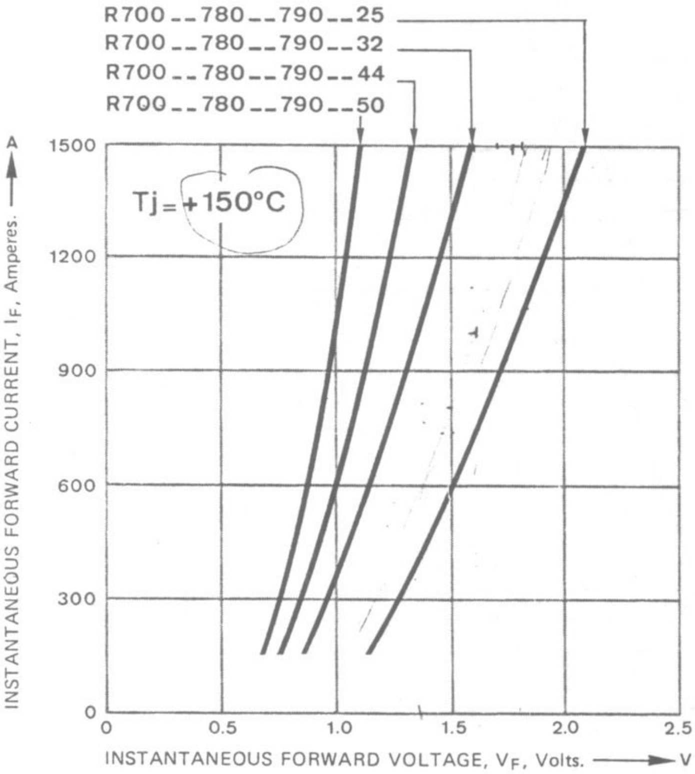


Figure 28 – Typical Forward Characteristics.

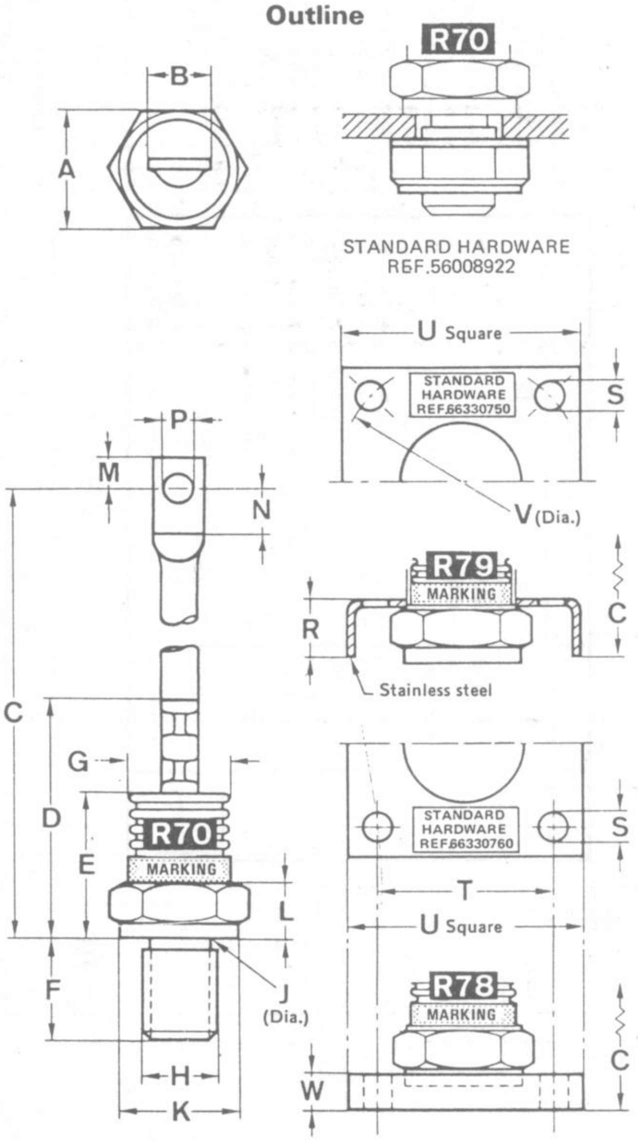
Mechanical Data

R70, R78, R79 FLEX LEAD ORDER CODE — UA

MAXIMUM THREAD TORQUE
LUBRICATED — 300 in-lbs — 3.5 m.kg
APPROXIMATE WEIGHT R70 — 18.5 oz — 525 g
APPROXIMATE WEIGHT R78 — 26.5 oz — 755 g
APPROXIMATE WEIGHT R79 — 15.5 oz — 440 g

NICKEL PLATE FINISH

Outline



Dimensions

	INCHES MIN.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS MAX.
A	1.750		44.45	
B	0.950		24.00	
C	9.724	10.118	247.00	257.00
D	3.000		76.20	
E	1.830		46.50	
F	1.063		27.00	
G	1.417		36.00	
H	3/4 16 UNF - 2A Thread			
J	0.669	0.750	17.00	19.05
K	1.595		40.50	
L	0.787		20.00	
M	0.433		11.00	
N	0.433		11.00	
P	0.435		11.05	
R	0.819	0.897	20.80	22.80
S	0.315 (4 holes)		8 (4 holes)	
T	1.812		46.00	
U	2.400		61.00	
V	2.400		61.00	
W	0.500		12.70	

LEAD SECTION 60 mm^2

NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS APPROVED