Bulletin I2031/A

International
IOR Rectifier

70/300U(R)..D SERIES

STANDARD RECOVERY DIODES

Stud Version

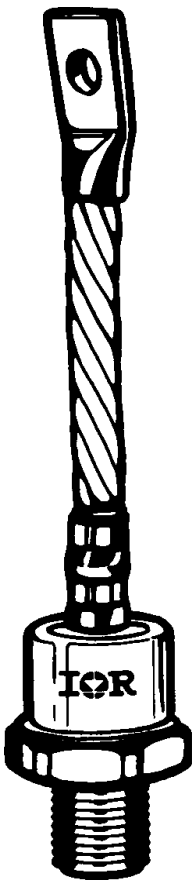
250A

Features

- Diffused diode
- Wide current range
- High voltage ratings up to 1600V
- High surge current capabilities
- Stud cathode and stud anode version

Typical Applications

- Converters
- Power supplies
- Machine tool controls
- High power drives
- Medium traction applications



case style
DO-205AB (DO-9)

Major Ratings and Characteristics

Parameters		70/300U(R)..D	Units
$I_{F(AV)}$		250	A
	@ T_C	145	°C
$I_{F(RMS)}$		390	A
I_{FSM}	@ 50Hz	6550	A
	@ 60Hz	6850	A
I^2t	@ 50Hz	214	KA^2s
	@ 60Hz	195	KA^2s
V_{RRM} range		1200 to 1600	V
T_J		- 40 to 200	°C

ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	Voltage Code	V_{RRM}, maximum repetitive peak reverse voltage V	V_{RSM}, maximum non-repetitive peak rev. voltage V	I_{RRM} max. @ $T_J = T_J$ max. mA
70/300U(R)..D	120	1200	1300	60
	160	1600	1700	

Forward Conduction

Parameter		70/300U(R)..D	Units	Conditions		
$I_{F(AV)}$	Max. average forward current	250	A	180° conduction, half sine wave		
	@ Case temperature	145	°C			
$I_{F(RMS)}$	Max. RMS forward current	390	A	DC @ 134°C case temperature		
I_{FSM}	Max. peak, one-cycle forward, non-repetitive surge current	6550	A	t = 10ms	No voltage reapplied	Sinusoidal half wave, Initial $T_J = T_J$ max.
		6850		t = 8.3ms		
		5500		t = 10ms	100% V_{RRM} reapplied	
		5750		t = 8.3ms		
I^2t	Maximum I^2t for fusing	214	KA^2s	t = 10ms	No voltage reapplied	
		195		t = 8.3ms		
		151		t = 10ms	100% V_{RRM} reapplied	
		138		t = 8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	2140	$KA^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied		
$V_{F(TO)1}$	Low level value of threshold voltage	0.61	V	(16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ max.		
$V_{F(TO)2}$	High level value of threshold voltage	0.83		(I > π x $I_{F(AV)}$), $T_J = T_J$ max.		
r_{f1}	Low level value of forward slope resistance	0.75	mΩ	(16.7% x π x $I_{F(AV)}$ < I < π x $I_{F(AV)}$), $T_J = T_J$ max.		
r_{f2}	High level value of forward slope resistance	0.49		(I > π x $I_{F(AV)}$), $T_J = T_J$ max.		
V_{FM}	Max. forward voltage drop	1.30	V	I_{pk}= 785A, T_J = 25°C, t_p = 10ms sinusoidal wave		

Thermal and Mechanical Specifications

	Parameter	70/300U(R)..D	Units	Conditions
T_J	Max. junction operating temperature range	-40 to 200	°C	
T_{stg}	Max. storage temperature range	-40 to 200		
R_{thJC}	Max. thermal resistance, junction to case	0.18	K/W	DC operation
R_{thCS}	Max. thermal resistance, case to heatsink	0.08		Mounting surface, smooth, flat and greased
T	Max. allowed mounting torque +0 -20%	37	Nm	Not lubricated threads
		28		Lubricated threads
wt	Approximate weight	250	g	
	Case style	DO-205AB (DO-9)		See Outline Table

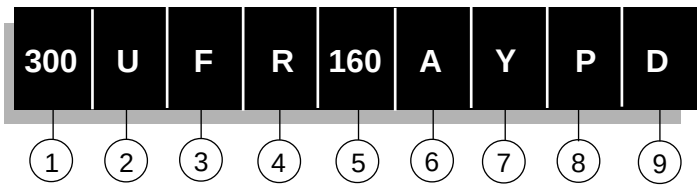
ΔR_{thJC} Conduction

(The following table shows the increment of thermal resistence R_{thJC} when devices operate at different conduction angles than DC)

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.020	0.015	K/W	$T_J = T_J$ max.
120°	0.024	0.025		
90°	0.031	0.034		
60°	0.045	0.047		
30°	0.077	0.077		

Ordering Information Table

Device Code



1 - 300 = Standard 300U device
70 = Standard 70U device
302 = 300U Top Threaded version
72 = 70U Top Threaded version

2 - U = Essential Part Number

3 - F = Flat Base (with Pinch Bolt)
None = Normal Stud

4 - R = Stud Reverse Polarity (Anode to Stud)
None = Stud Normal Polarity (Cathode to Stud)

5 - Voltage code: Code x 10 = V_{RRM} (See Voltage Ratings table)

6 - A = Essential Part Number only for 300U Series
None = 70U Series

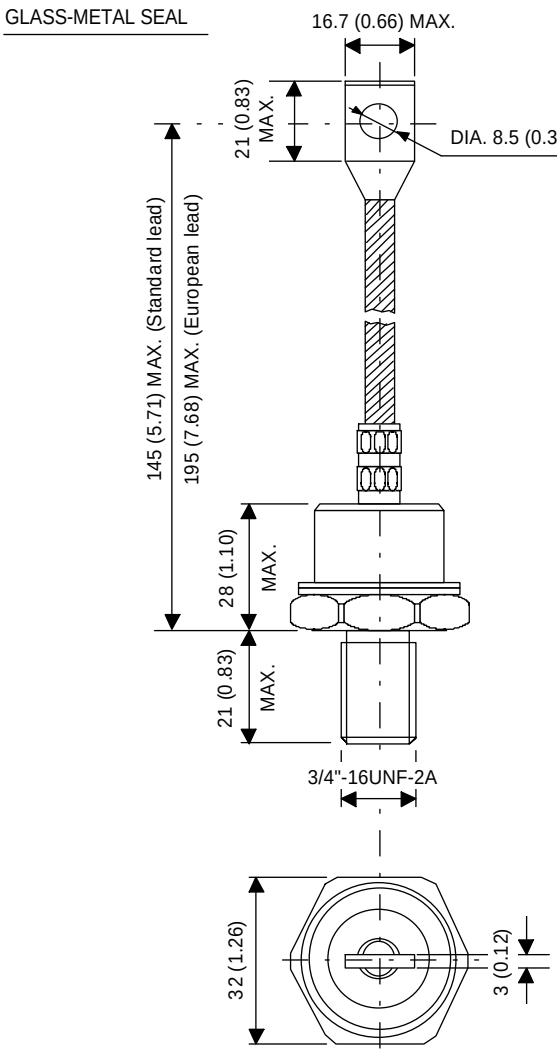
7 - Y = European Lead
None = Standard Lead

8 - P = Forward Selection (1.045V < V_{FM} < 1.125V, I_{FM} = 470A, T_J = 25°C)

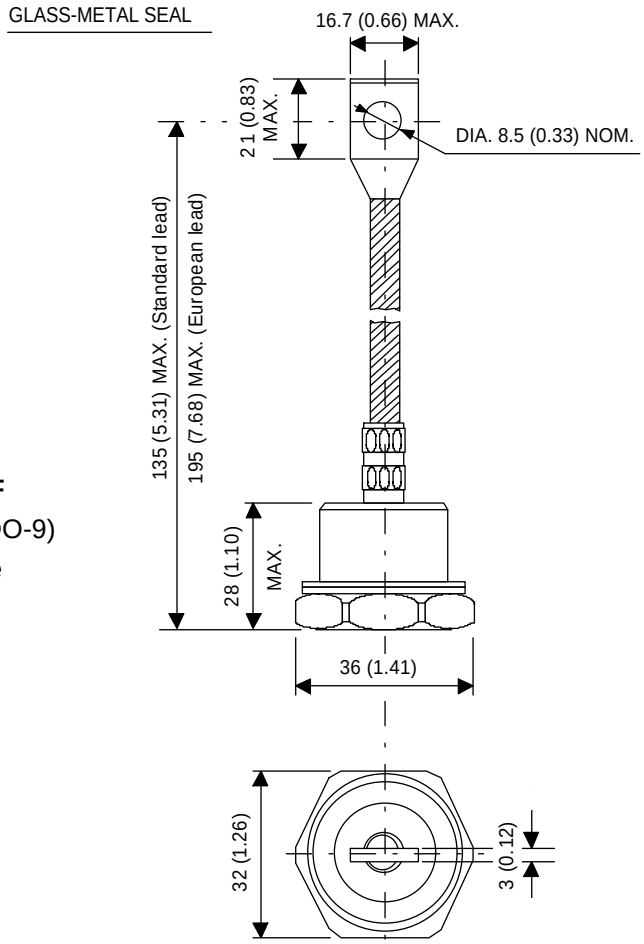
9 - D = Diffused diode

70/300U(R)..D Series

Outline Table



70/300U
DO-205AB (DO-9)

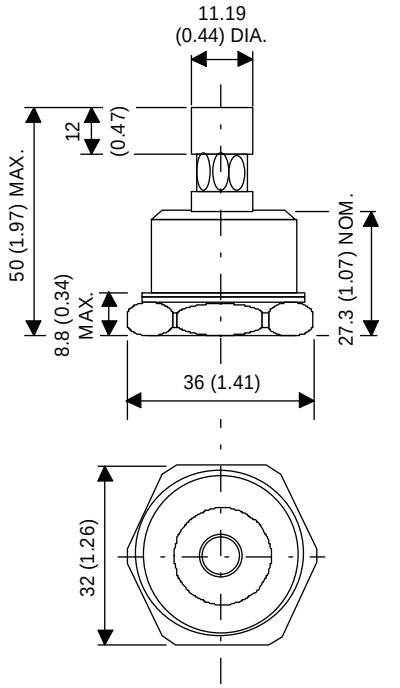


70/300UF
DO-205AB (DO-9)
Flat Base

All dimensions in millimeters (inches)

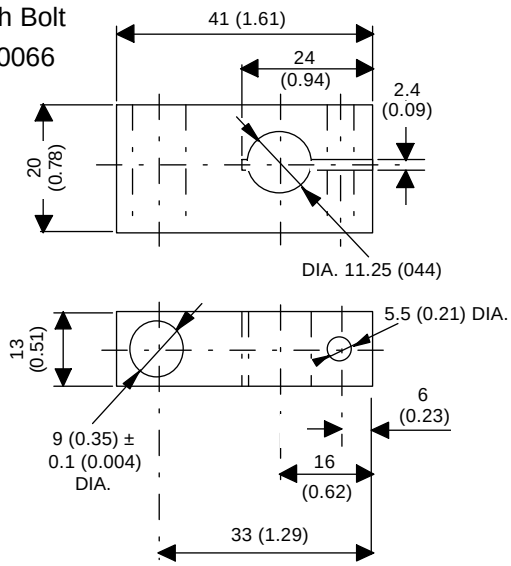
Outline Table

GLASS-METAL SEAL

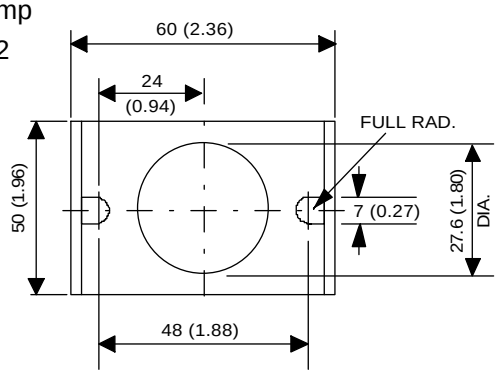


72/302UF
IR Case Style B26
Flat Bse

Pinch Bolt
35-0066

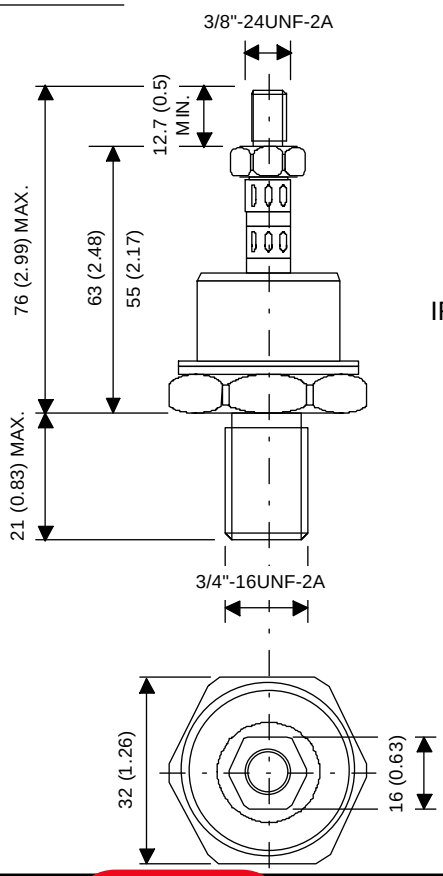


Spring Clamp
K41-0232



All dimensions in millimeters (inches)

GLASS-METAL SEAL



72/302U
IR Case Style B26

70/300U(R)..D Series

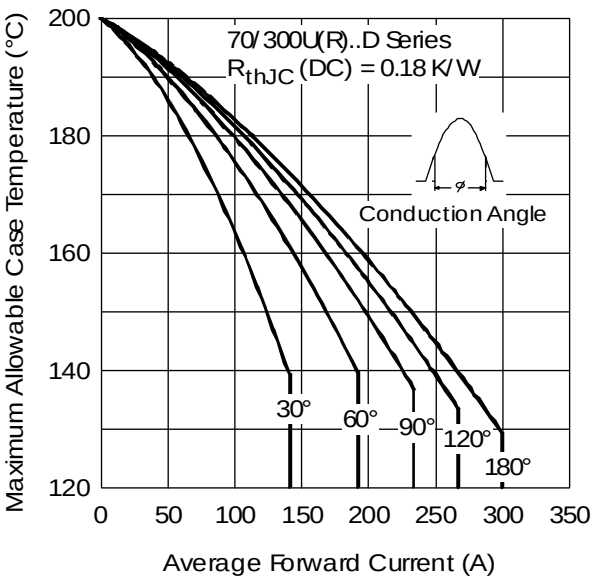


Fig. 1 - Current Ratings Characteristics

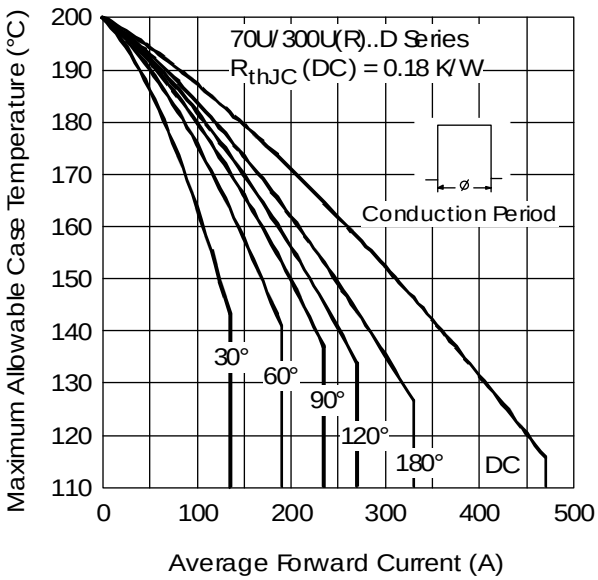


Fig. 2 - Current Ratings Characteristics

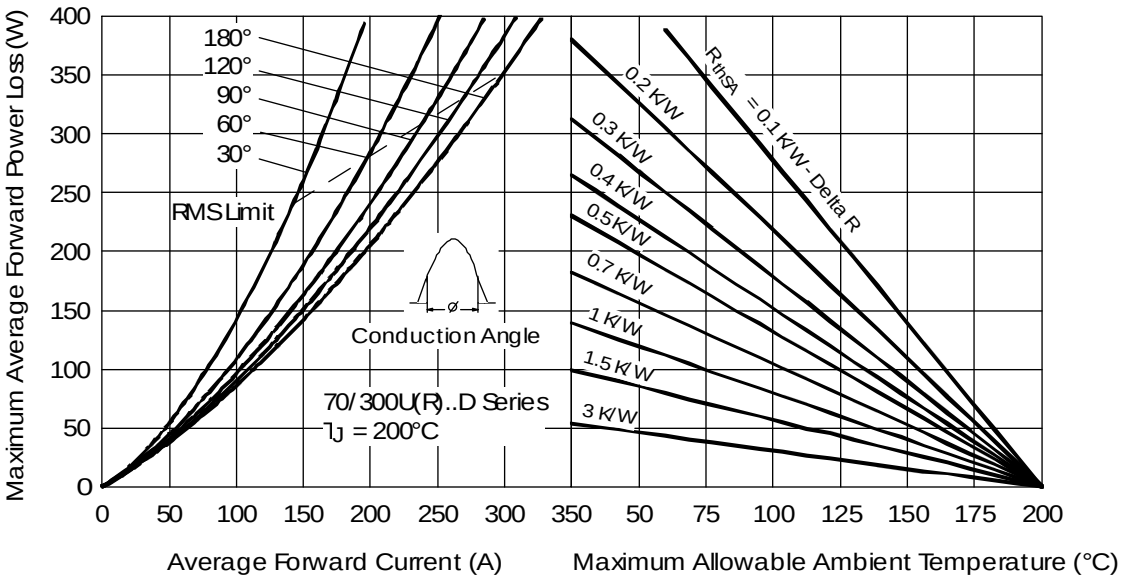


Fig. 3 - Forward Power Loss Characteristics

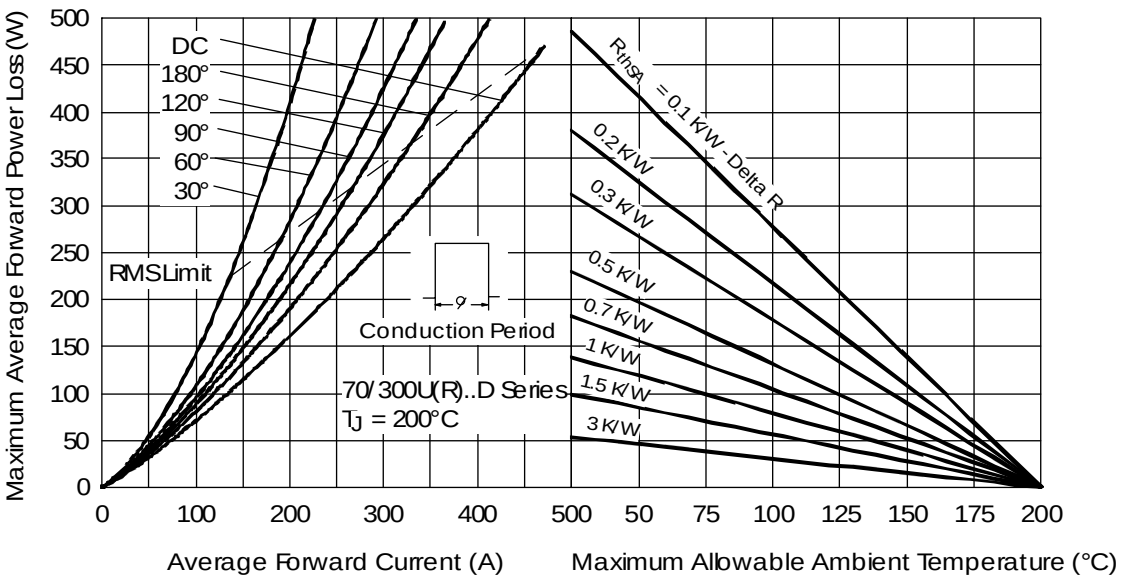


Fig. 4 - Forward Power Loss Characteristics

To Order
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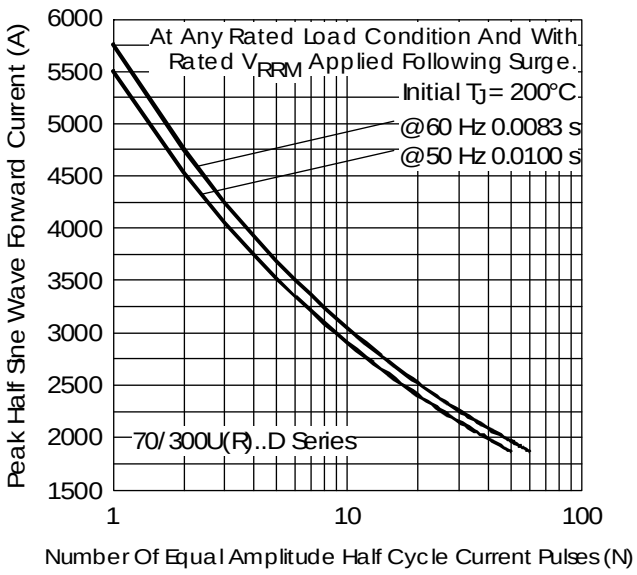

Fig. 5 - Maximum Non-Repetitive Surge Current

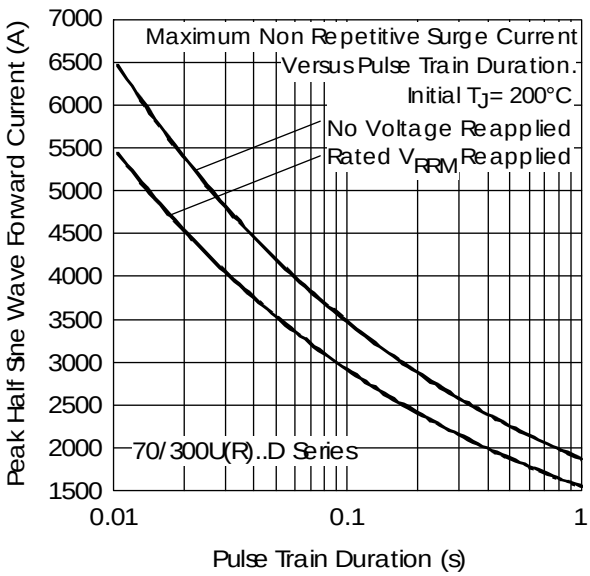

Fig. 6 - Maximum Non-Repetitive Surge Current

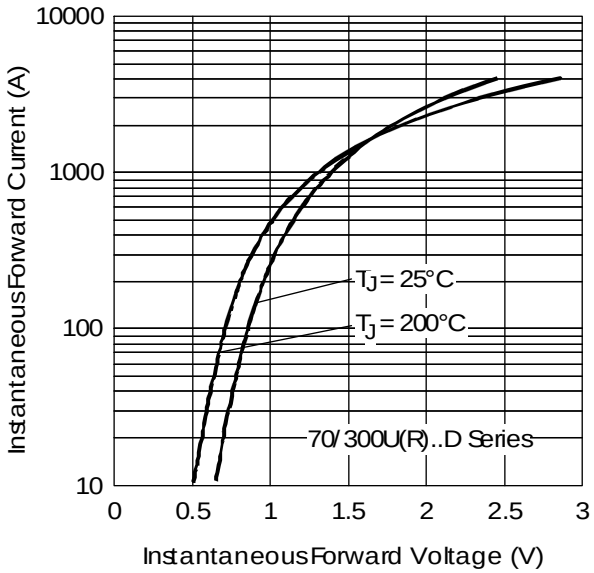

Fig. 7 - Forward Voltage Drop Characteristics

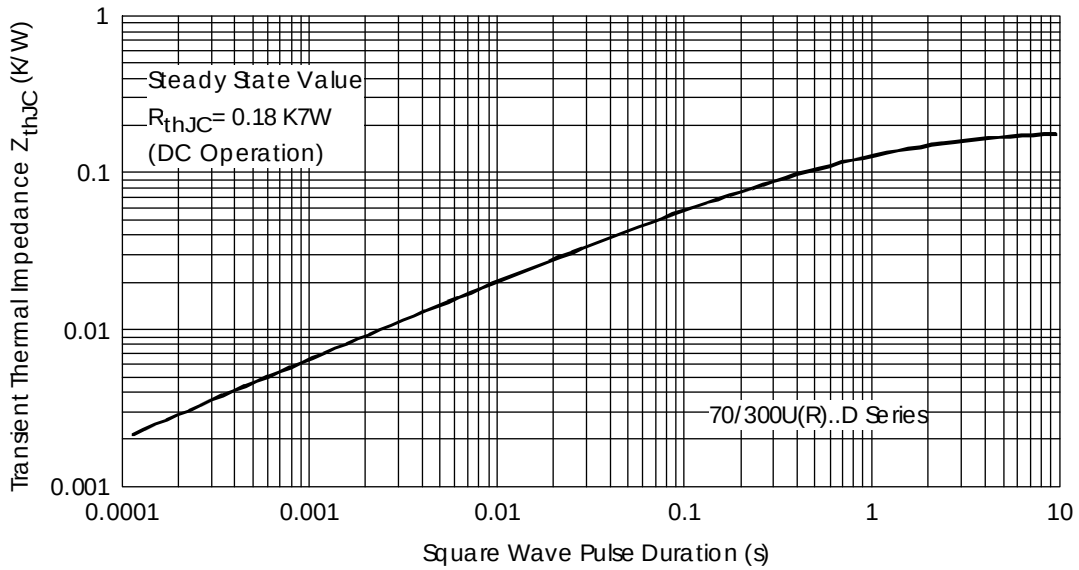

Fig. 8 - Thermal Impedance Z_{thJC} Characteristic