SILICON RECTIFIER DIODES

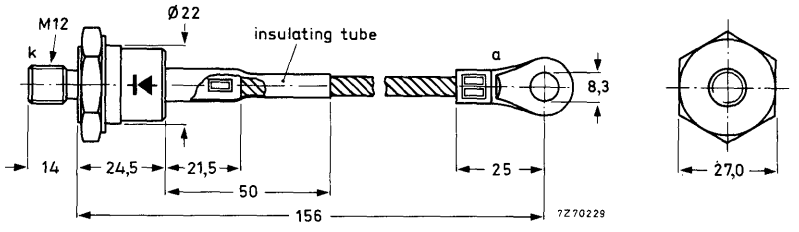
Diffused silicon diodes in metal envelopes with ceramic insulation, intended for power rectifier application. The series consists of the following types:
Normal polarity (cathode to stud): BYX32–600 to BYX32–1600
Reverse polarity (anode to stud): BYX32–600R to BYX32–1600R

QUICK REFERENCE DATA

			BYX32–	600 600R	800 800R	1000 1000R	1200 1200R	1600 1600R	
Crest working reverse voltage	V_{RWM}	max.		600	800	1000	1200	1200	V
Repetitive peak reverse voltage	V_{RRM}	max.		600	800	1000	1200	1600	V
Average forward current			$I_{F(AV)}$		max.		150		A
Non-repetitive peak forward current			I_{FSM}		max.		1600		A

MECHANICAL DATA

Dimensions in mm



Normal polarity (⊣◀): blue cable. Reverse polarity (▶⊢): red cable.

Net mass: 115 g

Diameter of clearance hole: max. 13.0 mm

Torque on nut: min. 10 Nm (100 kg cm)
max. 25 Nm (250 kg cm)

All information applies to frequencies up to 400 Hz.

RATINGS Limiting values in accordance with the Absolute Maximum System (IEC 134)

Voltages [1]			BYX32-	600 600R	800 800R	1000 1000R	1200 1200R	1600 1600R
Continuous reverse voltage	V_R	max.		600	800	1000	1200	1200 V
Crest working reverse voltage	V_{RWM}	max.		600	800	1000	1200	1200 V
Repetitive peak reverse voltage	V_{RRM}	max.		600	800	1000	1200	1600 V
Non-repetitive peak reverse voltage ($t \leq 10$ ms)	V_{RSM}	max.		650	900	1100	1300	1600 V

Currents

Average forward current (averaged over any 20 ms period) up to T_{mb} = 100 °C	$I_{F(AV)}$	max.	150 A
at T_{mb} = 125 °C	$I_{F(AV)}$	max.	115 A
Forward current (d.c.)	I_F	max.	240 A
R.M.S. forward current	$I_{F(RMS)}$	max.	240 A
Repetitive peak forward current	I_{FRM}	max.	750 A
Non-repetitive peak forward current (t = 10 ms; half sine wave) T_j = 190 °C prior to surge	I_{FSM}	max.	1600 A
I squared t for fusing (t = 10 ms)	I^2t	max.	12800 A^2s

Temperatures

Storage temperature	T_{stg}	-55 to +200 °C
Operating junction temperature	T_j	max. 190 °C

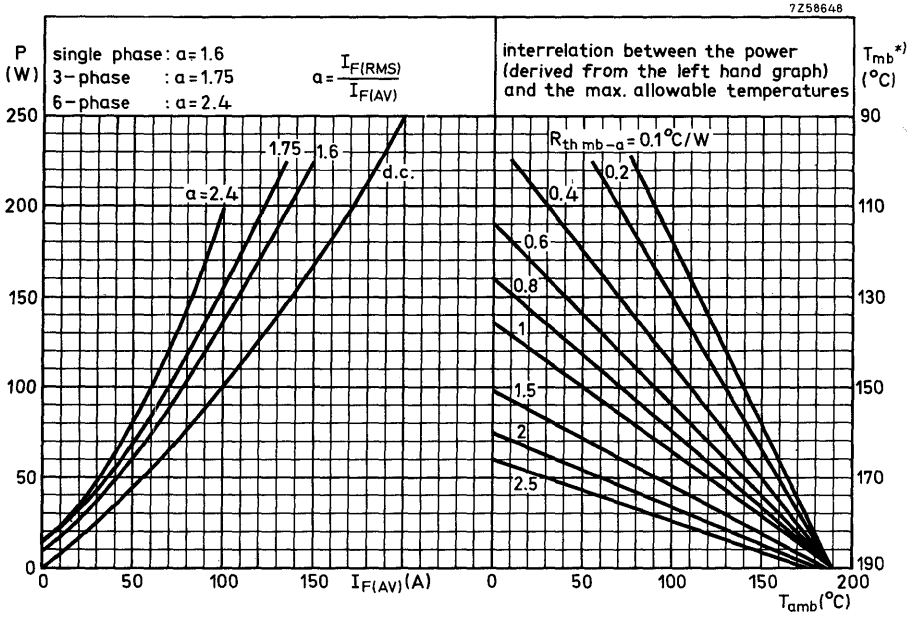
THERMAL RESISTANCE

From junction to mounting base	$R_{th\ j\text{-}mb}$	= 0.4 °C/W
From mounting base to heatsink without heatsink compound	$R_{th\ mb\text{-}h}$	= 0.1 °C/W
From mounting base to heatsink with heatsink compound (Dow Corning 340)	$R_{th\ mb\text{-}h}$	= 0.04 °C/W
Transient thermal impedance; t = 1 ms	$Z_{th\ j\text{-}mb}$	= 0.025 °C/W

[1] To ensure thermal stability: $R_{th\ j\text{-}a} < 0.75$ °C/W (continuous reverse voltage) or < 1.5 °C/W (a.c.)
For smaller heatsinks T_j should be derated. For a.c. see graph on page 3.
For continuous reverse voltage: $R_{th\ j\text{-}a}$ = 1 °C/W, then T_{jmax} = 184 °C
$R_{th\ j\text{-}a}$ = 1.2 °C/W, then T_{jmax} = 180 °C
$R_{th\ j\text{-}a}$ = 1.5 °C/W, then T_{jmax} = 175 °C

CHARACTERISTICS

		BYX32-	600(R)	800(R)	1000(R)	1200(R)	1600(R)	
Forward voltage								
I_F = 500 A; T_j = 25 °C	V_F	<	1,6	1,6	1,6	1,6	1,6	V [1])
Peak reverse current								
$V_{RM} = V_{RWMmax}$								
T_j = 175 °C	I_{RM}	<	24	18	15	12	12	mA

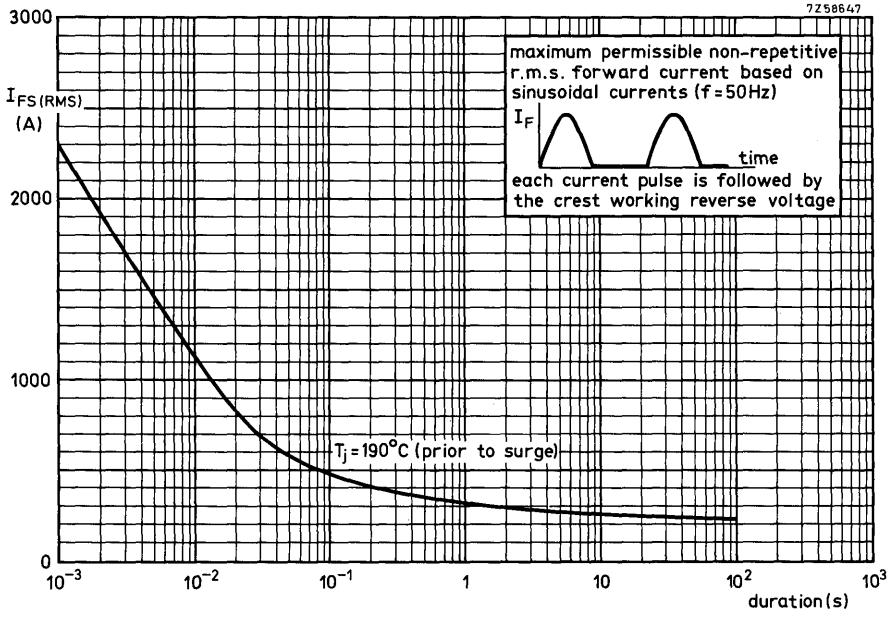


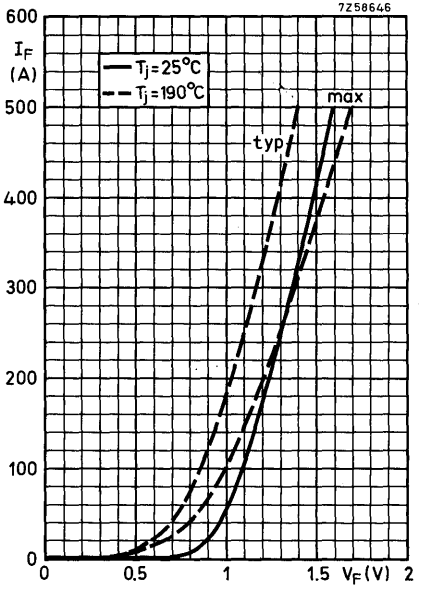
*) T_{mb}-scale is for comparison purposes only and is correct only for $R_{th\ mb\text{-}a} \leq 1.1$ °C/W

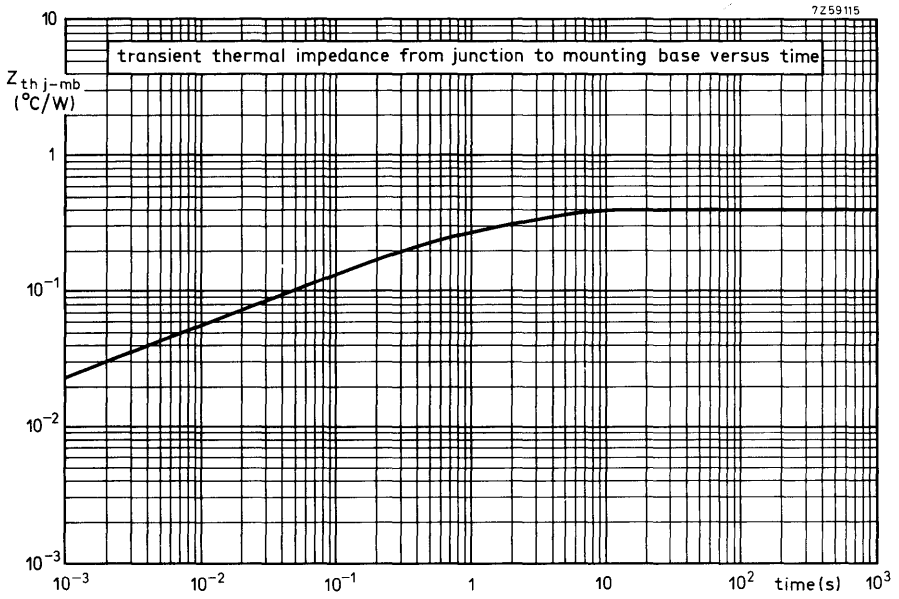
APPLICATION INFORMATION AND OPERATING NOTES

See general pages at the beginning of this section.

[1]) Measured under pulse conditions to avoid excessive dissipation.


7Z58647
3000
$I_{FS(RMS)}$ (A)
2000
1000
0
10^{-3}
10^{-2}
10^{-1}
1
10
10^{2}
10^{3}
duration (s)
maximum permissible non-repetitive r.m.s. forward current based on sinusoidal currents (f = 50Hz)
I_F
time
each current pulse is followed by the crest working reverse voltage
T_j = 190°C (prior to surge)


7Z58646
600
I_F (A)
500
400
300
200
100
0
T_j = 25°C
T_j = 190°C
max
typ
0
0.5
1
1.5
V_F (V)
2


7Z59115
transient thermal impedance from junction to mounting base versus time
$Z_{th\ j-mb}$ (°C/W)
10
1
10^{-1}
10^{-2}
10^{-3}
10^{-3}
10^{-2}
10^{-1}
1
10
10^{2}
time (s)
10^{3}