N AMER PHILIPS/DISCRETE 25E D 6653931 0022865 5

7-01-17

RECTIFIER DIODES

Silicon rectifier diodes in DO-4 metal envelopes, intended for use in power rectifier applications.
The series consists of the following types:
Normal polarity (cathode to stud): BYX99-300 to 1200.
Reverse polarity (anode to stud): BYX99-300R to 1200R.

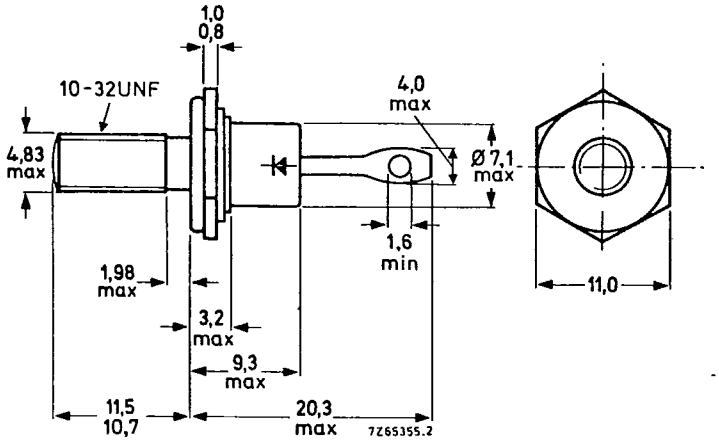
QUICK REFERENCE DATA

		BYX99-300(R)	600(R)	1200(R)	
Repetitive peak reverse voltage	V_{RRM}	max. 300	600	1200	V
Average forward current	$I_{F(AV)}$	max.		15	A
Non-repetitive peak forward current	I_{FSM}	max.		180	A

MECHANICAL DATA

Dimensions in mm

DO-4: Supplied with device: 1 nut, 1 lock-washer
Nut dimensions across the flats: 9.5 mm



Net mass: 6 g
Diameter of clearance hole: 5.2 mm
Accessories supplied on request:
see ACCESSORIES section
The mark shown applies to normal polarity types.

Torque on nut: min. 0.9 Nm
(9 kg cm)
max. 1.7 Nm
(17 kg cm)

Products approved to CECC 50 009-005, available on request

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

Voltages			BYX99-300(R)	600(R)	1200(R)	
Non-repetitive peak reverse voltage ($t \leq 10$ ms)	V_{RSM}	max.	300	600	1200	V
Repetitive peak reverse voltage ($\delta \leq 0,01$)	V_{RRM}	max.	300	600	1200	V
Crest working reverse voltage	V_{RWM}	max.	200	400	800	V
Continuous reverse voltage	V_R	max.	200	400	800	V

Currents				
Average forward current (averaged over any 20 ms period) up to T_{mb} = 129 °C	$I_{F(AV)}$	max.	15	A
R.M.S. forward current	$I_{F(RMS)}$	max.	24	A
Repetitive peak forward current	I_{FRM}	max.	180	A
Non-repetitive peak forward current (t = 10 ms; half sine-wave) T_j = 175 °C prior to surge; with reapplied V_{RWMmax}	I_{FSM}	max.	180	A
I^2t for fusing (t = 10 ms)	I^2t	max.	162	A^2s

Temperatures				
Storage temperature	T_{stg}		−55 to + 175	°C
Junction temperature	T_j	max.	175	°C

THERMAL RESISTANCE				
From junction to ambient in free air	$R_{th\ j\text{-}a}$	=	50	°C/W
From junction to mounting base	$R_{th\ j\text{-}mb}$	=	2,3	°C/W
From mounting base to heatsink with heatsink compound	$R_{th\ mb\text{-}h}$	=	0,5	°C/W
without heatsink compound	$R_{th\ mb\text{-}h}$	=	0,6	°C/W
Transient thermal impedance; t = 1 ms	$Z_{th\ j\text{-}mb}$	=	0,13	°C/W

CHARACTERISTICS

Forward voltage

I_F = 50 A; T_j = 25 °C	V_F	<	1,55	V [1]

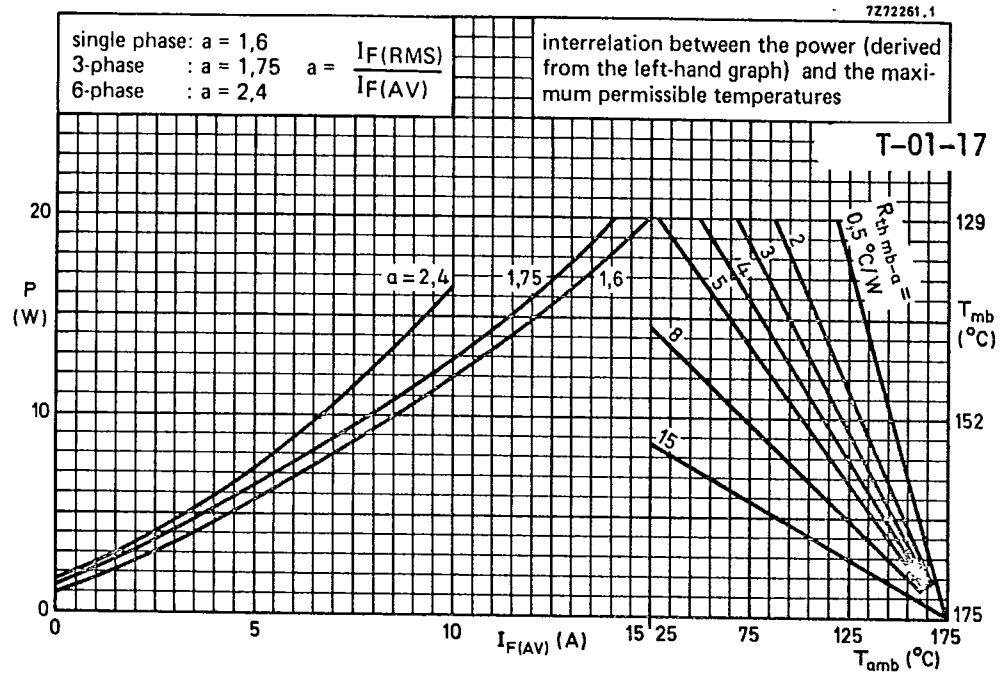
Reverse current

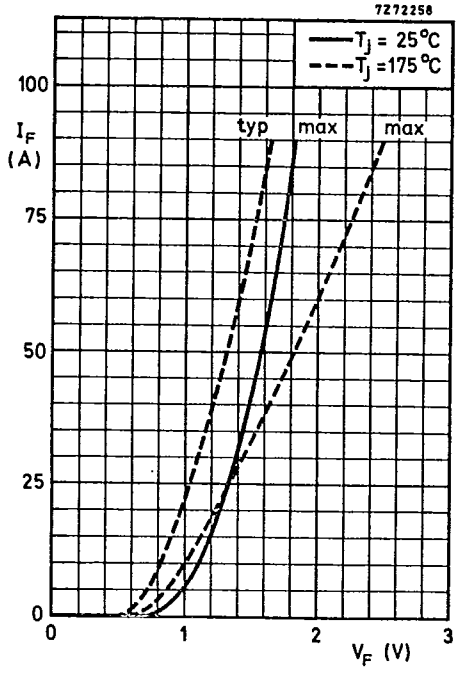
$V_R = V_{RWMmax}$; T_j = 125 °C	I_R	<	200	μA

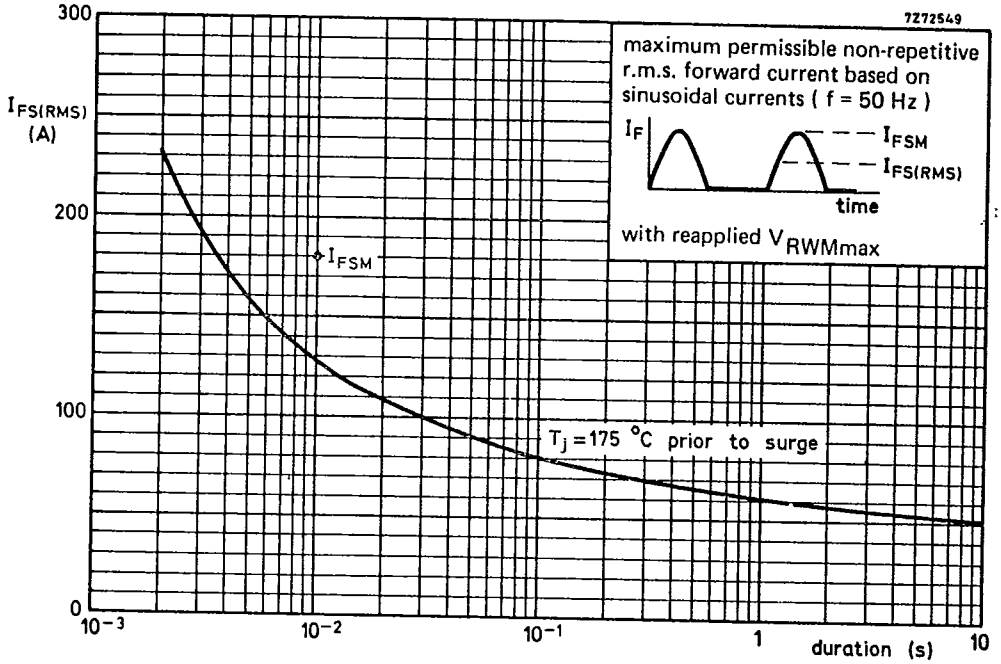
OPERATING NOTES

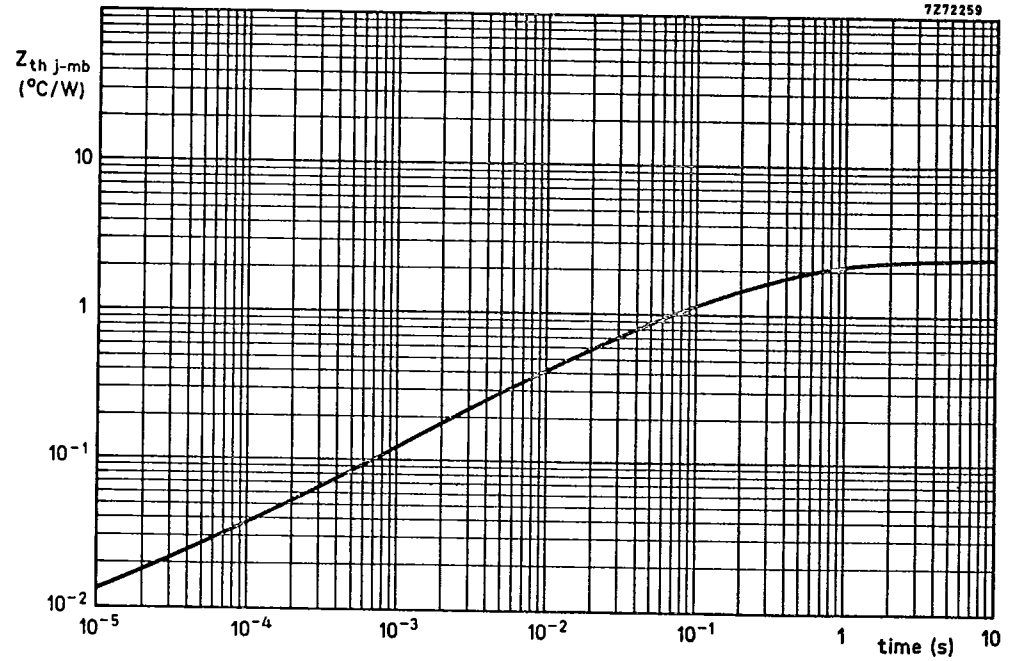
1. The top connector should neither be bent nor twisted; it should be soldered into the circuit so that there is no strain on it.
   During soldering the heat conduction to the junction should be kept to a minimum.
2. Where there is a possibility that transients, due to the energy stored in the transformer, will exceed the maximum permissible non-repetitive peak reverse voltage, see General Section for information on damping circuits.

[1] Measured under pulse conductions to avoid excessive dissipation.


7Z72261.1
single phase: a = 1,6
3-phase : a = 1,75
6-phase : a = 2,4
a = IF(RMS) / IF(AV)
interrelation between the power (derived from the left-hand graph) and the maximum permissible temperatures
T-01-17
P (W)
20
10
0
a = 2,4
1,75
1,6
Rth mb-a = 0,5 °C/W
2
3
4
5
8
15
129
152
175
Tmb (°C)
0
5
10
IF(AV) (A)
15
25
75
125
175
Tamb (°C)


7Z72258
Tj = 25 °C
Tj = 175 °C
typ
max
max
IF (A)
100
75
50
25
0
0
1
2
3
VF (V)


7Z72549
maximum permissible non-repetitive r.m.s. forward current based on sinusoidal currents (f = 50 Hz)
I_F
I_{FSM}
$I_{FS(RMS)}$
time
with reapplied V_{RWMmax}
$I_{FS(RMS)}$ (A)
300
200
100
0
I_{FSM}
T_j = 175 °C prior to surge
10^{-3}
10^{-2}
10^{-1}
1
10
duration (s)


7Z72259
$Z_{th\ j\text{-}mb}$ (°C/W)
10
1
10^{-1}
10^{-2}
10^{-5}
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
10
time (s)