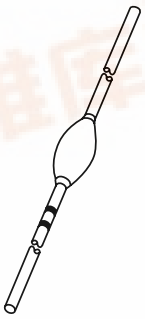
DATA SHEET



BY715 to BY724
Very fast high-voltage soft-recovery rectifiers

Product specification 2001 Sep 24

PHILIPS

Very fast high-voltage soft-recovery rectifiers BY715 to BY724

FEATURES

- Glass passivated
- High maximum operating temperature
- Low leakage current
- Excellent stability
- Soft-recovery switching characteristics
- Compact construction.

APPLICATIONS

- For high-voltage rectification up to 75 kHz
- High-voltage applications for:
  - Multipliers
  - Slot-wound diode-split-transformers.

DESCRIPTION

Rugged glass package, using a high temperature alloyed construction.

This package is hermetically sealed and fatigue free as coefficients of expansion of all used parts are matched.

The package is designed to be used in an insulating medium such as resin, oil or SF6 gas.

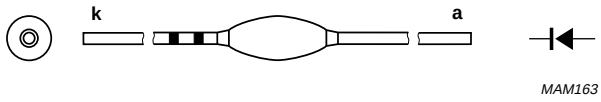


Fig.1 Simplified outline (SOD61) and symbol.

MARKING

Table 1 Cathode band colour codes

TYPE NUMBER	PACKAGE CODE	OUTER BAND	INNER BAND
BY715	SOD61E	green	brown
BY716	SOD61E	red	brown
BY717	SOD61E	green	red
BY718	SOD61E	blue	red
BY719	SOD61E	yellow	red
BY720	SOD61G	red	green
BY721	SOD61G	blue	green
BY722	SOD61K	red	blue
BY723	SOD61K	green	blue
BY724	SOD61K	yellow	blue

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RSM}	non-repetitive peak voltage				
	BY715		–	5	kV
	BY716		–	6	kV
	BY717		–	10	kV
	BY718		–	12	kV
	BY719		–	14	kV
	BY720		–	17	kV
	BY721		–	19	kV
	BY722		–	22	kV
	BY723		–	24	kV
	BY724		–	30	kV
V_{RRM}	repetitive peak reverse voltage				
	BY715		–	5	kV
	BY716		–	6	kV
	BY717		–	10	kV
	BY718		–	12	kV
	BY719		–	14	kV
	BY720		–	17	kV
	BY721		–	19	kV
	BY722		–	22	kV
	BY723		–	24	kV
	BY724		–	30	kV
V_{RW}	working reverse voltage				
	BY715		–	4	kV
	BY716		–	5	kV
	BY717		–	9	kV
	BY718		–	10	kV
	BY719		–	12	kV
	BY720		–	14	kV
	BY721		–	16	kV
	BY722		–	18	kV
	BY723		–	20	kV
	BY724		–	24	kV

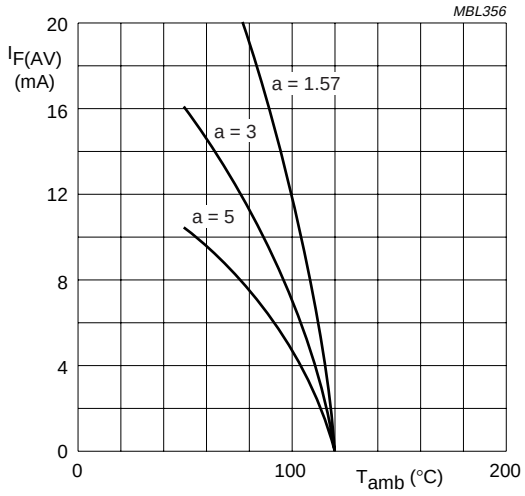
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{F(AV)}$	average forward current	averaged over any 20 ms period; see Figs 2, 3, 4 and 5			
	BY715		–	20	mA
	BY716		–	20	mA
	BY717		–	4	mA
	BY718		–	4	mA
	BY719		–	4	mA
	BY720		–	3	mA
	BY721		–	3	mA
	BY722		–	3	mA
	BY723		–	3	mA
	BY724		–	3	mA
I_{FRM}	repetitive peak forward current		–	500	mA
T_{stg}	storage temperature		–65	+120	°C
T_j	junction temperature		–65	+120	°C

ELECTRICAL CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_F	forward voltage	I_F = 100 mA; $T_j = T_{j\,max}$; see Figs 6, 7 and 8				
	BY715		–	–	28	V
	BY716		–	–	28	V
	BY717		–	–	69	V
	BY718		–	–	69	V
	BY719		–	–	69	V
	BY720		–	–	92	V
	BY721		–	–	92	V
V_F	forward voltage	I_F = 50 mA; $T_j = T_{j\,max}$; see Fig.9				
	BY722		–	–	88	V
	BY723		–	–	88	V
	BY724		–	–	88	V
I_R	reverse current	$V_R = V_{RWmax}$; T_j = 120 °C	–	–	3	µA
Q_r	recovery charge	when switched from I_F = 100 mA to $V_R \geq$ 100 V and dI_F/dt = –200 mA/µs; see Fig.11	–	–	0.4	nC
t_f	fall time	when switched from I_F = 100 mA to $V_R \geq$ 100 V and dI_F/dt = –200 mA/µs; see Fig.11	40	–	–	ns
t_{rr}	reverse recovery time	when switched from I_F = 100 mA to $V_R \geq$ 100 V and dI_F/dt = –200 mA/µs; see Fig.11	–	100	–	ns

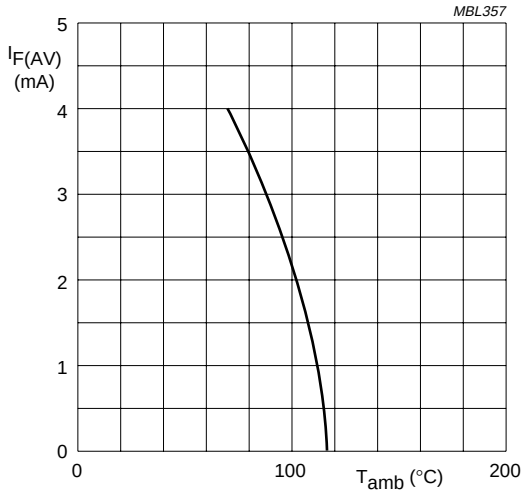
GRAPHICAL DATA



BY715 and BY716

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.

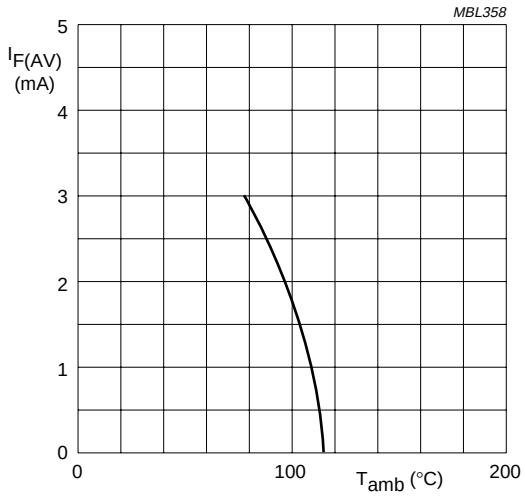
Fig.2 Maximum permissible average forward current as a function of ambient temperature.



BY717 to BY719

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.

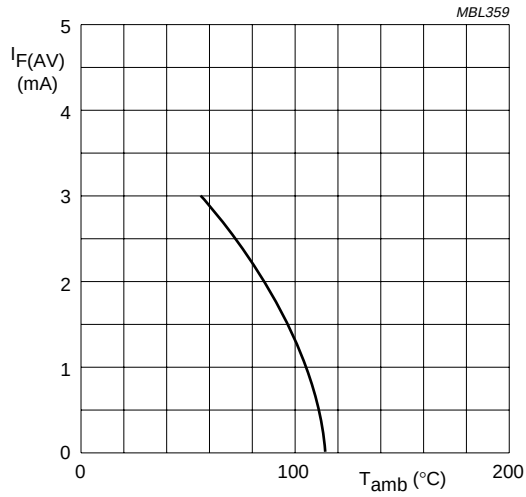
Fig.3 Maximum permissible average forward current as a function of ambient temperature.



BY720 and BY721

$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.

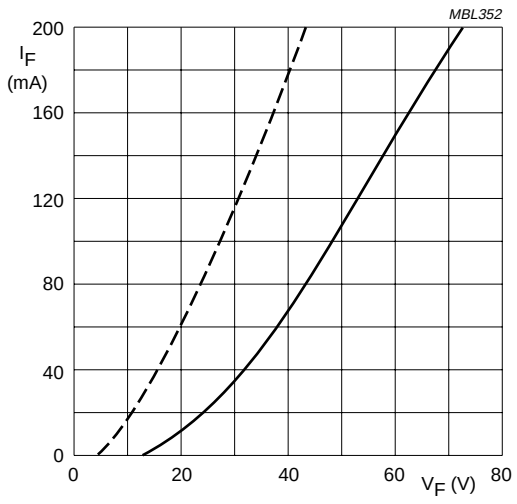
Fig.4 Maximum permissible average forward current as a function of ambient temperature.



BY722 to BY724

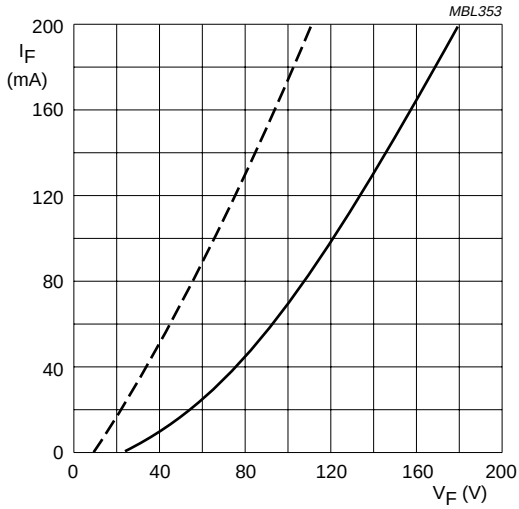
$a = I_{F(RMS)}/I_{F(AV)}$; $V_R = V_{RWmax}$; $R_{th\ j\text{-}a} \leq 120$ K/W.
a = 1.57: half sinewave.

Fig.5 Maximum permissible average forward current as a function of ambient temperature.



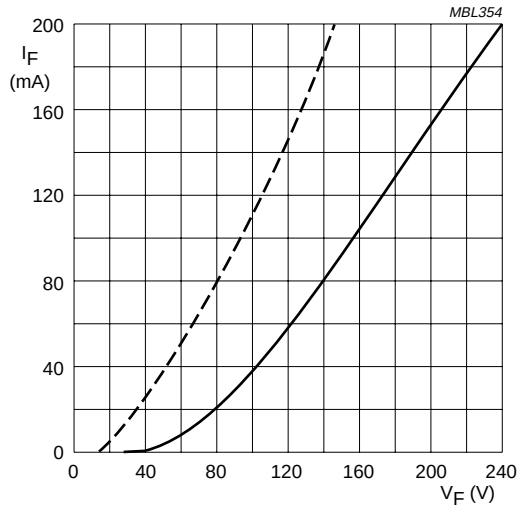
BY715 and BY716
Dotted line; T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.6 Forward current as a function of maximum forward voltage.



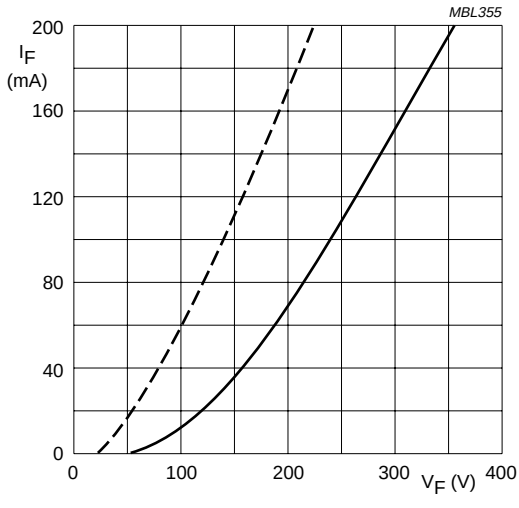
BY717 to BY719
Dotted line; T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.7 Forward current as a function of maximum forward voltage.



BY720 and BY721
Dotted line; T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.8 Forward current as a function of maximum forward voltage.



BY722 to BY724
Dotted line; T_j = 120 °C.
Solid line: T_j = 25 °C.

Fig.9 Forward current as a function of maximum forward voltage.

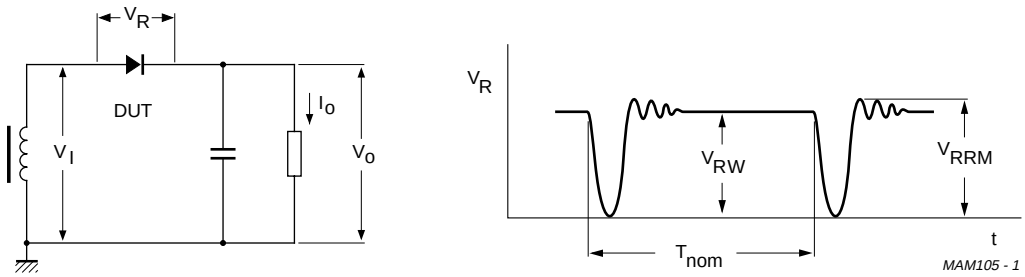


Fig.10 Typical operation circuit and voltage waveform.

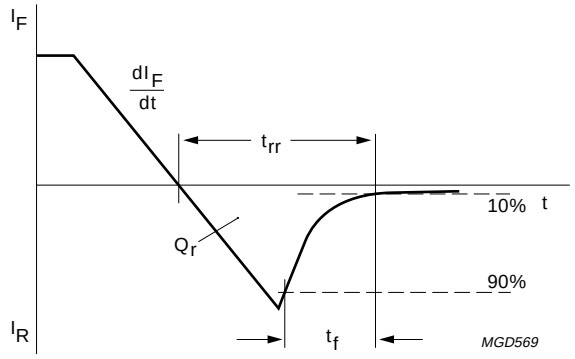
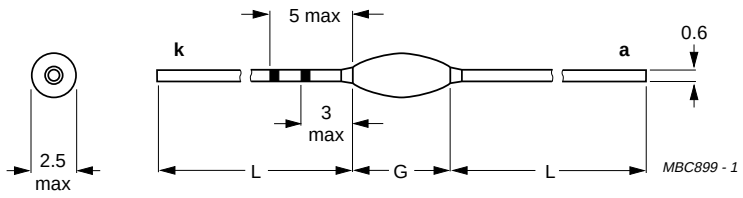


Fig.11 Reverse recovery definitions.

PACKAGE OUTLINE



The marking bands indicates the cathode.
Dimensions in mm; see table below.

Fig.12 SOD61E to K.

PACKAGE SPECIFICATION

TYPE NUMBER	PACKAGE CODE	L_{min} (mm)	G_{max} (mm)
BY715	SOD61E	29.7	9.5
BY716	SOD61E	29.7	9.5
BY717	SOD61E	29.7	9.5
BY718	SOD61E	29.7	9.5
BY719	SOD61E	29.7	9.5
BY720	SOD61G	29.0	11.0
BY721	SOD61G	29.0	11.0
BY722	SOD61K	28.2	12.5
BY723	SOD61K	28.2	12.5
BY724	SOD61K	28.2	12.5

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DATA SHEET STATUS[1]	PRODUCT STATUS[2]	DEFINITIONS
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