

1. General description

Ultrafast power diode in 2-lead TO220F plastic package.



2. Features and benefits

- Isolated package
- Low forward voltage drop
- Low leakage current
- Soft reverse recovery characteristics
- High thermal cycling performance
- Package meets UL94V0 which guaranteed by Epoxy Mold Compound

3. Applications

- Home appliance power supply
- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)

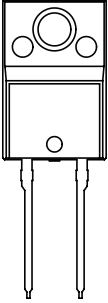
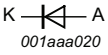
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
Absolute maximum rating							
V _{RRM}	repetitive peak reverse voltage			600			V
I _{F(AV)}	average forward current	δ = 0.5 ; square-wave pulse; T _h ≤ 80 °C; Fig. 1 ; Fig. 2 ; Fig. 3		8			A
I _{FRM}	repetitive peak forward current	δ = 0.5 ; t _p = 25 μs; T _h ≤ 80 °C; square-wave pulse		16			A
I _{FSM}	non-repetitive peak forward current	t _p = 10 ms; T _{j(init)} = 25 °C; sine-wave pulse; Fig. 4		100			A
		t _p = 8.3 ms; T _{j(init)} = 25 °C; sine-wave pulse		110			A
Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V _F	forward voltage	I _F = 8 A; T _J = 25 °C; Fig. 6		-	1.35	1.85	V
		I _F = 8 A; T _J = 150 °C; Fig. 6		-	1.10	1.50	V
Dynamic characteristics							
t _{rr}	reverse recovery time	I _F = 1 A; V _R = 30 V; dI _F /dt = 100 A/μs; T _J = 25 °C; Fig. 7		-	24	-	ns

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		
2	A	anode		
mb	n.c.	mounting base; isolated		

6. Ordering information

Table 3. Ordering information

Type number	Package name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
BYV29MFX-600P	TO220F-2L	BYV29MFX-600PQ	Tube	50	TO220Fd-2L	02-Aug-2022

7. Marking

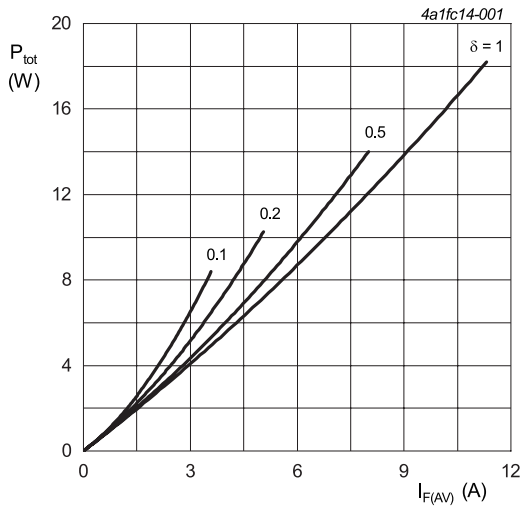
Table 4. Marking codes

Type number	Marking codes
BYV29MFX-600P	BYV29MFX 600P

8. Limiting values

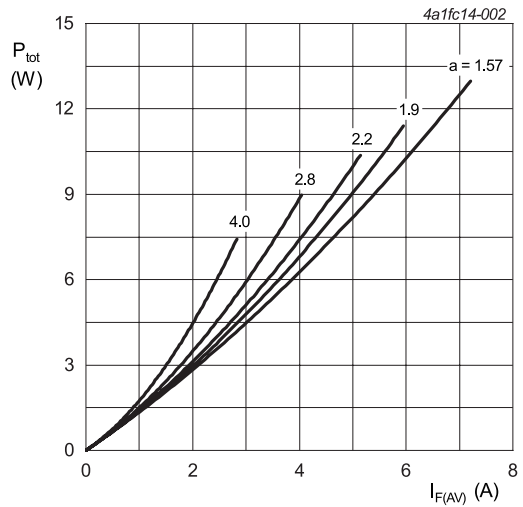
Table 5. Limiting values
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Notes	Values	Unit
V_{RRM}	repetitive peak reverse voltage			600	V
V_{RWM}	crest working reverse voltage			600	V
V_R	reverse voltage	DC		600	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; square-wave pulse; $T_h \leq 80\text{ }^{\circ}\text{C}$; Fig. 1 ; Fig. 2 ; Fig. 3		8	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25\text{ }\mu\text{s}$; $T_h \leq 80\text{ }^{\circ}\text{C}$; square-wave pulse		16	A
I_{FSM}	non-repetitive peak forward current	$t_p = 10\text{ ms}$; $T_{j(\text{init})} = 25\text{ }^{\circ}\text{C}$; sine-wave pulse; Fig. 4		100	A
		$t_p = 8.3\text{ ms}$; $T_{j(\text{init})} = 25\text{ }^{\circ}\text{C}$; sine-wave pulse		110	A
T_{stg}	storage temperature			-65 to 175	$^{\circ}\text{C}$
T_j	junction temperature			-65 to 175	$^{\circ}\text{C}$



$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$
 $V_o = 1.268\text{ V}$; $R_s = 0.0301\text{ }\Omega$

Fig. 1. Forward power dissipation as a function of average forward current; square waveform; maximum values



$a = \text{form factor} = I_{F(RMS)} / I_{F(AV)}$
 $V_o = 1.268\text{ V}$; $R_s = 0.0301\text{ }\Omega$

Fig. 2. Forward power dissipation as a function of average forward current; sinusoidal waveform; maximum values

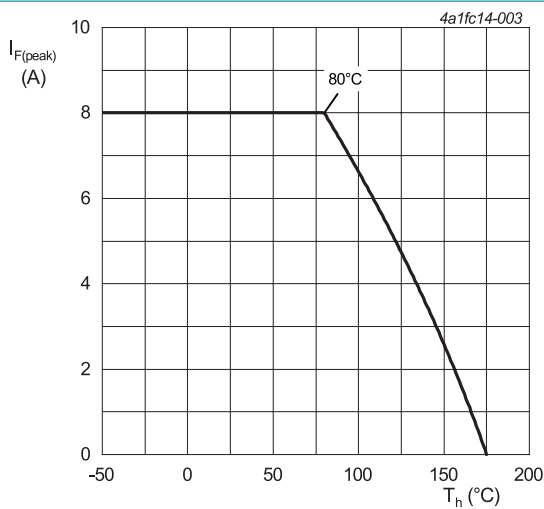


Fig. 3. Forward current as a function of heatsink temperature; maximum values

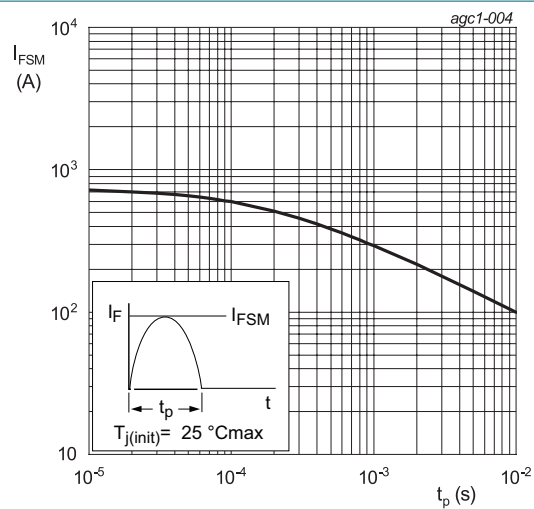
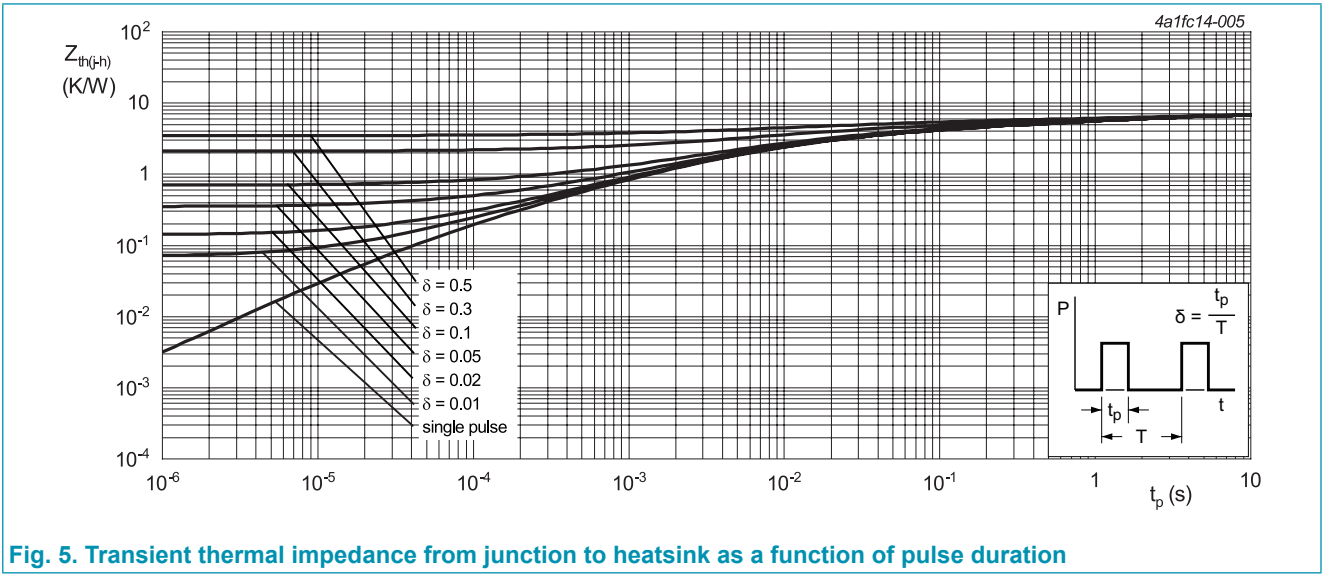


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
$R_{th(j-h)}$	thermal resistance from junction to heatsink	with heatsink compound; Fig. 5		-	-	6.8	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	60	-	K/W



10. Isolation characteristics

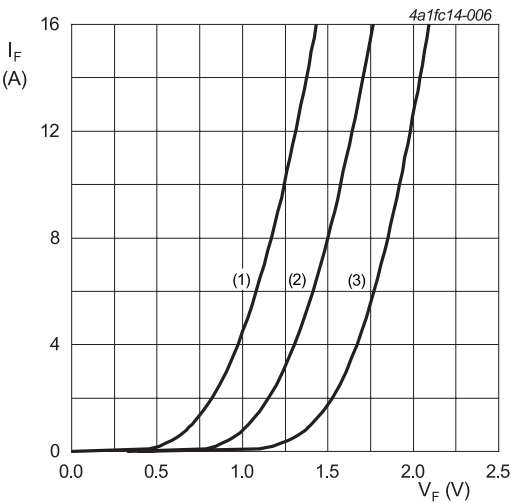
Table 7. Isolation characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
$V_{isol(RMS)}$	RMS isolation voltage	50 Hz ≤ f ≤ 60 Hz; RH ≤ 65 %; from all pins to external heatsink; sinusoidal waveform; clean and dust free		-	-	2500	V
C_{isol}	isolation capacitance	from cathode to external heatsink		-	10	-	pF

11. Characteristics

Table 8. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V _F	forward current	I _F = 8 A; T _j = 25 °C; Fig. 6		-	1.35	1.85	V
		I _F = 8 A; T _j = 150 °C; Fig. 6		-	1.10	1.50	V
I _R	reverse current	V _R = 600 V; T _j = 25 °C		-	-	8	μA
		V _R = 600 V; T _j = 150 °C		-	-	120	μA
Dynamic characteristics							
Q _r	reverse charge	I _F = 1 A; V _R = 30 V; dI _F /dt = 100 A/μs; T _j = 25 °C; Fig. 7		-	24	-	nC
t _{rr}	reverse recovery time	I _F = 0.5 A; I _{rr} = 0.25 A; I _R = 1 A; T _j = 25 °C		-	28	-	ns
		I _F = 1 A; V _R = 30 V; dI _F /dt = 100 A/μs; T _j = 25 °C; Fig. 7		-	24	-	ns
I _{RM}	peak reverse recovery current	I _F = 1 A; V _R = 30 V; dI _F /dt = 100 A/μs; T _j = 25 °C; Fig. 7		-	1.9	-	A



$V_o = 1.268\text{ V}; R_s = 0.0301\text{ }\Omega$
(1) $T_J = 150\text{ °C}$; typical values
(2) $T_J = 150\text{ °C}$; maximum values
(3) $T_J = 25\text{ °C}$; maximum values

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

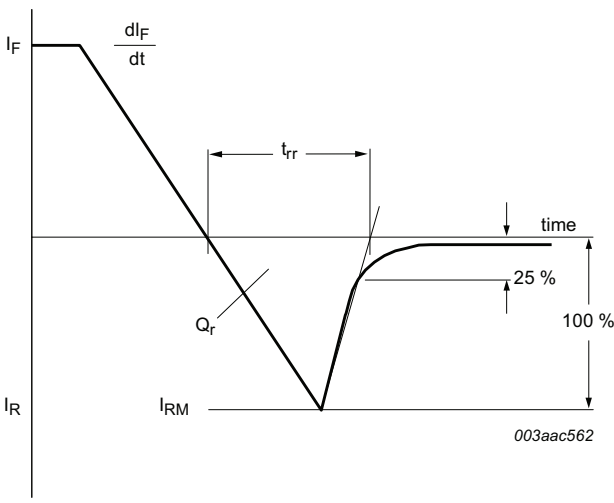
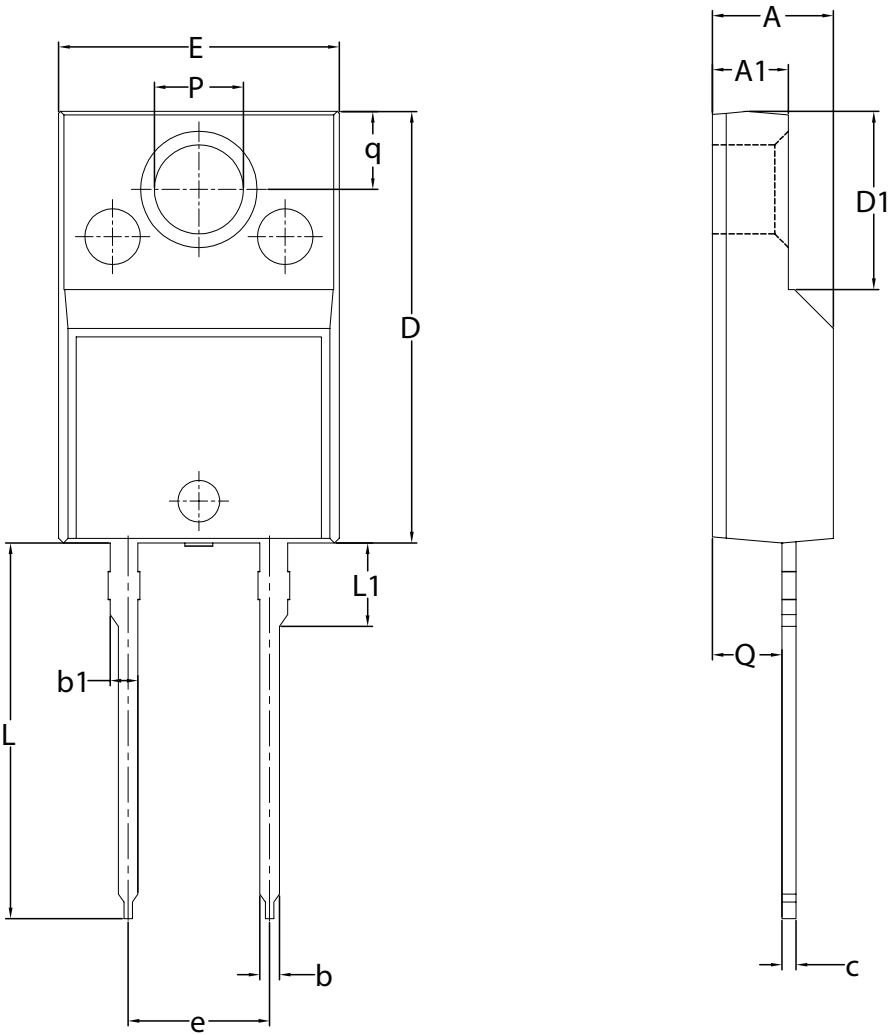


Fig. 7. Reverse recovery definitions; ramp recovery

12. Package outline

Plastic single-ended package; isolated heatsink mounted;1 mounting hole; 2 leads TO-220 'full pack' TO220F-2L



Unit	A	A1	b	b1	c	D	D1	E	e	L	L1	P	Q	q
min	4.00	2.50	0.70	0.90	0.40	15.20	6.30	9.80	5.08	13.50	2.80	3.00	2.30	2.60
max	4.60	3.10	0.90	1.10	0.70	15.80	6.50	10.30	(BSC)	14.40	3.30	3.40	2.80	3.00

Note:
1. All dimensions don't include mold flash and metal protrusion.

13. Legal information

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Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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Product [short] data sheet	Production	This document contains the product specification.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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