MURS360B

Ultrafast power diode

Rev.02 - 1 August 2018 Product data sheet

1. General description

Ultrafast power diode in a SMB surface-mountable plastic package.

2. Features and benefits

- Low on-state loss
- Low leakage current
- Low thermal resistance
- Surface-mountable package
- Reduces switching losses in associated MOSFET or IGBT

3. Applications

- Buck and Boost converter
- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)
- Inverter freewheeling and protection diode

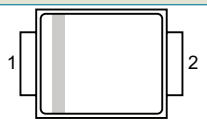
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	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_{lead} ≤ 86 °C; Fig. 1; Fig. 2; Fig. 3	3				A
I_{FRM}	repetitive peak forward current	δ = 0.5 ; t_p = 25 µs; T_{lead} ≤ 86 °C; square-wave pulse	6				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**		**Min**	**Typ**	**Max**	**Unit**
Static characteristics							
V_F	forward voltage	I_F = 3 A; T_j = 25 °C; Fig. 6		-	-	1.3	V
		I_F = 3 A; T_j = 150 °C; Fig. 6		-	0.88	1.05	V
Dynamic characteristics							
t_{rr}	reverse recovery time	I_F = 1 A; V_R = 30 V; dI_F/dt = 50 A/µs; T_j = 25 °C; Fig. 7		-	50	-	ns

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		
2	A	anode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
MURS360B	SMB	Hermetically sealed plastic package; SMB; 2 leads	SMB

7. Marking

Table 4. Marking codes

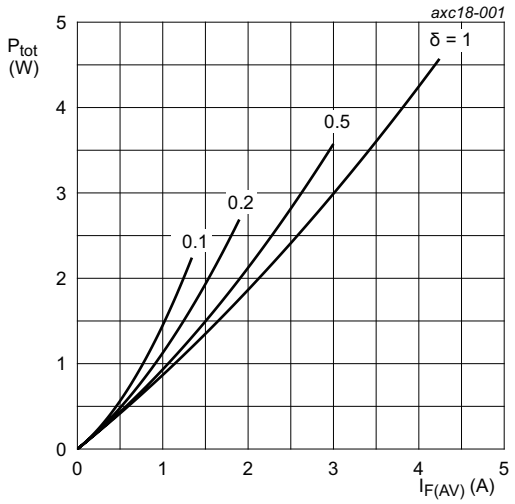
Type number	Marking codes
MURS360B	360B

8. Limiting values

Table 5. Limiting values

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

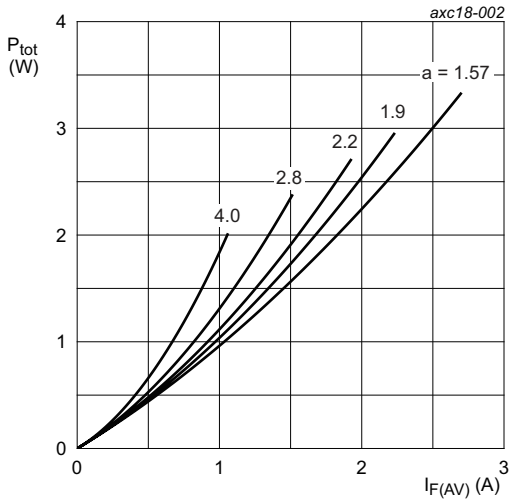
Symbol	Parameter	Conditions	Values	Unit
V_{RRM}	repetitive peak reverse voltage		600	V
V_{RWM}	crest working reverse voltage		600	V
V_R	reverse voltage	DC	600	V
$I_{F(AV)}$	average forward current	δ = 0.5 ; square-wave pulse; $T_{lead} \leq 86$ °C; Fig. 1; Fig. 2; Fig. 3	3	A
I_{FRM}	repetitive peak forward current	δ = 0.5 ; t_p = 25 µs; $T_{lead} \leq 86$ °C; square-wave pulse	6	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
T_{stg}	storage temperature		-65 to 175	°C
T_j	junction temperature		175	°C



$I_{F(AV)} = I_{F(RMS)} \times \sqrt{\delta}$

V_o = 0.803 V; R_s = 0.0647 Ω

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



a = form factor = $I_{F(RMS)} / I_{F(AV)}$

Vo = 0.803 V; Rs = 0.0647 Ω

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

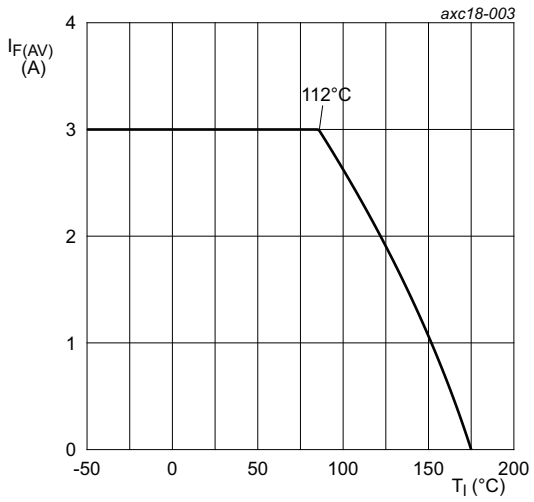


Fig. 3. Forward current as a function of lead temperature; maximum values

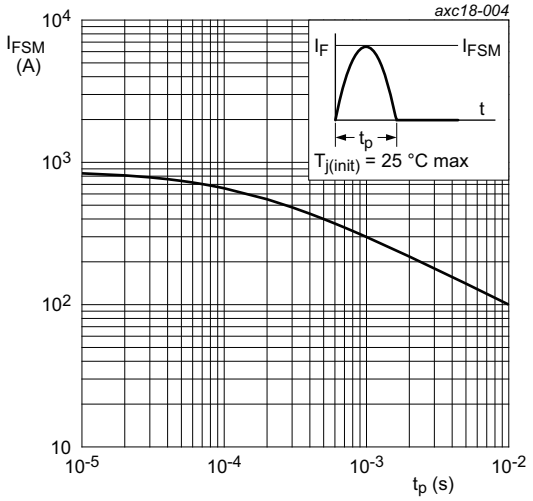


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j\text{-}lead)}$	thermal resistance from junction to lead	mounted on a minimum footprint printed-circuit board (FR4); Fig. 5		-	-	25	K/W
$R_{th(j\text{-}a)}$	thermal resistance from junction to ambient free air	mounted on a minimum footprint printed-circuit board (FR4)		-	75	-	K/W

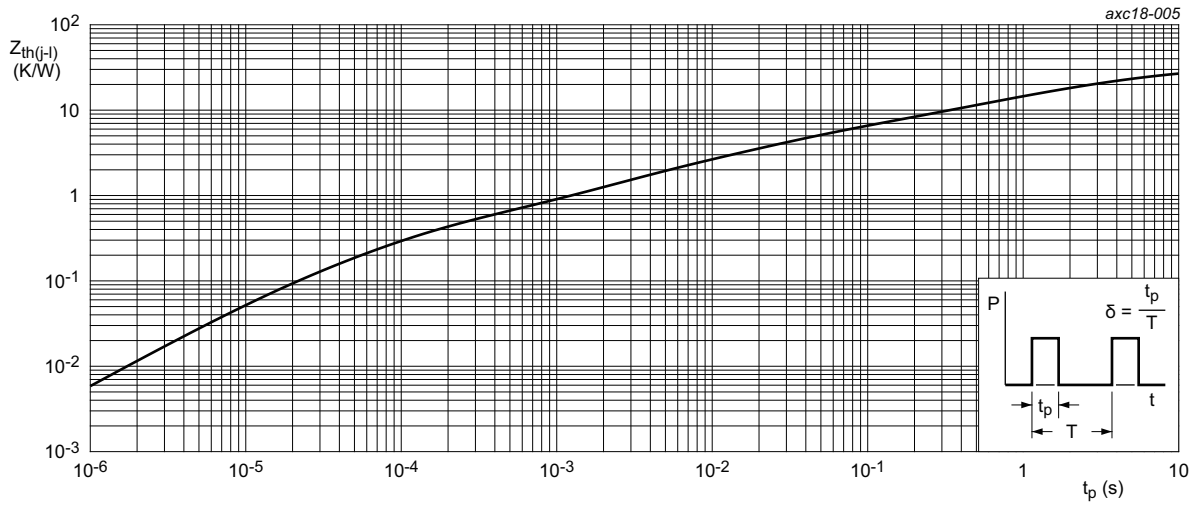
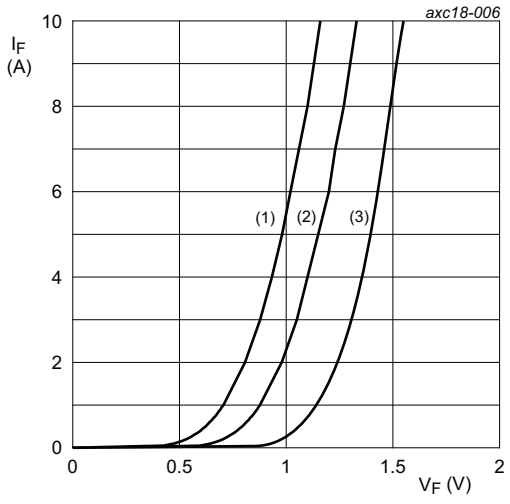


Fig. 5. Transient thermal impedance from junction to lead as a function of pulse duration

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V_F	forward current	I_F = 3 A; T_j = 25 °C; Fig. 6		-	-	1.3	V
		I_F = 3 A; T_j = 150 °C; Fig. 6		-	0.88	1.05	V
I_R	reverse current	V_R = 600 V; T_j = 25 °C		-	-	3	µA
		V_R = 600 V; T_j = 150 °C		-	-	1	mA
Dynamic characteristics							
Q_r	reverse charge	I_F = 3 A; V_R = 400 V; dI_F/dt = 200 A/µs; T_j = 25 °C; Fig. 7		-	122	-	nC
		I_F = 3 A; V_R = 400 V; dI_F/dt = 200 A/µs; T_j = 125 °C; Fig. 7		-	199	-	nC
t_{rr}	reverse recovery time	I_F = 1 A; V_R = 30 V; dI_F/dt = 50 A/µs; T_j = 25 °C; Fig. 7		-	50	-	ns
		I_F = 0.5 A; I_R = 1 A; $I_{R(meas)}$ = 0.25 A; T_j = 25 °C; Step recovery		-	-	50	ns
		I_F = 3 A; V_R = 400 V; dI_F/dt = 200 A/µs; T_j = 25 °C; Fig. 7		-	52	-	ns
		I_F = 3 A; V_R = 400 V; dI_F/dt = 200 A/µs; T_j = 125 °C; Fig. 7		-	65	-	ns
I_{RM}	peak reverse recovery current	I_F = 3 A; V_R = 400 V; dI_F/dt = 200 A/µs; T_j = 25 °C; Fig. 7		-	4.7	-	A
		I_F = 3 A; V_R = 400 V; dI_F/dt = 200 A/µs; T_j = 125 °C; Fig. 7		-	6.1	-	A
E_{as}	non-repetitive avalanche energy	I_R = 1.2 A; $T_{j(init)}$ = 25 °C; L = 15 mH		10.8	-	-	mJ



V_o = 0.803 V; R_s = 0.0647 Ω
(1) T_j = 150 °C; typical values
(2) T_j = 150 °C; maximum values
(3) T_j = 25 °C; maximum values

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

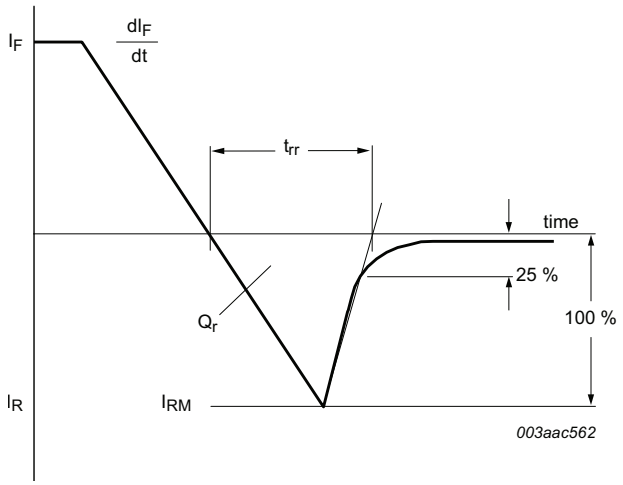
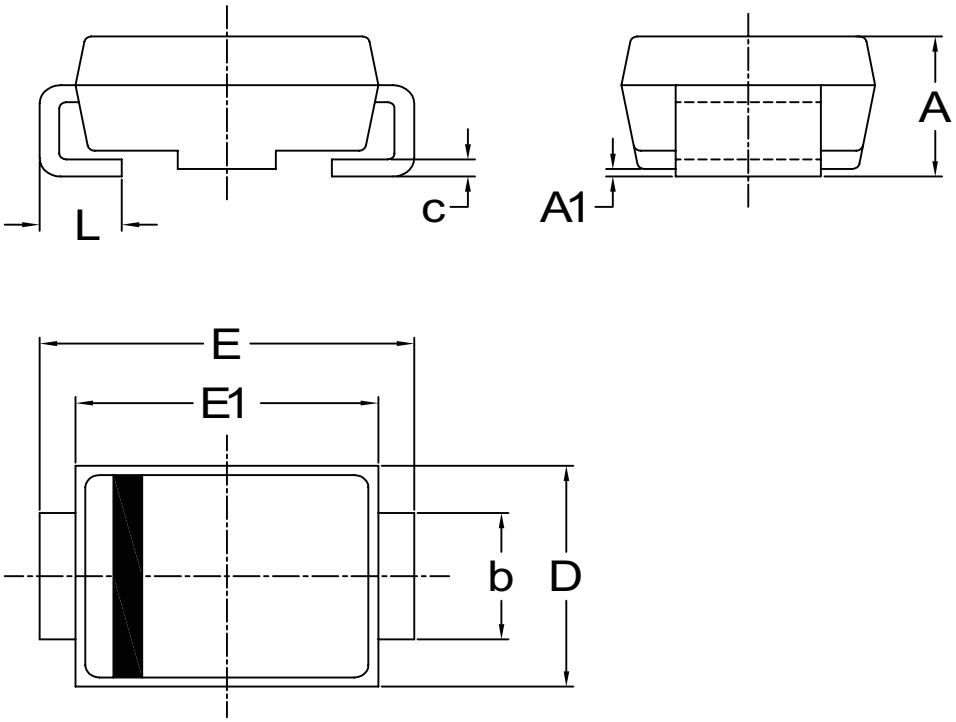


Fig. 7. Reverse recovery definitions; ramp recovery

11. Package outline



UNIT		A	A1	b	c	D	E	E1	L
mm	Max	2.50	0.20	2.21	0.31	3.95	5.60	4.60	1.60
	Min	2.00	0.05	1.96	0.15	3.30	5.20	4.05	0.75

Remark: Dimensions D and E1 do not include mold flash.

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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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