

## 1. General description

Ultrafast power diode in a SMA package.

## 2. Features and benefits

- Fast switching
- SMA package
- High voltage capability
- Low forward voltage drop
- Low leakage current
- Low thermal resistance
- Soft recovery characteristic

## 3. Applications

- Discontinuous Current Mode (DCM) Power Factor Correction (PFC)
- Switching power supplies, inverters and as free wheeling diodes
- High frequency switched-mode power supplies

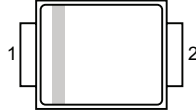

## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Values	Unit
<b>Absolute maximum rating</b>				
$V_{RRM}$	repetitive peak reverse voltage		600	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$ ; square-wave pulse; $T_{lead} \leq 140 \text{ }^\circ\text{C}$ ; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a>	1	A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25 \text{ } \mu\text{s}$ ; $T_{lead} \leq 140 \text{ }^\circ\text{C}$ ; square-wave pulse	2	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 10 \text{ ms}$ ; $T_{J(init)} = 25 \text{ }^\circ\text{C}$ ; sine-wave pulse; <a href="#">Fig. 4</a>	39	A
		$t_p = 8.3 \text{ ms}$ ; $T_{J(init)} = 25 \text{ }^\circ\text{C}$ ; sine-wave pulse	43	A

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		 001aaa020
2	A	anode		

## 6. Ordering information

Table 3. Ordering information

Type number	Package Name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
MURS160	SMA	MURS160J	Reel	7500	SMAE	03-Mar-2020

## 7. Marking

Table 4. Marking codes

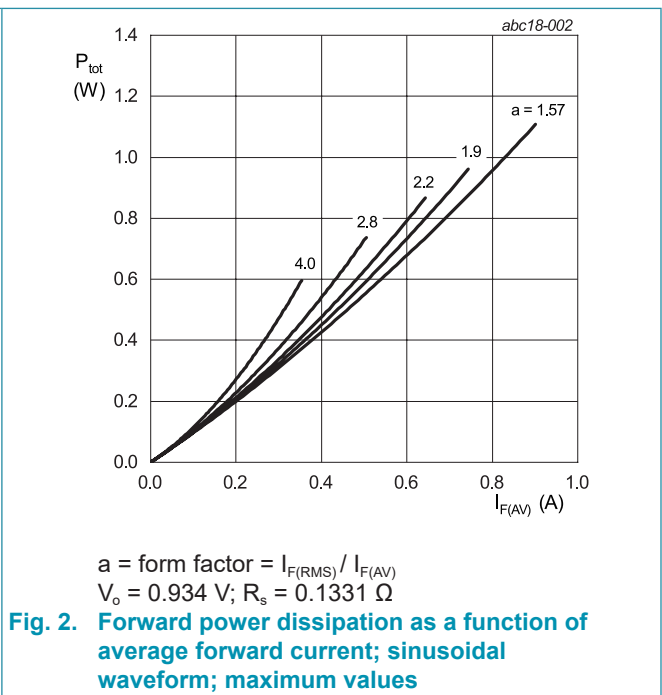
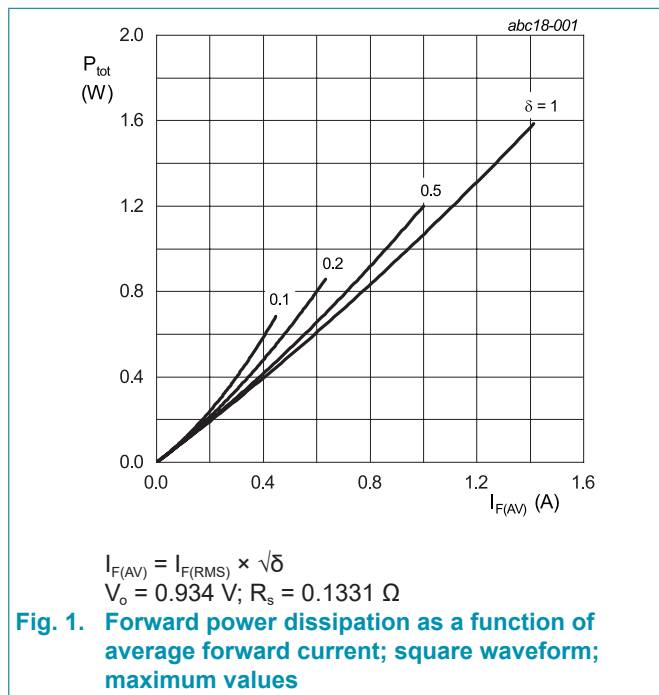
Type number	Marking codes
MURS160	S160

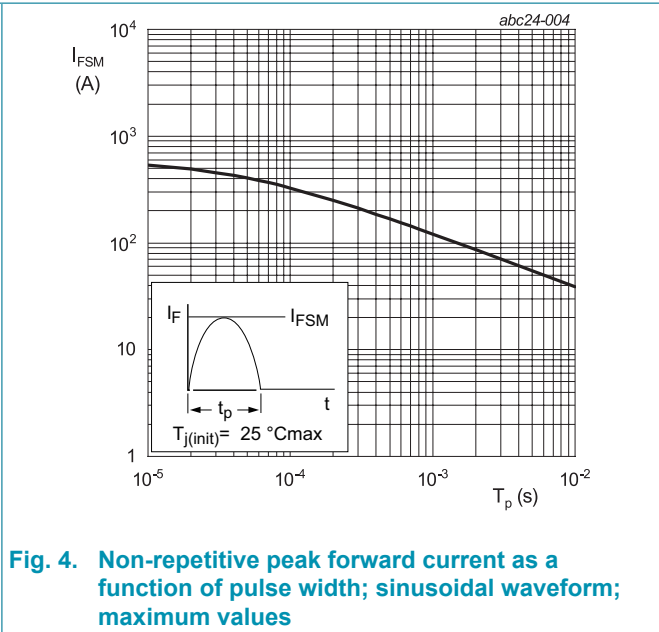
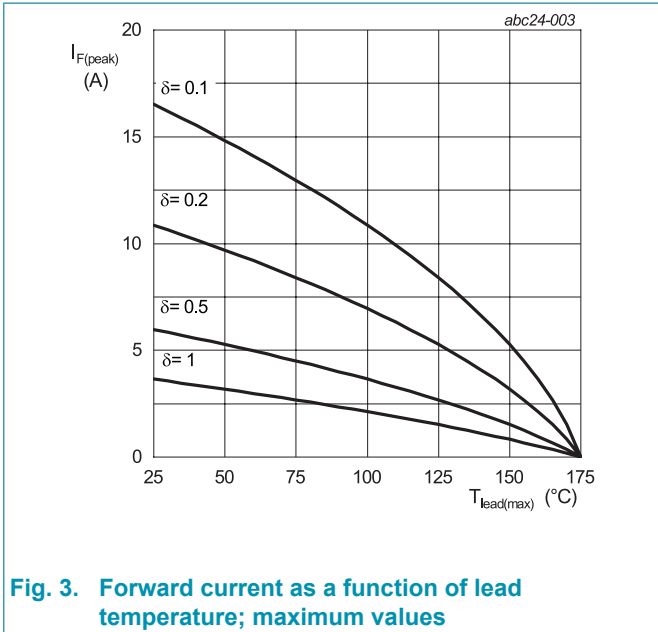
## 8. Limiting values

**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	$\delta = 0.5$ ; square-wave pulse; $T_{lead} \leq 140\text{ }^\circ\text{C}$ ; <a href="#">Fig. 1</a> ; <a href="#">Fig. 2</a> ; <a href="#">Fig. 3</a>	1	A
$I_{FRM}$	repetitive peak forward current	$\delta = 0.5$ ; $t_p = 25\text{ }\mu\text{s}$ ; $T_{lead} \leq 140\text{ }^\circ\text{C}$ ; square-wave pulse	2	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; <a href="#">Fig. 4</a>	39	A
		$t_p = 8.3\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$ ; sine-wave pulse	43	A
$T_{stg}$	storage temperature		-65 to 175	$^\circ\text{C}$
$T_j$	junction temperature		175	$^\circ\text{C}$





## 9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-lead)}$	thermal resistance from junction to lead	<a href="#">Fig. 5</a>	-	-	29	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air	-	-	216	K/W

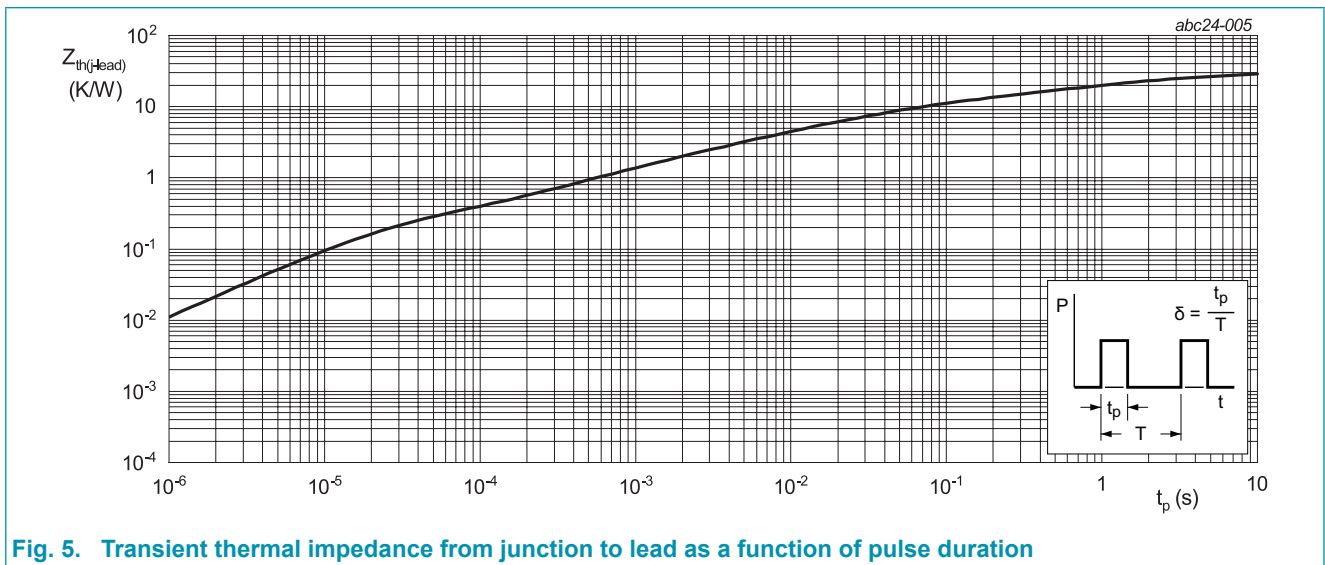
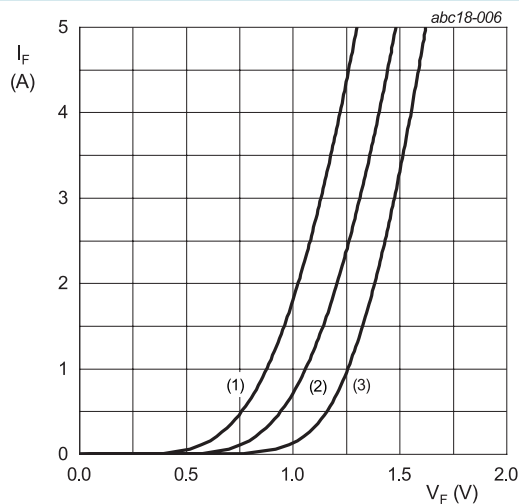


Fig. 5. Transient thermal impedance from junction to lead as a function of pulse duration

## 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_F$	forward voltage	$I_F = 1 \text{ A}; T_J = 25 \text{ }^\circ\text{C}$	-	-	1.25	V
		$I_F = 1 \text{ A}; T_J = 150 \text{ }^\circ\text{C}$	-	-	1.05	V
$I_R$	reverse current	$V_R = 600 \text{ V}; T_J = 25 \text{ }^\circ\text{C}$	-	-	5	$\mu\text{A}$
		$V_R = 600 \text{ V}; T_J = 150 \text{ }^\circ\text{C}$	-	-	150	$\mu\text{A}$
<b>Dynamic characteristics</b>						
$Q_r$	reverse charge	$I_F = 1 \text{ A}; V_R = 400 \text{ V}; dI_F/dt = 200 \text{ A/us}; T_J = 25 \text{ }^\circ\text{C}; \text{Fig. 7}$	-	45	-	nC
		$I_F = 1 \text{ A}; V_R = 400 \text{ V}; dI_F/dt = 200 \text{ A/us}; T_J = 125 \text{ }^\circ\text{C}; \text{Fig. 7}$	-	81	-	nC
$t_{rr}$	reverse recovery time	$I_F = 1 \text{ A}; V_R = 30 \text{ V}; dI_F/dt = 50 \text{ A/us}; T_J = 25 \text{ }^\circ\text{C}; \text{Fig. 7}$	-	-	75	ns
		$I_F = 0.5 \text{ A}; I_R = 1 \text{ A}; I_{R(\text{meas})} = 0.25 \text{ A}; T_J = 25 \text{ }^\circ\text{C}; \text{Step recovery}$	-	-	56	ns
		$I_F = 1 \text{ A}; V_R = 400 \text{ V}; dI_F/dt = 200 \text{ A/us}; T_J = 25 \text{ }^\circ\text{C}; \text{Fig. 7}$	-	31	-	ns
		$I_F = 1 \text{ A}; V_R = 400 \text{ V}; dI_F/dt = 200 \text{ A/us}; T_J = 125 \text{ }^\circ\text{C}; \text{Fig. 7}$	-	46	-	ns
$I_{RM}$	peak reverse recovery current	$I_F = 1 \text{ A}; V_R = 400 \text{ V}; dI_F/dt = 200 \text{ A/us}; T_J = 25 \text{ }^\circ\text{C}; \text{Fig. 7}$	-	2.9	-	A
		$I_F = 1 \text{ A}; V_R = 400 \text{ V}; dI_F/dt = 200 \text{ A/us}; T_J = 125 \text{ }^\circ\text{C}; \text{Fig. 7}$	-	3.5	-	A
$E_{as}$	non-repetitive avalanche energy	$I_R = 0.9 \text{ A}; L = 15 \text{ mH}; T_{J(\text{init})} = 25 \text{ }^\circ\text{C}$	6	-	-	mJ



$V_o = 0.934 \text{ V}; R_s = 0.1331 \text{ } \Omega$   
 (1)  $T_J = 150 \text{ }^\circ\text{C}$ ; typical values  
 (2)  $T_J = 150 \text{ }^\circ\text{C}$ ; maximum values  
 (3)  $T_J = 25 \text{ }^\circ\text{C}$ ; maximum values

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

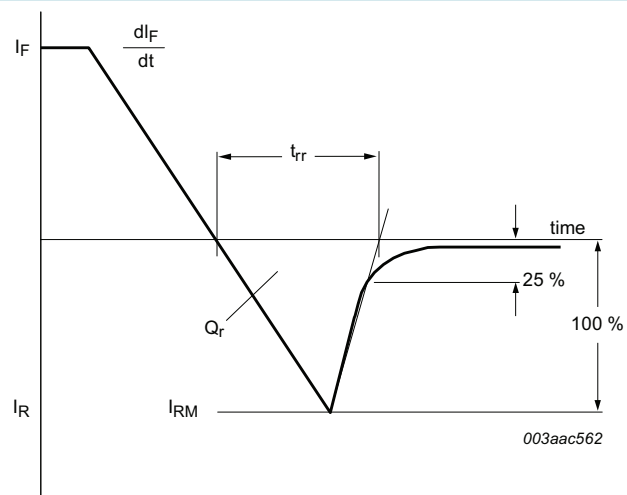
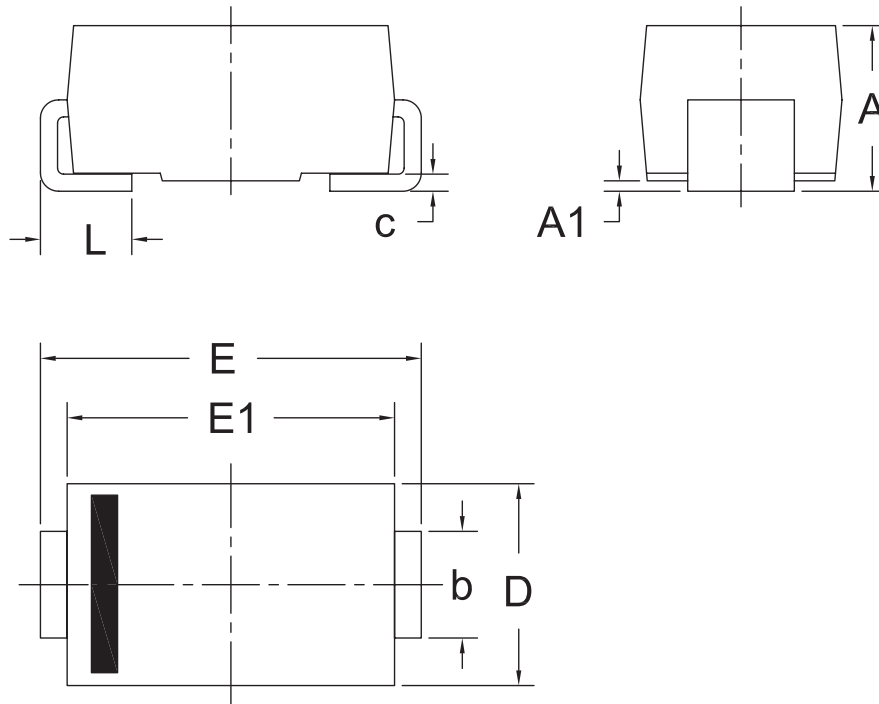


Fig. 7. Reverse recovery definitions; ramp recovery

### 11. Package outline



UNIT	A	A1	b	c	D	E	E1	L
mm	Max 2.35	0.21	1.5	0.25	2.80	5.2	4.45	1.5
	Min 1.95	0.05	1.3	0.15	2.50	4.8	4.15	0.9

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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
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- [1] Please consult the most recently issued document before initiating or completing a design.
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