

# DATA SHEET

**BYV29F, BYV29X series**  
Rectifier diodes  
ultrafast

Product specification

February 1999



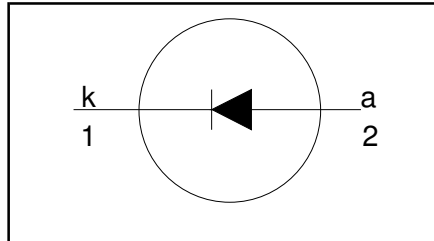
**Rectifier diodes  
ultrafast**

**BYV29F, BYV29X series**

**FEATURES**

- Low forward volt drop
- Fast switching
- Soft recovery characteristic
- High thermal cycling performance
- Isolated mounting tab

**SYMBOL**



**QUICK REFERENCE DATA**

$V_R = 300\text{ V} / 400\text{ V} / 500\text{ V}$
$V_F \leq 1.03\text{ V}$
$I_{F(AV)} = 9\text{ A}$
$t_{rr} \leq 60\text{ ns}$

**GENERAL DESCRIPTION**

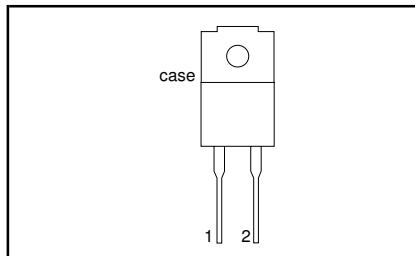
Ultra-fast epitaxial rectifier diodes intended for use in switched mode power supply output rectification, electronic lighting ballasts and high frequency switching circuits in general.

The BYV29F series is supplied in the SOD100 package.  
The BYV29X series is supplied in the SOD113 package.

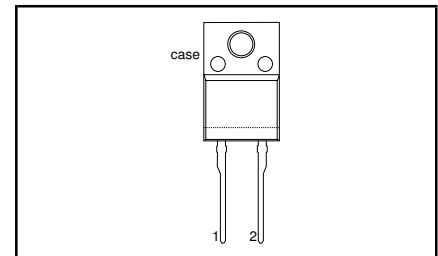
**PINNING**

PIN	DESCRIPTION
1	cathode (k)
2	anode (a)
tab	isolated

**SOD100**



**SOD113**



**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.			UNIT
				-300	-400	-500	
$V_{RRM}$	Peak repetitive reverse voltage	<b>BYV29F/BYV29X</b> $T_{hs} \leq 138^\circ\text{C}^1$ square wave; $\delta = 0.5$ ; $T_{hs} \leq 90^\circ\text{C}$ $t = 10\text{ ms}$ $t = 8.3\text{ ms}$ sinusoidal; with reapplied $V_{RRM(max)}$	-	300	400	500	V
$V_R$	Continuous reverse voltage		-	300	400	500	V
$I_{F(AV)}$	Average forward current <sup>2</sup>		-	9			A
$I_{FSM}$	Non-repetitive peak forward current		-	-	100	110	A
$T_{stg}$	Storage temperature	-40	-	150	-	$^\circ\text{C}$	
$T_j$	Operating junction temperature	-	-	150	-	$^\circ\text{C}$	

<sup>1</sup>  $T_{hs}$  de-rating for thermal stability.

<sup>2</sup> Neglecting switching and reverse current losses

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**ISOLATION LIMITING VALUE & CHARACTERISTIC** $T_{hs} = 25\text{ °C}$  unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{isol}$	Peak isolation voltage from all terminals to external heatsink	SOD100 package; R.H. $\leq$ 65%; clean and dustfree	-	-	1500	V
$V_{isol}$	R.M.S. isolation voltage from all terminals to external heatsink	SOD113 package; $f = 50\text{-}60\text{ Hz}$ ; sinusoidal waveform; R.H. $\leq$ 65%; clean and dustfree	-	-	2500	V
$C_{isol}$	Capacitance from pin 2 to external heatsink	$f = 1\text{ MHz}$	-	10	-	pF

**THERMAL RESISTANCES**

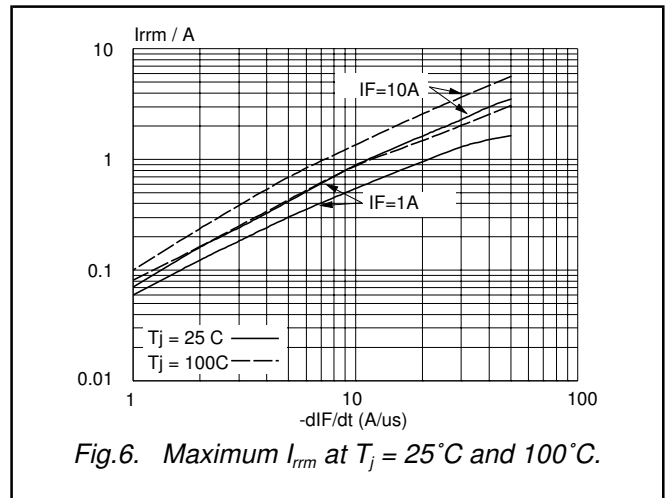
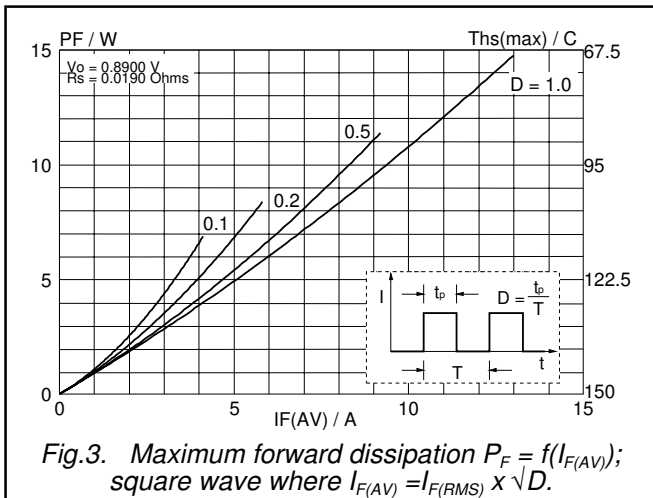
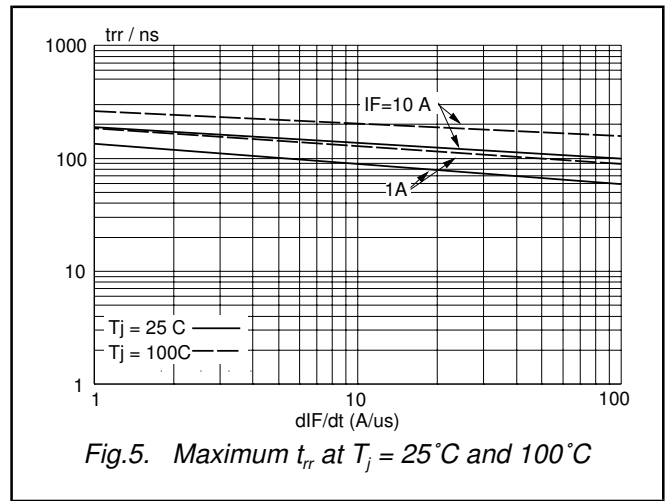
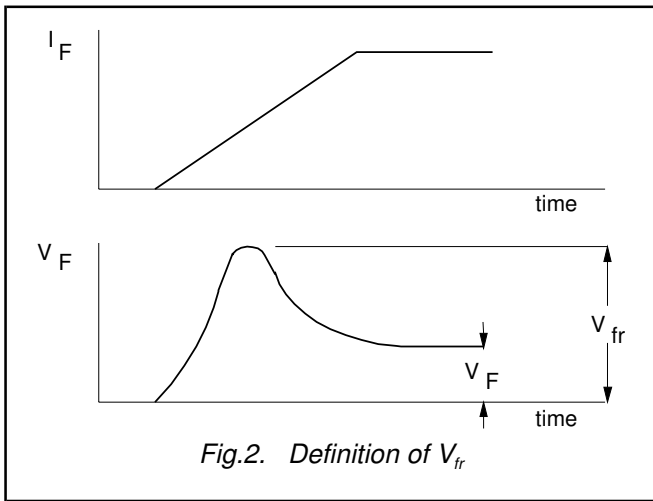
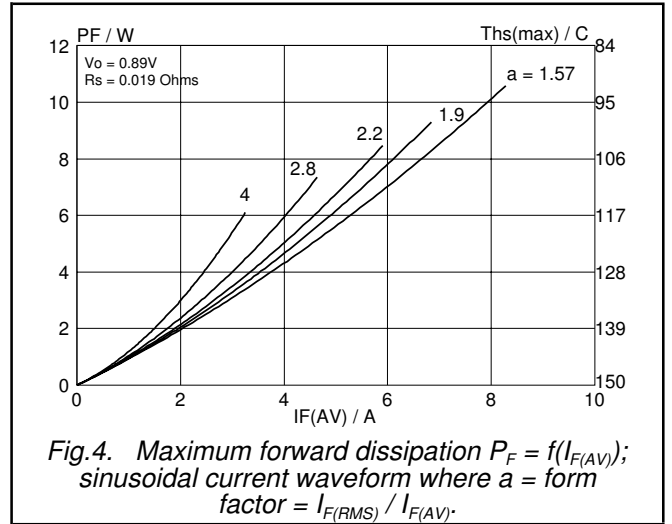
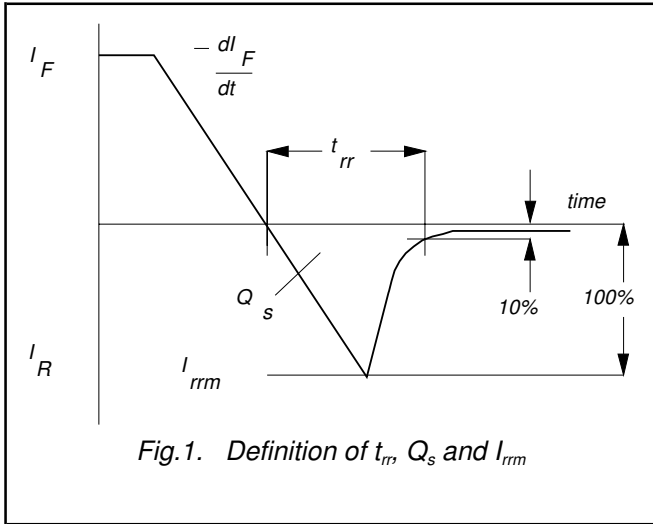
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}hs}$	Thermal resistance junction to heatsink	with heatsink compound	-	-	5.5	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	without heatsink compound in free air.	-	55	7.2	K/W

**ELECTRICAL CHARACTERISTICS** $T_j = 25\text{ °C}$  unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$	Forward voltage	$I_F = 8\text{ A}$ ; $T_j = 150\text{ °C}$	-	0.90	1.03	V
		$I_F = 8\text{ A}$	-	1.05	1.25	V
		$I_F = 20\text{ A}$	-	1.20	1.40	V
$I_R$	Reverse current	$V_R = V_{RRM}$	-	2.0	50	$\mu\text{A}$
		$V_R = V_{RRM}$ ; $T_j = 100\text{ °C}$	-	0.1	0.35	mA
$Q_s$	Reverse recovery charge	$I_F = 2\text{ A}$ to $V_R \geq 30\text{ V}$ ; $dl_F/dt = 20\text{ A}/\mu\text{s}$	-	40	60	nC
$t_{rr}$	Reverse recovery time	$I_F = 1\text{ A}$ to $V_R \geq 30\text{ V}$ ; $dl_F/dt = 100\text{ A}/\mu\text{s}$	-	50	60	ns
$I_{rrm}$	Peak reverse recovery current	$I_F = 10\text{ A}$ to $V_R \geq 30\text{ V}$ ; $dl_F/dt = 50\text{ A}/\mu\text{s}$ ; $T_j = 100\text{ °C}$	-	4.0	5.5	A
$V_{fr}$	Forward recovery voltage	$I_F = 10\text{ A}$ ; $dl_F/dt = 10\text{ A}/\mu\text{s}$	-	2.5	-	V

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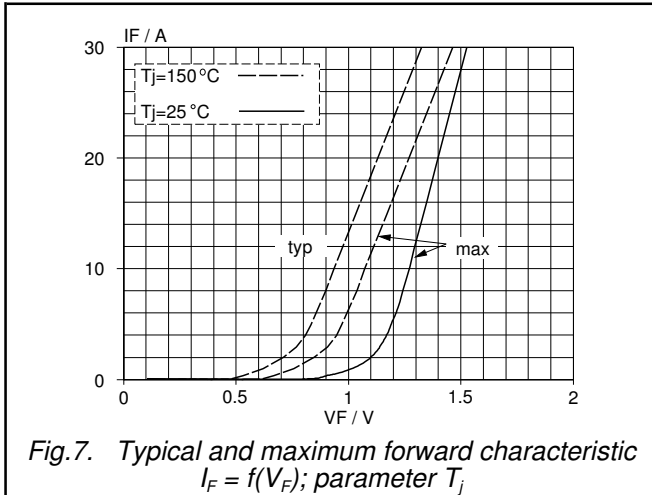


Fig.7. Typical and maximum forward characteristic  $I_F = f(V_F)$ ; parameter  $T_j$

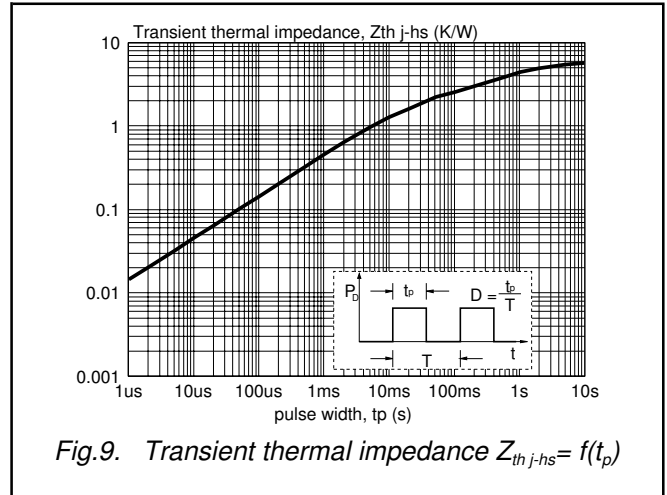


Fig.9. Transient thermal impedance  $Z_{th\ j-hs} = f(t_p)$

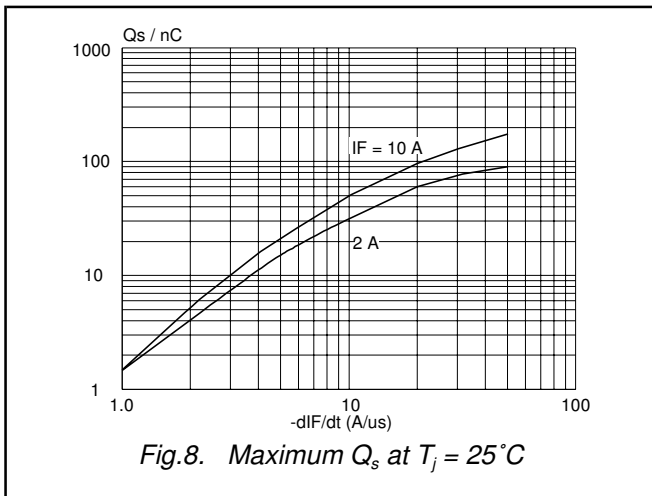
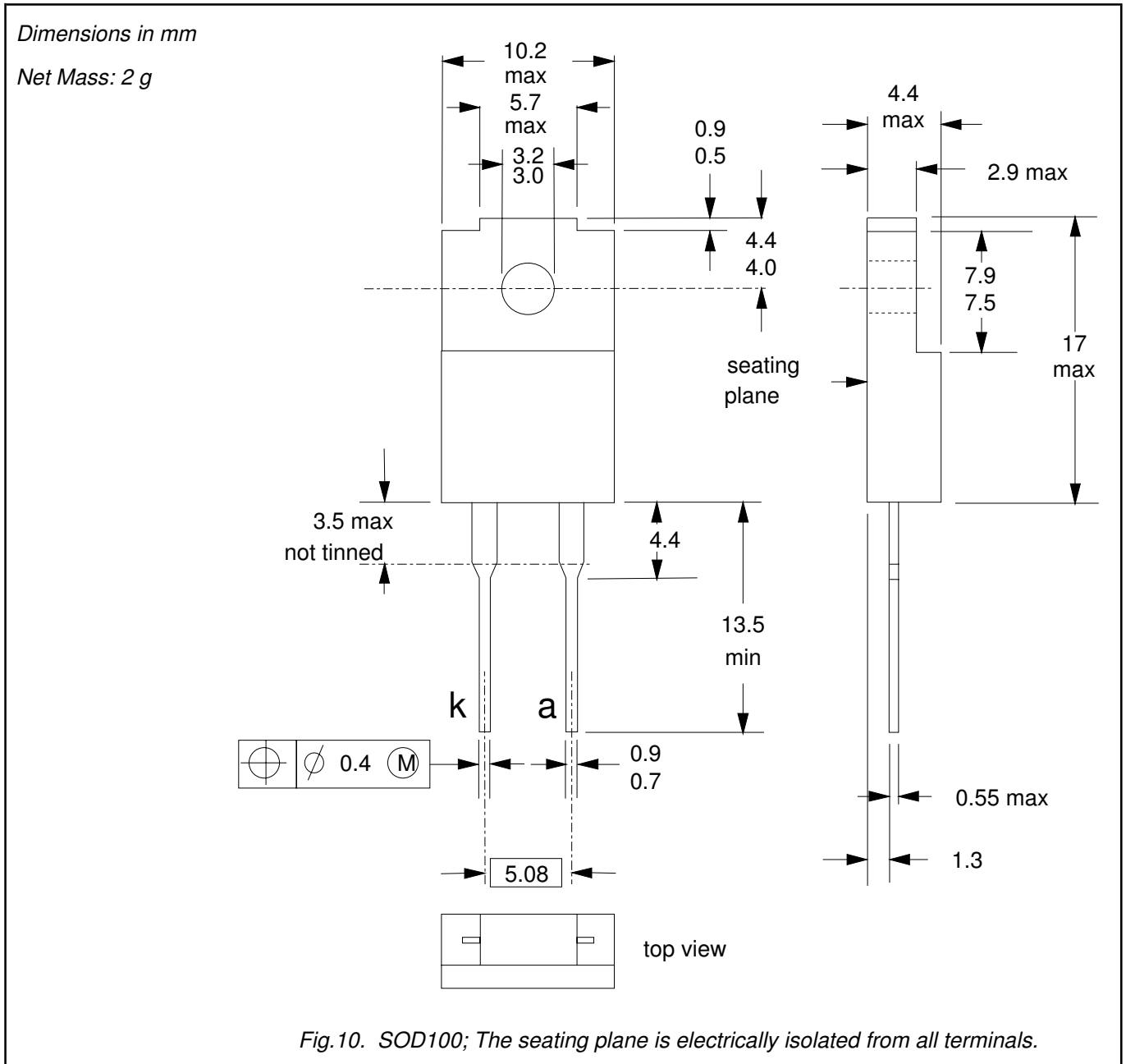


Fig.8. Maximum  $Q_s$  at  $T_j = 25^\circ\text{C}$

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**MECHANICAL DATA**



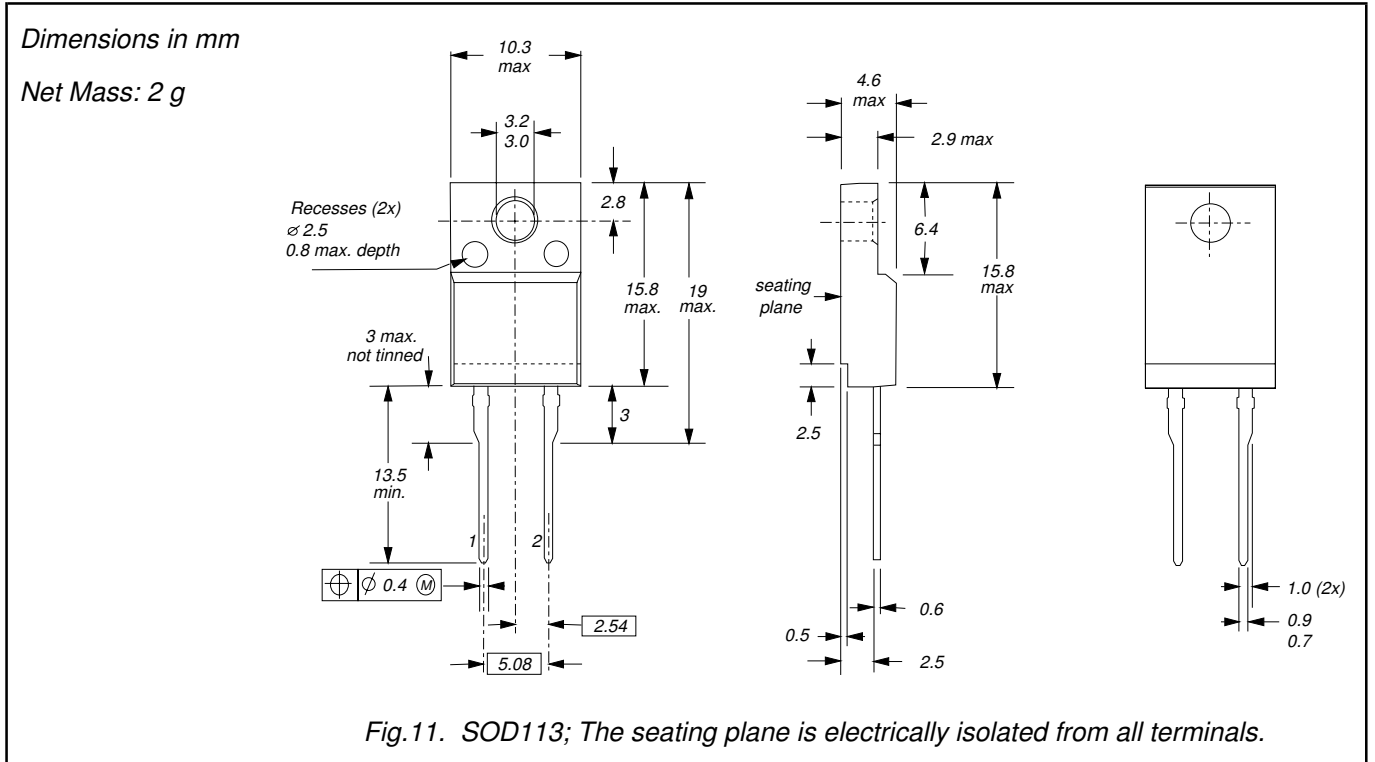
**Notes**

1. Refer to mounting instructions for F-pack envelopes.
2. Epoxy meets UL94 V0 at 1/8".

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**MECHANICAL DATA**



**Notes**

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## Legal information

### DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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