

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 10 A
V_{RRM}	45 V
$T_j(\text{max})$	175 °C
$V_F(\text{max})$	0.57 V

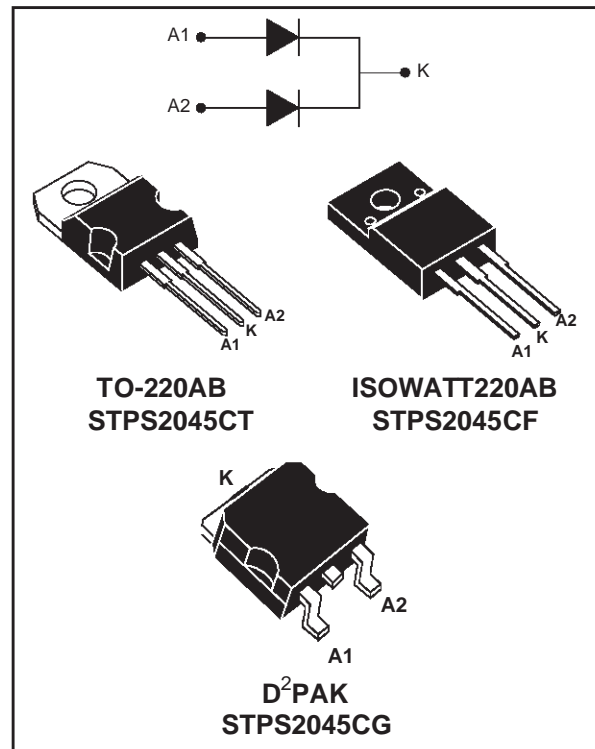
FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- INSULATED PACKAGE: ISOWATT220AB
Insulating voltage = 2000V DC
Capacitance = 12pF

DESCRIPTION

Dual center tap Schottky rectifier suited for Switch-Mode Power Supply and high frequency DC to DC converters.

Packaged either in TO-220AB, ISOWATT220AB or D²PAK, this device is especially intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter			Value	Unit	
V_{RRM}	Repetitive peak reverse voltage			45	V	
$I_{F(RMS)}$	RMS forward current			30	A	
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AB	$T_c = 155^\circ\text{C}$	Per diode	10	A
		D ² PAK				
		ISOWATT220AB	$T_c = 125^\circ\text{C}$	Per device	20	
I_{FSM}	Surge non repetitive forward current		$t_p = 10 \text{ ms}$ sinusoidal	180	A	
I_{RRM}	Repetitive peak reverse current		$t_p = 2 \mu\text{s}$ square $F = 1 \text{ kHz}$	1	A	
I_{RSM}	Non repetitive peak reverse current		$t_p = 100 \text{ ms}$ square	2	A	
T_{stg}	Storage temperature range			-65 to +175	°C	
T_j	Maximum operating junction temperature*			175	°C	
dV/dt	Critical rate of rise of reverse voltage			10000	V/ μs	

* : $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

STPS2045CT/CF/CG

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit	
R _{th(j-c)}	Junction to case	TO-220AB/ D ² PAK	Per diode Total	2.2 1.3	°C/W
		ISOWATT220AB	Per diode Total	4.5 3.5	
R _{th(c)}		TO-220AB/ D ² PAK	Coupling	0.3	
		ISOWATT220AB		2.5	

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j(\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)}(\text{per diode}) + P(\text{diode 2}) \times R_{th(c)}$$

STATIC ELECTRICAL CHARACTERISTICS (Per diode)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I _R *	Reverse leakage current	T _j = 25°C	V _R = V _{RRM}			100	μA
		T _j = 125°C			7	15	mA
V _F *	Forward voltage drop	T _j = 125°C	I _F = 10 A		0.5	0.57	V
		T _j = 25°C	I _F = 20 A			0.84	
		T _j = 125°C	I _F = 20 A		0.65	0.72	

Pulse test : * t_p = 380 μs, δ < 2%

To evaluate the conduction losses use the following equation :

$$P = 0.42 \times I_{F(AV)} + 0.015 I_{F(RMS)}^2$$

Fig. 1: Average forward power dissipation versus average forward current (per diode).

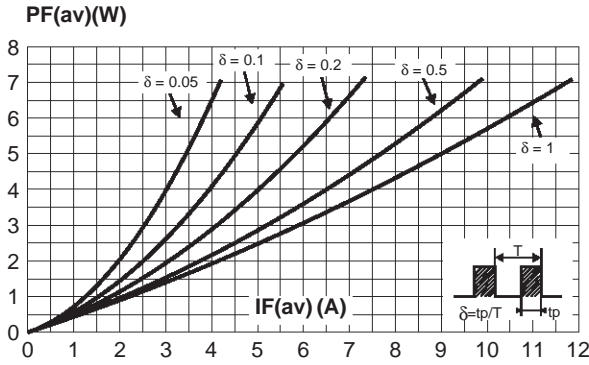


Fig. 2: Average current versus ambient temperature ($\delta=0.5$, per diode).

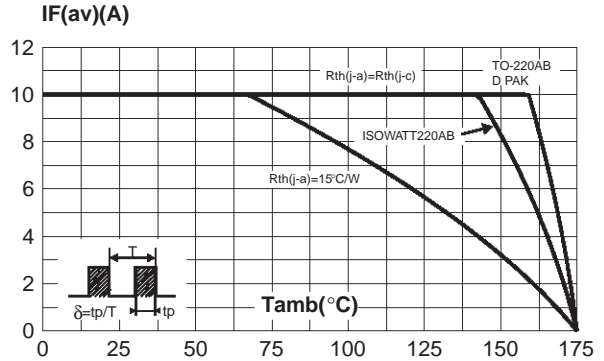


Fig. 3-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB and D²PAK).

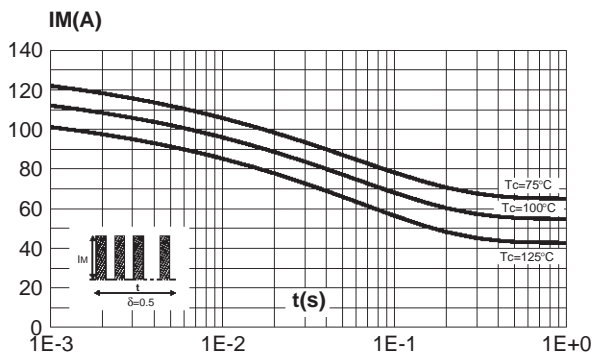


Fig. 3-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (ISOWATT220AB).

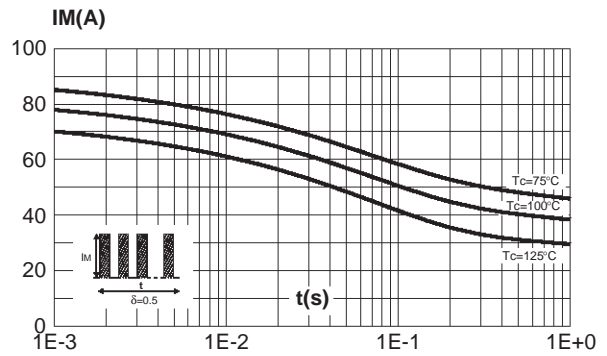


Fig. 4-1: Relative variation of thermal transient impedance junction to case versus pulse duration (TO-220AB and D²PAK).

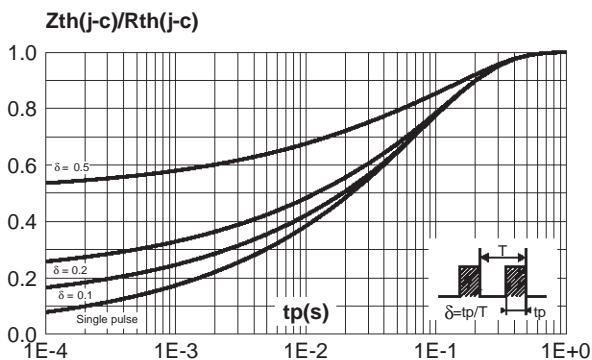


Fig. 4-2: Relative variation of thermal transient impedance junction to case versus pulse duration (ISOWATT220AB).

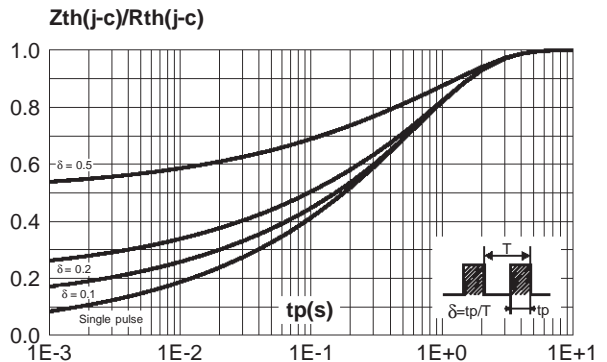


Fig. 5: Reverse leakage current versus reverse voltage applied (typical values, per diode).

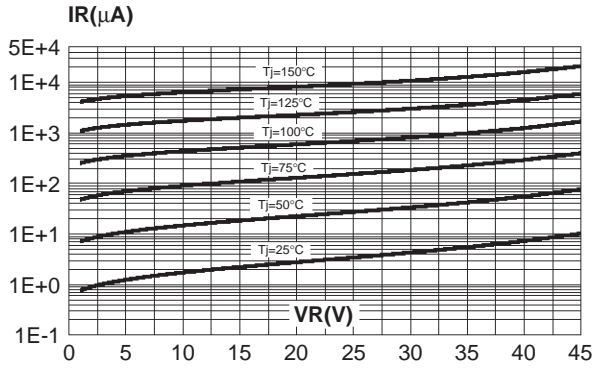


Fig. 6: Junction capacitance versus reverse voltage applied (typical values, per diode).

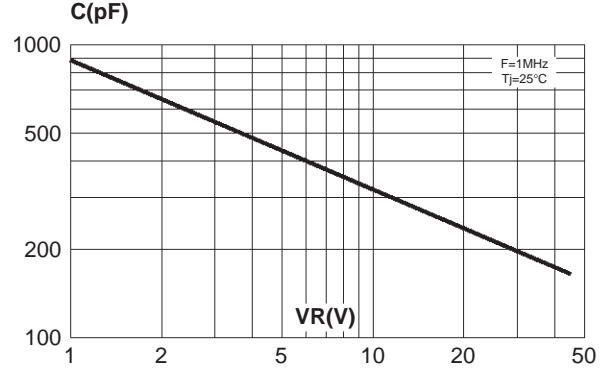


Fig. 7: Forward voltage drop versus forward current (maximum values, per diode).

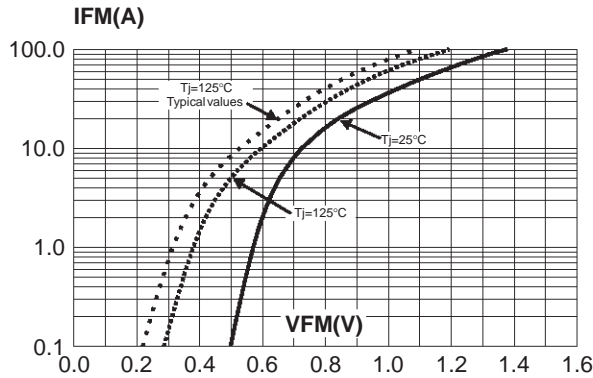
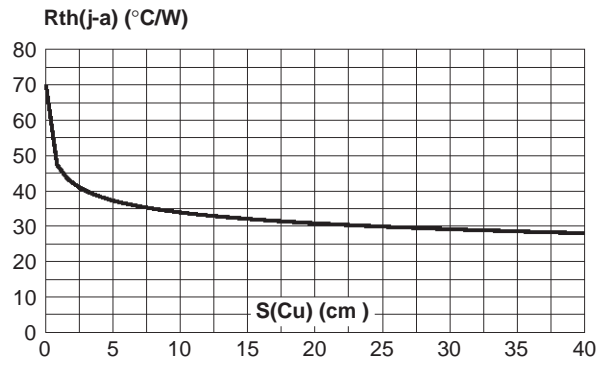
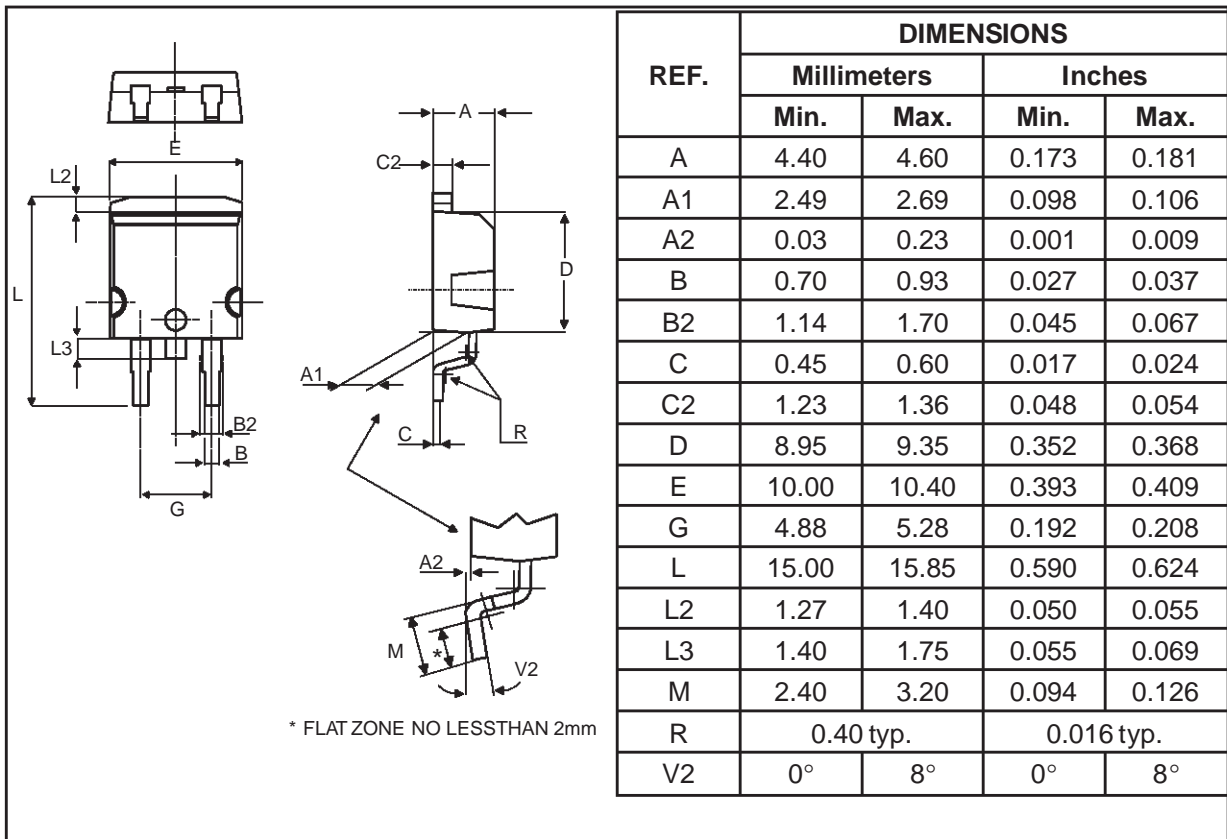


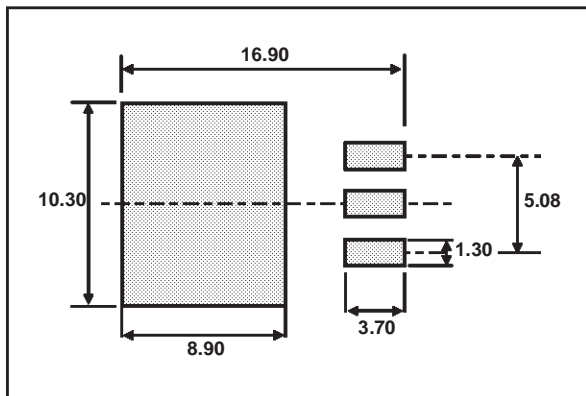
Fig. 8: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board, copper thickness: $35\mu m$).



PACKAGE MECHANICAL DATA
D²PAK

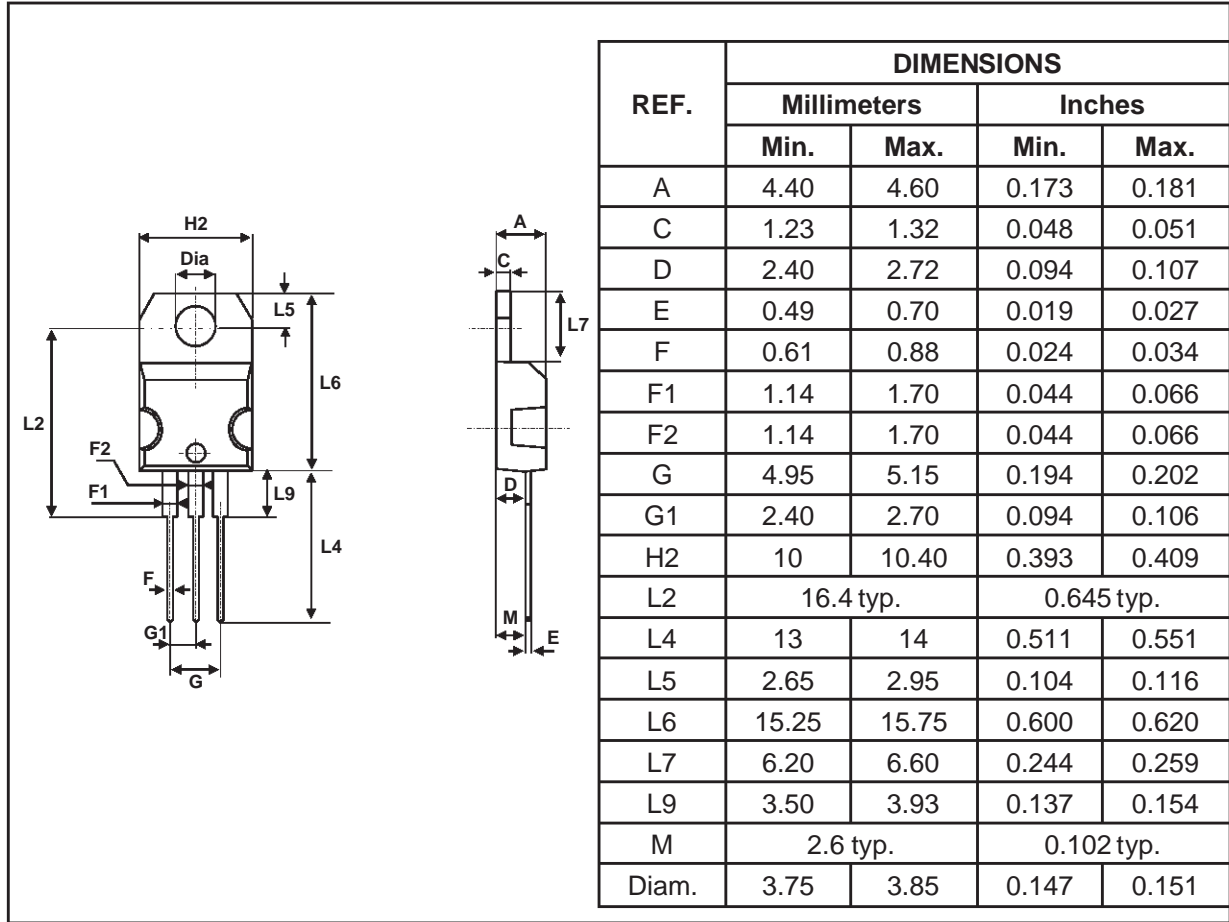


FOOTPRINT DIMENSIONS (in millimeters)

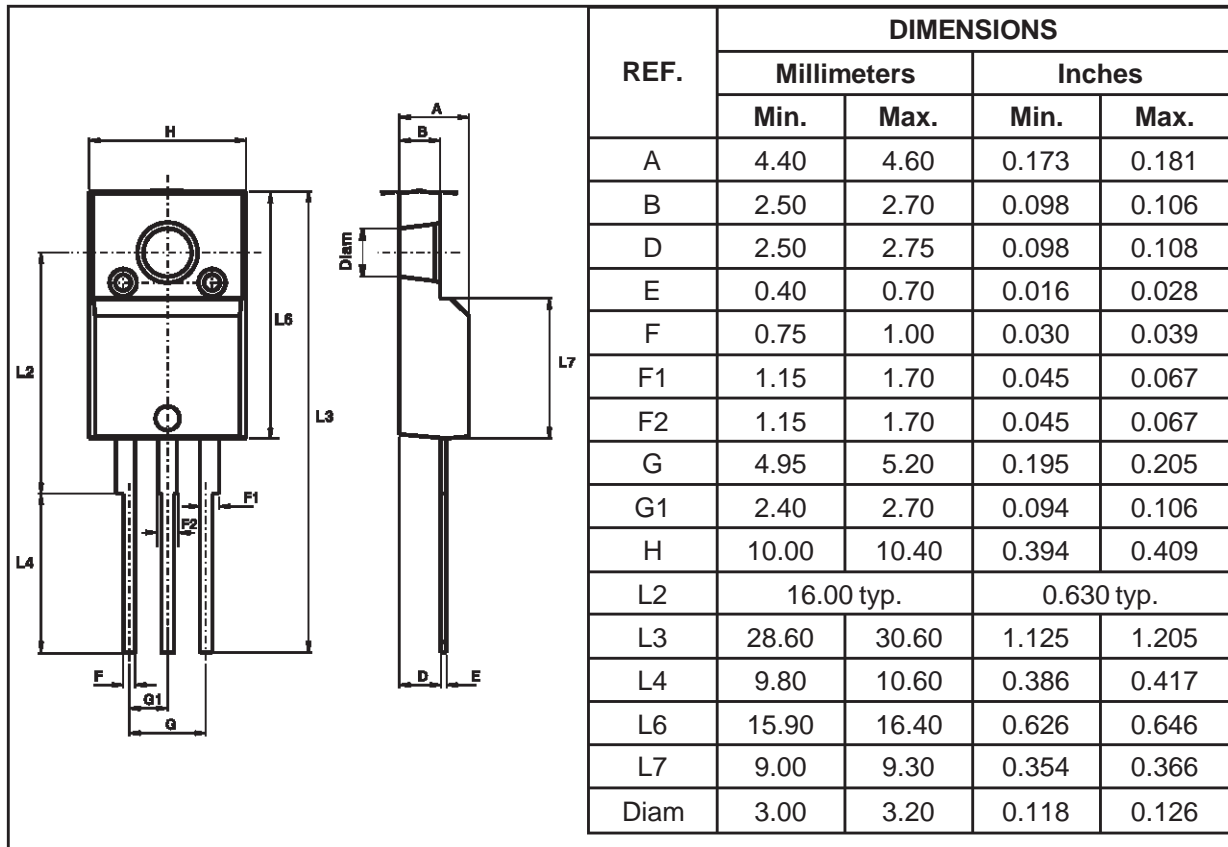


STPS2045CT/CF/CG

PACKAGE MECHANICAL DATA
TO-220AB



PACKAGE MECHANICAL DATA
ISOWATT220AB



Type	Marking	Package	Weight	Base qty	Delivery mode
STPS2045CT	STPS2045CT	TO-220AB	2.25 g.	50	Tube
STPS2045CF	STPS2045CF	ISOWATT220AB	2.08 g.	50	Tube
STPS2045CG	STPS2045CG	D ² PAK	1.48 g.	50	Tube
STPS2045CG-TR	STPS2045CG	D ² PAK	1.48 g.	1000	Tape & reel

- Cooling method: by conduction (C)
- Recommended torque value: 0.55 N.m.
- Maximum torque value: 0.7 N.m.
- Epoxy meets UL94,V0

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