

## ULTRA-FAST RECOVERY RECTIFIER DIODES

### MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	5 A
$V_{RRM}$	200 V
$T_j$ (max)	150°C
$V_F$ (max)	0.99 V
$t_{rr}$ (max)	30 ns

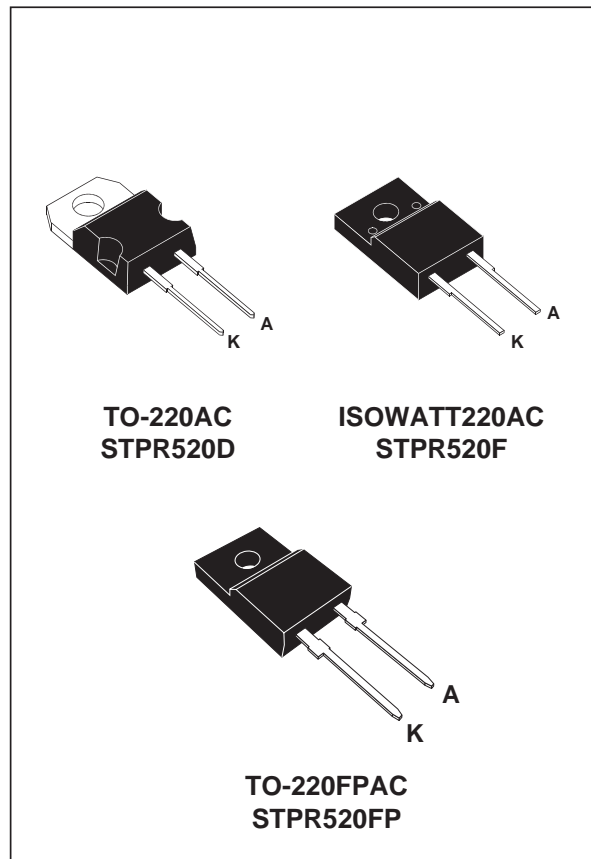
### FEATURES

- Suited for SMPS
- Very low forward losses
- Negligible switching losses
- High surge current capability
- Insulated packages:  
ISOWATT220AC / TO-220FPAC  
Insulation voltage = 2000V DC  
Capacitance = 12pF

### DESCRIPTION

Low cost single chip rectifier suited for Switch Mode Power Supplies and high frequency DC to DC converters.

Packaged in TO-220AC, ISOWATT220AC and TO-220FPAC, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		200	V
$I_{F(RMS)}$	RMS forward current		10	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AC	5	A
		ISOWATT220AC TO-220FPAC		
$I_{FSM}$	Surge non repetitive forward current		50	A
$T_{stg}$	Storage temperature range		- 65 to + 150	°C
$T_j$	Maximum operating junction temperature		+ 150	

# STPR520D/F/FP

## THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AC	4	°C/W
		ISOWATT220AC / TO-220FPAC	6	

## STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameters	Test conditions		Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			50	$\mu\text{A}$
		$T_j = 100^\circ\text{C}$				0.5	mA
$V_F^{**}$	Forward voltage drop	$T_j = 125^\circ\text{C}$	$I_F = 5\text{ A}$			0.99	V
		$T_j = 125^\circ\text{C}$	$I_F = 10\text{ A}$			1.20	
		$T_j = 25^\circ\text{C}$	$I_F = 10\text{ A}$			1.25	

Pulse test : \*  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

\*\*  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equation :

$$P = 0.78 \times I_{F(AV)} + 0.042 \times I_{F(RMS)}^2$$

## RECOVERY CHARACTERISTICS

Symbol	Test conditions			Min.	Typ.	Max.	Unit
$t_{rr}$	$T_j = 25^\circ\text{C}$	$I_F = 0.5\text{ A}$	$I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$			30	ns
$t_{fr}$	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$	$t_r = 10\text{ ns}$ $V_{FR} = 1.1 \times V_F$		20		
$V_{FP}$	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$	$t_r = 10\text{ ns}$		3		V

Fig. 1: Average forward power dissipation versus average forward current.

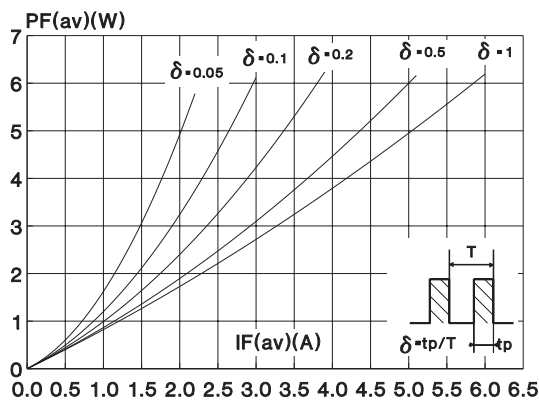
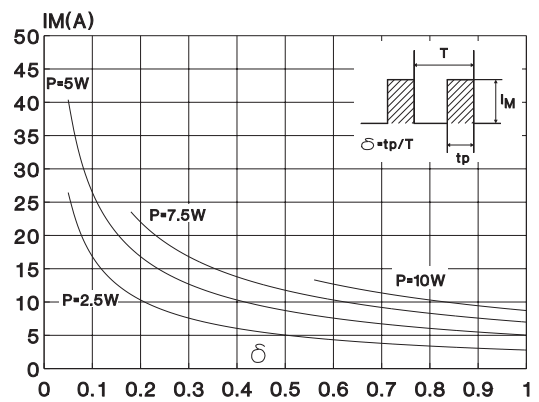
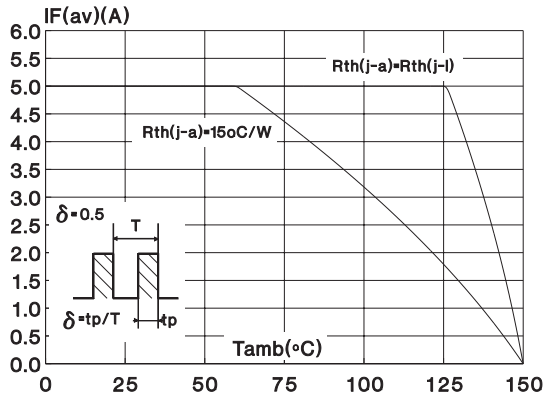


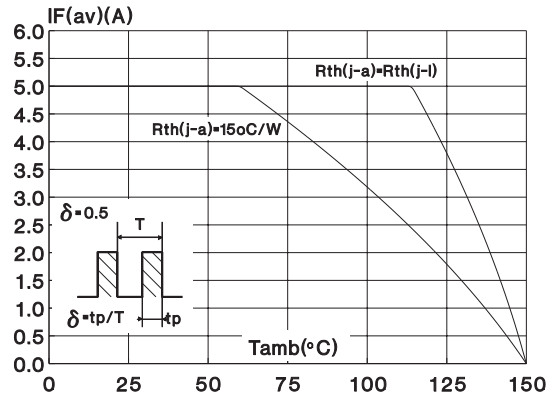
Fig. 2: Peak current versus form factor.



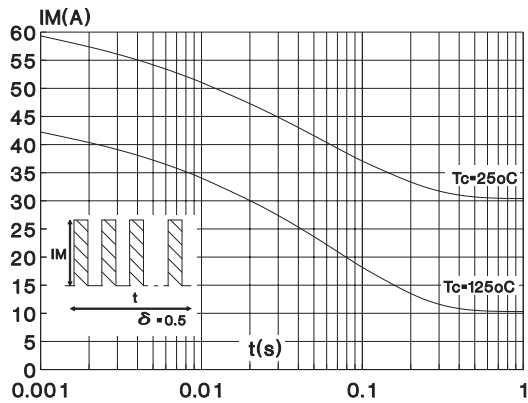
**Fig. 3:** Average current versus ambient temperature.



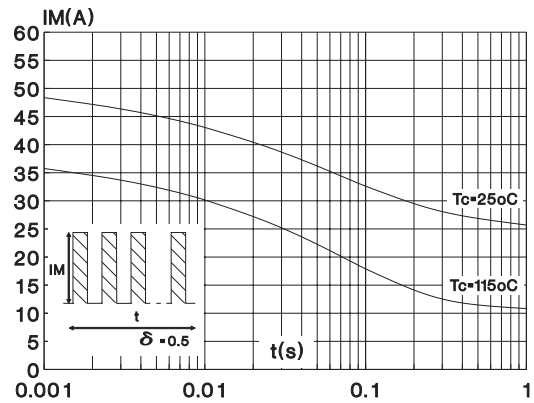
**Fig. 4:** Average current versus ambient temperature.



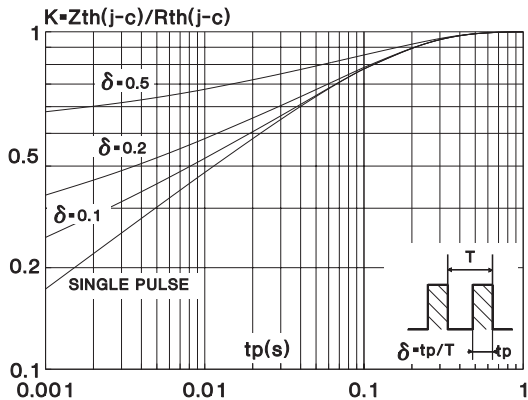
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220AC).



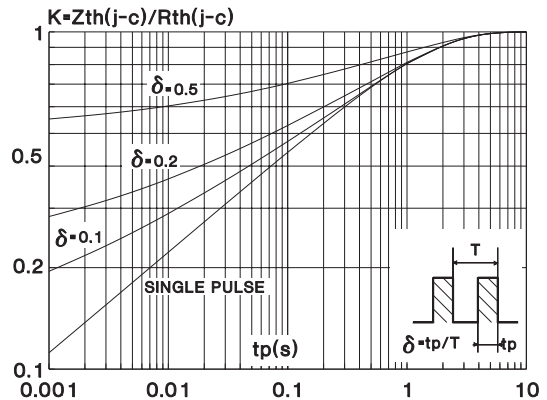
**Fig. 6:** Non repetitive surge peak forward current versus overload duration (maximum values) (ISOWATT220AC, TO-220FPAC).



**Fig. 7:** Relative variation of thermal transient impedance junction to case versus pulse duration (TO-220AC).

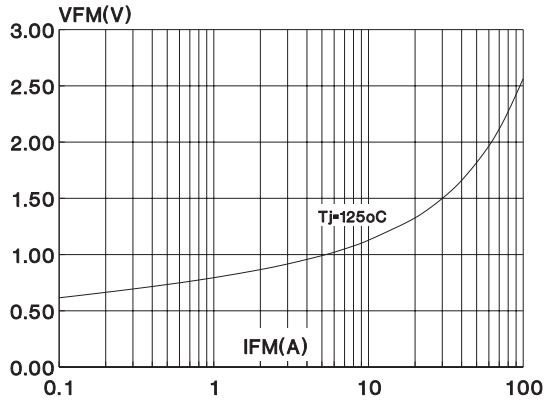


**Fig. 8:** Relative variation of thermal transient impedance junction to case versus pulse duration (ISOWATT220AC, TO-220FPAC).

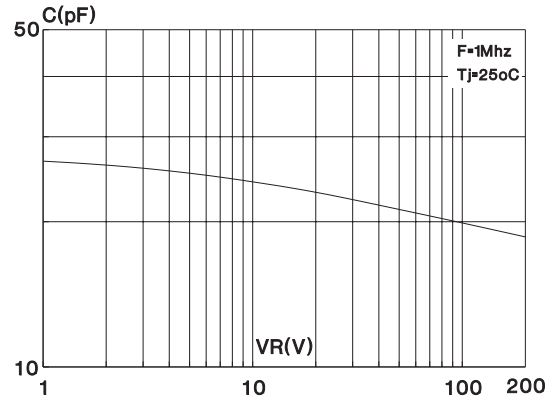


**STPR520D/F/FP**

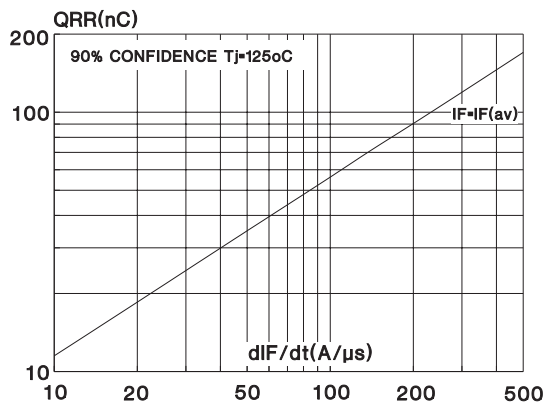
**Fig. 9:** Forward voltage drop versus forward current.



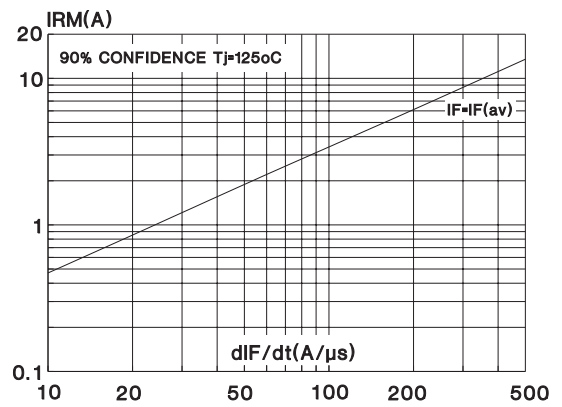
**Fig. 10:** Junction capacitance versus reverse voltage applied (typical values).



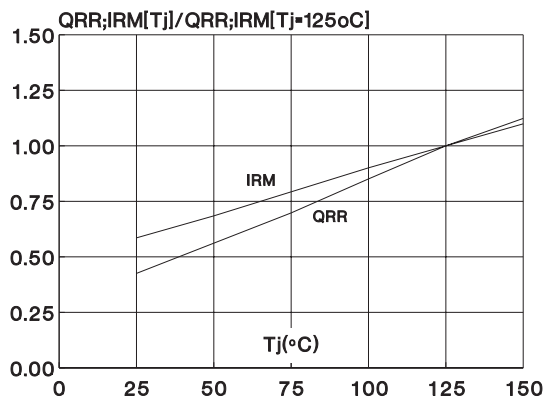
**Fig. 11:** Recovery charge versus  $di_F/dt$ .



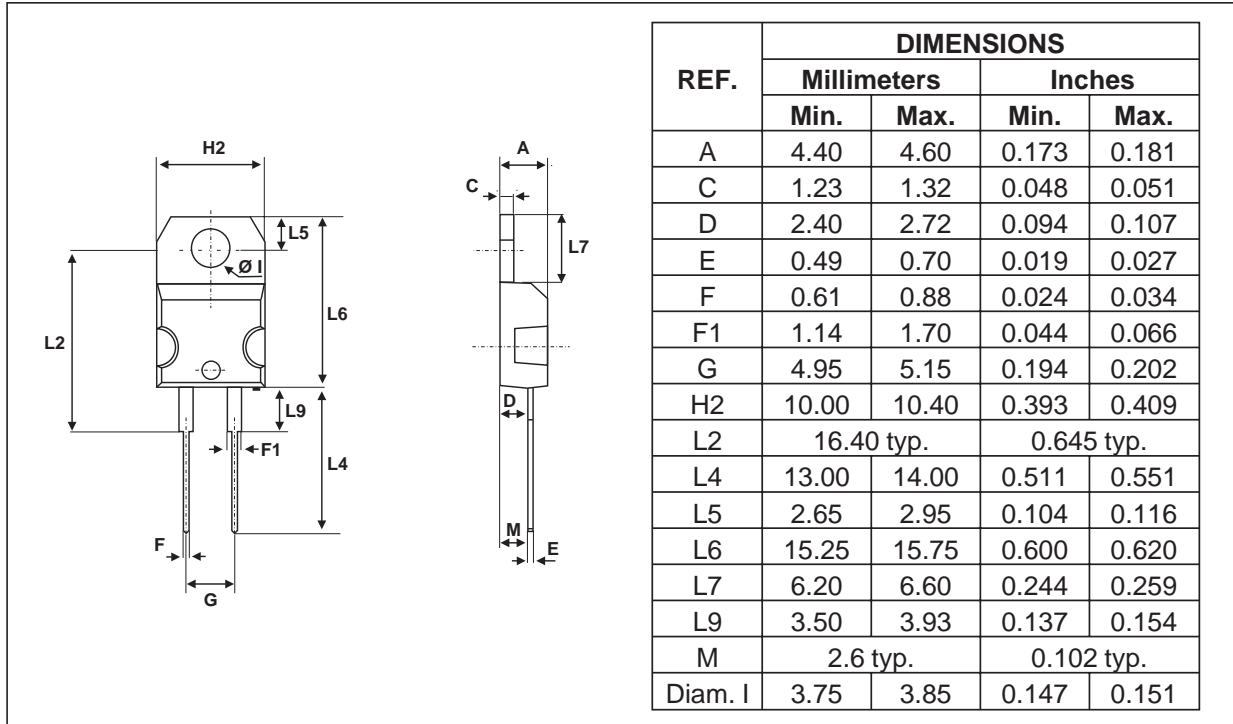
**Fig. 12:** Peak reverse current versus  $di_F/dt$ .



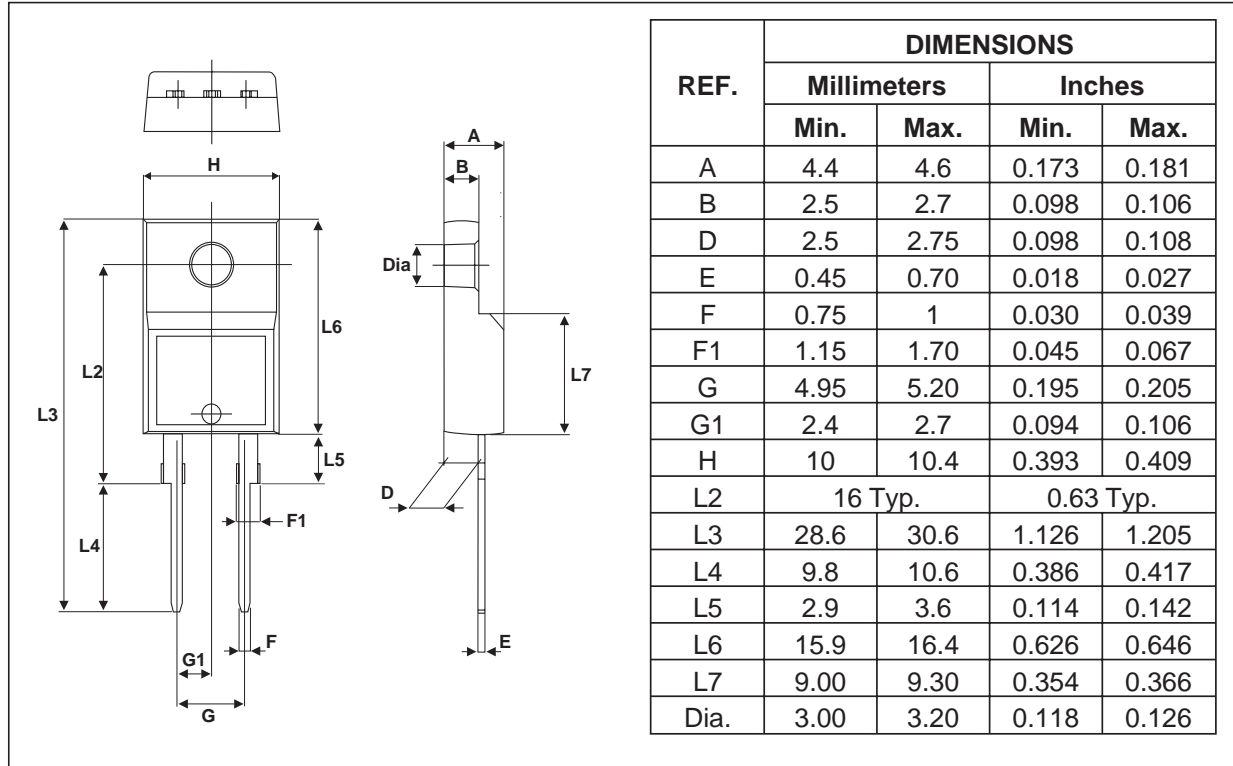
**Fig. 13:** Dynamic parameters versus junction temperature.



**PACKAGE MECHANICAL DATA**  
TO-220AC

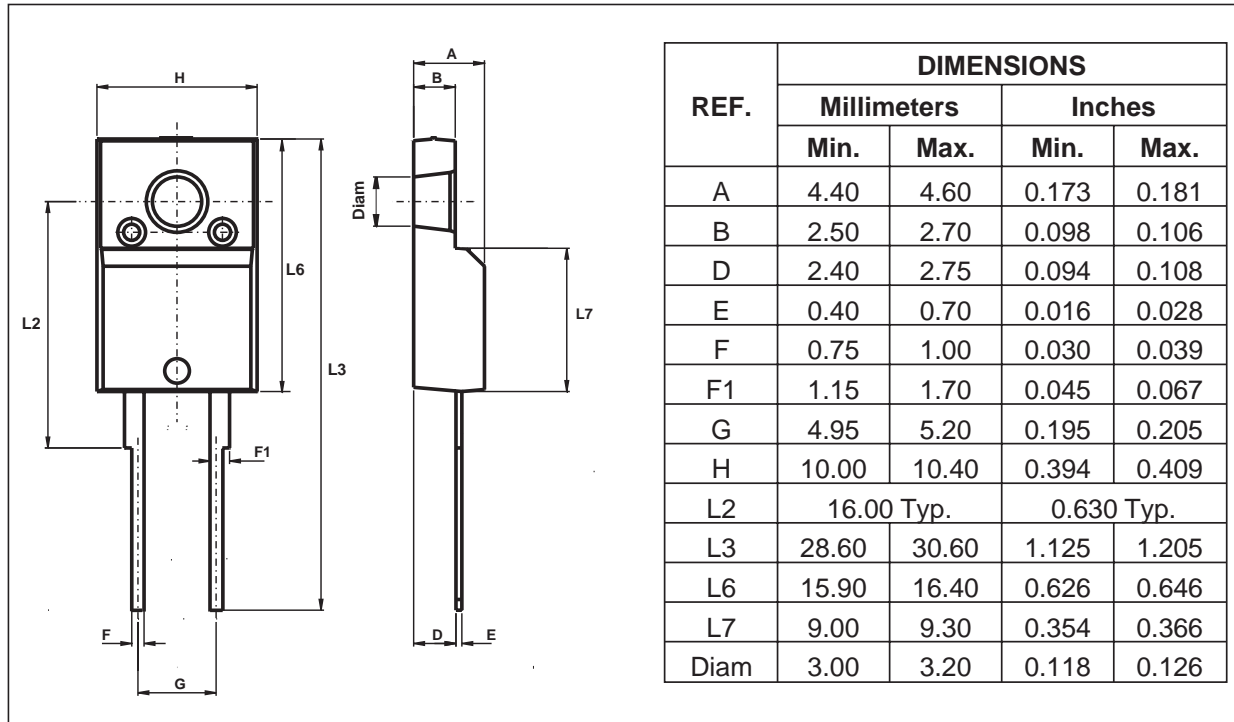


**PACKAGE MECHANICAL DATA**  
TO-220FPAC



# STPR520D/F/FP

## PACKAGE MECHANICAL DATA ISOWATT220AC



Type	Marking	Package	Weight	Base Qty	Delivery mode
STPR520D	STPR520D	TO-220AC	2.3 g	50	Tube
STPR520F	STPR520F	ISOWATT220AC	2 g	50	Tube
STPR520FP	STPR520FP	TO-220FPAC	1.8 g	50	Tube

- Cooling method: by conduction (C)
- Recommended torque value (ISOWATT220AC, TO-220FPAC): 0.55 nm
- Maximum torque value (ISOWATT220AC, TO-220FPAC): 0.7 Nm
- Recommended torque value (TO-220AC): 0.8 Nm
- Maximum torque value (TO-220AC): 1.0 Nm
- Epoxy meets UL94, V0

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