

## ULTRA-FAST RECOVERY RECTIFIER DIODES

### MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	<b>2 x 8 A</b>
$V_{RRM}$	<b>200 V</b>
$T_j(\text{max})$	<b>150°C</b>
$V_F(\text{max})$	<b>0.99 V</b>
$t_{rr}(\text{max})$	<b>30 ns</b>

### FEATURES

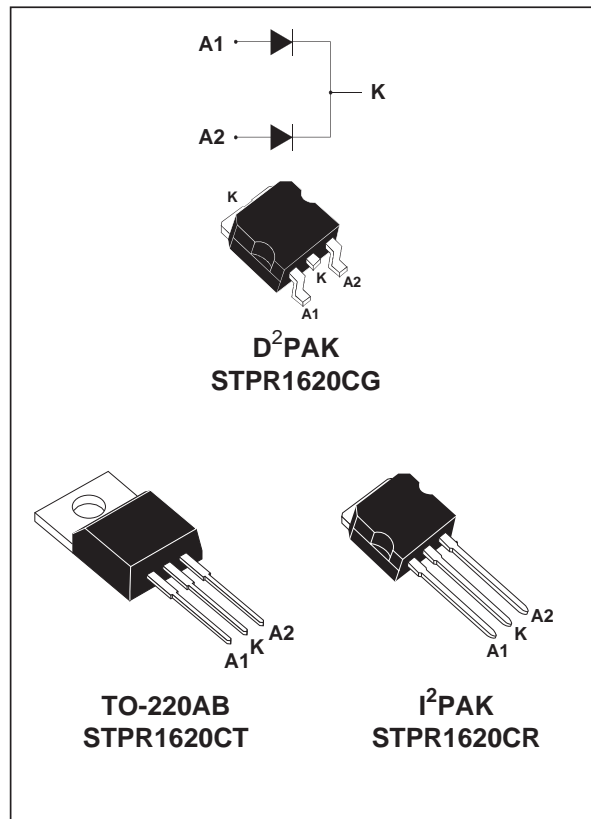
- SUITED FOR SMPS
- LOW LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIME
- HIGH SURGE CURRENT CAPABILITY

### DESCRIPTION

Low cost dual center tap rectifier suited for Switched Mode Power Supplies and high frequency DC to DC converters. Packaged in D<sup>2</sup>PAK, I<sup>2</sup>PAK or TO-220AB, this device is 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		200	V
$I_{F(RMS)}$	RMS forward current		20	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	$T_c = 120^\circ\text{C}$ Per diode Per device	8 16	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ms}$ sinusoidal	80	A
$T_{stg}$	Storage temperature range		- 65 to + 150	°C
$T_j$	Maximum operating junction temperature		150	°C



## STPR1620CG / STPR1620CT / STPR1620CR

### THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
R <sub>th(j-c)</sub>	Junction to case	Per diode	3.0	°C/W
		Total	1.8	°C/W
R <sub>th(c)</sub>		Coupling	0.6	°C/W

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

Symbol	Test conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> *	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			50	μA
	T <sub>j</sub> = 100°C			0.2	0.6	mA
V <sub>F</sub> **	T <sub>j</sub> = 125°C	I <sub>F</sub> = 8 A		0.8	0.99	V
	T <sub>j</sub> = 125°C	I <sub>F</sub> = 16 A		0.95	1.20	
	T <sub>j</sub> = 25°C	I <sub>F</sub> = 16 A			1.25	

Pulse test : \* tp = 5 ms, δ < 2 %

\*\* tp = 380 μs, δ < 2 %

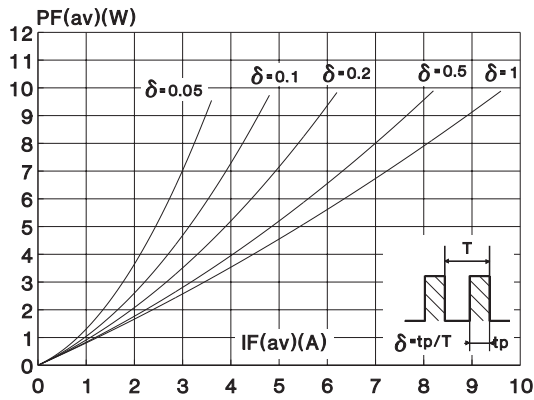
To evaluate the conduction losses use the following equation :

$$P = 0.78 \times I_{F(AV)} + 0.026 \times I_{F(RMS)}^2$$

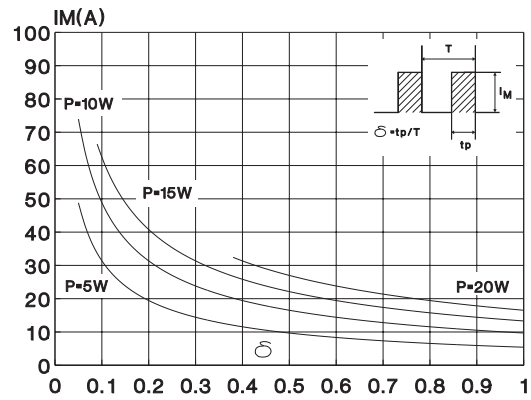
### RECOVERY CHARACTERISTICS

Symbol	Test conditions		Min.	Typ.	Max.	Unit
trr	T <sub>j</sub> = 25°C	I <sub>F</sub> = 0.5A I <sub>R</sub> = 1A			30	ns
tfr	T <sub>j</sub> = 25°C	I <sub>F</sub> = 3A V <sub>FR</sub> = 1.1 x V <sub>F</sub> max		20		ns
V <sub>FP</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 3A		3		V

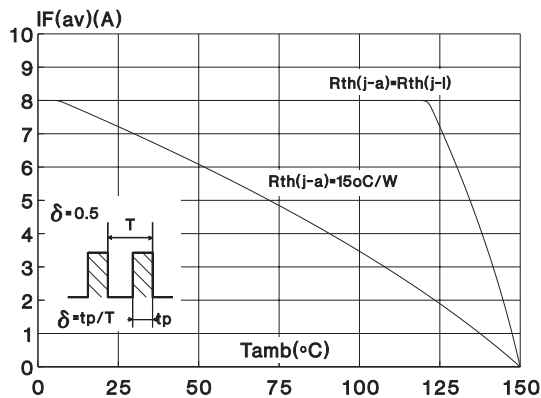
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



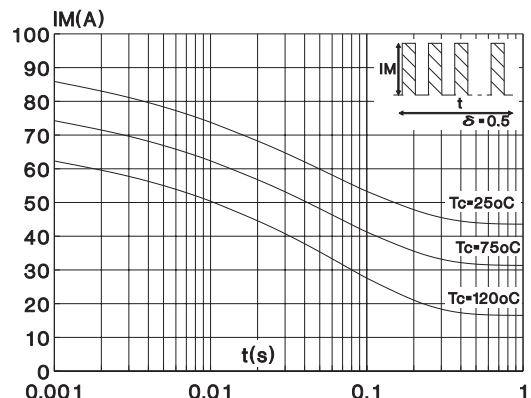
**Fig. 2:** Peak current versus form factor (per diode).



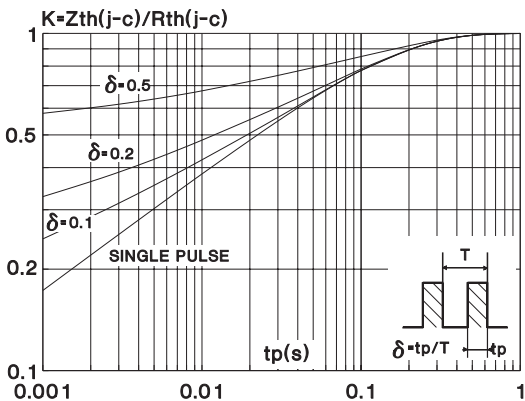
**Fig. 3:** Average current versus ambient temperature ( $\delta : 0.5$ , per diode).



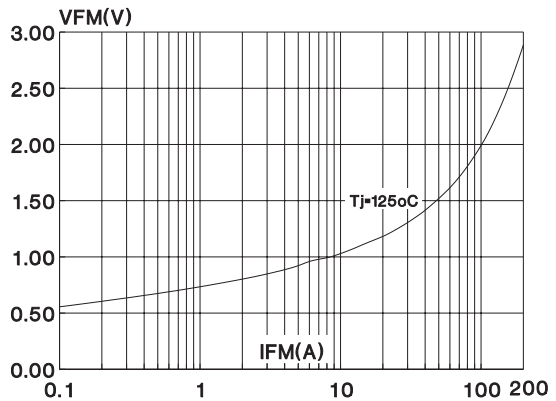
**Fig. 4:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode).



**Fig. 5:** Relative variation of thermal transient impedance junction to case versus pulse duration (per diode).

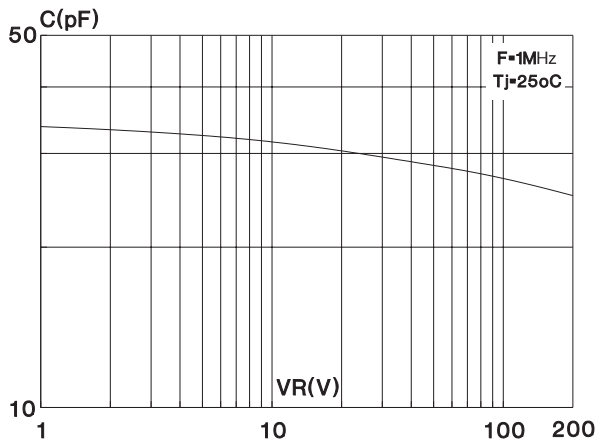


**Fig. 6:** Forward voltage drop versus forward current (maximum values, per diode).

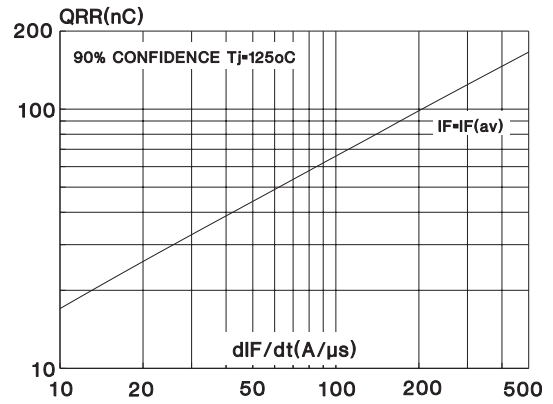


**STPR1620CG / STPR1620CT / STPR1620CR**

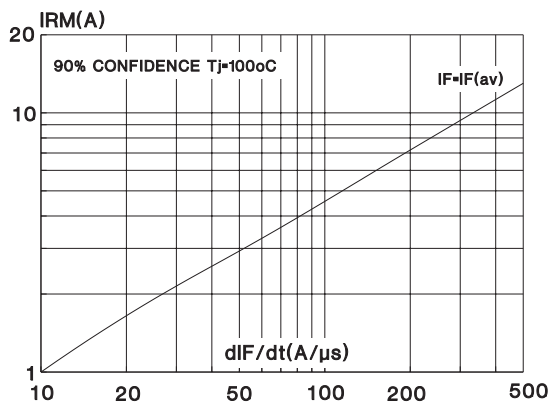
**Fig. 7:** Junction capacitance versus reverse voltage applied (typical values, per diode).



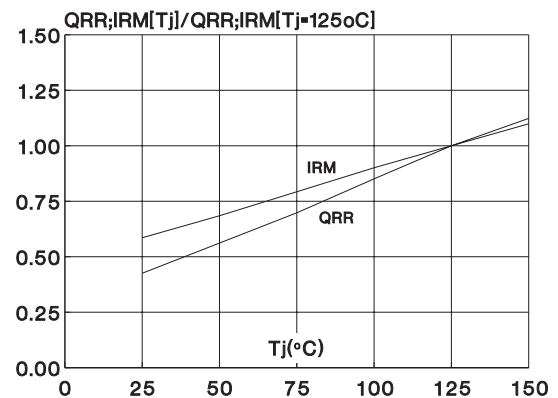
**Fig. 8:** Recovery charges versus  $dI_F/dt$  (per diode).



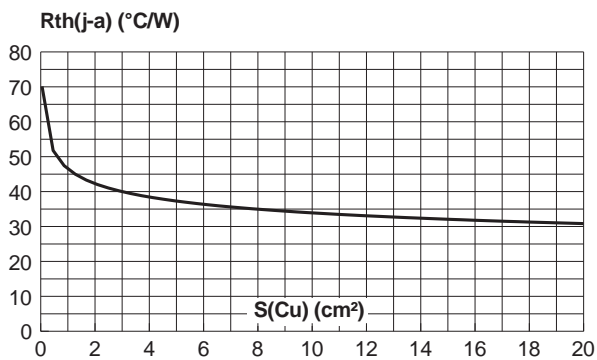
**Fig. 9:** Peak reverse current versus  $dI_F/dt$  (per diode).



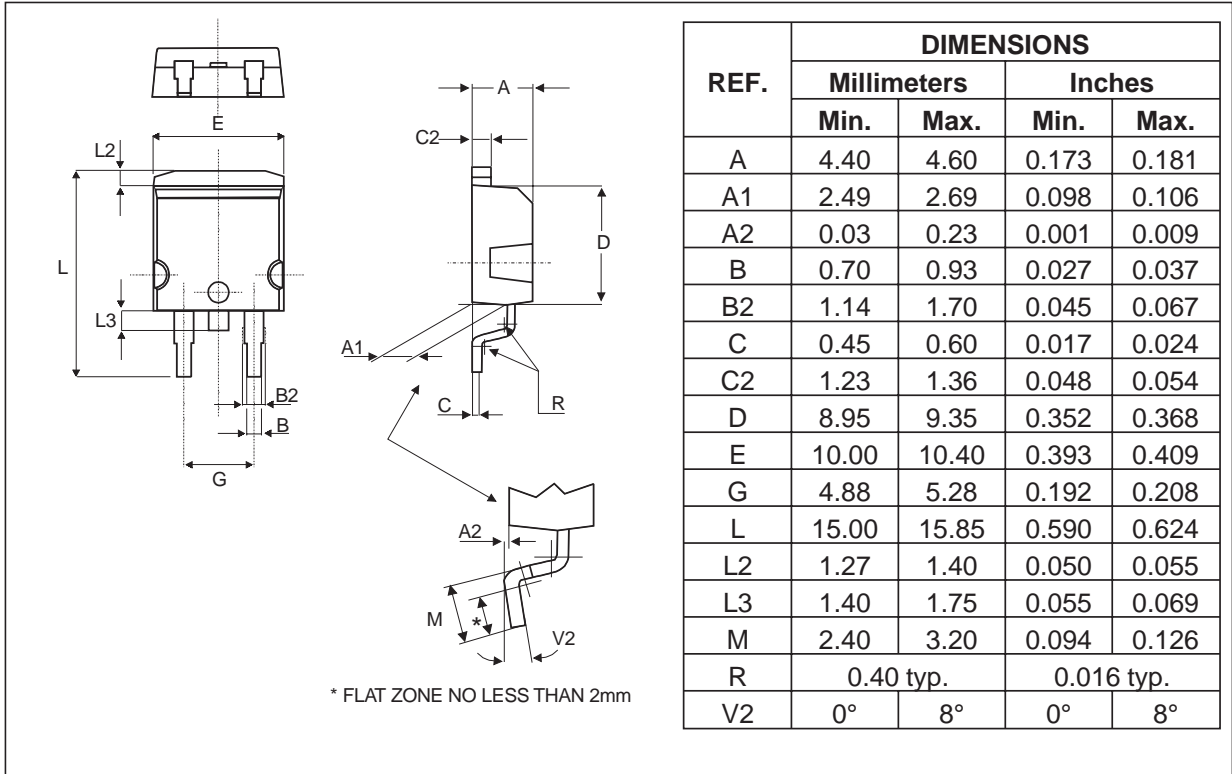
**Fig. 10:** Dynamic parameters versus junction temperature (per diode).



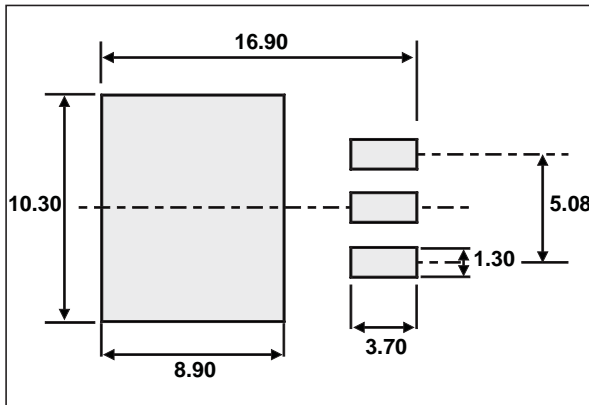
**Fig. 11:** Thermal resistance junction to ambient versus copper surface under tab (epoxy printed circuit board,  $CU = 35\mu s$ ) (STPR1620CG only).



**PACKAGE MECHANICAL DATA**  
D<sup>2</sup>PAK (Plastic)

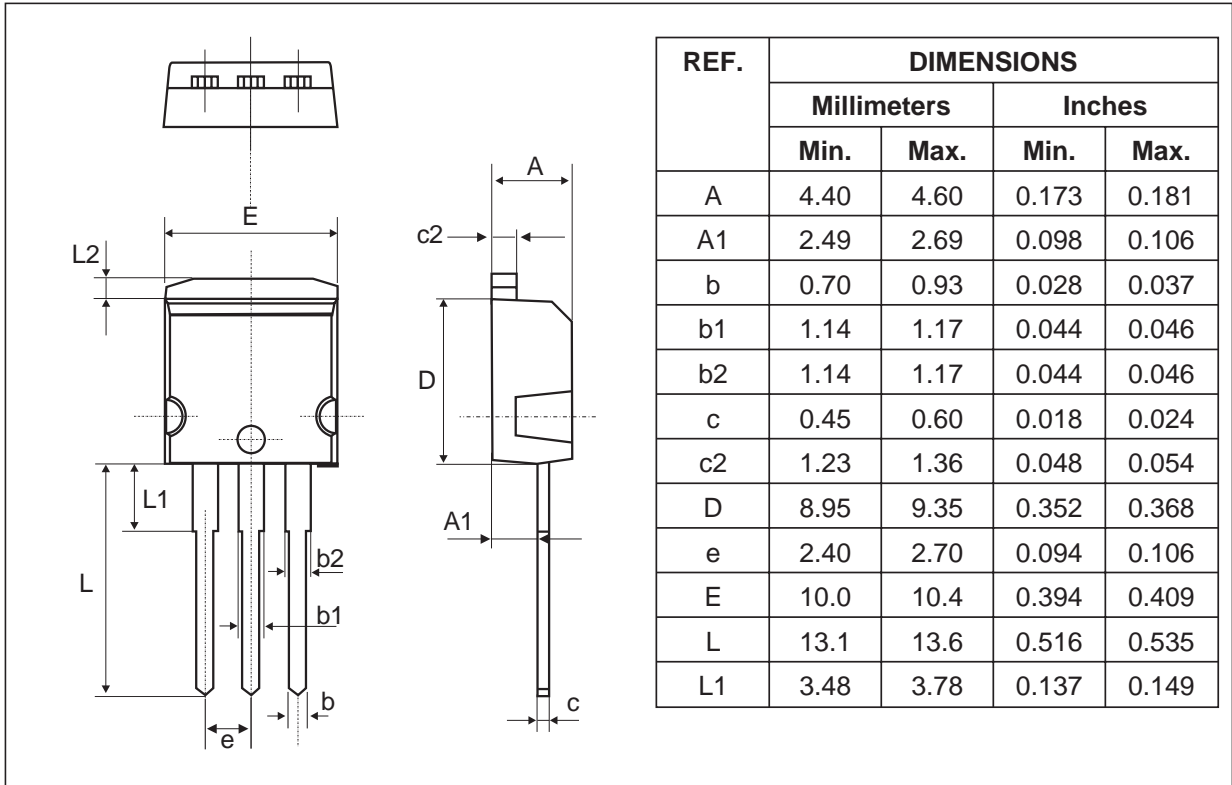


**FOOT PRINT (in millimeters)**

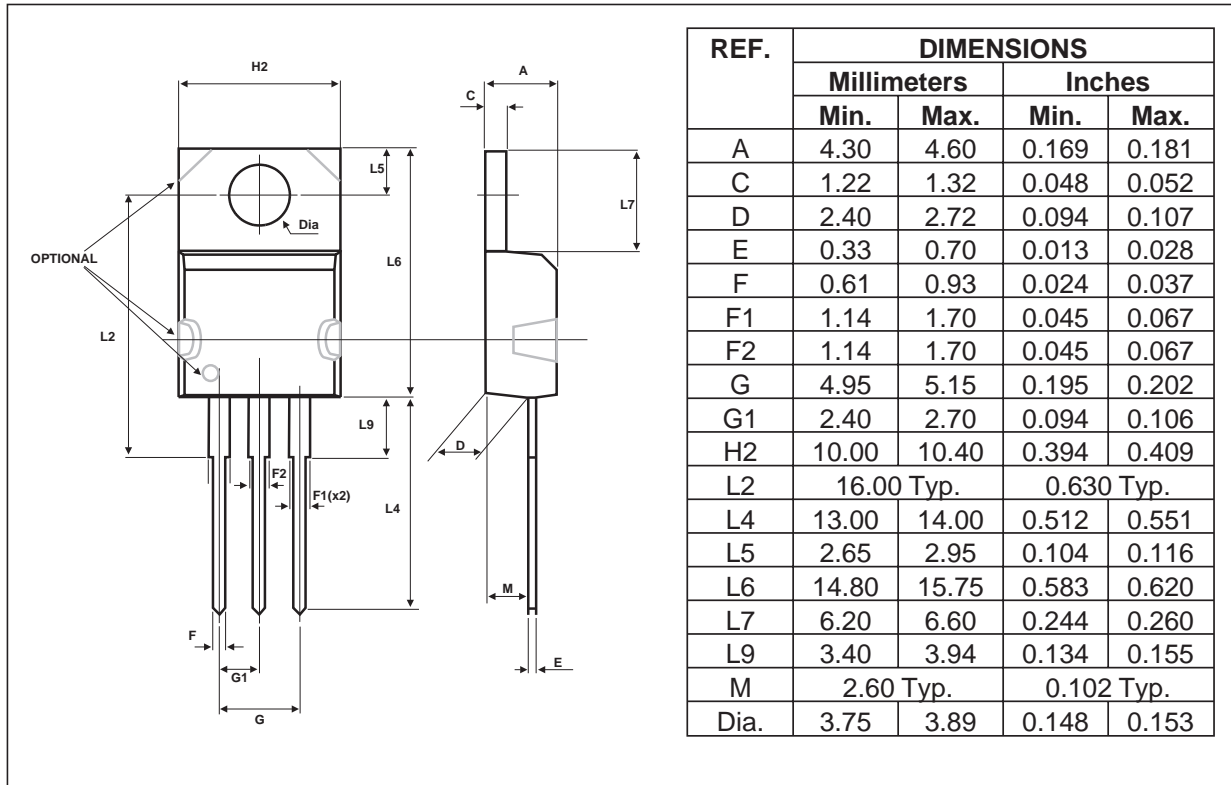


**STPR1620CG / STPR1620CT / STPR1620CR**

**PACKAGE MECHANICAL DATA**  
*I*<sup>2</sup>PAK



**PACKAGE MECHANICAL DATA**  
TO-220AB (JEDEC outline)



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPR1620CT	STPR1620CT	TO-220AB	2.23 g	50	Tube
STPR1620CG	STPR1620CG	D <sup>2</sup> PAK	1.48 g	50	Tube
STPR1620CG-TR	STPR1620CG	D <sup>2</sup> PAK	1.48 g	1000	Tape & reel
STPR1620CR	STPR1620	I <sup>2</sup> PAK	1.49 g	50	Tube

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

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