



## STPR1620CG/CT/CR

### ULTRA-FAST RECOVERY RECTIFIER DIODES

#### MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2 x 8 A
$V_{RRM}$	200 V
$T_j(max)$	150°C
$V_F(max)$	0.99 V
$trr(max)$	30 ns

#### FEATURES

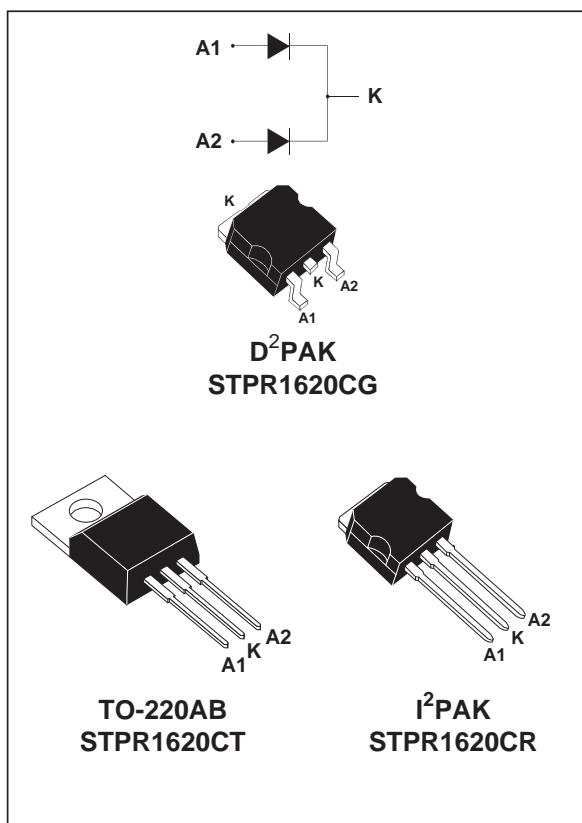
- SUITED FOR SMPS
- LOW LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIME
- HIGH SURGE CURRENT CAPABILITY

#### 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 <sub>RRM</sub>	Repetitive peak reverse voltage			200	V
I <sub>F(RMS)</sub>	RMS forward current			20	A
I <sub>F(AV)</sub>	Average forward current δ = 0.5	T <sub>C</sub> =120°C	Per diode Per device	8 16	A
I <sub>FSM</sub>	Surge non repetitive forward current	tp=10ms sinusoidal		80	A
T <sub>stg</sub>	Storage temperature range			- 65 to + 150	°C
T <sub>j</sub>	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 %

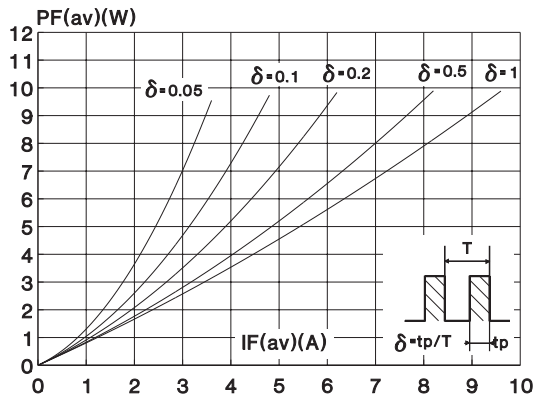
To evaluate the conduction losses use the following equation :

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

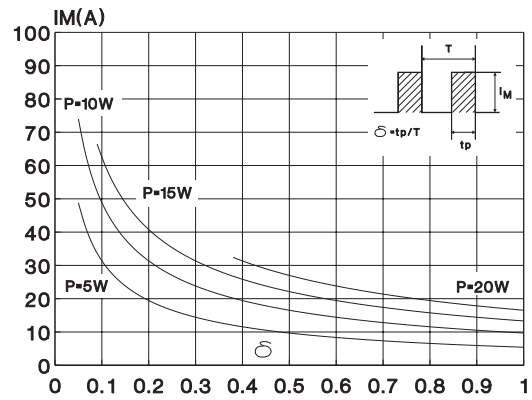
### RECOVERY CHARACTERISTICS

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 I <sub>rr</sub> = 0.25A			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 dI <sub>F</sub> /dt = 50 A/μs		20		ns
V <sub>FP</sub>	T <sub>j</sub> = 25°C	I <sub>F</sub> = 3A dI <sub>F</sub> /dt = 50 A/μs		3		V

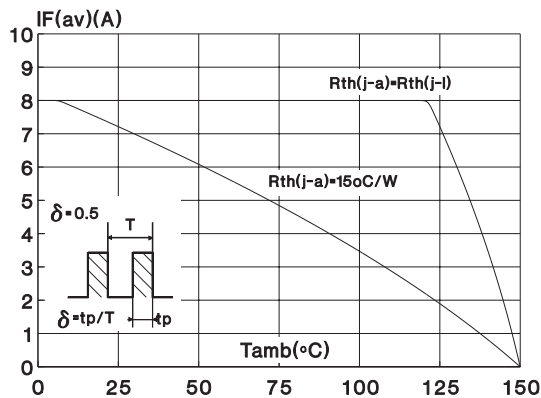
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



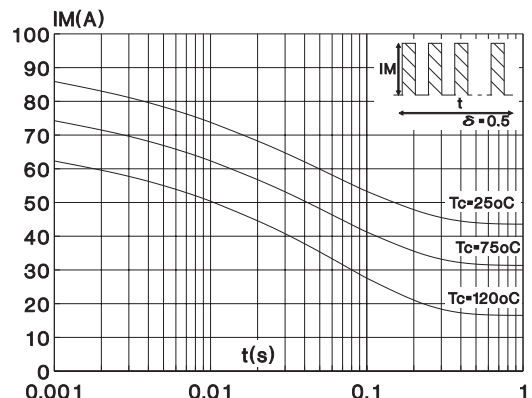
**Fig. 2:** Peak current versus form factor (per diode).



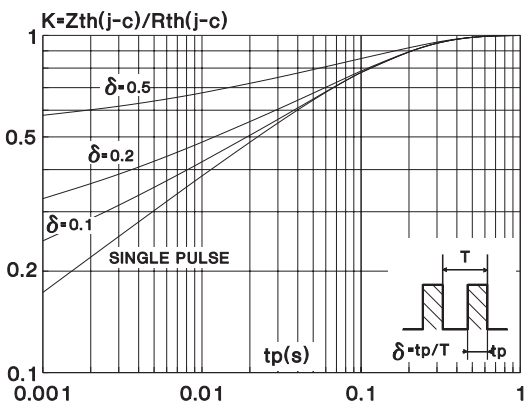
**Fig. 3:** Average current versus ambient temperature ( $\delta : 0.5$ , per diode).



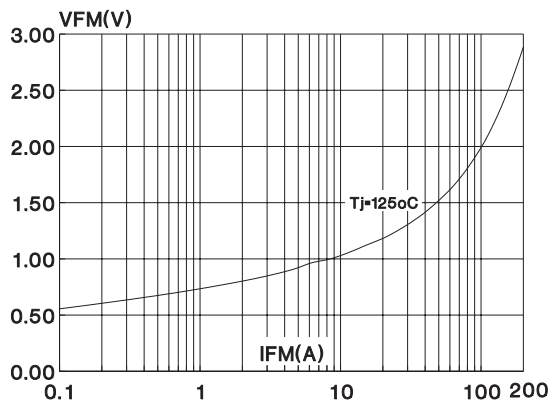
**Fig. 4:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode).



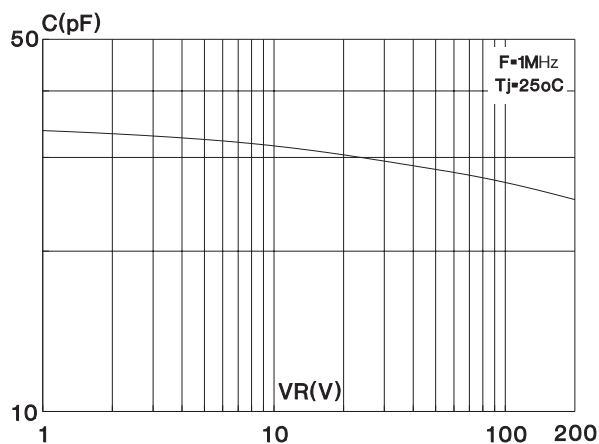
**Fig. 5:** Relative variation of thermal transient impedance junction to case versus pulse duration (per diode).



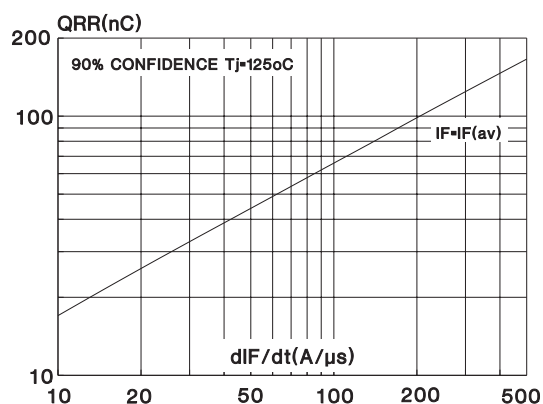
**Fig. 6:** Forward voltage drop versus forward current (maximum values, per diode).



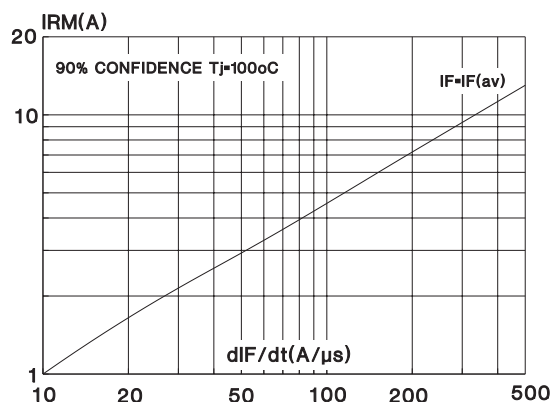
**Fig. 7:** Junction capacitance versus reverse voltage applied (typical values, per diode).



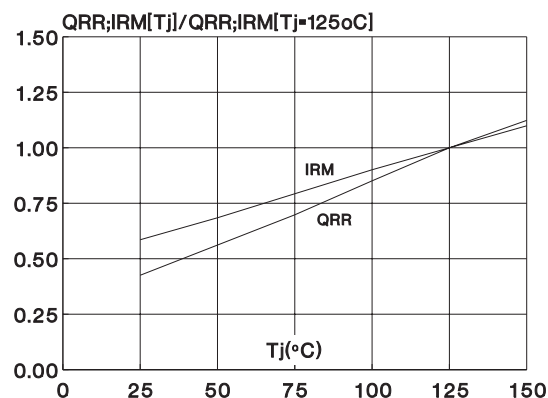
**Fig. 8:** Recovery charges versus  $dI_F/dt$  (per diode).



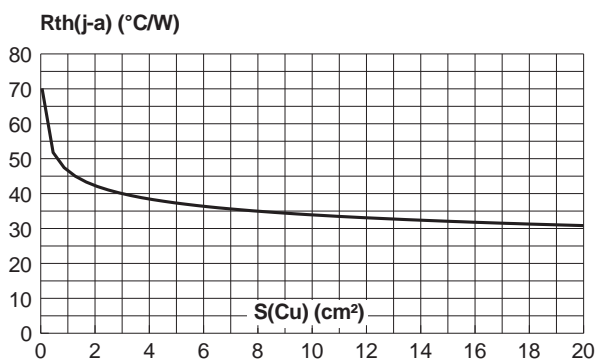
**Fig. 9:** Peak reverse current versus  $dI_F/dt$  (per diode).

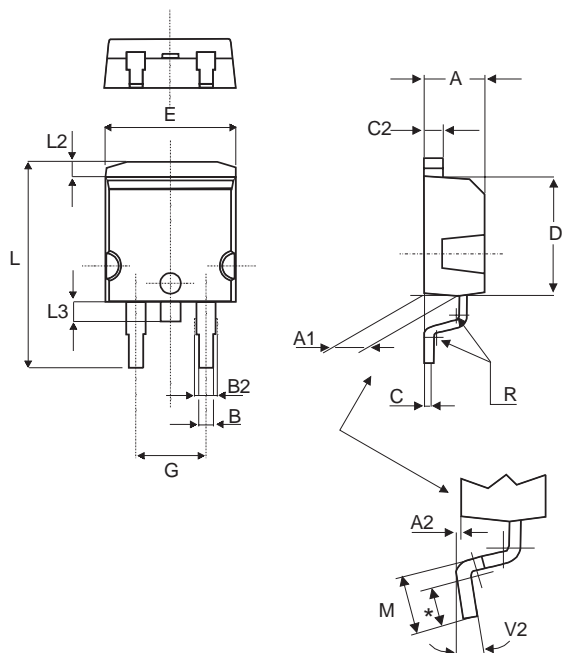


**Fig. 10:** Dynamic parameters versus junction temperature (per diode).



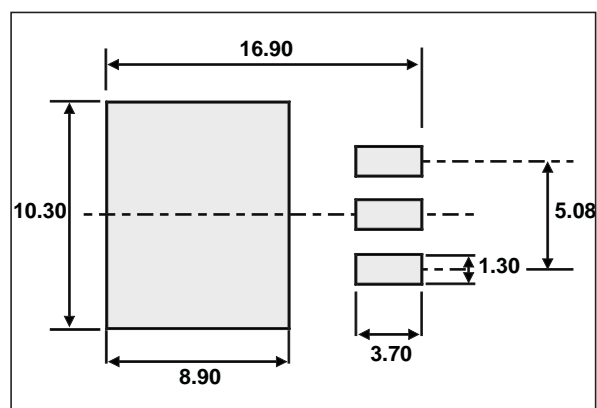
**Fig. 11:** Thermal resistance junction to ambient versus copper surface under tab (epoxy printed circuit board,  $CU = 35\mu s$ ) (STPR1620CG only).



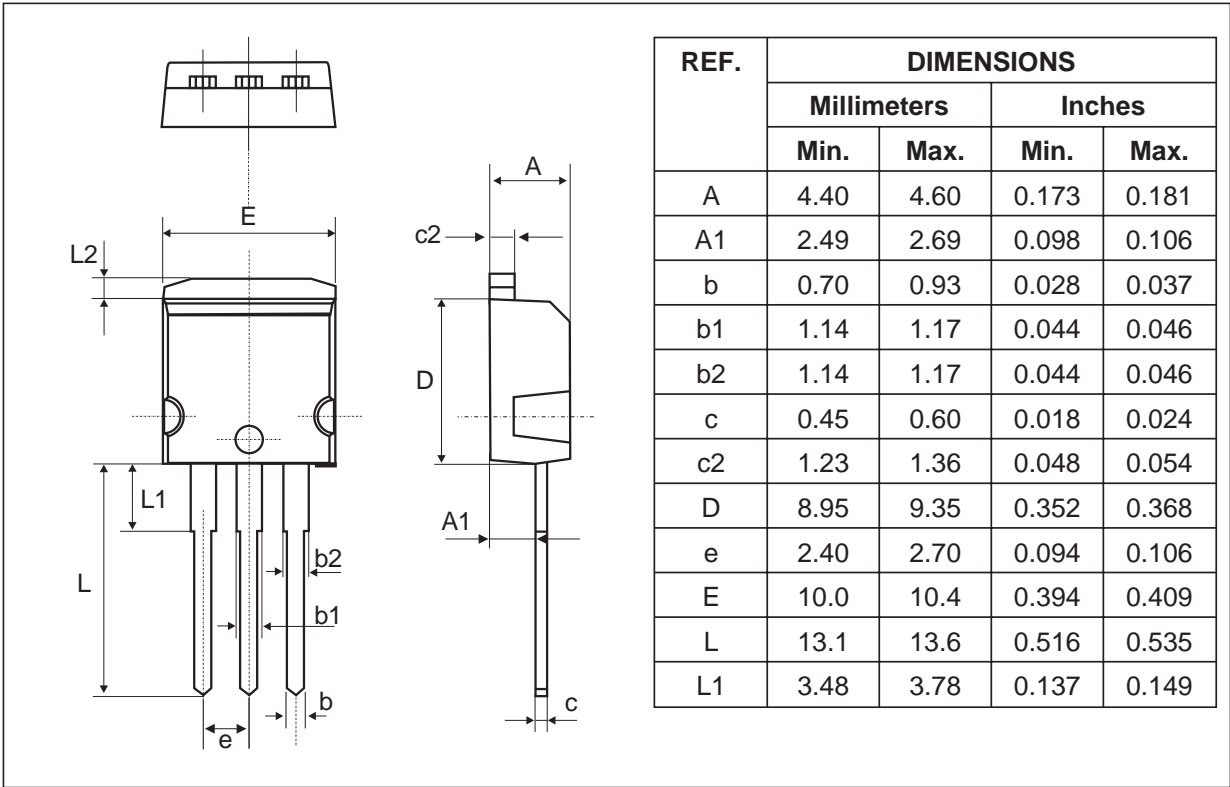
**PACKAGE MECHANICAL DATA**D<sup>2</sup>PAK (Plastic)

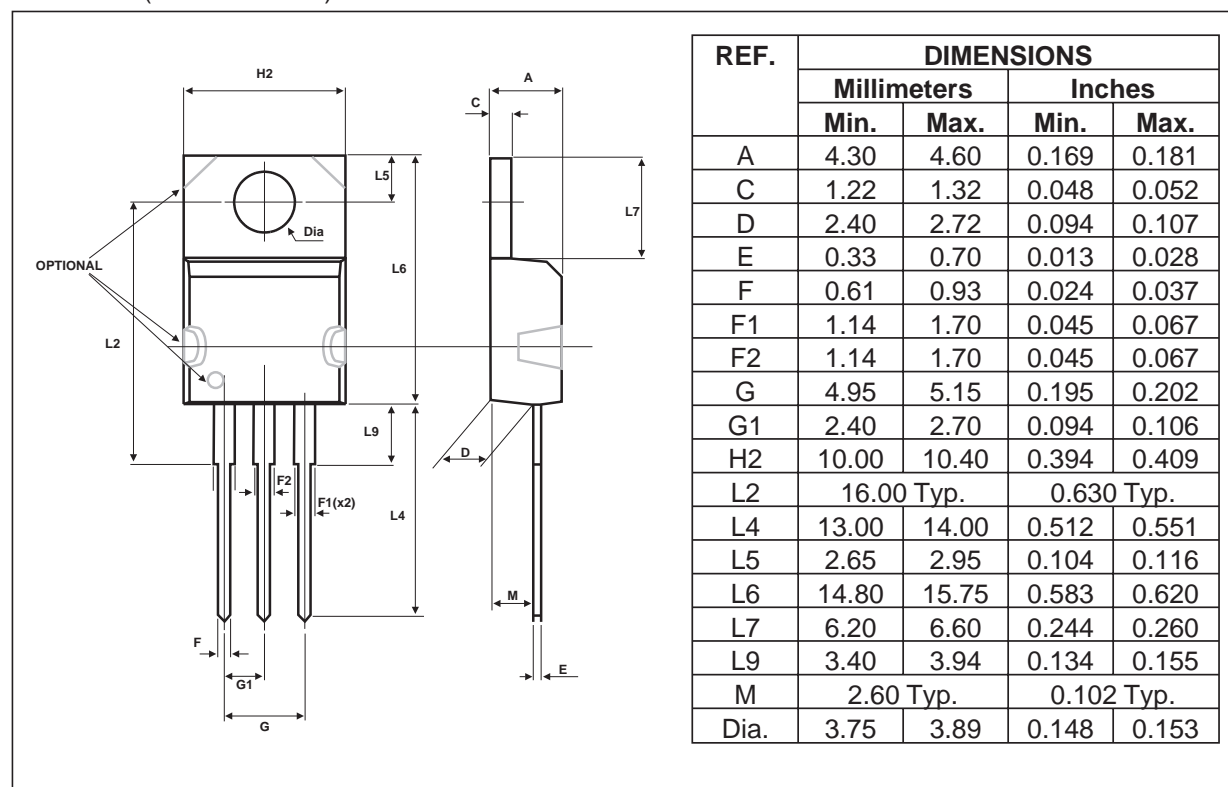
\* FLAT ZONE NO LESS THAN 2mm

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°

**FOOT PRINT (in millimeters)**

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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