



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
$t_{rr} (max)$	30 ns

FEATURES

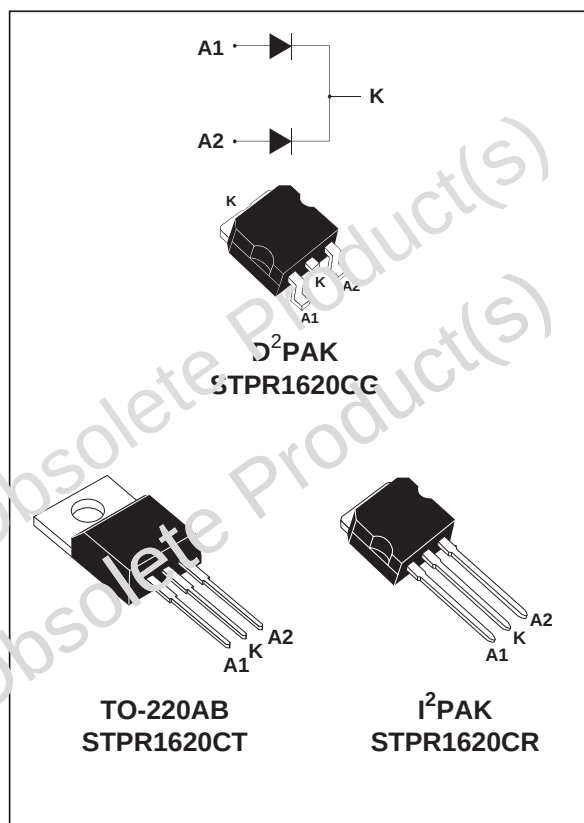
- SUITED FOR SMPS
- LOW LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIME
- HIGH SURGE CURRENT CAPABILITY

DESCRIPTION

Low cost dual center tap rectifier suited for Switched Mode Power Supplies and high frequency DC to DC converters. Packaged in D²PAK, I²PAK 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 _{PRM}	Repetitive peak reverse voltage			200	V
I _{F(RMS)}	RMS forward current			20	A
I _{F(AV)}	Average forward current δ = 0.5	T _c =120°C	Per diode Per device	8 16	A
I _{FSM}	Surge non repetitive forward current	tp=10ms 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 _{th(j-c)}	Junction to case	Per diode	3.0	°C/W
		Total	1.8	°C/W
R _{th(c)}		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 _R *	T _J = 25°C	V _R = V _{RRM}			50	μA
	T _J = 100°C			0.2	0.6	mA
V _F **	T _J = 125°C	I _F = 8 A		0.8	0.99	V
	T _J = 125°C	I _F = 16 A		0.95	1.20	
	T _J = 25°C	I _F = 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 _J = 25°C	I _F = 0.5A I _R = 1A	I _{rr} = 0.25A			30	ns
tfr	T _J = 25°C	I _F = 3A V _{FR} = 1.1 x V _F max	dI _F /dt = 50 A/μs		20		ns
V _{rr}	T _J = 25°C	I _F = 3A	dI _F /dt = 50 A/μs		3		V

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

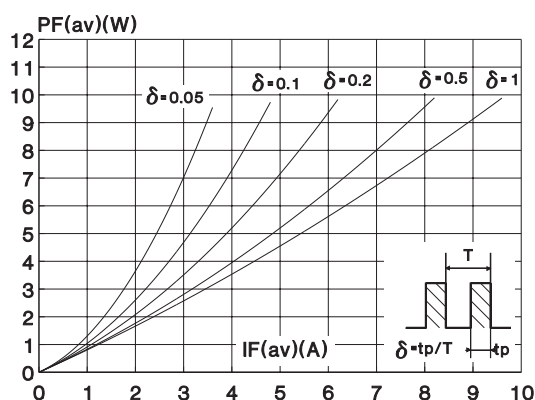


Fig. 2: Peak current versus form factor (per diode).

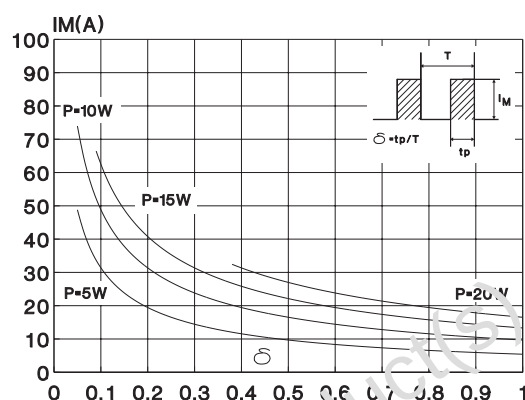


Fig. 3: Average current versus ambient temperature ($\delta : 0.5$, per diode).

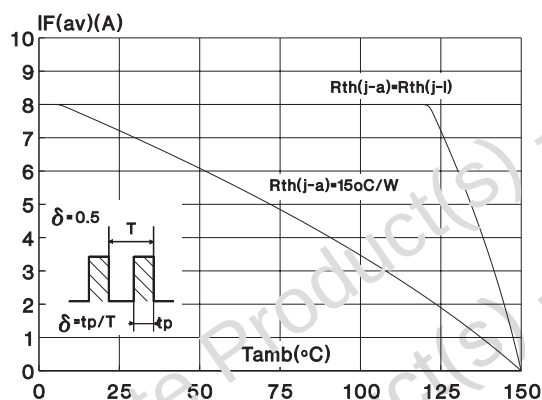


Fig. 4: Non repetitive surge peak forward current versus overload duration (maximum values, per diode).

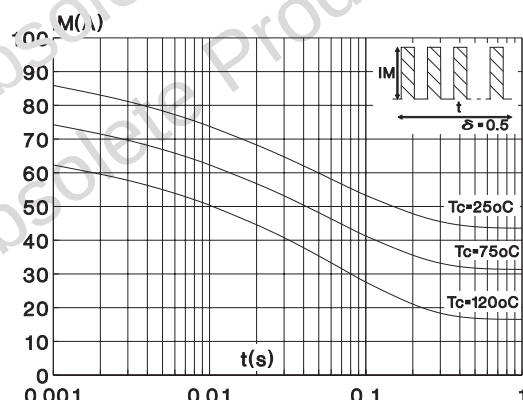


Fig. 5: Relative variation of thermal transient impedance junction to case versus pulse duration (per diode).

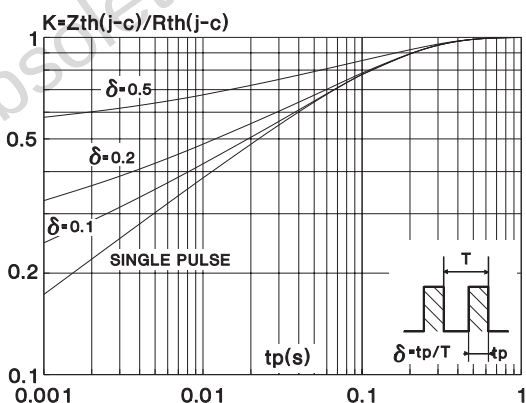


Fig. 6: Forward voltage drop versus forward current (maximum values, per diode).

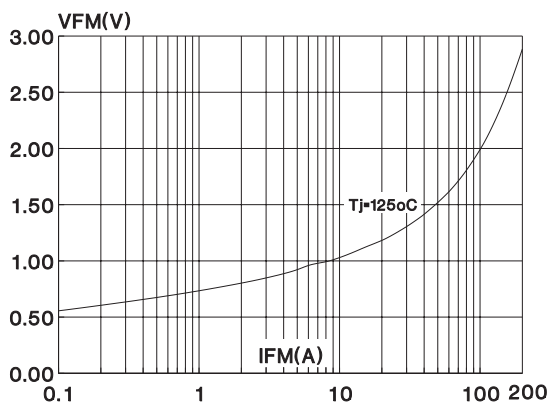


Fig. 7: Junction capacitance versus reverse voltage applied (typical values, per diode).

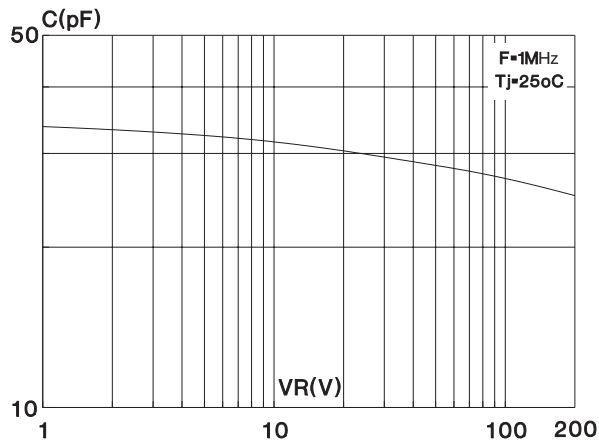


Fig. 8: Recovery charges versus dI_F/dt (per diode).

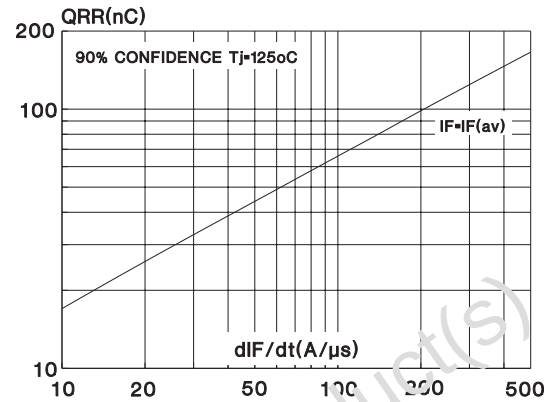


Fig. 9: Peak reverse current versus dI_F/dt (per diode).

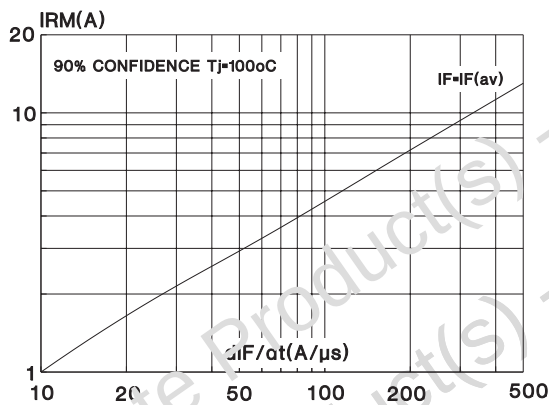


Fig. 10: Dynamic parameters versus junction temperature (per diode).

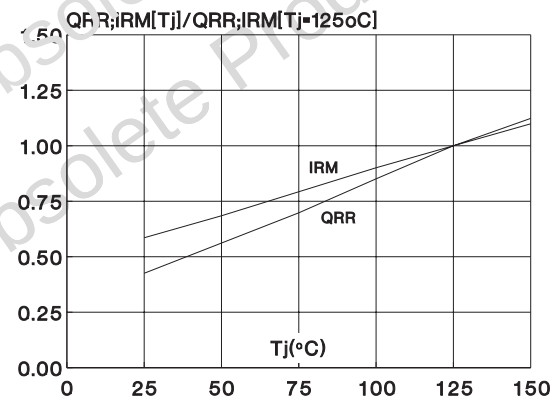
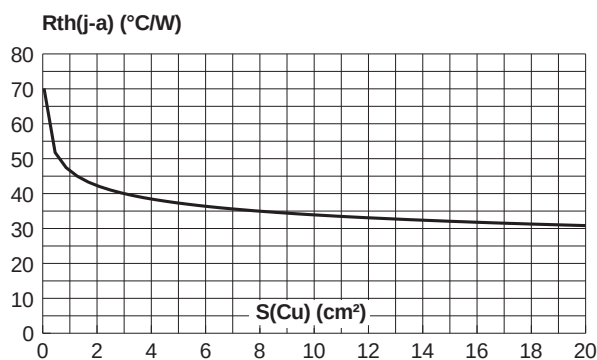
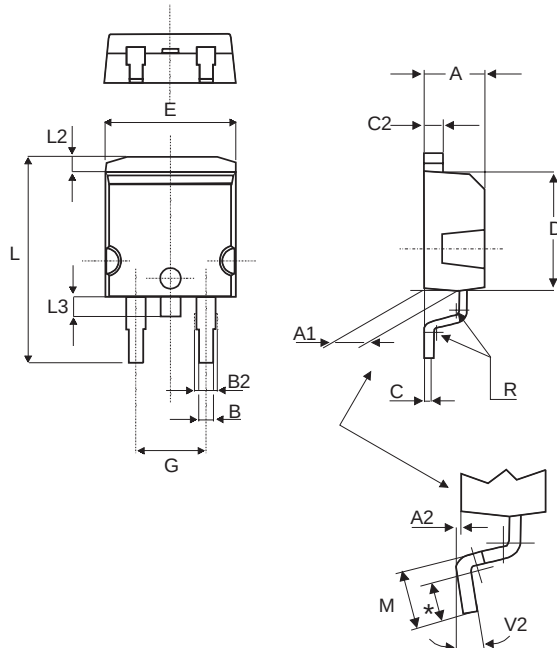


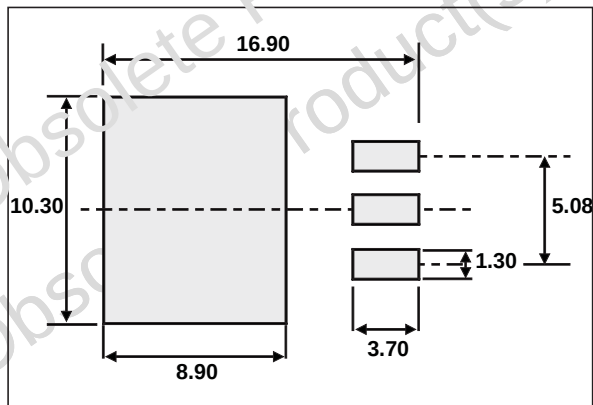
Fig. 11: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed circuit board, $CU = 35\mu s$) (STPR1620CG only).



PACKAGE MECHANICAL DATA
D²PAK (Plastic)


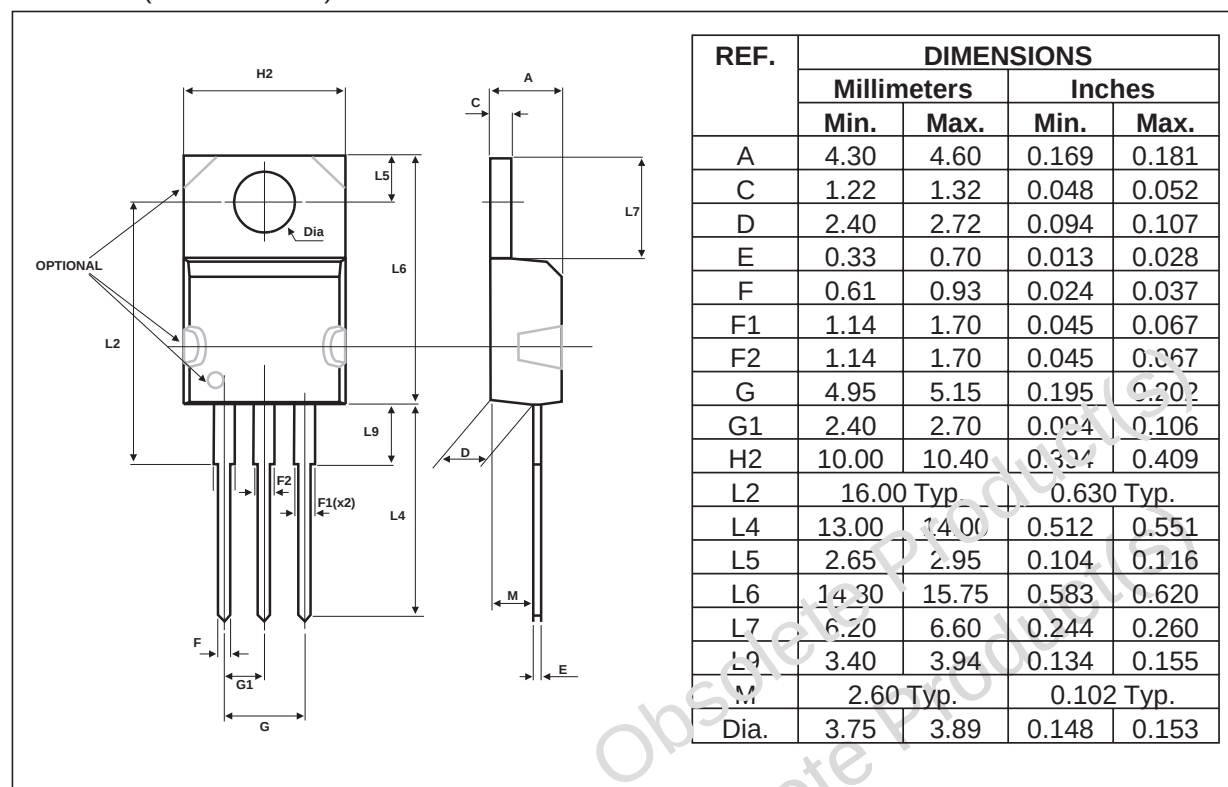
* FLAT ZONE NO LESS THAN 2mm

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	5.29	0.192	0.208
L	15.00	15.35	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
I²PAK

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
b	0.70	0.93	0.028	0.037
b1	1.14	1.17	0.044	0.046
b2	1.14	1.17	0.044	0.046
c	0.45	0.60	0.018	0.024
c2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
e	2.40	2.70	0.094	0.106
E	10.3	10.4	0.394	0.409
L	13.1	13.6	0.516	0.535
L1	3.48	3.78	0.137	0.149

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 ² PAK	1.48 g	50	Tube
STPR1620CG-TR	STPR1620CG	D ² PAK	1.48 g	1000	Tape & reel
STPR1620CR	STPR1620	I ² 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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