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ULTRA-FAST RECOVERY RECTIFIER DIODES

MAIN PRODUCTS CHARACTERISTICS

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

FEATURES

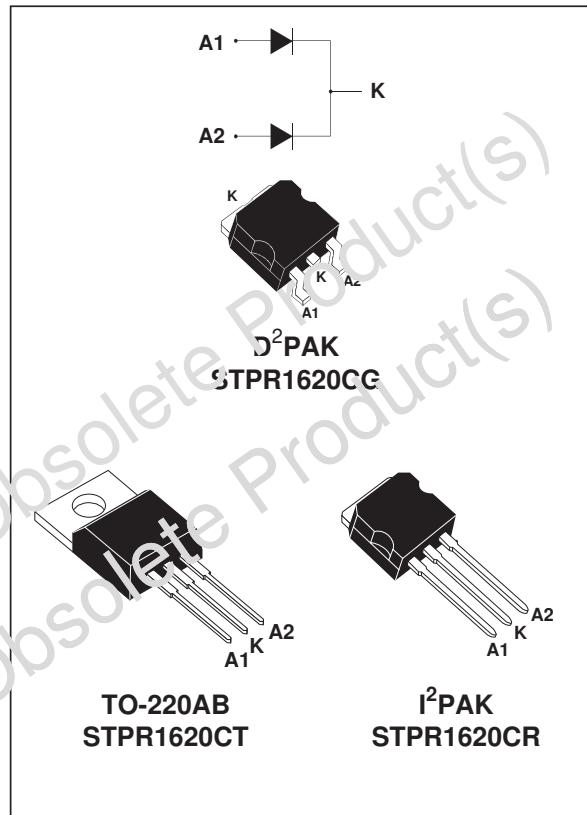
- SUITED FOR SMPS
- LOW LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIME
- HIGH SURGE CURRENT CAPABILITY

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
$I_{F(\text{RMS})}$	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 _{th} (j-c)	Junction to case	Per diode	3.0
		Total	1.8
R _{th} (c)	Coupling	0.6	°C/W

When the diodes 1 and 2 are used simultaneously :
 $\Delta T_j(\text{diode 1}) = P(\text{diode 1}) \times R_{\text{th(j-c)}} (\text{Per diode}) + P(\text{diode 2}) \times R_{\text{th(c)}}$

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 :

$$P = 0.78 \times I_F(AV) + 0.026 \times I_F^2(RMS)$$

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 _{IP}	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).

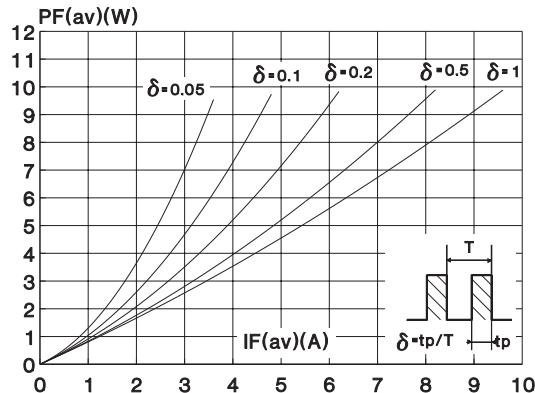


Fig. 3: Average current versus ambient temperature (δ : 0.5, per diode).

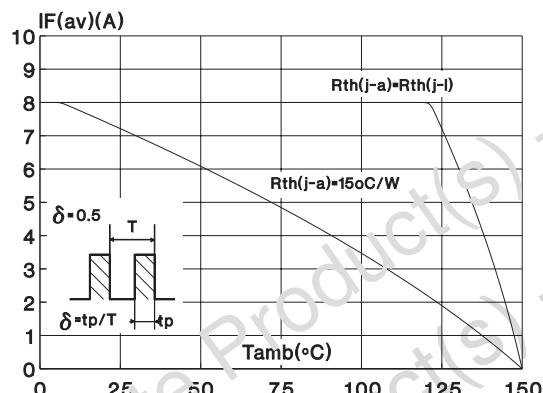


Fig. 5: Relative variation of thermal transient impedance junction to case versus pulse duration (per diode).

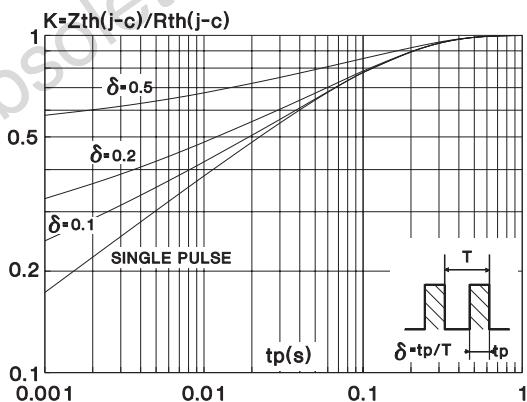


Fig. 2: Peak current versus form factor (per diode).

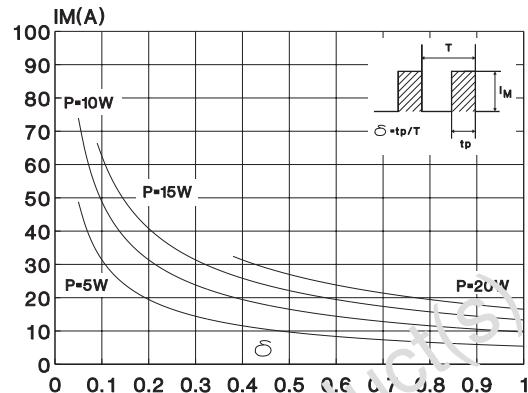


Fig. 4: Non repetitive surge peak forward current versus overload duration (maximum values, per diode).

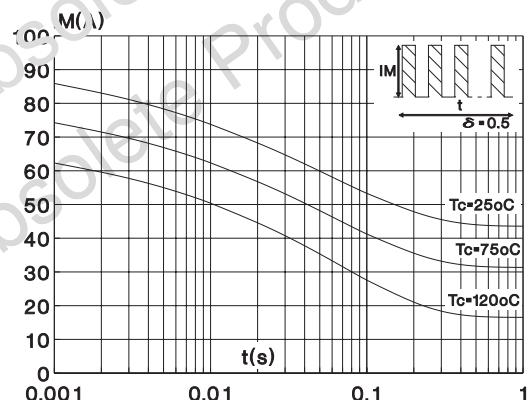
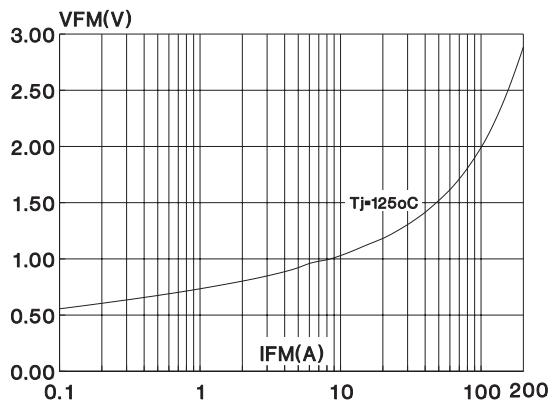


Fig. 6: Forward voltage drop versus forward current (maximum values, per diode).



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

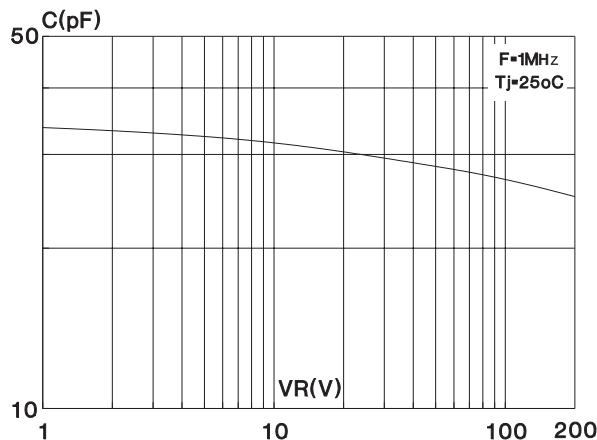


Fig. 9: Peak reverse current versus $\text{d}I/\text{dt}$ (per diode).

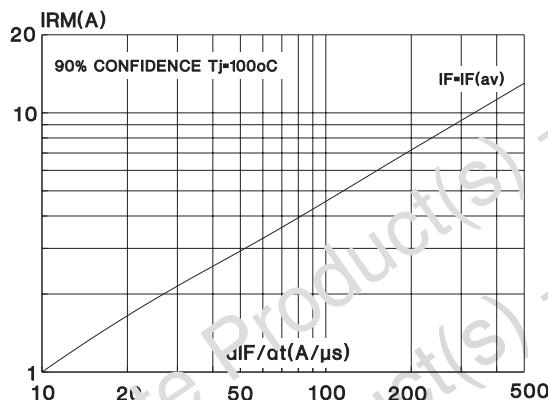


Fig. 8: Recovery charges versus $\text{d}I/\text{dt}$ (per diode).

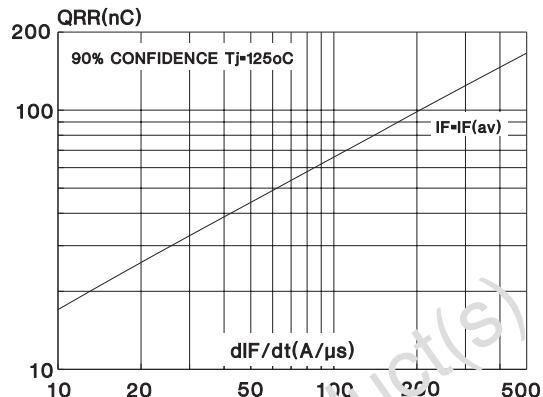


Fig. 10: Dynamic parameters versus junction temperature (per diode).

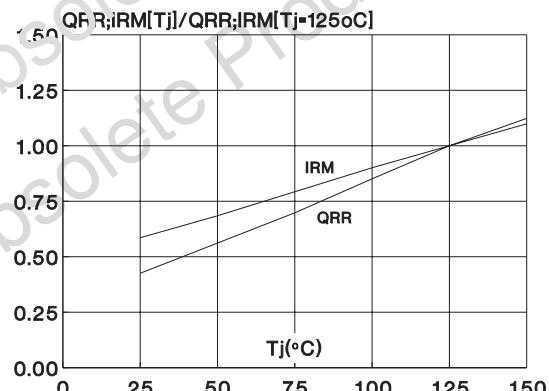
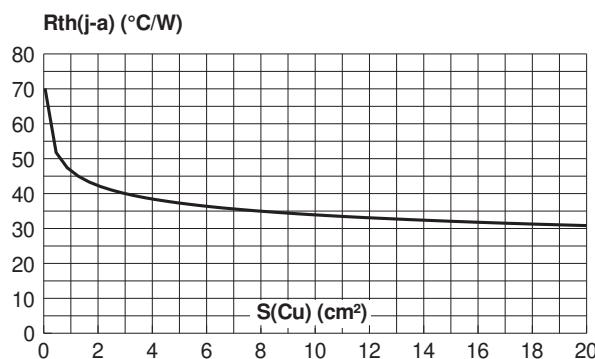
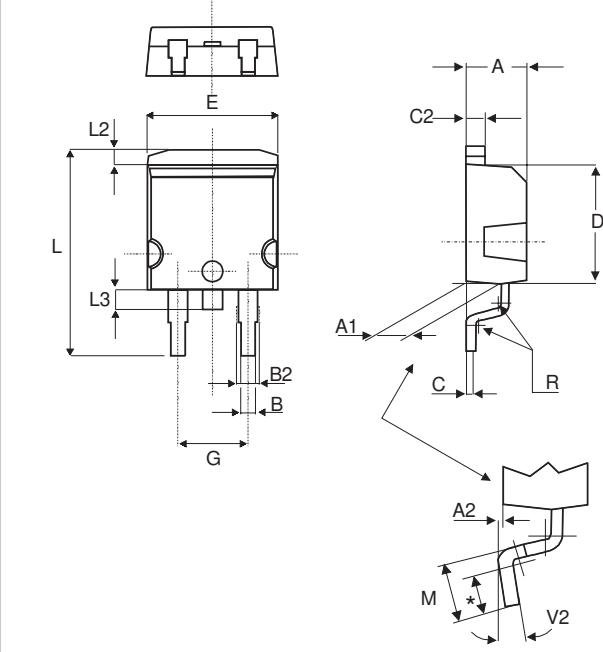


Fig. 11: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed circuit board, $CU = 35\mu\text{s}$) (STPR1620CG only).



STPR1620CG / STRP1620CT / STPR1620CR

PACKAGE MECHANICAL DATA D²PAK (Plastic)



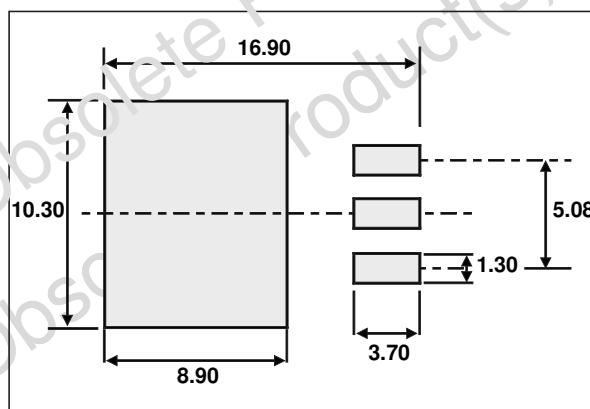
The diagram illustrates the 3D mechanical dimensions of the STPR1620CG / STRP1620CT / STPR1620CR package. It includes a top view, a side view, and a detailed view of the lead and body. Dimensions are labeled as follows:

- Top View:** Shows height L, lead spacing L2, lead thickness L3, lead width B2, lead pitch G, and lead height E.
- Side View:** Shows height L, lead thickness L2, lead width B2, lead pitch G, lead height E, lead angle A1, lead width A2, lead height C2, lead angle A, lead width C, lead height D, lead angle R, lead width M, lead angle V2, and lead height V2.
- Bottom Lead Detail:** Shows lead height C2, lead width A2, lead angle A, lead width C, lead height D, lead angle R, lead width M, lead angle V2, and lead height V2.

A note at the bottom states: * 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	15.93	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°	

FOOT PRINT (in millimeters)



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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	10.0	10.4	0.394	0.409
L	13.1	13.6	0.516	0.535
L1	3.48	3.78	0.137	0.149

STPR1620CG / STPR1620CT / STPR1620CR

PACKAGE MECHANICAL DATA TO-220AB (JEDEC outline)

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.60	0.169	0.181
C	1.22	1.32	0.048	0.052
D	2.40	2.72	0.094	0.107
E	0.33	0.70	0.013	0.028
F	0.61	0.93	0.024	0.037
F1	1.14	1.70	0.045	0.067
F2	1.14	1.70	0.045	0.067
G	4.95	5.15	0.195	0.202
G1	2.40	2.70	0.094	0.106
H2	10.00	10.40	0.394	0.409
L2	16.00	Typ.	0.630	Typ.
L4	13.00	14.00	0.512	0.551
L5	2.65	2.95	0.104	0.116
L6	1.30	15.75	0.583	0.620
L7	6.20	6.60	0.244	0.260
L9	3.40	3.94	0.134	0.155
M	2.60	Typ.	0.102	Typ.
Dia.	3.75	3.89	0.148	0.153

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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