

Pb Free Plating Product

## APT30D20BCA/APT30D20BCAG

2\*30A/200V Heatsink Dual Anode Common Ultra Fast Recovery Rectifiers

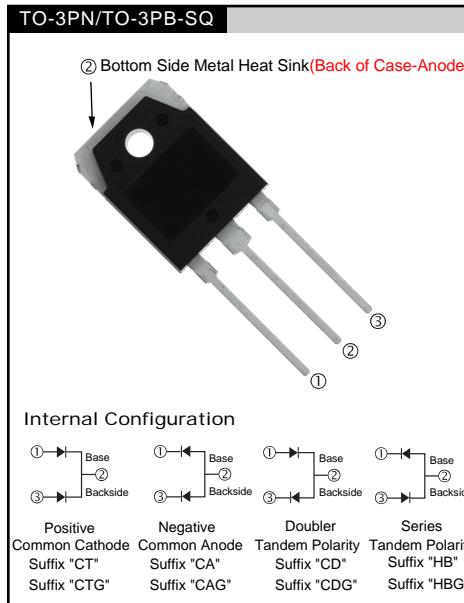


### APPLICATION

- Freewheeling, Snubber, Clamp
- Inversion Welder
- PFC
- Plating Power Supply
- Ultrasonic Cleaner and Welder
- Converter & Chopper
- UPS

### PRODUCT FEATURE

- Ultrafast Recovery Time
- Soft Recovery Characteristics
- Low Recovery Loss
- Low Forward Voltage
- High Surge Current Capability
- Low Leakage Current



### GENERAL DESCRIPTION

APT30D20BCA/APT30D20BCAG using the lastest FRED FAB process(planar passivation pellet) with ultrafast and soft recovery characteristics.

### MAXIMUM RATINGS

All Ratings Per Leg:  $T_C = 25^\circ\text{C}$  unless otherwise specified.

Symbol	Characteristic / Test Conditions	APT30D20BCA/APT30D20BCAG	UNIT
$V_R$	Maximum D.C. Reverse Voltage		
$V_{RRM}$	Maximum Peak Repetitive Reverse Voltage	200	Volts
$V_{RWM}$	Maximum Working Peak Reverse Voltage		
$I_{F(AV)}$	Maximum Average Forward Current ( $T_C = 101^\circ\text{C}$ , Duty Cycle = 0.5)	30	
$I_{F(AV)}$	RMS Forward Current (Square wave, 50% duty)	43	Amps
$I_{FSM}$	Non-Repetitive Forward Surge Current ( $T_J = 45^\circ\text{C}$ , 8.3ms)	320	
$T_J, T_{STG}$	Operating and StorageTemperature Range	-55 to 175	$^\circ\text{C}$
$T_L$	Lead Temperature for 10 Sec.	300	

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$V_F$	Forward Voltage	$I_F = 30\text{A}$		1.1	1.3
		$I_F = 60\text{A}$		1.4	
		$I_F = 30\text{A}, T_J = 125^\circ\text{C}$		0.9	
$I_{RM}$	Maximum Reverse Leakage Current	$V_R = V_R \text{ Rated}$		250	
		$V_R = V_R \text{ Rated}, T_J = 125^\circ\text{C}$		500	$\mu\text{A}$
$C_T$	Junction Capacitance, $V_R = 200\text{V}$		95		pF

**DYNAMIC CHARACTERISTICS**

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
$t_{rr}$	Reverse Recovery Time $I_F = 1A, di_F/dt = -100A/\mu s, V_R = 30V, T_J = 25^\circ C$	$I_F = 30A, di_F/dt = -200A/\mu s$ $V_R = 133V, T_C = 25^\circ C$	-	21		ns
$t_{rr}$	Reverse Recovery Time		-	24		
$Q_{rr}$	Reverse Recovery Charge	$I_F = 30A, di_F/dt = -200A/\mu s$ $V_R = 133V, T_C = 25^\circ C$	-	33		nC
$I_{RRM}$	Maximum Reverse Recovery Current		-	3	-	Amps
$t_{rr}$	Reverse Recovery Time	$I_F = 30A, di_F/dt = -200A/\mu s$ $V_R = 133V, T_C = 125^\circ C$	-	48		ns
$Q_{rr}$	Reverse Recovery Charge		-	150		nC
$I_{RRM}$	Maximum Reverse Recovery Current	$I_F = 30A, di_F/dt = -1000A/\mu s$ $V_R = 133V, T_C = 125^\circ C$	-	6	-	Amps
$t_{rr}$	Reverse Recovery Time	$I_F = 30A, di_F/dt = -1000A/\mu s$ $V_R = 133V, T_C = 125^\circ C$	-	31		ns
$Q_{rr}$	Reverse Recovery Charge		-	355		nC
$I_{RRM}$	Maximum Reverse Recovery Current		-	19		Amps

**THERMAL AND MECHANICAL CHARACTERISTICS**

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			1.7	°C/W
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance			40	
$W_T$	Package Weight		0.22		oz
			5.9		g
Torque	Maximum Mounting Torque		10		lb•in
			1.1		N•m

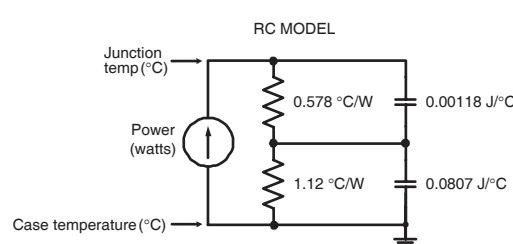
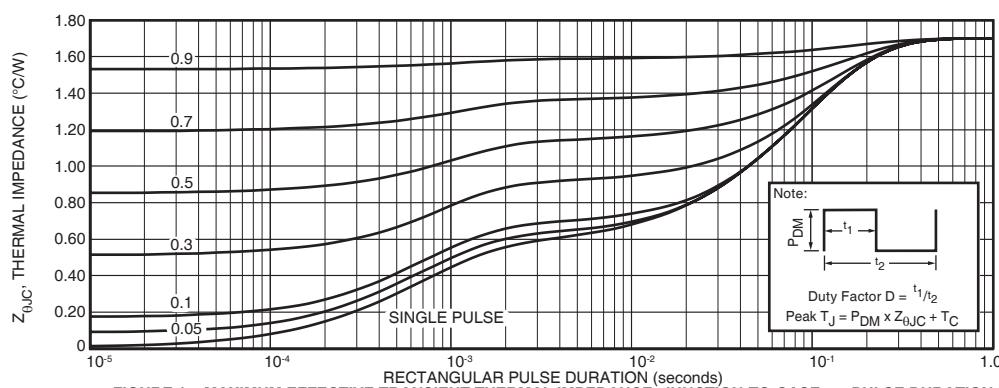


FIGURE 1b. TRANSIENT THERMAL IMPEDANCE MODEL

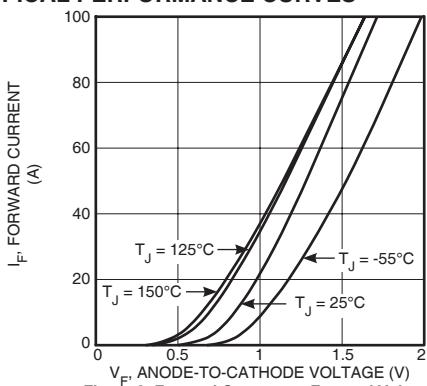
**TYPICAL PERFORMANCE CURVES**

Figure 2. Forward Current vs. Forward Voltage

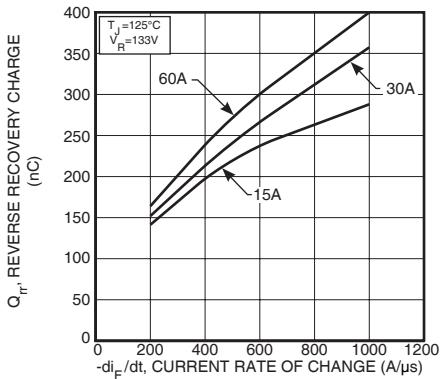


Figure 4. Reverse Recovery Charge vs. Current Rate of Change

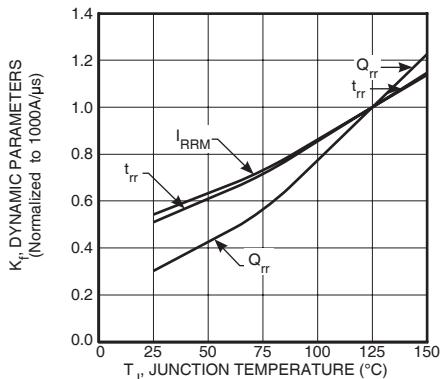


Figure 6. Dynamic Parameters vs. Junction Temperature

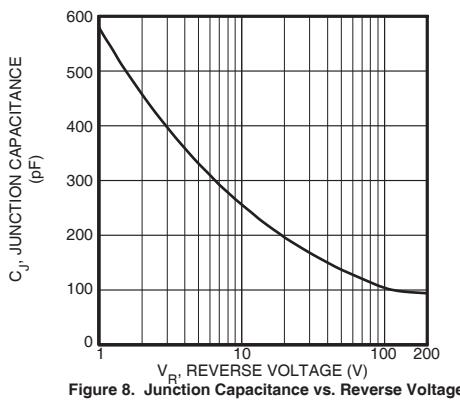


Figure 8. Junction Capacitance vs. Reverse Voltage

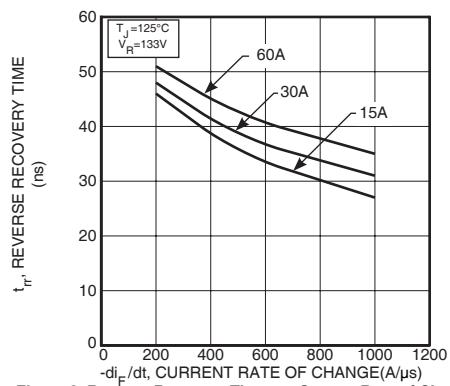


Figure 3. Reverse Recovery Time vs. Current Rate of Change

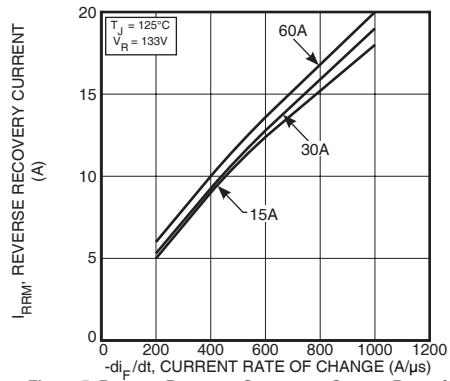


Figure 5. Reverse Recovery Current vs. Current Rate of Change

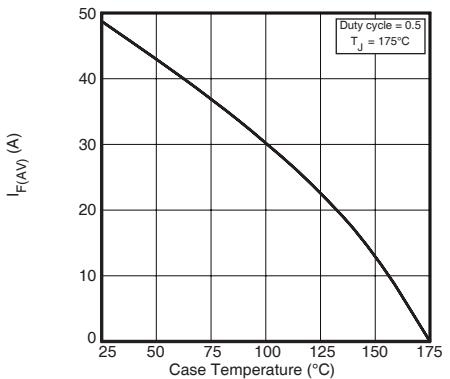


Figure 7. Maximum Average Forward Current vs. Case Temperature

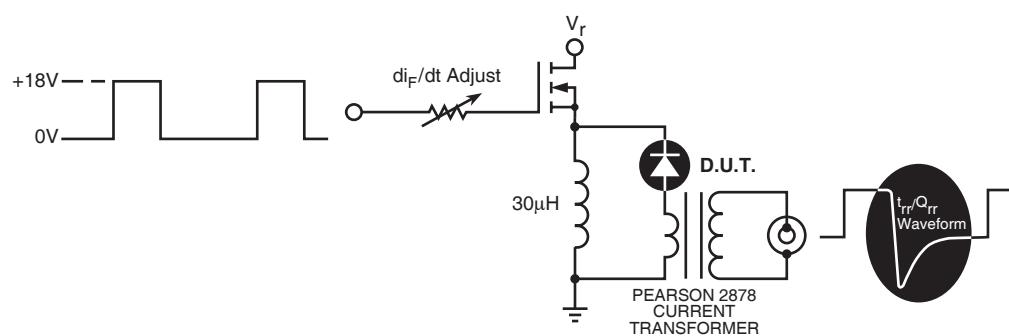


Figure 9. Diode Test Circuit

- ①  $I_F$  - Forward Conduction Current
- ②  $di_F/dt$  - Rate of Diode Current Change Through Zero Crossing.
- ③  $I_{RRM}$  - Maximum Reverse Recovery Current.
- ④  $t_{rr}$  - Reverse Recovery Time, measured from zero crossing where diode current goes from positive to negative, to the point at which the straight line through  $I_{RRM}$  and  $0.25 \cdot I_{RRM}$  passes through zero.
- ⑤  $Q_{rr}$  - Area Under the Curve Defined by  $I_{RRM}$  and  $t_{rr}$ .

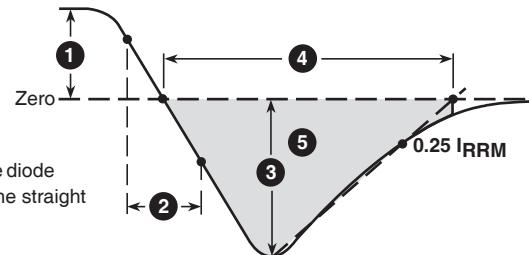
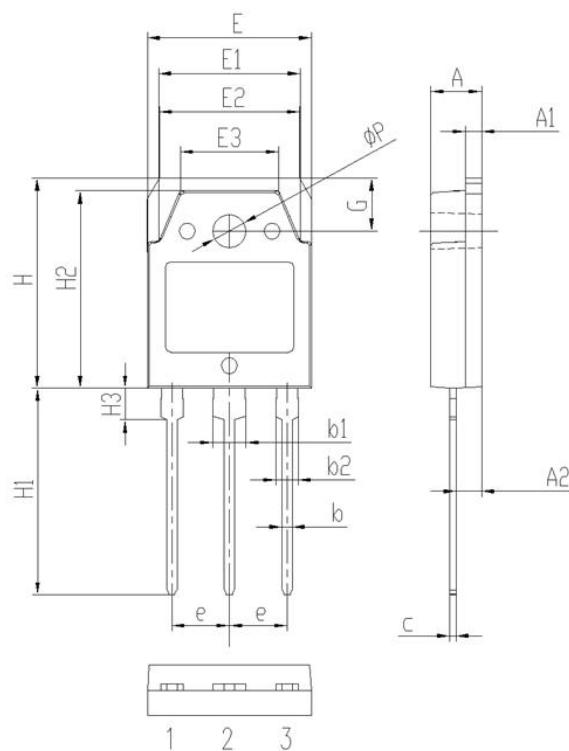


Figure 10. Diode Reverse Recovery Waveform and Definitions

## Package Outline

THINKI TO-3PN/TO-3PB-SQ



Symbol	Dimensions(millimeters)	
	Min.	Max.
A	4.60	5.00
A1	1.50	2.00
A2	2.20	2.60
b	0.80	1.20
b1	2.90	3.30
b2	1.90	2.30
c	0.40	0.80
e	5.25	5.65
E	15.3	15.7
E1	13.2	13.6
E2	13.1	13.5
E3	9.10	9.50
H	19.7	20.1
H1	19.1	20.1
H2	18.3	18.7
H3	2.80	3.20
G	4.80	5.20
ΦP	3.00	3.40