

Pb Free Plating Product

## APT30D20BCT/APT30D20BCTG

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

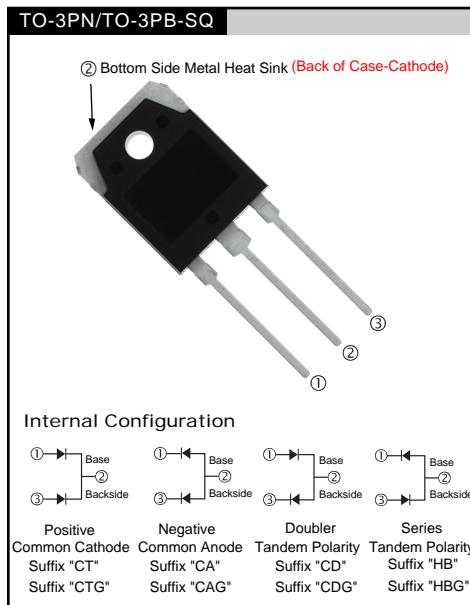


### APPLICATION

- 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

APT30D20BCT/APT30D20BCTG 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	A P T 3 0 D 2 0 B C T / A P T 3 0 D 2 0 B C T G	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 ( $T_C = 145^\circ\text{C}$ , Duty Cycle = 0.5)	30	Amps
$I_{F(AV)}$	RMS Forward Current (Square wave, 50% duty)	80	
$I_{FSM}$	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	Volts
		$I_F = 30\text{A}, T_J = 125^\circ\text{C}$		0.9	
$I_{RM}$	Maximum Reverse Leakage Current	$V_R = V_R \text{ Rated}$		250	$\mu\text{A}$
		$V_R = V_R \text{ Rated}, T_J = 125^\circ\text{C}$		500	
$C_T$	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		-	31		ns
$Q_{rr}$	Reverse Recovery Charge	$I_F = 30A, di_F/dt = -1000A/\mu s, V_R = 133V, T_C = 125^\circ C$	-	355		nC
$I_{RRM}$	Maximum Reverse Recovery Current		-	19		Amps

**THERMAL AND MECHANICAL CHARACTERISTICS**

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{0JC}$	Junction-to-Case Thermal Resistance			.67	$^\circ C/W$
$R_{0JA}$	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

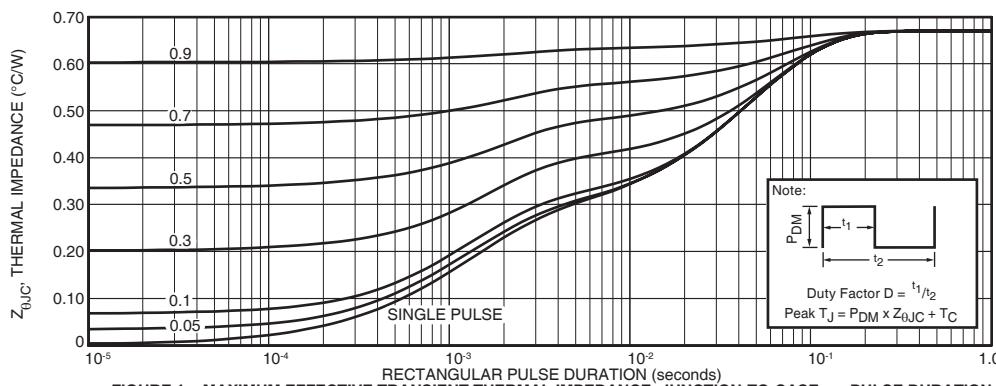


FIGURE 1a. MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs. PULSE DURATION

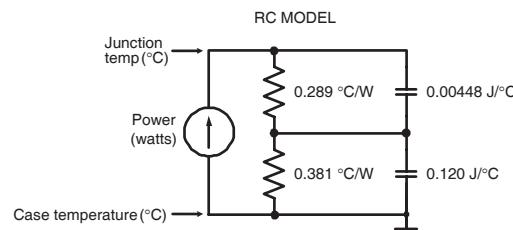
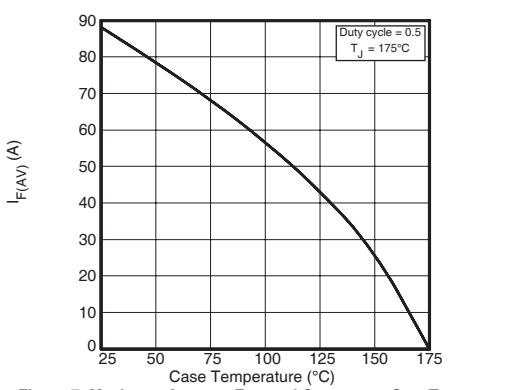
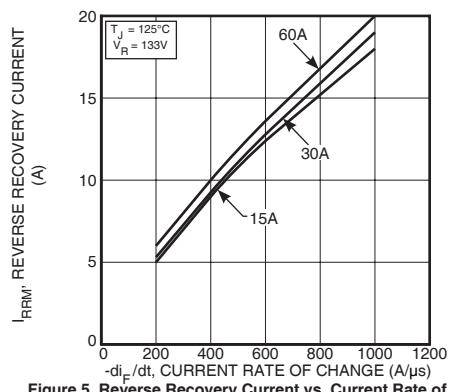
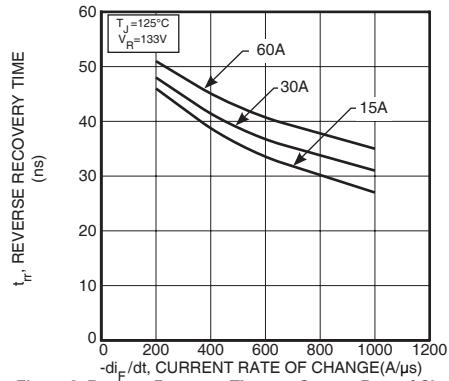
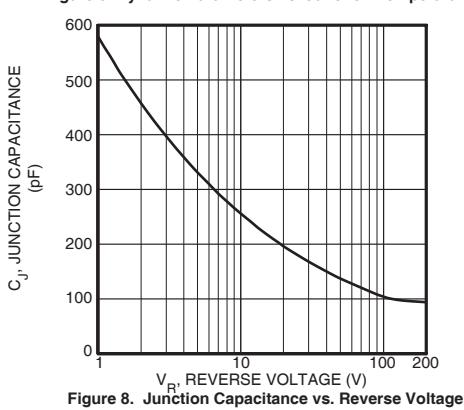
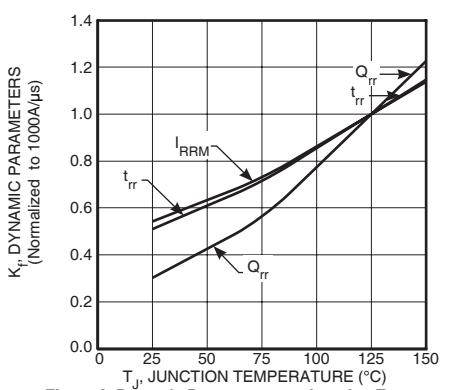
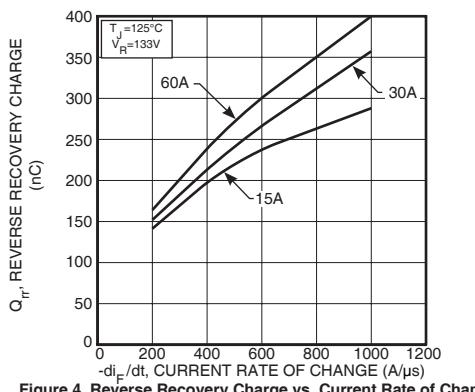
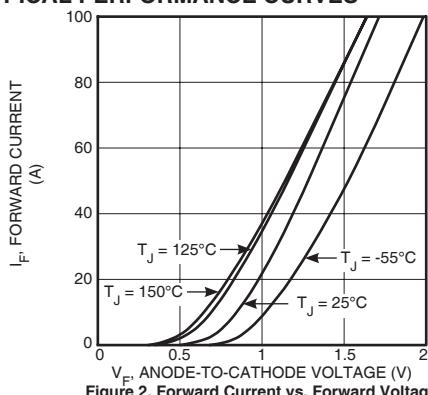


FIGURE 1b. TRANSIENT THERMAL IMPEDANCE MODEL

**TYPICAL PERFORMANCE CURVES**

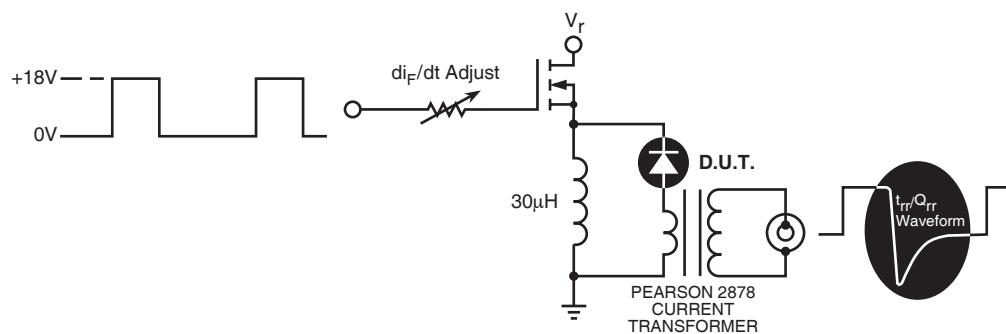


Figure 9. Diode Test Circuit

- 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  $t_{rr}$ .

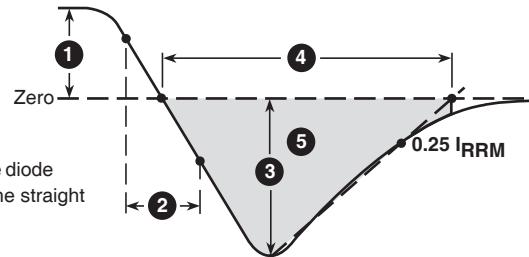
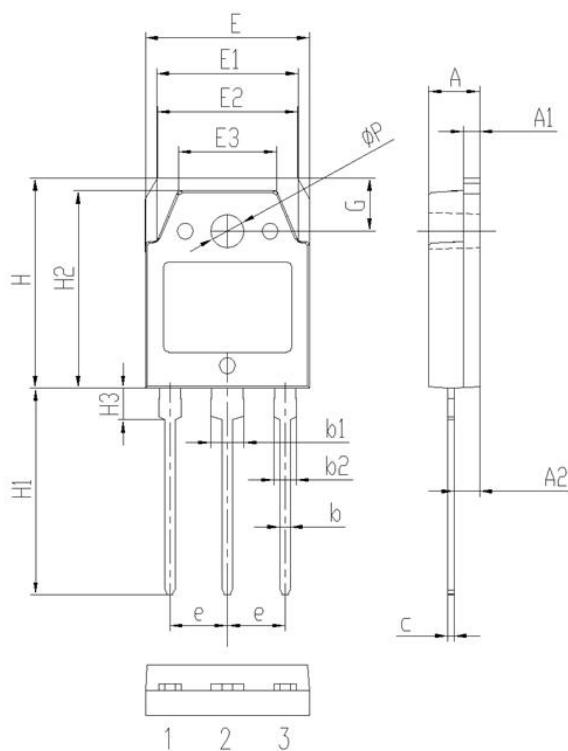


Figure 10. Diode Reverse Recovery Waveform and Definitions

## 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