

Pb Free Plating Product

APT15DQ100BCT/APT15DQ100BCTG



2*15A/1000V 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

TO-3PN/TO-3PB-SQ

② Bottom Side Metal Heat Sink(Back of Case-Cathode)

Internal Configuration

①	②	③	Configuration	Suffix
Base	Backside	Backside	Positive Common Cathode	"CT"
Base	Backside	Backside	Negative Common Anode	"CA"
Base	Backside	Backside	Doubler Tandem Polarity	"CD"
Base	Backside	Backside	Series Tandem Polarity	"HB"

Suffix "CTG" Suffix "CAG" Suffix "CDG" Suffix "HBG"

GENERAL DESCRIPTION

APT15DQ100BCT/APT15DQ100BCTG using the latest FRED FAB process(planar passivation pellet) with ultrafast and soft recovery characteristics.

MAXIMUM RATINGS All Ratings Per Leg: T_C = 25°C unless otherwise specified.

Symbol	Characteristic / Test Conditions	APT15DQ100BCT/APT15DQ100BCTG	UNIT
V _R	Maximum D.C. Reverse Voltage	1000	Volts
V _{RRM}	Maximum Peak Repetitive Reverse Voltage		
V _{RWM}	Maximum Working Peak Reverse Voltage		
I _{F(AV)}	Maximum Average Forward Current (T _C = 126°C, Duty Cycle = 0.5)	15	Amps
I _{F(RMS)}	RMS Forward Current (Square wave, 50% duty)	29	
I _{FSM}	Non-Repetitive Forward Surge Current (T _J = 45°C, 8.3ms)	80	
E _{AVL}	Avalanche Energy (1A, 40mH)	20	mJ
T _J , T _{STG}	Operating and StorageTemperature Range	-55 to 175	°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 = 15A	2.5	3.0	Volts
		I _F = 30A	3.06		
		I _F = 15A, T _J = 125°C	1.92		
I _{RM}	Maximum Reverse Leakage Current	V _R = 1000V		100	μA
		V _R = 1000V, T _J = 125°C		500	
C _T	Junction Capacitance, V _R = 200V		12		pF

DYNAMIC CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
t_{rr}	Reverse Recovery Time	$I_F = 1\text{A}$, $di_F/dt = -100\text{A}/\mu\text{s}$, $V_R = 30\text{V}$, $T_J = 25^\circ\text{C}$	-	20		ns
t_{rr}	Reverse Recovery Time		-	235		
Q_{rr}	Reverse Recovery Charge		-	185		nC
I_{RRM}	Maximum Reverse Recovery Current	$I_F = 15\text{A}$, $di_F/dt = -200\text{A}/\mu\text{s}$, $V_R = 667\text{V}$, $T_C = 25^\circ\text{C}$	-	3	-	Amps
t_{rr}	Reverse Recovery Time		-	300		ns
Q_{rr}	Reverse Recovery Charge		-	810		nC
I_{RRM}	Maximum Reverse Recovery Current	$I_F = 15\text{A}$, $di_F/dt = -200\text{A}/\mu\text{s}$, $V_R = 667\text{V}$, $T_C = 125^\circ\text{C}$	-	6	-	Amps
t_{rr}	Reverse Recovery Time		-	125		ns
Q_{rr}	Reverse Recovery Charge		-	1150		nC
I_{RRM}	Maximum Reverse Recovery Current	$I_F = 15\text{A}$, $di_F/dt = -1000\text{A}/\mu\text{s}$, $V_R = 667\text{V}$, $T_C = 125^\circ\text{C}$	-	19		Amps
t_{rr}	Reverse Recovery Time		-			
Q_{rr}	Reverse Recovery Charge		-			

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			1.18	$^\circ\text{C}/\text{W}$
W_T	Package Weight		0.22		oz
			5.9		g
Torque	Maximum Mounting Torque			10	lb•in
				1.1	N•m

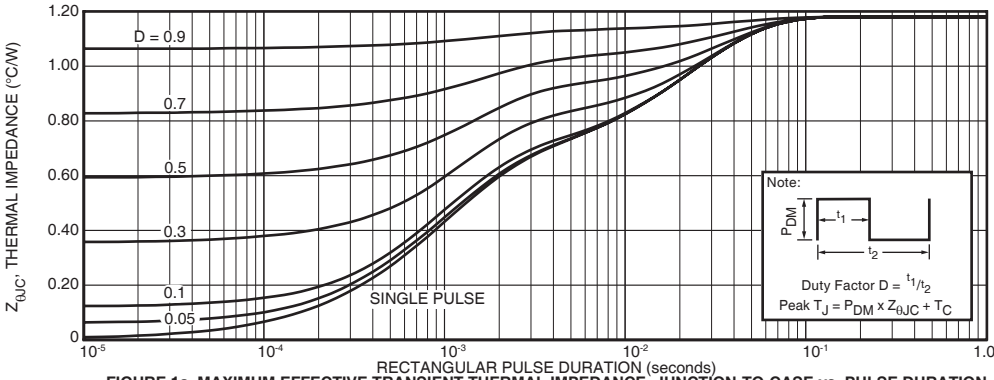


FIGURE 1a. MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs. PULSE DURATION

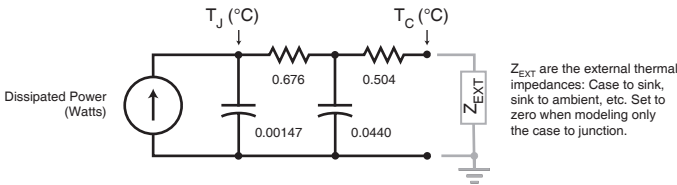


FIGURE 1b. TRANSIENT THERMAL IMPEDANCE MODEL

TYPICAL PERFORMANCE CURVES

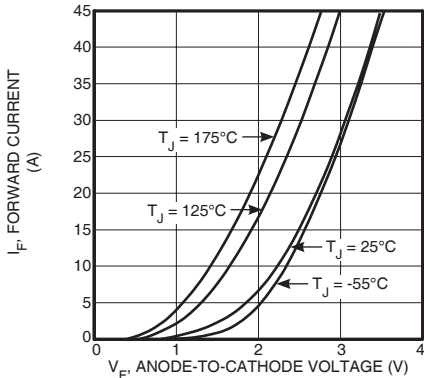


Figure 2. Forward Current vs. Forward Voltage

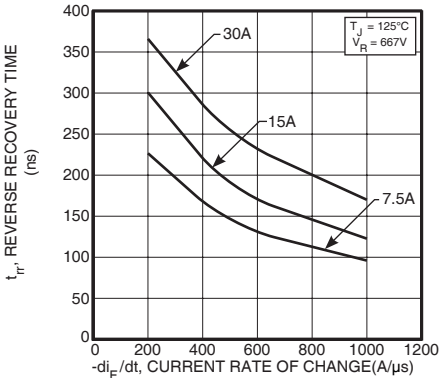


Figure 3. Reverse Recovery Time vs. Current Rate of Change

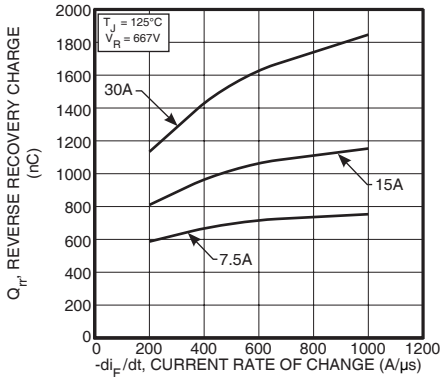


Figure 4. Reverse Recovery Charge vs. Current Rate of Change

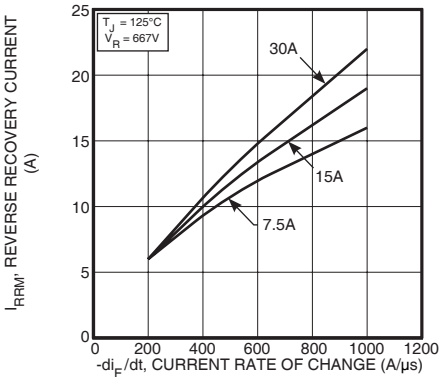


Figure 5. Reverse Recovery Current vs. Current Rate of Change

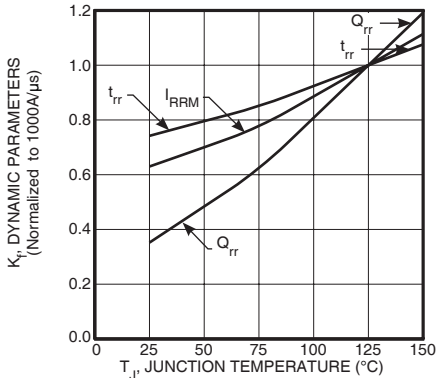


Figure 6. Dynamic Parameters vs. Junction Temperature

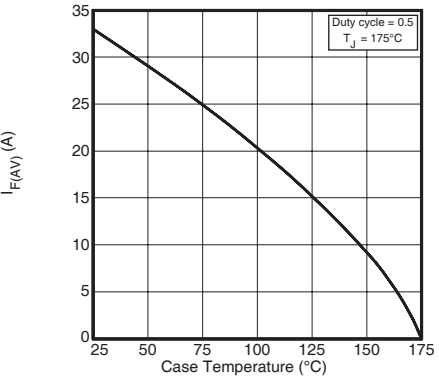


Figure 7. Maximum Average Forward Current vs. Case Temperature

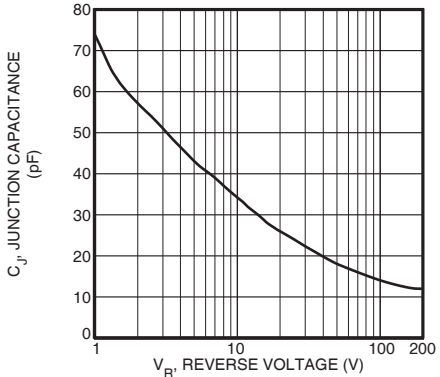


Figure 8. Junction Capacitance vs. Reverse Voltage

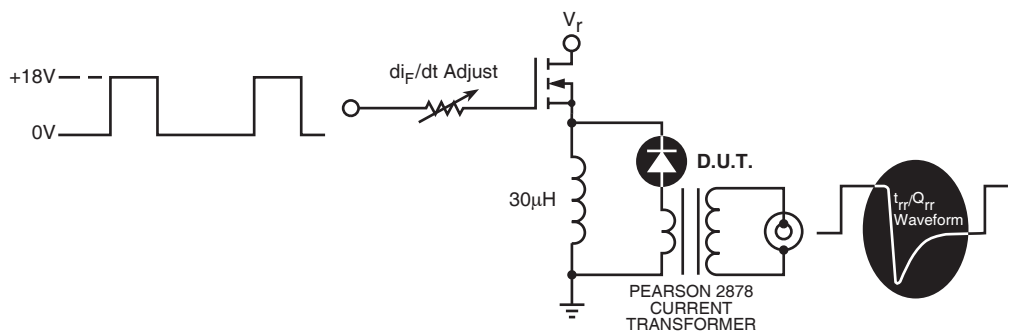


Figure 9. Diode Test Circuit

- 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} .

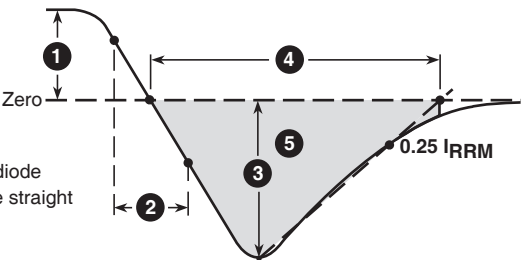
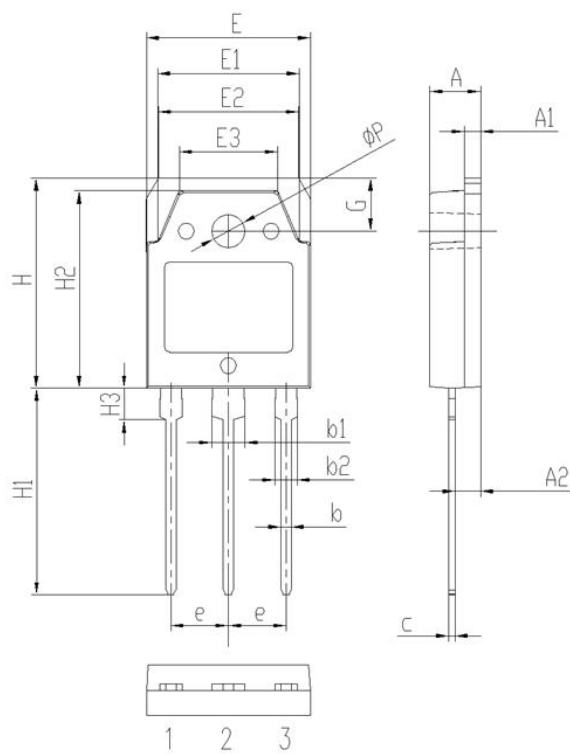


Figure 10, Diode Reverse Recovery Waveform and Definitions

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