

Pb Free Plating Product

APT15DQ60BCT/APT15DQ60BCTG



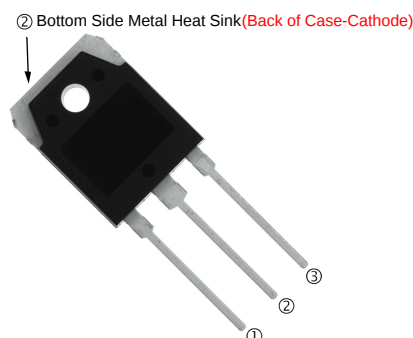
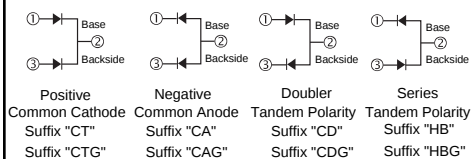
2*15A/600V Heatsink Dual Cathode Common Ultra Fast Recovery Rectifiers

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**Internal Configuration****GENERAL DESCRIPTION**

APT15DQ60BCT/APT15DQ60BCTG using the latest FRED FAB process(planar passivation pellet) with ultrafast and soft recovery characteristics.

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

Symbol	Characteristic / Test Conditions	APT15DQ60BCT/APT15DQ60BCTG	UNIT
V_R	Maximum D.C. Reverse Voltage	600	Volts
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		
V_{RWM}	Maximum Working Peak Reverse Voltage		
$I_{F(AV)}$	Maximum Average Forward Current ($T_C = 129^\circ\text{C}$, Duty Cycle = 0.5)	15	Amps
$I_{F(RMS)}$	RMS Forward Current (Square wave, 50% duty)	30	
I_{FSM}	Non-Repetitive Forward Surge Current ($T_J = 45^\circ\text{C}$, 8.3ms)	110	
E_{AVL}	Avalanche Energy (1A, 40mH)	20	mJ
T_J, T_{STG}	Operating and Storage Temperature 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	$I_F = 15\text{A}$	2.0	2.4	Volts
		$I_F = 30\text{A}$	2.5		
		$I_F = 15\text{A}, T_J = 125^\circ\text{C}$	1.56		
I_{RM}	Maximum Reverse Leakage Current	$V_R = 600\text{V}$		25	μA
		$V_R = 600\text{V}, T_J = 125^\circ\text{C}$		500	
C_T	Junction Capacitance, $V_R = 200\text{V}$		25		pF

DYNAMIC CHARACTERISTICS

Symbol	Characteristic	Test Conditions	MIN	TYP	MAX	UNIT
t_{rr}	Reverse Recovery Time	$I_F = 1A, di_F/dt = -100A/\mu s, V_R = 30V, T_J = 25^{\circ}C$	-	15		ns
t_{rr}	Reverse Recovery Time		-	19		
Q_{rr}	Reverse Recovery Charge		-	21		nC
I_{RRM}	Maximum Reverse Recovery Current	$I_F = 15A, di_F/dt = -200A/\mu s, V_R = 400V, T_C = 25^{\circ}C$	-	2	-	Amps
t_{rr}	Reverse Recovery Time		-	105		ns
Q_{rr}	Reverse Recovery Charge		-	250		nC
I_{RRM}	Maximum Reverse Recovery Current	$I_F = 15A, di_F/dt = -200A/\mu s, V_R = 400V, T_C = 125^{\circ}C$	-	5	-	Amps
t_{rr}	Reverse Recovery Time		-	55		ns
Q_{rr}	Reverse Recovery Charge		-	420		nC
I_{RRM}	Maximum Reverse Recovery Current	$I_F = 15A, di_F/dt = -1000A/\mu s, V_R = 400V, T_C = 125^{\circ}C$	-	15		Amps
t_{rr}	Reverse Recovery Time		-	15		
Q_{rr}	Reverse Recovery Charge		-	15		

THERMAL AND MECHANICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			1.35	$^{\circ}C/W$
W_T	Package Weight		0.22		oz
			5.9		g
Torque	Maximum Mounting Torque			10	lb•in
				1.1	N•m

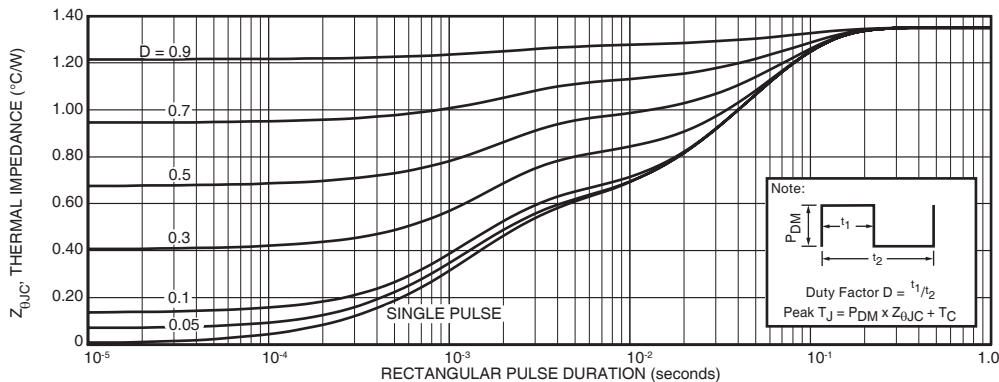


FIGURE 1a. MAXIMUM EFFECTIVE TRANSIENT THERMAL IMPEDANCE, JUNCTION-TO-CASE vs. PULSE DURATION

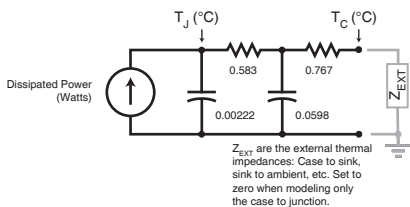


FIGURE 1b, TRANSIENT THERMAL IMPEDANCE MODEL

TYPICAL PERFORMANCE CURVES

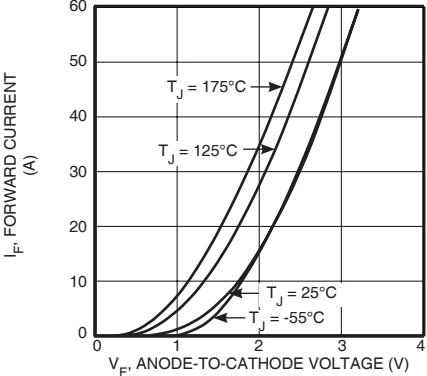


Figure 2. Forward Current vs. Forward Voltage

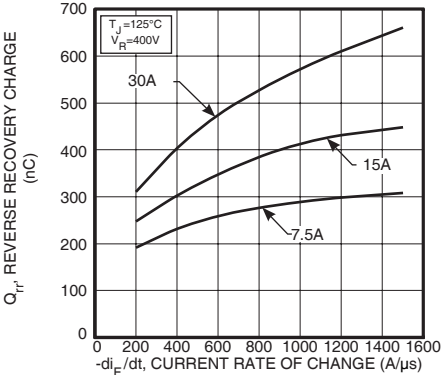


Figure 4. Reverse Recovery Charge vs. Current Rate of Change

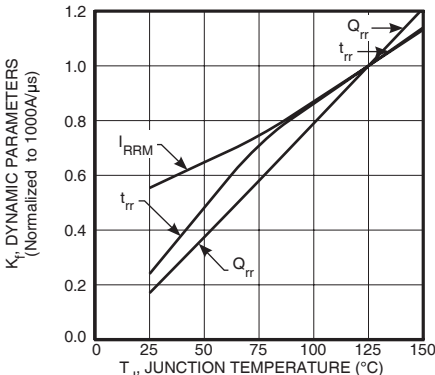


Figure 6. Dynamic Parameters vs. Junction Temperature

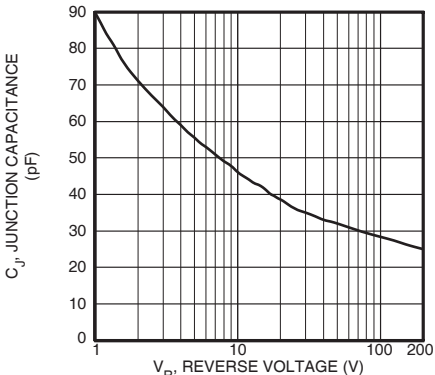


Figure 8. Junction Capacitance vs. Reverse Voltage

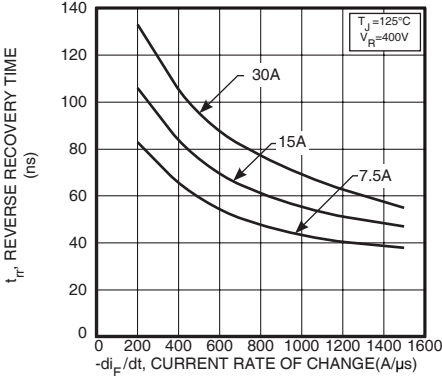


Figure 3. Reverse Recovery Time vs. Current Rate of Change

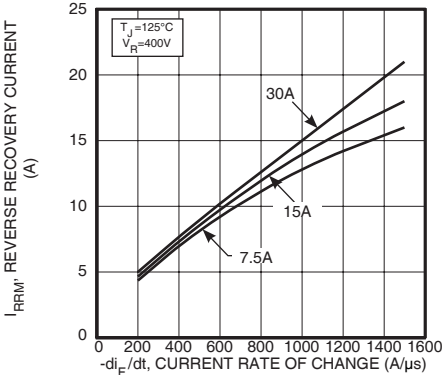


Figure 5. Reverse Recovery Current vs. Current Rate of Change

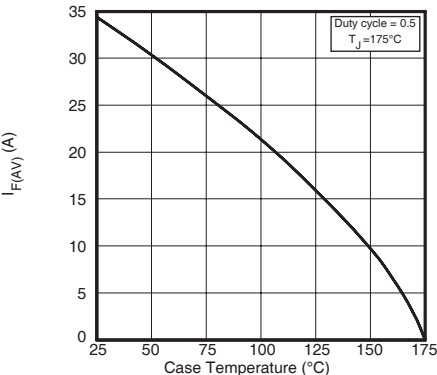


Figure 7. Maximum Average Forward Current vs. Case Temperature

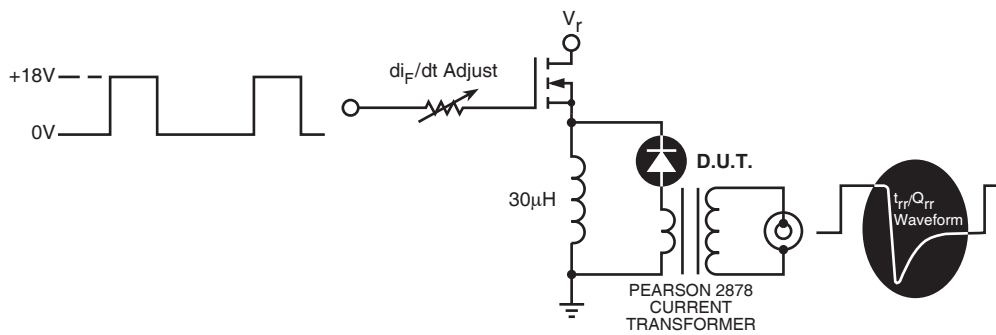


Figure 9. Diode Test Circuit

- ❶ I_F - Forward Conduction Current
- ❷ di_F/dt - Rate of Diode Current Change Through Zero Crossing.
- ❸ I_{RRM} - Maximum Reverse Recovery Current.
- ❹ 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.
- ❺ Q_{rr} - Area Under the Curve Defined by I_{RRM} and t_{rr} .

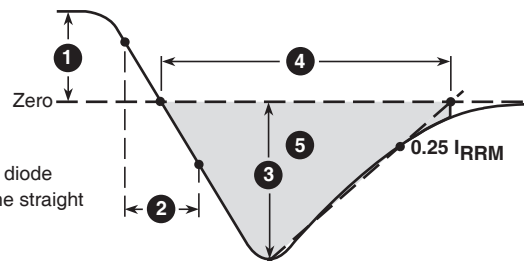
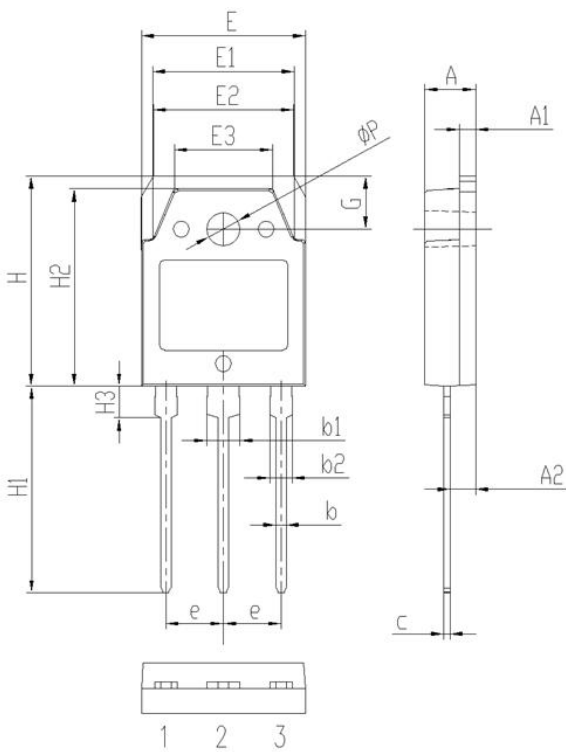


Figure 10. Diode Reverse Recovery Waveform and Definitions

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