

Pb Free Plating Product

ETU3006



ThinkiSemi 30Amperes,600Volts SwitchMode Ultrafast Recovery Epitaxial Diode

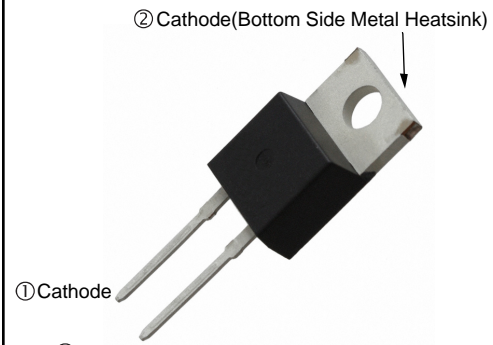
APPLICATION

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

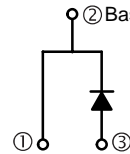
PRODUCT FEATURE

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

TO-220AC/TO-220CB-2P-SQ



Internal Configuration



GENERAL DESCRIPTION

ETU3006 using THINKISEMI latest FRED FAB process(planar passivation pellet) with ultrafast and soft recovery characteristics.

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Peak repetitive reverse voltage	V_{RRM}		600	V
Average rectified forward current in DC	$I_{F(AV)}$	$T_C = 130\text{ }^\circ\text{C}$	30	A
Non-repetitive peak surge current	I_{FSM}	$T_J = 25\text{ }^\circ\text{C}$	200	
Operating junction and storage temperatures	T_J, T_{Stg}		-65 to +175	$^\circ\text{C}$

ELECTRICAL SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Breakdown voltage, blocking voltage	V_{BR}, V_R	$I_R = 100\text{ }\mu\text{A}$	600	-	-	V
Forward voltage	V_F	$I_F = 30\text{ A}$	-	1.4	2.0	V
		$I_F = 30\text{ A}, T_J = 150\text{ }^\circ\text{C}$	-	1.15	1.35	
Reverse leakage current	I_R	$V_R = V_R\text{ rated}$	-	0.02	30	μA
		$T_J = 150\text{ }^\circ\text{C}, V_R = V_R\text{ rated}$	-	30	250	
Junction capacitance	C_T	$V_R = 600\text{ V}$	-	20	-	pF
Series inductance	L_S	Measured lead to lead 5 mm from package body	-	8	-	nH

DYNAMIC RECOVERY CHARACTERISTICS (T _J = 25 °C unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t _{rr}	I _F = 1 A, dI _F /dt = 50 A/μs, V _R = 30 V	-	30	45	ns
		T _J = 25 °C	-	45	-	
		T _J = 125 °C	-	100	-	
Peak recovery current	I _{RRM}	T _J = 25 °C	-	5.6	-	A
		T _J = 125 °C	-	10	-	
Reverse recovery charge	Q _{rr}	T _J = 25 °C	-	127	-	nC
		T _J = 125 °C	-	580	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range	T _J , T _{Stg}		-65	-	175	°C
Thermal resistance, junction-to-case	R _{thJC}		-	0.84	1.3	°C/W
Thermal resistance, junction-to-ambient	R _{thJA}	Typical socket mount	-	-	70	
Typical thermal resistance, case-to-heatsink	R _{thCS}	Mounting surface, flat, smooth, and greased	-	0.5	-	
Weight			-	2	-	g
			-	0.07	-	oz.
Mounting torque			6 (5)	-	12 (10)	kgf · cm (lbf · in)
Marking device		Case style 2L TO-220AC	ETU3006			

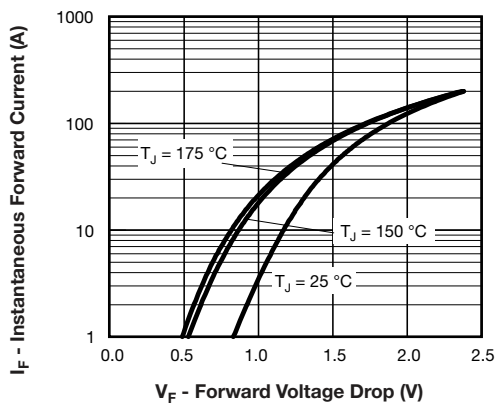


Fig. 1 - Typical Forward Voltage Drop Characteristics

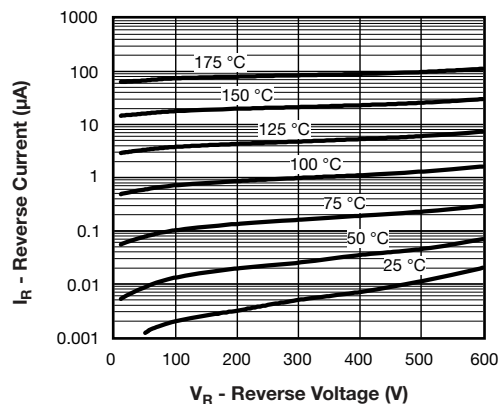


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

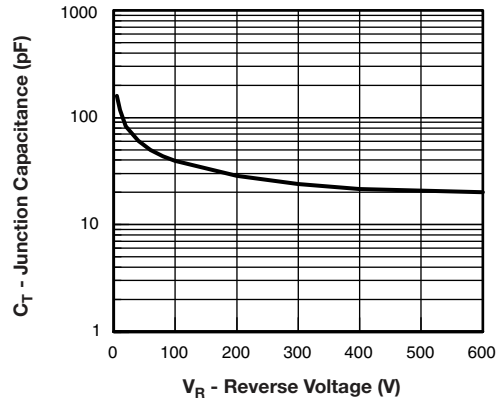


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

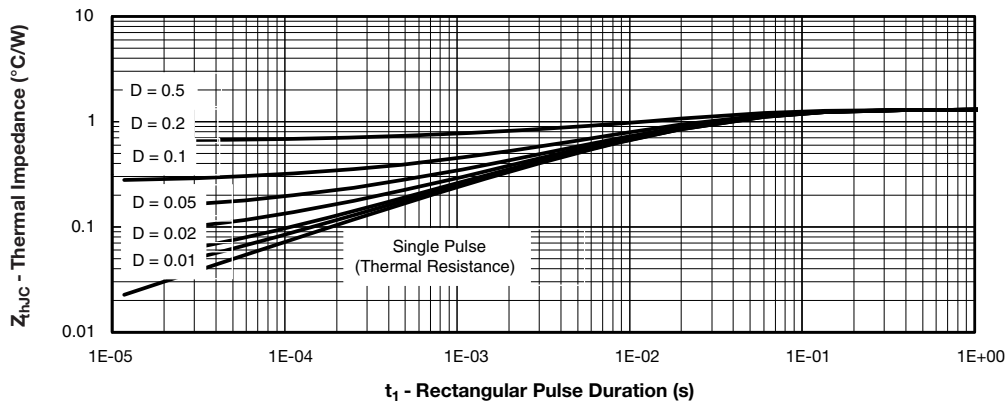


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

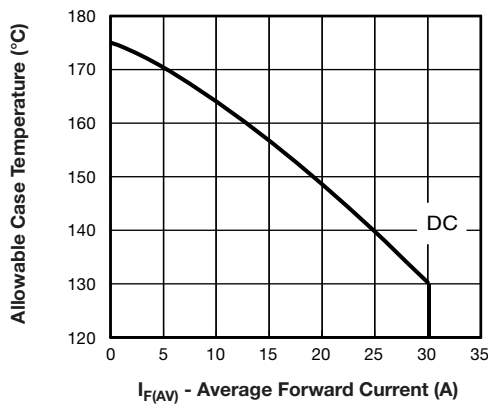


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

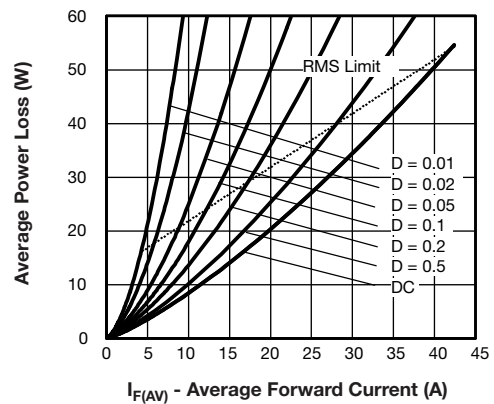


Fig. 6 - Forward Power Loss Characteristics

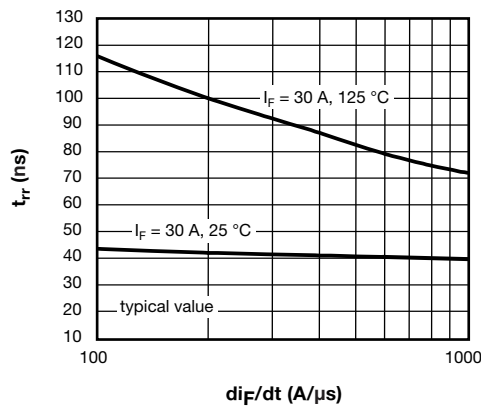


Fig. 7 - Typical Reverse Recovery vs. di_F/dt

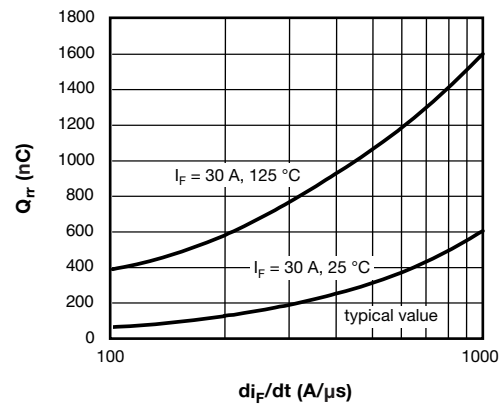
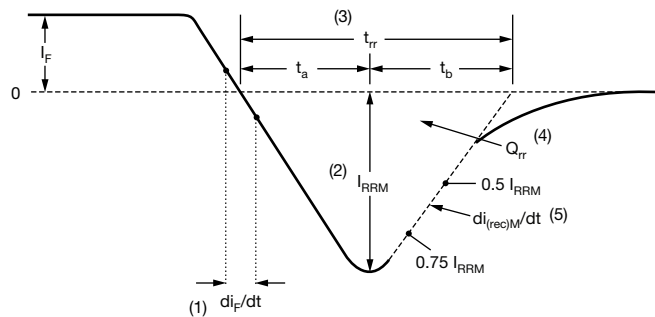


Fig. 8 - Typical Stored Charge vs. di_F/dt

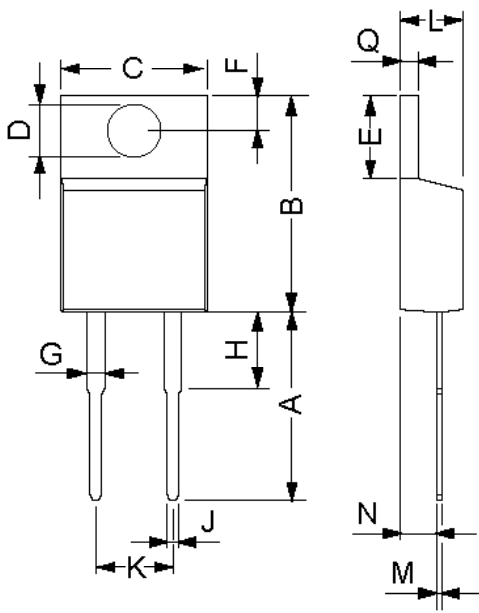


- (1) di_F/dt - rate of change of current through zero crossing
- (2) I_{RRM} - peak reverse recovery current
- (3) t_{rr} - reverse recovery time measured from zero crossing point of negative going I_F to point where a line passing through $0.75 I_{RRM}$ and $0.50 I_{RRM}$ extrapolated to zero current.
- (4) Q_{rr} - area under curve defined by t_{rr} and I_{RRM}
- (5) $di_{(rec)M}/dt$ - peak rate of change of current during t_b portion of t_{rr}

$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

Fig. 9 - Reverse Recovery Waveform and Definitions

Mechanical Dimensions THINKI TO-220AC/TO-220CB-2P-SQ



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	12.7	14.73	0.5	0.58
B	14.23	16.51	0.56	0.65
C	9.66	10.66	0.38	0.42
D	3.54	4.08	0.139	0.161
E	5.85	6.85	2.3	0.42
F	2.54	3.42	0.1	0.135
G	1.15	1.77	0.045	0.07
H	-	6.35	-	0.25
J	0.64	0.89	0.025	0.035
K	4.83	5.33	0.19	0.21
L	3.56	4.82	0.14	0.19
M	0.51	0.76	0.02	0.03
N	2.04	2.49	0.08	0.115
Q	0.64	1.39	0.025	0.055