

## FRED

### Ultrafast Soft Recovery Diode

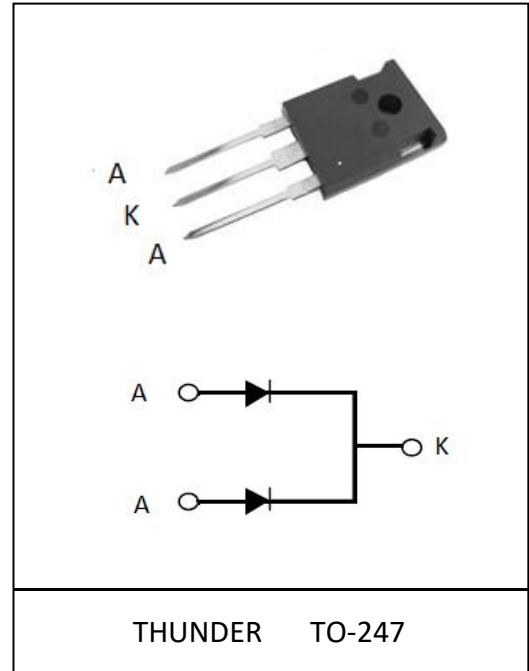
#### FEATURES:

- Ultrafast Recovery
- 175°C operating junction temperature
- High frequency operation
- Low power loss, less RFI and EMI
- Low  $I_R$  value
- High surge capacity

#### Benefits:

- Reduced RFI and EMI
- Higher frequency operation
- Reduced snubbing
- Reduced part count

Product Summary	
$V_R$	400 V
$I_{F(AV)}$	2*20A
$t_{rr}$	22ns



#### Description/Applications

These diodes are optimized to less losses and EMI/RFI in high frequency power conditioning system. The soft recovery behavior of the diodes offers the need as snubber in most applications. These devices are ideally suited for HF welding power converters and other applications where the switching losses are not significant portion of the total losses.

#### Absolute Maximum Ratings

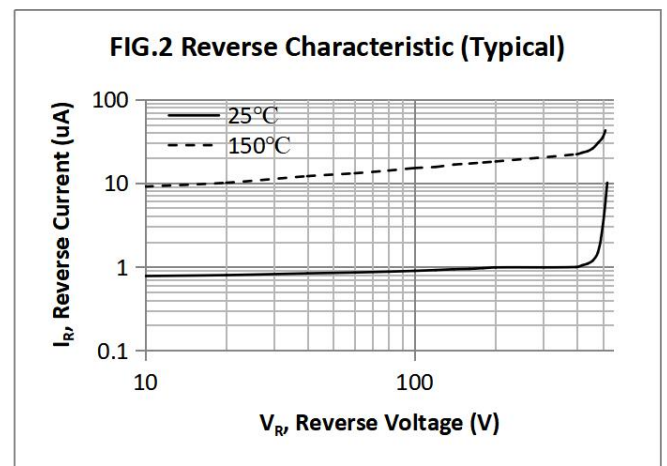
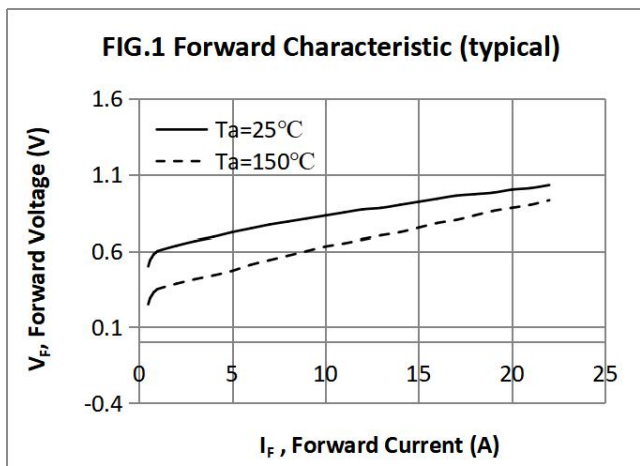
Parameter	Symbol	Test Conditions	Values	Units
Repetitive peak reverse voltage	$V_{RRM}$		400	V
Continuous forward current	$I_{F(AV)}$	$T_c = 110^\circ\text{C}$	2*20	A
Single pulse forward current	$I_{FSM}$	$T_c = 25^\circ\text{C}$	2*200	A
Maximum repetitive forward current	$I_{FRM}$	Square wave, 20kHz	2*40	A
Operating junction	$T_j$		175	$^\circ\text{C}$
Storage temperatures	$T_{stg}$		-55 to +175	$^\circ\text{C}$

### Electrical characteristics (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ.	Max.	Units
Breakdown voltage Blocking voltage	$V_{BR}$ , $V_R$	$I_R=100\mu A$	400			V
Forward voltage (Per Diode)	$V_F$	$I_F=20A$		1.25	1.50	
		$I_F=20 A, T_j=125^\circ C$		1.10	1.40	
Reverse leakage current(Per Diode)	$I_R$	$V_R=V_{RRM}$			20	$\mu A$
		$T_j=150^\circ C, V_R=400V$			200	
Reverse recovery time(Per Diode)	$t_{rr}$	$I_F=0.5A, I_R=1A, I_{RR}=0.25A$		30	50	ns
		$I_F=1A, V_R=30V, di/dt=200A/\mu s$		22	30	

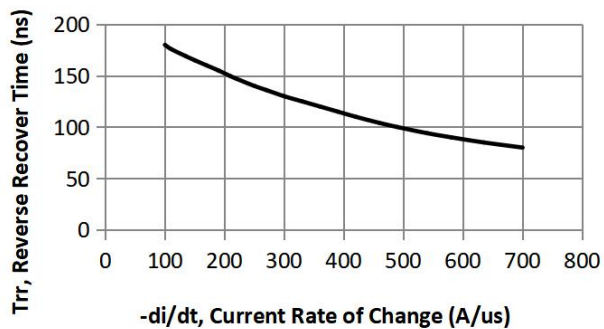
### Thermal characteristics

Paramter	Symbol	Typ	Units
Junction-to-Case	$R_{\theta JC}$	0.75	$^\circ C/W$

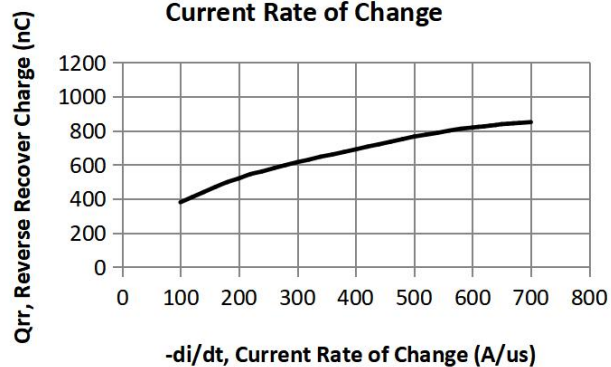


### Electrical performance (typical single die)

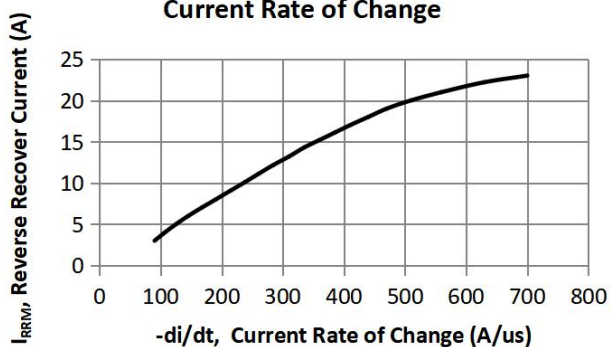
**FIG.3 Reverse Recover Time vs. Current Rate of Change**



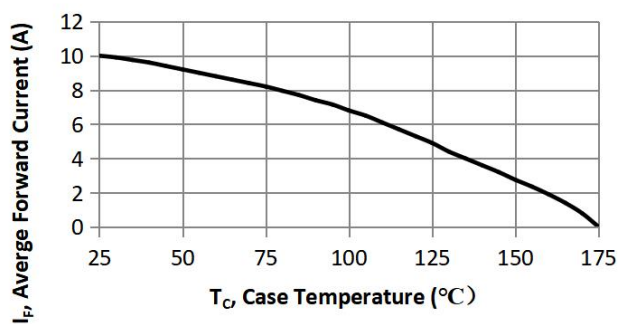
**FIG.4 Reverse Recover Charge vs. Current Rate of Change**



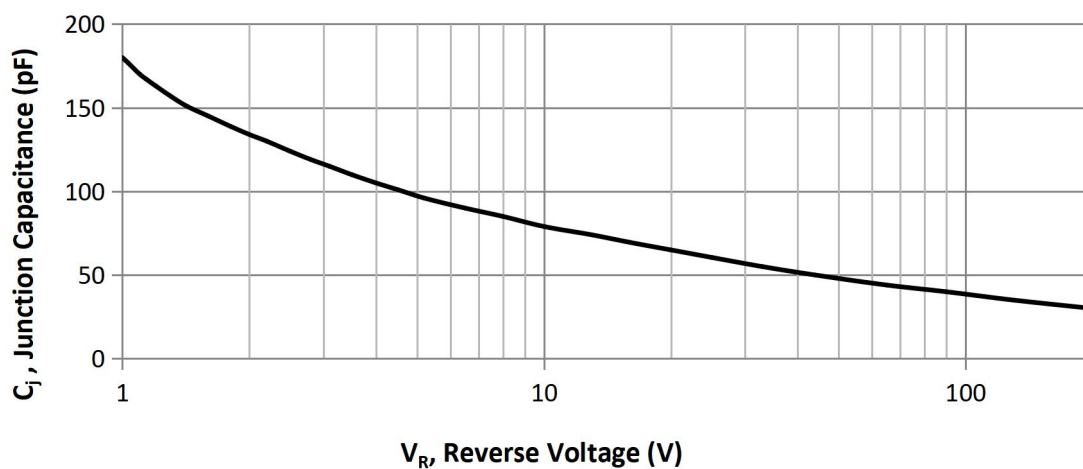
**FIG.5 Reverse Recover Current vs. Current Rate of Change**



**FIG.6 Average Forward Current vs. Case Temperature**

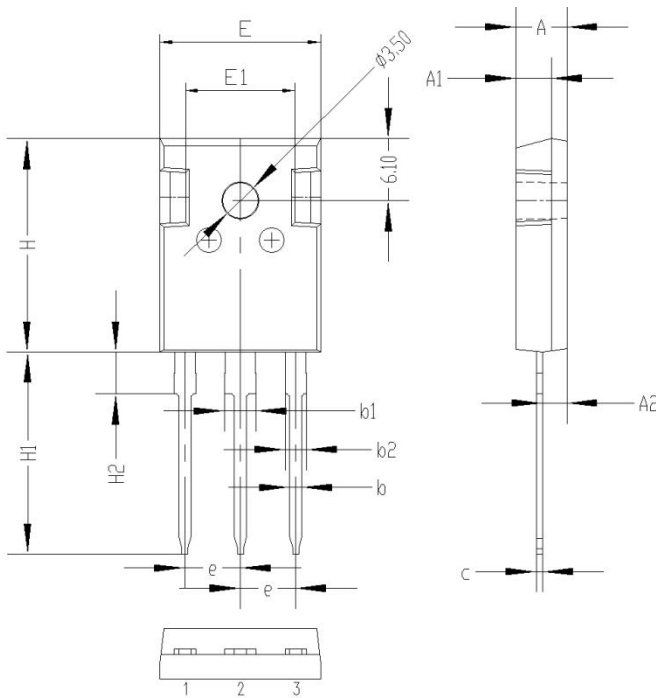


**FIG.7 Junction Capacitance vs. Reverse Voltage**



## Package Information

### TO-247 PACKAGE



Symbol	Unit mm		
	Min	Typ	Max
A	4.8	5.00	5.20
A1	3.3	3.5	3.7
A2	2.20	2.40	2.60
b	1.00	1.2	1.40
b1	2.90	3.10	3.30
b2	1.80	2.00	2.20
c	0.50	0.60	0.70
e	5.25	5.45	5.65
E	15.2	15.7	16.2
H	20.8	21	21.2
H1	19.5	20.0	20.5
H2	3.9	4.1	4.3
G	5.9	6.1	6.3
ΦP	3.30	3.50	3.70

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