

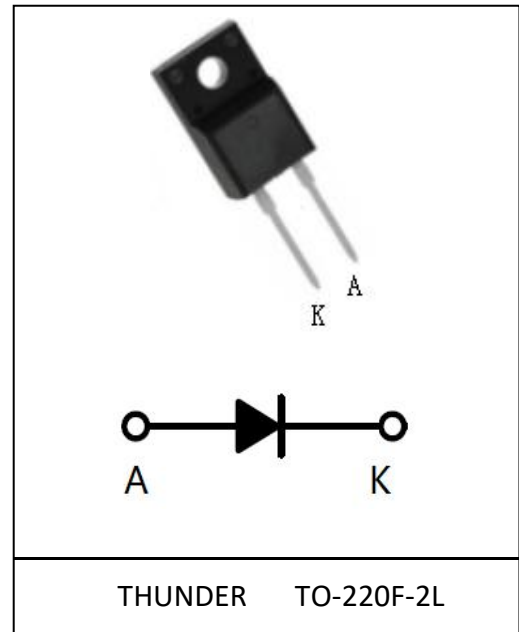
Thunder High Power Products

FRED Ultrafast Soft Recovery Diode, 15A

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
- Epitaxial chip construction

Product Summary	
V_R	600 V
$I_{F(AV)}$	15A
t_{rr}	24 ns



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}		600	V
Continuous forward current	$I_{F(AV)}$	$T_c = 110^\circ\text{C}$	15	A
Single pulse forward current	I_{FSM}	$T_c = 25^\circ\text{C}$	150	
Maximum repetitive forward current	I_{FRM}	Square wave, 20kHz	30	
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	$I_R=100\mu A$	600	—	—	V
Forward voltage	V_F	$I_F=15A$	—	1.35	1.70	
		$I_F=15A, T_j=125^\circ C$	—	1.25	1.60	
Reverse leakage current	I_R	$V_R=V_{RRM}$	—	—	20	μA
		$T_j=150^\circ C, V_R=600V$	—	—	200	
Reverse recovery time	t_{rr}	$I_F=0.5A, I_R=1A, I_{RR}=0.25A$	—	35	50	ns
		$I_F=1A, V_R=30V, di/dt=200A/\mu s$	—	24	35	
Reverse recovery time	t_{rr}	$I_F=15A, V_R=300V,$ $di/dt=-200A/\mu s,$ $T_j=25^\circ C$	—	48	—	ns
		$I_F=15A, V_R=300V,$ $di/dt=-200A/\mu s,$ $T_j=125^\circ C$	—	84	—	ns
Reverse Recovery Charge	Q_{rr}	$I_F=15A, V_R=300V,$ $di/dt=-200A/\mu s,$ $T_j=25^\circ C$	—	130	—	nC
		$I_F=15A, V_R=300V,$ $di/dt=-200A/\mu s,$ $T_j=125^\circ C$	—	470	—	nC
Peak Reverse Recovery Current	I_{RM}	$I_F=15A, V_R=300V,$ $di/dt=-200A/\mu s,$ $T_j=25^\circ C$	—	4.0	—	A
		$I_F=15A, V_R=300V,$ $di/dt=-200A/\mu s,$ $T_j=125^\circ C$	—	7.0	—	A

Thermal characteristics

Paramter	Symbol	Typ	Units
Junction-to-Case	$R_{\theta JC}$	2.5	$^\circ C/W$

Electrical performance (typical)

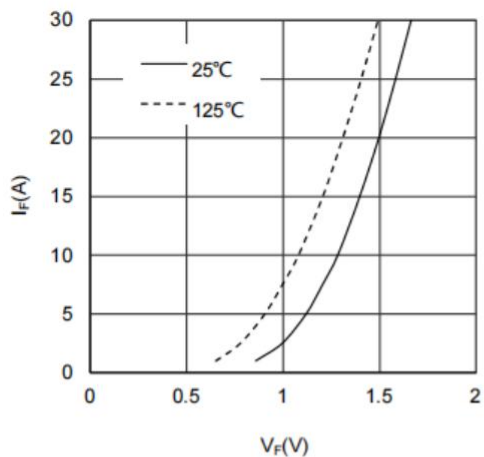


Figure 1. Forward Voltage Drop vs Forward Current

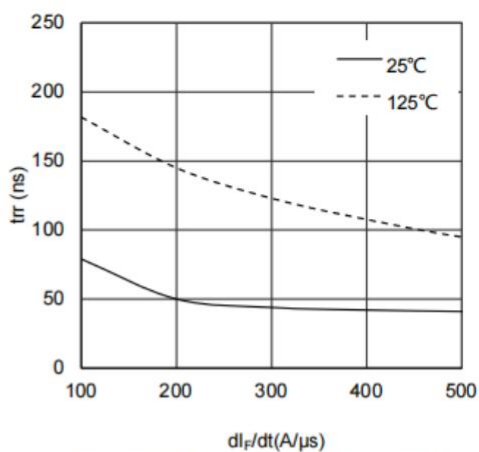


Figure 2. Reverse Recovery Time vs dI_F/dt

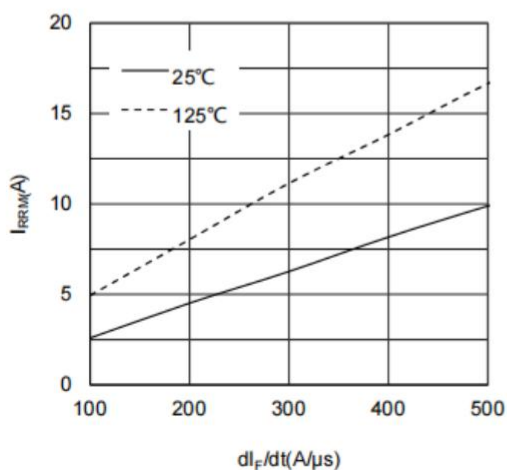


Figure 3. Reverse Recovery Current vs dI_F/dt

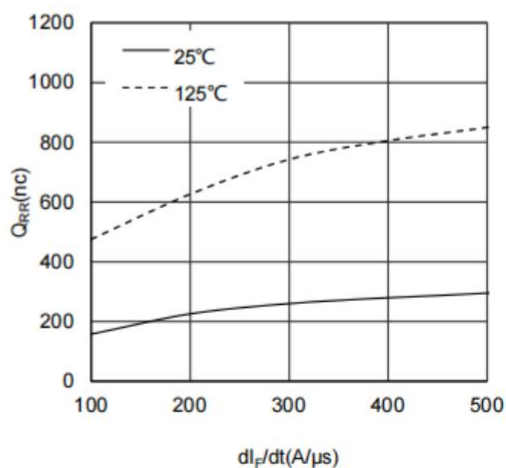


Figure 4. Reverse Recovery Charge vs dI_F/dt

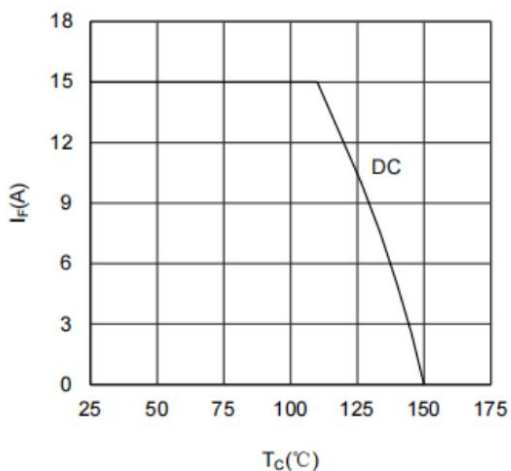


Figure 5. Forward current vs Case temperature

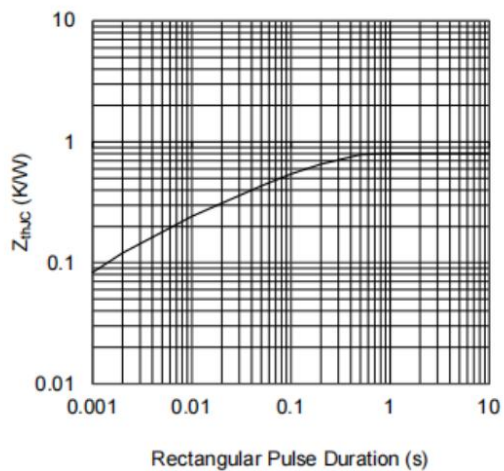
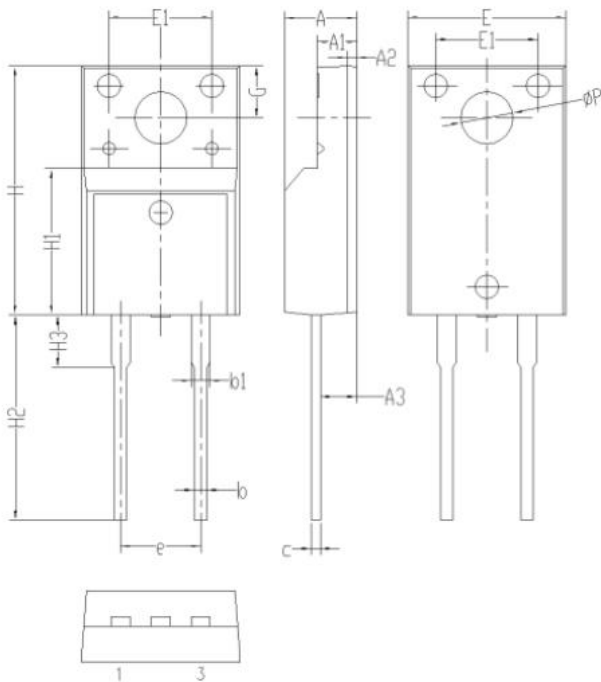


Figure 6. Transient Thermal Impedance

Package Information

TO-220F-2L PACKAGE



Symbol	Dimensions(millimeters)	
	Min.	Max.
A	4.35	4.75
A1	2.30	2.70
A2	0.40	0.80
A3	2.10	2.50
b	0.60	1.00
b1	1.00	1.40
c	0.30	0.70
e	4.60	5.40
E	9.80	10.2
E1	6.30	6.70
H	15.6	16.0
H1	8.80	9.20
H2	12.9	13.5
H3	3.10	3.50
G	3.10	3.50
Φ P	3.10	3.50

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