

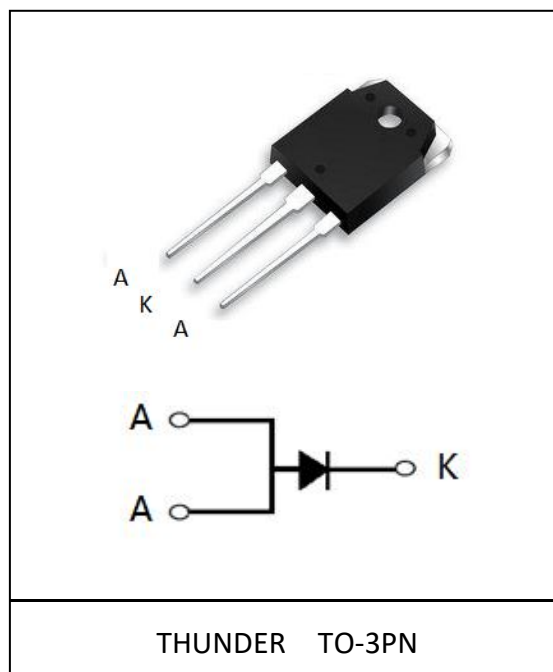
## FRED

### Ultrafast Soft Recovery Diode, 60A

#### 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
$I_F(AV)$	60A
$t_{rr}$	32ns



#### 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	$I_F(AV)$	$T_c = 110^\circ\text{C}$	60	A
Single pulse forward current	$I_{FSM}$	$T_c = 25^\circ\text{C}$	600	
Maximum repetitive forward current	$I_{FRM}$	Square wave, 20kHz	120	
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)**

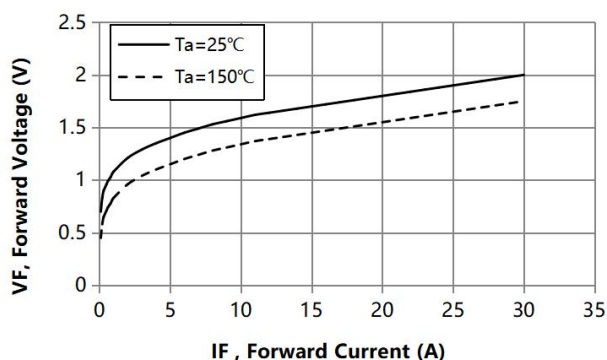
Parameter	Symbol	Test Conditions	Min	Typ.	Max.	Units
Breakdown voltage Blocking voltage	$V_{BR}$ , $V_R$	$I_R=100\mu A$	600			V
Forward voltage	$V_F$	$I_F=60A$		1.45	1.80	
		$I_F=60A, T_J=125^\circ C$		1.30	1.70	
Reverse leakage current	$I_R$	$V_R=V_{RRM}$			50	$\mu A$
		$T_J=150^\circ C, V_R=600V$			500	
Reverse recovery time	$t_{rr}$	$I_F=0.5A, I_R=1A, I_{RR}=0.25A$		50	70	ns
		$I_F=1A, V_R=30V, di/dt=200A/\mu s$		32	45	
Reverse recovery time	$t_{rr}$	$I_F=60A, V_R=300V,$ $di_F/dt=-200A/\mu s, T_J=25^\circ C$		55		ns
Maximum Reverse Recovery Current	$I_{RM}$			5		A
Reverse Recovery Charge	$Q_{rr}$			346		nC
Reverse recovery time	$t_{rr}$	$I_F=60A, V_R=300V,$ $di_F/dt=-200A/\mu s, T_J=125^\circ C$		132		ns
Maximum Reverse Recovery Current	$I_{RM}$			12		A
Reverse Recovery Charge	$Q_{rr}$			1960		nC

**Thermal characteristics**

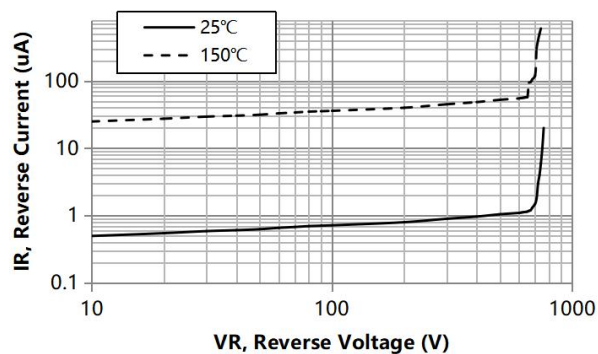
Paramter	Symbol	Typ	Units
Junction-to-Case	$R_{\theta JC}$	0.75	$^\circ C/W$

## Electrical performance (typical)

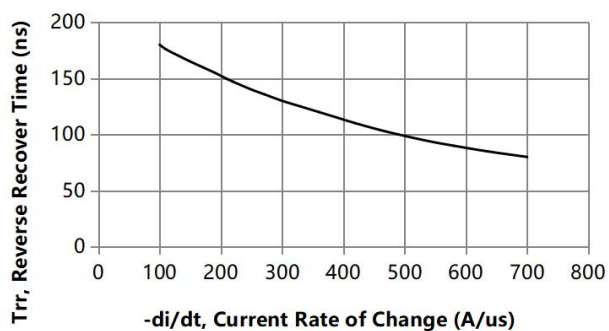
**FIG.1 Forward Characteristic (typical)**



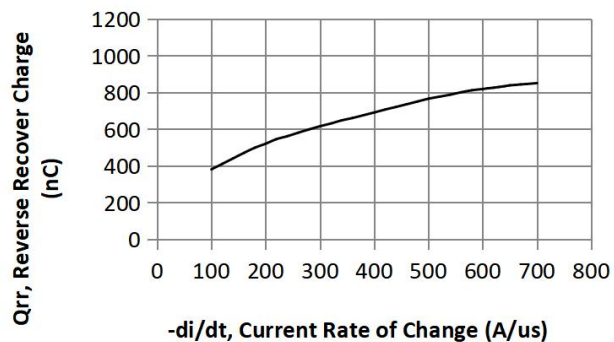
**FIG.2 Reverse Characteristic (Typical)**



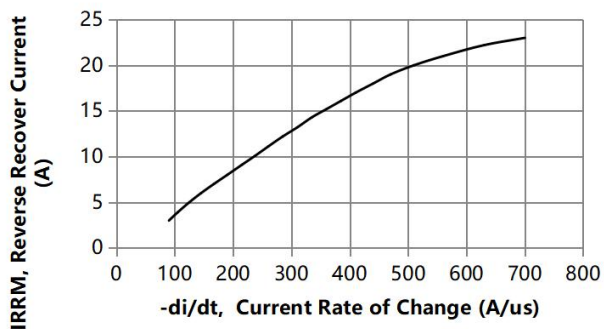
**FIG.3 Reverse Recover Time vs. Current Rate of Change**



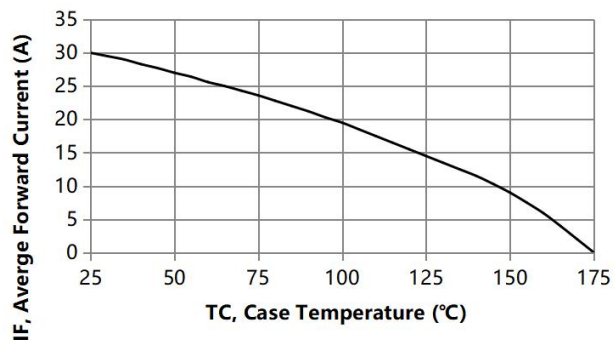
**FIG.4 Reverse Recover Charge vs. Current Rate of Change**



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

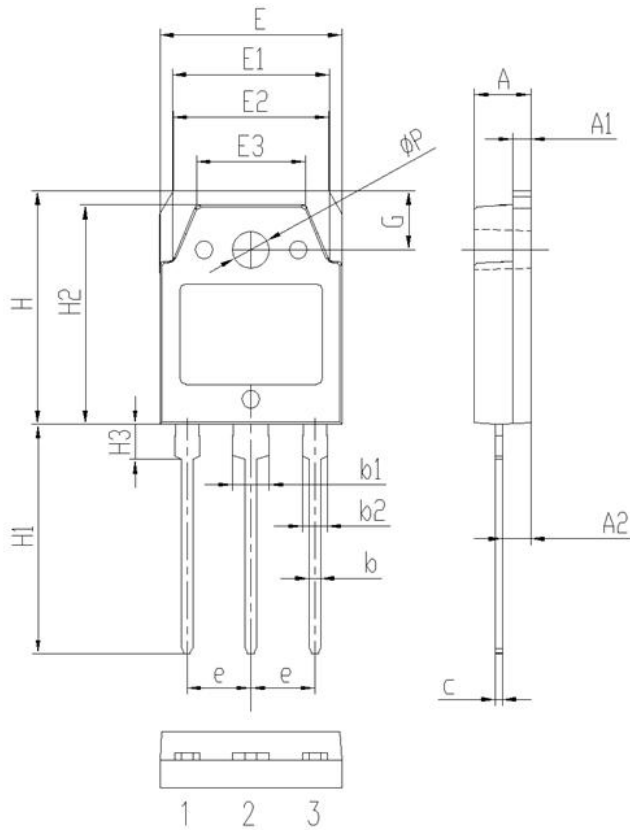


**FIG.6 Average Forward Current vs. Case Temperature**



## Package Information

### TO-3PN PACKAGE



Symbol	Dimensions(millimeters)	
	Min.	Max.
A	4.60	5.00
A1	1.30	1.70
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
$\Phi P$	3.00	3.40

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