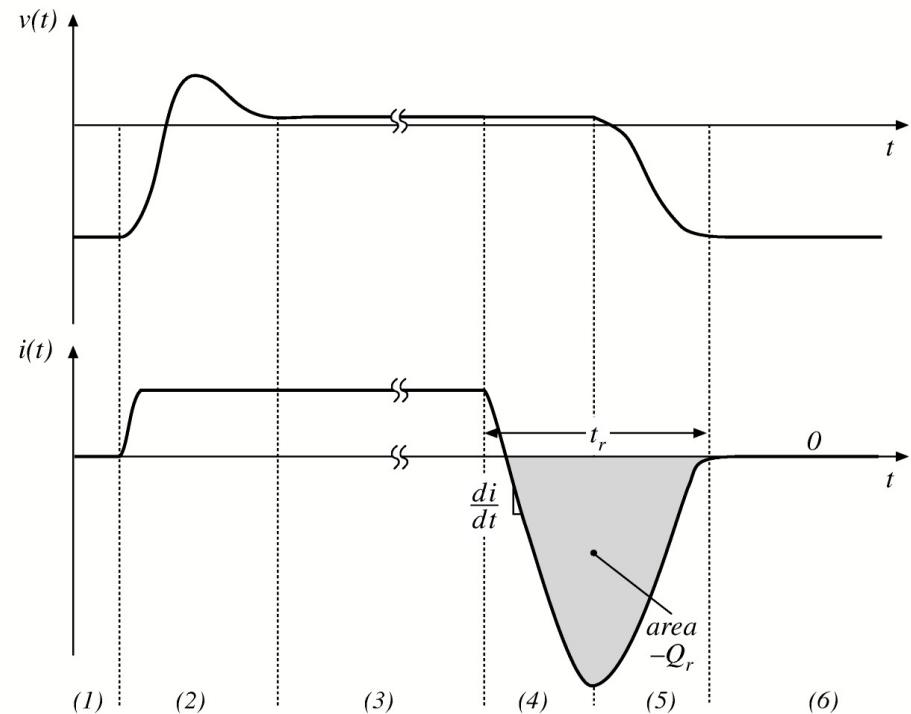


Diode Reverse Recovery

- FET body diodes may turn on during dead time intervals
- Significant reverse recovery losses possible



$$E_{on,rr} = ((I_L - \Delta i_L)t_{rr} + Q_{rr})V_{bus}$$

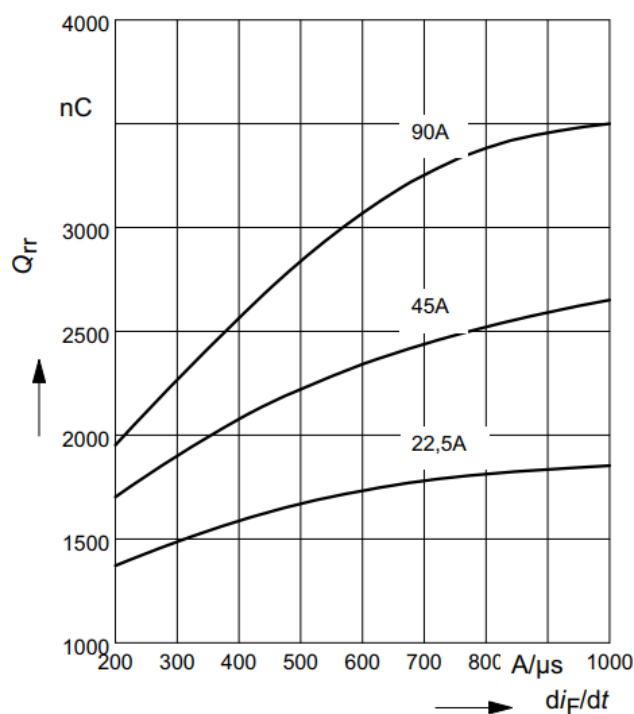
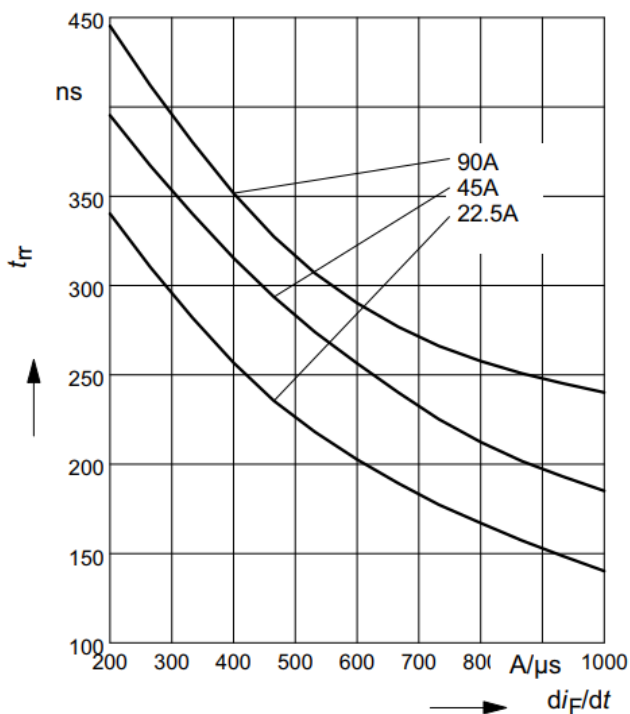
Reverse Recovery - Datasheet

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Reverse recovery time	t_{rr}				ns
$V_R=400V, I_F=45A, di_F/dt=1000A/\mu s, T_j=25^\circ C$		-	140	-	
$V_R=400V, I_F=45A, di_F/dt=1000A/\mu s, T_j=125^\circ C$		-	185	-	
$V_R=400V, I_F=45A, di_F/dt=1000A/\mu s, T_j=150^\circ C$		-	195	-	
Reverse recovery charge	Q_{rr}				nC
$V_R=400V, I_F=45A, di_F/dt=1000A/\mu s, T_j=25^\circ C$		-	1400	-	
$V_R=400V, I_F=45A, di_F/dt=1000A/\mu s, T_j=125^\circ C$		-	2650	-	
$V_R=400V, I_F=45A, di_F/dt=1000A/\mu s, T_j=150^\circ C$		-	2900	-	

5 Typ. reverse recovery time

$$t_{rr} = f(di_F/dt)$$

parameter: $V_R = 400V, T_j = 125^\circ C$



Reverse Recovery – Rough Approximations

- $E_{rr} \approx E_{rr_datasheet} \frac{I_F}{I_{F_datasheet}} \frac{V_{DC}}{V_{DC_datasheet}}$
- **Rough** approximation with $I_F \ll I_{max}$

