

Fast Switching Emitter Controlled Diode

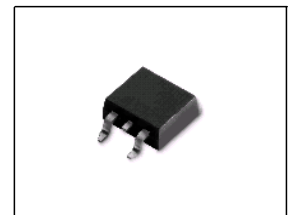
Feature

- 1200 V Emitter Controlled technology
- Fast recovery
- Soft switching
- Low reverse recovery charge
- Low forward voltage
- Easy paralleling
- Qualified according to JEDEC⁰⁾ for target applications

Product Summary

V_{RRM}	1200	V
I_F	30	A
V_F	1.65	V
T_{jmax}	150	°C

PG-TO263-3-2



Type	Package	Ordering Code	Marking	Pin 1	PIN 2	PIN 3
IDB30E120	PG-TO263-3-2	-	D30E120	NC	C	A

Maximum Ratings, at $T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Value	Unit
Repetitive peak reverse voltage	V_{RRM}	1200	V
Continuous forward current	I_F	30	A
$T_C=25\text{ °C}$		50	
$T_C=90\text{ °C}$		30	
Surge non repetitive forward current	I_{FSM}	102	
$T_C=25\text{ °C}$, $t_p=10\text{ ms}$, sine halfwave			
Maximum repetitive forward current	I_{FRM}	76.5	
$T_C=25\text{ °C}$, t_p limited by T_{jmax} , $D=0.5$			
Power dissipation	P_{tot}	138	W
$T_C=25\text{ °C}$		138	
$T_C=90\text{ °C}$		66	
Operating and storage temperature	T_j, T_{stg}	-55...+150	°C
Soldering temperature	T_S	260	°C
reflow soldering, MSL1			

Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Thermal resistance, junction - case	R_{thJC}	-	-	0.9	K/W
Thermal resistance, junction - ambient, leaded	R_{thJA}	-	-	62	
SMD version, device on PCB: @ min. footprint @ 6 cm ² cooling area ¹⁾	R_{thJA}	-	-	62	
		-	35	-	

Electrical Characteristics, at $T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Reverse leakage current $V_R=1200V, T_j=25\text{ °C}$ $V_R=1200V, T_j=150\text{ °C}$	I_R	-	-	100 2500	μA
Forward voltage drop $I_F=30A, T_j=25\text{ °C}$ $I_F=30A, T_j=150\text{ °C}$	V_F	-	1.65 1.7	2.15 -	V

⁰J-STD20 and JESD22

¹Device on 40mm*40mm*1.5mm epoxy PCB FR4 with 6cm² (one layer, 70 μm thick) copper area for drain connection. PCB is vertical without blown air.

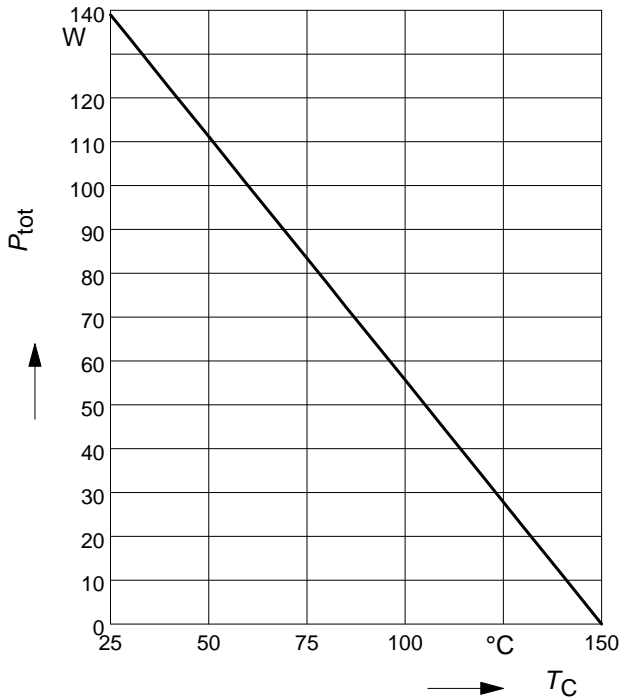
Electrical Characteristics, at $T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Reverse recovery time $V_R=800\text{V}$, $I_F=30\text{A}$, $di_F/dt=850\text{A}/\mu\text{s}$, $T_j=25\text{°C}$ $V_R=800\text{V}$, $I_F=30\text{A}$, $di_F/dt=850\text{A}/\mu\text{s}$, $T_j=125\text{°C}$ $V_R=800\text{V}$, $I_F=30\text{A}$, $di_F/dt=850\text{A}/\mu\text{s}$, $T_j=150\text{°C}$	t_{rr}	-	243 355 380	-	ns
Peak reverse current $V_R=800\text{V}$, $I_F = 30\text{ A}$, $di_F/dt=850\text{A}/\mu\text{s}$, $T_j=25\text{°C}$ $V_R=800\text{V}$, $I_F = 30\text{A}$, $di_F/dt=850\text{A}/\mu\text{s}$, $T_j=125\text{°C}$ $V_R=800\text{V}$, $I_F = 30\text{A}$, $di_F/dt=850\text{A}/\mu\text{s}$, $T_j=150\text{°C}$	I_{rrm}	-	23.7 28.3 29.5	-	A
Reverse recovery charge $V_R=800\text{V}$, $I_F=30\text{A}$, $di_F/dt=850\text{A}/\mu\text{s}$, $T_j=25\text{°C}$ $V_R=800\text{V}$, $I_F = 30\text{A}$, $di_F/dt=850\text{A}/\mu\text{s}$, $T_j=125\text{°C}$ $V_R=800\text{V}$, $I_F = 30\text{A}$, $di_F/dt=850\text{A}/\mu\text{s}$, $T_j=150\text{°C}$	Q_{rr}	-	2630 4700 5200	-	nC
Reverse recovery softness factor $V_R=800\text{V}$, $I_F=30\text{A}$, $di_F/dt=850\text{A}/\mu\text{s}$, $T_j=25\text{°C}$ $V_R=800\text{V}$, $I_F=30\text{A}$, $di_F/dt=850\text{A}/\mu\text{s}$, $T_j=125\text{°C}$ $V_R=800\text{V}$, $I_F=30\text{A}$, $di_F/dt=850\text{A}/\mu\text{s}$, $T_j=150\text{°C}$	S	-	6 7.4 7.5	-	

1 Power dissipation

$P_{tot} = f(T_C)$

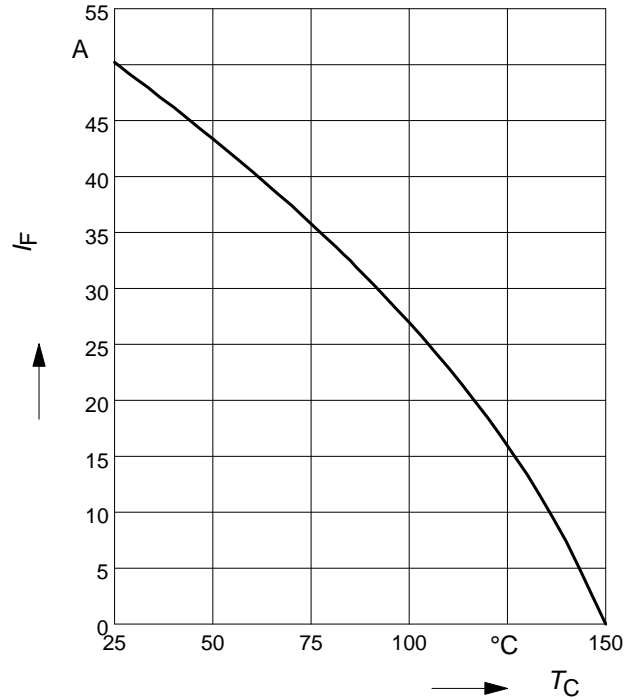
parameter: $T_j \leq 150^\circ\text{C}$



2 Diode forward current

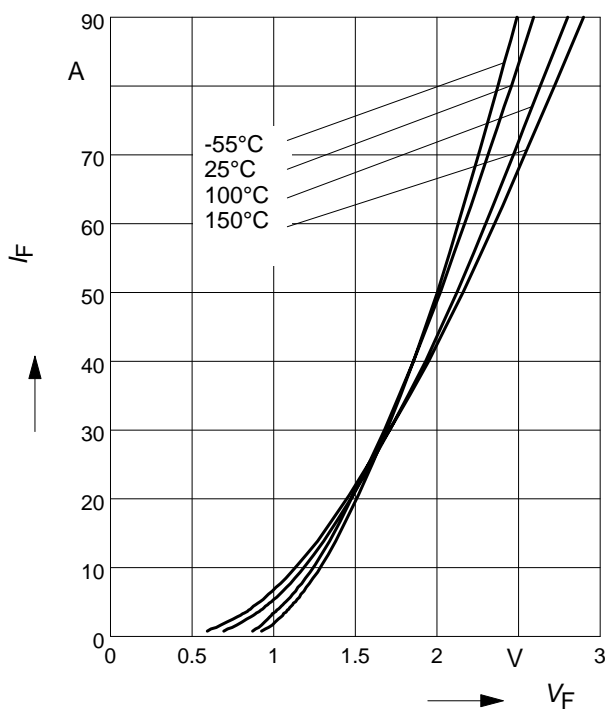
$I_F = f(T_C)$

parameter: $T_j \leq 150^\circ\text{C}$



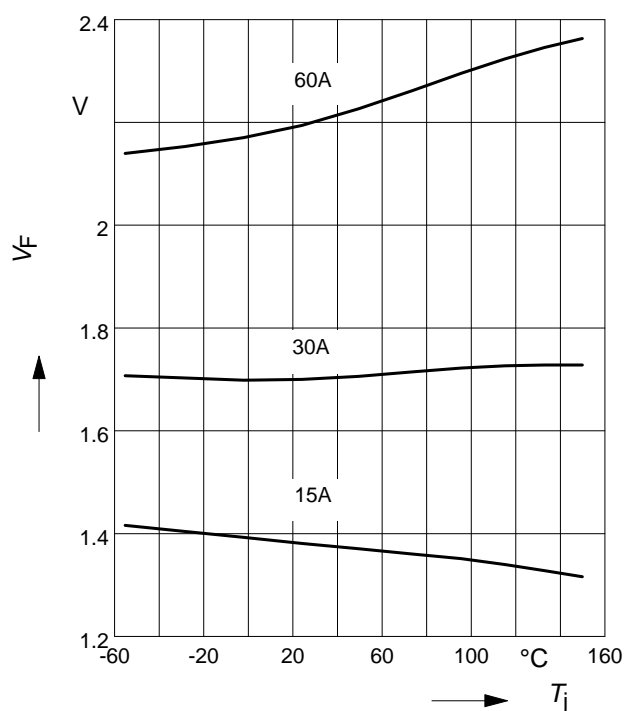
3 Typ. diode forward current

$I_F = f(V_F)$



4 Typ. diode forward voltage

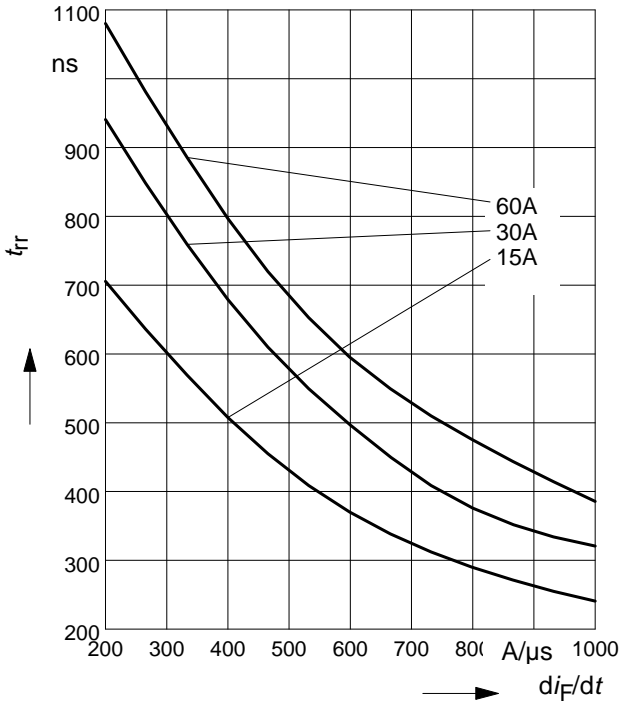
$V_F = f(T_j)$



5 Typ. reverse recovery time

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

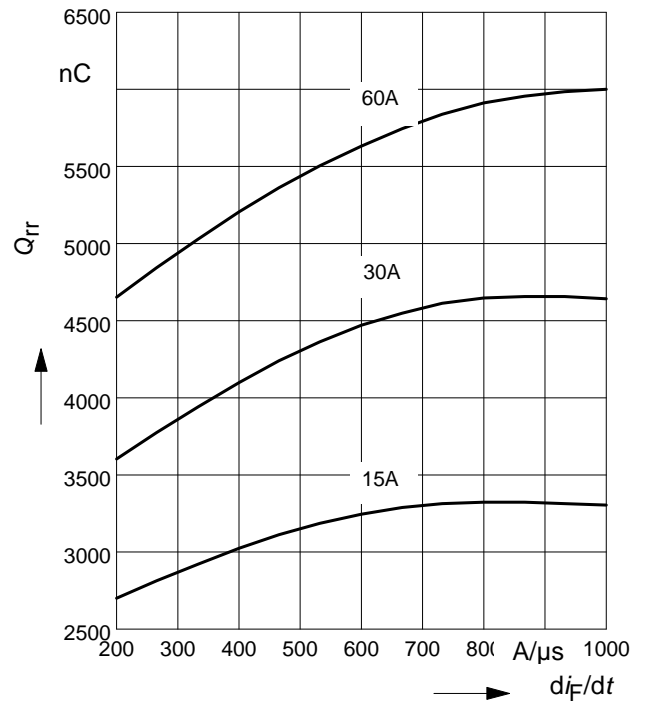
parameter: $V_R = 800V, T_j = 125^\circ C$



6 Typ. reverse recovery charge

$$Q_{rr} = f(dI_F/dt)$$

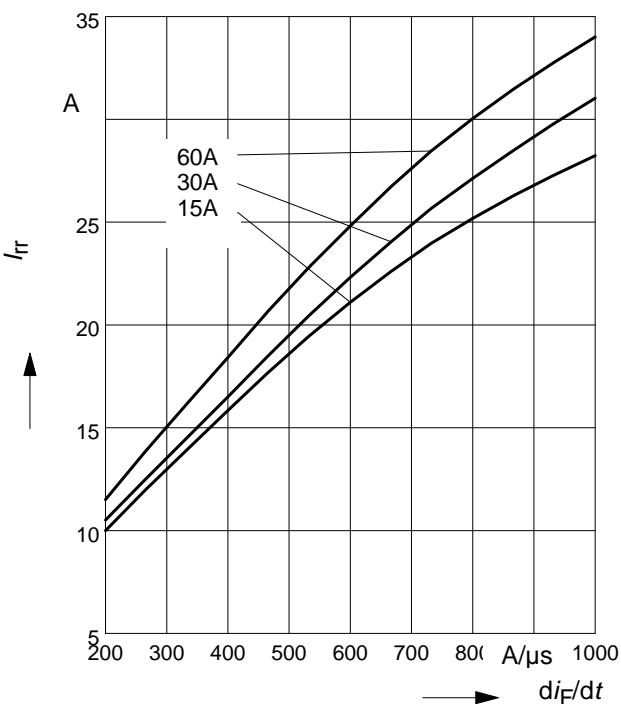
parameter: $V_R = 800V, T_j = 125^\circ C$



7 Typ. reverse recovery current

$$I_{rr} = f(dI_F/dt)$$

parameter: $V_R = 800V, T_j = 125^\circ C$



8 Typ. reverse recovery softness factor

$$S = f(dI_F/dt)$$

parameter: $V_R = 800V, T_j = 125^\circ C$

