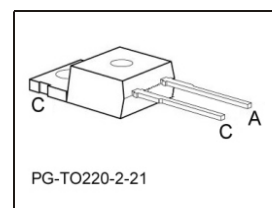


**Fast Switching EmCon Diode**
**Feature**

- 1200 V EmCon technology
- Fast recovery
- Soft switching
- Low reverse recovery charge
- Low forward voltage
- Easy paralleling
- Pb-free lead plating; RoHS compliant
- Qualified according to JEDEC<sup>(0)</sup> for target applications

**Product Summary**

$V_{RRM}$	1200	V
$I_F$	18	A
$V_F$	1.65	V
$T_{jmax}$	150	°C



Type	Package	Marking	Pin 1	PIN 2	
IDH18E120	PG-TO220-2-21	D18E120	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	$I_F$	18	A
$T_C=25\text{ °C}$		31	
$T_C=90\text{ °C}$		19.8	
Surge non repetitive forward current	$I_{FSM}$	78	
$T_C=25\text{ °C}$ , $t_p=10\text{ ms}$ , sine halfwave			
Maximum repetitive forward current	$I_{FRM}$	47	
$T_C=25\text{ °C}$ , $t_p$ limited by $T_{jmax}$ , $D=0.5$			
Power dissipation	$P_{tot}$	113	W
$T_C=25\text{ °C}$		113	
$T_C=90\text{ °C}$		54	
Operating and storage temperature	$T_j, T_{stg}$	-55...+150	°C
Soldering temperature	$T_S$	260	°C
wavesoldering, 1.6mm (0.063 in.) from case for 10s			

<sup>0</sup> J-STD20 and JESD22

**Thermal Characteristics**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Characteristics</b>					
Thermal resistance, junction - case	$R_{thJC}$	-	-	1.1	K/W
Thermal resistance, junction - ambient, leaded	$R_{thJA}$	-	-	62	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Static Characteristics</b>					
Reverse leakage current	$I_R$	-	-	100	$\mu\text{A}$
$V_R=1200\text{V}, T_j=25^\circ\text{C}$					
$V_R=1200\text{V}, T_j=150^\circ\text{C}$		-	-	1400	
Forward voltage drop	$V_F$	-	1.65	2.15	V
$I_F=18\text{A}, T_j=25^\circ\text{C}$					
$I_F=18\text{A}, T_j=150^\circ\text{C}$					

<sup>1</sup>Device on 40mm\*40mm\*1.5mm epoxy PCB FR4 with 6cm<sup>2</sup> (one layer, 70  $\mu\text{m}$  thick) copper area for drain connection. PCB is vertical without blown air.

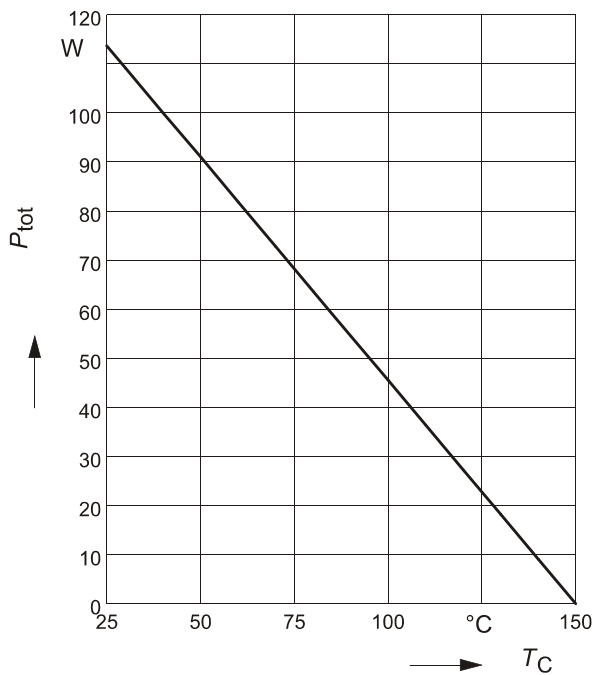
**Electrical Characteristics**, at  $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Dynamic Characteristics</b>					
Reverse recovery time	$t_{rr}$				ns
$V_R=800\text{V}$ , $I_F=18\text{A}$ , $di_F/dt=800\text{A}/\mu\text{s}$ , $T_j=25^\circ\text{C}$		-	195	-	
$V_R=800\text{V}$ , $I_F=18\text{A}$ , $di_F/dt=800\text{A}/\mu\text{s}$ , $T_j=125^\circ\text{C}$		-	280	-	
$V_R=800\text{V}$ , $I_F=18\text{A}$ , $di_F/dt=800\text{A}/\mu\text{s}$ , $T_j=150^\circ\text{C}$		-	300	-	
Peak reverse current	$I_{rrm}$				A
$V_R=800\text{V}$ , $I_F = 18\text{A}$ , $di_F/dt=800\text{A}/\mu\text{s}$ , $T_j=25^\circ\text{C}$		-	20.2	-	
$V_R=800\text{V}$ , $I_F = 18\text{A}$ , $di_F/dt=800\text{A}/\mu\text{s}$ , $T_j=125^\circ\text{C}$		-	24.4	-	
$V_R=800\text{V}$ , $I_F = 18\text{A}$ , $di_F/dt=800\text{A}/\mu\text{s}$ , $T_j=150^\circ\text{C}$		-	25.3	-	
Reverse recovery charge	$Q_{rr}$				nC
$V_R=800\text{V}$ , $I_F=18\text{A}$ , $di_F/dt=800\text{A}/\mu\text{s}$ , $T_j=25^\circ\text{C}$		-	1880	-	
$V_R=800\text{V}$ , $I_F = 18\text{A}$ , $di_F/dt=800\text{A}/\mu\text{s}$ , $T_j=125^\circ\text{C}$		-	3200	-	
$V_R=800\text{V}$ , $I_F = 18\text{A}$ , $di_F/dt=800\text{A}/\mu\text{s}$ , $T_j=150^\circ\text{C}$		-	3540	-	
Reverse recovery softness factor	S				
$V_R=800\text{V}$ , $I_F=18\text{A}$ , $di_F/dt=800\text{A}/\mu\text{s}$ , $T_j=25^\circ\text{C}$		-	5.5	-	
$V_R=800\text{V}$ , $I_F=18\text{A}$ , $di_F/dt=800\text{A}/\mu\text{s}$ , $T_j=125^\circ\text{C}$		-	6.6	-	
$V_R=800\text{V}$ , $I_F=18\text{A}$ , $di_F/dt=800\text{A}/\mu\text{s}$ , $T_j=150^\circ\text{C}$		-	6.7	-	

**1 Power dissipation**

$$P_{tot} = f(T_C)$$

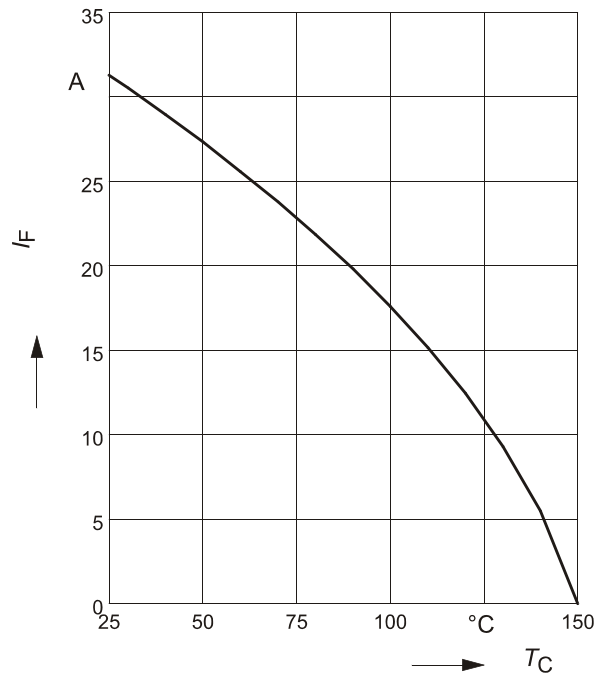
parameter:  $T_j \leq 150^\circ\text{C}$



**2 Diode forward current**

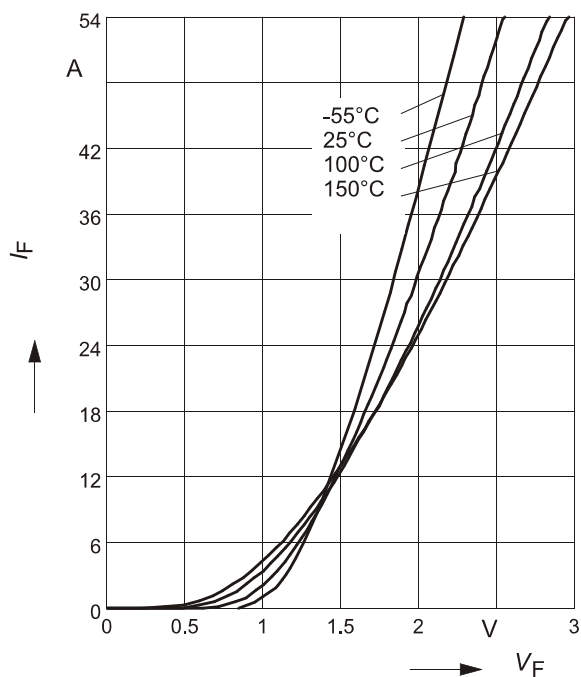
$$I_F = f(T_C)$$

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



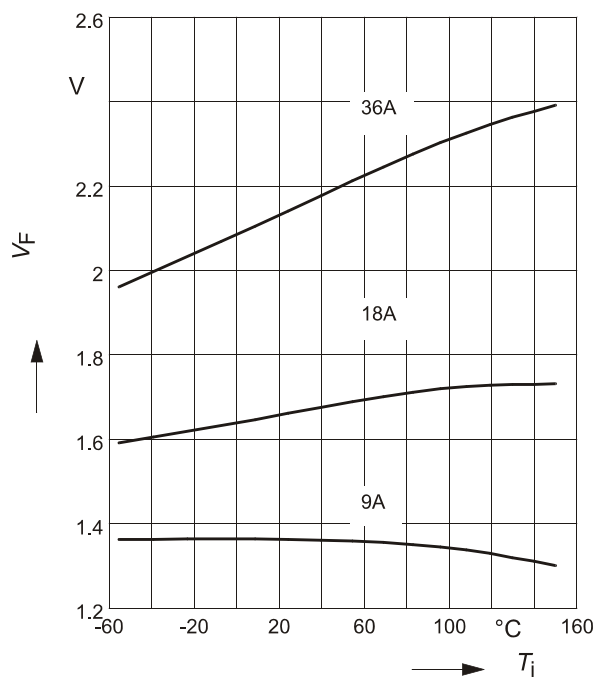
**3 Typ. diode forward current**

$$I_F = f(V_F)$$



**4 Typ. diode forward voltage**

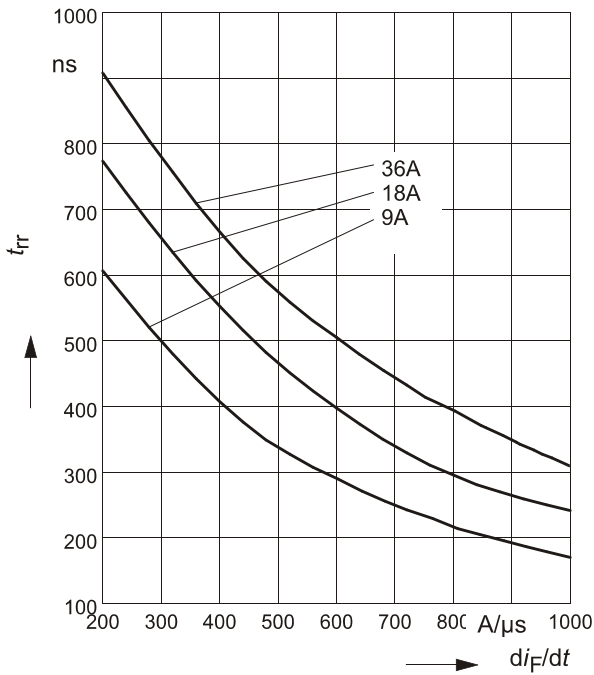
$$V_F = f(T_j)$$



**5 Typ. reverse recovery time**

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

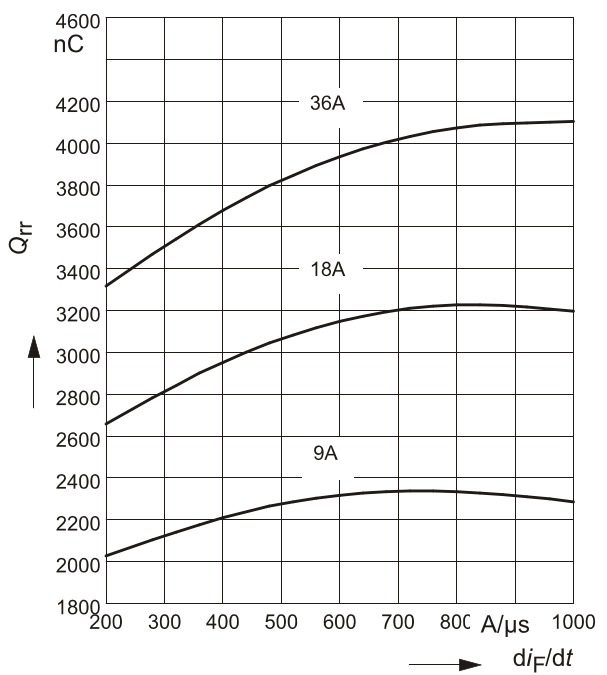
parameter:  $V_R = 800V, T_j = 125^\circ C$



**6 Typ. reverse recovery charge**

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

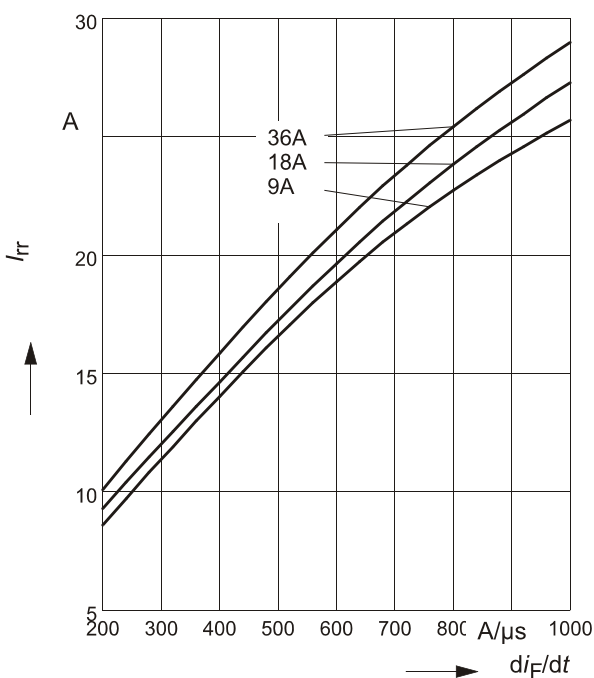
parameter:  $V_R = 800V, T_j = 125^\circ C$



**7 Typ. reverse recovery current**

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

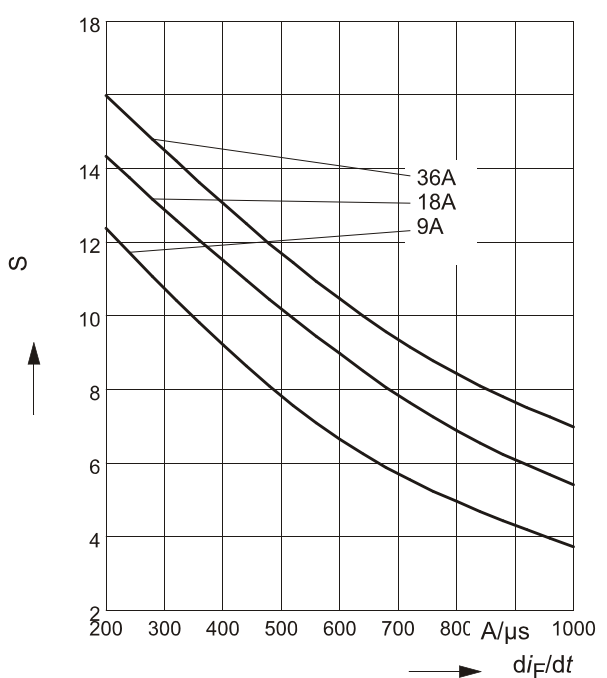
parameter:  $V_R = 800V, T_j = 125^\circ C$



**8 Typ. reverse recovery softness factor**

$S = f(di_F/dt)$

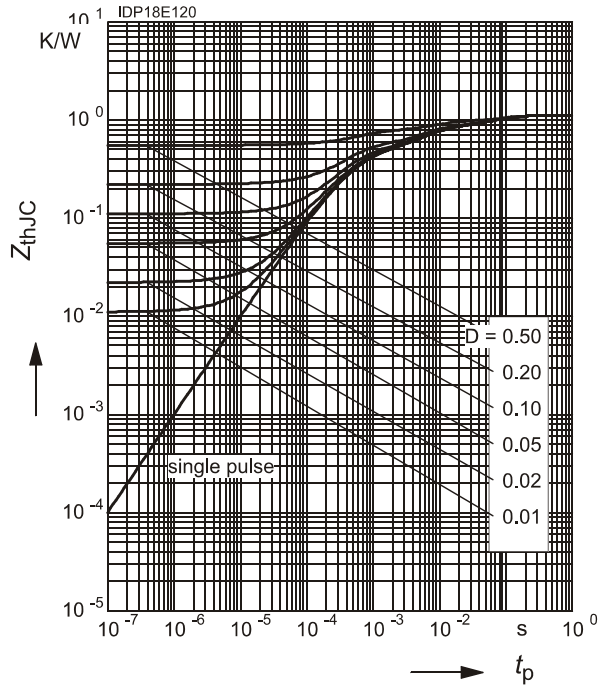
parameter:  $V_R = 800V, T_j = 125^\circ C$



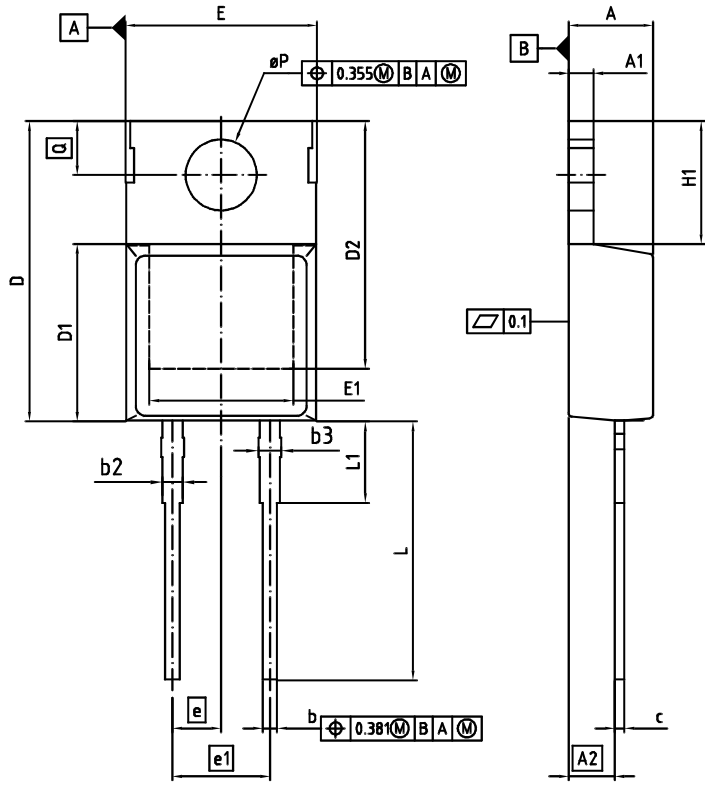
**9 Max. transient thermal impedance**

$$Z_{thJC} = f(t_p)$$

parameter :  $D = t_p/T$



PG-TO220-2-21



symbol	dimensions			
	[mm]		[inch]	
	min	max	min	max
A	4.191	4.699	0.165	0.185
A1	1.219	1.321	0.048	0.052
A2	2.387	2.489	0.094	0.098
b	0.635	0.889	0.025	0.035
b2	1.143	1.397	0.045	0.055
b3	1.143	1.651	0.045	0.065
c	0.331	0.635	0.013	0.025
D	15.113	15.621	0.595	0.615
D1	9.017	9.271	0.355	0.365
D2	13.737	14.245	0.541	0.561
E	9.677	9.931	0.381	0.391
E1	8.28	8.788	0.324	0.346
e	2.54		0.1	
e1	5.029	5.131	0.198	0.202
H1	6.096	6.35	0.24	0.25
L	12.802	13.31	0.504	0.524
L1	3.048	3.302	0.12	0.13
P	3.632	3.734	0.143	0.147
Q	2.54	3.048	0.1	0.12

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