



# THE DATASHEET OF IDD06E60BUMA1



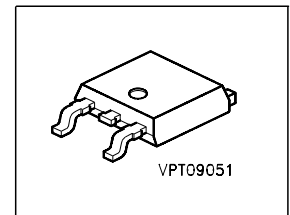
## Fast Switching EmCon Diode

### Product Summary

$V_{RRM}$	600	V
$I_F$	6	A
$V_F$	1.5	V
$T_{jmax}$	175	°C

### Feature

- 600 V EmCon technology
- Fast recovery
- Soft switching
- Low reverse recovery charge
- Low forward voltage
- 175°C operating temperature
- Easy paralleling
- Pb-free lead plating; RoHS compliant
- Qualified according to JEDEC<sup>0)</sup> for target applications



Type	Package	Ordering Code	Marking	Pin 1	PIN 2,4	PIN 3
IDD06E60		-	D06E60	NC	C	A

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

Parameter	Symbol	Value	Unit
Repetitive peak reverse voltage	$V_{RRM}$	600	V
Continuous forward current $T_C = 25\text{ °C}$ $T_C = 90\text{ °C}$	$I_F$	14.7 10	A
Surge non repetitive forward current $T_C = 25\text{ °C}$ , $t_p = 10\text{ ms}$ , sine halfwave	$I_{FSM}$	29	A
Maximum repetitive forward current $T_C = 25\text{ °C}$ , $t_p$ limited by $t_{j,max}$ , $D = 0.5$	$I_{FRM}$	22	A
Power dissipation $T_C = 25\text{ °C}$ $T_C = 90\text{ °C}$	$P_{tot}$	46.8 26.6	W
Operating junction temperature	$T_j$	-40...+175	°C
Storage temperature	$T_{stg}$	-55...+150	
Soldering temperature 1.6mm (0.063 in.) from case for 10 s	$T_S$	260	

**Thermal Characteristics**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Characteristics</b>					
Thermal resistance, junction - case	$R_{thJC}$	-	-	3.2	K/W
SMD version, device on PCB:	$R_{thJA}$				
@ min. footprint		-	-	75	
@ 6 cm <sup>2</sup> cooling area <sup>1)</sup>		-	-	50	

**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	$I_R$				$\mu\text{A}$
$V_R=600\text{V}, T_j=25^\circ\text{C}$		-	-	50	
$V_R=600\text{V}, T_j=150^\circ\text{C}$		-	-	500	
Forward voltage drop	$V_F$				V
$I_F=6\text{A}, T_j=25^\circ\text{C}$		-	1.5	2	
$I_F=6\text{A}, T_j=150^\circ\text{C}$		-	1.5	-	

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

<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.

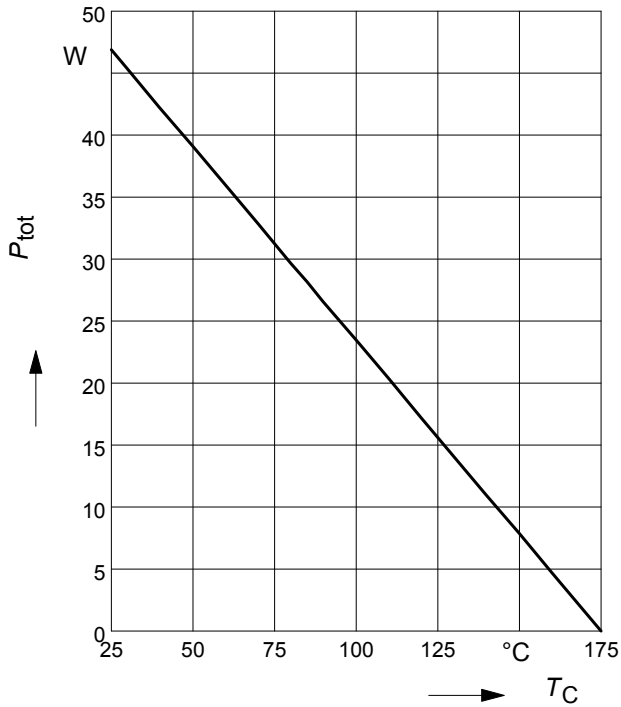
**Electrical Characteristics, at  $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>Dynamic Characteristics</b>					
Reverse recovery time $V_R=400\text{V}$ , $I_F=6\text{A}$ , $di/dt=550\text{A}/\mu\text{s}$ , $T_j=25^\circ\text{C}$ $V_R=400\text{V}$ , $I_F=6\text{A}$ , $di/dt=550\text{A}/\mu\text{s}$ , $T_j=125^\circ\text{C}$ $V_R=400\text{V}$ , $I_F=6\text{A}$ , $di/dt=550\text{A}/\mu\text{s}$ , $T_j=150^\circ\text{C}$	$t_{rr}$	- - -	70 100 105	- - -	ns
Peak reverse current $V_R=400\text{V}$ , $I_F=6\text{A}$ , $di/dt=550\text{A}/\mu\text{s}$ , $T_j=25^\circ\text{C}$ $V_R=400\text{V}$ , $I_F=6\text{A}$ , $di/dt=550\text{A}/\mu\text{s}$ , $T_j=125^\circ\text{C}$ $V_R=400\text{V}$ , $I_F=6\text{A}$ , $di/dt=550\text{A}/\mu\text{s}$ , $T_j=150^\circ\text{C}$	$I_{rrm}$	- - -	6.5 7.4 7.9	- - -	A
Reverse recovery charge $V_R=400\text{V}$ , $I_F=6\text{A}$ , $di/dt=550\text{A}/\mu\text{s}$ , $T_j=25^\circ\text{C}$ $V_R=400\text{V}$ , $I_F=6\text{A}$ , $di/dt=550\text{A}/\mu\text{s}$ , $T_j=125^\circ\text{C}$ $V_R=400\text{V}$ , $I_F=6\text{A}$ , $di/dt=550\text{A}/\mu\text{s}$ , $T_j=150^\circ\text{C}$	$Q_{rr}$	- - -	240 360 400	- - -	nC
Reverse recovery softness factor $V_R=400\text{V}$ , $I_F=6\text{A}$ , $di_F/dt=550\text{A}/\mu\text{s}$ , $T_j=25^\circ\text{C}$ $V_R=400\text{V}$ , $I_F=6\text{A}$ , $di_F/dt=550\text{A}/\mu\text{s}$ , $T_j=125^\circ\text{C}$ $V_R=400\text{V}$ , $I_F=6\text{A}$ , $di_F/dt=550\text{A}/\mu\text{s}$ , $T_j=150^\circ\text{C}$	S	- - -	4 4.8 4.9	- - -	

**1 Power dissipation**

$P_{tot} = f(T_C)$

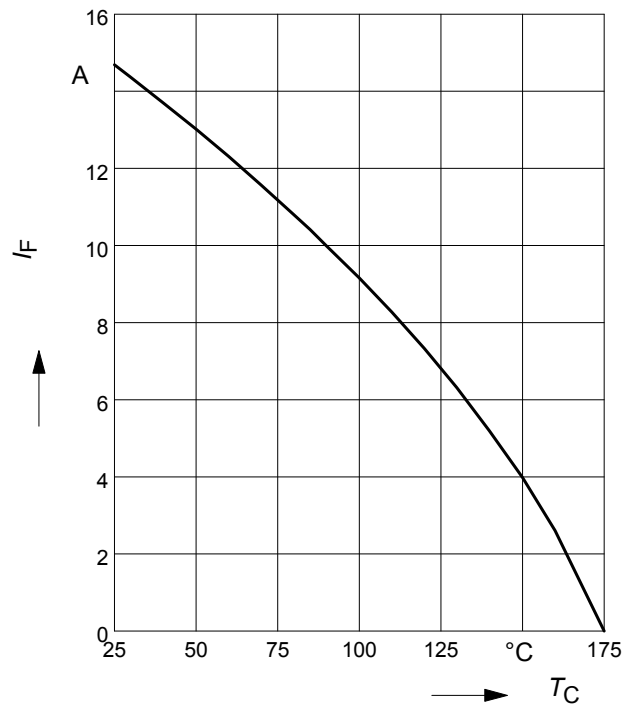
parameter:  $T_j \leq 175^\circ\text{C}$



**2 Diode forward current**

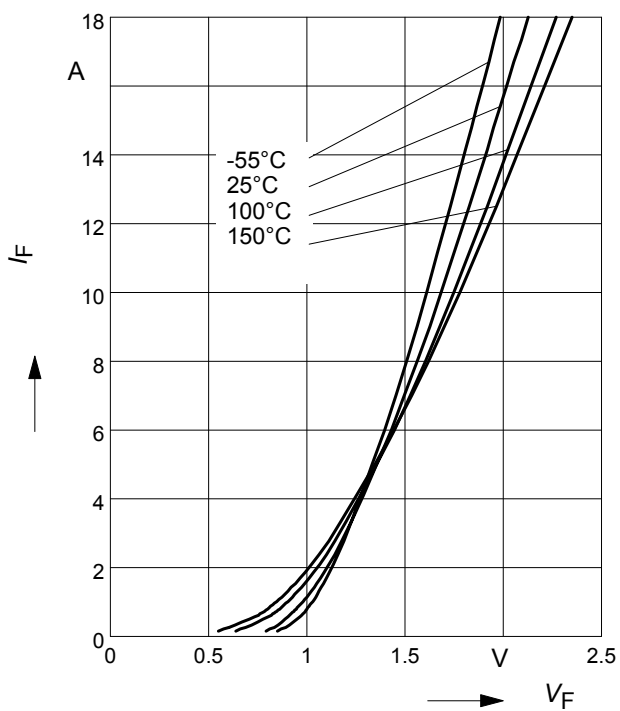
$I_F = f(T_C)$

parameter:  $T_j \leq 175^\circ\text{C}$



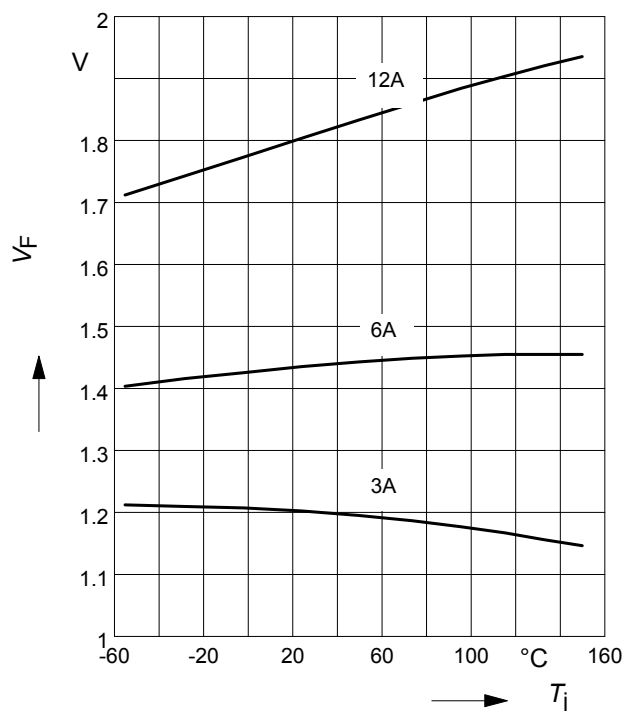
**3 Typ. diode forward current**

$I_F = f(V_F)$



**4 Typ. diode forward voltage**

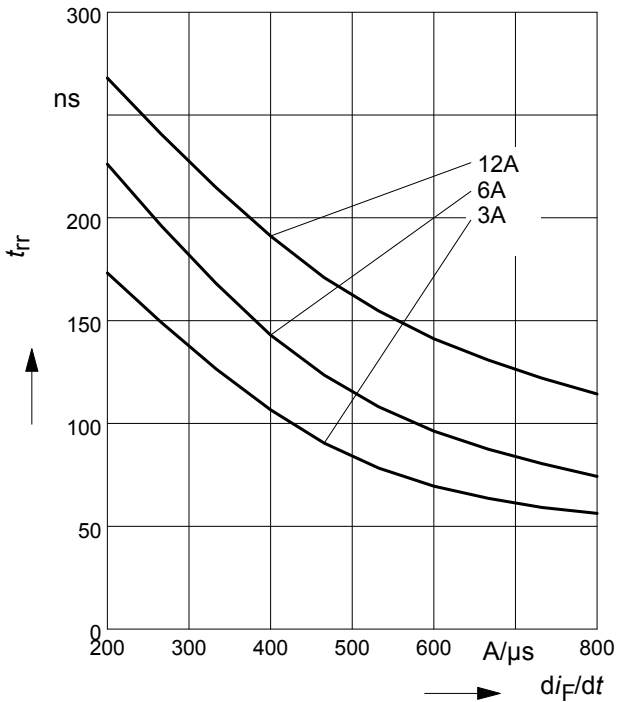
$V_F = f(T_j)$



**5 Typ. reverse recovery time**

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

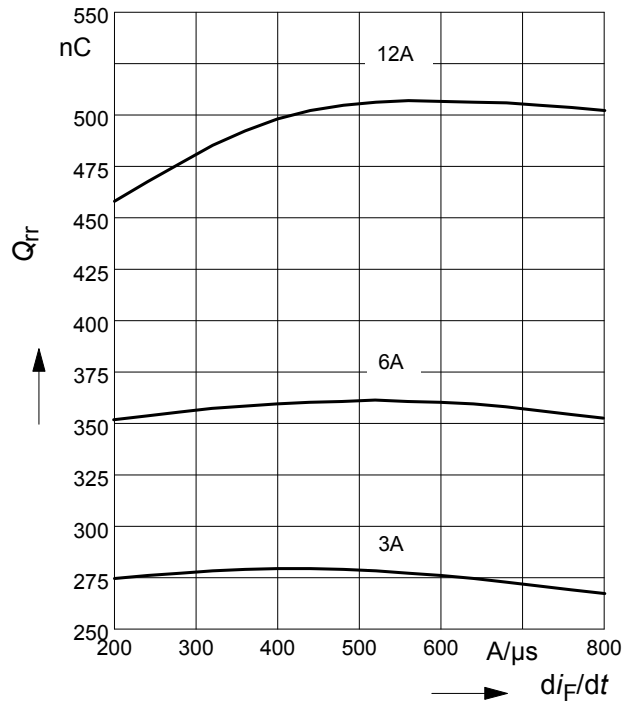
parameter:  $V_R = 400V, T_j = 125^\circ C$



**6 Typ. reverse recovery charge**

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

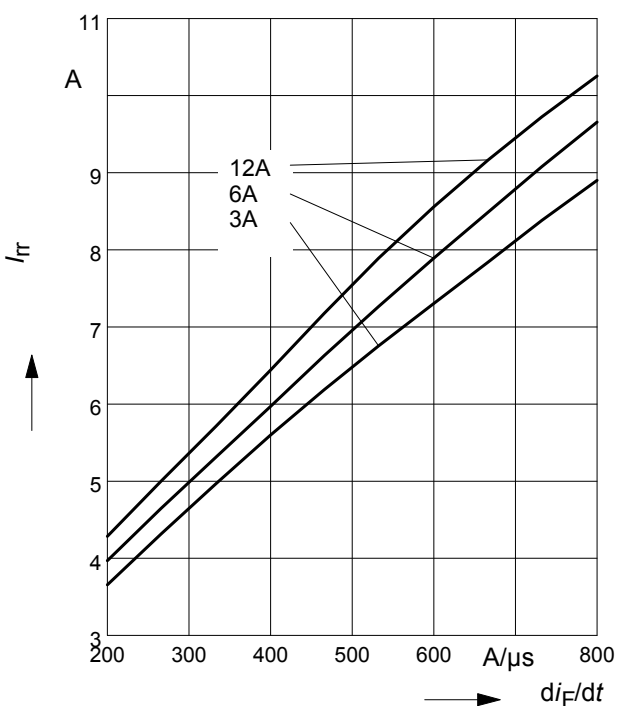
parameter:  $V_R = 400V, T_j = 125^\circ C$



**7 Typ. reverse recovery current**

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

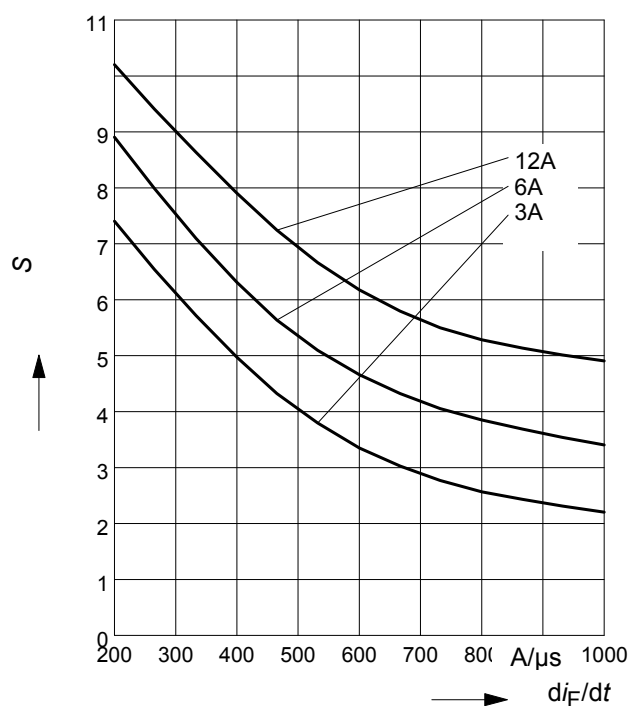
parameter:  $V_R = 400V, T_j = 125^\circ C$



**8 Typ. reverse recovery softness factor**

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

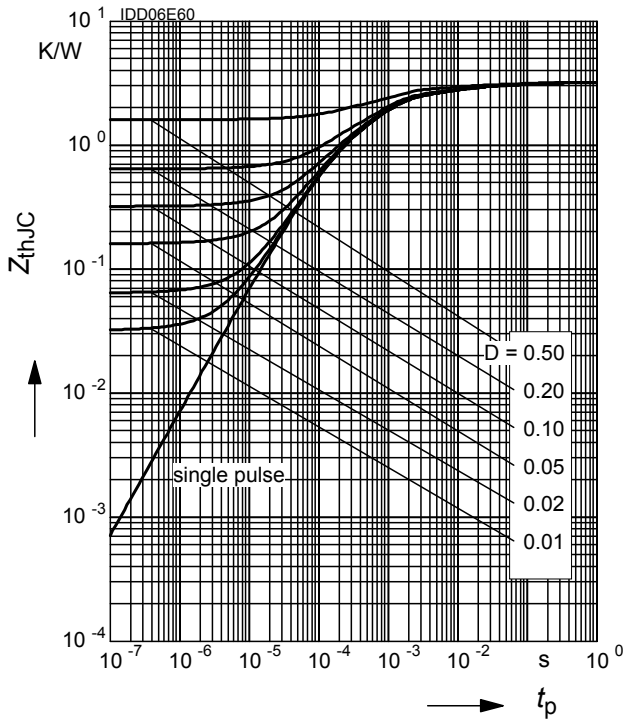
parameter:  $V_R = 400V, T_j = 125^\circ C$



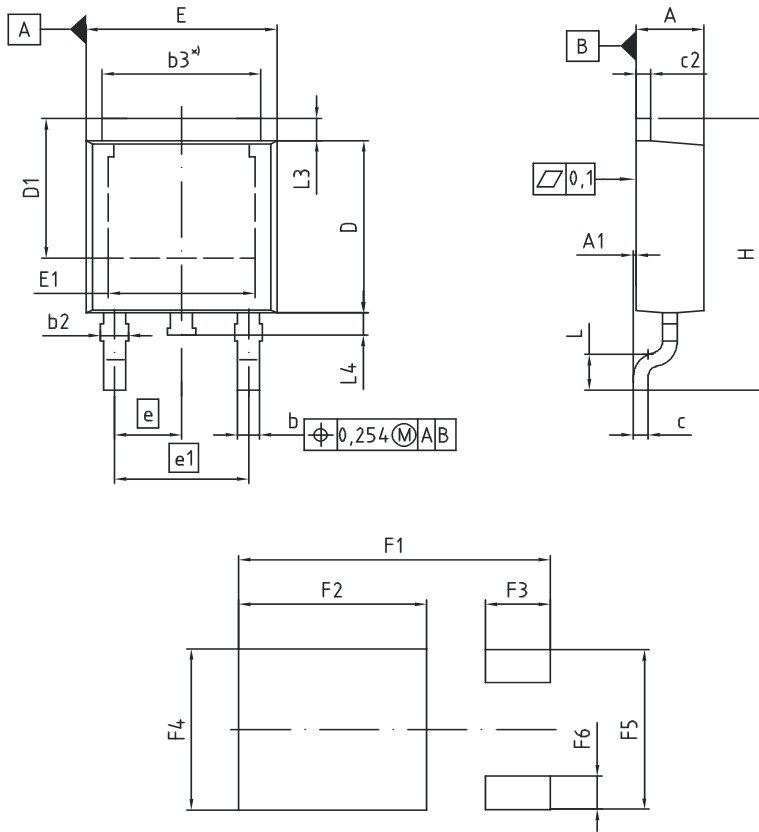
**9 Max. transient thermal impedance**

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

parameter :  $D = t_p/T$



PG-TO252 -3



\*) mold flash not included

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.16	2.41	0.085	0.095
A1	0.00	0.15	0.000	0.006
b	0.64	0.89	0.025	0.035
b2	0.65	1.15	0.026	0.045
b3	5.00	5.50	0.197	0.217
c	0.46	0.60	0.018	0.024
c2	0.46	0.98	0.018	0.039
D	5.97	6.22	0.235	0.245
D1	5.02	5.84	0.198	0.230
E	6.40	6.73	0.252	0.265
E1	4.70	5.21	0.185	0.205
e	2.29 (BSC)		0.090 (BSC)	
e1	4.57		0.180	
N	3		3	
H	9.40	10.48	0.370	0.413
L	1.18	1.70	0.046	0.067
L3	0.90	1.25	0.035	0.049
L4	0.51	1.00	0.020	0.039
F1	10.60		0.417	
F2	6.40		0.252	
F3	2.20		0.087	
F4	5.80		0.228	
F5	5.76		0.227	
F6	1.20		0.047	

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