

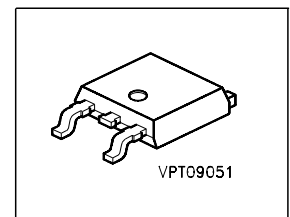
**Fast Switching Emitter Controlled Diode**

**Feature**

- 600V Emitter Controlled 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

**Product Summary**

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



Type	Package	Ordering Code	Marking	Pin 1	PIN 2,4	PIN 3
IDD06E60	PG-TO252-3	-	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.

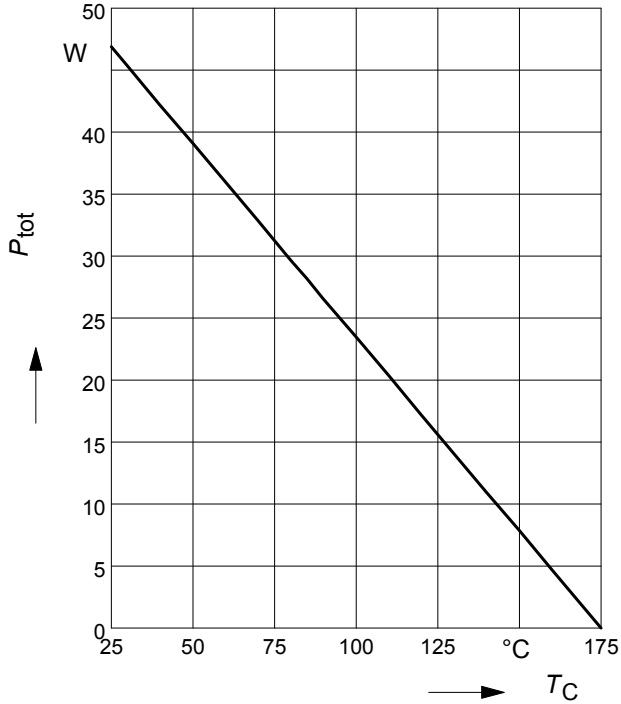
**Electrical Characteristics, at  $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified**

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**

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

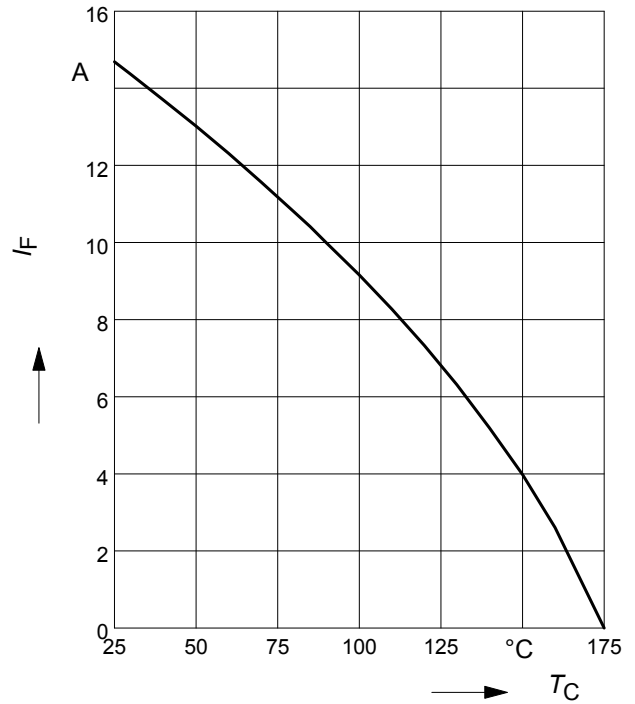
parameter:  $T_j \leq 175^\circ\text{C}$



**2 Diode forward current**

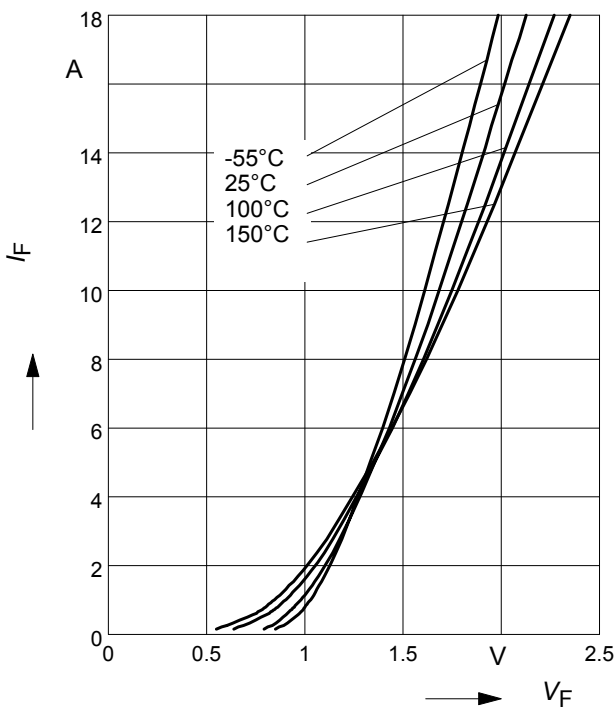
$$I_F = f(T_C)$$

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



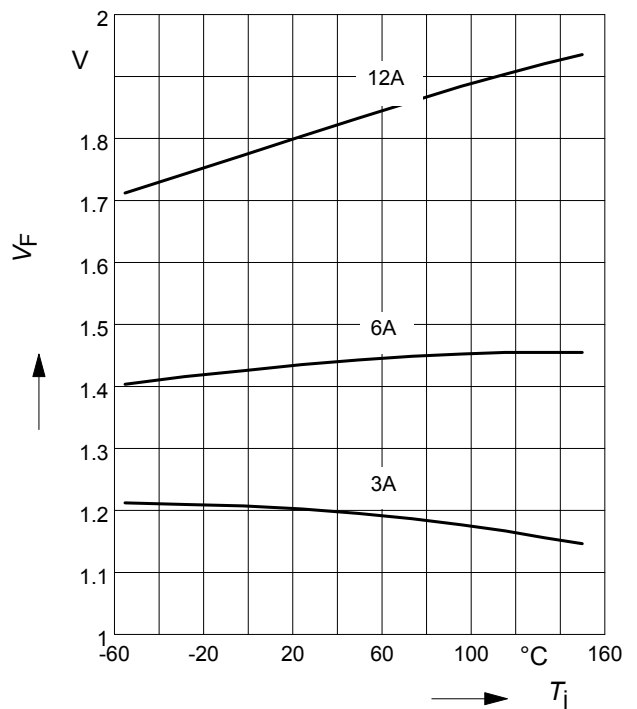
**3 Typ. diode forward current**

$$I_F = f(V_F)$$



**4 Typ. diode forward voltage**

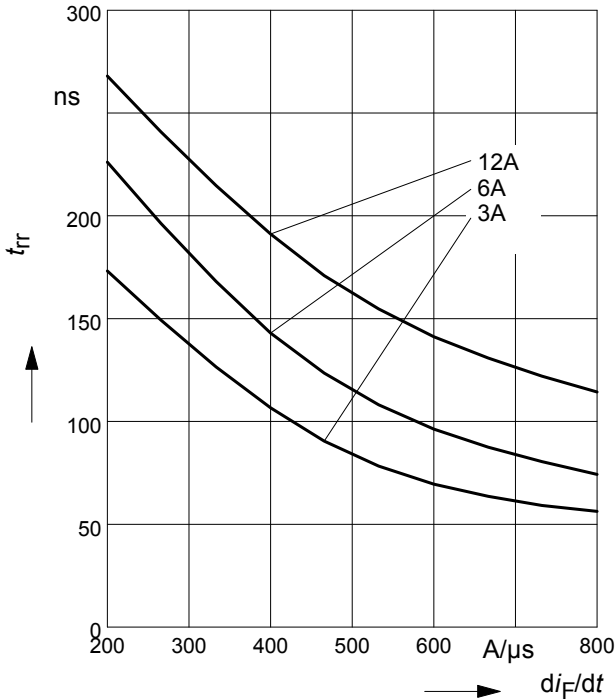
$$V_F = f(T_j)$$



**5 Typ. reverse recovery time**

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

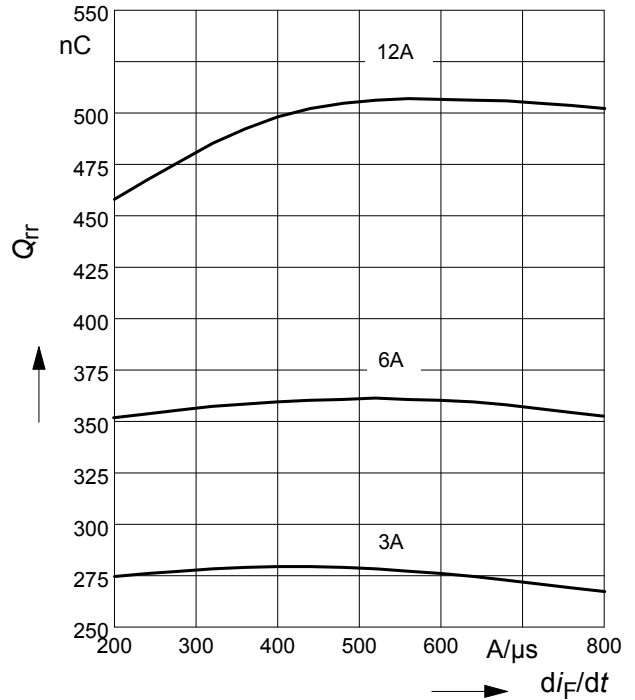
parameter:  $V_R = 400V, T_j = 125^\circ C$



**6 Typ. reverse recovery charge**

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

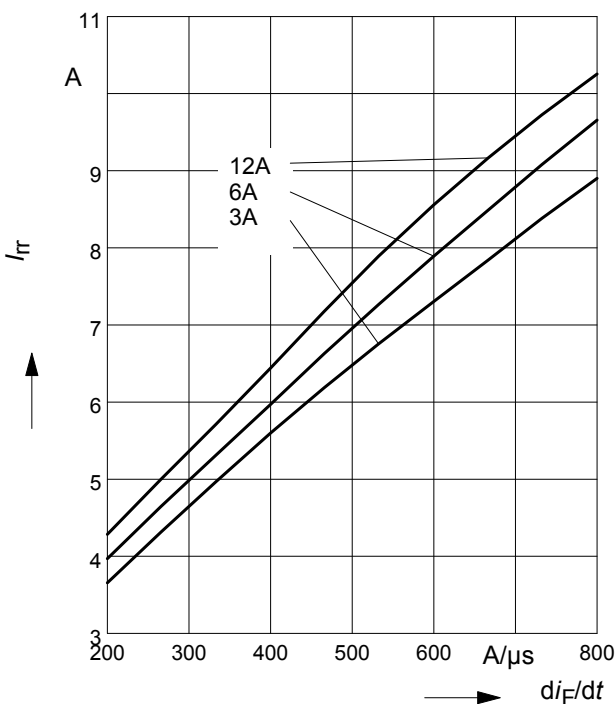
parameter:  $V_R = 400V, T_j = 125^\circ C$



**7 Typ. reverse recovery current**

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

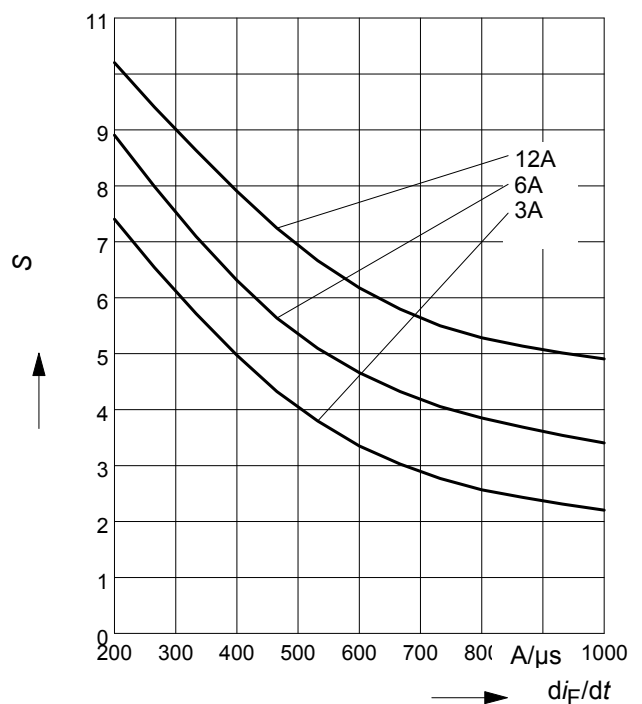
parameter:  $V_R = 400V, T_j = 125^\circ C$



**8 Typ. reverse recovery softness factor**

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

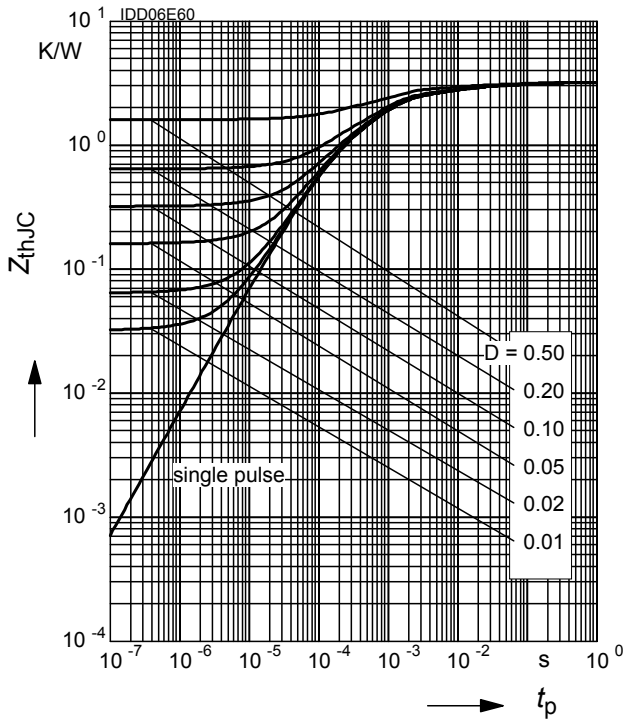
parameter:  $V_R = 400V, T_j = 125^\circ C$



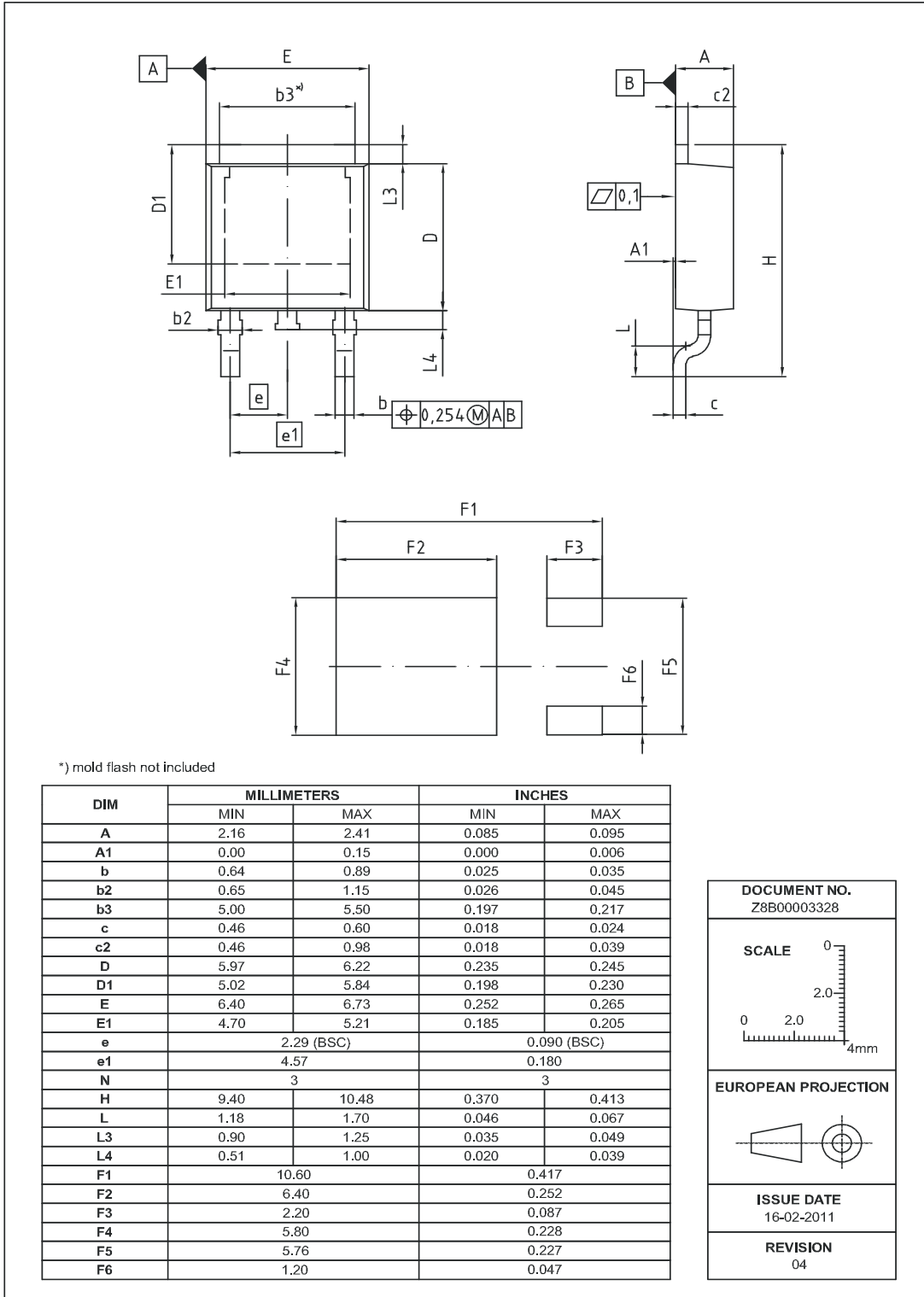
**9 Max. transient thermal impedance**

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

parameter :  $D = t_p/T$



PG-TO252 -3



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