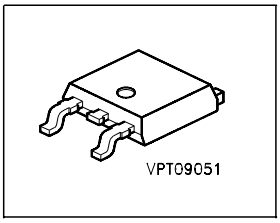
Fast Switching Emitter Controlled Diode

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[0)] for target applications

Product Summary

V_{RRM}	600	V
I_F	15	A
V_F	1.5	V
T_{jmax}	175	°C



Type	Package	Ordering Code	Marking	Pin 1	PIN 2,4	PIN 3
IDD15E60	PG-TO252-3-1	-	D15E60	NC	C	A

Maximum Ratings, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Value	Unit
Repetitive peak reverse voltage	V_{RRM}	600	V
Continous forward current	I_F		A
T_C=25°C		29.2	
T_C=90°C		19.6	
Surge non repetitive forward current T_C=25°C, t_p=10 ms, sine halfwave	I_{FSM}	60	
Maximum repetitive forward current T_C=25°C, t_p limited by T_{jmax}, D=0.5	I_{FRM}	45	
Power dissipation	P_{tot}		W
T_C=25°C		83.3	
T_C=90°C		47.2	
Operating and storage temperature	T_j , T_{stg}	-55...+175	°C
Soldering temperature reflow soldering, MSL3	T_S	260	°C

Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Thermal resistance, junction - case	R_{thJC}	-	-	1.8	K/W
SMD version, device on PCB:	R_{thJA}				
@ min. footprint		-	-	75	
@ 6 cm^2 cooling area [1)]		-	-	50	

Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Reverse leakage current	I_R				µA
V_R=600V, T_j=25°C		-	-	50	
V_R=600V, T_j=150°C		-	-	1250	
Forward voltage drop	V_F				V
I_F=15A, T_j=25°C		-	1.5	2	
I_F=15A, T_j=150°C		-	1.5	-	

[0] J-STD20 and JESD22

[1] Device 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.

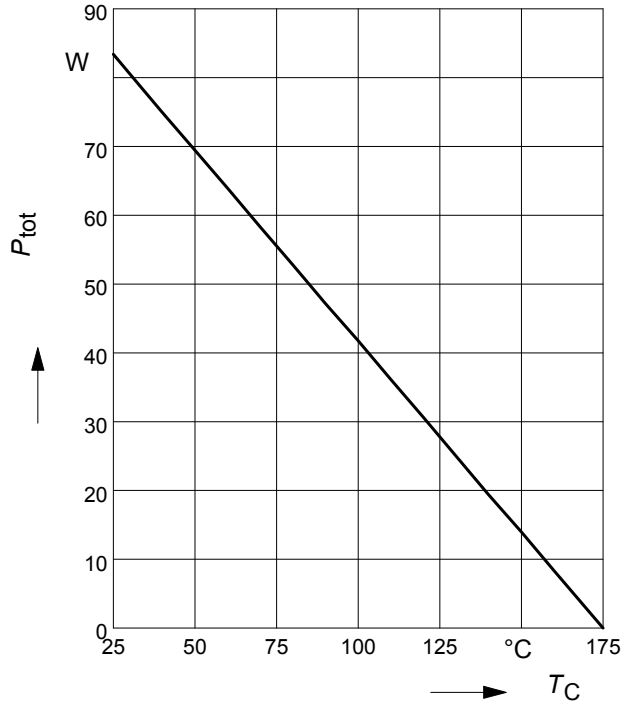
Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Dynamic Characteristics					
Reverse recovery time	t_{rr}				ns
V_R=400V, I_F=15A, di_F/dt=1000A/µs, T_j=25°C		-	87	-	
V_R=400V, I_F=15A, di_F/dt=1000A/µs, T_j=125°C		-	124	-	
V_R=400V, I_F=15A, di_F/dt=1000A/µs, T_j=150°C		-	131	-	
Peak reverse current	I_{rrm}				A
V_R=400V, I_F = 15 A, di_F/dt=1000A/µs, T_j=25°C		-	13.7	-	
V_R=400V, I_F =15A, di_F/dt=1000A/µs, T_j=125°C		-	16.4	-	
V_R=400V, I_F =15A, di_F/dt=1000A/µs, T_j=150°C		-	19.3	-	
Reverse recovery charge	Q_{rr}				nC
V_R=400V, I_F=15A, di_F/dt=1000A/µs, T_j=25°C		-	595	-	
V_R=400V, I_F =15A, di_F/dt=1000A/µs, T_j=125°C		-	995	-	
V_R=400V, I_F =15A, di_F/dt=1000A/µs, T_j=150°C		-	1104	-	
Reverse recovery softness factor	S				
V_R=400V, I_F=15A, di_F/dt=1000A/µs, T_j=25°C		-	3.6	-	
V_R=400V, I_F=15A, di_F/dt=1000A/µs, T_j=125°C		-	4.3	-	
V_R=400V, I_F=15A, di_F/dt=1000A/µs, T_j=150°C		-	4.5	-	

1 Power dissipation

$P_{tot} = f(T_C)$

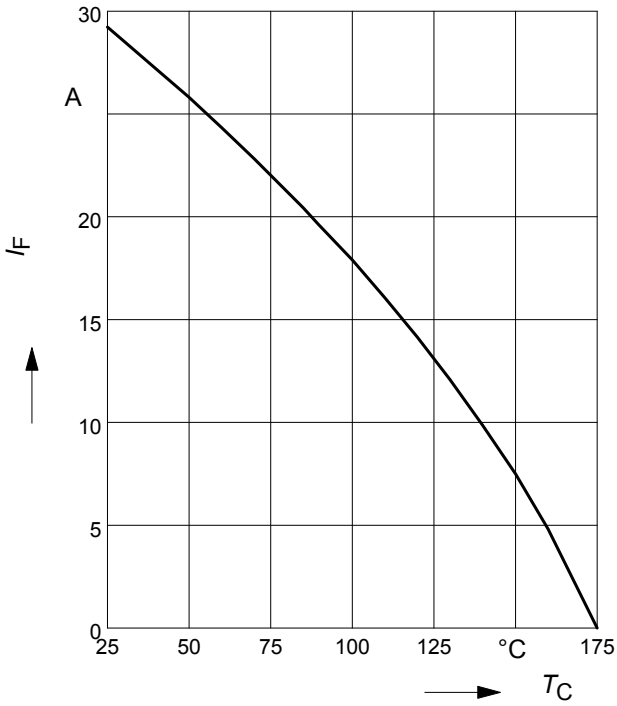
parameter: $T_j \leq 175$ °C



2 Diode forward current

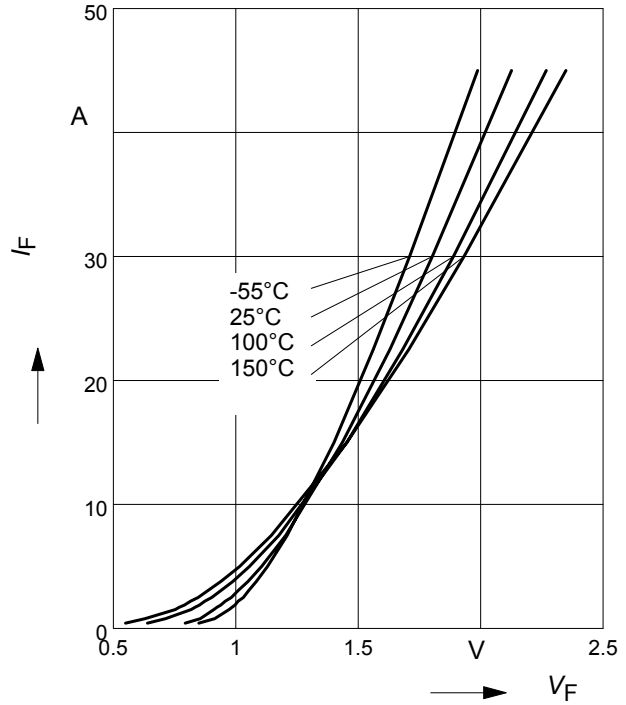
$I_F = f(T_C)$

parameter: $T_j \leq 175$°C



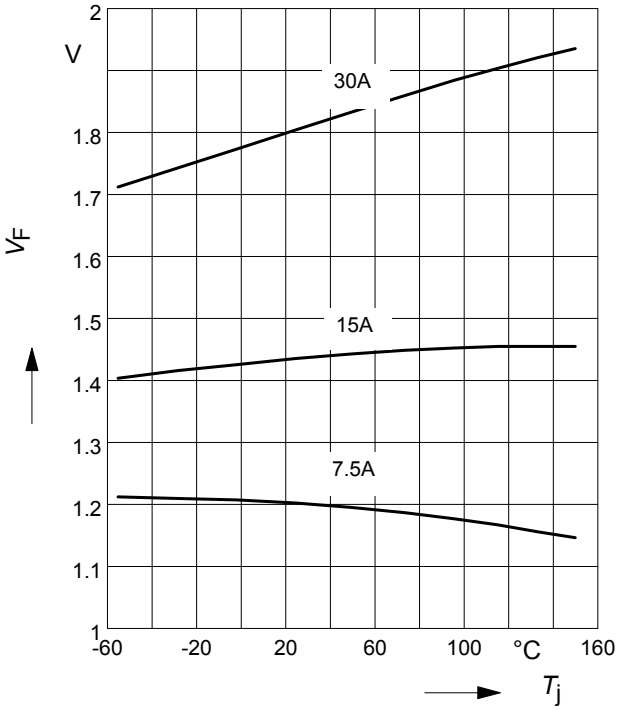
3 Typ. diode forward current

$I_F = f(V_F)$



4 Typ. diode forward voltage

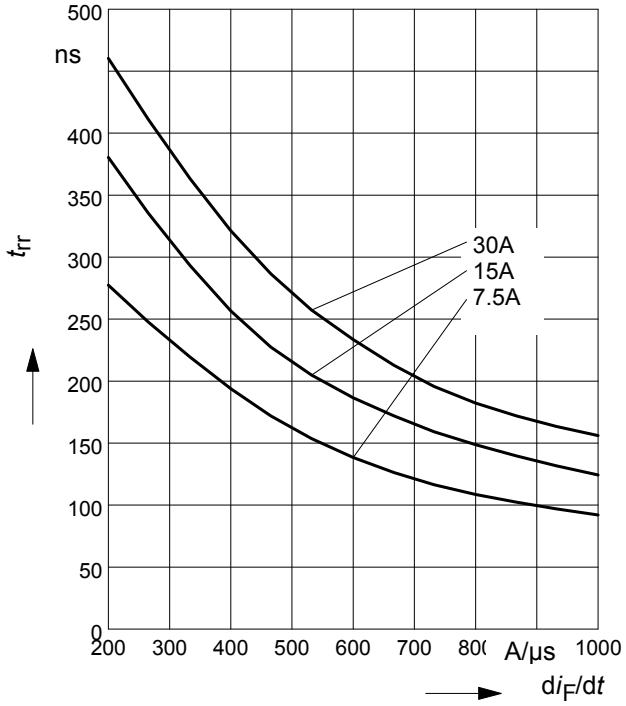
$V_F = f(T_j)$



5 Typ. reverse recovery time

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

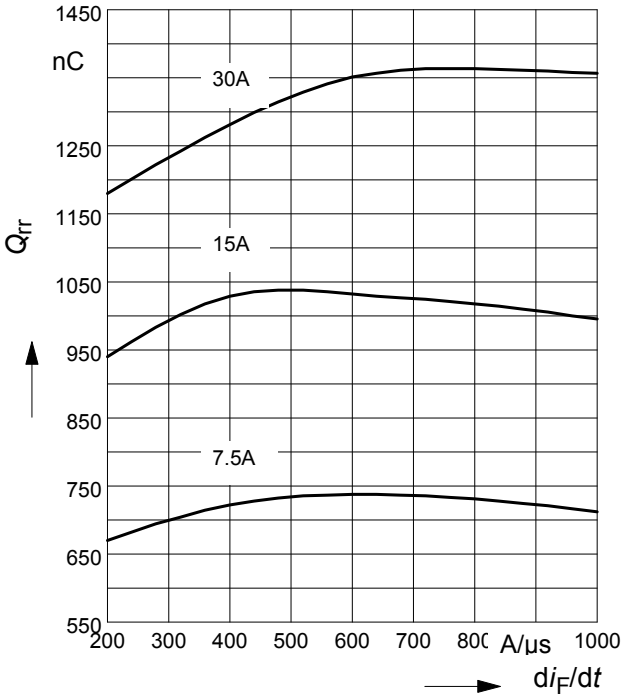
parameter: V_R = 400V, T_j = 125°C



6 Typ. reverse recovery charge

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

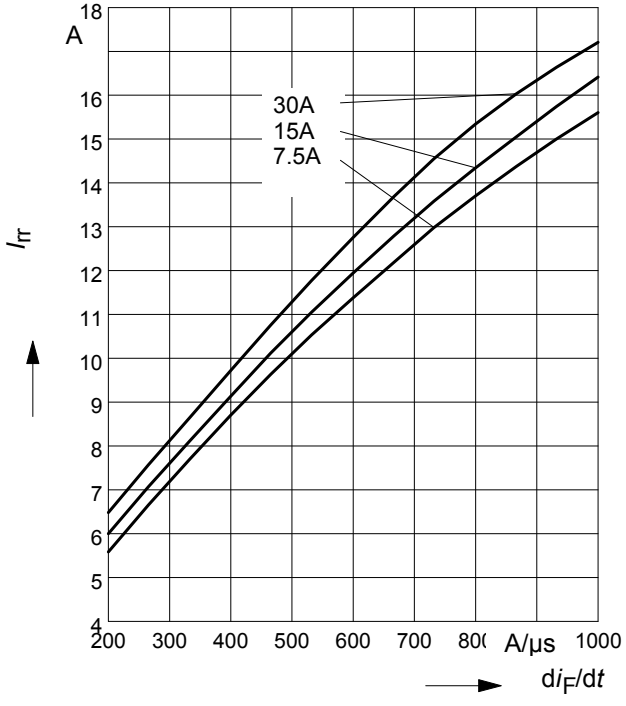
parameter: V_R = 400V, T_j = 125 °C



7 Typ. reverse recovery current

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

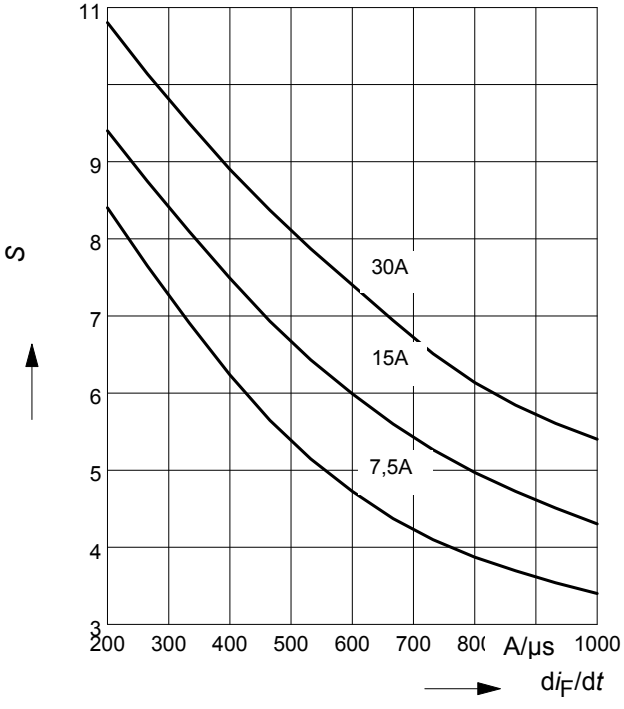
parameter: V_R = 400V, T_j = 125°C



8 Typ. reverse recovery softness factor

S = f(di_F/dt)

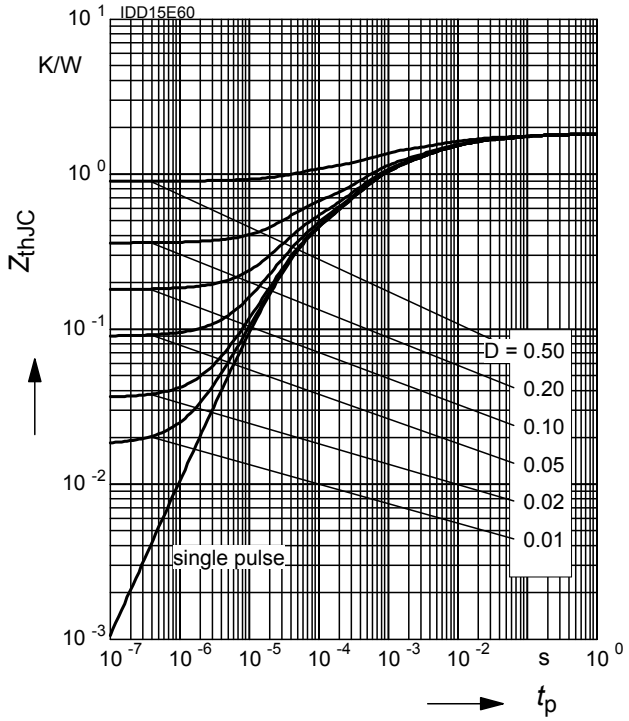
parameter: V_R = 400V, T_j = 125°C



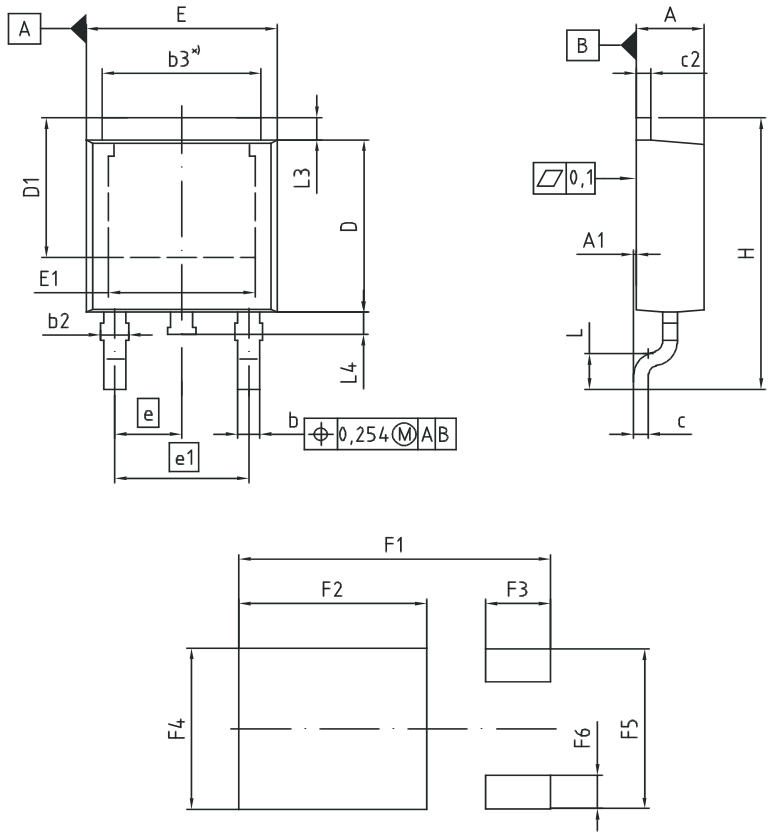
9 Max. transient thermal impedance

$Z_{thJC} = f(t_p)$

parameter : $D = t_p/T$



PG-TO252-3



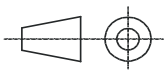
*) mold flash not included

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	

DOCUMENT NO.
Z8B00003328

SCALE
0 2.0 0 2.0 4mm

EUROPEAN PROJECTION



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