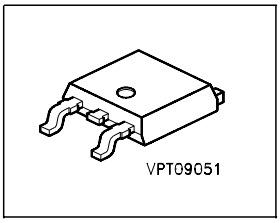
Fast Switching EmCon Diode

Feature

- 600 V EmCon technology
- Fast recovery
- Soft switching
- Low reverse recovery charge
- Low forward voltage
- 175°C operating temperature
- Easy paralleling

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	PIN 3
IDD15E60	P-TO252-3-1	Q67040-S4380	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 for 10s (according to JEDEC J-STD-020A)	T_S	255	°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	-	

[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.

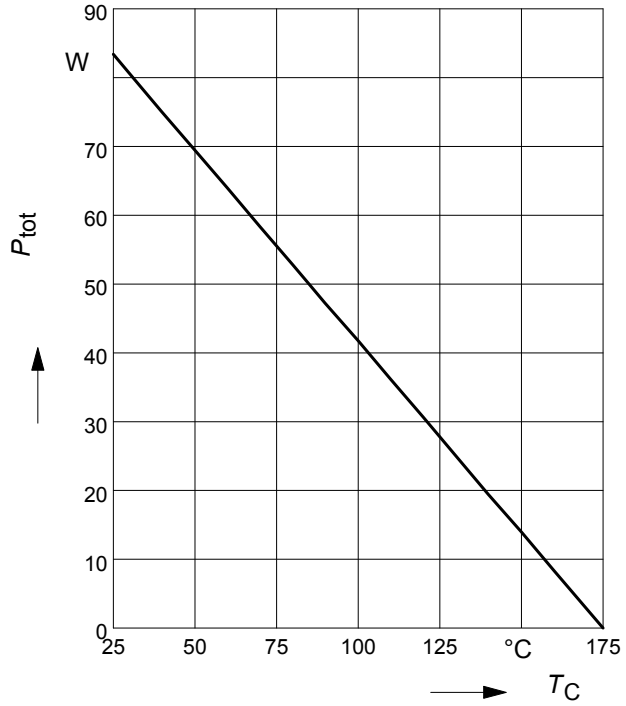
Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

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

$P_{tot} = f(T_C)$

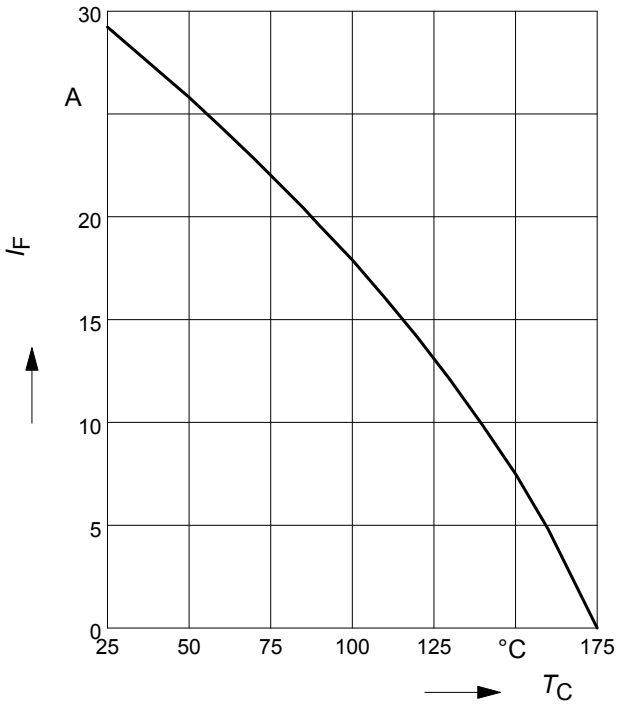
parameter: $T_j \leq 175$ °C



2 Diode forward current

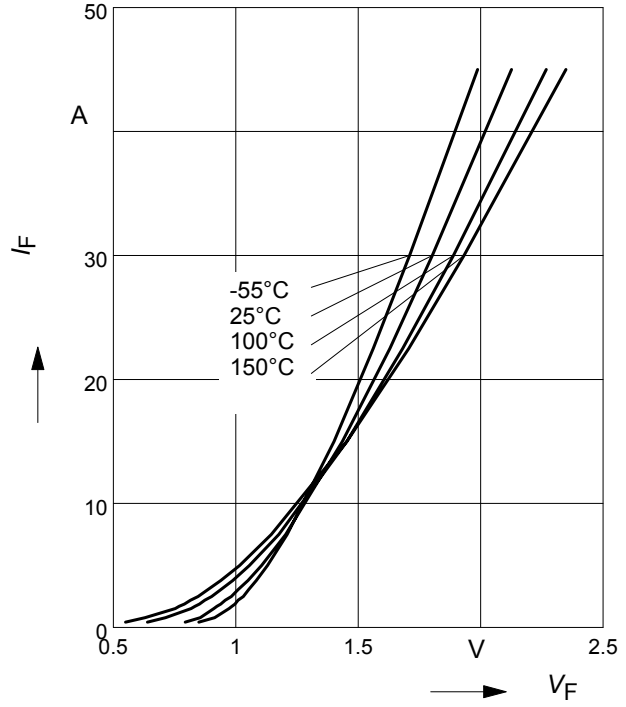
$I_F = f(T_C)$

parameter: $T_j \leq 175$°C



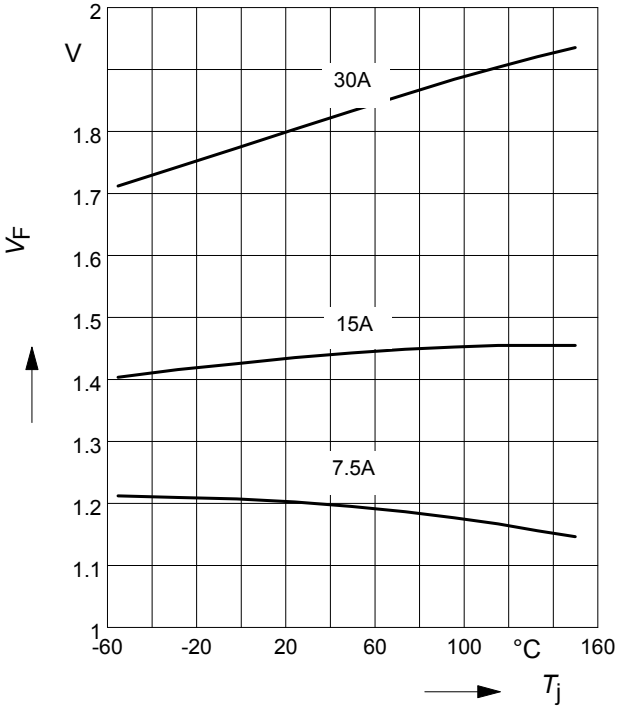
3 Typ. diode forward current

$I_F = f(V_F)$



4 Typ. diode forward voltage

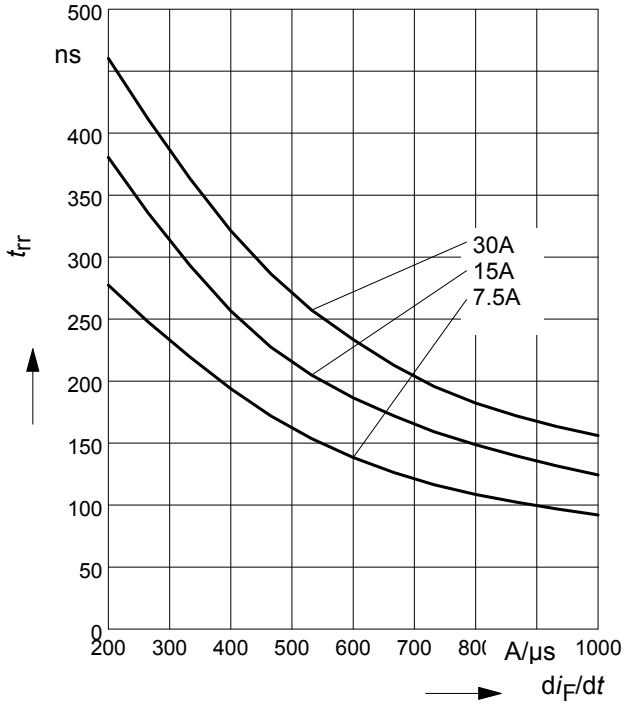
$V_F = f(T_j)$



5 Typ. reverse recovery time

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

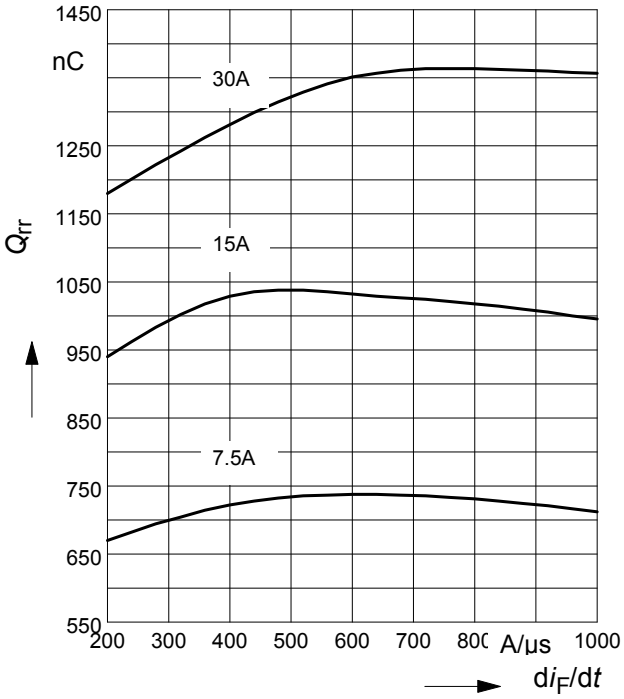
parameter: V_R = 400V, T_j = 125°C



6 Typ. reverse recovery charge

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

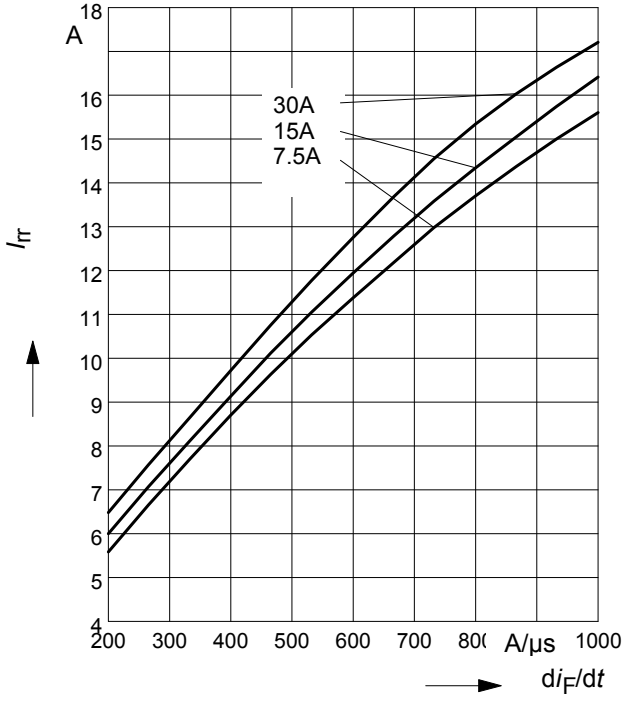
parameter: V_R = 400V, T_j = 125 °C



7 Typ. reverse recovery current

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

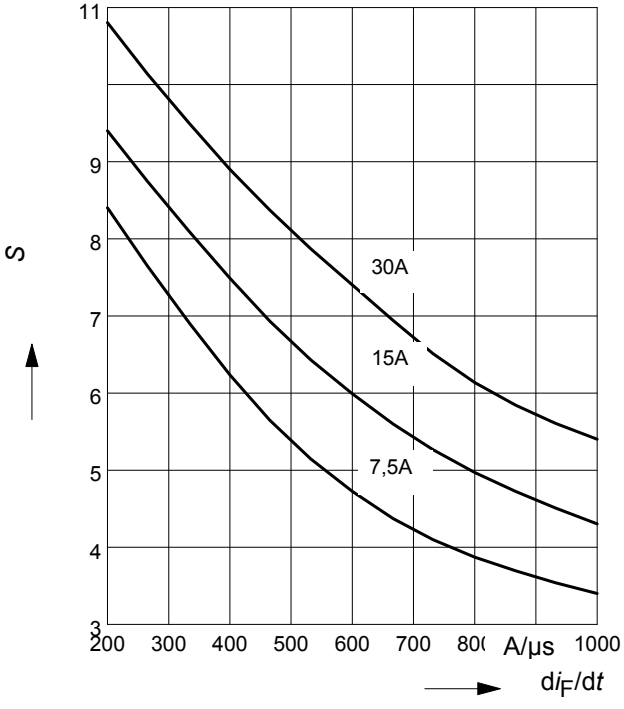
parameter: V_R = 400V, T_j = 125°C



8 Typ. reverse recovery softness factor

S = f(di_F/dt)

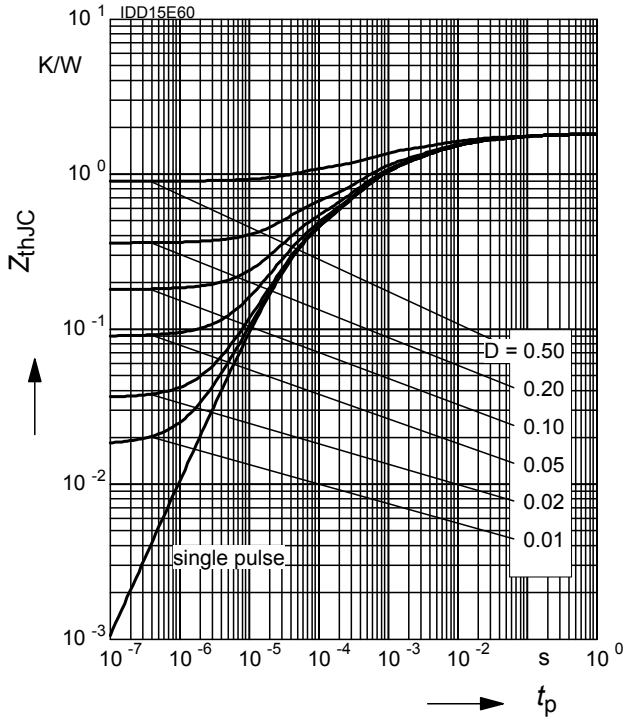
parameter: V_R = 400V, T_j = 125°C

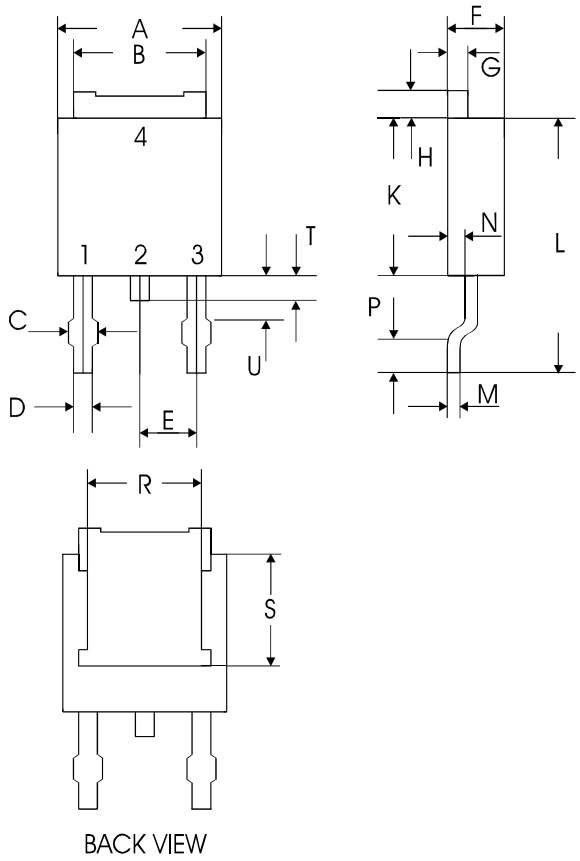


9 Max. transient thermal impedance

$Z_{thJC} = f(t_p)$

parameter : $D = t_p/T$





P-TO252 (D-Pak)

symbol	dimensions [mm] min	[mm] max	inch] min	inch] max
A	6.40	6.73	0.2520	0.2650
B	5.25	5.50	0.2067	0.2165
C	(0.65)	(1.15)	(0.0256)	(0.0453)
D	0.63	0.89	0.0248	0.0350
E	2.28		0.2520	
F	2.19	2.39	0.0862	0.0941
G	0.76	0.98	0.0299	0.0386
H	0.90	1.21	0.0354	0.0476
K	5.97	6.23	0.2350	0.2453
L	9.40	10.40	0.3701	0.4094
M	0.46	0.58	0.0181	0.0228
N	0.87	1.15	0.0343	0.0453
P	0.51	-	0.0201	-
R	5.00	-	0.1969	-
S	4.17	-	0.1642	-
T	0.26	1.02	0.0102	0.0402
U	-	-	-	-

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