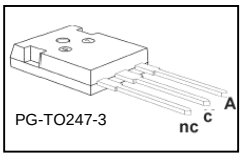
Fast Switching Emitter Controlled Diode



Features:

- 600V Emitter Controlled technology
- Fast recovery
- Soft switching
- Low reverse recovery charge
- Low forward voltage
- 175°C junction operating temperature
- Easy paralleling
- Pb-free lead plating; RoHS compliant
- Complete product spectrum and PSpice Models: http://www.infineon.com

Applications:

- Welding
- Motor drives

Type	V_{RRM}	I_F	$V_{F,Tj=25°C}$	$T_{j,max}$	Marking	Package
IDW100E60	600V	100A	1.65V	175°C	D100E60	PG-TO247-3

Maximum Ratings

Parameter	Symbol	Value	Unit
Repetitive peak reverse voltage	V_{RRM}	600	V
Continuous forward current T_C = 25°C T_C = 90°C T_C = 100°C	I_F	 150 104 96	A
Surge non repetitive forward current T_C = 25°C, t_p = 10 ms, sine halfwave	I_{FSM}	400	A
Maximum repetitive forward current T_C = 25°C, t_p limited by $t_{j,max}$, D = 0.5	I_{FRM}	300	A
Power dissipation T_C = 25°C T_C = 90°C T_C = 100°C	P_{tot}	 375 212 198	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 Resistance

Parameter	Symbol	Conditions	Max. Value	Unit
Characteristic				
Thermal resistance, junction – case	R_{thJC}		0.40	K/W
Thermal resistance, junction – ambient	R_{thJA}		40	

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

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	
Static Characteristic						
Collector-emitter breakdown voltage	V_{RRM}	I_R=0.25mA	600	-	-	V
Diode forward voltage	V_F	I_F=100A				
		T_j=25°C	-	1.65	2.0	
		T_j=175°C	-	1.65	-	
Reverse leakage current	I_R	V_R=600V				µA
		T_j=25°C	-	-	40	
		T_j=175°C	-	-	3300	
Dynamic Electrical Characteristics						
Diode reverse recovery time	t_{rr}	T_j=25°C	-	120	-	ns
Diode reverse recovery charge	Q_{rr}	V_R=400V,	-	3.6	-	µC
Diode peak reverse recovery current	I_{rr}	I_F=100A,	-	49.5	-	A
Diode peak rate of fall of reverse recovery current during t_b	dI_{rr}/dt	dI_F/dt=1200A/µs	-	750	-	A/µs
Diode reverse recovery time	t_{rr}	T_j=125°C	-	168	-	ns
Diode reverse recovery charge	Q_{rrm}	V_R=400V,	-	5.8	-	µC
Diode peak reverse recovery current	I_{rr}	I_F=100A,	-	61.6	-	A
Diode peak rate of fall of reverse recovery current during t_b	dI_{rr}/dt	dI_F/dt=1200A/µs	-	705	-	A/µs
Diode reverse recovery time	t_{rr}	T_j=175°C	-	200	-	ns
Diode reverse recovery charge	Q_{rrm}	V_R=400V,	-	7.8	-	µC
Diode peak reverse recovery current	I_{rr}	I_F=100A,	-	67.0	-	A
Diode peak rate of fall of reverse recovery current during t_b	dI_{rr}/dt	dI_F/dt=1200A/µs	-	650	-	A/µs

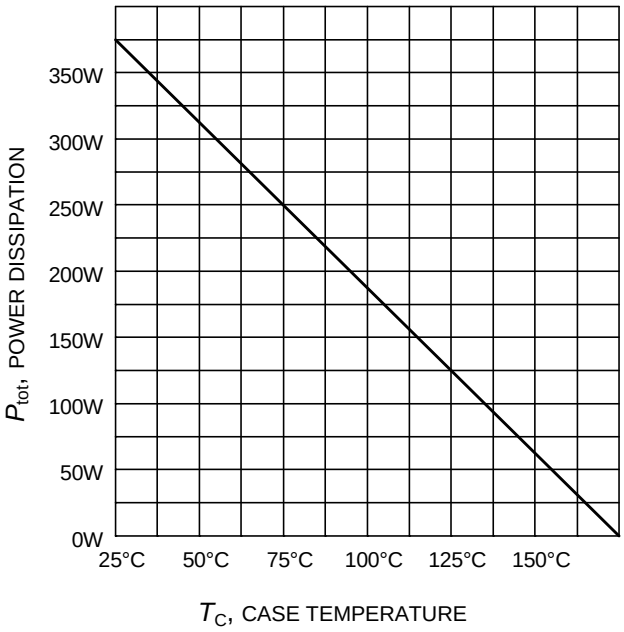


Figure 1. Power dissipation as a function of case temperature
($T_j \leq 175°C$)

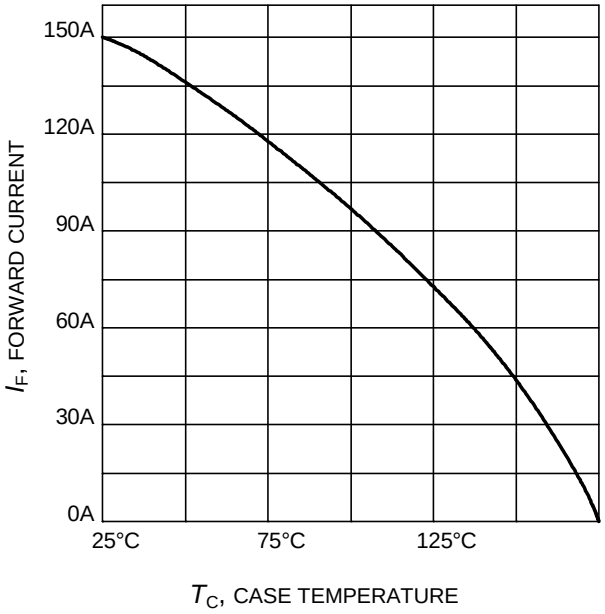


Figure 2. Diode forward current as a function of case temperature
($T_j \leq 175°C$)

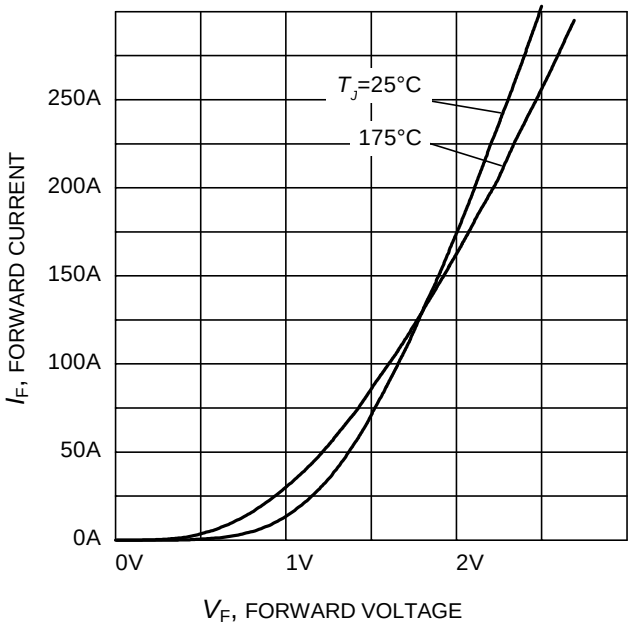


Figure 3. Typical diode forward current as a function of forward voltage

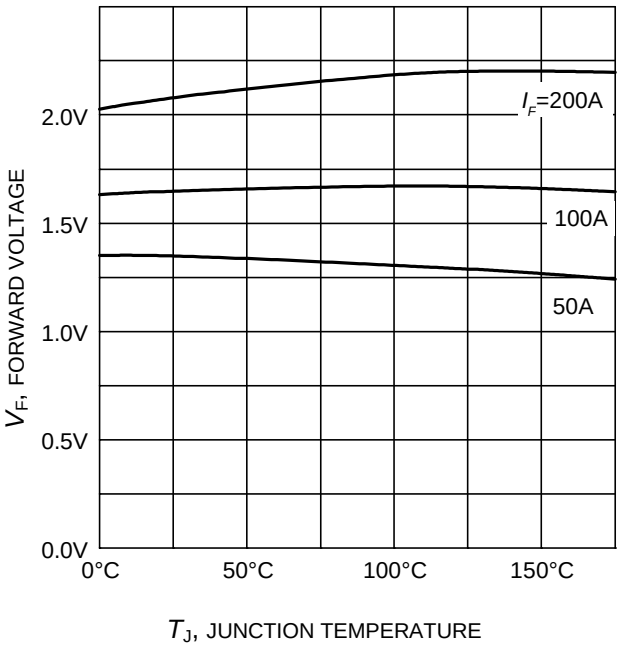


Figure 4. Typical diode forward voltage as a function of junction temperature

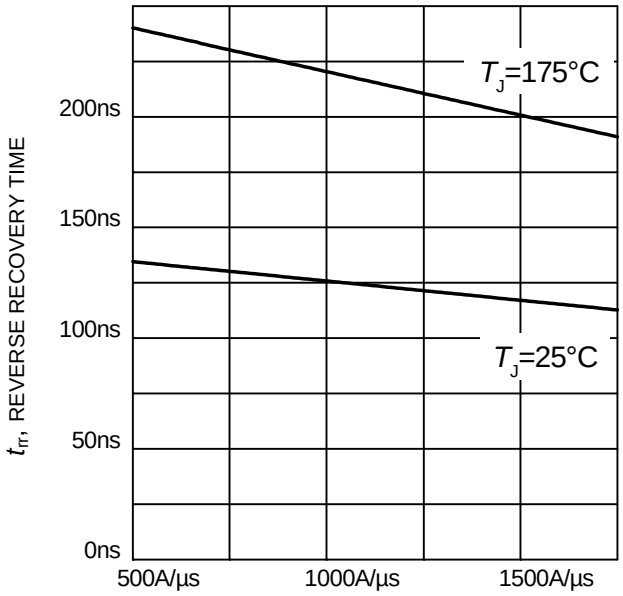


Figure 5. Typical reverse recovery time as a function of diode current slope
(V_R=400V, I_F=100A,
Dynamic test circuit in Figure E)

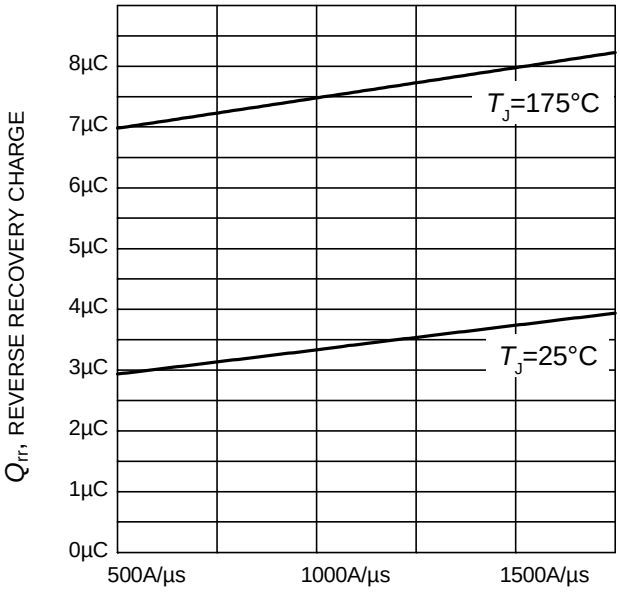


Figure 6. Typical reverse recovery charge as a function of diode current slope
(V_R = 400V, I_F = 100A,
Dynamic test circuit in Figure E)

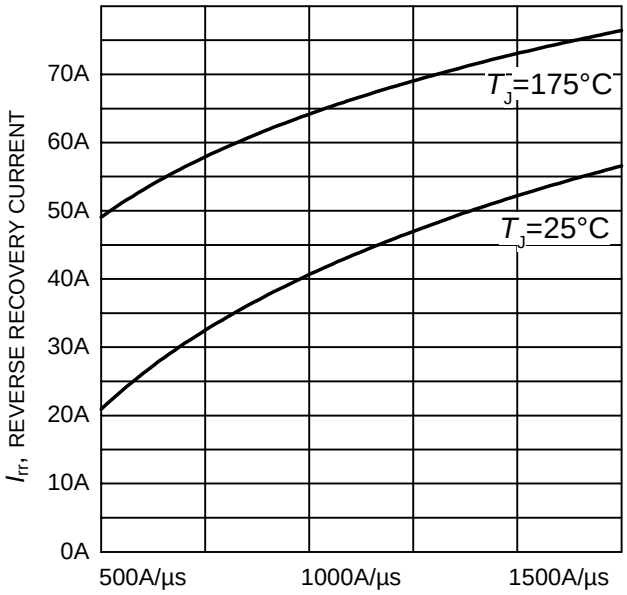


Figure 7. Typical reverse recovery current as a function of diode current slope
(V_R = 400V, I_F = 100A,
Dynamic test circuit in Figure E)

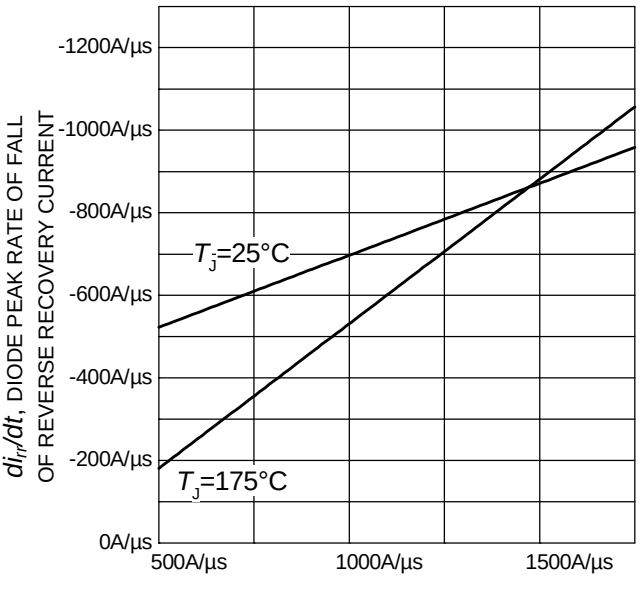


Figure 8. Typical diode peak rate of fall of reverse recovery current as a function of diode current slope
(V_R=400V, I_F=100A,
Dynamic test circuit in Figure E)

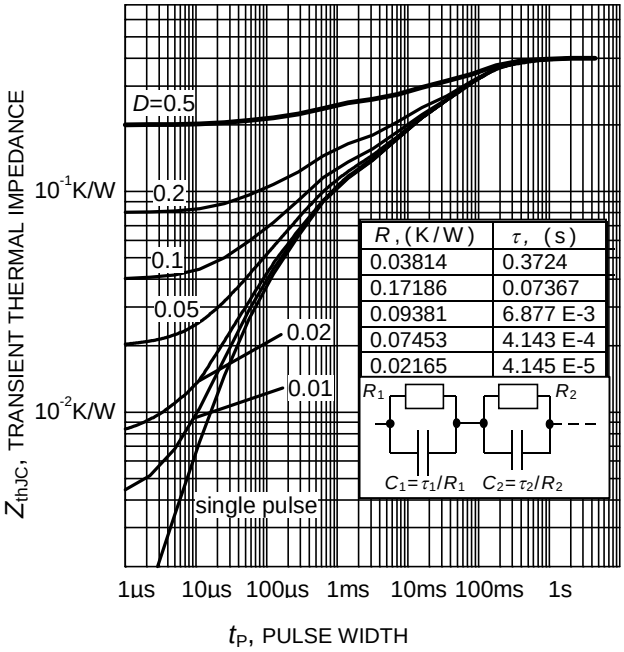
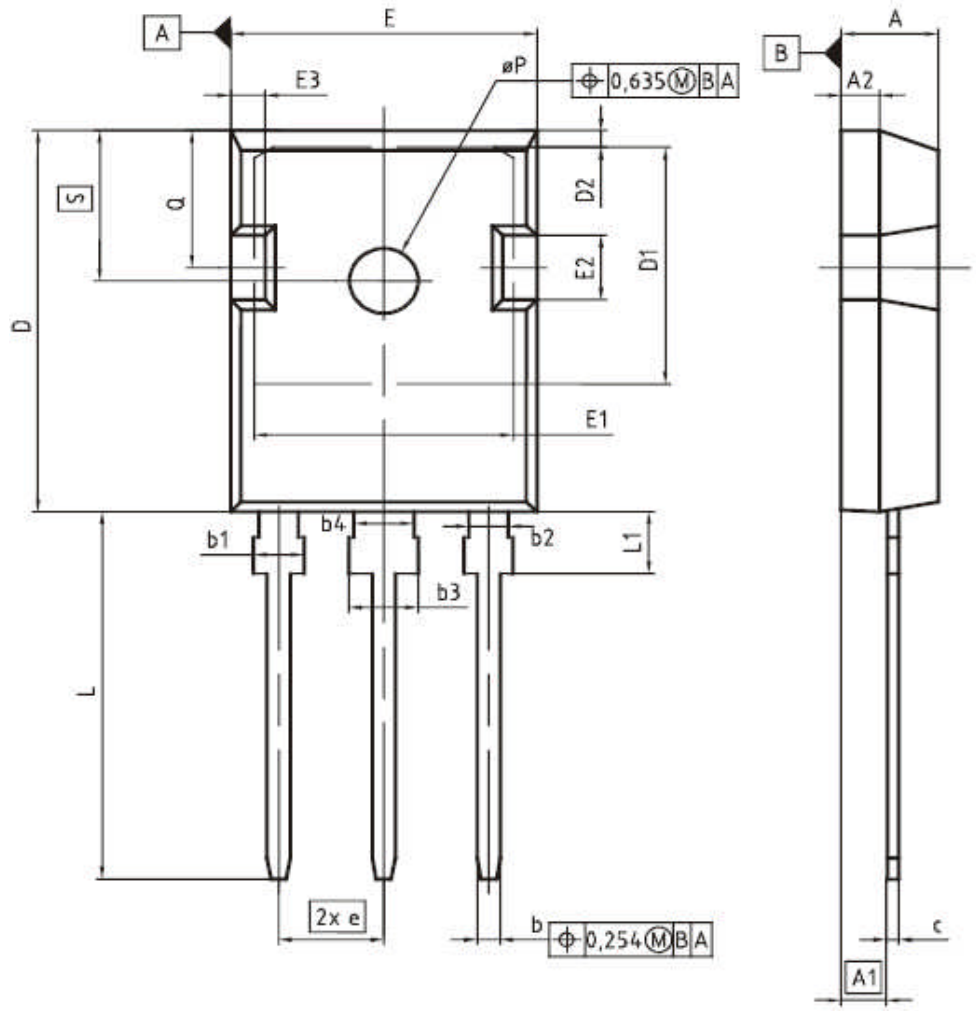


Figure 9. Diode transient thermal impedance as a function of pulse width
($D=t_P/T$)

PG-TO247-3



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4,83	5,21	0,190	0,205
A1	2,27	2,54	0,089	0,100
A2	1,85	2,16	0,073	0,085
b	1,07	1,33	0,042	0,052
b1	1,90	2,41	0,075	0,095
b2	1,90	2,16	0,075	0,085
b3	2,87	3,38	0,113	0,133
b4	2,87	3,13	0,113	0,123
c	0,55	0,68	0,022	0,027
D	20,80	21,10	0,819	0,831
D1	16,25	17,65	0,640	0,695
D2	0,95	1,35	0,037	0,053
E	15,70	16,13	0,618	0,635
E1	13,10	14,15	0,516	0,557
E2	3,68	5,10	0,145	0,201
E3	1,00	2,60	0,039	0,102
e	5,44 (BSC)		0,214 (BSC)	
N	3		3	
L	19,80	20,32	0,780	0,800
L1	4,10	4,47	0,161	0,176
øP	3,50	3,70	0,138	0,146
Q	5,49	6,00	0,216	0,236
S	6,04	6,30	0,238	0,248

DOCUMENT NO.	Z8B00003327
SCALE	0 5 5 7,5mm
EUROPEAN PROJECTION	
ISSUE DATE	09-07-2010
REVISION	05

Published by
Infineon Technologies AG
81726 Munich, Germany

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