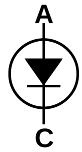
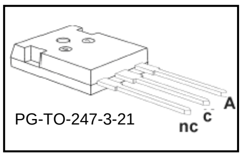
Fast Switching EmCon Diode

Features:

- 600 V EmCon 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/emcon/





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-TO-247-3-21

Maximum Ratings

Parameter	Symbol	Value	Unit
Repetitive peak reverse voltage	V_{RRM}	600	V
Continuous forward current	I_F		A
T_C = 25°C		150	
T_C = 90°C		104	
T_C = 100°C		96	
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	P_{tot}		W
T_C = 25°C		375	
T_C = 90°C		212	
T_C = 100°C		198	
Operating junction and storage temperature	T_j, T_{stg}	-55…+175	°C
Soldering temperature 1.6mm (0.063 in.) from case for 10 s	T_S	260	°C

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	-	-	1000	

Dynamic Electrical Characteristics

Parameter	Symbol	Conditions	min.	typ.	max.	Unit
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

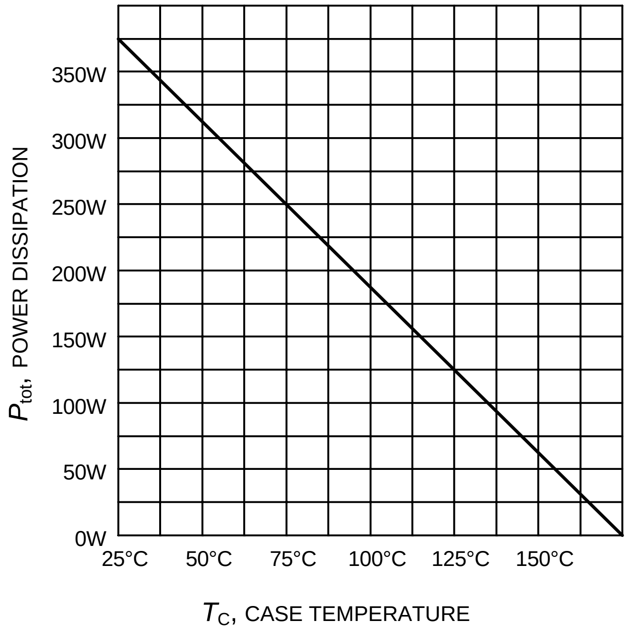


Figure 1. Power dissipation as a function of case temperature
($T_j \leq 175$°C)

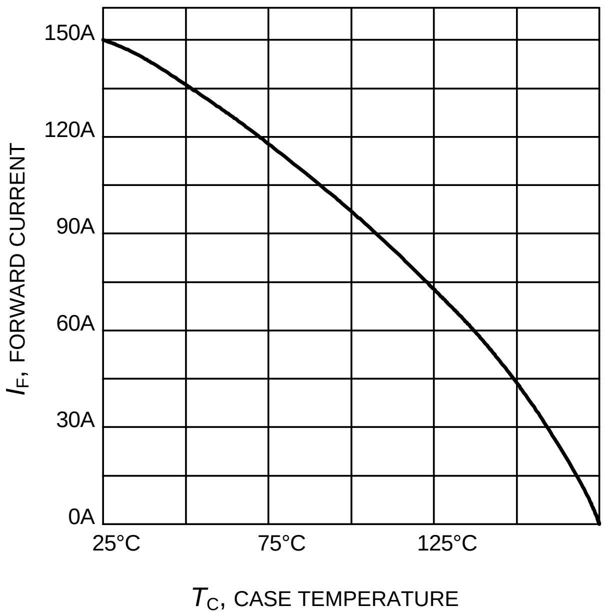


Figure 2. Diode forward current as a function of case temperature
($T_j \leq 175$°C)

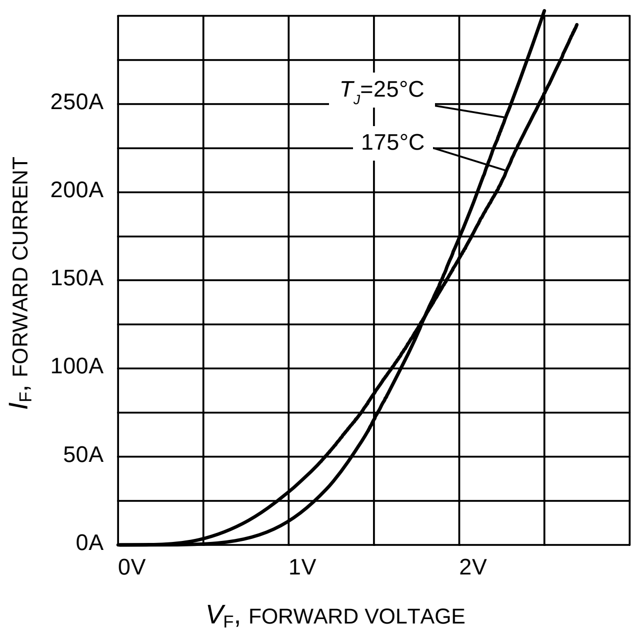


Figure 3. Typical diode forward current as a function of forward voltage

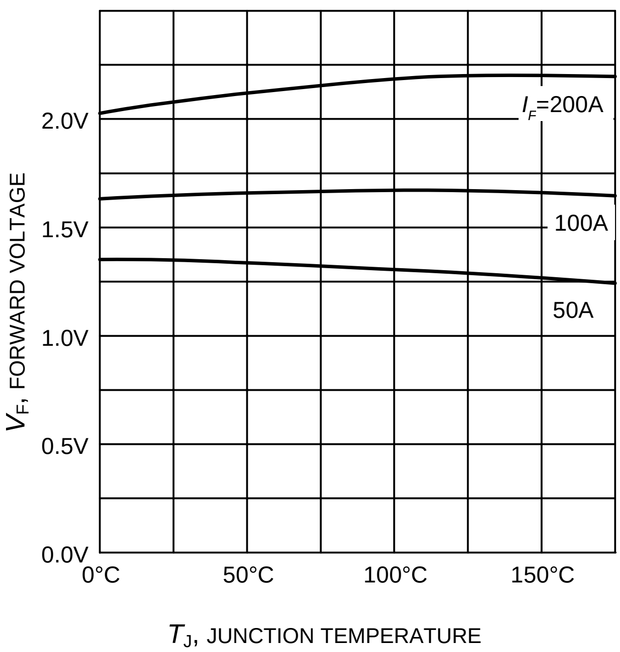


Figure 4. Typical diode forward voltage as a function of junction temperature

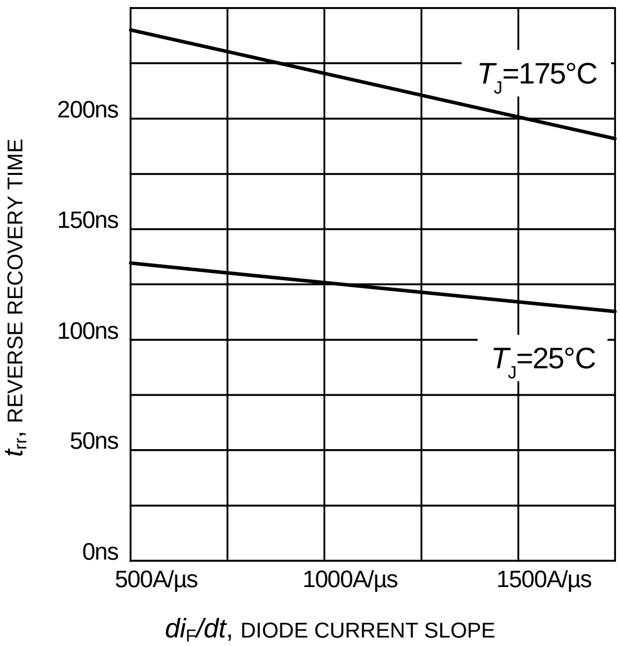


Figure 5. Typical reverse recovery time as a function of diode current slope
(V_R=400V, I_F=100A,
Dynamic test circuit in Figure E)

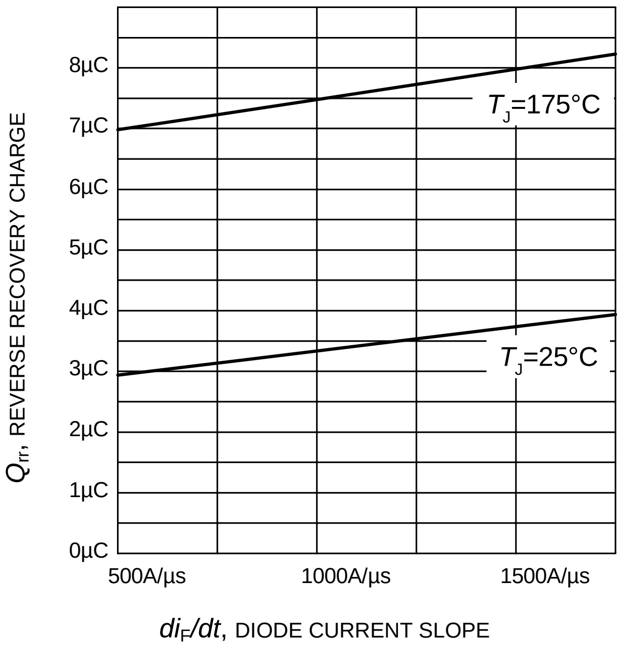


Figure 6. Typical reverse recovery charge as a function of diode current slope
(V_R = 400V, I_F = 100A,
Dynamic test circuit in Figure E)

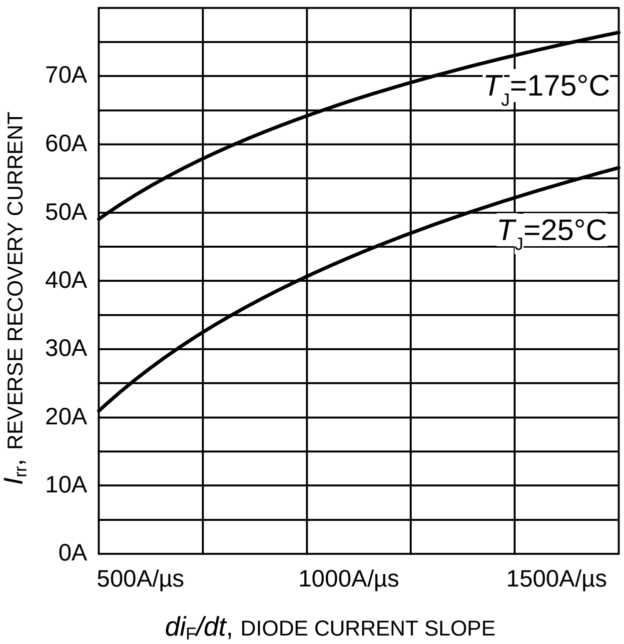


Figure 7. Typical reverse recovery current as a function of diode current slope
(V_R = 400V, I_F = 100A,
Dynamic test circuit in Figure E)

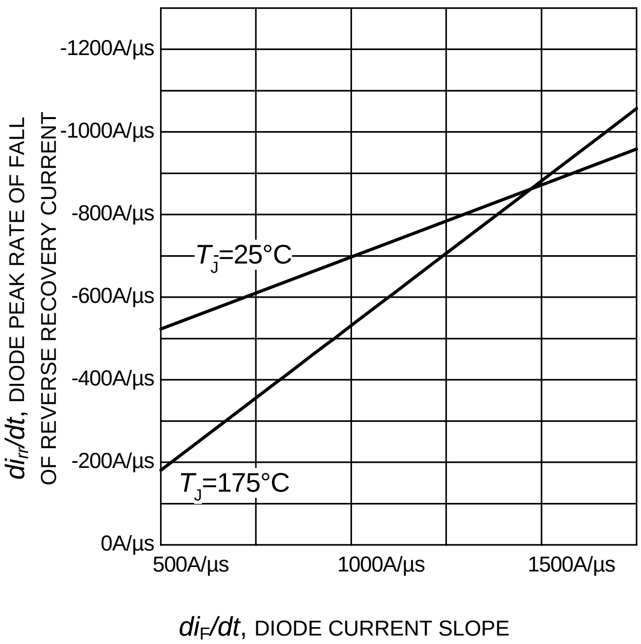


Figure 8. Typical diode peak rate of fall of reverse recovery current as a function of diode current slope
(V_R=400V, I_F=100A,
Dynamic test circuit in Figure E)

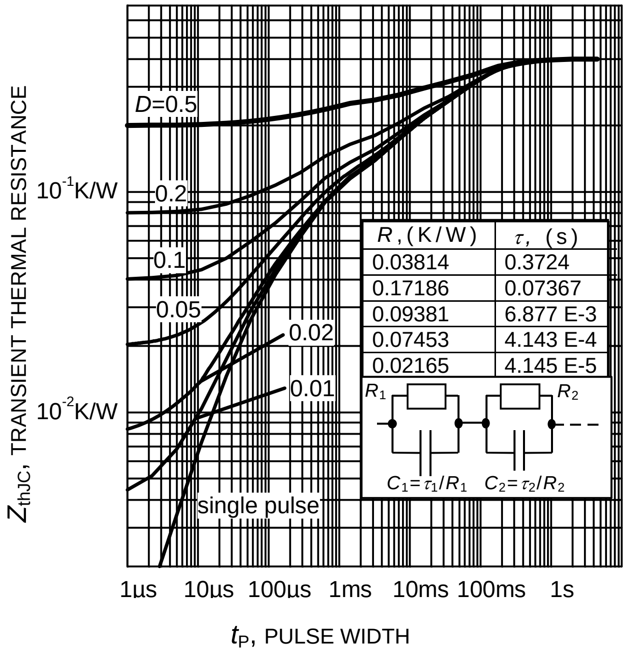


Figure 9. Diode transient thermal impedance as a function of pulse width
($D=t_P/T$)

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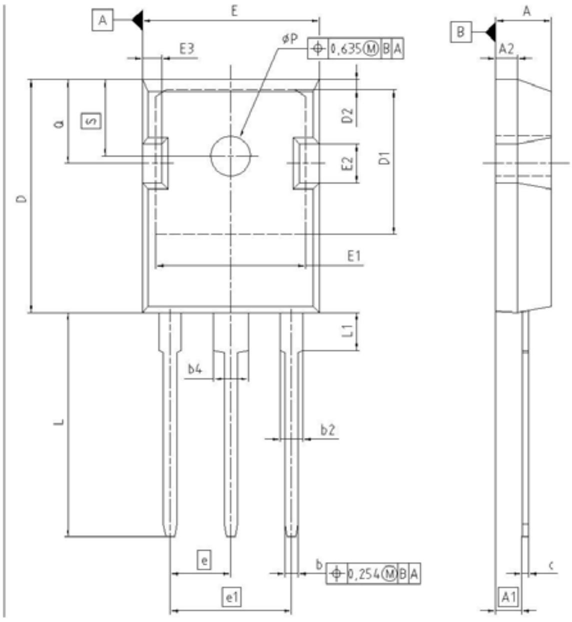

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.903	5.157	0.193	0.203
A1	2.273	2.527	0.092	0.096
A2	1.853	2.107	0.075	0.081
b	1.073	1.327	0.047	0.052
b2	1.903	2.386	0.075	0.094
b4	2.870	3.454	0.113	0.136
c	0.549	0.752	0.024	0.030
D	20.823	21.077	0.820	0.830
D1	17.323	17.831	0.682	0.702
D2	1.063	1.317	0.042	0.052
E	15.773	16.027	0.621	0.631
E1	13.893	14.147	0.547	0.557
E2	3.683	3.937	0.145	0.155
E3	1.683	1.937	0.066	0.076
e	5.450		0.215	
e1	10.900		0.430	
N	3		3	
L	20.053	20.307	0.789	0.799
L1	4.168	4.472	0.164	0.176
øP	3.559	3.661	0.140	0.144
Q	5.493	5.747	0.216	0.226
S	6.043	6.297	0.238	0.248

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