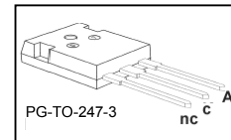


## Fast Switching EmCon Diode

**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	$V_{RRM}$	$I_F$	$V_{F, T_J=25^\circ C}$	$T_{j,max}$	Marking	Package
IDW100E60	600V	100A	1.65V	175°C	D100E60	PG-TO-247-3

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Repetitive peak reverse voltage	$V_{RRM}$	600	V
Continuous forward current	$I_F$		A
$T_C = 25^\circ C$		150	
$T_C = 90^\circ C$		104	
$T_C = 100^\circ C$		96	
Surge non repetitive forward current	$I_{FSM}$	400	A
$T_C = 25^\circ C, t_p = 10 \text{ ms, sine halfwave}$			
Maximum repetitive forward current	$I_{FRM}$	300	A
$T_C = 25^\circ C, t_p \text{ limited by } t_{j,max}, D = 0.5$			
Power dissipation	$P_{tot}$		W
$T_C = 25^\circ C$		375	
$T_C = 90^\circ C$		212	
$T_C = 100^\circ C$		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
<b>Characteristic</b>				
Thermal resistance, junction – case	$R_{thJC}$		0.40	K/W
Thermal resistance, junction – ambient	$R_{thJA}$		40	

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

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	

**Static Characteristic**

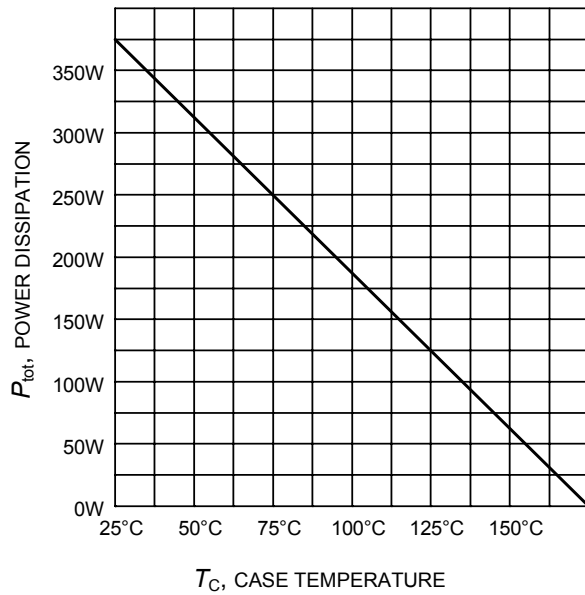
Collector-emitter breakdown voltage	$V_{RRM}$	$I_R=0.25\text{mA}$	600	-	-	V
Diode forward voltage	$V_F$	$I_F=100\text{A}$ $T_j=25^\circ\text{C}$ $T_j=175^\circ\text{C}$	-	1.65	2.0	
Reverse leakage current	$I_R$	$V_R=600\text{V}$ $T_j=25^\circ\text{C}$ $T_j=175^\circ\text{C}$	-	-	40	$\mu\text{A}$
			-	-	1000	

**Dynamic Electrical Characteristics**

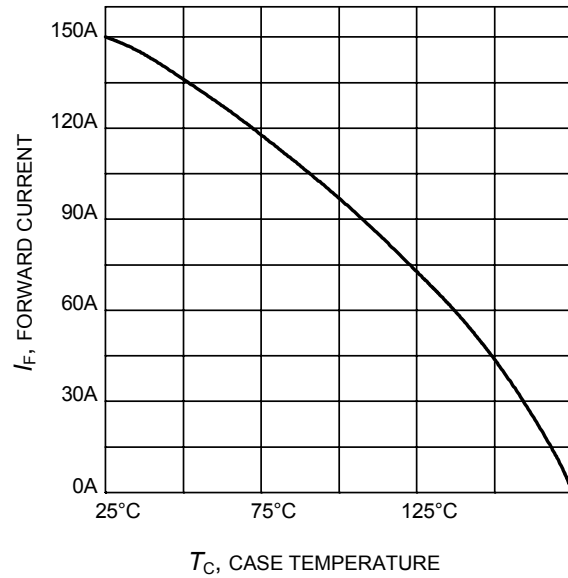
Diode reverse recovery time	$t_{rr}$	$T_j=25^\circ\text{C}$	-	120	-	ns
Diode reverse recovery charge	$Q_{rr}$	$V_R=400\text{V}$ ,	-	3.6	-	$\mu\text{C}$
Diode peak reverse recovery current	$I_{rr}$	$I_F=100\text{A}$ ,	-	49.5	-	A
Diode peak rate of fall of reverse recovery current during $t_b$	$dl_{rr}/dt$	$dl_F/dt=1200\text{A}/\mu\text{s}$	-	750	-	$\text{A}/\mu\text{s}$

Diode reverse recovery time	$t_{rr}$	$T_j=125^\circ\text{C}$	-	168	-	ns
Diode reverse recovery charge	$Q_{rrm}$	$V_R=400\text{V}$ ,	-	5.8	-	$\mu\text{C}$
Diode peak reverse recovery current	$I_{rr}$	$I_F=100\text{A}$ ,	-	61.6	-	A
Diode peak rate of fall of reverse recovery current during $t_b$	$dl_{rr}/dt$	$dl_F/dt=1200\text{A}/\mu\text{s}$	-	705	-	$\text{A}/\mu\text{s}$

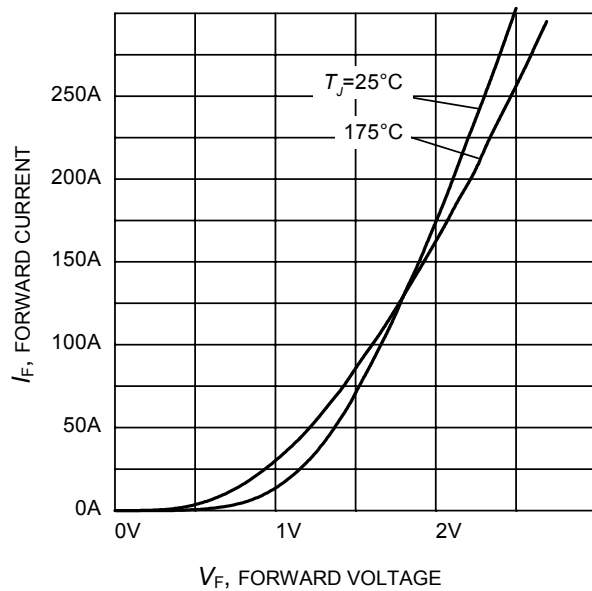
Diode reverse recovery time	$t_{rr}$	$T_j=175^\circ\text{C}$	-	200	-	ns
Diode reverse recovery charge	$Q_{rrm}$	$V_R=400\text{V}$ ,	-	7.8	-	$\mu\text{C}$
Diode peak reverse recovery current	$I_{rr}$	$I_F=100\text{A}$ ,	-	67.0	-	A
Diode peak rate of fall of reverse recovery current during $t_b$	$dl_{rr}/dt$	$dl_F/dt=1200\text{A}/\mu\text{s}$	-	650	-	$\text{A}/\mu\text{s}$



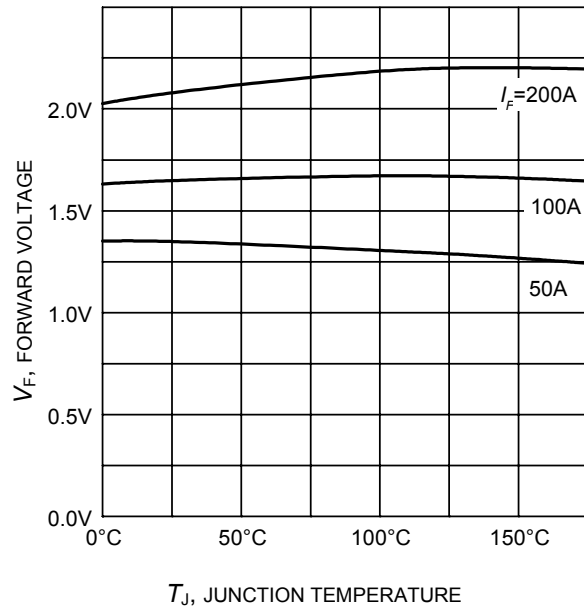
**Figure 1. Power dissipation as a function of case temperature**  
( $T_j \leq 175^\circ\text{C}$ )



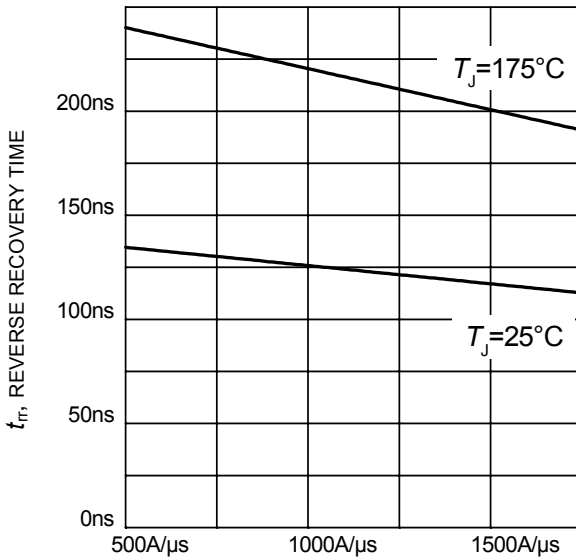
**Figure 2. Diode forward current as a function of case temperature**  
( $T_j \leq 175^\circ\text{C}$ )



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

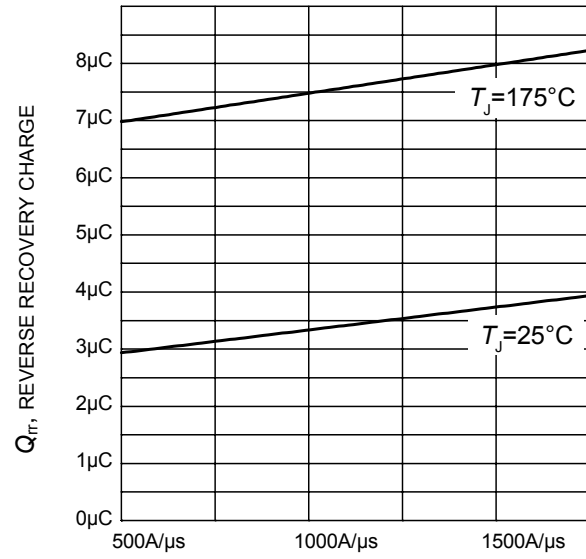


**Figure 4. Typical diode forward voltage as a function of junction temperature**



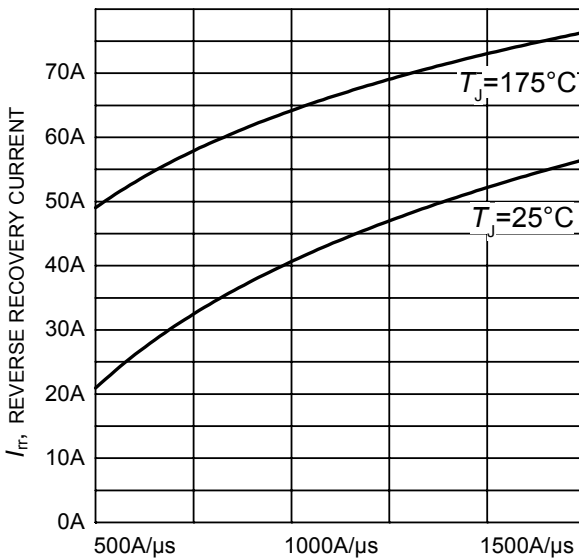
$di_f/dt$ , DIODE CURRENT SLOPE

**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)



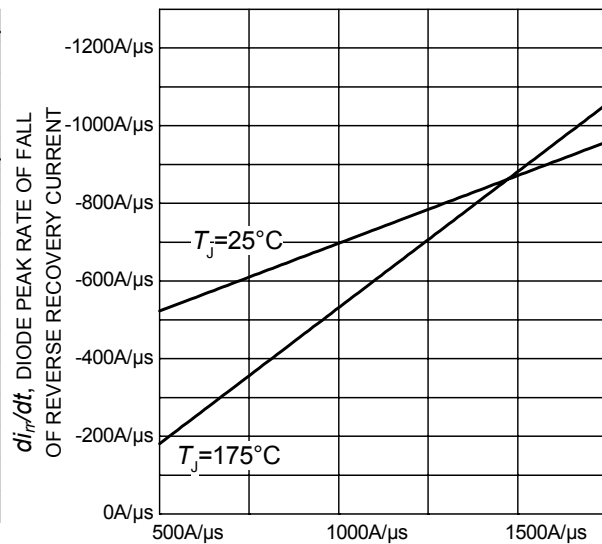
$di_f/dt$ , DIODE CURRENT SLOPE

**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)



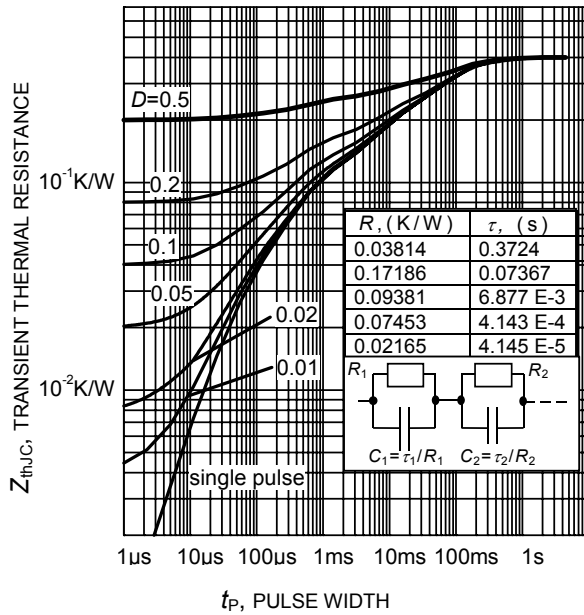
$di_f/dt$ , DIODE CURRENT SLOPE

**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)



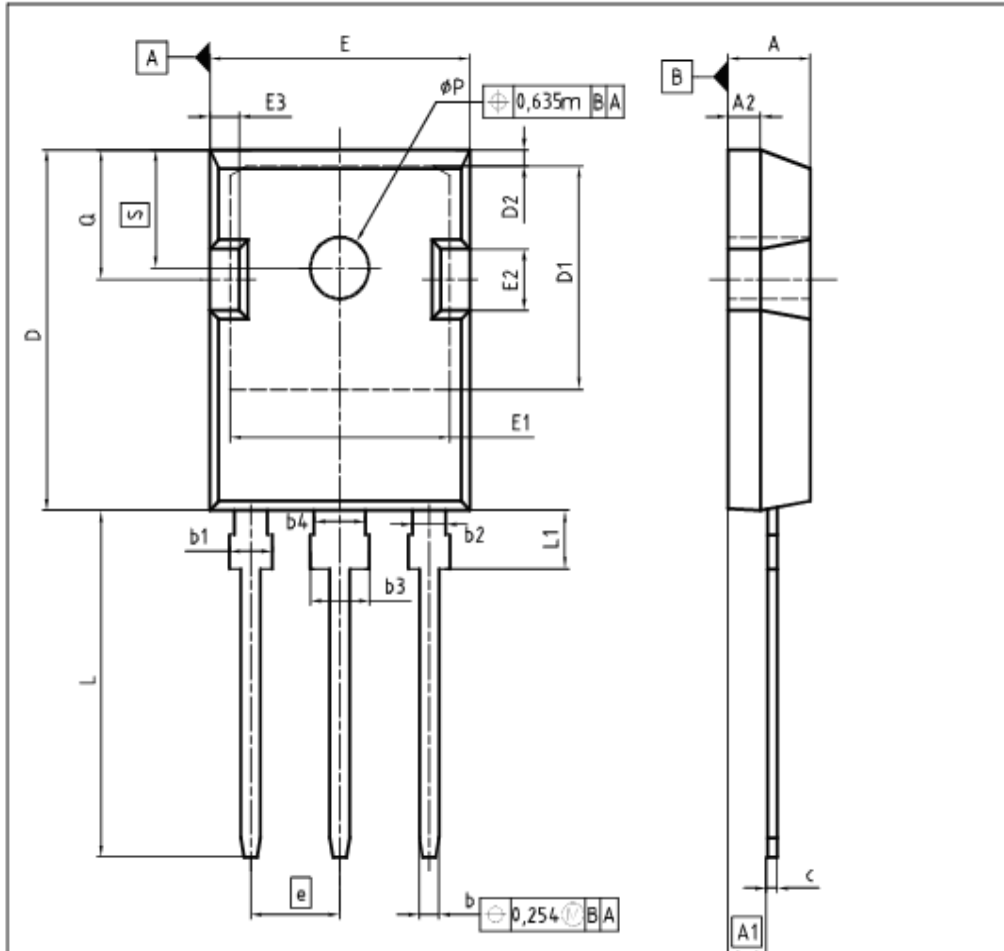
$di_f/dt$ , DIODE CURRENT SLOPE

**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**  
 ( $D=t_p/T$ )

T0247-3



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.83	5.21	0.180	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		0.214	
N	3		3	
L	19.80	20.32	0.780	0.800
L1	4.10	4.47	0.161	0.176
$\phi P$	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

EUROPEAN PROJECTION

ISSUE DATE  
01-10-2009

REVISION  
04

**Published by**  
**Infineon Technologies AG**  
**81726 Munich, Germany**  
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