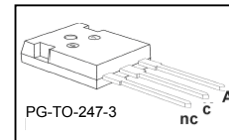


Fast Switching EmCon Diode

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	$V_F, T_J=25^\circ\text{C}$	$T_{J,max}$	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	150	A
$T_C = 25^\circ\text{C}$		104	
$T_C = 90^\circ\text{C}$		96	
$T_C = 100^\circ\text{C}$			
Surge non repetitive forward current	I_{FSM}	400	A
$T_C = 25^\circ\text{C}$, $t_p = 10$ ms, sine halfwave			
Maximum repetitive forward current	I_{FRM}	300	A
$T_C = 25^\circ\text{C}$, t_p limited by $t_{j,max}$, $D = 0.5$			
Power dissipation	P_{tot}	375	W
$T_C = 25^\circ\text{C}$		212	
$T_C = 90^\circ\text{C}$		198	
$T_C = 100^\circ\text{C}$			
Operating junction and storage temperature	T_J, T_{stg}	-55...+175	°C
Soldering temperature	T_S	260	°C
1.6mm (0.063 in.) from case for 10 s			

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 $T_j = 25^\circ\text{C}$, 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	$I_F = 100\text{A}$	-	1.65	2.0	
		$T_j = 25^\circ\text{C}$ $T_j = 175^\circ\text{C}$	-	1.65	-	
Reverse leakage current	I_R	$V_R = 600\text{V}$	-	-	40	μA
		$T_j = 25^\circ\text{C}$ $T_j = 175^\circ\text{C}$	-	-	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	-	μC
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	-	μC
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	-	μC
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	-	$\text{A}/\mu\text{s}$

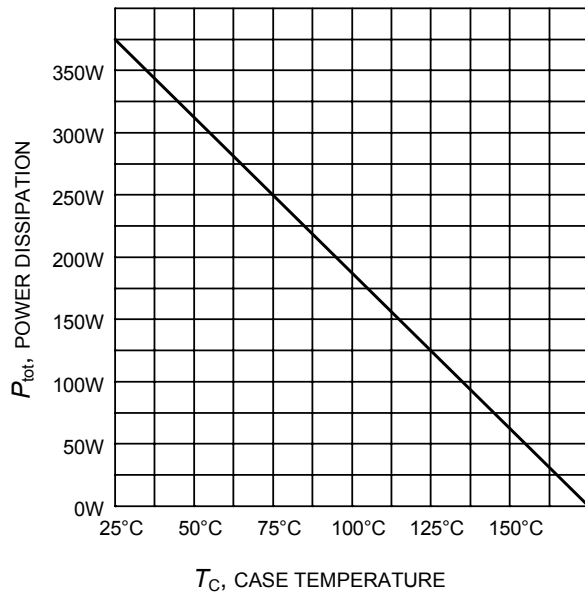


Figure 1. Power dissipation as a function of case temperature
($T_j \leq 175^\circ\text{C}$)

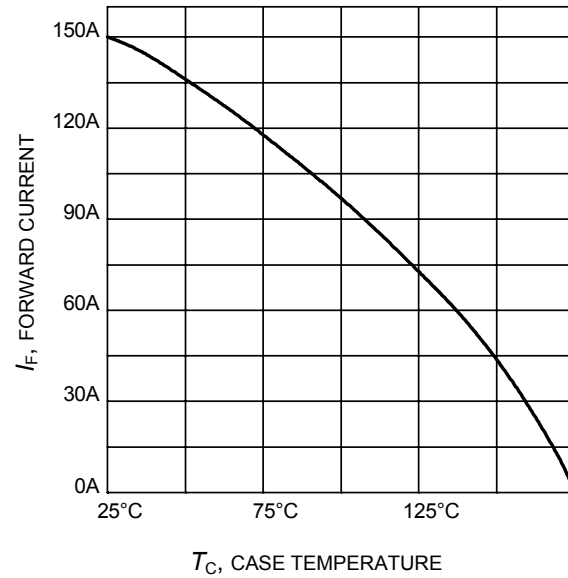


Figure 2. Diode forward current as a function of case temperature
($T_j \leq 175^\circ\text{C}$)

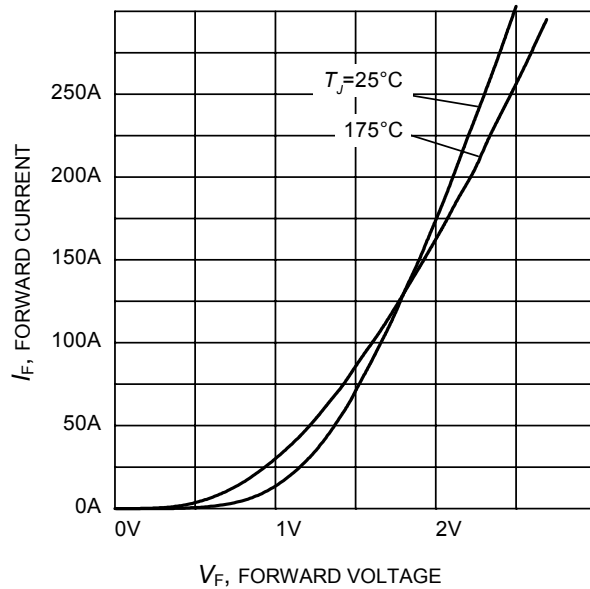


Figure 3. Typical diode forward current as a function of forward voltage

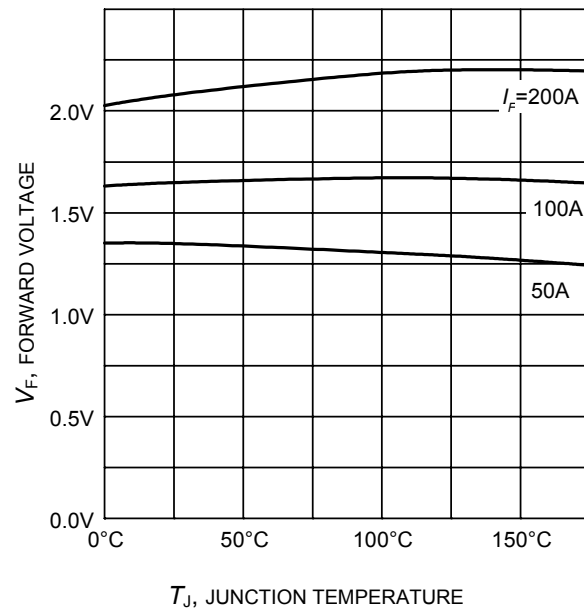


Figure 4. Typical diode forward voltage as a function of junction temperature

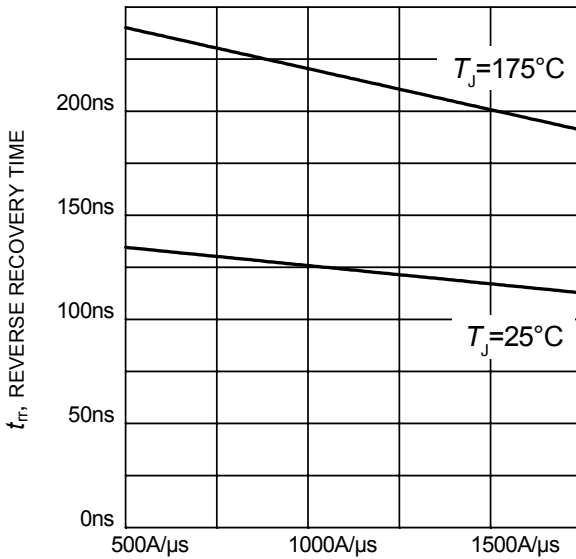

 di_F/dt , DIODE CURRENT SLOPE

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

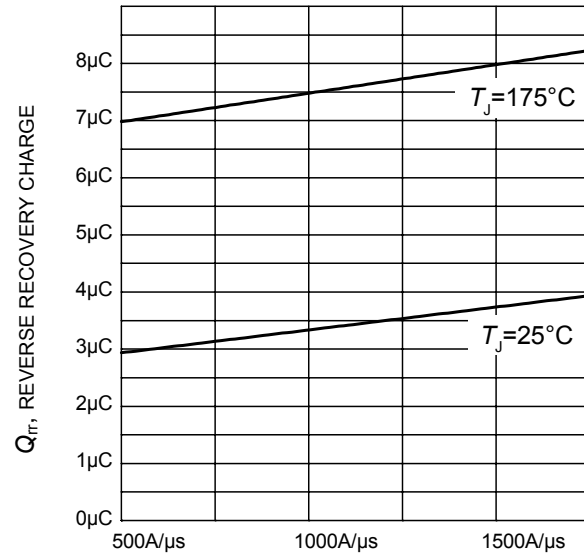

 di_F/dt , DIODE CURRENT SLOPE

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

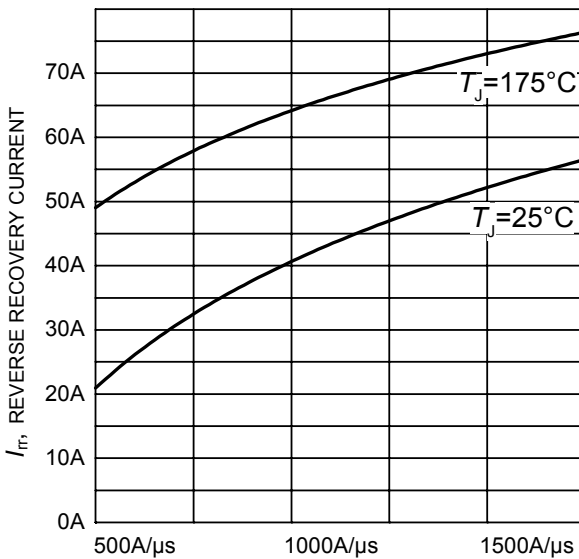

 di_F/dt , DIODE CURRENT SLOPE

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

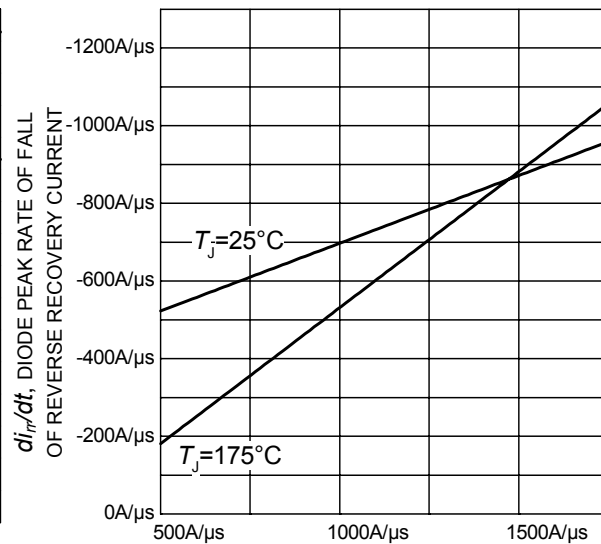

 di_F/dt , DIODE CURRENT SLOPE

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

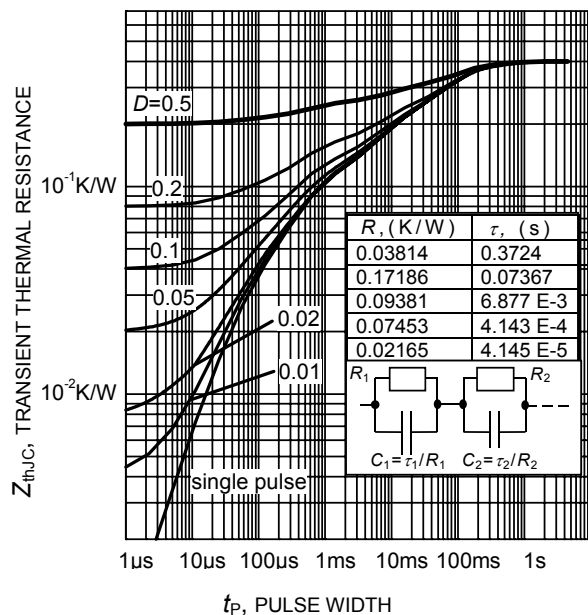
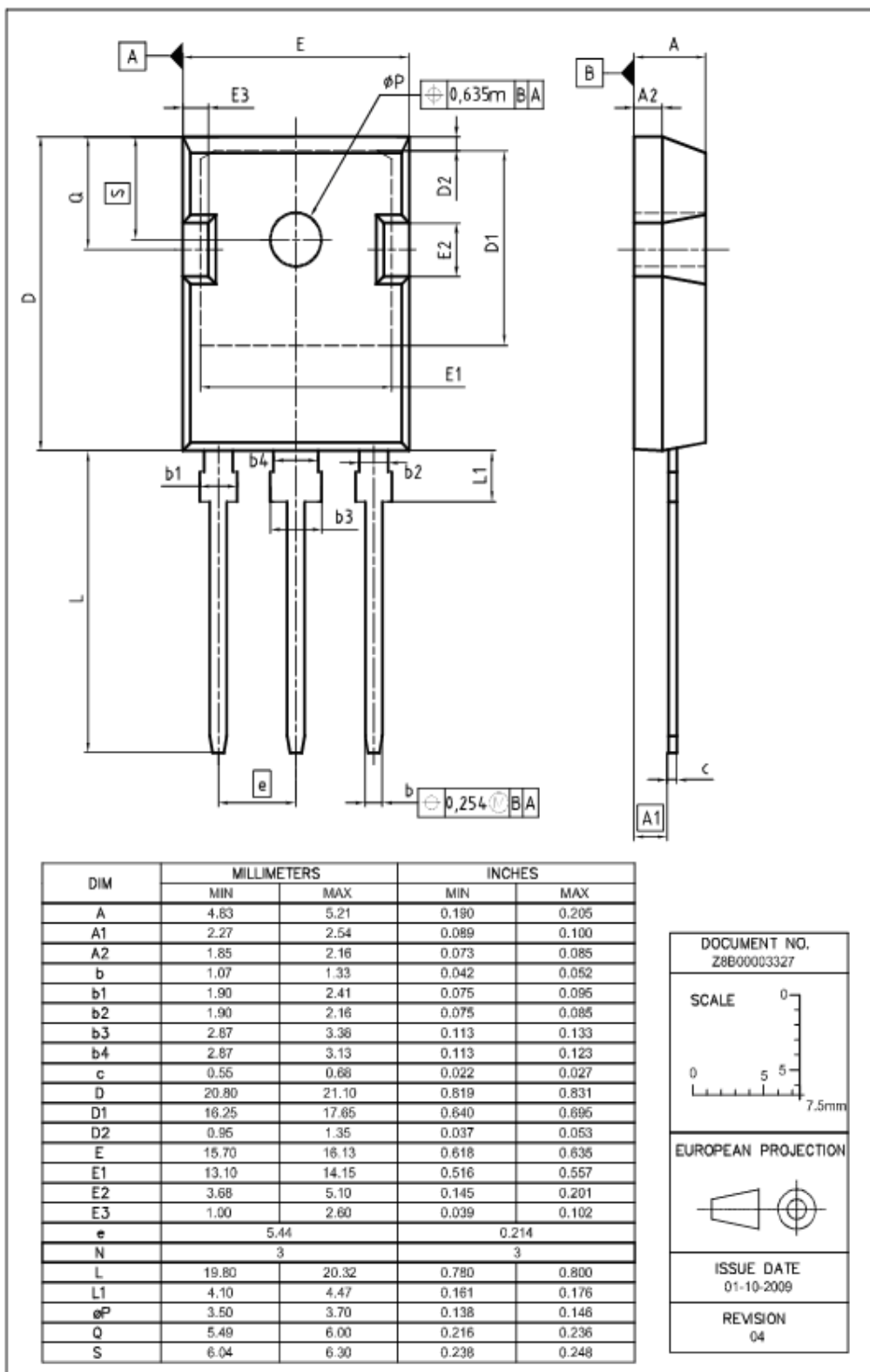


Figure 9. Diode transient thermal impedance as a function of pulse width
 $(D=t_p/T)$

T0247-3



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