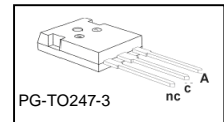
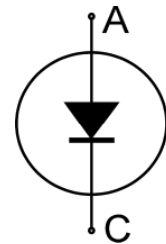


## Fast Switching Emitter Controlled Diode



### Features:

- 600V 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

Datasheet IDW75E60

Type	$V_{RRM}$	$I_F$	$V_{F,T_j=25^\circ C}$	$T_{j,max}$	Marking	Package
IDW75E60	600V	75A	1.65V	175°C	D75E60	PG-TO247-3

### Maximum Ratings

Parameter	Symbol	Value	Unit
Repetitive peak reverse voltage	$V_{RRM}$	600	V
Continuous forward current	$I_F$	120	A
$T_C = 25^\circ C$		82	
$T_C = 90^\circ C$		75	
Surge non repetitive forward current	$I_{FSM}$	220	A
$T_C = 25^\circ C, t_p = 10 \text{ ms, sine halfwave}$			
Maximum repetitive forward current	$I_{FRM}$	225	A
$T_C = 25^\circ C, t_p \text{ limited by } t_{j,max}, D = 0.5$			
Power dissipation	$P_{tot}$	300	W
$T_C = 25^\circ C$		170	
$T_C = 90^\circ C$		150	
$T_C = 100^\circ C$			
Operating junction temperature	$T_j$	-40...+175	°C
Storage temperature	$T_{stg}$	-55...+150	
Soldering temperature	$T_s$	260	
1.6mm (0.063 in.) from case for 10 s			

**Thermal Resistance**

Parameter	Symbol	Conditions	Max. Value	Unit
<b>Characteristic</b>				
Thermal resistance, junction – case	$R_{thJC}$		0.5	K/W
Thermal resistance, junction – ambient	$R_{thJA}$		40	

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

Parameter	Symbol	Conditions	Value			Unit
			min.	typ.	max.	

**Static Characteristic**

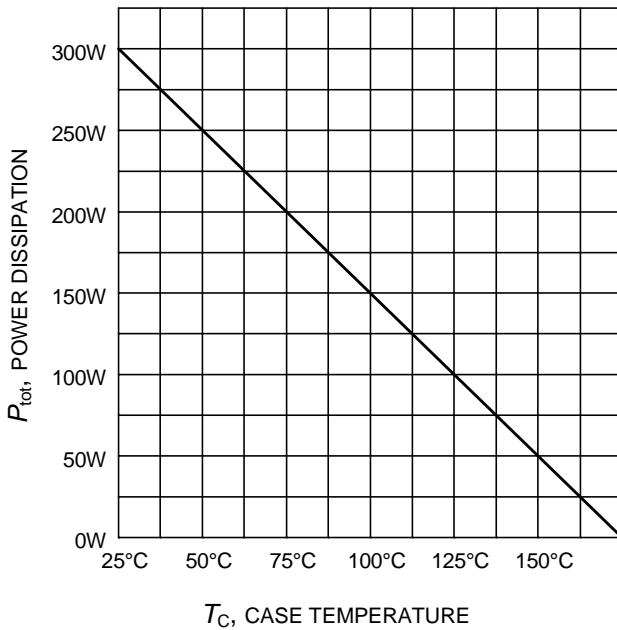
Collector-emitter breakdown voltage	$V_{RRM}$	$I_R=0.25\text{ mA}$	600	-	-	V
Diode forward voltage	$V_F$	$I_F=75\text{ A}$	-	1.65	2.0	
		$T_j=25\text{ °C}$	-	1.65	-	
Reverse leakage current	$I_R$	$V_R=600\text{ V}$	-	-	40	$\mu\text{ A}$
		$T_j=25\text{ °C}$	-	-	2500	
		$T_j=175\text{ °C}$	-	-		

**Dynamic Electrical Characteristics**

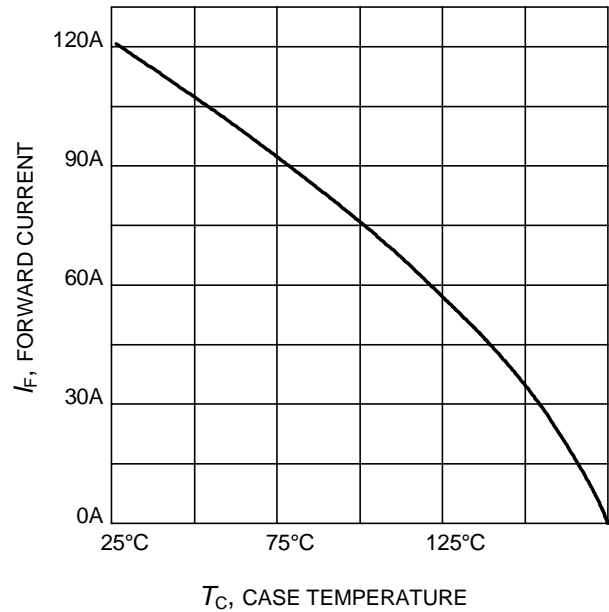
Diode reverse recovery time	$t_{rr}$	$T_j=25\text{ °C}$	-	121	-	ns
Diode reverse recovery charge	$Q_{rr}$	$V_R=400\text{ V}, I_F=75\text{ A},$	-	2.4	-	$\mu\text{ C}$
Diode peak reverse recovery current	$I_{rr}$	$dI_F/dt=1460\text{ A}/\mu\text{ s}$	-	38.5	-	A
Diode peak rate of fall of reverse recovery current during $t_b$	$dI_{rr}/dt$		-	921	-	$\text{A}/\mu\text{ s}$

Diode reverse recovery time	$t_{rr}$	$T_j=125\text{ °C}$	-	155	-	ns
Diode reverse recovery charge	$Q_{rrm}$	$V_R=400\text{ V}, I_F=75\text{ A},$	-	4.4	-	$\mu\text{ C}$
Diode peak reverse recovery current	$I_{rr}$	$dI_F/dt=1460\text{ A}/\mu\text{ s}$	-	46.6	-	A
Diode peak rate of fall of reverse recovery current during $t_b$	$dI_{rr}/dt$		-	960	-	$\text{A}/\mu\text{ s}$

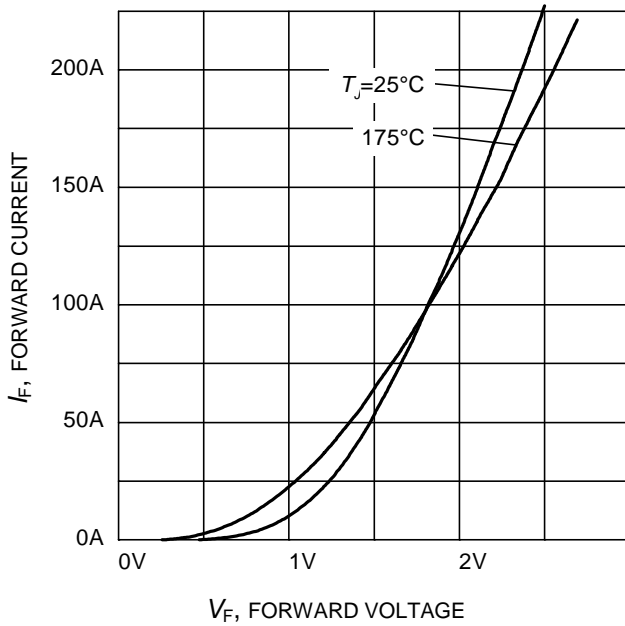
Diode reverse recovery time	$t_{rr}$	$T_j=175\text{ °C}$	-	182	-	ns
Diode reverse recovery charge	$Q_{rrm}$	$V_R=400\text{ V}, I_F=75\text{ A},$	-	5.8	-	$\mu\text{ C}$
Diode peak reverse recovery current	$I_{rr}$	$dI_F/dt=1460\text{ A}/\mu\text{ s}$	-	56.2	-	A
Diode peak rate of fall of reverse recovery current during $t_b$	$dI_{rr}/dt$		-	1013	-	$\text{A}/\mu\text{ s}$



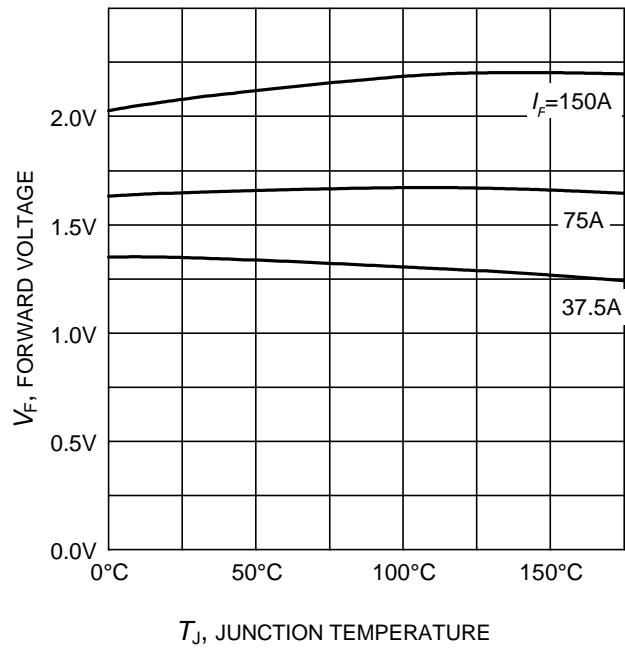
**Figure 1. Power dissipation as a function of case temperature**  
( $T_j \leq 175^\circ\text{C}$ )



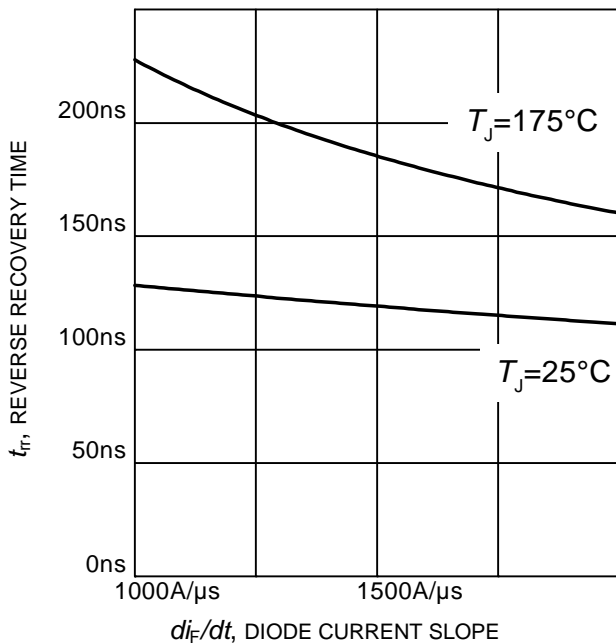
**Figure 2. Diode forward current as a function of case temperature**  
( $T_j \leq 175^\circ\text{C}$ )



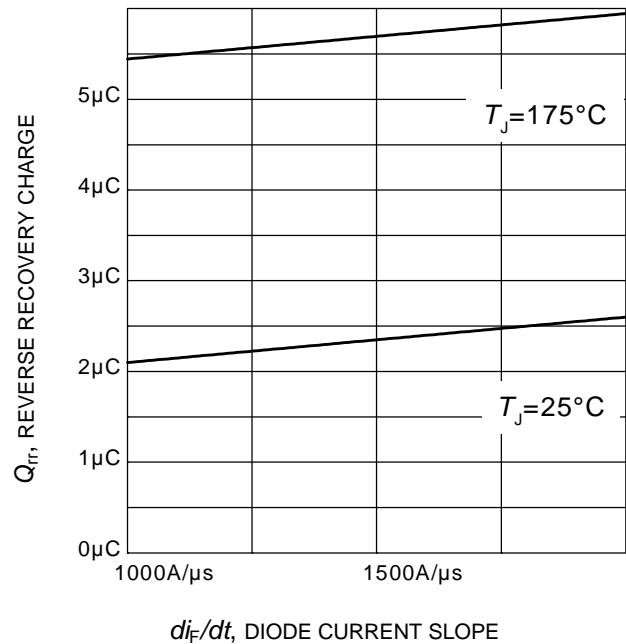
**Figure 3. Typical diode forward current as a function of forward voltage**



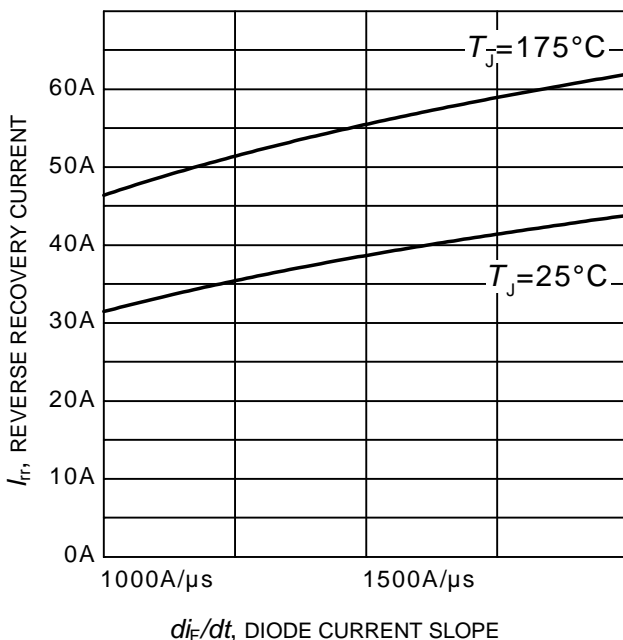
**Figure 4. Typical diode forward voltage as a function of junction temperature**



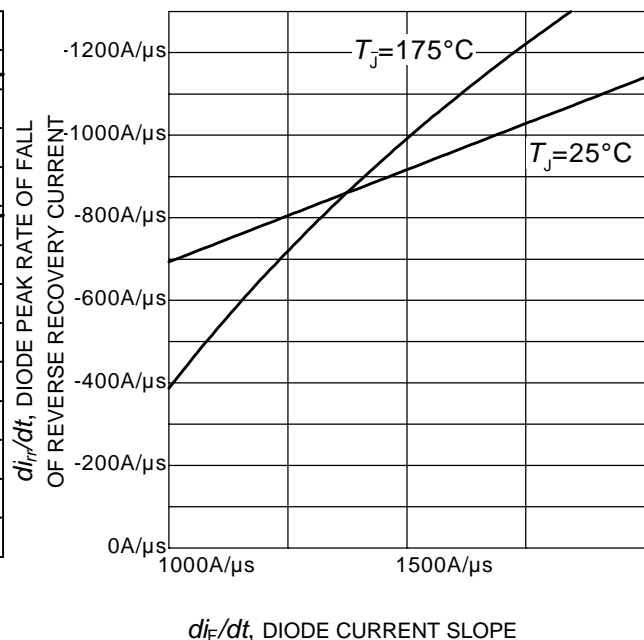
**Figure 5. Typical reverse recovery time as a function of diode current slope**  
 ( $V_R=400V$ ,  $I_F=75A$ ,  
 Dynamic test circuit in Figure E)



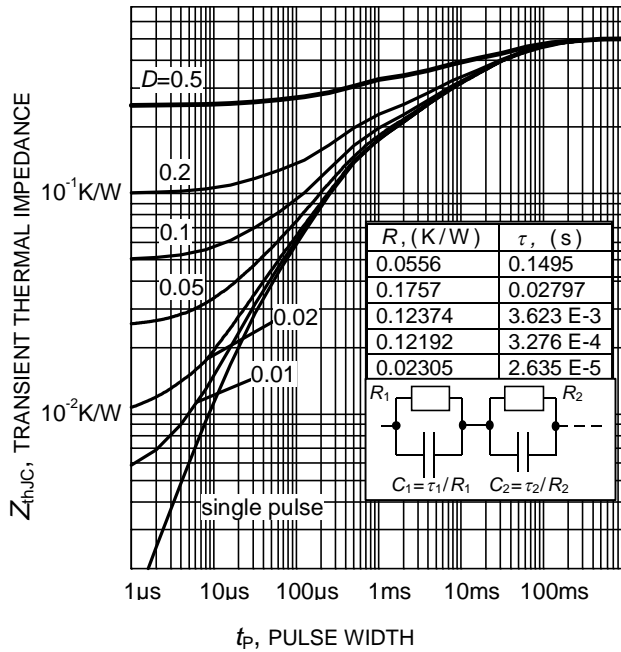
**Figure 6. Typical reverse recovery charge as a function of diode current slope**  
 ( $V_R = 400V$ ,  $I_F = 75A$ ,  
 Dynamic test circuit in Figure E)



**Figure 7. Typical reverse recovery current as a function of diode current slope**  
 ( $V_R = 400V$ ,  $I_F = 75A$ ,  
 Dynamic test circuit in Figure E)

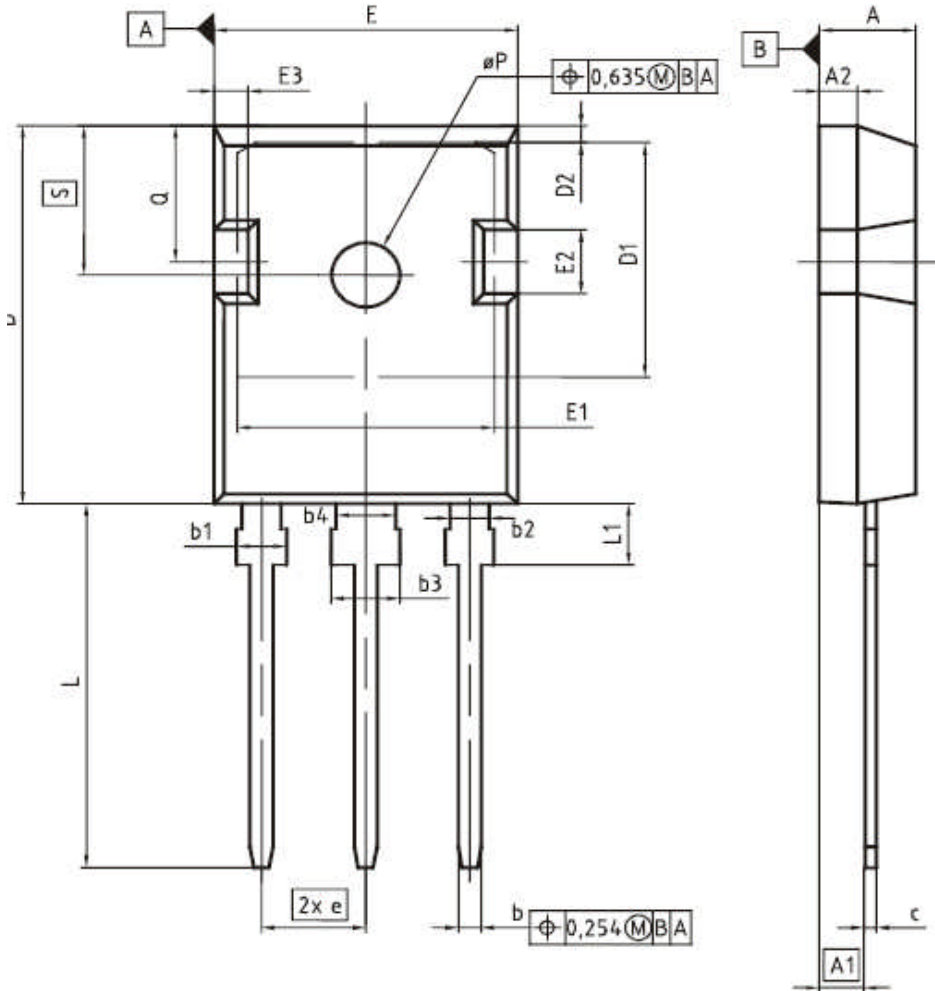


**Figure 8. Typical diode peak rate of fall of reverse recovery current as a function of diode current slope**  
 ( $V_R=400V$ ,  $I_F=75A$ ,  
 Dynamic test circuit in Figure E)



**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
eP	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

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