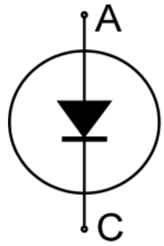
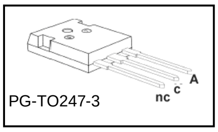
Fast Switching Emitter Controlled Diode



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

Type	V_{RRM}	I_F	$V_{F,Tj=25°C}$	$T_{j,max}$	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 T_C = 25°C T_C = 90°C T_C = 100°C	I_F	120 82 75	A
Surge non repetitive forward current T_C = 25°C, t_p = 10 ms, sine halfwave	I_{FSM}	220	A
Maximum repetitive forward current T_C = 25°C, t_p limited by $t_{j,max}$, D = 0.5	I_{FRM}	225	A
Power dissipation T_C = 25°C T_C = 90°C T_C = 100°C	P_{tot}	300 170 150	W
Operating junction temperature	T_j	-40…+175	°C
Storage temperature	T_{stg}	-55...+150	°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}		0.5	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=75A				
		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	-	-	2500	

Dynamic Electrical Characteristics

Parameter	Symbol	Conditions	min.	typ.	max.	Unit
Diode reverse recovery time	t_{rr}	T_j=25°C	-	121	-	ns
Diode reverse recovery charge	Q_{rr}	V_R=400V, I_F=75A,	-	2.4	-	µC
Diode peak reverse recovery current	I_{rr}	dI_F/dt=1460A/µs	-	38.5	-	A
Diode peak rate of fall of reverse recovery current during t_b	dI_{rr}/dt		-	921	-	A/µs
Diode reverse recovery time	t_{rr}	T_j=125°C	-	155	-	ns
Diode reverse recovery charge	Q_{rrm}	V_R=400V, I_F=75A,	-	4.4	-	µC
Diode peak reverse recovery current	I_{rr}	dI_F/dt=1460A/µs	-	46.6	-	A
Diode peak rate of fall of reverse recovery current during t_b	dI_{rr}/dt		-	960	-	A/µs
Diode reverse recovery time	t_{rr}	T_j=175°C	-	182	-	ns
Diode reverse recovery charge	Q_{rrm}	V_R=400V, I_F=75A,	-	5.8	-	µC
Diode peak reverse recovery current	I_{rr}	dI_F/dt=1460A/µs	-	56.2	-	A
Diode peak rate of fall of reverse recovery current during t_b	dI_{rr}/dt		-	1013	-	A/µs

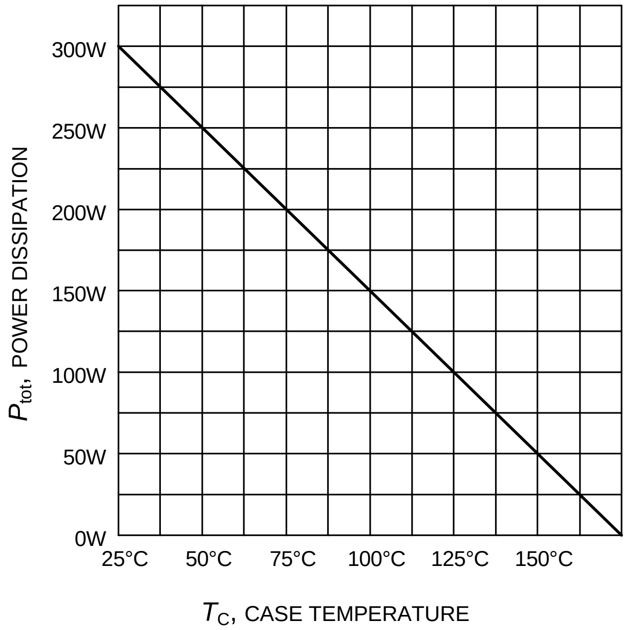


Figure 1. Power dissipation as a function of case temperature
($T_j \leq 175°C$)

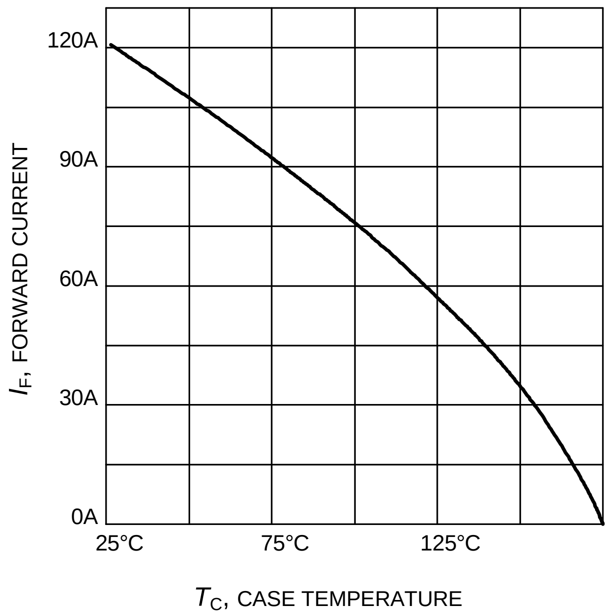


Figure 2. Diode forward current as a function of case temperature
($T_j \leq 175°C$)

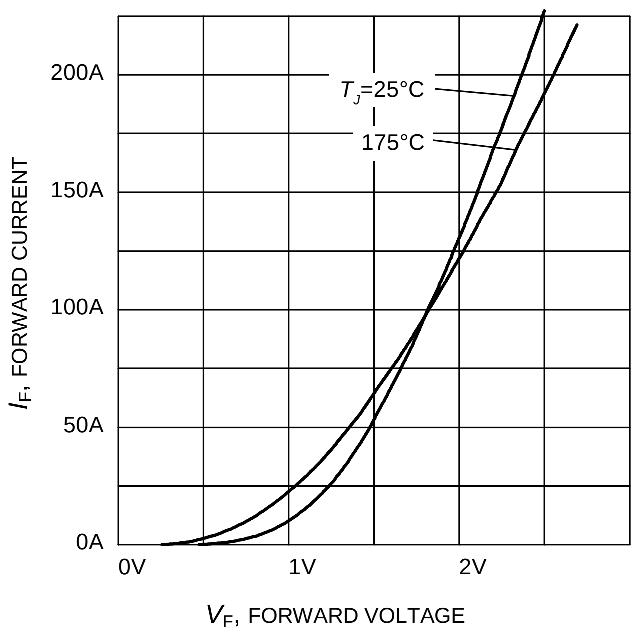


Figure 3. Typical diode forward current as a function of forward voltage

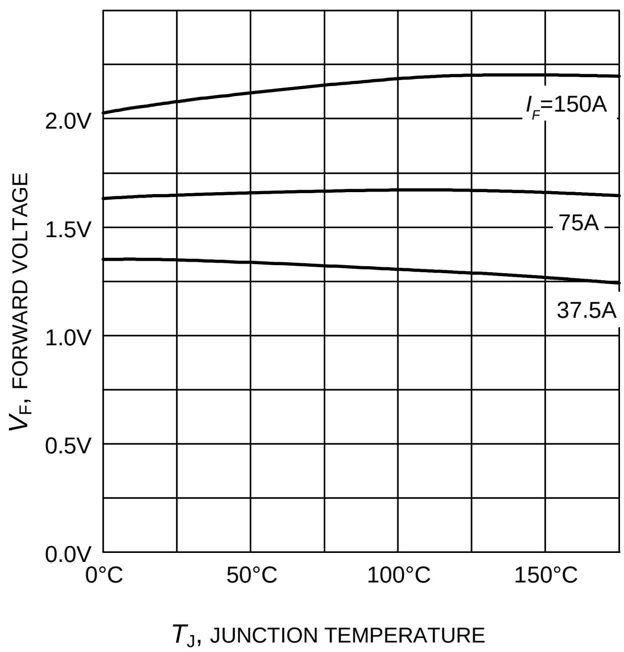


Figure 4. Typical diode forward voltage as a function of junction temperature

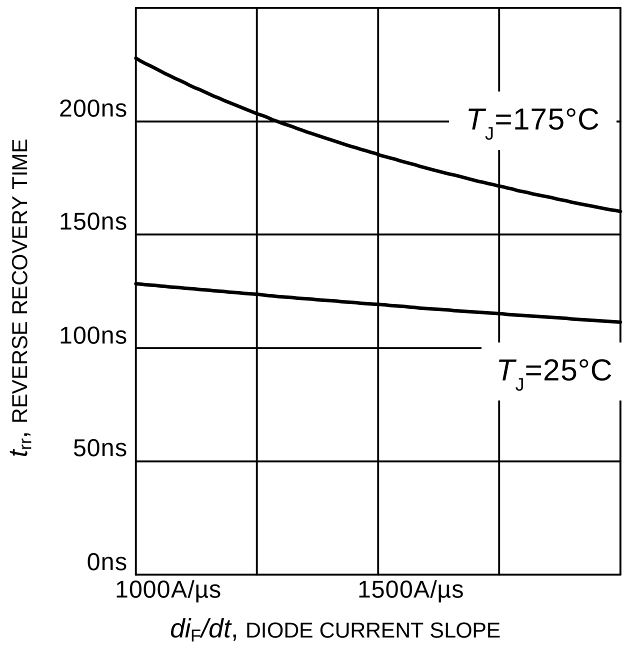


Figure 5. Typical reverse recovery time as a function of diode current slope
(V_R=400V, I_F=75A,
Dynamic test circuit in Figure E)

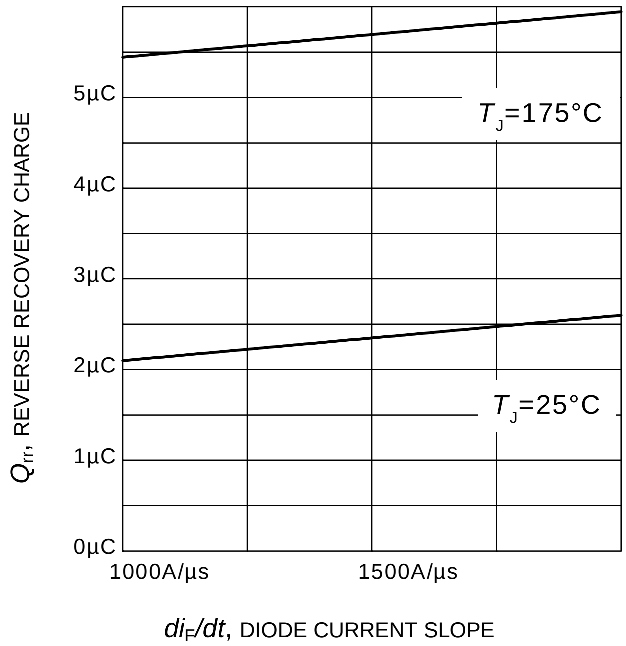


Figure 6. Typical reverse recovery charge as a function of diode current slope
(V_R = 400V, I_F = 75A,
Dynamic test circuit in Figure E)

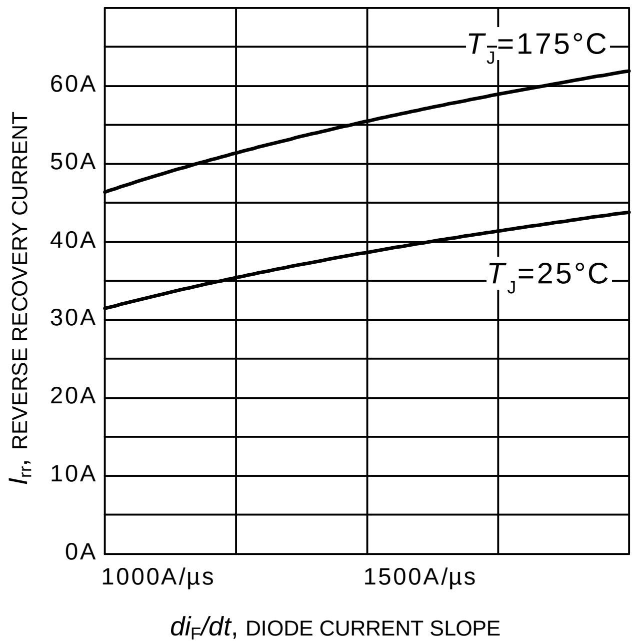


Figure 7. Typical reverse recovery current as a function of diode current slope
(V_R = 400V, I_F = 75A,
Dynamic test circuit in Figure E)

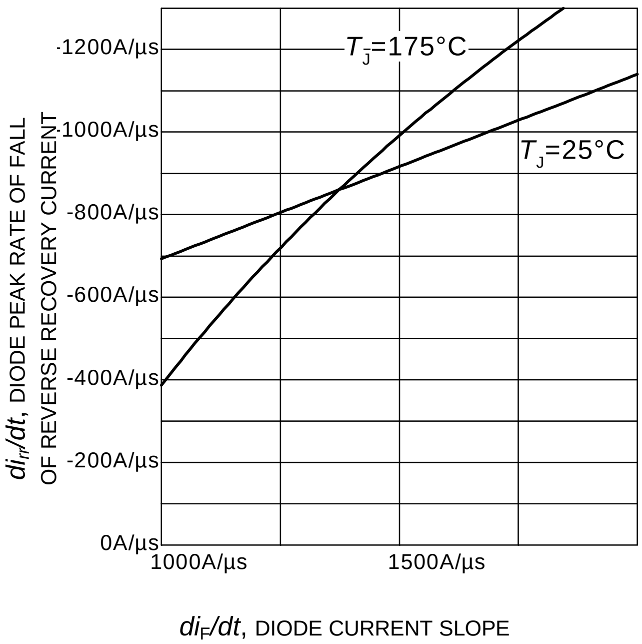


Figure 8. Typical diode peak rate of fall of reverse recovery current as a function of diode current slope
(V_R=400V, I_F=75A,
Dynamic test circuit in Figure E)

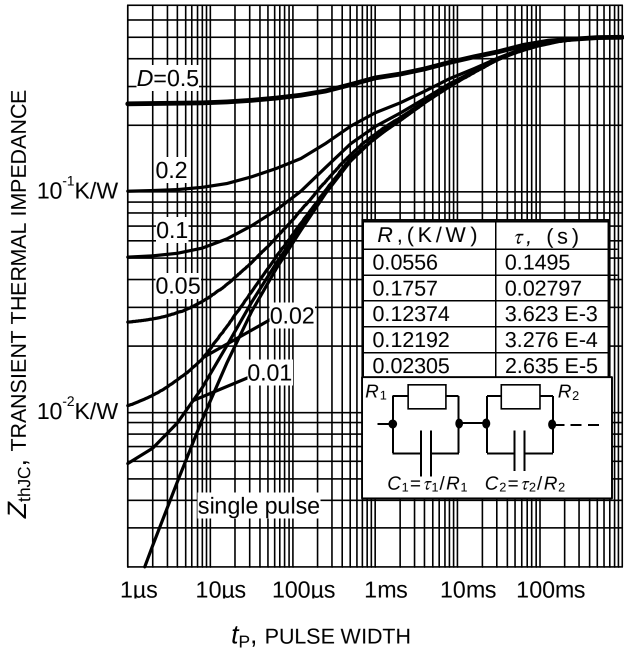
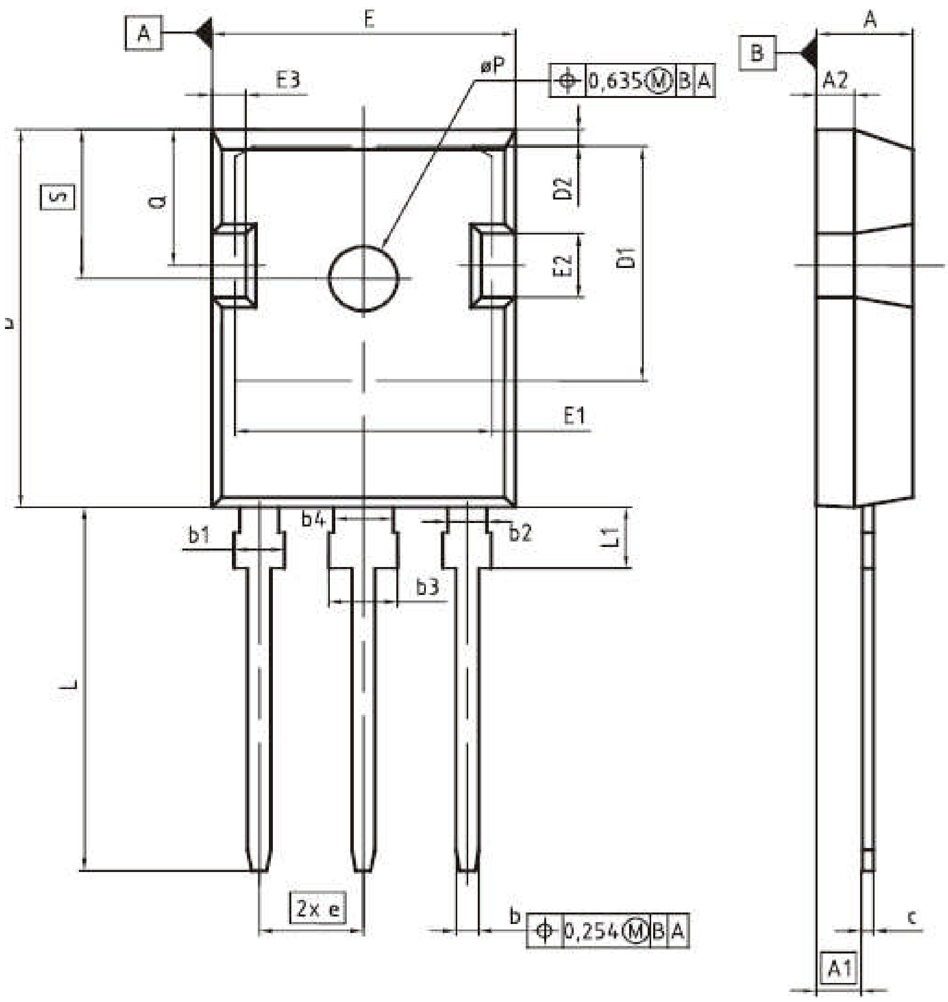


Figure 9. Diode transient thermal impedance as a function of pulse width
($D=t_P/T$)

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
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

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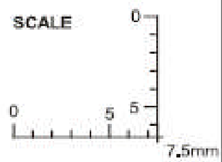
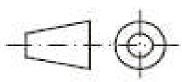
SCALE



EUROPEAN PROJECTION



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