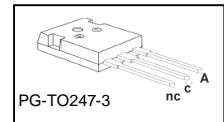
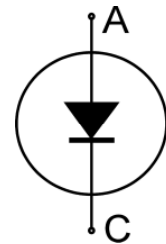


Fast Switching Emitter Controlled Diode



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 |
|--|------------|------------|------------|------|
| Characteristic | | | | |
| Thermal resistance, junction – case | R_{thJC} | | 0.5 | K/W |
| Thermal resistance, junction – ambient | R_{thJA} | | 40 | |

Electrical Characteristic, at $T_j = 25\text{ }^\circ\text{C}$, 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 | $I_F=75\text{A}$ $T_j=25\text{ }^\circ\text{C}$ $T_j=175\text{ }^\circ\text{C}$ | - | 1.65 | 2.0 | |
| Reverse leakage current | I_R | $V_R=600\text{V}$ $T_j=25\text{ }^\circ\text{C}$ $T_j=175\text{ }^\circ\text{C}$ | - | - | 40 | μA |
| | | | - | - | 2500 | |

Dynamic Electrical Characteristics

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

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

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

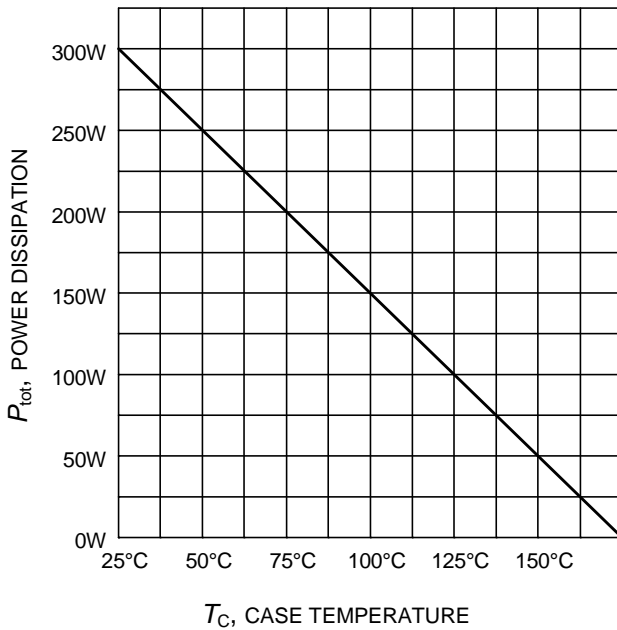


Figure 1. Power dissipation as a function of case temperature
($T_j \leq 175^\circ\text{C}$)

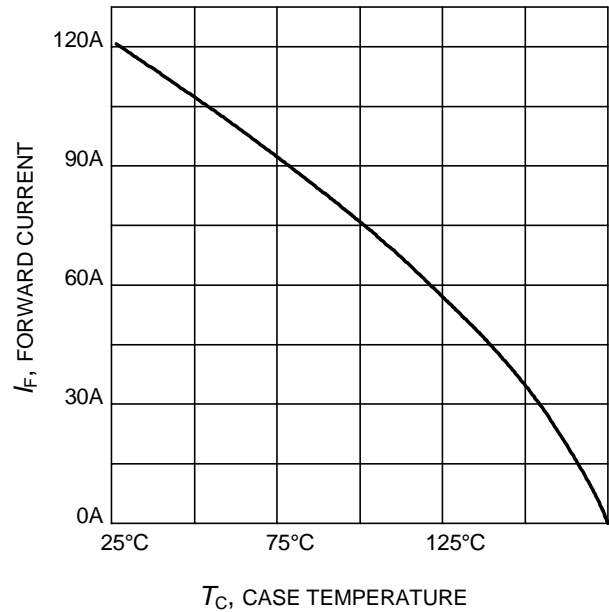


Figure 2. Diode forward current as a function of case temperature
($T_j \leq 175^\circ\text{C}$)

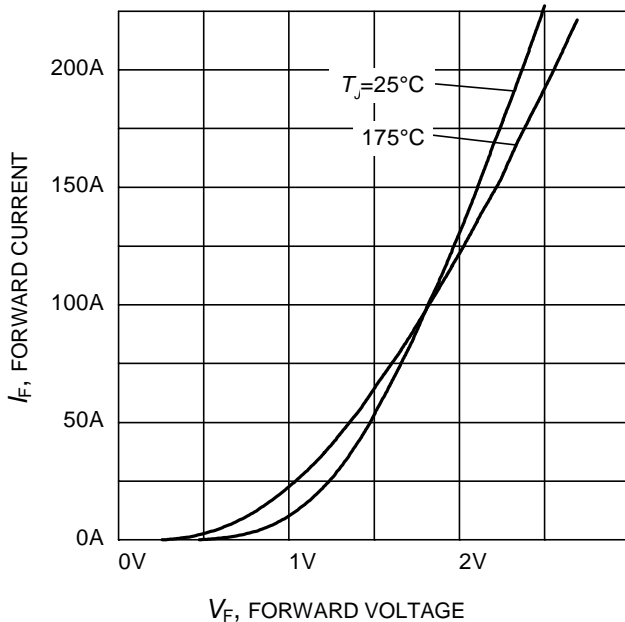


Figure 3. Typical diode forward current as a function of forward voltage

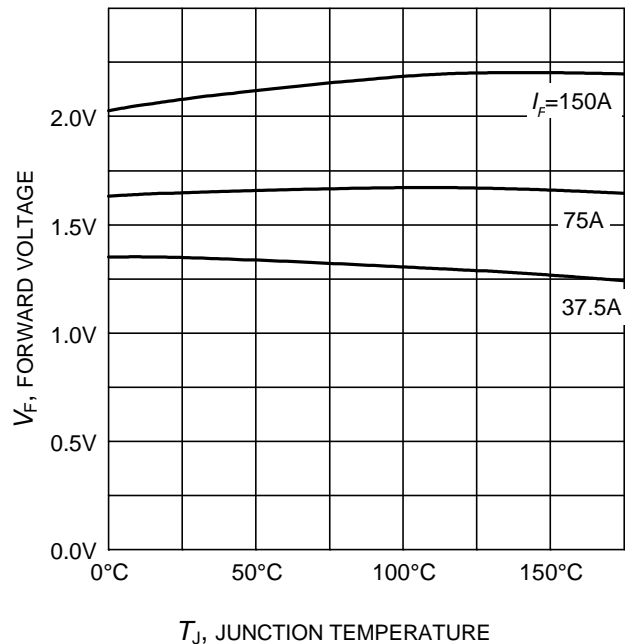


Figure 4. Typical diode forward voltage as a function of junction temperature

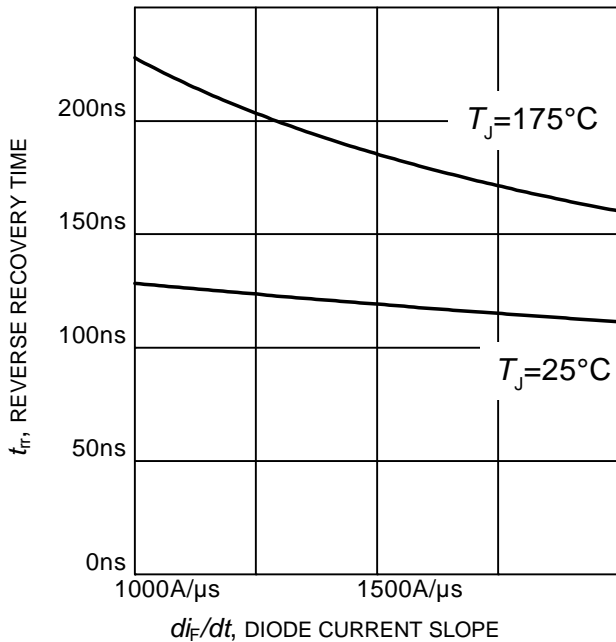


Figure 5. Typical reverse recovery time as a function of diode current slope
 ($V_R=400V$, $I_F=75A$,
 Dynamic test circuit in Figure E)

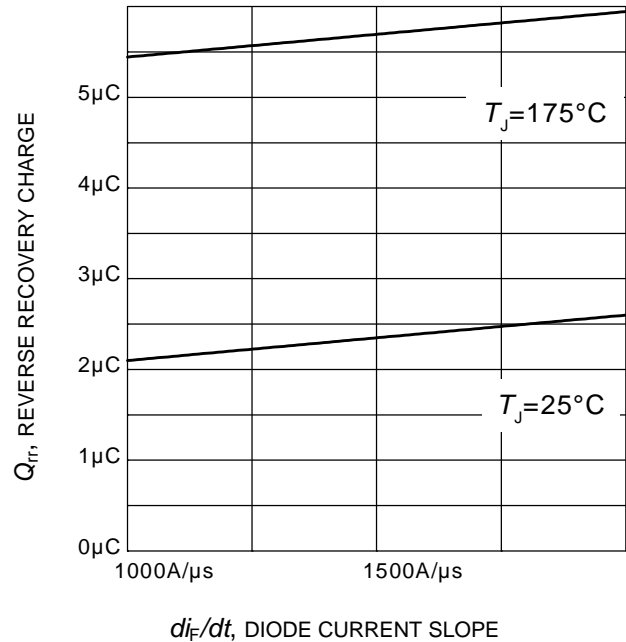


Figure 6. Typical reverse recovery charge as a function of diode current slope
 ($V_R = 400V$, $I_F = 75A$,
 Dynamic test circuit in Figure E)

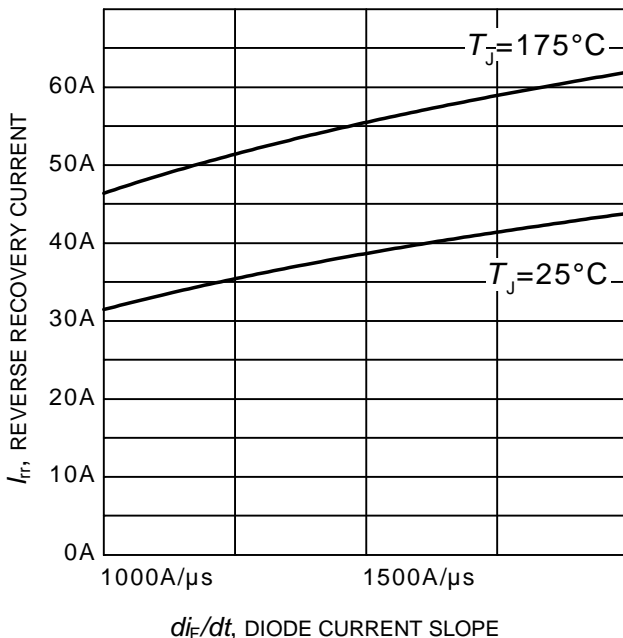


Figure 7. Typical reverse recovery current as a function of diode current slope
 ($V_R = 400V$, $I_F = 75A$,
 Dynamic test circuit in Figure E)

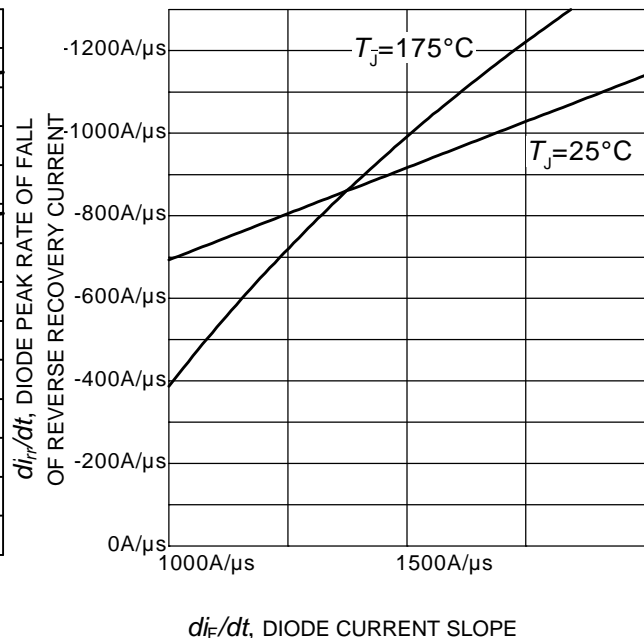


Figure 8. Typical diode peak rate of fall of reverse recovery current as a function of diode current slope
 ($V_R=400V$, $I_F=75A$,
 Dynamic test circuit in Figure E)

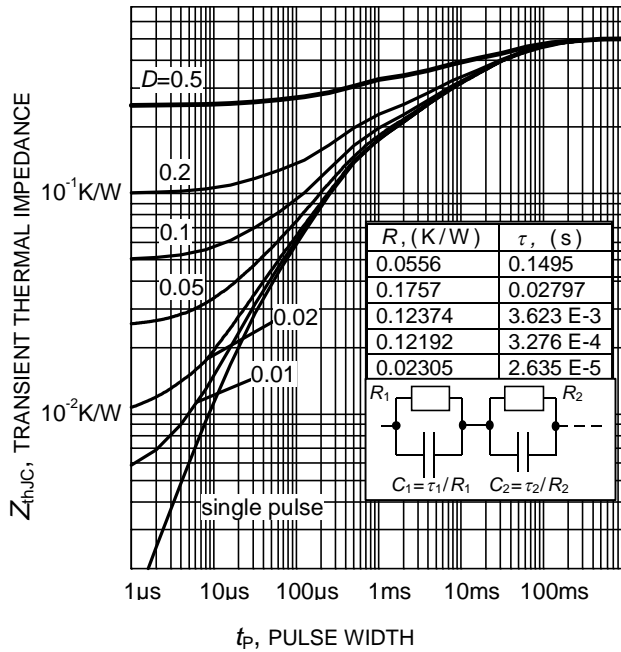
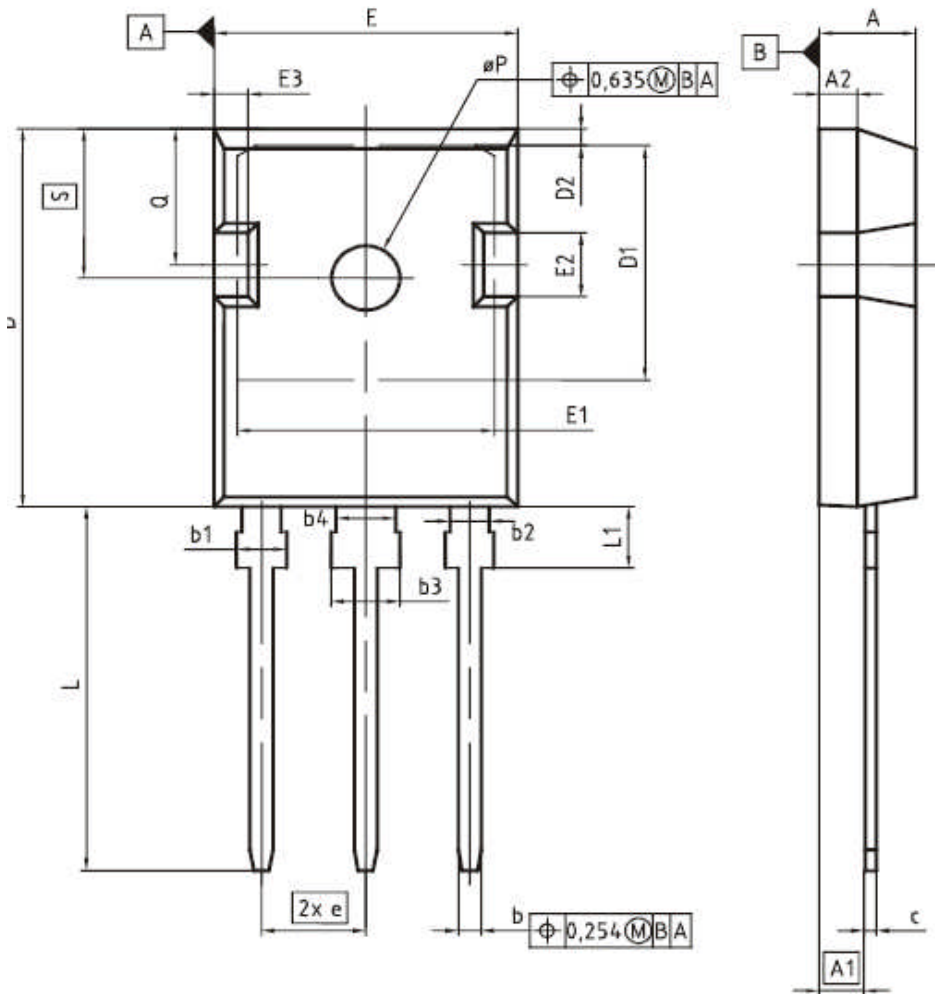


Figure 9. Diode transient thermal impedance as a function of pulse width
 ($D = t_p / T$)

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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