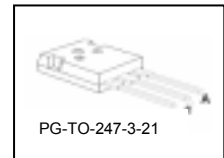


Fast Switching EmCon Diode

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-247-3-21 |

Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|----------------|------------|------|
| Repetitive peak reverse voltage | V_{RRM} | 600 | V |
| Continuous forward current | I_F | | A |
| $T_C = 25^\circ\text{C}$ | | 150 | |
| $T_C = 90^\circ\text{C}$ | | 104 | |
| $T_C = 100^\circ\text{C}$ | | 96 | |
| 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} | | W |
| $T_C = 25^\circ\text{C}$ | | 375 | |
| $T_C = 90^\circ\text{C}$ | | 212 | |
| $T_C = 100^\circ\text{C}$ | | 198 | |
| 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 $T_j = 25\text{ }^\circ\text{C}$, 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 | $I_F=100\text{A}$ $T_j=25\text{ }^\circ\text{C}$ $T_j=175\text{ }^\circ\text{C}$ | - | 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 |
| | | | - | - | 1000 | |

Dynamic Electrical Characteristics

| | | | | | | |
|--|--------------|------------------------------------|---|------|---|------------------------|
| Diode reverse recovery time | t_{rr} | $T_j=25\text{ }^\circ\text{C}$ | - | 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} | $T_j=125\text{ }^\circ\text{C}$ | - | 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} | $T_j=175\text{ }^\circ\text{C}$ | - | 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 | - | $\text{A}/\mu\text{s}$ |

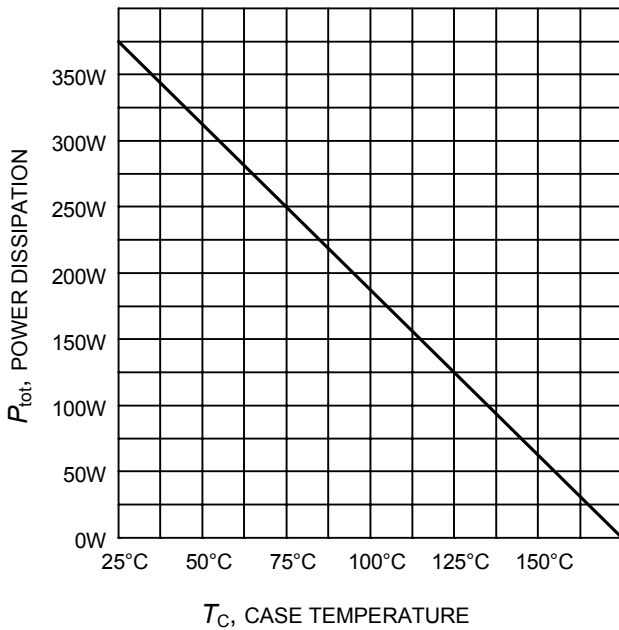


Figure 1. Power dissipation as a function of case temperature
($T_j \leq 175^\circ\text{C}$)

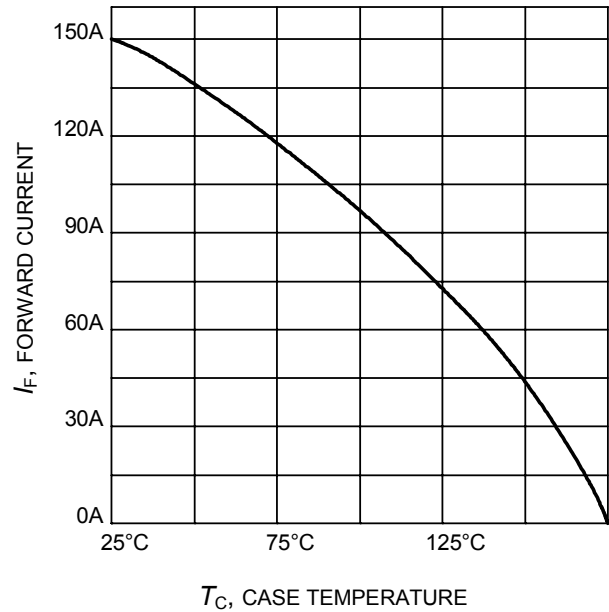


Figure 2. Diode forward current as a function of case temperature
($T_j \leq 175^\circ\text{C}$)

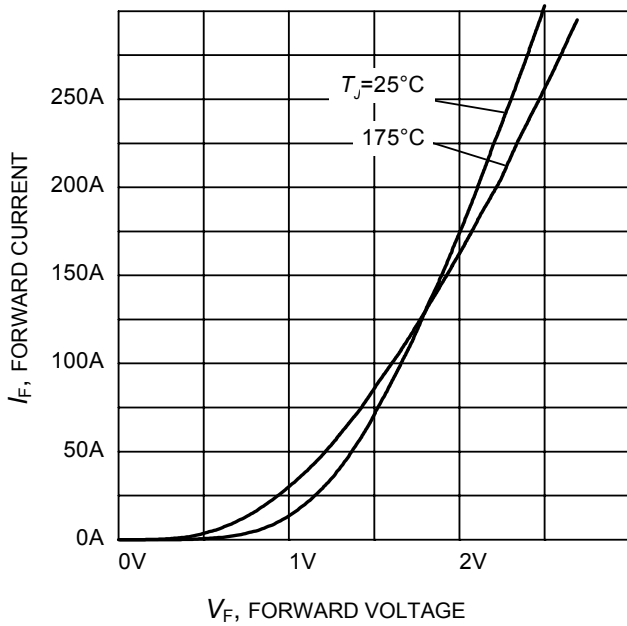


Figure 3. Typical diode forward current as a function of forward voltage

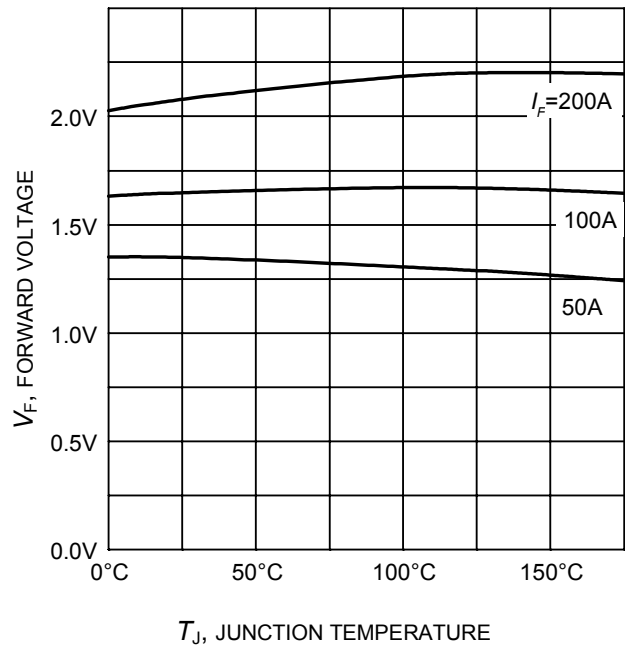
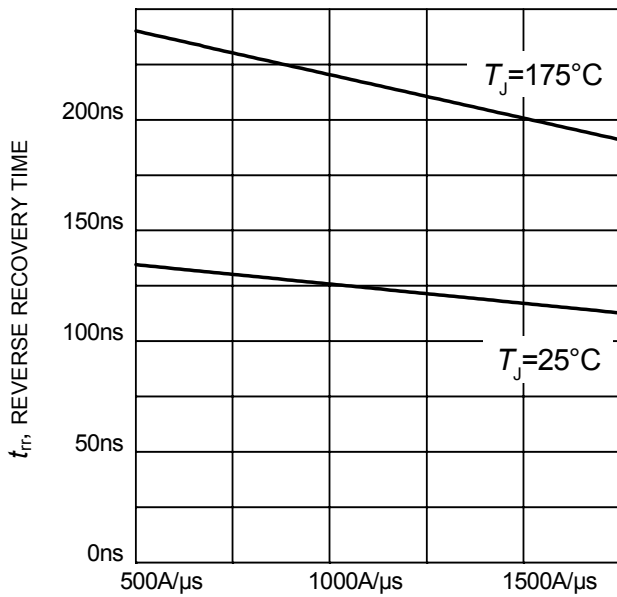
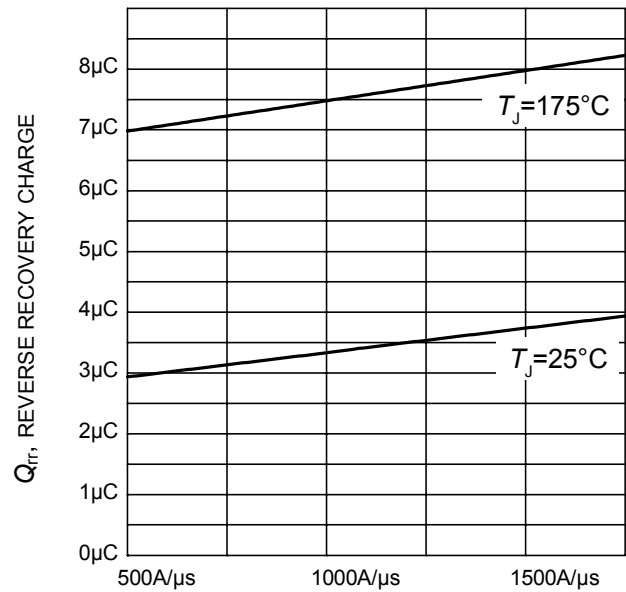


Figure 4. Typical diode forward voltage as a function of junction temperature



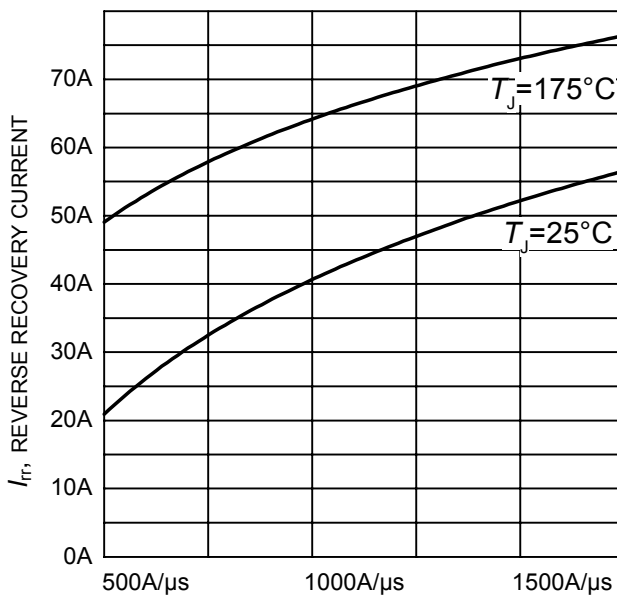
di_F/dt , DIODE CURRENT SLOPE

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



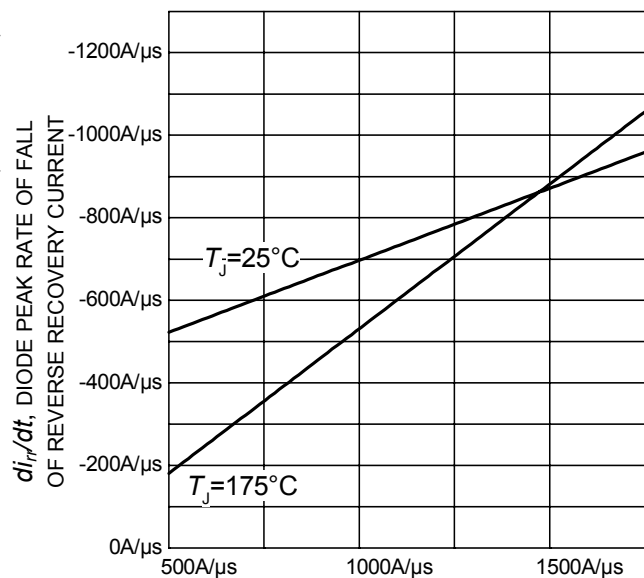
di_F/dt , DIODE CURRENT SLOPE

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)

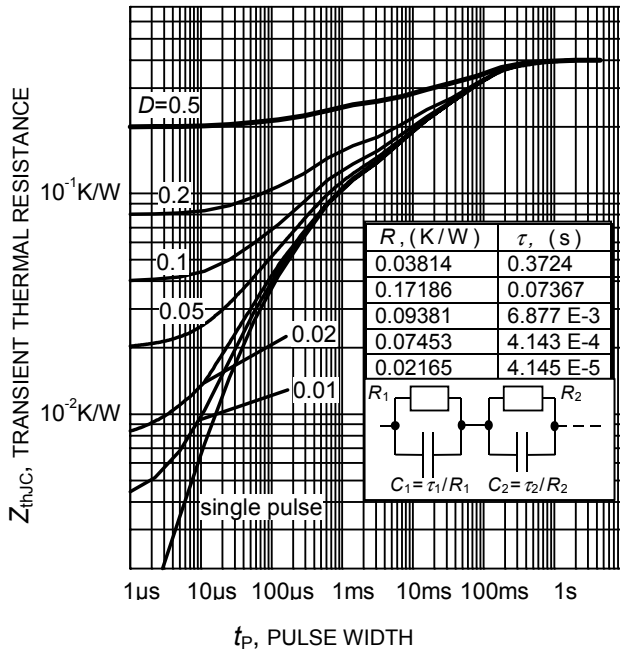
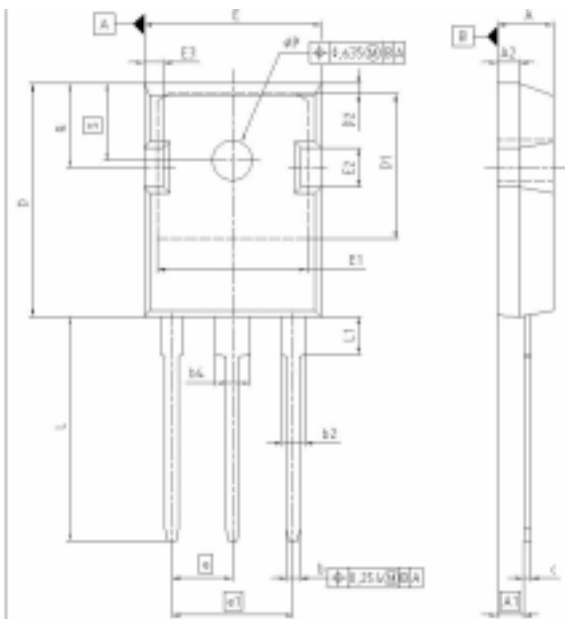


Figure 9. Diode transient thermal impedance as a function of pulse width
($D=t_p/T$)

PG-TO247-3-21



| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|--------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 4.905 | 5.157 | 0.193 | 0.203 |
| A1 | 2.273 | 2.527 | 0.090 | 0.099 |
| A2 | 1.653 | 2.107 | 0.075 | 0.083 |
| b | 1.073 | 1.327 | 0.047 | 0.052 |
| b2 | 1.903 | 2.306 | 0.075 | 0.091 |
| b4 | 2.870 | 3.454 | 0.113 | 0.136 |
| c | 0.549 | 0.752 | 0.024 | 0.030 |
| D | 29.823 | 24.077 | 0.820 | 0.890 |
| D1 | 17.323 | 17.831 | 0.682 | 0.702 |
| D2 | 1.083 | 1.317 | 0.042 | 0.052 |
| E | 15.773 | 16.027 | 0.621 | 0.631 |
| E1 | 13.893 | 14.147 | 0.547 | 0.557 |
| E2 | 3.683 | 3.107 | 0.145 | 0.122 |
| E3 | 1.663 | 1.997 | 0.065 | 0.078 |
| e | 5.450 | | 0.215 | |
| et | 10.900 | | 0.430 | |
| N | 3 | | 3 | |
| L | 20.053 | 20.307 | 0.789 | 0.799 |
| L1 | 4.166 | 4.472 | 0.164 | 0.175 |
| eP | 3.559 | 3.661 | 0.140 | 0.144 |
| Q | 5.490 | 5.747 | 0.216 | 0.228 |
| S | 6.043 | 6.297 | 0.238 | 0.248 |

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