

Tentative Data

Insulated Gate Bi-Polar Transistor

Type T0840NC17E

Absolute Maximum Ratings

| | VOLTAGE RATINGS | MAXIMUM LIMITS | UNITS |
|----------------|--|----------------|-------|
| V_{CES} | Collector – emitter voltage | 1700 | V |
| $V_{DC\ link}$ | Permanent DC voltage for 100 FIT failure rate. | 900 | V |
| V_{GES} | Peak gate – emitter voltage | ± 20 | V |

| | RATINGS | MAXIMUM LIMITS | UNITS |
|-------------|--|----------------|-------------|
| $I_{C(DC)}$ | DC collector current, IGBT | 840 | A |
| I_{CRM} | Repetitive peak collector current, $t_p=1ms$, IGBT | 1680 | A |
| I_{ECO} | Maximum reverse emitter current, $t_p=100\mu s$, (note 2 & 3) | 840 | A |
| P_{MAX} | Maximum power dissipation, IGBT (Note 2) | 2.59 | kW |
| T_j | Operating temperature range. | -40 to +125 | $^{\circ}C$ |
| T_{stg} | Storage temperature range. | -40 to +125 | $^{\circ}C$ |

Notes: -

- 1) Unless otherwise indicated $T_j = 125^{\circ}C$.
- 2) $T_{sink} = 25^{\circ}C$, double side cooled.
- 3) Maximum commutation loop inductance 140nH.

Characteristics

IGBT Characteristics

| | PARAMETER | MIN | TYP | MAX | TEST CONDITIONS | UNITS |
|----------------------|--|-----|------|------|--|---|
| V _{CE(sat)} | Collector – emitter saturation voltage | - | 2.37 | 2.65 | I _C = 840A, V _{GE} = 15V, T _j = 25°C | V |
| | | - | 2.97 | 3.30 | I _C = 840A, V _{GE} = 15V | V |
| V _{T0} | Threshold voltage | - | - | 1.22 | Current range: 280A – 840A | V |
| r _T | Slope resistance | - | - | 2.48 | | mΩ |
| V _{GE(TH)} | Gate threshold voltage | - | 5 | - | V _{CE} = V _{GE} , I _C = 28mA | V |
| I _{CES} | Collector – emitter cut-off current | - | 5 | 15 | V _{CE} = V _{CES} , V _{GE} = 0V | mA |
| I _{GES} | Gate leakage current | - | - | ±15 | V _{GE} = ±20V | µA |
| C _{ies} | Input capacitance | - | 68 | - | V _{CE} = 25V, V _{GE} = 0V, f = 100kHz, T _j =25°C | nF |
| t _{d(on)} | Turn-on delay time | - | 0.28 | - | I _C =840A, V _{CE} =900V, di/dt=4500A/µs V _{GE} = ±15V, L _s =140nH R _{g(ON)} = 2.3Ω, R _{g(OFF)} = 18Ω, C _{ge} =105nF | µs |
| t _{r(V)} | Rise time | - | 0.82 | - | | µs |
| Q _{g(on)} | Turn-on gate charge | - | 3.6 | - | | µC |
| E _{on} | Turn-on energy | - | 0.41 | - | | J |
| t _{d(off)} | Turn-off delay time | - | 2 | - | | µs |
| t _{f(l)} | Fall time | - | 0.55 | - | | µs |
| Q _{g(off)} | Turn-off gate charge | - | 2.1 | - | | µC |
| E _{off} | Turn-off energy | - | 0.7 | - | | J |
| I _{SC} | Short circuit current | - | 2100 | - | | V _{GE} =+15V, V _{CC} =900V, V _{CEmax} ≤V _{CES} , t _p ≤10µs |

Thermal Characteristics

| | PARAMETER | MIN | TYP | MAX | TEST CONDITIONS | UNITS |
|-------------------|---|-----|-----|------|-----------------------|-------|
| R _{thJK} | Thermal resistance junction to sink, IGBT | - | - | 38.6 | Double side cooled | K/kW |
| | | - | - | 67.8 | Collector side cooled | K/kW |
| | | - | - | 92.7 | Emitter side cooled | K/kW |
| F | Mounting force | 8 | - | 12 | Note 2 | kN |
| W _t | Weight | - | 0.5 | - | | kg |

Notes:-

- 1) Unless otherwise indicated T_j=125°C.
- 2) Consult application note 2008AN01 for detailed mounting requirements
- 3) C_{GE} is additional gate – emitter capacitance added to output of gate drive

Curves

Figure 1 – Typical collector-emitter saturation voltage characteristics

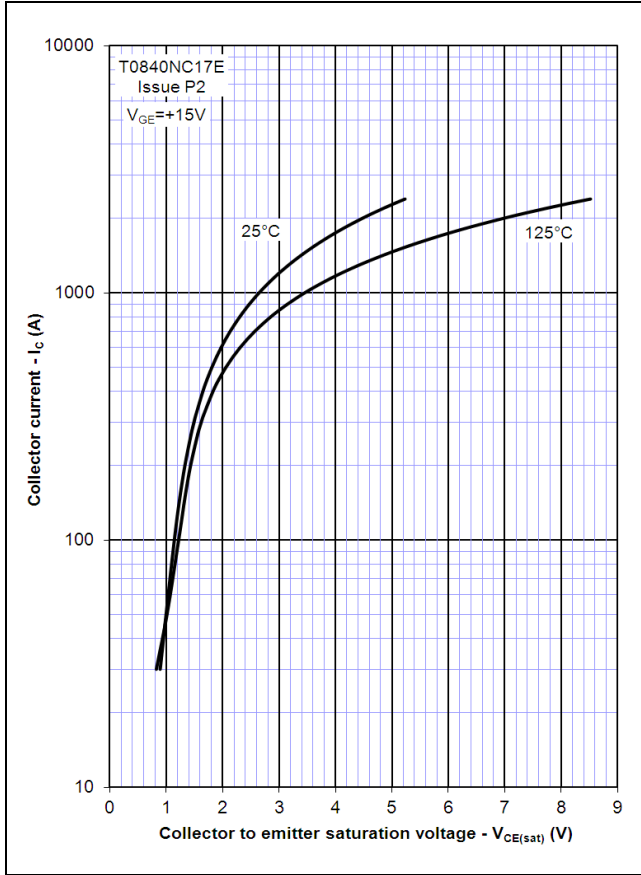


Figure 2 – Typical output characteristic

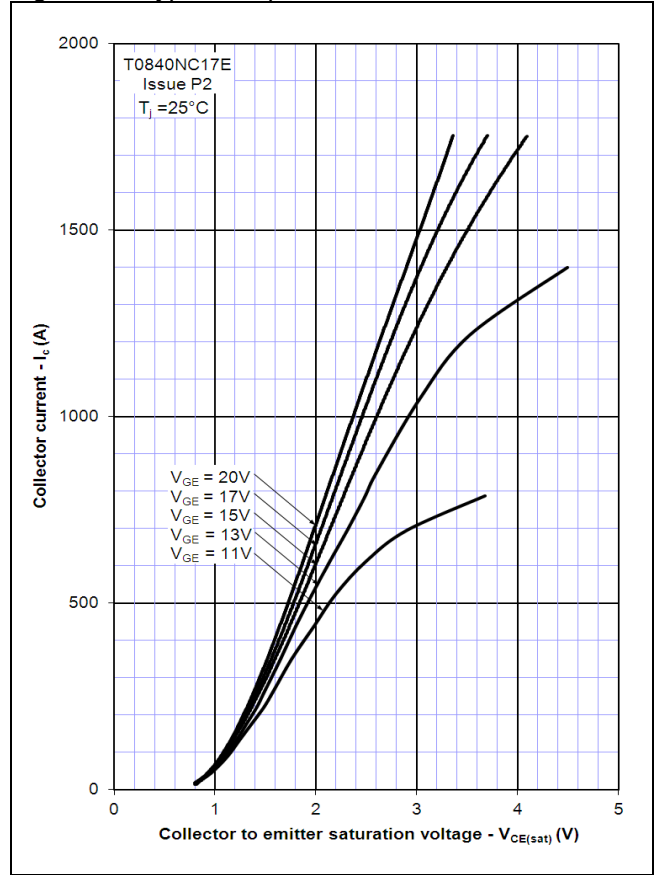


Figure 3 – Typical output characteristic

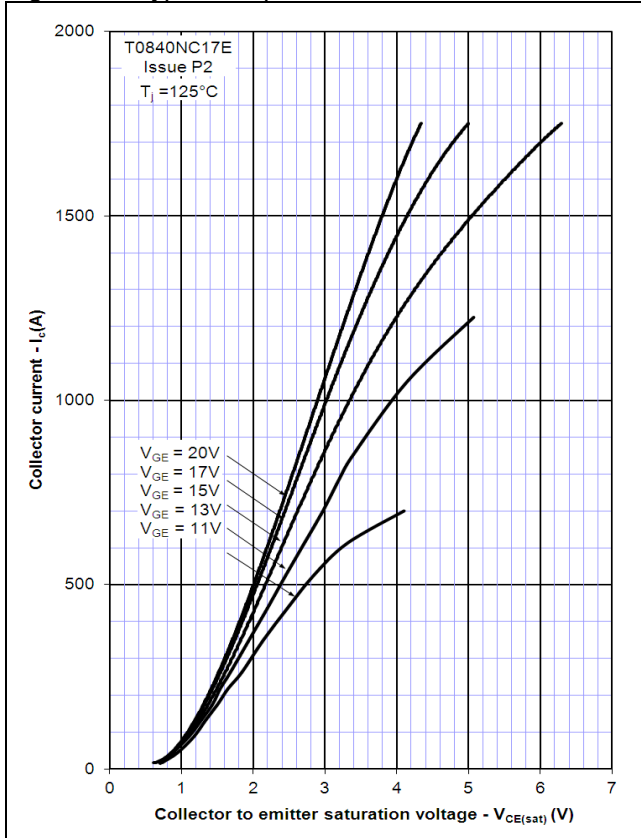


Figure 4 – Safe operating area

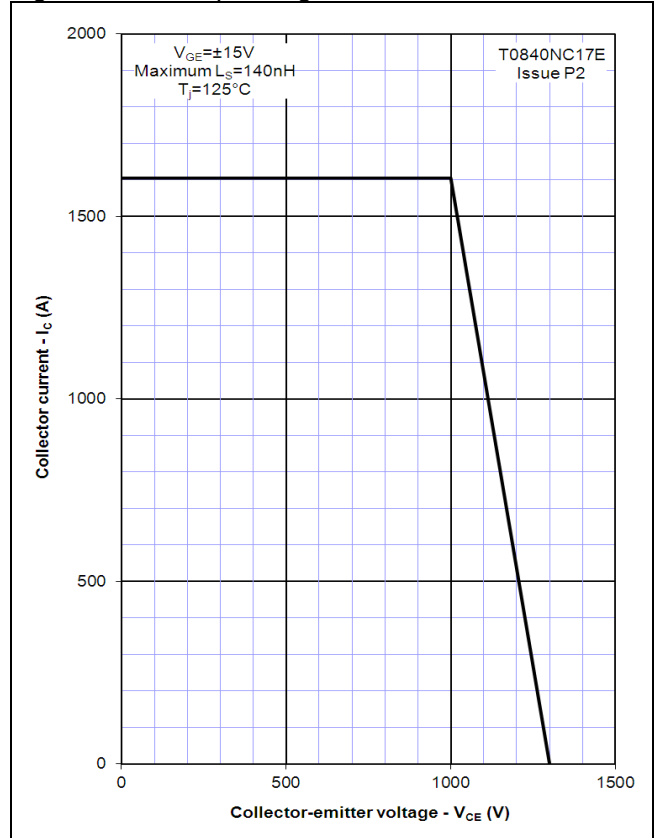
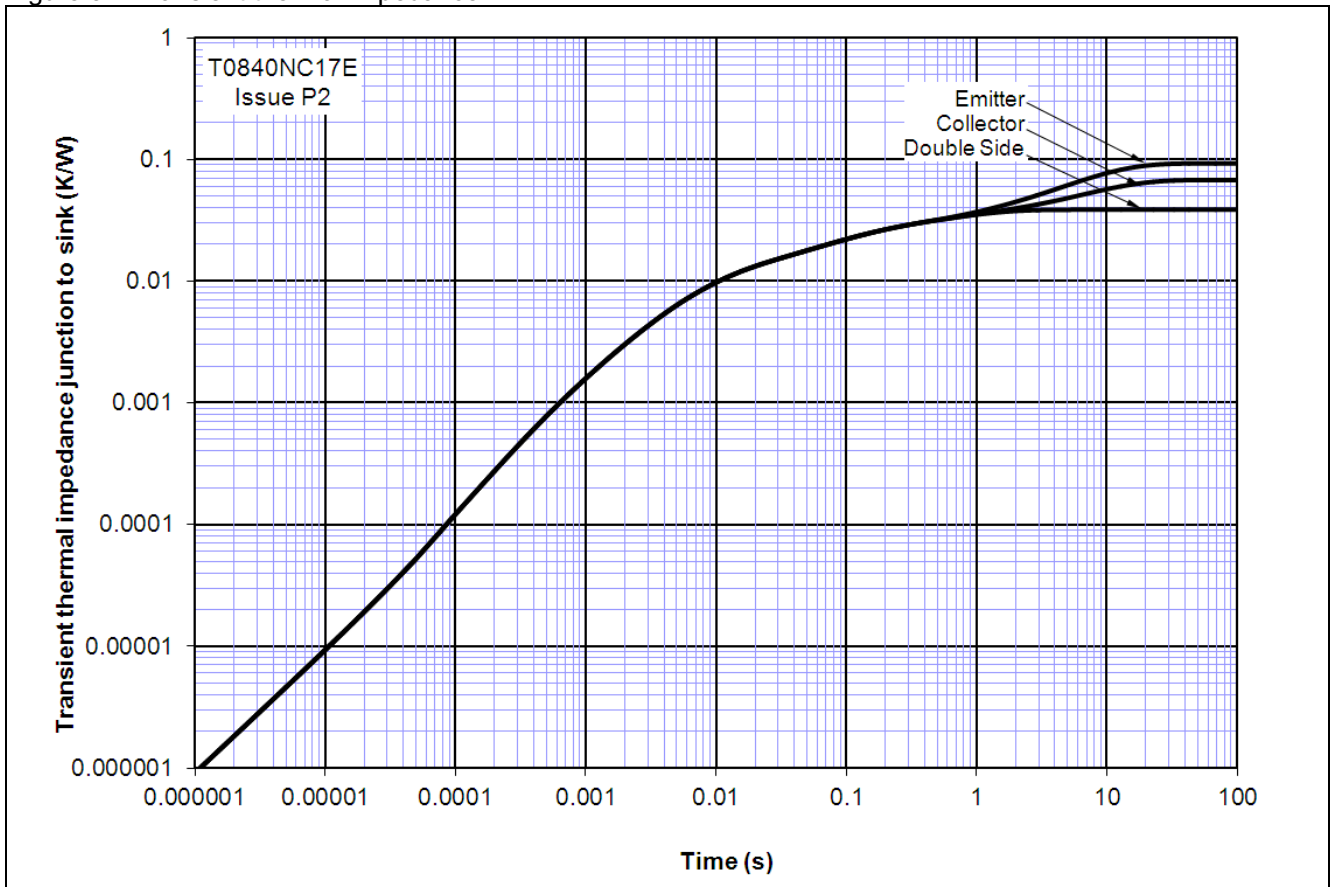
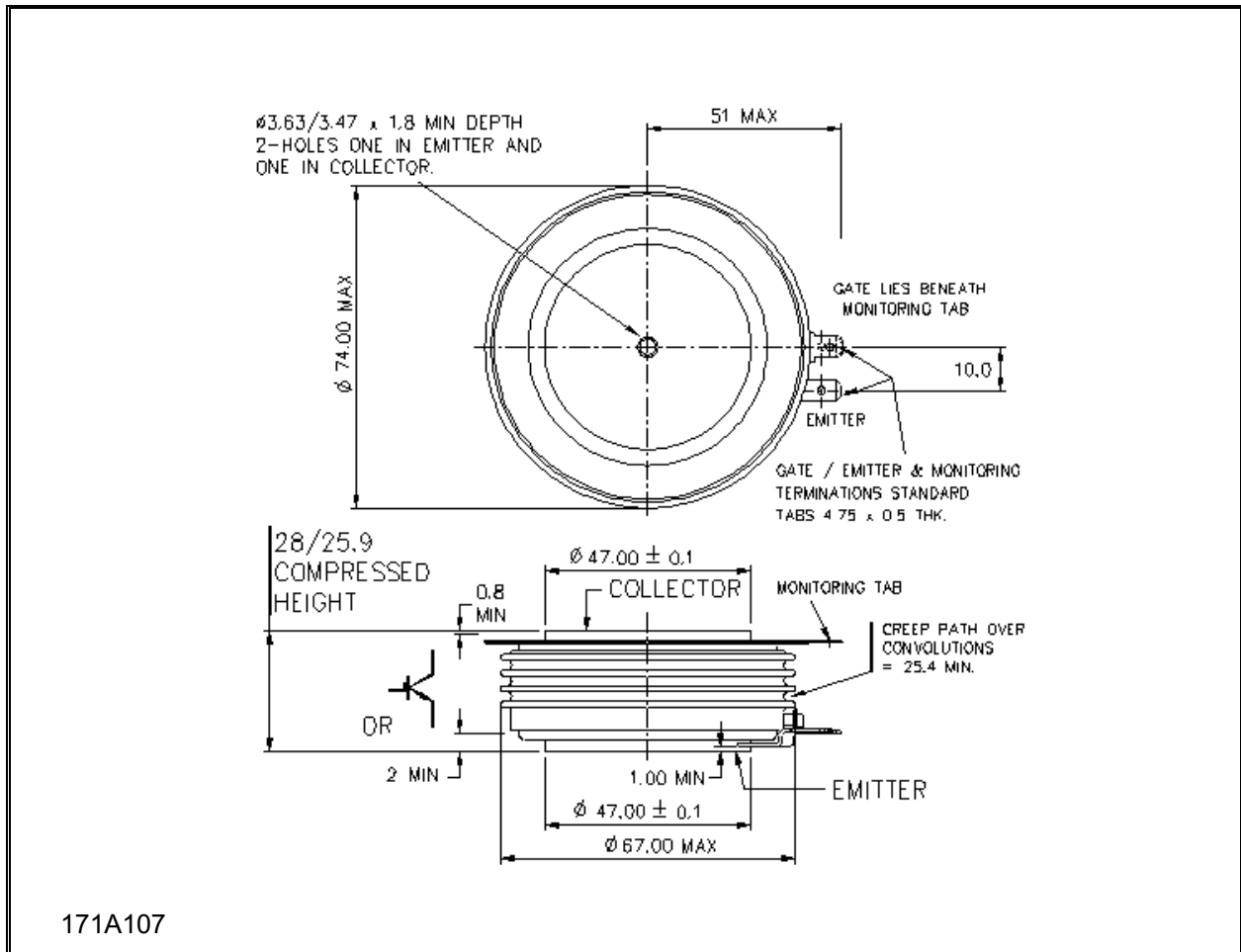


Figure 5 – Transient thermal impedance



Outline Drawing & Ordering Information



171A107

ORDERING INFORMATION

(Please quote 10 digit code as below)

| | | | |
|---------------------------------|---------------------------------|---|-------------------------------|
| T0840 Fixed type Code | NC Fixed Outline Code | 17 Voltage Grade $V_{CES}/100$ 17 | E Fixed format code |
|---------------------------------|---------------------------------|---|-------------------------------|

Typical order code: T0840NC17E ($V_{CES} = 1700V$)

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