

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

### Thermal Characteristics

	PARAMETER	MIN	TYP	MAX	TEST CONDITIONS	UNITS
R <sub>thJK</sub>	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 <sub>t</sub>	Weight	-	0.5	-		kg

#### Notes:-

- 1) Unless otherwise indicated T<sub>j</sub>=125°C.
- 2) Consult application note 2008AN01 for detailed mounting requirements
- 3) C<sub>GE</sub> is additional gate – emitter capacitance added to output of gate drive

**Curves**

Figure 1 – Typical collector-emitter saturation voltage characteristics

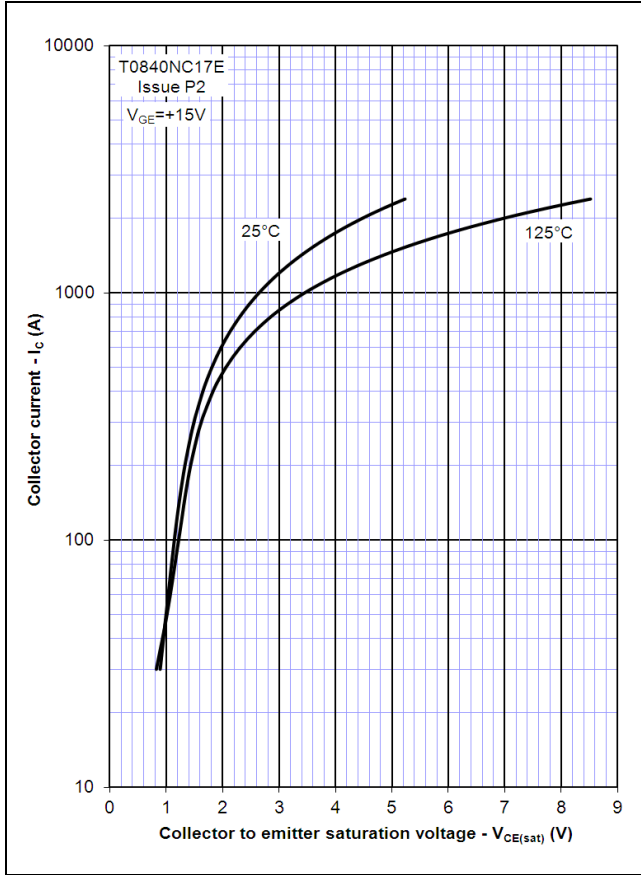


Figure 2 – Typical output characteristic

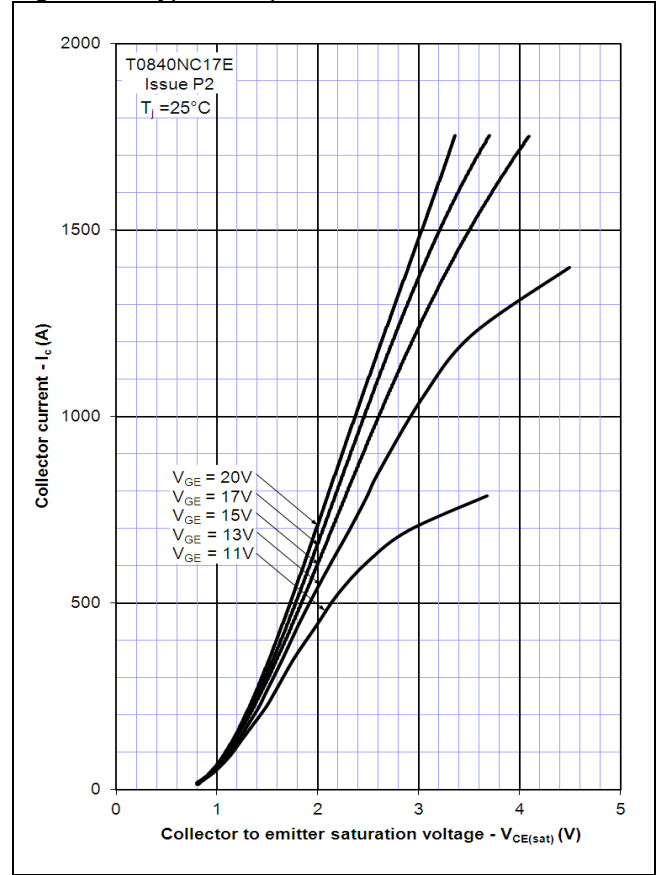


Figure 3 – Typical output characteristic

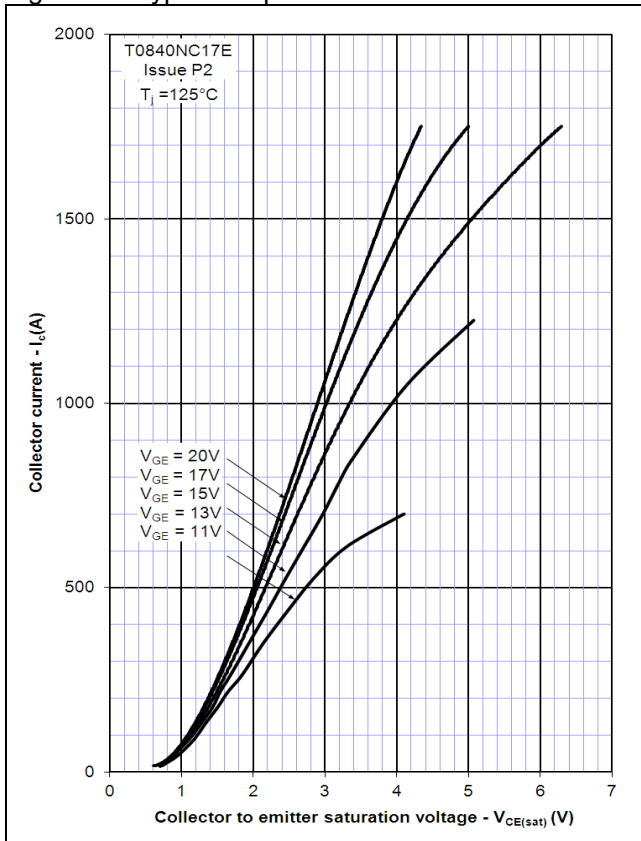


Figure 4 – Safe operating area

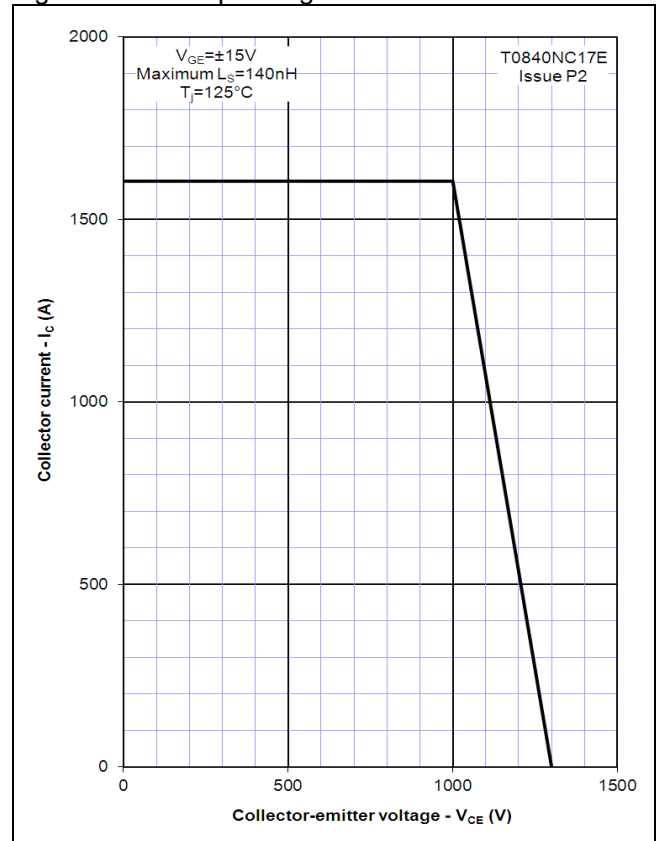
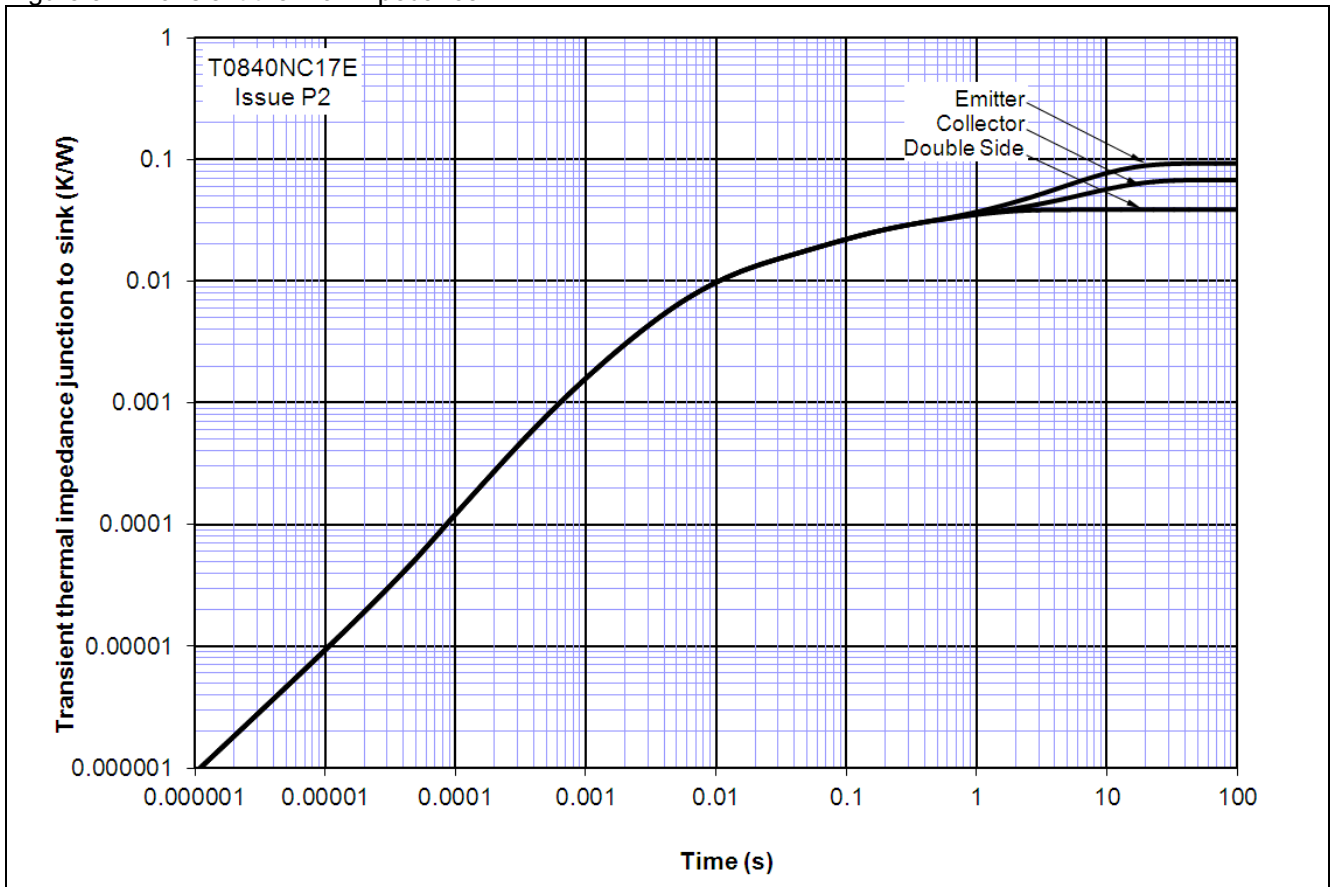
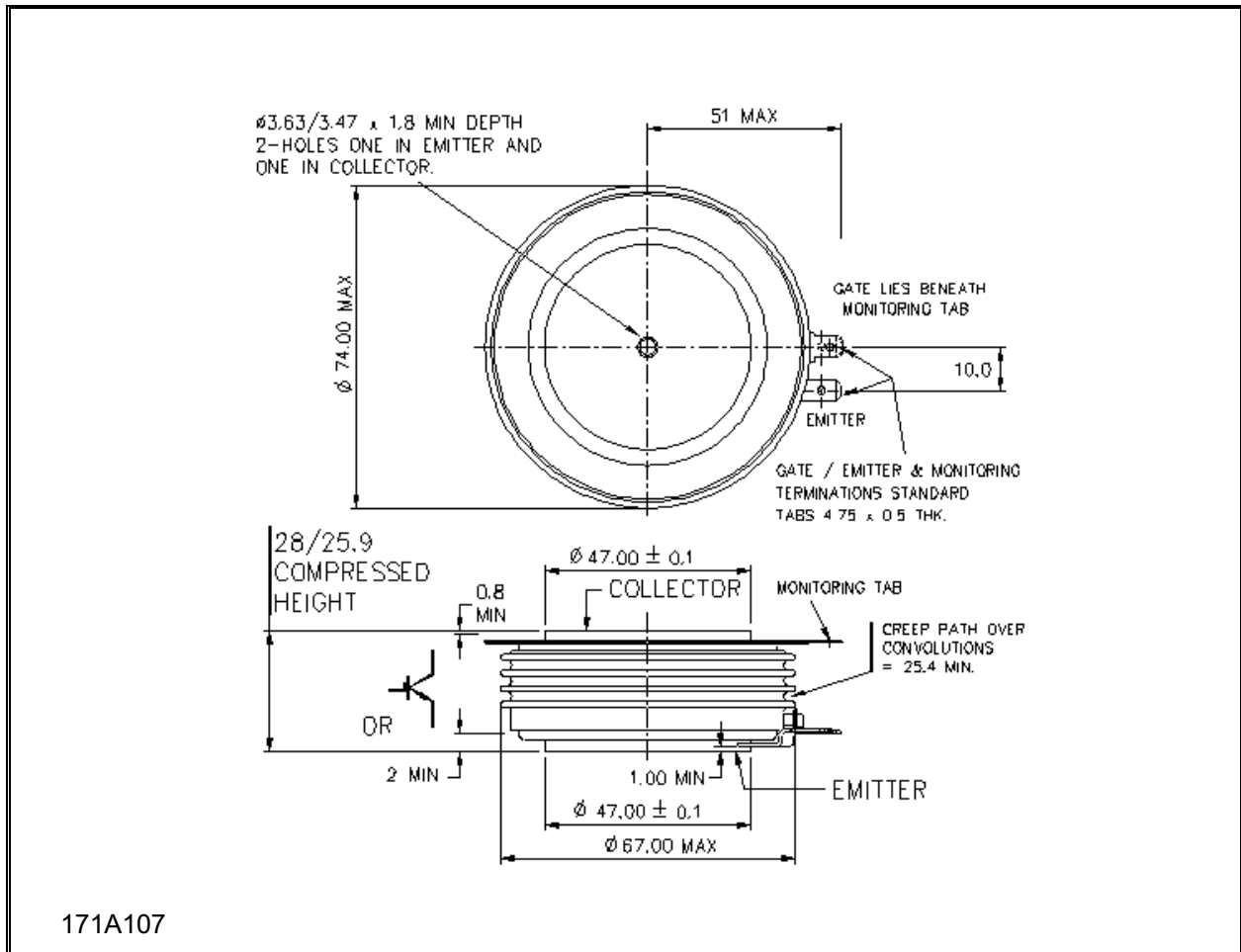


Figure 5 – Transient thermal impedance



**Outline Drawing & Ordering Information**



171A107

**ORDERING INFORMATION**

(Please quote 10 digit code as below)

<b>T0840</b> Fixed type Code	<b>NC</b> Fixed Outline Code	<b>17</b> Voltage Grade $V_{CES}/100$ 17	<b>E</b> Fixed format code
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Typical order code: T0840NC17E ( $V_{CES} = 1700V$ )

**IXYS Semiconductor GmbH**  
Edisonstraße 15  
D-68623 Lampertheim  
Tel: +49 6206 503-0  
Fax: +49 6206 503-627  
E-mail: [marcom@ixys.de](mailto:marcom@ixys.de)



**IXYS UK Westcode Ltd**  
Langley Park Way, Langley Park,  
Chippenham, Wiltshire, SN15 1GE.  
Tel: +44 (0)1249 444524  
Fax: +44 (0)1249 659448  
E-mail: [sales@ixysuk.com](mailto:sales@ixysuk.com)

**IXYS Corporation**  
1590 Buckeye Drive  
Milpitas CA 95035-7418  
Tel: +1 (408) 457 9000  
Fax: +1 (408) 496 0670  
E-mail: [sales@ixys.net](mailto:sales@ixys.net)

[www.ixysuk.com](http://www.ixysuk.com)

[www.ixys.net](http://www.ixys.net)

**IXYS Long Beach**  
IXYS Long Beach, Inc  
2500 Mira Mar Ave, Long Beach  
CA 90815  
Tel: +1 (562) 296 6584  
Fax: +1 (562) 296 6585  
E-mail: [service@ixyslongbeach.com](mailto:service@ixyslongbeach.com)

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