

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	$I_C = 840A, V_{GE} = 15V, T_j = 25^\circ C$	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		m Ω
$V_{GE(TH)}$	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	$V_{GE} = \pm 20V$	μA
C_{ies}	Input capacitance	-	68	-	$V_{CE} = 25V, V_{GE} = 0V, f = 100kHz, T_j = 25^\circ C$	nF
$t_{d(on)}$	Turn-on delay time	-	0.28	-	$I_C = 840A, V_{CE} = 900V, di/dt = 4500A/\mu s$ $V_{GE} = \pm 15V, L_s = 140nH$ $R_{g(ON)} = 2.3\Omega, R_{g(OFF)} = 18\Omega, C_{ge} = 105nF$	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	-	$V_{GE} = +15V, V_{CC} = 900V, V_{CEmax} \leq V_{CES}, t_p \leq 10\mu s$	A

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 $T_j = 125^\circ C$.
- 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

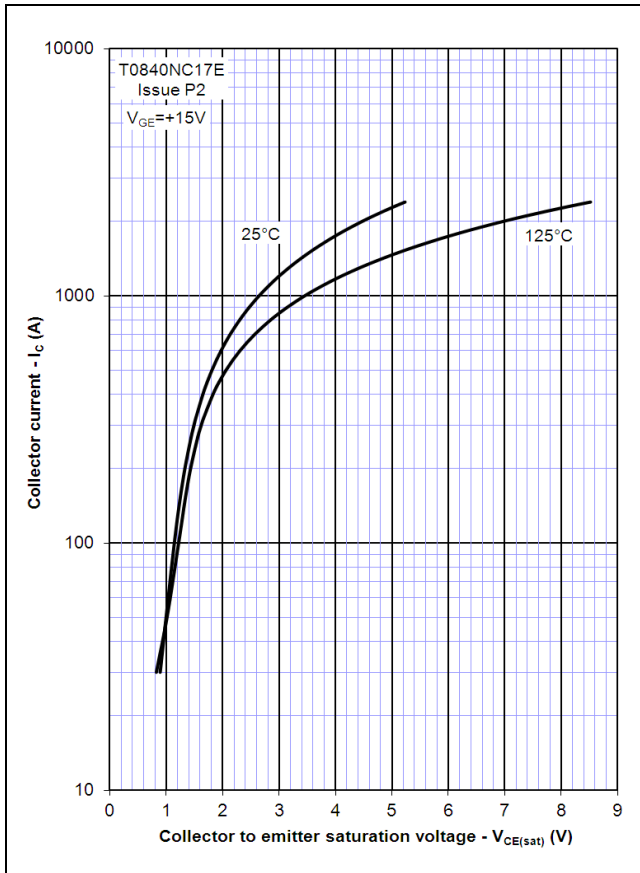


Figure 2 – Typical output characteristic

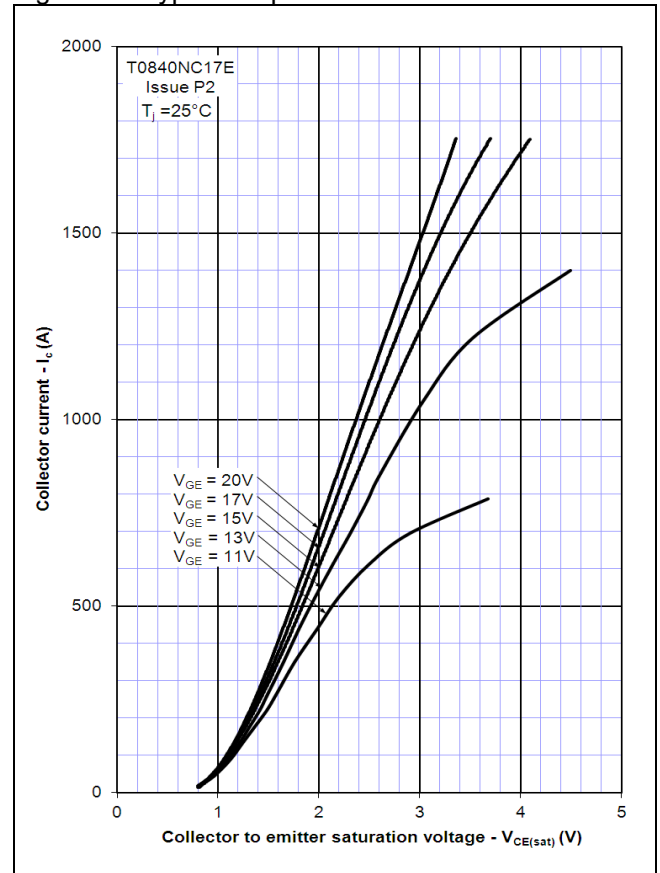


Figure 3 – Typical output characteristic

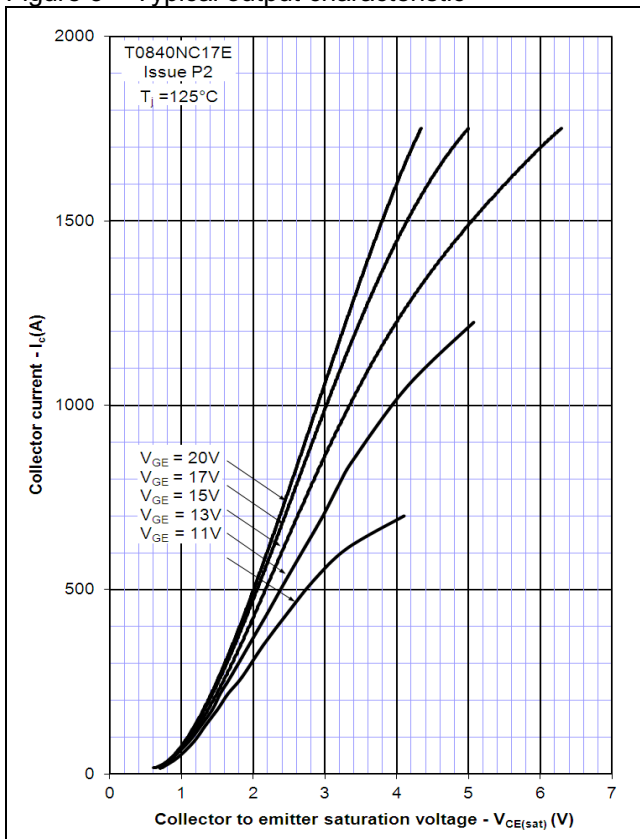


Figure 4 – Safe operating area

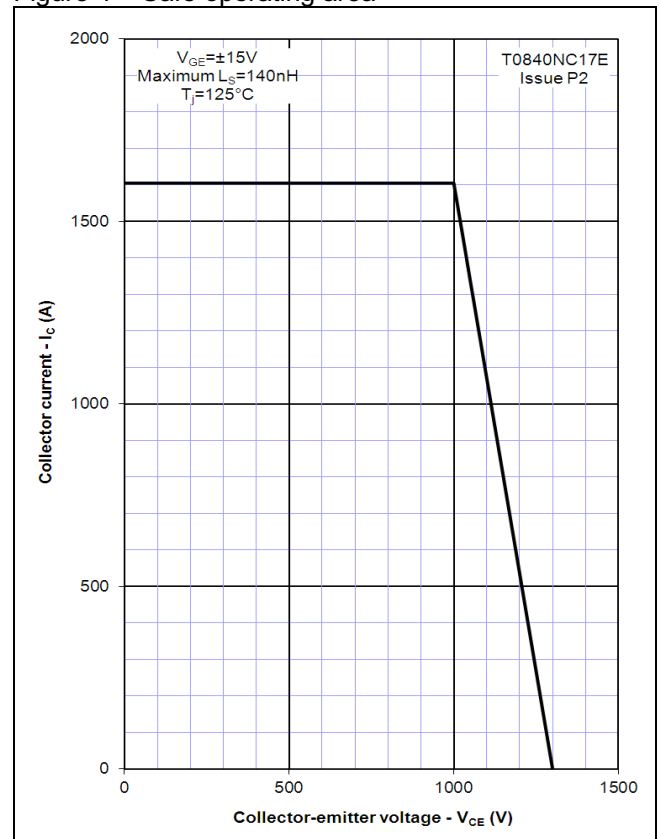
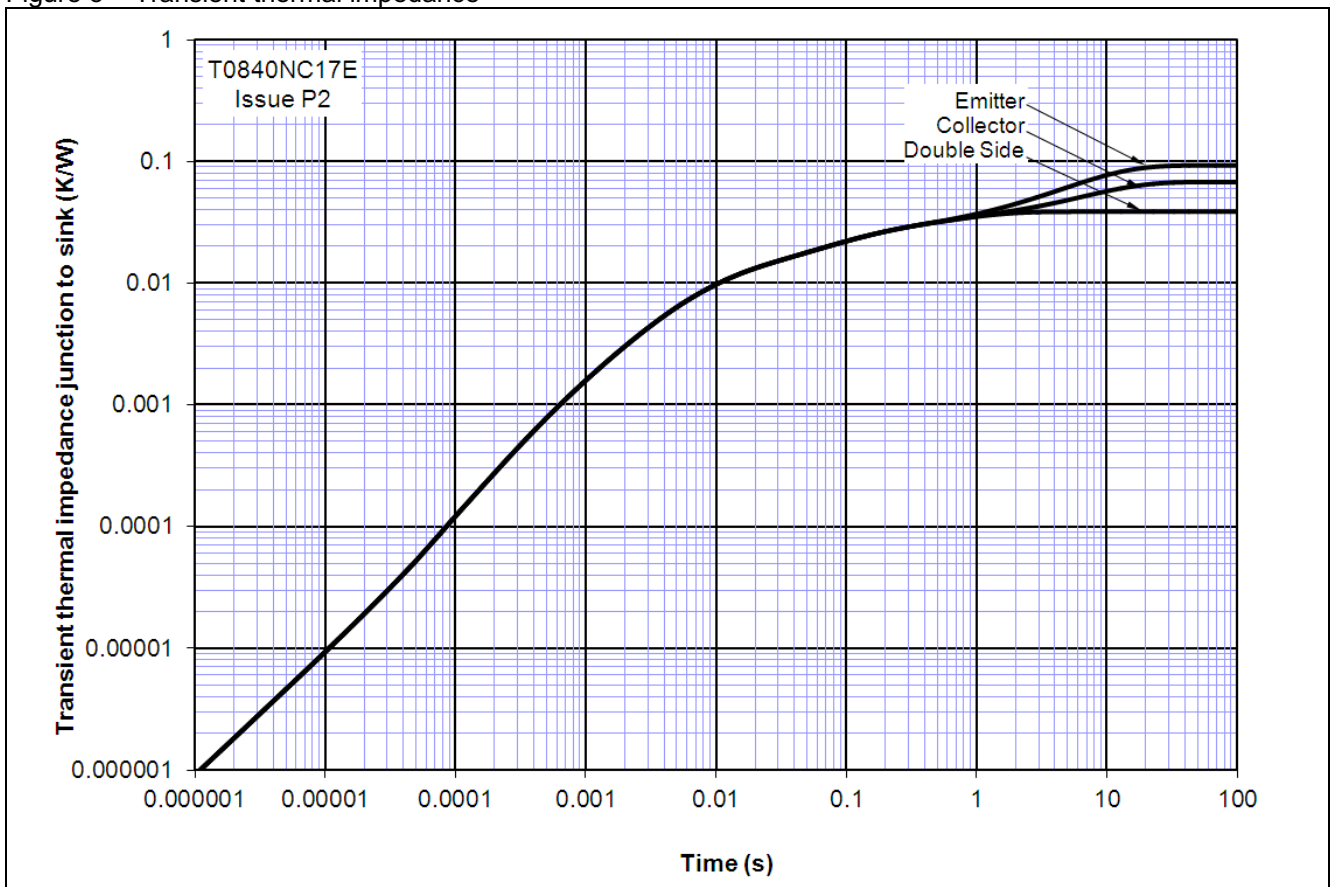
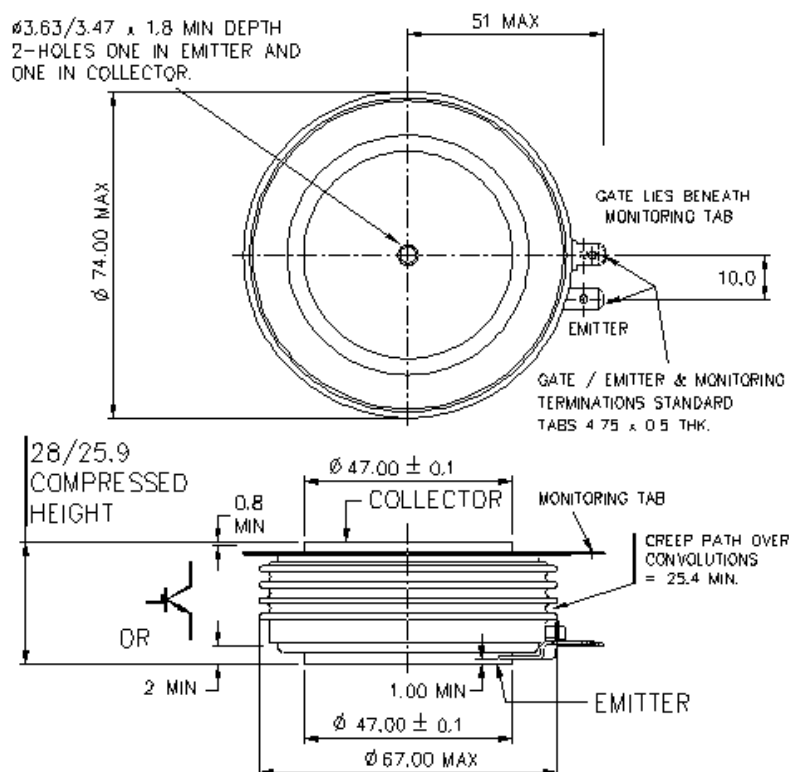


Figure 5 – Transient thermal impedance



Outline Drawing & Ordering Information



171A107

ORDERING INFORMATION

(Please quote 10 digit code as below)

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

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

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