

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

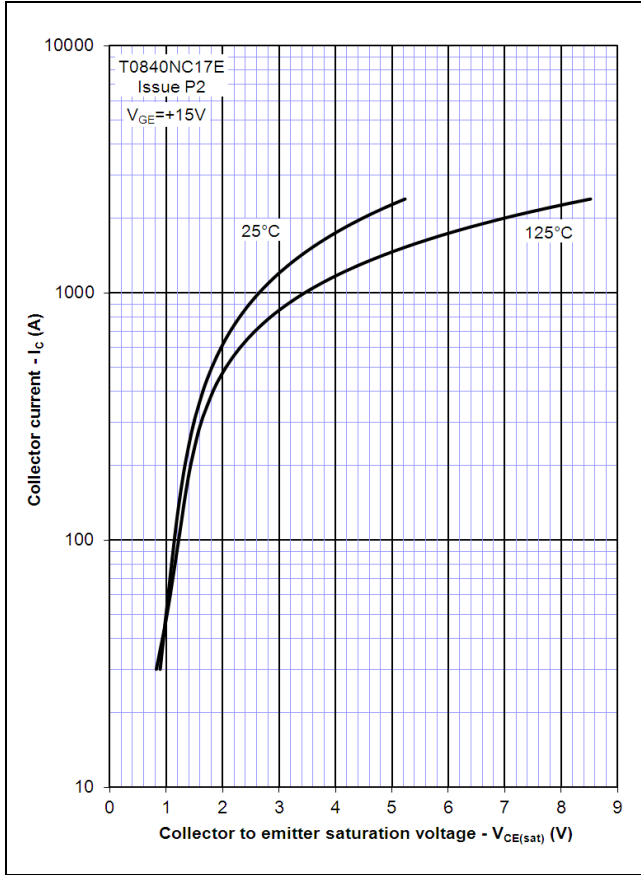


Figure 2 – Typical output characteristic

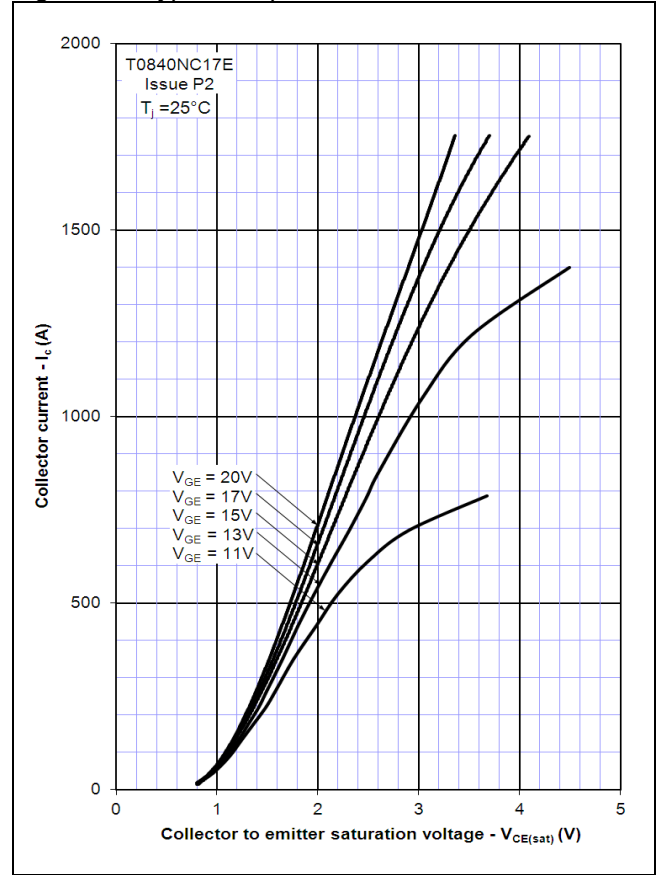


Figure 3 – Typical output characteristic

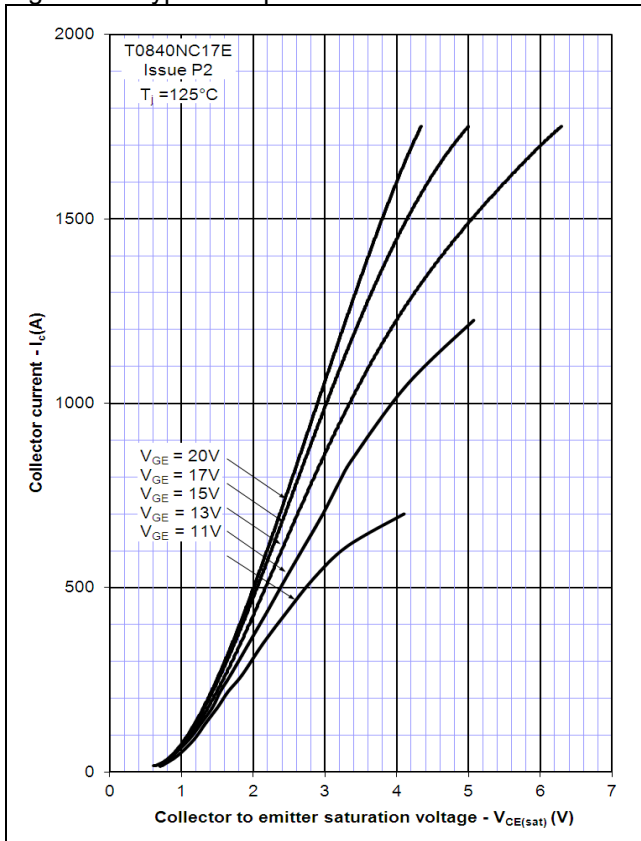


Figure 4 – Safe operating area

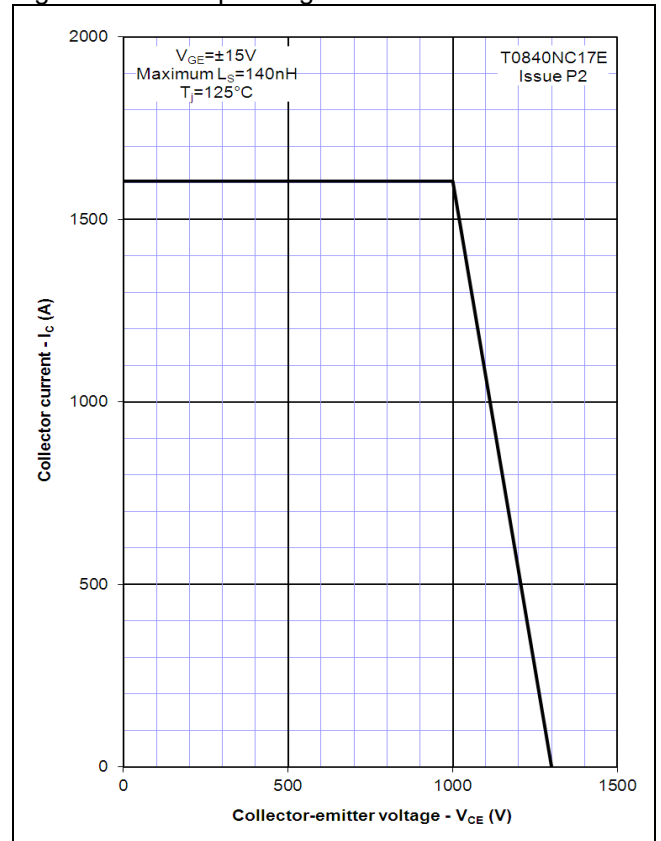
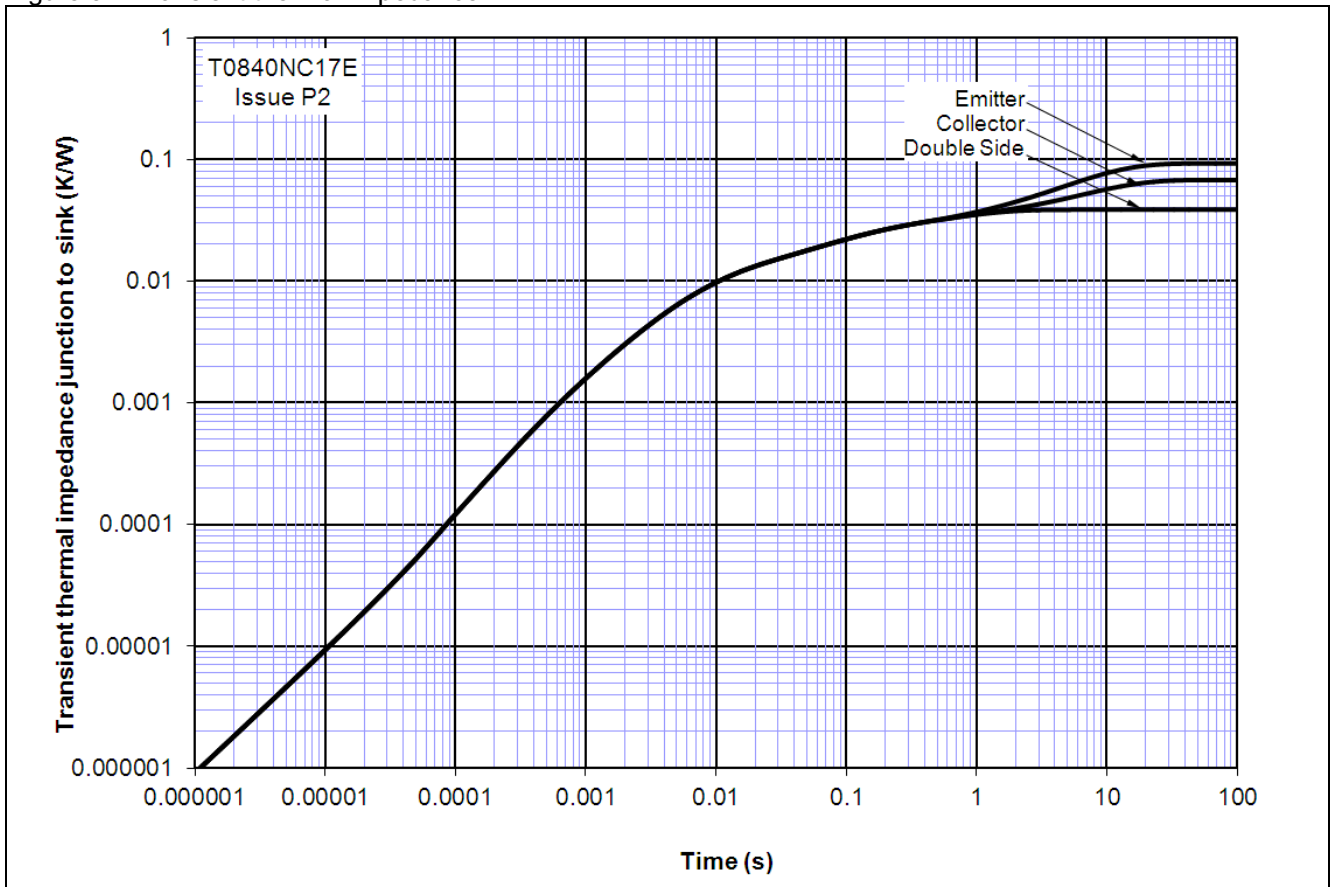


Figure 5 – Transient thermal impedance





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